City of Fort Collins Neighborhood Meeting

DATE: February 25, 2014

PROJECT: Capstone Cottages

PROJECT PLANNER: Courtney Levingston

The meeting began at 5:30 with the project planner giving a brief overview of the City's development review process, including information that this project has not yet been formally submitted, and there may be an additional neighborhood meeting held.

Question (Citizen): Will this project be processed as a Type 1 or Type 2?
Response (City): The decision maker for this project will be the Planning & Zoning Board (Type 2). Prior to the Public Hearing, another neighborhood notice will be sent out.

Applicant Presentation / Project Summary

This is a student-oriented housing, meaning the project is designed for and marketed towards students, however by law, the project is not restricted to students only.

The project site is located east of Lemay Avenue and north of Lincoln Avenue, surrounding the existing bank. The project site is slightly larger than 23 acres. A total of 182 dwelling units are proposed.

Ripley Design Inc. has represented many multifamily residential projects over the years, and we typically hear concerns in five areas: the density is too high, the buildings are out of scale, the buildings are too tall, there is not enough parking, and that the project increases traffic. We plan to show how this project addresses these common concerns.

The site currently sits on two zoning districts; Medium Density Mixed-Use Zoning on the western portion of the site and Industrial to the east. Our intention is to rezone the Industrial portion to Medium Density Mixed-Use.

The Medium Density Mixed-Use Zone District requires a minimum density of 12 dwelling units per acre. The project we're showing tonight is proposing 9 dwelling units per acre. This is below the City's requirement, requiring a modification of standard. We feel the reduced number of dwelling units is appropriate at this location.

The site plan shows lots of small buildings, rather than several larger structures. This particular developer builds what they call cottages, some single-family, some are duplexes such as two cottages building together, and some are townhomes. Many of the units have different architectural looks. The smaller scale units surrounding the project, and the 3-story townhomes are oriented and located towards the interior of the project site. All of the buildings have individual front doors and face onto

streets or greenspace. It is very much like an old town neighborhood, you do not see parking/garages from the edges.

There are a total of 841 bedrooms proposed and there is 1 parking space for each bedroom, with an additional 21 spaces beyond this. It is well parked. Parking is screened from public view.

The project contains amenities such as a clubhouse, swimming pool, and volleyball court. Walking spaces and paths are spread throughout for connections. A City sidewalk will be located around the project to connect to the rest of the community. It is easy for the residents to get to the stores and multifamily housing located south across Lincoln Avenue.

The cottages are designed to look like a single-family house. They offer a pedestrian scale, and will not dwarf the nearby neighborhoods. It will look like a single-family development in addition to the many amenities offered on-site. The buildings are not more massive than a single family home or neighborhood. There is plenty of parking for this project; students will not need to park in adjacent neighborhoods.

This project should not create additional traffic through neighborhoods. Current estimates are that 40% of the traffic generated will head west on Lincoln, 45% south on Lemay, 5% on 12th street, 5% east on Lincoln and the remaining 5% north on Lemay.

Comments, Questions & Responses

Question (Citizen): With the 5-bedroom house, how does that correlate with the Fort Collins "you plus two" rule?
Response (Applicant): The product is offered as a different lifestyle opportunity, with friends living together. Here they can do that in a controlled environment with management staff on-site. This has been popular and successful in other communities.
Response (Applicant): These have to be developed as single-family and duplex units first; after they are constructed the developer will have to apply for an extra occupancy rental license. They have to meet the requirements such as parking spaces and square footage.
Response (City): The rental license is done through Zoning with the City.

Question (Citizen): Will you be charging for parking?
Response (Applicant): Parking is typically included in the rent.
Question (Citizen): What is the rent for parking?
Response (Applicant): Rents are on a per-bed or bedroom basis, parking is included with this.
Question (Citizen): Will the parking always be with the property? Down the road will you start charging for parking spaces?
Response (Applicant): The parking will stay with the property, and be used for each bedroom rented.
Comment (Citizen): I have seen in districts around CSU that parking is being pushed further and further out into the neighborhoods.
Question (Citizen): Do you plan to add covered parking?
Response (Applicant): We do not have plans right now, but we're always looking at the market.
Comment (Citizen): I'd like for the parking to always stay with the facility, so it won't be of additional concern to the nearby neighborhoods.

Question (Citizen): You have to be able to rent to anyone, but you're marketing towards students. In your traffic study, do you factor in or account for non-student users and residents? Does this change the traffic study and will it reflect this? Will this be marketed equally to students and non-students?
Response (Applicant): The project is really designed and marketed towards students, especially as we rent on a per bedroom basis. People get keys to individual bedrooms, which include a bathroom, and then a fab to the unit itself. Typically, our marketing strategies are towards students. By charging on a per bedroom basis, it appeals to students. There will also be a shuttle service to campus. These characteristics and marketing – we predominately see from our other developments that these are for students.
Question (Citizen): This is open to non-students, but you're staying it's primarily student by design.
Response (Applicant): Anyone can rent here; it is not precluded, but given the type of housing we're providing, it's primarily students that would rent here.
Comment (Citizen): I think what they mean is that by law, the project cannot exclude non-students, even if it is designed and marketed towards students themselves.
Comment (Citizen): By function, it's excluding non-students anyway.
Response (Applicant): Given that nearly 99% of the residents will be students, the distribution we're working with in the traffic study is appropriate. If those demographics changed, you're right we would need to look at the traffic study.

Question (Citizen): Is the project going to be paying for the future Lemay rerouting?
Response (Applicant): This is not contributing towards that more than any other project that pays towards street oversizing fees.
Response (Applicant): Each of the developments pay into the City's funds for roadway work and expansion. Provision for adequate public facilities does not take away from this; it's more a policy of adequacy than adding funds to anything.
Question (Citizen): So this will not be helping pay and promote the Lemay reroute/overpass?
Response (Applicant): In the aspect that the fees collected from building permits helps, but how that is divvied up is not specific.
Question (Citizen): Will the traffic study glean some of these details?
Response (Applicant): Yes

Comment (Citizen): I have the same concern with traffic. If this project comes before the bypass over the train tracks, this is going to be a nightmare. We already have traffic accidents on a weekly basis and backups on a daily basis. This is a huge concern. Traffic needs to be alleviated.

Question (Citizen): Will the pool be available to those outside the development?
Response (Applicant): Usually it's limited to residents and their guests.

Comment (Citizen): We're trapped in Andersonville right now, and we have huge concerns with additional traffic coming in, especially with the recent Woodward project. I don't know how we're going to get out of our neighborhood. I really want to bring that to the attention of everyone here.
Comment (Citizen): I feel like the traffic situation has been largely ignored. I remember coming to a meeting when I first moved to the area 7 years ago, and traffic was brought up as a serious issue, and here we are at this time, still continuing to develop, the issue is still being brought up, and I'm not seeing that it is going to be addressed.

Question (Citizen): You talk about traffic on Lemay and Lincoln, but what about on Duff, International and Webster?
Response (Applicant): International and Duff will be extended into the site. We can't connect it over to Lemay now because of the planned swing of Lemay. The City may require an escrow for the extension. This is an interim solution. The rest of Duff Drive will likely be funded by this development. We will be required to pay our local street frontage.
Question (Citizen): What will be the impacts to the businesses?
Response (Applicant): What will happen is the western portion of the Industrial park currently has to go east or south to eventually head west. With the new connections, a portion will have the opportunity to use these new road extensions and that is included in the traffic study. We estimate how much traffic will do that, such as for those segments of International.

Question (Citizen): I am a business owner in the business park. Webster and Duff drive, they will be connected to this development?
Response (Applicant): Yes.
Comment (Citizen): The businesses in the area just collected a quarter million ourselves to fix the streets, and we have concerns over the increase in traffic. We have people showing up and we don't know who they are or what they're trying to access, this was a frequent occurrence after the Bull Run Apartments were constructed. People are going to go through our area; it's the path of least resistance. This is concern for many business owners in the area. We paid for these streets, and now the traffic is going to tear them up.
Response (Applicant): The expectation is that Duff and Webster will likely help the business park more than hurt, because the people working in the western potions will not have to take Link to get to Lincoln. The residents of this development, the students, will find it time-consuming to go east, to eventually go west. It's going to be easy to go down the extended International and take a right turn to go to campus.
Comment (Citizen): I was late for the first part of the meeting because I was sitting in traffic. It's bad right now, what is it going to be like when we put another 800 people and cars out there?
Response (Applicant): The traffic study takes into account current conditions.

Question (Citizen): Are you going to put a light in there at International?
Response (Applicant): No
Comment (Citizen): They will use our access because we have the stoplight.
Comment (Citizen): Duff is a failed intersection. That traffic light gets wiped out at least once a year from the trucks trying to make the turn. The trucks will see an easy way out through the apartments; you may have a lot of truck traffic coming through.

Question (Citizen): What is the future of east/west Vine, and how will that shape the future?
Response (Applicant): The future plan is that Vine will be downgraded after the overpasses and New Vine are built. Lemay will also be altered, although final details are not yet set. Connectivity from anything east of Lemay and Timberline is hard to say due to the ground characteristics, such as wetlands.
Question (Citizen): What do you think will come first? Lemay or Vine improvements?
Response (City): They are tied hand-in-hand, each affects the other.

Question (Citizen): Why would you not complete the traffic study prior to the neighborhood meeting? When it's presented at the public hearing, people have no time to assimilate that information on the spot.

Response (Applicant): The traffic study is underway.
Comment (Citizen): That doesn't help the people who came down tonight with all these questions if the traffic study isn't completed.
Response (City): The neighborhood meeting is a required step prior to formal submittal, which includes the traffic study. The meeting is held early in the process to hear neighborhood concerns and solutions and give the developer opportunity to make changes.
Question (Citizen): If the traffic study is already underway, share it with the public.
Response (City): Once the project is submitted, the public can look at the traffic study; there will also likely be another neighborhood meeting.
Response (City): Matt is out gathering data and background statistics right now, and we will sit down and scope the project for the information we need; we still need to do that.

Question (Citizen): When you reviewed the traffic study for Woodward Governor, what was the service level for Vine and Lincoln and Vine and Lemay?
Response (Applicant): Vine and Lemay is operating at level of service D.
Response (City): Lincoln and Lemay is a B condition, overall.
Comment (Citizen): I represent some applicants on Vine and Lemay. He told me it will remain a local street, and that's in the master street plan. They are planning on pulling traffic away from the existing Vine with the New Vine buildout. They are going to go hand-in-hand with one another (overpasses over the railroad tracks).

Question (Citizen): What is the frequency of the shuttle going to be?
Response (Applicant): Typically 20 to 30 minute headways, but still working on final details.
Question (Citizen): How late will it run?
Response (Applicant): Typically it runs from 7am to 5pm or 7am to 7pm, and sometimes there are night shuttles to downtown.
Comment (Citizen): The best model to look at is Ramblewood near Poudre High School. They started I believe in 1971 and it's the most successful one. You will want to look at their model and really focus on it. The neighbors are right that you are going to have spillover traffic into this neighborhood. There is some opposition because neighbors are worried about gentrification of the neighborhood, and the traffic. I had to wait at the same intersection for two light cycles to get here; it took me 20 minutes to get here and I don't live that far away. This development compounds all the traffic, especially with Woodward coming in. Vine and Lemay need to get done, but we don't know when those improvements are going to come in. I recommend you include the neighborhoods as much as possible, the earlier speaker asking for this to be opened up to the neighborhoods is correct.

Question (Citizen): It seems like traffic is on the minds of many here. Is Capstone planning to have a direct transportation pathway from the project straight to CSU?
Response (Applicant): Yes, there will be a private shuttle that goes from the development to CSU.
Question (Citizen): Are you improving Lincoln Avenue, like they are planning?
Response (Applicant): Any improvements that will be needed will come after the traffic study is completed.
Response (Applicant): Lincoln will not look like it does right now.

Comment (Citizen): With traffic going through the industrial area, I know students normally wouldn't go through there on the way to CSU, but consider Miramont gym and their heavy use of that facility.

Response (Applicant): There will be a full-service gym in the clubhouse, including tanning, sauna, study rooms, computer rooms for the residents to use. Hopefully this will keep that type of traffic down as the amenities are already located on site.

Question (Citizen): How does student housing affect property values for nearby neighborhoods?
Response (Applicant): I do not know the effect of property values. I would encourage you to ask real estate professionals. My own experience is that something brad new and new development in an area can raise property values.
Comment (Citizen): I am a real estate agent and it can go several ways – values can go down if the property isn't properly maintained. I'm going to guess it will be neutral for now, because we don't have a strong community experience with this kind of development. One worry could be gentrification for the nearby areas. If Lemay is built, you will have some buffering, and as long as traffic quality and quantity is maintained it could help.
Comment (Citizen/Consultant): The cottages are a night and day difference versus one or two large multifamily buildings that you typically see. The company has a reputation for maintaining their developments.
Comment (Citizen): There is another project similar to this called Aspen Heights. I have listings over there; Aspen Heights is the nearest comparable example to this project. They will follow a similar pattern. Looks at Aspen Heights if you want to see something similar. It's about 650 bedrooms plus or minus, and this is 841, so this is about 25% larger.

Comment (Citizen): The community missed an opportunity with Aspen Heights for multi-modal transportation opportunities. Right now is the time to enhance these transportation opportunities for this part of town. I encourage the community to get involved early and create pathways to help alleviate and motivate people to stay out of their cars.

Question (Citizen): Are there other communities you have building around the country?
Response (Applicant): We have developed about 14 cottage-style communities throughout the country.
Question (Citizen): What have you learned? What mistakes did you find and what adjustments did you make as you built these communities? Where are these communities?
Response (Applicant): Our website has a full list of all our communities, but they are everywhere from New Hampshire to Florida to Texas.
Response (Applicant): The unique thing about cottages is the sense of pride in ownership that students take versus the typical flat-style apartment complex. If a bush dies in front of their cottage, we hear about it immediately and they call us to come fix it. This helps the development stay looking nice. We also enforce things, such as fines for trash left out; because we also have an interest in keeping it look nice.
Response (Applicant): The site plans have improved over time. Our first community we didn't have things like parallel parking, and now we make sure we have enough parking along the roads. We also create the sense of community and connectedness by creating the grid through the development to connect with the rest of the community. You're creating the neighborhood and a sense of place.

Question (Citizen): How are your utilities handled?
Response (Applicant): Typically we sub-meter for water. Utilities usually are paid by the resident. Sometimes we provide it as a package, but with a cap or limit on the amount.

Question (Citizen): What is your onsite management like?

Response (Applicant): We will have five full-time employees, and one of those individuals typically lives on-site. We also try to work with local police departments to try and have more of a presence on site, sometimes even having a police officer live in the development and ask them to patrol at night. Then if there are complaints there is someone already on site.
Response (City): We will need to follow-up with the police about patrolling/an on-site officer and update that in these neighborhood meeting notes.
Response (Applicant): Some jurisdictions don't like that arrangement; in that case we would still have a courtesy manager to serve as the first point of contact if someone were to occur in the evening.

Question (Citizen): Is there any environmental or sustainable design elements? I don't see south-facing windows, or solar panels on the clubhouse. These are things that are going to make you look good in this community. If it's just a place to make money off people living in your houses, if you really show the Fort Collins community that something is progressive and provides value to them and the community they can support this.
Response (Applicant): Our target market cares about sustainability. There are lots of practices we put into the cottages to make sure they're sustainable, such as the way they are constructed, the insulation used, the appliances are efficient. We want to make sure they're energy efficient, even from just an operating standpoint.
Comment (Citizen): I'd like to see something more. If you look at something perhaps like carports with solar panels.
Comment (City): Another trend we're seeing is room and space for community gardening efforts.

Question (Citizen): Are you leasing per unit or per bedroom?
Response (Applicant): Per bedroom.

Question (Citizen): How does the future Lemay Avenue connect into old Lemay?
Question (Citizen): How far are they moving Vine ("New Vine")?
Response (Applicant): New Vine will be about 1,000 feet to the north of existing Vine Drive.
Response (City): The realignment of Vine starts east of Timberline and goes past Lemay and then will connect over to College. There will be a new alignment, a jog, of Lemay Avenue. The current roadway is straight, and with the realignment it will curve and begin to rise in elevation for an overpass over the train tracks. The existing section of Lemay will be downgraded to a local street. The existing portions of Vine will become local and collector designations.
Comment (Citizen): The existing connections will change, but there are no concrete details of designs yet.

Comment (Citizen): The Andersonville community was under the impression that with the overpass, the old Lemay would dead-end at the tracks. We would like that to happen so that trains are not actually crossing a street and so there is no need to use their horns.
Response (City): The purpose is ultimately mobility. There has been nothing officially determined or set at this point. Final determinations still need to be made.
Comment (Citizen): The honking is really loud and definitely a concern for the neighborhood.

Question (Citizen): When is the City going to deal with the train? They're allowed to carry stuff through town that isn't allowed on roads. The noise is related to the fact they're still coming through. They don't even have a stop in town except for Budweiser. Why don't we use our strength as a community to effect change and ensure our safety?

Comment (Citizen): A lot of this has to do with the power railroads have, starting with the Railroad Act of 1847. There have been previous discussions to move the tracks and routes east of the Front Range, but all the communities north of Denver would have to agree and help pay for the move.
Comment (Citizen): I would like to hear from the City. What we're talking about in Fort Collins, is a reasonable expectation of safety for its citizens. I don't want to see anyone hurt from a spill or derailment. Things could be wiped out in an instant. We need to have a conversation to help them (railroads) before more efficient. We need some leadership in transportation.
Response (City): Conversations have been ongoing, but we have to win the political fight first, and then pay money to help the railroads move. This is a very large discussion.

Question (Citizen): This area is a floodplain, and we've had to address drainage and other issues ourselves, has any study been done to make sure this won't negatively affect surrounding neighborhoods?
Response (Applicant): There is a comprehensive drainage study and report that is required for the project. The Lincoln channel has had some drainage difficulties. The City has exhaustive stormwater requirements that will have to be satisfied as it progresses through development review.
Response (City): We typically require onsite detention and LID to be incorporated into projects.

Comment (Citizen): If you compare this project to the District at CSU or The Summit, I like what they have done compared to previous student housing projects. Parking is a big thing – you are taking into account you need to provide more parking compared to some of the problems we've seen at other student housing developments. I recommend working with the neighbors and their residents, you definitely have some folks with concerns.

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NEIGHBORHOOD INFORMATION MEETING SUMMARY

PROJECT: Capstone Cottages PDP

DATE: July 24, 2014 (2nd Neighborhood Meeting)

LOCATION: City of Fort Collins, Streets Facility Training Room

PROJECT PLANNER: Pete Wray

Project Planner Presentation Summary:

The Capstone Cottages Project Development Plan (PDP) is in the process of staff review. This neighborhood meeting represents the second neighborhood meeting for the project this year, after the first meeting held in February. The purpose of the meeting is for nearby residents and neighbors to ask questions, and provide additional feedback and input about the project as it continues to evolve. The applicant is here tonight to share information and the changes that have occurred since the last neighborhood meeting.

The discussions tonight are being recorded, not verbatim but reflecting a summary of the notes taken. This summary will be shared with citizens who attended the meeting, and the decision maker for the project, the Planning and Zoning Board.

Applicant Presentation Summary:

Capstone Collegiate Communities is the developer of the project. The applicant, represented by Linda Ripley with Ripley Design as consultants, provided a general overview of the project and changes since the and 1st neighborhood meeting and initial submittal.

The project site is located north of Lincoln Avenue and east of Lemay Avenue. The project proposes student housing that will include approximately 180 dwelling units. The consultants have done a lot of student housing projects and some of the questions and concerns they often hear are: the density is too high, the building is too large or out of scale, the buildings are too tall, there's not enough parking, and increased traffic. The presentation focuses on how this project responds to these concerns.

The site has two different zone districts. To the west is Medium Density Mixed-Use Neighborhood District (MMN), requiring a minimum of 12 units per acre. The other portion of the site is zoned Industrial (I). As part of the project, a rezone request of the Industrial zone to Medium Density Mixed-Use is proposed.

Several changes have occurred since the first plans were shown in early spring. In the spring, the proposal was for underground detention, the extension of Duff Drive would stop at mid-block only to allow access into the development, and a normal T-intersection was proposed at International and Lincoln. New changes have been

proposed that show the former T-intersection as a roundabout, as it has been determined a roundabout is the best solution for this intersection given its proximity to the Lincoln and Lemay intersection. The other changes are that the land east of International is now reserved for above-ground detention to hold the stormwater for the entire project and that Duff Drive will now continue west to a cul-de-sac at the future intersection with the realigned Lemay.

With the proposed extension of Duff, it is now so close to the neighborhood, there is an opportunity to provide a vehicular or pedestrian connection, or both. On those days when traffic is backed up on Lemay and you can't get out, this would provide a back-door. It would be an informal, interim street until the future Lemay was built. In order to do that, the developer would have to purchase the land, but if the neighborhood is interested in this, they is willing to negotiate for the land – the applicant is looking for feedback tonight if this is a good idea or bad idea. The applicant is also looking for input on the roundabout as the project moves forward.

Since the previous plan, the units on the east side of International are now gone because of the detention and roundabout. The applicant has concluded they are going to have to incorporate some of those units back into the rest of the project for it to remain feasible. There are many variables with the number and location of units, and this could still shift. Once project details are formalized further, the applicant will come back and have another neighborhood meeting to show revised plans.

The units being proposed as a part of the project include single-family cottages around the project perimeter. These units would have 5 bedrooms. There are also plans for duplexes, with two units adjoined. Each unit reflects a 2-story, single-family scale building. In the center, around the clubhouse there is a 3-story townhome project. This is interior to the project. Overall, there will be approximately 180 units with the intent that it blends into a single family neighborhood.

There are multiple unit types, and within the same type of units such as the single family units, they also vary in architecture. The look is very similar to a single family neighborhood in terms of architecture, size, scale, and orientation to the sidewalk. There will be many amenities provided at the clubhouse in the center.

Early on, as part of the traffic study, it was determined about 40% of the traffic would head to the west, about 45% would go south to downtown and the university, another 5% that would go south but take 12th street, and another 5% east out Lincoln Avenue and only 5% of the traffic would go north by Andersonville.

Questions, Comments & Responses:

Question (Citizen): How did you come up with the trip generation figures?
Response (Applicant): The project is student housing, so most will be headed to the university, and the major accesses will be Lincoln or Lemay, so most trips will be headed in that direction. A few trips headed north, potentially to King Soopers. There could possibly be trips heading east to the I-25 corridor.

Comment (Citizen): Do you know that going east on Vine is not going to get you to I-25 because there are no exchange ramps. When Matt Delich was at the last meeting, he said the 5% could be as high as 20% going north, as I asked him that question and he was going to do more research on this.
Response (Applicant): For data sheets we came up with the numbers with the City from their direction on how to scope the project. The project was scoped with a student housing focus.

Comment (Applicant): John Atkin, who was here for the last meeting, said that by law they cannot restrict this to only students, but it is designed for and marketed towards students. In all the student oriented projects they

do, they find they don't have many people that want to live there with other students. It's not to say a student may not graduate and continue to live at the project another semester, but it's unlikely a family would move in.

Comment (Citizen): The traffic is all structured towards students, but the traffic study could be flawed with false assumptions because there is the potential for non-students living there. There needs to be a reality-check about what could happen and for the traffic study to be updated accordingly.
Response (Applicant): We're trying to produce a traffic study about what we expect to happen – we could add more information if this wasn't a student project in the future.
Comment (Citizen): If you're looking to bring traffic into the neighborhood, I don't see Lemay being a more straight shot. The project should pay its share, have development pay its own way and pay and build realigned Lemay to the Duff Drive intersection, and allow people to get into the neighborhood.

Question (Citizen): When is the realigned Lemay supposed to happen?
Response (Applicant): That is more a question for the City; we don't have any control over that.
Response (City): Our capital projects department could best answer this, but we can tell you it is on the books and what we want to do, and what we think needs to happen for this area to begin development to the northeast. We're working through the next cycle of budgeting right now, and there is an offer within the budgeting process to begin the design of realigned Lemay. We should know more this fall whether the design was funded or not.

Question (Citizen): Lemay turns into Lindenmeier, how is that going to work?
Response (City): Existing Lemay goes straight, and the proposal is that in the future it would be routed around the east side of Andersonville, have an overpass over the railroad tracks and Vine Drive, and then resume back to the existing alignment that Lemay takes now north of Vine Drive.

Question (Citizen): I don't know how far it goes and where it turns into Lindenmeier, but there's always been a problem there with mail.
Response (City): You mean with the addressing? If there is a challenge with that we can check with those who help with addressing to see if they know of any issues or problems.

Question (Citizen): Are they still working on the new road in there that goes through Lindenmeier?
Response (City): There are two roads they are looking at; one is "New Vine." Existing Vine is really constrained and the proposal is that "New Vine," which would be located north of the current Vine would help carry a lot of the existing east-west traffic that uses Vine drive right now and move it away from the railroad tracks. We also have a challenge with Lincoln in this area where it comes out at Timberline – it's a problematic intersection with safety issues. The Master Street Plan shows that International would be extended and connects from Timberline around the airpark to Lincoln. This extension of International has been one of the challenges for the applicant and development team to make this work.

Comment (Citizen): They're building so much above us to the north.
Comment (Citizen): The plan for this area is that Lemay would be rebuilt with the overpass and New Vine would come through in the north.
Comment: I understood it to be that Lemay would be partially close off.
Response (Citizen): They are going to realign it.
Response (City): The portion of existing Lemay front of the neighborhoods would remain, but only for use of local neighborhood traffic as a residential local street.

Comment (Citizen): One idea I had is that if you look at the realigned Lemay, it's going to be an overpass; it's going to be like having a freeway outside the backyards and be problematic for all of Andersonville – the incline would have to start where Andersonville neighborhood starts. With Lemay being realigned it may help, but what if were to be a 2-lane instead of a 4-lane, and with the money being saved, the property to the east of the neighborhood could be purchased for open space to be consistent with Nature in the City and instead of having a freeway with an overpass you'd have a little buffer and then a 2-lane arterial. We need to build with 2-lane arterials in mind; fossil fuels are a finite resource.

I realize the existing Lemay is impossible for the neighborhood. I think something could happen faster if it becomes 2-lane. There has been some discussion with the utility commission that it could be an at-grade crossing. The study conducted by City staff about whether to pursue an underpass or overpass is almost available for the public to view.
Comment (Citizen): When the design is funded, the ideas you're talking about are going to need to be discussed in detail. Right now it's just a fat line on a map.
Comment (Citizen): That line may destroy the neighborhood.
Response (City): Those comments you're providing are great, there are many variables that have to be taken into account for the future realignment of Lemay or other options -- these are exactly the type of questions that need to be asked and looked into when the design begins for the project.

Comment (Citizen): I was on the Planning & Zoning Board when this idea was brought up in 2002 to 2004. This has been on the books for 10 years. The intent was to build something to get the traffic away from the neighborhood. The idea was for the progression from 2 to 4 lanes. You have traffic coming down from the north and vice versa.
The original Vine and Lemay were originally grade-separated; there were tunnels underneath the tracks. It was this way and it worked until the City came in and closed the tunnel and now we have a problem. If you proposed something different than what we have on the books for New Vine and Lemay, we may just be shifting the problem east with the added pollution and waiting from signals or train traffic if the crossing is still at-grade.
It would be beneficial for the applicant to build the new section of realigned Lemay to Duff Drive, providing a good intersection for the neighborhood to use to enter and exit from.
Response (Applicant): The plans are proposing a connection to the existing Lemay. Eventually when realigned Lemay is built, the connection would be closer than it is now.
Response (Citizen): You're not helping because the portion of realigned Lemay going up to Duff is not yet built. If they aren't connected you make them go down to Duff and International to Lincoln. You need both connections to make your traffic work. I would advocate getting that piece built with the project development and it will demonstrate our philosophy that development pays its own way.

Question (Citizen): We have fought for a traffic light at Buckingham and Lemay and keep getting shut down -- that we can't have it unless we have more traffic, and here with this development we're going to have more traffic. Can we get this light now, or are we still getting shut down? I would like to see Duff go all the way to Buckingham.
Response (City): We have had a lot of discussion about the existing intersection of Buckingham and Lemay. There are challenges with considering an interim signal including the fact that the intersection does not currently meet signal warrants. Ultimately it's planned for the new intersection to the east when Lemay gets realigned. We don't know when the connection to Duff Drive will go over to the curved alignment. This drawing is showing a potential local connection to Buckingham and 10th Street as an option for the existing residents of the neighborhoods to have the choice for access to and from the south. We're continuing to review the project as it involves, if there is support or not support for the street connection or a pedestrian connection and we're looking for feedback for this tonight.

We've identified some neighborhood projects as part of the Lincoln Corridor Plan and there was an interim sidewalk planned down to Lincoln where there are existing gaps from the bank to the north and a small gap between Walmart and the apartments. We think this project can achieve one of the projects identified through Lincoln Corridor process by providing a sidewalk down the side of the realigned Lemay alignment.

Comment (Citizen): At a recent council meeting about the Lincoln Corridor, it was mentioned that no Community Development Block Grant (CDBG) money was going to be used for roads/streets and that the City didn't have money to go out an add the streets and sidewalks. Why can't CDBG money be used to build better sidewalks and connections? Why make the developer pay for it when we have money to pay for it in conjunction along with the developer money. I think this CDBG block money should be explored. You need to have something substantial that could be enjoyed by all, and the money is there if you use community block money.

Question (Citizen): Is there a sidewalk next to the bank?
Response (City): Yes. One project we identified for Lincoln was to continue the sidewalks, but there are timing considerations. If the realigned Lemay is funded, it will dead-end and the old portion of Lemay is rebuilt to a local street, and the funding for that will include sidewalks.

Question (Citizen): I'm assuming the project is going to pay the street oversizing fee for that intersection anyway? How much further away from the gap are they to achieve what you want to do? How much more is needed?
Response (City): This project is responsible for their local street improvement portions adjacent to their project. They would provide their local street portion of curb and gutter and sidewalk adjacent to their project.

Question (Citizen): So would they be contributing to the realigned Lemay?
Response (City): The developer is required to build their local portion. If the development on an arterial, the developer is reimbursed for the difference in cost between the larger street over the cost of a neighborhood street (This is called "street oversizing".). In this proposal, they're proposing the trees and sidewalk in the ultimate location, but not the curb and gutter. If they were looking to build it today, it would be interesting to see how the new Lemay would intersect with the existing Lemay – it may make more sense for that portion of new Lemay to be built at a later date with the realignment. If that's something the neighborhood wants to see we can look at how it could be engineered -- how would you have the new portion built and operating but still tie into the existing north-south Lemay?
Response (City): There is a standard for separation of the intersections. Engineering would be concerned about two intersections so close together. The developer has to escrow the money right now regardless. It sounds like some of the comments are learning towards the idea of a connection into the neighborhood may be beneficial, however?
Response (Citizen): I would scrap it. If you put the road in, if that is part of it, you're going to make the people meander to do it. People would come in through Lincoln and International – you could be creating artificial traffic congestion with the meandering route. This thing has been on the books for 10 years, and if it could be built, build it and make it easier for everybody and the residents could go into and out of, you'd have a better flow of traffic, contrary to the traffic study which I think is skewed. You'd have more harmonious solution and better compatibility standards.

Comment (Citizen): Traffic is a huge concern; it is going to break this neighborhood. If we can't get this to work, redesign the project. It comes down to Adequate Public Facilities. You have a project here that is going to hurt this neighborhood based on my knowledge and experience with the City.

Comment (Citizen): I don't know how much support the City has backing this development, but from what I have painfully heard with the Lincoln Corridor Plan, the City was hell-bent on getting that built, so it didn't matter what people from the neighborhood said. My concerns are: it's only for students; we need affordable housing for the working class people and I continue to have to fight on that note, and we need affordable housing for people that are working minimum wage jobs. If you look across the street to the apartment complex, it doesn't fit. The cottages are lovely, it's a beautiful development that is solely geared for students, but I feel like it doesn't fit with the neighborhood and will continue to gentrify the neighborhood. Those are serious concerns I have. If the City is hell-bent on getting this development through, then we need to make sure we get something for the neighborhood. That traffic on Lemay is going to make everyone pull their head out and it feels like our concerns fall on deaf ears. College Avenue has lights so close together; I don't understand why we can't have a light here on Lemay.

There needs to be some things for the neighborhood, they are long-overdue. I feel angry because I don't ever see anything that comes forward for the working-poor. I don't see the housing for the low-income, for the Hispanic community, for those working minimum-wage jobs; where is their housing? That needs to be addressed. I need to know how much the City is backing this development to happen, and if it's a done deal please tell me so I can save time and energy. You find some way to relieve the traffic on Lemay and I'll be quiet.

Response (City): With any development project, it's never a done deal; the City doesn't advocate or push for the project. It's in the review process and things continue to evolve to make sure the project meets our standards. Ultimately the decision-maker decides if the project is meeting the standards. We are facilitating the development review process. This is a large, complicated project, and a lot of issues associated with the project and one of the purposes of the meeting tonight, for instance, are to hear from everyone about the connection to the neighborhood. If you can't get out on Lemay, does the connection provide an alternative option, is that a viable option or not?

Comment (Citizen): The notification process is evolving and hit a train wreck today; some of us didn't get notified of this meeting. All of the sign-in sheets in March, I didn't get notified even though I signed in. If Betty had not called me, I wouldn't have come because I wouldn't have known about it. How many people got missed from the last notification? This is a very big concern, is it purposeful exclusion? Please fix the process.

Question (Citizen): What's changed from March to now in the plans? How many units?
Response (Applicant): We can't tell you how many units right now, the plans shown tonight are to illustrate the roundabout and the potential connection, but the number of units shown on this drawing is significantly less than what was shown in March. We can't do the project without more units – when we figure out where these units will go we will be back here to have another neighborhood meeting. We know it's going to be about 180 units; it will be under the 12du/acre minimum required in MMN district. The intensity is there because of the number of bedrooms, but we will be requesting a modification for less density than is required.

Question (Citizen): What is the cost difference between a street and roundabout?
Response (City): Depends on the design of the street and roundabout. Without a roundabout, the Master Street Plan would have required a sweeping curve; it's the geometrics of it, the design, where it would be built. The proposal now is for a roundabout and the reason for this and why staff is okay with the option is because originally the T-Intersection wasn't going to function well as a stop-controlled intersection with the traffic volumes anticipated. A signal was proposed but that is difficult due to proximity with the Lincoln/Lemay intersection. We want to eventually minimize the volumes we have on Lincoln, because we don't want all those cars coming out on Timberline as that is a safety concern for us. Putting in a roundabout keeps our options

open. It provides adequate access for the apartments to the south and from a safety perspective, roundabouts have fewer associated accidents. Given all the uncertainty for the area, we thought this would be a good option.
Response (Applicant): When you looked at a full signalized intersection, the cost of that and the roundabout was approximately the same.
Response (Citizen): I'm a numbers person, I like to know that.
Response (Applicant): Get with me after the meeting and we can look the numbers up.

Question (Citizen): What are your accident rates for a roundabout?
Response (City): Generally, when you compare a single lane roundabout and a signalized intersection, the regular intersection has 32 ways a cars can hit one another, and a roundabout has 8, and that is reflected in the overall safety statistics. In a regular intersection you can hit head on and broadside, which are the most serious types of crashes. In roundabouts crashes that occur are typically sideswipes, or low-speed rear-ends which tend to not be as severe. The number of accidents and fatalities is reduced dramatically. Roundabouts are simply a tool we use; they may not be appropriate everywhere. We think it is a good option in this location.

Comment/Question (Citizen): I think it is a great project. Are you going to put a fence up? Being commercial next door to you we don't always have the greatest looking lots. The detention pond works for that as a buffer.
Response (Applicant): Yes, the detention area will serve as a buffer, will be landscaped as well. We actually have the property a little on the east side of International and further up, that would be landscaped and might be detention as well. No plans at present to put a fence up as there is no reason to. It's putting the front door to the street and hiding parking behind the units.

Comment (Citizen): I think the traffic circle will also help the situation and flow a lot better, so people won't have a need to use the local streets including Duff Drive and Webster Street. .
Comment (Citizen): These people have been here forever and they are getting squeezed out. I live at Collins Aire Park, and you have Timbervine going in next door, are they going to wipe that out too? Why can't there be spaces for trailers to go in there. This seems like it should be on the west side of campus. It doesn't seem right.
Response (Applicant): I keep hearing the need for affordable housing and there is the need for it, but it's sort of like comparing apples and oranges. The City is not building this project, it is being built by a private developer looking to make a profit; it's not like the City controls the land and can decide what is going to be built. This developer isn't going to build affordable housing, and as far as I know the City isn't negotiating for control of the property; City staff can't change that right now. It might be nice to have a presentation at the next neighborhood meeting concerning affordable housing options the City is exploring overall.

Comment (Citizen): I think it would also be wise to explain the difference between the different types of affordable housing and what's more in demand. There's also a city code coming up to consider that every development project in the future would incorporate affordable housing or money in lieu.
Response (Citizen): That doesn't help us now, and while a beautiful project, I feel it doesn't fit with the neighborhood. I'm seeing 5 mobile home parks are already gone. Our neighborhood, we definitely feel like we're being pushed out, because we have people moving in with money. This feels like its one more layer to gentrify the neighborhood and I'm concerned about that. We have and should have a place in Fort Collins.
Response (City): This is zoned MMN, and similar to what you're seeing with the existing parking, there are many options to satisfy the requirements of that zone, it could be additional high density apartments, this student housing proposal is another option. The City doesn't decide the ultimate development proposal.

Comment (Citizen): I know you don't have any control over this. We have people that work in restaurants or entry level jobs. Is the attitude that they don't even want those people here? We need housing, it just doesn't work. I wanted to say this so the issue is known.

Response (Applicant): We appreciate that feedback. This has been a longstanding challenge and it's been difficult to achieve additional affordable housing in this community. There are some incentives and the City is going to explore other options to hopefully ensure we see more outcomes along these lines.
Response (Citizen): This is the first time we're being introduced to student housing on this end of town. I feel like student housing shouldn't have a place on this side of town when we have so many families that need affordable housing.
Response (City): Student housing and its chosen location has continued to evolve over the past 10 years. Recently, we've seen more student housing projects going further and further away from the main campus. In this area, there is also Aspen Heights up by Conifer and North College, under construction. Like Aspen Heights I believe there would be a shuttle service for this project as well.
Response (Applicant): There is also a City policy that student housing should be distributed throughout the community, not just concentrated next to campus.
Response (Citizen): In part, that's how the 3-unrelated policy got passed.

Comment (Citizen): The cost of land has gone up. I see around campus private buyers having to compete with the University for properties. CSU has bought so much property and they are already marching south, and eventually they will march east, so these folks have to go where they need to be. I agree this is an inappropriate area for this type of project. We know the impact of The Summit with Capstone on College. It's a royal mess. They're now trying to recover with the parking garage. There is a better job here planning than the other one. We're not being NIMBY here; there are genuine, legitimate concerns for the project in this area. I agree we want to spread student housing around the community, but this is too intense and too much and you're going to break the backs of some of those living in the area. There is going to be diversity impact, income impact, compatibility is going to be a problem because it doesn't fit. We want to let you know what we feel and are seeing; we're nervous about the changes; we all should be nervous given the increases in property values and rents. CSU has a habit of saying we don't solve the housing problem. They have not kept up with demand with the dorms, they have not increased the number of net students who live there because it's not their problem, and they call it a City problem. So now we're all trying to solve CSU's problem, but it's hurting the neighborhood. We have to avoid hurting people.
Comment (Citizen): I also had concerns about compatibility. With a birds-eye view, you could see the perspective this affluent neighborhood is to the low-income neighborhood it surrounds. Given its upscale student-housing, there's a good possibility that most students will have their own vehicles. Does the traffic study look at this? Behavior-wise, students will have their own cars. We're talking 2.5 miles to the center of campus from here – I see the advantage of having students all over town, and the city is doing innovating things with TOD and pollution, but I think it's too far from campus. It's going to serve as a means to further gentrify the neighborhoods that are already struggling.
Response (City): In this area, most students are going to have their own vehicles. In terms of the traffic study, we didn't allow them to consider the shuttle service or assume a reduction in traffic counts when looking at their impact to the neighborhoods.

Comment (Applicant): There will be approximately 180 units. In the first plan there were 182 and now we have less than that, we're down about 80 beds because of the changes to International and the units that were on the east side. With those units gone the project is infeasible, so we have to find some way to recoup those units, or the project can't move forward. That's what the developer is working on now to see how many units they need and where they will go, that's why we will come back for another meeting.
Question (Citizen): How many total beds?
Response (Applicant): About 800 bedrooms.

Comment (Citizen): 842 was the number brought up at the February meeting.

Response (Applicant): We did a traffic study with the 841 number. We're saying they are going to have cars, and so we're providing a vehicle for every vehicle. There will be transit opportunities with the shuttle service, mass transit, and we expect some students to ride their bikes. There will be improvements of Lincoln with bike lanes; there will be some students who ride their bikes, but we weren't allowed to factor that into the traffic study. We recognize the students will have cars.

Comment (Citizen): I don't like roundabouts as my personal opinion. If it works for you, if that's what you want to put it there…
Comment (Citizen): On Lincoln, in the past they had brought up they didn't want trucks or semis going through there. With a roundabout, and you get a lot of semis, it's going to get kind of crazy.
Response (City): The roundabout will be designed to accommodate trucks. In this design, because it's on an arterial it is required to handle not only regular trailers, but also the extra-long semis. This roundabout would look similar to the one at Vine Drive and South Taft Hill. There is also a truck apron in the center where back wheels can go for large trucks and trailers.

Comment (Citizen): Right now it's a nightmare with all the semis that go along there.
Question (Citizen): Can it handle a triple?
Response (City): Yes, because of the way the tracking works with the extra hinges, they can track more easily.

Question (Citizen): It can handle a 53'?
Response (City): Yes

Question (Citizen): You're taking the worst case scenario to design and build those roundabouts?
Response (City): Yes, that is what it's designed for. When you look at the old traditional intersections, and you get a semi making a turn, they have a problem making the left and especially making the right. In the roundabout you don't have to do that anymore.

Comment (Citizen): The roundabouts may take more time to get through.

Question (Citizen): Flood insurance – is this area in a flood zone?
Response (Applicant): No, this particular site is not in the flood zone.

Comment (Citizen): I have to have flood insurance, and I live just down the road from here (along Lemay north of Vine).
Response (City): In this area, in various spots, there are flood zones as a combination of either the Poudre or Dry Creek.

Question (Citizen): How far down does the floodplain go?
Response (City): We don't have a map depicting this tonight; at the next meeting we can bring floodplain maps. (Note: staff met with the resident after the meeting and looked at floodplain maps online.)

Comment (Citizen): When In-Situ came in we learned we were taken out of the floodplain.
Response (City): The Poudre River floodplain goes through a portion of the Woodward site.

Question (Citizen): So they have to have flood insurance too?
Response (City): They dedicated more land to provide more spread of the floodplain, and increased the grade of the area adjacent to Lincoln & Lemay.

Response (City): The Buckingham neighborhood used to be in the flood plain, but there was a levy built at the Oxbow site, that diverted the Poudre River floodplain away from Buckingham. This corner, it's not in the Poudre River Floodplain, or in the Dry Creek floodplain.

Question (Citizen): Why is it just a small area that's in the flood zone that doesn't make sense?
Response (Citizen): Call Glen Schlueter at the City, he can help answer these questions for you.
Response (City): Flood plains change and evolve, as do our standards. The Dry Creek floodplain has been reduced significant by a lot of projects done way north of Fort Collins. Still a few more projects left to be done through culverts and rechannelizations that will continue to narrow the floodplain down.

Comment (Citizen): Last fall with all the flooding, they flooded the fields north of where my mother lives, and her basement flooded because of the underground water.
Question (Citizen): Can Glen come to the next meeting and talk about this? He's worked in the Dry Creek part and he would be a great source of information.
Comment (Citizen): On the south side of Mulberry, they put in those homes by the ponds and now the houses are getting cracked basements. In Dry Creek, they are replacing driveways and replacing them and the floodplains goes across Mulberry over to Dry Creek in the field by the airport. It's still there it looks like.
Response (City): I know there have been issues with driveways and expansive soils.
Comment (Citizen): Timbervine is planned for that same area.

Question (Citizen): When will the next meeting be?
Response (Applicant): The earliest would be 5 or 6 weeks from now for another neighborhood meeting, but we can't commit to an exact timeframe. We would like people to provide feedback on the connections to the neighborhood, if you talk with your neighbors after tonight's meeting and they have feedback, please let us know.

Question (Citizen): Is that Lemay portion a viable option to have included with this, to connect to Duff even through it's not the final design? Could that still be built?
Response (City): When the two streets come together in a configuration of a "Y" it is problematic with operations and safety.

Comment (Citizen): It should get built from Lemay to the intersection on Duff Drive. If it was temporary I would say yes, that would help, and then couple it with it going into the neighborhood, to help move the local traffic off of Lemay. I think that would be a strong gesture on the City and developer that they are committed to the project and the neighborhood.
Question (City): Are you saying you want people to be exiting off the realigned Lemay to go into the neighborhood?
Response (Citizen): With proper signage, yes.

Comment (Citizen): I would encourage the "Y" be built, and have people use the realigned Lemay to enter their neighborhood, and have other traffic continue to use the existing Lemay,
Response (City): From a traffic engineering perspective, that works for those going northbound making a right turn. It's really problematic for traffic control, because the rest of the traffic that is going straight is in essence making a left turn. From an operational standpoint you almost never see intersections that have a "Y" such as this. Our standards require intersections to come in within 10 degrees of 90 degrees. If there is a way to look at how we make it work, it would be at 90 degrees.

Response (Citizen): You already did a road once like this on West Harmony going west to Taft Hill, where you had a straight road and the new Harmony cut off. That was done when I was on the (Planning and Zoning) board. This is really no different.
Response (City): We did close off the access to old Harmony in that circumstance.
Comment (Citizen): You could do this on an interim basis until realigned Lemay is fully built.
Response (City): The Y-concept cutting across the traffic coming southbound, operationally it isn't something we would allow. We would have to look at all the options. We're hearing there is a preference if there is a roadway connection that is more direct rather than meandering around the new development.
Comment (Citizen): I feel that good engineering, good collaboration of everybody, we can make this work. I don't want to just hear "no," I want to hear how we can all work together to make this work.
Response (City): Our interest is to find a way to say yes, within an appropriate set of standards and guidelines and everything that comes with it.

Question (Citizen): If you did that "Y" like you asked, is your concern about traffic coming back south, could they access Lemay again?
Response (City): That's part of it.

Comment (Citizen): We have something similar in my neighborhood, with protected left turns onto Timberline near the Timberline/Harmony intersection.
Response (City): It can depend on traffic volumes. We can take a look at it.

Comment (Citizen): Could you make it a one-way? I've seen it on Lemay with the do not block signs and painting, it gets completely filled. If there is a train, it is terrible. If there is a way to get around this issue, even if it was only one-way, it would be a huge help.
Response (City): There is an access proposed right there and we're going to look at that. With the Y's, we tend to see the speeds remain very high. If you have a high speed they become like interstate exits.
Response (Citizen): The Y-intersection on North College seems to work.
Response (City): That Y was redesigned to be more perpendicular a number of years ago. It wasn't working operationally and from a safety standpoint.

Question (Citizen): If Duff went all the way to Buckingham, and because of the increased traffic from this proposed development, could we get a light?
Response (City): It's a question that comes up frequently. We're not sitting on this, we do have the intersection on our radar and we know eventually that it may be signalized in the future. Currently, the volumes are low.

Question (Citizen): Did I hear you say 16,000 vehicles on Lemay?
Response (City): It's in that ballpark. When we look at traffic signals we have to balance a number of things, part of it is definitely how long do you have to wait to get out, part of it is safety, and part is signal progression. In parts of the city our cycle lengths can be 2 minutes. If you put a signal like that in at a minor road, you are going to sit there because most of the green will be on Lemay. We have thousands of intersections but only about 118 signalized intersections and we have 100s where signals are being requested. When you put in a signal, you often see crashes go up, and we are very mindful of this because there can be impacts. One of the complicating factors is if you put a signal in here now, and Lemay is realigned in a few years, it could be a waste of money.

Question (Citizen): When will realigned Lemay eventually be built?
Response (City): No crystal ball on that right now. We're watching this, and please don't think we're saying no for the sake of it, we're trying to balance these variables.

Comment (Citizen): It seems the neighborhoods you don't really want the signal itself, you just want the signal to get in and out of your neighborhood, and it seems you would choose the access rather than the signal. I would say take the one-way and get the backdoor in that is going to get you more bang for your buck. I would take the focus off the light and get the back-door option if you can get the one-way.

Question (Citizen): Didn't you mention that the funding of Lemay is incumbent on the BFO process? Which means they have to extend the sales tax?
Response (City): We're not sure of the ultimate funding. Right now they're looking at the design. There are also those interested in this being its own separate project to go before the voters, and take it out of Building on Basics.

Comment (Citizen): I think if it did go to the voters it would be passed overwhelmingly.
Question/Comment (Citizen): Why pay for something you should have in the first place? Extend BOB and include this in it. If you're looking at individual taxes, it's a waste of our money and has no sense and something neighborhoods may vote it down because it's not near them. Don't segment it out. They tried that with the Mason Street Corridor and it got knocked down twice. That is the wrong path.

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NEIGHBORHOOD INFORMATION MEETING SUMMARY

PROJECTS: Capstone Cottages - Plan Amendment/Rezoning and PDP

DATE: December 10, 2014 (3rd Neighborhood Meeting)

LOCATION: City of Fort Collins, Streets Facility Training Room

PROJECT PLANNER: Pete Wray

NUMBER OF ATTENDEES: 26

Project Planner Presentation Summary:

- Two projects submitted: one is a plan amendment and rezoning, and the second is the project development plan that describes the details of the specific project (units, layout, parking, etc.) Both are currently under review.
- The information from the neighborhood meetings will be forwarded to the decision maker for the projects, whether a hearing officer or the Planning & Zoning Board.
- The plan amendment and rezoning item is going to the Planning & Zoning Board tomorrow evening (Dec 11, 2014), for their recommendation to City Council.

Applicant Presentation Summary:

- Applicant team is Ripley Design, representing Capstone Collegiate Communities. Additional members present from Northern Engineering and Delich Associates and Ray Martinez as a consultant to the neighborhood.
- There will be a public hearing tomorrow evening at the Planning & Zoning Board for a rezoning hearing for a portion of the project site.
- Approximately 12.7 acres of land need to be rezoned from Industrial to Medium Density Mixed-Use Neighborhood District.
    - Amend the East Mulberry Corridor Plan Map; amend the City Structure Plan Map, Rezoning.

- The site of only the MMN district was not large enough to accommodate a typical multifamily development, and requesting the rezone for 12.7 additional acres.
- Tomorrow's hearing will cover the rezoning aspect, and not the specific characteristics of the project itself.

- The project is located at the northeast corner of Lincoln and Lemay Avenues. A student housing project with 195 dwelling units.
- There will be access from Lemay Avenue and Lincoln, and an access point off International Boulevard, and one access from Duff Drive.
- A roundabout will be built at the intersection of International and Lincoln. Webster will extend to International, and Duff Drive will extend to the planned realigned Lemay Avenue.
- There is a future realignment of Lemay that would veer to the east from the existing alignment and go over the railroad tracks in the future, with no definitive date planned for construction.
- The project is proposing to add a connection from Duff Drive to the existing Buckingham Street, providing an informal connection for pedestrians, bicycles, and vehicles. If traffic is backed up on Lemay, there is the opportunity to use another entrance/exit out of the Andersonville neighborhood.
- There are 866 parking spaces (.9 for every bedroom).
- 5 different building types including 3-bedroom cottages, 5-bedroom cottages, and 5-bedroom cottage duplexes along the outer perimeter of the project that are each 2 stories. They are designed to look like single-family homes. The bedrooms would be rented individually to students. Interior to the project, there are 3-story townhomes, each with 4 bedrooms and walk-up flats that occur in the parking lot. They are 1-story constructed over parking.
- There is a centrally-located clubhouse with a swimming pool, open space, and other amenities.
- All of the housing will have front doors facing onto public streets or walkway spines, so it is neighborhood-oriented.

Questions, Comments & Responses:

Question (Citizen): Are you increasing the flow of traffic out of this area? You're bringing a lot of people here. I still see the same troubled Lemay Avenue to the north that is blocked by trains all the time. I don't see how that is going to do anything for the traffic flow on Lincoln. There are already too many people for the roads we have, and I don't see that you're going to enhance our quality of life. I'm not impressed at all.
Response (Applicant): Most of the traffic goes to the south. We are preparing a traffic impact study for the proposal, and that includes collecting data for all the streets in the area and the intersections and streets impacted. It's a given that this project will add traffic to the neighborhood. The primary direction of travel from this development is towards Colorado State University, to the southwest; south on Lemay or west on Lincoln.

Comment (Citizen): We have three growing communities and development to the north of this area. There is a lot of new traffic coming. If you slip around the back way you have to go all the way around. You're going to be adding more traffic.

Question (Citizen): How much parking are you going to provide? What is the ratio?
Response (Applicant): 766 parking spaces. There are .9 parking spaces per bedroom, almost one per bedroom.

Question (Citizen): Are there going to be any traffic lights at Buckingham/Lemay? We can't get out of there already.
Response (City): We're always looking at the overall traffic impacts, what we have now, and what the development will contribute to the existing traffic and what will be required of them and traffic conditions of this area/city. Primarily, the students are anticipated to travel south or west, so we're not in a position to require them to make improvements to the north. This doesn't mean we don't recognize the traffic problems and conditions to the north.

One thing we talked about was what does the connection to the north and Buckingham Street look like? And how does that move with the timeline for the realigned Lemay. We're trying to figure out what these intersections look like in the future. This development will not be required to put a signal at the intersection of Lemay and Buckingham.

In the 2015-2016 budgets, Council approved a million dollars to begin working on the design and acquiring right-of-way for the realigned Lemay. This is a high priority for the City to see how we can make that happen. There is no timeline when it will actually be built as it's a very expensive project.

If a realigned Lemay is built, the likely spot for a signalized intersection is at Duff Drive. We know the issues trying to get out of your neighborhood on Lemay – we've heard from you folks from the issues. The idea with trying to get the connection between the proposed development and the existing neighborhood is for your benefit. It's supposed to be a way to help you out.

Comment (Citizen): Take away the access on Lemay so there's no traffic going on Lemay at all. That means there's no traffic going on Lemay at all and there's only access from Lincoln Avenue and International.

Question/Comment (Citizen): The amount of students that are actually being housed in this development is 858, is that correct? We've been begging for a light to get these folks out of the neighborhood, it's a nightmare, because they can't get out of the neighborhood. Why is it so hard to get a light? That's a lot more traffic, and I thought we were told if we had more traffic we would get a light.

If this is student housing, I think it is a slap in the face for those looking for affordable housing in the community. I think that is what should go in there.
Response (City): What generates the need for the traffic light is not necessarily the traffic on Lemay; it's the traffic on the cross-street. The proposed connection shown is there to help the neighborhood, if the neighborhood doesn't want it, we can take it out.

Comment (Citizen): A lot of the kids play in the streets, and that is another concern with adding traffic to the neighborhood on 10th street. It's too dangerous.

Question (City): Can we get a show of hands as to who wants the arrow shown removed (referring to the neighborhood connection)? Majority do not want the connection.

Comment (City): That arrow represents potentially three options. We've heard there is a need for additional pedestrian connections, particularly along Lemay down to Lincoln where there are gaps. Until we get funding for implementing those Lincoln projects there is an opportunity to get an interim sidewalk connection, until such time as the Lemay bypass is built.

As an additional option, it could also provide for a vehicular connection. If there isn't support for those connections, there would be a gap there until the realigned Lemay is built.

Comment (Citizen): If we had a light, we could use the sidewalks across the street on the west side, but we need to be able to cross the street first.
Response (City): Another item in the budget for this year is a light to cross Lemay from the neighborhood. It won't be at Buckingham, it will be a little north of Buckingham.

Comment (Citizen): My biggest fear is that they will spill out in our neighborhood. It looks nice, but it doesn't help where we live at all; if we could get a turn signal that would help a lot. When we go downtown we like to walk, but we can't even cross the street there is so much traffic.

Question (Citizen): Is this the same Capstone that built The Summit?
Response (Applicant): There are a number of Capstone companies. There are four separate companies, individually managed, that are affiliated. They split apart about 2 or 3 years ago. The company developing this is focused on cottage-style development. Capstone Development Partners did the Summit. They are typically focused on public-private partnerships.
Comment (Citizen): With all the controversy on the other project, I hope the City would deal with this Capstone project differently.
Comment (Citizen): I see a cottage as more of a very small house; I see nothing here that is like a cottage. If you visualize cottages, it gives you a much different image.

I was in Albuquerque touring a similar Capstone Cottages-style development. The tour guide mentioned generally Capstone does not continue to own projects like this, they sell them off. How does the community know that at some point down the road, that kind of maintenance will continue if you sell the project? Does the planning & zoning board know you are likely to sell this in the future?
Response (Applicant): It depends on the project. In some cases we've sold cottage developments to other companies or investors. The management model for student housing is fairly similar across the board. We'd have managers, leasing managers, maintenance etc. With a development like this, some we hold onto for a long period of time, and some we sell off.

Comment (Citizen): This doesn't look like a sustainable development. This idea of future Lemay has been going on for a long time, and we have a train that isn't being diverted either. We're one of the last City's in the nation that has a train going through town and it controls how everything flows. If this develops, you're going to have this train honking all the time non-stop. We deal with it, but I feel the infrastructure is not there. You're going to have a nightmare. We've got to find who will pay for future Lemay.

Comment (Citizen): I support the project and I am a former property owner near the University of Denver. I know what happens when you have 3 students, you really have 6 cars, because students have boyfriends and girlfriends. My only question is for parking, are you planning on having sufficient visitor parking? Otherwise, I'm not concerned with International roundabout.

Comment (Citizen): I live in the neighborhood, and what is going to happen is that some people will go down 10th street and through the neighborhood.

Question (Citizen): What will happen to the black-tailed prairie dogs occupying the land?
Response (City): The shorter answer is that if it is determined there is valued wildlife habitat, the project and applicants will be required to do an ecological characterization study.
Response (Applicant): The ECS was already completed and they would be removed, but I'm not sure with what method.

Question (Citizen): What happened to the prairie dogs over there by Jax? (Aspen Heights development).
Response (City): I don't have specifics for that project.

Question (Citizen): The letter describes this as student-oriented housing. Do you have to be a student at CSU to live there? The traffic surveyor seems to be basing their assumptions that everyone will be a student.
Response (Applicant): Anybody can lease a bedroom in the development. The fact that we market to students, lease by the bed, and have 5-bedroom units, we find that 99% of those in similar communities are students.

Question (Citizen): When the traffic study was done, did you account for a train going through at busy times such as rush hour?
Response (Applicant): We didn't do it with a train as that is a difficult scenario to replicate.
Comment (Citizen): I used to have an office on Lemay, south of the railroad tracks. I used to have patients that would call me because they were 20 to 30 minutes late from the train switching yard. I've seen Lemay back up for over a mile both ways, and this is 800 more cars. I don't think the infrastructure is there to support the development. The concept that at some point in the future the City will have funds to build the realigned Lemay seems like a formula for a total breakdown and traffic has nowhere to go. I'm not against development or students but I am against building things before the infrastructure is ready for it.

Question (Citizen): You said this year there is going to be a light, but you don't know where it's going to be?
Response (City): In 2015, we have money budgeted to put in a pedestrian crossing with a signal, between Buckingham and the north end of your neighborhood. There is talk of a park at the Streets Facility and that is a connection to the potential park. We don't have the pedestrian facilities on the east side figured out yet, so we don't know the exact placement of the pedestrian light pinned down tonight.
Question (Citizen): It won't be for cars, only pedestrians?
Response (City): Yes
Comment (Citizen): So we're stuck in our neighborhoods then if we're in a car.

Comment (Citizen): You want us to swallow that pill (the connection to the neighborhood) so we can get the light?
Response (City): No, the pedestrian light is a City project we're doing regardless of this development.

Question (Citizen): Have you considered other sites in town?
Response (Applicant): What we like about the site, in order to create a neighborhood and sense of place we need an appropriate scale, requiring a larger tract of land, but also because it has the access onto Lincoln Avenue, it has good traffic flow and proximity to Downtown.
Comment (Citizen): Generally, student-housing has gone west out on Elizabeth. It's totally off the wall to bring all the students up this direction with the Industrial areas and affordable residential housing and the way old town is migrating towards this area. I don't understand why you're going this direction.

Question (Citizen): If this does go in, that's probably going to be 2000 cars in and out throughout the day. CSU is off to the west, and Woodward is going in at the intersection. What are you going to do with the Lincoln Bridge and route hundreds more cars into Downtown? You have potentially 1000 cars heading west and another 1000 coming back east.
Response (Applicant): Some traffic will go west on Lincoln, but some will also go south on Lemay.
Comment (Citizen): I'm assuming half the traffic goes south and the other half goes west.

Question (Citizen): Will the busses be re-routed?
Response (City): There are 2 existing Transfort routes that will remain.
Response (Applicant): We are working with Transfort to add additional stops as a part of the development as well. There will continue to be transit service.

Comment (Citizen): The quickest way to CSU is going up Buckingham Street, and that's why I'm worried about the connection. You can go straight past New Belgium to Linden. That means Buckingham is going to get a massive amount of extra traffic. If the train is backing traffic up, people will try to find alternate routes like Buckingham.
Response (City): We want to understand as well how many additional cars are we talking about, and where are they going, and where will we see pinch points and what do we do about it? If this is approved, how do we deal with it, and what do we require the applicant do that is proportional to the development.

The Woodward had to look at how their access functions along Lincoln. They have to rebuild portions of Magnolia. That is the kind of requirements that we put on Woodward for their traffic impacts. For this particular development, if it's approved, one thing we talked about was the collector (International Blvd extension) to de-emphasize Lincoln to the east. The roundabout gives us a lot of options for turning movements. The Lincoln Bridge is a part of the Lincoln Corridor Plan and we know what it will look likely in the future when funding is identified. We understand the corridor has concerns and how that works in the future.
Comment (Citizen): Basically the solution is don't drive on Lincoln after this is built because it's going to back up from the light. It doesn't benefit us.
Response (City): We looked at a signal at the intersection, but it would cause backups, versus the roundabout that works generally without a queues.

Comment (Citizen/Consultant): Can you talk more about the shuttle from the development to campus.
Response (Applicant): There will be a shuttle providing travel to CSU approximately every 30 minutes. A lot of the students may take the shuttle to avoid the parking at CSU.

Question (Citizen): What's the rent?
Response (Applicant): Per bedroom, upper 500s to 600.

Question (Citizen): How high do you have to move the earth for flood protection?
Response (Applicant): This area is outside the 100-year high risk floodplain, so it does not have to be raised for flood protection. There will be some earth moving for other grading or storm detention.

Comment (Citizen): During the flood event we had water running down the streets; I know we're in the flood plain.
Response (City): Apartment housing in the 500 year floodplain is not considered a critical facility. The water from this development is all being collected in detention ponds in holding systems so there is no water that is draining to the north. The general direction of drainage is to the southeast. We know Andersonville has issues; we have the Northeast Corridor Plan, called NECCO, identified in our master plan to build storage upstream of

you to help with these issues. We have areas upstream of you that are affecting you, not necessarily this project. We have a dedicated funding source for our master plan projects that we collect from fees that citizens pay that will go towards projects like NECCO.

If there is an existing problem in the City, then the City will be responsible for taking care of it. The requirements for this project are that they cannot make an existing condition worse.

As far as the fill, they filled the Bull Run when it was developed, and we had from overflow from the Poudre River because the bank was low, and that's being resolved with the natural area next to Woodward.

Question (Citizen): We have Woodward Governor, and where will people that want to support Woodward build because there's no Industrial land left because it is rezoned?
Response (City): The applicants have their justification for why they think it makes sense. We have our staff report that is going to the Planning & Zoning Board tomorrow night with staff's justification and rationale for the rezone. The P&Z will forward a recommendation to Council, who makes the ultimate decision. Staff has looked at the overall inventory of Industrial land in the Growth Management Area, that in losing 12 acres of Industrial land, we still have land for industrial development for the long-term.

Comment (Citizen): I disagree from the connection from 10th street to Duff Drive because I don't want college kids coming into the neighborhood because that's where I play.

Comment (Citizen): I share concerns with other folks about compatibility, especially with the potential gentrifying of the neighborhoods. We're talking about dropping in a very upscale development several miles away from campus, surrounded by low to moderate income historic neighborhoods. The shuttle idea is great, but students that can afford 500 dollars per bedroom can afford a parking pass at campus and will be driving back and forth multiple times per day. I think there are other areas where this could be going.

Comment (Citizen): If the City wants something to go through, they are going to make it go through, so I am going to put this out there. I do know that you guys can't get out of the neighborhood, and I wanted to find a way to get something out of this development for the neighborhood, and if that meant being able to cut through their development out to Lincoln when you can't get out of the neighborhood – that is what I was looking at.

Question (Citizen): What if it's one way (the neighborhood connection)? The neighborhood can get out but the development renters can't get into Andersonville.

Response (City): This project is predominantly zoned M-M-N and the applicants are proposing to expand that onto 12.7 acres of Industrial land. The degree that City has on the type of development that comes forward; we have established with the Land Use Code, including City-wide standards and zone-specific standards. We can control those aspects to make sure projects comply with our regulations, the rest is market driven. For this MMN area, there are a number of development types that could come forward that is driven by the market.

Response (City-Social Sustainability): I heard that you would like to see affordable housing. As a City, we don't build affordable housing, we partner with others to build it. We rely on our partners to locate in appropriate places. City Plan asks for affordable housing to be spread throughout the entire City. Our partners would have to have a complete a market study that shows this is where it is required in the community.

We also have land bank properties that had development impediments at one point that were not valuable to the market and we hold on to them to develop them for affordable housing at a future date. We wouldn't be able to come to this lot without ownership or control to say we need affordable housing. There are definitely issues throughout the community, including gentrification. Social Sustainability and the City have recently hired consultants to look at housing affordability policies and we're looking at ways we can incentivize the right products in our community.
Response (Citizen): We need to find someone from the market to provide affordable housing and get people to support that. How do we make that happen and partner to make that happen?
Response (City): That's what we're looking at, and we have a strong partner with the Fort Collins Housing Authority. The amount of layers and financing to make these projects work make it a very hard thing to do.

Comment (City): If what people want is a connection, a one-way option could be considered. It's up to you all as to if a connection is made, and what it looks like (vehicular, one way, pedestrian only, etc.)
Response (Citizen): The only hope or relief that we have to get out of Andersonville is the connection until Lemay is realigned and built? So if we say no to the connection, what we're really saying is we want it to stay the same way it is right now.

Question (Citizen): So you're saying the students will all go out and go south? The breweries are to the north – don't tell me they aren't going to go to the breweries.
Response (Applicant): There are breweries to the west and to the east. New Belgium is the main brewery that is located to the north.

Comment (Citizen): I appreciate the discussion on affordable housing, but I don't think that's what this meeting is about. I think the biggest issue is the infrastructure, and is that in place to handle this development? I drive up and down Lemay and Lincoln. You can't get out on Lemay from Buckingham or Andersonville. It's too much traffic. If a train comes along, how much longer is Fort Collins going to develop without dealing with the trains, and the trains affect the traffic. Everyone knows Lemay needs to be widened, but it's not going to happen. At what point does the City actually have the funds to do the infrastructure. This is too big of a project and the infrastructure is just not there.

Comment (Citizen): BNSF just built more lines at the switching yard, and the trains are long with the Vestas windblades. You wait just as long on North College as you do anywhere else.
Response (City): There are lots of people sharing your frustration. I can't tell you how frustrating the railroads re for the City as well. It's something we deal with on a daily basis. What we're also seeing is that it happens on Prospect west of Timberline. We have trains that stop there for 30 or 45 minutes. It is all over Fort Collins. How we deal with that is a huge challenge, and it's larger than what we could require a typical development to solve. We have no control over the train schedules and no ability to regulate that.
Comment (Citizen): It's not that you require them to fix the issue, but not to exacerbate it.

Comment (Citizen): In my observation, the City is anti-automobile, and that the City is just being too cheap to put in a light until the realigned Lemay is built. This is something that needs to be done, and I see the stoplights sitting in the back at the traffic department on Linden – why can't they use those?
Response (City): It's not about money. We've put in traffic signals where they are appropriate to put in. It's about safety. People think it's a cure-all to put in traffic signals, and sometimes they cause more traffic and cause more severe types of accidents. I know it's counter-intuitive.
Comment (Citizen): When a kid gets squashed on Buckingham, it will be traffic safety, and you'll put up a light.

Question (Citizen): How long is the potential connector road between Duff and 10th street?

Response (City): I'm guessing about 100 feet.

Comment (City): We want to make sure we are accurately capturing your level of interest in the potential neighborhood connection. The options include: We can do absolutely nothing; we can do a sidewalk connection, or a one-way or two-way vehicle connection. We have heard about the difficulties getting in and out of Andersonville. The original thought was that based on traffic volumes, safety, that signal is really problematic and in lieu of that or until we get Lemay realigned, the idea was to provide the ability to get out on Lemay without a left – is that a benefit to your neighborhood? What we've heard so far tonight is that the connection isn't a good idea or isn't wanted. Can we get another show of hands on some of the potential options?

Informal vote:

No connection:	Majority of votes
Southbound (one-way) only:	Several votes
Two-way connection:	No votes
Pedestrian connection:	No votes

Comment (Citizen): If we take it, we know the other option won't happen.
Comment (Citizen): I feel like we need to process this first – we need more time. I feel like there are a lot of people impacted who aren't here tonight. I don't think the decision should just be made by just a handful in attendance tonight. I feel like we're desperate for an outlet, and I feel like this could provide it, but it only seems like a great idea because if we don't do this, it's only going to continue to get worse. I know a lot of people said they don't want this, but I feel like we need to ask more people. I don't feel like that decision should be made tonight. A lot of people in the neighborhood are older, don't speak English, or just aren't up to speed yet.
Comment (Applicant): I don't think 5 people should be making the decision either. I think the next opportunity will be at the public hearing which will be in a couple months. Come to that meeting and let the decision maker know then after you've had a chance to speak with your neighbors. We think the connection makes sense, but if the neighborhood doesn't want it, we won't build it.

<u>Next steps (City):</u>

- The summary will be sent to everyone who signed in at the meeting tonight, and forwarded to the decision maker.
- We have been reviewing the first PDP submittal since last May. When a new submittal is made, the development review will continue.
- The rezoning is a separate item and is going to P&Z tomorrow night (12/11/14) and to Council on January 6th.
- For future meetings and hearings, there will be additional mailed notices.

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NEIGHBORHOOD INFORMATION MEETING SUMMARY

PROJECTS: Capstone Cottages - PDP

DATE: October 5, 2015 (4th Neighborhood Meeting)

LOCATION: City of Fort Collins, Streets Facility Training Room

PROJECT PLANNER: Pete Wray

NUMBER OF ATTENDEES: 20

Project Planner Presentation Summary:

- Applicant submitted revised plans in mid-August, currently under review by staff (Round 3 of review).
- The information from the neighborhood meetings will be forwarded to the decision maker for the project, in this case a hearing officer. No public hearing has been set yet.
- Project consists of several parcels that have been consolidated; on the NE corner of Lincoln Ave. and Lemay Ave.
- Part of the East Mulberry Corridor Plan
- Zoned for Medium Density Mixed-Use Zoning. The project proposes single family attached dwellings (Type 1 review), minimum average density of 12 dwelling units/acre. The Project Development Plan is not meeting the density requirement, so a request for modification to this standard is included with the submittal.

Applicant Presentation Summary:

- Associates from Ripley Design, Capstone Collegiate Communities, Northern Engineering, Delich Associates all present.
- Rezoning has been completed; proposal for roundabout has been met favorably by City Council (but nothing has been officially approved yet).
- Discovered that units over parking on perimeter of site were too expensive given the public improvements in the project (roundabout, extending International Blvd., dedicating right-of-way, etc.)

- Changes from last submittal: now there are still a few single-family homes on the site, but have added triplexes instead of duplexes. Three-story buildings remain on interior and southern side of the site. Access also remains the same.
- Last time we talked a lot about the traffic neighbors experience on Lemay. What we're proposing is a one-way connection to the cul-de-sac on Duff Drive so you can leave your neighborhood if traffic is backed up on Lemay. There is also no right-out from the property on Lemay to discourage people from turning north into your neighborhood. We believe most students will travel to the west and south.
- Townhome units vary architecturally (3 types of building design) and in number of units per building (3 – 5 or 7, depending on the design)
- No change to amenities.

Questions, Comments & Responses:

Q: (Citizen) In relation to the site map, where is the Andersonville Neighborhood?
A: (Applicant) To the north and slightly west

Q: (Citizen) You're saying that housing for 2-3 families will be along International and Duff Drive?
A: (Applicant) Yes, there are some single-family detached buildings. The complex will include single-family tri-plex and four-plex buildings. The dwelling units in these buildings have 5 bedrooms. The townhome units have 4 bedrooms.

Q: (Citizen) A single-family home with 5 bedrooms? Does that comply with You + 2?
A: (Applicant) We're applying for extra occupancy units. You +2 does not apply if you can meet parking and square footage requirements. *(Clarification added after the meeting: extra occupancy units must meet parking and square footage requirements, and are allowed in only certain zone districts, including Mixed-Use Medium Density (MMN), where this project is located.)*

Q: (Citizen) So how many bedrooms are in each of the other units?
A: (Applicant) There are 5 bedrooms in each dwelling unit; 15 bedrooms total in the tri-plex.

Q: (Citizen) So there will be 50 people in each house?
A: (Applicant) There will be 15 people in each tri-plex building. And we still have to request a modification from the City because we don't have the density required in MMN zoning. We have about 8 dwelling units per acre, and the requirement is 12.

Q: (Citizen) How much bigger has this become since last time? What's the ratio of people to parking spaces?
A: (Applicant) Difference: old plan had 195 dwelling units, this one has 201. Bedrooms: 858, this one has 888. Parking ratio is .83 – more than 80% of the bedrooms.

Q: (Citizen) What happens to visitors and people who are in the other 20% of units?
A: (Applicant) In addition to the parking we're providing, there will be parking along Duff Drive that we have not counted. There will be some students who can live here without owning a car. There will be buses/shuttles provided, or they could ride a bike.

Q: (Citizen) In a previous meeting, we talked about Duff Drive not connecting to Lemay. Is that still the case?

A: (Applicant) Duff Drive doesn't connect to Lemay; it connects to the future Lemay Ave.

Q: (Citizen) Are the streets public or private?
A: (Applicant) This would be a private drive built and maintained by the developer.

Q: (Citizen) What guarantee would we have that the exit from the neighborhood wouldn't change when Lemay is built?
A: (Applicant) We'd be happy to put it in the development agreement with the City to make sure it stays.

Q: (Citizen) What if there's a problem (with the cul-de-sac on Duff)?
A: (Applicant) There will be an on-site manager, and you can always contact that person if there's a problem.

Q: (Citizen) In the traffic analysis, you were looking at 5-10% going north. Has that changed? Also, will the parking spaces be part of the lease or do they have to pay extra? Do you have traffic data we can see tonight?
A: (Applicant) The distribution to the north remains at about 5%. Attractions to the north are minimal.
A: (Applicant) We include parking as part of the overall lease. We've compared to other developments, and we think the amount of parking is adequate.
Q: (Citizen) Would like development agreement to state that there won't be a change to the parking being included in the lease. If you charge for parking it pushes students out into the neighborhood.
Q: (Citizen) Have you made changes to the traffic study given the changes to the projects?
A: (Applicant) We did the study in May of this year. We did a supplemental memo when the project changed in August.
Q: (Citizen) Did you update your regression? I don't agree that it's 5%, could be 15-20%. The traffic and additional breweries, and Woodward Governor…the whole study needs to be updated. The study could be flawed. People will be moving differently.
A: (Applicant) The traffic studies we do reflect the morning and afternoon peak hours, in our judgement the 5% number is proper.
Q: (Citizen) I understand that that's your opinion, but that's why this meeting started 7 minutes late today because some of us were stuck in traffic. I'd like to see the traffic study updated with numbers that show 15-20% distribution to the north.

A: (City) The city submittal documents will be available online tomorrow.
Q: (Citizen) They should be emailed so we don't have to go online.
A: (City) Because the files are too large to email, we can send links to everyone who provided their email addresses on the sign-in sheets.

Q: (Citizen) This traffic study is weak, and will give us an inaccurate picture.
A (City): I'm not sure there was a question in there, more a comment on your part that we will definitely take into consideration. Our interest in this is really looking to minimize the traffic headed to and from the north from this particular development. We've heard this from you all at these neighborhood meetings. The section of Lemay to the north is a huge challenge. We were concerned about the right out onto Lemay, which has been removed. When we're looking at the total volume of traffic at Vine and Lemay, the 5% we're talking about here is 1-2% of the total traffic there. It's a very small increase.

Q: (Citizen) The reality is that this project is just too intense from a traffic perspective alone, not to mention other things. A stronger traffic review and assessment is in order to give neighbors comfort and assurance. We don't know when we're going to see the Lemay bypass.
A: (City) We'll make a note and make sure the traffic studies are available for you to take a look at.

Q: (Citizen) Woodward is going in with no roadway improvements at all, and now this will increase traffic by another 50% and still no roadway improvements. When will we improve the roads in the area? I drive these roads every day, ¼ mile backups and lots of traffic.
A: (City) Woodward has been responsible for intersection improvements at Mulberry and Lemay and along Lemay and Lincoln. The Lincoln Corridor final design is in process. Funding is in place to do most of the Lincoln improvements including the bridge.

Q: (Citizen) When you put this 5% traffic into perspective, what does that mean? 5% more traffic at the am and pm peak?
A: (Applicant) No, this is going to and from Lemay to the north. (City) – 5% of the traffic from the development will go to the north. At the afternoon rush hour, that's a little less than 20 vehicles.
Q: (Citizen) That's just ridiculous! I sat through 5 signal light rotations to get to Lemay to turn left today.
A: What I'm saying is that those 20 northbound vehicles are what will be added during the afternoon rush hour.
Q: (Citizen) Even adding one more vehicle at that time of day is ludicrous.

Q: (Citizen) Our problem is traffic off Lemay. We don't want any more on Lemay. Can we do away with the exit going from Lemay in to the development? Why can't they go in from Lincoln and International?
A: (Applicant) It's a requirement to connect on all sides of the development. I understand your question, it's a valid question. It just provides better access to the project. We've noted your comment and we'll look at it – I can't say yes or no tonight.

Q: (Citizen) The tradeoff is all this traffic, which will be compounded even more on Lemay. I don't know why the city doesn't get it. We're pounded with traffic on Lemay trying to get out of the neighborhood. What part of that traffic congestion does the city not get? Unless you're willing to add a light (which we're not going to get) we have to use the pedestrian crosswalk light just to get out of the neighborhood. I understand that this is an upscale development for students. It's a slap in the face to poor people who live in the neighborhood. Why can't we get affordable housing? And yes, it's a nice development but it's student housing. Students will be going to the breweries, and we have another brewery coming in. This will just continue to gentrify the area. I can't support this project and I won't.

Q: (Citizen) What are the green areas shown on the east of the project?
A: (Applicant) The developer is in the process of acquiring this land. One is an extra parking lot, and the green area is where we have our detention pond. The narrow green strip is maintenance equipment and a trash compactor.
Q: (Citizen) One of our concerns (Fort Collins Business Association) is that we'd like the City to make sure that there's adequate parking. We're concerned that the students will start parking in the industrial area. The industrial area was built in the 60s, and can't handle spillover parking. Right now parking is prohibited in that area, but people park there anyway. You mentioned that you have a percentage that you know how many students bring cars – what is that number?
A: (Applicant) It's right around where we are. Depends on several factors, but we are confident that this is enough parking. It doesn't include Duff Drive parking.
A: (Applicant) It's quite a bit over what the city requires.

Q: (Citizen) The reality is that people are going to bring their cars, regardless of what the city says.

Q: (Citizen) I live right on Lemay. I want some clarification on what's going to happen to the roads. This is my first meeting so some of this may have been covered. I understand that Lemay is going to curve?
A: (Applicant) The long-range plan is for Lemay to curve and rise over the railroad tracks and over Vine Dr.
A: (City) What will happen with the existing Lemay is that it is downsized to a local street. Lemay coming South at Buckingham will probably stop.
Q: (Citizen) I take Lemay from my house all the way down to work. What kind of access will I have to future Lemay Ave?
A: (City) Buckingham will come across and connect with Duff Drive.
Q: (Citizen) While this is being built, I'm concerned that we'll be stranded. To go up to Vine is a mile out of your way to go south. It's hard enough to get out going south now.
A: (Applicant) All the infrastructure for the site would need to be built before the development. Until future Lemay goes in, the existing Lemay will not be impacted.
Q: (Citizen) Where will people who are part of the construction crew for the development park?
A: (Applicant) We haven't gotten to that level of detail yet for the parking. What's good is that we have a fair amount of land we're developing here. We've also leased off-site parking spaces before, not sure we'll need to do that here.

Q: (Citizen) I question the compatibility of the location. Having an upscale student development surrounded by a low-income neighborhood and breweries – I'm not sure that makes sense, including the distance from CSU. I'm really concerned about traffic. Everywhere you turn there's another parking garage going up on campus, students will drive. I think students like to drive, especially if they can park on campus. You have parking as part of the lease, what's the incentive to park in the overflow lot if they don't drive every day?

Q: (Citizen) Summit was not very well done (re: parking and traffic). Your numbers for the parking study need to be higher. Compare it to Aspen Heights is comparing apples and oranges. This development is right up against constraints. Aspen Heights is different, it's a greenfield. I wouldn't compare this to Summit either, it's different. The density is overwhelming and you're going to destroy the three neighborhoods. The city has failed to bring these projects in when they're needed (Lemay realignment). Why should we pay for development when it's not adequately paying for itself? You let Woodward sneak in, breweries accumulating, New Belgium expanding, problems with Tour de Fat and drunken parties…you're going to hurt the neighborhoods. My concern is: traffic has not been well addressed. The assessment falls short. 2 – compatibility with the neighborhood – fails to give adequate public facilities. Unless this is dramatically changed and made compatible it shouldn't happen.

Q: (Citizen) Will this be built in phases or all at once?
A: (Applicant) All at once, over the course of about a year.

Q: (Citizen) I really hadn't thought about the breweries. Look at Aspen Heights, neighbors asking "why so far away from the university," and I had the same thoughts about this too. What are you going to use as your attraction? I can't help but think that it will be the breweries. What kind of effect will that have with almost 900 students in close proximity to neighborhoods and breweries? What kind of message are we sending to students?
A: (Applicant) Is your question "what is the attraction of this development"?
Q: (Citizen) It's not a question, just a statement that students will see breweries as an attraction.

Q: (Citizen) We already have problems with drunkenness, crime, people being hit by drivers (ped/bike). With all of this, there will be more problems. People drink and drive all the time. There are 5-6 major breweries within a mile or half-mile of this development, but they're just far enough out to not be near any police officers. It raises a lot of problems. We own houses, we're not going to go anywhere. Housing prices are ridiculous. To watch my investment get washed down the drain because it's going to turn into Beer Town USA is kind of disappointing. Putting 900 college students + breweries + neighborhoods isn't a good idea.

Q: (Citizen) 9 breweries and 1 distillery and dispensaries in industrial area and further north. Maybe the traffic north should be adjusted for that – students going north to dispensaries.

Q: (Citizen) The traffic circle on Lincoln – can't tell what its capacity is for handling commercial traffic. Semis especially, we're seeing more on Lincoln. Concerned about large semis being able to make the circuit, and if they can't do that they'll come the other way.
A: (City) we require that the roundabout be designed to handle the largest semis allowed on the road. Traffic circle has to be able to accommodate that.
Q: (Citizen) Can it handle a triple?
A: (City) Yes. We can run all of the truck turning templates, and triples generally have an easier time actually.
Q: (Citizen) How will the bikes work in the roundabout?
A: (City) They're designed so there's not a bike lane inside the roundabout. You have a choice to either take the lane or use a sidewalk/path around the side of the roundabout.

Q: (Citizen) Can I take a picture of the site plan?
A: (Applicant) Yes, that's fine. It's conceptual.

Q: (Citizen) Do we know whether the Lemay realignment will happen? Is there a timeline? We can't build this development until we get the Lemay alignment done. We need the bypass and then build it. Let the developers pay for it. We need the bypass so everyone can get in and out and past the train. I know you want to make your money guys, I understand. But we need this first. 25 years already and it still hasn't happened.

Q: (Citizen) I'm not sure that even with the bypass I could be positive about the development. My concern with the future Lemay is that it will be a 4-lane right at the property line, like looking at a freeway for neighbors to the east. I've talked with people at the city about acquiring more land to the east for a better buffer. People in Andersonville are so eager to get out of their neighborhood that they might not be thinking about it. If this development went in like this, could we acquire more space to the east?
A: (City) Plans originally showed a 4-lane expansion where Lemay is currently, but the potential impact to the neighborhoods and need to preserve the historic neighborhoods led to current plans. Whether there's support for additional Right-of-Way to the east I'm not sure. We don't know at this point whether the road will go over or under the railroad tracks. Back to your original question about the projects, the funding is a big part of the timeline. For more information on the Vine/Lemay BNSF Intersection Project see link at: http://www.fcgov.com/engineering/vine-lemay.php.

Q: (Citizen) I don't know if the neighborhood is aware of another brewery coming in at the storage facility, but that should also be taken into consideration for traffic. More bikes, more traffic, something is bound to happen trying to get in or out of the neighborhood.

Q: (Citizen) It's redundant that you drag us back here time after time when we've told you that this project isn't a fit with our neighborhood. It will flop for students and you'll end up putting street people in here because it's a great group housing situation. It's an Animal House with no dorm mother and a recipe for alcoholism.

Q: (Citizen) Where are we in the process?
A: (City) Step 5, Staff Reviews project. We're in the 3rd round of review, not sure if there will be another round at this point. When there is a hearing date that will be sent out in the mail like the notices for these meetings are. There will be opportunity for public testimony. A decision isn't made that day – the hearing officer has 10 days to render a decision.
A: (City) and anything you send to Pete or me or any of the other City staff will be sent to the hearing officer, in addition to the notes of your questions and comments at this meeting. These notes will also be sent out to everyone who is at the meeting tonight.

Next steps (City):

- The summary will be sent to everyone who signed in and provided their email address at the meeting tonight, posted on the Development Review Meeting Agenda web site at: http://www.fcgov.com/developmentreview/agendas.php, and forwarded to the decision maker. Links to the plans submitted to the City will also be emailed to attendees who provided their email addresses. They are also provided below:

  - Application Form - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575458&dt=SUBMITTAL+DOCUMENTS
  - Planning Objectives - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575465&dt=SUBMITTAL+DOCUMENTS
  - Modification Request - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575473&dt=SUBMITTAL+DOCUMENTS
  - Elevations - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575463&dt=PLANS
  - Landscape Plans - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575464&dt=PLANS
  - Subdivision Plat - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575466&dt=PLANS
  - Site Plan - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575467&dt=PLANS
  - Utility Plans - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575471&dt=PLANS
  - Drainage Report - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575461&dt=REPORTS

- Environmental Characterization Study Report - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575462&dt=REPORTS
- Traffic Study - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575469&dt=REPORTS
- Traffic Study Addendum - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575470&dt=REPORTS
- Wetland Report - http://citydocs.fcgov.com/?cmd=convert&vid=185&docid=2575472&dt=REPORTS

- There will be additional mailed notices for the Administrative Type I Hearing, yet to be scheduled.

Community Development & Neighborhood Services
Planning
281 North College Avenue
P.O. Box 580
Fort Collins, CO 80522.0580

970.221.6376
970.224.6111- fax

Capstone Cottages PDP
Citizen Input for the Record (Pre-Hearing)

Comments Received Pre-Hearing

Date: 11/20/15
Contact: Aldrid Clarita
Address: 100 1st Street, Fort Collins
Phone: (970) 482-4452

- Can't make meeting but forwarding comments
- Concerned by project and traffic impacts
- The re-aligned Lemay/Vine overpass needs to be done now
- Why has this overpass not been funded before?

CEDAR CREEK ASSOCIATES, INC.
916 Willshire Ave., Fort Collins, CO 80521 • (970) 493-4394

September 3, 2013

Mr. John Acken
Capstone Collegiate Communities
431 Office Park Drive
Birmingham, Alabama 35223

RE: Environmental Characterization Study Report for the Capstone Cottages Project Site

This letter report documents the evaluation of habitat conditions on the proposed Capstone Cottages 21-acre development parcel in Fort Collins, Colorado. The proposed development site is located in Fort Collins, Larimer County, Colorado in the Northwest 1/4 of Section 7 (T. 7 N. R. 68 W.) at the northeast corner of the intersection of Lemay Avenue and Lincoln Avenue. Existing land uses within the property consist entirely of a cleared, abandoned farmstead area and fallow, non-native grassland pasture. Topography of the site is essentially level with a drainage gradient to the southeast.

An environmental and wetland survey of the property was completed on August 23, 2013. The wetland delineation and sampling work for the wetlands within the project area were completed using the methods and techniques specified for "routine on-site delineations" in the publication, *Corps of Engineers Wetlands Delineation Manual* (USACOE 1987), and supplemented by the document, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region, Version 2.0* (USACOE 2010) (see attached draft wetland report).

The following provides the ecological characterization checklist of information required by Fort Collins Land Use Code under 3.4.1 (D) (1) items (a) through (k).

(a) & (i) The majority of the project area supports non-native grassland. A previous ECSR report prepared by Cedar Creek for a portion of this property in August 2005 documented the presence of an abandoned farmstead on the property as well as grazing use by horses. This habitat has been converted to non-native grassland to support livestock grazing in the past (see attached Figure 1). Non-native grassland is dominated primarily by smooth brome (*Bromus inermis*)[1] with lesser amounts of Kentucky bluegrass (*Poa pratensis*), tall fescue (*Festuca arundinacea*), slender wheatgrass (*Elymus trachycaulus*), crested wheatgrass (*Agropyron cristatum*), western wheatgrass (*Pascopyrom smithii*), and cheatgrass (*Bromus tectorum*). Alfalfa (*Medicago sativa*) is also present as a sub-dominant species in non-native grassland over portions of the eastern half of the property. Western wheatgrass and slender wheatgrass are the only native species among these. Total vegetation cover ranges from 10 percent, in the overgrazed prairie dog town area, to nearly 100 percent in the weed dominated former farmstead area. The former farmstead area has been cleared of all structures and is now dominated by tall, dense stands of kochia (*Bassia scoparia*) and carelessweed (*Cyclachaena xanthiifolia*). Vegetation cover in the prairie dog town at the north edge of the property is sparse as a result of prairie dog overgrazing and is dominated primarily by weedy species including field bindweed (*Convolvulus arvensis*), cheatgrass, Russian thistle (*Salsola tragus*), and pitseed goosefoot (*Chenopodium berlandieri*) with minor amounts of smooth brome. Woody vegetation is restricted primarily to small (less than 6 inches in diameter) Russian olive (*Elaeagnus angustifolia*), eastern cottonwood (*Populus deltoides*), and peachleaf willow trees (see attached Figure 1). Lance-leaf cottonwoods at the southwest property corner are the only potentially significant trees located on the property.

[1] Scientific nomenclature follows USDA, NRCS Plants Database. Available online at: http://plants.usda.gov/java/

Aside from potentially significant trees and small wetland areas (see following Section b), the project area does not support any native vegetation or other unique habitat features, and no features of ecological value exist within 500 feet of the development site. Habitat value and wildlife use of non-native grassland/pasture and weedy habitats is limited by the general lack of woody vegetation, dominance by non-native grass species, and surrounding development and roads. Mice, voles, black-tailed prairie dog, and pocket gopher are the principal species likely to establish resident mammal populations in non-native grassland. Songbirds such as western meadowlark, Brewer's blackbird, common grackle, and black-billed magpie may also occasionally use non-native grassland/pasture habitat. Trees on the property may be used for perching, nesting, and foraging by urban-adapted songbirds, and Canada geese grass may occasionally graze the non-native grassland areas. No songbird nests were located in trees on the project area during the August 23, 2013 survey.

(b) According to the Soil Conservation Service's (SCS) *Soil Survey of Larimer County Area, Colorado* project area soils are Loveland clay loam; Nunn clay loam, wet; and Caruso clay loam. Nunn clay loam, wet, is not a hydric (wetland) soil, but both Loveland clay loam and Caruso clay loam are classified as hydric. These two hydric soils cover about 70 percent of the property in the south half and northeast quarter. Although hydric soils are prevalent, only two wetland areas were delineated on the project area. They are located near the southeast corner of the property and near the southeast corner along the Lincoln Avenue borrow/drainage ditch (see Figure 1). A draft wetland report has been prepared and will be submitted to the COE for these wetlands once the boundaries are surveyed and their sizes (acres) are determined. The southeast corner wetlands are isolated and will likely not be classified as jurisdictional by the COE. A previous approved jurisdictional determination issued by the COE for Larimer County's Lincoln Avenue/Link Lane intersection upgrade project determined that the wetlands and waters in the Lincoln Avenue ditch are non-jurisdictional (see COE File No. 200580352). A copy of the COE response letter for the Capstone Cottages report will be provided to the City once it is received.

The borrow ditch wetland along Lincoln Avenue is characterized by a vegetation community dominated by cattails (*Typha latifolia*), dogbane (*Apocynum cannabinum*), and Emory sedge (*Carex emoryi*). The small depression wetlands in the southeast property corner are dominated by Baltic rush eastern cottonwood (Populus deltoides), dogbane, and round-fruit rush (Juncus compressus) with upland plant species making up a small percentage of the absolute cover.

(c) The property does not provide any unobstructed views of significant landscape or topographical features.

(d) Because of past farmstead development and pasture conversion of the property, the only native woody vegetation located on the property are few young (less than 6 inches in diameter) eastern cottonwood (*Populus deltoides*) trees, associated with the wetland area, and lance-leaf cottonwood (*Populus acuminata*) trees the western property boundary (see attached Figure 2).

(e) There are no perennial water features or natural drainages on or near the property.

(f) The project area was evaluated with regards to potential habitat for state and federal listed threatened and endangered species, and it was determined that no suitable habitat exists for Preble's meadow jumping mouse (*Zapus hudsonius preblei*), Ute ladies'-tresses orchid (*Spriranthes diluvialis*), or Colorado butterfly plant (*Gaura neomexicana coloradenis).* A portion of a black-tailed prairie dog town extends into the northern portion of the project area. Little active prairie dog activity was noted at the time of the field survey except in the northeast portion of the town where prairie dog activity was observed. The prairie dog town is well under 50 acres acres, and Section 3.4.1 of the Land Use Code provides for no protection of prairie dog towns less than 50 acres in size. Section 3.4.1 (N)(6) does stipulate that *before the commencement of grading or other construction on the development site, any prairie dogs inhabiting portions of the site within the LOD shall be relocated or eradicated by the developer using city-approved*

methods as set forth in Chapter 4 of the City Code and, when applicable, using methods reviewed and approved by the Colorado Division of Wildlife.

(g) Because of past cultivation of non-native grass pasture over most of the property, there are no special habitat features present except for the larger trees noted on Figure and the small cluster of isolated wetlands near the southeast property corner (see Section b).

(h) There are no suitable wildlife movement corridors on or near the property.

(j) Because of the lack of natural habitat features on the project area, there are only two issues regarding the timing of property development and ecological features or wildlife use of the project area. If the development proposal includes removal of any trees on the property, tree removal during the songbird-nesting season could result in the loss or abandonment of a nest and would be in violation of the federal Migratory Bird Treaty Act. Prairie dogs in the proposed offsite detention pond area would need to be removed as indicated in paragraph (f) prior to the initiation of grading and construction activities.

(k) Wetlands and lance-leaf cottonwood (*Populus acuminata*) trees 6 inches or greater in diameter on the property may require protection as per the City's Land Use Code. Trees will need to be evaluated by the City Forester or a private arborist to determine which trees may be classified as significant. Loss of trees classified as significant would need to be mitigated with replacement trees as per Section 3.2.1 (F) of the Code. Most wetlands require protection, and based on Section 3.4.1(E)(1)(d) of the Land Use Code, the small (less than 0.3-acre) wetlands on the property would require a 50-foot non-development setback.

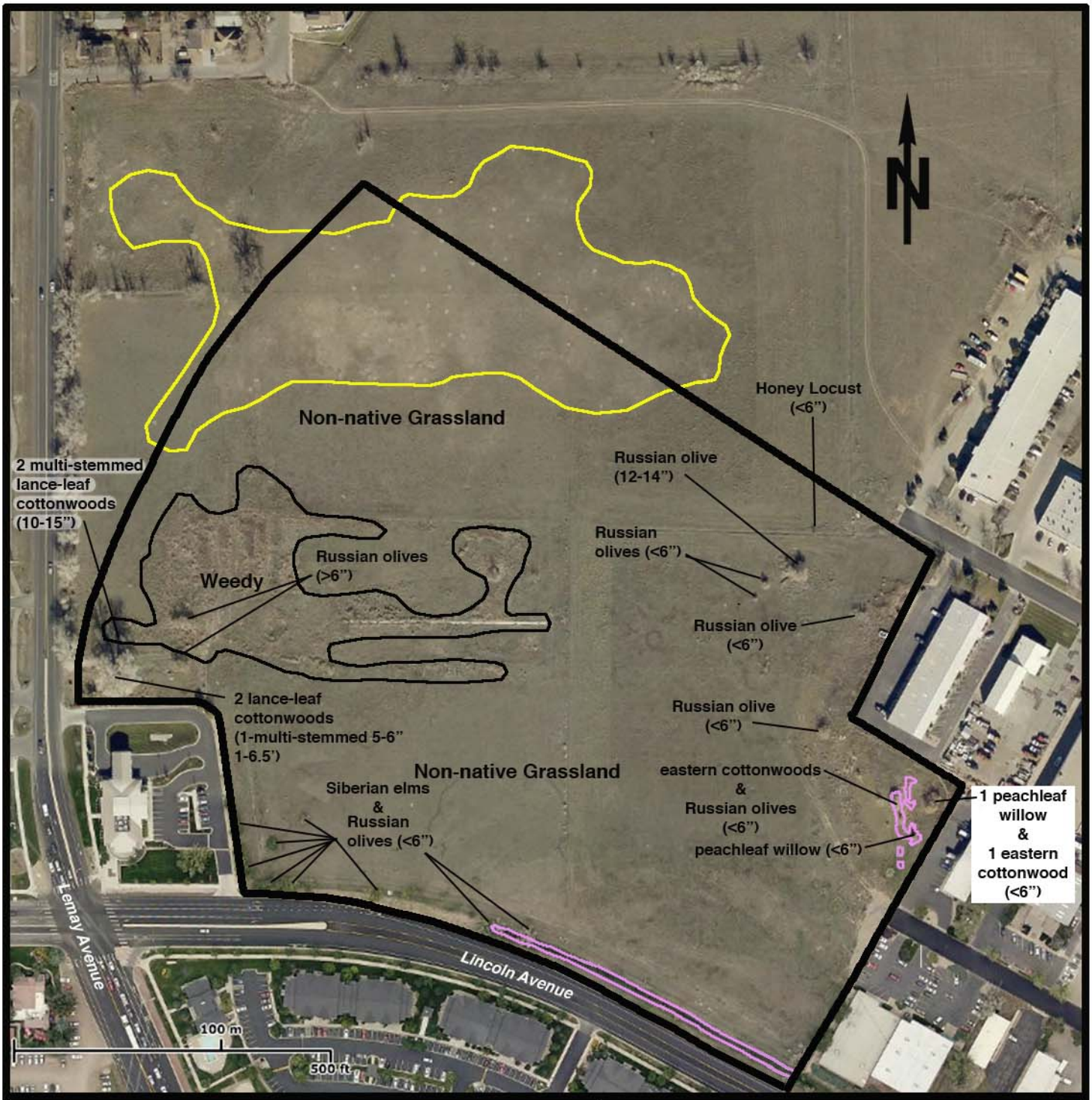
Because tree removal during the songbird nesting season could result in the loss or abandonment of a nest, it is recommended that tree removal or pruning occur outside of the songbird nesting season (April 1 – July 31), or trees be surveyed to ensure lack of nesting prior to removal during the nesting season. This mitigation recommendation would preclude the possible incidental take or disturbance of active songbird nests.

Prairie dogs in the proposed offsite detention pond area would need to be removed as indicated in paragraph (f) prior to the initiation of construction activities.

John, this concludes my environmental assessment of the Capstone Villages project area. Please let me know if you have any questions.

Sincerely,
CEDAR CREEK ASSOCIATES, INC.

T. Michael Phelan
Principal



LEGEND

- Property Boundary
- Habitat Boundary
- Wetland Boundary
- Prairie Dog Town Boundary

Aerial Photo Source: Larimer County Imagery Explorer 2012 Aerial Imagery

CEDAR CREEK ASSOCIATES, INC.
916 Wilshire Ave., Fort Collins, CO 80521 • (970) 493-4394

FIGURE 1
Habitat Mapping for the Capstone Cottages Project Area

PHOTO APPENDIX: PHOTOS TAKEN AUGUST 23, 2013 AT THE CAPSTONE COTTAGES PROJECT SITE



P-1: W-1 – Borrow Ditch



P-2: W-2 – Depression



P-3: W-3 – Shallow Drainage

Geotechnical Engineering Report

Capstone Cottages of Fort Collins
Northeast of N. Lemay Avenue and E. Lincoln Avenue
Fort Collins, Colorado

March 28, 2014
Terracon Project No. 20145005



Prepared for:
Capstone Collegiate Communities, LLC
Birmingham, Alabama

Prepared by:
Terracon Consultants, Inc.
Fort Collins, Colorado

Offices Nationwide
Employee-Owned
Established in 1965
terracon.com

Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

March 28, 2014

Terracon

Capstone Collegiate Communities, LLC
431 Office Park Drive
Birmingham, Alabama 35223

Attn: Mr. John Acken
P: (205) 414-6400
F: (205) 414-6405

Re: Geotechnical Engineering Report
Capstone Cottages of Fort Collins
Northeast of N. Lemay Avenue and E. Lincoln Avenue
Fort Collins, Colorado
Terracon Project No. 20145005

Dear Mr. Aken:

Terracon Consultants, Inc. (Terracon) has completed the geotechnical engineering services for the project referenced above. These services were performed in general accordance with our revised Proposal No. P20120239 and signed Agreement for Services dated August 7, 2013. This geotechnical engineering report presents the results of the current and previously completed subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor systems, and pavements for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

COLORADO REGISTERED ERIC D. BERNHARDT 3/28/14 38829 PROFESSIONAL ENGINEER

Bryce C. Reeves, E.I.
Geotechnical Engineer

Eric D. Bernhardt, P.E.
Geotechnical Department Manager

Enclosures

Copies to: Addressee (via e-mail)

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Exhibit C-3	Description of Rock Properties
Exhibit C-4	Laboratory Test Significance and Purpose
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EXECUTIVE SUMMARY

A geotechnical investigation has been performed for the proposed Capstone Cottages of Fort Collins to be constructed northeast of North Lemay Avenue and East Lincoln Avenue in Fort Collins, Colorado. Previously, Terracon prepared a Geotechnical Engineering Report (Project No. 20045173; report dated November 17, 2004) for this site that included completion of five (5) borings throughout the site. Boring logs for the previously completed borings are presented as Exhibits A-4 through A-8 in Appendix A. Eleven (11) borings, presented as Exhibits A-9 through A-19 and designated as Boring No. 6 through Boring No. 16, were performed to depths of approximately 17 to 23 feet below existing site grades. This report specifically addresses the recommendations for the proposed apartment buildings, cottage buildings, and associated pavements. Borings performed in these areas are for informational purposes and will be utilized by others.

Based on the information obtained from our previous and current subsurface explorations, the site can be developed for the proposed project. However, the following geotechnical considerations were identified and will need to be considered:

- The proposed buildings may be supported on shallow, post-tensioned slab foundation systems bearing on scarified, moisture conditioned, recompacted native soils or on newly placed engineered fill. Spread footings constructed on stable subgrade or new, properly placed engineered fill is also considered an appropriate foundation system for support of the proposed buildings.

- Unstable and/or nearly saturated to wet soils should be anticipated as excavations approach the level of groundwater. Foundations extending below grade near the level of groundwater will require stabilization of the subgrade and/or construction dewatering prior to construction.

- If the Owner selects a post-tensioned slab foundation system, the foundation will also function as the floor system for the proposed buildings. If a conventional spread footing foundation system is selected, we recommend a slab-on-grade floor system for the proposed buildings.

- The amount of movement of foundations, slabs, pavements, etc. will be related to the wetting of underlying supporting soils. Therefore, it is imperative the recommendations discussed in the **4.2.7 Grading and Drainage** section of this report be followed to reduce potential movement.

- Groundwater was encountered at depths ranging from about 1½ to 7 feet below the existing ground surface during our field study. Shallow groundwater conditions will prohibit basement construction, significantly impact installation of deep utilities buried below the site as well as areas planned for cuts on the order of 2 feet or more.

- Budget contingencies should be provided in the contract documents for stabilizing soft subgrade soils expected below portions of the project site.

- The 2012 International Building Code, Table 1613.5.2 IBC seismic site classification for this site is D.

- Close monitoring of the construction operations discussed herein will be critical in achieving the design subgrade support. We therefore recommend that Terracon be retained to monitor this portion of the work.

This summary should be used in conjunction with the entire report for design purposes. It should be recognized that details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled **GENERAL COMMENTS** should be read for an understanding of the report limitations.

GEOTECHNICAL ENGINEERING REPORT
Capstone Cottages of Fort Collins
Northeast of N. Lemay Avenue and E. Lincoln Avenue
Fort Collins, Colorado

Terracon Project No. 20145005
March 28, 2014

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering services performed for the proposed Capstone Cottages of Fort Collins to be located at Northeast of N. Lemay Avenue and E. Lincoln Avenue in Fort Collins, Colorado. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- subsurface soil and bedrock conditions
- groundwater conditions
- grading and drainage
- lateral earth pressures
- seismic considerations
- foundation design and construction
- floor slab design and construction
- pavement construction
- earthwork

Our geotechnical engineering scope of work for this project included review and compilation of previously completed geotechnical data at the site, the initial site visit, the advancement of eleven (11) supplemental test borings to depths ranging from approximately 17 to 23 feet below existing site grades, laboratory testing for soil engineering properties and engineering analyses to provide foundation, floor system, and pavement design and construction recommendations.

Logs of the borings along with an Exploration Plan (Exhibit A-2) are included in Appendix A. The results of the laboratory testing performed on soil and bedrock samples obtained from the site during the field exploration are included in Appendix B.

Previously, Terracon performed a geotechnical study at the project site, as presented in Report No. 20045173 dated November 17, 2004. Information from the previous study was used in the evaluation of the current project. Boring logs and laboratory test results from the previous study are included in this report.

2.0 PROJECT INFORMATION

2.1 Project Description

Item	Description
Site layout	Refer to the Exploration Plan (Exhibit A-2 in Appendix A)
Structures	The project is a mix of two product types including three-story "lodge" or apartment buildings and two-story "cottages" with varying sizes. We anticipate the multi-family buildings will be wood-framed structures constructed on cast-in-place concrete foundations with no basements.
Grading	At the time this report was prepared, site grading plans were not fully developed. We anticipate cuts and fills on the order of 10 feet or less will be necessary for the proposed construction. Deeper cuts may be necessary for the installation of buried utilities.
Traffic loading	We understand both city-maintained roadways and privately-maintained roadways are planned for this site. Expected traffic loading was not provided; however, we anticipate that traffic loads will be produced primarily by automobile traffic, occasional delivery and trash removal trucks, and occasional bus traffic. Based on the information provided to us on a Conceptual Site Plan, the proposed Duff Drive will be a collector road and the proposed International Boulevard will be a 2-lane arterial road. We have assumed Duff Drive will be classified as an industrial/commercial collector according to the Larimer County Urban Area Street Standards (LCUASS). LCUASS indicates a design Equivalent Single Axel Load (ESAL) of 730,000 should be used for an industrial/commercial collector and two-lane arterial roadways.

2.2 Site Location and Description

Item	Description
Location	The project site is located northeast of North Lemay Avenue and East Lincoln Avenue in Fort Collins, Colorado.
Existing site features	The site is currently undeveloped land with Bank of Colorado located to the southwest, Buffalo Run Student Housing to the south, and irrigated farmland to the north. The site is bordered to the east by industrial and commercial properties.
Current ground cover	The site is covered with native grasses and weeds.
Existing topography	The site is relatively flat gently sloping from the northwest to the southeast.

3.0 SUBSURFACE CONDITIONS

3.1 Typical Subsurface Profile

Specific conditions encountered at each boring location are indicated on the individual boring logs included in Appendix A. Stratification boundaries on the boring logs represent the approximate location of changes in soil types; in-situ, the transition between materials may be gradual. Based on the results of the previously completed and supplemental borings, subsurface conditions on the project site can be generalized as follows:

Material Description	Approximate Depth to Bottom of Stratum (feet)	Consistency/Density/Hardness
Lean clay with varying amounts of sand	About 1 to 7 feet below existing site grades.	Soft to very stiff
Sand with varying amounts of silt and gravel	About 14½ to 22 feet below existing site grades.	Loose to very dense
Siltstone/claystone bedrock	To the maximum depth of exploration of about 24½ feet.	Weathered to very hard

The upper ½ to 1 foot of the siltstone and/or siltstone/claystone bedrock was weathered.

3.2 Laboratory Testing

Representative soil samples were selected for swell-consolidation testing and exhibited slight compression to 0.1 percent swell when wetted. The siltstone bedrock is also considered to have low expansive potential or be non-expansive. Samples of site soils and bedrock selected for plasticity testing exhibited medium to high plasticity with liquid limits ranging from non-plastic to 49 and plasticity indices ranging from 5 to 29. Laboratory test results are presented in Appendix B.

3.3 Groundwater

The boreholes were observed while drilling and after completion for the presence and level of groundwater. In addition, delayed water levels were also obtained in some borings. The water levels observed in the boreholes are noted on the attached boring logs, and are summarized below:

Boring Number	Depth to groundwater while drilling, ft.	Depth to groundwater several days after drilling, ft.	Elevation of groundwater several days after drilling, ft.
1	3	Backfilled	--
2	3	Backfilled	--

Boring Number	Depth to groundwater while drilling, ft.	Depth to groundwater several days after drilling, ft.	Elevation of groundwater several days after drilling, ft.
3	3	Backfilled	--
4	3	Backfilled	--
5	6	Backfilled	--
6	6	Backfilled	--
7	6	Backfilled	--
8	6	Backfilled	--
9	7	2.5	93.3
10	2	1.5	94.3
11	6	Backfilled	--
12	3	Backfilled	--
13	3	2.2	91.8
14	4	Backfilled	--
15	4	Backfilled	--
16	5	Backfilled	--

These observations represent groundwater conditions at the time of the field exploration, and may not be indicative of other times or at other locations. Groundwater levels can be expected to fluctuate with varying seasonal and weather conditions, and other factors.

Groundwater level fluctuations occur due to seasonal variations in amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structures may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

Fluctuations in groundwater levels can best be determined by implementation of a groundwater monitoring plan. Such a plan would include installation of groundwater piezometers, and periodic measurement of groundwater levels over a sufficient period of time.

Terracon has provided a proposal to install five (5) temporary piezometers at the site to facilitate groundwater monitoring.

4.0 RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

4.1 Geotechnical Considerations

Based on subsurface conditions encountered in the borings, the site appears suitable for the proposed construction from a geotechnical point of view provided certain precautions and design and construction recommendations described in this report are followed. We have identified geotechnical conditions that could impact design and construction of the proposed structures, pavements, and other site improvements.

4.1.1 Existing, Undocumented Fill

Existing fill materials were not encountered in any of our borings on this site. However, mounds of soil and/or deleterious materials were observed during our field investigation. We do not possess any information regarding the source of the soil and/or deleterious materials. We are uncertain what is contained within the stockpiles; our scope of services did not include exploration of these materials. We recommend the existing mounds of fill and deleterious materials be thoroughly inspected prior to consideration for use as on-site fill materials.

Support of foundations, floor slabs, and pavements on or above existing fill soils is discussed in this report. However, even with the recommended construction testing services, there is an inherent risk for the owner that compressible fill or unsuitable material within or buried by the fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the existing fill, but can be reduced by performing additional testing and evaluation.

4.1.2 Shallow Groundwater

As previously stated, groundwater was measured at depths ranging from about 1½ to 7 feet below existing site grades. Terracon recommends maintaining a separation of at least 3 feet between the bottom of proposed foundations and/or pavement subgrade and measured groundwater levels. It is also possible and likely that groundwater levels below this site may rise.

4.1.3 Weak Soils near Foundation Elevations

Unstable and/or nearly saturated soils should be anticipated as excavations approach the level of groundwater. Foundations extending below grade to the groundwater depth will require stabilization of the subgrade and/or construction dewatering prior to construction. Recommendations for stabilization of foundation subgrade are presented in subsequent sections of this report.

4.1.4 Expansive Soils and Bedrock

Laboratory testing indicates the native clay soils and siltstone bedrock exhibited slight compression to 0.1 percent swell at the samples in-situ moisture content. However, it is our

opinion these materials will exhibit a higher expansive potential if the clays undergo a significant loss of moisture.

This report provides recommendations to help mitigate the effects of soil shrinkage and expansion. However, even if these procedures are followed, some movement and cracking in the structures, pavements, and flatwork should be anticipated. The severity of cracking and other damage such as uneven floor slabs will probably increase if any modification of the site results in excessive wetting or drying of the expansive clays. Eliminating the risk of movement and distress is generally not feasible, but it may be possible to further reduce the risk of movement if significantly more expensive measures are used during construction. It is imperative the recommendations described in section **4.2.7 Grading and Drainage** of this report be followed to reduce movement.

4.2 Earthwork

The following presents recommendations for site preparation, excavation, subgrade preparation and placement of engineered fills on the project. All earthwork on the project should be observed and evaluated by Terracon on a full-time basis. The evaluation of earthwork should include observation of over-excavation operations, testing of engineered fills, subgrade preparation, subgrade stabilization, and other geotechnical conditions exposed during the construction of the project.

4.2.1 Site Preparation

Prior to placing any fill, strip and remove existing vegetation and any other deleterious materials from the proposed construction areas.

Stripped organic materials should be wasted from the site or used to re-vegetate landscaped areas or exposed slopes (if any) after completion of grading operations. Prior to the placement of fills, the site should be graded to create a relatively level surface to receive fill, and to provide for a relatively uniform thickness of fill beneath proposed structures.

If fill is placed in areas of the site where existing slopes are steeper than 5:1 (horizontal:vertical), the area should be benched to reduce the potential for slippage between existing slopes and fills. Benches should be wide enough to accommodate compaction and earth moving equipment, and to allow placement of horizontal lifts of fill.

4.2.2 Excavation

It is anticipated that excavations for the proposed construction can be accomplished with conventional earthmoving equipment. Excavations into the on-site soils may encounter weak and/or saturated soil conditions with possible caving conditions.

Excavation penetrating the bedrock may require the use of specialized heavy-duty equipment, together with ripping or jack-hammering to advance the excavation and facilitate rock break-up

and removal. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project if excavations will extend into bedrock.

The soils to be excavated can vary significantly across the site as their classifications are based solely on the materials encountered in widely-spaced exploratory test borings. The contractor should verify that similar conditions exist throughout the proposed area of excavation. If different subsurface conditions are encountered at the time of construction, the actual conditions should be evaluated to determine any excavation modifications necessary to maintain safe conditions.

Although evidence of underground facilities such as septic tanks, vaults, basements, and utilities was not observed during the site reconnaissance, such features could be encountered during construction. If unexpected fills or underground facilities are encountered, such features should be removed and the excavation thoroughly cleaned prior to backfill placement and/or construction.

Depending upon depth of excavation and seasonal conditions, surface water infiltration and/or groundwater may be encountered in excavations on the site. It is anticipated that pumping from sumps may be utilized to control water within excavations. Well points may be required for significant groundwater flow, or where excavations penetrate groundwater to a significant depth.

The subgrade soil conditions should be evaluated during the excavation process and the stability of the soils determined at that time by the contractors' Competent Person. Slope inclinations flatter than the OSHA maximum values may have to be used. The individual contractor(s) should be made responsible for designing and constructing stable, temporary excavations as required to maintain stability of both the excavation sides and bottom. All excavations should be sloped or shored in the interest of safety following local, and federal regulations, including current OSHA excavation and trench safety standards. If any excavation, including a utility trench, is extended to a depth of more than 20 feet, it will be necessary to have the side slopes and/or shoring system designed by a professional engineer.

As a safety measure, it is recommended that all vehicles and soil piles be kept a minimum lateral distance from the crest of the slope equal to the slope height. The exposed slope face should be protected against the elements

4.2.3 Subgrade Preparation

After the deleterious materials have been removed from the construction areas, the top 10 inches of the exposed ground surface should be scarified, moisture conditioned, and recompacted to at least 95 percent of the maximum dry unit weight as determined by ASTM D698 before any new fill, foundation, or pavement is placed.

In addition, large cobbles may be encountered beneath foundation areas. Such conditions could create point loads on the bottom of foundations, increasing the potential for differential foundation movement. If such conditions are encountered in the foundation excavations, the

cobbles should be removed and be replaced with engineered fill, conditioned to near optimum moisture content and compacted.

After the bottom of the excavation has been compacted, engineered fill can be placed to bring the building pads and pavement subgrade to the desired grade. Engineered fill should be placed in accordance with the recommendations presented in subsequent sections of this report.

The stability of the subgrade may be affected by precipitation, repetitive construction traffic or other factors. If unstable conditions develop, workability may be improved by scarifying and drying. Alternatively, over-excavation of wet zones and replacement with granular materials may be used, or crushed gravel and/or rock can be tracked or "crowded" into the unstable surface soil until a stable working surface is attained. Lightweight excavation equipment may also be used to reduce subgrade pumping. Budget contingencies should be provided in the contract documents for stabilizing soft subgrade soils expected below portions of the project site.

4.2.4 Fill Materials and Placement

The on-site soils or approved granular and low plasticity cohesive imported materials may be used as fill material. The soil removed from this site that is free of organic or objectionable materials, as defined by a field technician who is qualified in soil material identification and compaction procedures, can be re-used as fill for the building pads and pavement subgrade. It should be noted that on-site soils may require reworking to adjust the moisture content to meet the compaction criteria.

Imported soils (if required) should meet the following material property requirements:

Gradation	Percent finer by weight (ASTM C136)
4"	100
3"	70-100
No. 4 Sieve	50-100
No. 200 Sieve	10-50

Soil Properties	Value
Liquid Limit	30 (max.)
Plastic Limit	15 (max.)
Maximum Expansive Potential (%)	Non-expansive[1]

1. Measured on a sample compacted to approximately 95 percent of the maximum dry unit weight as determined by ASTM D698 at optimum moisture content. The sample is confined under a 100 psf surcharge and submerged.

4.2.5 Compaction Requirements

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift.

Item	Description
Fill lift thickness	9 inches or less in loose thickness when heavy, self-propelled compaction equipment is used 4 to 6 inches in loose thickness when hand-guided equipment (i.e. jumping jack or plate compactor) is used
Minimum compaction requirements	95 percent of the maximum dry unit weight as determined by ASTM D698
Moisture content cohesive soil (clay)	-1 to +3 % of the optimum moisture content
Moisture content cohesionless soil (sand)	-3 to +2 % of the optimum moisture content

1. We recommend engineered fill be tested for moisture content and compaction during placement. Should the results of the in-place density tests indicate the specified moisture or compaction limits have not been met, the area represented by the test should be reworked and retested as required until the specified moisture and compaction requirements are achieved.
2. Specifically, moisture levels should be maintained low enough to allow for satisfactory compaction to be achieved without the fill material pumping when proofrolled.
3. Moisture conditioned clay materials should not be allowed to dry out. A loss of moisture within these materials could result in an increase in the material's expansive potential. Subsequent wetting of these materials could result in undesirable movement.

4.2.6 Utility Trench Backfill

All trench excavations should be made with sufficient working space to permit construction including backfill placement and compaction.

All underground piping within or near the proposed structures should be designed with flexible couplings, so minor deviations in alignment do not result in breakage or distress. Utility knockouts in foundation walls should be oversized to accommodate differential movements. It is imperative that utility trenches be properly backfilled with relatively clean materials. If utility trenches are backfilled with relatively clean granular material, they should be capped with at least 18 inches of cohesive fill in non-pavement areas to reduce the infiltration and conveyance of surface water through the trench backfill.

Utility trenches are a common source of water infiltration and migration. All utility trenches that penetrate beneath the buildings should be effectively sealed to restrict water intrusion and flow through the trenches that could migrate below the buildings. We recommend constructing an effective clay "trench plug" that extends at least 5 feet out from the face of the building exteriors. The plug material should consist of clay compacted at a water content at or above the soil's

optimum water content. The clay fill should be placed to completely surround the utility line and be compacted in accordance with recommendations in this report.

It is strongly recommended that a representative of Terracon provide full-time observation and compaction testing of trench backfill within building and pavement areas.

4.2.7 Grading and Drainage

All grades must be adjusted to provide effective drainage away from the proposed buildings and pavements during construction and maintained throughout the life of the proposed project. Infiltration of water into foundation excavations must be prevented during construction. Landscape irrigation adjacent to foundations should be minimized or eliminated. Water permitted to pond near or adjacent to the perimeter of the structures (either during or post-construction) can result in significantly higher soil movements than those discussed in this report. As a result, any estimations of potential movement described in this report cannot be relied upon if positive drainage is not obtained and maintained, and water is allowed to infiltrate the fill and/or subgrade.

Exposed ground (if any) should be sloped at a minimum of 10 percent grade for at least 10 feet beyond the perimeter of the proposed buildings, where possible. The use of swales, chases and/or area drains may be required to facilitate drainage in unpaved areas around the perimeter of the buildings. Backfill against foundations and exterior walls should be properly compacted and free of all construction debris to reduce the possibility of moisture infiltration. After construction of the proposed buildings and prior to project completion, we recommend verification of final grading be performed to document positive drainage, as described above, has been achieved.

Flatwork and pavements will be subject to post-construction movement. Maximum grades practical should be used for paving and flatwork to prevent areas where water can pond. In addition, allowances in final grades should take into consideration post-construction movement of flatwork, particularly if such movement would be critical. Where paving or flatwork abuts the structures, care should be taken that joints are properly sealed and maintained to prevent the infiltration of surface water.

Planters located adjacent to structures should preferably be self-contained. Sprinkler mains and spray heads should be located a minimum of 5 feet away from the building line(s). Low-volume, drip style landscaped irrigation should not be used near the building. Roof drains should discharge on to pavements or be extended away from the structures a minimum of 10 feet through the use of splash blocks or downspout extensions. A preferred alternative is to have the roof drains discharge by solid pipe to storm sewers or to a detention pond or other appropriate outfall.

4.2.8 Exterior Slab Design and Construction

Exterior slabs on-grade, exterior architectural features, and utilities founded on, or in backfill or the site soils will likely experience some movement due to the volume change of the material. Potential movement could be reduced by:

- Minimizing moisture increases in the backfill;
- Controlling moisture-density during placement of the backfill;
- Using designs which allow vertical movement between the exterior features and adjoining structural elements; and
- Placing control joints on relatively close centers.

4.2.9 Corrosion Protection

Results of water-soluble sulfate testing indicate that ASTM Type V portland cement or approved substitute should be specified for all project concrete on and below grade. Foundation concrete should be designed for very severe sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

4.3 Foundations

Terracon considered several foundation alternatives for support of the proposed structures including:

- Traditional post-tensioned slabs
- Frost protected post-tensioned slabs
- Spread footings
- Drilled piers or helical piles

There are advantages and disadvantages associated with each of the foundation alternatives we believe are suitable for this project site. Shallow groundwater conditions encountered below this site will likely impact spread footing and traditional post-tensioned slab foundations. Foundation excavations approaching the level of groundwater will likely encounter soft to very loose and nearly saturated to wet soil conditions. Stabilization of foundation subgrade soils will be required prior to spread footing or traditional post-tensioned slab foundation construction. Drilled pier foundations bottomed in bedrock will require temporary casing, concrete placement using tremie methods and rock coring bits to achieve penetration in the very hard bedrock below the site. Helical pile foundations may be comparatively costly and achieving torque in the sand and gravel below the site may be difficult.

We believe constructing the proposed buildings on frost protected post-tensioned slabs is a suitable foundation alternative that will reduce impacts of shallow groundwater and limit areas where subgrade stabilization will be required. The bearing depth for frost protected post-tensioned slabs will be significantly less than the bearing depth for other conventional shallow foundations systems such as spread footings and traditional post-tensioned slab foundations. However, there will be requirements to protect the foundation bearing soils from frost action that will include placement of insulation adjacent to the perimeter edges of foundations.

Design recommendations for the recommended foundation alternatives for the proposed structures and related structural elements are presented in the following sections.

4.3.1 Frost Protected Post-tensioned Slabs

A frost protected shallow foundation is a foundation that does not extend below the design frost depth, but is protected against effects of frost. Protection from frost heave is achieved by insulating to retard frost penetration below the foundation and to retard heat flow from beneath the foundation. Installation of insulation will allow shallower foundation bearing depths to be possible with significantly reduced risk of frost damage. Recommendations for design and construction of frost protected shallow foundations are presented in *Design and Construction of Frost-Protected Shallow Foundations* prepared by the American Society of Civil Engineers (ASCE 32-01).

4.3.2 Post-Tensioned Slabs – Design Recommendations

Based on the subsurface conditions encountered, use of post-tensioned slabs is feasible for support of the structures provided some foundation movement can be tolerated and:

- The post-tensioned slab foundations are properly designed and constructed.
- Approved materials supporting the foundation are properly placed and compacted.
- Proper surface drainage is maintained throughout the life of the structures.
- Prudent landscaping measures are used.

In our opinion, total foundation movements on the order of about 1 inch should be expected. Provided foundations are properly designed, foundation movements could result in periodic, and possibly seasonal, cosmetic distress to drywall, window frames, door frames and other features. We would anticipate that the frequency of distress and amount of movement would generally diminish with time provided proper drainage is established and/or maintained. We believe potential total foundation movements can be reduced to ½ to ¾ inch or less if at least 3 feet of imported granular engineered fill is placed directly below the post-tensioned slab foundations. The granular fill should consist of materials within the specified limits presented in the **4.2.4 Fill Materials and Placement** section of this report.

Based on the subsurface conditions, post-tensioned slabs should be designed using criteria outlined by the Post-Tensioning Institute[1] based on the following:

[1] (2004, Third Edition), ***Design (and Construction) of Post-Tensioned Slabs-on-Ground***, Post-Tensioning Institute.

Post-tensioned Slab Design Parameter		PTI, Third Edition 2012 IBC/IRC
Edge Moisture Variation Distance, e_m (feet)	Center Lift Condition	7½
	Edge Lift Condition	4
Differential Soil Movement, y_m (inches)	Center Lift Condition	¼
	Edge Lift Condition	¾

- Maximum Allowable Net Bearing Pressure.....2,000 psf

- Slab-Subgrade Friction Coefficient, μ
  - on polyethylene sheeting 0.75
  - on cohesionless soils.....1.00
  - on cohesive soils.....2.00

The maximum allowable net bearing pressure may be increased by 1/3 for transient wind or seismic loading.

It should be noted that y_m is the estimated vertical movement at the edges of a uniformly loaded slab. These are theoretical values that are used in the design of post-tensioned slabs-on-grade and do not represent the movements that would be expected from the actual loading conditions. As previously discussed, the use of post-tensioned slabs assumes that some potential movement is considered acceptable.

4.3.3 Post-Tensioned Slabs – Construction Considerations

Post-tensioned slabs, thickened or turndown edges and/or interior beams should be designed and constructed in accordance with the requirements of the PTI and the American Concrete Institute (ACI).

As previously discussed, foundations should be protected from frost heave using insulation. If traditional post-tensioned slab foundations are selected, exterior slab edges should be placed a minimum of 30 inches below finished grade for frost protection. Finished grade is the lowest adjacent grade for perimeter beams. Extending exterior slab edges to depths of at least 30 inches will likely encroach upon soft to very loose and nearly saturated to wet soils requiring stabilization of subgrade prior to construction.

If portions of the building floor slab will be unheated, such as patios and entryways, consideration should be given to structurally separating these areas of the slab from the remaining interior portion of the slab. Exterior slab areas may be cantilevered portions of the slab which are subject to uplift from frost heave and swelling of the expansive soils, sometimes beyond those used for design, due to over watering of adjacent to landscaped areas. Such movement in the exterior slabs can result in change in slab grade to the point where negative grade results and water ponds adjacent to the interior areas of the slab. Repairs of such conditions are difficult and costly, particularly if the floor slabs are post-tensioned slabs.

Exterior slabs in unheated areas are subject to frost heave beneath the slab. Therefore, in design of the exterior slabs, potential movement from frost heave should be considered in the design.

It should be noted that the presences of 1 to 2-foot steps within long spans of post-tensioned slabs could create a situation where the slabs at different elevations perform independently of one another unless the steps are properly reinforced and designed to tie the slabs together to act as one rigid structure. We strongly recommend that joints be designed within the full height of the structure of the building over each step in order to help the structure be capable of withstanding movements on the order of 1 inch.

The estimated movement should also be considered as the potential amount of tilting of the structure, which could be caused by non-uniform, significant wetting of the subsurface materials below the post-tensioned slab, resulting in potential movement. Failure to maintain soil water content below the slab and to maintain proper drainage around the structure will nullify the movement estimates provided above.

4.3.4 Spread Footings - Design Recommendations

Description	Value
Bearing material	Stabilized subgrade or new, properly placed engineered fill.
Maximum allowable bearing pressure [1]	2,000 psf
Lateral earth pressure coefficients [2]	On-site soils: Active, K_a = 0.41 Passive, K_p = 2.46 At-rest, K_o = 0.58 Imported fill: Active, K_a = 0.27 Passive, K_p = 3.69 At-Rest, K_o = 0.43
Sliding coefficient [2]	On-site soils: μ = 0.37 Import material: μ = 0.56
Moist soil unit weight	On-site soils: ɣ = 120 pcf Import material: ɣ = 135 pcf
Minimum embedment depth below finished grade [3]	30 inches

Description	Value
Estimated total movement	About 1 inch

1. The recommended maximum allowable bearing pressure assumes any unsuitable fill or soft soils, if encountered, will be stabilized as described in this report. The design bearing pressure applies to a dead load plus ½ design live load condition. The design bearing pressure may be increased by one-third when considering total loads that include wind or seismic conditions.
2. The lateral earth pressure and sliding coefficients are ultimate values and do not include a factor of safety. The foundation designer should include the appropriate factors of safety.
3. For frost protection and to reduce the effects of seasonal moisture variations in the subgrade soils. The minimum embedment depth is for perimeter footings beneath unheated areas and is relative to lowest adjacent finished grade, typically exterior grade.

Footings should be proportioned on the basis of equal total dead load pressure to reduce differential movement between adjacent footings. As discussed, total movement resulting from the assumed structural loads is estimated to be on the order of about 1 inch. Additional foundation movements could occur if water from any source infiltrates the foundation soils; therefore, proper drainage should be provided in the final design and during construction and throughout the life of the structure. Failure to maintain the proper drainage as recommended in the **4.2.7 Grading and Drainage** section of this report will nullify the movement estimates provided above.

4.3.5 Spread Footings - Construction Considerations

To reduce the potential of “pumping” and softening of the foundation soils at the foundation bearing level and the requirement for corrective work, we suggest the foundation excavation for the proposed buildings be completed remotely with a track-hoe operating outside of the excavation limits.

Footings and foundation walls should be reinforced as necessary to reduce the potential for distress caused by differential foundation movement.

Unstable subgrade conditions are anticipated as excavations approach the groundwater surface. Unstable surfaces will need to be stabilized prior to backfilling excavations and/or constructing the building foundations. The use of angular rock, recycled concrete and/or gravel pushed or “crowded” into the yielding subgrade is considered suitable means of stabilizing the subgrade. The use of bi-axial or tri-axial geogrid materials in conjunction with gravel or aggregate base course could also be considered and could be more cost effective. Unstable subgrade conditions should be observed by Terracon to assess the subgrade and provide suitable alternatives for stabilization.

Foundation excavations should be observed by Terracon. If the soil conditions encountered differ significantly from those presented in this report, supplemental recommendations will be required.

4.4 Seismic Considerations

Code Used	Site Classification
2012 International Building Code (IBC) [1]	D [2]

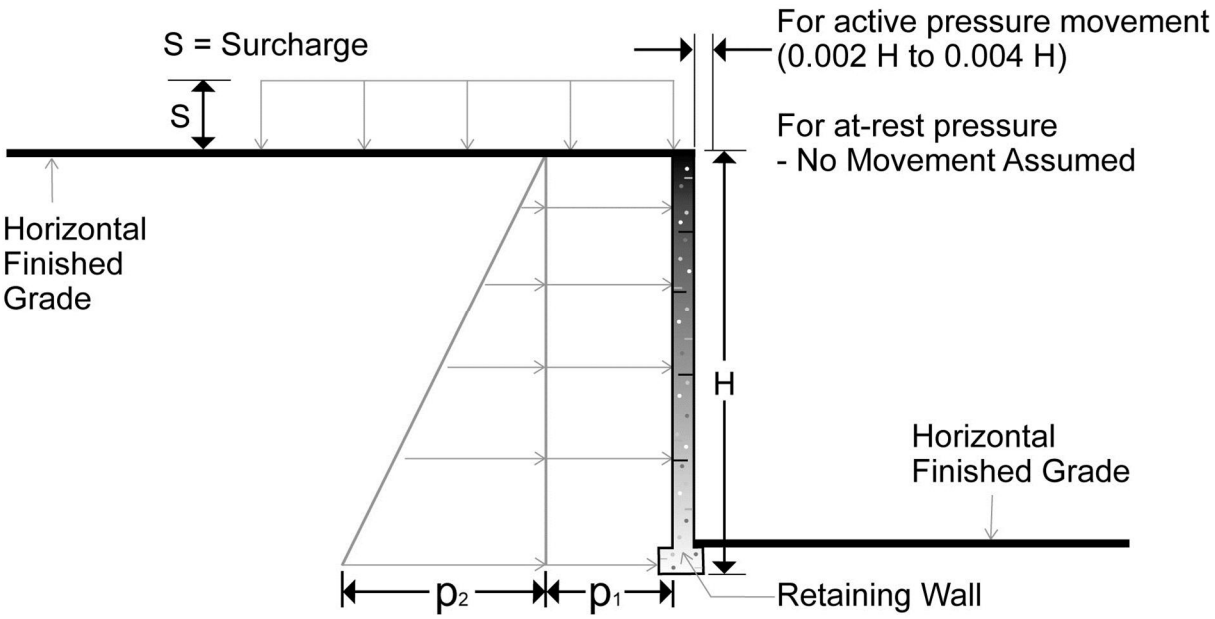
1. In general accordance with the *2012 International Building Code,* Table 1613.5.2.
2. The 2012 International Building Code (IBC) requires a site soil profile determination extending a depth of 100 feet for seismic site classification. The current scope requested does not include the required 100 foot soil profile determination. The borings completed for this project extended to a maximum depth of about 23 feet and this seismic site class definition considers that similar soil and bedrock conditions exist below the maximum depth of the subsurface exploration. Additional exploration to deeper depths could be performed to confirm the conditions below the current depth of exploration. Alternatively, a geophysical exploration could be utilized in order to attempt to justify a more favorable seismic site class; however, we believe this is unlikely.

4.5 Floor Systems

If a post-tensioned slab foundation system is selected by the Owner, the foundation system will also function as the floor system for the proposed buildings. If a spread footing foundation system is selected by the Owner, we recommend a slab-on-grade for the floor system for the proposed buildings. If a slab-on-grade floor system is planned as part of the proposed construction, we can provide recommendations for floor slabs.

4.6 Lateral Earth Pressures

Reinforced concrete walls with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to those indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The "at-rest" condition assumes no wall movement. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls.



EARTH PRESSURE COEFFICIENTS

Earth Pressure Conditions	Coefficient for Backfill Type	Equivalent Fluid Density (pcf)	Surcharge Pressure, p_1 (psf)	Earth Pressure, p_2 (psf)
Active (Ka)	Granular - 0.27 Lean Clay - 0.41	37 49	(0.27)S (0.41)S	(37)H (49)H
At-Rest (Ko)	Granular - 0.43 Lean Clay - 0.58	58 70	(0.43)S (0.58)S	(58)H (70)H
Passive (Kp)	Granular - 3.69 Lean Clay - 2.46	375 255	--- ---	--- ---

Applicable conditions to the above include:

- For active earth pressure, wall must rotate about base, with top lateral movements of about 0.002 **H** to 0.004 **H**, where **H** is wall height;
- For passive earth pressure to develop, wall must move horizontally to mobilize resistance;
- Uniform surcharge, where S is surcharge pressure;
- In-situ soil backfill weight a maximum of 125 pcf;
- Horizontal backfill, compacted between 95 and 98 percent of maximum dry unit weight as determined by ASTM D698;
- Loading from heavy compaction equipment not included;
- No hydrostatic pressures acting on wall;
- No dynamic loading;
- No safety factor included in soil parameters; and
- Ignore passive pressure in frost zone.

To control hydrostatic pressure behind the walls we recommend that a drain be installed at the foundation walls with a collection pipe leading to a reliable discharge. If this is not possible, then combined hydrostatic and lateral earth pressures should be calculated for lean clay backfill using an equivalent fluid weighing 90 and 100 pcf for active and at-rest conditions, respectively. For granular backfill, an equivalent fluid weighing 85 and 90 pcf should be used for active and at-rest, respectively. These pressures do not include the influence of surcharge, equipment or floor loading, which should be added. Heavy equipment should not operate within a distance closer than the exposed height of retaining walls to prevent lateral pressures more than those provided.

4.8 Pavements

4.8.1 Pavements – Subgrade Preparation

On most project sites, the site grading is accomplished relatively early in the construction phase. Fills are typically placed and compacted in a uniform manner. However as construction proceeds, the subgrade may be disturbed due to utility excavations, construction traffic, desiccation, or rainfall/snow melt. As a result, the pavement subgrade may not be suitable for pavement construction and corrective action will be required. The subgrade should be carefully evaluated at the time of pavement construction for signs of disturbance or instability. We recommend the pavement subgrade be thoroughly proofrolled with a loaded tandem-axle dump truck prior to final grading and paving. All pavement areas should be moisture conditioned and properly compacted to the recommendations in this report immediately prior to paving.

4.8.2 Pavements – Design Recommendations

Design of pavements for the project have been based on the procedures outlined in the 1993 Guideline for Design of Pavement Structures prepared by the American Association of State Highway and Transportation Officials (AASHTO) and the Larimer County Urban Area Street Standards (LCUASS). The recommended pavement thicknesses provided in this report are appropriate for the privately-maintained roadways. As required by LCUASS, the Final Pavement Design Report for city-maintained roadways should occur after grading for roadways and utility installation is complete. Terracon can assist with final design of city-maintained roadways following roadway grading and utility installation, upon your request.

Samples of the upper clay soils obtained from our borings selected for swell-consolidation testing exhibited slight compression or low swell. Therefore, swell-mitigation of the subgrade materials prior to pavement operations is not required. However, depending upon final grading plans we anticipate stabilization of pavement subgrade will be necessary for this project.

Water-soluble sulfate concentrations measured on samples of soils obtained from our borings at this site ranged from 550 to 21,540 parts per million (ppm). These concentrations are above typical acceptable limits to allow for chemical stabilization of subgrade soils. In order to stabilize the subgrade below the proposed pavements planned as part of this project, we recommend utilizing a layer of geogrid below the aggregate base course. Prior to placing a layer of geogrid,

the roadway should be rough graded and the subgrade should be scarified to a depth of at least 10 inches, moisture conditioned and compacted in-place. Once the subgrade is properly prepared, we recommend placing a single layer of geogrid (Hanes Geo Components TerraGrid® RX 1200 or engineered approved equivalent) over the entire subgrade from back of curb to back of curb.

Traffic patterns and anticipated loading conditions were not available at the time that this report was prepared. However, we anticipate that traffic loads will be produced primarily by automobile traffic, occasional delivery and trash removal trucks, and occasional bus traffic. We understand Duff Drive will be classified as an industrial/commercial collector and International Boulevard will be classified as a two-lane arterial road according to the Larimer County Urban Area Street Standards (LCUASS). LCUASS indicates a design Equivalent Single Axel Load (ESAL) of 730,000 should be used for an industrial/commercial collector and a two-lane arterial road. Minimum flexible pavement sections are presented in Table 10-1 of LCUASS. If heavier traffic loading is expected, Terracon should be provided with the information and allowed to review these pavement sections.

Asphaltic cement concrete (ACC) pavements can be used for pavements such as drive lanes and parking areas. We recommend portland cement concrete (PCC) pavements for entrance aprons, trash container pads, loading areas, and in any other areas subjected to heavy wheel loads and/or turning traffic. Recommended minimum pavement sections are provided in the table below.

Recommended Pavement Thickness (inches) [1]

Traffic Area	Alternative	Asphalt Concrete		Portland Cement Concrete	Aggregate Base Course	Total Thickness
		Surface Course	Base Course			
Light-Duty (car parking)	PCC	--	--	5	12	17
	ACC	4	--	--	12	16
Medium-Duty (drives and loading areas)	PCC	--	--	6	12	18
	ACC	2	3	--	12	17
Trash Container Pad	PCC	--	--	7	12	19

[1] Each pavement section below includes a single layer of geogrid placed below the composite section as described above.

Aggregate base course should consist of a blend of sand and gravel which meets strict specifications for quality and gradation. Use of materials meeting Colorado Department of Transportation (CDOT) Class 5 or 6 specifications is recommended for base course. Aggregate

base course should be placed in lifts not exceeding 6 inches and compacted to a minimum of 95 percent of the maximum dry unit weight as determined by ASTM D698.

Asphalt concrete should be composed of a mixture of aggregate, filler and additives (if required) and approved bituminous material. The asphalt concrete should conform to approved mix designs stating the Superpave properties, optimum asphalt content, job mix formula and recommended mixing and placing temperatures. Aggregate used in asphalt concrete should meet particular gradations. Material meeting CDOT Grading S or SX specifications or equivalent is recommended for asphalt concrete. Mix designs should be submitted prior to construction to verify their adequacy. Asphalt material should be placed in maximum 3-inch lifts and compacted within a range of 92 to 96 percent of the theoretical maximum density (ASTM D2041).

Where rigid pavements are used, the concrete should be obtained from an approved mix design with the following minimum properties:

Properties	Value
Compressive strength at 28 days	4,000 psi (minimum)
Cement type	Type I or Type II
Entrained air content (%)	5 to 8
Concrete aggregate	ASTM C33 and CDOT Section 703

Longitudinal and transverse joints should be provided as needed in concrete pavements for expansion/contraction and isolation per ACI 325. The location and extent of joints should be based upon the final pavement geometry. Joints should be sealed to prevent entry of foreign material and doweled where necessary for load transfer. We understand others will utilize the information presented in this report to design pavement reinforcement for the proposed concrete pavements. Proper joint spacing will also be required for PCC pavements to prevent excessive slab curling and shrinkage cracking. All joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

For areas subject to concentrated and repetitive loading conditions such as dumpster pads, truck delivery docks and ingress/egress aprons, we recommend using a portland cement concrete pavement with a thickness of at least 7 inches underlain by at least 6 inches of granular base. Prior to placement of the granular base the areas should be thoroughly proof rolled. For dumpster pads, the concrete pavement area should be large enough to support the container and tipping axle of the refuse truck.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:

- Site grades should slope a minimum of 2 percent away from the pavements;
- The subgrade and the pavement surface have a minimum 2 percent slope to promote proper surface drainage;
- Consider appropriate edge drainage and pavement under drain systems;
- Install pavement drainage surrounding areas anticipated for frequent wetting;
- Install joint sealant and seal cracks immediately;
- Seal all landscaped areas in, or adjacent to pavements to reduce moisture migration to subgrade soils; and
- Placing compacted, low permeability backfill against the exterior side of curb and gutter.

4.8.3 Pavements – Construction Considerations

The placement of a partial pavement thickness for use during construction is not suggested without a detailed pavement analysis incorporating construction traffic.

Openings in pavement, such as landscape islands, are sources for water infiltration into surrounding pavements. Water collects in the islands and migrates into the surrounding subgrade soils thereby degrading support of the pavement. This is especially applicable for islands with raised concrete curbs, irrigated foliage, and low permeability near-surface soils. The civil design for the pavements with these conditions should include features to restrict or to collect and discharge excess water from the islands. Examples of features are edge drains connected to the storm water collection system or other suitable outlet and impermeable barriers preventing lateral migration of water such as a cutoff wall installed to a depth below the pavement structure.

4.8.4 Pavements – Maintenance

Preventative maintenance should be planned and provided for an ongoing pavement management program in order to enhance future pavement performance. Preventive maintenance consists of both localized maintenance (e.g. crack and joint sealing and patching) and global maintenance (e.g. surface sealing). Preventative maintenance is usually the first priority when implementing a planned pavement maintenance program and provides the highest return on investment for pavements.

5.0 GENERAL COMMENTS

Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

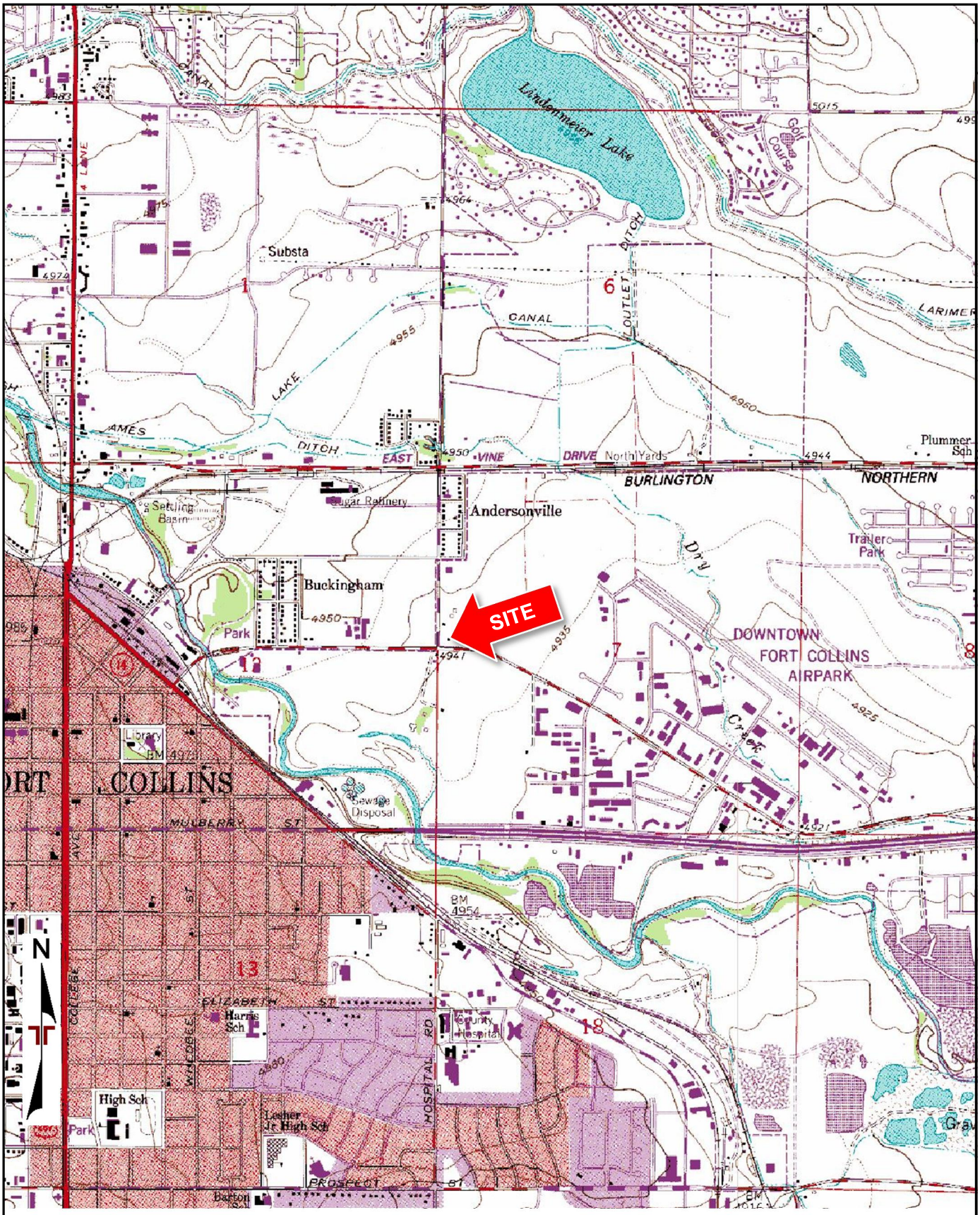
The analysis and recommendations presented in this report are based upon the data obtained from the borings performed at the indicated locations and from other information discussed in this report. This report does not reflect variations that may occur between borings, across the

site, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, and bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. Site safety, excavation support, and dewatering requirements are the responsibility of others. In the event that changes in the nature, design, or location of the project as described in this report are planned, the conclusions and recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

APPENDIX A
FIELD EXPLORATION



TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY
QUADRANGLES INCLUDE: FORT COLLINS, CO (1/1/1984).

Project Manager: EDB	Project No. 20145005	Terracon 1901 Sharp Point Dr Suite C Ft. Collins, CO	SITE LOCATION MAP	Exhibit
Drawn by: BCR	Scale: 1:24,000		Capstone Cottages of Fort Collins Northeast of N. Lemay Ave. and E. Lincoln Ave. Fort Collins, CO	A-1
Checked by: EDB	File Name:			
Approved by: EDB	Date: 3/24/2014			

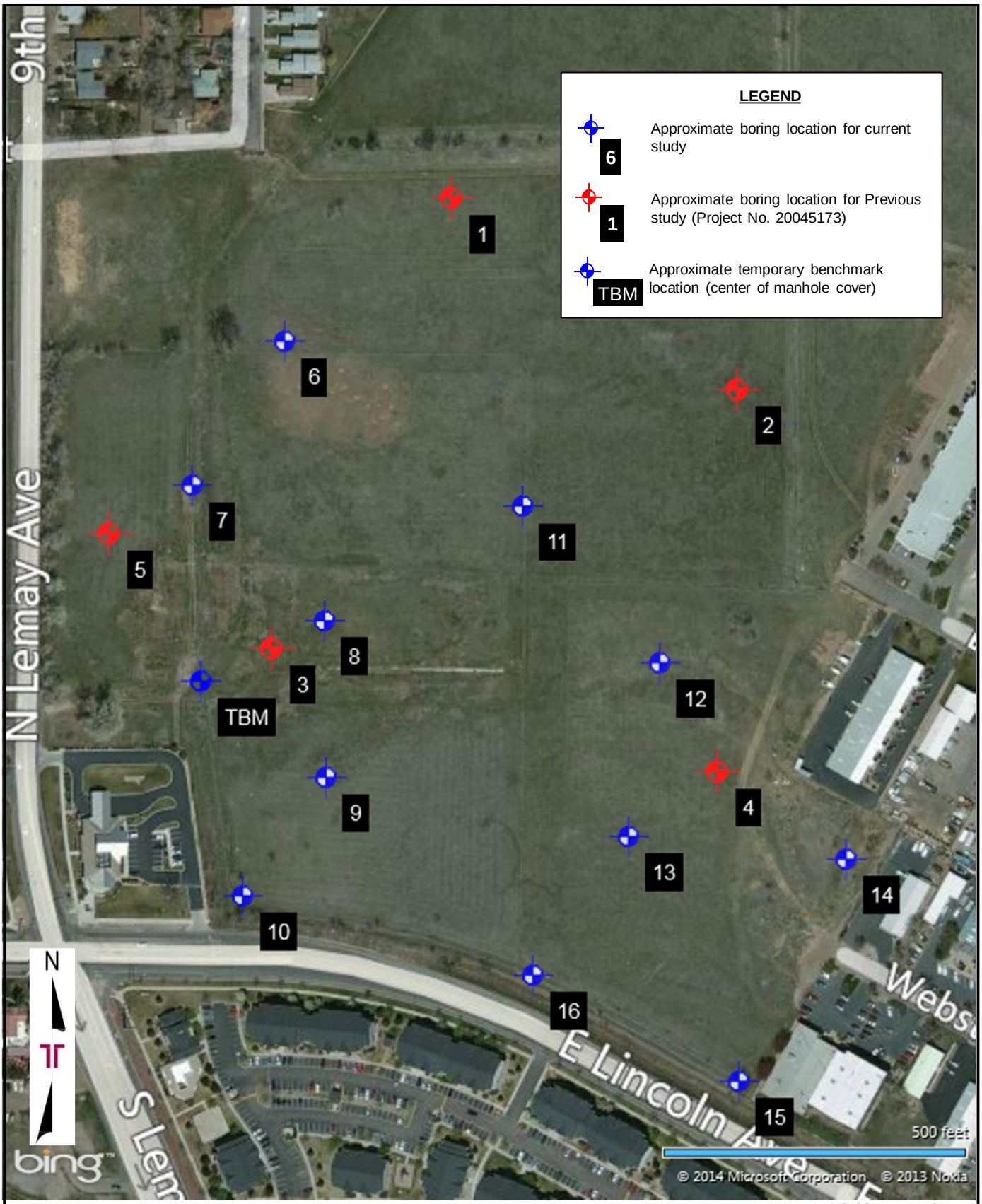


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Project Manager: EDB	Project No. 20145005	Terracon 1901 Sharp Point Dr Suite C Ft. Collins, CO	EXPLORATION PLAN Capstone Cottages of Fort Collins Northeast of N. Lemay Ave. and E. Lincoln Ave. Fort Collins, CO	EXHIBIT A-2
Drawn By: BCR	Scale: AS SHOWN			
Check By: EDB	File Name:			
Approved By: EDB	Date: 3/24/2014			

Field Exploration Description

The locations of the supplemental borings were based upon the proposed development shown on the provided site plan and were selected in areas to supplement previously completed subsurface exploration. The supplemental borings were located in the field by measuring from property lines and existing site features. The ground surface elevation was surveyed at each supplemental boring location referencing the temporary benchmark shown on Exhibit A-2 using an engineer's level.

The supplemental borings were drilled with a CME-75 truck-mounted rotary drill rig with hollow-stem augers. During the drilling operations, lithologic logs of the borings were recorded by the field engineer. Disturbed samples were obtained at selected intervals utilizing a 2-inch outside diameter split-spoon sampler and a 3-inch outside diameter ring-barrel sampler. Penetration resistance values were recorded in a manner similar to the standard penetration test (SPT). This test consists of driving the sampler into the ground with a 140-pound hammer free-falling through a distance of 30 inches. The number of blows required to advance the ring-barrel sampler 12 inches (18 inches for standard split-spoon samplers, final 12 inches are recorded) or the interval indicated, is recorded as a standard penetration resistance value (N-value). The blow count values are indicated on the boring logs at the respective sample depths. Ring-barrel sample blow counts are not considered N-values.

A CME automatic SPT hammer was used to advance the samplers in the supplemental borings performed on this site. A greater efficiency is typically achieved with the automatic hammer compared to the conventional safety hammer operated with a cathead and rope. Published correlations between the SPT values and soil properties are based on the lower efficiency cathead and rope method. This higher efficiency affects the standard penetration resistance blow count value by increasing the penetration per hammer blow over what would be obtained using the cathead and rope method. The effect of the automatic hammer's efficiency has been considered in the interpretation and analysis of the subsurface information for this report.

The standard penetration test provides a reasonable indication of the in-place density of sandy type materials, but only provides an indication of the relative stiffness of cohesive materials since the blow count in these soils may be affected by the moisture content of the soil. In addition, considerable care should be exercised in interpreting the N-values in gravelly soils, particularly where the size of the gravel particle exceeds the inside diameter of the sampler.

Groundwater measurements were obtained in the borings at the time of site exploration, and several days after drilling in some of the borings. After completion of drilling, the borings were backfilled with auger cuttings. Some settlement of the backfill may occur and should be repaired as soon as possible.

LOG OF BORING NO. 1

CLIENT **Lagunitas-Lincoln, Inc.**

ENGINEER

SITE **N/E/C of Lemay Ave. and Lincoln Ave. Fort Collins, Colorado**

PROJECT **Proposed Multi-Family Development- Lincoln Project**

Approx. Surface Elev.: 100.6 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	TESTS LIQUID LIMIT/ PLASTIC INDEX/ % (-) #200
	0.5 6" TOPSOIL (100)										
	1 **SANDY LEAN CLAY** Brown, calcareous, stiff (99.5)										
	POORLY GRADED SAND WITH GRAVEL Brown, dense to very dense ▽		CL	1	RS	11	50/0.9	1.1			
		5	SP	2	SS	12	48	7.5			NP/NP/4
	* Trace cobbles encountered	10	SP	3	SS	12	31	15.9			
		15	SP	4	SS	12	43	20.6			
	22 (78.5)	20									
	23 **WEATHERED SILTSTONE/CLAYSTONE** Grey, rust (77.5)										
	24.3 **WEATHERED SILTSTONE/CLAYSTONE** Grey, rust, hard to very hard (76.5)			5	SS	3	50/0.3	15.6			
	BOTTOM OF BORING										

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 3	WD	▼ FILLED IN AB
WL	▽		▼
WL	Initial Water Level Reading		

Terracon

BORING STARTED	10-22-04		
BORING COMPLETED	10-22-04		
RIG	CME-55	FOREMAN	CMG
APPROVED	DAR	JOB #	20045173

BOREHOLE 99 20045173.GPJ TERRACON.GDT 11/18/04

Exhibit A-4

LOG OF BORING NO. 2

CLIENT: **Lagunitas-Lincoln, Inc.**

ENGINEER:

SITE: **N/E/C of Lemay Ave. and Lincoln Ave. Fort Collins, Colorado**

PROJECT: **Proposed Multi-Family Development- Lincoln Project**

Approx. Surface Elev.: 98.9 ft

DEPTH, ft.	GRAPHIC LOG	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
		0.5 6" TOPSOIL 98.5								
		SANDY LEAN CLAY Brown, calcareous, medium stiff to very stiff ▽	CL	1	RS	12	13	16.0		
			SM	2	SS	12	7	19.0	106	
5		5 94								
		SILTY SAND WITH GRAVEL Brown, loose to very dense	SM	3	SS	12	50/0.9	8.6		
10		* Trace cobbles encountered								
		14.9 84	SM	4	SS	12	50/0.9	7.9		
		BOTTOM OF BORING								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 3	WD	▼ FILLED IN AB
WL	▼		▼
WL	Initial Water Level Reading		

Terracon

BORING STARTED	10-22-04		
BORING COMPLETED	10-22-04		
RIG	CME-55	FOREMAN	CMG
APPROVED	DAR	JOB #	20045173

BOREHOLE 99 20045173.GPJ TERRACON.GDT 11/18/04

Exhibit A-5

LOG OF BORING NO. 3

CLIENT **Lagunitas-Lincoln, Inc.**

ENGINEER

SITE **N/E/C of Lemay Ave. and Lincoln Ave. Fort Collins, Colorado**

PROJECT **Proposed Multi-Family Development- Lincoln Project**

Approx. Surface Elev.: 99.2 ft

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf
	0.5 6" TOPSOIL 98.5 **SANDY LEAN CLAY** Brown, calcareous, medium stiff ▽		CL	1	RS	12	9	10.4	101	
	5 94 **SILTY SAND WITH GRAVEL** Brown, dense	5	SM	2	SS	12	30	4.9		
	* Trace cobbles encountered	10								
	15 84		SM	3	SS	12	45	9.4		
	BOTTOM OF BORING	15								

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 3	WD	▼ FILLED IN AB
WL	▼		▼
WL	Initial Water Level Reading		

Terracon

BORING STARTED	10-22-04		
BORING COMPLETED	10-22-04		
RIG	CME-55	FOREMAN	CMG
APPROVED	DAR	JOB #	20045173

BOREHOLE 99 20045173.GPJ TERRACON.GDT 11/18/04

Exhibit A-6

LOG OF BORING NO. 4

CLIENT: **Lagunitas-Lincoln, Inc.**

ENGINEER:

SITE: **N/E/C of Lemay Ave. and Lincoln Ave. Fort Collins, Colorado**

PROJECT: **Proposed Multi-Family Development- Lincoln Project**

Approx. Surface Elev.: 94.9 ft

DEPTH, ft.	DESCRIPTION	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	TESTS LIQUID LIMIT/ PLASTIC INDEX/ % (-) #200
0.5	6" TOPSOIL (94.5)									
	SANDY LEAN CLAY Brown, calcareous, stiff	CL	1	SS	12	9	15.3			
3	▽ (92)									
	SILTY SAND WITH GRAVEL Brown, loose to dense	SM	2	RS	12	18	16.6			
5										
		SM	3	SS	12	19	13.5			NP/NP/18
10										
		SM	4	SS	12	36	12.3			
15	* Trace cobbles encountered									
		SM	5	SS	12	26	33.4			
20										
22	(73)									
23	**WEATHERED SILTSTONE/CLAYSTONE** Grey, rust (72)									
24.5	**SILTSTONE/CLAYSTONE** Grey, rust, hard to very hard (70.5)		6	SS	6	50/0.5	13.9			
	BOTTOM OF BORING									

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 3	WD	▼ FILLED IN AB
WL	▼		▼
WL	Initial Water Level Reading		

Terracon

BORING STARTED	10-22-04		
BORING COMPLETED	10-22-04		
RIG	CME-55	FOREMAN	CMG
APPROVED	DAR	JOB #	20045173

BOREHOLE 99 20045173.GPJ TERRACON.GDT 11/18/04

Exhibit A-7

LOG OF BORING NO. 5

CLIENT: Lagunitas-Lincoln, Inc.

ENGINEER:

SITE: N/E/C of Lemay Ave. and Lincoln Ave. Fort Collins, Colorado

PROJECT: Proposed Multi-Family Development- Lincoln Project

GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES RECOVERY, in.	SAMPLES SPT - N BLOWS / ft.	TESTS WATER CONTENT, %	TESTS DRY UNIT WT pcf	TESTS UNCONFINED STRENGTH, psf	TESTS LIQUID LIMIT/ PLASTIC INDEX/ % (-) #200
	Approx. Surface Elev.: 99.8 ft										
	0.5 6" TOPSOIL 99.5 **SANDY LEAN CLAY** Brown, calcareous, medium stiff										
	3 97 **WELL GRADED SAND WITH SILT AND GRAVEL** Brown, medium dense		CL	1	SS	12	6	7.2			
		5									
			SW SM	2	SS	12	22	10.0			NP/NP/8
	* Trace gravel encountered	10									
	14 86		SW SM	3	SS	AC*		10.2			
	BOTTOM OF BORING										

(AC*) Denotes that auger cuttings were collected due to hole collapse

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.

WATER LEVEL OBSERVATIONS, ft			
WL	▽ 6	WD	▼ FILLED IN AB
WL	▼		▼
WL	Initial Water Level Reading		

Terracon

BORING STARTED	10-22-04		
BORING COMPLETED	10-22-04		
RIG	CME-55	FOREMAN	CMG
APPROVED	DAR	JOB #	20045173

BOREHOLE 99 20045173.GPJ TERRACON.GDT 11/18/04

Exhibit A-8

BORING LOG NO. 6

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.59152° Longitude: -105.056213°

Surface Elev.: 100.7 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	100											
VEGETATIVE LAYER - 9 inches												
LEAN CLAY WITH SAND, trace gravel and cobbles, dark brown, very stiff												
3.0	97.5											
						28-50/5"			5	135		
POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), trace cobbles, brown, very dense		5				20-37-50/5" N=87/11"			2			
			▽									
		10				18-34-41 N=75			9		27-22-5	8
		15				45-50/2" N=95/8"			10			
20.0	80.5											
20.5 **WEATHERED SILTSTONE**, rust and light brown	80	20				28-34-41 N=75			17			
SILTSTONE, gray to dark gray, very hard												
23.0	77.5											
Auger refusal at 23 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/13/2014 Boring Completed: 2/13/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-9

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 7

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.590868° Longitude: -105.056762°

Surface Elev.: 100.7 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	100											
VEGETATIVE LAYER - 9 inches												
SILT WITH SAND (ML), trace gravel, brown, stiff												
						11-7		-1.9	11	114	27-22-5	71
4.0	96.5											
POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, coarse to medium grained, brown, medium dense to very dense		5	▽			8-5-6 N=11			2			
		10				30-23-22 N=45			9			
		15				45-50/2" N=95/8"			10			
20.0	80.5					50/6" N=50/6"			11			
SILTSTONE, gray to dark gray, very hard		20										
22.0	78.5											
Auger refusal at 22 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/13/2014 Boring Completed: 2/13/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-10

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 8

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.590257° Longitude: -105.055976°

Surface Elev.: 98.5 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	97.5											
VEGETATIVE LAYER - 9 inches												
LEAN CLAY WITH SAND, trace gravel, dark brown, stiff												
						7-6			14	98		
4.0	94.5											
POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, brown, dense to very dense		5	▽			22-21-17 N=38			3			
		10				16-44-38 N=82			13			
		15				13-22-28 N=50			13			
20.0	78.5											
20.3	78	20				32-36-50/3" N=86/9"			15			
WEATHERED SILTSTONE, rust and light brown												
SILTSTONE, dark gray, very hard												
22.0	76.5											
Auger refusal at 22 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/13/2014 Boring Completed: 2/13/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-11

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 9

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.589551° Longitude: -105.055967°

Surface Elev.: 95.8 (Ft.)

DEPTH	ELEVATION (Ft.)	Material Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	95	**VEGETATIVE LAYER - 9 inches**											
		LEAN CLAY, trace gravel, dark brown, medium stiff to stiff		▽			6-7	2.154					
			5				4-3-3 N=6			27			
7.0	89			▽									
		POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, brown, medium dense	10				20-13-9 N=22			15			
15.0	81		15				5-10-13 N=23			21			
19.5	76.5	**SILTY SAND**, fine to medium grained, brown, medium dense											
19.8	76	**WEATHERED SILTSTONE**, rust and light brown	20				12-21-50 N=71			18			
22.5	73.5	**SILTSTONE**, dark gray, very hard											
		Auger refusal at 22.5 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*
▽ *2/19/14*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014 Boring Completed: 2/12/2014
Drill Rig: CME-75 Driller: Drilling Engineers, Inc.
Project No.: 20145005 Exhibit: A-12

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 10

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.589013° Longitude: -105.056462°

Surface Elev.: 95.8 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	95											
VEGETATIVE LAYER - 9 inches												
2.0	94											
LEAN CLAY WITH SAND (CL), trace gravel, dark brown			▽									
			▽									
						4-4		0.01	24	98	37-15-22	74
SILTY SAND (SM), brown, medium dense												
5.0	91					2-6-9 N=15			20		NP	7
POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, brown, dense to very dense		5										
		10				25-47-47 N=94			9			
		15				16-21-27 N=48			11			
20.0	76	20				41-50/3" N=91/9"			21			
Auger refusal at 20 Feet												

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*
▽ *2/19/14*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014 Boring Completed: 2/12/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-13

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 11

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.590774° Longitude: -105.054798°

Surface Elev.: 99.2 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	98.5	**VEGETATIVE LAYER - 9 inches**
		LEAN CLAY WITH SAND, dark brown, stiff to very stiff
7.0	92	
		POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, brown, dense to very dense
19.3	80	
20.0	79	**SILTSTONE**, dark gray, very hard
		Auger refusal at 20 Feet

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
				6-5			17	103		
5	▽			3-6-17 N=23			17			
10				10-10-22 N=32			15			
15				36-50/3" N=86/9"			11			
20				27-50/6" N=77			16			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/13/2014 Boring Completed: 2/13/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-14

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 12

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.590068° Longitude: -105.053983°

Surface Elev.: 93.9 (Ft.)

GRAPHIC LOG	DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
	0.8	93											
VEGETATIVE LAYER - 9 inches													
LEAN CLAY WITH SAND (CL), dark brown, stiff				▽			6-4	0.467	0.1	29	93	49-20-29	72
	4.0	90											
POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), brown, medium dense to dense			5				7-15-14 N=29			8			
			10				14-14-24 N=38			12		NP	7
	14.5	79.5											
WEATHERED SILTSTONE, rust and light brown	15.0	79	15				42-20-50 N=70			19			
SILTSTONE, dark gray, very hard	17.0	77											
Auger refusal at 17 Feet													

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014 Boring Completed: 2/12/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-15

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 13

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.589281° Longitude: -105.054169°

Surface Elev.: 94 (Ft.)

DEPTH	ELEVATION (Ft.)	Material Description	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	93	**VEGETATIVE LAYER - 9 inches**											
		LEAN CLAY WITH SAND, trace gravel, dark brown, soft		▽									
				▽			1-2			24	95		
4.0	90												
		POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, coarse to medium grained, brown, medium dense to dense	5				10-11-16 N=27			9			
			10				10-12-10 N=22			17			
16.0	78		15				9-20-28 N=48			13			
		SILTSTONE, gray to dark gray, very hard											
			20				50/6" N=50/6"			18			
21.0	73												
		Auger refusal at 21 Feet											

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*
▽ *2/19/14*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014 Boring Completed: 2/12/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-16

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 14

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.589179° Longitude: -105.052875°

Surface Elev.: 92.5 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	91.5	**VEGETATIVE LAYER - 9 inches**
		LEAN CLAY WITH SAND, dark brown, medium stiff
3.0	89.5	
		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), trace cobbles, coarse to medium grained, brown, medium dense to very dense
14.5	78	
		SILTSTONE, dark gray, hard to very hard
19.5	73	
		Auger refusal at 19.5 Feet

DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
			0	3-2						
5	▽			12-14-15 N=29			6		NP	5
10				21-28-37 N=65			9			
15				11-38-50/4" N=88/10"			15			
				50/6" N=50/6"			18			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014 Boring Completed: 2/12/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-17

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 15

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.588176° Longitude: -105.053513°

Surface Elev.: 93.9 (Ft.)

DEPTH	ELEVATION (Ft.)	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
0.8	93											
2.0	92											
						12-13			1	92		
			▽									
		5				17-22-15 N=37			7			
		10				17-28-27 N=55			9			
		15				30-50/4" N=80/10"			11			
19.0	75											
		20				13-50/5" N=63/11"			16			
22.0	72											

GRAPHIC LOG

VEGETATIVE LAYER - 9 inches

LEAN CLAY WITH SAND, trace gravel, dark brown

POORLY GRADED SAND WITH SILT AND GRAVEL, trace cobbles, brown, medium dense to very dense

SILTSTONE, dark gray, hard to very hard

Auger refusal at 22 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014	Boring Completed: 2/12/2014
Drill Rig: CME-75	Driller: Drilling Engineers, Inc.
Project No.: 20145005	Exhibit: A-18

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

BORING LOG NO. 16

PROJECT: Capstone Cottages of Fort Collins

CLIENT: Capstone Collegiate Communities, LLC Birmingham, Alabama

SITE: NE of South Lemay and E Lincoln Fort Collins, Colorado

LOCATION See Exhibit A-2

Latitude: 40.588655° Longitude: -105.054737°

Surface Elev.: 95.1 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
0.8	94.5	**VEGETATIVE LAYER - 9 inches**
2.0	93	**LEAN CLAY WITH SAND**, trace gravel, dark brown
17.0	78	**POORLY GRADED SAND WITH SILT AND GRAVEL**, trace cobbles, fine to coarse grained, brown, dense to very dense
18.0	77	**SILTSTONE**, dark gray, very hard
		Auger refusal at 18 Feet

DEPTH (Ft.)	SAMPLE TYPE	RECOVERY (In.)	FIELD TEST RESULTS	SULFATES (%)	SWELL (%)	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
			47-50/5"			1	125		
5			23-22-14 N=36	0.055		5			
10			20-19-35 N=54			9			
15			25-50/6" N=75			12			

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
4.25-inch hollow stem auger

Abandonment Method:
Borings backfilled with soil cuttings upon completion.

See Exhibit A-3 for description of field procedures.
See Appendix B for description of laboratory procedures and additional data (if any).
See Appendix C for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

While drilling

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

Boring Started: 2/12/2014 Boring Completed: 2/12/2014

Drill Rig: CME-75 Driller: Drilling Engineers, Inc.

Project No.: 20145005 Exhibit: A-19

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL 20145005.GPJ TERRACON2012.GDT 3/28/14

APPENDIX B
LABORATORY TESTING

Laboratory Testing Description

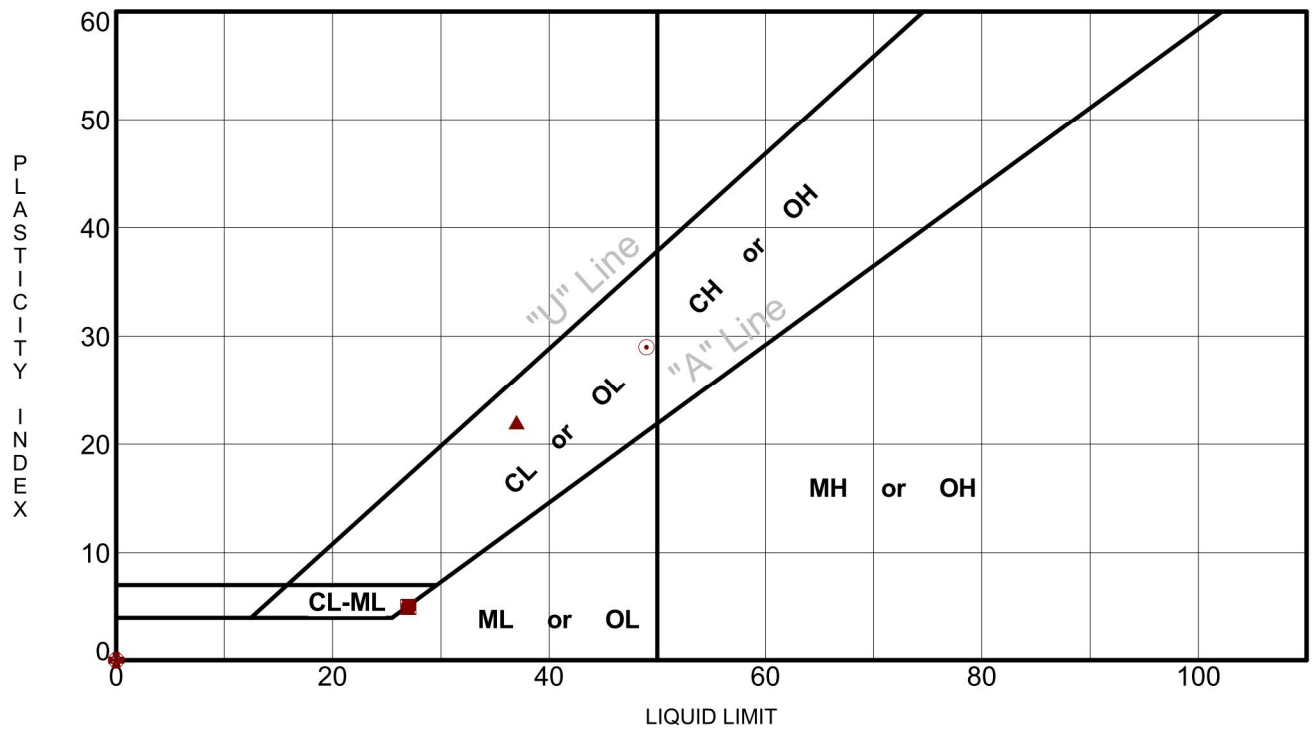
The soil and bedrock samples retrieved during the field exploration were returned to the laboratory for observation by the project geotechnical engineer. At that time, the field descriptions were reviewed and an applicable laboratory testing program was formulated to determine engineering properties of the subsurface materials.

Laboratory tests were conducted on selected soil and bedrock samples. The results of these tests are presented on the boring logs and in this appendix. The test results were used for the geotechnical engineering analyses, and the development of foundation and earthwork recommendations. The laboratory tests were performed in general accordance with applicable locally accepted standards. Soil samples were classified in general accordance with the Unified Soil Classification System described in Appendix C. Rock samples were visually classified in general accordance with the description of rock properties presented in Appendix C.

- Water content
- Grain-size distribution
- Consolidation/swell
- Water-soluble sulfate content
- Plasticity index
- Dry density
- pH

ATTERBERG LIMITS RESULTS

ASTM D4318



Boring ID	Depth	LL	PL	PI	Fines	USCS	Description
● 6	9.0	27	22	5	8	SP-SM	POORLY GRADED SAND with SILT and GRAVEL
⊠ 7	2.0	27	22	5	71	ML	SILT with SAND
▲ 10	2.0	37	15	22	74	CL	LEAN CLAY with SAND
★ 10	4.0	NP	NP	NP	7	SM	SILTY SAND
⊙ 12	2.0	49	20	29	72	CL	LEAN CLAY with SAND
✿ 12	9.0	NP	NP	NP	7	SP-SM	POORLY GRADED SAND with SILT and GRAVEL
○ 14	4.0	NP	NP	NP	5	SP-SM	POORLY GRADED SAND with SILT and GRAVEL

PROJECT: Capstone Cottages of Fort Collins

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

PROJECT NUMBER: 20145005

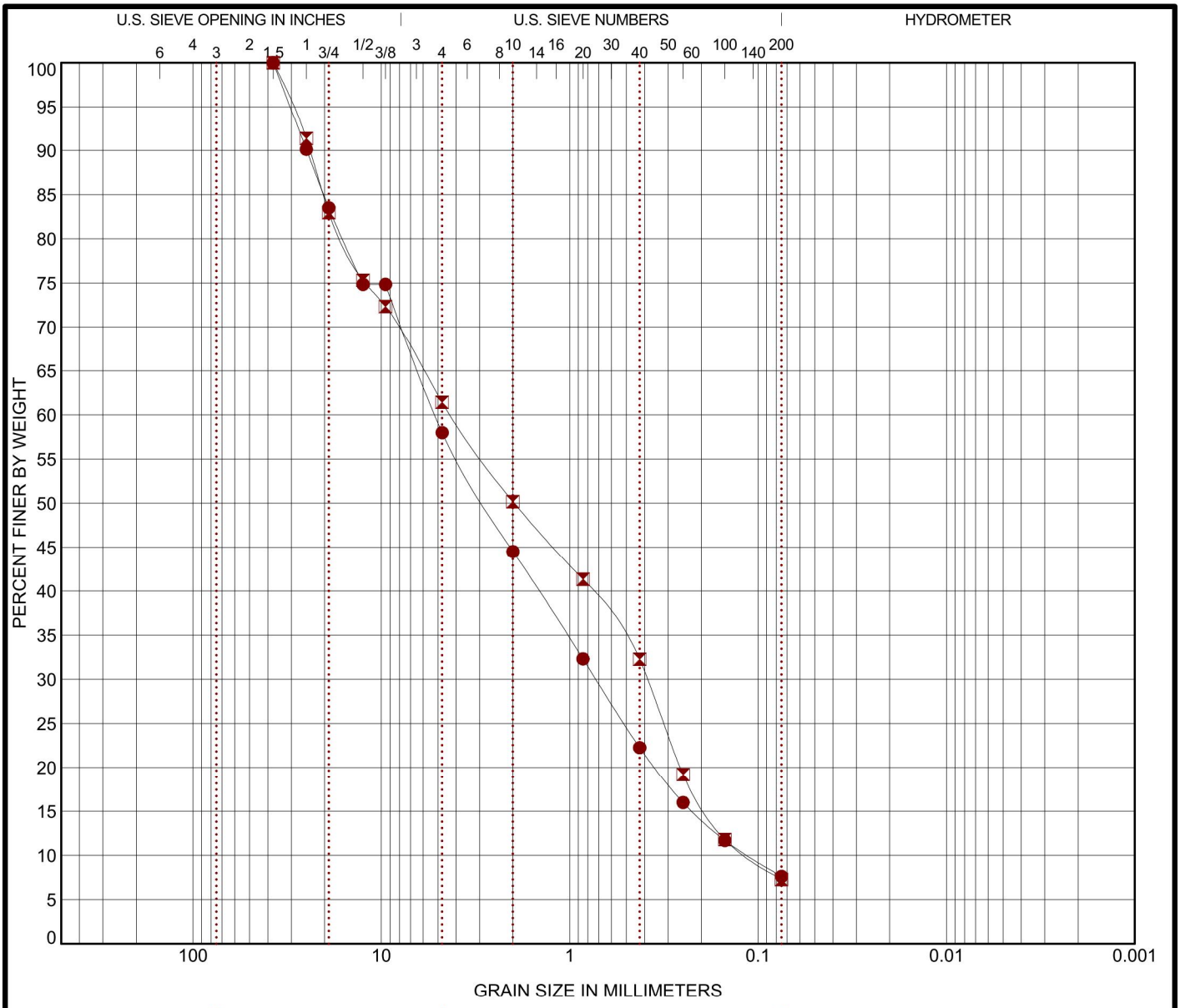
CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

EXHIBIT: B-2

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. ATTERBERG LIMITS 20145005.GPJ TERRACON2012.GDT 2/26/14

GRAIN SIZE DISTRIBUTION

ASTM D422



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Boring ID	Depth	USCS Classification	LL	PL	PI	Cc	Cu
● 6	9.0	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	27	22	5	0.90	45.85
⧓ 12	9.0	POORLY GRADED SAND with SILT and GRAVEL(SP-SM)	NP	NP	NP	0.31	37.34

Boring ID	Depth	D_{100}	D_{60}	D_{30}	D_{10}	%Gravel	%Sand	%Silt	%Clay
● 6	9.0	37.5	5.159	0.725	0.113	42.0	50.4	7.6	
⧓ 12	9.0	37.5	4.259	0.388	0.114	38.6	54.1	7.3	

PROJECT: Capstone Cottages of Fort Collins

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

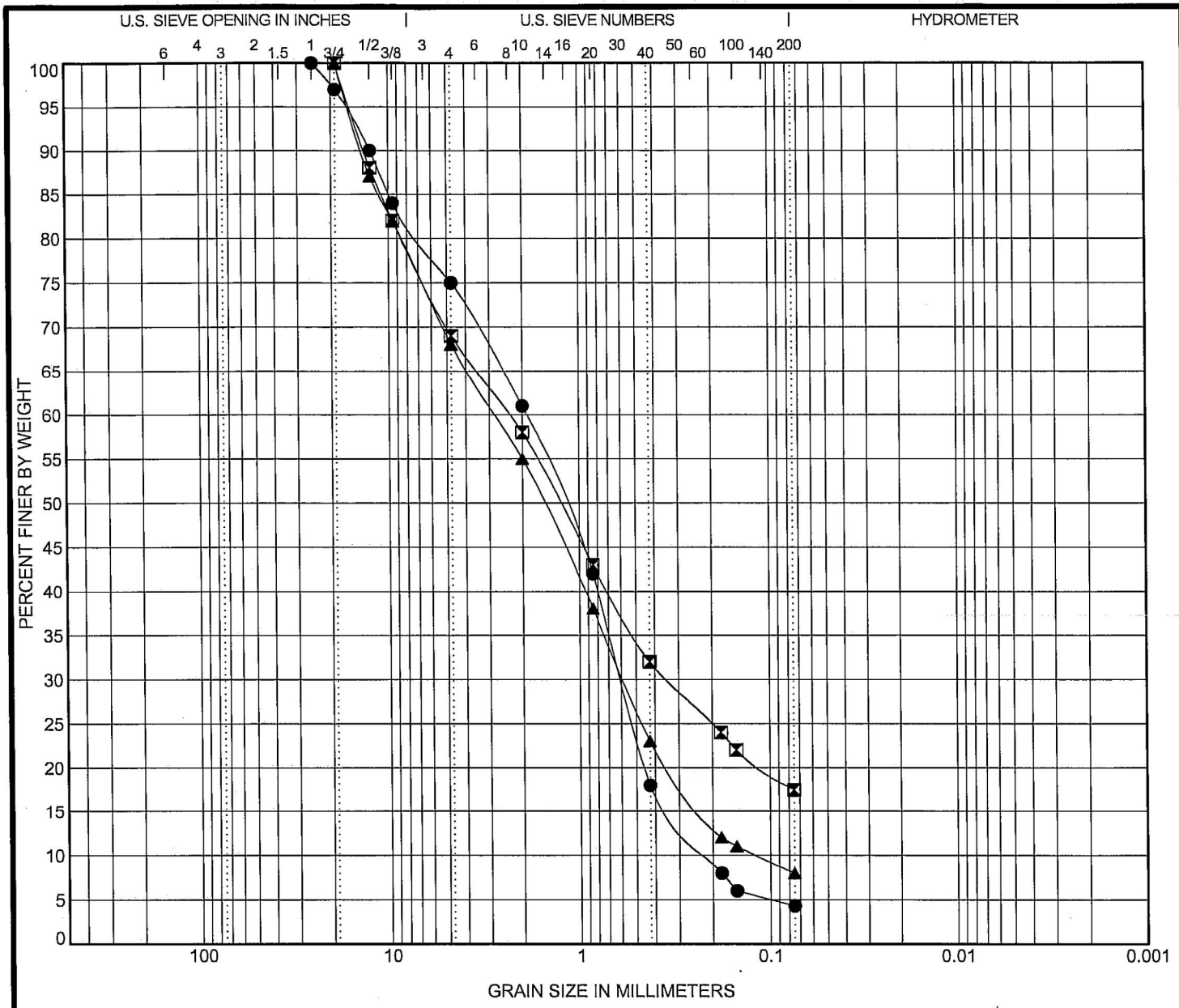
Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

PROJECT NUMBER: 20145005

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

EXHIBIT: B-3

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS-2 20145005.GPJ TERRACON2012.GDT 2/26/14



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	1	7.0ft	**POORLY GRADED SAND with GRAVEL(SP)**	NP	NP	NP	0.88	8.94
⊠	4	7.0ft	**SILTY SAND with GRAVEL(SM)**	NP	NP	NP		
▲	5	9.0ft	**WELL-GRADED SAND with SILT and GRAVEL(SW-SM)**	NP	NP	NP	1.04	23.43

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	1	7.0ft	25	1.912	0.601	0.214	25.0	70.7	4.3	
⊠	4	7.0ft	19	2.341	0.343		31.0	51.5	17.5	
▲	5	9.0ft	19	2.789	0.587	0.119	32.0	60.0	8.0	

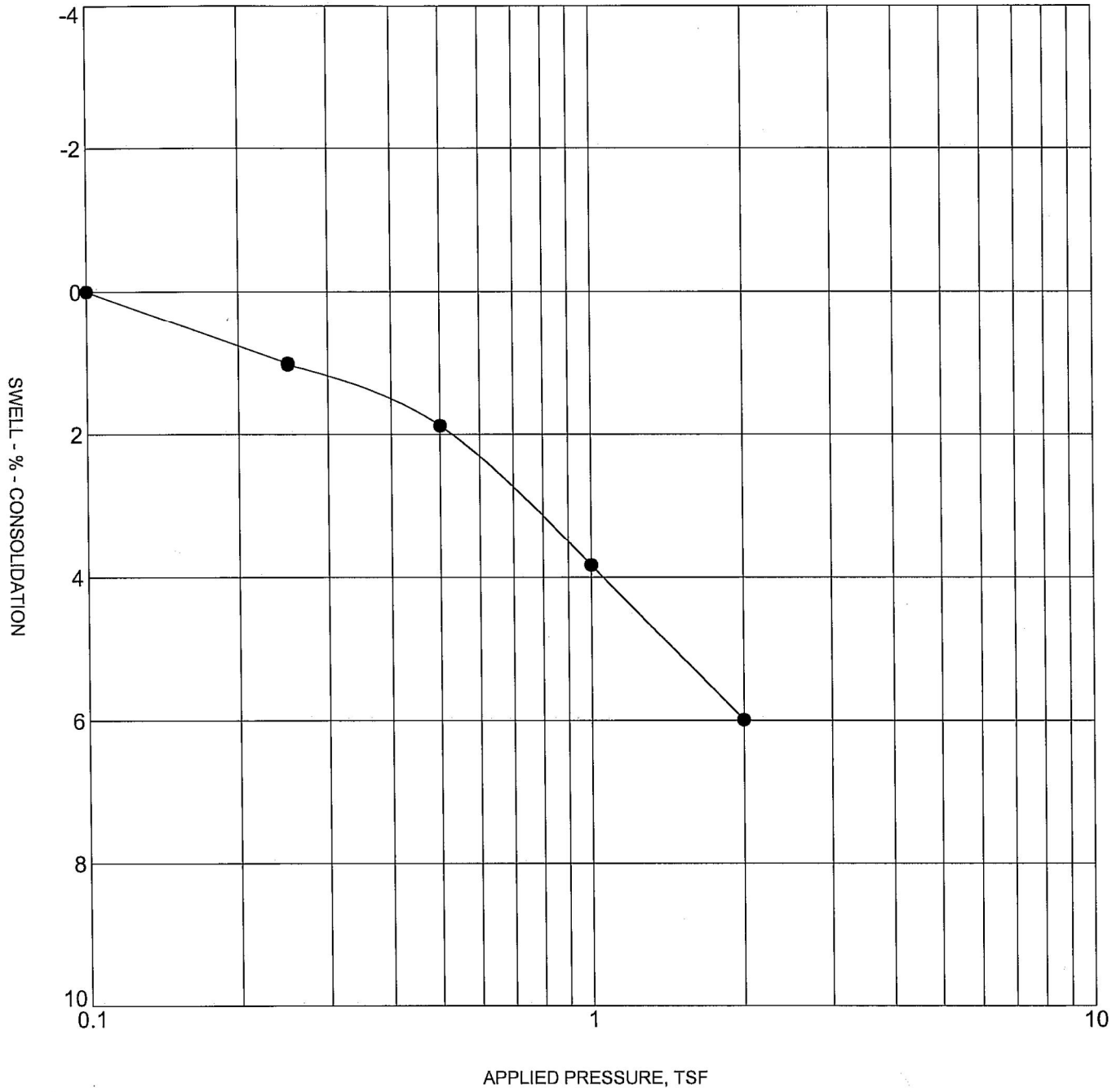
Terracon

GRAIN SIZE DISTRIBUTION

Project: Proposed Multi-Family Development- Lincoln Project
Site: NE CNR of Lemay Ave and Lincoln Fort Collins, Colorado
Job #: 20045173
Date: 11-5-04

Exhibit B-4

TC GRAIN SIZE 20045173.GPJ TERRACON.GDT 11/5/04



Specimen Identification		Classification	γ_d, pcf	WC,%
● 2	3.0ft	**SANDY LEAN CLAY**	**106**	**19**

Notes:

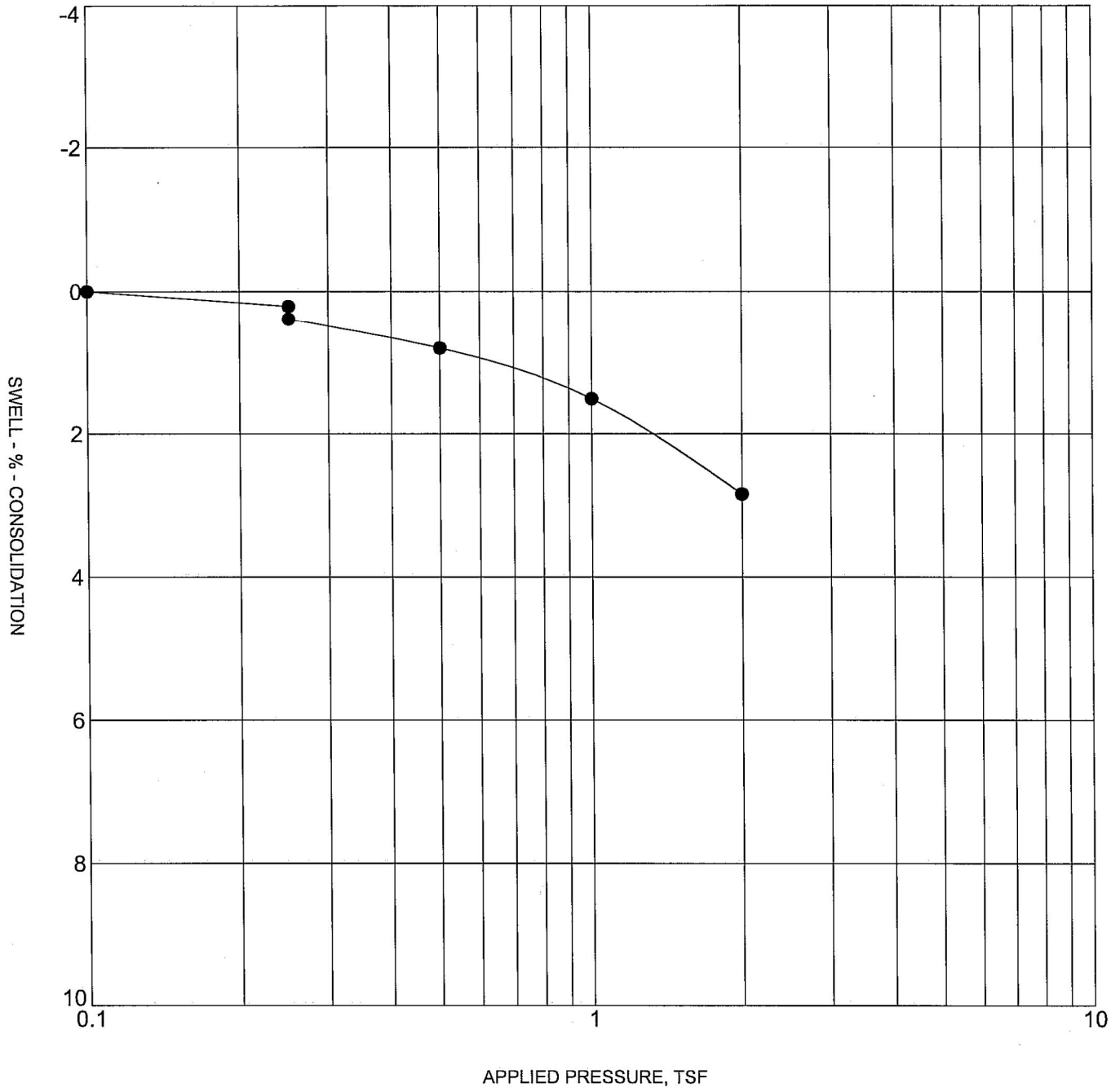
Terracon

CONSOLIDATION TEST

Project: Proposed Multi-Family Development- Lincoln Project
Site: NE CNR of Lemay Ave and Lincoln Fort Collins, Colorado
Job #: 20045173
Date: 11-5-04

Exhibit B-5

TC CONSOL STRAIN 20045173.GPJ CONSOL.GDT 11/5/04



Specimen Identification		Classification	γ_d, pcf	WC,%
● 3	3.0ft	**SANDY LEAN CLAY**	**101**	**10**

Notes:

Terracon

CONSOLIDATION TEST

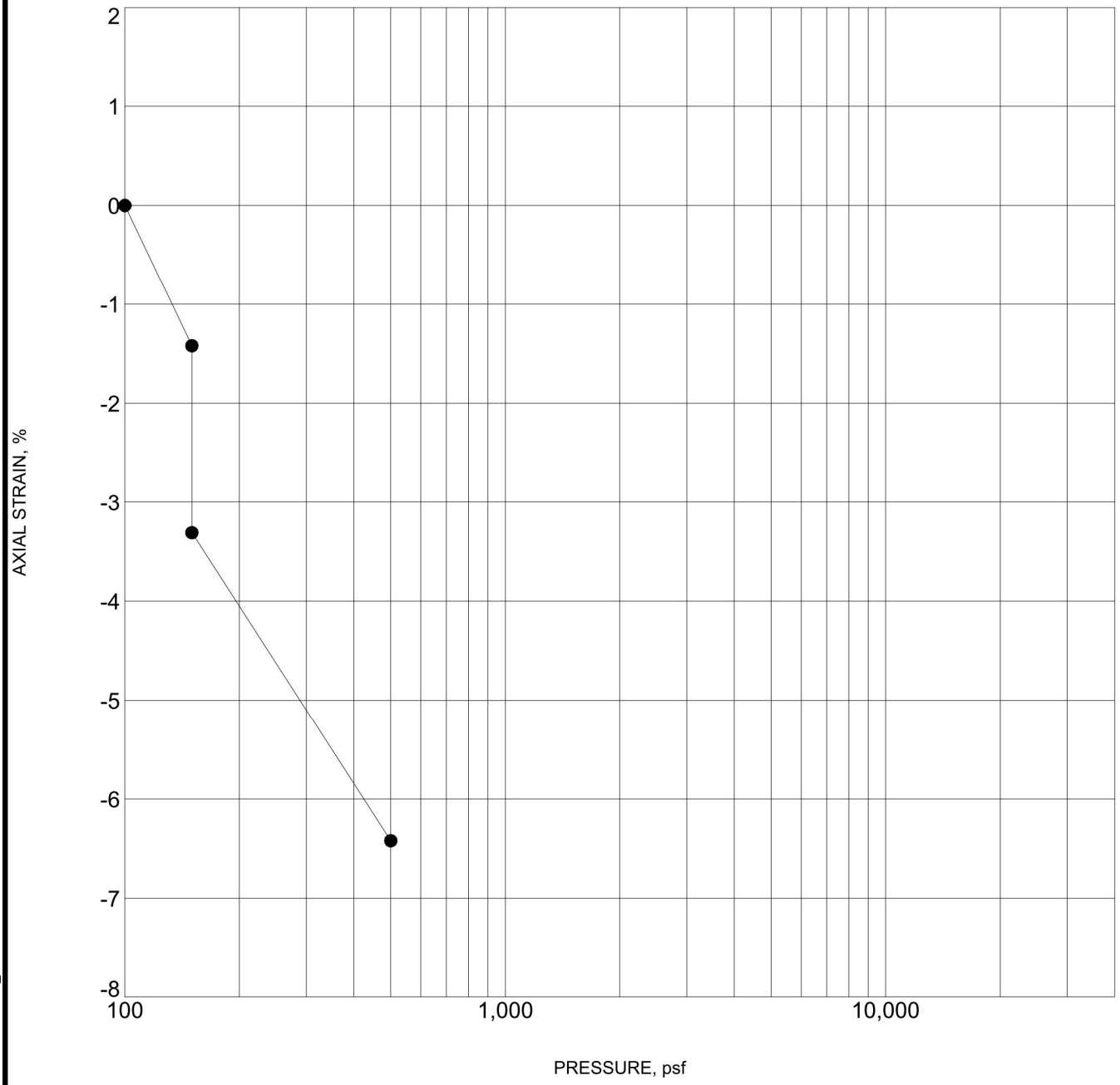
Project: Proposed Multi-Family Development- Lincoln Project
Site: NE CNR of Lemay Ave and Lincoln Fort Collins, Colorado
Job #: 20045173
Date: 11-5-04

Exhibit B-6

TC CONSOL STRAIN 20045173.GPJ CONSOL.GDT 11/5/04

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification			Classification	γ_d, pcf	WC, %
●	7	2.0 ft	SILT with SAND(ML)	114	11

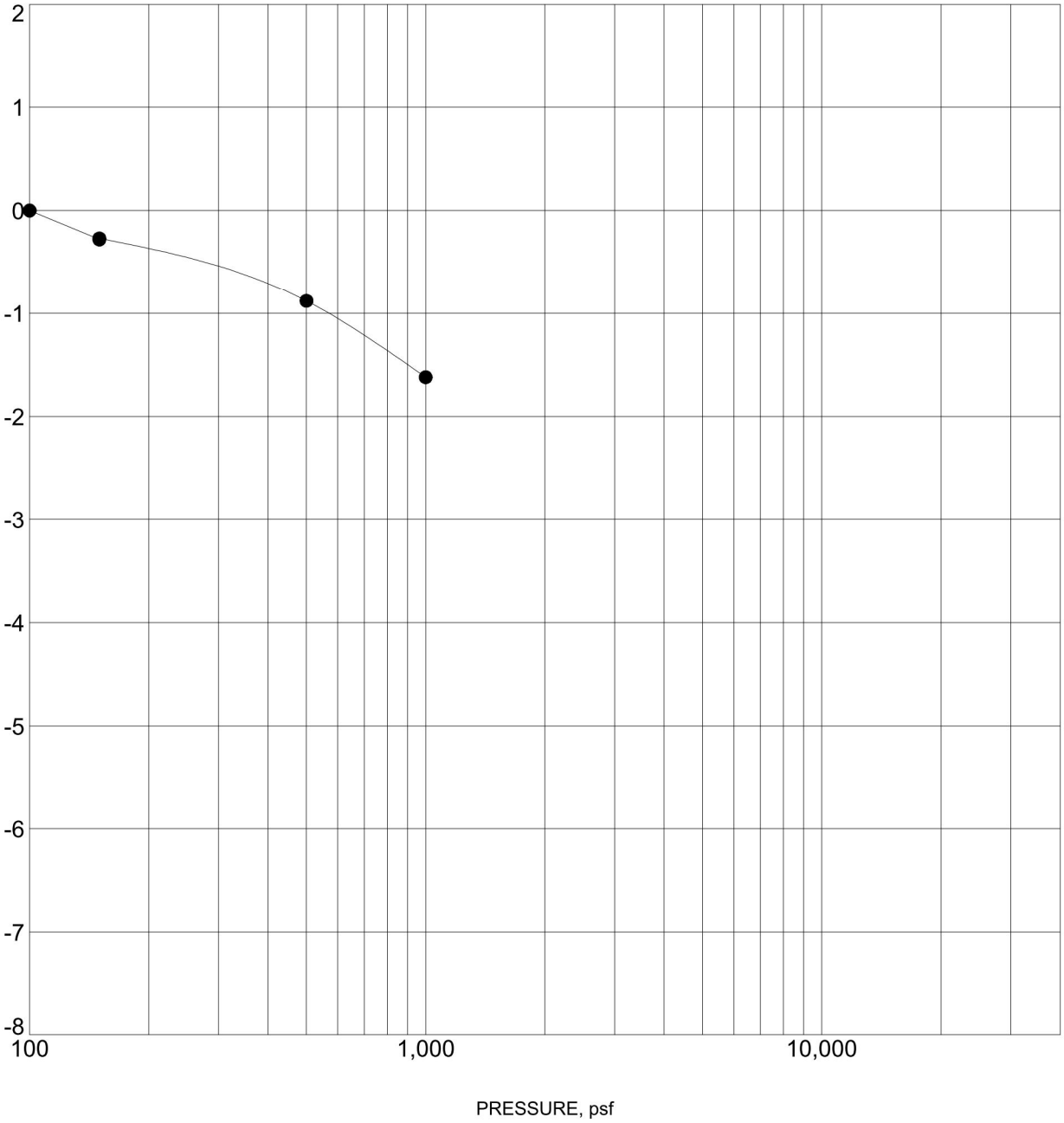
NOTES: Sample exhibited 1.9 percent compression upon wetting under an applied pressure of 150 psf.

PROJECT: Capstone Cottages of Fort Collins	Terracon 1901 Sharp Point Drive, Suite C Fort Collins, Colorado	PROJECT NUMBER: 20145005
SITE: NE of South Lemay and E Lincoln Fort Collins, Colorado		CLIENT: Capstone Collegiate Communities, LLC Birmingham, Alabama
		EXHIBIT: B-7

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CONSOL_STRAIN-USCS 20145005.GPJ TERRACCN2012.GDT 3/28/14

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification			Classification	γ_d, pcf	WC, %
●	10	2.0 ft	LEAN CLAY with SAND	98	24

NOTES: Sampe exhibited 0.01 percent swell upon wetting under an applied pressure of 150 psf.

PROJECT: Capstone Cottages of Fort Collins

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

PROJECT NUMBER: 20145005

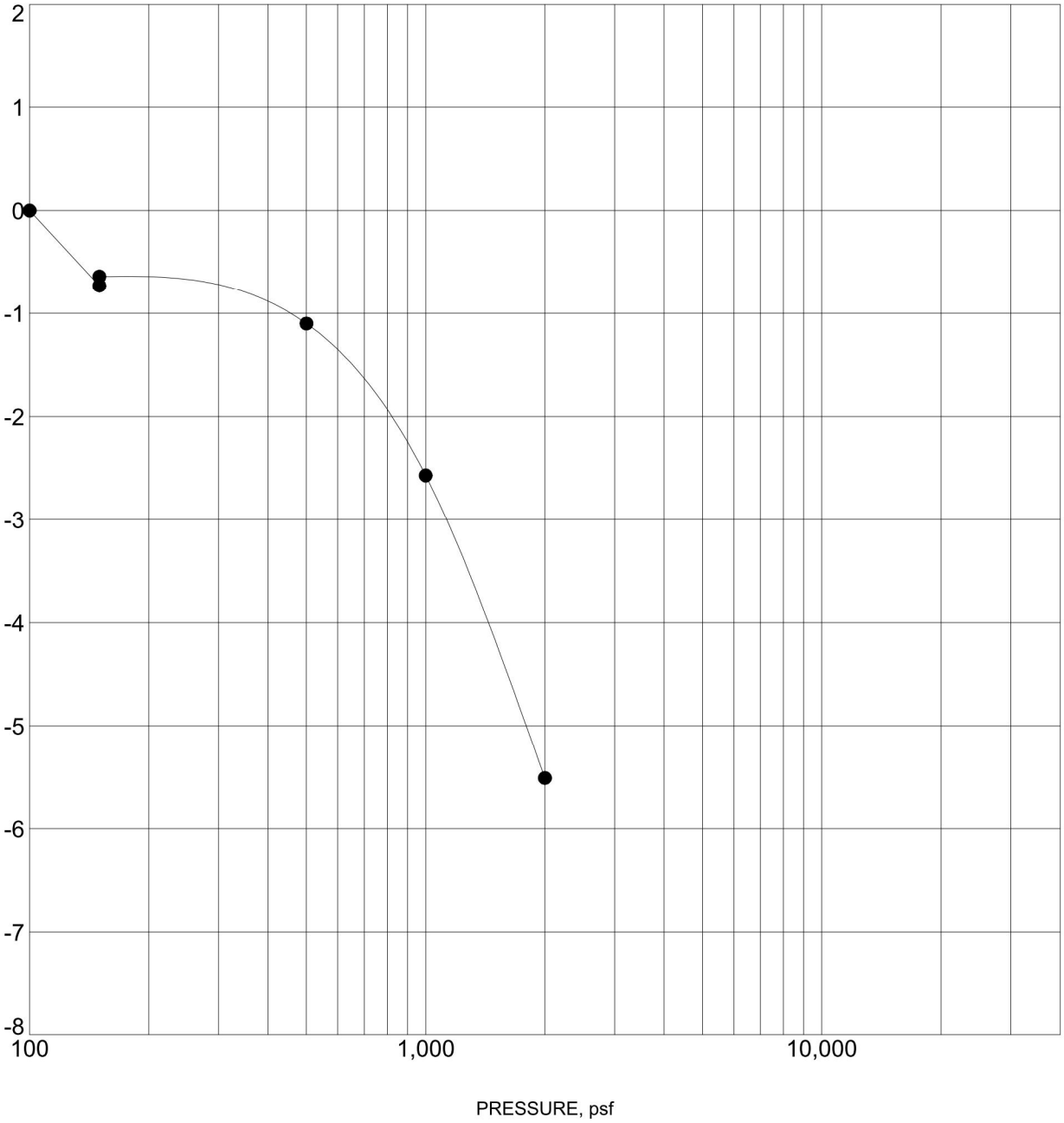
CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

EXHIBIT: B-8

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CONSOL_STRAIN-USCS 20145005.GPJ TERRACCN2012.GDT 3/28/14

SWELL CONSOLIDATION TEST

ASTM D4546



Specimen Identification			Classification	γ_d, pcf	WC, %
●	12	2.0 ft	LEAN CLAY with SAND(CL)	93	29

NOTES: Sample exhibited 0.1 percent swell upon wetting under an applied pressure of 150 psf.

PROJECT: Capstone Cottages of Fort Collins

SITE: NE of South Lemay and E Lincoln
Fort Collins, Colorado

Terracon
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado

PROJECT NUMBER: 20145005

CLIENT: Capstone Collegiate Communities, LLC
Birmingham, Alabama

EXHIBIT: B-9

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CONSOL_STRAIN-USCS 20145005.GPJ TERRACCN2012.GDT 3/28/14

Colorado Analytical LABORATORIES, INC.

Analytical Results

TASK NO: 140224030

Report To: Bryce C. Reeves
Company: Terracon, Inc. - Fort Collins
1901 Sharp Point Drive
Suite C
Fort Collins CO 80525

Bill To: Accounts Payable
Company: Terracon, Inc. - Lenexa
13910 W. 96th Terrace
Lenexa KS 66215

Task No.: 140224030
Client PO:
Client Project: 20145005

Date Received: 2/24/14
Date Reported: 2/28/14
Matrix: Soil - Geotech

Customer Sample ID 16 @ 4
Lab Number: 140224030-01

Test	Result	Method
pH	**7.9 units**	AASHTO T289-91
Sulfate - Water Soluble	**0.055 %**	AASHTO T290-91/ ASTM D4327

Customer Sample ID 12 @ 2
Lab Number: 140224030-02

Test	Result	Method
pH	**7.8 units**	AASHTO T289-91
Sulfate - Water Soluble	**0.467 %**	AASHTO T290-91/ ASTM D4327

Customer Sample ID 9 @ 2
Lab Number: 140224030-03

Test	Result	Method
pH	**7.8 units**	AASHTO T289-91
Sulfate - Water Soluble	**2.154 %**	AASHTO T290-91/ ASTM D4327

Abbreviations/ References:

AASHTO - American Association of State Highway and Transportation Officials.
ASTM - American Society for Testing and Materials.
ASA - American Society of Agronomy.
DIPRA - Ductile Iron Pipe Research Association Handbook of Ductile Iron Pipe.

DATA APPROVED FOR RELEASE BY

240 South Main Street / Brighton, CO 80601-0507 / 303-659-2313
Mailing Address: P.O. Box 507 / Brighton, CO 80601-0507 / Fax: 303-659-2315

APPENDIX C
SUPPORTING DOCUMENTS

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

SAMPLING

Modified Dames & Moore Ring Sampler

Standard Penetration Test

WATER LEVEL

Water Initially Encountered

Water Level After a Specified Period of Time

Water Level After a Specified Period of Time

Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.

FIELD TESTS

(HP)	Hand Penetrometer
(T)	Torvane
(DCP)	Dynamic Cone Penetrometer
(PID)	Photo-Ionization Detector
(OVA)	Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance			CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance				BEDROCK		
Descriptive Term (Density)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Descriptive Term (Consistency)	Unconfined Compressive Strength Qu, (tsf)	Standard Penetration or N-Value Blows/Ft.	Ring Sampler Blows/Ft.	Ring Sampler Blows/Ft.	Standard Penetration or N-Value Blows/Ft.	Descriptive Term (Consistency)
Very Loose	0 - 3	0 - 6	Very Soft	less than 0.25	0 - 1	< 3	< 30	< 20	Weathered
Loose	4 - 9	7 - 18	Soft	0.25 to 0.50	2 - 4	3 - 4	30 - 49	20 - 29	Firm
Medium Dense	10 - 29	19 - 58	Medium-Stiff	0.50 to 1.00	4 - 8	5 - 9	50 - 89	30 - 49	Medium Hard
Dense	30 - 50	59 - 98	Stiff	1.00 to 2.00	8 - 15	10 - 18	90 - 119	50 - 79	Hard
Very Dense	> 50	≥ 99	Very Stiff	2.00 to 4.00	15 - 30	19 - 42	> 119	>79	Very Hard
			Hard	> 4.00	> 30	> 42			

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 15
With	15 - 29
Modifier	> 30

GRAIN SIZE TERMINOLOGY

Major Component of Sample	Particle Size
Boulders	Over 12 in. (300 mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)
Sand	#4 to #200 sieve (4.75mm to 0.075mm
Silt or Clay	Passing #200 sieve (0.075mm)

RELATIVE PROPORTIONS OF FINES

Descriptive Term(s) of other constituents	Percent of Dry Weight
Trace	< 5
With	5 - 12
Modifier	> 12

PLASTICITY DESCRIPTION

Term	Plasticity Index
Non-plastic	0
Low	1 - 10
Medium	11 - 30
High	> 30

Terracon

Exhibit: C-1

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	$Cu \geq 4$ and $1 \leq Cc \leq 3$ [E]		GW	Well-graded gravel [F]
			$Cu < 4$ and/or $1 > Cc > 3$ [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F,G,H]
			Fines classify as CL or CH		GC	Clayey gravel [F,G,H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	$Cu \geq 6$ and $1 \leq Cc \leq 3$ [E]		SW	Well-graded sand [I]
			$Cu < 6$ and/or $1 > Cc > 3$ [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G,H,I]
			Fines classify as CL or CH		SC	Clayey sand [G,H,I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A" line [J]		CL	Lean clay [K,L,M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OL	Organic clay [K,L,M,N]
			Liquid limit - not dried			Organic silt [K,L,M,O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K,L,M]
			PI plots below "A" line		MH	Elastic Silt [K,L,M]
		Organic:	Liquid limit - oven dried	< 0.75	OH	Organic clay [K,L,M,P]
			Liquid limit - not dried			Organic silt [K,L,M,Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

[A] Based on the material passing the 3-inch (75-mm) sieve

[B] If field sample contained cobbles or boulders, or both, add "with cobbles or boulders, or both" to group name.

[C] Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GW-GC well-graded gravel with clay, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.

[D] Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay

[E] $Cu = D_{60}/D_{10}$ $\quad Cc = \dfrac{(D_{30})^2}{D_{10} \times D_{60}}$

[F] If soil contains ≥ 15% sand, add "with sand" to group name.

[G] If fines classify as CL-ML, use dual symbol GC-GM, or SC-SM.

[H] If fines are organic, add "with organic fines" to group name.

[I] If soil contains ≥ 15% gravel, add "with gravel" to group name.

[J] If Atterberg limits plot in shaded area, soil is a CL-ML, silty clay.

[K] If soil contains 15 to 29% plus No. 200, add "with sand" or "with gravel," whichever is predominant.

[L] If soil contains ≥ 30% plus No. 200 predominantly sand, add "sandy" to group name.

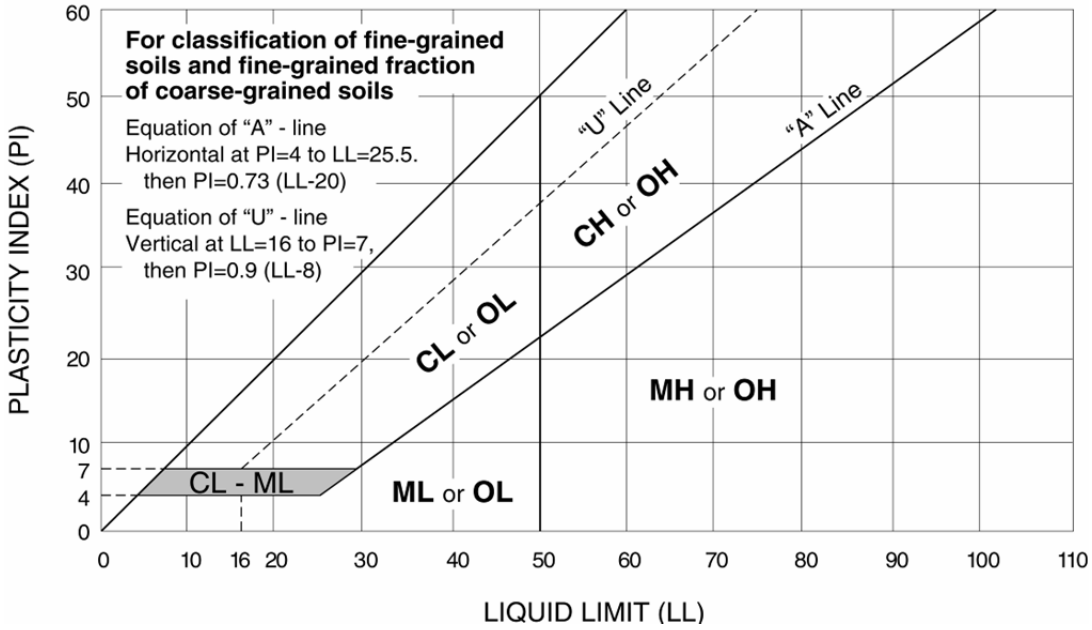
[M] If soil contains ≥ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ≥ 4 and plots on or above "A" line.

[O] PI < 4 or plots below "A" line.

[P] PI plots on or above "A" line.

[Q] PI plots below "A" line.



Terracon

Exhibit C-2

DESCRIPTION OF ROCK PROPERTIES

WEATHERING

Fresh	Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.
Very slight	Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.
Slight	Rock generally fresh, joints stained, and discoloration extends into rock up to 1 in. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.
Moderate	Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some show clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.
Moderately severe	All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick.
Severe	All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.
Very severe	All rock except quartz discolored or stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.
Complete	Rock reduced to "soil". Rock "fabric" not discernible or discernible only in small, scattered locations. Quartz may be present as dikes or stringers.

HARDNESS (for engineering description of rock – not to be confused with Moh's scale for minerals)

Very hard	Cannot be scratched with knife or sharp pick. Breaking of hand specimens requires several hard blows of geologist's pick.
Hard	Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.
Moderately hard	Can be scratched with knife or pick. Gouges or grooves to ¼ in. deep can be excavated by hard blow of point of a geologist's pick. Hand specimens can be detached by moderate blow.
Medium	Can be grooved or gouged 1/16 in. deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1-in. maximum size by hard blows of the point of a geologist's pick.
Soft	Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.
Very soft	Can be carved with knife. Can be excavated readily with point of pick. Pieces 1-in. or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

Joint, Bedding, and Foliation Spacing in Rock [a]

Spacing	Joints	Bedding/Foliation
Less than 2 in.	Very close	Very thin
2 in. – 1 ft.	Close	Thin
1 ft. – 3 ft.	Moderately close	Medium
3 ft. – 10 ft.	Wide	Thick
More than 10 ft.	Very wide	Very thick

a. Spacing refers to the distance normal to the planes, of the described feature, which are parallel to each other or nearly so.

Rock Quality Designator (RQD) a

RQD, as a percentage	Diagnostic description
Exceeding 90	Excellent
90 – 75	Good
75 – 50	Fair
50 – 25	Poor
Less than 25	Very poor

a. RQD (given as a percentage) = length of core in pieces 4 in. and longer/length of run.

Joint Openness Descriptors

Openness	Descriptor
No Visible Separation	Tight
Less than 1/32 in.	Slightly Open
1/32 to 1/8 in.	Moderately Open
1/8 to 3/8 in.	Open
3/8 in. to 0.1 ft.	Moderately Wide
Greater than 0.1 ft.	Wide

References: American Society of Civil Engineers. Manuals and Reports on Engineering Practice - No. 56. Subsurface Investigation for Design and Construction of Foundations of Buildings. New York: American Society of Civil Engineers, 1976. U.S. Department of the Interior, Bureau of Reclamation, Engineering Geology Field Manual.

LABORATORY TEST
SIGNIFICANCE AND PURPOSE

Test	Significance	Purpose
California Bearing Ratio	Used to evaluate the potential strength of subgrade soil, subbase, and base course material, including recycled materials for use in road and airfield pavements.	***Pavement Thickness Design***
Consolidation	Used to develop an estimate of both the rate and amount of both differential and total settlement of a structure.	***Foundation Design***
Direct Shear	Used to determine the consolidated drained shear strength of soil or rock.	***Bearing Capacity, Foundation Design, and Slope Stability***
Dry Density	Used to determine the in-place density of natural, inorganic, fine-grained soils.	***Index Property Soil Behavior***
Expansion	Used to measure the expansive potential of fine-grained soil and to provide a basis for swell potential classification.	***Foundation and Slab Design***
Gradation	Used for the quantitative determination of the distribution of particle sizes in soil.	***Soil Classification***
Liquid & Plastic Limit, Plasticity Index	Used as an integral part of engineering classification systems to characterize the fine-grained fraction of soils, and to specify the fine-grained fraction of construction materials.	***Soil Classification***
Permeability	Used to determine the capacity of soil or rock to conduct a liquid or gas.	***Groundwater Flow Analysis***
pH	Used to determine the degree of acidity or alkalinity of a soil.	***Corrosion Potential***
Resistivity	Used to indicate the relative ability of a soil medium to carry electrical currents.	***Corrosion Potential***
R-Value	Used to evaluate the potential strength of subgrade soil, subbase, and base course material, including recycled materials for use in road and airfield pavements.	***Pavement Thickness Design***
Soluble Sulfate	Used to determine the quantitative amount of soluble sulfates within a soil mass.	***Corrosion Potential***
Unconfined Compression	To obtain the approximate compressive strength of soils that possess sufficient cohesion to permit testing in the unconfined state.	***Bearing Capacity Analysis for Foundations***
Water Content	Used to determine the quantitative amount of water in a soil mass.	***Index Property Soil Behavior***

REPORT TERMINOLOGY
(Based on ASTM D653)

Allowable Soil Bearing Capacity	The recommended maximum contact stress developed at the interface of the foundation element and the supporting material.
Alluvium	Soil, the constituents of which have been transported in suspension by flowing water and subsequently deposited by sedimentation.
Aggregate Base Course	A layer of specified material placed on a subgrade or subbase usually beneath slabs or pavements.
Backfill	A specified material placed and compacted in a confined area.
Bedrock	A natural aggregate of mineral grains connected by strong and permanent cohesive forces. Usually requires drilling, wedging, blasting or other methods of extraordinary force for excavation.
Bench	A horizontal surface in a sloped deposit.
Caisson (Drilled Pier or Shaft)	A concrete foundation element cast in a circular excavation which may have an enlarged base. Sometimes referred to as a cast-in-place pier or drilled shaft.
Coefficient of Friction	A constant proportionality factor relating normal stress and the corresponding shear stress at which sliding starts between the two surfaces.
Colluvium	Soil, the constituents of which have been deposited chiefly by gravity such as at the foot of a slope or cliff.
Compaction	The densification of a soil by means of mechanical manipulation
Concrete Slab-on-Grade	A concrete surface layer cast directly upon a base, subbase or subgrade, and typically used as a floor system.
Differential Movement	Unequal settlement or heave between, or within foundation elements of structure.
Earth Pressure	The pressure exerted by soil on any boundary such as a foundation wall.
ESAL	Equivalent Single Axle Load, a criteria used to convert traffic to a uniform standard, (18,000 pound axle loads).
Engineered Fill	Specified material placed and compacted to specified density and/or moisture conditions under observations of a representative of a geotechnical engineer.
Equivalent Fluid	A hypothetical fluid having a unit weight such that it will produce a pressure against a lateral support presumed to be equivalent to that produced by the actual soil. This simplified approach is valid only when deformation conditions are such that the pressure increases linearly with depth and the wall friction is neglected.
Existing Fill (or Man-Made Fill)	Materials deposited throughout the action of man prior to exploration of the site.
Existing Grade	The ground surface at the time of field exploration.

REPORT TERMINOLOGY
(Based on ASTM D653)

Expansive Potential	The potential of a soil to expand (increase in volume) due to absorption of moisture.
Finished Grade	The final grade created as a part of the project.
Footing	A portion of the foundation of a structure that transmits loads directly to the soil.
Foundation	The lower part of a structure that transmits the loads to the soil or bedrock.
Frost Depth	The depth at which the ground becomes frozen during the winter season.
Grade Beam	A foundation element or wall, typically constructed of reinforced concrete, used to span between other foundation elements such as drilled piers.
Groundwater	Subsurface water found in the zone of saturation of soils or within fractures in bedrock.
Heave	Upward movement.
Lithologic	The characteristics which describe the composition and texture of soil and rock by observation.
Native Grade	The naturally occurring ground surface.
Native Soil	Naturally occurring on-site soil, sometimes referred to as natural soil.
Optimum Moisture Content	The water content at which a soil can be compacted to a maximum dry unit weight by a given compactive effort.
Perched Water	Groundwater, usually of limited area maintained above a normal water elevation by the presence of an intervening relatively impervious continuous stratum.
Scarify	To mechanically loosen soil or break down existing soil structure.
Settlement	Downward movement.
Skin Friction (Side Shear)	The frictional resistance developed between soil and an element of the structure such as a drilled pier.
Soil (Earth)	Sediments or other unconsolidated accumulations of solid particles produced by the physical and chemical disintegration of rocks, and which may or may not contain organic matter.
Strain	The change in length per unit of length in a given direction.
Stress	The force per unit area acting within a soil mass.
Strip	To remove from present location.
Subbase	A layer of specified material in a pavement system between the subgrade and base course.
Subgrade	The soil prepared and compacted to support a structure, slab or pavement system.

JORDAN'S
TREE MOVING &
MAINTENANCE, INC.

12/2/14

To: Ripley Design, Inc.

Attn: Mr. Damon Holland

Site: Capstone Cottages Site (NE corner of Lincoln & Lemay), Fort Collins

Re: Report on current condition and recommendations on one mature cottonwood, and one mature American elm.

The following are my findings and recommendations on these specific trees after providing an inspection on 11/25/14, to document the health and potential hazards for risk assessment, and future planning.

Cottonwood is located on the southwest most corner of the property (just north of the Bank of Colorado building, on the NE corner of Lincoln & Lemay, in Fort Collins).



Picture # 1: This 66" cottonwood is roughly 70' tall.



Picture # 2: (North side view) at 5’ above grade cottonwood splits into two main leaders. This picture shows included bark between the two main leaders. This is a structural defect, increasing the likeness that this could be a point where the tree could split, or fail. At present, I did not see gapping between these two leaders, or noticeable pockets of decay, between the two main leaders.



Picture # 3: (South side view) Just above grade are two visible pockets of decay.



Picture # 4: Roughly 25% of canopy has buds present, or 75% of canopy is dead.



Picture # 5: Another upper canopy picture to document the declining health of this tree.

Recommendation: REMOVAL - With the amount of die-back in the crown of this tree, the decay at base of tree, and with the included bark between the two main leaders at grade (and up to 5') making the tree structurally weak. .

American Elm is located to the NE of the above cottonwood, by an old fence line.



Picture # 7: American Elm is roughly 45’ tall. Roughly 15% of canopy has buds present, or 85% of canopy is dead.



Picture # 8: East side of tree: Canopy splits into three main leaders at 15’ above grade. There was no visible decay present at the attachment of these three main leaders.



Picture # 9: The right side of this picture, and/or the east side of the base of this tree, shows no root flair at grade, which would imply little/or no holding roots on this side creating structural stability issues.

Recommend: REMOVAL - Due to the overall state of decline that this tree is in.

Please let me know if you require further information.

Thank you for allowing me to assist you with this evaluation process.

Sincerely,

David Jordan

ISA Certified Arborist (RM 2198)

Jordan's Tree Moving & Maintenance Inc.

1025 Smithfield Dr., FC, CO 80524

970-482-6331

December 10, 2014

PRELIMINARY DRAINAGE AND EROSION CONTROL REPORT FOR

CAPSTONE COTTAGES

Fort Collins, Colorado

Prepared for:
Capstone Collegiate Communities
431 Office Park Drive
Birmingham, Alabama 35223

Prepared by:

200 South College Avenue, Suite 10
Fort Collins, Colorado 80524
Phone: 970.221.4158 Fax: 970.221.4159
www.northernengineering.com

This Drainage Report is consciously provided as a PDF.
Please consider the environment before printing this document in its entirety.
When a hard copy is absolutely necessary, we recommend double-sided printing.

Project Number: 939-001

NORTHERN ENGINEERING

ADDRESS:
200 S. College Ave. Suite 10
Fort Collins, CO 80524

PHONE: 970.221.4158
FAX: 970.221.4159

WEBSITE:
www.northernengineering.com

December 10, 2014

City of Fort Collins
Stormwater Utility
700 Wood Street
Fort Collins, Colorado 80521

RE: Preliminary Drainage and Erosion Control Report for
CAPSTONE COTTAGES

Dear Staff:

Northern Engineering is pleased to submit this Preliminary Drainage and Erosion Control Report for your review. This report accompanies the Project Development Plan submittal for the proposed Capstone Cottages development.

This report has been prepared in accordance to Fort Collins Stormwater Criteria Manual (FCSCM), and serves to document the stormwater impacts associated with the proposed project. We understand that review by the City is to assure general compliance with standardized criteria contained in the FCSCM.

If you should have any questions as you review this report, please feel free to contact us.

Sincerely,
NORTHERN ENGINEERING SERVICES, INC.



Aaron Cvar, PE
Project Engineer

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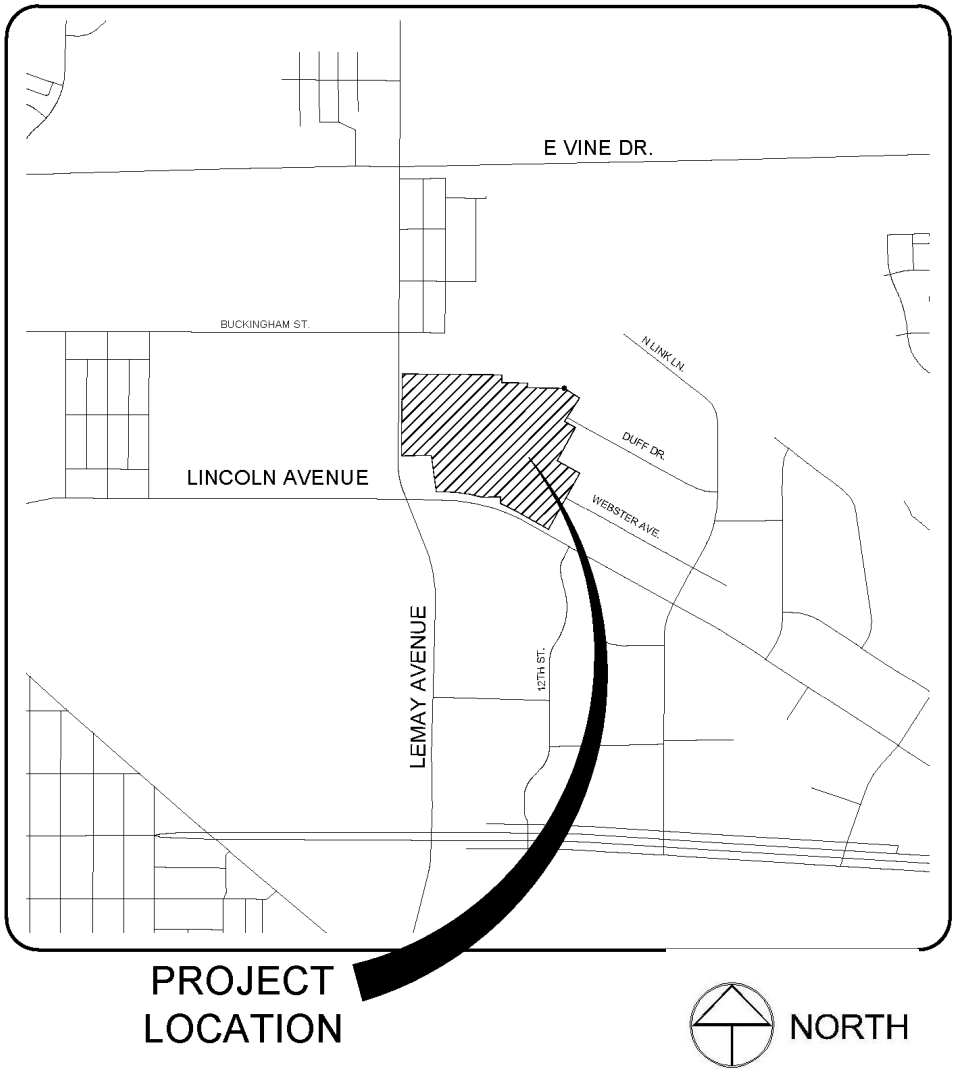
MAP POCKET:

Proposed Drainage Exhibit

I. GENERAL LOCATION AND DESCRIPTION

A. Location

1. Vicinity Map



2. The project site is located in the west half of Section 7, Township 6 North, Range 68 West of the 6th Principal Meridian, City of Fort Collins, County of Larimer, State of Colorado .
3. The project site is located just northeast of the intersection of Lemay Avenue and Lincoln Avenue.
4. The project site lies within the Dry Creek Basin. Detention requirements are to detain the difference between the 100-year developed inflow rate and the historic 2-year release rate. The historic release rate for this basin is 0.20 cfs per acre.
5. The Mulberry Street Walmart and the Buffalo Run Apartment complex exist just to the south of the site, on the south side of Lincoln Avenue. The San Criso residential development exists to the north of the site. The Sunward Condos development exists to the east of the site. The Lincoln Channel (Storm Drainage) runs along the southern boundary of the project site, and will be utilized as the storm outfall for the majority of

developed site runoff.

6. No offsite flows enter the site from the north, south, or east. The Lincoln Channel conveys regional flows from the west; this channel conveys flows east along the southern boundary of the project site.
7. An existing 36-inch diameter storm line runs along the west side of the site, which will be utilized in the proposed site design to serve as an outfall for the proposed paver detention system shown in drainage Basin 4 on the proposed drainage exhibit. The existing storm line will also serve as an outfall for the proposed inlets within the future Realigned Lemay Avenue (drainage Basin 14). The existing 36-inch diameter line begins to the north of the proposed site and serves as the outfall for the existing San Cristo neighborhood detention pond.

B. Description of Property

1. The development area is roughly 28.33 net acres.



Figure 1 – Aerial Photograph

2. The subject property is an undeveloped parcel with native ground cover. Existing ground slopes are mild to moderate (i.e., 1 - 6±%) through the interior of the property. General topography slopes from northwest to southeast. The Lincoln Channel, running along the southern boundary of the project site, collects the majority of historic site runoff.

3. According to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey website: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, the site consists of Caruso Clay Loam, Loveland Clay Loam, and Nunn Clay Loam, which all fall into Hydrologic Soil Group C.
4. The proposed project site plan is composed of residential and commercial development. Associated roadways, water and sewer lines will be constructed with the development. Onsite detention is proposed within the subgrade of a permeable paver system. The proposed paver system is to be located throughout the site, predominantly within proposed parking areas. This paver system is anticipated to meet or exceed the current City LID requirements.

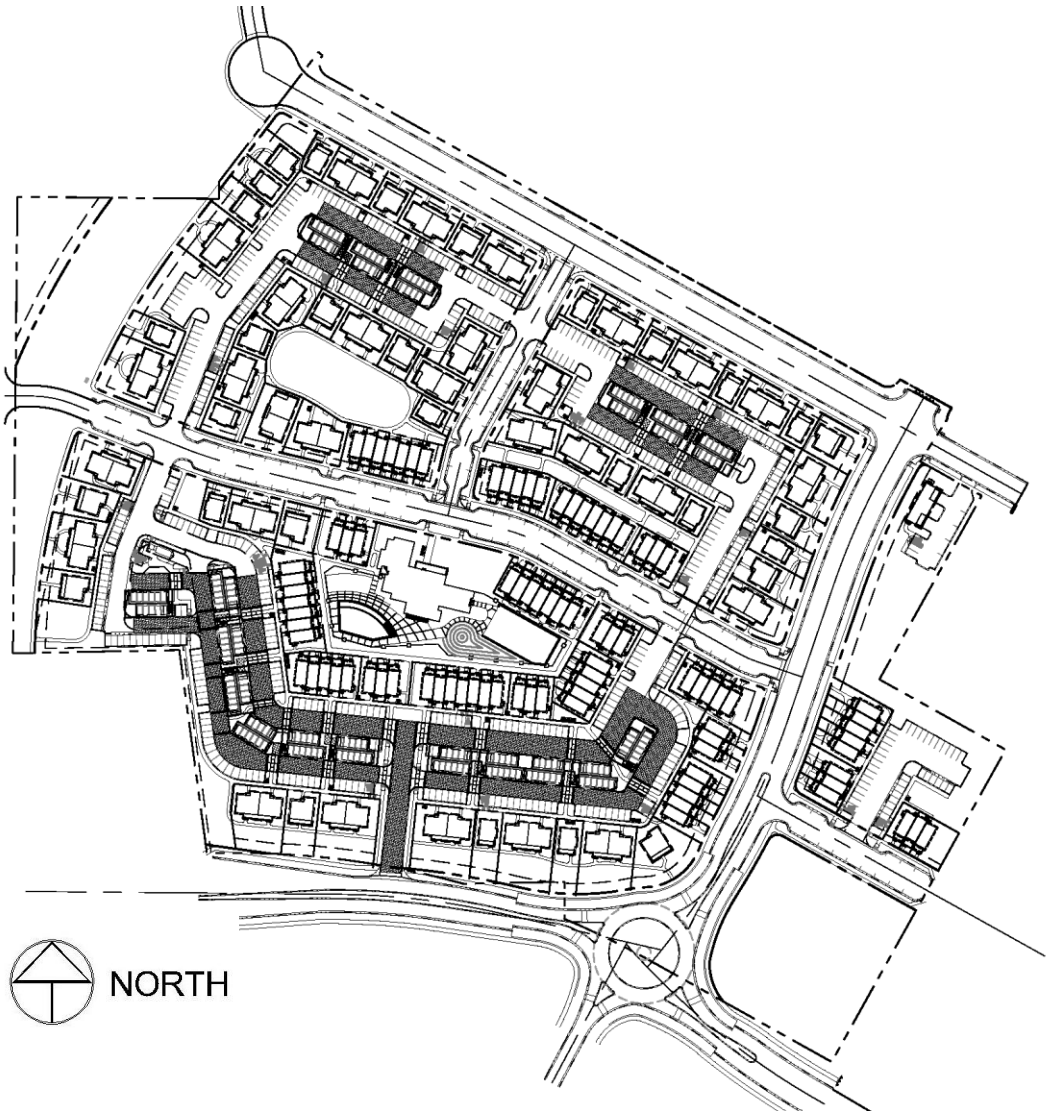


Figure 2– Proposed Site Plan

5. There are no known irrigation laterals crossing the site.
6. The proposed land use is residential and commercial.

C. Floodplain

1. The project site is not encroached by any City or FEMA 100-year floodplain. The site is located within the 500-year floodplain of the Cache La Poudre Rive.



Figure 3 –Area Floodplain Mapping

II. DRAINAGE BASINS AND SUB-BASINS

A. Major Basin Description

2. The project site lies within the Dry Creek Basin. Detention requirements are to detain the difference between the 100-year developed inflow rate and the historic 2-year release rate. The historic release rate for this basin is 0.20 cfs per acre. The site outfall is the existing Lincoln Channel, running along the southern boundary of the site.

B. Sub-Basin Description

1. The subject property historically drains overland from northwest to southeast. Runoff

from the majority of the site has historically been collected in the Lincoln Channel, running along the southern boundary of the site. The Lincoln Channel captures regional flows from the west and conveys these flows east.

2. A more detailed description of the project drainage patterns follows in Section IV.A.4., below.

III. DRAINAGE DESIGN CRITERIA

A. Regulations

There are no optional provisions outside of the FCSCM proposed with the proposed project.

B. Four Step Process

The overall stormwater management strategy employed with the proposed project utilizes the "Four Step Process" to minimize adverse impacts of urbanization on receiving waters. The following is a description of how the proposed development has incorporated each step.

Step 1 – Employ Runoff Reduction Practices
Several techniques have been utilized with the proposed development to facilitate the reduction of runoff peaks, volumes, and pollutant loads as the site is developed from the current use by implementing multiple Low Impact Development (LID) strategies including:

- Conserving existing amenities in the site including the existing vegetated areas.
- Providing vegetated open areas throughout the site to reduce the overall impervious area and to minimize directly connected impervious areas (MDCIA).
- Routing flows, to the extent feasible, through vegetated swales to increase time of concentration, promote infiltration and provide initial water quality.

Step 2 – Implement BMPs That Provide a Water Quality Capture Volume (WQCV) with Slow Release
The efforts taken in Step 1 will facilitate the reduction of runoff; however, urban development of this intensity will still generate stormwater runoff that will require additional BMPs and water quality. The majority of stormwater runoff from the site will ultimately be intercepted and treated using extended detention methods prior to exiting the site.

Step 3 – Stabilize Drainageways
There are no major drainageways within the subject property (the Lincoln Channel is located outside of the property boundary). While this step may not seem applicable to proposed development, the project indirectly helps achieve stabilized drainageways nonetheless. By providing water quality where none previously existed, sediment with erosion potential is removed from the downstream drainageway systems. Furthermore, this project will pay one-time stormwater development fees, as well as ongoing monthly stormwater utility fees, both of which help achieve City-wide drainageway stability.

Step 4 – Implement Site Specific and Other Source Control BMPs.
The proposed project will improve upon site specific source controls compared to historic conditions:

- Trash, waste products, etc. that were previously left exposed with the historic trailer park will no longer be allowed to exposure to runoff and transport to receiving

drainageways. The proposed development will eliminate these sources of potential pollution.

C. Development Criteria Reference and Constraints

The subject property is surrounded by currently developed properties. Thus, several constraints have been identified during the course of this analysis that will impact the proposed drainage system including:

- Existing elevations along the property lines will generally be maintained.
- As previously mentioned, overall drainage patterns of the existing site will be maintained.
- Elevations of existing downstream facilities that the subject property will release to will be maintained.

D. Hydrological Criteria

1. The City of Fort Collins Rainfall Intensity-Duration-Frequency Curves, as depicted in Figure RA-16 of the FCSCM, serve as the source for all hydrologic computations associated with the proposed development. Tabulated data contained in Table RA-7 has been utilized for Rational Method runoff calculations.
2. The Rational Method has been employed to compute stormwater runoff utilizing coefficients contained in Tables RO-11 and RO-12 of the FCSCM.
3. Three separate design storms have been utilized to address distinct drainage scenarios. A fourth design storm has also been computed for comparison purposes. The first design storm considered is the 80th percentile rain event, which has been employed to design the project's water quality features. The second event analyzed is the "Minor," or "Initial" Storm, which has a 2-year recurrence interval. The third event considered is the "Major Storm," which has a 100-year recurrence interval. The fourth storm computed, for comparison purposes only, is the 10-year event.
4. No other assumptions or calculation methods have been used with this development that are not referenced by current City of Fort Collins criteria.

E. Hydraulic Criteria

1. As previously noted, the subject property maintains historic drainage patterns.
2. All drainage facilities proposed with the project are designed in accordance with criteria outlined in the FCSCM and/or the Urban Drainage and Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual.
3. As stated above, the subject property is not located in a City or FEMA regulatory floodplain.
4. The proposed project does not propose to modify any natural drainageways.

F. Modifications of Criteria

1. The proposed development is not requesting any modifications to criteria at this time.

IV. DRAINAGE FACILITY DESIGN

A. General Concept

1. The main objectives of the project drainage design are to maintain existing drainage patterns, and to ensure no adverse impacts to any adjacent properties.
2. Onsite detention will be provided within the subgrade of the proposed permeable pavement systems for Basin 4, and in the pond within Basin 7 for the majority of the site (please see exceptions discussed below). Water quality capture volume for the purpose of water quality treatment conforming to extended detention criteria will also be provided in the lower stage of the pond within Basin 7. Detention and water quality release rates will be controlled through sub-surface control structures.
3. The site has been broken into 14 sub-basins for preliminary design purposes. Anticipated drainage patterns for proposed drainage basins are described below.

Onsite Basins 1-7, 10, 12, 13

Basins 1-7, 10, 12, 13 will generally drain via overland flow and curb and gutter flow into inlets and storm line systems within the project site. A series of permeable paver systems will be designed to both capture direct runoff and collect runoff from storm line systems. The permeable paver sub-grade material will be utilized for a portion (up to 0.99 acre-feet) of onsite detention volume for Basin 4. Detention for Basins 1 through 3, 5 through 7, and 10, 12, 13 will be provided within the detention/water quality pond in Basin 7.

Basins 8, 9, 11, and 14

Due to site grading constraints Basins 8, 9, 11, and 14 are currently shown to drain offsite undetained. Basin 14 will drain into the proposed inlets shown within the future Realigned Lemay Avenue, which will convey flows into the existing 36-inch diameter storm line running along the west side of the site (discussed above in Section I.A).

Please see further discussion of water quality and detention requirements in Section IV.B, below.

A full-size copy of the Drainage Exhibit can be found in the Map Pocket at the end of this report.

B. Specific Details

1. Quantity detention is a requirement for the site, and portion (0.99 acre-feet) of quantity detention is proposed to be provided within the permeable paver sub-grade material within Basin 4. The majority of the site will be directed into the onsite pond within Basin 7 which will be designed at Final in order to provide the required water quality capture volume and to maintain the required site release rate. The current stipulation for release rate is 0.20 cfs per acre per the Dry Creek Master Plan. The project site encompasses 26.66 acres, thus, a release rate of 5.33 cfs for the overall site is required by this criteria. A total detention volume of 5.11 acre-feet with a release rate of 4.5 cfs has been estimated for preliminary purposes for the detention/water quality pond in Basin 7. A detention volume of 0.82 acre-feet with a release rate of 0.7 cfs has been estimated for preliminary purposes for the paver system detention in

Basin 4. Detention volumes have been estimated using the computer program EPA SWMM (please see Appendix C).

2. Water quality capture volume will be provided in the lower stage of the detention/water quality pond in Basin 7. A required water quality capture volume based on a 40-hour holding time has been estimated at 0.43 acre-feet for the pond.
3. LID features will be incorporated in the design of the overall site at Final design. The site plan currently shows the majority of LID measures proposed with the development plan as consisting of a very significant permeable paver system. The site plan shows 1.58 acres of pavers to be placed within the drive and parking areas in Basins 1, 2, 4, 5 and 10; while the paved drive and parking surface area within the proposed site consists of roughly 4.13 acres. This results in 28% of paved drive and parking surfaces being composed of permeable pavers. The site will be designed at Final to ensure a minimum of 25% of paved drive and parking areas to consist of permeable pavers. Additionally, paver systems will be designed at Final to meet the 2:1 flow-on ratio. The paver system will greatly enhance filtration of storm runoff, and will provide significant storm runoff infiltration.
4. Final design details, construction documentation, and Standard Operating Procedures (SOP) Manual shall be provided to the City of Fort Collins for review prior to Final Development Plan approval. A final copy of the approved SOP manual shall be provided to City and must be maintained on-site by the entity responsible for the facility maintenance. Annual reports must also be prepared and submitted to the City discussing the results of the maintenance program (i.e. inspection dates, inspection frequency, volume loss due to sedimentation, corrective actions taken, etc.).
5. Proper maintenance of the drainage facilities designed with the proposed development is a critical component of their ongoing performance and effectiveness. The water quality pond in Basin 7 will be designed at Final to be easily accessed by maintenance staff via gentle slopes provided to the bottom of the pond.
6. The drainage features associated with the proposed project are all private facilities, located on private property.

V. CONCLUSIONS

A. Compliance with Standards

1. The drainage design proposed with the proposed project complies with the City of Fort Collins' Stormwater Criteria Manual.
2. The drainage design proposed with this project complies with requirements for the Dry Creek Basin.
3. The drainage plan and stormwater management measures proposed with the proposed development are compliant with all applicable State and Federal regulations governing stormwater discharge.

B. Drainage Concept

1. The drainage design proposed with this project will effectively limit any potential damage associated with its stormwater runoff by providing detention and water

quality mitigation features.

2. The drainage concept for the proposed development is consistent with requirements for the Dry Creek Basin.

References

1. City of Fort Collins Landscape Design Guidelines for Stormwater and Detention Facilities, November 5, 2009, BHA Design, Inc. with City of Fort Collins Utility Services.

2. Fort Collins Stormwater Criteria Manual, City of Fort Collins, Colorado, as adopted by Ordinance No. 174, 2011, and referenced in Section 26-500 (c) of the City of Fort Collins Municipal Code.

3. Larimer County Urban Area Street Standards, Adopted January 2, 2001, Repealed and Reenacted, Effective October 1, 2002, Repealed and Reenacted, Effective April 1, 2007.

4. Soils Resource Report for Larimer County Area, Colorado, Natural Resources Conservation Service, United States Department of Agriculture.

5. Urban Storm Drainage Criteria Manual, Volumes 1-3, Urban Drainage and Flood Control District, Wright-McLaughlin Engineers, Denver, Colorado, Revised April 2008.

APPENDIX A

HYDROLOGIC COMPUTATIONS

DEVELOPED COMPOSITE % IMPERVIOUSNESS AND RUNOFF COEFFICIENT CALCULATIONS

CHARACTER OF SURFACE:	**Runoff Coefficient**	**Percentage Impervious**
Streets, Parking Lots, Roofs, Alleys, and Drives:		
Asphalt	0.95	100%
Concrete	0.95	90%
Gravel	0.50	40%
Roofs	0.95	90%
Pavers	0.40	22%
Lawns and Landscaping		
Sandy Soil	0.15	0%
Clayey Soil	0.25	0%

Project: 335-008
Calculations By: ATC
Date: December 1, 2014

2-year C_f = 1.00 10-year C_f = 1.00 100-year C_f = 1.25

Runoff Coefficients are taken from the City of Fort Collins Storm Drainage Design Criteria and Construction Standards, Table 3-3. % Impervious taken from UDFCD USDCM, Volume I.

Basin ID	Basin Area (s.f.)	Basin Area (ac)	Area of Asphalt (ac)	Area of Concrete (ac)	Area of Roofs (ac)	Area of Pavers (ac)	Area of Lawns and Landscaping (ac)	2-year Composite Runoff Coefficient	10-year Composite Runoff Coefficient	100-year Composite Runoff Coefficient	Composite % Imperv.
1	175111	4.02	0.98	0.50	0.86	0.18	1.15	0.64	0.64	0.80	56%
2	158123	3.63	0.84	0.40	0.91	0.20	1.28	0.67	0.67	0.84	57%
3	84071	1.93	1.28	0.34	0.00	0.00	0.31	0.83	0.83	1.00	82%
4	159865	3.67	1.37	0.19	0.49	0.68	0.94	0.67	0.67	0.84	58%
5	312761	7.18	1.61	0.94	1.04	0.45	3.00	0.60	0.60	0.76	49%
6	40685	0.93	0.46	0.23	0.00	0.00	0.23	0.77	0.77	0.96	72%
7	60984	1.40	0.24	0.00	0.00	0.00	1.05	0.35	0.35	0.44	17%
8	8364	0.19	0.16	0.03	0.00	0.00	0.00	0.95	0.95	1.00	98%
9	15856	0.36	0.29	0.07	0.00	0.00	0.00	0.95	0.95	1.00	98%
10	62726	1.44	0.32	0.08	0.20	0.00	0.84	0.54	0.54	0.68	40%
11	3136	0.07	0.03	0.00	0.00	0.00	0.00	0.41	0.41	0.51	43%
12	15333	0.35	0.18	0.00	0.00	0.00	0.00	0.48	0.48	0.60	51%
13	13721	0.32	0.28	0.00	0.03	0.00	0.00	0.95	0.95	1.00	99%
14	239462	5.50	2.176	0.169	0.00	0.00	3.15	0.55	0.55	0.69	42%

DEVELOPED TIME OF CONCENTRATION COMPUTATIONS

Overland Flow, Time of Concentration:

$$T_i = \frac{1.87(1.1 - C * Cf)\sqrt{L}}{S^{1/3}}$$

Gutter/Swale Flow, Time of Concentration:

$T_t = L / 60V$

$T_c = T_i + T_t$ (Equation RO-2)

Velocity (Gutter Flow), $V = 20 \cdot S^{½}$

Velocity (Swale Flow), $V = 15 \cdot S^{½}$ } (Equation RO-4)

Table 3-4

RATIONAL METHOD FREQUENCY ADJUSTMENT FACTORS

Storm Return Period (years)	Frequency Factor C_f
2 to 10	1.00
11 to 25	1.10
26 to 50	1.20
51 to 100	1.25

Note: The product of C times C_f shall not exceed 1.00

Project: 335-008
Calculations By: ATC
Date: December 1, 2014

NOTE: C-value for overland flows over grassy surfaces; C = 0.25

Design Point	Basin	Overland Flow										Gutter Flow				Swale Flow				Time of Concentration		
		Is Length >500' ?	C*C_f (2-yr C_f=1.00)	C*C_f (10-yr C_f=1.00)	C*C_f (100-yr C_f=1.25)	Length, L (ft)	Slope, S (%)	T_i *2-yr* (min)	T_i *10-yr* (min)	T_i *100-yr* (min)	Length, L (ft)	Slope, S (%)	Velocity, V (ft/s)	T_t (min)	Length, L (ft)	Slope, S (%)	Velocity, V (ft/s)	T_t (min)	2-yr T_c (min)	10-yr T_c (min)	100-yr T_c (min)
1	1	No	0.95	0.95	1.00	120	2.00%	2.4	2.4	1.6	520	1.00%	2.00	4.3	0	0.00%	N/A	N/A	7	7	6
2	2	No	0.95	0.95	1.00	120	2.00%	2.4	2.4	1.6	460	1.00%	2.00	3.8	0	0.00%	N/A	N/A	6	6	5
3	3	No	0.95	0.95	1.00	40	2.00%	1.4	1.4	0.9	790	1.00%	2.00	6.6	0	0.00%	N/A	N/A	8	8	8
4	4	No	0.95	0.95	1.00	120	2.00%	2.4	2.4	1.6	250	1.00%	2.00	2.1	0	0.00%	N/A	N/A	5	5	5
5	5	No	0.25	0.25	0.31	150	2.00%	15.5	15.5	14.4	410	1.00%	2.00	3.4	0	0.00%	N/A	N/A	19	19	18
6	6	No	0.95	0.95	1.00	40	2.00%	1.4	1.4	0.9	1030	1.00%	2.00	8.6	0	0.00%	N/A	N/A	10	10	10
7	7	No	0.35	0.35	0.44	202	2.00%	15.8	15.8	13.9	0	1.00%	N/A	N/A	0	0.00%	N/A	N/A	16	16	14
8	8	No	0.95	0.95	1.00	40	2.00%	1.4	1.4	0.9	188	1.00%	2.00	1.6	0	0.00%	N/A	N/A	5	5	5
9	9	No	0.95	0.95	1.00	40	2.00%	1.4	1.4	0.9	416	1.00%	2.00	3.5	0	0.00%	N/A	N/A	5	5	5
10	10	No	0.95	0.95	1.00	120	2.00%	2.4	2.4	1.6	193	1.00%	2.00	1.6	0	0.00%	N/A	N/A	5	5	5
11	11	No	0.95	0.95	1.00	40	2.00%	1.4	1.4	0.9	35	1.00%	2.00	0.3	0	0.00%	N/A	N/A	5	5	5
12	12	No	0.95	0.95	1.00	40	2.00%	1.4	1.4	0.9	190	1.00%	2.00	1.6	0	0.00%	N/A	N/A	5	5	5
13	13	No	0.95	0.95	1.00	80	2.00%	2.0	2.0	1.3	0	1.00%	N/A	N/A	0	0.00%	N/A	N/A	5	5	5
14	14	No	0.25	0.25	0.31	334	0.60%	34.4	34.4	32.0	123	1.00%	2.00	1.0	0	0.00%	N/A	N/A	35	35	33

DEVELOPED RUNOFF COMPUTATIONS

Rational Method Equation:

$$Q = C_f(C)(i)(A)$$

From Section 3.2.1 of the CFCSDDC

Table 3-4

RATIONAL METHOD FREQUENCY ADJUSTMENT FACTORS

Storm Return Period (years)	Frequency Factor C_f
2 to 10	1.00
11 to 25	1.10
26 to 50	1.20
51 to 100	1.25

Note: The product of C times C_f shall not exceed 1.00

Project: 335-008
Calculations By: ATC
Date: December 1, 2014

Rainfall Intensity:

Rainfall Intensity taken from the City of Fort Collins Storm Drainage Design Criteria (CFCSDDC), Figure 3.1

Design Point	Basin(s)	Area, A (acres)	2-yr T_c (min)	10-yr T_c (min)	100-yr T_c (min)	C_2	C_{10}	C_{100}	Intensity, i_2 (in/hr)	Intensity, i_{10} (in/hr)	Intensity, i_{100} (in/hr)	Flow, Q_2 (cfs)	Flow, Q_{10} (cfs)	Flow, Q_{100} (cfs)
1	1	4.02	7	7	6	0.64	0.64	0.80	2.60	4.44	9.63	6.7	11.4	31.0
2	2	3.63	6	6	5	0.67	0.67	0.84	2.67	4.56	9.95	6.5	11.1	30.4
3	3	1.93	8	8	8	0.83	0.83	1.00	2.46	4.21	8.59	4.0	6.8	16.6
4	4	3.67	5	5	5	0.67	0.67	0.84	2.85	4.87	9.95	7.0	11.9	30.5
5	5	7.18	19	19	18	0.60	0.60	0.76	1.68	2.86	6.01	7.3	12.4	32.6
6	6	0.93	10	10	10	0.77	0.77	0.96	2.26	3.86	7.88	1.6	2.8	7.1
7	7	1.40	16	16	14	0.35	0.35	0.44	1.84	3.14	6.82	0.9	1.5	4.2
8	8	0.19	5	5	5	0.95	0.95	1.00	2.85	4.87	9.95	0.5	0.9	1.9
9	9	0.36	5	5	5	0.95	0.95	1.00	2.85	4.87	9.95	1.0	1.7	3.6
10	10	1.44	5	5	5	0.54	0.54	0.68	2.85	4.87	9.95	2.2	3.8	9.7
11	11	0.07	5	5	5	0.41	0.41	0.51	2.85	4.87	9.95	0.1	0.1	0.4
12	12	0.35	5	5	5	0.48	0.48	0.60	2.85	4.87	9.95	0.5	0.8	2.1
13	13	0.32	5	5	5	0.95	0.95	1.00	2.85	4.87	9.95	0.9	1.5	3.1
14	14	5.50	35	35	33	0.55	0.55	0.69	1.17	2.00	4.24	3.5	6.0	16.0

APPENDIX B

WATER QUALITY DESIGN COMPUTATIONS

WATER QUALITY DESIGN CALCULATIONS
Total Req'd Water Quality Capture Volume

Project: 939-001
By: ATC
Date: 12/2/14

REQUIRED STORAGE & OUTLET WORKS:

BASIN AREA =	22.990	<-- INPUT from impervious calcs
BASIN IMPERVIOUSNESS PERCENT =	57.00	<-- INPUT from impervious calcs
BASIN IMPERVIOUSNESS RATIO =	0.5700	<-- CALCULATED
WQCV (watershed inches) =	0.226	<-- CALCULATED from Figure EDB-2
WQCV (ac-ft) =	0.434	<-- CALCULATED from UDFCD DCM V.3 Section 6.5
WQ Depth (ft) =	**	<-- INPUT from stage-storage table
AREA REQUIRED PER ROW, a (in^2) =	**	<-- CALCULATED from Figure EDB-3

CIRCULAR PERFORATION SIZING:

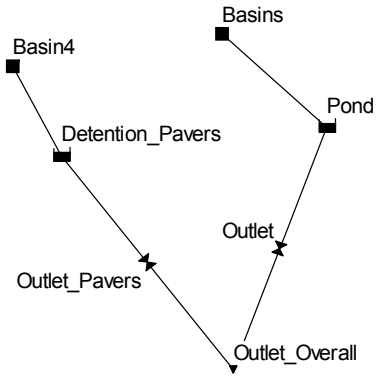
dia (in) =	**	<-- INPUT from Figure 5
n =	**	<-- INPUT from Figure 5
t (in) =	**	<-- INPUT from Figure 5
number of rows =	**	<-- CALCULATED from WQ Depth and row spacing

**To be completed at final design

APPENDIX C

STORMWATER MANAGEMENT MODEL (SWMM)

FtCollins-100yr



EPA STORM WATER MANAGEMENT MODEL - VERSION 5.0 (Build 5.0.022)

****
NOTE: The summary statistics displayed in this report are
based on results found at every computational time step,
not just on results from each reporting time step.
****

****
Analysis Options
****
Flow Units ..... CFS
Process Models:
  Rainfall/Runoff ..... YES
  Snowmelt ..... NO
  Groundwater ..... NO
  Flow Routing ..... YES
  Ponding Allowed ..... NO
  Water Quality ..... NO
Infiltration Method ..... HORTON
Flow Routing Method ..... KINWAVE
Starting Date NOV-21-2012 00:00:00
Ending Date NOV-21-2012 06:00:00
Antecedent Dry Days 0.0
Report Time Step 00:15:00
Wet Time Step 00:05:00
Dry Time Step 01:00:00
Routing Time Step ..... 30.00 sec

Runoff Quantity Continuity	Volume acre-feet	Depth inches
Total Precipitation	8.152	3.669
Evaporation Loss	0.000	0.000
Infiltration Loss	1.418	0.638
Surface Runoff	6.658	2.997
Final Surface Storage	0.128	0.058
Continuity Error (%)	-0.644	

Flow Routing Continuity	Volume acre-feet	Volume 10^6 gal
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	6.658	2.170
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	2.195	0.715
Internal Outflow	0.000	0.000
Storage Losses	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	4.463	1.454
Continuity Error (%)	-0.003	

****

Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****
Minimum Time Step   :   30.00 sec
Average Time Step   :   30.00 sec
Maximum Time Step   :   30.00 sec
Percent in Steady State   :   0.00
Average Iterations per Step :   1.00

****
Subcatchment Runoff Summary
****

Subcatchment	Total Precip in	Total Runon in	Total Evap in	Total Infil in	Total Runoff in	Total Runoff 10^6 gal	Peak Runoff CFS	Runoff Coeff
Basins	3.67	0.00	0.00	0.64	2.99	1.87	170.37	0.816
Basin4	3.67	0.00	0.00	0.61	3.03	0.30	29.03	0.824

****
Node Depth Summary
****

Node	Type	Average Depth Feet	Maximum Depth Feet	Maximum HGL Feet	Time of Max Occurrence days hr:min
Outlet_Overall	OUTFALL	0.00	0.00	96.00	0 00:00
Pond	STORAGE	2.52	2.99	99.99	0 02:12
Detention_Pavers	STORAGE	2.19	2.58	99.58	0 02:11

****
Node Inflow Summary
****

Node	Type	Maximum Lateral Inflow CFS	Maximum Total Inflow CFS	Time of Max Occurrence days hr:min	Lateral Inflow Volume 10^6 gal	Total Inflow Volume 10^6 gal
Outlet_Overall	OUTFALL	0.00	5.18	0 02:12	0.000	0.715
Pond	STORAGE	170.37	170.37	0 00:40	1.868	1.868
Detention_Pavers	STORAGE	29.03	29.03	0 00:40	0.301	0.301

****
Node Surcharge Summary
****

Surcharging occurs when water rises above the top of the highest conduit.

Node	Type	Hours Surcharged	Max. Height Above Crown Feet	Min. Depth Below Rim Feet
Pond	STORAGE	6.01	2.986	7.014
Detention_Pavers	STORAGE	6.01	2.582	7.418

****
Node Flooding Summary
****

No nodes were flooded.

****
Storage Volume Summary
****

Storage Unit	Average Volume 1000 ft3	Avg Pcnt Full	E&I Pcnt Loss	Maximum Volume 1000 ft3	Max Pcnt Full	Time of Max Occurrence days hr:min	Maximum Outflow CFS
Pond	173.202	7	0	222.951	9	0 02:12	4.48
Detention_Pavers	27.845	5	0	35.839	6	0 02:10	0.70

****
Outfall Loading Summary
****

Outfall Node	Flow Freq. Pcnt.	Avg. Flow CFS	Max. Flow CFS	Total Volume 10^6 gal
Outlet_Overall	97.23	4.55	5.18	0.715
System	97.23	4.55	5.18	0.715

****
Link Flow Summary
****

Link	Type	Maximum |Flow| CFS	Time of Max Occurrence days hr:min	Maximum |Veloc| ft/sec	Max/ Full Flow	Max/ Full Depth
Outlet	DUMMY	4.48	0 02:12			
Outlet_Pavers	DUMMY	0.70	0 00:47			

****
Conduit Surcharge Summary
****

No conduits were surcharged.

Analysis begun on: Tue Dec 02 15:14:38 2014
Analysis ended on: Tue Dec 02 15:14:38 2014
Total elapsed time: < 1 sec

APPENDIX D

EROSION CONTROL REPORT

EROSION CONTROL REPORT

A comprehensive Erosion and Sediment Control Plan (along with associated details) will be included with the final construction drawings. It should be noted, however, that any such Erosion and Sediment Control Plan serves only as a general guide to the Contractor. Staging and/or phasing of the BMPs depicted, and additional or different BMPs from those included may be necessary during construction, or as required by the authorities having jurisdiction.

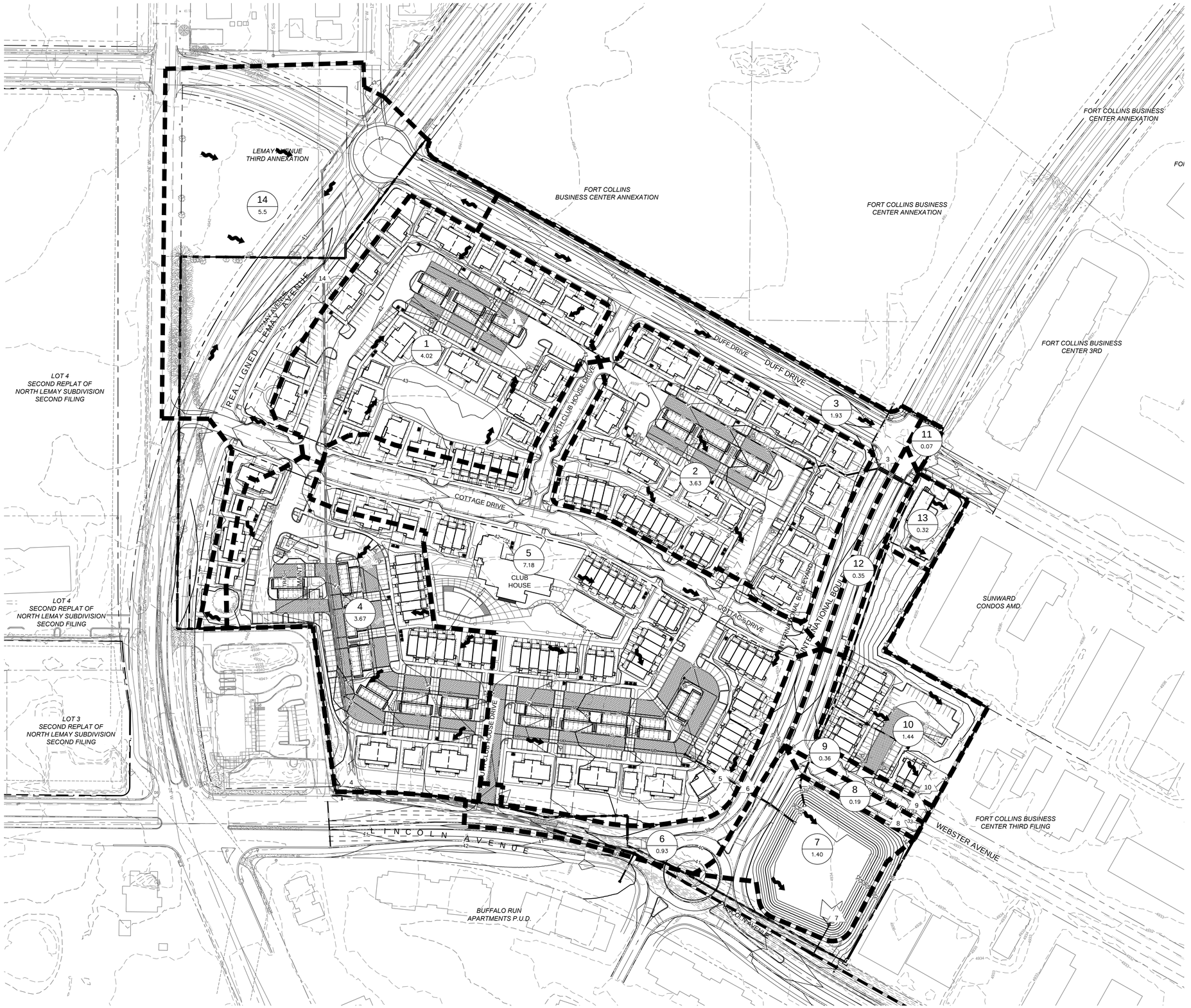
It shall be the responsibility of the Contractor to ensure erosion control measures are properly maintained and followed. The Erosion and Sediment Control Plan is intended to be a living document, constantly adapting to site conditions and needs. The Contractor shall update the location of BMPs as they are installed, removed or modified in conjunction with construction activities. It is imperative to appropriately reflect the current site conditions at all times.

The Erosion and Sediment Control Plan shall address both temporary measures to be implemented during construction, as well as permanent erosion control protection. Best Management Practices from the Volume 3, Chapter 7 – *Construction BMPs* will be utilized. Measures may include, but are not limited to, silt fencing along the disturbed perimeter, gutter protection in the adjacent roadways and inlet protection at existing and proposed storm inlets. Vehicle tracking control pads, spill containment and clean-up procedures, designated concrete washout areas, dumpsters, and job site restrooms shall also be provided by the Contractor.

Grading and Erosion Control Notes can be found on the Utility Plans. The Final Plans will contain a full-size Erosion Control sheet as well as a separate sheet dedicated to Erosion Control Details. In addition to this report and the referenced plan sheets, the Contractor shall be aware of, and adhere to, the applicable requirements outlined in the Development Agreement for the development. Also, the Site Contractor for this project will be required to secure a Stormwater Construction General Permit from the Colorado Department of Public Health and Environment (CDPHE), Water Quality Control Division – Stormwater Program, prior to any earth disturbance activities. Prior to securing said permit, the Site Contractor shall develop a comprehensive StormWater Management Plan (SWMP) pursuant to CDPHE requirements and guidelines. The SWMP will further describe and document the ongoing activities, inspections, and maintenance of construction BMPs.

MAP POCKET

DRAINAGE EXHIBITS



NORTH

80 0 80 160 240

(IN FEET)
1 INCH = 80 FEET

LEGEND:

- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN — UD
- PROPOSED INLET
- PROPOSED CONTOUR — 93
- EXISTING CONTOUR — 4953
- PROPOSED SWALE
- PROPOSED CURB & GUTTER
- PROPERTY BOUNDARY
- DESIGN POINT — 1
- FLOW ARROW
- DRAINAGE BASIN LABEL — BASIN DESIGNATION 1, 0.22 BASIN AREA (AC)
- DRAINAGE BASIN BOUNDARY
- PERMEABLE PAVERS

NOTES:

1. REFER TO THE "PRELIMINARY DRAINAGE AND EROSION CONTROL REPORT FOR CAPSTONE COTTAGES" BY NORTHERN ENGINEERING, DATED DECEMBER 10, 2014 FOR ADDITIONAL INFORMATION.

PROJECT BENCHMARKS

BENCHMARK #1:
City of Fort Collins Benchmark 3-00
NGVD29 Elevation= 4964.15
(NAVD88 Elevation= 4967.33)

BENCHMARK #2:
City of Fort Collins Benchmark 12-07
NGVD29 Elevation= 4944.68
(NAVD88 Elevation= 4947.86)

FOR DRAINAGE REVIEW ONLY
NOT FOR CONSTRUCTION

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

Know what's below.
Call before you dig.

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date
CHECKED BY: _____ Water Utility _____ Date
CHECKED BY: _____ Stormwater Utility _____ Date
CHECKED BY: _____ Parks & Recreation _____ Date
CHECKED BY: _____ Traffic Engineer _____ Date
CHECKED BY: _____ Environmental Planner _____ Date

No. | Revisions: | Date:

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

These drawings are instruments of service provided by Northern Engineering Services, Inc. and are not to be used for any type of construction unless signed and sealed by a Professional Engineer in the employ of Northern Engineering Services, Inc.

NORTHERN ENGINEERING
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521
www.northernengineering.com
Phone: 970.221.4158

PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
DATE: DECEMBER 10, 2014
SCALE: 1"=80'
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

DRAINAGE EXHIBIT

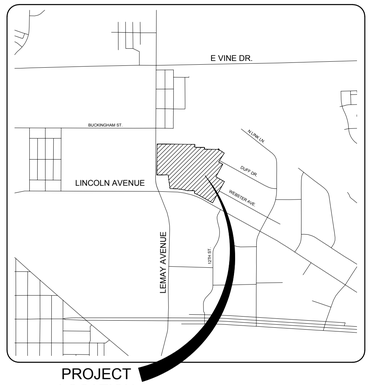
Sheet
C600
Of 34 Sheets

UTILITY PLANS FOR

CAPSTONE COTTAGES

LOCATED IN THE WEST HALF OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST OF THE 6TH P.M.,
CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO

DECEMBER 2014



CONTACT INFORMATION

PROJECT TEAM:

OWNER/APPLICANT
Capstone Collegiate Communities
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431 Office Park Drive
Birmingham, Alabama 35223
(205) 414-6400

ARCHITECT
Dungan Nequette Architects
Louis Nequette, AIA
1906 Cahaba Road
Mountain Brook, Alabama 35223
(205) 329-7088

LANDSCAPE ARCHITECT
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Daman Holland, ASLA, RLA
401 West Mountain Avenue
Fort Collins, Colorado 80521
(970) 224-5828

SITE ENGINEER
Nick Haws, PE, LEED AP
Northern Engineering Services, Inc.
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Fort Collins, Colorado 80521
(970) 221-4158

SURVEYOR
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Northern Engineering Services, Inc.
301 North Howes Street, Sutie 100
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(970) 221-4158

TRAFFIC ENGINEER
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Loveland, Colorado 80538
(970) 669-2061

GEOTECHNICAL ENGINEER
Eric D. Bernhart, PE
Terracon Consulting Engineers & Scientists
1901 Sharp Point Drive, Suite C
Fort Collins, Colorado 80525
(970) 484-0359

ENVIRONMENTAL CONSULTANTS
Steven Long
Cedar Creek Associates, Inc.
5586 Overhill Drive
Fort Collins, Colorado 80525
(970) 223-0775

UTILITY CONTACT LIST: *

UTILITY COMPANY		PHONE NUMBER
GAS----------	Xcel Energy---------- Stephanie Rich	(970) 225-7828
ELECTRIC--------	City of Fort Collins Light & Power----- Doug Martine	(970) 224-6152
CABLE----------	Comcast---------- Don Kapperman	(970) 567-0245
TELECOM.---------	CenturyLink Local Network---------- Robert Rulli	(970) 490-7503
WATER----------	ELCO Water District---------- Randy Siddens	(970) 493-2044
WATER----------	North Weld County Water District----- Eric Larson	(970) 356-3020
WASTEWATER--	City of Fort Collins---------- Roger Buffington	(970) 212-2900
STORMWATER-	City of Fort Collins Utilities---------- Glen Schlueter	(970) 224-6065
SANITATION-----	Boxelder Sanitation District---------- Eric Garner	(970) 498-0604

* This list is provided as a courtesy reference only. Northern Engineering Services assumes no responsibility for the accuracy or completeness of this list. In no way shall this list relinquish the Contractor's responsibility for locating all utilities prior to commencing any construction activity. Please contact the Utility Notification Center of Colorado (UNCC) at 811 for additional information.

SHEET INDEX

C000	COVER SHEET
C001	GENERAL AND CONSTRUCTION NOTES
C101-C104	EXISTING CONDITIONS
C200	PAVING PLAN
C300	OVERALL UTILITY PLAN
C301-C304	UTILITY PLANS
C305-C306	WATER LINE PLAN & PROFILES
C400	OVERALL GRADING PLAN
C401-C404	GRADING PLANS
C501-C504	LEMAY AVENUE PLAN & PROFILES
C506-C507	DUFF DRIVE PLAN & PROFILES
C508-C509	INTERNATIONAL BOULEVARDPLAN & PROFILES
C510-C512	LINCOLN AVENUE PLAN & PROFILES
C513	WEBSTER AVENUE PLAN & PROFILES
C514-C515	COTTAGE DRIVE PLAN & PROFILES
C516	NORTH CLUB HOUSE DRIVE PLAN & PROFILES
C517	LEMAY AVENUE STRIPING PLAN
C518	LEMAY AVENUE AND LINCOLN AVENUE STRIPING PLAN
C519	LINCOLN AVE. AND INTERNATIONAL BLVD. STRIPING PLAN
C520	DUFF DRIVE STRIPING PLAN
C600	DRAINAGE EXHIBIT

PROJECT BENCHMARKS:

PROJECT DATUM: NGVD29 Unadjusted (Old City of Fort Collins Datum)

BENCHMARK #1:
City of Fort Collins Benchmark 3-00: On a parapet wall at the Northwest end of the Lincoln Ave. Bridge near the Northeast corner of Lincoln Ave. and Willow St.
Elevation: 4964.15

BENCHMARK #2:
City of Fort Collins Benchmark 12-07: South side of Vine Dr. on the South headwall of the bridge over dry creek basin 0.4 miles East of North Lemay Ave.
Elevation: 4944.68

NOTE: If NAVD 88 Datum is required for any purpose, the following equation should be used: NAVD88 = NGVD29 Unadjusted + 3.18'

Basis of Bearings
West line of the Northeast Quarter of said Section 7 as bearing North 00°35'51" East.

ORIGINAL FIELD SURVEY BY:

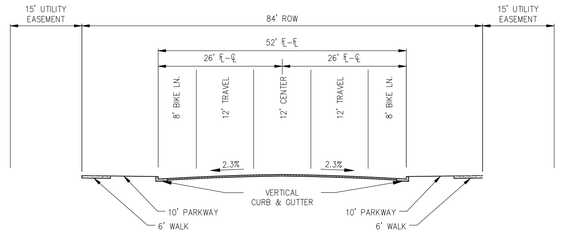
Northern Engineering Services, Inc.
Project No. 939-001
Date: July 31, 2013

DISCLAIMER STATEMENT:

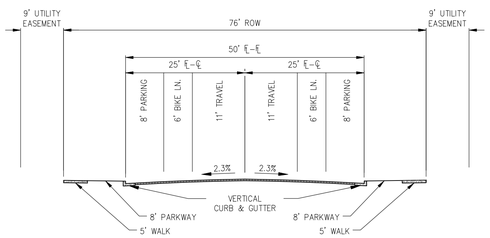
These plans have been reviewed by the City of Fort Collins for concept only. The review does not imply responsibility by the reviewing department, the City of Fort Collins Engineer, or the City of Fort Collins for accuracy and correctness of the calculations. Furthermore, the review does not imply that quantities of items on the plans are the final quantities required. The review shall not be construed for any reason as acceptance of financial responsibility by the City of Fort Collins for additional quantities of items shown that may be required during the construction phase.

CERTIFICATION STATEMENT:

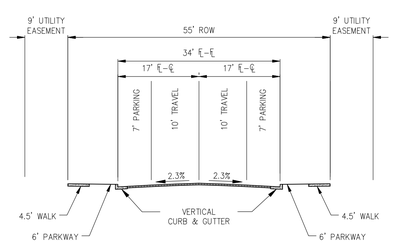
I hereby affirm that these final construction plans were prepared under my direct supervision, in accordance with all applicable City of Fort Collins and State of Colorado standards and statutes, respectively; and that I am fully responsible for the accuracy of all design. revisions, and record conditions that I have noted on these plans.



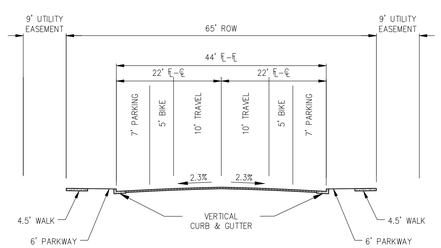
INTERNATIONAL BOULEVARD
(TWO-LANE ARTERIAL STREET - 84' R.O.W.)



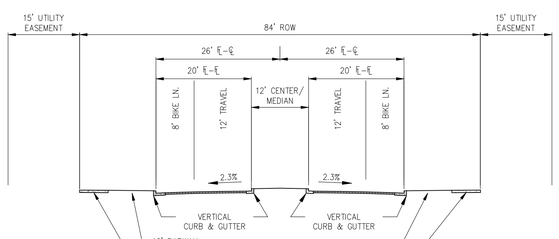
DUFF DRIVE
(MINOR COLLECTOR STREET - 76' R.O.W.)



NORTH CLUB HOUSE DRIVE
(RESIDENTIAL LOCAL STREET - 55' R.O.W.)



COTTAGE DRIVE, WEBSTER AVENUE
(RESIDENTIAL LOCAL STREET - 65' R.O.W.)



LEMAY AVENUE / LINCOLN AVENUE
(TWO-LANE ARTERIAL STREET - 115' R.O.W.)

BOXELDER SANITATION DISTRICT
UTILITY PLAN APPROVAL
APPROVED: _____ MANAGER
DATE: _____
APPROVED: _____ SYSTEMS ENGINEER
DATE: _____

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
Know what's below. Call before you dig.
CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

ELCO WATER DISTRICT
UTILITY PLAN APPROVAL
APPROVED: _____ MANAGER
DATE: _____
APPROVED: _____ SYSTEMS ENGINEER
DATE: _____

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL
APPROVED: _____ City Engineer _____ Date
CHECKED BY: _____ Water Utility _____ Date
CHECKED BY: _____ Stormwater Utility _____ Date
CHECKED BY: _____ Parks & Recreation _____ Date
CHECKED BY: _____ Traffic Engineer _____ Date
CHECKED BY: _____ Environmental Planner _____ Date

No. Revisions: Date:
1 REVIEW SET NOT FOR CONSTRUCTION 12/10/14

These drawings are instruments of service provided by Northern Engineering Services, Inc. and are not to be used for any purpose or project, unless signed and sealed by a Professional Engineer in the employ of Northern Engineering Services, Inc.

NORTHERN ENGINEERING
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521
Phone: (970) 221-4158
www.northernengineering.com

PROJECT: 939-001
DESIGNED BY: A. Roese
DRAWN BY: A. Boese
DATE: DECEMBER 10, 2014
SCALE: N/A
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

COVER SHEET

Sheet C000
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\939-001_COVER.dwg LAYOUT NAME: C000 DATE: Dec 10, 2014 - 4:39pm CAD OPERATOR: sdorn
LIST OF XREFS: [NES-xbrdwg] [Relwg]

A. GENERAL NOTES

1. All materials, workmanship, and construction of public improvements shall meet or exceed the standards and specifications set forth in the Larimer County Urban Area Street Standards and applicable state and federal regulations. Where there is conflict between these plans and the specifications, or any applicable standards, the most restrictive standard shall apply. All work shall be inspected and approved by the City of Fort Collins.

2. All references to any published standards shall refer to the latest revision of said standard, unless specifically stated otherwise.

3. These public improvement construction plans shall be valid for a period of three years from the date of approval by the City of Fort Collins Engineer. Use of these plans after the expiration date will require a new review and approval process by the City of Fort Collins prior to commencement of any work shown in these plans.

4. The engineer who has prepared these plans, by execution and/or seal hereof, does hereby affirm responsibility to the City of Fort Collins, as beneficiary of said engineer's work, for any errors and omissions contained in these plans, and approval of these plans by the City of Fort Collins Engineer shall not relieve the engineer who has prepared these plans of all such responsibility. Further, to the extent permitted by law, the engineer hereby agrees to hold harmless and indemnify the City of Fort Collins, and its officers and employees, from and against all liabilities, claims, and demands which may arise from any errors and omissions contained in these plans.

5. All storm sewer construction, as well as power and other "dry" utility installations, shall conform to the City of Fort Collins standards and specifications current at the date of approval of the plans by the City of Fort Collins Engineer.

6. The type, size, location and number of all known underground utilities are approximate when shown on the drawings. It shall be the responsibility of the Developer to verify the existence and location of all underground utilities along the route of the work before commencing new construction. The Developer shall be responsible for unknown underground utilities.

7. The Developer shall contact the Utility Notification Center of Colorado (UNCC) at 1-800-922-1987, at least 2 working days prior to beginning excavation or grading, to have all registered utility locations marked. Other unregistered utility entities (i.e. ditch / irrigation company) are to be located by contacting the respective representative. Utility service laterals are also to be located prior to beginning excavation or grading. It shall be the responsibility of the Developer to relocate all existing utilities that conflict with the proposed improvements shown on these plans.

8. The Developer shall be responsible for protecting all utilities during construction and for coordinating with the appropriate utility company for any utility crossings required.

9. If a conflict exists between existing and proposed utilities and/or a design modification is required, the Developer shall coordinate with the engineer to modify the design. Design modification(s) must be approved by the City of Fort Collins prior to beginning construction.

10. The Developer shall coordinate and cooperate with the City of Fort Collins, and all utility companies involved, to assure that the work is accomplished in a timely fashion and with a minimum disruption of service. The Developer shall be responsible for contacting, in advance, all parties affected by any disruption of any utility service as well as the utility companies.

11. No work may commence within any public storm water, sanitary sewer or potable water system until the Developer notifies the utility provider. Notification shall be a minimum of 2 working days prior to commencement of any work. At the discretion of the water utility provider, a pre-construction meeting may be required prior to commencement of any work.

12. The Developer shall sequence installation of utilities in such a manner as to minimize potential utility conflicts. In general, storm sewer and sanitary sewer should be constructed prior to installation of the water lines and dry utilities.

13. The minimum cover over water lines is 4.5 feet and the maximum cover is 6feet unless otherwise noted in the plans and approved by the Water Utility.

14. A State Construction Dewatering Wastewater Discharge Permit is required if dewatering is required in order to install utilities or if water is discharged into a storm sewer, channel, irrigation ditch or any waters of the United States.

15. The Developer shall comply with all terms and conditions of the Colorado Permit for Storm Water Discharge (Contact Colorado Department of Health, Water Quality Control Division, (303) 692-3590), the Storm Water Management Plan, and the Erosion Control Plan.

16. The City of Fort Collins shall not be responsible for the maintenance of storm drainage facilities located on private property. Maintenance of onsite drainage facilities shall be the responsibility of the property owner(s).

17. Prior to final inspection and acceptance by the City of Fort Collins, certification of the drainage facilities, by a registered engineer, must be submitted to and approved by the Stormwater Utility Department. Certification shall be submitted to the Stormwater Utility Department at least two weeks prior to the release of a certificate of occupancy for single family units. For commercial properties, certification shall be submitted to the Stormwater Utility Department at least two weeks prior to the release of any building permits in excess of those allowed prior to certification per the Development Agreement.

18. The City of Fort Collins shall not be responsible for any damages or injuries sustained in this Development as a result of groundwater seepage, whether resulting from groundwater flooding, structural damage or other damage unless such damage or injuries are sustained as a result of the City of Fort Collins failure to properly maintain its water, wastewater, and/or storm drainage facilities in the development.

19. All recommendations of the Preliminary DrainageReport for Capstone Cottages dated December 10, 2014by Northern Engineering shall be followed and implemented.

20. Temporary erosion control during construction shall be provided as shown on the Erosion Control Plan. All erosion control measures shall be maintained in good repair by the Developer, until such time as the entire disturbed areas is stabilized with hard surface or landscaping.

21. The Developer shall be responsible for insuring that no mud or debris shall be tracked onto the existing public street system. Mud and debris must be removed within 24 hours by an appropriate mechanical method (i.e. machine broom sweep, light duty front-end loader, etc.) or as approved by the the City of Fort Collins street inspector.

22. No work may commence within any improved or unimproved public Right-of-Way until a Right-of-Way Permit or Development Construction Permit is obtained, if applicable.

23. The Developer shall be responsible for obtaining all necessary permits for all applicable agencies prior to commencement of construction. The Developer shall notify the the City of Fort Collins Inspector (Fort Collins - 221-6605) and the City of Fort Collins Erosion Control Inspector (Fort Collins - 221-6700) at least 2 working days prior to the start of any earth disturbing activity, or construction on any and all public improvements. If the City of Fort Collins Engineer is not available after proper notice of construction activity has been provided, the Developer may commence work in the Engineer absence. However, the City of Fort Collins reserves the right not to accept the improvement if subsequent testing reveals an improper installation.

24. The Developer shall be responsible for obtaining soils tests within the Public Right-of-Way after right of way grading and all utility trench work is complete and prior to the placement of curb, gutter, sidewalk and pavement. If the final soils/pavement design report does not correspond with the results of the original geotechnical report, the Developer shall be responsible for a re-design of the subject pavement section or, the Developer may use the City of Fort Collins' default pavement thickness section(s). Regardless of the option used, all final soils/pavement design reports shall be prepared by a licensed Professional Engineer. The final report shall be submitted to the Inspector a minimum of 10 working days prior to placement of base and asphalt. Placement of curb, gutter, sidewalk, base and asphalt shall not occur until the City of Fort Collins Engineer approves the final report.

25. The contractor shall hire a licensed engineer or land surveyor to survey the constructed elevations of the street subgrade and the gutter flowline at all intersections, inlets, and other locations requested by the the City of Fort Collins inspector. The engineer or surveyor must certify in a letter to the City of Fort Collins that these elevations conform to the approved plans and specifications. Any deviations shall be noted in the letter and then resolved with the City of Fort Collins before installation of base course or asphalt will be allowed on the streets.

26. All utility installations within or across the roadbed of new residential roads must be completed prior to the final stages of road construction. For the purposes of these standards, any work except c/g above the subgrade is considered final stage work. All service lines must be stubbed to the property lines and marked so as to reduce the excavation necessary for building connections.

27. Portions of Larimer County are within overlay districts. The Larimer County Flood Plain Resolution should be referred to for additional criteria for roads within these districts.

28. All road construction in areas designated as Wild Fire Hazard Areas shall be done in accordance with the construction criteria as established in the Wild Fire Hazard Area Mitigation Regulations in force at the time of final plat approval.

29. Prior to the commencement of any construction, the contractor shall contact the Local Entity Forester to schedule a site inspection for any tree removal requiring a permit.

30. The Developer shall be responsible for all aspects of safety including, but not limited to, excavation, trenching, shoring, traffic control, and security. Refer to OSHA Publication 2226, Excavating and Trenching.

31. The Developer shall submit a Construction Traffic Control Plan, in accordance with MUTCD, to the appropriate Right-of-Way authority. (The City of Fort Collins, Larimer County, Colorado), for approval, prior to any construction activities within, or affecting, the Right-of-Way. The Developer shall be responsible for providing any and all traffic control devices as may be required by th e construction activities.

32. Prior to the commencement of any construction that will affect traffic signs of any type, the contractor shall contact the City of Fort Collins Traffic Operations Department, who will temporarily remove or relocate the sign at no cost to the contractor, However, if the contractor moves the traffic sign then the contractor will be charged for the labor, materials and equipment to reinstall the sign as needed.

33. The Developer is responsible for all costs for the initial installation of traffic signing and striping for the Development related to the Development's local street operations. In addition, the Developer is responsible for all costs for traffic signing and striping related to directing traffic access to and from the Development.

34. There shall be no site construction activities on Saturdays, unless specifically approved by the City of Fort Collins Engineer, and no site construction activities on Sundays or holidays, unless there is prior written approval by the City of Fort Collins .

35. The Developer is responsible for providing all labor and materials necessary for the completion of the intended improvements, shown on these drawings, or designated to be provided, installed, or constructed, unless specifically noted otherwise.

36. Dimensions for layout and construction are not to be scaled from any drawing. If pertinent dimensions are not shown, contact the Designer for clarification, and annotate the dimension on the as-built record drawings.

37. The Developer shall have, onsite at all times, one (1) signed copy of the approved plans, one (1) copy of the appropriate standards and specifications, and a copy of any permits and extension agreements needed for the job.

38. If, during the construction process, conditions are encountered which could indicate a situation that is not identified in the plans or specifications, the Developer shall contact the Designer and the City of Fort Collins Engineer immediately.

39. The Developer shall be responsible for recording as-built information on a set of record drawings kept on the construction site, and available to the Larimer County's Inspector at all times. Upon completion of the work, the contractor(s) shall submit record drawings to the City of Fort Collins Engineer.

40. The Designer shall provide, in this location on the plan, the location and description of the nearest survey benchmarks (2) for the project as well as the basis of bearings. The information shall be as follows:

    Project Datum: NGVD29 Unadjusted (Old City of Fort Collins Datum)

    City of Fort Collins Benchmark3-00
    On a parapet wall at the northwest end of the Lincoln Ave. bridge near the northeast corner of Lincoln Ave. and Willow St.
    Elevation: 4964.15

    City of Fort Collins Benchmark12-07
    South side of Vine Dr. on the south headwall of the bridge over Dry Creek Basin 0.4 miles east of North Lemay Ave.
    Elevation: 4944.68

    Note: If NAVD88 Datum is required for any purpose, the following equation should be used: NAVD88 = NGVD29 Unadjusted + 3.18'

    Basis of Bearings
    The Basis of Bearing is the Westline of the Northeast Quarter of said Section 7 as bearing North 00°35' 51`" East.

41. All stationing is based on centerline of roadways unless otherwise noted.

42. Damaged curb, gutter and sidewalk existing prior to construction, as well as existing fences, trees, streets, sidewalks, curbs and gutters, landscaping, structures, and improvements destroyed, damaged or removed due to construction of this project, shall be replaced or restored in like kind at the Developer's expense, unless otherwise indicated on these plans, prior to the acceptance of completed improvements and/or prior to the issuance of the first Certificate of Occupancy.

43. When an existing asphalt street must be cut, the street must be restored to a condition equal to or better than its original condition. The existing street condition shall be documented by the City of Fort Collins Construction Inspector before any cuts are made. Patching shall be done in accordance with the City of Fort Collins Street Repair Standards. The finished patch shall blend in smoothly into the existing surface. All large patches shall be paved with an asphalt lay-down machine. In streets where more than one cut is made, an overlay of the entire street width, including the patched area, may be required. The determination of need for a complete overlay shall be made by the Larimer County Engineer and/or the City of Fort Collins Inspector at the time the cuts are made.

44. Upon completion of construction, the site shall be cleaned and restored to a condition equal to, or better than, that which existed before construction, or to the grades and condition as required by these plans.

45. Standard Handicap ramps are to be constructed at all curb returns and at all "T" intersections.

46. After acceptance by the City of Fort Collins, public improvements depicted in these plans shall be guaranteed to be free from material and workmanship defects for a minimum period of two years from the date of acceptance.

47. The City of Fort Collins shall not be responsible for the maintenance of roadway and appurtenant improvements, including storm drainage structures and pipes, for the following private streets:

48. Approved Variances are listed as follows: (None)

CONSTRUCTION NOTES

A. Grading and Erosion Control Notes

1. The erosion control inspector must be notified at least twenty-four (24) hours prior to any construction on this site.

2. There shall be no earth-disturbing activity outside the limits designated on the accepted plans.

3. All required perimeter silt and construction fencing shall be installed priorto any land disturbing activity (stockpiling, stripping, grading, etc). All other required erosion control measures shall be installed at the appropriate time in the construction sequence as indicated in the approved project schedule, construction plans, and erosion control report.

4. At all times during construction, the Developer shall be responsible for preventing and controlling on-site erosion including keeping the property sufficiently watered so as to minimize wind blown sediment. The Developer shall also be responsible for installing and maintaining all erosion control facilities shown herein.

5. Pre-disturbance vegetation shall be protected and retained wherever possible. Removal or disturbance of existing vegetation shall be limited to the area(s) required for immediate construction operations, and for the shortest practical period of time.

6. All soils exposed during land disturbing activity (stripping, grading, utility installations, stockpiling, filling, etc.) shall be kept in a roughened condition by ripping or disking along land contours until mulch, vegetation, or other permanent erosion control BMPs are installed. No soils in areas outside project street rights-of-way shall remain exposed by land disturbing activity for more than thirty (30) days before required temporary or permanent erosion control (e.g. seed/mulch, landscaping, etc.) is installed, unless otherwise approved by the City/County.

7. In order to minimize erosion potential, all temporary (structural) erosion control measures shall:

    a. Be inspected at a minimum of once every two (2) weeks and after each significant storm event and repaired or reconstructed as necessary in order to ensure the continued performance of their intended function.
    b. Remain in place until such time as all the surrounding disturbed areas are sufficiently stabilized as determined by the erosion control inspector.
    c. Be removed after the site has been sufficiently stabilized as determined by the erosion control inspector.

8. When temporary erosion control measures are removed, the Developer shall be responsible for the clean up and removal of all sediment and debris from all drainage infrastructure and other public facilities.

9. The contractor shall immediately clean up any construction materials inadvertently deposited on existing streets, sidewalks, or other public rights of way, and make sure streets and walkways are cleaned at the end of each working day.

10. All retained sediments, particularly those on paved roadway surfaces, shall be removed and disposed of in a manner and location so as not to cause their release into any waters of the United States.

11. No soil stockpile shall exceed ten (10) feet in height. All soil stockpiles shall be protected from sediment transport by surface roughening, watering, and perimeter silt fencing. Any soil stockpile remaining after thirty (30) days shall be seeded and mulched.

12. The stormwater volume capacity of detention ponds will be restored and storm sewer lines will be cleaned upon completion of the project and before turning the maintenance over to the City/County or Homeowners Association (HOA).

13. City Ordinance and Colorado Discharge Permit System (CDPS) requirements make it unlawful to discharge or allow the discharge of any pollutant or contaminated water from construction sites. Pollutants include, but are not limited to discarded building materials, concrete truck washout, chemicals, oil and gas products, litter, and sanitary waste. The developer shall at all times take whatever measures are necessary to assure the proper containment and disposal of pollutants on the site in accordance with any and all applicable local, state, and federal regulations.

14. A designated area shall be provided on site for concrete truck chute washout. The area shall be constructed so as to contain washout material and located at least fifty (50) feet away from any waterway during construction. Upon completion of construction activities the concrete washout material will be removed and properly disposed of prior to the area being restored.

15. Conditions in the field may warrant erosion control measures in addition to what is shown on these plans. The Developer shall implement whatever measures are determined necessary, as directed by the City.

16. Additional information to be provided by a separate Stormwater Management Plan / Erosion Control Report for Capstone Cottages at Final Design.

B. Street Improvement Notes

1. All street construction is subject to the General Notes on the cover sheet of these plans as well as the Street Improvements Notes listed here.

2. A paving section design, signed and stamped by a Colorado licensed Engineer, must be submitted to the City of Fort Collins Engineer for approval, prior to any street construction activity, (full depth asphalt sections are not permitted at a depth greater than 8 inches of asphalt). The job mix shall be submitted for approval prior to placement of any asphalt.

3. Where proposed paving adjoins existing asphalt, the existing asphalt shall be saw cut, a minimum distance of 12 inches from the existing edge, to create a clean construction joint. The Developer shall be required to remove existing pavement to a distance where a clean construction joint can be made. Wheel cuts shall not be allowed unless approved by the City of Fort Collins Engineer in Fort Collins.

4. Street subgrades shall be scarified the top 12 inches and re-compacted prior to subbase installation. No base material shall be laid until the subgrade has been inspected and approved by the City of Fort Collins Engineer.

5. Ft. Collins only. Valve boxes and manholes are to be brought up to grade at the time of pavement placement or overlay. Valve box adjusting rings are not allowed.

6. When an existing asphalt street must be cut, the street must be restored to a condition equal to or better than its original condition. The existing street condition shall be documented by the Inspector before any cuts are made. Cutting and patching shall be done in conformance with Chapter 25, Reconstruction and Repair. The finished patch shall blend smoothly into the existing surface. The determination of need for a complete overlay shall be made by the City of Fort Collins Engineer. All overlay work shall be coordinated with adjacent landowners such that future projects do not cut the new asphalt overlay work.

7. All traffic control devices shall be in conformance with these plans or as otherwise specified in M.U.T.C.D. (including Colorado supplement) and as per the Right-of-Way Work Permit traffic control plan.

8. The Developer is required to perform a gutter water flow test in the presence of the City of Fort Collins Inspector and prior to installation of asphalt. Gutters that hold more than 1/4 inch deep or 5 feet longitudinally, of water, shall be completely removed and reconstructed to drain properly.

9. Prior to placement of H.B.P. or concrete within the street and after moisture/density tests have been taken on the subgrade material (when a full depth section is proposed) or on the subgrade and base material (when a composite section is proposed), a mechanical "proof roll" will be required. The entire subgrade and/or base material shall be rolled with a heavily loaded vehicle having a total GVW of not less than 50,000 lbs. and a single axle weight of at least 18,000 lbs. with pneumatic tires inflated to not less that 90 p.s.i.g. "Proof roll" vehicles shall not travel at speeds greater than 3 m.p.h. Any portion of the subgrade or base material which exhibits excessive pumping or deformation, as determined by the City of Fort Collins Engineer, shall be reworked, replaced or otherwise modified to form a smooth, non-yielding surface. The City of Fort Collins Engineer shall be notified at least 24 hours prior to the "proof roll." All "proof rolls" shall be preformed in the presence of an Inspector.

C. Traffic Signing and Pavement Marking Construction Notes

1. All signage and marking is subject to the General Notes on the cover sheet of these plans, as well as the Traffic Signing and Marking Construction Notes listed here.

2. All symbols, including arrows, ONLYS, crosswalks, stop bars, etc. shall be pre-formed thermo-plastic.

3. All signage shall be per the City of Fort Collins Standards and these plans or as otherwise specified in MUTCD.

4. All lane lines for asphalt pavement shall receive two coats of latex paint with glass beads.

5. All lane lines for concrete pavement should be epoxy paint.

6. Prior to permanent installation of traffic striping and symbols, the Developer shall place temporary tabs or tape depicting alignment and placement of the same. Their placement shall be approved by the City of Fort Collins Traffic Engineer prior to permanent installation of striping and symbols.

7. Pre-formed thermo-plastic applications shall be as specified in these Plans and/or these Standards.

8. Epoxy applications shall be applied as specified in CDOT Standard Specifications for Road and Bridge Construction.

9. All surfaces shall be thoroughly cleaned prior to installation of striping or markings.

10. All sign posts shall utilize break-away assemblies and fasteners per the Standards.

11. A field inspection of location and installation of all signs shall be performed by the City of Fort Collins Traffic Engineer. All discrepancies identified during the field inspection must be corrected before the 2-year warranty period will begin.

12. The Developer installing signs shall be responsible for locating and protecting all underground utilities.

13. Special care shall be taken in sign location to ensure an unobstructed view of each sign.

14. Signage and striping has been determined by information available at the time of review. Prior to initiation of the warranty period,the City of Fort Collins Traffic Engineer reserves the right to require additional signage and/or striping if the City of Fort Collins Traffic Engineer determines that an unforeseen condition warrants such signage according to the MUTCD or the CDOT M and S Standards. All signage and striping shall fall under the requirements of the 2-year warranty period for new construction (except fair wear on traffic markings).

15. Sleeves for sign posts shall be required for use in islands/medians. Refer to Chapter 14, Traffic Control Devices, for additional detail.

D. Storm Drainage Notes

1. The City of Fort Collins shall not be responsible for the maintenance of storm drainage facilities located on private property. Maintenance of onsite drainage facilities shall be the responsibility of the property owner(s).

2. All recommendations of the Preliminary DrainageReport for Capstone Cottages dated December 10, 2014by Northern Engineering shall be followed and implemented.

3. Prior to final inspection and acceptance by the City of Fort Collins, certification of the drainage facilities, by a registered engineer, must by submitted to and approved by the Stormwater Utility Department. Certification shall be submitted to the Stormwater Utility Department at least two weeks prior to the release of a certificate of occupancy for single family units. For commercial properties, certification shall by submitted to the Stormwater Utility Department at least two weeks prior to the release of any building permits in excess of those allowed prior to certification per the Development Agreement.

E. Utility Notes

1. All waterline construction shall conform to the East Larimer County Water Districtstandards and specifications current to date of construction.

2. Allsanitary sewer construction west of International Boulevard shall conform to the City of Fort Collins standards and specifications current to date of construction.

3. All sanitary sewer construction East of International Boulevardshall conform to the Boxelder Sanitation District standards and specifications.

4. A minimum cover of 4.5feet shall be maintained throughout the waterline and service line installation, particularly in areas of new grading and drainage swales. Extra bury depth may be required to maintain minimum cover at drainage culvert crossings and/or fire hydrant runs. Maximum allowable cover shall be 6 feet, unless specifically approved by the District.

5. All water piping shall be Polyvinyl Chloride (PVC). All PVC piping through 12-inch shall be manufactured in accordance with AWWA Standard C900, "Polyvinyl Chloride (PVC) Pressure Pipe, 4-inch through 12-inch, For Water Distribution", Class 150 (SDR 18). All PVC piping 14-inch through 36-inch shall be manufactured in accordance with AWWA Standard C905, "Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14-inch through 36", Class 200 (SDR 18). Approved manufacturers are JM Eagle, Certainteed, Gifford Hills or Carlon. Size of the pipe as shown on the approved plans. All non-metal water piping shall be installed with a twelve (12) gauge braided copper wire, plastic coated, six hundred (600) volt taped to top of pipe and surfaced at each fire hydrant. Pipe joints shall be made using an integral bell with an elastomeric gasket push-on type joint or using machined couplings of a sleeve type with rubber ring gaskets and machined pipe ends to form a push-on type joint. All materials installed shall be free of manufacturer defects. Any defective or damaged materials noted on the construction site shall be so marked and removed from the site. All fittings shall be mechanical joint, cast iron or ductile, manufactured in accordance with AWWA Standard C110. Fittings shall be furnished with a cement-mortar lining of standard thickness class with a 250 psi pressure rating. Under no circumstances shall any PVC piping be installed utilizing mechanical equipment to seat the joints.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

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CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

BOXELDER SANITATION DISTRICT
UTILITY PLAN APPROVAL

APPROVED: ____________________ MANAGER
DATE: __________
APPROVED: ____________________ SYSTEMS ENGINEER
DATE: __________

ELCO WATER DISTRICT
UTILITY PLAN APPROVAL

APPROVED: ____________________ MANAGER
DATE: __________
APPROVED: ____________________ SYSTEMS ENGINEER
DATE: __________

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED:	City Engineer	Date
CHECKED BY:	Water Utility	Date
CHECKED BY:	Stormwater Utility	Date
CHECKED BY:	Parks & Recreation	Date
CHECKED BY:	Traffic Engineer	Date
CHECKED BY:	Environmental Planner	Date

No.	Revisions:	By:	Date:

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

These drawings are instruments of service provided by Northern Engineering Services, Inc. and are not to be used for any type of construction unless signed and sealed by a Professional Engineer in the employ of Northern Engineering Services, Inc.

NORTHERN ENGINEERING
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521
www.northernengineering.com
Phone: 970.221.4158

PROJECT: 939-001	DATE: DECEMBER 10, 2014	
DESIGNED BY: A. Reese	SCALE: N/A	
DRAWN BY: A. Boese	REVIEWED BY: N. Haws	

CAPSTONE COTTAGES

GENERAL AND CONSTRUCTION NOTES

Sheet
C001
Of 40 Sheets

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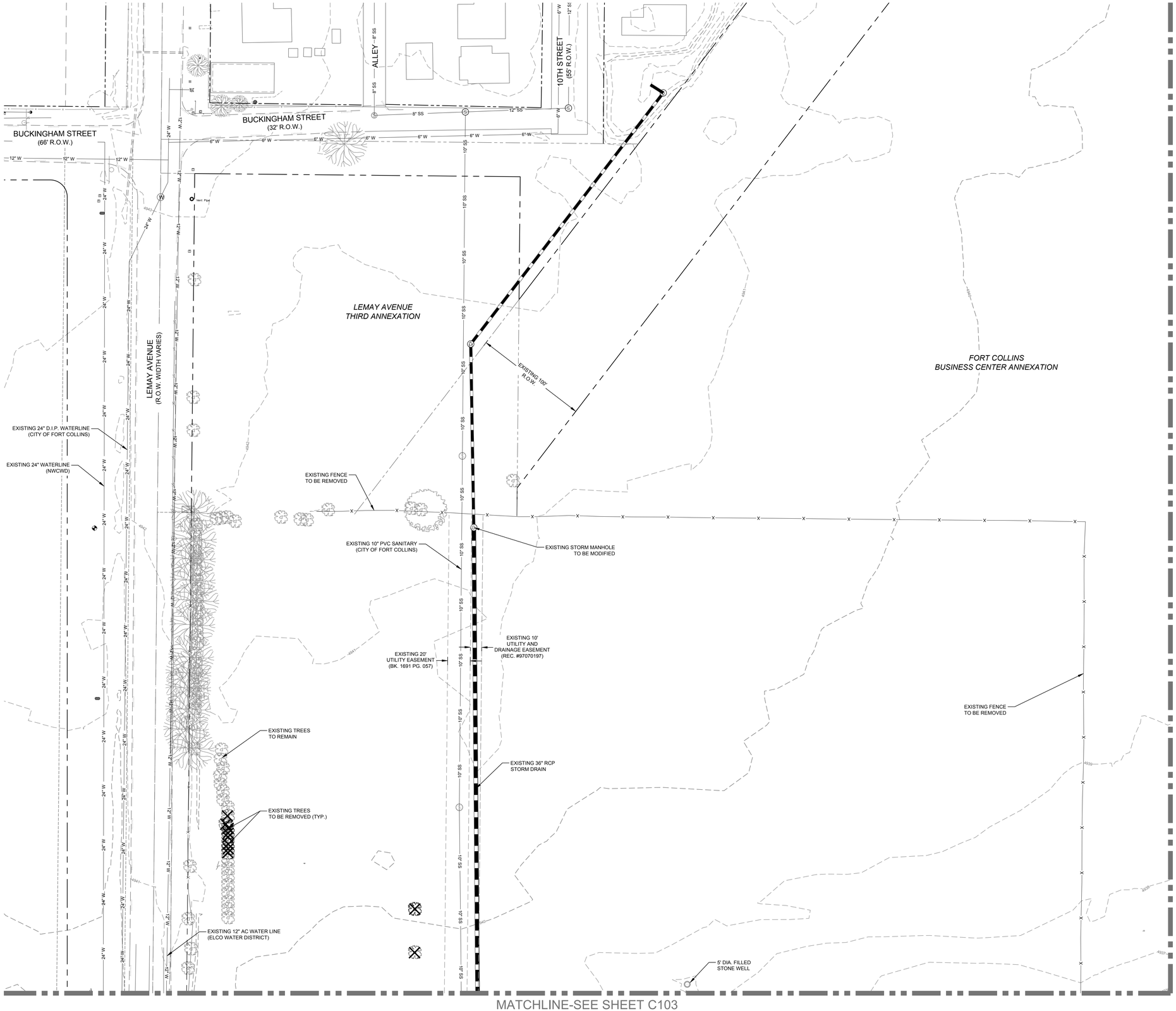

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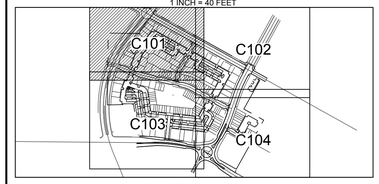
(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

PROJECT BOUNDARY	
EXISTING LOT LINE	
EXISTING RIGHT-OF-WAY	
EXISTING MAJOR CONTOUR	5015
EXISTING MINOR CONTOUR	5013
EXISTING STORM DRAIN	
EXISTING TELEPHONE	T
EXISTING GAS	G
EXISTING SANITARY SEWER	8" SS
EXISTING WATER	6" W
EXISTING ELECTRIC	E
EXISTING FENCE	X
EXISTING ELECTRIC VAULT	
EXISTING FIRE HYDRANT	
EXISTING IRRIGATION BOX	
EXISTING WATER METER	
EXISTING GAS METER	
EXISTING TELEPHONE PEDESTAL	
EXISTING MONITORING WELL	
EXISTING TREES TO BE REMOVED	
EXISTING TREES TO REMAIN	
EXISTING WETLANDS	
EXISTING PAVEMENT TO BE REMOVED	

ORIGINAL FIELD SURVEY BY:

Northern Engineering Services, Inc.
Project No. 939-001
Date: July 31, 2013

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK. BEFORE COMMENCING NEW CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING DEMOLITION, REMOVAL, REPLACEMENT, AND DISPOSAL OF ALL FACILITIES AND MATERIAL.
3. CONTRACTOR IS ENCOURAGED TO PERFORM DEMOLITION IN A MANNER THAT MAXIMIZES SALVAGE, RE-USE, AND RECYCLING OF MATERIALS. THIS INCLUDES APPROPRIATE SORTING AND STORING. IN PARTICULAR, DEMOLISHED CONCRETE, ASPHALT, AND BASE COURSE SHOULD BE RECYCLED IF POSSIBLE. THE CITY OF FORT COLLINS STREET DEPARTMENT OPERATES A CRUSHING OPERATION THAT WILL ACCEPT CONCRETE MATERIAL AT NO COST FOR CRUSHING AND RE-USE AS RECYCLED AGGREGATE. THIS OPERATION IS LOCATED AT 1380 HOFFMAN MILL ROAD AND CAN BE REACHED AT (970) 482-1249.
4. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.
5. CONTACT THE PROJECT SURVEYOR FOR ANY INQUIRIES RELATED TO THE EXISTING SITE SURVEY.
6. REFER TO LANDSCAPE PLANS FOR TREE REMOVAL AND MITIGATION.
7. REFER TO ENVIRONMENTAL CHARACTERIZATION STUDY DATED SEPTEMBER 3, 2013 BY CEDAR CREEK ASSOCIATES FOR ADDITIONAL INFORMATION.

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City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. Revisions: Date:
1 REVIEW SET NOT FOR CONSTRUCTION 12/10/14

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NORTHERN ENGINEERING
www.northernengineering.com
Phone: (970) 221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Hawa
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bloese

CAPSTONE COTTAGES

EXISTING CONDITIONS

Sheet
C101
Of 40 Sheets

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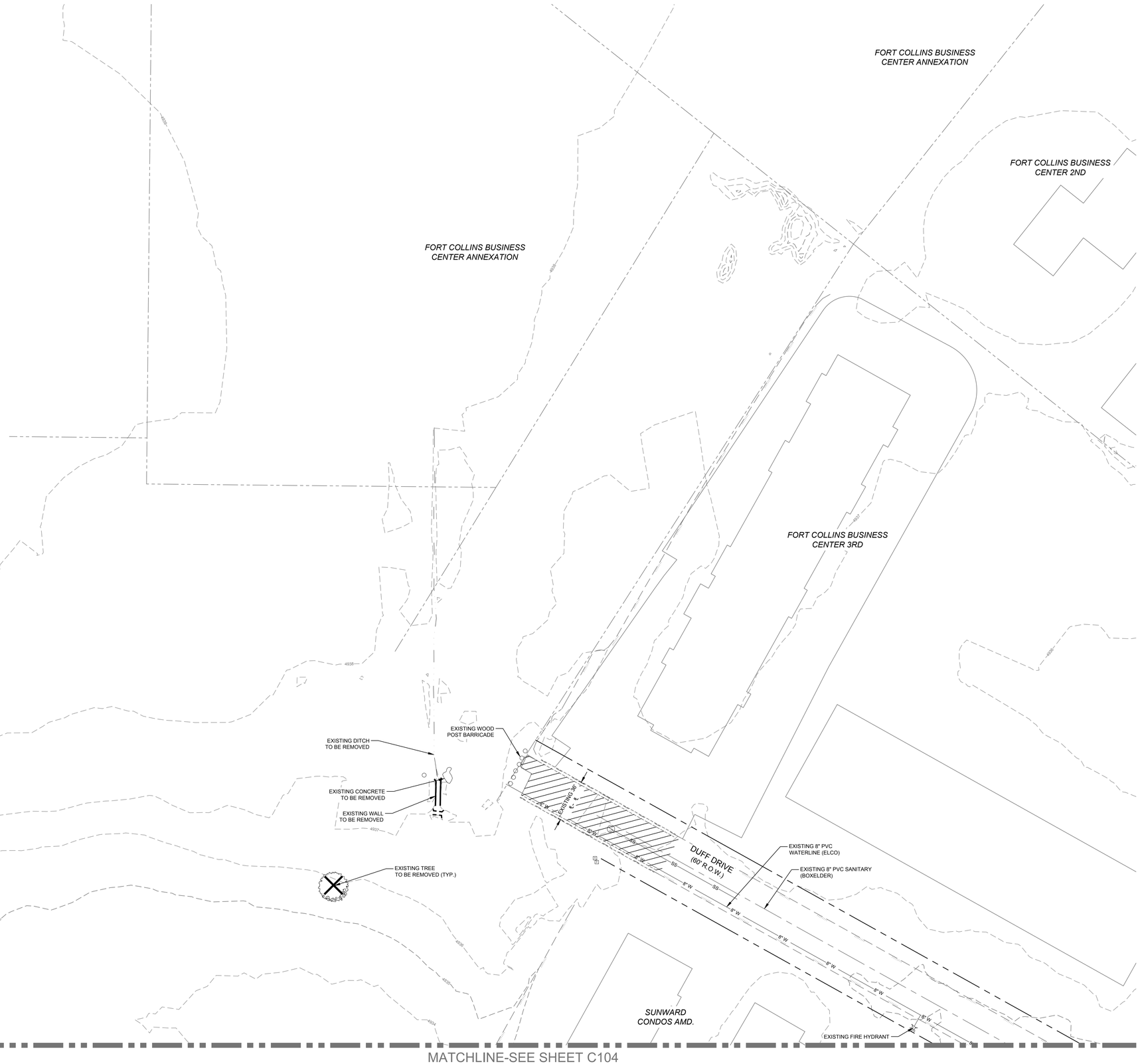

NORTH

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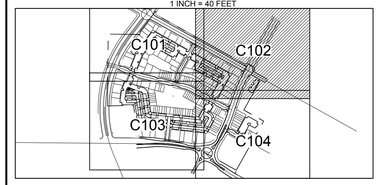
(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- PROJECT BOUNDARY
- EXISTING LOT LINE
- EXISTING RIGHT-OF-WAY
- EXISTING MAJOR CONTOUR — 5015 —
- EXISTING MINOR CONTOUR — 5013 —
- EXISTING STORM DRAIN
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ORIGINAL FIELD SURVEY BY:

Northern Engineering Services, Inc.
Project No. 939-001
Date: July 31, 2013

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CHECKED BY: _____ Environmental Planner _____ Date

Date:
Revisions:
No.

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

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NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bobse

CAPSTONE COTTAGES

EXISTING CONDITIONS

Sheet
C102
Of 40 Sheets

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MATCHLINE-SEE SHEET C101

MATCHLINE-SEE SHEET C104

EXISTING 12" AC WATER LINE (ELCO WATER DISTRICT)

EXISTING TREES TO REMAIN

EXISTING 24" D.I.P. WATERLINE (CITY OF FORT COLLINS)

LEMAY AVENUE (PUBLIC R.O.W. WIDTH VARYS)

EXISTING TREES TO BE REMOVED (TYP.)

EXISTING 24" WATERLINE (NWCWD)

EXISTING 10" PVC SANITARY (CITY OF FORT COLLINS)

EXISTING 36" RCP

12" AC WATERLINE (ELCO)TO BE ABANDONED IN PLACE PER DISTRICT REQUIREMENTS

EXISTING 20' UTILITY EASEMENT (BK. 1691 PG. 057)

EXISTING 10' UTILITY AND DRAINAGE EASEMENT (REC. #97070197)

BANK OF COLORADO

5' DIA. FILLED STONE WELL

EXISTING FENCE TO BE REMOVED

EXISTING CONCRETE TO BE REMOVED

EXISTING FENCE TO BE REMOVED

EXISTING 24" WATERLINE (NWCWD)

EXISTING 48" RCP STORM DRAIN

EXISTING 12" AC WATERLINE (ELCO) TO BE ABANDONED IN PLACE PER DISTRICT REQUIREMENTS

EXISTING TREES TO BE REMOVED (TYP.)

EXISTING 48" RCP STORM DRAIN

EXISTING WETLAND

LINCOLN AVENUE (115' R.O.W.)

EXISTING EDGE OF ASPHALT

LINCOLN CHANNEL

EXISTING 8" D.I.P. WATERLINE (CITY OF FORT COLLINS)

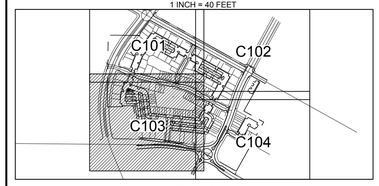
EXISTING 30" VERTICAL CURB AND GUTTER TO BE REMOVED

BUFFALO RUN APARTMENTS P.U.D.

NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- PROJECT BOUNDARY
- EXISTING LOT LINE
- EXISTING RIGHT-OF-WAY
- EXISTING MAJOR CONTOUR — 5015 —
- EXISTING MINOR CONTOUR — 5013 —
- EXISTING STORM DRAIN
- EXISTING TELEPHONE — T —
- EXISTING GAS — G —
- EXISTING SANITARY SEWER — 8" SS —
- EXISTING WATER — 6" W —
- EXISTING ELECTRIC — E —
- EXISTING FENCE — X —
- EXISTING ELECTRIC VAULT
- EXISTING FIRE HYDRANT
- EXISTING IRRIGATION BOX
- EXISTING WATER METER
- EXISTING GAS METER
- EXISTING TELEPHONE PEDESTAL
- EXISTING MONITORING WELL
- EXISTING TREES TO BE REMOVED
- EXISTING TREES TO REMAIN
- EXISTING WETLANDS
- EXISTING PAVEMENT TO BE REMOVED

ORIGINAL FIELD SURVEY BY:

Northern Engineering Services, Inc.
Project No. 939-001
Date: July 31, 2013

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK. BEFORE COMMENCING NEW CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
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4. ALL SYMBOLS ARE ONLY GRAPHICALLY REPRESENTED AND ARE NOT TO SCALE.
5. CONTACT THE PROJECT SURVEYOR FOR ANY INQUIRIES RELATED TO THE EXISTING SITE SURVEY.
6. REFER TO LANDSCAPE PLANS FOR TREE REMOVAL AND MITIGATION.
7. REFER TO ENVIRONMENTAL CHARACTERIZATION STUDY DATED SEPTEMBER 3, 2013 BY CEDAR CREEK ASSOCIATES FOR ADDITIONAL INFORMATION.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811 Know what's below. Call before you dig.

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. Revisions: Date:
1 REVIEW SET NOT FOR CONSTRUCTION 12/10/14

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NORTHERN ENGINEERING
www.northernengineering.com
Phone: (970) 221-4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bobse

CAPSTONE COTTAGES

EXISTING CONDITIONS

Sheet C103
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Cad\Civil\939-001_ECON.dwg LAYOUT NAME: C103 DATE: Dec 10, 2014 - 4:10pm CAD OPERATOR: ssmm
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MATCHLINE-SEE SHEET C102

MATCHLINE-SEE SHEET C103

SUNWARD CONDOS AMD.

EXISTING FIRE HYDRANT

DUFF DRIVE (60' R.O.W.)

EXISTING WETLAND

EXISTING 6" PVC WATERLINE (ELCO)

WEBSTER DRIVE (80' R.O.W.)

FORT COLLINS BUSINESS CENTER THIRD FILING

EXISTING 8" PVC SANITARY (BOXELDER)

EXISTING 36" ℄ ℄

EXISTING FIRE HYDRANT

FORT COLLINS BUSINESS CENTER THIRD FILING

EXISTING 12" AC WATERLINE (ELCO) TO BE ABANDONED IN PLACE PER DISTRICT REQUIREMENTS

EXISTING 24" WATERLINE (NWCWD)

EXISTING WETLAND

LINCOLN AVENUE (115' R.O.W.)

LINCOLN CHANNEL

EXISTING 8" WATERLINE (CITY OF FORT COLLINS)

EXISTING 12" AC WATERLINE (ELCO)

BUFFALO RUN APARTMENTS P.U.D.

EXISTING 52' ℄ ECP

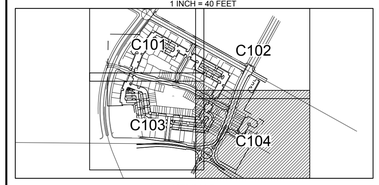
EXISTING EDGE OF ASPHALT

EXISTING 36" VERTICAL CURB AND GUTTER TO BE REMOVED

NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

PROJECT BOUNDARY	
EXISTING LOT LINE	
EXISTING RIGHT-OF-WAY	
EXISTING MAJOR CONTOUR	5015
EXISTING MINOR CONTOUR	5013
EXISTING STORM DRAIN	
EXISTING TELEPHONE	T
EXISTING GAS	G
EXISTING SANITARY SEWER	8" SS
EXISTING WATER	8" W
EXISTING ELECTRIC	E
EXISTING FENCE	X
EXISTING ELECTRIC VAULT	
EXISTING FIRE HYDRANT	
EXISTING IRRIGATION BOX	
EXISTING WATER METER	
EXISTING GAS METER	
EXISTING TELEPHONE PEDESTAL	
EXISTING MONITORING WELL	
EXISTING TREES TO BE REMOVED	
EXISTING TREES TO REMAIN	
EXISTING WETLANDS	
EXISTING PAVEMENT TO BE REMOVED	

ORIGINAL FIELD SURVEY BY:

Northern Engineering Services, Inc.
Project No. 939-001
Date: July 31, 2013

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City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED:	City Engineer	Date
CHECKED BY:	Water Utility	Date
CHECKED BY:	Stormwater Utility	Date
CHECKED BY:	Parks & Recreation	Date
CHECKED BY:	Traffic Engineer	Date
CHECKED BY:	Environmental Planner	Date

Date:
Revisions:
No.

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

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www.northernengineering.com
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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

EXISTING CONDITIONS

Sheet
C104
Of 40 Sheets

DRAWING FILENAME: G:\Projects\939-001\Engineering\CAD\Sheets\939-001_ECP.dwg LAYOUT NAME: C104 DATE: Dec 10, 2014 - 4:10pm CAD OPERATOR: sam
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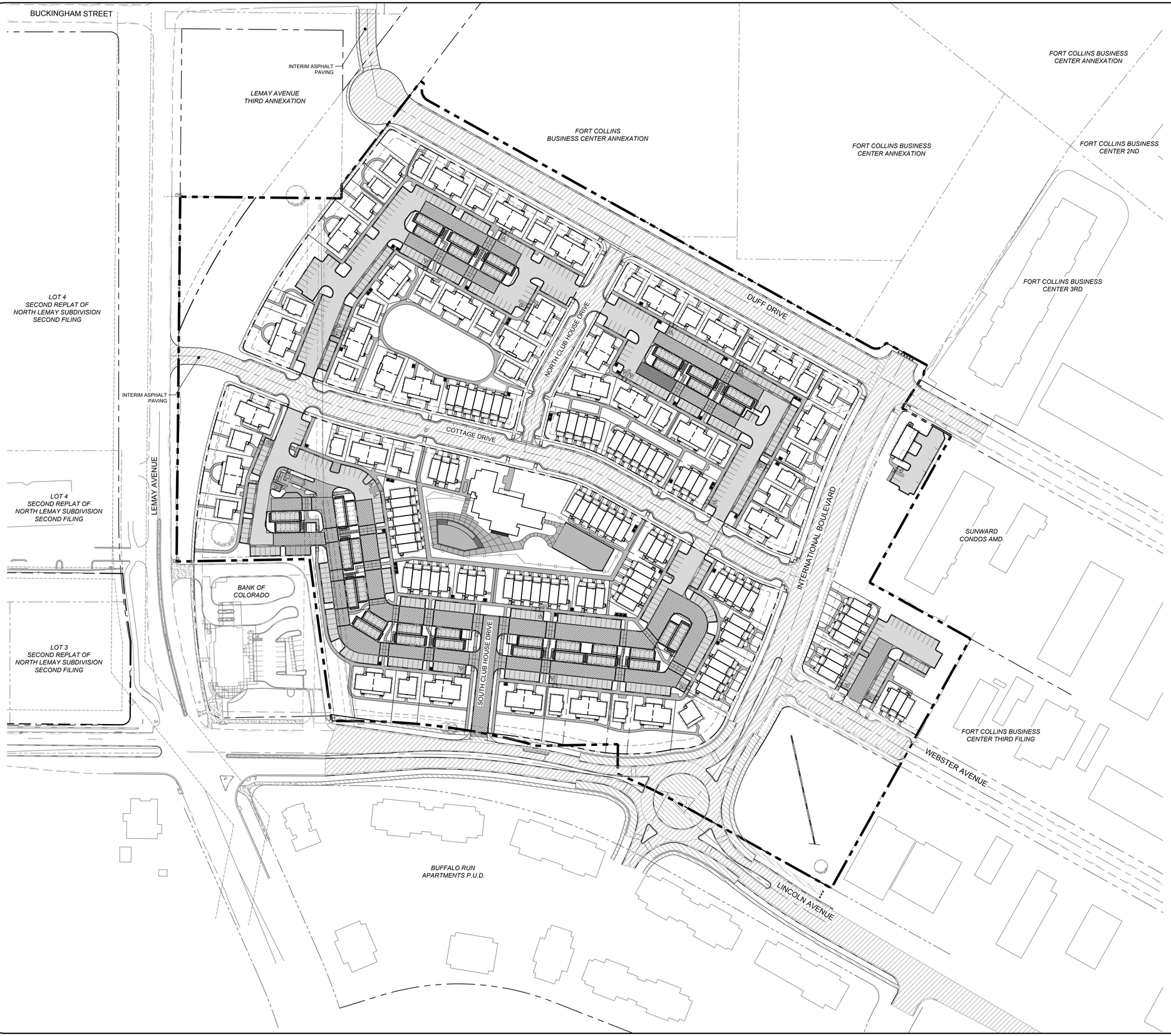

NORTH

80 0 80 160 240

(IN FEET)
1 INCH = 80 FEET

LEGEND:

- PROPOSED CURB & GUTTER
- PROJECT BOUNDARY
- PROPOSED RIGHT-OF-WAY
- EXISTING RIGHT OF WAY
- EASEMENT LINE
- LOT LINE
- PUBLIC PAVING
- PRIVATE PAVING
- PERMEABLE PAVERS

NOTES:

1. SEE DETAIL SHEETS FOR ADDITIONAL INFORMATION REGARDING CURBS AND PAVEMENT SECTIONS.
2. PAVEMENT MARKINGS SHALL BE PER CITY STANDARDS AND PROJECT SPECIFICATION MANUAL.
3. SEE GEOTECHNICAL REPORT FOR SUBGRADE PREPARATION AND PAVEMENT RECOMMENDATIONS.
4. REFER TO SITE AND LANDSCAPE PLANS FOR PAVERS, DECORATIVE PAVING, SCORING, ETC.
5. REFER TO ARCHITECTURAL PLANS FOR PRIVATE SIGNAGE AND STRIPING INFORMATION.
6. CONCRETE PARKING LOT SHALL BE CONSTRUCTED IN ACCORDANCE WITH ACI 330R-08.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

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UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water & Wastewater Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

Revisions: No. Date:
REVIEW SET
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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bokse
DATE: DECEMBER 10, 2014
SCALE: 1"=80'
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

PAVING PLAN

Sheet
C200
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Civ\939-001_PAVE.dwg LAYOUT NAME: C200 DATE: Dec 10, 2014 - 4:19pm CAD OPERATOR: adam
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FOR REFERENCE ONLY.
SEE 40 SCALE DRAWINGS FOR
DETAILED INFORMATION.

LEMAY AVENUE THIRD ANNEXATION

FORT COLLINS BUSINESS CENTER ANNEXATION

FORT COLLINS BUSINESS CENTER ANNEXATION

FORT COLLINS BUSINESS CENTER ANNEXATION

FORT COLLINS BUSINESS CENTER 2ND

FORT COLLINS BUSINESS CENTER 3RD

FORT COLLINS BUSINESS CENTER THIRD FILING

LOT 4
SECOND REPLAT OF
NORTH LEMAY SUBDIVISION
SECOND FILING

LOT 4
SECOND REPLAT OF
NORTH LEMAY SUBDIVISION
SECOND FILING

LOT 3
SECOND REPLAT OF
NORTH LEMAY SUBDIVISION
SECOND FILING

BANK OF COLORADO

CLUB HOUSE

SUNWARD CONDOS AMD.

BUFFALO RUN APARTMENTS P.U.D.

REALIGNED LEMAY AVENUE

DUFF DRIVE

COTTAGE DRIVE

NORTH CLUB HOUSE DRIVE

SOUTH CLUB HOUSE DRIVE

INTERNATIONAL BOULEVARD

WEBSTER AVENUE

L I N C O L N A V E N U E

MODIFIED STORM MANHOLE

FIRE HYDRANT

8" PVC SEWER

6" PVC WATER

8" PVC WATER

12" PVC WATER

UNDERDRAIN

STORM DRAIN

MASTER METER

EXISTING 12" PVC SANITARY SEWER (CITY OF FORT COLLINS)

CONNECT TO EXISTING 12" AC WATERLINE (ELCO)

EXISTING 8" PVC WATERLINE (CITY OF FORT COLLINS)

EXISTING 24" RCCP WATERLINE (NWCWD)

CONNECT TO EXISTING 8" SANITARY SEWER (BOXELDER)

EXISTING 8" PVC WATERLINE (ELCO)

STORM FES

OUTLET STRUCTURE

STORM DRAINS

EXISTING 8" WATERLINE (CITY OF FORT COLLINS)

12" WATERLINE (ELCO) TO BE ABANDONED IN PLACE

CONNECT TO EXISTING 12" AC WATERLINE (ELCO)

CONNECT TO EXISTING 6" WATERLINE (ELCO)

EXISTING 6" PVC WATERLINE (ELCO)

NORTH

80 0 80 160 240

(IN FEET)
1 INCH = 80 FEET

KEYMAP

C301 C302 C303 C304

LEGEND:

EXISTING WATER MAIN	W
EXISTING SANITARY SEWER	SS
PROPOSED SEWER SERVICE	S
PROPOSED CURB STOP & METER PIT	W
PROPOSED FIRE DEPT. CONN.	FDC
PROPOSED FIRE HYDRANT	
EXISTING FIRE HYDRANT	
PROPOSED STORM DRAIN	
PROPOSED UNDERDRAIN	
EXISTING STORM DRAIN	
EXISTING ELECTRIC	E
EXISTING TELEPHONE	T
EXISTING GAS	G
PROPOSED CURB & GUTTER	
PROJECT BOUNDARY	
PROPOSED LOT LINE	
EXISTING RIGHT OF WAY	
EASEMENT LINE	

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2. ALL WATER CONSTRUCTION SHALL BE PER ELCO WATER DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS LATEST EDITION.
3. ALL SEWER CONSTRUCTION WEST OF INTERNATIONAL BOULEVARDSHALL BE PER FORT COLLINS UTILITIES STANDARD CONSTRUCTION SPECIFICATIONS, LATEST EDITION.
4. ALL SEWER CONSTRUCTION EAST OF INTERNATIONAL BOULEVARDSHALL BE PER BOXELDER SANITATION DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS, LATEST EDITION.
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7. MAINTAIN 10' HORIZONTAL AND 18" VERTICAL MINIMUM SEPARATION BETWEEN ALL SANITARY SEWER MAINS, WATER MAINS & SERVICES.
8. REFER TO THE PLAT FOR LOT AREAS, TRACT SIZES, EASEMENTS, LOT DIMENSIONS, UTILITY EASEMENTS, OTHER EASEMENTS, AND OTHER SURVEY INFORMATION.

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DATE: DECEMBER 10, 2014
SCALE: 1"=80'
REVIEWED BY: N. Haws
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bobse

CAPSTONE COTTAGES

OVERALL UTILITY PLAN

Sheet
C300
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Util\939-001_OAUTIL.dwg LAYOUT NAME: C300 DATE: Dec 10, 2014 - 4:15pm CAD OPERATOR: ssmn
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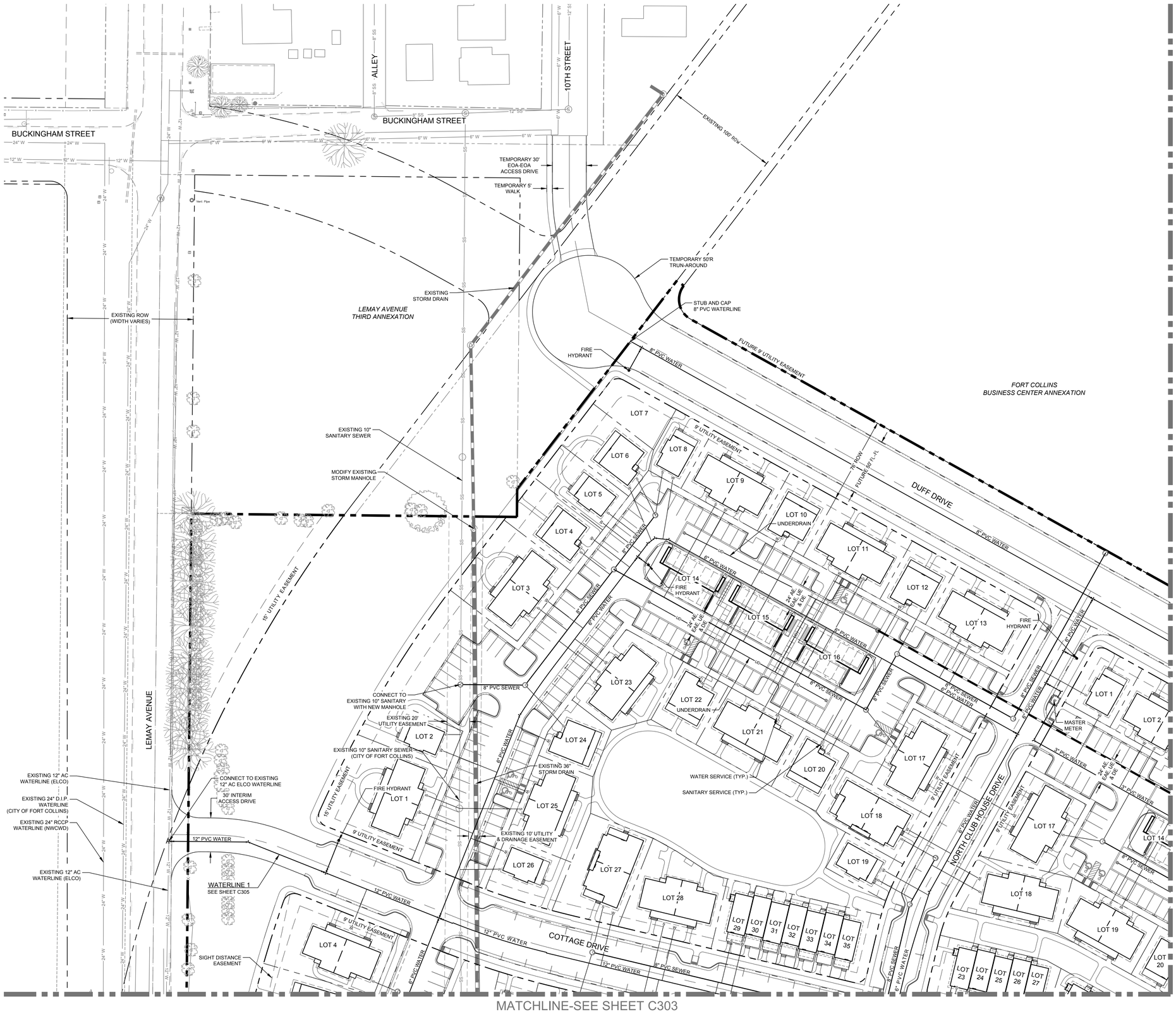
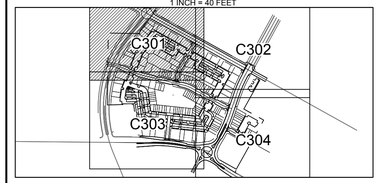


NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- EXISTING WATER MAIN — W
- EXISTING SANITARY SEWER — SS
- PROPOSED SEWER SERVICE — S
- PROPOSED CURB STOP & METER PIT — W
- PROPOSED FIRE DEPT. CONN. — FDC
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN — UD
- EXISTING STORM DRAIN
- EXISTING ELECTRIC — E
- EXISTING TELEPHONE — T
- EXISTING GAS — G
- PROPOSED CURB & GUTTER
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING RIGHT OF WAY
- EASEMENT LINE

ABBREVIATIONS:

AE = ACCESS EASEMENT
DE = DRAINAGE EASEMENT
UE = UTILITY EASEMENT
EAE = EMERGENCY ACCESS EASEMENT

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PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bokse

CAPSTONE COTTAGES

UTILITY PLAN

Sheet
C301
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Util\939-001_UTIL.dwg LAYOUT NAME: C301 DATE: Dec 10, 2014 - 4:11pm CAD OPERATOR: osborn
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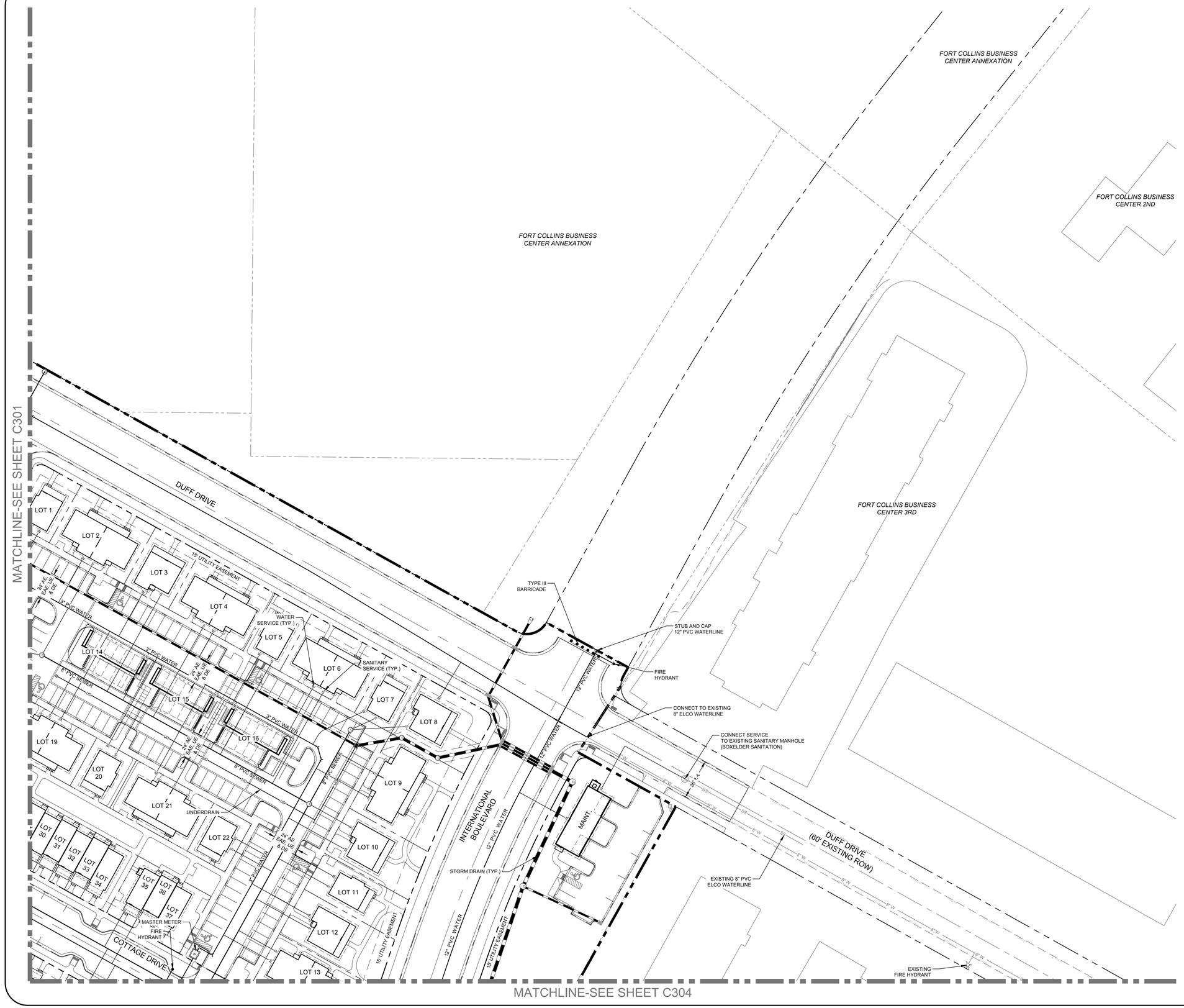
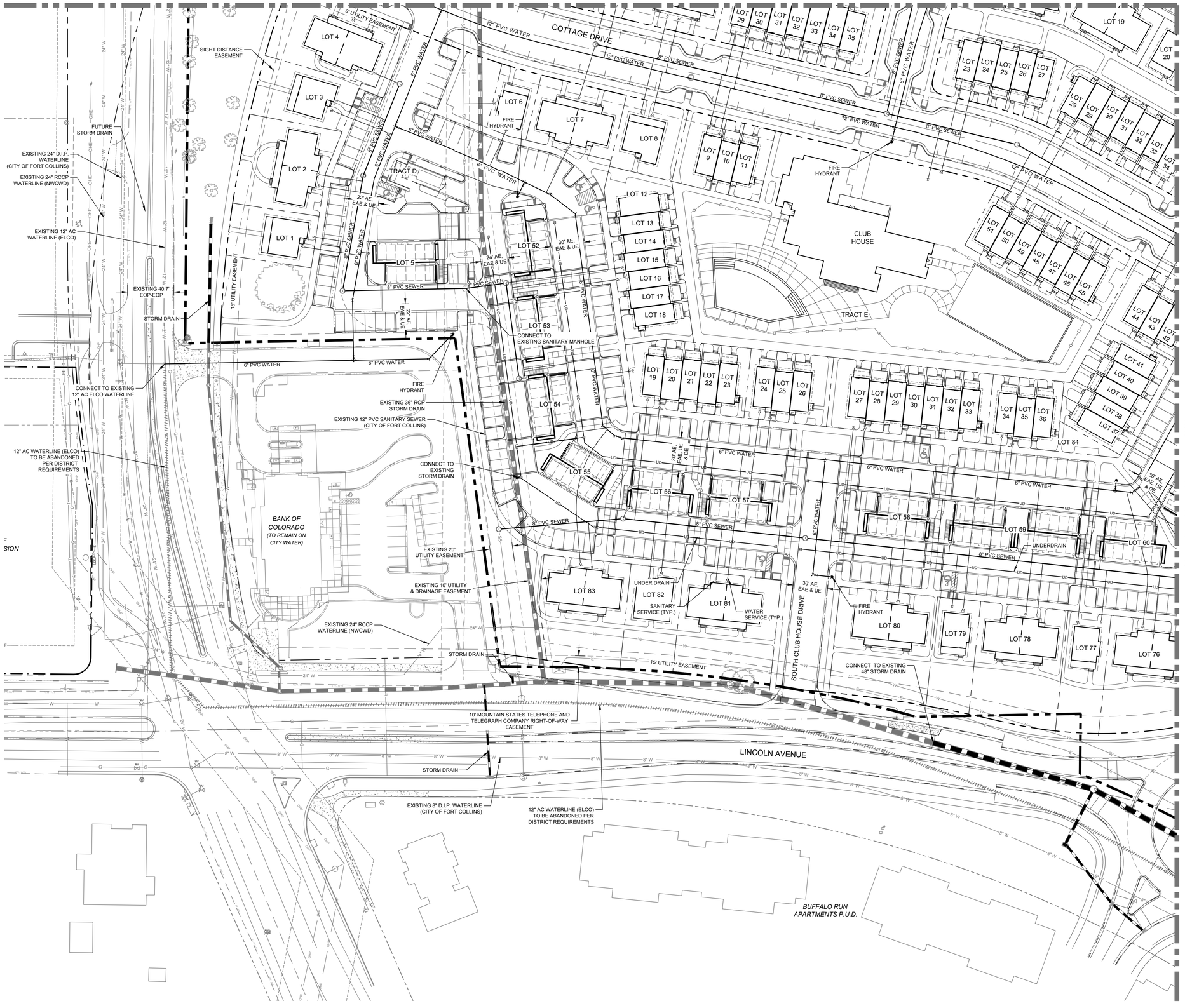

MATCHLINE-SEE SHEET C301
MATCHLINE-SEE SHEET C304
FORT COLLINS BUSINESS CENTER ANNEXATION
FORT COLLINS BUSINESS CENTER ANNEXATION
FORT COLLINS BUSINESS CENTER 2ND
FORT COLLINS BUSINESS CENTER 3RD
DUFF DRIVE
DUFF DRIVE (60' EXISTING ROW)
INTERNATIONAL BOULEVARD
COTTAGE DRIVE
LOT 1
LOT 2
LOT 3
LOT 4
LOT 5
LOT 6
LOT 7
LOT 8
LOT 9
LOT 10
LOT 11
LOT 12
LOT 13
LOT 14
LOT 15
LOT 16
LOT 19
LOT 20
LOT 21
LOT 22
LOT 30
LOT 31
LOT 32
LOT 33
LOT 34
LOT 35
LOT 36
LOT 37
15' UTILITY EASEMENT
24' AE, 4' DE, 4' UE
12" PVC WATER
8" PVC SEWER
UNDERDRAIN
WATER SERVICE (TYP.)
SANITARY SERVICE (TYP.)
TYPE III BARRICADE
STUB AND CAP 12" PVC WATERLINE
FIRE HYDRANT
CONNECT TO EXISTING 8" ELCO WATERLINE
CONNECT SERVICE TO EXISTING SANITARY MANHOLE (BOXELDER SANITATION)
STORM DRAIN (TYP.)
EXISTING 8" PVC ELCO WATERLINE
EXISTING FIRE HYDRANT
MAINT
1 MASTER METER
FIRE HYDRANT
15' UTILITY EASEMENT
15' UTILITY EASEMENT
12" PVC WATER
12" PVC WATER
12" PVC WATER
12" PVC WATER
8" PVC SEWER
8" PVC SEWER
3" PVC WATER
3" PVC WATER
3" PVC WATER
3" PVC WATER
3" PVC WATER
8" W
8" W
8" W

MATCHLINE-SEE SHEET C303

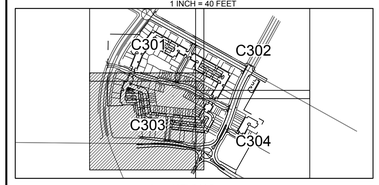
MATCHLINE-SEE SHEET C304



NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- EXISTING WATER MAIN — W
- EXISTING SANITARY SEWER — SS
- PROPOSED SEWER SERVICE — S
- PROPOSED CURB STOP & METER PIT — W
- PROPOSED FIRE DEPT. CONN. — FDC
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN — UD
- EXISTING STORM DRAIN
- EXISTING ELECTRIC — E
- EXISTING TELEPHONE — T
- EXISTING GAS — G
- PROPOSED CURB & GUTTER
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING RIGHT OF WAY
- EASEMENT LINE

ABBREVIATIONS:

AE = ACCESS EASEMENT
DE = DRAINAGE EASEMENT
UE = UTILITY EASEMENT
EAE = EMERGENCY ACCESS EASEMENT

NOTES:

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CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

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City of Fort Collins, Colorado
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APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. | Revisions: | Date:
1 | REVIEW SET NOT FOR CONSTRUCTION | 12/10/14

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NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

UTILITY PLAN

Sheet C303

Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\dwg\Civil\939-001_UTIL.dwg LAYOUT NAME: C03 DATE: Dec 10, 2014 - 4:19pm CAD OPERATOR: adam
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MATCHLINE-SEE SHEET C302

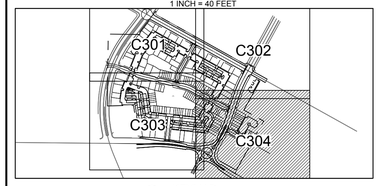
MATCHLINE-SEE SHEET C303



NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

EXISTING WATER MAIN	W
EXISTING SANITARY SEWER	SS
PROPOSED SEWER SERVICE	S
PROPOSED CURB STOP & METER PIT	W
PROPOSED FIRE DEPT. CONN.	FDC
PROPOSED FIRE HYDRANT	
EXISTING FIRE HYDRANT	
PROPOSED STORM DRAIN	
PROPOSED UNDERDRAIN	
EXISTING STORM DRAIN	
EXISTING ELECTRIC	E
EXISTING TELEPHONE	T
EXISTING GAS	G
PROPOSED CURB & GUTTER	
PROJECT BOUNDARY	
PROPOSED LOT LINE	
EXISTING RIGHT OF WAY	
EASEMENT LINE	

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www.northernengineering.com
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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

UTILITY PLAN

Sheet
C304
Of 40 Sheets

DRAWING FILENAME: G:\Projects\939\001\Dwg\Civil\939-001_UTIL.dwg LAYOUT NAME: C304 DATE: Dec 10, 2014 - 4:12pm CAD OPERATOR: seem
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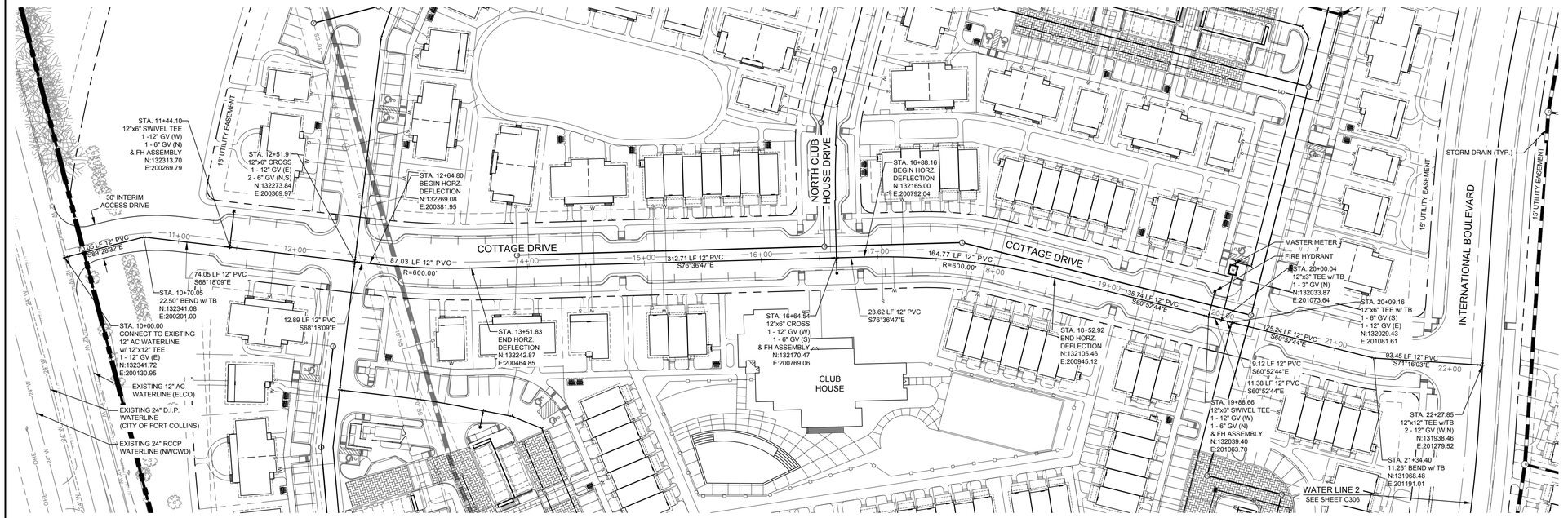
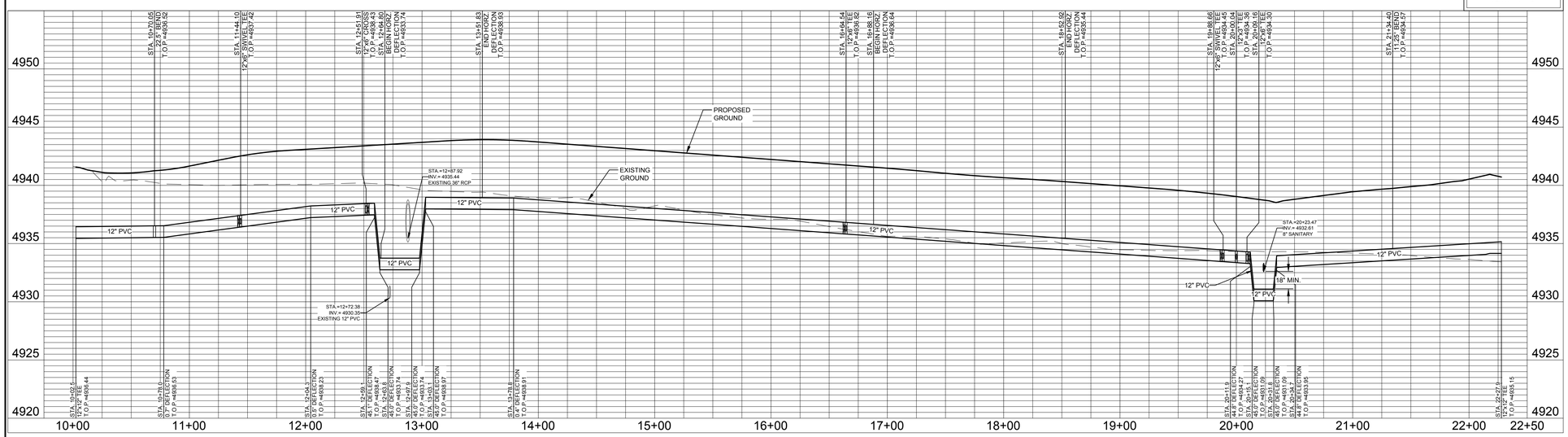
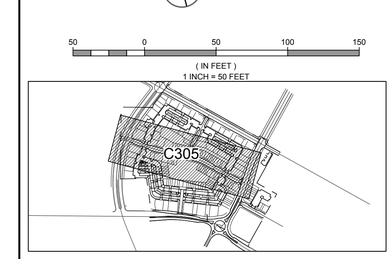


WATER LINE 1

PROFILE SCALE:
HORIZ. 1" = 50'
VERT. 1" = 5'





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- EXISTING WATER MAIN — W
- EXISTING SANITARY SEWER — SS
- PROPOSED SEWER SERVICE — S
- PROPOSED CURB STOP & METER PIT — W
- PROPOSED FIRE DEPT. CONN. — FDC
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED STORM DRAIN — D
- PROPOSED UNDERDRAIN — D
- EXISTING STORM DRAIN — D
- EXISTING ELECTRIC — E
- EXISTING TELEPHONE — T
- EXISTING GAS — G
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- EXISTING RIGHT OF WAY
- EASEMENT LINE

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No. | Revisions: | Date:
1 | 12"to14 | 12/19/14
REVIEW SET
NOT FOR CONSTRUCTION

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301 North Howes Street, Suite 100
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DATE: DECEMBER 10, 2014
SCALE: 1"=50'
REVIEWED BY: N. Hawes
PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

WATER LINE 1
PLAN AND PROFILE

Sheet
C305
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\dwg\Util\939-001_WATER 1.dwg LAYOUT NAME: C305 DATE: Dec 10, 2014 - 4:15pm CAD OPERATOR: adam
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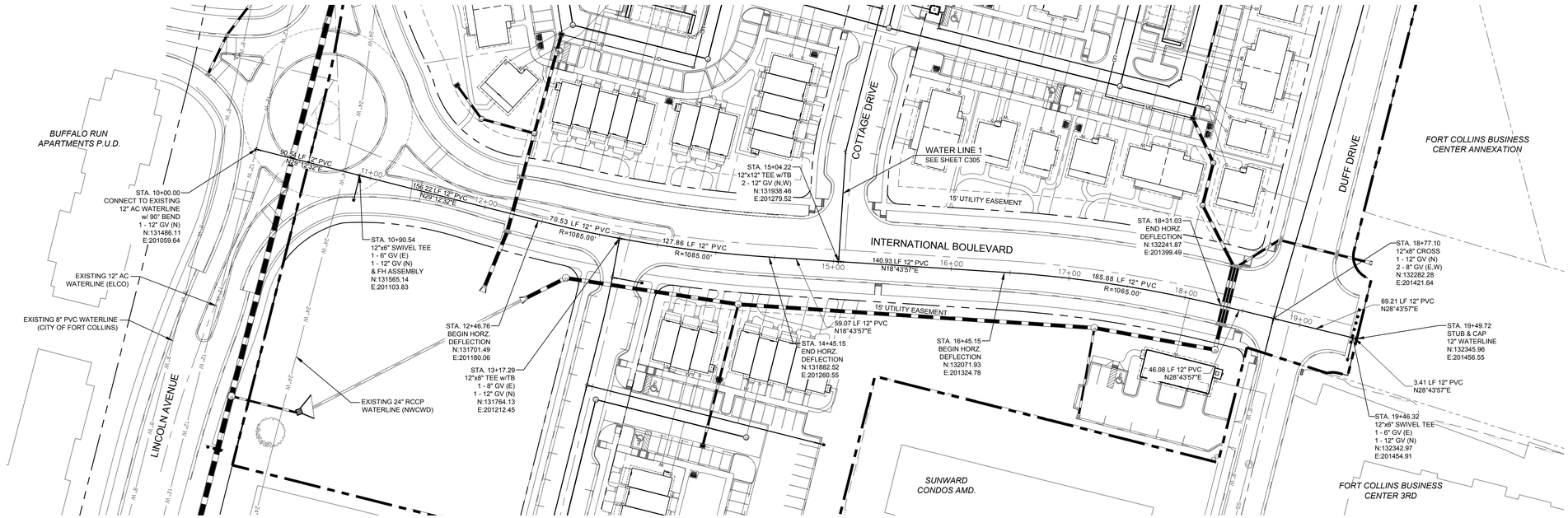
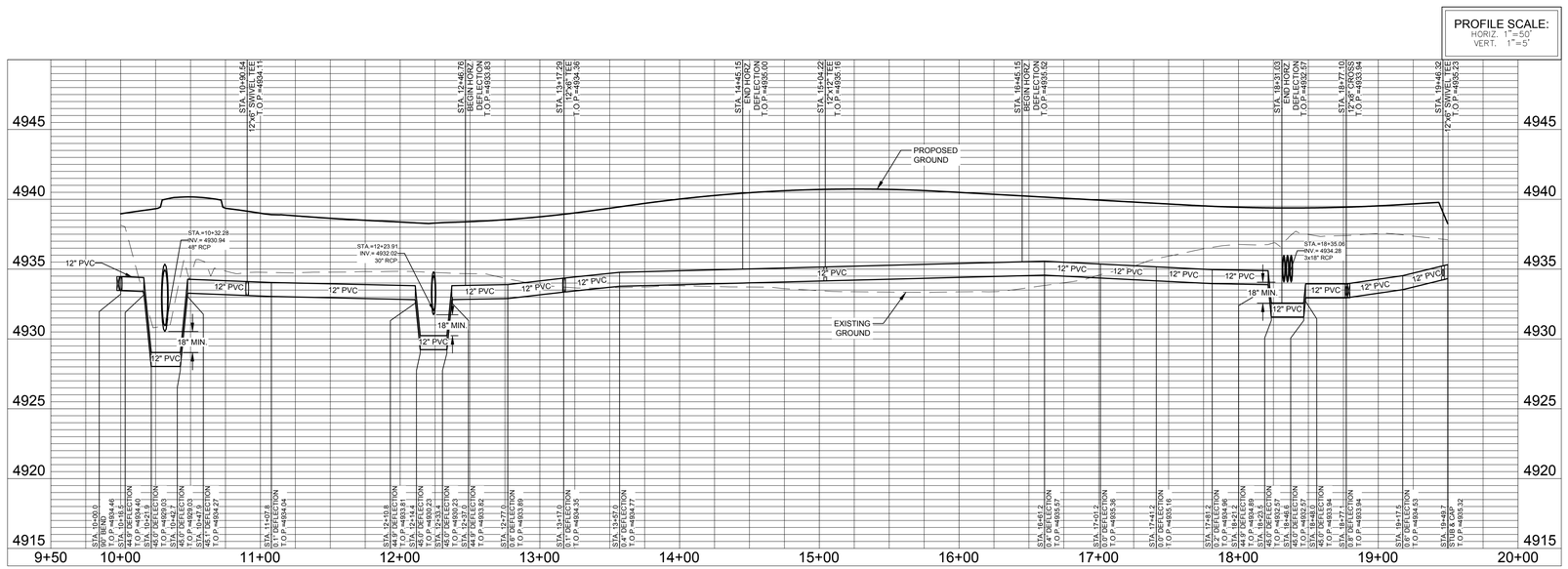
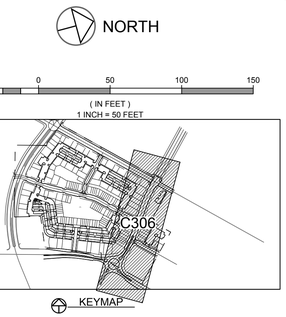


WATER LINE 2





LEGEND:

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- EXISTING SANITARY SEWER — SS
- PROPOSED SEWER SERVICE — S
- PROPOSED CURB STOP & METER PIT — W
- PROPOSED FIRE DEPT. CONN. — FDC
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN — D
- EXISTING STORM DRAIN
- EXISTING ELECTRIC — E
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No. Revisions: Date:
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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=50'
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
REVIEWED BY: N. Haws

PROJECT: 559-001

CAPSTONE COTTAGES

WATER LINE 2
PLAN AND PROFILE

Sheet C306
Of 40 Sheets

DRAWING FILENAME: D:\Projects\559-001\dwg\Utility\559-001_WATER 2.dwg LAYOUT NAME: C306 DATE: Dec 10, 2014 - 4:14pm CAD OPERATOR: aaam
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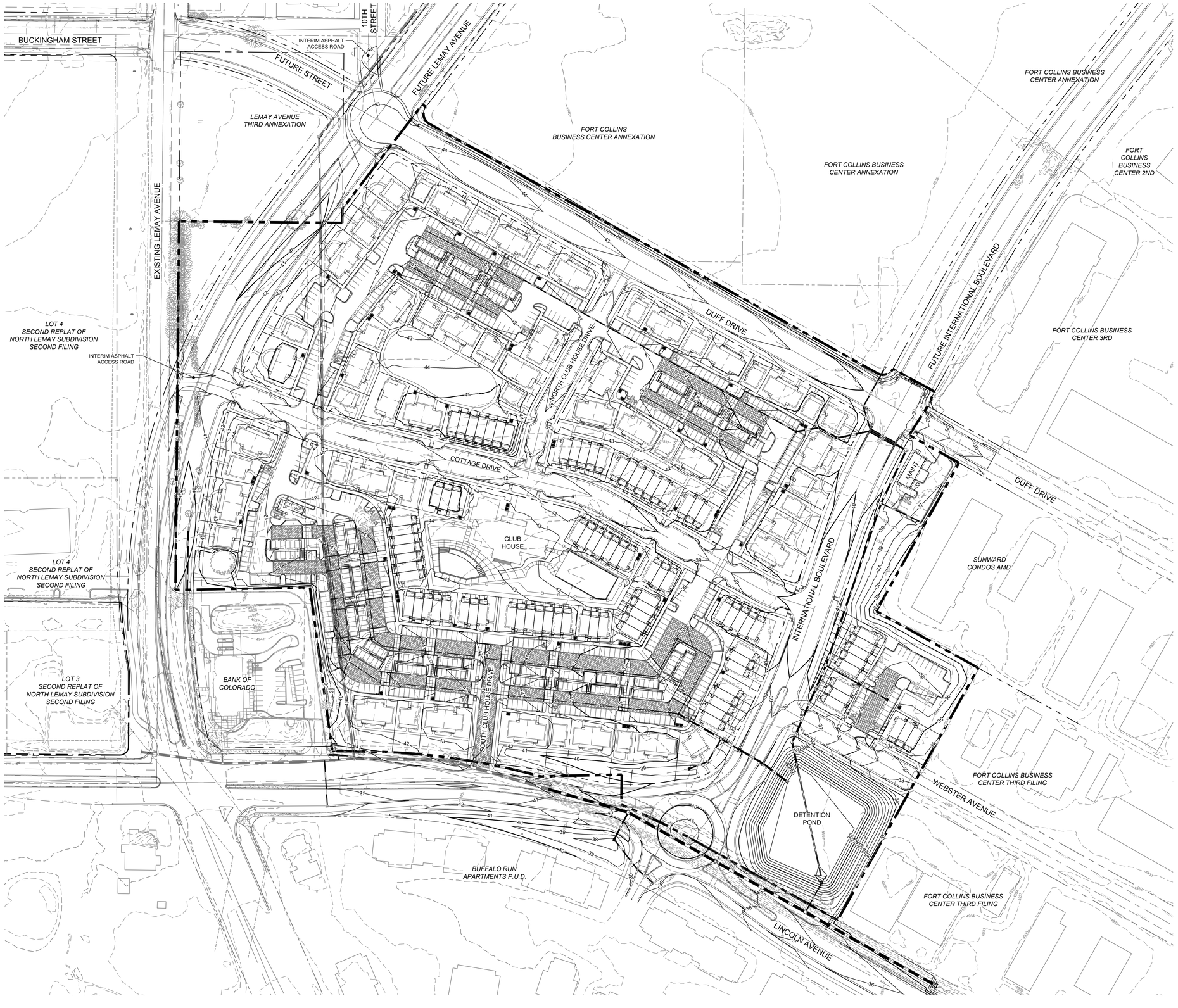
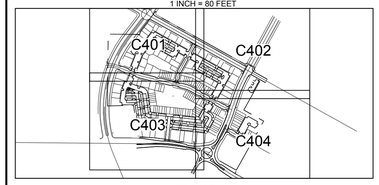


NORTH

80 0 80 160 240

(IN FEET)
1 INCH = 80 FEET



KEYMAP

LEGEND:

PROPOSED CONTOUR	93
EXISTING CONTOUR	5013
PROPOSED CURB & GUTTER	
PROJECT BOUNDARY	
PROPOSED STORM DRAIN	
PROPOSED UNDERDRAIN	
EXISTING STORM DRAIN	
PROPOSED SPOT ELEVATION	33.43
EXISTING SPOT ELEVATION	(47.45)
PROPOSED SLOPES	2.0%
PEDESTRIAN ACCESS RAMPS	

NOTES:

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3. ALL PROJECT DATA IS ON THE CITY OF FORT COLLINS VERTICAL DATUM; NGVD 29 (UNADJUSTED). SEE COVER SHEET FOR BENCHMARK REFERENCES.
4. ALL CURB SPOTS ARE FLOWLINE ELEVATIONS. ALL OTHER SPOTS ARE FINISHED GRADE ELEVATIONS.

FOR REFERENCE ONLY.
SEE 40 SCALE DRAWINGS FOR DETAILED INFORMATION.

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Fort Collins, Colorado 80521

PROJECT: 539-001
DATE: DECEMBER 10, 2014
DESIGNED BY: A. Reese
SCALE: 1"=80'
DRAWN BY: A. Bolese
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

OVERALL GRADING PLAN

Sheet C400
Of 40 Sheets

DRAWING FILENAME: G:\Projects\539-001\Civil\539-001_OVERALL.dwg LAYOUT NAME: C400 DATE: Dec 10, 2014 - 4:53pm CAD OPERATOR: adam
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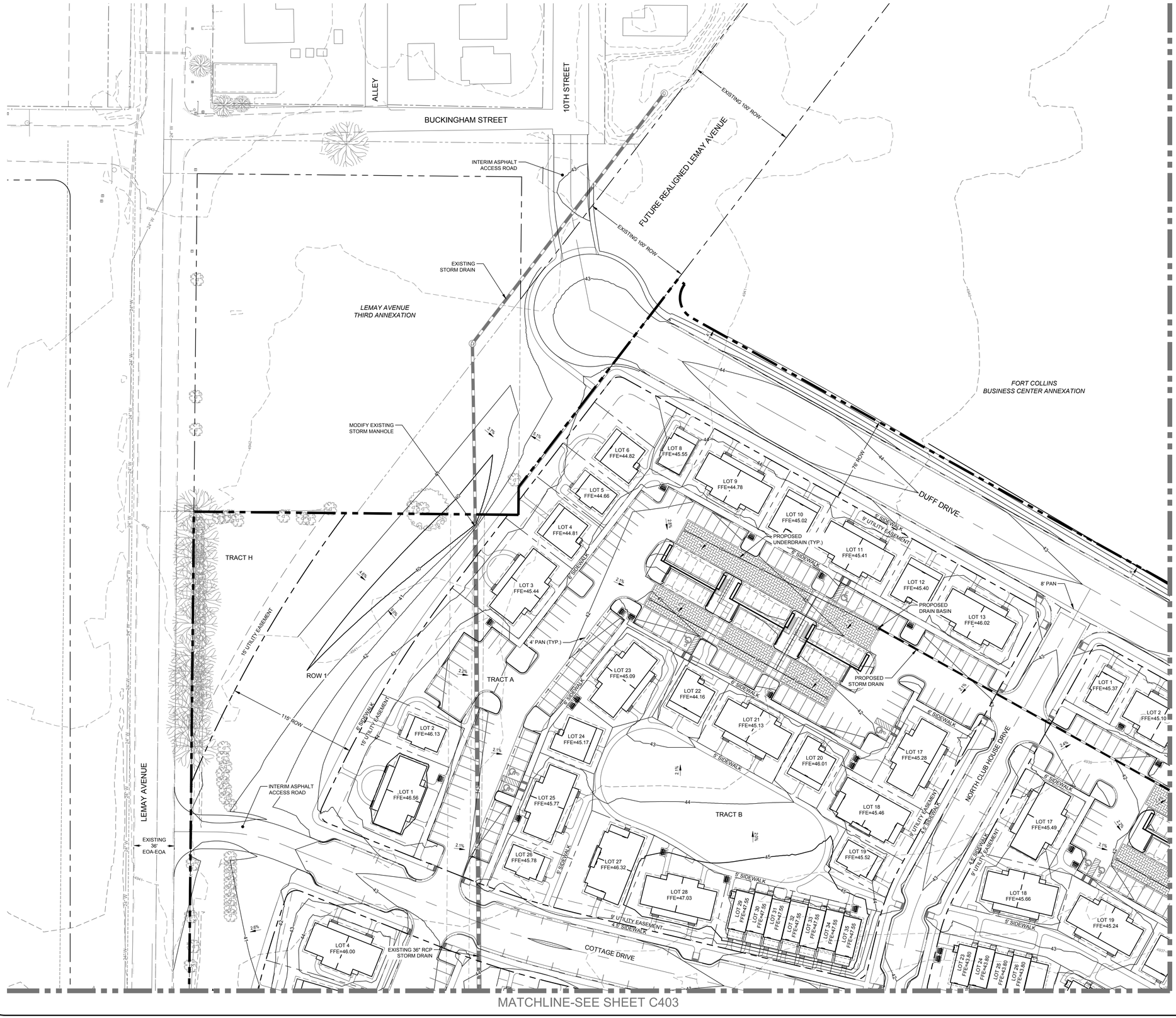
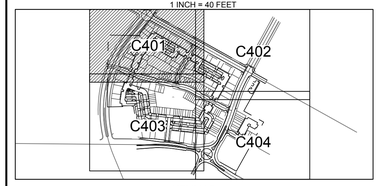


NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- PROPOSED CONTOUR — 93
- EXISTING CONTOUR — 5013
- PROPOSED CURB & GUTTER
- PROJECT BOUNDARY
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN
- EXISTING STORM DRAIN
- PROPOSED SPOT ELEVATION — 33.43
- EXISTING SPOT ELEVATION — (47.45)
- PROPOSED SLOPES — 2.0%
- PEDESTRIAN ACCESS RAMPS

NOTES:

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4. ALL CURB SPOTS ARE FLOWLINE ELEVATIONS. ALL OTHER SPOTS ARE FINISHED GRADE ELEVATIONS.
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CALL UTILITY NOTIFICATION CENTER OF COLORADO

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City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

Date:
Revisions:
No.

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

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NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

PROJECT: 539-001
DESIGNED BY: A. Reese
DRAWN BY: A. Bolese
DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

GRADING PLAN

Sheet
C401
Of 40 Sheets

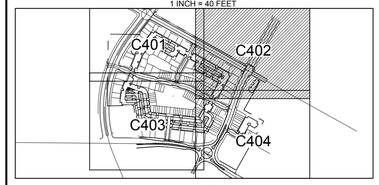
DRAWING FILENAME: G:\Projects\539-001\Engineering\Civil\Plan Sets\Grading\539-001_GRDP.dwg LAYOUT NAME: C401 DATE: Dec 10, 2014 - 4:15pm CAD OPERATOR: adam [539-001_GRDP.dwg] [539-001-Xref-Base.dwg] [539-001-Xref-Base-Ref.dwg] [539-001-Xref-Base-Ref-Ref.dwg] [539-001-Xref-Base-Ref-Ref-Ref.dwg] [539-001-Xref-Base-Ref-Ref-Ref-Ref.dwg] [539-001-Xref-Base-Ref-Ref-Ref-Ref-Ref.dwg] [539-001-Xref-Base-Ref-Ref-Ref-Ref-Ref-Ref.dwg] [539-001-Xref-Base-Ref-Ref-Ref-Ref-Ref-Ref-Ref.dwg] [539-001-Xref-Base-Ref-Ref-Ref-Ref-Ref-Ref-Ref-Ref.dwg]



NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- PROPOSED CONTOUR — 93
- EXISTING CONTOUR — 5013
- PROPOSED CURB & GUTTER
- PROJECT BOUNDARY
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN
- EXISTING STORM DRAIN
- PROPOSED SPOT ELEVATION — 33.43
- EXISTING SPOT ELEVATION — 97.45
- PROPOSED SLOPES — 2.0%
- PEDESTRIAN ACCESS RAMPS

NOTES:

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CHECKED BY: _____ Traffic Engineer _____ Date

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Revisions: No. — Date:

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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Hawes
PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Bobse

CAPSTONE COTTAGES

GRADING PLAN

Sheet
C402
Of 40 Sheets

DRAWING PATHNAME: G:\Projects\939.001\Civil\939-001_GRADING.dwg LAYOUT NAME: C402 DATE: Dec 10, 2014 - 4:19pm CAD OPERATOR: adam
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MATCHLINE-SEE SHEET C401

MATCHLINE-SEE SHEET C404

LEMAY AVENUE

LINCOLN AVENUE

COTTAGE DRIVE

SOUTH CLUB HOUSE DRIVE

TRACT D

TRACT E

TRACT I

CLUB HOUSE FFE=45.08

PAVER DETENTION AREA

BANK OF COLORADO

BUFFALO RUN APARTMENTS P.U.D.

LOT 1 FFE=44.32
LOT 2 FFE=45.11
LOT 3 FFE=45.30
LOT 4 FFE=46.00
LOT 6 FFE=46.16
LOT 7 FFE=46.45
LOT 8 FFE=45.75
LOT 9 FFE=46.64
LOT 10 FFE=46.64
LOT 11 FFE=46.64
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LOT 81 FFE=44.97
LOT 80 FFE=44.39
LOT 79 FFE=43.34
LOT 78 FFE=43.08
LOT 77 FFE=42.19
LOT 76 FFE=41.70

PROPOSED INLET
PROPOSED STORM DRAIN
PROPOSED UNDERDRAIN
PROPOSED DRAIN BASIN
PROPOSED AREA INLET
EXISTING 36" RCP STORM DRAIN
EXISTING 42" RCP STORM DRAIN
4' PAN (TYP.)
10' PAN
6' CONC. PAN
TRASH
9' UTILITY EASEMENT
15' UTILITY EASEMENT
4.5' SIDEWALK
5' SIDEWALK
6' SIDEWALK
8' SIDEWALK
4' SIDEWALK

NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET

KEYMAP

LEGEND:

- PROPOSED CONTOUR — 93
- EXISTING CONTOUR — 5013
- PROPOSED CURB & GUTTER
- PROJECT BOUNDARY
- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN
- EXISTING STORM DRAIN
- PROPOSED SPOT ELEVATION — 33.43
- EXISTING SPOT ELEVATION — 47.45
- PROPOSED SLOPES — 2.0%
- PEDESTRIAN ACCESS RAMPS

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CHECKED BY: _____ Stormwater Utility _____ Date

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CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. Revisions: Date:

1 REVIEW SET NOT FOR CONSTRUCTION 12/10/14

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NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

PROJECT: 559-001
DATE: DECEMBER 10, 2014
SCALE: 1"=40'
DESIGNED BY: A. Reese
DRAWN BY: A. Bolese
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

GRADING PLAN

Sheet C403
Of 40 Sheets

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MATCHLINE-SEE SHEET C402

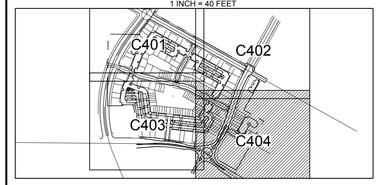
MATCHLINE-SEE SHEET C403



NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

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- EXISTING CONTOUR — 5013
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- PROJECT BOUNDARY
- PROPOSED STORM DRAIN
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No. Revisions: Date:

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301 North Howes Street, Suite 100
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PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

GRADING PLAN

Sheet
C404
Of 40 Sheets

DRAWING FILENAME: G:\Projects\939-001\Engineering\Civil\Sheets\939-001_GRADING_PLAN.dwg LAYOUT NAME - C404 DATE: Dec 10, 2014 - 4:15pm CAD OPERATOR: adam
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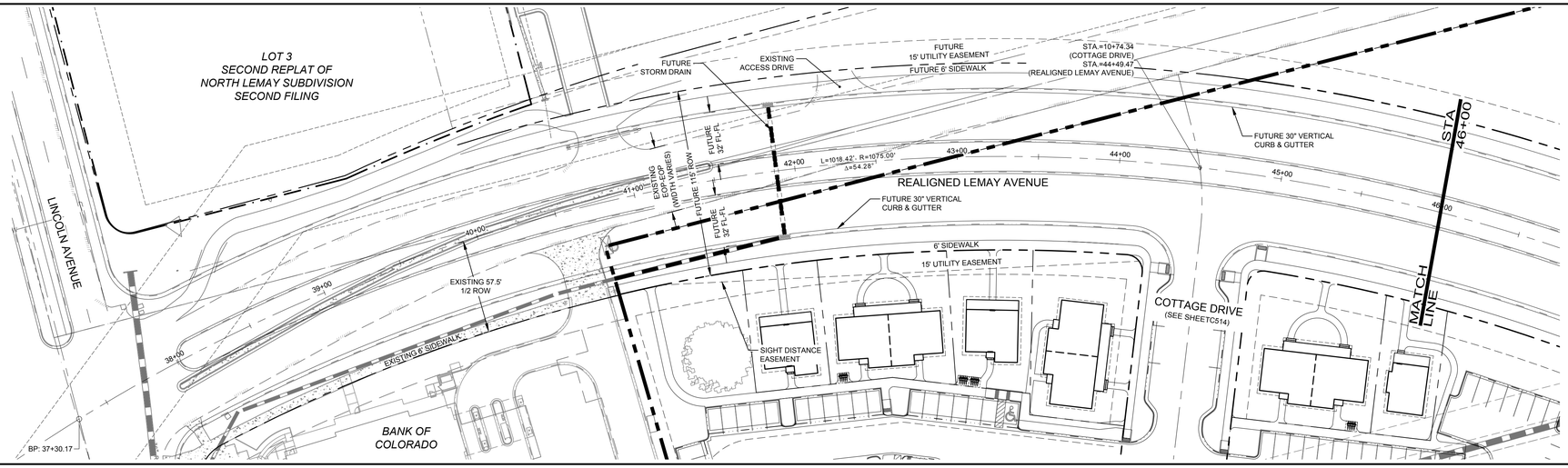

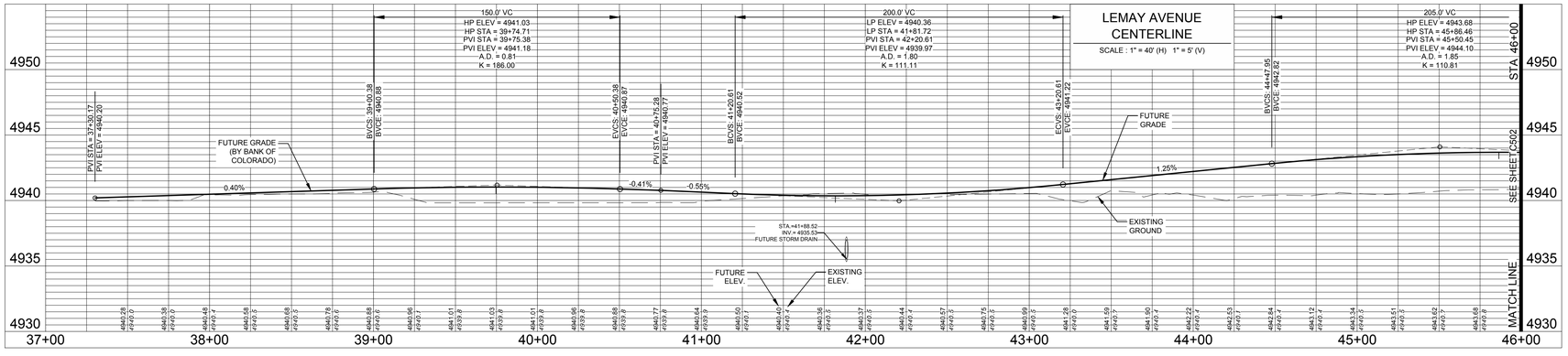

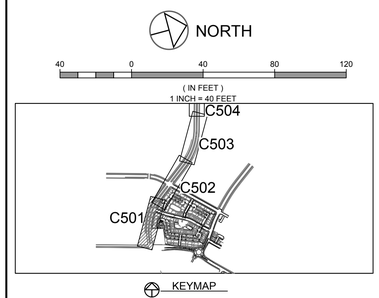

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM DRAIN
- EXISTING EDGE OF ASPHALT
- PEDESTRIAN ACCESS RAMPS
- PROPOSED CONCRETE CROSSPAN (TYP.)

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4. LIMITS OF STREET CUT ARE APPROXIMATE. FINAL LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CITY ENGINEERING INSPECTOR. ALL REPAIRS TO BE IN ACCORDANCE WITH CITY STREET REPAIR STANDARDS.

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Revisions:

No.		Date:
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DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Bastis
DRAWN BY: A. Bastis

CAPSTONE COTTAGES

LEMAY AVENUE PLAN & PROFILE

Sheet
C501
Of 40 Sheets

DRAWING FILENAME: G:\Projects\939\001\Dwg\Sht\939-001_Lemay Avenue.dwg LAYOUT NAME: C501 DATE: Dec 10, 2014 - 4:17pm CAD OPERATOR: adam
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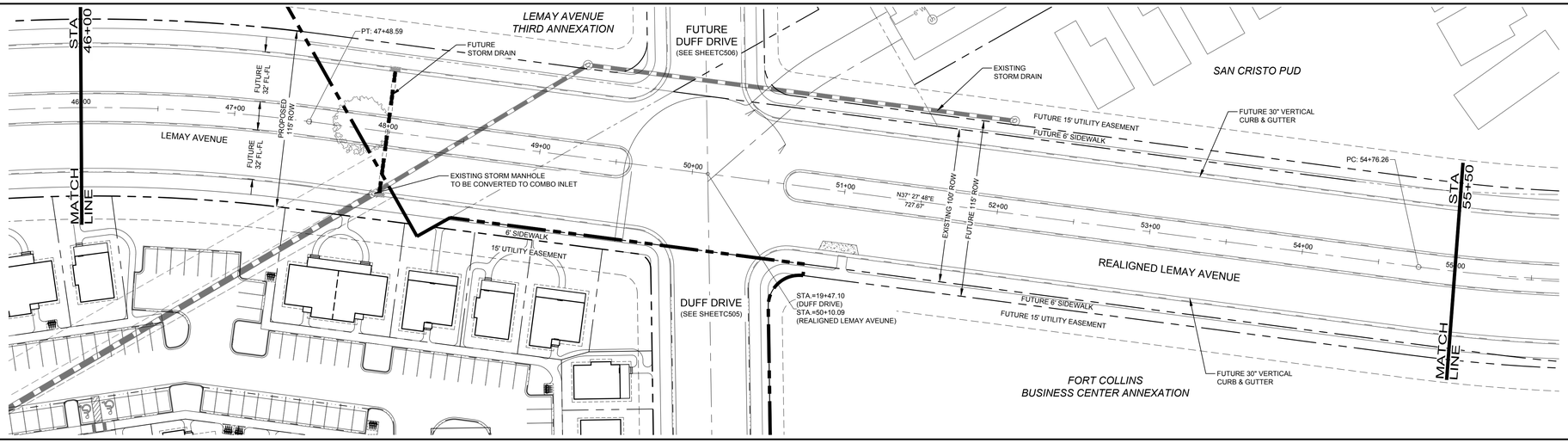

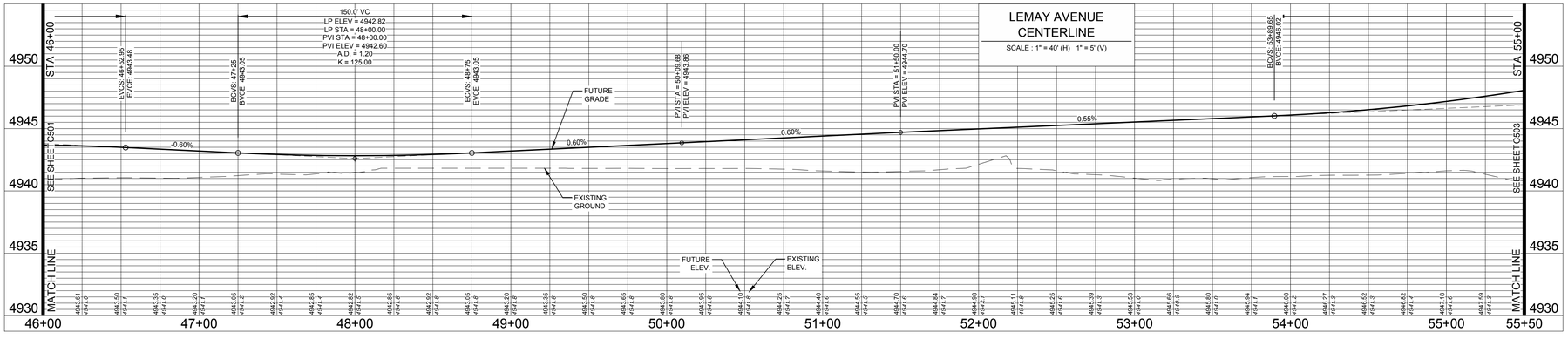

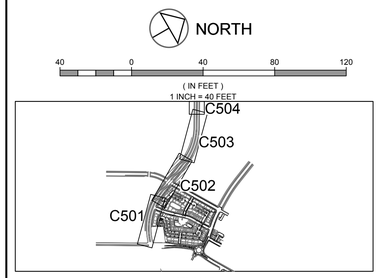

KEYMAP

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
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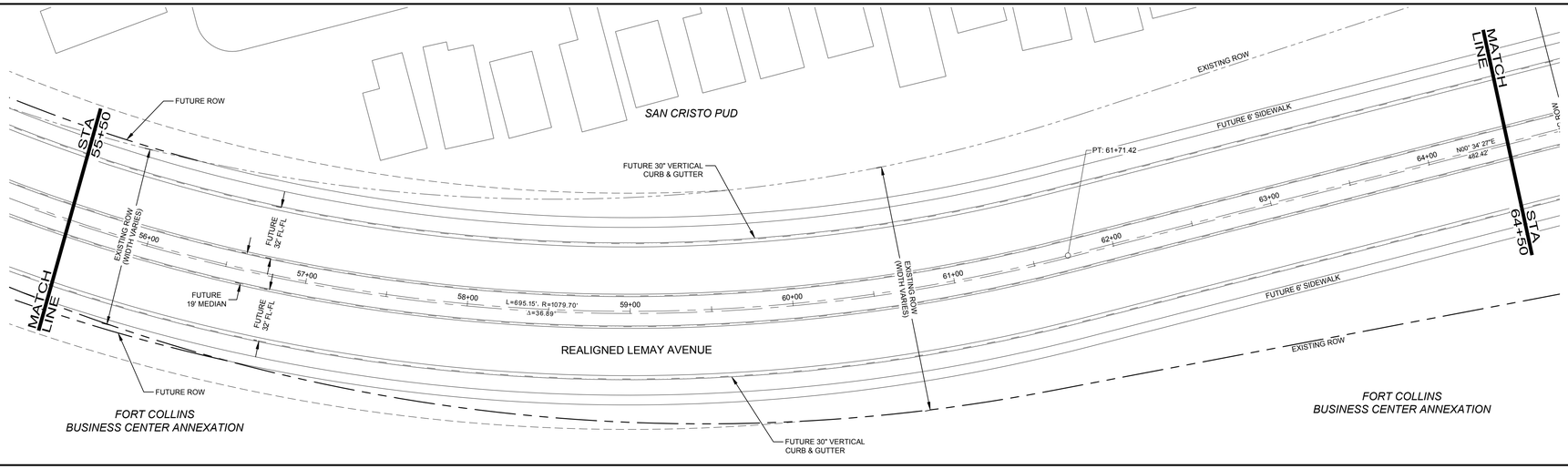
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

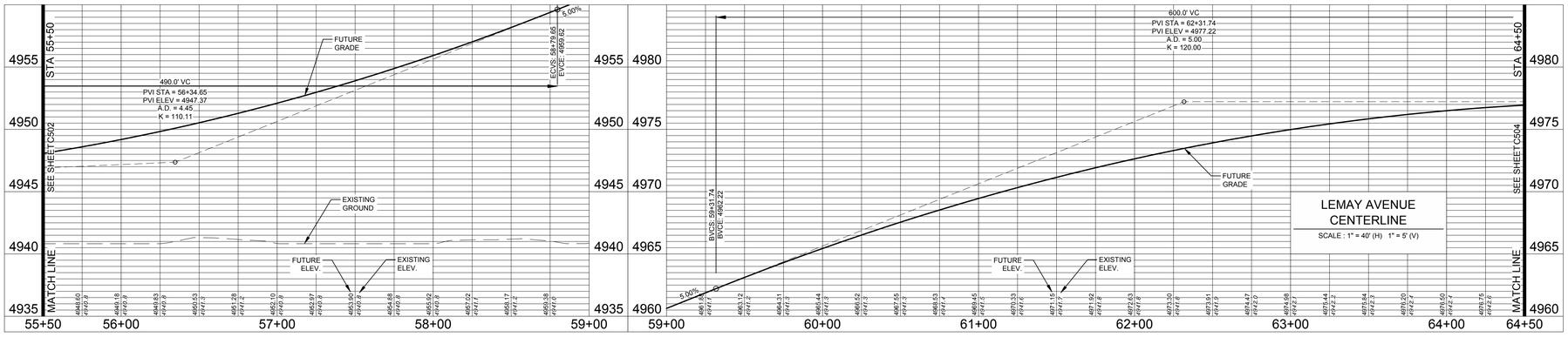
CAPSTONE COTTAGES

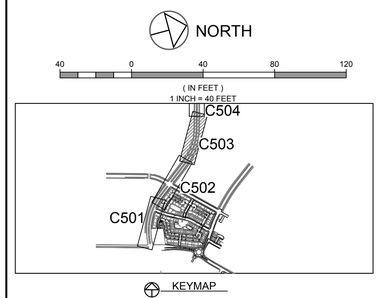
LEMAY AVENUE
PLAN & PROFILE

Sheet
C502
Of 40 Sheets

DRAWING FILENAME: G:\Projects\939-001\Dwg\Civil\939-001_Lemay Avenue.dwg LAYOUT NAME: C502 DATE: Dec 10, 2014 - 4:18pm CAD OPERATOR: ddm
LIST OF XREFS: [939-001_LAYO][939-001_XSP_LEMAY][LIST][939-001_XS01][939-001_PLTH][HCS+standard][939-001_STRM][939-001_ACTRAMP-SWK][939-001_PARCEL]







LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM DRAIN
- EXISTING EDGE OF ASPHALT
- PEDESTRIAN ACCESS RAMPS
- PROPOSED CONCRETE CROSSPAN (TYP.)

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK. BEFORE COMMENCING NEW CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
2. SEE SOILS REPORT FOR PAVEMENT AND SUBGRADE PREPARATION, DESIGN AND RECOMMENDATIONS.
3. EXPANSION JOINTS SHALL BE PROVIDED IN ALL SIDEWALKS AT MAXIMUM SPACING OF 50 FEET.
4. LIMITS OF STREET CUT ARE APPROXIMATE. FINAL LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CITY ENGINEERING INSPECTOR. ALL REPAIRS TO BE IN ACCORDANCE WITH CITY STREET REPAIR STANDARDS.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

Know what's below.
Call before you dig.

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. | Revisions: | Date:
1 | 12/10/14 | REVIEW SET NOT FOR CONSTRUCTION

These drawings are instruments of service provided by Northern Engineering Services, Inc. and are not to be used for any type of construction unless signed and sealed by a Professional Engineer in the employ of Northern Engineering Services, Inc.

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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014 | SCALE: 1"=40' | REVIEWED BY: N. Haws
PROJECT: 939.001 | DESIGNED BY: A. Rosse | DRAWN BY: A. Bosse

CAPSTONE COTTAGES

LEMAY AVENUE
PLAN & PROFILE

Sheet
C503
Of 40 Sheets

DRAWING FILENAME: G:\Projects\939-001\Dwg\Ltd\939-001_Lemay Avenue.dwg LAYOUT NAME: C503 DATE: Dec 10, 2014 - 4:18pm CAD OPERATOR: ddm
LIST OF XREFS: 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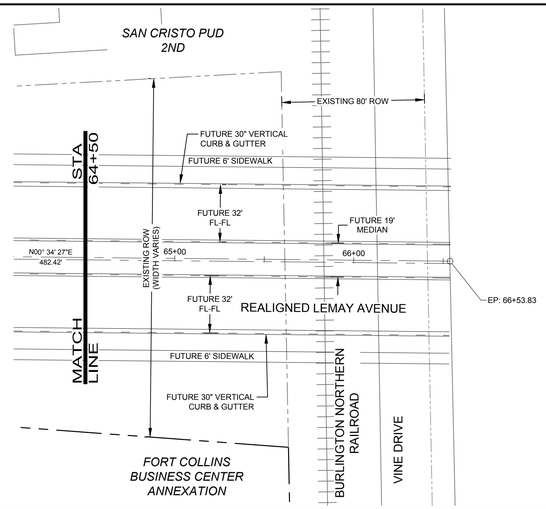

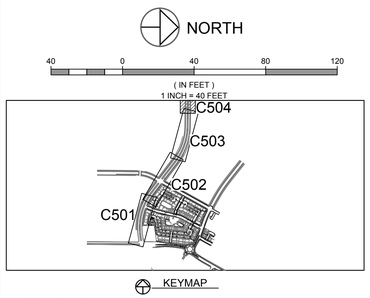

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
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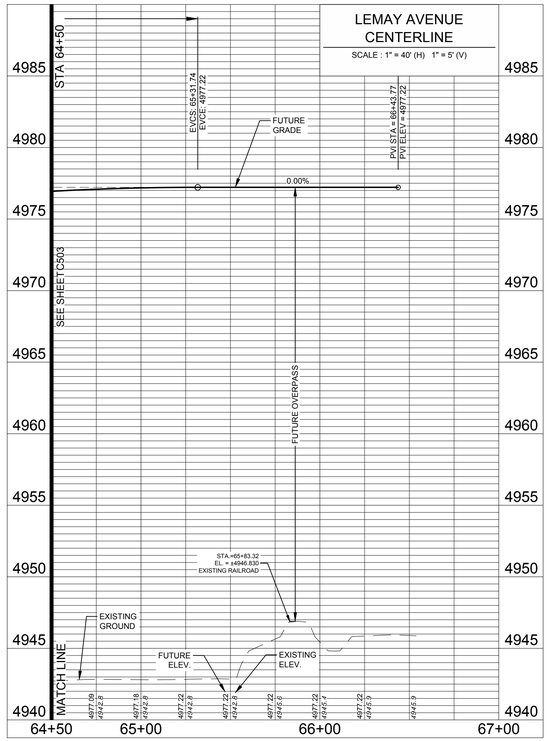

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

Know what's below.
Call before you dig.

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

Date: 12/10/14
Revisions:
No.
REVIEW SET
NOT FOR CONSTRUCTION

These drawings are instruments of service provided by Northern Engineering Services, Inc. and are not to be used for any type of construction unless signed and sealed by a Professional Engineer in the employ of Northern Engineering Services, Inc.

NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

LEMAY AVENUE
PLAN & PROFILE

Sheet
C504
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Ust\939-001_Lemay Avenue.dwg LAYOUT NAME: C504 DATE: Dec 10, 2014 - 4:18pm CAD OPERATOR: sdsm
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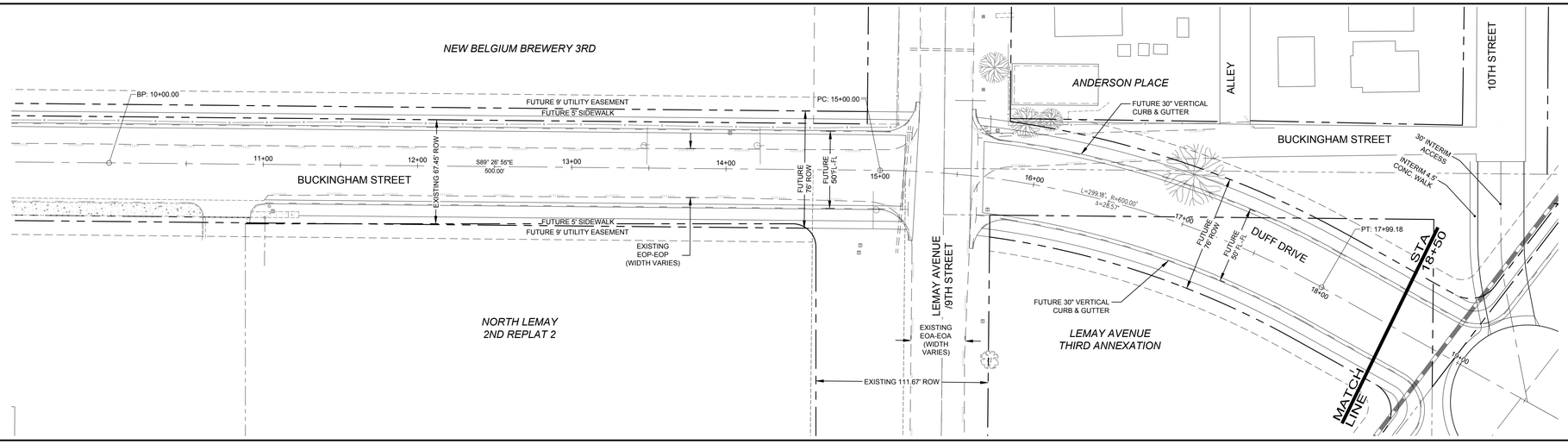

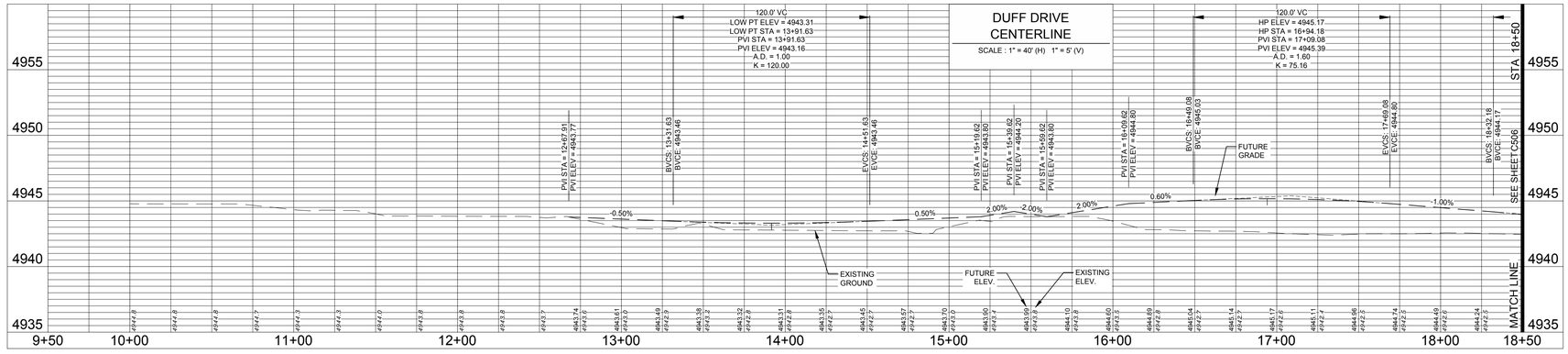

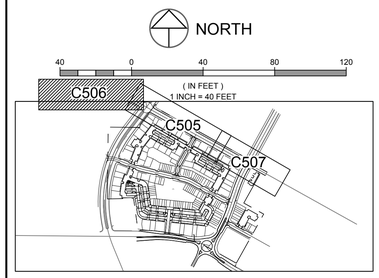

KEYMAP

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CAPSTONE COTTAGES

DUFF DRIVE PLAN & PROFILE

Sheet C505
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_Duff Drive.dwg LAYOUT NAME: C505 DATE: Dec 10, 2014 - 4:19pm CAD OPERATOR: ddm
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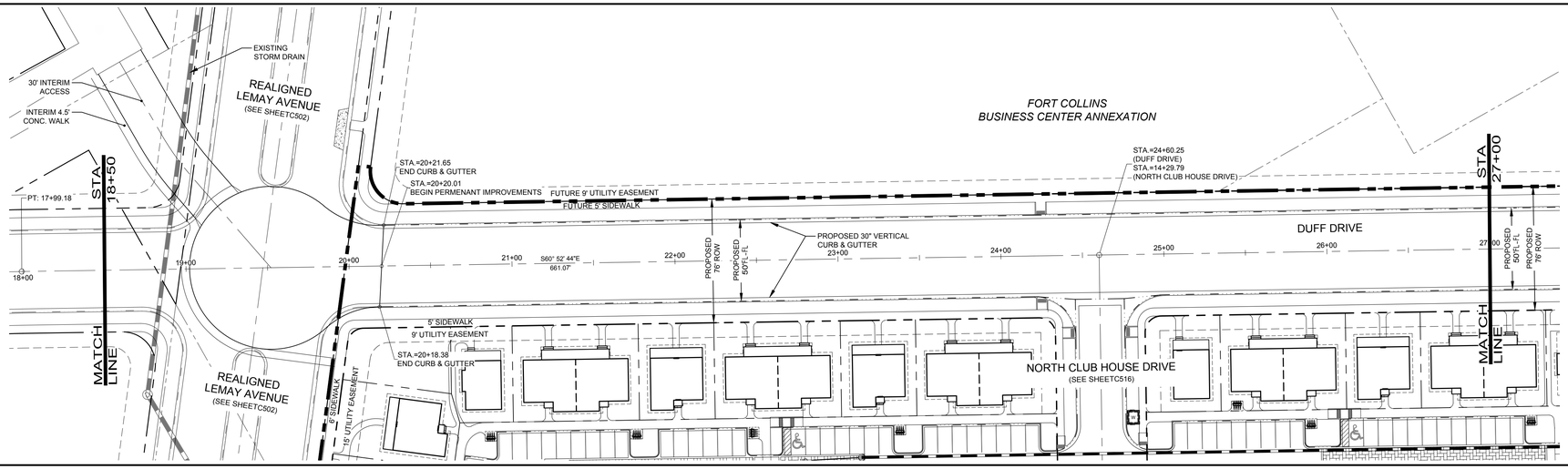

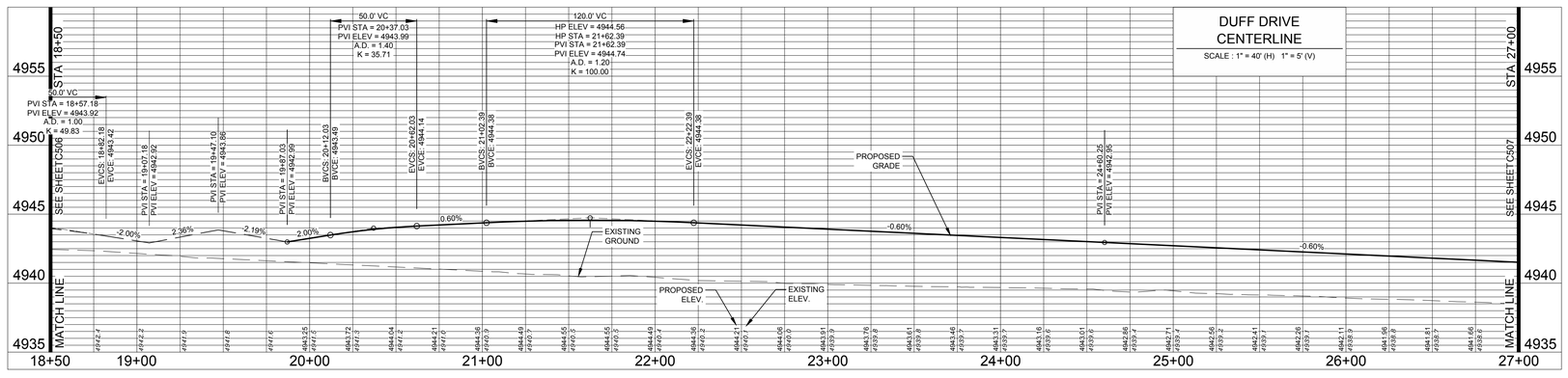

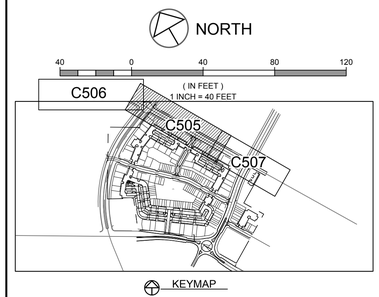

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM DRAIN
- EXISTING EDGE OF ASPHALT
- PEDESTRIAN ACCESS RAMPS
- PROPOSED CONCRETE CROSSPAN (TYP.)

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK. BEFORE COMMENCING NEW CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
2. SEE SOILS REPORT FOR PAVEMENT AND SUBGRADE PREPARATION, DESIGN AND RECOMMENDATIONS.
3. EXPANSION JOINTS SHALL BE PROVIDED IN ALL SIDEWALKS AT MAXIMUM SPACING OF 50 FEET.
4. LIMITS OF STREET CUT ARE APPROXIMATE. FINAL LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CITY ENGINEERING INSPECTOR. ALL REPAIRS TO BE IN ACCORDANCE WITH CITY STREET REPAIR STANDARDS.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

811

Know what's below. Call before you dig.

CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

Revisions: No. Date:

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

These drawings are instruments of service provided by Northern Engineering Services, Inc. and are not to be used for any purpose or project unless signed and sealed by a Professional Engineer in the employ of Northern Engineering Services, Inc.

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DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Bosse
DRAWN BY: A. Bosse

CAPSTONE COTTAGES

DUFF DRIVE PLAN & PROFILE

Sheet C506
Of 40 Sheets

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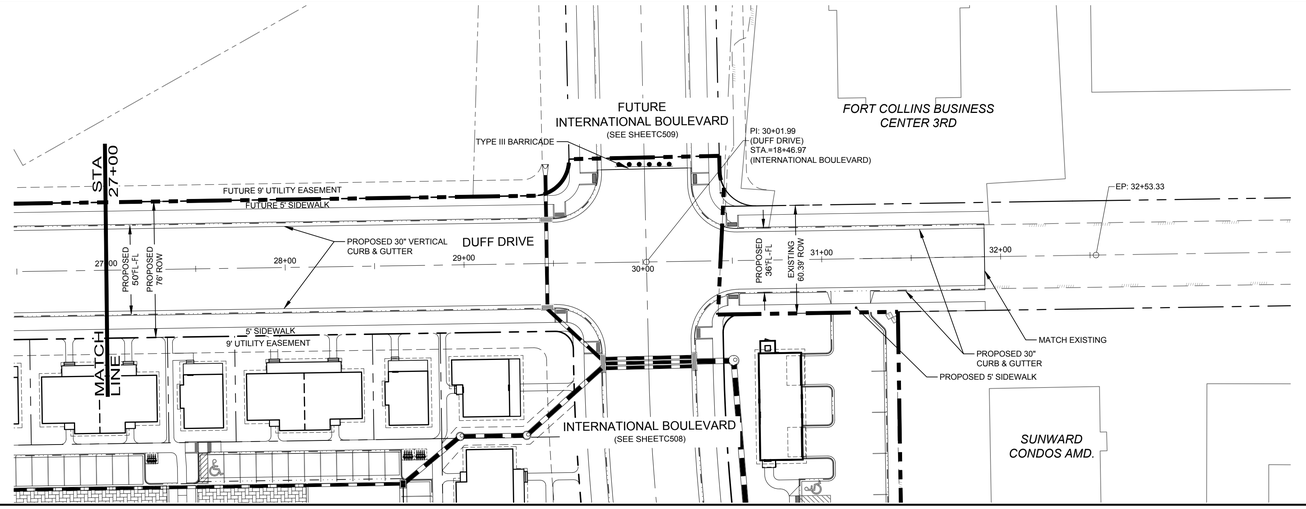

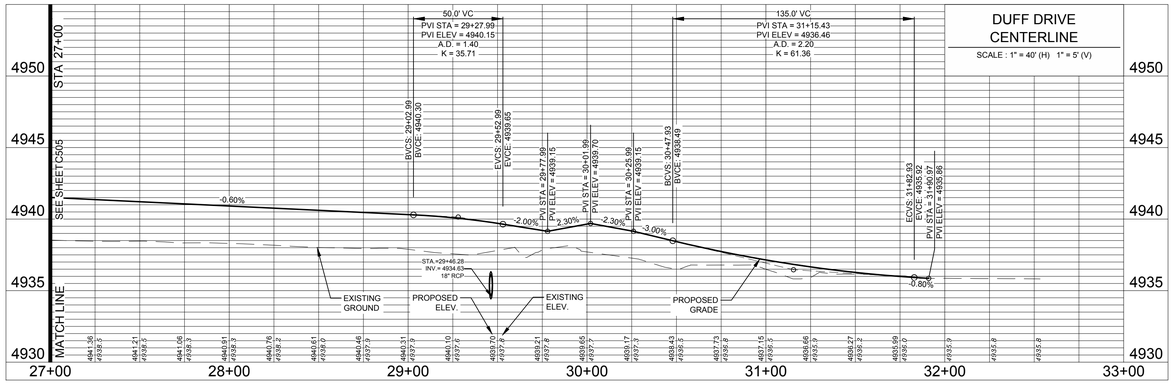

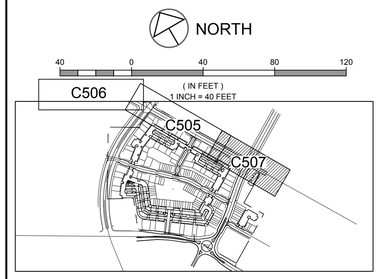

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- FUTURE CURB & GUTTER
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- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM DRAIN
- EXISTING EDGE OF ASPHALT
- PEDESTRIAN ACCESS RAMPS
- PROPOSED CONCRETE CROSSPAN (TYP.)

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK, BEFORE COMMENCING NEW CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
2. SEE SOILS REPORT FOR PAVEMENT AND SUBGRADE PREPARATION, DESIGN AND RECOMMENDATIONS.
3. EXPANSION JOINTS SHALL BE PROVIDED IN ALL SIDEWALKS AT MAXIMUM SPACING OF 50 FEET.
4. LIMITS OF STREET CUT ARE APPROXIMATE. FINAL LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CITY ENGINEERING INSPECTOR. ALL REPAIRS TO BE IN ACCORDANCE WITH CITY STREET REPAIR STANDARDS.

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City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. | Revisions: | Date:
1 | REVIEW SET NOT FOR CONSTRUCTION | 12/10/14

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www.northernengineering.com
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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

DUFF DRIVE
PLAN & PROFILE

Sheet
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Of 40 Sheets

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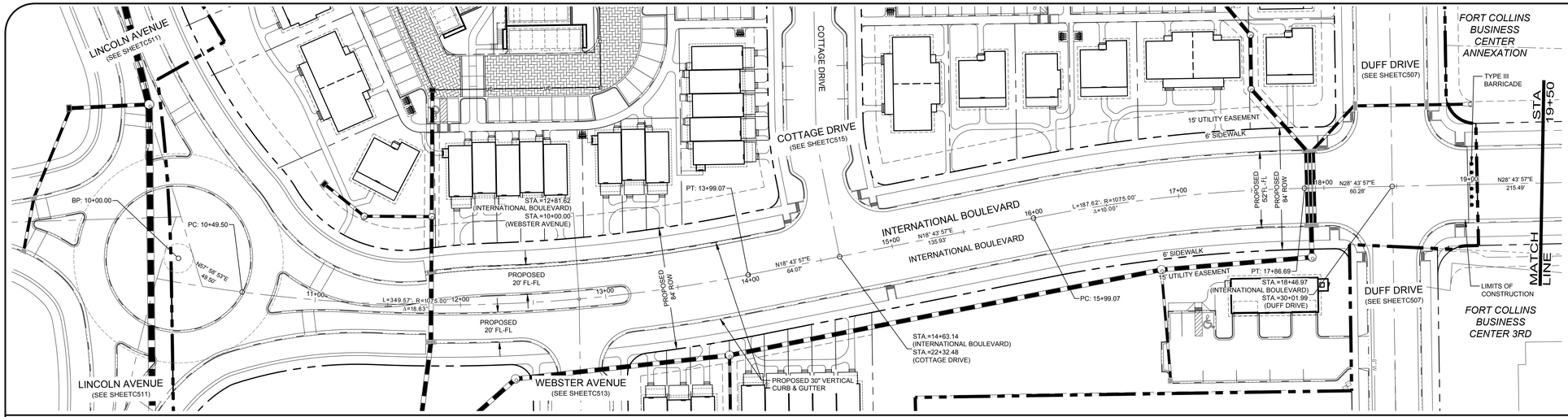

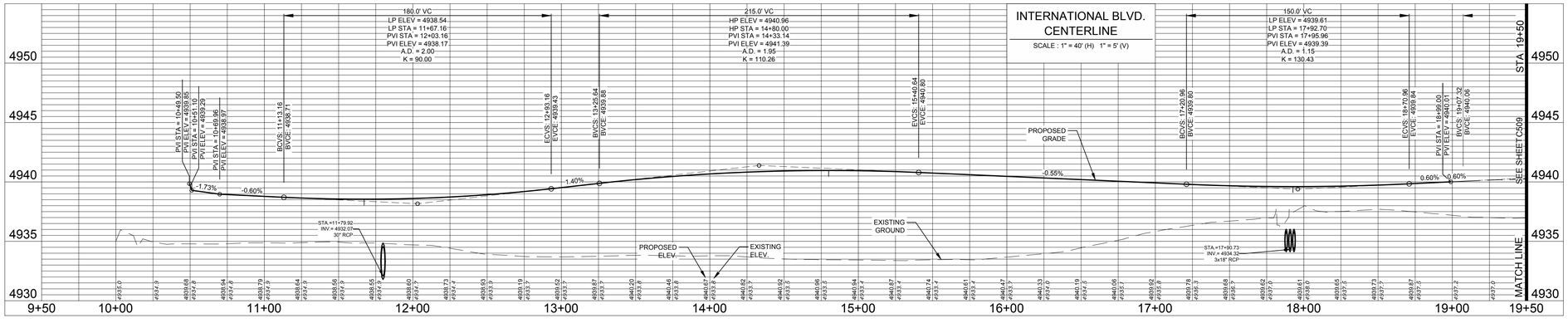

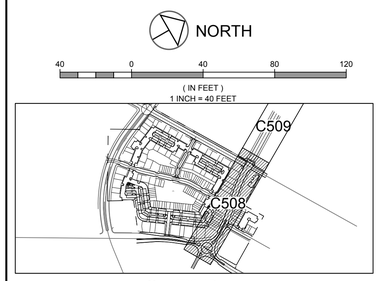

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CHECKED BY: _____ Environmental Planner _____ Date

No. | Revisions: | Date:
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NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
DESIGNED BY: A. Reese
DRAWN BY: A. Bocse
REVIEWED BY: N. Haws
PROJECT: 939.001

CAPSTONE COTTAGES

INTERNATIONAL BOULEVARD PLAN & PROFILE

Sheet
C508
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_Intersection Renovation.dwg LAYOUT NAME: C508 DATE: Dec 10, 2014 - 4:21pm CAD OPERATOR: sdam
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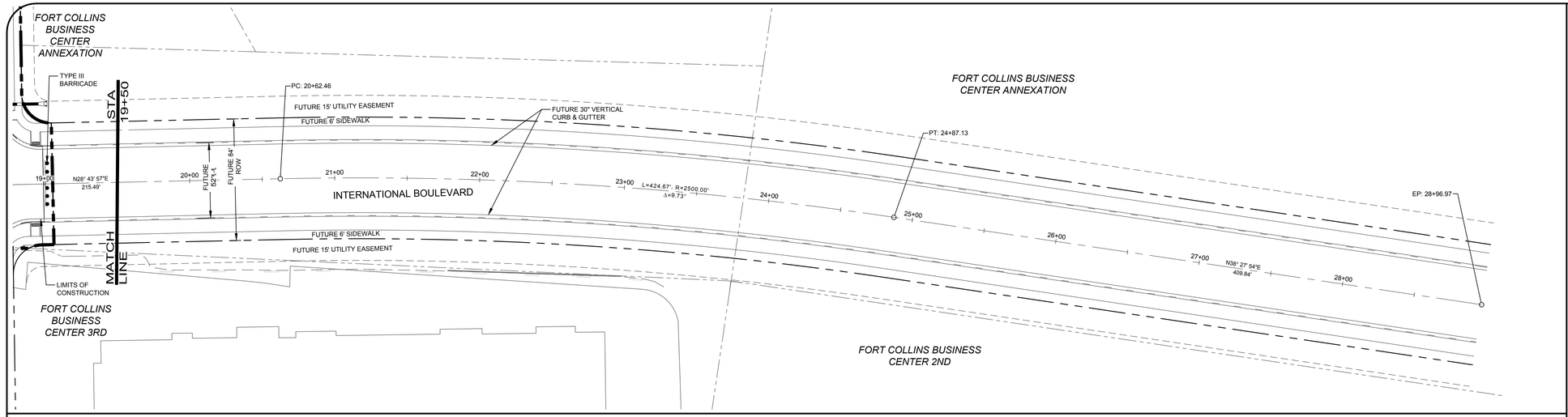

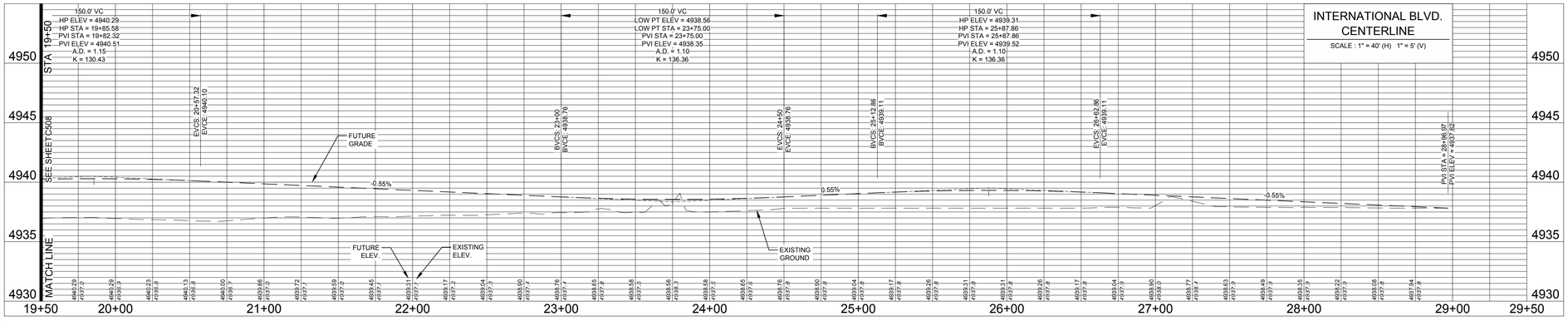

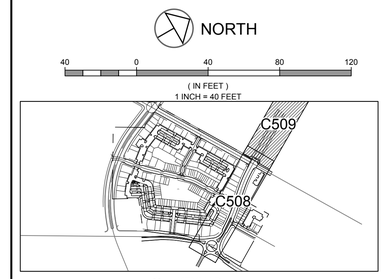

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
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- PROPOSED LOT LINE
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- SAWCUT LINE
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- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
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City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

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PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

INTERNATIONAL BOULEVARD PLAN & PROFILE

Sheet C509
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_Intersection Redevelopment.dwg LAYOUT NAME: C509 DATE: Dec 10, 2014 - 4:22pm CAD OPERATOR: sdorn
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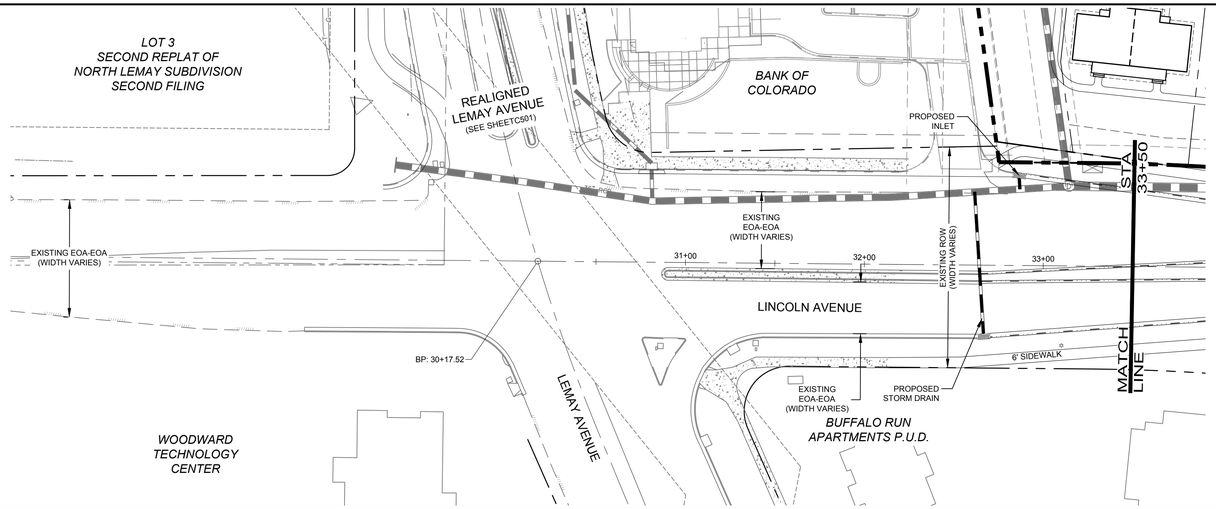

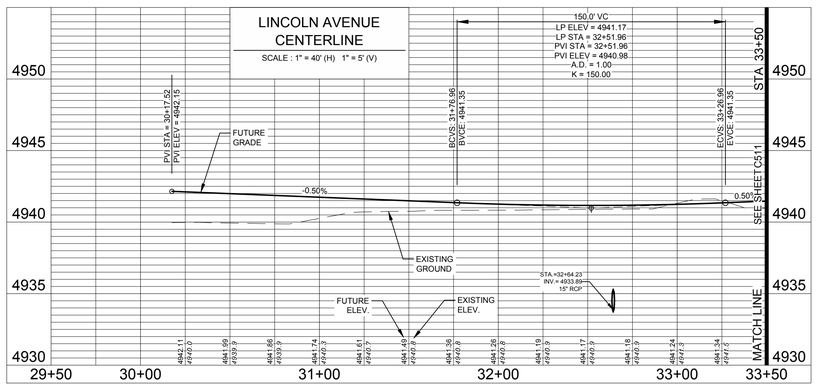

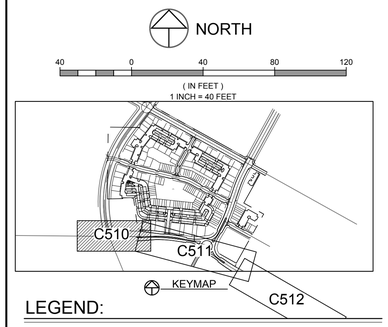

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CAPSTONE COTTAGES

LINCOLN AVENUE PLAN & PROFILE

Sheet
C510
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_Lincoln Avenue.dwg LAYOUT NAME: C510 DATE: Dec 10, 2014 - 4:23pm CAD OPERATOR: adam
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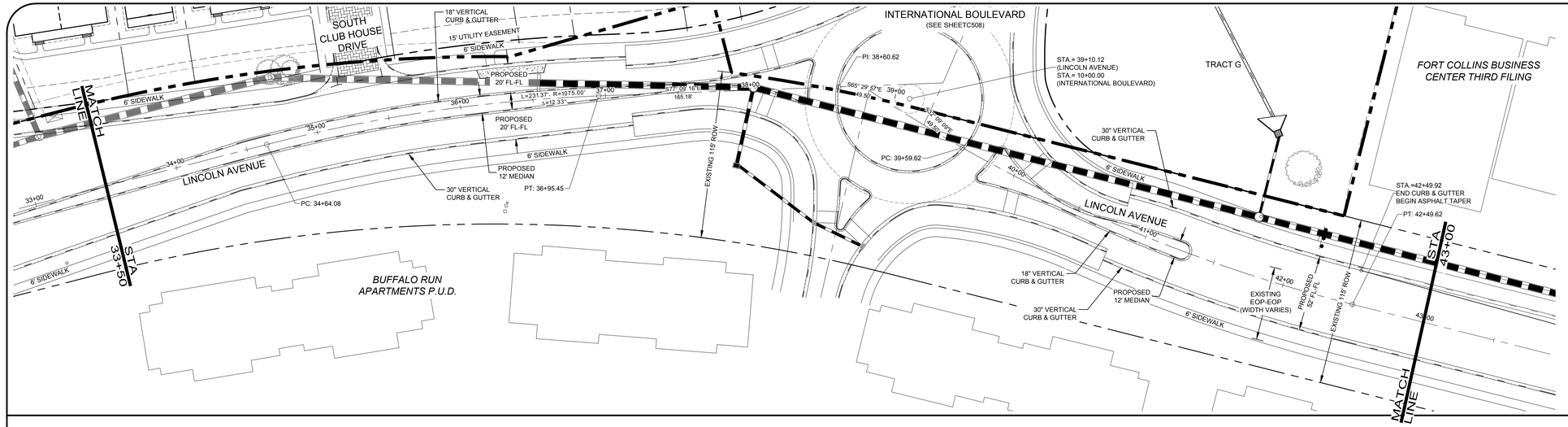

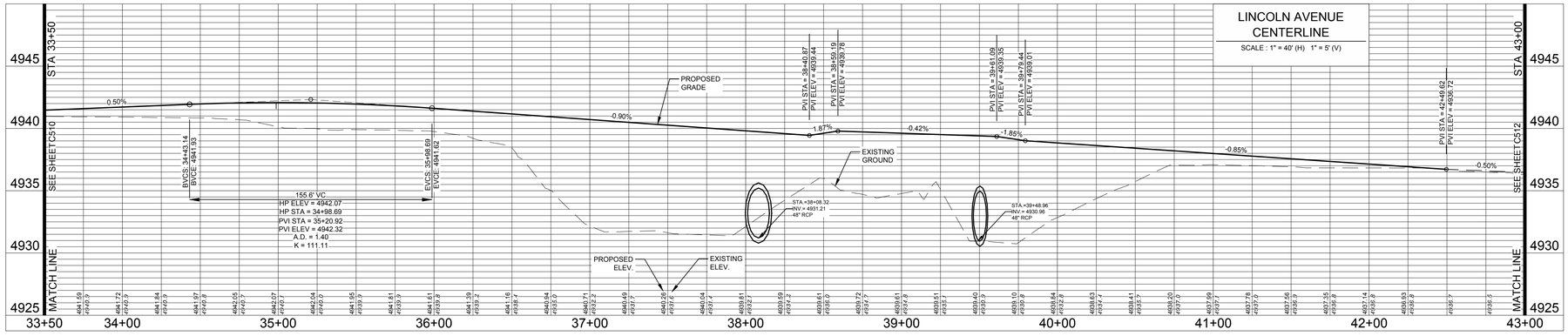

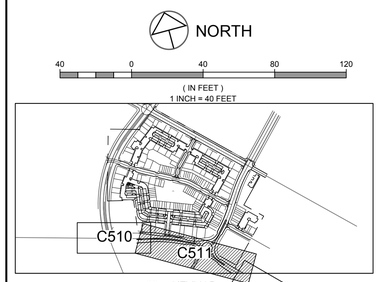

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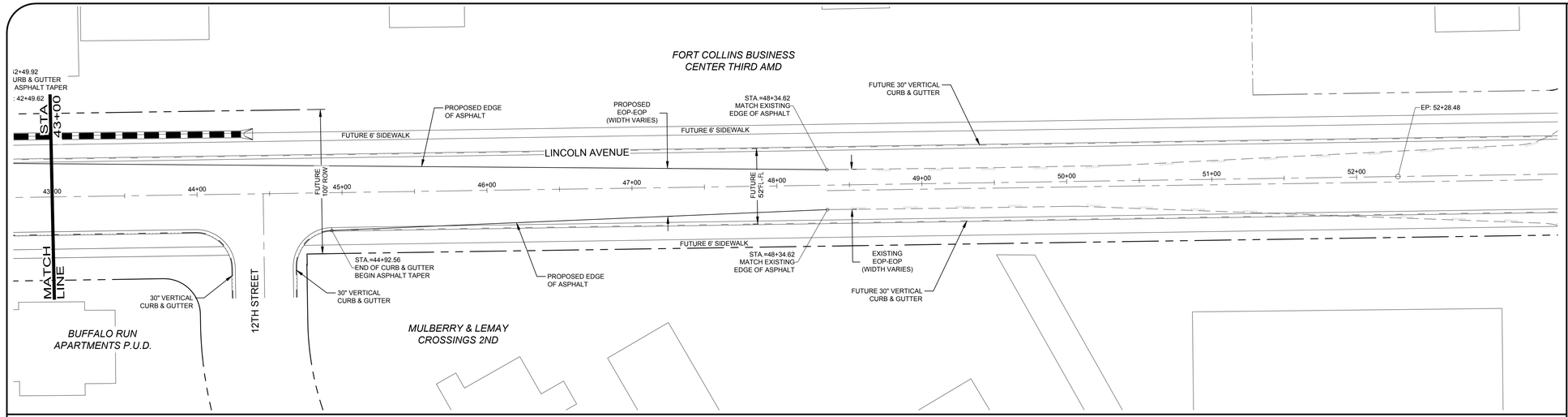

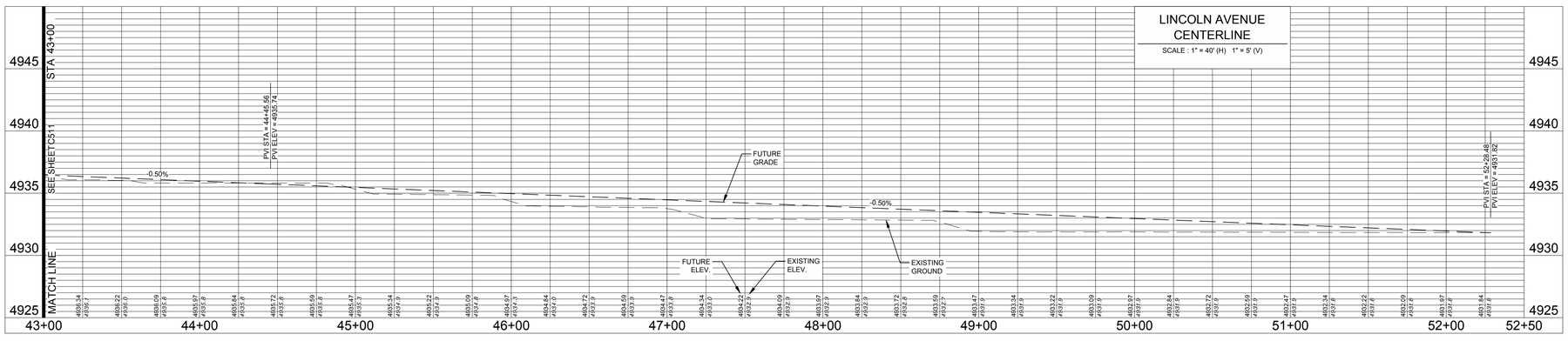

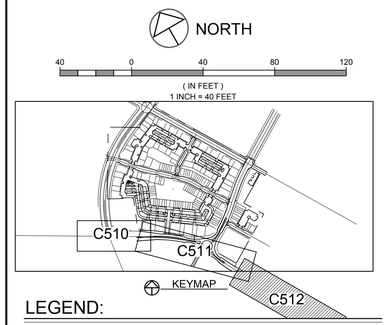

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Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_Lincoln Avenue.dwg LAYOUT NAME: C512 DATE: Dec 10, 2014 - 4:23pm CAD OPERATOR: ddam
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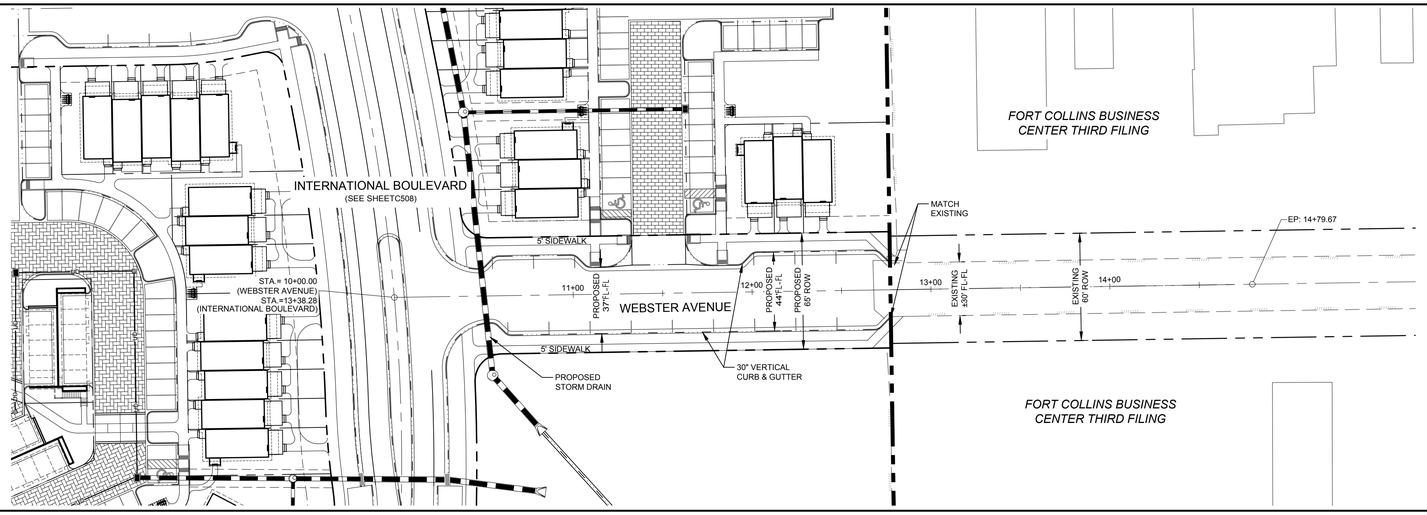

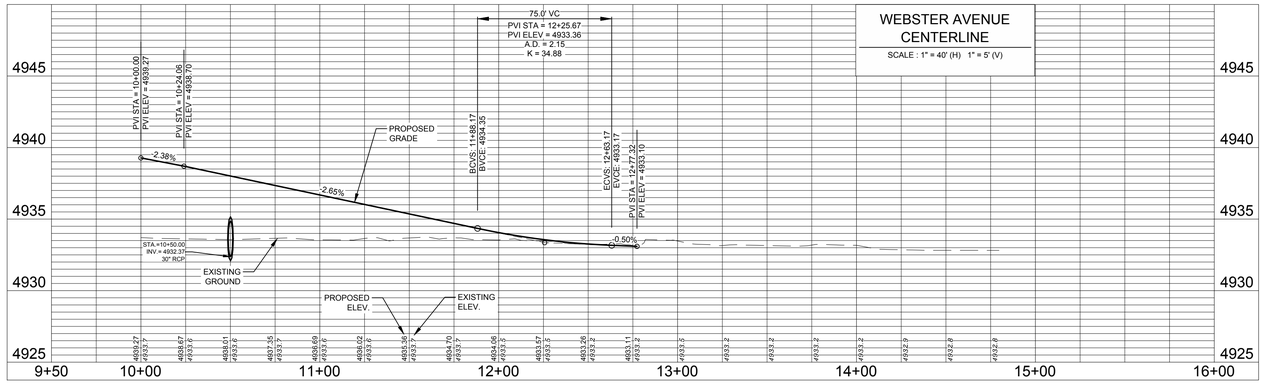

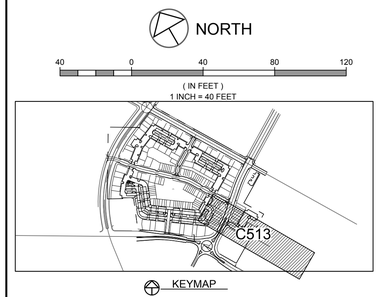

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM DRAIN
- EXISTING EDGE OF ASPHALT
- PEDESTRIAN ACCESS RAMPS
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CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. Revisions: Date:
1 REVIEW SET NOT FOR CONSTRUCTION 12/10/14

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Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

WEBSTER AVENUE PLAN & PROFILE

Sheet C513
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Civil\939-001_Webster Avenue.dwg LAYOUT NAME: C513 DATE: Dec 10, 2014 - 4:24pm CAD OPERATOR: adam
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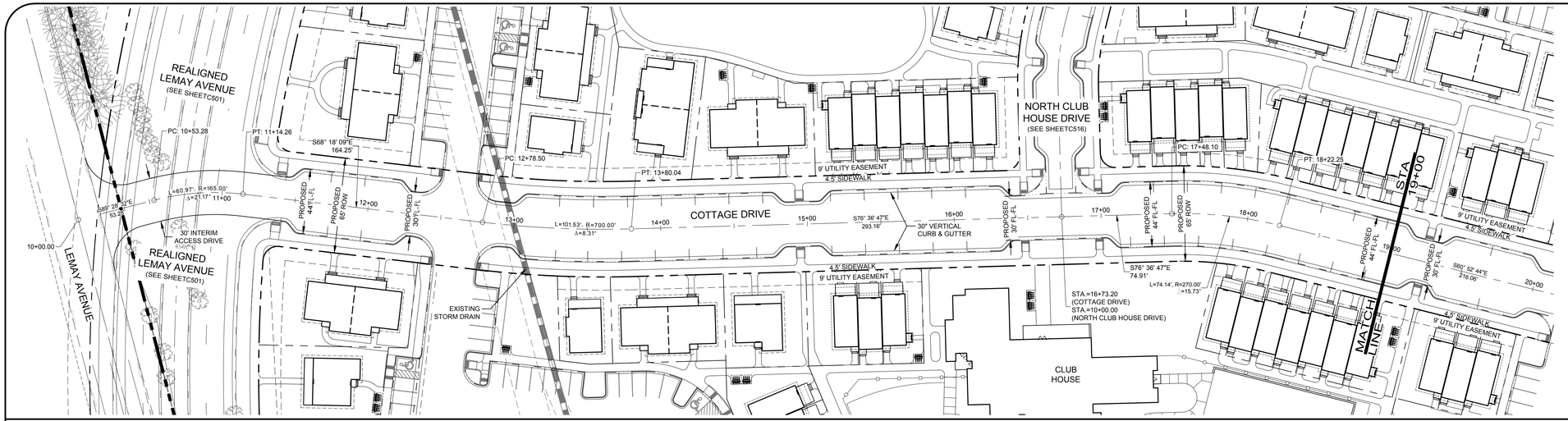

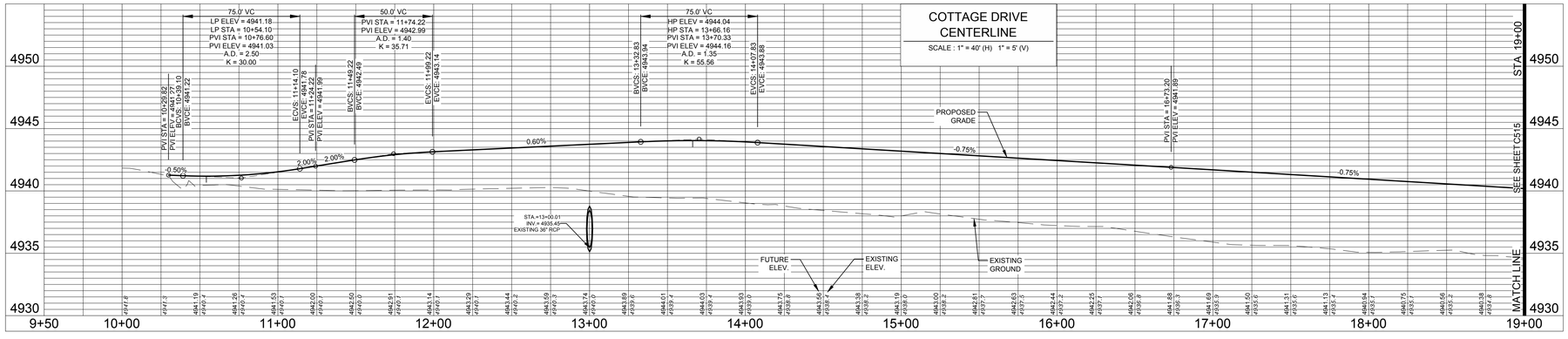

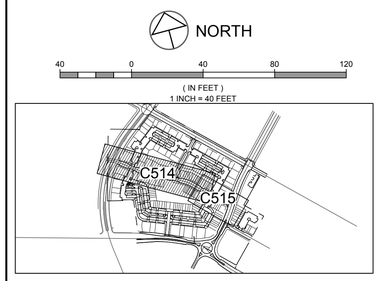

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
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- PROPOSED RIGHT-OF-WAY
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CHECKED BY: _____ Environmental Planner _____ Date

No. | Revisions: | Date:
1 | REVIEW SET NOT FOR CONSTRUCTION | 12/10/14

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www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
REVIEWED BY: N. Haws
PROJECT: 939.001

CAPSTONE COTTAGES

COTTAGE DRIVE PLAN & PROFILE

Sheet C514
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_COTTAGE DRIVE.dwg LAYOUT NAME: C514 DATE: Dec 10, 2014 - 4:29pm CAD OPERATOR: adam
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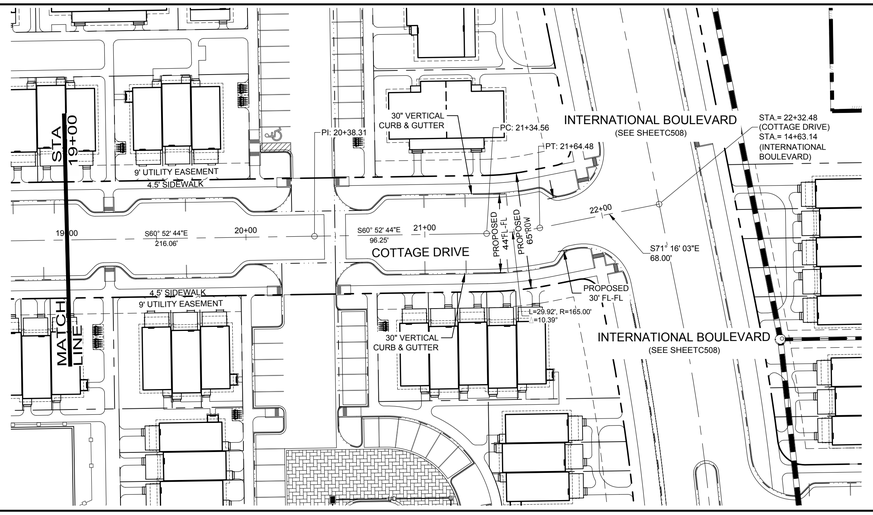

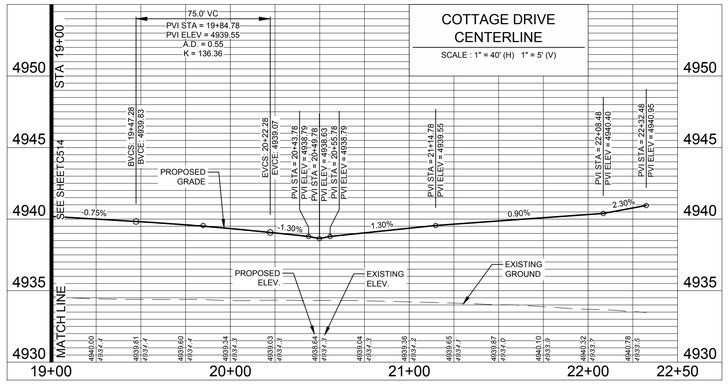

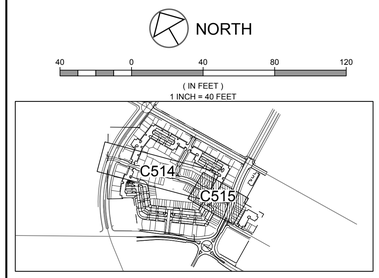

KEYMAP

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
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CHECKED BY: _____ Environmental Planner _____ Date

No.	Revisions:	Date:
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301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Bastis
DRAWN BY: A. Bastis

CAPSTONE COTTAGES

COTTAGE DRIVE
PLAN & PROFILE

Sheet
C515
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_COTTAGE DRIVE.dwg, LAYOUT NAME: C515, DATE: Dec 10, 2014 - 4:29pm, CAD OPERATOR: adam
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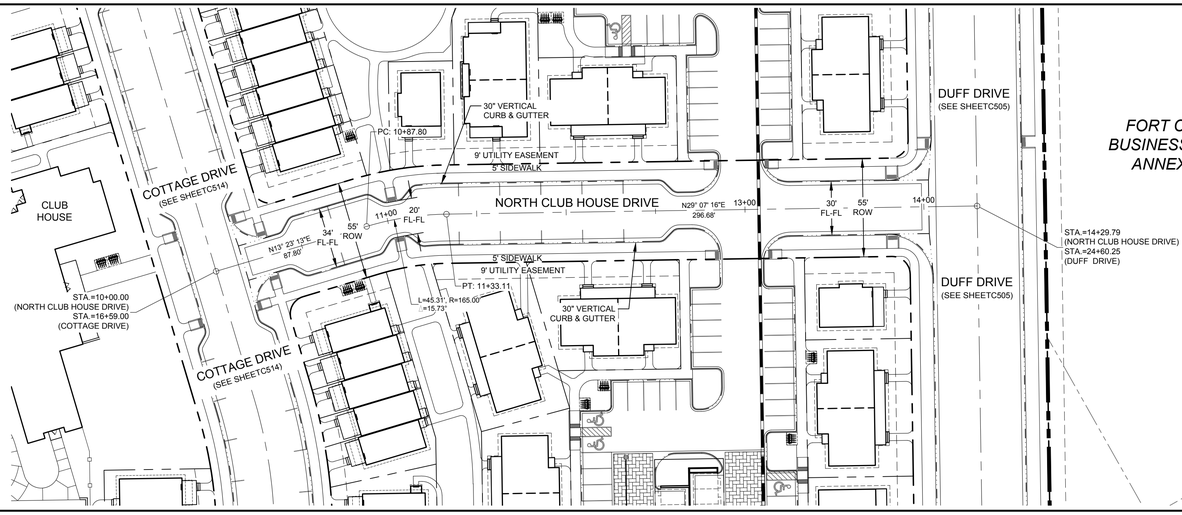

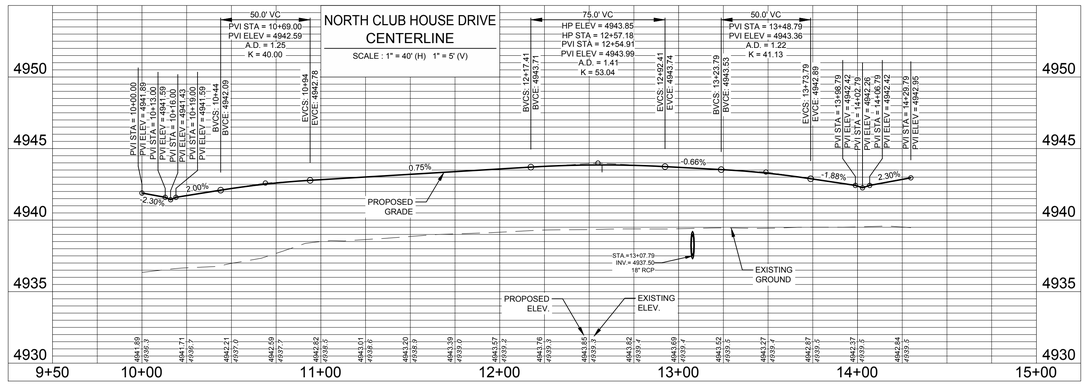

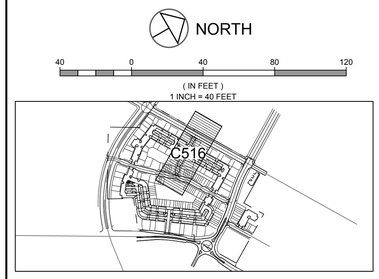

KEYMAP

LEGEND:

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- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
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DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Boese
DRAWN BY: A. Boese

CAPSTONE COTTAGES

NORTH CLUB HOUSE DRIVE PLAN & PROFILE

Sheet
C516
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Sht\939-001_NORTH CLUB HOUSE DRIVE.dwg LAYOUT NAME: C516 DATE: Dec 11, 2014 - 4:57pm CAD OPERATOR: aaam
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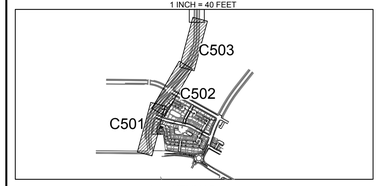
(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

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- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
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Date: 12/10/14
Revisions:
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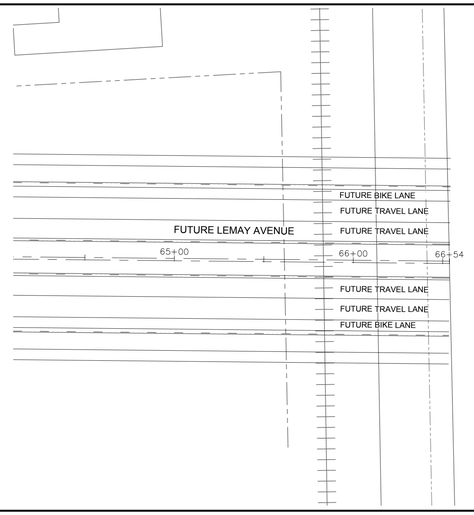
PROJECT: 539.001	DATE: DECEMBER 10, 2014
DESIGNED BY: A. Reese	SCALE: 1"=40'
DRAWN BY: A. Bolese	REVIEWED BY: N. Haws

CAPSTONE COTTAGES

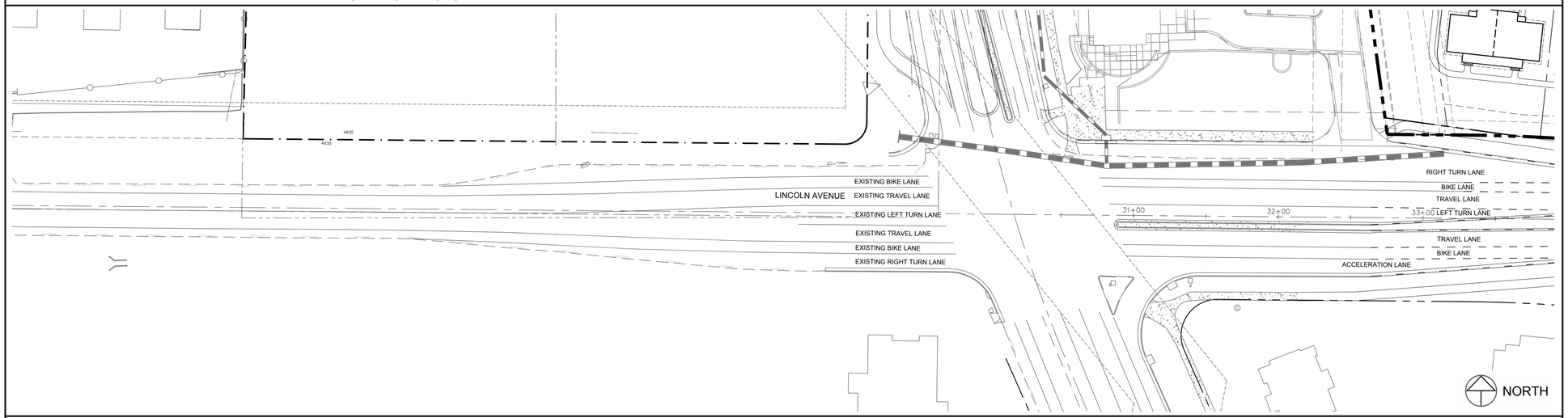
LEMAY AVENUE STRIPING PLAN

Sheet
C517
Of 40 Sheets

DRAWING FILENAME: G:\Projects\539.001\CAD\539-001-PLAN_LAYOUT_C517.dwg Proj Eng LAYOUT MAKE C517 DATE: Dec 11, 2014 - 4:57pm CAD OPERATOR: adam



NORTH



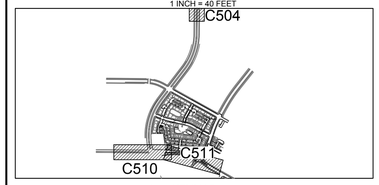
NORTH



NORTH

40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

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Revisions:

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PROJECT: 939-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

LEMAY AVENUE STRIPING PLAN

Sheet
C518
Of 40 Sheets

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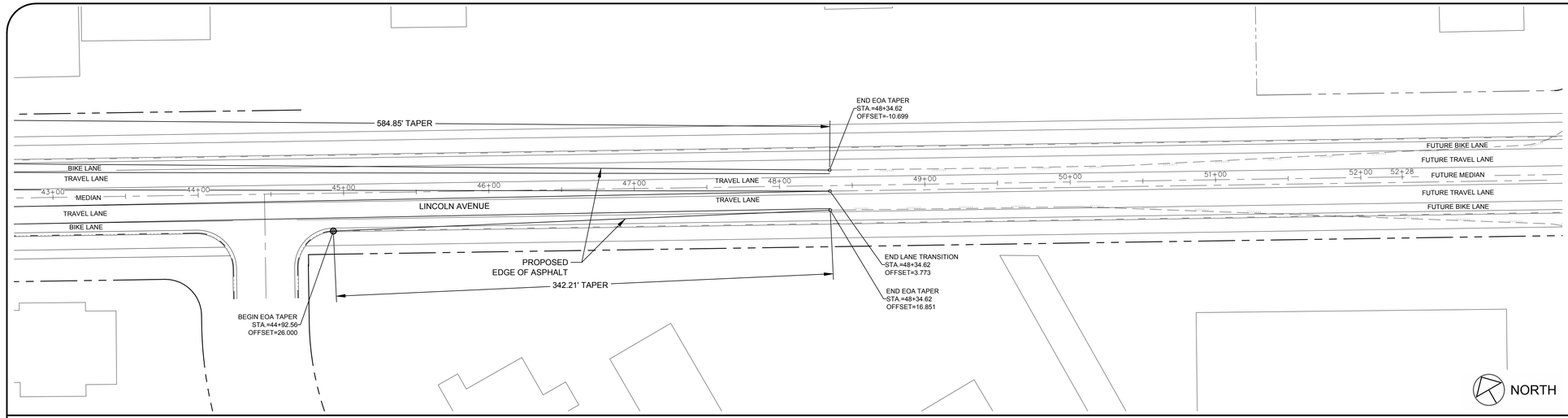

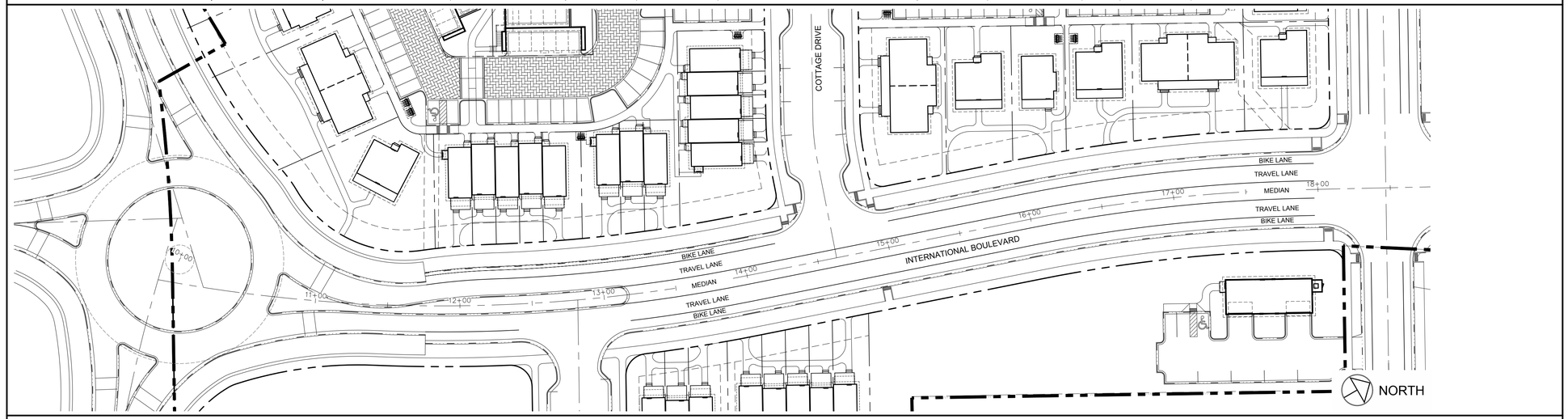



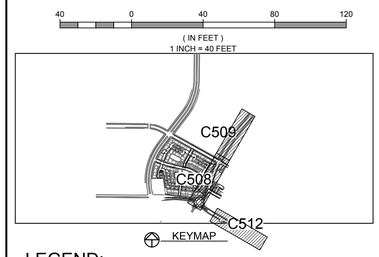

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
- FUTURE RIGHT-OF-WAY
- EXISTING RIGHT-OF-WAY
- PROJECT BOUNDARY
- PROPOSED LOT LINE
- EXISTING LOT LINE
- EASEMENT LINE
- SAWCUT LINE
- PROPOSED STORM DRAIN
- FUTURE STORM DRAIN
- PROPOSED STORM MANHOLE
- PROPOSED STORM INLET
- EXISTING STORM DRAIN
- EXISTING EDGE OF ASPHALT
- PEDESTRIAN ACCESS RAMPS
- PROPOSED CONCRETE CROSSPAN (TYP.)

NOTES:

1. THE SIZE, TYPE AND LOCATION OF ALL KNOWN UNDERGROUND UTILITIES ARE APPROXIMATE WHEN SHOWN ON THESE DRAWINGS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE EXISTENCE OF ALL UNDERGROUND UTILITIES IN THE AREA OF THE WORK, BEFORE COMMENCING NEW CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND SHALL BE RESPONSIBLE FOR ALL UNKNOWN UNDERGROUND UTILITIES.
2. SEE SOILS REPORT FOR PAVEMENT AND SUBGRADE PREPARATION, DESIGN AND RECOMMENDATIONS.
3. EXPANSION JOINTS SHALL BE PROVIDED IN ALL SIDEWALKS AT MAXIMUM SPACING OF 50 FEET.
4. LIMITS OF STREET CUT ARE APPROXIMATE. FINAL LIMITS ARE TO BE DETERMINED IN THE FIELD BY THE CITY ENGINEERING INSPECTOR. ALL REPAIRS TO BE IN ACCORDANCE WITH CITY STREET REPAIR STANDARDS.

CALL UTILITY NOTIFICATION CENTER OF COLORADO

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CALL 2 BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

City of Fort Collins, Colorado
UTILITY PLAN APPROVAL

APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

Revisions: No. Date:

REVIEW SET
NOT FOR CONSTRUCTION
12/10/14

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www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

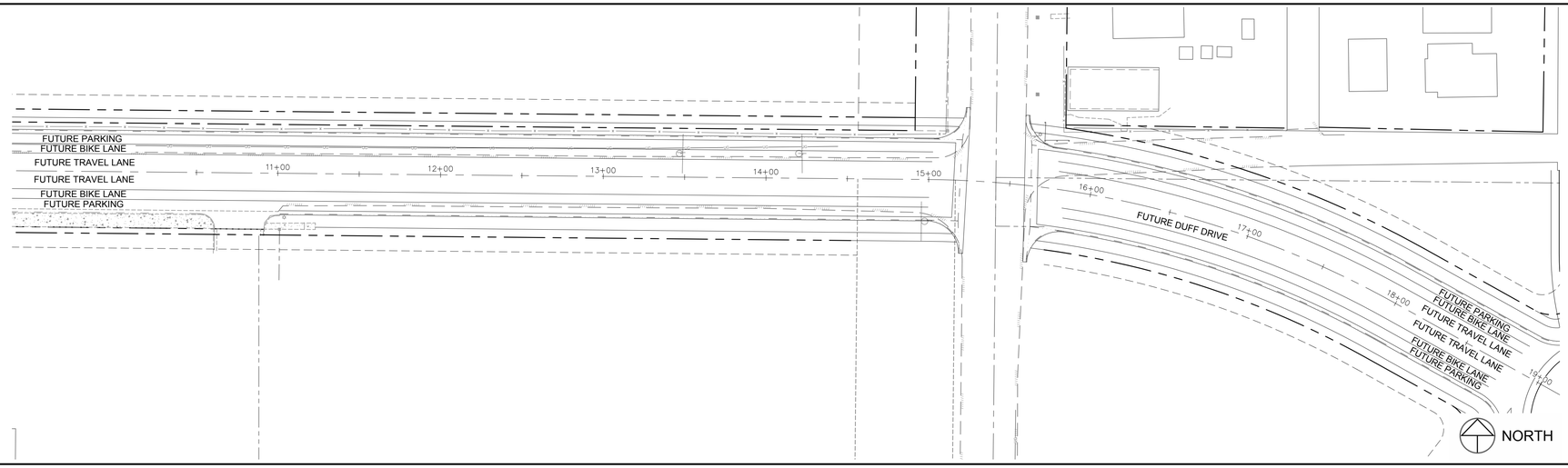
DATE: DECEMBER 10, 2014
SCALE: 1"=40'
REVIEWED BY: N. Haws
PROJECT: 939.001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese

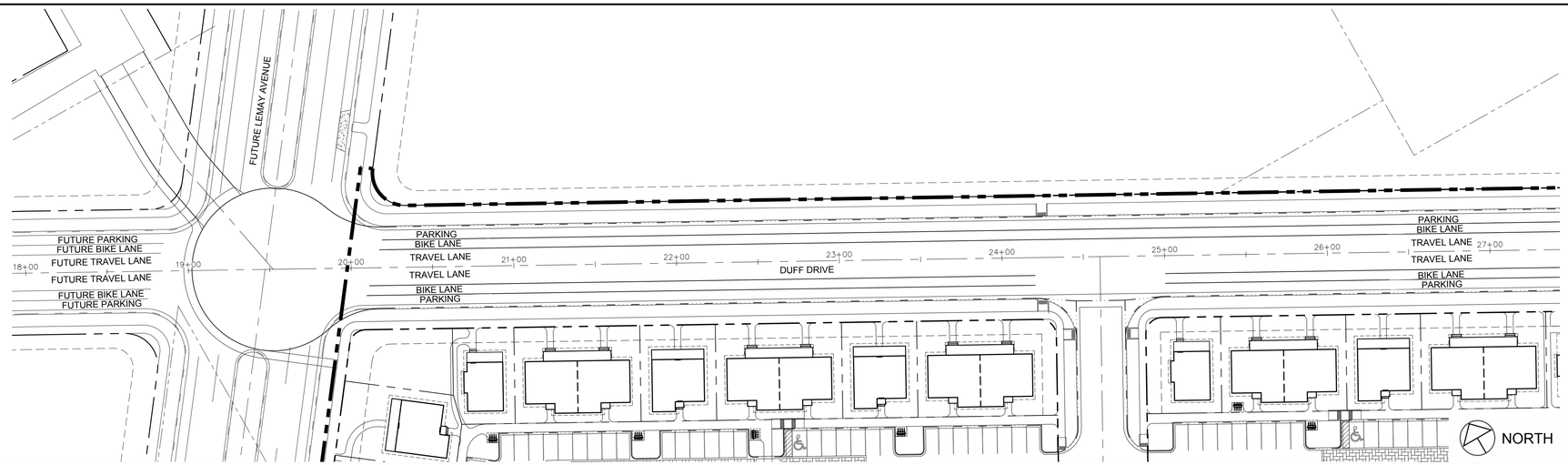
CAPSTONE COTTAGES

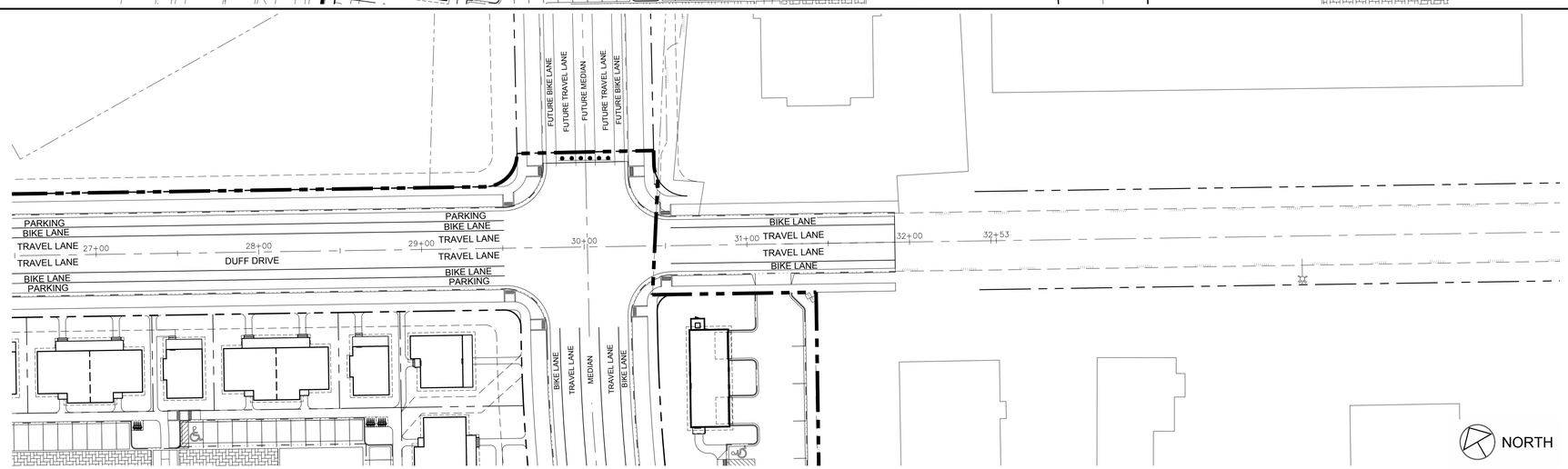
LINCOLN AVE. & INTERNATIONAL BLVD. STRIPING PLAN

Sheet
C519
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Civil\939-001_Striping Plan.dwg LAYOUT NAME: C519 DATE: Dec 11, 2014 - 4:58pm CAD OPERATOR: adam
LIST OF XREFS: [939-001_xAD] [939-001_MP_ASIS] [939-001_xC519] [ACS-xbase#] [939-001_xSTRIPing] [939-001_xCNAM~1999]

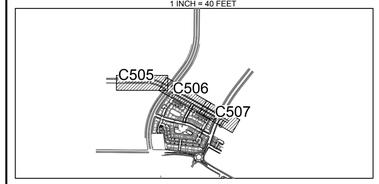






40 0 40 80 120

(IN FEET)
1 INCH = 40 FEET



KEYMAP

LEGEND:

- PROPOSED CURB & GUTTER
- FUTURE CURB & GUTTER
- PROPOSED CENTERLINE
- FUTURE CENTERLINE
- PROPOSED RIGHT-OF-WAY
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APPROVED: _____ City Engineer _____ Date

CHECKED BY: _____ Water Utility _____ Date

CHECKED BY: _____ Stormwater Utility _____ Date

CHECKED BY: _____ Parks & Recreation _____ Date

CHECKED BY: _____ Traffic Engineer _____ Date

CHECKED BY: _____ Environmental Planner _____ Date

No. Revisions: Date:
1 12/10/14

REVIEW SET
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NORTHERN ENGINEERING
www.northernengineering.com
Phone: 970.221.4158
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

PROJECT: 939.001
DATE: DECEMBER 10, 2014
SCALE: 1"=40'
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
REVIEWED BY: N. Haws

CAPSTONE COTTAGES

DUFF DRIVE
STRIPING PLAN

Sheet
C520
Of 40 Sheets

DRAWING FILENAME: D:\Projects\939-001\Dwg\Civil\939-001_Striping Plan.dwg LAYOUT NAME: C520 DATE: Dec 11, 2014 - 4:59pm CAD OPERATOR: sdsm
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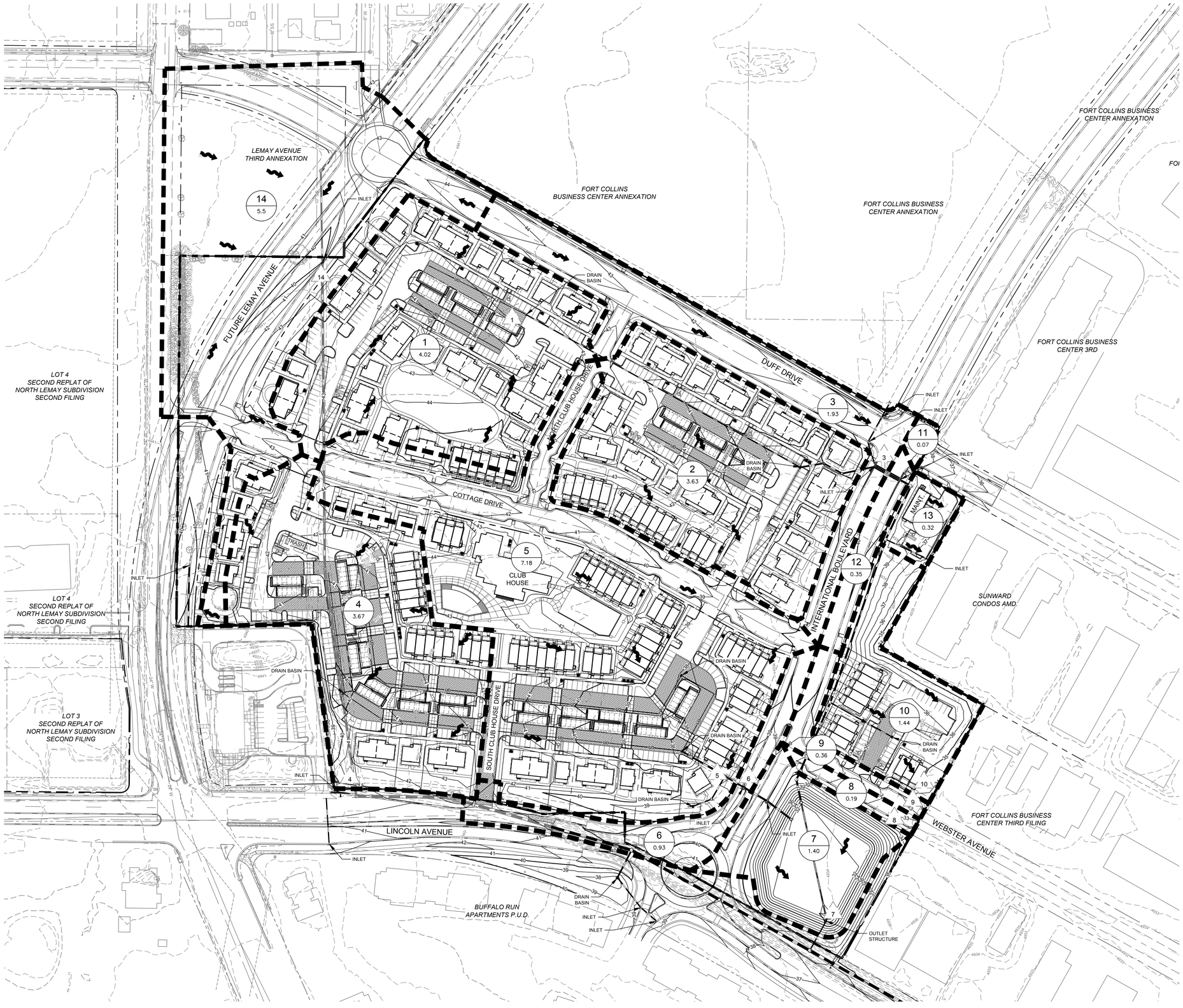

NORTH

80 0 80 160 240

(IN FEET)
1 INCH = 80 FEET

LEGEND:

- PROPOSED STORM DRAIN
- PROPOSED UNDERDRAIN (UD)
- PROPOSED INLET
- PROPOSED CONTOUR (93)
- EXISTING CONTOUR (4953)
- PROPOSED SWALE
- PROPOSED CURB & GUTTER
- PROPERTY BOUNDARY
- DESIGN POINT (1)
- FLOW ARROW
- DRAINAGE BASIN LABEL (BASIN DESIGNATION 1, 0.22 BASIN AREA (AC))
- DRAINAGE BASIN BOUNDARY
- PERMEABLE PAVERS

NOTES:

1. REFER TO THE "PRELIMINARY DRAINAGE AND EROSION CONTROL REPORT FOR CAPSTONE COTTAGES" BY NORTHERN ENGINEERING, DATED DECEMBER 10, 2014 FOR ADDITIONAL INFORMATION.

PROJECT BENCHMARKS

BENCHMARK #1:
City of Fort Collins Benchmark 3-00
NGVD29 Elevation= 4964.15
(NAVD88 Elevation= 4967.33)

BENCHMARK #2:
City of Fort Collins Benchmark 12-07
NGVD29 Elevation= 4944.68
(NAVD88 Elevation= 4947.86)

FOR DRAINAGE REVIEW ONLY
NOT FOR CONSTRUCTION

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Revisions: No. Date:
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NORTHERN ENGINEERING
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PROJECT: 659-001
DESIGNED BY: A. Reese
DRAWN BY: A. Boese
DATE: DECEMBER 10, 2014
SCALE: 1"=80'
REVIEWED BY: N. Hawa

CAPSTONE COTTAGES

DRAINAGE EXHIBIT

Sheet
C600
Of 40 Sheets

DRAWING FILENAME: D:\Projects\659-001\Engineering\Drainage\659-001_DRNG.dwg LAYOUT NAME: C600 DATE: Dec 11, 2014 - 4:59pm CAD OPERATOR: adam
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Luminaire Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens Per Lamp	Light Loss Factor	Wattage
	A3	4	Antique Street Lamps	TLRC15 63LED 530mA 40K GCF R4 120 DBL	RESONANCE 1.5 63LED 530mA 4000K FLAT LENS TYPE4 120V DBL	ONE 110-WATT LED, DOWNLIGHT PENDANT POS.	1	TLRC15_63LED_530mA_40K_GCF_R4_120_DBL.ies	7237.24	1	110.6
	B4	28	Lithonia Lighting	KAD LED 1 63B530/40K SR4	KAD LED GEN 1 HLM, 63 LEDs, 530mA DRIVER, 4000K COLOR TEMPERATURE, TYPE 4 LENS	LED	1	KAD_LED_1_63B530_40K_SR4.ies	8245.934	1	109
	B2	29	Lithonia Lighting	KAD LED 1 63B530/40K SR2	KAD LED GEN 1 HLM, 63 LEDs, 530mA DRIVER, 4000K COLOR TEMPERATURE, TYPE 2 LENS	LED	1	KAD_LED_1_63B530_40K_SR2.ies	8352.301	1	109
	B5	10	Lithonia Lighting	KAD LED 1 63B530/40K SR5	KAD LED GEN 1 HLM, 63 LEDs, 530mA DRIVER, 4000K COLOR TEMPERATURE, TYPE 5 LENS	LED	1	KAD_LED_1_63B530_40K_SR5.ies	8451.672	1	109
	A2	31	Antique Street Lamps	TLRC15 49LED 350mA 40K GCF R2 120 DBL	RESONANCE 1.5 49LED 350mA 4000K FLAT LENS TYPE 2 120 DBL	ONE 58.52-WATT LED, PENDANT DOWNLIGHT POS.	1	TLRC15_49LED_350mA_40K_GCF_R2_120_DBL.ies	4222.698	1	58.52

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max
Calc Zone #1	+	0.4 fc	8.5 fc	0.0 fc	N/A	N/A	0.0:1

CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

RIPLEY DESIGN INC.

• •land planning • •landscape architecture • •
• •urban design • •entitlement • •

401 West Mountain Avenue Suite 100 Fort Collins, CO 80521
fax 970.224.1682 phone 970.224.5828 www.vfrdesigninc.com

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CAPSTONE COLLEGIATE COMMUNITIES
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BIRMINGHAM, ALABAMA 35223
205.414.6400

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MANAGER: LOUIS NEQUETTE, AIA
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MOUNTAIN BROOK, ALABAMA 35223
205.329.7003

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FORT COLLINS, CO 80521
970.493.4394

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FORT COLLINS, CO 80521
970.224.5828

TRAFFIC ENGINEER
DELICH ASSOCIATES
MATT DELICH, P.E., PTOE
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
970.669.2061

ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	12-10-2014

REVISIONS

No.	DESCRIPTION	DATE

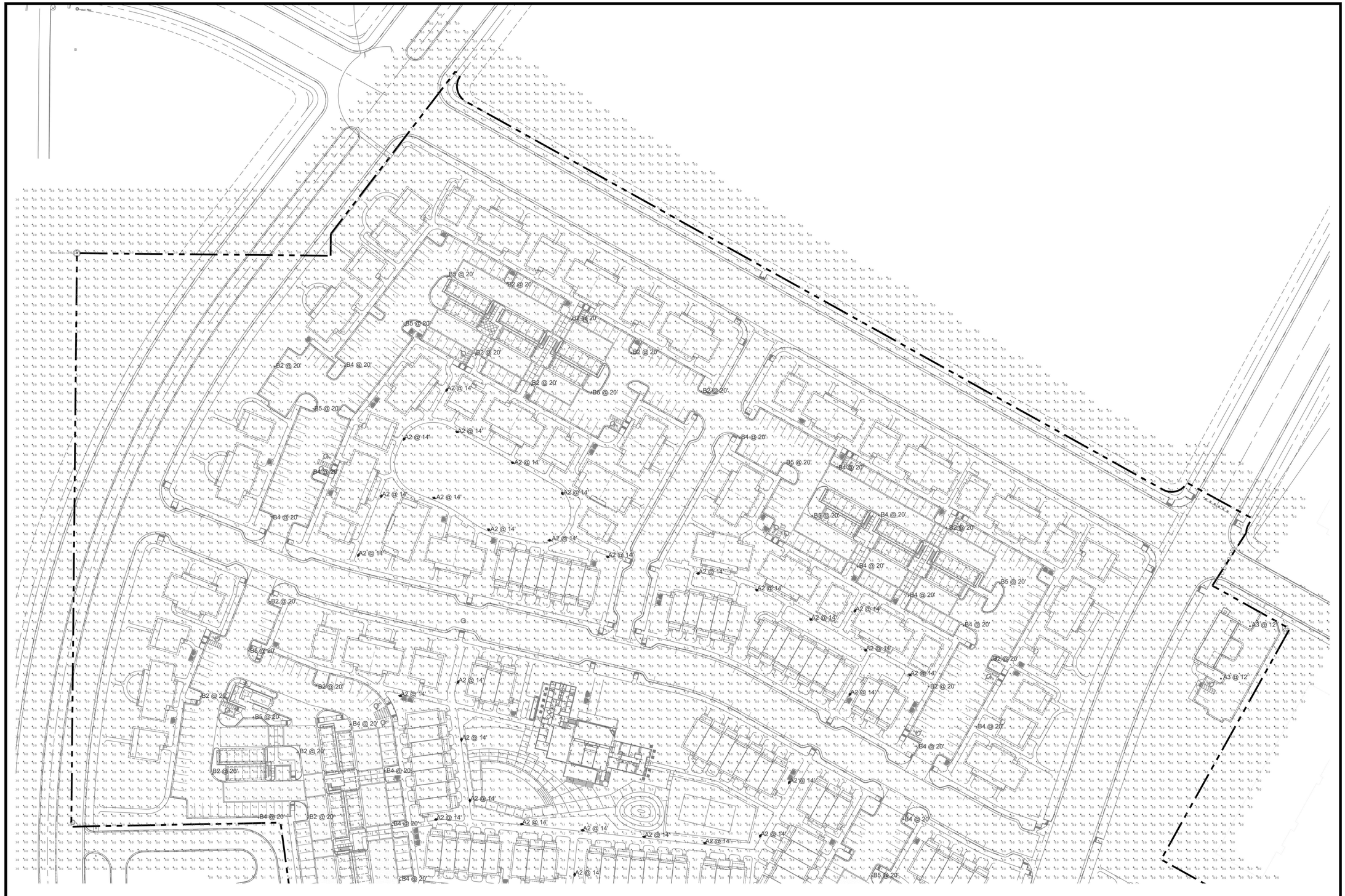
SEAL:

PROJECT No.:
DRAWN BY:
REVIEWED BY:

PHOTOMETRIC PLAN FIXTURE LOCATIONS

DRAWING NUMBER:

P1.0



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No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	12-10-2014

REVISIONS

No.	DESCRIPTION	DATE

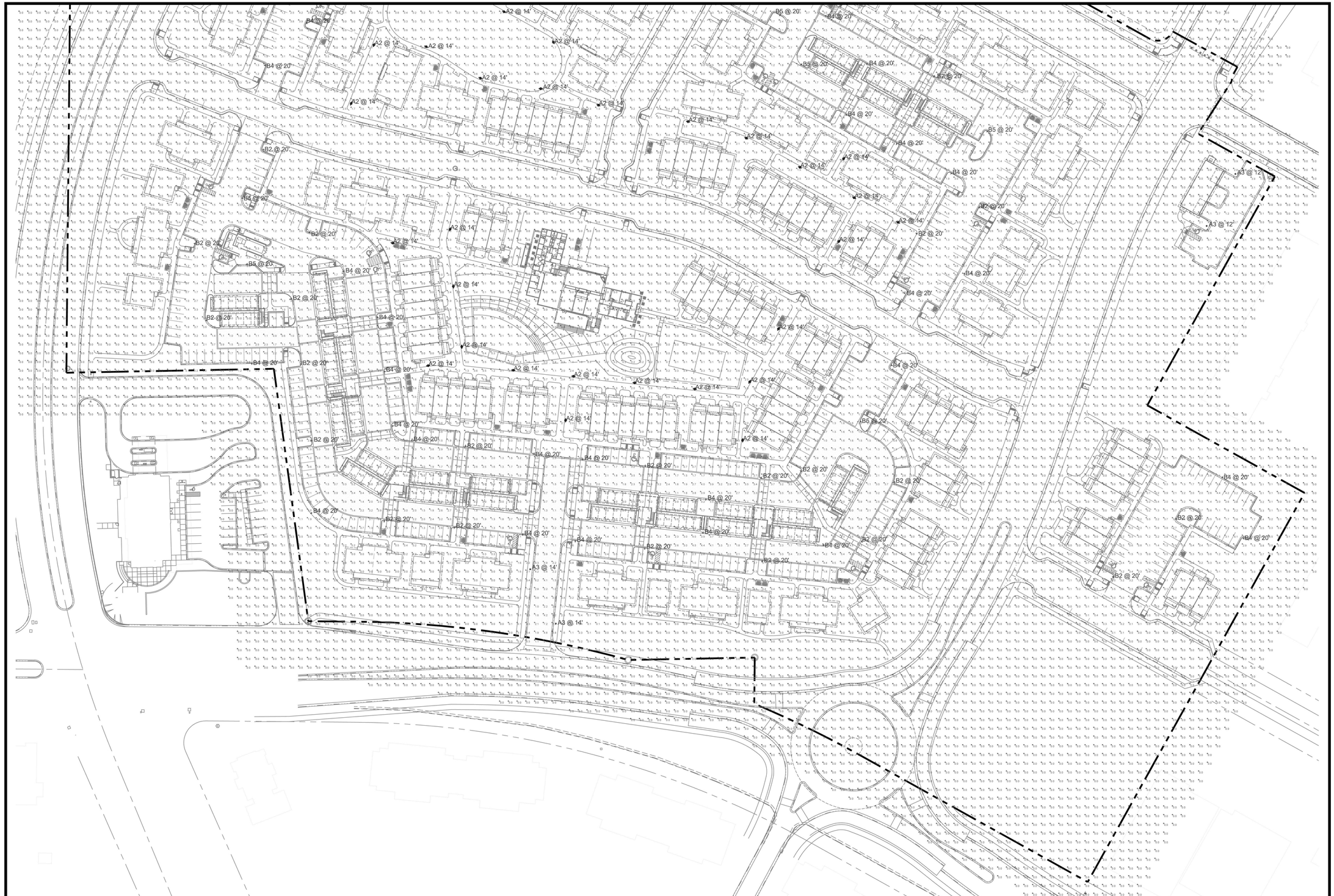
SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

PHOTOMETRIC PLAN NORTH

DRAWING NUMBER:

P2.0



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ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	12-10-2014

REVISIONS

No.	DESCRIPTION	DATE

SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

PHOTOMETRIC PLAN SOUTH

DRAWING NUMBER:

P3.0

ANTIQUE STREET LAMPS™ — RESONANCE™ 1.5 LED TLRC15

CATALOG # TYPES
PROJECT
TYPE A2,A3



Construction:
The luminaire is die cast and permanent mold aluminum. The roof has an internal hinge, hidden from view. Roof and driver lids are sealed with silicone gaskets. All exposed hardware is weather resistant.
FINISH: The luminaire has a powder coat finish utilizing a premium TGIC polyester powder. The finish is a three-stage process that consists of drying, powder application and curing. Before coating, the parts are treated with a five-stage pretreatment process, consisting of a heated alkaline cleaner, rinse, phosphate coating, rinse, and sealant.

Optics:
The horizontal lens is tempered flat glass with a continuous seal. The luminaire utilizes a precision acrylic refractive optics for optimum light distribution through the flat glass lens. Available in Type II, III, IV, and V.

Electrical:
High-efficiency nominal 4000K, 65 CRI LEDs mounted to a metal-core circuit board and aluminum heat sink, ensuring optimal thermal management and long life. Designed to provide more thatn 60,000 hours of performance (L85) at 25C (77F) ambient temperatures. Maximum ambient 35C (95F). Standard and dimming drivers are available in 120-277V and 347-480V; 50/60 Hz. Drivers have power factor >90% and THD <20%. Expected driver life is over 60,000 hours, matching the light engine life. Integral surge protection tested in accordance with IEEE/ANSI C62.41.2 to Category C Low.

Installation:
The luminaire mounts on a 3" O.D. x 3" tall tenon with six, ¼-20 socket set screws. The hinged roof/reflector housing is furnished with captive screws for access to the light engine. The light engine is furnished with a quick-disconnect plug. The driver assembly is furnished with a quick-disconnect plug and mounts on a bracket. The bracket is accessible by removing the driver lid fastened by a fastener.

Listings:
The luminaire is tested to and meets all NRTL's outdoor requirement standards, wet location use, through the fully accredited and approved CSA laboratory.

Max EPA: 1.8 sq feet
Max Height: 33" (83.8 cm)
Max Width: 19" (48.2 cm)
Max Weight: 46 lbs (20.8 kg)

Sample Catalog number:

TLRC15	49LED 350MA	30K	R2	120	GCF	SF	DWH
Series	Lumen Package	LED Color	Distribution	Voltage	Lens	Options	Finish

ENERGY INDEPENDENCE AND SECURITY ACT 2007 (EISA) — NIGHTTIME FRIENDLY

Ordering *Guide:*

Series	Lumen Package	LED Color	Distribution	Voltage	Lens	Options
TLRC15	49LED 350MA 49LED 530MA 49LED 700MA 63LED 350MA 63LED 530MA 63LED 700MA	30K 40K 50K	R2 Type 2 R3 Type 3 R4 Type 4 R5 Type 5	120 208 240 277 347[1] 480[1] MVOLT	GCF	SF Single Fuse SF Double Fuse SPD6KV[2] Surge Protection SPD10KV[2] Surge Protection

Finish

DBL Black
DDB Dark Bronze
DNA Natural Aluminum
DWH White
CM Custom Match
CS Custom Select RAL Colors

Notes:
1. 347 and 480V not available with dimming
2. Specific voltage required with surge protection

TLRC15 LED

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Series

Select Your Options From
- ☐ TLRC15 Tersen Luminaires-Resonance 1.5 LED

Lumen Package

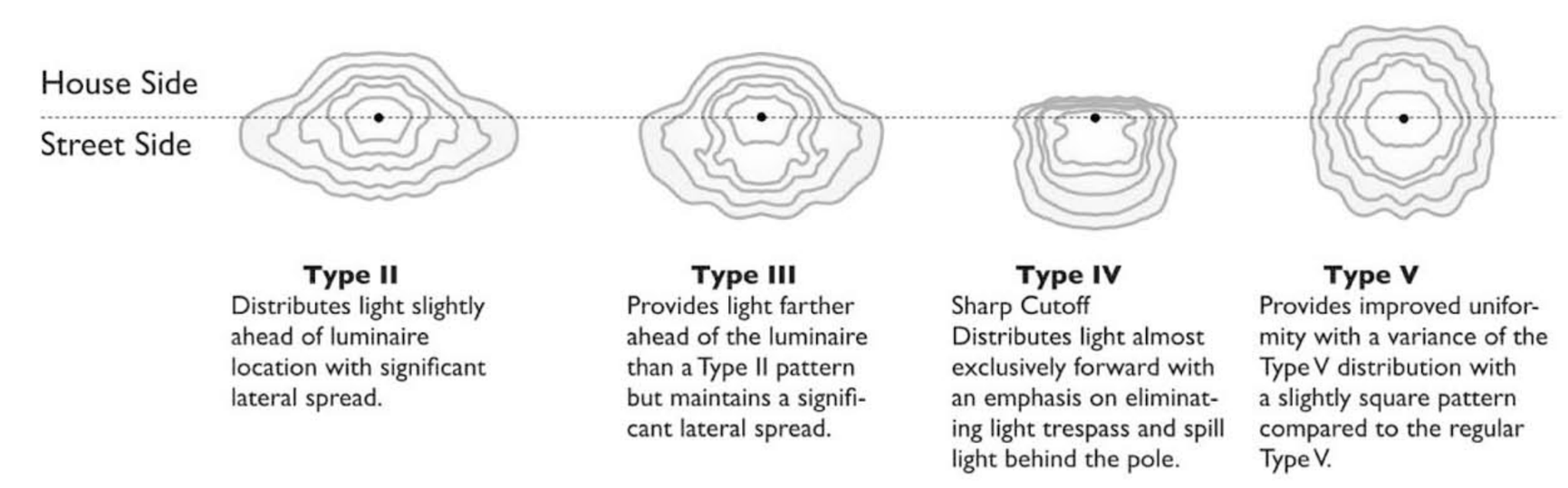
Select Your Options From
- ☐ 49LED 350MA
- ☐ 49LED 530MA
- ☐ 49LED 700MA
- ☐ 63LED 350MA
- ☐ 63LED 530MA
- ☐ 63LED 700MA

LED Color

Select Your Options From
- ☐ 30K
- ☐ 40K
- ☐ 50K

Distribution

Select Your Options From
- ☐ R2 Type II
- ☐ R3 Type III
- ☐ R4 Type IV
- ☐ R5 Type V



Type II Distributes light slightly ahead of luminaire location with significant lateral spread.

Type III Provides light farther ahead of the luminaire than a Type II pattern but maintains a significant lateral spread.

Type IV Sharp Cutoff Distributes light almost exclusively forward with an emphasis on eliminating light trespass and spill light behind the pole.

Type V Provides improved uniformity with a variance of the Type V distribution with a slightly square pattern compared to the regular Type V.

TLRC15 LED

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Voltage

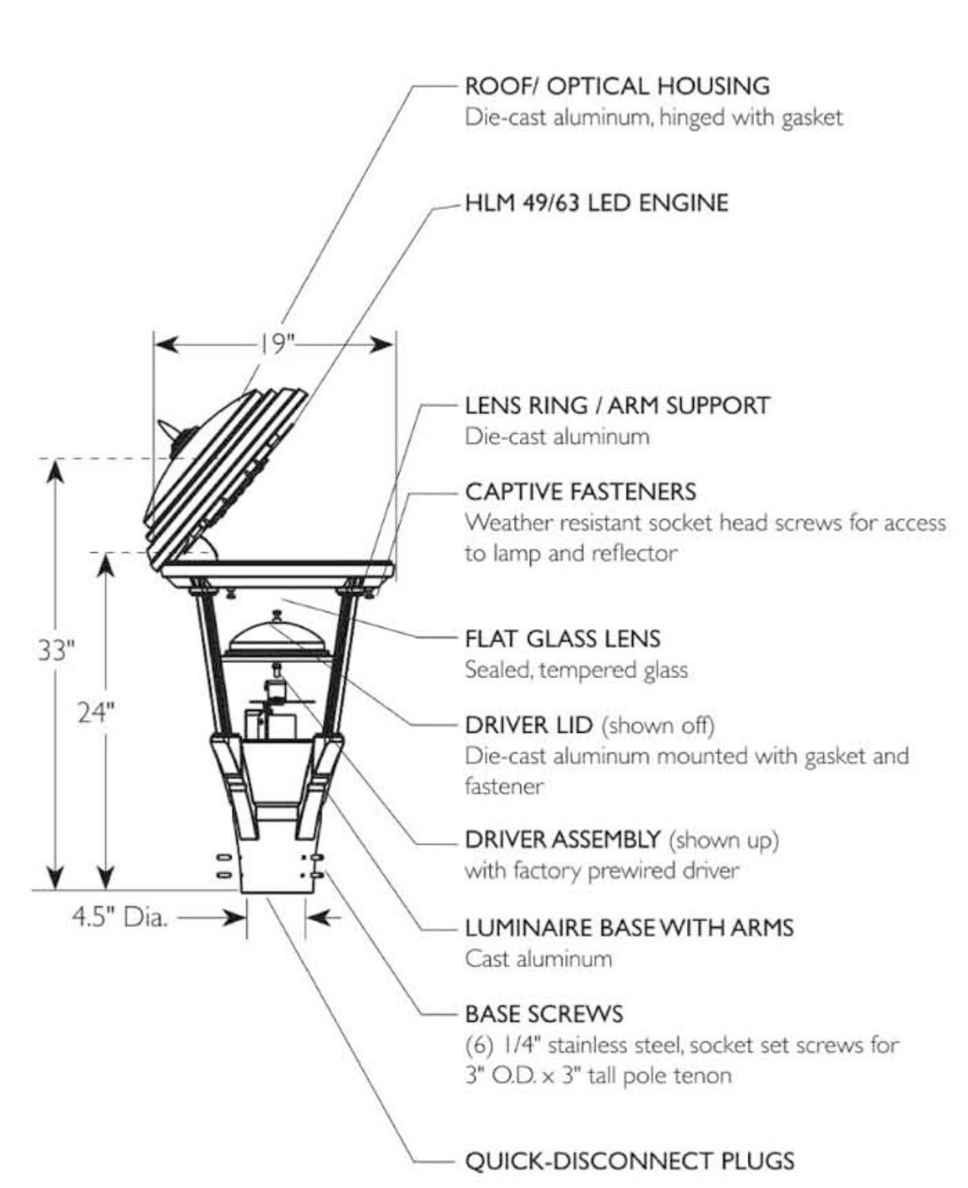
Select Your Options From
- ☐ 120 120 Volt
- ☐ 208 208 Volt
- ☐ 240 240 Volt
- ☐ 277 277 Volt
- ☐ 347[1] 347 Volt
- ☐ 480[1] 480 Volt
- ☐ MVOLT

Notes:
1. 347 and 480V not available with dimming

Lens

Select Your Options From
- ☐ GCF Glass Flat Lens

Options



Select Your Options From
- ☐ SF Single Fusing
- ☐ DF Double Fusing
- ☐ SPD6KV[2] Surge Protection
- ☐ SPD10KV[2] Surge Protection

Notes:
2. Specific voltage required with surge protection

TLRC15 LED

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Finish

The luminaire has a powder coat finish utilizing a premium TGIC polyester powder. The finish is a three-stage process which consists of drying, powder application and curing. Before coating, the parts are treated with a five-stage pretreatment process, consisting of a heated alkaline cleaner, rinse, phosphate coating, rinse and sealant.

For a complete listing of colors, visit:
www.acuitybrandslighting.com/architecturalcolors

Select Your Options From
- ☐ DBL Black
- ☐ DDB Dark Bronze
- ☐ DNA Natural Aluminum
- ☐ DWH White
- ☐ CM Custom Match
- ☐ CS Custom Select (RAL colors)

Notes:
CS: This choice requires that a custom powder be manufactured to match a specific color chip provided by the specifier
CM: ASL offers custom selected RAL powder coat colors. See chart (form 794.3) for cataloged optional colors or contact the factory.

TLRC15 LED

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KAD LED
LED Area Luminaire



Catalog Number TYPES
Notes B2,B3,B5
Type

Hit the Tab key or mouse over the page to see all interactive elements.

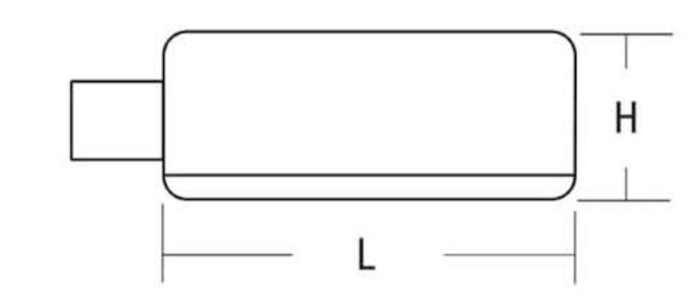
Introduction

The Contour® Series luminaires offer traditional square dayforms with softened edges for a versatile look that complements many applications.

The KAD LED combines the latest in LED technology with the familiar aesthetic of the Contour® Series for stylish, high-performance illumination that lasts. It is ideal for replacing 100-250W metal halide in area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.

Specifications

EPA: 1.2 ft² (0.11 m²)
Length: 17-1/2" (44.5 cm)
Width: 17-1/2" (44.5 cm)
Height: 7-1/8" (18.1 cm)
Weight (max): 36 lbs (16.4 kg)



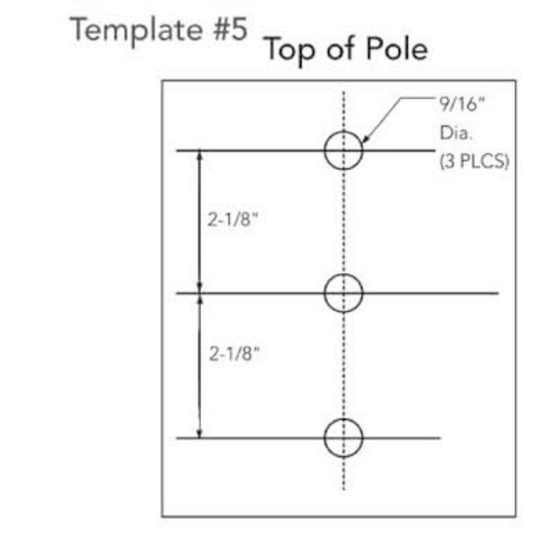
Ordering Information

EXAMPLE: KAD LED 1 63B350/40K SR5 MVOLT SPD04 DDBXD

Series	Light Engines	Performance Package[1]	Distribution	Voltage	Mounting	Options	Finish (required)
KAD LED	1 One engine (49 or 63 LEDs)	**350 mA options:** 49B350/30K 3000K 49B350/40K 4000K 49B350/50K 5000K 63B350/30K 3000K 63B350/40K 4000K 63B350/50K 5000K **530 mA options:** 63B530/30K 3000K 63B530/40K 4000K 63B530/50K 5000K	SR2 Type II SR3 Type III SR4 Type IV SR5 Type V	MVOLT[2] 120[2] 208[2] 240[2] 277[2] 347 480	**Shipped included** Type / Length SPD__ Square pole — 04 4" arm RPD__ Round pole — 06 6" arm WBD__ Wall bracket — 09 9" arm WWD__ Wood pole or wall — 12 12" arm	**Shipped installed** PER NEMA twist-lock receptacle only (no controls) SF Single fuse (120, 277, 347V)[3] DF Double fuse (208, 240, 480V)[3] DMG 0-10V dimming driver (no controls)[4] DFL Diffusing lens **Shipped separately** VG Vandal guard[5] WG Wire guard[5]	DDBXD Dark bronze DBLXD Black DNAXD Natural aluminum DWHXD White DDBTXD Textured dark bronze DBLBXD Textured black DNATXD Textured natural aluminum DWHGXD Textured white

Drilling

Template #5 Top of Pole



Accessories
Ordered and shipped separately.

DLL127F 1.5 JU	Photocell - SSL twist-lock (120-277V)[6]
DLL347F 1.5 CUL JU	Photocell - SSL twist-lock (347V)[6]
DLL480F 1.5 CUL JU	Photocell - SSL twist-lock (480V)[6]
SC U	Shorting cap[6]
KMA DDBXD U	Mast arm adapter (specify finish)
KADWG U	Wire guard accessory
KADVG U	Vandal guard accessory

For more control options, visit DTL and ROAM online.

Tenon Mounting Slipfitter *

Tenon O.D.	Single Unit	2 at 180°	2 at 90° †	3 at 120°	3 at 90° †	4 at 90° †
2-3/8"	T20-190	T20-280	T20-290	T20-320 †	T20-390	T20-490
2-7/8"	T25-190	T25-280	T25-290	T25-320	T25-390	T25-490
4"	T35-190	T35-280	T35-290	T35-320	T35-390	T35-490

* For round pole mounting (RPA) only. † Requires 9" or 12" arm.

NOTES
1. Configured with 4000K (/40K) provides the shortest lead times. Consult factory for 3000K (/30K) and 5000K (/50K) lead times.
2. MVOLT driver operates on any line voltage from 120-277V (50/60 Hz). Specify 120, 208, 240 or 277 options only when ordering with fusing (SF, DF options).
3. Single fuse (SF) requires 120, 277 or 347 voltage option. Double fuse (DF) requires 208, 240 or 480 voltage option.
4. Not available with 347 or 480V.
5. Also available as a separate accessory; see Accessories information at left.
6. Requires luminaire to be specified with PER option. Ordered and shipped as a separate line item.

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Performance Data

Lumen Output

Lumen values are from photometric tests performed in accordance with IESNA LM-79-08. Data is considered to be representative of the configurations shown, within the tolerances allowed by Lighting Facts. Actual wattage may differ by +/- 8% when operating between 120-480V +/- 10%. Contact factory for performance data on any configurations not shown here.

LEDs	Drive Current (mA)	Performance Package	System Watts	Dist. Type	40 K (4000 K, 67 CRI) Lumens	B	U	G	LPW
1 (49 LEDs)	350	49B350/--K	59W	SR2	5068	1	0	1	86
				SR3	4663	1	0	1	80
				SR4	4667	1	0	1	80
				SR5	4853	3	0	1	82
1 (63 LEDs)	350	63B350/--K	74W	SR2	6148	1	0	1	83
				SR3	6374	1	0	1	86
				SR4	6250	1	0	1	84
				SR5	6464	3	0	1	87
	530	63B530/--K	109W	SR2	8353	2	0	2	77
				SR3	8595	2	0	2	79
				SR4	8246	2	0	2	76
				SR5	8452	3	0	1	78

Lumen Ambient Temperature (LAT) Multipliers

Use these factors to determine relative lumen output for average ambient temperatures from 0-40°C (32-104°F).

Ambient		Lumen Multiplier
0°C	32°F	1.02
10°C	50°F	1.01
20°C	68°F	1.00
25°C	**77°F**	**1.00**
30°C	86°F	1.00
40°C	104°F	0.99

Projected LED Lumen Maintenance

Data references the extrapolated performance projections for the **KAD LED 1 63B530** platform in a **40°C ambient**, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Operating Hours	0	25,000	50,000	100,000
Lumen Maintenance Factor	1.0	0.95	0.92	0.87

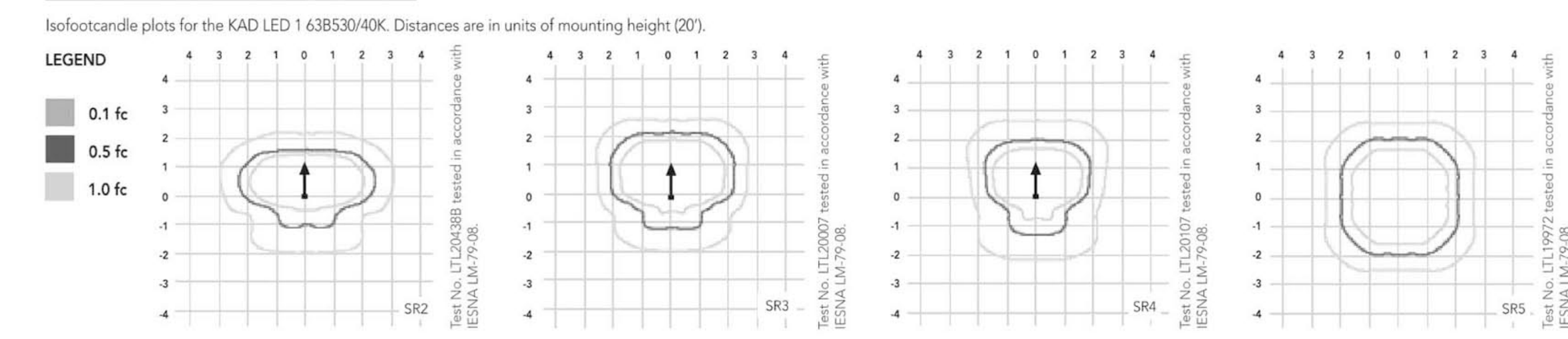
Electrical Load

Light Engines	Drive Current (mA)	System Watts	Current (A) 120	208	240	277	347	480
1 (49)	350	59W	0.55	0.32	0.27	0.24	0.19	0.14
1 (63)	350	74W	0.69	0.40	0.34	0.30	0.24	0.17
	530	109W	1.01	0.58	0.50	0.44	0.35	0.25

Photometric Diagrams

To see complete photometric reports or download .ies files for this product, visit Lithonia Lighting's KAD LED homepage.

Isofootcandle plots for the KAD LED 1 63B530/40K. Distances are in units of mounting height (20').



FEATURES & SPECIFICATIONS

INTENDED USE
The energy savings and long life of the KAD LED area luminaire make it a reliable choice for illuminating streets, walkways, parking lots, and surrounding areas.

CONSTRUCTION
Single-piece die-cast, aluminum housing with contoured edges has a 0.12" nominal wall thickness. Die-cast door frame has an impact-resistant, tempered glass lens that is fully gasketed with one-piece tubular silicone.

FINISH
Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering. A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling.

OPTICS
Precision-molded refractive acrylic lenses housed behind the door frame lens are available in four distributions. Light engines are available in standard 4000K (67 CRI) or optional 3000K (80 CRI) or 5000K (67 CRI) configurations.

ELECTRICAL
Light engine consists of 49 or 63 high-efficacy LEDs mounted to a metal-core circuit board and aluminum heat sink, ensuring optimal thermal management and long life. Class 1 electronic driver has a power factor >90%, THD <20%, and has an expected life of 100,000 hours with <1% failure rate. Easily-serviceable surge protection device meets a minimum Category C Low (per ANSI/IEEE C62.41.2).

INSTALLATION
Extruded aluminum arm for pole or wall mounting.

LISTINGS
CSA certified to U.S. and Canadian standards. Luminaire is IP65 rated. Rated for -40°C minimum ambient.

DesignLights Consortium® (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org to confirm which versions are qualified.

WARRANTY
Five year limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx.

Note: Specifications subject to change without notice.

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CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

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ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	12-10-2014

REVISIONS

No.	DESCRIPTION	DATE

SEAL:

PROJECT No.:
DRAWN BY:
REVIEWED BY:

PHOTOMETRIC CUT SHEETS

DRAWING NUMBER:

P4.0

CAPSTONE COTTAGES
TRANSPORTATION IMPACT STUDY

FORT COLLINS, COLORADO

MARCH 2015

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Project # 1495

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B. Peak Hour Traffic Counts
C. Current Peak Hour Operation/Level of Service Descriptions/Fort Collins Motor Vehicle LOS Standards (Intersections)
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I. Pedestrian/Bicycle Level of Service Worksheets

I. INTRODUCTION

This transportation impact study (TIS) addresses the capacity, geometric, and control requirements at and near the proposed Capstone Cottages development. The proposed Capstone Cottages site is located in the northeast quadrant of the Lemay/Lincoln intersection in Fort Collins, Colorado. Capstone Cottages is a student housing development.

During the course of the analysis, numerous contacts were made with the owner (Capstone Collegiate Communities), the project engineer (Northern Engineering), the project planning consultant (Ripley Design), and Fort Collins Traffic Engineering. The Transportation Impact Study Base Assumptions form and related documents are provided in Appendix A. This study generally conforms to the format set forth in the Fort Collins TIS Guidelines in the "Larimer County Urban Area Street Standards" (LCUASS). Due to the trip generation, this is a full transportation impact study. The study involved the following steps:

- Collect physical, traffic, and development data;
- Perform trip generation, trip distribution, and trip assignment;
- Determine peak hour traffic volumes;
- Conduct capacity and operational level of service analyses on key intersections;
- Analyze signal warrants;
- Conduct level of service evaluation of pedestrian, bicycle, and transit modes of transportation

This TIS is a revision of the "Capstone Cottages PDP Transportation Impact Study" dated March 2014 and the "Capstone Cottages Transportation Impact Study" dated December 2014. The revised TIS addresses City staff comments and the revised site plan.

II. EXISTING CONDITIONS

The location of the Capstone Cottages development is shown in Figure 1. It is important that a thorough understanding of the existing conditions be presented.

Land Use

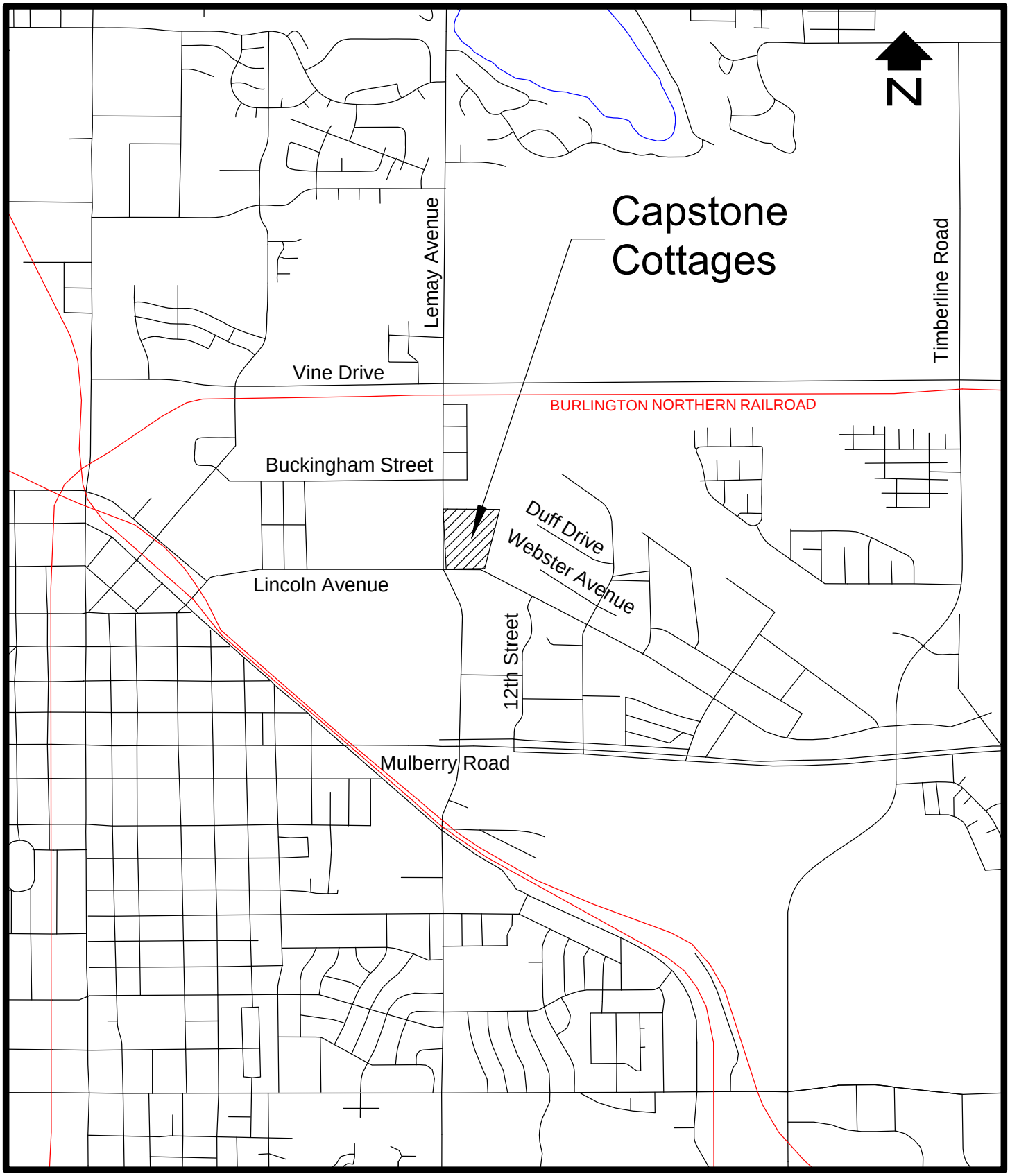
Land uses in the area are primarily residential, industrial, and commercial. There are residential uses to the north and south of the site. There are industrial uses to the east and west of the site. There are commercial uses to the south of the site. The proposed Capstone Cottages site is currently vacant. The center of Fort Collins lies to the southwest of the proposed Capstone Cottages site.

Streets

The primary streets near the Capstone Cottages site are Lemay Avenue, Lincoln Avenue, Buckingham Street, 12th Street, Duff Drive, Webster Avenue, Vine Drive, and future International Boulevard. Figure 2 shows a schematic of the existing geometry at the Lemay/Lincoln, Lemay/Buckingham, Lemay/Vine, Lincoln/Buffalo Run Access, and Lincoln/12th intersections.

Lemay Avenue is to the west of (adjacent to) the proposed Capstone Cottages site. It is a north-south street classified as a four-lane arterial according to the Fort Collins Master Street Plan. Currently, Lemay Avenue has a four-lane cross section, south of Lincoln and a two-lane cross section, north of Lincoln. At the Lemay/Lincoln intersection, Lemay Avenue has a northbound and a southbound left-turn lane, a through lane in each direction, and a northbound right-turn lane. At the Lemay/Buckingham intersection, Lemay Avenue has all movements combined into a single lane. At the Lemay/Vine intersection, Lemay Avenue has all movements combined into a single lane. The Lemay/Lincoln and Lemay/Vine intersections have signal control. The Lemay/Buckingham intersection has stop sign control on Buckingham. The posted speed limit in this area of Lemay Avenue is 35 mph, south of Lincoln Avenue, 30 mph from Lincoln to Vine Drive, and 35 mph, north of Vine Drive.

Lincoln Avenue is to the south of (adjacent to) the proposed Capstone Cottages site. It is an east-west street classified as a two-lane arterial according to the Fort Collins Master Street plan. Currently, Lincoln Avenue has a two-lane cross section. At the Lemay/Lincoln intersection, Lincoln Avenue has an eastbound and a westbound left-turn lane, a through lane in each direction, and an eastbound and a westbound right-turn lane. At the Lincoln/Buffalo Run Access intersection, Lincoln Avenue has a two-way left-turn lane and a through lane in each direction. At the Lincoln/12th intersection, Lincoln Avenue has all movements combined into a single lane. The Lincoln/Buffalo Run Access and Lincoln/12th intersections have stop sign control on Buffalo Run and 12th Street, respectively. The posted speed limit in this area of Lincoln Avenue is 35 mph.

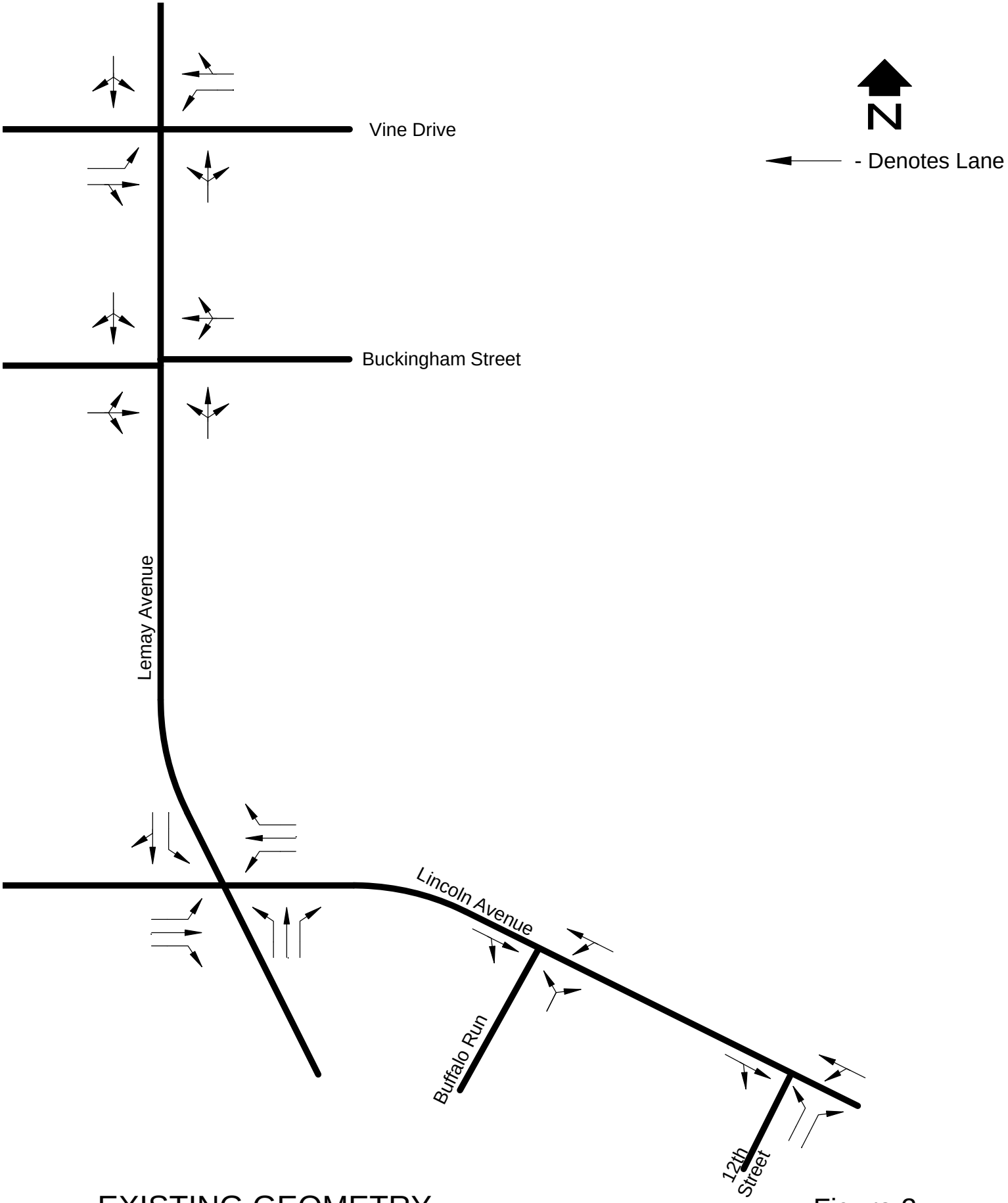


SCALE: 1"=2000'

SITE LOCATION

Figure 1

DELICH ASSOCIATES



EXISTING GEOMETRY

Figure 2

Buckingham Street is to the north of the proposed Capstone Cottages site. It is an east-west street classified as a two-lane collector according to the Fort Collins Master Street plan. Currently, Buckingham Street has a two-lane cross section. At the Lemay/Buckingham intersection, Buckingham Street has all movements combined into a single lane. The east and west legs of Buckingham Street are offset by approximately 18 feet at the Lemay/Buckingham intersection. West of Lemay Avenue, Buckingham Street is approximately 32 feet wide. East of Lemay Avenue, Buckingham Street is approximately 18 feet wide. The posted speed limit in this area on Buckingham Street is 30 mph, west of Lemay Avenue and 25 mph, east of Lemay Avenue.

Vine Drive is to the north of the proposed Capstone Cottages site. It is an east-west street classified a two-lane collector according to the Fort Collins Master Street plan. Currently, Vine Drive has a two-lane cross section. At the Lemay/Vine intersection, Vine Drive has an eastbound and a westbound left-turn lane and a through/right-turn lane in each direction. The posted speed limit in this area of Vine Drive is 35 mph, west of Lemay Avenue and 45 mph, east of Lemay Avenue.

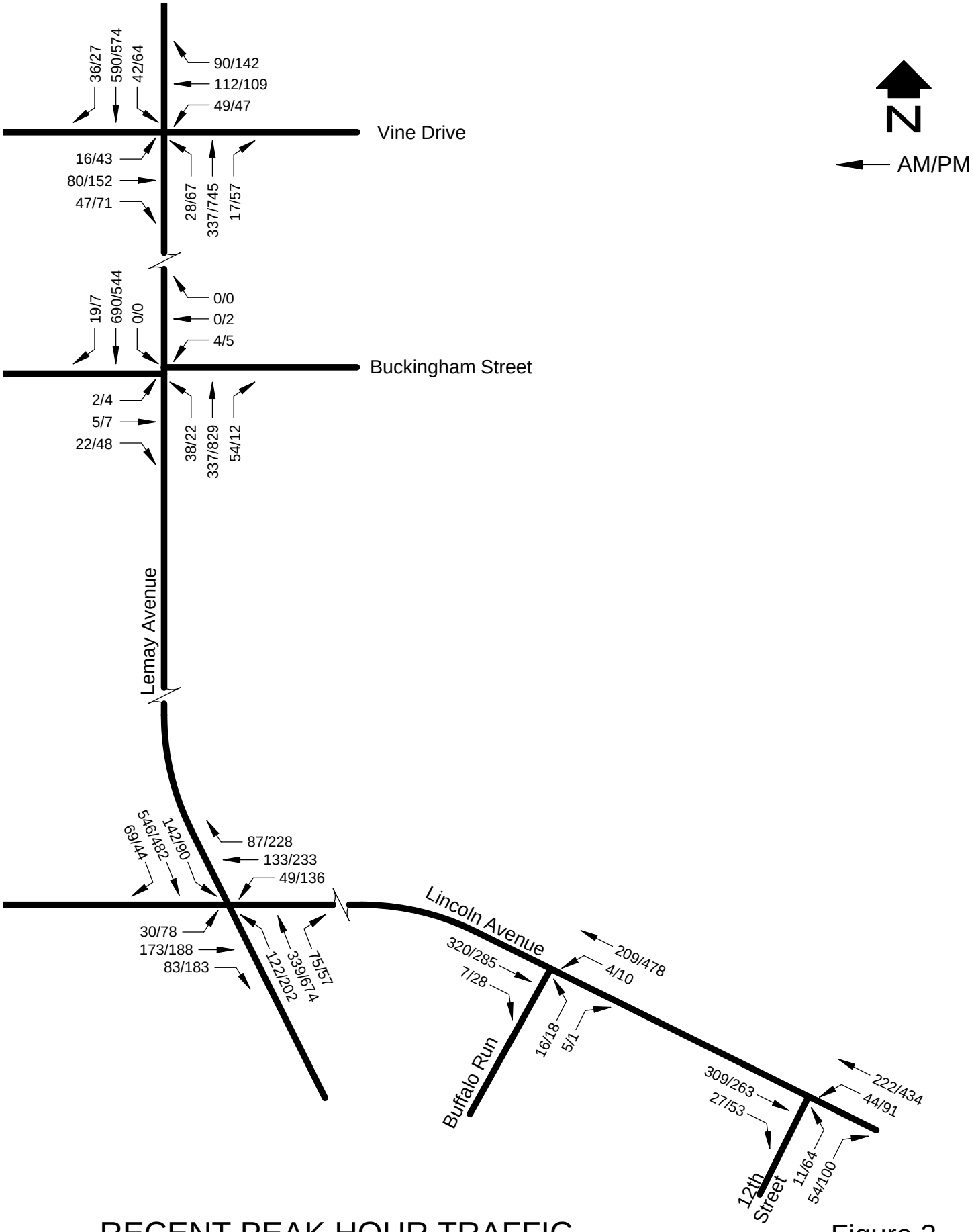
Twelfth Street is to the east of the proposed Capstone Cottages site. It is a north-south street classified a local street according to the Fort Collins Master Street plan. Twelfth Street only has a south leg at the Lincoln/12th intersection. Currently, 12th Street has a two-lane cross section with a two-way left-turn lane. At the Lincoln/12th intersection, 12th Street has two-way left turn lane and a right-turn lane. The posted speed limit in this area of 12th Street is 30 mph.

Duff Drive is to the east of the proposed Capstone Cottages site. It is a southeast-northwest street classified a two-lane collector according to the Fort Collins Master Street plan. Currently, Duff Drive has a two-lane cross section. Duff Drive terminates near the future International/Duff intersection. The posted speed limit in this area of Duff Drive is 25 mph.

Webster Avenue is to the east of the proposed Capstone Cottages site. It is a southeast-northwest street classified a local street according to the Fort Collins Master Street plan. Currently, Webster Avenue has a two-lane cross section. Webster Avenue terminates at the Capstone Property line. The posted speed limit in this area of Webster Avenue is 25 mph.

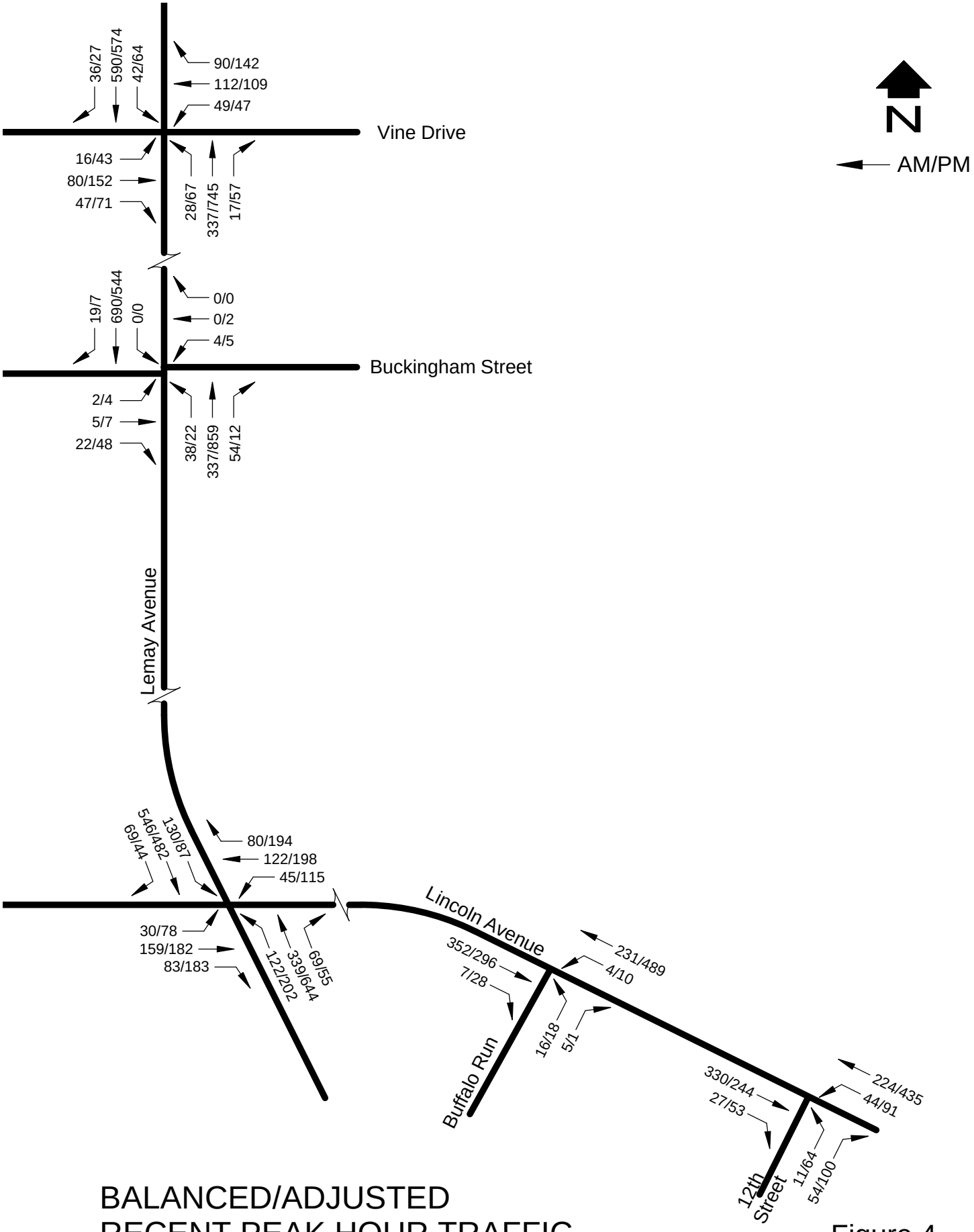
Existing Traffic

Recent morning and afternoon peak hour traffic volumes are shown in Figure 3. The traffic counts at the Lemay/Buckingham, Lemay/Vine, Lincoln/Buffalo Run Access, and Lincoln/12th intersections were obtained in February 2014. The traffic counts at the Lemay/Lincoln intersection were obtained in May 2014 by the City of Fort Collins. The traffic counts at the Lemay/Vine intersection were obtained in August 2012 by the City of Fort Collins. Raw traffic count data are provided in Appendix B. Since the counts



RECENT PEAK HOUR TRAFFIC

Figure 3



BALANCED/ADJUSTED RECENT PEAK HOUR TRAFFIC

Figure 4

were done on different days, the counts were adjusted/balanced. The adjusted/balanced recent peak hour traffic is shown in Figure 4. The Lemay/Vine intersection counts were not adjusted, since they are the basis of the Adequate Public Facilities analysis.

Existing Operation

The Lemay/Lincoln, Lemay/Buckingham, Lemay/Vine, Lincoln/Buffalo Run Access, and Lincoln/12th intersections were evaluated using techniques provided in the 2010 Highway Capacity Manual and 2000 Highway Capacity Manual (for Lemay/Vine intersection). Using the morning and afternoon peak hour traffic shown in Figure 4, the peak hour operation and the calculated delay for levels of service E & F are shown in Table 1. Calculation forms are provided in Appendix C. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during in the morning and afternoon peak hours, except the Lemay/Buckingham intersection in the afternoon peak hour. At the Lemay/Buckingham intersection, the calculated delay for the morning and afternoon peak hour westbound approach was commensurate with level of service E and F, respectively. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour eastbound left-turn lane was commensurate with level of service E. A description of level of service for signalized and unsignalized intersections from the 2010 Highway Capacity Manual is provided in Appendix C. Table 4-3 (revised per staff comments regarding type of intersection) showing the Fort Collins Motor Vehicle LOS Standards (Intersections) are also provided in Appendix C. This site is in an area termed “all other areas” on the Fort Collins Structure Plan. In areas termed “all other areas,” acceptable overall operation at signalized intersections during the peak hours is defined as level of service D or better. At signalized intersections, acceptable operation of any leg and any movement is level of service E. At arterial/arterial, arterial/collector or local stop sign controlled intersections, acceptable operation is considered to be at level of service E. At collector/local stop sign controlled intersections, acceptable operation is considered to be at level of service C for any approach leg.

Pedestrian Facilities

There are sidewalks along the south side of Lincoln Avenue along the Buffalo Run development. There are sidewalks along the west side of Lemay Avenue, between Lincoln Avenue and Vine Drive. There are sidewalks along the east side of Lemay Avenue, south of Lincoln Avenue. It is expected that as properties in this area are developed or redeveloped, sidewalks will be installed as part of the street/property infrastructure.

Bicycle Facilities

Bicycle lanes exist along Lincoln Avenue, Lemay Avenue, Buckingham Street, and Vine Drive within the study area.

TABLE 1 Current Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	A	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	A	A
	NB T	B	B
	NB RT	A	A
	NB APPROACH	A	B
	SB LT	A	B
	SB T/RT	A	A
	SB APPROACH	A	A
	OVERALL	B	C
Lemay/Buckingham (stop sign)	EB LT/T/RT	C	C
	WB LT/T/RT	E (40.2 secs)	F (51.3 secs)
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
Lemay/Vine (signal)	EB LT	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T/RT	D	D
	WB APPROACH	D	D
	SB LT/T/RT	A	A
	NB LT/T/RT	A	A
	OVERALL	B	B
Lincoln/Buffalo Run (stop sign)	NB LT/RT	B	C
	WB LT/T	A	A
Lincoln/12th (stop sign)	NB LT/RT	B	C
	WB LT/T	A	A

Transit Facilities

Currently, this area of Fort Collins is served by Transfort routes 5 and 14.

III. PROPOSED DEVELOPMENT

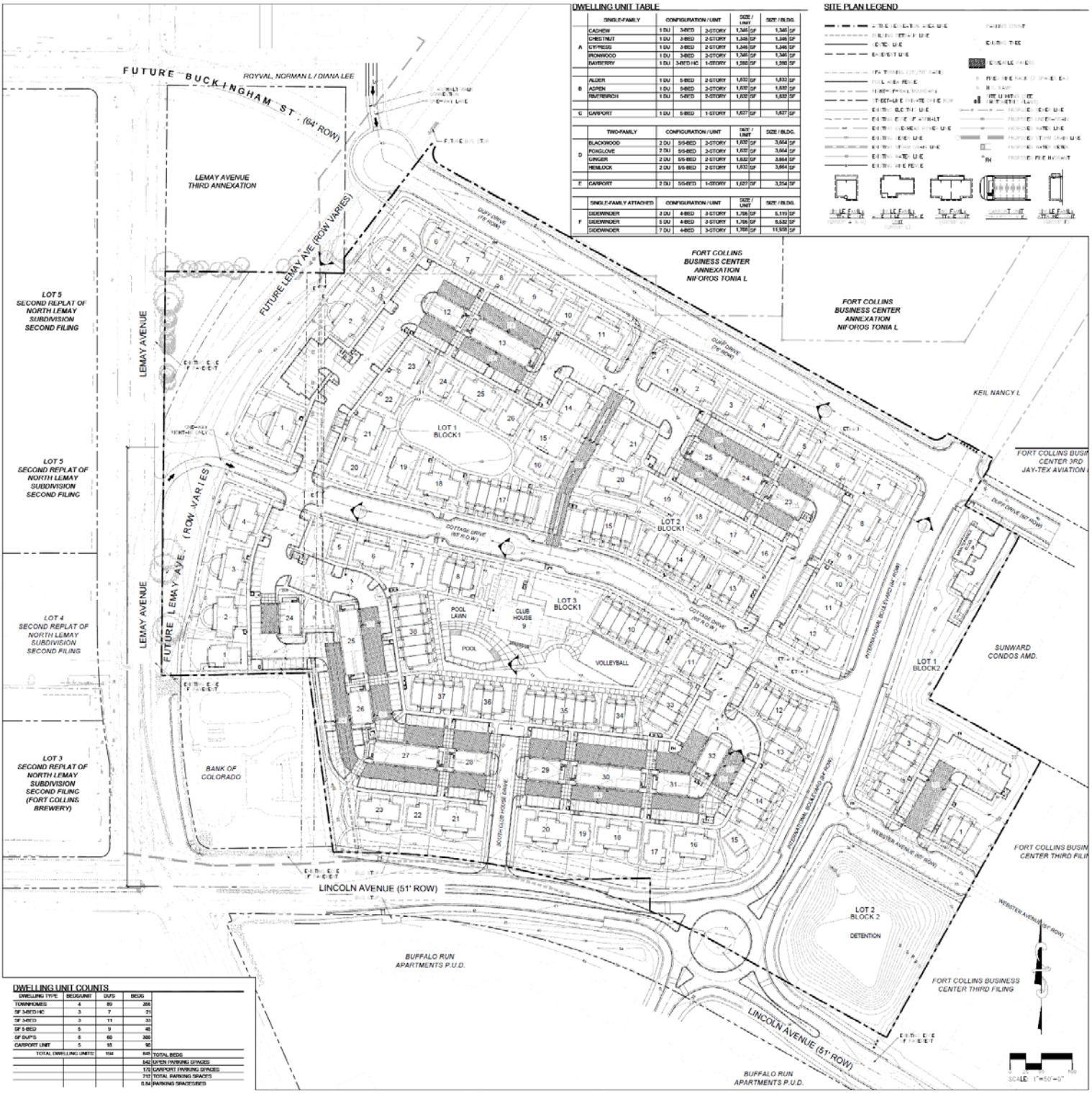
The Capstone Cottages is a student housing development with 860 beds (197 units). Figure 5 shows a site plan of the Capstone Cottages development. The short range analysis (Year 2019) includes the full development of the site and an appropriate increase in background traffic due to normal growth and other potential developments in the area. This development will build International Boulevard along the Capstone Cottages property. Duff Drive will also be built along the Capstone Cottages property. The long range future analysis year is considered to be 2035 and reflects the future realigned Lemay Avenue. In the short range (2019) future, the site plan shows that Capstone Cottages will have a right-in only access to Lemay Avenue and a full movement access to International Boulevard, and to Duff Drive. Capstone Cottages will have a right-in/right-out access to Lincoln Avenue. Webster Avenue will have right-in/right-out access to International Boulevard. There will be a temporary connection to the Anderson Place and San Cristo neighborhood to the north at the northwest end of Duff Drive, this will be a southbound only access. In the long range (2035) future, it is expected that the site access to Lemay Avenue would become right-in/right-out.

Trip Generation

Trip generation is important in considering the impact of a development such as this upon the existing and proposed street system. A compilation of trip generation information contained in Trip Generation, 9th Edition, ITE is customarily used to estimate the trips that would be generated by the proposed/expected uses at a site. However, the City of Fort Collins has performed a trip generation study for apartments in Fort Collins. Therefore, the trip generation rates calculated by the City will be used. Each unit will have 4 or 5 bedrooms. Therefore, a person/bed was used as the trip generation variable. A trip is defined as a one-way vehicle movement from origin to destination. Table 2 shows the expected trip generation on a daily and peak hour basis. The trip generation of Capstone Cottages development resulted in 2280 daily trip ends; 163 morning peak hour trip ends; and 361 afternoon peak hour trip ends.

TABLE 2
Capstone Cottages Trip Generation

Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
220	Apartment	860 beds	2.65	2280	0.04	34	0.15	129	0.27	232	0.15	129



SITE PLAN

Figure 5

DELICH ASSOCIATES

Trip Distribution

Trip distribution for the Capstone Cottages was based on existing/future travel patterns, land uses in the area, consideration of trip attractions/productions in the area, and engineering judgment. Figure 6 shows the trip distribution for the short range (2019) and long range (2035) analysis futures. The trip distribution was agreed to by City of Fort Collins staff in the scoping meeting.

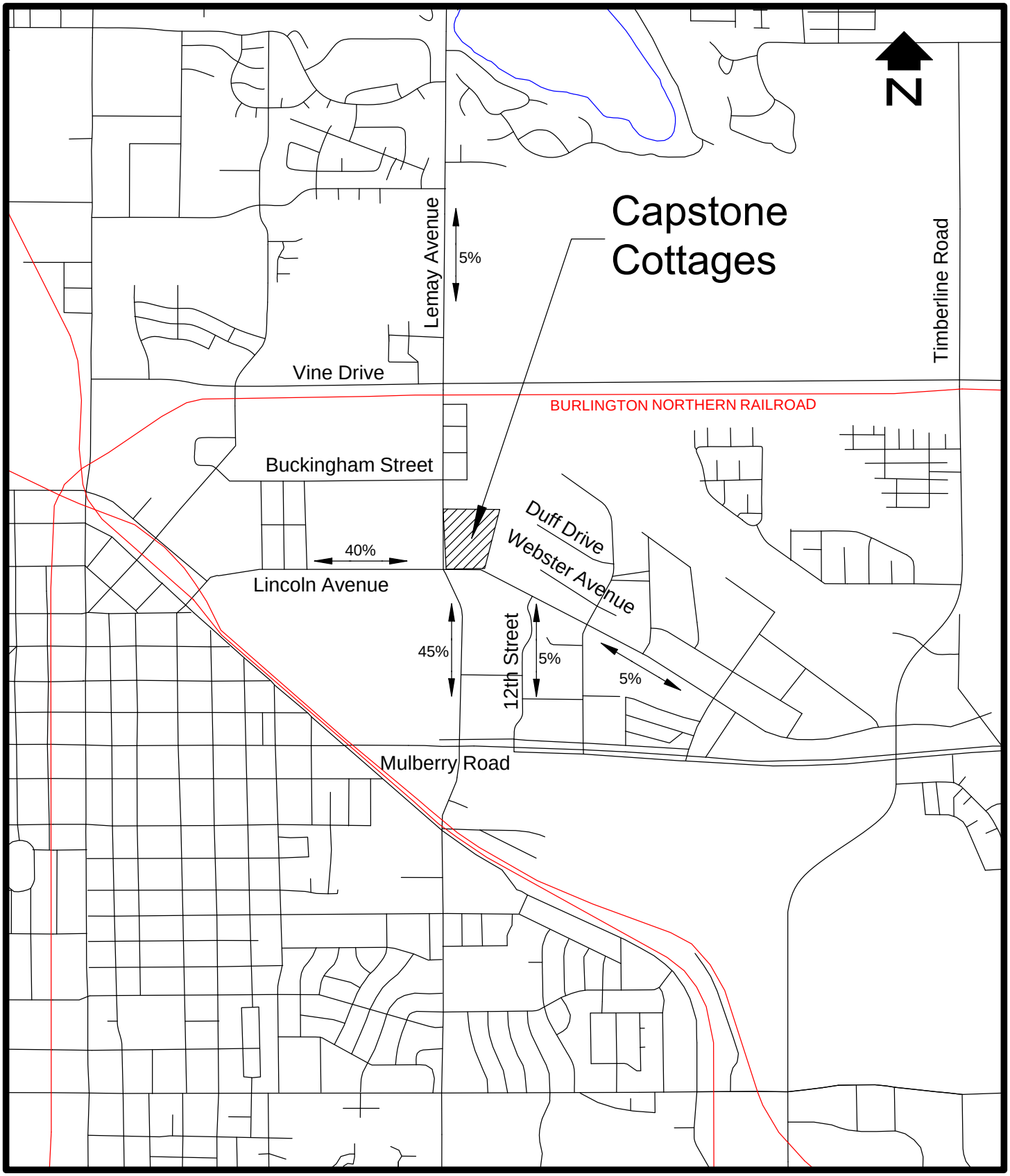
Background Traffic Projections

Figure 7 shows the short range (2019) background peak hour traffic projections. These forecasts assume that the current street network exists in this area. Background traffic projections for the short range were obtained by reviewing the North Front Range Regional Transportation Plan, engineering judgment, and various traffic studies prepared for this area of Fort Collins. Based upon these sources, it was determined that the traffic volumes would increase by approximately 1.5 percent per year. The Waterfield and Woodward Governor developments were added to the background traffic. The Lemay/Vine intersection traffic was increased due to approved projects in the area that are yet to be built or built out. This data was provided by Fort Collins City staff. While the north leg of the Lincoln/International intersection will be built with this development, the connection to Duff Drive and Webster Avenue will enable some traffic to/from the industrial park to have an alternative route to Lincoln Avenue. This is reflected in Figure 7.

Figure 8 shows the long range (2035) background peak hour traffic projections. This reflects completion of the Lemay Avenue overpass and completion of International Boulevard, as shown in the Fort Collins Master Street Plan.

Trip Assignment

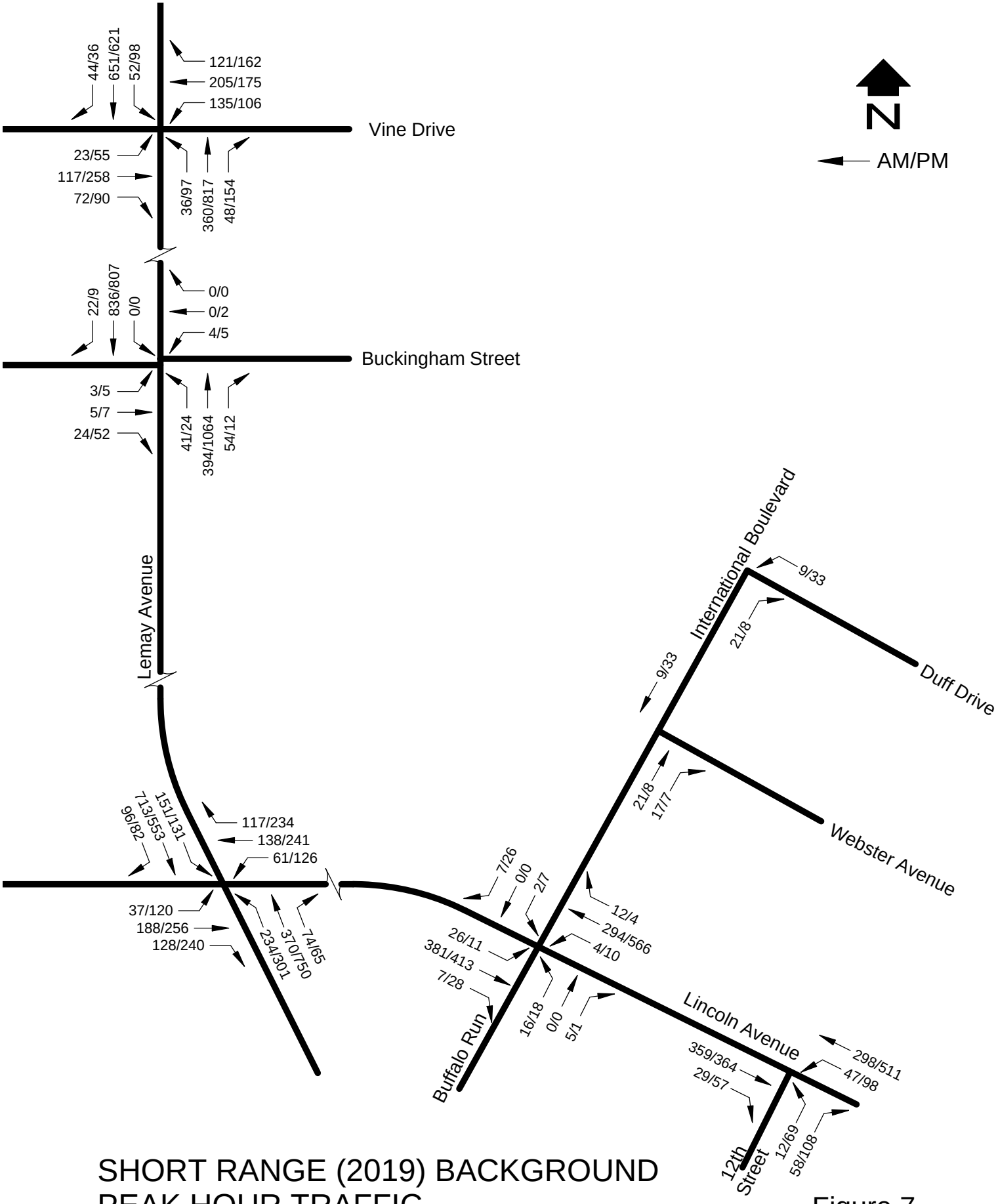
Trip assignment is how the generated and distributed trips are expected to be loaded on the street system. The assigned trips are the resultant of the trip distribution process. It is not likely that residents of the Capstone Cottages development would go east on either Duff Drive or Webster Avenue to go to their primary peak hour destination (Colorado State University). This would require out of direction travel which would result in longer travel time. While there may be limited attractions (Miramont Gym, for example) within the industrial park that may be used by the Capstone residents, it is not likely that these trips would occur in the peak hours. Figures 9 and 10 show the respective short range (2019) and long range (2035) site generated peak hour traffic assignment. Figures 11 and 12 show the respective short range (2019) and long range (2035) total (site plus background) peak hour traffic assignment.



SCALE: 1"=2000'

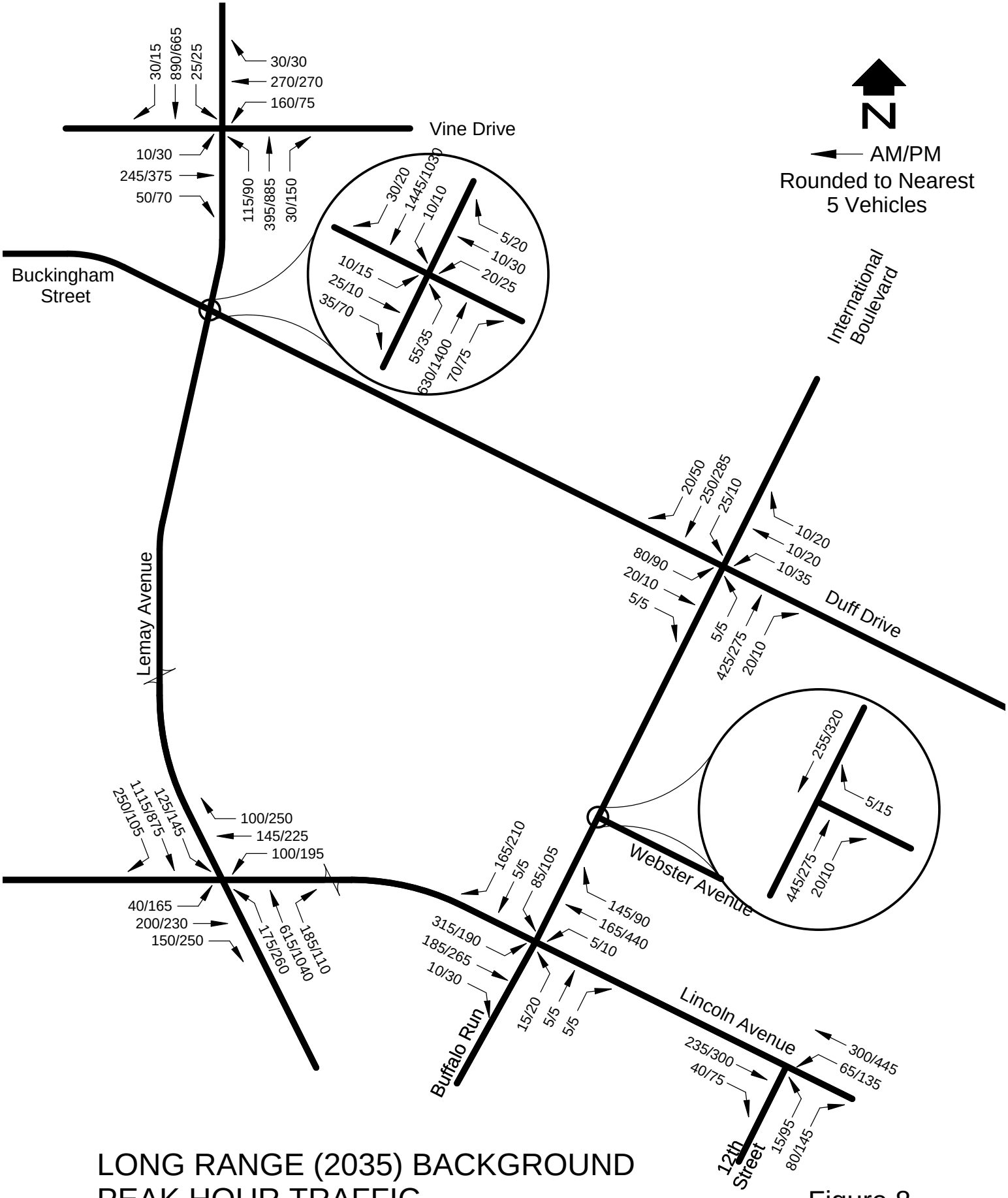
TRIP DISTRIBUTION

Figure 6



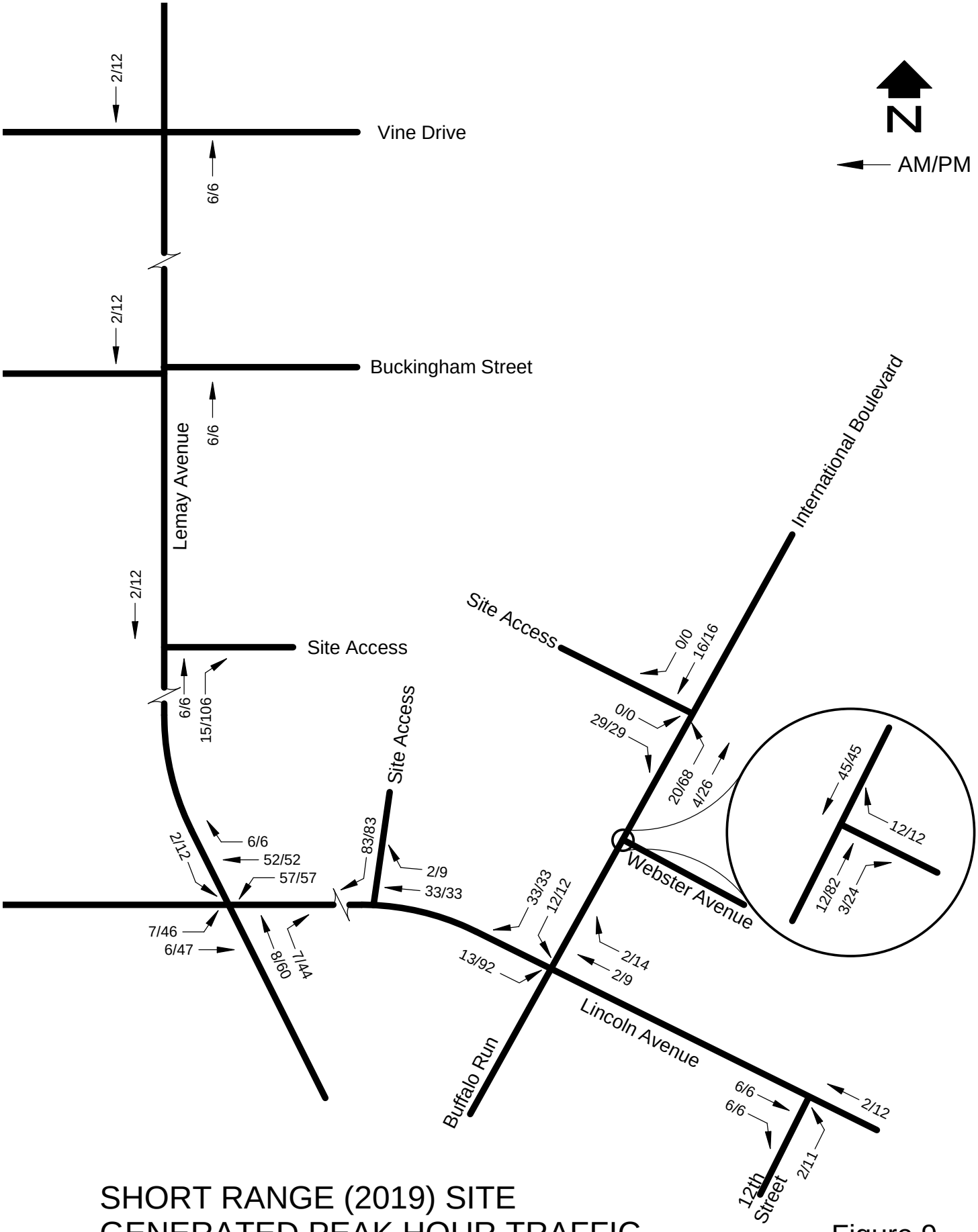
SHORT RANGE (2019) BACKGROUND PEAK HOUR TRAFFIC

Figure 7



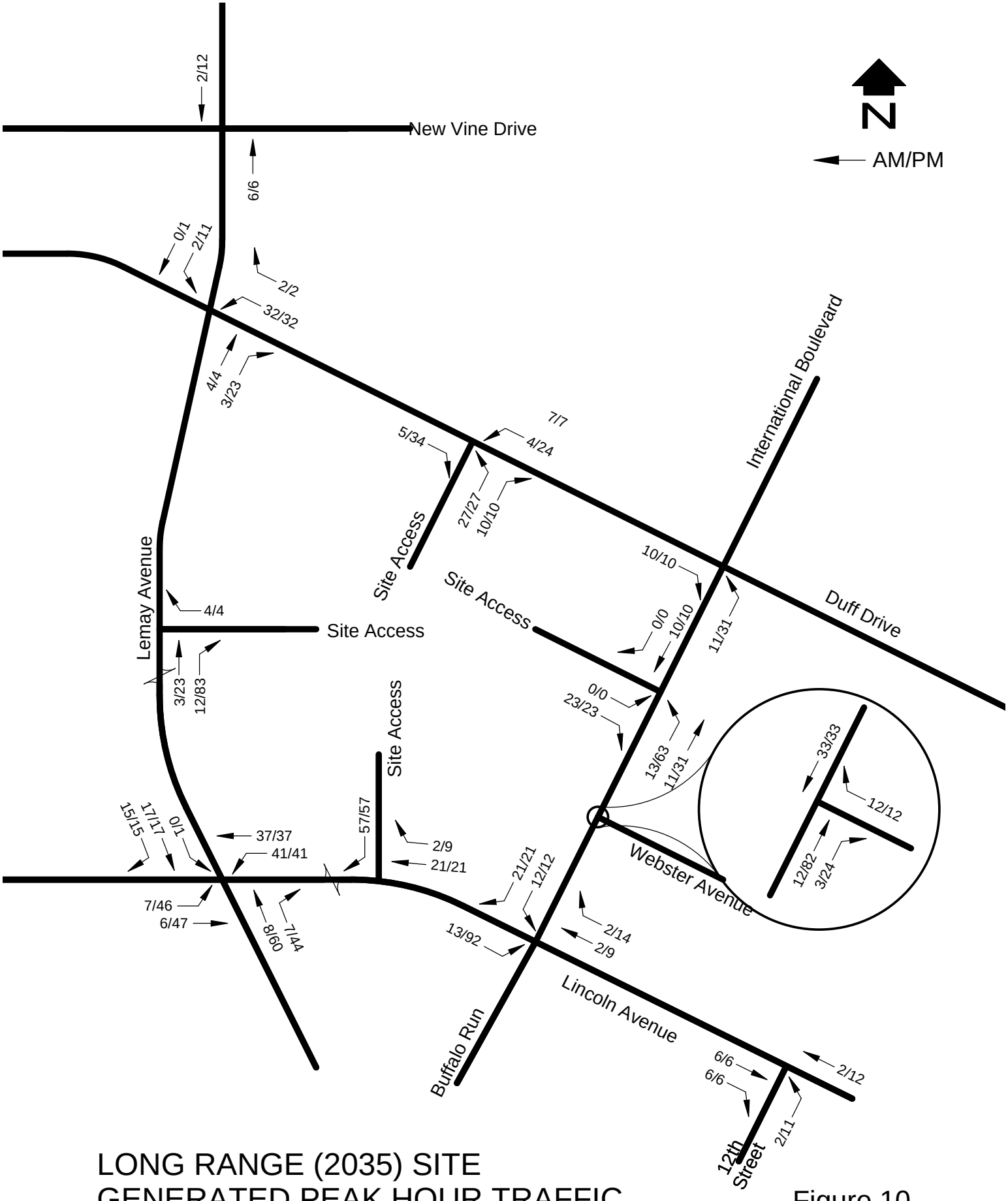
LONG RANGE (2035) BACKGROUND
PEAK HOUR TRAFFIC

Figure 8



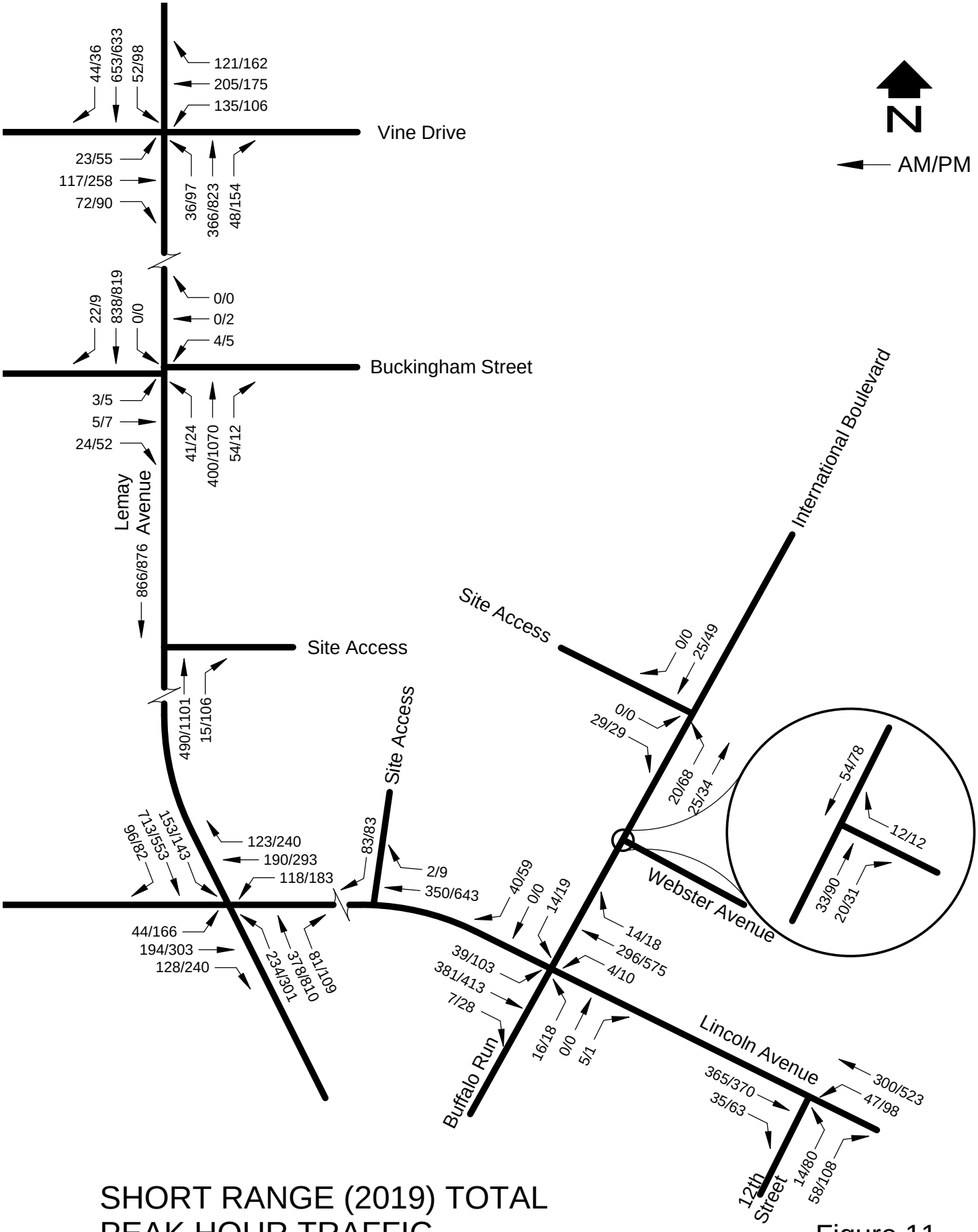
SHORT RANGE (2019) SITE GENERATED PEAK HOUR TRAFFIC

Figure 9



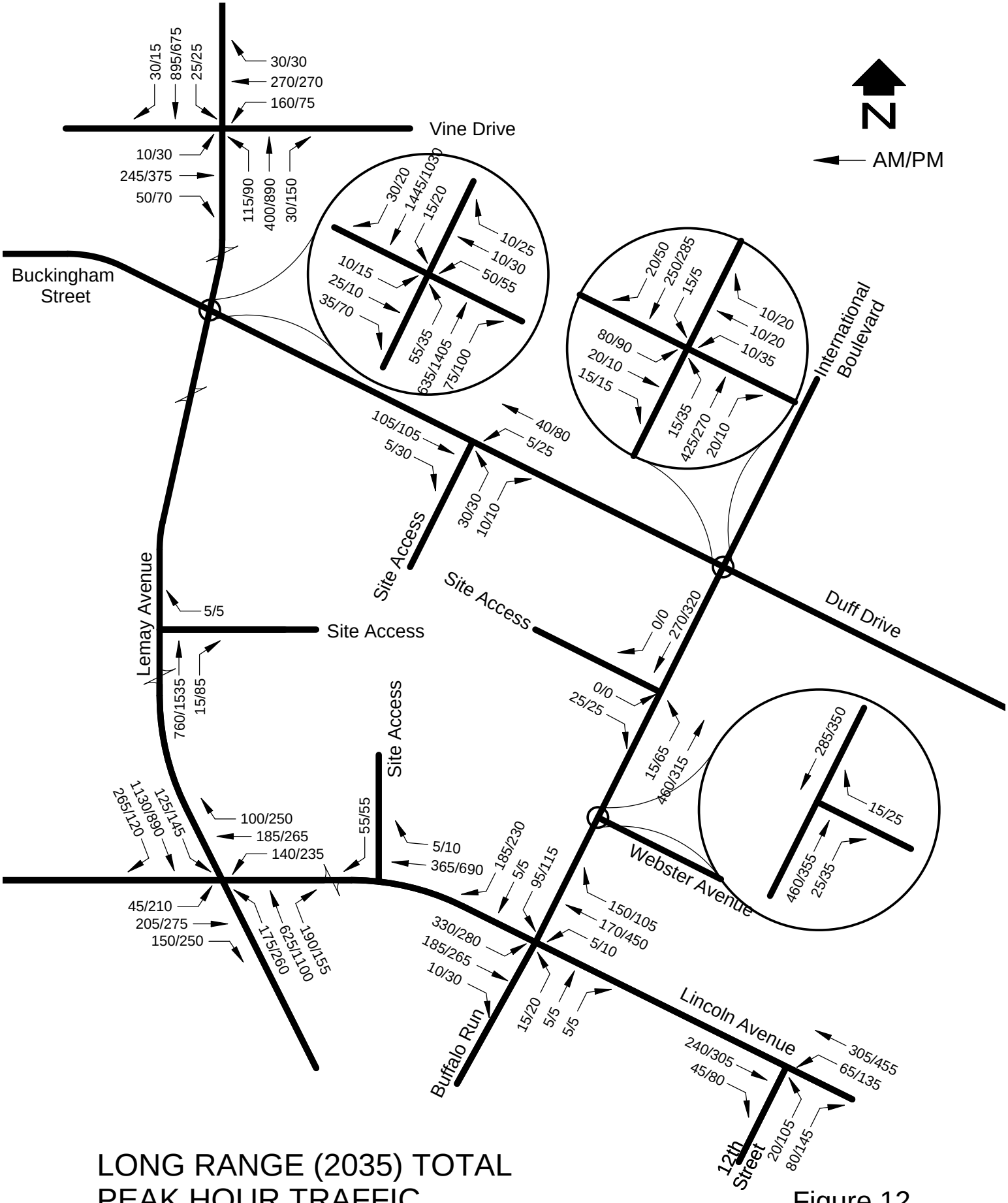
LONG RANGE (2035) SITE GENERATED PEAK HOUR TRAFFIC

Figure 10



SHORT RANGE (2019) TOTAL PEAK HOUR TRAFFIC

Figure 11



LONG RANGE (2035) TOTAL PEAK HOUR TRAFFIC

Figure 12

Signal Warrants

As a matter of policy, traffic signals are not installed at any location unless warrants are met according to the Manual on Uniform Traffic Control Devices. For the streets in the vicinity of the Capstone Cottages development, four hour and/or eight hour signal warrants are applicable. These warrants require much data and are applied when the traffic is actually on the area street system. It is acknowledged that peak hour signal warrants should not be applied, but since the peak hour forecasts are readily available in a traffic impact study, it is reasonable to use them to get an idea whether other signal warrants may be met. If peak hour signal warrants will not be met at a given intersection, it is reasonable to conclude that it is not likely that other signal warrants would be met. If peak hour signal warrants are met, it merely indicates that further evaluation should occur in the future as the development occurs. However, a judgment can be made that some intersections will likely meet other signal warrants.

Using the short range (2019) total peak hour traffic (Figure 11), none of the key unsignalized intersections will meet the lower threshold volume for the minor street approach (100 vehicles).

Using the long range (2035) total peak hour traffic (Figure 11), the peak hour signal warrant will not be met at the Lemay/Buckingham-Duff intersection. However, this intersection may be signalized in the long range (2035) future per discussions with the Traffic Operations staff. Therefore, the Lincoln/Buckingham-Duff intersection was analyzed with stop sign and signal control in the long range (2035) future. The peak hour signal warrant analyses are provided in Appendix D.

Operation Analysis

In the short range (2019) future, capacity analyses were performed at the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham, Lemay/Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, and International/Site Access intersections. The following operations tables reflect the level of service and the calculated delay for levels for service E and F. In the long range (2035) future, capacity analyses were performed at the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, International/Duff, and Duff/Site Access intersections. The Lincoln/International-Buffalo Run Access intersection was analyzed as a roundabout in the short range and long range futures.

Using the traffic volumes shown in Figure 7, the Lemay/Lincoln, Lemay/Buckingham, Lemay/Vine, Lincoln/International-Buffalo Run Access, Lincoln/12th, and International/Webster intersections operate in the short range (2019) background traffic future as indicated in Table 3. Calculation forms for these analyses are provided in Appendix E. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for the

TABLE 3 Short Range (2019) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	A	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	E (66.7 secs)	B
	NB T	B	C
	NB RT	A	B
	NB APPROACH	C	C
	SB LT	A	B
	SB T/RT	D	A
	SB APPROACH	D	B
	OVERALL	D	C
Lemay/Buckingham (stop sign)	EB LT/T/RT	D	E (42.3 secs)
	WB LT/T/RT	F (61.8 secs)	F (137.7 secs)
	NB LT/T/RT	B	A
	SB LT/T/RT	A	A
Lemay/Vine (signal)	EB LT	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPROACH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C	D
Lincoln/International-Buffalo Run (roundabout)	EB LT/T/RT	A	A
	WB LT/T/RT	A	B
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/T	B	D
International/Webster (stop sign)	WB RT	A	A

Lemay/Vine intersection in the afternoon peak hour and the Lemay/Buckingham intersection in the morning and afternoon peak hours. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour westbound left-turn will be commensurate with level of service F. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach was commensurate with level of service F in the morning and afternoon peak hours. Although the Lemay/Buckingham intersection operates at this level of service, a signal is not warranted in the short range (2019) future.

Using the traffic volumes shown in Figure 8, the Lemay/Lincoln, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, and International/Duff intersections operate in the long range (2035) background traffic future as indicated in Table 4. Calculation forms for these analyses are provided in Appendix F. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours with signal control at the Lemay/Buckingham-Duff intersection.

Using the traffic volumes shown in Figure 11, the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham, Lemay/Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, and International/Site Access intersections operate in the short range (2019) total traffic future as indicated in Table 5. Calculation forms for these analyses are provided in Appendix G. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for Lemay/Buckingham intersection in the morning and afternoon peak hours. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour westbound left-turn will be commensurate with level of service F. However, this project does not have a significant negative impact at the Lemay/Vine intersection since the project traffic causes less than a two percent increase in the intersection delay. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach will be commensurate with level of service F in the morning and afternoon peak hours. In an urban environment, along arterial streets, this level of delay is normal during the peak hours. No site generated traffic is added to the movements that operate at level of service F. Although the Lemay/Buckingham intersection operates at this level of service, a signal is not warranted in the short range (2019) future. However, a southbound only access from Buckingham to Duff Drive will be installed with this development which will give motorists from the neighborhood to the north the ability to avoid this intersection.

Using the traffic volumes shown in Figure 12, the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, and International/Duff intersections operate in the long range (2035) total traffic future as indicated in Table 6. Calculation forms for these analyses are provided in Appendix H. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during morning and afternoon peak hours with signal control at the Lemay/Buckingham-Duff intersection.

TABLE 4 Long Range (2035) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	B	B
	NB T	B	C
	NB RT	B	B
	NB APPROACH	B	B
	SB LT	A	B
	SB T	D	A
	SB RT	C	A
	SB APPROACH	C	A
	OVERALL	C	C
Lemay/Buckingham-Duff (stop sign)	EB LT	F (242.1 secs)	F (- secs)
	EB T/RT	F (191.5 secs)	F (74.4 secs)
	EB APPROACH	F (198.7 secs)	F (- secs)
	WB LT	F (527.1 secs)	F (966.7 secs)
	WB T/RT	F (116.3 secs)	F (532.4 secs)
	WB APPROACH	F (351.0 secs)	F (677.2 secs)
	NB LT	B	B
	SB LT	A	B
Lemay/Buckingham-Duff (signal)	EB LT	C	C
	EB T/RT	C	C
	EB APPROACH	C	C
	WB LT	C	C
	WB RT	C	C
	WB APPROACH	C	C
	NB LT	A	A
	NB T	A	A
	NB RT	A	A
	NB APPROACH	A	A
	SB LT	A	A
	SB T	A	A
	SB RT	A	A
	SB APPROACH	A	A
	OVERALL	A	A

Continued on next page

Continued from previous page

TABLE 4
Long Range (2035) Background Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
Lemay/New Vine (signal)	EB LT	D	C
	EB T	E	D
	EB RT	D	C
	EB APPROACH	D	D
	WB LT	D	C
	WB T	D	D
	WB RT	C	C
	WB APPROACH	D	D
	NB LT	B	B
	NB T	B	B
	NB RT	B	B
	NB APPROACH	B	B
	SB LT	B	B
	SB T	B	B
	SB RT	B	B
	SB APPROACH	B	C
	OVERALL	C	C
Lincoln/International-Buffalo Run (roundabout)	EB LT/T/RT	B	B
	WB LT/T/RT	B	B
	NB LT/T/RT	A	A
	SB LT/T/RT	A	B
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/RT	B	D
International/Webster (stop sign)	WB RT	B	A
International/Duff (stop sign)	EB LT	C	C
	EB T/RT	C	B
	EB APPROACH	C	C
	WB LT	C	C
	WB T/RT	B	B
	WB APPROACH	C	B
	NB LT	A	A
	SB LT	A	A

TABLE 5 Short Range (2019) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	E (73.2 secs)	B
	NB T	B	D
	NB RT	B	B
	NB APPROACH	D	C
	SB LT	B	C
	SB T/RT	D	A
	SB APPROACH	D	A
	OVERALL	D	C
Lemay/Buckingham (stop sign)	EB LT/T/RT	D	E (44.7 secs)
	WB LT/T/RT	F (63.7 secs)	F (148.0 secs)
	NB LT/T/RT	B	A
	SB LT/T/RT	A	A
Lemay/Vine (signal)	EB LT	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPROACH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C	D
Lincoln/Site Access (RT-in/RT-out)	SB RT	B	C
Lincoln/International-Buffalo Run (roundabout)	NB LT/T/RT	A	B
	SB LT/T/RT	A	C
	EB LT/T/RT	A	A
	EB LT/T/RT	A	A
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/T	B	D
International/Webster (stop sign)	WB RT	A	A
International/Site Access (stop sign)	EB LT/RT	A	A
	NB LT/T	A	A

TABLE 6 Long Range (2035) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	E (59.8 secs)
	EB RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	C	C
	NB T	B	C
	NB RT	B	B
	NB APPROACH	B	C
	SB LT	B	C
	SB T	D	D
	SB T	C	C
	SB APPROACH	C	D
	OVERALL	C	D
Lemay/Buckingham-Duff (stop sign)	EB LT	F (256.6 secs)	F (- secs)
	EB T/RT	F (203.4 secs)	F (80.5 secs)
	EB APPROACH	F (211.0 secs)	F (- secs)
	WB LT	F (1272.2 secs)	F (2135.4 secs)
	WB T/RT	F (96.6 secs)	F (568.4 secs)
	WB APPROACH	F (910.5 secs)	F (1351.9 secs)
	NB LT	B	B
	SB LT	A	B
Lemay/Buckingham-Duff (signal)	EB LT/T	C	C
	EB RT	C	C
	EB APPROACH	C	C
	WB LT	C	C
	WB RT	C	C
	WB APPROACH	C	C
	NB LT	A	A
	NB T	A	A
	NB RT	A	A
	NB APPROACH	A	A
	SB LT	A	A
	SB T	A	A
	SB RT	A	A
	SB APPROACH	A	A
	OVERALL	A	A

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TABLE 6
Long Range (2035) Total Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
Lemay/Site Access (stop sign)	WB RT	B	C
Lemay/New Vine (signal)	EB LT	D	C
	EB T	E	D
	EB RT	D	C
	EB APPROACH	D	D
	WB LT	D	C
	WB T	D	D
	WB RT	C	C
	WB APPROACH	D	D
	NB LT	B	B
	NB T	B	A
	NB RT	B	A
	NB APPROACH	B	A
	SB LT	B	B
	SB T	B	B
	SB RT	B	B
	SB APPROACH	B	B
	OVERALL	C	B
Lincoln/Site Access (stop sign)	SB RT	B	B
Lincoln/International-Buffalo Run (roundabout)	EB LT/T/RT	B	B
	WB LT/T/RT	B	C
	NB LT/T/RT	A	A
	SB LT/T/RT	A	B
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/RT	B	E (38.1 secs)
International/Webster (stop sign)	WB RT	B	B
International/Site Access (stop sign)	EB LT/RT	B	B
	NB LT	A	A
International/Duff (stop sign)	EB LT	C	C
	EB T/RT	B	B
	EB APPROACH	C	C
	WB LT	C	C
	WB T/RT	B	B
	WB APPROACH	C	C
	NB LT	A	A
	SB LT	A	A

Vine/Lemay Adequate Public Facilities

Proposed developments in Northeast Fort Collins are required to address the operation at the Vine/Lemay intersection. This intersection has operational and geometric constraints that may create an adequate public facilities (APF) issue. Succinctly, if this intersection does not meet the overall level of service (LOS) criteria, then a development may add traffic such that the overall intersection delay is not increased by more than 2 percent over the base condition. The intersection falls under the operational criteria of "All other areas." In this area, acceptable operation at signalized intersections during the peak hours is defined as level of service D or better for the overall intersection.

City of Fort Collins Traffic Operations staff has developed the base condition. The base condition is described as the current traffic (2012) plus traffic from those development projects that have a commitment at this intersection. Figure 7 shows the base condition peak hour traffic. Table 3 shows the operation at the Vine/Lemay intersection with the base condition traffic and using the 2000 Highway Capacity Manual techniques. In the morning and afternoon peak hours, this intersection meets the overall level of service criteria. Therefore, under the base condition, there is not an APF issue at this intersection.

Figure 11 shows the base condition plus the site traffic at the Vine/Lemay intersection. Table 5 shows the base condition plus site traffic operation at the Vine/Lemay intersection. In the morning and afternoon peak hours, this intersection continues to meet the overall level of service criteria. Therefore, there is not an APF issue at this intersection.

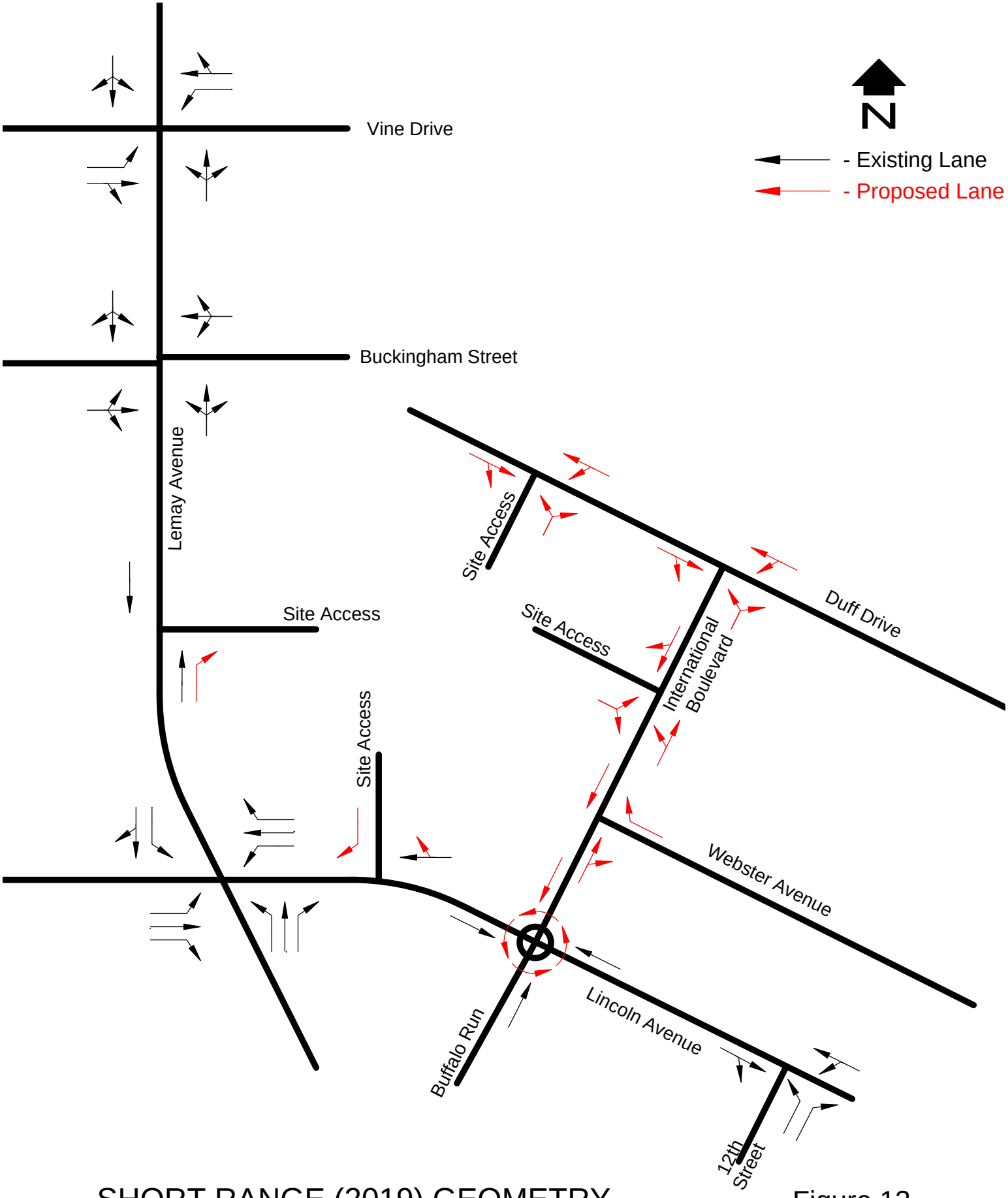
Geometry

Figure 13 shows a schematic of the short range (2019) geometry. This is existing geometry at the existing key intersections. At the Lemay/Site Access intersection, the approach volumes on Lemay Avenue meet the right-turn lane criteria in LCUASS, Figure 8-4. This project does not add traffic to other required lanes based on LCUASS.

Figure 14 shows a schematic of the long range (2035) geometry. In the long range (2035) future, it is expected that Lemay Avenue will be realigned north of the Lemay/Lincoln intersection and have two through lanes in each direction.

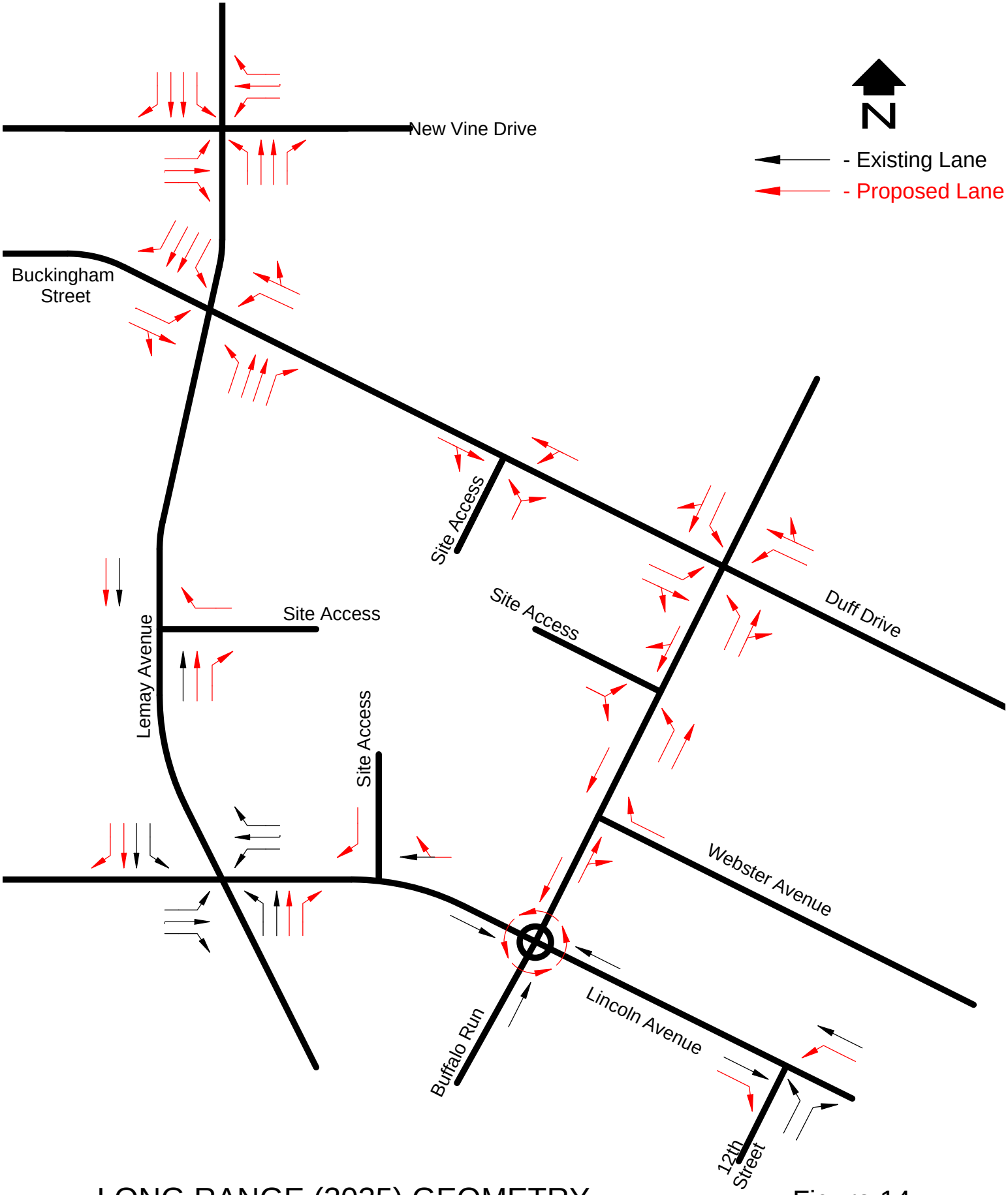
Pedestrian Level of Service

Appendix I shows a map of the area that is within 1320 feet of the Capstone Cottages development. There are four pedestrian destinations within 1320 feet of the Capstone Cottages development. These are: 1) the commercial area to the west of this site; 2) the residential area (Buffalo Run) and commercial (Walmart) areas to the south of this site; 3) the residential (Anderson Place/San Cristo) area to the north of this site;



SHORT RANGE (2019) GEOMETRY

Figure 13



LONG RANGE (2035) GEOMETRY

Figure 14

and 4) the industrial area to the east of this site. The Capstone Cottages site is located within an area termed as “transit corridor,” which sets the level of service threshold at LOS B for directness and security and LOS C for all other measured categories. Pedestrian level of service is achieved for pedestrian destinations. The Pedestrian LOS Worksheet is provided in Appendix I. Duff Drive and Webster Avenue, within the industrial area, do not have sidewalks. This industrial area is located outside of the Fort Collins city limits and has been in existence for decades. The practical limits of pedestrian improvements would be on and adjacent to the Capstone Cottages site itself. Capstone Cottages will have a sidewalk connection to the Anderson Place/San Cristo neighborhoods at the Buckingham and Duff Drive access.

Bicycle Level of Service

Appendix I shows a map of the area that is within 1320 feet of the Capstone Cottages development. There is one bicycle destination within 1320 feet of the Capstone Cottages development, the commercial to the south. The Bicycle LOS Worksheet is provided in Appendix I. The minimum level of service for this site is C. This site is connected to bike lanes on Lemay Avenue and Lincoln Avenue. Therefore, it is concluded that level of service A can be achieved.

Transit Level of Service

This area of Fort Collins is served by Transfort Routes 5 and 14.

IV. CONCLUSIONS

This study assessed the impacts of the Capstone Cottages on the street system in the vicinity of the proposed development in the short range (2019) and long range (2035) futures. As a result of this analysis, the following is concluded:

- The development of the Capstone Cottages is feasible from a traffic engineering standpoint. The Capstone Cottages development will generate approximately 2280 daily trips, 163 morning peak hour trip ends, and 361 afternoon peak hour trip ends.

- Current operation at the Lemay/Lincoln, Lemay/Vine, Lincoln/Buffalo Run, and Lincoln/12th intersections meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours. The Lemay/Buckingham intersection does not meet the standard in the afternoon peak hour.

- Using the short range (2019) total peak hour traffic forecasts, the peak hour signal warrant will not likely be met at any of the key unsignalized intersections. Using the long range (2035) total peak hour traffic forecasts, the peak hour signal warrant will not be met at the Lemay/Buckingham-Duff intersection. However, this intersection may be signalized in the long range (2035) future per discussions with the Traffic Operations staff.

- In the short range (2019) future, given development of the Capstone Cottages and an increase in background traffic, the Lincoln/Lemay, Lemay/Site Access, Lemay/Buckingham, Lemay/Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, and International/Duff intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for the Lemay/Buckingham intersection in the morning and afternoon peak hours. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour westbound left-turn will be commensurate with level of service F. However, this project does not have a significant negative impact at the Lemay/Vine intersection since the project traffic causes less than a two percent increase in the intersection delay. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach will be commensurate with level of service F in the morning and afternoon peak hours. In an urban environment, along arterial streets, this level of delay is normal during the peak hours. No site generated traffic is added to the movements that operate at level of service F. Although the Lemay/Buckingham intersection operates at this level of service, a signal is not warranted in the short range (2019) future. However, a southbound only access from Buckingham to Duff Drive will be installed with this development which will give motorists from the neighborhood to the north the ability to avoid this intersection.

- In the long range (2035) future, given development of the Capstone Cottages and an increase in background traffic, the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/Site Access,

Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, and International/Duff intersections will meet the City of Fort Collins Motor Vehicle LOS Standard with signal control at the Lemay/Buckingham-Duff intersection.

- The Lemay/Vine intersection meets the overall level of service criteria with the short range (2019) total traffic. Therefore, there is not an APF issue at the Lemay/Vine intersection.

- The short range (2019) geometry is shown in Figure 13. The long range (2035) geometry is shown in Figure 14.

- Acceptable level of service is achieved for pedestrian, bicycle, and transit modes based upon the measures in the multi-modal transportation guidelines and future improvements to the street system in the area. The practical limits of pedestrian improvements would be on and adjacent to the Capstone Cottages site itself.

City of Fort Collins

3rd Round Submittal 8-28-15

DEVELOPMENT REVIEW:
APPLICATION FORM

For Office Use Only

Date Submitted 5/07/2014 Current Planning File # _____ Planner _____

Project Information

Project Name: Capstone Cottages

Project Description *(Choose type of request from the list on the back):*

Project Development Plan (PDP) with Subdivision Plat

Location Description/Project Address: Portions of three parcels northeast of Lincoln Avenue and Lemay Avenue (excluding Bank of Colorado). Address: 1110 East Lincoln Ave. (parcel 8707200002); Fort Collins Business Center One & Two (parcels 87072000016 and 87072000017)

Major Cross Streets: Lincoln Avenue and Lemay Avenue

Zone District: Medium Density Mixed-Use Neighborhood (MMN) and Industrial (I)

Parcel Number: 8707200002, 87072000016 and 87072000017

Building/Unit Information

Residential: 354,597 Square Feet

Commercial: _____ Square Feet

Industrial: _____ Square Feet

Building Floor Area Ratio: 0.328

Platted Area: _____

Number of Units:

Single Family Attached: 192 **Single Family Detached:** 9

Two Family: _____ **Multi-Family:** _____

Dates:

Conceptual Review Meeting Date 08/05/2013

Neighborhood Meeting Date 02/25/2014

Hearing Type Type 1

Site/Area Information

Residential Area:	1,081,295	**Sq. Ft.**	24.82	**Acres**
Commercial Area:		**Sq. Ft.**		**Acres**
Industrial Area:		**Sq. Ft.**		**Acres**
Mixed Use Area:		**Sq. Ft.**		**Acres**
Right of Way Area:	91,077	**Sq. Ft.**	2.09	**Acres**
Parking and Drive Area:	309,763	**Sq. Ft.**	7.11	**Acres**
Stormwater Detention Area:		**Sq. Ft.**		**Acres**
Landscape Area:	346,403	**Sq. Ft.**	7.95	**Acres**
Open/Other Areas:		**Sq. Ft.**		**Acres**
Gross Area:	1,234,127	**Sq. Ft.**	28.33	**Acres**

Floor Area Ratio: 0.328

Gross Density: 7.09 **Net Density** 8.10

Owner Information

Name: Capstone Collegiate Communities, LLC

Address: 431 Office Park Drive

City: Birmingham **State:** Alabama **Zip:** 35223

Phone: 205-414-6400 **Email:** JAckan@capstonemail.com

Applicant Information

Name: Linda Ripley

Organization Name: Ripley Design Inc.

Contact: _____

Address: 401 West Mountain Avenue

City Fort Collins **State:** CO **Zip:** 80521

Phone: 970.224.5828 **Email:** linda.ripley@ripleydesigninc.com

Preferred Method of Contact: email/phone

CERTIFICATION

I certify the information and exhibits submitted are true and correct to the best of my knowledge and that in filing this application, I am acting with the knowledge, consent, and authority of the owners of the real property, as those terms are defined in Section 1-2 of the City Code (including common areas legally connected to or associated with the property which is the subject of this application) without whose consent and authority the requested action could not lawfully be accomplished. Pursuant to said authority, I hereby permit City officials to enter upon the property for the purpose of inspection, and if necessary, for posting of public notice on the property.

Name (Please PRINT): Duncan Holland

Address: 419 Canyon Ave, Suite 200

Telephone: 224 5920

Signature: (and title showing authority to sign, if applicable) D. Holland

⇨ CERTIFICATION MUST BE SIGNED. ⇦

8-28-15 waiting until finalized to finalize payments

Transportation Development Review Fee

Date Received/ Paid _____

Total Amount Paid _____

Project Name: Capstone Cottages

Project Location: Lemay Avenue and Lincoln Avenue Date: 3/11/2015

Type of Submittal

Please indicate the type of application submitted by checking the box preceding the appropriate request(s).

		Fee structure	amount due
☐	Overall Development Plan (ODP)	$500 each	
☐	Final Development Plan (FDP) This fee includes 2 rounds of review	$1000 each	
☐	Additional round of review	$ 500 each	
☐	Annexation	$20 X ___ acres = ___ + $250 =	
	The maximum fee for each annexation document/ filing shall be $2,000		
☐	Minor Amendment	$158 each	
☐	Major Amendment	$2,500 each	
☒	Re-zone	$200 each	$200.00
☐	Modification to Land Use Code	$200 each	
☐	Wireless Telecommunication Equipment (WTE)	$65 each	
☐	Road Projects	_____ acres (of roadway) X $3,500 =	
☐	Vacation of Easement(s) ***	# of vacations ___ X $400 =	
☐	Vacation of Right(s)-of-Way ***	# of vacations ___ X $800 =	
☐	Dedication of Easement(s) and/or Right(s)-of-Way ***	# of dedications ___ X $250 =	

☒ Project Development Plan (PDP) or Basic Development Review
Project requiring Transportation Services Review and/or utility plan review.
This fee includes 3 rounds of review.

Detached Single Family $160 per unit
9 # of units X $160 = $1,440.00

Multifamily or other residential units $115 per unit
192 # of units X $115 = $22,080.00

Commercial, Industrial, Retail, and/or Non residential building square footage $0.25 per square foot
9,073 sq ft X $0.25 = $2,268.25

Size of the development (area being platted or if not being platted size of parcel accompanying all development improvements) $250 per acre
28.29 acres X $ 250 = $7,072.50

Project fee $2,000 each $2,000

Total of above amounts $35,060.75

If this fee amount exceeds $30,000 then the fee amount shall be adjusted with the following formula: $30,000 + ½ (the amount over 30,000) = $32,530.38

The maximum fee for any residential ONLY project shall be $500 per residential unit. This check should be used to verify the fee amount (does not apply to mixed-use developments). PDP fee shall be the lesser of this amount or the above calculated amount.
201 # of residential units X $500 = $100,500

If this fee amount equals or exceeds $65,000 then the City Manager shall have the ability to reduce the fee amount.

Reduction for affordable housing – a copy of the City letter certifying/ authorizing the affordable housing shall be provided with this application. Amount of reduction to be applied _____

$32,530.38

Total owed for PDP $31,804.13) Pd 4/2/14
($950.49) Pd. 3/11/15

$224.24 owed to Applicant

General Information:

Owners Name(s): Capstone Collegiate Communities, LLC

Street address: 431 Office Park Drive

City/State/Zip: Birmingham, Alabama 35223

Telephone: 205-414-6400 Fax: _____

Applicants/ Consultants Firm Name: Ripley Design Inc.

Contact: Linda Ripley

Street address: 401 West Mountain Ave.

Suite 100

City/State/ Zip: Fort Collins, Colorado 80521

Telephone: 970.224.5828 Fax: 970.224.1662

Certification:

By signing this permit I acknowledge that I am acting with the knowledge, consent, and authority of the owners of the property (including all owners having legal or equitable interest in the real property, as defined in Section 1-2 of the City Code; and including common areas legally connected to or associated with the property which is the subject of this application) without whose consent and authority the requested action could not lawfully be accomplished. Pursuant to said authority, I hereby permit City officials to enter upon the property for purposes of inspection.

Name (please print): _____

Signature: _____

Telephone: _____

Foot Notes:

When a development project involves a change of use for a building, the charge per square foot shall apply to the portion of the overall building size for which the change of use is proposed, provided that the new use generates more traffic than the existing use, as determined by the current Institute of Transportation Engineers Trip Generation. If the new use does not generate more traffic than the existing use then the charge per square foot for shall apply only to the net additional building size (if any).

These fees do not include the cost of filing fees for the recording of the Development Agreement. When a Development Agreement or Amendment Agreement is entered into the Developer shall be responsible for the cost of recording the document. Said filing fees shall be calculated and provided when the signed document is returned to the City for signatures and filing.

*** This fee does not include the cost of filing fees. Filing fees shall be determined at the time of final document submittal and will be required prior to filing.

cc: Christie White, Engineering
Development Review Engineering

2012 form

August 28, 2015

Capstone Cottages PDP

Planning Objectives

Project Site

Capstone Collegiate Communities (Applicant) would like to develop a student-oriented housing project northeast of the intersection of Lincoln and Lemay Avenues. The Bank of Colorado is located on the corner and the proposed project would be situated to the north and east of the bank. The Applicant has assembled a project site that includes a 13.5 acre parcel zoned Medium Density Mixed Use Neighborhood (M-M-N). The remainder of the site was rezoned from I-Industrial to M-M-N on January 20, 2015. The entire 23.13-acre net developable site is needed to develop the proposed student-oriented housing project. The M-M-N zone provides a transition between existing single-family neighborhoods to the northwest and the existing industrial uses to the east and existing commercial uses located to the south.

Surrounding Neighborhood

Undeveloped land is located to the north, existing industrial uses are located to the east, and Buffalo Run Apartments and the Mulberry and Lemay Crossings shopping complex are located to the south. The Woodward Campus is located to the southwest and undeveloped land exists on the west side of Lemay Avenue adjacent to the project site. The San Cristo/Andersonville and Alta Vista residential communities are located northwest of the project site with intervening road right-of-way and I-Industrial zoned property.

Project Description

The Applicant specializes in the development, construction and management of high-quality student housing developments in close proximity to major colleges and universities across the country. On this site, the Applicant proposes to develop both cottage-style and townhome student-oriented housing. Cottage style units arranged in tri-plex and four-plex buildings composed of attached single-family units that are rented to 5 unrelated people. Townhome style units are single-family attached units, rented to 4 unrelated people. Town home buildings include 3-unit buildings, 5-unit buildings and 7-unit buildings. The higher density townhome buildings are located on the south and to the interior of the site, while the lower density tri-plex units are on the north and west closer to existing single family neighborhoods.

The project will be marketed to students but may also include tenants who are not attending college. The housing project will provide needed rental units for the growing student population in Fort Collins within a managed setting with recreational opportunities on-site. The low-profile design of the project allows it to easily blend with nearby single family housing in the neighborhood. The development will

401 W. Mountain Ave., Suite 100 ■ Fort Collins, CO 80521 ■ tel. 970.224.5828 ■ fax 970.224.1662 ■
www.**ripley**design**inc**.com

include top of the line amenities that offer a unique lifestyle for students including features such as walks, benches, bar-b-que areas, open green spaces, volleyball court, and resort-style pool. The project will also include a clubhouse that offers comfortable gathering places, state-of-the art fitness facilities, a theater and study rooms.

The project is designed as a series of residential blocks with all dwelling units facing a public street, private street or a major walkway spine, creating a pleasant, attractive pedestrian-oriented neighborhood. The project proposes 201 dwelling units in seven different building types including:

3	2-story, 5-bedroom cottages (single-family)
6	2-story, 5-bedroom cottages (single-family and HC accessible)
21	2-story, 5-bedroom tri-plex cottages (single-family attached)
3	2-story, 5-bedroom four-plex cottages (single-family attached
3	3-story, 4-bedroom townhomes (single-family attached, 3-unit buildings)
10	3-story, 4-bedroom townhomes (single-family attached, 5-unit buildings)
9	3-story, 4-bedroom townhomes (single-family attached, 7-unit buildings)

The Applicant intends to convert the single family attached cottage style and townhome units to Extra Occupancy Rental Houses which would allow the addition of one or two tenants to each dwelling unit for a maximum of five per dwelling unit. Extra Occupancy Rental Houses are allowed in the M-M-N zone district, however, the Applicant will need to go the through the basic development review process for each building. Each dwelling unit that is approved for extra occupancy could then be rented to an additional one or two tenants. The Applicant has planned ahead for the conversion of the units for extra occupancy by providing adequate parking and interior square footage as required by the Land Use Code.

The dwellings facing the surrounding streets effectively screen the surface parking located behind the units, resulting in a low to medium density housing development. Building setbacks along Lemay Avenue, Lincoln Avenue, and International Boulevard are 30-feet wide resulting in a attractive streetscape appearance for the neighborhood. The project offers students a more neighborhood oriented lifestyle than typical student apartment complexes, while still providing high quality management and site amenities.

The unique cottage style/townhome housing project will provide a transition in density from Buffalo Run Apartments at 16.78 dwelling units per acre to the single-family neighborhoods located northwest of the project site. Capstone Cottages proposes 8.69 dwelling units per net acre. The City's Land Use Code requires a minimum density of 12 dwelling units per acre in M-M-N District. The Applicant is requesting a Modification for lower density (see attached) in order to develop a project with architectural scale that is more compatible with the nearby single-family neighborhoods.

<u>Environmental Issues</u>

The project area was once a farmstead. The fields have reverted to a mixture of upland vegetation and shallow, dry drainages. Existing vegetation includes native, introduced and weedy species. A prairie dog colony occurs over a portion of the project area. There are a few small patches of wetlands (less than .04 acres) along the eastern border of the property and small wetland dominated by cattails in a borrow ditch adjacent to Lincoln Avenue. (Ecological Characterization Study Report and letter from US Army Corps of Engineers was submitted in May of 2014)

Access, Vehicular/Pedestrian Circulation and Parking

The project is designed to accommodate the future re-alignment of Lemay Avenue, the future location of International Boulevard, and the future extension of Duff Drive to Buckingham Drive as indicated on the City's Master Street Plan. The project site includes several points of access:

- Access from the existing Lemay Avenue is proposed approximately 710 feet from the intersection of Lincoln and Lemay. This access is proposed as a right-in only, preventing anyone from leaving the project site at this point to travel north through the Lemay/Vine intersection.
- Access from the future Duff Drive is proposed approximately 383 feet west of the intersection of International Boulevard and Duff Drive.
- Access from International Boulevard is proposed approximately 455 feet north of the roundabout proposed at the intersection of International Boulevard and Lincoln Avenue.
- Access from Lincoln Avenue is proposed approximately 225 feet west of the roundabout at International Boulevard and Lincoln Avenue.
- Webster Avenue will extend from the east and connect to International Boulevard.
- The project will also provide an interim pedestrian, bike and vehicular connection between the temporary cul de sac at the end of Duff Drive and the San Cristo/Andersonville neighborhood to the northwest. This informal connection would allow vehicular access out of the neighborhood when access points on the existing Lemay Avenue are blocked by traffic. This access is proposed as one-way south so that residents from the project will not drive north through the existing residential neighborhood.

Adjacent street right-of-ways will be dedicated as required; however, the Applicant is not proposing to construct all the adjacent streets at the time of development. The Applicant intends to build International Boulevard from Lincoln Avenue north to Duff Drive. Duff Drive will be extended from International Boulevard to the existing right-of-way for the future Lemay Avenue. The Duff Drive to Buckingham connection and the re-aligned Lemay Avenue would be constructed when the City is able to fund the proposed grade separated rail crossing proposed north of this area. The Applicant does, however, intend to build the street sidewalk and parkway strip with street trees along these future street edges in order to complete the pedestrian blocks and create a walkable neighborhood.

A total of 741 parking spaces (.83 per bedroom) are provided exceeding the requirements for multi-family development and extra occupancy dwelling units contained in the Land Use Code. Parking is distributed throughout the site so that it is convenient for residents, but not visible from public streets surrounding the project. Some of the parking is located on the east side of International Boulevard . This more remote parking lot can provide convenient parking for students that don't use their cars on a daily basis. Similarly there will be one bicycle parking space for each bedroom distributed throughout the site with 60% of those spaces covered as required by the Land Use Code. Trash and recycle enclosures are conveniently located throughout the site with pick-ups scheduled to handle expected volumes. A trash compactor and maintenance facility is located on the east side of International Boulevard at the north end of the site.

Landscape/Maintenance

In addition to attractive, pedestrian oriented streetscapes, the project interior includes many pedestrian walkways and small pocket park spaces suitable for small gatherings and bar-be-ques. There is a centrally located recreation center with clubhouse and pool that will include the leasing office, study areas, social area, fitness center, computer facilities and a multi-purpose room.

The site will be generously landscaped utilizing xeriscape principles to conserve water and reduce maintenance. Canopy shade trees are provided along all streets, while evergreen and ornamental trees are added for seasonal interest. Trees and landscape will be maintained by the Homeowner Association. Security lighting will be provided along walkway spines and within parking areas.

Stormwater/Detention

Stormwater will be managed through a combination of permeable interlocking concrete pavement (PICP) systems as well as more traditional inlets, pipes, and a landscaped detention pond. The permeable pavers will be utilized to satisfy the City's LID requirements, as well as to provide water quality treatment and a small amount of subsurface detention.

Detention storage volume will be provided to offset the difference between the peak developed 100-year flow and the area master planned rate of 0.20 cfs per acre as prescribed by the City of Fort Collins. The computer model SWMM has been utilized to determine required peak detention volume based on this criteria. 1 ac-ft of detention storage volume will be provided within the aggregate reservoir of the PICP systems, while the majority of the stormwater volume will reside in the open detention pond. Wetland mitigation, habitat creation, and enhanced planting are proposed to achieve multi-purpose LID objectives within the detention pond.

Stormwater runoff from the project site will be slowly discharged into the Lincoln Channel. Existing water levels during the 100-year storm event within the Lincoln Channel have been accounted for in site design elevations. Additionally, high groundwater elevations will be taken into consideration with the PICP systems, wetland hydrology, and detention pond hydraulics.

Attachment A

City Plan

Principles and Policies with Explanatory Narratives

The requested Structure Plan Map Amendment and associated re-zoning would create a larger M-M-N site located northeast of the intersection of Lincoln and Lemay Avenues. The larger site is needed to create a student-oriented housing development that is supported by and consistent with City Plan Principles and Policies related to medium density housing development, land use transitions, and neighborhood compatibility. The proposed Capstone Cottages project is supported by the following City Plan Principles and Policies.

East Mulberry Corridor Plan Principles and Policies

Principle EMC.LU - Future residential neighborhoods will be integrated with existing residential subdivisions, and be within close proximity to shopping, recreation and employment destinations.

The proposed cottage-style/townhome student-oriented housing project is proposed to be located adjacent to an existing multi-family project (Buffalo Run Apartments) and close to a commercial development providing a variety of goods and services including groceries (Mulberry and Lemay Crossings). A wide variety of employment opportunities exist nearby including, Woodward located to the southwest, the commercial area located south and the existing industrial area to the east. Planned Lincoln Avenue improvements will make it convenient and safe to bicycle or walk to Downtown and/or to the CSU campus.

Principle EMC.T – 1 The transportation system within the East Mulberry Corridor study area will be improved and expanded to provide a variety of safe and efficient transportation choices.

The proposed project will help expand and connect street systems in the Corridor either by dedicating right-of-way or by actual street construction. Duff Drive and Webster Street will be extended to the west, Lincoln Avenue will be improved and International Boulevard will be constructed from Lincoln to where it intersects with Duff Drive. A roundabout will be constructed at the intersection of International and Lincoln. In addition, the project will dedicate right-of-way for the future realignment of Lemay Avenue. Only a short distance will remain to be acquired by the City between this project and the right-of-way already dedicated.

Principle EMC.H – 1 The East Mulberry Corridor study area will support a mix of housing by both maintaining existing housing stock and encouraging new development of a variety of housing types and choices.
Policy EMC.H – 1.1 A variety of housing types will be developed within new neighborhoods and located close to neighborhood shopping, employment and recreation.

Capstone Cottages will provide a unique lifestyle choice for tenants wanting to share a household within a managed community with recreational amenities adding to the variety of housing types already provided in the Plan area. (See also EMC.LU above)

City Plan Principles and Policies

Principle LIV 7: A variety of housing types and densities for all income levels shall be available throughout the Growth Management Area.

Policy LIV 7.1 – Encourage Variety in Housing Types and Locations
Encourage a variety of housing types and densities, including mixed-used developments that are well-served by public transportation and close to employment centers, shopping, services, and amenities.

Policy LIV 7.2 – Develop an Adequate Supply of Housing
Encourage public and private for- profit and non-profit sectors to take actions to develop and maintain an adequate supply of single- and multiple-family housing, including mobile homes and manufactured housing.

Policy LIV 7.4 – Maximize Land for Residential Development
Permit residential development in most neighborhoods and districts in order to maximize the potential land available for development of housing and thereby positively influence housing affordability.

Policy LIV 7.7 – Accommodate the Student Population
Plan for and incorporate new housing for the student population on campuses and in areas near educational campuses and/or that are well-served by public transportation.

The proposed Capstone Cottages project will provide a variety of housing within the project, by providing 4 and 5-bedroom units for rent. The rental units look more like single family homes than apartment buildings.. Buildings on the edge of the project have front doors that face tree-lined streets with detached sidewalks, while some buildings in the interior face tree-lined pedestrian spines creating walkable blocks and a neighborhood sense of place. Each building type has a variety of models with different architectural elements, details and color combinations.

Units are rented by the bedroom, allowing 4-5 people to share one dwelling unit. Each bedroom has its own private bath and is secure from the dining and living areas which are shared. This rental model provides another lifestyle choice for people seeking housing in Fort Collins. It also allows compatible roommates to share a house in a managed environment that is more affordable than other options offering similar security and amenities.

The proposed density is approximately 8.7 dwelling units per acre and provides a transition between Buffalo Run Apartments (16.78 DU/AC) and the San Cristo/Andersonville neighborhood to the northwest. The streetscape improvements planned for Lincoln Avenue will make it convenient and safe to bicycle or walk to Downtown approximately 1 mile away and/or to the CSU campus, approximately 2 miles away.

Providing additional student-oriented housing in managed projects like the one proposed will increase affordable rental opportunities within neighborhoods for families and people other than students. Providing opportunities for students to live in managed settings can also decrease the potential for loud parties, inadequate parking and declining appearances that are sometimes associated with student-oriented rentals within single-family neighborhoods.

Principle LIV 10: The city's streetscapes will be designed with consideration to the visual character and the experience of users and adjacent properties. Together, the layout of the street network and the streets themselves will contribute to the character, form, and scale of the city.

Policy LIV 10.1 – Design Safe, Functional, and Visually Appealing Streets
Ensure all new public streets are designed in accordance with the City street standards and design all new streets to be functional, safe, and visually appealing, with flexibility to serve the context and purpose of the street corridor. Provide a layout that is simple, interconnected, and direct, avoiding circuitous routes. Include elements such as shade trees, landscaped medians and parkways, public art, lighting, and other amenities in the streetscape. Approve alternative street designs where they are needed to accommodate unique situations, such as "green" stormwater functions, important landscape features, or distinctive characteristics of a neighborhood or district, provided that they meet necessary safety, accessibility, and maintenance requirements.

Policy LIV 10.2 – Incorporate Street Trees
Utilize street trees to reinforce, define and connect the spaces and corridors created by buildings and other features along a street. Preserve existing trees to the maximum extent feasible. Use canopy shade trees for the majority of tree plantings, including a mixture of tree types, arranged to establish urban tree canopy cover.

The project is designed to create walkable blocks formed by public streets with detached, tree-lined sidewalks and tree-lined pedestrian spines. Canopy shade trees will be used for the majority of tree plantings, including a mixture of tree types, arranged to establish urban tree canopy cover. Tree-lined parkway strips provide shade for the pedestrian as well as seasonal interest. The street layout is direct and efficient, providing safe, convenient access to front doors and to parking areas.

Principle LIV12: Security and crime prevention will be important factors in urban design.

The Capstone Cottages project will include onsite management that can provide surveillance to prevent crime before it happens. It also allows for other neighborhood impacts such as noise, or unsightly yards to be corrected as soon as it is noticeable. A combination of front porch lighting and street lights will provide adequate front entrance lighting and parking areas will be lighted as well to increase security for residents.

Principle LIV 14: Require quality and ecologically sound landscape design practices for all public and private development projects throughout the community.

Policy LIV 14.3 – Design Low Maintenance Landscapes
Design new landscaping projects based on maintainability over the life cycle of the project using proper soil amendment and ground preparation practices, as well as the appropriate use of hardscape elements, trees, mulches, turf grass, other plant materials, and irrigation systems. Low maintenance practices can be achieved in both turf and non-turf planting areas, provided these areas are designed and installed to minimize weeds, erosion and repairs.

The project will incorporate xeriscape principles throughout the landscape to achieve a visually attractive landscape that demonstrates conservative water use and is easy to maintain. Capstone takes pride in their landscapes and finds that their tenants have an increased pride in helping to maintain the landscape because it feels like their yard. This was an unexpected benefit of the "shared house" concept.

Principle LIV22: The design of residential neighborhoods should emphasize creativity, diversity, and individuality, be responsive to its context, and contribute to a comfortable, interesting community.

Policy LIV 22.1 – Vary Housing Models and Types

Provide variation in house models and types in large developments, along with variations in lot and block sizes, to avoid monotonous streetscapes, increase housing options, and eliminate the appearance of a standardized subdivision.

Policy LIV 22.2 – Provide Creative Multi-Family Housing Design
Design smaller multi-family buildings to reflect the characteristics and amenities typically associated with single-family detached houses. These characteristics and amenities include orientation of the front door to a neighborhood sidewalk and street, individual identity, private outdoor space, adequate parking and storage, access to sunlight, privacy, and security.

Policy LIV 22.3 – Offer Multi-Family Building Variation
Offer variation among individual buildings within multibuilding projects; yet stay within a coordinated overall "design theme." Achieve variation among buildings through a combination of different footprints, façade treatment, roof forms, entrance features, and, in specialized cases, building orientation. Avoid monotonous complexes of identical buildings, although there may be ways to achieve visual interest among substantially identical buildings with a high degree of articulation on each building, combined with variation in massing on the site.

Policy LIV 22.4 – Orient Buildings to Public Streets or Spaces
Orient residential buildings towards public sidewalks or other public outdoor spaces that connect to streets, the commercial core, and transit stops. Examples of public outdoor spaces include parks, squares, gardens with walkways, and courtyards.

Policy LIV 22.5 – Create Visually Interesting Streetscapes
All new residential buildings should be designed to emphasize the visually interesting features of the building, as seen from the public street and sidewalk, and to minimize and mitigate the visual impact of garage doors, driveways, and other off-street parking.

Policy LIV 22.6 – Enhance Street Design and Image
Enhance prominent connecting streets in neighborhoods by forming circles, squares, medians, or other special places to recall history, give identity, and calm traffic. Treelined streets and boulevards with inviting, landscaped walkways, parkways, and medians, will add to the image of these districts as safe and comfortable places to live.

Policy LIV 22.7 – Consider Landmarks and Views
Consider view corridors to the mountains or other landmarks in the arrangement of streets, Neighborhood Centers and Commercial Districts, and other shared spaces within neighborhoods. Design the view down a residential street to terminate on a visually interesting feature and not directly on a garage door.

Policy LIV 22.11 – Promote Neighborhood Upkeep and Property Maintenance
Encourage residents to maintain properties and ensure compliance with City Codes in order to reduce visible signs of decay and promote safe, comfortable, and strong neighborhoods.

Policy LIV22 having to do with the design of residential neighborhoods is achieved with the proposed Capstone Cottages residential community. Buildings on the edge of the project have front doors that face tree-lined streets with detached sidewalks, while some buildings in the interior face tree-lined pedestrian spines creating walkable blocks and a neighborhood sense of place. Each building type has a variety of models with different architectural elements, details and color combinations.

The clubhouse/pool complex is centrally located at the terminus of a street-like private drive creating an attractive focal point and landmark. Lawn areas are provided on either side of the clubhouse for active recreation such as croquet, bocce ball, horseshoes, Frisbee and other informal lawn games. All the

interior recreation spaces are linked with pedestrian walks that provide convenient, pleasant and direct access. Passive recreational opportunities such as reading, sun-bathing, and just hanging out are accommodated at the clubhouse recreation area as well as in smaller scale, node areas between buildings or along pedestrian ways.

Landscape areas are designed to be attractive, provide seasonal interest and also be easy to maintain, so that they continue to look attractive throughout the life of the project. Capstone takes pride in their landscapes and finds that their tenants have an increased pride in helping to maintain the landscape when it feels like their yard. This was an unexpected benefit of the "shared house" concept.

Principle LIV 23: Neighborhoods will feature a wide range of open lands, such as small parks, squares, greens, play fields, natural areas, orchards and community gardens, greenways, and other outdoor spaces to provide linkages and recreational opportunities both for neighborhoods and the community as a whole.

Policy LIV 23.1 – Provide Neighborhood Parks and Outdoor Spaces

Locate neighborhood parks or other public outdoor spaces within walking distance of homes. Design outdoor spaces in conjunction with streets and walkways to be attractive, formative, purposeful parts of any land development and not merely residual areas left over from site planning for other purposes. Aim to mostly surround public outdoor spaces with streets or house fronts in order to provide public visibility and monitoring of the area and promote safety.

Buildings in the cottage-style project are oriented to tree-lined streets or to walkway spines framing open space. The clubhouse, pool, open spaces and pedestrian spines are integrated into the site plan so that all are easily accessible and attractive spaces. The outdoor open spaces and walkway spines are lined with dwellings that face on to the space to provide public visibility, monitor the area and promote safety. Surface parking is located behind buildings where it is convenient for the users, but screened from public view by the dwellings.

Principle LIV 26: Neighborhood stability should be maintained and enhanced.

Policy LIV 26.1 – Maintain Existing Neighborhoods

Aim to preserve the character of existing neighborhoods through neighborhood planning, assistance to neighborhood organizations, and supportive regulatory techniques. Changes, if any, will be carefully planned and will result from initiatives by residents or from a specific subarea plan prepared in collaboration with residents. Other changes may result from specific initiatives intended to improve the quality of existing neighborhoods, such as improving mobility and access to everyday activities and services, adding flexibility for vacant and underutilized land, and introducing new neighborhood centers, parks, and small civic facilities.

Policy LIV 26.3 – Promote Compatibility of Uses

Encourage low intensity residential uses within predominantly residential neighborhoods, including but not limited to single-family, low density multi-family, and group homes. Allow other compatible uses to the extent that they reinforce and do not detract from the primary low density, residential function of the neighborhoods.

Policy LIV 26.4 – Balance Resident Preferences with Communitywide Interests

In determining the acceptability of changes to parcels of land adjacent to existing residential developments, balance the adjacent residents' preferences with communitywide interests. For example, if a commercial center is proposed in an existing neighborhood, provide direct community access but also seek context-sensitive solutions to reduce cut-through traffic within the neighborhood.

Policy LIV 26.5 – Retain Differences among Neighborhoods

Retain the size and pattern of lots and blocks, building style, street design details, street and outdoor lighting, and landscape characteristics in ways unique to a given neighborhood as infill and redevelopment occur.

The neighborhood surrounding the proposed project has been in and still is in transition. The construction of the Mulberry and Lemay Crossings shopping complex and Buffalo Run Apartments brought urban development closer to the county industrial area and to the historic San Cristo/Andersonville/Alta Vista neighborhoods. The recently approved Woodward campus, along with the Lincoln Avenue pedestrian improvements continues the transition from rural to urban.

The design of the Capstone project is sensitive to the changing neighborhood environment and seeks to provide an attractive and appropriate land use transition between older industrial uses, higher density residential, commercial uses and existing single-family neighborhoods. We believe the project is an ideal design fit for the neighborhood because it provides a low to medium density neighborhood appearance as viewed from surrounding public streets. Buildings on the edge of the project have front doors that face tree-lined streets with detached sidewalks, while some buildings in the interior face tree-lined pedestrian spines creating walkable blocks and a neighborhood sense of place.

It is projected that at least 95% of the traffic generated by the project will go to the west, south or east away from existing residential areas to the north.

Principle LIV 29: Medium Density Mixed-Use Neighborhoods include a mix of medium-density housing types, providing a transition and link between lower density neighborhoods and a Neighborhood, Community Commercial or Employment District.

Policy LIV 29.3 – Neighborhood or Community Commercial District
Integrate the design of a Medium Density Mixed-Use neighborhood with a Neighborhood Commercial District or Community Commercial District. Residents should be able to easily get to the Commercial District without the need to use an arterial street.

Policy LIV 29.4 – Mix of Housing Types
Include a variety of housing types suitable to a Medium Density Mixed-Use Neighborhood's transitional, higher activity location. Mix and distribute housing types at the neighborhood and block level, rather than creating isolated pockets of a particular housing type. Incorporate low and medium-cost housing with higher-cost housing and non-residential uses.

Policy LIV 29.5 – Transitions
Encourage non-residential uses and larger buildings of attached and multiple-family housing near the commercial core, with a transition to smaller buildings, such as duplex and detached houses, closer to surrounding lower density neighborhoods.

The proposed project on MMN zoned property will provide an attractive and appropriate land use transition between older industrial uses, higher density residential (Buffalo Run Apartments) and existing single-family neighborhoods (San Cristo/Andersonville/Alta Vista) to the north. The proposed higher density residential project will have convenient access to a variety of goods and services located in the Mulberry and Lemay Crossings shopping area located less than a quarter of a mile to the south. In addition, residents can easily access Downtown via Lincoln Avenue, soon to become an enhanced travel corridor.

We believe the project is an ideal design fit for the neighborhood because while it provides higher density and needed student housing for the community, it maintains a low to medium density neighborhood

appearance as viewed from surrounding public streets. Buildings on the edge of the project have front doors that face tree-lined streets with detached sidewalks.

Policy LIV 38.3 –Land Use Transitions
Provide a transition in the scale and intensity of uses at the edges of Employment Districts where they abut residential neighborhoods. Place land use boundaries at mid-block locations, rather than along streets, so that buildings facing each other are compatible and transitions between uses are gradual.

The project creates a mid-block land use transition, rather than having the street be the dividing line between industrial and residential land uses. Locating the maintenance facility, some of the parking and the detention area on the east side of International Boulevard effectively creates a seamless land use transition between the existing County industrial uses and the proposed residential neighborhood.

DELICH ASSOCIATES Traffic & Transportation Engineering
2272 Glen Haven Drive Loveland, Colorado 80538
Phone: (970) 669-2061 Fax: (970) 669-5034

MEMORANDUM



TO: John Acken, Capstone Collegiate Communities
Linda Ripley, Ripley Design
City of Fort Collins

FROM: Joe Delich/Matt Delich

DATE: August 28, 2015

SUBJECT: Capstone Cottages Transportation Impact Study Addendum
(File: 1495ME02)

This memorandum is an addendum to the "Capstone Cottages Transportation Impact Study" (CCTIS) dated March 2015. The CCTIS is also submitted with this memorandum.

The trip generation in the CCTIS was calculated using 860 beds. The revised site plan, attached, shows 888 beds. The calculated differences in the trip generation are: 74 more daily trip ends, 6 more morning peak hour trip ends, and 12 more afternoon peak hour trip ends.

SHORT RANGE FUTURE (2019)

The additional peak hour traffic was assigned at the key intersections using the trip distribution in the CCTIS. Figure 1 shows the short range (2019) site generated peak hour traffic from the CCTIS and the additional traffic from the increase in the number of beds. The incremental increase for any turning movement ranges from 0 to 4 vehicles. As reported in the CCTIS (page 23 and Table 5), the key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for the westbound approach at the Lemay/Buckingham intersection in both peak hours and the westbound left-turn movement at the Lemay/Vine intersection in the afternoon peak hour. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach will be commensurate with level of service F. In an urban environment, at stop sign controlled intersections along arterial streets, this level of delay is normal during the peak hours. No site generated traffic is added to the movements that operate at this level of service. In fact, this level of service occurs under the background traffic condition, without the Capstone Cottages development. At the Lemay/Vine intersection, the calculated delay for the westbound left-turn movement in the afternoon peak hour will be commensurate with level of service F. However, this project does not

have significant negative impact at this intersection, since the project traffic causes less than a two percent increase in the intersection delay.

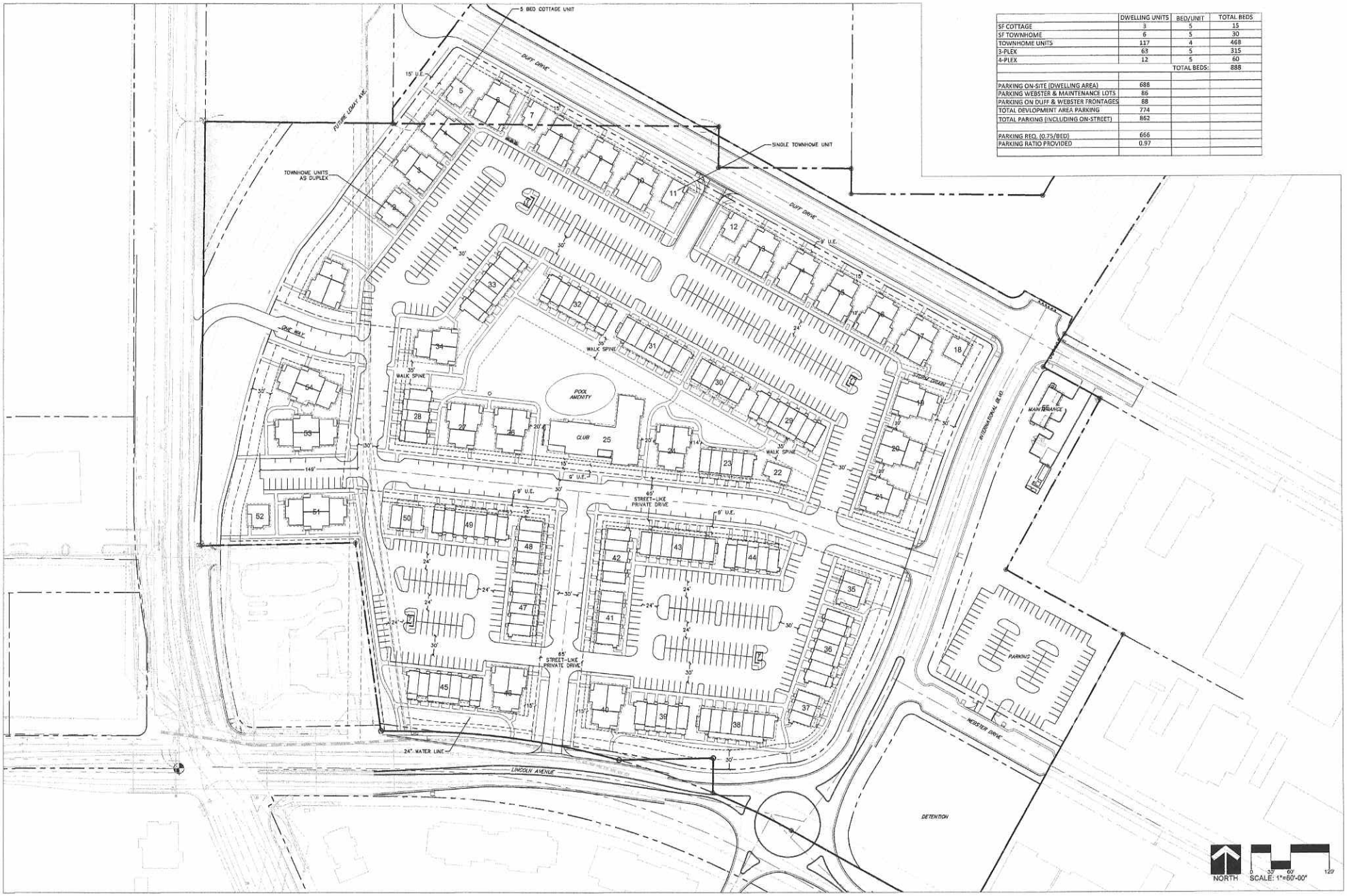
With the increase in the trip generation, no new peak hour traffic will be added to the Vine/Lemay intersection. As discussed in the CCTIS (page 29), there is not an APF issue at the Vine/Lemay intersection.

LONG RANGE FUTURE (2035)

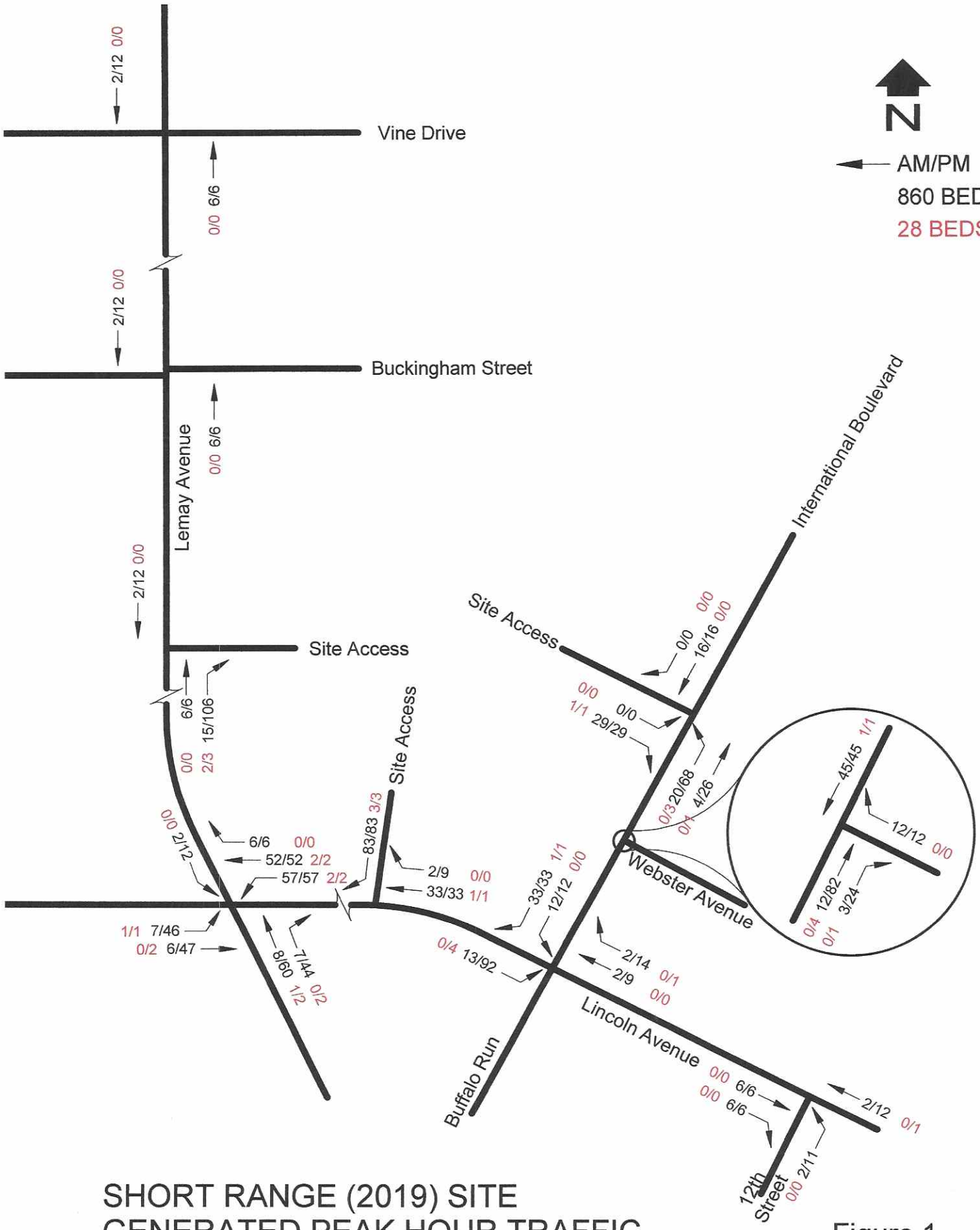
The additional peak hour traffic was assigned at the key intersections with the long range street network. Figure 2 shows the long range (2035) site generated peak hour traffic from the CCTIS and the additional traffic from the increase in the number of beds. The incremental increase for any turning movement ranges from 0 to 3 vehicles. As reported in the CCTIS (page 23 and Table 6), the key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours with signal control at the Lemay/Buckingham-Duff intersection.

SUMMARY

It is concluded that the increase from 860 beds to 888 beds has no significant bearing on the analyses and conclusions in the CCTIS dated March 2015.



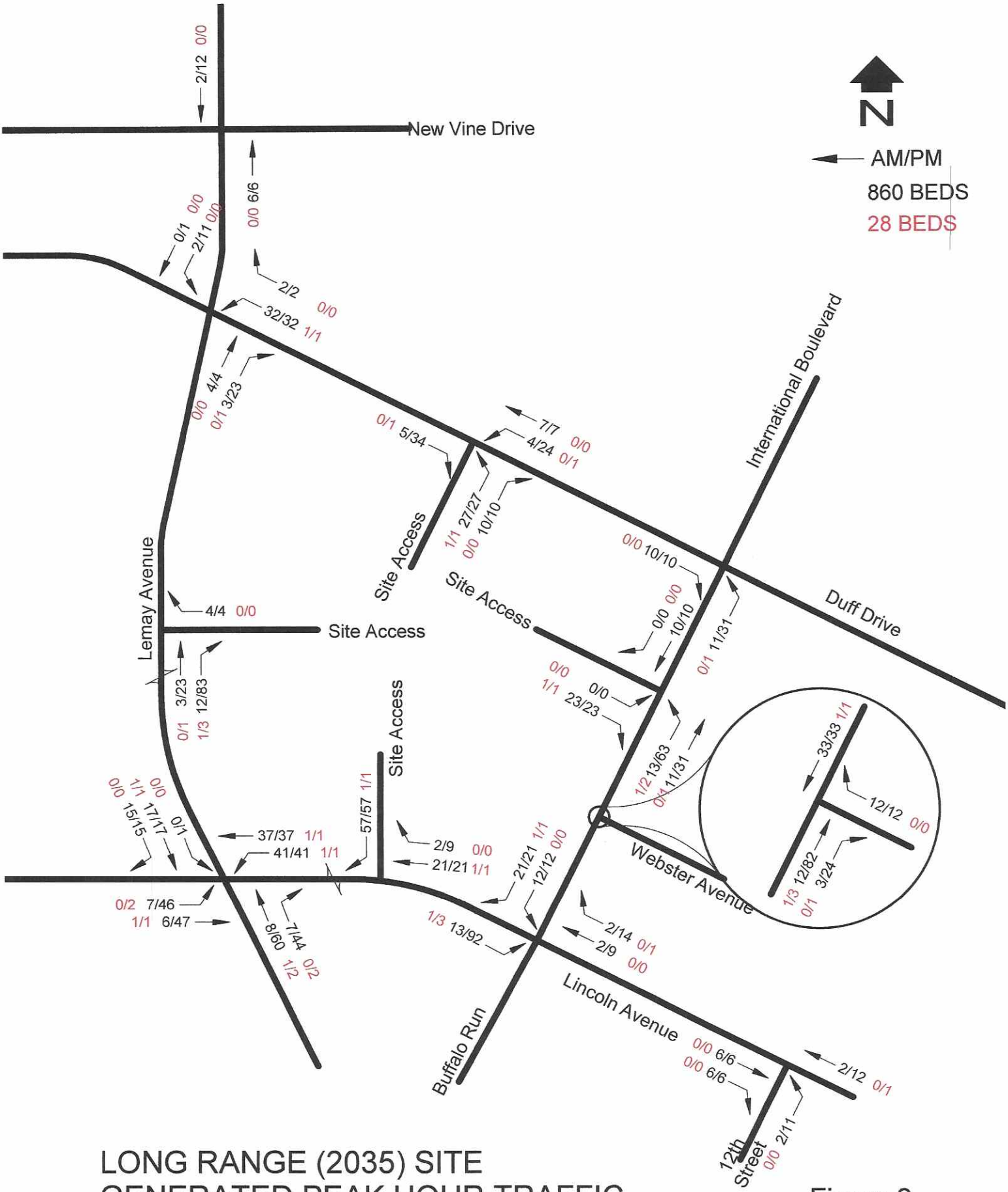
	DWELLING UNITS	BED/UNIT	TOTAL BEDS
SF COTTAGE	3	5	15
SF TOWNHOME	6	5	30
TOWNHOME UNITS	117	4	468
3-PLEX	63	5	315
4-PLEX	12	5	60
		TOTAL BEDS:	888
PARKING ON-SITE (DWELLING AREA)	688		
PARKING WEBSTER & MAINTENANCE LOTS	86		
PARKING ON DUFF & WEBSTER FRONTAGES	88		
TOTAL DEVLOPMENT AREA PARKING	774		
TOTAL PARKING (INCLUDING ON-STREET)	862		
PARKING REQ. (0.75/BED)	666		
PARKING RATIO PROVIDED	0.97		



SHORT RANGE (2019) SITE GENERATED PEAK HOUR TRAFFIC

Figure 1

DELICH ASSOCIATES



LONG RANGE (2035) SITE GENERATED PEAK HOUR TRAFFIC

Figure 2

DELICH ASSOCIATES

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MEMORANDUM

TO: John Acken, Capstone Collegiate Communities
Linda Ripley, Ripley Design
City of Fort Collins

FROM: Joseph Delich

DATE: November 9, 2015

SUBJECT: Capstone Cottages Additional Information
(File: 1495ME03)

This memorandum addresses comments given at the neighborhood meeting with regard to the "Capstone Cottages Transportation Impact Study (CCTIS) dated March 2015. The CCTIS had a trip distribution of 5 percent to/from the north on Lemay Avenue. This trip distribution was deemed to be appropriate. The citizen comment suggested that the trip distribution to/from the north on Lemay Avenue should be between 10 and 20 percent of the Capstone Cottages site generated traffic.

The trip assignment of the Capstone Cottages through the Lemay/Vine intersection was increased to 10, 15, and 20 percent in the morning and afternoon peak hours. Operational analyses were performed at the Lemay/Vine intersection using the trip distribution changes. Table 1 shows the short range (2019) peak hour operation at the Lemay/Vine intersection for the following conditions: 1) Background (without the project); 2) Total traffic at a trip distribution of 5 percent to/from the north; 3) Total traffic at a trip distribution of 10 percent to/from the north; 4) Total traffic at a trip distribution of 15 percent to/from the north; and 5) Total traffic at a trip distribution of 20 percent to/from the north.

Lemay/Vine Adequate Public Facilities

Proposed developments in Northeast Fort Collins are required to address the operation at the Lemay/Vine intersection. This intersection has operational and geometric constraints that may create an adequate public facilities (APF) issue. Succinctly, if this intersection does not meet the overall level of service (LOS) criteria, then a development may add traffic such that the overall intersection delay is not increased by more than 2 percent over the base condition. The intersection falls under the operational criteria of "commercial corridor." In this area, acceptable operation at signalized intersections during the peak hours is defined as level of service D or better overall for the intersection. Table 1 indicates that the Lemay/Vine intersection meets the overall level of service criteria. Therefore, there is not an APF issue at this intersection under all of the trip distribution scenarios.

Operations Analysis

At the Lemay/Vine intersection (Table 1), the overall level of service in the afternoon peak hour remains at LOS D for all trip distribution scenarios. In the afternoon peak hour, the overall calculated delay at the Lemay/Vine intersection is between 42.0 seconds and 45.8 seconds with the an incremental trip distribution of 5 – 20 percent to/from the north on Lemay Avenue. In the afternoon peak hour under the background traffic condition and under all trip distribution scenarios, the westbound left-turn movement will operate at level of service F. The calculated delay for this movement remains the same under all analysis conditions.

Summary

With the citizen suggested trip distribution of 10-20 percent to/from the north on Lemay Avenue, there will not be an APF issue at the Lemay/Vine intersection. The overall level of service in the afternoon peak hour remains at LOS D. In the afternoon peak hour, the overall calculated delay increases from 42.0 seconds (5% to/from north) to 45.8 seconds (20% to/from north). This is a modest increase in delay.

TABLE 1 Lemay/Vine Intersection Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Short Range Background	EB LT	D	D
	EB T/RT	D	D
	EB APPRAOCH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPRAOCH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C	D
Short Range Total with 5% to/from the north	EB LT	D	D
	EB T/RT	D	D
	EB APPRAOCH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPRAOCH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C (24.1 secs)	D (42.0 secs)
Short Range Total with 10% to/from the north	EB LT	D	D
	EB T/RT	D	D
	EB APPRAOCH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPRAOCH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C (24.1 secs)	D (43.3 secs)
Short Range Total with 15% to/from the north	EB LT	D	D
	EB T/RT	D	D
	EB APPRAOCH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPRAOCH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C (24.1 secs)	D (44.5 secs)
Short Range Total with 20% to/from the north	EB LT	D	D
	EB T/RT	D	D
	EB APPRAOCH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPRAOCH	D	E (75.0)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C (24.1 secs)	D (45.8 secs)

CAPSTONE COTTAGES
OUTLINE OF PROPOSAL TO ADDRESS CITY STAFF CONCERNS REGARDING
ACCESS, COMMON SPACES, UTILITIES AND OTHER ISSUES RELATED TO INDIVIDUAL LOT OWNERSHIP

A. Declaration of Covenants and Establishment of Association

- The concerns of City staff will be addressed through a declaration of covenants recorded against the property after approval. This declaration will be modelled on a typical HOA declaration. Most HOAs deal with the same types of issues present with this development.

- The declaration will provide for the creation of an association, with creation of the association to occur either concurrently with the declaration or prior to the sale of the first lot by the declarant.

    - If an association is formed at the outset, the association will own common areas and will be responsible for maintenance, managing parking, utilities, etc.

    - If the association is not formed at the outset, the declarant will own common areas and will be responsible for maintenance, managing parking, utilities, etc. Further, the declaration will provide that an association must be created prior to the sale of the first lot, with the transfer of rights/obligations from the declarant to the association to take place at the time of formation (e.g., ownership, easements, maintenance).

- Consistent with any other HOA community, individual lot owners would be members of the association and would have a say in the functioning of the association and matters within its purview (e.g., maintenance, parking).

B. Common Areas and Communal-Use Areas- Ownership, Use and Maintenance

- Areas identified on the plat as "tracts" (e.g., private roads, clubhouse, open spaces, certain sidewalks, parking areas) will be owned by the declarant/association ("Common Areas"). (See A above regarding association establishment.)

- Individual lots which contain features intended to be utilized by the Capstone Cottages community at large or which benefit the community at large (e.g., rain gardens, certain sidewalks, bicycle racks, park-type open spaces with landscaping features, tables/chairs, etc.) will be covered by easements in the declaration permitting such uses ("Communal-Use Areas").

- Common Areas and Communal-Use Areas will be managed by the declarant/association. Common Area and Communal-Use Area maintenance will be the responsibility of the declarant/association.

    - If lots are ever sold, individual lot owners will be assessed dues for this service, as per any other HOA.

C. Access and Parking

- The declaration will provide access easements allowing lot owners to utilize private roads, vehicle/bicycle parking areas and sidewalks (including those within Common Areas and those which cross individual lots).

    - Parking spaces will not be allocated to individual lots, but the declarant/ association would be empowered to address this issue in the future, in the event that individual lots are ever sold.

D. Utilities and Drainage Facilities/Features – Easements, Private Sewer and Water Service

- The declaration will describe the proposed private sewer and water plan.

- The declaration will provide easements that are necessary for:

    - Any third-party utility service which serves one lot by crossing over another lot or a common area;

    - Any private sewer or water mains/lines established pursuant to the proposed utility plan;

    - Drainage facilities and features.

E. City Approval of Certain Changes to the Declaration

- Changes to the declaration which would violate site plan approval conditions will require the prior approval of the City in accordance with then-current Land Use Code processes, with such changes to include:

    - Those which would materially limit the rights of any holder of an easement established under the declaration for utilities, drainage, lot access or vehicle/bicycle parking;

- Those which would eliminate the declarant's/association's maintenance responsibilities concerning Common Areas.

F. Timing of Final Declaration and Recordation

- During the FDP process, the declaration will be finalized concurrently with the development agreement, subject to review and approval by the City Attorney's Office of the language used in the declaration to address the matters described in sections (B), (C) (D) above.

- The declaration will be recorded with the Larimer County Clerk and Recorder's Office.

G. Plat Note

- A note will be added to the plat noting the existence of the declaration and indicating that it concerns such matters as easements for access/utilities/drainage/parking and common area use and maintenance.

REVEGETATION SCHEDULES

Excavation and grading may ordinarily occur during any month of the year. However, revegetation activities are typically more limited with respect to the time of year in which they should be completed and must be timed to coincide with a recognized planting season. The following tables depict two revegetation schedules that can be followed to achieve the mitigation objectives set for this project.

Site conditions and/or climatic variations may require that these schedules be modified somewhat to achieve revegetation success. The schedules do not reflect any weed control activities that may be employed on site and would be amended to incorporate such a program if required.

TABLE 1: FALL (DORMANT SEEDING) MITIGATION SCHEDULE

	Month											
Reclamation Technique	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
Excavation/Grading					Any month							
Resoiling and/or Ripping (if necessary)									XXX			
Seedbed Material Sampling									XXX			
Fertilization										XXX		
Seedbed Preparation										XXX		
Seeding										XX		
Mulching (as specified)										XX		
Shrub Seedling and Tree Planting (following year)				XX								
Willow Cutting and Planting (following year before breaking bud)			XX									

TABLE 2: SPRING MITIGATION SCHEDULE

Reclamation Technique	Month J	F	M	A	M	J	J	A	S	O	N	D
Excavation/Grading					Any month							
Resoiling and/or Ripping (if necessary)			XXX									
Seedbed Material Sampling			XXX									
Fertilization				XX								
Seedbed Preparation				XX								
Seeding				XX								
Mulching (as specified)				XX								
Shrub Seedling and Tree Planting				XX								
Willow Cutting and Planting (before breaking bud)			XX									

Note: Weather and surface conditions permitting, the earlier in the season spring planting is completed the higher the potential for revegetation success.

MANAGEMENT AND MAINTENANCE

No earth-moving activities will be permitted outside the boundaries of the mitigation area except as provided for in the site development plans. Adjunct disturbances related to the installation of emergency erosion control or site stabilization measures are also excepted.

All erosion control measures will be kept in good condition until the mitigation plan is deemed acceptable by the City or it is obvious that the site is stable and the installed measures are no longer required as per City direction. Within this time frame, any erosion control measure removed prematurely or damaged will be immediately replaced / repaired.

The permanent mitigation plantings will be inspected at least bi-monthly during the first three growing seasons following planting and immediately following intense rainstorms. Areas of poor “seed take” will be noted. Any area remaining unvegetated by desirable species throughout the first four growing seasons will be reseeded following the application of appropriate seedbed preparation techniques during the next Fall planting season. Shrub seedlings or tree plantings judged to be dead will be replaced as necessary to meet success requirements.

If nutrient deficiency symptoms develop on revegetated areas, this condition will be remedied by adding the proper nutrients in the proper amounts. Where slips, slides, or slumps occur on slopes, such will be remedied as soon as soil conditions permit access.

No mowing, trimming, or other similar vegetation modification activities will be permitted in the wetland mitigation area unless directly associated with a planned weed control activity.

WEED CONTROL PLAN SUMMARY

This section summarizes the elements of the weed control plan to be prepared for the project area if weeds are deemed to be detrimental to plant establishment success or are required to be eradicated as per regulations. No more than 10 % weeds (see below for "weed" definition), as estimated based on total plant cover, will be permitted in the project area at the end of each growing season. The project area will be evaluated twice per year for weed establishment; once in mid-growing season and once at the end of each growing season for a period of three years following construction and planting. The completed plan will be submitted to governmental agencies, including the City of Fort Collins as required for review and approval.

The weed control plan will be prepared by a Licensed Commercial Pesticide Applicator (LCPA). All subsequent weed control activities will also be conducted by an LCPA. The plan to be prepared will take the form of an Integrated Pest Management Plan (IPM) that will consider all methods of control that would potentially be applicable to the project area. These methods include mechanical, chemical, cultural, and biological techniques. Prior to plan preparation, a visit to the project area will be conducted at the end of the first growing season by the LCPA accompanied by representatives of the City of Fort Collins, as appropriate. The objective of this site visit is to assess site conditions, routes of access, weedy species present, the relationship of surrounding water / wetland bodies to the proposed areas to be treated, potential sources of run-on and run-off, and any other factors relevant to the weed control planning process. Given the presence of wetlands adjacent to project area, initial emphasis will be given to weed control methods other than those of a chemical nature, though chemical controls do exist that are considered by the Corps of Engineers to be appropriate in such cases.

Plant species to be considered as weeds and controlled and/or eradicated at this project site, as per City code, are those listed by the Larimer County Weed Control District and those listed as noxious by the Colorado Weed Law. Species listed by Larimer County and to be controlled include.

Canada Thistle
Dalmation toadflax
Diffuse Knapweed
Leafy spurge
Musk Thistle
Russian knapweed
Spotted knapweed
Tamarisk (saltcedar)
Yellow toadflax

MONITORING

Monitoring Overview

At the end of each of the first three full growing seasons following initial planting, the wetland mitigation sites will be monitored quantitatively to determine the overall level of construction success, site stability, and vegetation establishment. The results of this assessment will be submitted to the City of Fort Collins in a report on or about December 31.

Mitigation and revegetation success will be judged based on four criteria. These criteria include the size of the mitigation areas successfully established, the wetland soil moisture regimes created, the percent ground cover of wetland-classed species present in the wetland mitigation area, and the percent success of the shrub and tree plantings.

The mitigation size criterion will be met if the mitigation site qualifying as vegetated wetlands totals 0.22 acres. The soil moisture regime criteria will be met if the wetland mitigation area surface dedicated to the establishment of hydric species exhibits saturated conditions in the upper 12.0 inches of the soil profile and/or shallow flooding throughout the majority of the growing season as evidenced either by soil characteristics or the presence of sufficient wetland indicator species. Small ridges and potholes that enhance species diversity will be acceptable so long as these features do not compromise the overall integrity of the vegetated wetlands to be created. The average depth of free water over the mitigation sites will be reported as will an estimate of the percent of the vegetated mitigation area overlain by free surface water. (Surface water occurring in a mosaic with wetland species and representing a typical marsh community will not be included in the estimate of percent of open water present.)

The ground cover criterion will be met if, after three growing seasons, the total ground cover contributed by all grass, forb, and shrub species (including willow cuttings) present in the wetland mitigation area (point intercept method) is equal to or greater than 80 percent, on average, and wetland-classed species (FAC, FACW, and OBL) are dominant on site (51+ percent relative cover) as compared to upland-classed (FACU and UPL) species. In addition, there will be no evidence of erosion detrimental to vegetation establishment or site stability. The percent of open water occurring over the surface of the mitigation basin will be considered a “null set” when calculating percent herbaceous ground cover, so long as such surface water does not indicate the formation of an "open water" system.

Shrub (excluding willow cuttings which will be evaluated as a part of ground cover) and tree species planted as a part of wetland mitigation construction will be tallied by a simple count of viable species present at the time of monitoring fieldwork. Any indications of insect or animal damage will be noted as will any indications of nutrient deficiencies. Shrub and tree plantings will

be considered successful where 90 percent of the numbers planted are present on site. In the case of shrubs and trees, volunteer plants will be included in the tally.

Any actions deemed necessary to enhance mitigation success and / or site stability will be taken as a result of each annual monitoring assessment.

Specific vegetation sampling and analysis protocols will be developed prior to the first annual assessment. Information and showings to be submitted with each annual quantitative monitoring report include a project location map, a discussion of the conditions of the mitigation sites, a summary of the data collected, a list of all species observed within the mitigation areas, copies of all data sheets completed in the field, and a continuation of the photographic record submitted with the first annual report. As appropriate, recommendations will be made with respect to the continued maintenance and monitoring of the mitigation area.

Monitoring will continue on an annual basis until the City judges this mitigation program to be successful. Disturbed areas revegetated to upland conditions will not be included in the annual monitoring assessments.

Soil and Plant Cover Sampling Technique Specifics

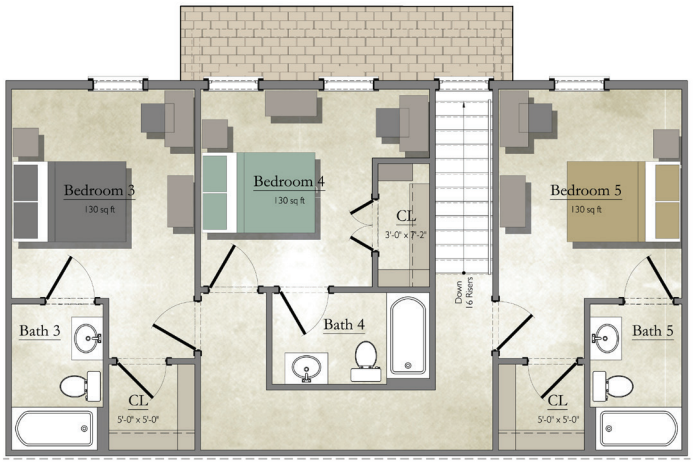
Compensatory Wetland Mitigation Area

To determine the depth to which non-inundated soils are saturated, soil sample pits will be dug at two to three representative locations in the wetland mitigation area. Each pit will be dug to a depth of 12.0-16.0 inches. The depth to saturation or flooding, if occurring, will be recorded. Soil matrix colors will be recorded to assess soil moisture regime characteristics. The presence of gleying or mottling will be noted and the color and percent of mottles in the matrix will be recorded, if present. A sulfidic (H_2S) odor will also be noted, if observed.

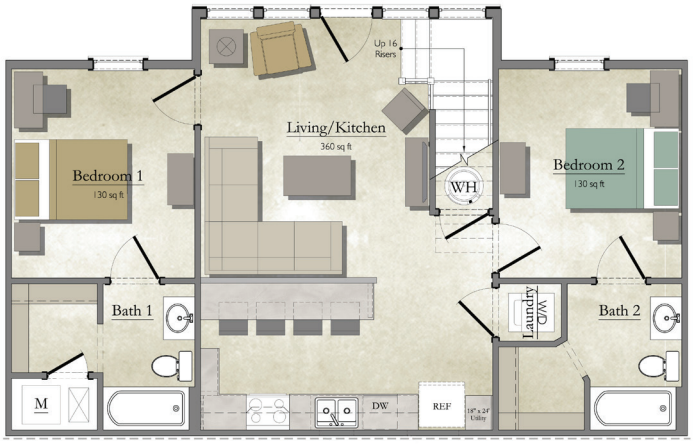
Plant cover will be evaluated using the point-intercept method. A 100-foot tape will be laid out along the surface at two to three locations in the created wetlands. Transects will be sited to represent the vegetation conditions common within the mitigation and enhancement area. At each one-foot interval along each transect, a "hit" will be recorded. A hit will consist of vegetation (by species), “free water”, floating algae, or bare ground/rock/litter combined. The percent total plant cover will then be calculated for each transect. The relative cover contributed by both hydric and upland plant species will also calculated for the wetland transects.

Shrub and tree planting success will be assessed by a simple tally of the shrubs and trees (by species) alive at the end of each growing season. Plant vigor will be recorded for each individual planting as “ viable”, “stressed”, or “dead”. Both viable and moderately stressed plants will be included in the success calculation. Seriously stressed plants will be selected for remedial planting on a case-by-case basis.

FIVE-FIVE DUPLEX COTTAGES

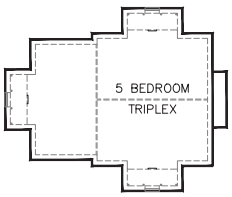


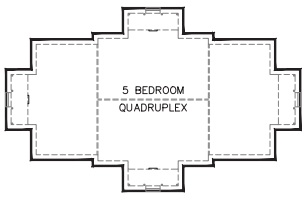
Upper Level



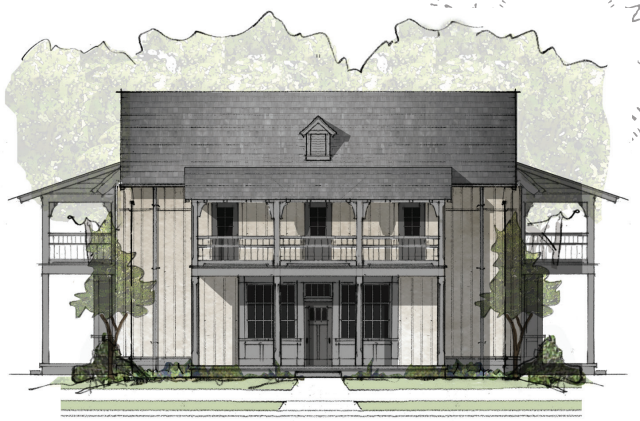
Lower Level







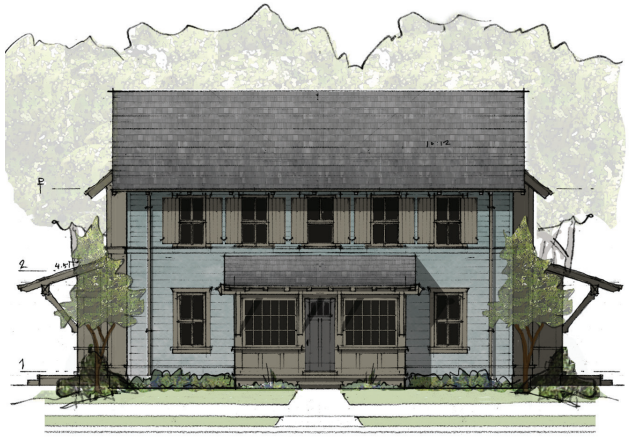
Building Configurations



Longleaf



Cloverdale



Oakwood



Pinewood

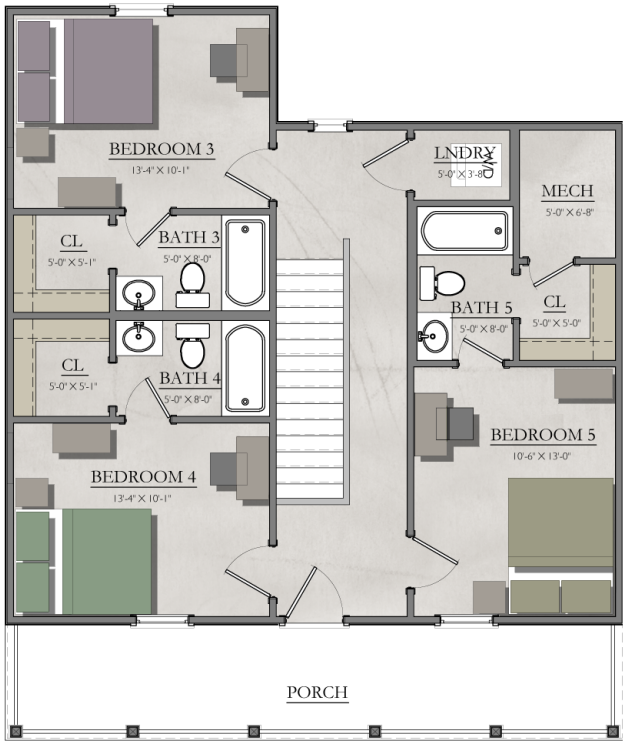
Windows & porches vary per elevation

1800 total square feet per unit

THE COTTAGES OF FORT COLLINS

SQUARE FOOTAGE VARIES BASED UPON ELEVATION AND FLOORPLANS. NEED NOT BE BUILT.

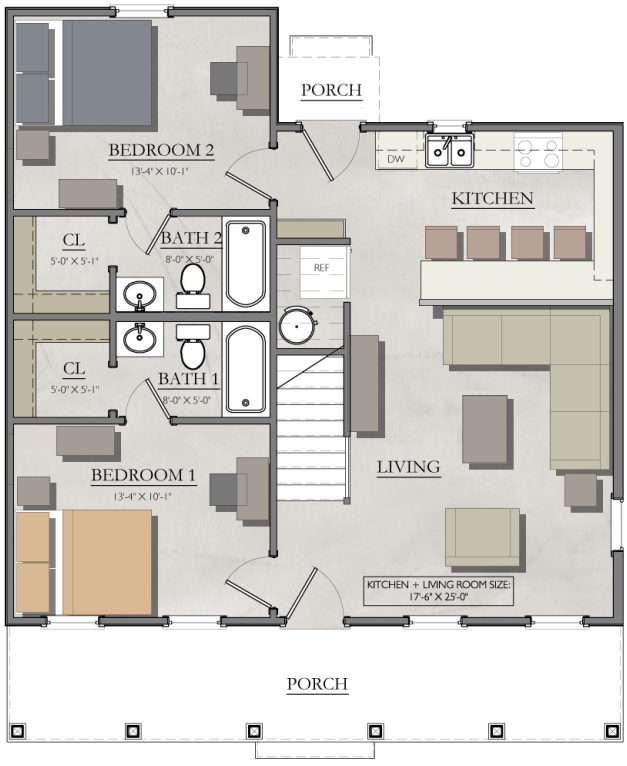
FIVE BEDROOM COTTAGES



Upper Level



Alder Cottage



Lower Level



Aspen Cottage

Windows & porches vary per elevation

1832 total square feet per unit

THE COTTAGES OF FORT COLLINS

SQUARE FOOTAGE VARIES BASED UPON ELEVATION AND FLOORPLANS. NEED NOT BE BUILT.

SNAPDRAGON TOWNHOUSE



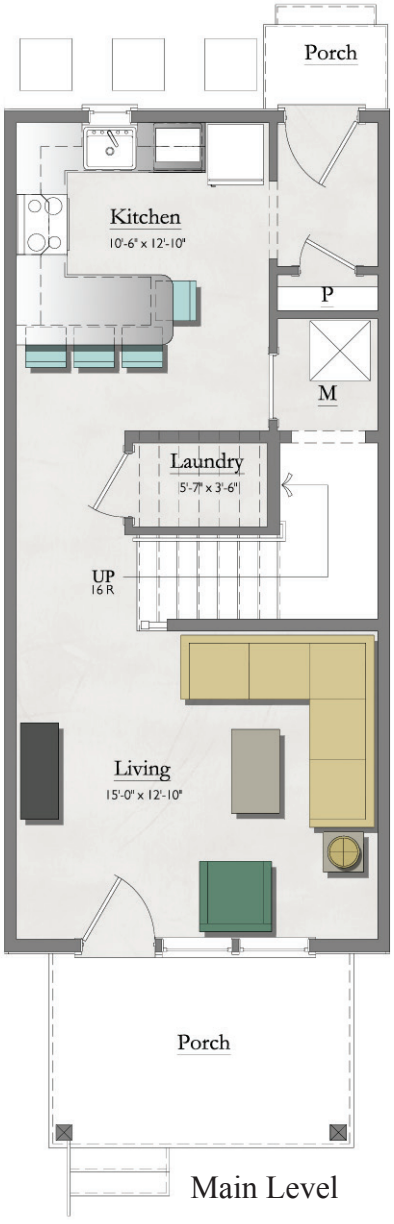
Three Unit



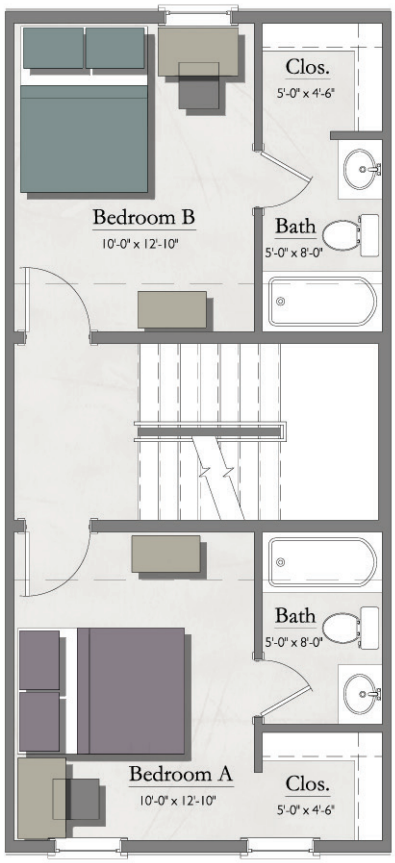
Five Unit



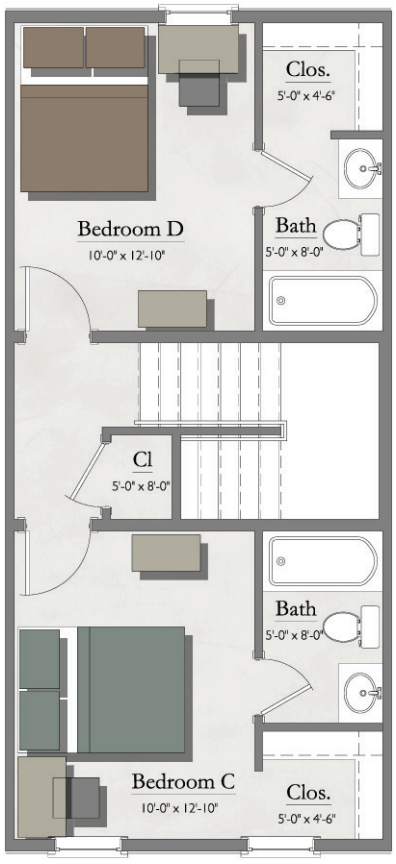
Seven Unit



Main Level



Second Level



Third Level

Windows & porches vary per elevation

1680 total square feet per unit

THE COTTAGES OF FORT COLLINS

SQUARE FOOTAGE VARIES BASED UPON ELEVATION AND FLOORPLANS. NEED NOT BE BUILT.

INDIGO TOWNHOUSE

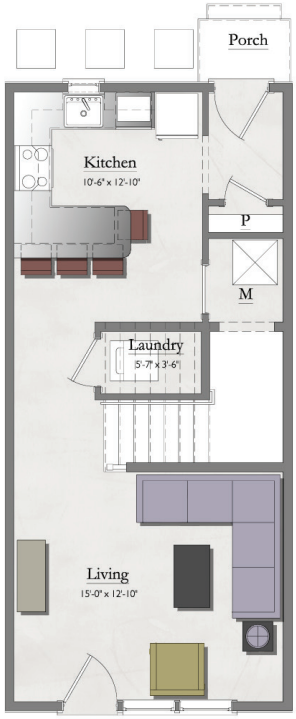


Three Unit

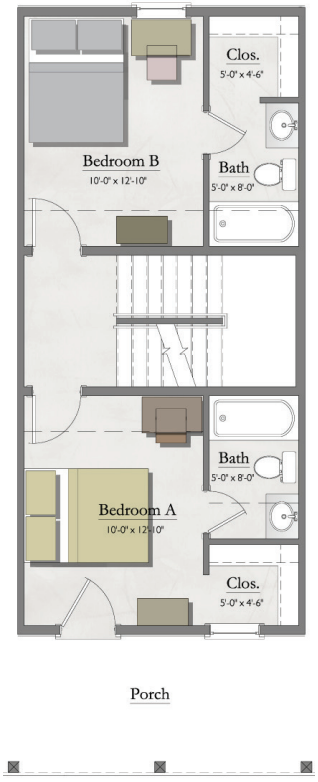


Seven Unit

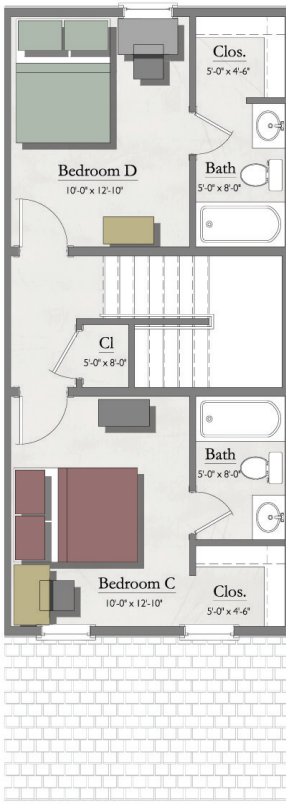
*Seven Unit End Units do not have access to upper balcony



Main Level



Second Level



Third Level

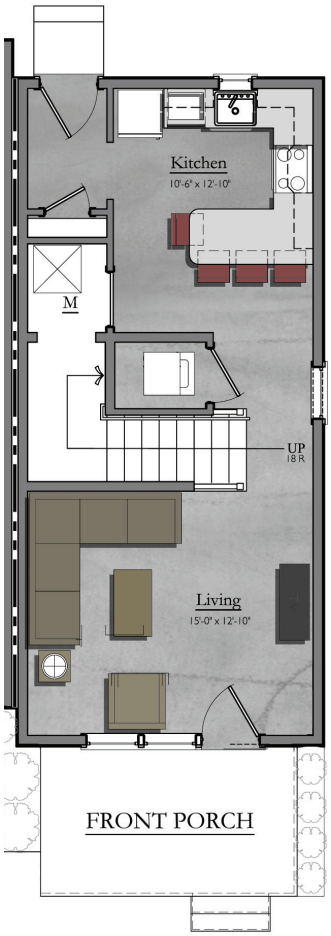
Windows & porches vary per elevation

1680 total square feet per unit

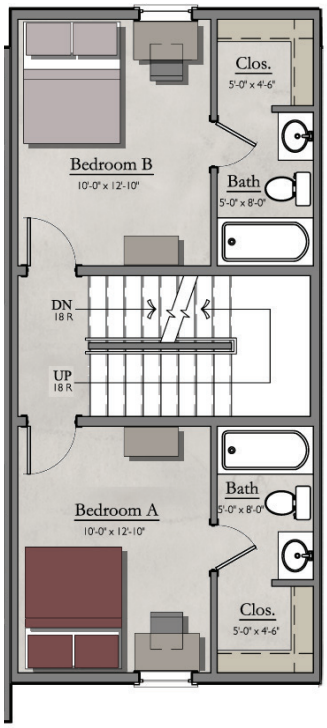
FOUR BEDROOM TOWNHOUSE



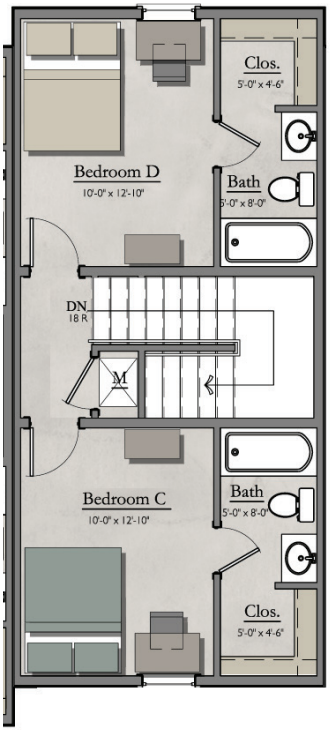
Rattlebush Townhouse



Main Level



Second Level

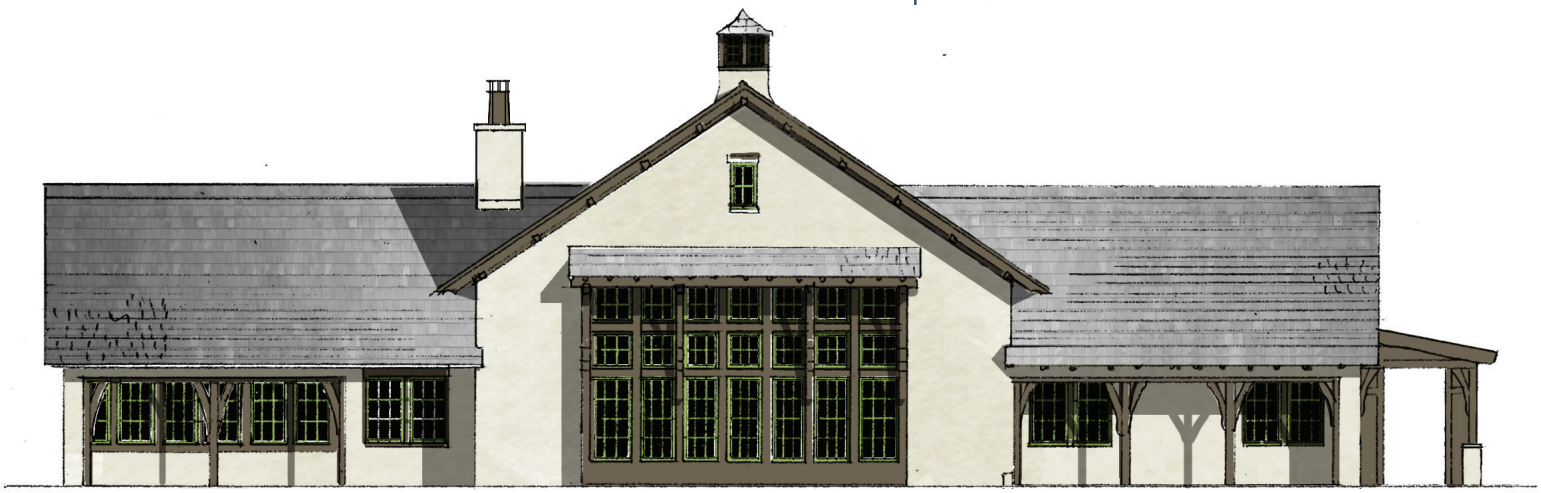


Third Level

Windows & porches vary per elevation

1680 sq ft per unit

CLUBHOUSE





Cottage Clubhouse Floor Plan

Windows & porches vary per elevation



Snapdragon Townhouse

Indigo Townhouse

Rattlebush Townhouse

Clubhouse


Longleaf


Cloverdale


Oakwood


Pinewood


Alder Cottage


Aspen Cottage

Cottage and Townhouse Elevations

2 Story Cottages

Bldg. No.	Bldg. Type	Front Elev.	Side Elevs.	Back Elev.	Color Scheme
1	5 BR Triplex	Longleaf	Longleaf	N/A	11
2	5 BR Duplex	Cloverdale	Pinewood	N/A	4
3	5 BR Triplex	Oakwood	Oakwood	N/A	2
4	5 BR Triplex	Pinewood	Cloverdale	N/A	5B
5	5 BR Cottage	Longleaf	N/A	N/A	3
6	5 BR Triplex	Cloverdale	Cloverdale	N/A	7
7	5 BR Cottage	Oakwood	N/A	N/A	1
8	5 BR Triplex	Pinewood	Oakwood	N/A	6
9	5 BR Triplex	Oakwood	Oakwood	N/A	10
10	5 BR Triplex	Longleaf	Cloverdale	N/A	8
11	5 BR Cottage	Oakwood	N/A	N/A	4
12	5 BR Cottage	Cloverdale	N/A	N/A	6
13	5 BR Triplex	Longleaf	Oakwood	N/A	5
14	5 BR Triplex	Cloverdale	Cloverdale	N/A	9
15	5 BR Triplex	Pinewood	Cloverdale	N/A	3
16	5 BR Triplex	Oakwood	Oakwood	N/A	1
17	5 BR Triplex	Longleaf	Cloverdale	N/A	8
18	5 BR Cottage	Aspen	N/A	N/A	2
19	5 BR Triplex	Pinewood	Pinewood	N/A	7
20	5 BR Triplex	Oakwood	Oakwood	N/A	5
21	5 BR Triplex	Longleaf	Longleaf	N/A	11
22	5 BR Cottage	Oakwood	N/A	N/A	2
24	5 BR Triplex	Pinewood	Pinewood	N/A	11
26	5 BR Triplex	Cloverdale	Cloverdale	N/A	8
27	5 BR Triplex	Longleaf	Longleaf	N/A	10
34	5 BR Triplex	Longleaf	Longleaf	N/A	7
40	5 BR Triplex	Longleaf	Longleaf	N/A	8
46	5 BR Triplex	Pinewood	Pinewood	N/A	9
51	5 BR Quad	Longleaf	Cloverdale	Cloverdale	6
52	5 BR Cottage	Alder	N/A	N/A	4
53	5 BR Quad	Longleaf	Oakwood	Longleaf	2
54	5 BR Quad	Pinewood	Cloverdale	Pinewood	11

3 Story Townhouses

Bldg. No.	Townhouse Type	Number of Units	Color Scheme
23	Snapdragon 5	5 Unit TH	3A
28	Rattlebush 5	5 Unit TH	10B
29	Indigo 7	7 Unit TH	6A
30	Snapdragon 5	5 Unit TH	1A
31	Rattlebush 7	7 Unit TH	9
32	Snapdragon 7	7 Unit TH	2A
33	Indigo 7	7 Unit TH	4A
35	Snapdragon 3	3 Unit TH	1A
36	Rattlebush 7	7 Unit TH	9
37	Indigo 3	3 Unit TH	2A
38	Snapdragon 7	7 Unit TH	4A
39	Rattlebush 5	5 Unit TH	1A
41	Indigo 5	5 Unit TH	3A
42	Snapdragon 5	5 Unit TH	6A
43	Indigo 7	7 Unit TH	2A
44	Rattlebush 5	5 Unit TH	5A
45	Indigo 7	7 Unit TH	3A
47	Snapdragon 7	7 Unit TH	7
48	Rattlebush 5	5 Unit TH	6A
49	Indigo 7	7 Unit TH	5A
50	Snapdragon 3	3 Unit TH	4A

Clubhouse

Bldg. No.	Bldg. Type	Front Elev.	Side Elevs.	Back Elev.	Color Scheme
25	Clubhouse	Longleaf	Longleaf	N/A	CH

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THE COTTAGES of FT. COLLINS

COTTAGE LAYOUT

Ft. Collins, Colorado
NUMBER 13044 ?????/ ??, ????

Drawn by: TAC
Checked by: TAC

REVISIONS

Cottage and Townhouse Elevations Layout Plan

B0-01

1 / B0-01 COTTAGE AND TOWNHOUSE ELEVATION LAYOUT PLAN

1" = 60'-0"

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1 - COLOR SCHEME

1 - BUILDING NUMBER

LEMAY AVENUE

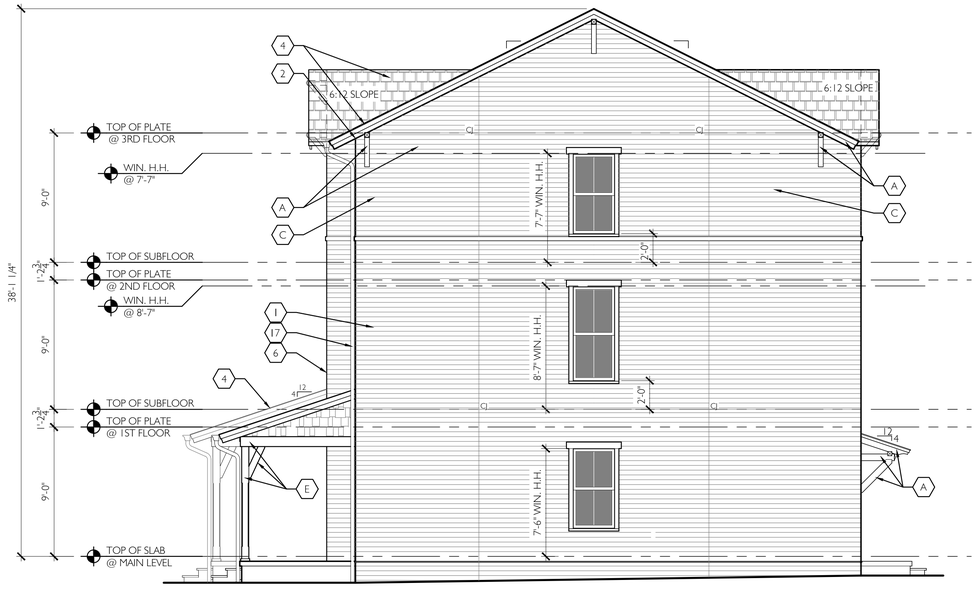
DUFF DRIVE

PRIVATE DRIVE

CLUB HOUSE CH 25

INTERNATIONAL BOULEVARD

WEBSTER AVENUE



2 A2-0 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	SIMULATED STONE VENEER
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6' - FASTENED W/ 1 ½" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	LAP SIDING FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR
H	STUCCO FINISH

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment along eaves, slope transitions and ridges, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
- Use non-corrosive fasteners and use of elastometric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all ½" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
-- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term



1 A2-0 FRONT ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

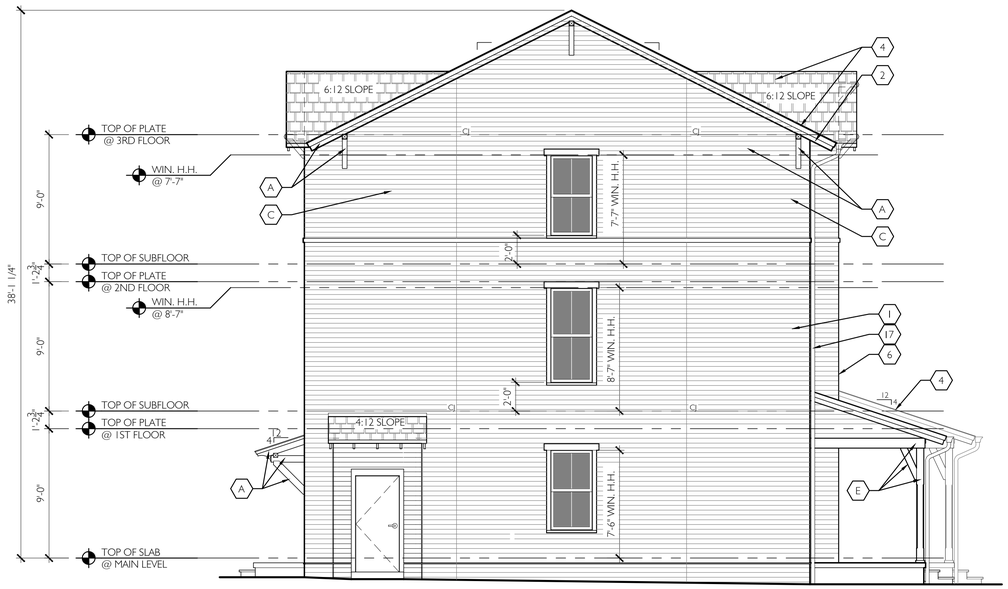
4 Bed Townhouse
Snapdragon-3-Unit
5,106 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
3 Unit Snapdragon



2 / A2-1 SIDE ELEVATION

3/16 = 1'-0"

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2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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1 / A2-1 BACK ELEVATION

3/16 = 1'-0"

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Snapdragon-3-Unit
5,106 total sq. ft.

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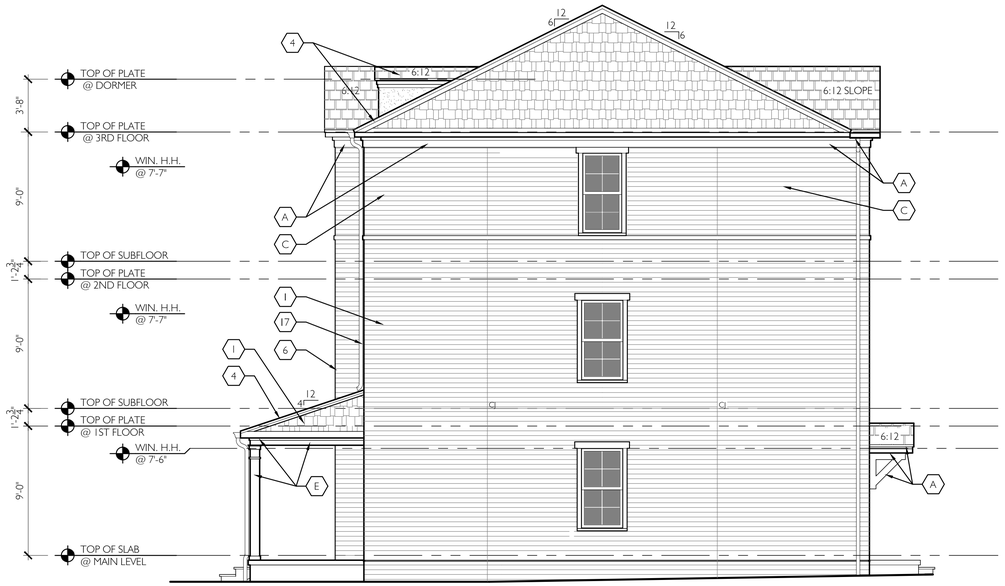
3 Unit Snapdragon



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Snapdragon-5-Unit
8,532 total sq. ft.

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NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Snapdragon



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3/16 = 1'-0"

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8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1 1/2" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	LAP SIDING FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR
H	STUCCO FINISH

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment along eaves, slope transitions and ridges, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
- Use non-corrosive fasteners and use of elastometric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all 1/2" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
- -- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term



1 / A2-1 BACK ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

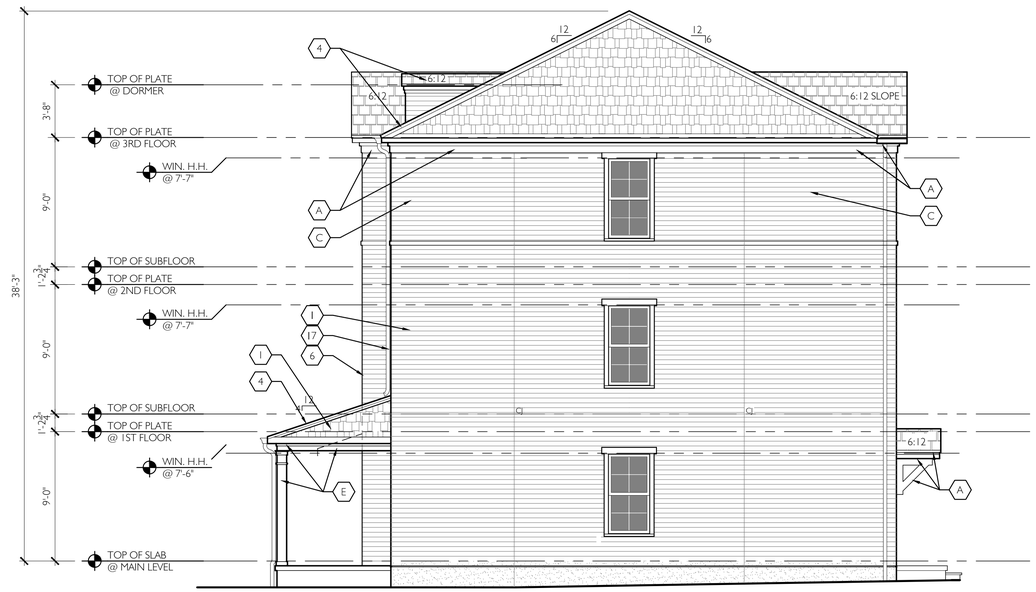
4 Bed Townhouse
Snapdragon-5-Unit
8,532 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Snapdragon



2 A2-0 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	SIMULATED STONE VENEER
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
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16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1 ½ " GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
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SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

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-- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term



1 A2-0 FRONT ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

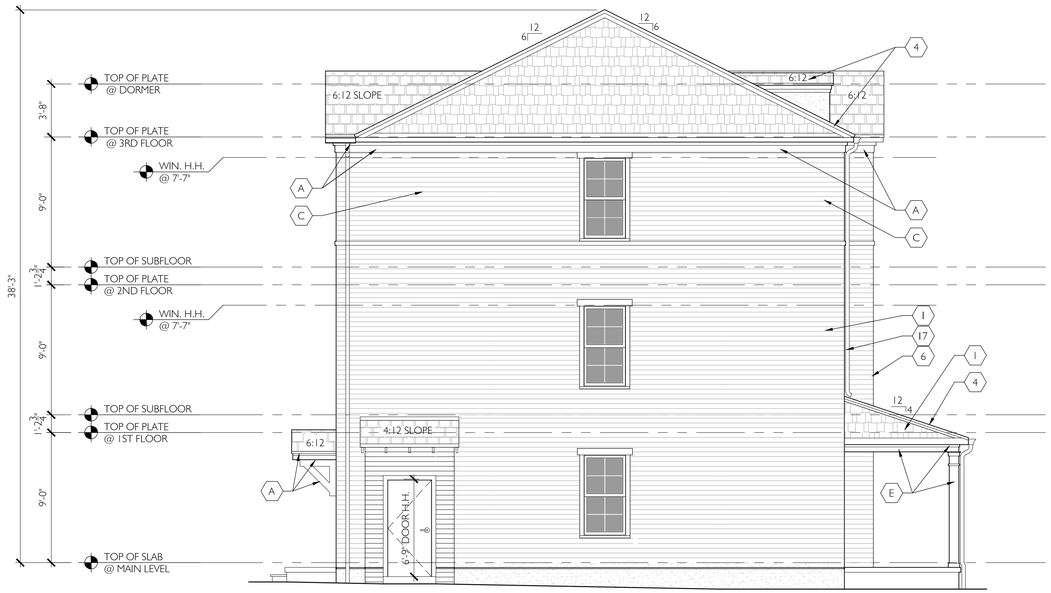
4 Bed Townhouse
Snapdragon-7-Unit
11,961 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
7 Unit Snapdragon



2 / A2-1 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
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1 / A2-1 BACK ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

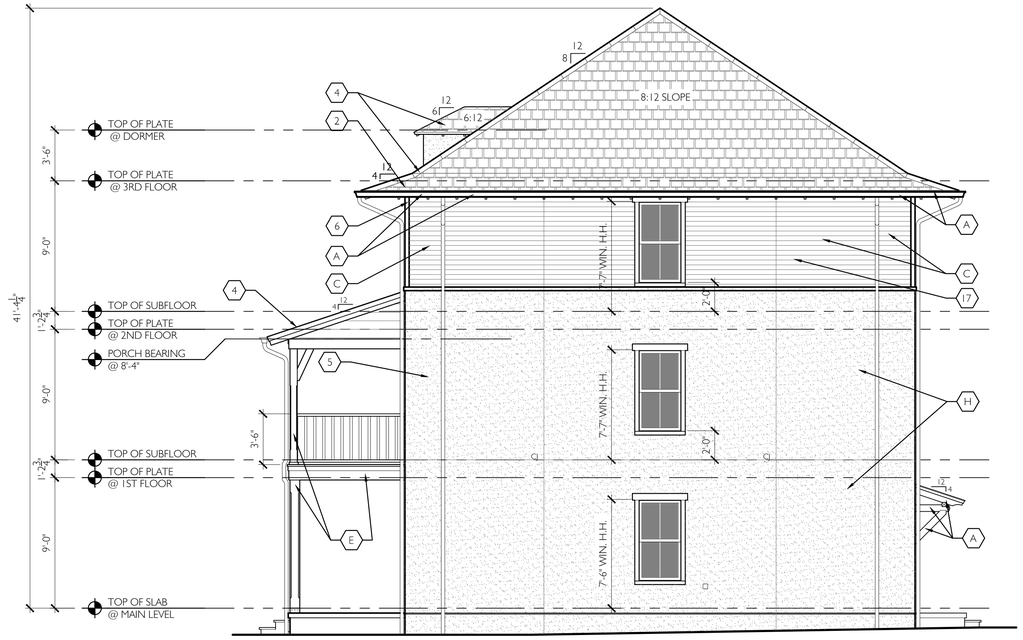
4 Bed Townhouse
Snapdragon-7-Unit
11,961 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
7 Unit Snapdragon



2 A2-0 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
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17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
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D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
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1 A2-0 FRONT ELEVATION

3/16 = 1'-0"

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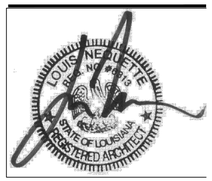


ISSUE FOR CONSTRUCTION

THE COTTAGES of Baton Rouge Phase IV

4 Bed Townhouse Indigo-3-Unit

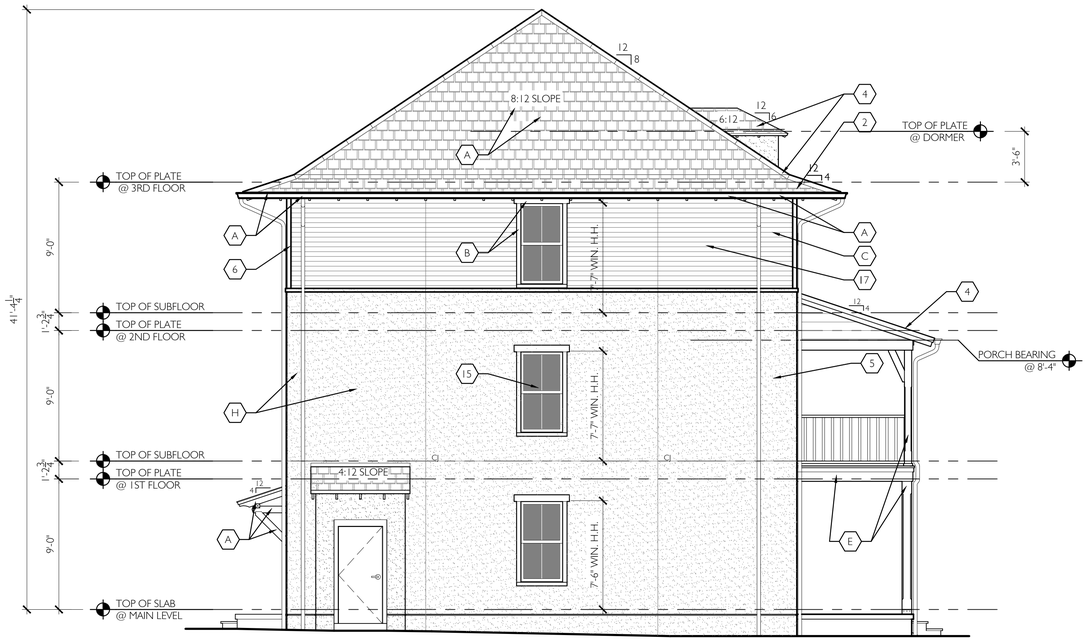
5109 total sq. ft.

Baton Rouge, Louisiana
NUMBER 14055 March 23, 2015

Drawn by: EFS
Checked by: EAL

REVISIONS

EXTERIOR ELEVATIONS
3 Unit Indigo



2 SIDE ELEVATION
A2-1
3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
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17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
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1 BACK ELEVATION
A2-1
3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

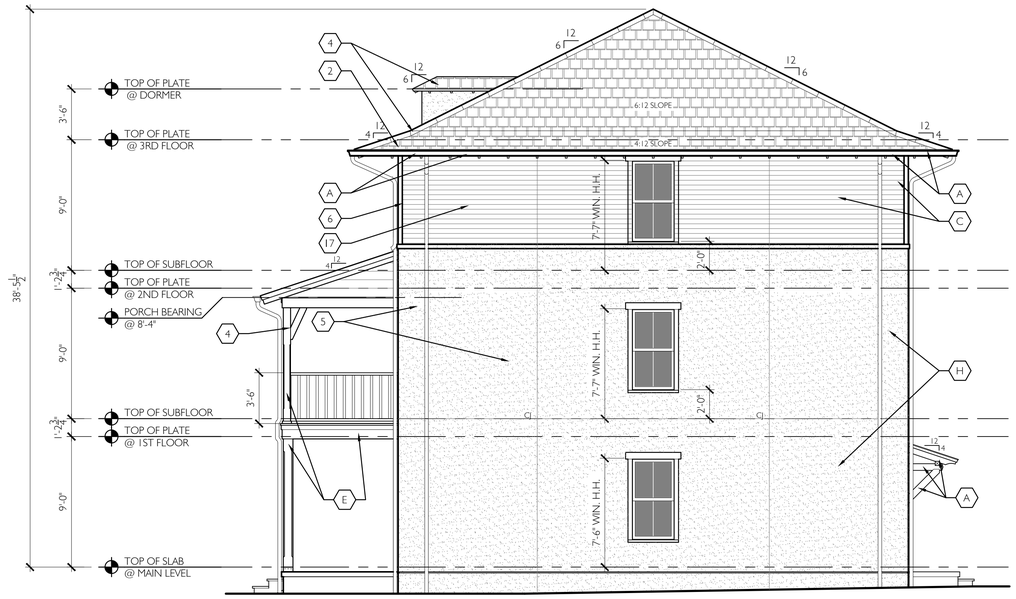
4 Bed Townhouse
Indigo-3-Unit
5109 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044
25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
3 Unit Indigo



2 A2-0 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
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5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
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EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
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GENERAL NOTE:

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1 A2-0 FRONT ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

4 Bed Townhouse
Indigo-5-Unit
8,515 total sq. ft

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Indigo



2 A2-1 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

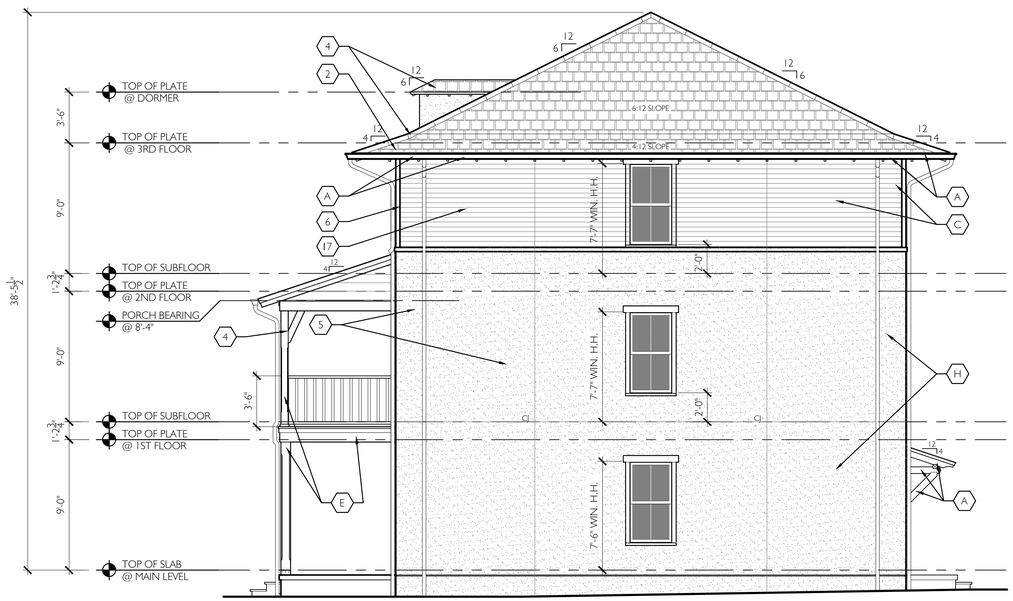
4 Bed Townhouse
Indigo-5-Unit
8,515 total sq. ft

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Indigo



2 A2-0 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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1 A2-0 FRONT ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

4 Bed Townhouse
Indigo-7-Unit
11,970 total sq. ft.

FT. COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
7 Unit Indigo



2 A2-1 SIDE ELEVATION

3/16 = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1 ½ " GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	LAP SIDING FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR
H	STUCCO FINISH

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment along eaves, slope transitions and ridges, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
- Use non-corrosive fasteners and use of elastometric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all ½" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
-- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term



1 A2-1 BACK ELEVATION

3/16 = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

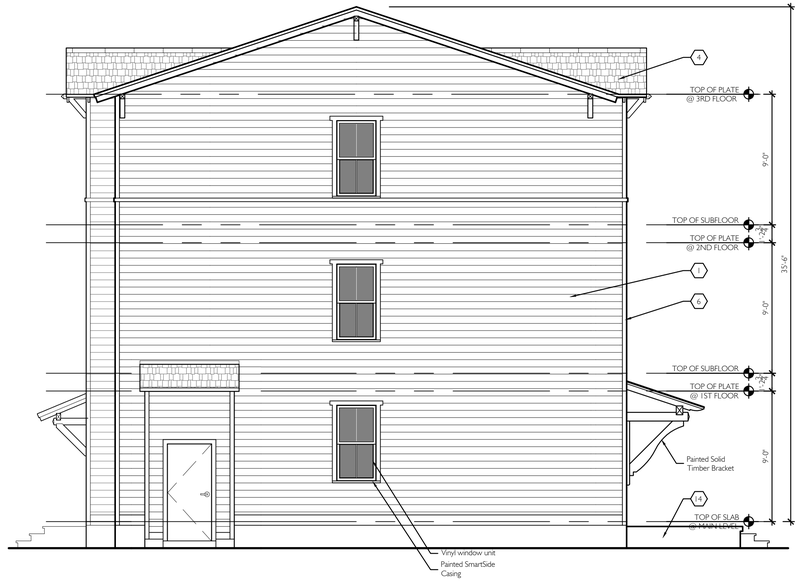
4 Bed Townhouse
Indigo-7-Unit
11,970 total sq. ft.

FT. COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: EFS
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
7 Unit Indigo



2 / A2-0 SIDE ELEVATION

3/16" = 1'-0"

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	STUCCO FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment around roof penetrations, in keeping with underlayment manufacturer's recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
-Use high temp modified bitumen underlayment at penetrations, typ.
- Use non-corrosive fasteners and use of elastomeric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all $\frac{1}{2}$" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	SIMULATED STONE VENEER
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1 $\frac{1}{2}$" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



1 / A2-0 FRONT ELEVATION

3/16" = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

4 Bed Townhouse
Rattlebush - 5 Unit

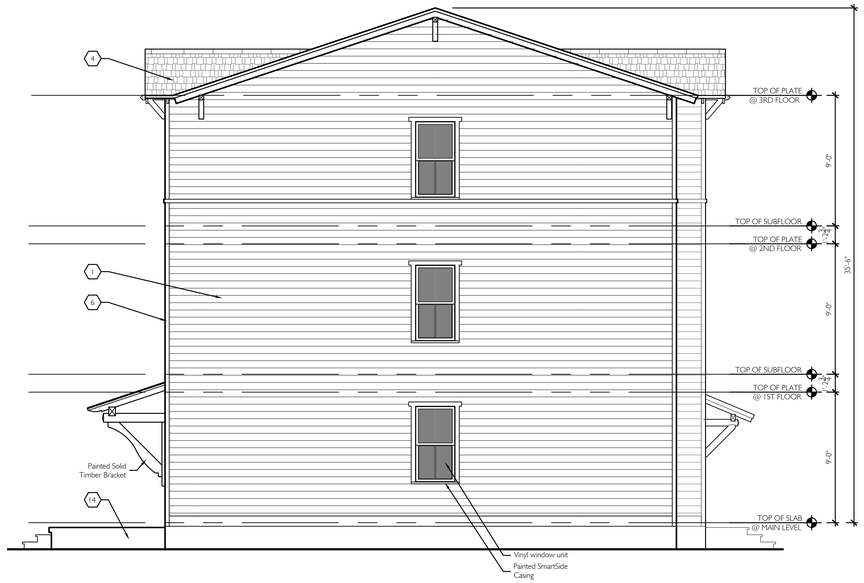
8532 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: JBU
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Sidewinder



2 A2-1 SIDE ELEVATION

3/16" = 1'-0"

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	STUCCO FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment around roof penetrations, in keeping with underlayment manufacturer's recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
-Use high temp modified bitumen underlayment at penetrations, typ.
- Use non-corrosive fasteners and use of elastomeric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all $\frac{1}{2}$" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



1 A2-1 BACK ELEVATION

3/16" = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

4 Bed Townhouse
Rattlebush - 5 Unit

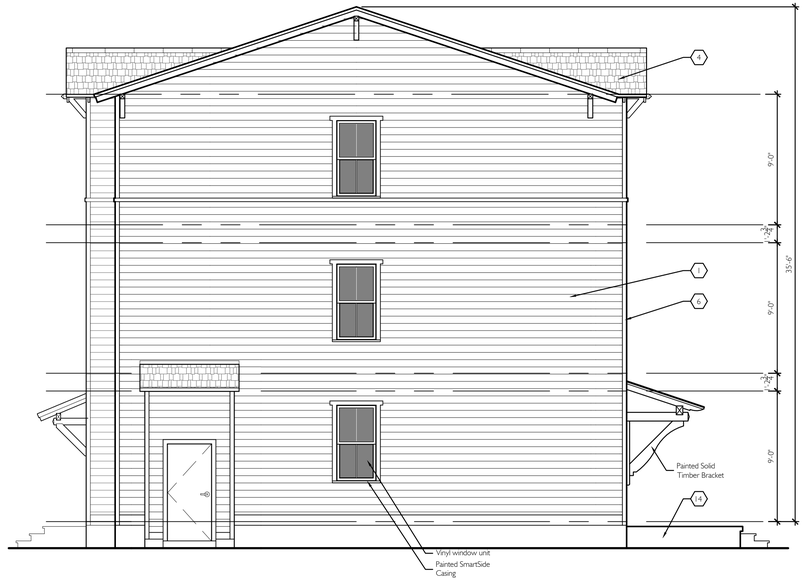
8532 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: JBU
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Sidewinder



2 A2-0 SIDE ELEVATION

3/16" = 1'-0"

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	STUCCO FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment around roof penetrations, in keeping with underlayment manufacturer's recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
-Use high temp modified bitumen underlayment at penetrations, typ.
- Use non-corrosive fasteners and use of elastomeric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all $\frac{1}{2}$" joint openings, wall penetrations, along inside corners and cladding changes
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EXTERIOR MATERIAL SCHEDULE	
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4	DIMENSIONAL ASPHALT SHINGLES
5	SIMULATED STONE VENEER
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16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1 $\frac{1}{2}$" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



1 A2-0 FRONT ELEVATION

3/16" = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

4 Bed Townhouse
Sidewinder - 7 Unit

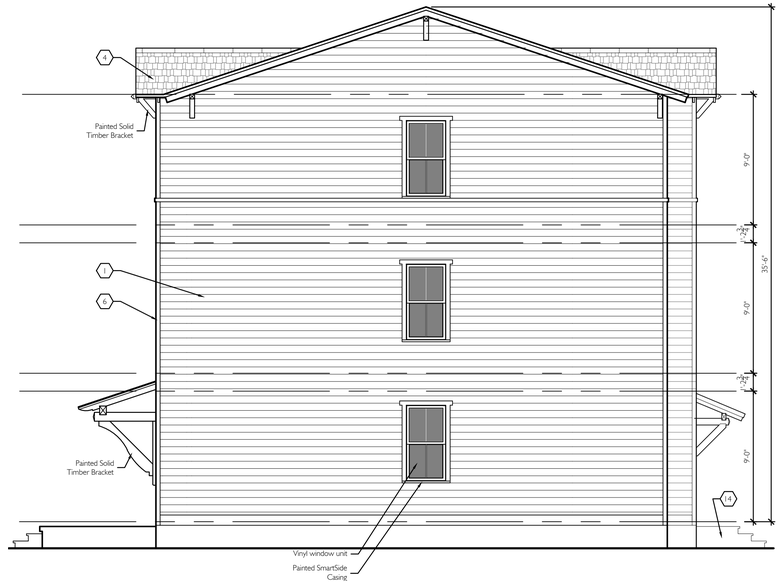
11958 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: JBU
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS
5 Unit Sidewinder



2 A2-1 SIDE ELEVATION

3/16" = 1'-0"

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	STUCCO FINISH
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

SEE COLOR SCHEME BOOK FOR PAINT COLOR SELECTIONS

GENERAL NOTE:

- Use high temp modified bitumen underlayment around roof penetrations, in keeping with underlayment manufacturer's recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
-Use high temp modified bitumen underlayment at penetrations, typ.
- Use non-corrosive fasteners and use of elastomeric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all $\frac{1}{2}$" joint openings, wall penetrations, along inside corners and cladding changes
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EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 7" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	SIMULATED STONE VENEER
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16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1 $\frac{1}{2}$" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



1 A2-1 BACK ELEVATION

3/16" = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

4 Bed Townhouse
Sidewinder - 7 Unit

11958 total sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: JBU
Checked by: TAC

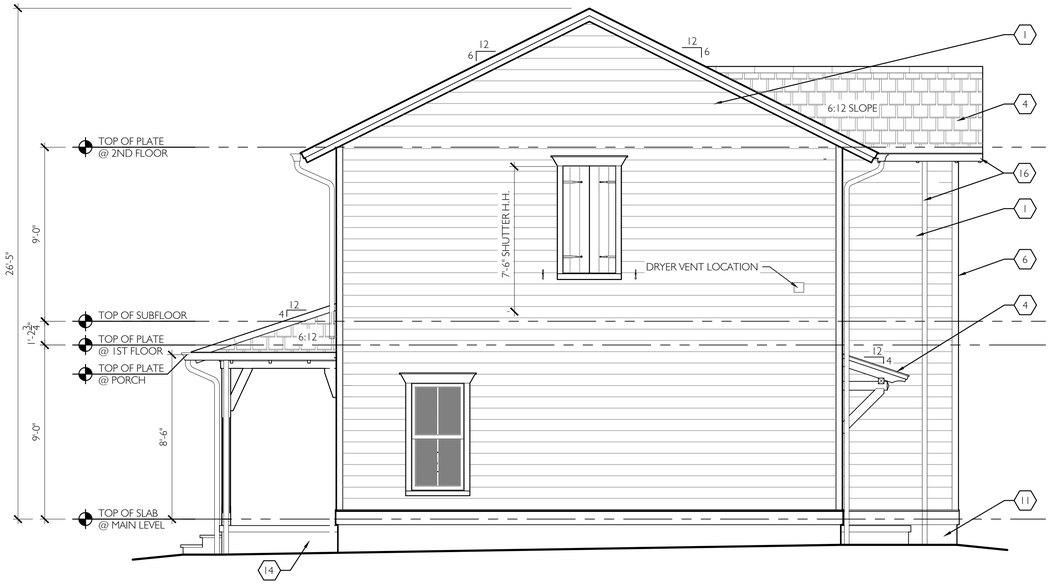
REVISIONS

EXTERIOR ELEVATIONS
5 Unit Sidewinder



1 A2-1 FRONT ELEVATION

1/4" = 1'-0"



2 A2-1 RIGHT SIDE ELEVATION

1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

GENERAL NOTE:

- Use modified bitumen (High Temp) underlayment along eaves, and slope transitions, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
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- Use non-corrosive fasteners and use of elastometric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all ½" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term



3 A2-1 REAR ELEVATION

1/4" = 1'-0"



4 A2-1 LEFT SIDE ELEVATION

1/4" = 1'-0"

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

5 BED-ALDER

1832 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: EAL
Checked by: TAC

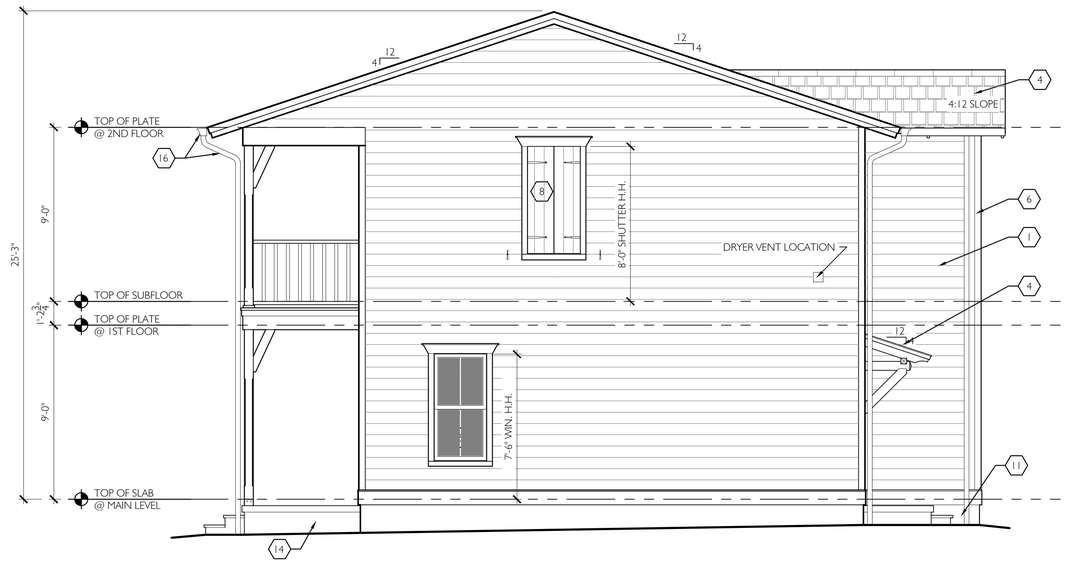
REVISIONS

EXTERIOR ELEVATIONS "ALDER"



1 A2-1 FRONT ELEVATION

1/4" = 1'-0"



2 A2-1 RIGHT SIDE ELEVATION

1/4" = 1'-0"



3 A2-1 REAR ELEVATION

1/4" = 1'-0"



4 A2-1 LEFT SIDE ELEVATION

1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE

1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
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GENERAL NOTE:

- Use modified bitumen (High Temp) underlayment along eaves, and slope transitions, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

5 BED-ASPEN

1832 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: TMB
Checked by: TAC

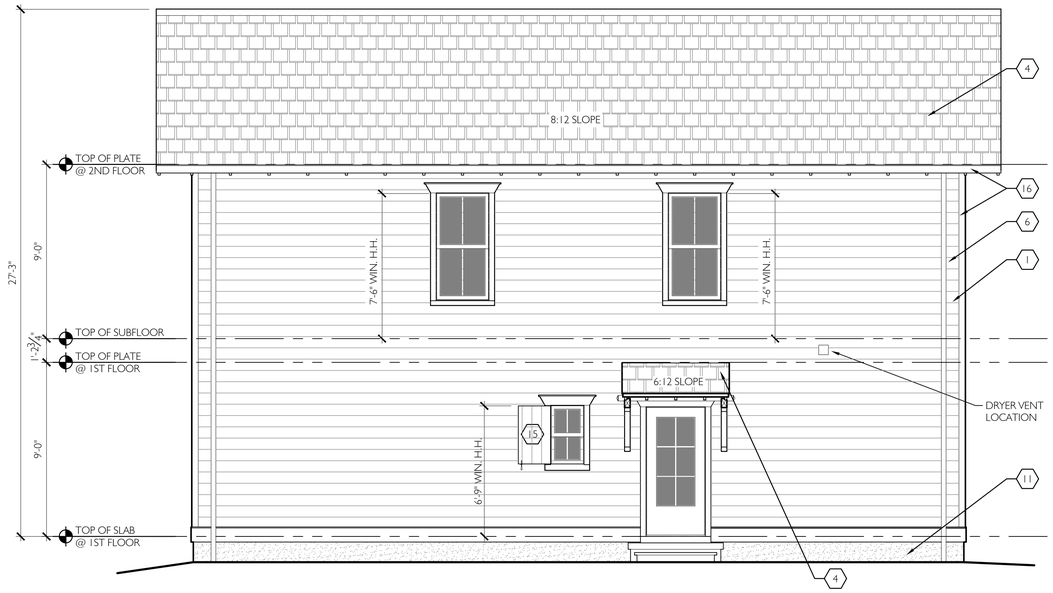
REVISIONS

EXTERIOR ELEVATIONS "ASPEN"



1 A2-1 FRONT ELEVATION

1/4" = 1'-0"



3 A2-1 REAR ELEVATION

1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
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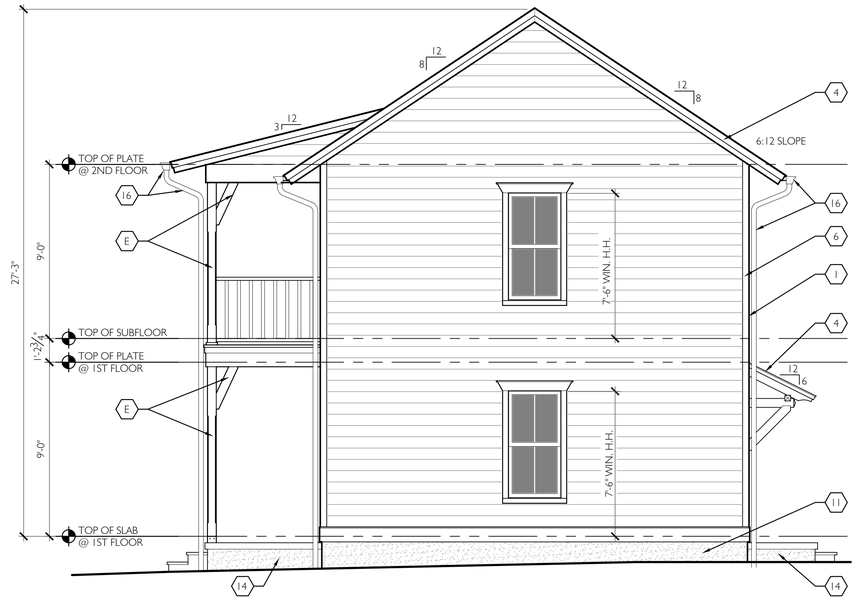
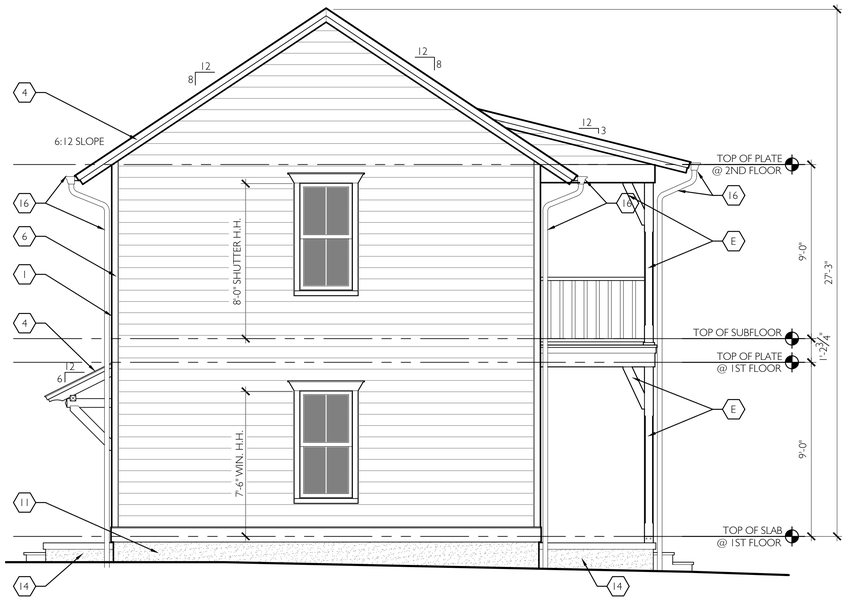


2 A2-1 RIGHT SIDE ELEVATION

1/4" = 1'-0"



4 A2-1 LEFT SIDE ELEVATION

1/4" = 1'-0"

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- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all ½" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term

DUNGAN NEQUETTE ARCHITECTS

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

5 BED-LONGLEAF
1800 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: TAC
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS "LONGLEAF"



1 A2-1 FRONT ELEVATION

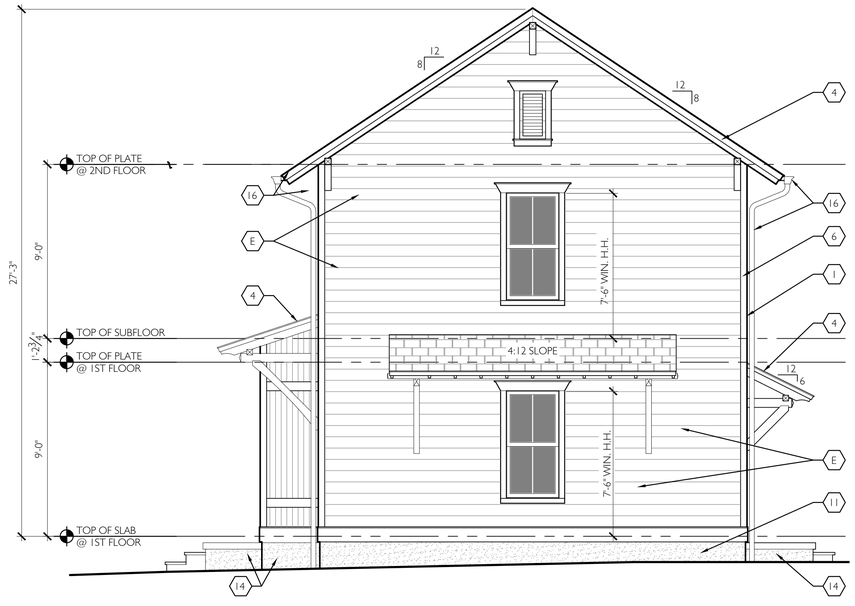
1/4" = 1'-0"



3 A2-1 REAR ELEVATION

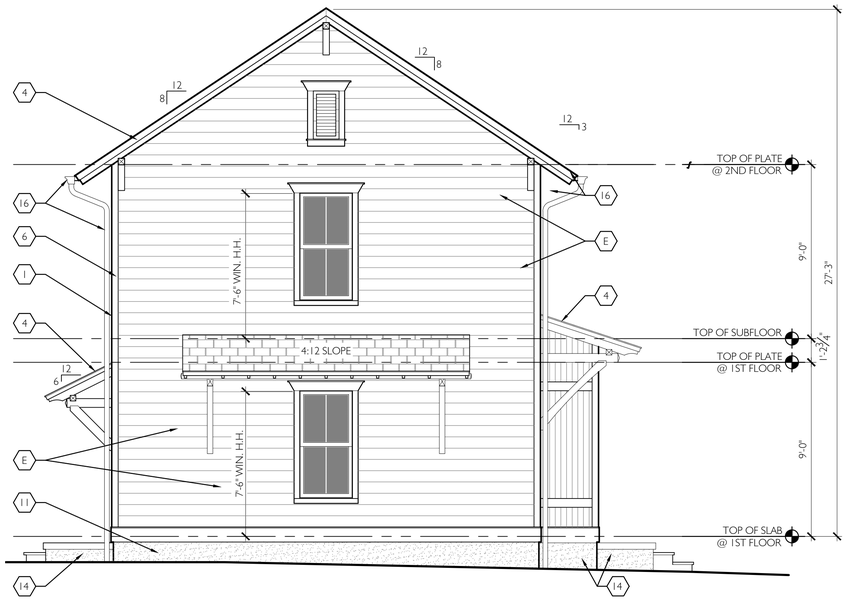
1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1½" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



2 A2-1 RIGHT SIDE ELEVATION

1/4" = 1'-0"



4 A2-1 LEFT SIDE ELEVATION

1/4" = 1'-0"

GENERAL NOTE:

- Use modified bitumen (High Temp) underlayment along eaves, and slope transitions, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
- Use non-corrosive fasteners and use of elastometric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all ½" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

5 BED-CLOVERDALE
1800 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: TAC
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS "CLOVERDALE"



1 A2-1 **FRONT ELEVATION**

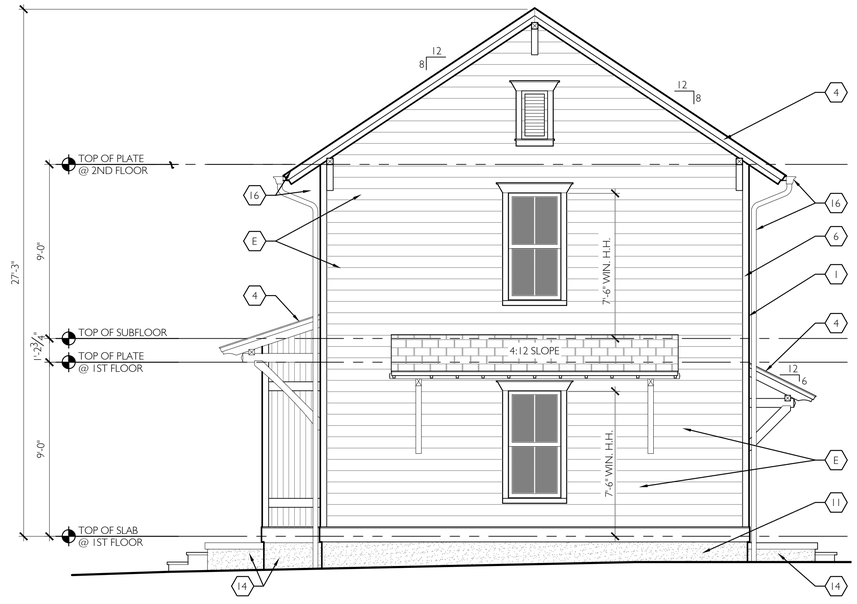
1/4" = 1'-0"



3 A2-1 **REAR ELEVATION**

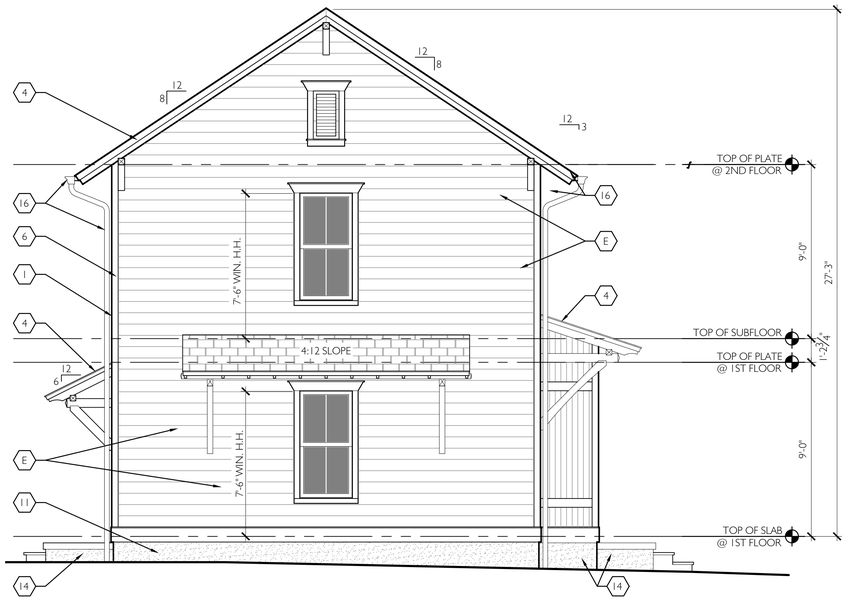
1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1½" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



2 A2-1 **RIGHT SIDE ELEVATION**

1/4" = 1'-0"



4 A2-1 **LEFT SIDE ELEVATION**

1/4" = 1'-0"

GENERAL NOTE:

- Use modified bitumen (High Temp) underlayment along eaves, and slope transitions, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
- Use membrane (high temp) flashing under metal flashing installations at windows, louvers, faux vents and wall accents.
- Use non-corrosive fasteners and use of elastometric washers where applicable and for securing downspouts; typical.
- Use 15# felt on all roofs.
- Use neutral cure silicone sealant at all ½" joint openings, wall penetrations, along inside corners and cladding changes
- Flash and seal wall penetrations to create a watertight cladding installation capable of performing under 6.24 psf water pressure test or equivalent rainfall - per IBC 2009; typ.
- Use double dipped galvanized roofing nails with ring shank for penetration flashing flange securement over the long term

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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

5 BED-OAKWOOD
1800 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: TAC
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS "OAKWOOD"



1 A2-1 **FRONT ELEVATION**

1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1½" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE



2 A2-1 **LEFT SIDE ELEVATION**

1/4" = 1'-0"

GENERAL NOTE:

- Use modified bitumen (High Temp) underlayment along eaves, and slope transitions, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
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- Use 15# felt on all roofs.
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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

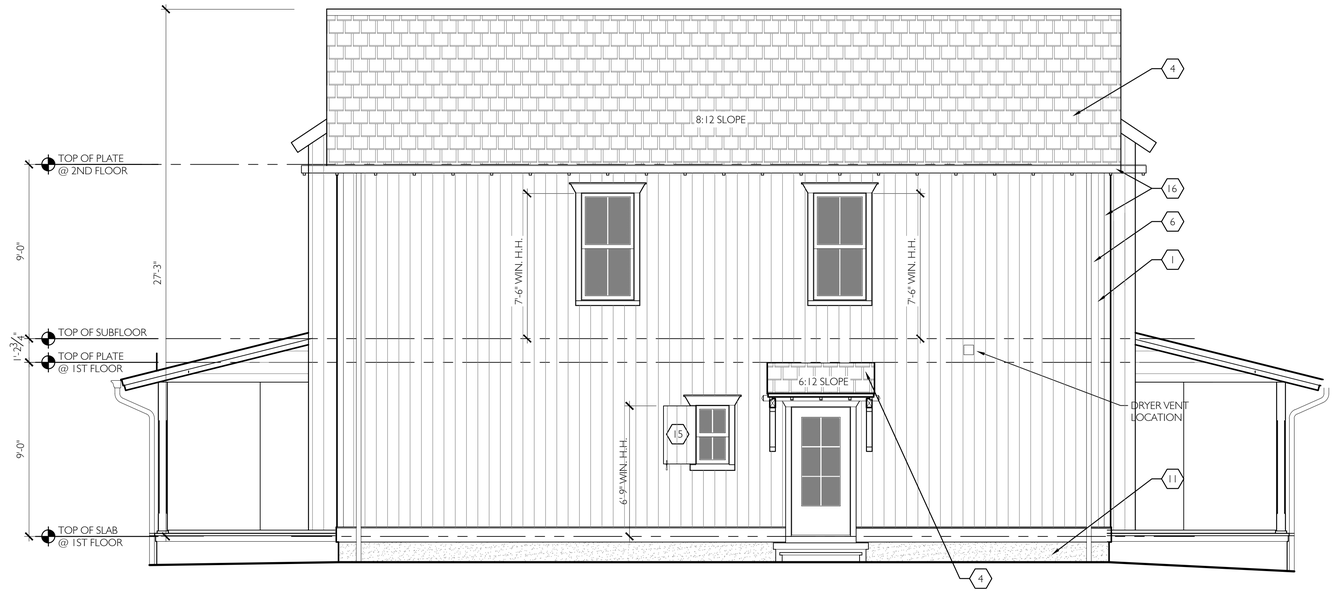
5 BED-PINEWOOD
1800 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 — 25 NOV 2015

Drawn by: TAC
Checked by: TAC

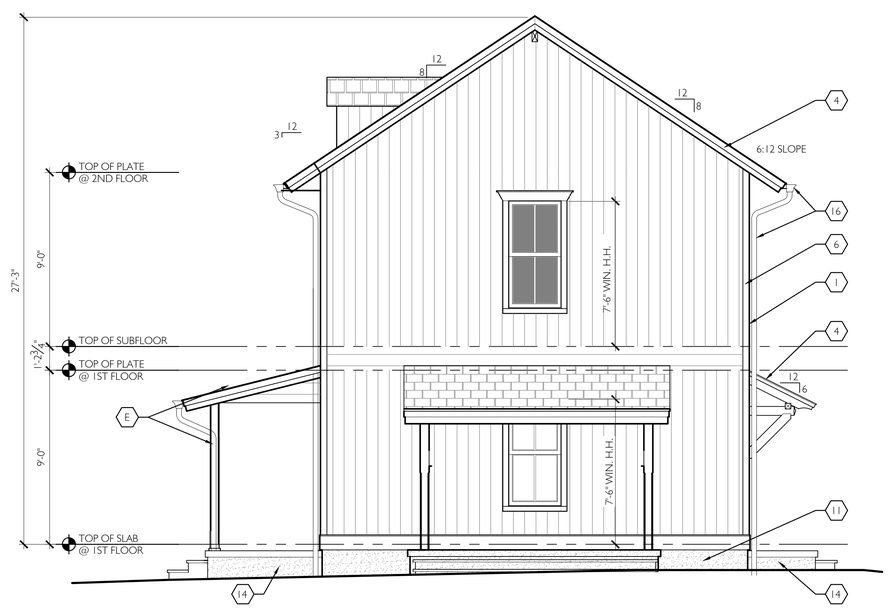
REVISIONS

EXTERIOR ELEVATIONS "PINEWOOD"



1 A2-2 REAR ELEVATION

1/4" = 1'-0"



2 A2-2 RIGHT SIDE ELEVATION

1/4" = 1'-0"

EXTERIOR MATERIAL SCHEDULE	
1	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 6" EXPOSURE
2	3/8" SMARTSIDE VERTICAL EXTERIOR PANEL W/ BATTEN STRIPS @ 16" O.C.
3	SITE FENCING. SEE CIVIL FOR DETAIL.
4	DIMENSIONAL ASPHALT SHINGLES
5	3 COAT STUCCO SYSTEM
6	5/4" "SMARTSIDE" CORNER BOARD 4" @ FRONT/REAR, 4" @ SIDES
7	WOOD LOUVER DORMER VENT
8	FAUX SHUTTERS. SEE DETAIL 15a to 15d ON SHEET A3.0 FOR DETAIL
9	IF FOUR OR MORE RISERS ARE REQUIRED SEE DETAIL 72. PER IRC R311.7.7
10	6" VERTICAL TONGUE & GROOVE BOARDS
11	MORTAR SMEAR
12	SEE DETAIL 12 FOR HOUSE NUMBER LOCATION
14	MORTAR SMEAR @ PORCH
15	SEE DETAIL 13 FOR WINDOW CALL OUTS AND DETAILS
16	6" K STYLE - 4" ROUND - HIDDEN HANGER 6" - FASTENED W/ 1½" GALV. SCREW W/ NEOPRENE WASHER
17	"SMARTSIDE" HORIZONTAL LAP SIDING W/ 4" EXPOSURE

GENERAL NOTE:

- Use modified bitumen (High Temp) underlayment along eaves, and slope transitions, in 18"-24"-36" widths, in keeping with underlayment manufacturers recommendations; install underlayment along both sides of valleys at 48" upslope. If required, see detail 27 for detail of flashing at valleys.
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ISSUE FOR REVIEW

THE COTTAGES of FORT COLLINS

5 BED-PINEWOOD
1800 sq. ft.

FORT COLLINS, COLORADO
NUMBER 13044 25 NOV 2015

Drawn by: TAC
Checked by: TAC

REVISIONS

EXTERIOR ELEVATIONS "PINEWOOD"

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7731 SAN ANTONIO SAGE
WINDOW/DOOR TRIM (B)		BM OC-14 NATURAL CRÈME
BODY COLOR (C)		SW 7731 SAN ANTONIO SAGE

SHUTTERS (D)	BM: OC-14 NATURAL CRÈME	
PORCH (TRIM & COLUMNS) (E)	SW 7731 SAN ANTONIO SAGE	
DORMERS (F)	SW 7731 SAN ANTONIO SAGE	
DOOR (G)	BM: BLACK	COLOR SCHEME # 1

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7729 EDAMAME
WINDOW/DOOR TRIM (B)		SW 7729 EDAMAME
BODY COLOR (C)		SW 7011 NATURAL CHOICE

SHUTTERS (D)	SW 7729 EDAMAME	
PORCH (TRIM & COLUMNS) (E)	SW 7729 EDAMAME	
DORMERS (F)	SW 7729 EDAMAME	
DOOR (G)	BM: BLACK	COLOR SCHEME # 2

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 6151 QUIVER TAN
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		BM AF-100 PASHMINA

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 6151 QUIVER TAN	
DORMERS (F)	SW 6151 QUIVER TAN	
DOOR (G)	BM: COUNTRY REDWOOD	COLOR SCHEME # 3

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7542 NATURAL
WINDOW/DOOR TRIM (B)		BM: AF-350 TUMERIC
BODY COLOR (C)		SW 7542 NATURAL

SHUTTERS (D)	BM: AF-350 TUMERIC	
PORCH (TRIM & COLUMNS) (E)	SW 7542 NATURAL	
DORMERS (F)	SW 7542 NATURAL	
DOOR (G)	BM: BLACK	COLOR SCHEME # 4

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7008 ALABASTER
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		SW 6156 RAIME

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 7008 ALABASTER	
DORMERS (F)	SW 7008 ALABASTER	
DOOR (G)	BM: BLACK	COLOR SCHEME # 5

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		BM 2137-30 DURANGO
WINDOW/DOOR TRIM (B)		BM 2137-30 DURANGO
BODY COLOR (C)		SW 7011 NATURAL CHOICE

SHUTTERS (D)	BM 2137-30 DURANGO	
PORCH (TRIM & COLUMNS) (E)	BM 2137-30 DURANGO	
DORMERS (F)	BM 2137-30 DURANGO	
DOOR (G)	BM: COUNTRY REDWOOD	COLOR SCHEME # 6

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7011 NATURAL CHOICE
WINDOW/DOOR TRIM (B)		SW 7011 NATURAL CHOICE
BODY COLOR (C)		SW 7011 NATURAL CHOICE

SHUTTERS (D)	SW 7011 NATURAL CHOICE		
PORCH (TRIM & COLUMNS) (E)	SW 7011 NATURAL CHOICE		
DORMERS (F)	SW 7011 NATURAL CHOICE		
DOOR (G)	BM: COUNTRY REDWOOD		COLOR SCHEME #7

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 6118 LEATHER BOUND
WINDOW/DOOR TRIM (B)		SW 6118 LEATHER BOUND
STUCCOCOLOR (C)		SW 6117 SMOKEY TOPAZ

SHUTTERS (D)	SW 6118 LEATHER BOUND	
PORCH (TRIM & COLUMNS) (E)	SW 6118 LEATHER BOUND	
DORMERS (F)	SW 6118 LEATHER BOUND	
DOOR (G)	SW 7675 SEALSKIN	COLOR SCHEME #8

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		BM OC-17 WHITE DOVE
WINDOW/DOOR TRIM (B)		BM OC-17 WHITE DOVE
STUCCOCOLOR (C)		SW 2861 AVOCADO

SHUTTERS (D)	BM: OC-17 WHITE DOVE	
PORCH (TRIM & COLUMNS) (E)	BM: OC-17 WHITE DOVE	
DORMERS (F)	BM: OC-17 WHITE DOVE	
DOOR (G)	BM: BLACK	COLOR SCHEME # 9

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7740 MESSENGER BAG
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		SW 7739 HERBAL WASH

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 7740 MESSENGER BAG	
DORMERS (F)	SW 7740 MESSENGER BAG	
DOOR (G)	SW 7675 SEALSKIN	COLOR SCHEME # 10

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		BM 1575 RAINY AFTERNOON
WINDOW/DOOR TRIM (B)		BM 1575 RAINY AFTERNOON
BODY COLOR (C)		BM 1574 RUSHING RIVER

SHUTTERS (D)	BM 1575 RAINY AFTERNOON	
PORCH (TRIM & COLUMNS) (E)	BM 1575 RAINY AFTERNOON	
DORMERS (F)	BM 1575 RAINY AFTERNOON	
DOOR (G)	BM: BLACK	COLOR SCHEME # 11

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		SW 7731 SAN ANTONIO SAGE
WINDOW/DOOR TRIM (B)		BM OC-14 NATURAL CRÈME
BODY COLOR (C)		1ST LEVEL BODY : SW 7731 SAN ANTONIO SAGE 2ND LEVEL BODY: SW 6157 FAVORITE TAN 3RD LEVEL BODY: SW 6157 FAVORITE TAN

SHUTTERS (D)	BM OC-14 NATURAL CRÈME	
PORCH (TRIM & COLUMNS) (E)	SW 7731 SAN ANTONIO SAGE	
DORMERS (F)	SW 7731 SAN ANTONIO SAGE	
DOOR (G)	BM: BLACK	COLOR SCHEME #1A

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		SW 6151 QUIVER TAN
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		1ST LEVEL BODY: SW 6151 QUIVER TAN. 2ND LEVEL BODY: BM AF-100 PASHMINA. 3RD LEVEL BODY: BM AF-100 PASHMINA.

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 6151 QUIVER TAN	
DORMERS (F)	SW 6151 QUIVER TAN	
DOOR (G)	BM: COUNTRY REDWOOD	COLOR SCHEME #2A

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		SW 6154 NACRE
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		1ST LEVEL BODY : SW 6156 RAIME 2ND LEVEL BODY: SW 6156 RAIME 3RD LEVEL BODY: SW 6154 NACRE
SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 6154 NACRE	
DORMERS (F)	SW 6154 NACRE	
DOOR (G)	BM: BLACK	COLOR SCHEME #3A

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

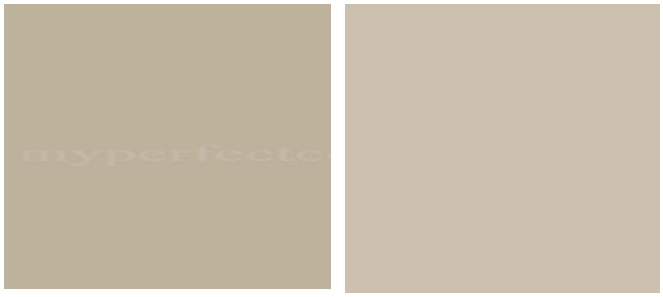
*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		SW 7542 NATURAL
WINDOW/DOOR TRIM (B)		SW 6341 RED CENT
BODY COLOR (C)		1ST LEVEL BODY: SW 7543 AVENUE TAN. 2ND LEVEL BODY: SW 7543 AVENUE TAN. 3RD LEVEL BODY: SW 7542 NATURAL.

SHUTTERS (D)	SW 6341 RED CENT	
PORCH (TRIM & COLUMNS) (E)	SW 7542 NATURAL	
DORMERS (F)	SW 7542 NATURAL	
DOOR (G)	BM: BLACK	COLOR SCHEME #4A

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		SW 7740 MESSENGER BAG
WINDOW/DOOR TRIM (B)		SW 7738 CARGO PANTS
BODY COLOR (C)	 	1ST LEVEL BODY : SW 7740 MESSENGER BAG 2ND LEVEL BODY: SW 7740 MESSENGER BAG 3RD LEVEL BODY: SW 7739 HERBAL WASH
SHUTTERS (D)	SW 7738 CARGO PANTS	
PORCH (TRIM & COLUMNS) (E)	SW 7740 MESSENGER BAG	
DORMERS (F)	SW 7740 MESSENGER BAG	
DOOR (G)	BM: BLACK	COLOR SCHEME #5A

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

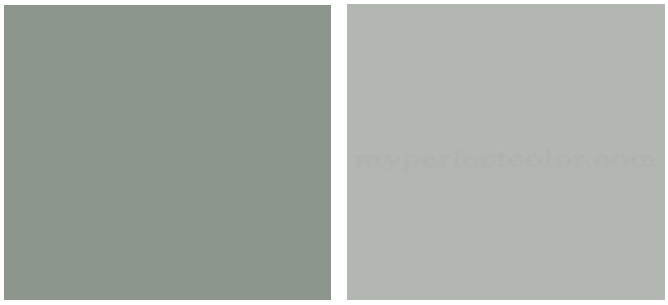
*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		BM: 1575 RAINY AFTERNOON
WINDOW/DOOR TRIM (B)		BM: 1575 RAINY AFTERNOON
BODY COLOR (C)		1ST LEVEL BODY : BM 1574 RUSHING RIVER 2ND LEVEL BODY: 1571 IMPERIAL GRAY 3RD LEVEL BODY: 1571 IMPERIAL GRAY

SHUTTERS (D)	BM: 1575 RAINY AFTERNOON	
PORCH (TRIM & COLUMNS) (E)	BM: 1575 RAINY AFTERNOON	
DORMERS (F)	BM: 1575 RAINY AFTERNOON	
DOOR (G)	BM: BLACK	COLOR SCHEME #6A

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7008 ALABASTER
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		SW 7718 OAK CREEK

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 7008 ALABASTER	
DORMERS (F)	SW 7008 ALABASTER	
DOOR (G)	SW 7675 SEALSKIN	COLOR SCHEME # 5B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

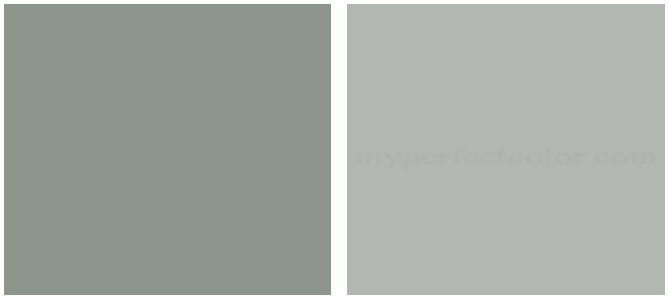
*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		BM: 1575 RAINY AFTERNOON
WINDOW/DOOR TRIM (B)		BM: 1575 RAINY AFTERNOON
BODY COLOR (C)		1ST LEVEL BODY : BM 1574 RUSHING RIVER 2ND LEVEL BODY: BM 1574 RUSHING RIVER 3RD LEVEL BODY: 1571 IMPERIAL GRAY

SHUTTERS (D)	BM: 1575 RAINY AFTERNOON	
PORCH (TRIM & COLUMNS) (E)	BM: 1575 RAINY AFTERNOON	
DORMERS (F)	BM: 1575 RAINY AFTERNOON	
DOOR (G)	BM: BLACK	COLOR SCHEME #10B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

DUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

CLUBHOUSE

11.17.15

PICTURE WINDOWS (A)		BENJAMIN MOORE HC-124 CALDWELL GREEN
WINDOW/DOOR TRIM (B)		SW 7731 SAN ANTONIO SAGE
BODY COLOR (C)		SW 6156 RAIME
SHUTTERS (D)		
PORCH (TRIM & COLUMNS) (E)		
DORMERS (F)		
DOOR (G)		COLOR SCHEME CH

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7542 NATURAL
WINDOW/DOOR TRIM (B)		SW 6341 RED CENT
STUCCOCOLOR (C)		SW 7542 NATURAL

SHUTTERS (D)	SW 6341 RED CENT	
PORCH (TRIM & COLUMNS) (E)	SW 7542 NATURAL	
DORMERS (F)	SW 7542 NATURAL	
DOOR (G)	BM: BLACK	COLOR SCHEME # 1B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

TOWNHOUSE

11.17.15

EAVES/FASCIA (A)		SW 7542 NATURAL
WINDOW/DOOR TRIM (B)		SW 6341 RED CENT
BODY COLOR (C)		1ST LEVEL BODY: SW 7543 AVENUE TAN. 2ND LEVEL BODY: SW 7543 AVENUE TAN. 3RD LEVEL BODY: SW 7542 NATURAL.
SHUTTERS (D)	SW 6341 RED CENT	
PORCH (TRIM & COLUMNS) (E)	SW 7542 NATURAL	
DORMERS (F)	SW 7542 NATURAL	
DOOR (G)	BM: BLACK	COLOR SCHEME #2B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		BM AF-100 PASHMINA
WINDOW/DOOR TRIM (B)		BM AF-240 SATCHEL
STUCCOCOLOR (C)		BM AF-100 PASHMINA

SHUTTERS (D)	BM: AF-240 SATCHEL	
PORCH (TRIM & COLUMNS) (E)	BM: AF-100 PASHMINA	
DORMERS (F)	BM: AF-100 PASHMINA	
DOOR (G)	SW 7675 SEALSKIN	COLOR SCHEME # 3B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		BM: 1575 RAINY AFTERNOON
WINDOW/DOOR TRIM (B)		BM: 1575 RAINY AFTERNOON
BODY COLOR (C)		BM OC-17 WHITE DOVE

SHUTTERS (D)	BM: 1575 RAINY AFTERNOON		
PORCH (TRIM & COLUMNS) (E)	BM: 1575 RAINY AFTERNOON		
DORMERS (F)	BM: 1575 RAINY AFTERNOON		
DOOR (G)	BM: BLACK		COLOR SCHEME # 4B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7011 NATURAL CHOICE
WINDOW/DOOR TRIM (B)		SW 7011 NATURAL CHOICE
BODY COLOR (C)		SW 6130 MANNERED GOLD

SHUTTERS (D)	SW 7011 NATURAL CHOICE	
PORCH (TRIM & COLUMNS) (E)	SW 7011 NATURAL CHOICE	
DORMERS (F)	SW 7011 NATURAL CHOICE	
DOOR (G)	BM: BLACK	COLOR SCHEME # 6B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7008 ALABASTER
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
STUCCOCOLOR (C)		BM: 1575 RAINY AFTERNOON

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 7008 ALABASTER	
DORMERS (F)	SW 7008 ALABASTER	
DOOR (G)	BM: BLACK	COLOR SCHEME # 7B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		SW 7008 ALABASTER
WINDOW/DOOR TRIM (B)		SW 7008 ALABASTER
BODY COLOR (C)		BM: COUNTRY REDWOOD

SHUTTERS (D)	SW 7008 ALABASTER	
PORCH (TRIM & COLUMNS) (E)	SW 7008 ALABASTER	
DORMERS (F)	SW 7008 ALABASTER	
DOOR (G)	BM: BLACK	COLOR SCHEME # 8B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

EAVES/FASCIA (A)		BM: 2137-30 DURANGO
WINDOW/DOOR TRIM (B)		BM: OC-17 WHITE DOVE
BODY COLOR (C)		SW 6151 QUIVER TAN

SHUTTERS (D)	BM: OC-17 WHITE DOVE	
PORCH (TRIM & COLUMNS) (E)	BM: 2137-30 DURANGO	
DORMERS (F)	BM: 2137-30 DURANGO	
DOOR (G)	BM: COUNTRY REDWOOD	COLOR SCHEME #9B

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN

XXXXXDUNGAN NEQUETTE ARCHITECTS

THE COTTAGES OF FORT COLLINS

11.17.15

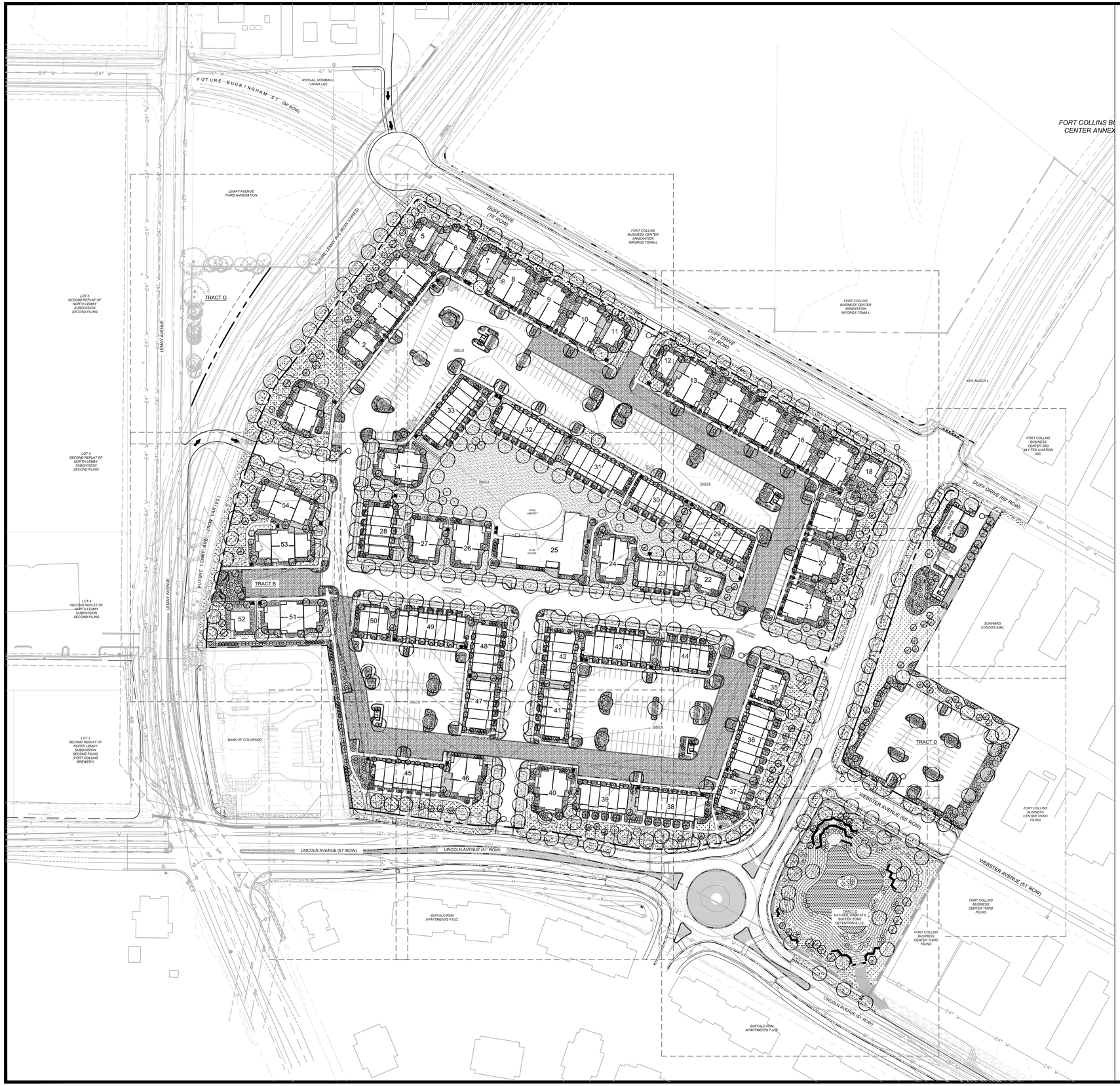
EAVES/FASCIA (A)		BM: OC-17 WHITE DOVE
WINDOW/DOOR TRIM (B)		BM: OC-17 WHITE DOVE
BODY COLOR (C)		SW 6118 LEATHER BOUND

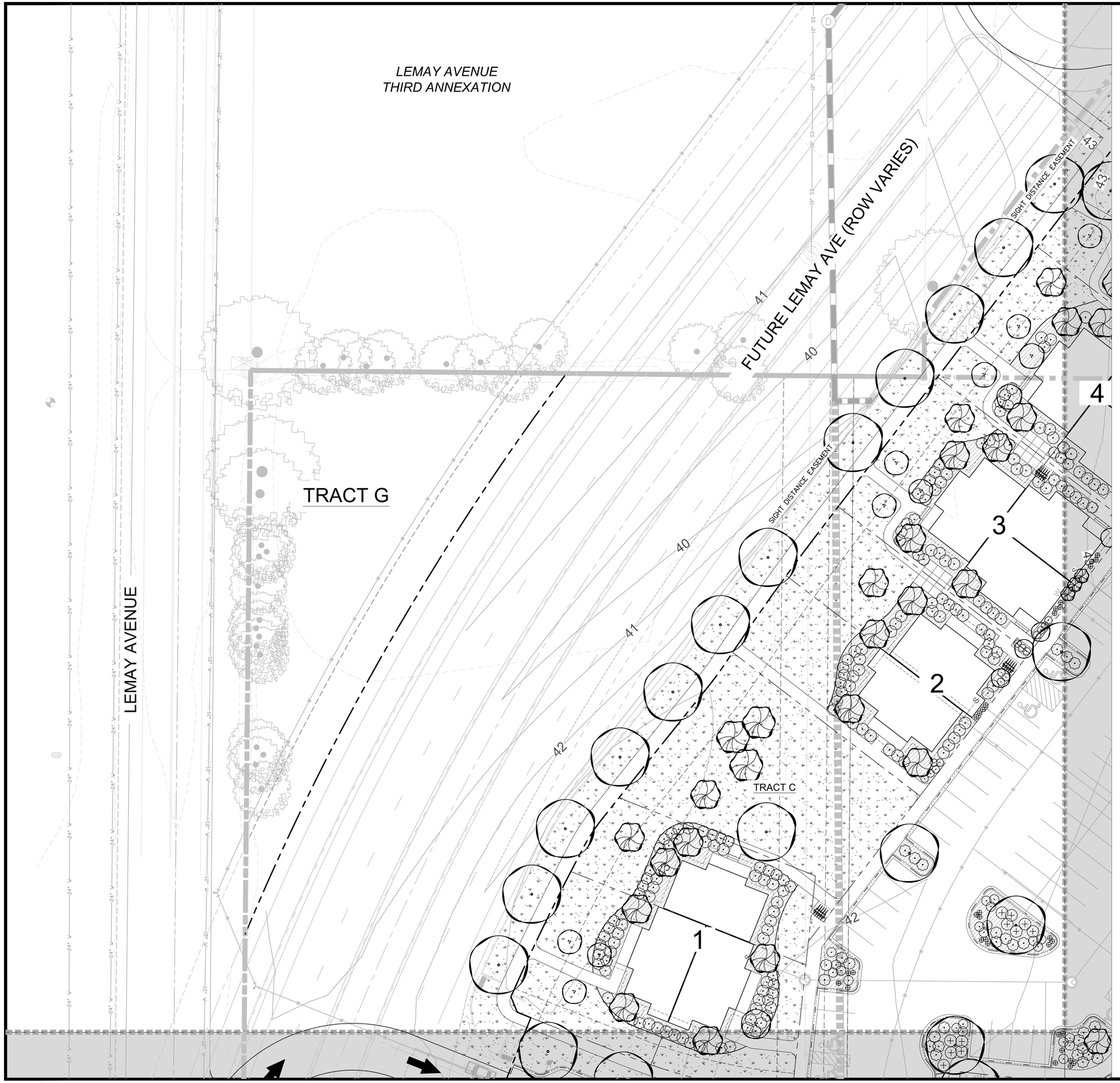
SHUTTERS (D)	BM: OC-17 WHITE DOVE	
PORCH (TRIM & COLUMNS) (E)	BM: OC-17 WHITE DOVE	
DORMERS (F)	BM: OC-17 WHITE DOVE	
DOOR (G)	BM: BLACK	COLOR SCHEME # 21

NOTE: CORNER BOARDS TO MATCH BODY COLORS

EXTERIOR PAINT SCHEDULE	
A	EAVES/FASCIA
B	WINDOW/DOOR TRIM
C	BODY COLOR
D	SHUTTERS
E	PORCH (TRIM & COLUMNS)
F	DORMERS
G	DOOR

*SEE PAINT PLAN


FUTURE BUCKINGHAM ST (64' ROW)
ROYVAL, NORMAN L / DIANA LEE
LEMAY AVENUE THIRD ANNEXATION
FUTURE LEMAY AVE (ROW VARIES)
DUFF DRIVE (76' ROW)
FORT COLLINS BUSINESS CENTER ANNEXATION NIFOROS TOMA L
FORT COLLINS BUSINESS CENTER ANNEXATION NIFOROS TOMA L
KEIL NANCY L
FORT COLLINS BUSINESS CENTER 3RD JAY-TEX AVIATION INC.
DUFF DRIVE (60' ROW)
LOT 5 SECOND REPLAT OF NORTH LEMAY SUBDIVISION SECOND FILING
TRACT G
LEMAY AVENUE
LOT 5 SECOND REPLAT OF NORTH LEMAY SUBDIVISION SECOND FILING
LOT 4 SECOND REPLAT OF NORTH LEMAY SUBDIVISION SECOND FILING
LOT 3 SECOND REPLAT OF NORTH LEMAY SUBDIVISION SECOND FILING (FORT COLLINS BREWERY)
FUTURE LEMAY AVE (ROW VARIES)
TRACT B
TRACT B
TRACT B



LANDSCAPE MATERIAL LEGEND

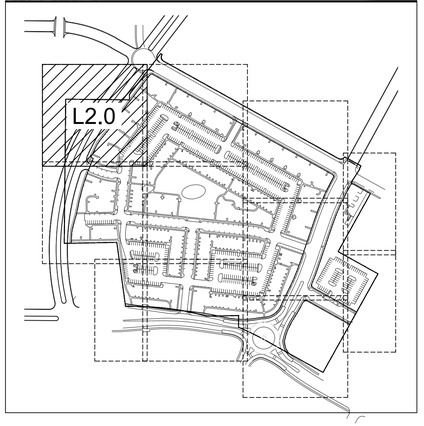
SYMBOL	DESCRIPTION
	IRRIGATED TURF (SEE LANDSCAPE NOTES)
	COBBLE MULCH
	PRAIRIE TURF (IRRIGATTED)
	DRYLAND NATIVE GRASS (NON-IRRIGATED)
	WETLAND MITIGATION AREA (WETLAND SEED)
	SHRUB BED MULCH AREA (INCLUDES INORGANIC AND ORGANIC MULCHES, SEE LANDSCAPE NOTES FOR MIX RATIO)
	EVERGREEN TREE
	PERENNIALS
	PERENNIAL GRASSES
	DECIDUOUS SHRUBS
	DECIDUOUS LOW SPREADING SHRUBS
	EVERGREEN SHRUBS
	CANOPY TREE
	ORNAMENTAL TREE

SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- FLOW LINE
- PFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- EXISTING OVERHEAD POWER LINE
- EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- EXISTING WATER LINE
- EXISTING WIRE FENCE
- PROPOSED SEWER LINE
- PROPOSED UNDERDRAIN
- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE
- PROPOSED WATER METER
- PROPOSED FIRE HYDRANT
- HANDICAP RAMP
- FIXED BIKE RACK (7 SPACES EA.)
- SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
- EXISTING TREE
- PERMEABLE PAVERS
- STOP SIGN

NOTE:
A FREE PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY STREET TREES ARE PLANTED IN THE PARKWAYS BETWEEN THE SIDEWALK AND CURB AND IN STREET MEDIANS. STREET TREE LOCATIONS AND NUMBERS MAY CHANGE TO MEET ACTUAL UTILITY/TREE SEPARATION STANDARDS. LANDSCAPE CONTRACTOR MUST OBTAIN APPROVAL OF STREET TREE LOCATIONS AFTER UTILITY LOCATES. STREET TREES MUST BE INSPECTED AND APPROVED BEFORE PLANTING. FAILURE TO OBTAIN THIS PERMIT IS A VIOLATION OF THE CODE OF THE CITY OF FORT COLLINS.

SHEET KEY



NORTH

0 10 20 40

SCALE: 1"=20'-00"

THIS IS A LAND USE PLANNING DOCUMENT. NOT A CONSTRUCTION DOCUMENT. REFER TO CIVIL ENGINEERING PLANS.

CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■
■ urban design ■ entitlement ■

401 West Mountain Avenue Suite 100 Fort Collins, CO 80521
fax 970/224.1662 phone 970/224.5828 www.vfrdesigninc.com

APPLICANT / OWNER
CAPSTONE COLLEGIATE COMMUNITIES
JOHN ACKEN, VICE PRESIDENT
431 OFFICE PARK DRIVE
BIRMINGHAM, ALABAMA 35223
205.414.6400

ARCHITECT
DUNGAN NEQUETTE ARCHITECTS
MANAGER: LOUIS NEQUETTE, AIA
1906 CAHABA ROAD
MOUNTAIN BROOK, ALABAMA 35223
205.329.7003

ENGINEER AND SURVEYOR
NORTHERN ENGINEERING
NICK HAWS, PE, LEED AP
200 S. COLLEGE AVE. SUITE 100
FORT COLLINS, CO 80524
970.221.4158

ENVIRONMENTAL
CEDAR CREEK ASSOCIATES, INC.
T. MICHAEL PHELAN
916 WILLSHIRE AVE.
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970.493.4394

PLANNER/LANDSCAPE ARCHITECT
RIPLEY DESIGN, INC.
LINDA RIPLEY, ASLA
401 W. MOUNTAIN AVE. SUITE 100
FORT COLLINS, CO 80521
970.224.5828

TRAFFIC ENGINEER
DELICH ASSOCIATES
MATT DELICH, P.E., PTOE
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
970.669.2061

ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	5-6-2014
2	PROJECT DEVELOPMENT PLAN	12-10-2014
3	PROJECT DEVELOPMENT PLAN	3-11-2015
4	PROJECT DEVELOPMENT PLAN	8-28-2015
5	PROJECT DEVELOPMENT PLAN	11-19-2015

REVISIONS

No.	DESCRIPTION	DATE

SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

LANDSCAPE PLAN

DRAWING NUMBER:

L2.0

DUFF DRIVE
(76' ROW)

FORT COLLINS
BUSINESS CENTER
ANNEXATION
NIFOROS TONIA L

TRACT B

LANDSCAPE MATERIAL LEGEND

SYMBOL	DESCRIPTION
	IRRIGATED TURF (SEE LANDSCAPE NOTES)
	COBBLE MULCH
	PRAIRIE TURF (IRRIGATTED)
	DRYLAND NATIVE GRASS (NON-IRRIGATED)
	WETLAND MITIGATION AREA (WETLAND SEED)
	SHRUB BED MULCH AREA (INCLUDES INORGANIC AND ORGANIC MULCHES, SEE LANDSCAPE NOTES FOR MIX RATIO)
	EVERGREEN TREE
	PERENNIALS
	PERENNIAL GRASSES
	DECIDUOUS SHRUBS
	DECIDUOUS LOW SPREADING SHRUBS
	EVERGREEN SHRUBS
	CANOPY TREE
	ORNAMENTAL TREE

SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- FLOW LINE
- PFA TURNING (25'/50' RADII)
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- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- EXISTING OVERHEAD POWER LINE
- EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- EXISTING WATER LINE
- EXISTING WIRE FENCE
- PROPOSED SEWER LINE
- PROPOSED UNDERDRAIN
- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE
- PROPOSED WATER METER
- PROPOSED FIRE HYDRANT
- HANDICAP RAMP
- FIXED BIKE RACK (7 SPACES EA.)
- SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
- EXISTING TREE
- PERMEABLE PAVERS
- STOP SIGN

NOTE:
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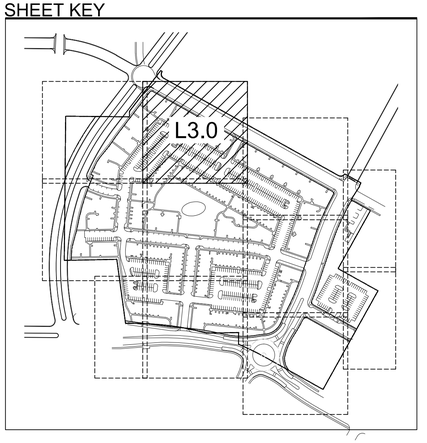
SHEET KEY



NORTH

SCALE: 1"=20'-00"

0 10 20 40

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TRAFFIC ENGINEER
DELICH ASSOCIATES
MATT DELICH, P.E., PTOE
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
970.669.2061

ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	5-6-2014
2	PROJECT DEVELOPMENT PLAN	12-10-2014
3	PROJECT DEVELOPMENT PLAN	3-11-2015
4	PROJECT DEVELOPMENT PLAN	8-28-2015
5	PROJECT DEVELOPMENT PLAN	11-19-2015

REVISIONS

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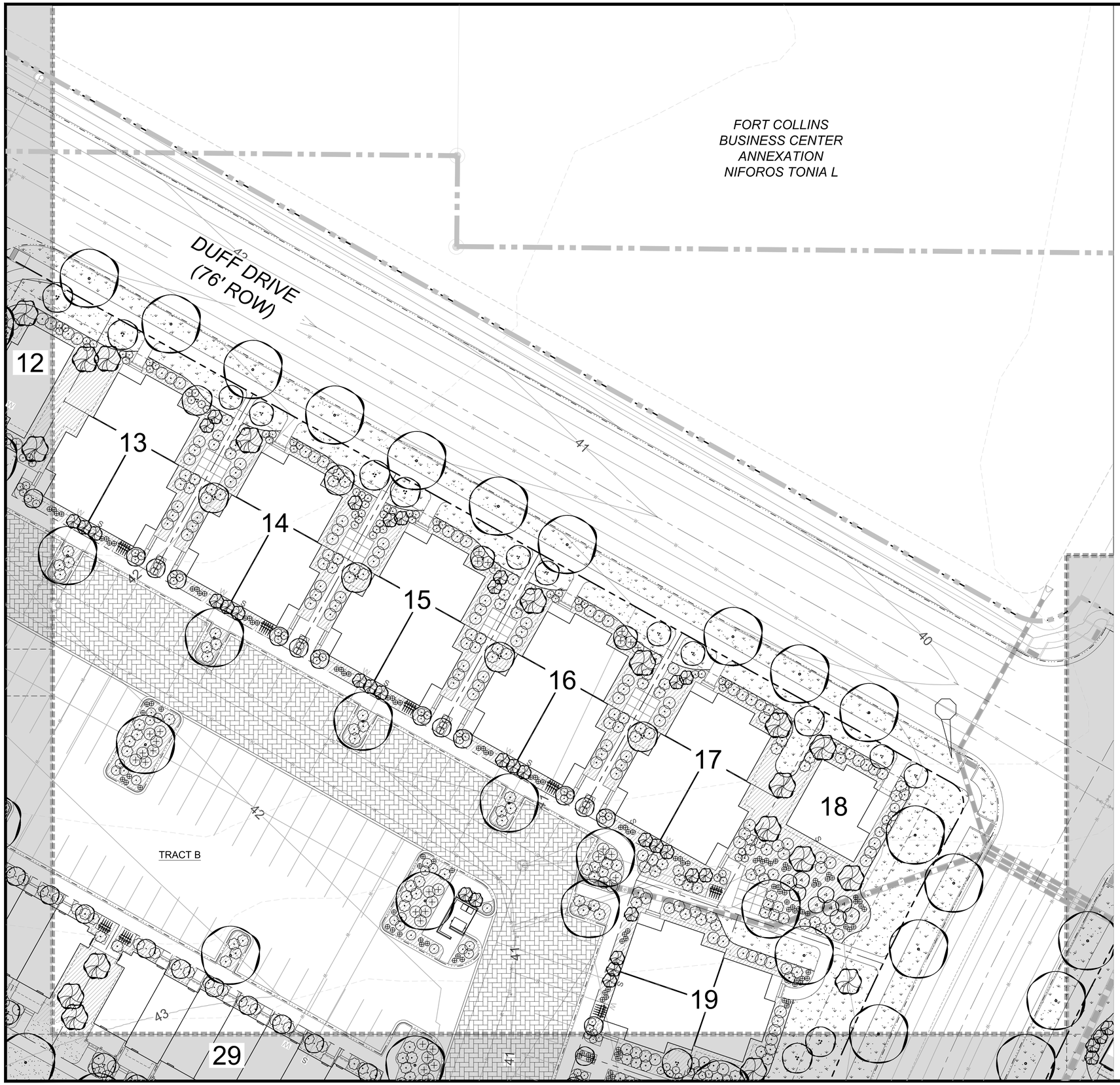
DRAWN BY:	
REVIEWED BY:	

LANDSCAPE PLAN

DRAWING NUMBER:

L3.0



LANDSCAPE MATERIAL LEGEND

SYMBOL	DESCRIPTION
	IRRIGATED TURF (SEE LANDSCAPE NOTES)
	COBBLE MULCH
	PRAIRIE TURF (IRRIGATTED)
	DRYLAND NATIVE GRASS (NON-IRRIGATED)
	WETLAND MITIGATION AREA (WETLAND SEED)
	SHRUB BED MULCH AREA (INCLUDES INORGANIC AND ORGANIC MULCHES, SEE LANDSCAPE NOTES FOR MIX RATIO)
	EVERGREEN TREE
	PERENNIALS
	PERENNIAL GRASSES
	DECIDUOUS SHRUBS
	DECIDUOUS LOW SPREADING SHRUBS
	CANOPY TREE
	ORNAMENTAL TREE
	EVERGREEN SHRUBS

SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- FLOW LINE
- PFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- OHP — EXISTING OVERHEAD POWER LINE
- SS — EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- W — EXISTING WATER LINE
- X — EXISTING WIRE FENCE
- S — PROPOSED SEWER LINE
- UD — PROPOSED UNDERDRAIN
- W — PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE
- W — PROPOSED WATER METER
- FH — PROPOSED FIRE HYDRANT
- R — HANDICAP RAMP
- B — FIXED BIKE RACK (7 SPACES EA.)
- SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
- EXISTING TREE
- PERMEABLE PAVERS
- STOP SIGN

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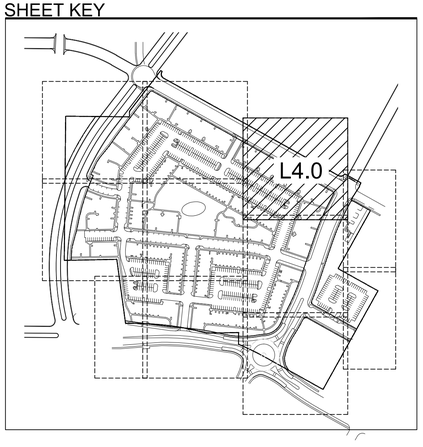

NORTH

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FORT COLLINS, COLORADO

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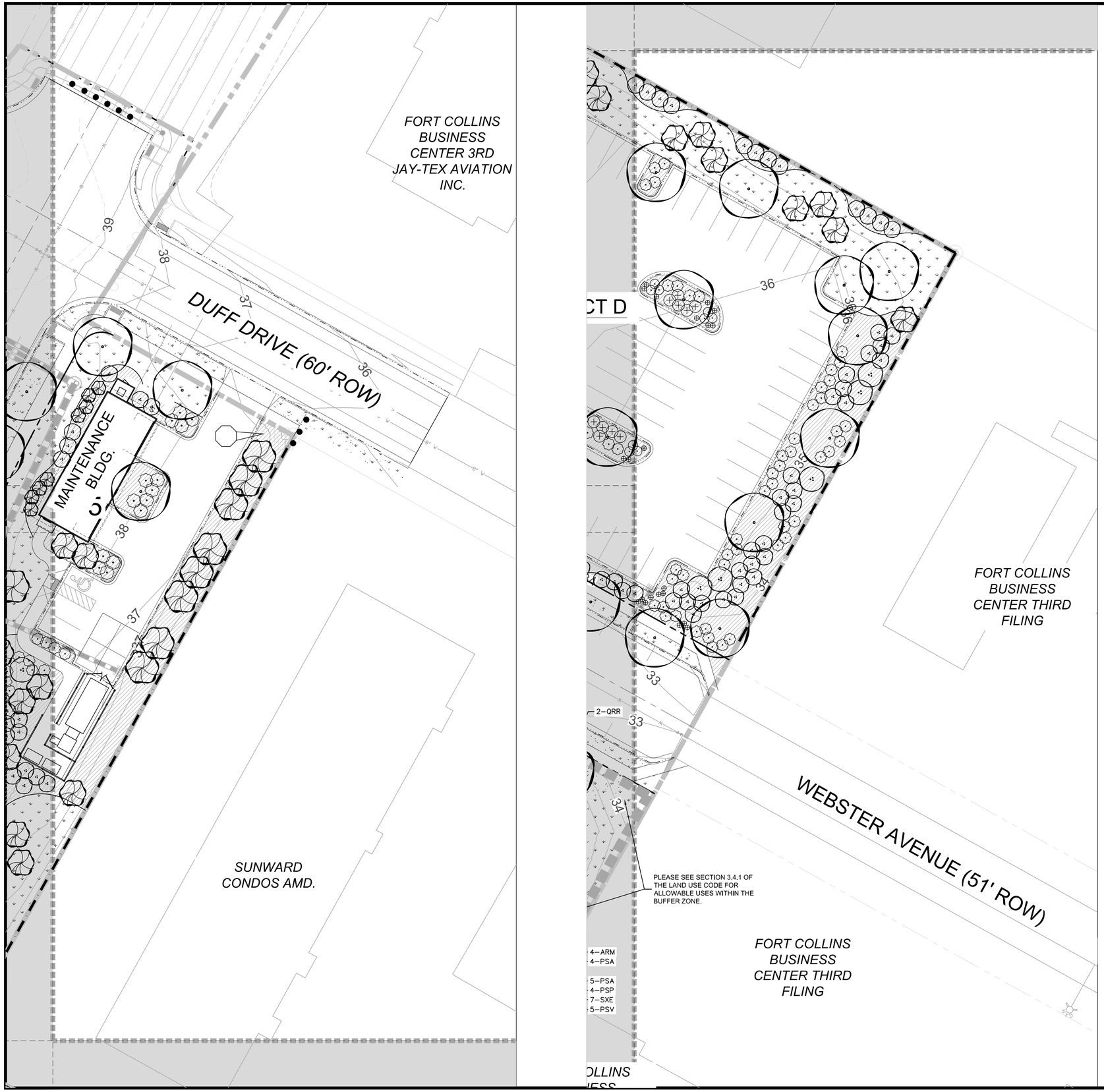

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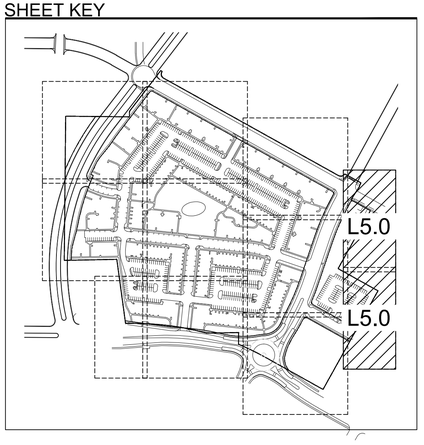

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LANDSCAPE PLAN

DRAWING NUMBER:

L5.0



LANDSCAPE MATERIAL LEGEND

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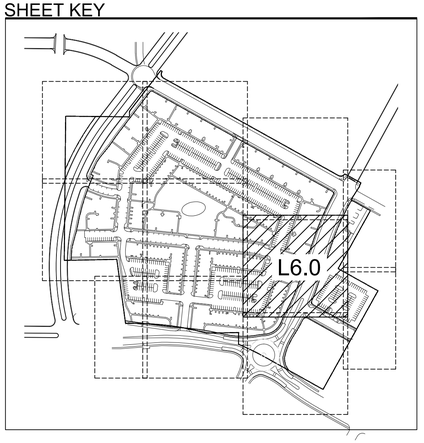

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LANDSCAPE PLAN

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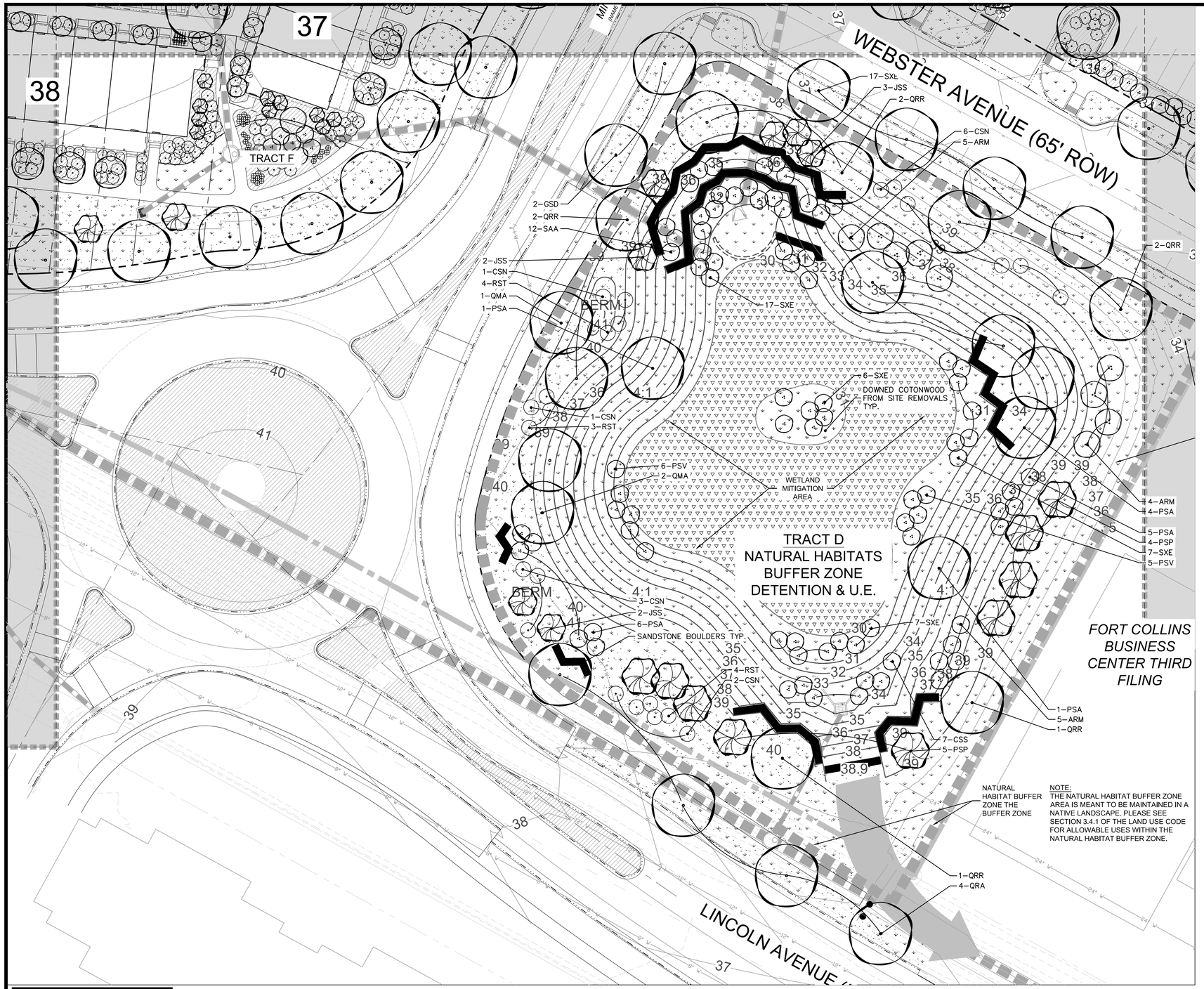

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SITE PLAN LEGEND

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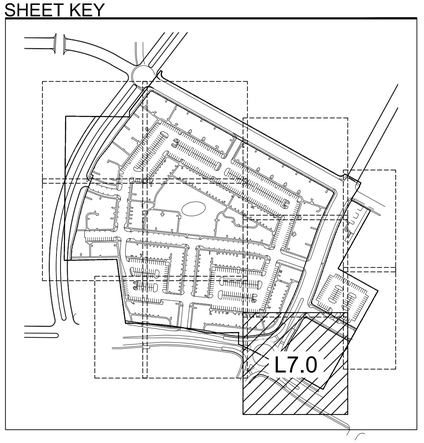

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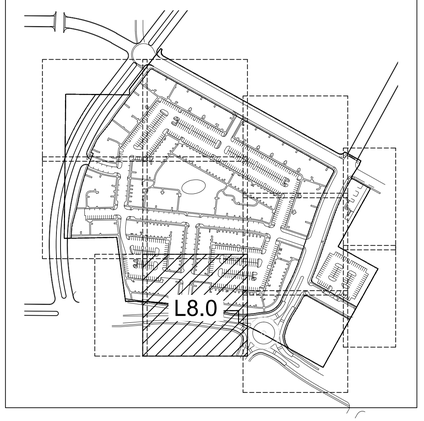

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JOHN ACKEN, VICE PRESIDENT
431 OFFICE PARK DRIVE
BIRMINGHAM, ALABAMA 35223
205.414.6400

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MANAGER: LOUIS NEQUETTE, AIA
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970.221.4158

ENVIRONMENTAL
CEDAR CREEK ASSOCIATES, INC.
T. MICHAEL PHELAN
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970.493.4394

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RIPLEY DESIGN, INC.
LINDA RIPLEY, ASLA
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970.224.5828

TRAFFIC ENGINEER
DELICH ASSOCIATES
MATT DELICH, P.E., PTOE
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
970.669.2061

ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	5-6-2014
2	PROJECT DEVELOPMENT PLAN	12-10-2014
3	PROJECT DEVELOPMENT PLAN	3-11-2015
4	PROJECT DEVELOPMENT PLAN	8-28-2015
5	PROJECT DEVELOPMENT PLAN	11-19-2015

REVISIONS

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REVIEWED BY:	

LANDSCAPE PLAN

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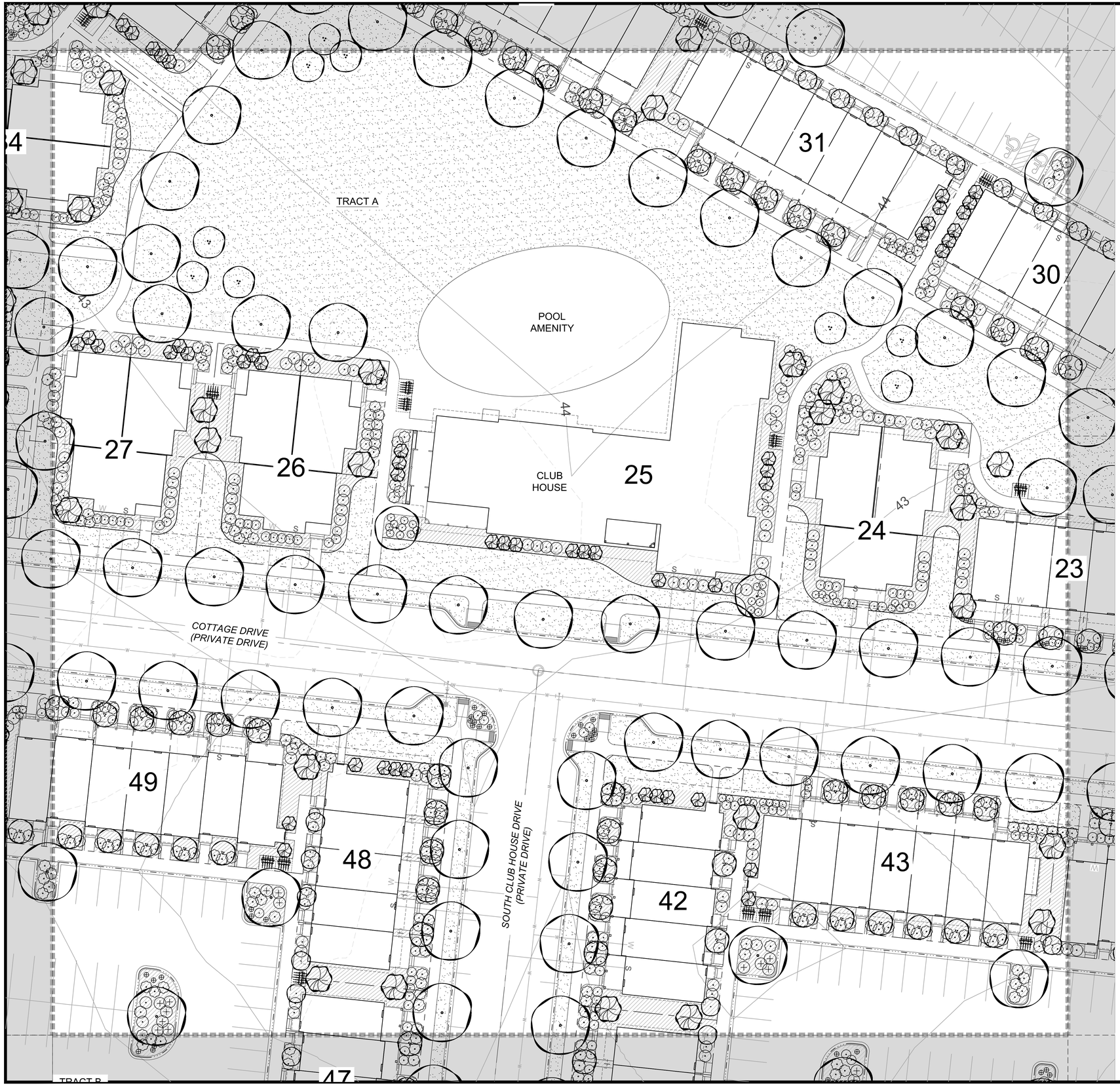

LANDSCAPE MATERIAL LEGEND

SYMBOL	DESCRIPTION
	IRRIGATED TURF (SEE LANDSCAPE NOTES)
	COBBLE MULCH
	PRAIRIE TURF (IRRIGATTED)
	DRYLAND NATIVE GRASS (NON-IRRIGATED)
	WETLAND MITIGATION AREA (WETLAND SEED)
	SHRUB BED MULCH AREA (INCLUDES INORGANIC AND ORGANIC MULCHES, SEE LANDSCAPE NOTES FOR MIX RATIO)
	EVERGREEN TREE
	PERENNIALS
	PERENNIAL GRASSES
	DECIDUOUS SHRUBS
	DECIDUOUS LOW SPREADING SHRUBS
	EVERGREEN SHRUBS
	CANOPY TREE
	ORNAMENTAL TREE

SITE PLAN LEGEND

	6' SOLID SCREEN FENCE
	BUILDING SETBACK LINE
	CENTER LINE
	EASEMENT LINE
	FLOW LINE
	PFA TURNING (25'/50' RADII)
	POOL AREA FENCE
	RIGHT-OF-WAY/BOUNDARY
	STREET-LIKE PRIVATE DRIVE ROW
	EXISTING ELECTRIC LINE
	EXISTING EDGE OF ASPHALT
OHP	EXISTING OVERHEAD POWER LINE
SS	EXISTING SEWER LINE
	EXISTING STORM DRAIN LINE
W	EXISTING WATER LINE
X	EXISTING WIRE FENCE
S	PROPOSED SEWER LINE
UD	PROPOSED UNDERDRAIN
W	PROPOSED WATER LINE
	PROPOSED STORM DRAIN LINE
W	PROPOSED WATER METER
FH	PROPOSED FIRE HYDRANT
R	HANDICAP RAMP
B	FIXED BIKE RACK (7 SPACES EA.)
	SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
	EXISTING TREE
	PERMEABLE PAVERS
	STOP SIGN

NOTE:
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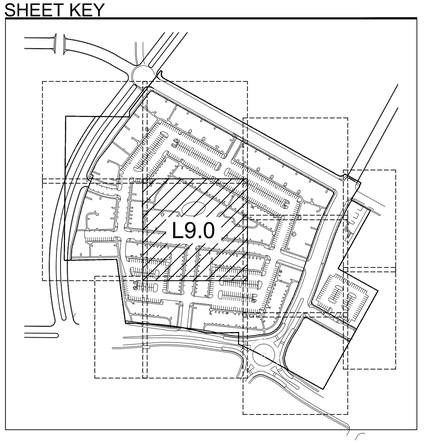
SHEET KEY



NORTH

SCALE: 1"=20'-00"

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CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■
■ urban design ■ entitlement ■

401 West Mountain Avenue Suite 100 Fort Collins, CO 80521
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LANDSCAPE MATERIAL LEGEND

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	DRYLAND NATIVE GRASS (NON-IRRIGATED)
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SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
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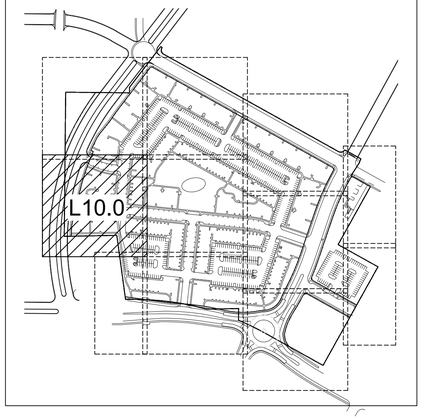

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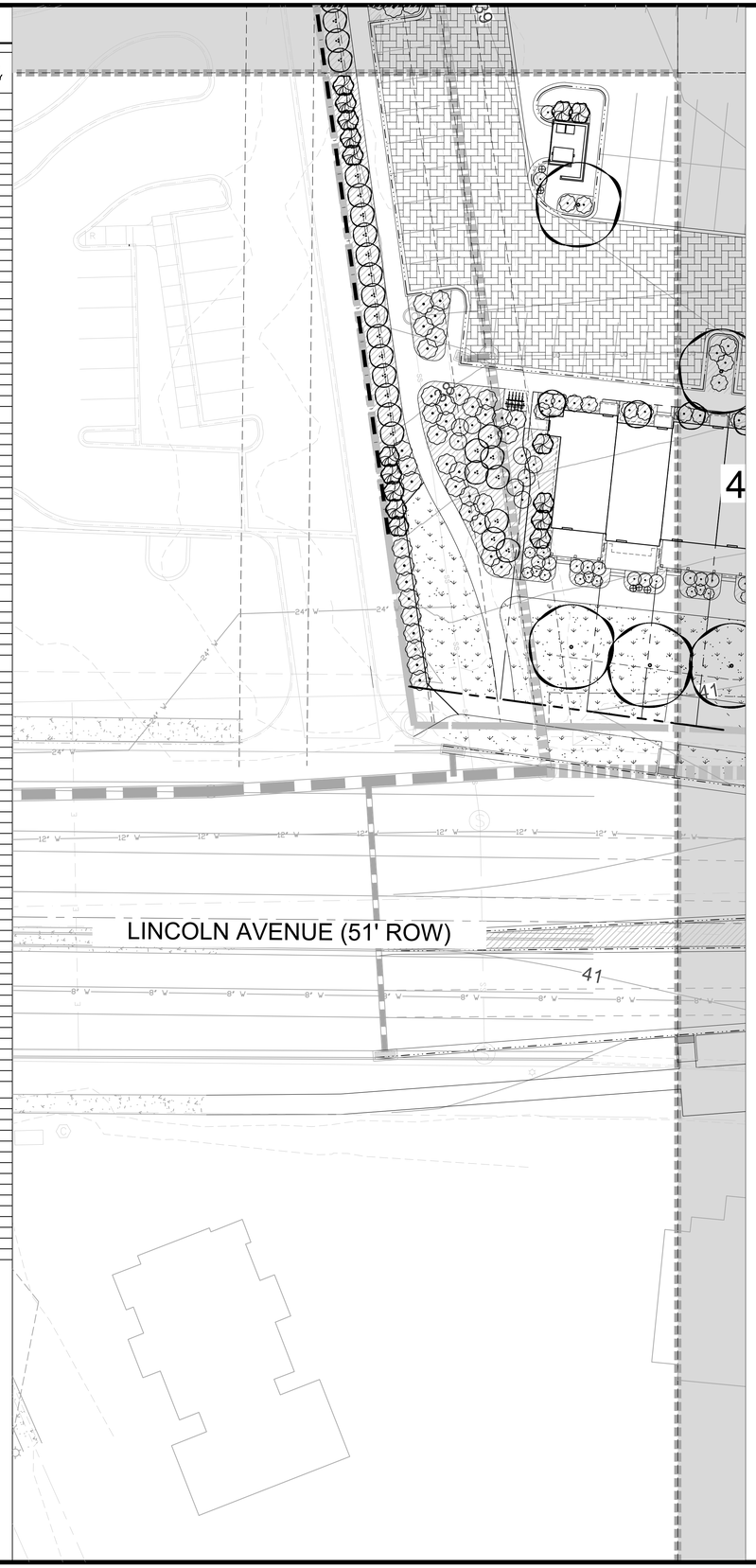
LANDSCAPE MATERIAL LEGEND

QUANTITY CONDITION 1 PLANT ID.	QUANTITY CONDITION 2 PLANT ID. (*)	PLANT ID.	SCIENTIFIC NAME	COMMON NAME	K-VAL	HEIGHT	SPREAD	CONDITION ONE	CONDITION TWO		SPECIES DIVERSITY
			LARGE DECIDUOUS TREES								
18		ARN	ACER NEGUNDO 'SENSATION'	SENSATION BOXELDER	L	25-30'	20-25'	2" CAL.	3" CAL.	B&B	<1%
24	12	CSW	CATALPA SPECIOSA	WESTERN CATALPA	L	50-60'	40-50'	2" CAL.	3" CAL.	B&B	2%
56		COS	CELTIS OCCIDENTALIS	WESTERN HACKBERRY	L	50-60'	40-50'	2" CAL.	3" CAL.	B&B	3%
26		GSD	GYMNOCLADUS DIOICUS 'ESPRESSO'	SEEDLESS KENTUCKY COFFEETREE	L	50-60'	40-50'	2" CAL.	3" CAL.	B&B	3%
14	0	GAS	GLEDITSIA TRIACANTHOS INERMIS 'SKYLINE'	SKYLINE HONEYLOCUST	M	40-50'	30-40'	2" CAL.	3" CAL.	B&B	3%
4	8	GAT	GLEDITSIA TRIACANTHOS INERMIS 'SHADEMASTER'	SHADEMASTER HONEYLOCUST	M	40-50'	30-40'	2" CAL.	3" CAL.	B&B	2%
5		PCC	PYRUS CALLERYANA 'CHANTICLEER'	CHANTICLEER PEAR	M	20-30'	15-20'	2" CAL.	3" CAL.	B&B	3%
6		PSA	POPULUS X ACUMINATA	LANCELEAF COTTONWOOD	M	50'	30'	2" CAL.	3" CAL.	B&B	<1%
56		QMA	QUERCUS MACROCARPA	BUR OAK	L	60-80'	60-80'	2" CAL.	3" CAL.	B&B	2%
8	18	QRP	QUERCUS ROBUR 'PYRAMICH'	SKYMASTER OAK	M	50'	25'	2" CAL.	3" CAL.	B&B	3%
18		QRA	QUERCUS BUCKLEYI	TEXAS RED OAK	M	40-60'	40-60'	2" CAL.	3" CAL.	B&B	<1%
24		QRR	QUERCUS ROBUR	ENGLISH OAK	M	40-60'	30-40'	2" CAL.	3" CAL.	B&B	2%
14	16	TAA	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LINDEN	M	30-40'	25-35'	2" CAL.	3" CAL.	B&B	2%
6		TAM	TILIA MONGOLICA 'HARVEST GOLD'	MONGOLIAN LINDEN	M	30'	25'	2" CAL.	3" CAL.	B&B	1%
10	22	USJ	ULMUS JAPONICA X U. WILSONIANA 'ACCOLADE'	ACCOLADE ELM	M	50-60'	40-50'	2" CAL.	3" CAL.	B&B	1%
0	6	USF	ULMUS X FRONTIER	FRONTIER ELM	M	25-35'	15-25'	2" CAL.	3" CAL.	B&B	2%
			ORNAMENTAL DECIDUOUS TREES								
8		AGM	ACER GRANDIDENTATUM 'SCHMIDT'	ROCKY MOUNTAIN GLOW MAPLE	L	25'	15'	2" CAL.	2.5" CAL.	B&B	<1%
32		ARG	AMELANCHIER X GRANDIFLORA 'AUTUMN BRILLIANCE'	AUTUMN BRILLIANCE SERVICEBERRY	L	15-20'	12-15'	2" CAL.	2.5" CAL.	B&B	2%
34		ART	ACER TATARICUM 'GARANN'	HOTWINGS MAPLE	L/M	20'	15'	2" CAL.	2.5" CAL.	B&B	1%
0		CSC	CRATAEGUS CRUS-GALLI 'INERMUS'	THORNLESS COCKSPUR HAWSTHORN	L/M	20'	15'	2" CAL.	2.5" CAL.	B&B	<1%
96		MSR	MALUS SP. 'RED BARRON'	RED BARRON CRABAPPLE	L/M	18'	12'	2" CAL.	2.5" CAL.	B&B	9%
2		MSS	MALUS SP. 'SPRING NOW'	SPRING SNOW CRABAPPLE	M	15-20'	12-15'	2" CAL.	2.5" CAL.	B&B	1%
154		PSC	PRUNUS CERASIFERA 'CRIMSON POINT'	COLUMNAR PURPLE PLUM	M	20-25'	8-10'	1.5" CAL.	2.5" CAL.	B&B	5%
154		SAR	SYRINGA RETICULATA	JAPANESE TREE LILAC	M	15'	12'	2" CAL.	2.5" CAL.	B&B	5%
0		PST	POPULUS TREMULA 'ERECTA'	SWEDISH ASPEN	M	20-30'	5-10'	2" CAL.	2.5" CAL.	B&B	8%
8		QSU	QUERCUS UNDULATA	WAVEYLEAF OAK	VL	10-20'	8-16'	6' CLUMP	2.5" CAL.	B&B	5%
			EVERGREEN TREES								
0		JCB	JUNIPEROUS CHINENSIS 'BLUE POINT'	BLUE POINT JUNIPER	L	8-10'	6-8'	10 GAL.	8' HT	CONT.	<1%
9		JSS	JUNIPERUS SCOPULORUM	ROCKY MOUNTAIN JUNIPER	L	20-30'	8-12'	6' HT	8' HT	B&B	3%
0		JSC	JUNIPERUS SCOPULORUM 'COLOGREEN'	COLORADO GREEN JUNIPER	L	20-30'	4-6'	6' HT	8' HT	B&B	<1%
473		JSG	JUNIPERUS SCOPULORUM 'GREY GLEAM'	GREY GLEM JUNIPER	L	20-30'	4-6'	6' HT	8' HT	B&B	13%
90		PFV	PINUS FLEXIS 'VANDERWOLF'S PYRAMID'	VANDERWOLF'S PINE	L	30-50'	15-30'	6' HT	8' HT	B&B	3%
0		PSA	PINUS ARISTATA	BRISTLECONE PINE	L	20-40'	10-20'	6' HT	8' HT	B&B	1%
0		PGA	PICEA GLAUCA 'DENSATA'	BLACK HILLS SPRUCE	L	20-30'	15-25'	6' HT	8' HT	B&B	<1%
0		PSH	PINUS HELDREICHII (LEUCODERMIS)	BOSNIAN PINE	L	15-20'	10-12'	6' HT	8' HT	B&B	1%
22		PSL	PINUS LEUCODERMIS 'EMERALD ARROW'	EMERALD ARROW BOSNIAN PINE	L	15-20'	6-8'	6' HT	8' HT	B&B	6%
83		PNA	PINUS NIGRA	AUSTRIAN PINE	L	40-60'	30-40'	6' HT	8' HT	B&B	3%
26		PSP	PINUS PONDEROSA	PONDEROSA PINE	L	60-80'	30-40'	6' HT	8' HT	B&B	1%
46		PPB	PICEA PUNGENS 'BAKERI'	BAKERI SPRUCE	M	35-40'	15-20'	6' HT	8' HT	B&B	1%
20		PPH	PICEA PUNGENS 'HOOPSII'	HOOPSII SPRUCE	M	35-40'	10-12'	6' HT	8' HT	B&B	1%
126		PPU	PICEA PUNGENS 'BABY BLUE EYES'	BABY BLUE EYES SPRUCE	M	20-30'	10-15'	6' HT	8' HT	B&B	2%
8		PES	PINUS EDULIS	PINON PINE	VL	20-30'	10-20'	6' HT	8' HT	B&B	<1%
			EVERGREEN SHRUBS								
431		JCA	JUNIPERUS COMMUNIS 'ALPINE CARPET'	ALPINE CARPET JUNIPER	L	12-18"	4-6'	5 GAL.	CONT.		
2		JHH	JUNIPERUS HORIZONTALIS 'HUGHES'	HUGHES JUNIPER	L	12-18"	5-6'	5 GAL.	CONT.		
0		JSA	JUNIPERUS CHINENSIS 'ARMSTRONGII'	ARMSTRONG JUNIPER	L	3-4'	3-4'	5 GAL.	CONT.		
8		JSB	JUNIPERUS SABINA 'BUFFALO'	BUFFALO JUNIPER	L	12-18"	6-8'	5 GAL.	CONT.		
0		PMO	PINUS MUGO 'SLOWMOUND'	SLOWMOUND MUGO PINE	L	3-5'	5-10'	10 GAL.	CONT.		
			DECIDUOUS SHRUBS								
21		ARM	ACER GLABRUM	ROCKY MOUNTAIN MAPLE	L	10-20'	10-15'	5 GAL.	CONT.		
12		ARA	AMELANCHIER ALNIFOLIA 'REGENT'	REGENT SERVICEBERRY	L	6-8'	6-8'	5 GAL.	CONT.		
4		CAS	CARAGANA ARBORESCENS ' SUTHERLAND'	SUTHERLAND PEASHRUB	L	1'2'	4-6'	5 GAL.	CONT.		
0		CAP	CARAGANA PYGMAEA	PYGMY PEASHRUB	L	3-4'	3-4'	5 GAL.	CONT.		
7		CSS	CORNUS STOLONIFERA	RED OSIER DOGWOOD	M	6-8'	8-12'	5 GAL.	CONT.		
332		CCI	CORNUS SERICEA 'ISANTI'	ISANTI DOGWOOD	M	4-5'	4-6'	5 GAL.	CONT.		
0		CCS	CARYOPTERIS X CLANDONENSIS	BLUE MIST SPIREA	L	3-4'	3-4'	5 GAL.	CONT.		
13		CSN	CHRYSOTHAMNUS NAUSEOSUS NAUSEOSUS	DWARF BLUE RABBIT BRUSH	L	4'	4'	5 GAL.	CONT.		
971		CRA	COTONEASTER APICULATUS	CRANBERRY COTONEASTER	L	18-24"	4-6'	5 GAL.	CONT.		
91		CRL	COTONEASTER LUCIDUS	PEKING COTONEASTER	L	6-12'	6-10'	5 GAL.	CONT.		
300		EAE	EPHEDRA EQUISETINA	BLUESTEM JOINT FIR	L	3-5'	2-3'	5 GAL.	CONT.		
0		FAP	FALLUGIA PARADOXA	APACHE PLUME	VL	3-6'	3-6'	5 GAL.	CONT.		
110		HME	HYDRANGEA MACROPHYLLA 'ENDLESS SUMMER'	ENDLESS SUMMER HYDRANGEA	M	3-5'	3-5'	5 GAL.	CONT.		
97		LAK	LONICERA KOROLKOWII	BLUE VELVET HONEY LOCUST	L	6-8'	6-8'	5 GAL.	CONT.		
286		MAC	MAHONIA AQUIFOLIUM COMPACTA	COMPACT OREGON GRAPEHOLLY	L	2-3'	2-3'	5 GAL.	CONT.		
0		PAD	POTENTILLA FRUTICOSA DAVURICA 'PRAIRIE SNOW'	PRAIRIE SNOW POTENTILLA	L	2-3'	3-5'	5 GAL.	CONT.		
0		PAK	POTENTILLA FRUTICOSA 'KATHERYN DYKES'	KATHERYN DYKES POTENTILLA	L	2-3'	3-4'	5 GAL.	CONT.		
545		PAY	POTENTILLA FRUTICOSA 'YELLOW GEM'	YELLOW GEM POTENTILLA	L	1-2'	2-3'	5 GAL.	CONT.		
11		PSA	PRUNUS AMERICANA	AMERICAN PLUM		10-20'	8-12'	5 GAL.	CONT.		
1014		PBB	PRUNUS BESSEYI 'PAWNEE BUTTES'	CREEPING WESTERN SAND CHERRY	L	18"	4-6'	5 GAL.	CONT.		
11		PSV	PRUNUS VIRGINIANA MELANOCARPA	NATIVE CHOKECHERRY	L	8-20'	8-12'	5 GAL.	CONT.		
52		PSD	PHYSOCARPUS OPULIFOLIUS 'DART'S GOLD'	DART'S GOLD NINEBARK	L	4'	4'	5 GAL.	CONT.		
144		PSO	PHYSOCARPUS OPULIFOLIUS 'NANUS'	DWARF NINEBARK	L	4-5'	4-5'	5 GAL.	CONT.		
0		RAC	ROSA 'AUSTRIAN COPPER'	AUSTRIAN COPPER ROSE	L	6-10'	6-8'	5 GAL.	CONT.		
791		RAG	RHUS AROMATICA 'GRO-LOW'	FRAGRANT DWARF SUMAC	L	2-3'	6-8'	5 GAL.	CONT.		
600		RAN	ROSA 'NEARLY WILD'	NEARLY WILD SHRUB ROSE	L	2-3'	3-4'	5 GAL.	CONT.		
36		RAM	ROSA 'MORDEN SUNRISE'	MORDEN SUNRISE SHRUB ROSE	L	2-4'	3-4'	5 GAL.	CONT.		
0		RFP	ROSA FOETIDA 'PERSIANA'	YELLOW PERSIAN ROSE	L	4-6'	4-6'	5 GAL.	CONT.		
60		RKO	ROSA 'KNOCK OUT'	SINGLE RED SHRUB ROSE	L	2-3'	2-3'	5 GAL.	CONT.		
791		RAG	RHUS AROMATICA 'GRO-LOW'	FRAGRANT DWARF SUMAC	L	2-3'	6-8'	5 GAL.	CONT.		
10		RST	RHUS TRILOBATA	THREE-LEAF SUMAC	L	3-6'	3-6'	5 GAL.	CONT.		
0		RTA	RHUS TRILOBATA 'AUTUMN AMBER'	CREEPING THREE-LEAF SUMAC	L	12-18"	3-6'	5 GAL.	CONT.		
37		SXE	SALIX EXIGUA	COYOTE WILLOW	M	6-12'	4-8'	5 GAL.	CONT.		
12		SAA	SHEPARDIA ARGENTEA	BUFFALOBERRY	VL	8-15'	6-12'	5 GAL.	CONT.		
296		SSH	SYMPHORICARPOS X CHENAULTI 'HANDCOCK'	HANCOCK CORALBERRY	L	2-3'	3-6'	5 GAL.	CONT.		
0		SSO	SYMPHORICARPOS OCCIDENTALIS	WESTERN SNOWBERRY	L	3'	5'	5 GAL.	CONT.		
8		VML	VIBURNUM LENTAGO	NANNYBERRY VIBURNUM	L	6-8'	6-8'	5 GAL.	CONT.		
284		VTB	VIBURNUM TRILOBUM 'BAILEY COMPACT'	COMPACT AMERICAN CRANBERRY	L	4-5'	4-5'	5 GAL.	CONT.		
			GROUND COVER, VINES & PERENNIALS								
2		AAM	ACHILLEA 'MOONSHINE'	MOONSHINE YARROW	L	24-30"	18-24"	1 GAL.	CONT.		
0		ACA	AQUILEGIA COERULEA	ROCKY MOUNTAIN COLUMBINE	M	18-24"	12-18"	1 GAL.	CONT.		
0		ASC	ARCTOSTAPHYLOS X COLORADOENSIS PANCHITO	PANCHITO MANZANITA	L	10-15"	3-5'	5 GAL.	CONT.		
0		AEC	AGASTACHE CORONADO RED	CORONADO RED HYSSOP	L	18-24"	18-24"	1 GAL.	CONT.		
357		BAB	BOUTELOUA GRACILIS 'BLONDE AMBITION'	BLONDE AMBITION GRAMA GRASS	L	2-3'	2-3'	1 GAL.	CONT.		
0		HRM	HEMEROCALLIS 'RED MAGIC'	RED DAYLILY	L	30-36"	24-30"	1 GAL.	CONT.		
0		HNS	HELICTOTRICHON SEMPERVIRENS	BLUE AVENA GRASS	L	2-3'	18-24"	1 GAL.	CONT.		
0		NAL	NEPETA X LITTLE TRUDY	LITTLE TRUDY CATMINT AKA 'PSFIKE'	L	8-12"	18-24"	1 GAL.	CONT.		
0		OAM	OENOTHERA MISSOURENSIS	MISSOURI PRIMROSE	L	12-18"	12-18"	1 GAL.	CONT.		
0		PAS	PENNISETUM ALOPECUROIDES 'HAMELN'	DWARF FOUNTAIN GRASS	L	1-2'	12-18"	1 GAL.	CONT.		
485		PMS	PANICUM VIRGATUM 'SHENANDOAH'	RED SWITCH GRASS	L	3-4'	12-18"	1 GAL.	CONT.		
2		RFG	RUDBECKIA FULGIDA 'GOLDSTRUM'	BLACK-EYED SUSAN	L	18-24"	18-24"	1 GAL.	CONT.		
0		SNA	SALVIA NEMOROSA 'BLUE QUEEN'	BLUE SALVIA	L	18-24"	12-18"	1 GAL.	CONT.		
2		SSC	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM GRASS	L	3-4'	24-30"	1 GAL.	CONT.		
0		PAI	POLYGONUM AUBERTII	SILVER LACE VINE	L	VINE	VINE	1 GAL.	CONT.		
0		YAG	YUCCA GLAUCA	SOAPWEED	L	2-4'	2-4'	5 GAL.	CONT.		

* 35 SHADE TREES TO BE UPSIZED TO 3" CAL. (LOCATIONS DETERMINED AT FDP)



LANDSCAPE MATERIAL LEGEND

SYMBOL	DESCRIPTION
	IRRIGATED TURF (SEE LANDSCAPE NOTES)
	COBBLE MULCH
	PRAIRIE TURF (IRRIGATTED)
	DRYLAND NATIVE GRASS (NON-IRRIGATED)
	WETLAND MITIGATION AREA (WETLAND SEED)
	SHRUB BED MULCH AREA (INCLUDES INORGANIC AND ORGANIC MULCHES, SEE LANDSCAPE NOTES FOR MIX RATIO)
	EVERGREEN TREE
	PERENNIALS
	PERENNIAL GRASSES
	DECIDUOUS SHRUBS
	DECIDUOUS LOW SPREADING SHRUBS
	CANOPY TREE
	ORNAMENTAL TREE
	EVERGREEN SHRUBS

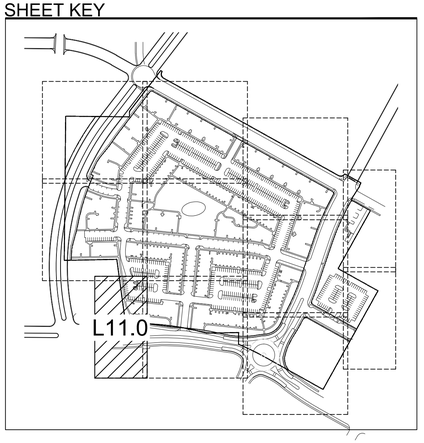
SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- FLOW LINE
- PFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- EXISTING OVERHEAD POWER LINE
- EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- EXISTING WATER LINE
- EXISTING WIRE FENCE
- PROPOSED SEWER LINE
- PROPOSED UNDERDRAIN
- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE

- PROPOSED WATER METER
- PROPOSED FIRE HYDRANT
- HANDICAP RAMP
- FIXED BIKE RACK (7 SPACES EA.)
- SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
- EXISTING TREE
- PERMEABLE PAVERS
- STOP SIGN

NOTE:
A FREE PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY STREET TREES ARE PLANTED IN THE PARKWAYS BETWEEN THE SIDEWALK AND CURB AND IN STREET MEDIANS. STREET TREE LOCATIONS AND NUMBERS MAY CHANGE TO MEET ACTUAL UTILITY/TREE SEPARATION STANDARDS. LANDSCAPE CONTRACTOR MUST OBTAIN APPROVAL OF STREET TREE LOCATIONS AFTER UTILITY LOCATES. STREET TREES MUST BE INSPECTED AND APPROVED BEFORE PLANTING. FAILURE TO OBTAIN THIS PERMIT IS A VIOLATION OF THE CODE OF THE CITY OF FORT COLLINS.

SHEET KEY



NORTH

SCALE: 1"=20'-00"

0 10 20 40

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CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■
■ urban design ■ entitlement ■

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REVISIONS		
No.	DESCRIPTION	DATE

SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

LANDSCAPE PLAN

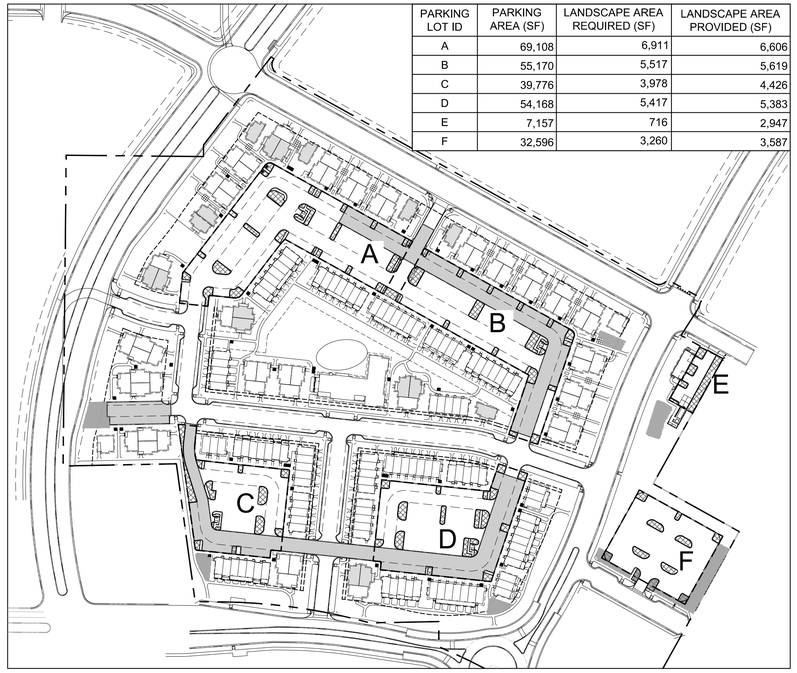
DRAWING NUMBER:

L11.0

PARKING LANDSCAPE AREA

SCALE: 1"=150'

PARKING LOT ID	PARKING AREA (SF)	LANDSCAPE AREA REQUIRED (SF)	LANDSCAPE AREA PROVIDED (SF)
A	69,108	6,911	6,606
B	55,170	5,517	5,619
C	39,776	3,978	4,426
D	54,168	5,417	5,383
E	7,157	716	2,947
F	32,596	3,260	3,587



HYDROZONE MAP

SCALE: 1"=150'



WATER BUDGET CHART

HYDROZONE	AREA (SF)	GALLONS / SF	TOTAL GALLONS	% OF TOTAL
HIGH	72121	18	1298178	16.70
MODERATE	131370	10	1313700	30.41
LOW	145505	3	436515	33.68
VERY LOW	82969	0	0	19.21
TOTALS:	431965.00		3048393.00	100%
AVERAGE:	7.06	GAL/SF		

LANDSCAPE NOTES

1. ALL PLANT MATERIAL SHALL MEET SPECIFICATIONS OF THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN) FOR NUMBER ONE GRADE. ALL TREES SHALL BE BALLED AND BURLAPPED OR EQUIVALENT.
2. TREES SHALL NOT BE PLANTED CLOSER THAN:
   - 2.1. 4 FEET TO ANY GAS LINE
   - 2.2. 10 FEET TO ANY WATER OR SEWER MAIN LINE
   - 2.3. 6 FEET FROM WATER OR SEWER SERVICE LINES
   - 2.4. 8 FEET FROM DRIVEWAYS OR CURB CUTS
   - 2.5. 40 FEET FROM STREET LIGHTS (SHADE TREES)
   - 2.6. 15 FEET FROM STREET LIGHTS (ORNAMENTAL TREES)
   - 2.7. 20 FEET FROM TRAFFIC CONTROL SIGNS & DEVICES (ORNAMENTAL AND SHADE TREES)
3. SHRUBS SHALL NOT BE PLANTED CLOSER THAN 4 FEET TO ANY WATER OR SEWER LINE.
4. THE SOIL IN ALL LANDSCAPE AREAS, INCLUDING PARKWAYS AND MEDIANS, SHALL BE THOROUGHLY LOOSENED TO A DEPTH OF NOT LESS THAN EIGHT (8) INCHES AND SOIL AMENDMENT SHALL BE THOROUGHLY INCORPORATED INTO THE SOIL OF ALL LANDSCAPE AREAS TO A DEPTH OF AT LEAST SIX (6) INCHES BY TILLING, DISCING OR OTHER SUITABLE METHOD, AT A RATE OF AT LEAST THREE (3) CUBIC YARDS OF SOIL AMENDMENT PER ONE THOUSAND (1,000) SQUARE FEET OF LANDSCAPE AREA.
5. MINOR CHANGES IN SPECIES AND PLANT LOCATIONS MAY BE MADE DURING CONSTRUCTION AS REQUIRED BY SITE CONDITIONS OR AVAILABILITY OF MATERIAL. OVERALL QUALITY AND DESIGN CONCEPT SHALL BE CONSISTENT WITH APPROVED LANDSCAPE PLANS. ANY CHANGES WILL BE PROVIDED TO THE LANDSCAPE ARCHITECT FOR REVIEW AND APPROVAL AS WELL AS THE CITY OF FORT COLLINS.
6. TREE PLANTING SHALL BE COORDINATED WITH PUBLIC SERVICE COMPANY. LOCATIONS OF ALL UTILITIES SHALL BE VERIFIED IN THE FIELD PRIOR TO PLANTING. A HORIZONTAL DISTANCE OF 40' BETWEEN STREET TREES AND STREET LIGHTS SHALL BE MAINTAINED.
7. LANDSCAPING SHALL BE INSTALLED OR SECURED WITH A LETTER OF CREDIT, ESCROW, OR PERFORMANCE BOND FOR 125% OF THE VALUE OF THE LANDSCAPING AND INSTALLATION PRIOR TO THE ISSUANCE OF A CERTIFICATE OF OCCUPANCY. FINAL RELEASE OF LETTER OF CREDIT, ESCROW OR PERFORMANCE BOND SHALL REQUIRE APPROVAL OF ALL PUBLIC STREET TREES BY THE CITY FORESTER.
8. LANDSCAPING WITHIN PUBLIC RIGHT-OF-WAYS AND COMMON OPEN SPACE AREAS SHALL BE INSTALLED BY THE DEVELOPER AND MAINTAINED BY THE OWNER.
9. DEVELOPER SHALL ENSURE THAT THE LANDSCAPE PLAN IS COORDINATED WITH THE PLANS DONE BY OTHER CONSULTANTS SO THAT THE PROPOSED GRADING, STORM DRAINAGE, OR OTHER CONSTRUCTION DOES NOT CONFLICT NOR PRECLUDE INSTALLATION AND MAINTENANCE OF LANDSCAPE ELEMENTS ON THIS PLAN.
10. THE IRRIGATION SYSTEM FOR LANDSCAPED AREAS SHALL BE REVIEWED AND APPROVED BY THE CITY OF FORT COLLINS WATER UTILITIES. IRRIGATION PLANS TO BE REVIEWED AS PART OF THE CONSTRUCTION PERMIT REVIEW PROCESS. THE IRRIGATION SYSTEM MUST BE INSTALLED ACCORDING TO APPROVE PLANS.
11. ALL IRRIGATED TURF AREAS SHALL BE IRRIGATED WITH AN UNDERGROUND AUTOMATIC, POP-UP IRRIGATION SYSTEM. ALL SHRUB AND PERENNIAL BEDS SHALL BE IRRIGATED WITH A PERMANENT AUTOMATIC DRIP OR BUBBLER SYSTEM. TREES AND SHRUBS LOCATED IN DRYLAND NATIVE GRASS AREAS TO BE IRRIGATED WITH A PERMANENT AUTOMATIC DRIP OR BUBBLER SYSTEM.
12. ALL SHRUB BEDS, NEW TREES AND TRANSPLANTED TREES SHALL BE MULCHED WITH A FOUR INCH (4") LAYER OF SHREDDED WOOD MULCH (SEE PLANTING DETAILS). SHREDDED WOOD MULCH TO BE PROVIDED BY THE CITY FORESTRY DEPARTMENT. CONTACT FORESTRY DEPARTMENT TO ARRANGE PICKUP.
13. EDGING BETWEEN GRASS AND SHRUB BEDS SHALL BE ⅛" X 4" STEEL SET LEVEL WITH TOP OF GRASS.

    TOPSOIL. TO THE MAXIMUM EXTENT FEASIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE CONSERVED FOR LATER USE.
14. SOIL AMENDMENTS. PRIOR TO INSTALLATION OF PLANT MATERIALS, AREAS THAT HAVE BEEN COMPACTED OR DISTURBED BY CONSTRUCTION ACTIVITY SHALL BE THOROUGHLY LOOSENED. ORGANIC AMENDMENTS SUCH AS COMPOST, PEAT, OR AGED MANURE SHALL BE THOROUGHLY INCORPORATED.

STREET TREE NOTES

1. STREET TREES SHALL BE SUPPLIED AND PLANTED BY THE DEVELOPER USING A QUALIFIED LANDSCAPE CONTRACTOR.
2. THE DEVELOPER SHALL REPLACE DEAD OR DYING STREET TREES AFTER PLANTING UNTIL FINAL MAINTENANCE INSPECTION AND ACCEPTANCE BY THE CITY OF FORT COLLINS FORESTRY DIVISION. ALL STREET TREES IN THE PROJECT MUST BE ESTABLISHED, OF AN APPROVED SPECIES AND OF ACCEPTABLE CONDITION PRIOR TO ACCEPTANCE.
3. STREET TREE LOCATIONS AND NUMBERS MAY BE ADJUSTED TO ACCOMMODATE DRIVEWAY LOCATIONS, UTILITY SEPARATIONS BETWEEN TREES, STREET SIGNS AND STREET LIGHTS. STREET TREES TO BE PLANTED AS CLOSE TO THE PROPOSED LOCATIONS AS FEASIBLE. QUANTITIES SHOWN ON PLAN MUST BE INSTALLED UNLESS A REDUCTION OCCURS TO MEET SEPARATION STANDARDS.
4. A PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY TREES OR SHRUBS AS NOTED ON THIS PLAN ARE PLANTED, PRUNED OR REMOVED. THIS PERMIT SHALL APPROVE THE LOCATION AND SPECIES TO BE PLANTED. FAILURE TO OBTAIN THIS PERMIT MAY RESULT IN REPLACING OR RELOCATING TREES AND A HOLD ON CERTIFICATE OF OCCUPANCY.
5. THE PROJECT MANAGER SHALL CONTACT THE CITY FORESTER TO INSPECT ALL STREET TREE PLANTINGS AT THE COMPLETION OF EACH PHASE OF THE DEVELOPMENT. ALL TREES NEED TO HAVE BEEN INSTALLED AS SHOWN ON THE LANDSCAPE PLAN. APPROVAL OF STREET TREE PLANTING IS REQUIRED BEFORE FINAL APPROVAL OF EACH PHASE.

   * 35 SHADE TREES TO BE UPSIZED TO 3" CAL. (LOCATIONS DETERMINED AT FDP)

NOTE:
A FREE PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY STREET TREES ARE PLANTED IN THE PARKWAYS BETWEEN THE SIDEWALK AND CURB AND IN STREET MEDIANS. STREET TREE LOCATIONS AND NUMBERS MAY CHANGE TO MEET ACTUAL UTILITY/TREE SEPARATION STANDARDS. LANDSCAPE CONTRACTOR MUST OBTAIN APPROVAL OF STREET TREE LOCATIONS AFTER UTILITY LOCATES. STREET TREES MUST BE INSPECTED AND APPROVED BEFORE PLANTING. FAILURE TO OBTAIN THIS PERMIT IS A VIOLATION OF THE CODE OF THE CITY OF FORT COLLINS.

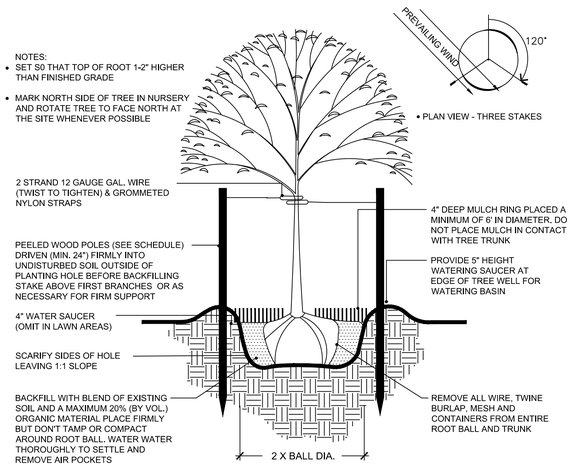
DRYLAND NATIVE SEED MIX

SPECIES		PREFERRED VARIETIES	SEEDED RATE LBS./ACRE (DRILLED)	PLS SEEDED/ACRE
LEYMUS CINEREUS	GREAT BASIN WILDRYE	MANGAR	3	285,000
NASSELLA VIRIDULA	GREEN NEEDLEGRASS	LODORM	2	362,000
ACHNATHERUM HYMENOIDES	INDIAN RICEGRASS	PALOMA, NEZPAR	1	188,000
ELYMUS TRACHYCAULUS	SLENDER WHEATGRASS	PRIMAR, REVENUE	2	320,000
ELYMUS LANCEOLATUS	THICKSPIKE WHEATGRASS	CRITANA	3	580,500
PASCOPYRUM SMITHII	WESTERN WHEATGRASS	ARRIBA, BARTON	4	504,000
		TOTALS =	15	2,239,500
				(~51 SEEDS/ SQ. FT.)

IRRIGATED PRAIRIE TURF SEED MIX

SPECIES		PREFERRED VARIETIES	SEEDED RATE LBS./ACRE (DRILLED)	
BUCHLOE DACTYLOIDES	BUFFALOGRASS	BISON	12	
BUCHLOE DACTYLOIDES	BUFFALOGRASS	BOWIE	12	
BOUTELOUA GRACILIS	BLUE GRAMA	ALMA	6	
BOUTELOUA GRACILIS	BLUE GRAMA	LOVINGTON	6	
		TOTALS =	36	PLS/ACRE

A TREE PLANTING DETAIL

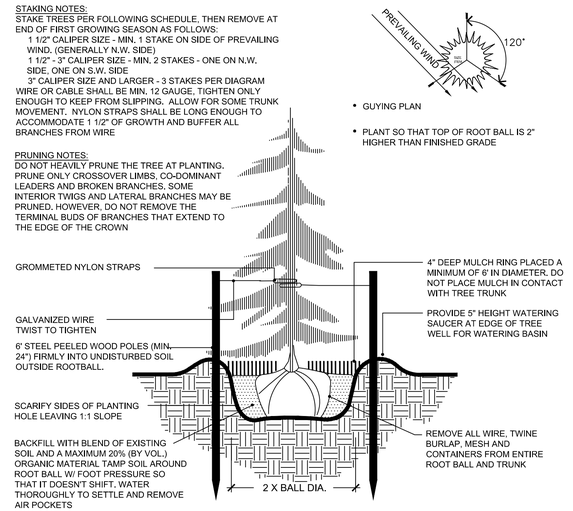


NOTES:
- SET S0 THAT TOP OF ROOT 1-2" HIGHER THAN FINISHED GRADE
- MARK NORTH SIDE OF TREE IN NURSERY AND ROTATE TREE TO FACE NORTH AT THE SITE WHENEVER POSSIBLE

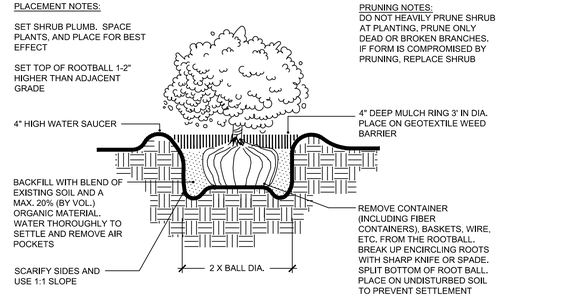
B CONIFER TREE PLANTING DETAIL

STAKING NOTES:
STAKE TREES PER FOLLOWING SCHEDULE, THEN REMOVE AT END OF FIRST GROWING SEASON AS FOLLOWS:
1 1/2" CALIPER SIZE - MIN. 1 STAKE ON SIDE OF PREVAILING WIND. (GENERALLY N.W. SIDE)
1 1/2" - 3" CALIPER SIZE - MIN. 2 STAKES - ONE ON N.W. SIDE, ONE ON S.W. SIDE
3" CALIPER SIZE AND LARGER - 3 STAKES PER DIAGRAM
WIRE OR CABLE SHALL BE MIN. 12 GAUGE, TIGHTEN ONLY ENOUGH TO KEEP FROM SLIPPING. ALLOW FOR SOME TRUNK MOVEMENT. NYLON STRAPS SHALL BE LONG ENOUGH TO ACCOMMODATE 1 1/2" OF GROWTH AND BUFFER ALL BRANCHES FROM WIRE

PRUNING NOTES:
DO NOT HEAVILY PRUNE THE TREE AT PLANTING. PRUNE ONLY CROSSOVER LIMBS, CO-DOMINANT LEADERS AND BROKEN BRANCHES. SOME INTERIOR TWIGS AND LATERAL BRANCHES MAY BE PRUNED, HOWEVER, DO NOT REMOVE THE TERMINAL BUDS OF BRANCHES THAT EXTEND TO THE EDGE OF THE CROWN



C SHRUB PLANTING DETAIL



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REVISIONS

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LANDSCAPE DETAILS

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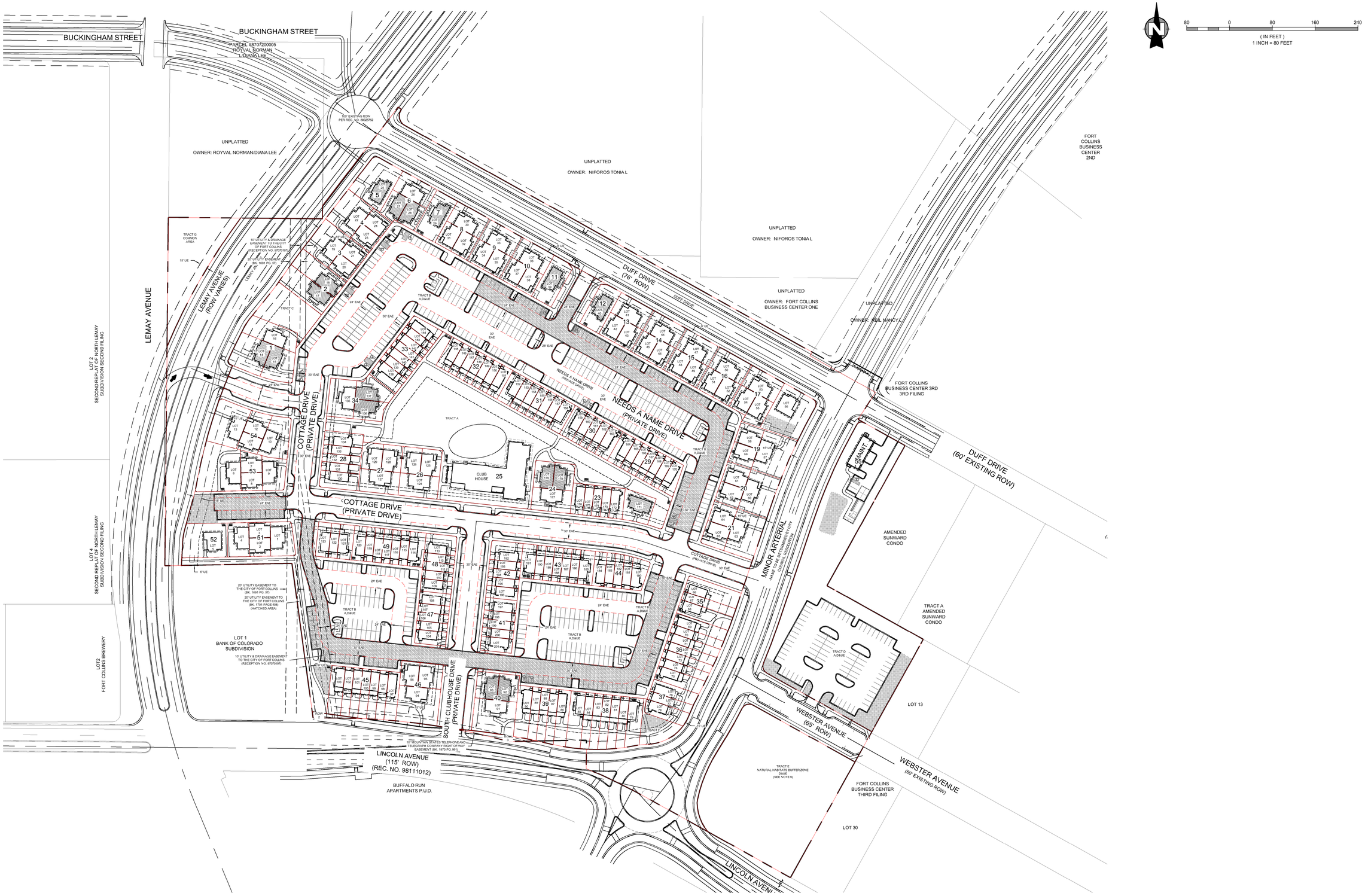
L12.0



11.19.15

NORTHERN ENGINEERING

ft.collins

CAPSTONE COTTAGES

SITE PLAN/PLAT OVERLAY EXHIBIT

CAPSTONE COTTAGES

A TRACT OF LAND LOCATED IN THE WEST HALF OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO

STATEMENT OF OWNERSHIP AND SUBDIVISION :

Know all persons by these presents, that the undersigned owner(s) of the following described land: A tract of land being a portion of the West Half of Section 7, Township 7 North, Range 68 West of the 6th P.M., City of Fort Collins, County of Larimer, State of Colorado being more particularly described as follows:

Considering the West line of the Northwest Quarter of said Section 7 as bearing North 00° 33' 51" East and with all bearings contained herein relative thereto:

Commencing at the West Quarter corner of Section 7; thence along said West line, North 00° 33' 51" East, 342.22 feet; thence, South 89° 26' 09" East, 30.00 feet to a point on the East right-of-way line of Lemay Avenue, said point being the POINT OF BEGINNING; thence along said East right-of-way line, North 00° 33' 51" East, 651.37 feet; thence departing said East right-of-way line, South 89° 26' 09" East, 287.98 feet to a point on the east line of that tract of land described at Reception No. 97065351, Larimer County Records; thence along said east line, North 00° 33' 51" East, 24.72 feet to a point on the southeasterly line of that tract of land described at Reception No. 88025752, Larimer County Records; thence along said southeasterly line, North 37° 27' 48" East, 232.40 feet; thence departing said southeasterly line, South 52° 32' 12" East, 7.50 feet; thence along a non-tangent curve concave to the northeast having a central angle of 98° 20' 32" with a radius of 20.00 feet, an arc length of 34.33 feet and the chord of which bears South 11° 42' 28" East, 30.27 feet; thence, South 60° 52' 44" East, 871.66 feet to a point on the west line of that tract of land described at Reception No. 20080065889, Larimer County Records; thence along said west line, South 31° 36' 41" West, 8.01 feet; thence along the south line of that tract of land described at Reception No. 20080065889, South 60° 52' 44" East, 140.00 feet to a point on the west line of the plat of Fort Collins Business Center Third Filing; thence along said west line the following five (5) courses and distance: South 32° 39' 26" West, 60.12 feet; thence, South 60° 52' 44" East, 100.57 feet; thence, South 29° 07' 16" West, 300.00 feet; thence, South 60° 52' 44" East, 206.10 feet; thence, South 29° 07' 16" West, 510.00 feet to the northerly right-of-way line of Lincoln Avenue; thence along said northerly right-of-way line the following nine (9) courses and distances: North 60° 52' 44" West, 299.35 feet; thence along a curve concave to the southwest having a central angle of 06° 21' 00" with a radius of 1206.00 feet, an arc length of 133.66 feet and the chord of which bears North 64° 03' 14" West, 133.59 feet; thence, North 00° 33' 51" East, 35.94 feet; thence along a non-tangent curve concave to the north having a central angle of 09° 55' 12" with a radius of 376.00 feet, an arc length of 65.10 feet and the chord of which bears North 82° 06' 52" West, 65.02 feet; thence, North 77° 09' 16" West, 19.45 feet; thence along a curve concave to the south having a central angle of 00° 27' 02" with a radius of 1117.00 feet, an arc length of 8.78 feet and the chord of which bears North 77° 22' 46" West, 8.78 feet; thence, South 88° 54' 32" West, 52.63 feet; thence along a non-tangent curve concave to the southwest having a central angle of 14° 59' 27" with a radius of 1206.00 feet, an arc length of 315.54 feet and the chord of which bears North 81° 58' 55" West, 314.64 feet; thence, North 89° 29' 09" West, 54.67 feet to a point on the east line of the plat of Bank of Colorado; thence along said east line, North 07° 45' 26" West, 291.70 feet; thence along the north line of said Bank of Colorado, South 88° 54' 32" West, 237.52 feet to the Point of Beginning.

The above described area contains 1,232,108 square feet or 28.285 acres more or less and is subject to all easements and rights-of-way now on record or existing.

For themselves and their successors in interest (collectively "Owner") have caused the above described land to be surveyed and subdivided into lots, tracts and streets as shown on this Plat to be known CAPSTONE COTTAGES (the "Development"), subject to all easements and rights-of-way now of record or existing or indicated on this Plat. The rights and obligations of this Plat shall run with the land.

CERTIFICATE OF DEDICATION :

The Owner does hereby dedicate and convey to the City of Fort Collins, Colorado (hereafter "City"), for public use, forever, a permanent right-of-way for street purposes and the "Easements" as laid out and designated on this Plat; provided, however, that (1) acceptance by the City of this dedication of Easements does not impose upon the City a duty to maintain the Easements so dedicated, and (2) acceptance by the City of this dedication of streets does not impose upon the City a duty to maintain streets so dedicated until such time as the provisions of the Maintenance Guarantee have been fully satisfied. The streets dedicated on this Plat are the fee property of the City as provided in Section 31-23-107 C.R.S. The City's rights under the Easements include the right to install, operate, access, maintain, repair, reconstruct, remove and replace within the Easements public improvements consistent with the intended purpose of the Easements; the right to install, maintain and use gates in any fences that cross the Easements; the right to mark the location of the Easements with suitable markers; and the right to permit other public utilities to exercise these same rights. Owner reserves the right to use the Easements for purposes that do not interfere with the full enjoyment of the rights hereby granted. The City is responsible for maintenance of its own improvements and for repairing any damage caused by its activities in the Easements, but by acceptance of this dedication, the City does not accept the duty of maintenance of the Easements, or of improvements in the Easements that are not owned by the City. Owner will maintain the surface of the Easements in a sanitary condition in compliance with any applicable weed, nuisance or other legal requirements.

Except as expressly permitted in an approved plan of development or other written agreement with the City, Owner will not install on the Easements, or permit the installation on the Easements, of any building, structure, improvement, fence, retaining wall, sidewalk, tree or other landscaping (other than usual and customary grasses and other ground cover). In the event such obstacles are installed in the Easements, the City has the right to require the Owner to remove such obstacles from the Easements. If Owner does not remove such obstacles, the City may remove such obstacles without any liability or obligation for repair and replacement thereof, and charge the Owner the City's costs for such removal. If the City chooses not to remove the obstacles, the City will not be liable for any damage to the obstacles or any other property to which they are attached.

The rights granted to the City by this Plat inure to the benefit of the City's agents, licensees, permittees and assigns.

OWNER:

By: ______________________________

STATE OF COLORADO)
)SS
COUNTY OF LARIMER)

The foregoing instrument was acknowledged before me this _____ day of _________________, 20____, by

________________________________ as ______________________ of _______________________

Witness my hand and official seal

My commission expires: _______________

____
Notary Public

OWNER:

By: ______________________________

STATE OF COLORADO)
)SS
COUNTY OF LARIMER)

The foregoing instrument was acknowledged before me this _____ day of _________________, 20____, by

________________________________ as ______________________ of _______________________

Witness my hand and official seal

My commission expires: _______________

____
Notary Public

NOTICE

ALL RESPONSIBILITIES AND COSTS OF OPERATION, MAINTENANCE AND RECONSTRUCTION OF THE PRIVATE STREETS AND/OR DRIVES LOCATED ON THE PRIVATE PROPERTY THAT IS THE SUBJECT OF THIS PLAT SHALL BE BORNE BY THE OWNERS OF SAID PROPERTY, EITHER INDIVIDUALLY, OR COLLECTIVELY, THROUGH A PROPERTY OWNERS' ASSOCIATION, IF APPLICABLE. THE CITY OF FORT COLLINS SHALL HAVE NO OBLIGATION OF OPERATION, MAINTENANCE OR RECONSTRUCTION OF SUCH PRIVATE STREETS AND/OR DRIVES NOR SHALL THE CITY HAVE ANY OBLIGATION TO ACCEPT SUCH STREETS AND/OR DRIVES AS PUBLIC STREETS OR DRIVES.

OWNER:

By: ______________________________

STATE OF COLORADO)
)SS
COUNTY OF LARIMER)

The foregoing instrument was acknowledged before me this _____ day of _________________, 20____, by

________________________________ as ______________________ of _______________________

Witness my hand and official seal

My commission expires: _______________

____
Notary Public

DRAFT
11-19-15

LIENHOLDER:

By: ______________________________

STATE OF COLORADO)
)SS
COUNTY OF LARIMER)

The foregoing instrument was acknowledged before me this _____ day of _________________, 20____, by

________________________________ as ______________________ of _______________________

Witness my hand and official seal

My commission expires: _______________

____
Notary Public

MAINTENANCE GUARANTEE :

The Owner hereby warrants and guarantees to the City, for a period of two (2) years from the date of completion and first acceptance by the City of the improvements warranted hereunder, the full and complete maintenance and repair of the improvements to be constructed in connection with the Development which is the subject of this Plat. This warranty and guarantee is made in accordance with the City Land Use Code and/or the Transitional Land Use Regulations, as applicable. This guarantee applies to the streets and all other appurtenant structures and amenities lying within the rights-of-way, Easements and other public properties, including, without limitation, all curbing, sidewalks, bike paths, drainage pipes, culverts, catch basins, drainage ditches and landscaping. Any maintenance and/or repair required on utilities shall be coordinated with the owning utility company or department.

The Owner shall maintain said improvements in a manner that will assure compliance on a consistent basis with all construction standards, safety requirements and environmental protection requirements of the City. The Owner shall also correct and repair, or cause to be corrected and repaired, all damages to said improvements resulting from development-related or building-related activities. In the event the Owner fails to correct any damages within thirty (30) days after written notice thereof, then said damages may be corrected by the City and all costs and charges billed to and paid by the Owner. The City shall also have any other remedies available to it as authorized by law. Any damages which occurred prior to the end of said two (2) year period and which are unrepaired at the termination of said period shall remain the responsibility of the Owner.

REPAIR GUARANTEE :

In consideration of the approval of this final Plat and other valuable consideration, the Owner does hereby agree to hold the City harmless for a five (5) year period, commencing upon the date of completion and first acceptance by the City of the improvements to be constructed in connection with the development which is the subject of this Plat, from any and all claims, damages, or demands arising on account of the design and construction of public improvements of the property shown herein; and the Owner furthermore commits to make necessary repairs to said public improvements, to include, without limitation, the roads, streets, fills, embankments, ditches, cross pans, sub-drains, culverts, walls and bridges within the right-of-way, Easements and other public properties, resulting from failures caused by design and/or construction defects. This agreement to hold the City harmless includes defects in materials and workmanship, as well as defects caused by or consisting of settling trenches, fills or excavations.

Further, the Owner warrants that he/she owns fee simple title to the property shown hereon and agrees that the City shall not be liable to the Owner or his/her successors in interest during the warranty period, for any claim of damages resulting from negligence in exercising engineering techniques and due caution in the construction of cross drains, drives, structures or buildings, the changing of courses of streams and rivers, flooding from natural creeks and rivers, and any other matter whatsoever on private property. Any and all monetary liability occurring under this paragraph shall be the liability of the Owner. I further warrant that I have the right to convey said land according to this Plat.

NOTICE OF OTHER DOCUMENTS :

All persons take notice that the Owner has executed certain documents pertaining to this Development which create certain rights and obligations of the Development, the Owner and/or subsequent Owners of all or portions of the Development site, many of which obligations constitute promises and covenants that, along with the obligations under this Plat, run with the land. The said documents may also be amended from time to time and may include, without limitation, the Development Agreement, Site And Landscape Covenants, Final Site Plan, Final Landscape Plan, and Architectural Elevations, which documents are on file in the office of the clerk of the City and should be closely examined by all persons interested in purchasing any portion of the Development site.

ATTORNEY'S CERTIFICATION

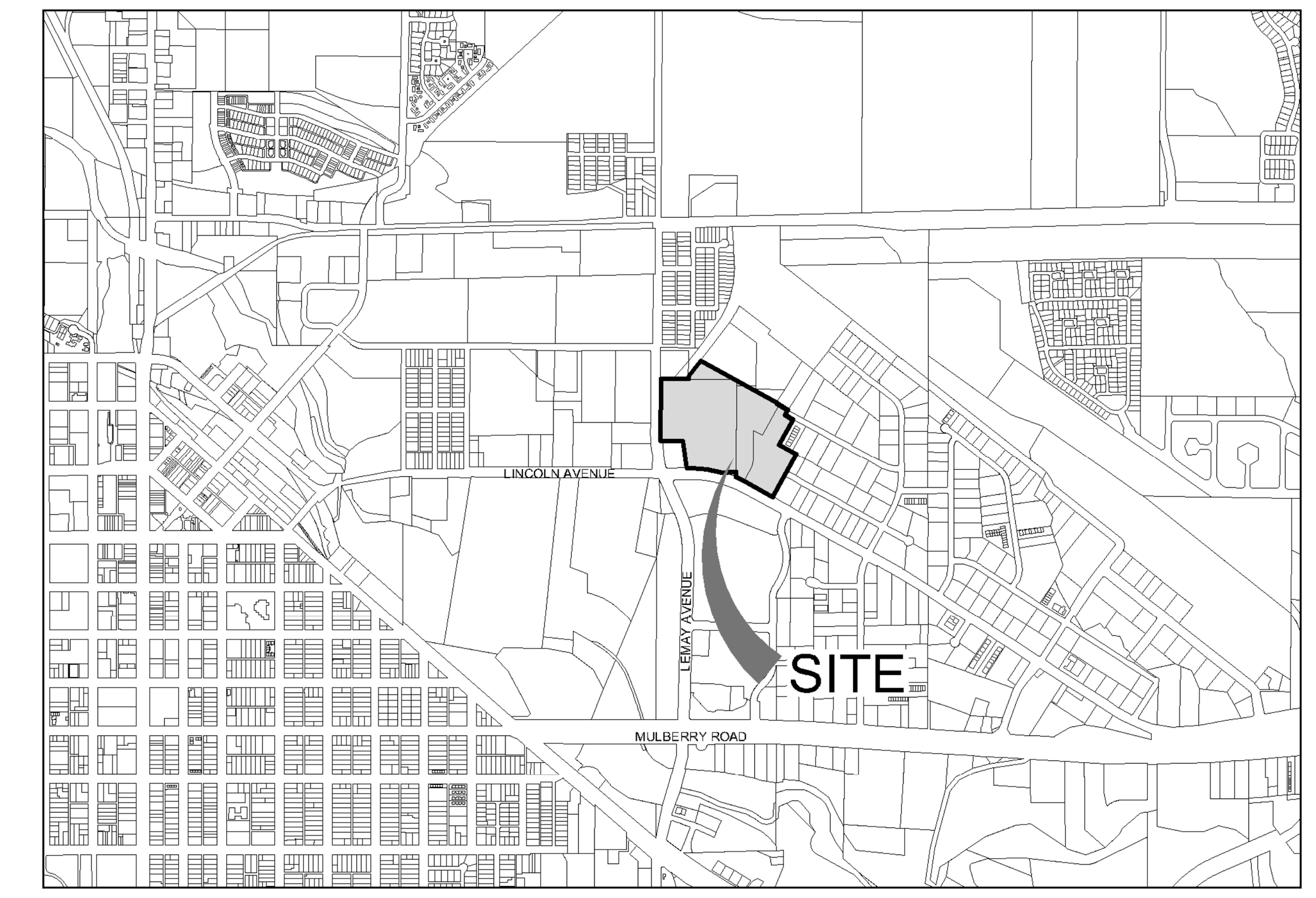
I hereby certify that this Subdivision Plat has been duly executed as required pursuant to Section 2.2.3(C)(3)(a) through (e) inclusive of the Land Use Code of the City of Fort Collins and that all persons signing this Subdivision Plat on behalf of a corporation or other entity are duly authorized signatories under the laws of the State of Colorado. This Certification is based upon the records of the Clerk and Recorder of Larimer County, Colorado as of the date of execution of the Plat and other information discovered by me through reasonable inquiry and is limited as authorized by Section 2.2.3(C)(3)(f) of the Land Use Code.

Attorney:______________________________________

Address: ______________________________________

____

Registration No.:_______________________________



VICINITY MAP
1" = 2000'

APPROVED AS TO FORM, CITY ENGINEER

By the City Engineer of the City of Fort Collins, Colorado this ______day of _____________ A.D., 20_____.

____
City Engineer

PLANNING APPROVAL

By the Director of Community Development and Neighborhood Services (CDNS) of the City of Fort Collins, Colorado this _____ day of ___________ A.D., 20_____.

____
Director of CDNS

SIGHT DISTANCE EASEMENT RESTRICTIONS :

Sight Distance Easement - The sight distance easement is an easement required by the City at some street intersections where it is necessary to protect the line of sight for a motorist needing to see approaching traffic and to react safely for merging their vehicle into the traffic flow. The following are requirements for certain objects that may occupy a sight distance easement for level grade:

1. Structures and landscaping within the easement shall not exceed 24 inches in height with the following exceptions:
2. Fences up to 42 inches in height may be allowed as long as they do not obstruct the line of sight for motorists.
3. Deciduous trees may be allowed as long as all branches of the trees are trimmed so that no portion thereof or leaves thereon hang lower than six (6) feet above the ground, and the trees are spaced such that they do not obstruct line of sight for motorists. Deciduous trees with trunks large enough to obstruct line of sight for motorists shall be removed by the owner.

For non-level areas these requirements shall be modified to provide the same degree of visibility.

NOTES:

1) The Basis of Bearings is the West line of the Northwest Quarter of said Section 7 as bearing North 00° 33' 51" East (assumed bearing) and monumented as shown on drawing.

2) All information regarding easements, right-of-way or title of record, Northern Engineering relied upon Property Information Binder Order Number FCIF 25121384 and FCIF 25121385, dated March 5, 2014 , prepared by Land Title Guarantee Company.

3) The lineal unit of measurement for this plat is U. S. Survey Feet.

4) Entire site is located in the FEMA-regulatory Poudre River 500-year Floodplain.

5) "At-Risk Population and Essential Service" critical facilities are not allowed within the 500-year Floodplain.

6) See Section 3.4.1(E) of the Lane Use Code for allowable uses within the "Natural Habitats Buffer Zone." Refer to planning documents by Ripley Design, Inc. for additional information.

SURVEYOR'S STATEMENT

I, Eric, R. Smith, a Colorado Registered Professional Land Surveyor do hereby state that this Subdivision Plat was prepared from an actual survey under my personal supervision, that the monumentation as indicated hereon were found or set as shown, and that the foregoing plat is an accurate representation thereof, all this to the best of my knowledge, information and belief.

Eric R. Smith
Colorado Registered Professional
Land Surveyor No. 37987
By and on behalf of Northern Engineering Services

NOTICE:
According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years after the date of the certificate shown hereon.

SECTION: 7
TOWNSHIP: 7 N
RANGE: 68 W of the 6th PM

NORTHERN ENGINEERING
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521
PHONE: 970.221.4158
www.northernengineering.com

DATE: 11/19/15
SCALE: N.A.
REVIEWED BY: B. Tessely
PROJECT: 939-001
CLIENT: Capstone
DRAWN BY: L. Smith

CAPSTONE COTTAGES
CITY OF FORT COLLINS
STATE OF COLORADO

CAPSTONE COTTAGES

A TRACT OF LAND LOCATED IN THE WEST HALF OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO

NORTHWEST CORNER SECTION 7-7-68 FOUND #6 REBAR w/ 3-1/4" ALUMINUM CAP LS 17497

BASIS OF BEARINGS WEST LINE OF THE NORTHWEST QUARTER SECTION 7-7-68 N00°33'51"E 2643.58'

LOT 2 SECOND REPLAT OF NORTH LEMAY SUBDIVISION SECOND FILING

LEMAY AVENUE (ROW WIDTH VARIES) (BOOK 2137, PAGE 212)

N00°33'51"E 651.37'

MAY

S52°32'12"E 7.50'

Delta= 98°20'32"
R=20.00' L=34.33'
Dir= S11°42'28"E
Chord= 30.27'

100' EXISTING ROW PER REC. NO. 88025752

UNPLATTED

OWNER: ROYVAL NORMAN/DIANA LEE

N37°27'48"E 232.40'

EXISTING ROW PER REC. NO. 97065351

N00°33'51"E 24.72'

FND. #4 REBAR W/CAP ILLEGIBLE

S89°26'09"E 287.98'

N37°27'48"E 30.63'

TRACT G COMMON AREA 14,724 sq. ft. 0.338 ac.

15' UE

10' UTILITY & DRAINAGE EASEMENT TO THE CITY OF FORT COLLINS (RECEPTION NO. 97070197)

20' UTILITY EASEMENT (BK. 1691 PG. 57)

LEMAY AVENUE (ROW VARIES)

TRACT C 6,709 sq. ft.

SIGHT DISTANCE EASEMENT

TRACT B A,D&UE 376,694 sq. ft. 8.648 ac.

S11°59'46"W 203.22'

N82°14'34"E 20.00'

COTTAGE DRIVE (PRIVATE DRIVE)

TRACT A A,D&UE 68,205 sq. ft. 1.566 ac.

CLUBHOUSE BUILDING ENVELOPE (EXCLUDED FROM BLANKET EASEMENT)

TRACT B A,D&UE 376,694 sq. ft. 8.648 ac.

NEED A NAME DRIVE (PRIVATE DRIVE)

TRACT B A,D&UE 376,694 sq. ft. 8.648 ac.

UNPLATTED

OWNER: NIFOROS TONIA L

UNPLATTED

OWNER: NORTH VALLEY BANK

S60°52'44"E 871.66'

DUFF DRIVE (76' ROW)

UNPLATTED

OWNER: NIFOROS TONIA L

UNPLATTED

OWNER: FORT COLLINS BUSINESS CENTER ONE

UNPLATTED

OWNER: KEIL NANCY L

S31°36'41"W 8.01'

S60°52'44"E 140.00'

FND. #4 REBAR NO CAP

FORT COLLINS BUSINESS CENTER 3RD 3RD FILING

DUFF DRIVE (EXISTING ROW)

S32°39'26"W 60.12'

S60°52'44"E 100.57'

FND. #4 REBAR NO CAP

FND. #4 REBAR w/PLASTIC CAP LS #37963

S29°07'16"W 300.00'

MINOR ARTERIAL NAME TBD BY CITY COUNCIL RESOLUTION (84' ROW)

10' DRAINAGE EASEMENT

MATCH LINE

SEE SHEET 3

LAND USE TABLE					
PARCEL	AREA		PERCENT	USE	OWNED & MAINTAINED BY
TRACT A	68,205 S.F.	1.57 AC.	5.54%	Access, Drainage Utility Easement	HOA
TRACT B	376,689 S.F.	8.65 AC.	30.57%	Access, Drainage Utility Easement	HOA
TRACT C	6,709 S.F.	0.15 AC.	0.54%	Common Area	HOA
TRACT D	75,843 S.F.	1.74 AC.	6.16%	Access, Drainage Utility Easement	HOA
TRACT E	56,325 S.F.	1.29 AC.	4.57%	Drainage & Utility Easement	HOA
TRACT F	3,178 S.F.	0.07 AC.	0.26%	Common Area	HOA
TRACT G	14,724 S.F.	0.34 AC.	1.20%	Common Area	HOA
ROW	239,321 S.F.	5.49 AC.	19.42%	Right of Way	City of Fort Collins
LOTS	391,114 S.F.	8.98 AC.	31.74%	Single-Family Residential	Property Owner
TOTAL	1,232,108 S.F.	28.29 AC.	100.00%		

DRAFT 11-19-15

Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas		Lot Areas	
Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.	Lot Number	AREA S.F.
LOT 1	2725 S.F.	LOT 16	3701 S.F.	LOT 31	1561 S.F.	LOT 46	1607 S.F.	LOT 61	1791 S.F.	LOT 76	2041 S.F.	LOT 91	4918 S.F.	LOT 106	949 S.F.	LOT 121	1751 S.F.	LOT 136	2086 S.F.	LOT 151	1415 S.F.	LOT 166	1005 S.F.	LOT 181	1022 S.F.	LOT 196	1359 S.F.
LOT 2	1375 S.F.	LOT 17	4079 S.F.	LOT 32	1607 S.F.	LOT 47	2935 S.F.	LOT 62	1791 S.F.	LOT 77	1384 S.F.	LOT 92	1904 S.F.	LOT 107	949 S.F.	LOT 122	1053 S.F.	LOT 137	2473 S.F.	LOT 152	1703 S.F.	LOT 167	1005 S.F.	LOT 182	1046 S.F.	LOT 197	1389 S.F.
LOT 3	1166 S.F.	LOT 18	3803 S.F.	LOT 33	2935 S.F.	LOT 48	1607 S.F.	LOT 63	4712 S.F.	LOT 78	2124 S.F.	LOT 93	2051 S.F.	LOT 108	1336 S.F.	LOT 123	1564 S.F.	LOT 138	2126 S.F.	LOT 153	1005 S.F.	LOT 168	1005 S.F.	LOT 183	1052 S.F.	LOT 198	966 S.F.
LOT 4	2576 S.F.	LOT 19	4120 S.F.	LOT 34	1607 S.F.	LOT 49	1607 S.F.	LOT 64	1781 S.F.	LOT 79	2484 S.F.	LOT 94	5257 S.F.	LOT 109	1366 S.F.	LOT 124	3090 S.F.	LOT 139	1005 S.F.	LOT 154	1005 S.F.	LOT 169	1005 S.F.	LOT 184	1449 S.F.	LOT 199	966 S.F.
LOT 5	5245 S.F.	LOT 20	1540 S.F.	LOT 35	1607 S.F.	LOT 50	2935 S.F.	LOT 65	2017 S.F.	LOT 80	1585 S.F.	LOT 95	2037 S.F.	LOT 110	949 S.F.	LOT 125	1851 S.F.	LOT 140	1005 S.F.	LOT 155	1005 S.F.	LOT 170	1598 S.F.	LOT 185	1751 S.F.	LOT 200	966 S.F.
LOT 6	6612 S.F.	LOT 21	1540 S.F.	LOT 36	2851 S.F.	LOT 51	1607 S.F.	LOT 66	3206 S.F.	LOT 81	1639 S.F.	LOT 96	1576 S.F.	LOT 111	949 S.F.	LOT 126	1816 S.F.	LOT 141	1005 S.F.	LOT 156	1005 S.F.	LOT 171	2916 S.F.	LOT 186	1053 S.F.	LOT 201	1547 S.F.
LOT 7	1486 S.F.	LOT 22	4136 S.F.	LOT 37	1607 S.F.	LOT 52	1607 S.F.	LOT 67	1682 S.F.	LOT 82	1680 S.F.	LOT 97	2001 S.F.	LOT 112	949 S.F.	LOT 127	3169 S.F.	LOT 142	1005 S.F.	LOT 157	1005 S.F.	LOT 172	1445 S.F.	LOT 187	1053 S.F.		
LOT 8	1354 S.F.	LOT 23	1540 S.F.	LOT 38	1515 S.F.	LOT 53	2935 S.F.	LOT 68	2694 S.F.	LOT 83	1710 S.F.	LOT 98	1497 S.F.	LOT 113	2095 S.F.	LOT 128	1816 S.F.	LOT 143	1005 S.F.	LOT 158	1504 S.F.	LOT 173	939 S.F.	LOT 188	1053 S.F.		
LOT 9	2621 S.F.	LOT 24	1552 S.F.	LOT 39	3637 S.F.	LOT 54	1607 S.F.	LOT 69	2244 S.F.	LOT 84	1728 S.F.	LOT 99	1509 S.F.	LOT 114	1891 S.F.	LOT 129	1944 S.F.	LOT 144	1597 S.F.	LOT 159	1614 S.F.	LOT 174	939 S.F.	LOT 189	1053 S.F.		
LOT 10	3639 S.F.	LOT 25	5652 S.F.	LOT 40	3564 S.F.	LOT 55	1979 S.F.	LOT 70	1641 S.F.	LOT 85	2935 S.F.	LOT 100	1522 S.F.	LOT 115	1053 S.F.	LOT 130	2261 S.F.	LOT 145	1585 S.F.	LOT 160	1005 S.F.	LOT 175	939 S.F.	LOT 190	1053 S.F.		
LOT 11	1312 S.F.	LOT 26	2919 S.F.	LOT 41	2900 S.F.	LOT 56	6391 S.F.	LOT 71	1620 S.F.	LOT 86	2417 S.F.	LOT 101	1517 S.F.	LOT 116	1053 S.F.	LOT 131	1187 S.F.	LOT 146	1005 S.F.	LOT 161	1005 S.F.	LOT 176	1351 S.F.	LOT 191	1732 S.F.		
LOT 12	1791 S.F.	LOT 27	1869 S.F.	LOT 42	1569 S.F.	LOT 57	4803 S.F.	LOT 72	1595 S.F.	LOT 87	1681 S.F.	LOT 102	1509 S.F.	LOT 117	1053 S.F.	LOT 132	1187 S.F.	LOT 147	1005 S.F.	LOT 162	1005 S.F.	LOT 177	3112 S.F.	LOT 192	2110 S.F.		
LOT 13	4900 S.F.	LOT 28	1760 S.F.	LOT 43	1607 S.F.	LOT 58	1808 S.F.	LOT 73	1565 S.F.	LOT 88	1649 S.F.	LOT 103	2362 S.F.	LOT 118	1053 S.F.	LOT 133	1187 S.F.	LOT 148	1005 S.F.	LOT 163	1658 S.F.	LOT 178	1891 S.F.	LOT 193	966 S.F.		
LOT 14	4161 S.F.	LOT 29	3882 S.F.	LOT 44	2935 S.F.	LOT 59	1791 S.F.	LOT 74	1531 S.F.	LOT 89	1620 S.F.	LOT 104	1501 S.F.	LOT 119	1053 S.F.	LOT 134	1872 S.F.	LOT 149	1005 S.F.	LOT 164	1658 S.F.	LOT 179	1802 S.F.	LOT 194	966 S.F.		
LOT 15	3255 S.F.	LOT 30	2893 S.F.	LOT 45	1607 S.F.	LOT 60	4468 S.F.	LOT 75	2424 S.F.	LOT 90	2610 S.F.	LOT 105	949 S.F.	LOT 120	1481 S.F.	LOT 135	3510 S.F.	LOT 150	1005 S.F.	LOT 165	1005 S.F.	LOT 180	1595 S.F.	LOT 195	966 S.F.

NORTH

50 0 50 100 150 Feet

(U.S. SURVEY FEET)
1 inch = 50 ft.

LEGEND

- EASEMENT LINE
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- BOUNDARY LINE
- LOT LINE
- SECTION LINE
- SET #4 REBAR w/1" PLASTIC CAP, LS 37987
- FOUND PROPERTY CORNER AS DESCRIBED
- SECTION CORNER

UE UTILITY EASEMENT
D&UE DRAINAGE & UTILITY EASEMENT
A,D&UE ACCESS, DRAINAGE & UTILITY EASEMENT
EAE EMERGENCY ACCESS EASEMENT

NOTICE:
According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years after the date of the certificate shown hereon.

SECTION: 7
TOWNSHIP: 7 N
RANGE: 68 W of the 6th PM

NORTHERN ENGINEERING
PHONE: 970.221.4158
www.northernengineering.com
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521

DATE: 11/19/15
SCALE: 1"=50'
REVIEWED BY: B. Teasdy
PROJECT: 939-001
CLIENT: Capstone
DRAWN BY: L. Smith

CAPSTONE COTTAGES
CITY OF FORT COLLINS
STATE OF COLORADO

Sheet 2
Of 3 Sheets

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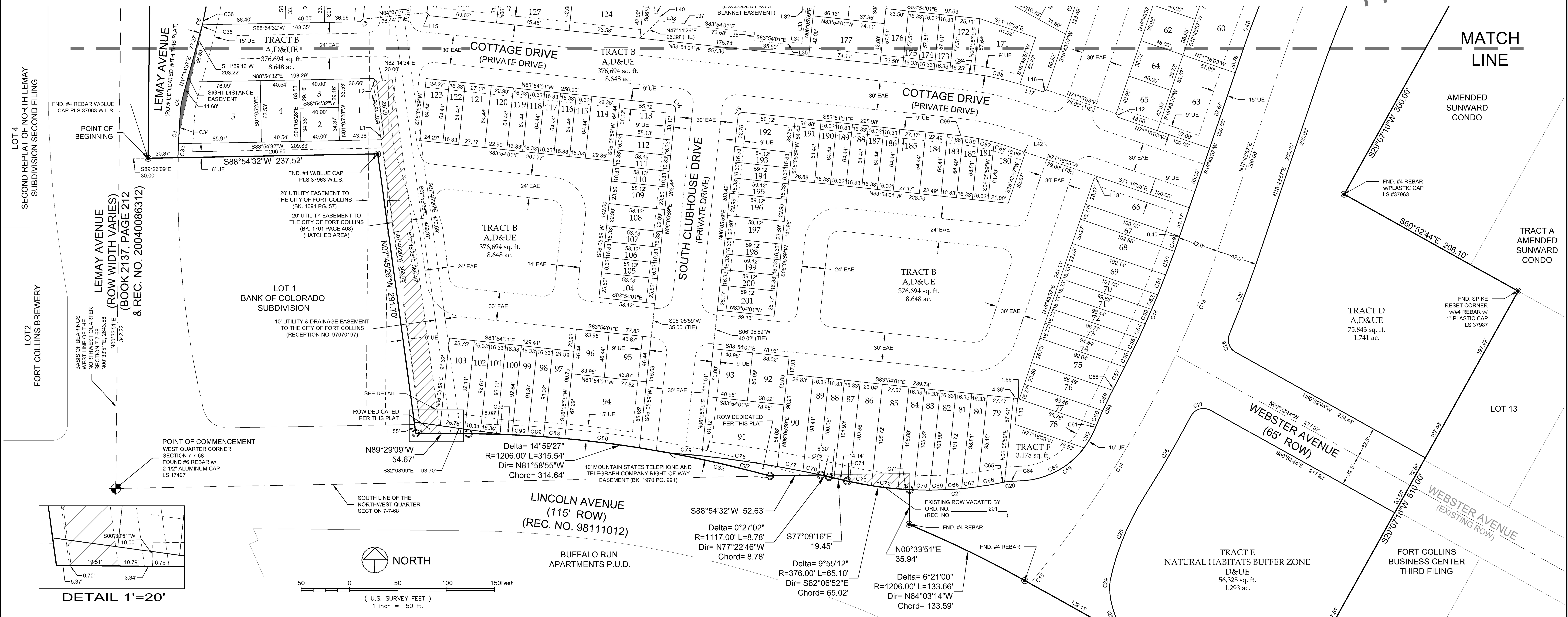
CAPSTONE COTTAGES

A TRACT OF LAND LOCATED IN THE WEST HALF OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST
OF THE 6TH PRINCIPAL MERIDIAN, CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO

DRAFT 11-19-15

SEE SHEET 2



CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD
C1	14°01'01"	1132.50'	277.06'	S29°49'22"W	276.37'
C2	24°04'20"	1075.00'	451.65'	N25°25'38"E	448.34'
C3	2°44'01"	1017.50'	48.54'	N03°01'35"E	48.54'
C4	10°51'02"	84.00'	15.91'	N09°49'06"E	15.88'
C5	5°14'30"	116.00'	10.61'	N12°37'22"E	10.61'
C6	11°41'44"	1005.50'	205.25'	N15°50'59"E	204.89'
C7	3°58'19"	1017.50'	70.54'	N25°53'25"E	70.52'
C8	10°51'02"	84.00'	15.91'	N33°18'06"E	15.88'
C9	5°14'30"	116.00'	10.61'	N36°06'22"E	10.61'
C10	3°58'41"	1005.50'	69.81'	N35°28'27"E	69.80'
C11	81°39'28"	10.00'	14.25'	N78°17'32"E	13.08'
C12	10°00'00"	1075.00'	187.62'	N23°43'57"E	187.38'
C13	6°15'35"	1075.00'	117.45'	N21°51'44"E	117.39'
C14	13°50'25"	1075.00'	259.68'	N31°54'44"E	259.05'
C15	1°09'08"	1075.00'	21.62'	N39°24'31"E	21.62'
C16	89°36'41"	10.00'	15.64'	S16°04'24"E	14.09'
C17	10°00'00"	1117.00'	194.95'	S23°43'57"W	194.71'
C18	9°24'24"	1033.00'	169.60'	S23°26'09"W	169.41'
C19	67°39'02"	86.00'	101.54'	S55°39'41"W	95.75'
C20	11°02'50"	94.00'	18.12'	S83°57'47"W	18.10'
C21	14°29'10"	376.00'	95.06'	S85°40'57"W	94.81'
C22	8°06'50"	1117.00'	158.18'	N81°39'42"W	158.05'
C23	39°00'35"	86.00'	58.55'	N19°58'32"W	57.43'
C24	12°43'07"	26.00'	5.77'	N05°53'20"E	5.76'
C25	20°08'55"	276.00'	97.06'	N22°19'21"E	96.56'

Curve Table

CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD
C26	4°47'22"	1117.00'	93.37'	N30°00'08"E	93.35'
C27	91°30'49"	15.00'	23.96'	N73°21'51"E	21.49'
C28	83°39'55"	15.00'	21.90'	N19°02'47"W	20.01'
C29	4°03'14"	1117.00'	79.03'	N20°45'34"E	79.02'
C30	10°00'00"	1033.00'	180.29'	N23°43'57"E	180.06'
C31	90°23'19"	10.00'	15.78'	N73°55'36"E	14.19'
C32	5°03'37"	1206.00'	106.51'	N77°01'00"W	106.48'
C33	0°49'18"	1017.50'	14.59'	N02°04'14"E	14.59'
C34	1°54'42"	1017.50'	33.95'	N03°26'14"E	33.95'
C35	1°25'22"	116.00'	2.88'	N14°31'56"E	2.88'
C36	3°49'08"	116.00'	7.73'	N11°54'41"E	7.73'
C37	5°08'47"	1005.50'	90.31'	N12°34'31"E	90.28'
C38	4°29'11"	1005.50'	78.73'	N17°23'30"E	78.71'
C39	2°03'46"	1005.50'	36.20'	N20°39'58"E	36.20'
C40	3°20'36"	1017.50'	59.37'	N25°34'34"E	59.37'
C41	2°31'16"	237.50'	10.45'	N69°33'47"W	10.45'
C42	13°04'36"	237.50'	54.21'	N77°21'43"W	54.09'
C44	0°19'49"	1005.50'	5.80'	N33°39'01"E	5.80'
C45	2°16'54"	1005.50'	40.04'	N34°57'23"E	40.04'
C46	3°02'20"	1117.00'	59.24'	S27°12'47"W	59.24'
C47	4°01'46"	1117.00'	78.56'	S23°40'44"W	78.54'
C48	2°55'54"	1117.00'	57.15'	S20°11'54"W	57.15'
C49	0°53'01"	1033.00'	15.93'	S19°10'27"W	15.93'
C50	1°27'27"	1033.00'	26.28'	S20°20'41"W	26.28'
C51	1°13'36"	1033.00'	22.12'	S21°41'13"W	22.12'

Curve Table

CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD
C52	0°54'29"	1033.00'	16.37'	S22°45'16"W	16.37'
C53	0°54'34"	1033.00'	16.39'	S23°39'47"W	16.39'
C54	0°54'38"	1033.00'	16.42'	S24°34'23"W	16.42'
C55	0°54'44"	1033.00'	16.45'	S25°29'04"W	16.45'
C56	0°54'51"	1033.00'	16.48'	S26°23'52"W	16.48'
C57	1°17'04"	1033.00'	23.16'	S27°29'49"W	23.16'
C58	0°30'53"	436.00'	3.92'	S27°52'55"W	3.92'
C59	3°06'51"	436.00'	23.70'	S26°04'03"W	23.69'
C60	2°09'14"	436.00'	16.39'	S23°26'01"W	16.39'
C61	0°31'15"	436.00'	3.96'	S22°05'47"W	3.96'
C62	15°04'18"	86.00'	22.62'	S29°22'19"W	22.56'
C63	52°34'44"	86.00'	78.92'	S63°11'50"W	76.18'
C64	8°45'53"	94.00'	14.38'	S85°06'15"W	14.37'
C65	2°16'57"	94.00'	3.74'	S79°34'50"W	3.74'
C66	3°44'03"	376.00'	24.51'	S80°18'24"W	24.50'
C67	2°33'04"	376.00'	16.74'	S83°26'57"W	16.74'
C68	2°31'42"	376.00'	16.59'	S85°59'20"W	16.59'
C69	2°30'40"	376.00'	16.48'	S88°30'31"W	16.48'
C70	2°29'56"	376.00'	16.40'	N88°59'11"W	16.40'
C71	2°29'30"	376.00'	16.35'	S86°29'28"E	16.35'
C72	4°13'02"	376.00'	27.68'	N83°08'12"W	27.67'
C73	3°31'22"	376.00'	23.12'	N79°15'59"W	23.12'
C74	0°21'03"	376.00'	2.30'	N77°19'47"W	2.30'
C75	0°34'16"	1117.00'	11.14'	N77°26'24"W	11.14'
C76	0°50'31"	1117.00'	16.42'	N78°08'48"W	16.42'

Curve Table

CURVE	DELTA	RADIUS	LENGTH	BEARING	CHORD
C77	1°22'52"	1117.00'	26.92'	N79°15'29"W	26.92'
C78	4°03'12"	1117.00'	79.02'	N81°58'31"W	79.01'
C79	1°42'59"	1117.00'	33.46'	N84°51'37"W	33.46'
C80	3°41'54"	1206.00'	77.85'	N82°53'51"W	77.83'
C81	1°21'59"	1005.50'	23.98'	N36°46'49"E	23.98'
C82	3°38'02"	302.50'	19.19'	S70°07'10"E	19.18'
C83	1°02'42"	1206.00'	22.00'	N85°16'09"W	22.00'
C84	1°40'54"	302.50'	8.88'	N83°03'34"W	8.88'
C85	9°14'13"	302.50'	48.77'	N77°36'01"W	48.72'
C86	3°35'11"	237.50'	14.87'	S73°03'39"E	14.86'
C87	3°58'16"	237.50'	16.46'	S76°50'23"E	16.46'
C89	0°46'36"	1206.00'	16.35'	N86°10'48"W	16.35'
C91	0°37'43"	1017.50'	11.16'	N27°33'43"E	11.16'
C92	0°46'38"	1206.00'	16.36'	N86°57'25"W	16.36'
C93	0°23'35"	1206.00'	8.27'	N87°32'31"W	8.27'
C94	6°18'11"	436.00'	47.96'	S24°59'15"W	47.94'
C96	7°38'48"	302.50'	40.37'	S75°45'35"E	40.34'
C97	4°19'03"	302.50'	22.79'	S81°44'30"E	22.79'
C98	3°56'49"	237.50'	16.36'	S80°47'56"E	16.36'
C99	1°07'41"	237.50'	4.68'	S83°20'11"E	4.68'

LINE TABLE

LINE	LENGTH	BEARING
L1	4.48'	S40°34'33.00"W
L2	3.99'	S49°25'27.00"E
L3	3.97'	S47°30'15.46"W
L4	4.24'	S38°54'01.09"E
L5	10.17'	S83°54'01.09"E
L6	7.20'	N65°39'58.37"E
L7	7.21'	N22°11'56.66"W
L8	4.67'	N83°54'01.09"W
L9	4.24'	S51°05'58.91"W
L10	14.81'	S41°12'38.82"E
L11	14.81'	S80°32'49.18"E
L12	4.24'	N26°16'03.40"W
L13	26.77'	N06°05'58.91"E
L14	4.24'	S38°54'01.09"E
L15	4.24'	N38°54'01.09"W
L16	4.24'	S63°43'56.60"W
L17	25.14'	N71°34'34.13"W
L18	4.24'	N63°43'56.60"E
L19	4.24'	N51°05'58.92"E
L20	41.44'	S06°03'56.29"W
L21	5.67'	N83°54'01.09"W

LINE TABLE

LINE	LENGTH	BEARING
L22	7.34'	S06°05'58.91"W
L23	26.42'	N83°54'01.09"W
L24	1.33'	S06°05'58.91"W
L25	1.33'	N06°05'58.91"E
L26	23.08'	N83°54'01.09"W
L27	35.50'	N83°54'01.09"W
L28	3.67'	N06°05'58.91"E
L29	14.50'	N83°54'01.09"W
L30	35.00'	N06°05'58.91"E
L31	3.58'	S83°54'01.09"E
L32	3.58'	N83°54'01.09"W
L33	35.00'	N06°05'58.91"E
L34	14.50'	S83°54'01.09"E
L35	2.42'	N06°05'58.92"E
L36	8.50'	S06°05'58.91"W
L37	1.38'	S06°05'58.91"W
L38	26.53'	S83°54'01.58"E
L39	5.52'	S83°56'03.71"E
L40	7.34'	S06°03'56.29"W
L41	33.99'	N21°41'51.16"E
L42	4.24'	S26°16'03.40"E

LEGEND

EASEMENT LINE
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
BOUNDARY LINE
LOT LINE
SECTION LINE
SET #4 REBAR w/1" PLASTIC CAP, LS 37987
FOUND PROPERTY CORNER AS DESCRIBED
SECTION CORNER

UE — UTILITY EASEMENT
D&UE — DRAINAGE & UTILITY EASEMENT
A,D&UE — ACCESS, DRAINAGE & UTILITY EASEMENT
EAE — EMERGENCY ACCESS EASEMENT

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SECTION: 7
TOWNSHIP: 7 N
RANGE: 68 W of the 6th PM

NORTHERN ENGINEERING
301 North Howes Street, Suite 100
Fort Collins, Colorado 80521
PHONE: 970.221.4158
www.northernengineering.com

DATE: 11/19/15
SCALE: 1"=50'
REVIEWED BY: B. Tessely
PROJECT: 939-001
CLIENT: Capstone
DRAWN BY: L. Smith

CAPSTONE COTTAGES
CITY OF FORT COLLINS
STATE OF COLORADO

CAPSTONE COTTAGES

A TRACT OF LAND LOCATED IN THE NORTHEAST QUARTER OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST OF THE 6TH P.M., CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO

OWNER'S CERTIFICATION

THE UNDERSIGNED DOES/DO HEREBY CERTIFY THAT I/WE ARE THE LAWFUL OWNERS OF THE REAL PROPERTY DESCRIBED ON THIS SITE PLAN AND DO HEREBY CERTIFY THAT I/WE ACCEPT THE CONDITIONS AND RESTRICTIONS SET FORTH ON SAID SITE PLAN.

_____ _____
OWNER (SIGNED) Date

THE FOREGOING INSTRUMENT WAS ACKNOWLEDGED BEFORE ME

THIS _____ _____ A.D., DAY OF 20 _____ BY

_____
(PRINT NAME)

AS _____

MY COMMISSION EXPIRES: _____

WITNESS MY HAND AND OFFICIAL SEAL.

_____ _____
NOTARY PUBLIC ADDRESS

PLANNING CERTIFICATE

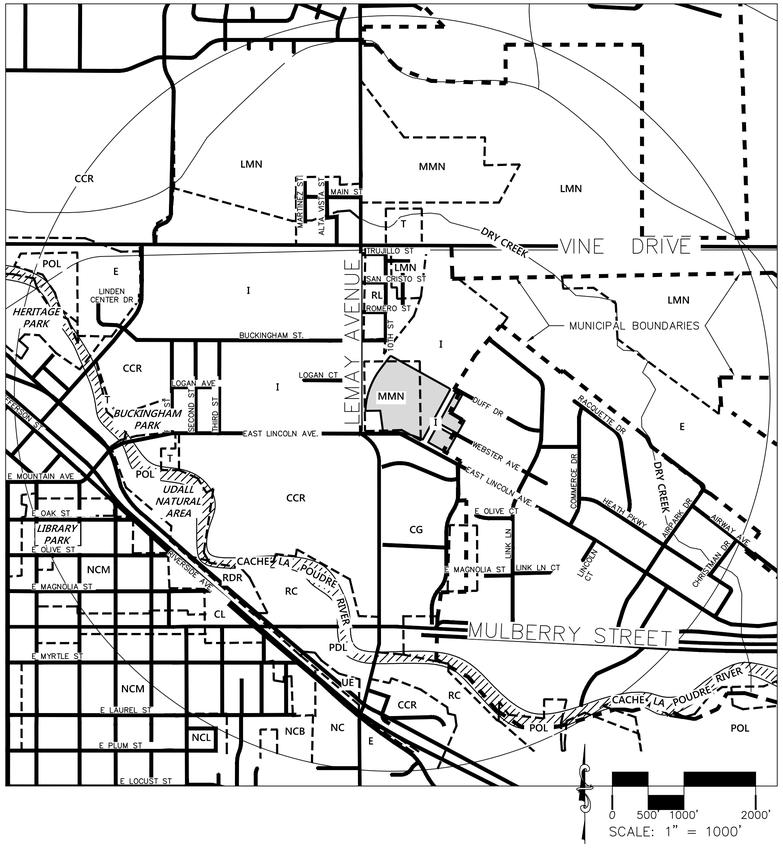
APPROVED BY THE COMMUNITY DEVELOPMENT AND NEIGHBORHOOD SERVICES (CDNS) OF THE CITY OF FORT COLLINS, COLORADO

ON THIS _____ DAY OF _____, 20_____ .

_____
CDNS

CONTEXT VICINITY MAP

SCALE: 1"=1000'

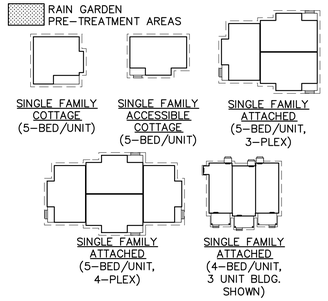


SHEET INDEX (PLANNING SET)

SP 1.0 SITE PLAN COVER SHEET
SP 2.0 SITE PLAN - OVERALL
SP 3.0 SITE PLAN - NORTH
SP 4.0 SITE PLAN - SOUTH
SP 5.0 SITE PLAN - SOUTHEAST
SP 6.0 SETBACK SECTIONS

SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- FLOW LINE
- PFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- OHP EXISTING OVERHEAD POWER LINE
- SS EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- W EXISTING WATER LINE
- X EXISTING WIRE FENCE
- S S PROPOSED SEWER LINE
- UD PROPOSED UNDER-DRAIN
- W PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE
- PROPOSED WATER METER
- FH PROPOSED FIRE HYDRANT
- B FIXED BIKE RACK (7 SPACES EA.)
- R HANDICAP RAMP
- SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
- EXISTING TREE
- PERMEABLE PAVERS
- STOP SIGN
- WETLAND MITIGATION AREA
- CY SHARED COURTYARD (SEE SHEET SP5)
- RAIN GARDEN PRE-TREATMENT AREAS



SINGLE FAMILY COTTAGE (5-BED/UNIT)

SINGLE FAMILY ACCESSIBLE COTTAGE (5-BED/UNIT)

SINGLE FAMILY ATTACHED (5-BED/UNIT, 3-PLEX)

SINGLE FAMILY ATTACHED (5-BED/UNIT, 4-PLEX)

SINGLE FAMILY ATTACHED (4-BED/UNIT, 3 UNIT BLDG. SHOWN)

GENERAL NOTES

1. THE ENTIRE PROJECT SITE IS LOCATED IN THE POUDRE RIVER FEMA-REGULATORY 500-YR FLOODPLAIN (ZONE X).
2. AT-RISK POPULATION AND ESSENTIAL SERVICE CRITICAL FACILITIES ARE NOT ALLOWED WITHIN THE 500-YR FLOODPLAIN.
3. ALL BIKE PARKING TO BE PROVIDED PER LAND USE CODE WITH 60% REQUIRED SPACES COVERED AND 40% REQUIRED SPACES OPEN.
4. REFER TO UTILITY PLANS FOR LOCATIONS OF STORM DRAINAGE STRUCTURES, UTILITY MAINS AND SERVICES.
5. SINGLE-FAMILY AND DUPLEX DWELLING UNITS WILL BE CONVERTED TO EXTRA OCCUPANCY RENTAL HOUSES AFTER CERTIFICATES OF OCCUPANCY ARE OBTAINED FOR THE SINGLE-FAMILY AND DUPLEXES.
6. REFER TO THE CIVIL ENGINEERING PLANS FOR DETAILED INFORMATION OF PROPOSED TOPOGRAPHY, UTILITY, AND STREET IMPROVEMENTS.
7. REFER TO THE PLAT FOR LOT AREAS, TRACT SIZES, EASEMENTS, LOT DIMENSIONS, UTILITY EASEMENTS, OTHER EASEMENTS, AND OTHER SURVEY INFORMATION.
8. ALL SIDEWALKS AND RAMPS WILL CONFORM TO CITY STANDARDS. ALL HANDICAP PARKING SPACES, AND RAMPS ARE TO BE VERIFIED WITH CIVIL ENGINEER FOR GRADING, DRAINAGE, AND ACCESSIBLE ROUTE CONSIDERATIONS. HANDICAP PARKING SPACES SHOULD SLOPE NO MORE THAN 1:48 IN ANY DIRECTION. ALL ACCESSIBLE ROUTES SHOULD SLOPE NO MORE THAN 1:20 IN DIRECTION OF TRAVEL AND NO MORE THAN 1:48 CROSS SLOPE.
9. ACCESSIBLE RAMPS TO BE PROVIDED AT ALL STREET AND DRIVE INTERSECTIONS AND AT ALL DESIGNATED ACCESSIBLE PARKING SPACES.
10. PROPOSED EXTERIOR LIGHTING WILL BE BUILDING-MOUNTED FIXTURES WITH DOWN-DIRECTIONAL AND SHARP CUTOFF LUMINARIES, AND SHALL COMPLY WITH ALL CITY OF FORT COLLINS LIGHTING REQUIREMENTS
11. ALL SIGNS UTILIZED WILL COMPLY WITH THE CITY OF FORT COLLINS SIGN CODE.
12. PLACEMENT OF ALL LANDSCAPING SHALL BE IN ACCORDANCE WITH THE SIGHT DISTANCE CRITERIA AS SPECIFIED BY THE CITY OF FORT COLLINS. NO STRUCTURES OR LANDSCAPE ELEMENTS GREATER THAN 24" SHALL BE ALLOWED WITHIN THE SIGHT DISTANCE TRIANGLE OR EASEMENT WITH THE EXCEPTION OF DECIDUOUS TREES PROVIDING THE LOWEST BRANCH IS AT LEAST 6' FROM GRADE. ANY FENCES WITHIN THE SIGHT DISTANCE TRIANGLE OR EASEMENT SHALL BE NO MORE THAN 42" IN HEIGHT AND OF AN OPEN DESIGN.

THIS IS A LAND USE PLANNING DOCUMENT, NOT A CONSTRUCTION DOCUMENT. REFER TO CIVIL ENGINEERING PLANS.

CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■ ■ urban design ■ entitlement ■

401 West Mountain Avenue Suite 100 Fort Collins, CO 80521
fax 970/224.1662 phone 970/224.5828 www.vfrdesigninc.com

APPLICANT / OWNER
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BIRMINGHAM, ALABAMA 35223
205.414.6400

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DUNGAN NEQUETTE ARCHITECTS
MANAGER: LOUIS NEQUETTE, AIA
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970.221.4158

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916 WILLSHIRE AVE.
FORT COLLINS, CO 80521
970.493.4394

PLANNER/LANDSCAPE ARCHITECT
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LINDA RIPLEY, ASLA
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TRAFFIC ENGINEER
DELICH ASSOCIATES
MATT DELICH, P.E., PTOE
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
970.669.2061

ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	5-6-2014
2	PROJECT DEVELOPMENT PLAN	12-10-2014
3	PROJECT DEVELOPMENT PLAN	3-11-2015
4	PROJECT DEVELOPMENT PLAN	8-28-2015
5	PROJECT DEVELOPMENT PLAN	11-19-2015

REVISIONS

No.	DESCRIPTION	DATE

SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

SITE PLAN COVER SHEET

DRAWING NUMBER:

SP1.0

DEVELOPMENT SUMMARY

EXISTING ZONING: MEDIUM DENSITY MIXED-USE NEIGHBORHOOD (MMN) & INDUSTRIAL (I)
PROPOSED ZONING: MEDIUM DENSITY MIXED-USE NEIGHBORHOOD (MMN)
LAND-USES PROPOSED: SINGLE-FAMILY, TWO-FAMILY & SINGLE-FAMILY ATTACHED

LAND USE SUMMARY FOR PDP	AREA (SF)	AREA (ACRES)	% OF GROSS PDP AREA
PDP GROSS AREA	1,234,127	28.33	100%
TOTAL ROW DEDICATED AREA	152,832	3.51	12%
NET DEVELOPABLE AREA	1,081,295	24.82	88%
INTERNATIONAL/LINCOLN R.O.W. (ARTERIAL)	91,077	2.09	7%
LEMAY R.O.W. (ARTERIAL)	69,559	1.60	6%
DUFF R.O.W.	69,506	1.60	6%
WEBSTER R.O.W.	15,390	0.35	1%
SITE DRIVES & PARKING AREA	309,763	7.11	25%
SITE WALKS & FLATWORK AREA	78,681	1.81	6%
SITE BUILDING COVERAGE AREA	346,448	7.95	28%
SITE OPEN SPACE AND LANDSCAPE AREA	346,403	7.95	28%
SITE ACTIVE RECREATIONAL USE AREA	51,132	1.17	
SITE PERMEABLE PAVER AREA REQ.	77,441		25%

RESIDENTIAL UNIT SUMMARY

RESIDENTIAL UNIT SUMMARY	TOTAL UNITS	TOTAL BEDS	BUILDING HEIGHT	FLOOR AREA PER UNIT (SF)	TOTAL FLOOR AREA/UNIT (SF)
SINGLE-FAMILY ATTACHED (4-BED/UNIT)	117	468	3-STORY	1710	200,070
SINGLE-FAMILY ATTACHED (5-BED/UNIT)	75	375	2-STORY	1832	137,400
SINGLE-FAMILY COTTAGES (5-BED/UNIT)	3	15	2-STORY	1985	5,955
SINGLE-FAMILY COTTAGES (5-BED/UNIT HC)	6	30	2-STORY	1862	11,172
TOTALS:	201	888			354,597

TOTAL FLOOR AREA:	354,597	SF
TOTAL DEVELOPED AREA:	1,081,295	SF
FLOOR AREA RATIO:	0.328	FAR
RESIDENTIAL DENSITY (GROSS):	7.09	DUs/ACRE
RESIDENTIAL DENSITY (NET):	8.10	DUs/ACRE

LOT COVERAGE SUMMARY

BUILDING COVERAGE	TOTAL AREA COVERAGE PER UNIT TYPE (SF)	AREA (ACRES)	% OF GROSS PDP AREA
SINGLE-FAMILY ATTACHED (4-BED/UNIT)	82,775	1.90	6.71%
SINGLE-FAMILY ATTACHED (5-BED/UNIT)	76,353	1.75	6.19%
SINGLE-FAMILY COTTAGES (5-BED/UNIT)	3,306	0.08	0.27%
SINGLE-FAMILY COTTAGES (5-BED/UNIT HC)	6,060	0.14	3.97%
CLUBHOUSE	8,010	0.18	0.65%
MAINTENANCE	1,440	0.03	0.12%
TRASH COMPACTOR	539	0.01	0.04%
TOTAL STRUCTURE COVERAGE AREA:	178,483	4.10	17.94%

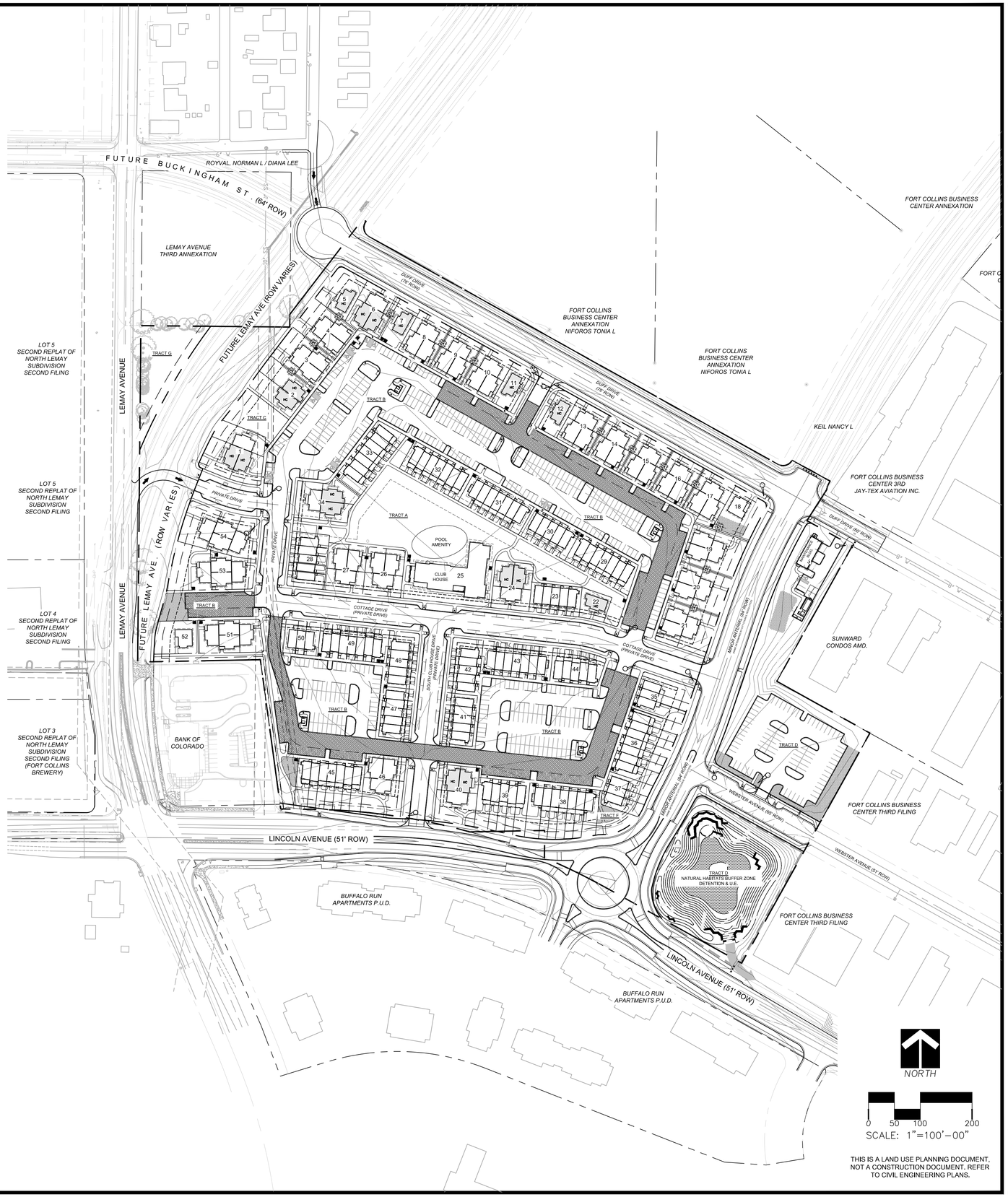
OFF-STREET PARKING SUMMARY

PARKING CALCULATIONS	TOTAL UNITS	BEDS PER BLDG. TYPE	REQUIRED SPACES PER "MULTI-FAMILY" LUC. SEC. 3.2.2.(K)		REQUIRED SPACES PER "EXTRA-OCCUPANCY" LUC. SEC. 3.2.2.(K)(j)	
SINGLE-FAMILY ATTACHED (4-BED/UNIT)	117	468	3 SP / DU	351	0.75 / BED	351
SINGLE-FAMILY ATTACHED (5-BED/UNIT)	75	375	3 SP / DU	225	0.75 / BED	281
SINGLE-FAMILY COTTAGES (5-BED/UNIT)	3	15	3 SP / DU	9	0.75 / BED	11
SINGLE-FAMILY COTTAGES (5-BED/UNIT HC)	6	30	3 SP / DU	18	0.75 / BED	23
TOTALS:	201	888		603		666

TOTAL REQUIRED PARKING SPACES PER MULTI-FAMILY REQ.:	603	
TOTAL REQUIRED PARKING SPACES PER EXTRA-OCCUPANCY REQ.:	666	
TOTAL PROVIDED PARKING SPACES (1):	738	
PARKING SPACES PER BEDROOM:	0.83	
REQUIRED HANDICAP PARKING SPACES:	15	(2% PARKING SPACES)
PROVIDED HANDICAP PARKING SPACES:	15	

BIKE PARKING	REQ. BIKE PARKING SPACES	PROVIDED BIKE PRK. SPACES	
RESIDENTIAL AREA BIKE PARKING (1 SP/BED):	888		
CLUB HOUSE BIKE PARKING (1 SP/2,000 SF):	5		
TOTAL REQUIRED BIKE PARKING:	893		
FIXED BIKE PARKING (40%):	357	357	51 RACKS PROVIDED @ 7 BIKES/RACK
ENCLOSED BIKE PARKING (60%):	536	536	COVERED PARKING PROVIDED AT PORCHES
	893	893	TOTAL BIKE PARKING PROVIDED

(1) TOTAL PARKING PROVIDED EXCLUDES AVAILABLE ON-STREET PARKING ON DUFF DRIVE AND WEBSTER DRIVE



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CAPSTONE COTTAGES PROJECT DEVELOPMENT PLAN

FORT COLLINS, COLORADO

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■
■ urban design ■ entitlement ■

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fax 970/224.1662 phone 970/224.5828 www.vfrdesigninc.com

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MANAGER: LOUIS NEQUETTE, AIA
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REVISIONS

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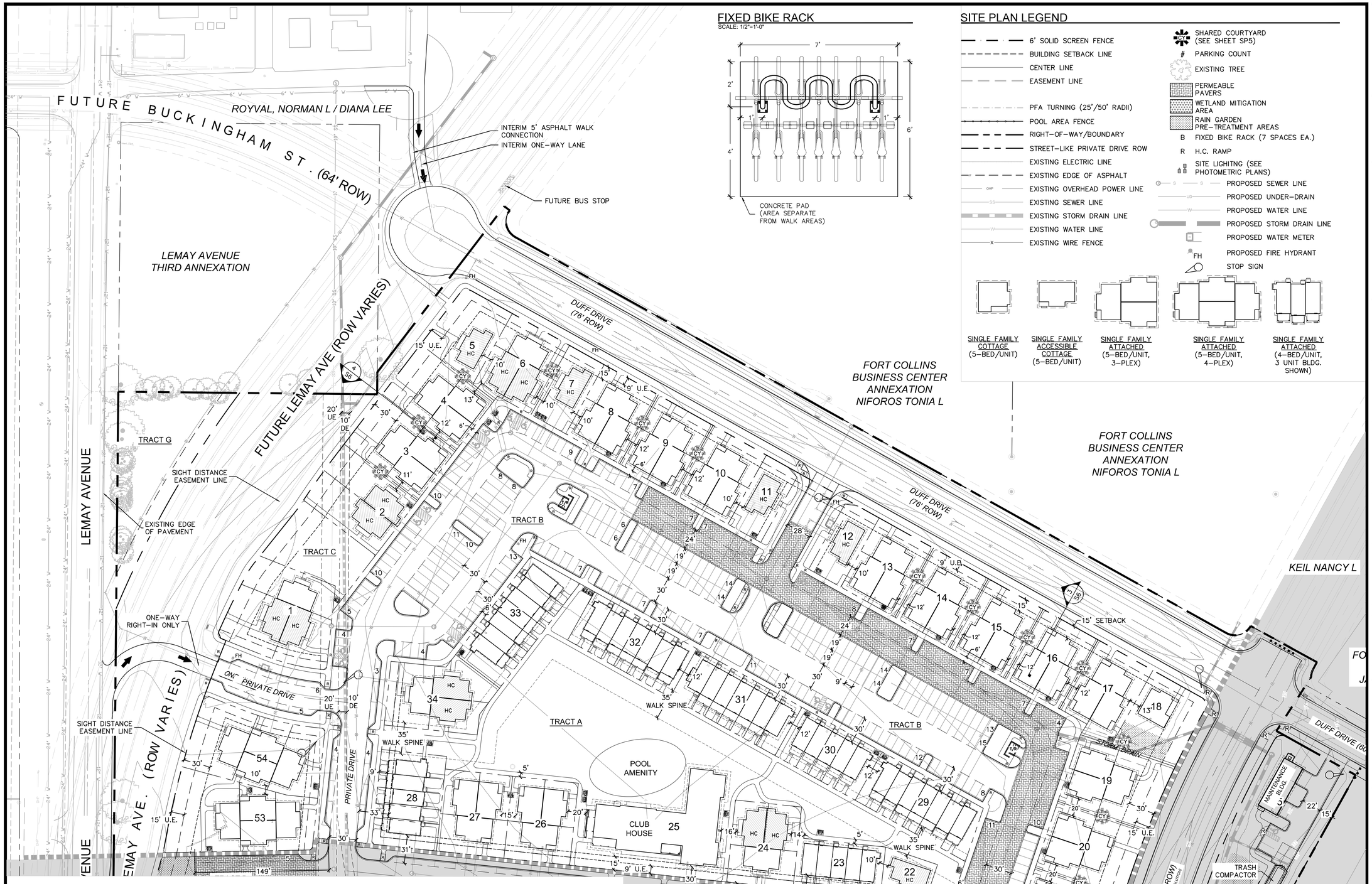
SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

SITE PLAN OVERALL

DRAWING NUMBER:

SP2.0



FIXED BIKE RACK

SCALE: 1/2"=1'-0"

SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- PFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- EXISTING OVERHEAD POWER LINE
- EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- EXISTING WATER LINE
- EXISTING WIRE FENCE

- SHARED COURTYARD (SEE SHEET SP5)
- # PARKING COUNT
- EXISTING TREE
- PERMEABLE PAVERS
- WETLAND MITIGATION AREA
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- R H.C. RAMP
- SITE LIGHITNG (SEE PHOTOMETRIC PLANS)
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- PROPOSED WATER METER
- FH PROPOSED FIRE HYDRANT
- STOP SIGN

SINGLE FAMILY COTTAGE (5-BED/UNIT)

SINGLE FAMILY ACCESSIBLE COTTAGE (5-BED/UNIT)

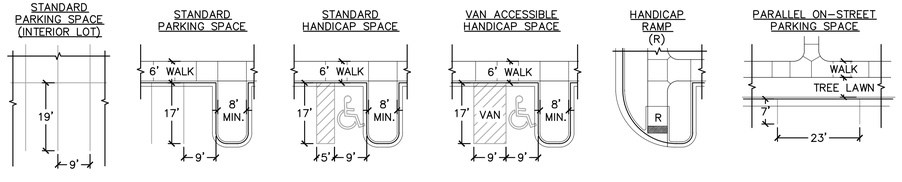
SINGLE FAMILY ATTACHED (5-BED/UNIT, 3-PLEX)

SINGLE FAMILY ATTACHED (5-BED/UNIT, 4-PLEX)

SINGLE FAMILY ATTACHED (4-BED/UNIT, 3 UNIT BLDG. SHOWN)

TYPICAL PARKING LOT DIMENSIONS

SCALE: 1"=20'-0"



NORTH

0 25 50 100

SCALE: 1"=50'-00"

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REVISIONS

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SEAL:

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REVIEWED BY:

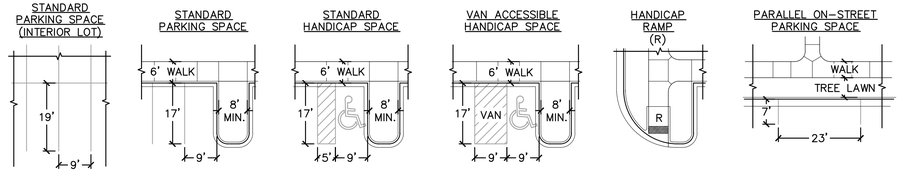
SITE PLAN NORTH

DRAWING NUMBER:

SP3.0

TYPICAL PARKING LOT DIMENSIONS

SCALE: 1"=20'-0"



SITE PLAN LEGEND

- 6' SOLID SCREEN FENCE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- PFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
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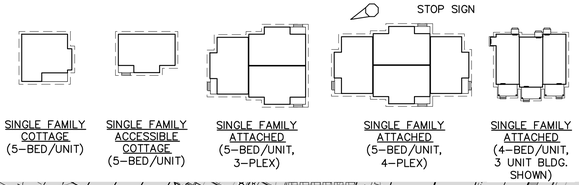

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REVISIONS

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SEAL:

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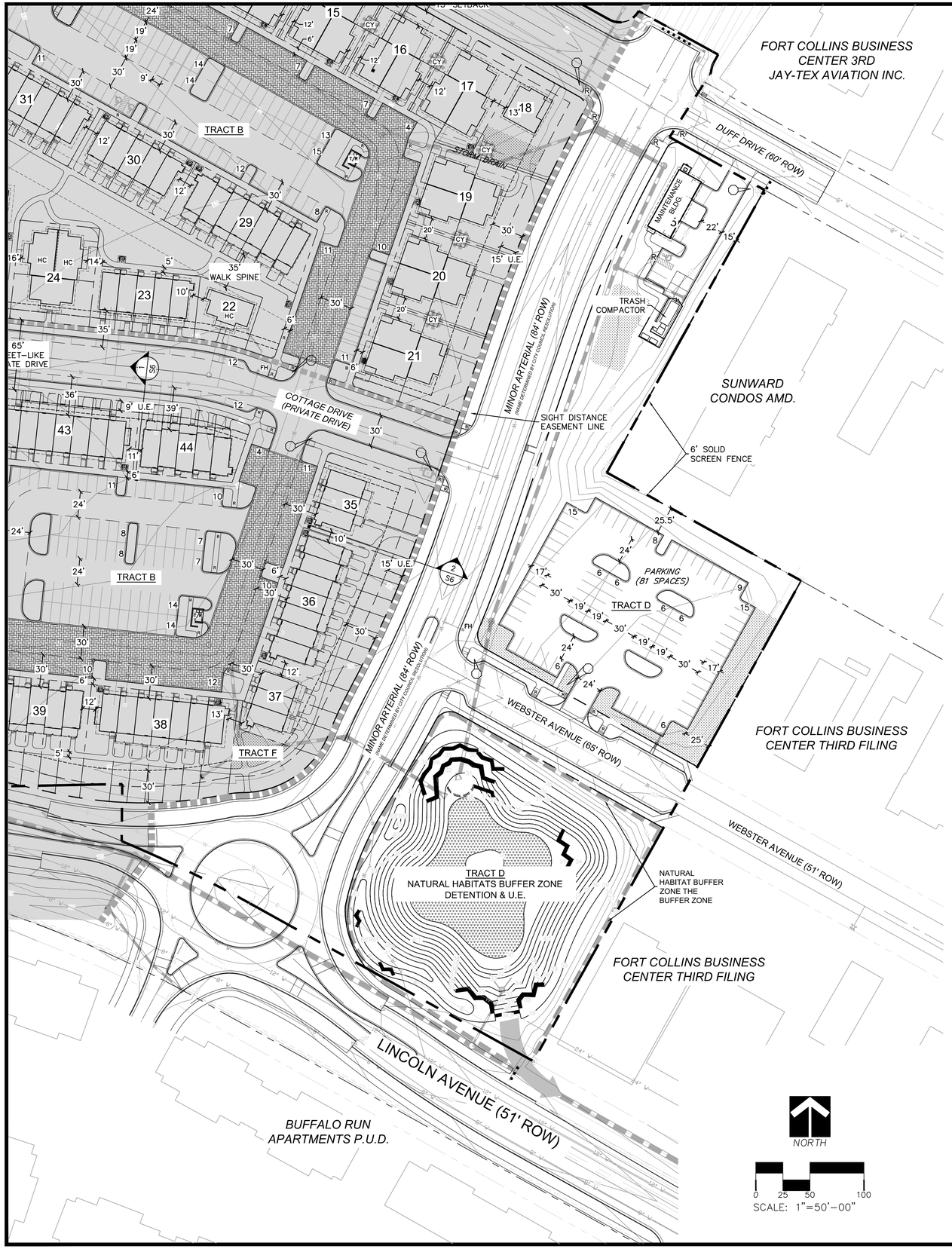
REVIEWED BY:	

SITE PLAN SOUTH

DRAWING NUMBER:

SP4.0



SITE PLAN LEGEND

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- CENTER LINE
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- PFA TURNING (25'/50' RADII)
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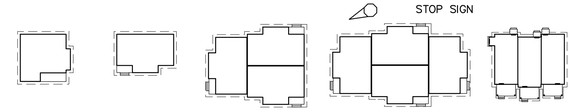


SINGLE FAMILY COTTAGE (5-BED/UNIT)

SINGLE FAMILY ACCESSIBLE COTTAGE (5-BED/UNIT)

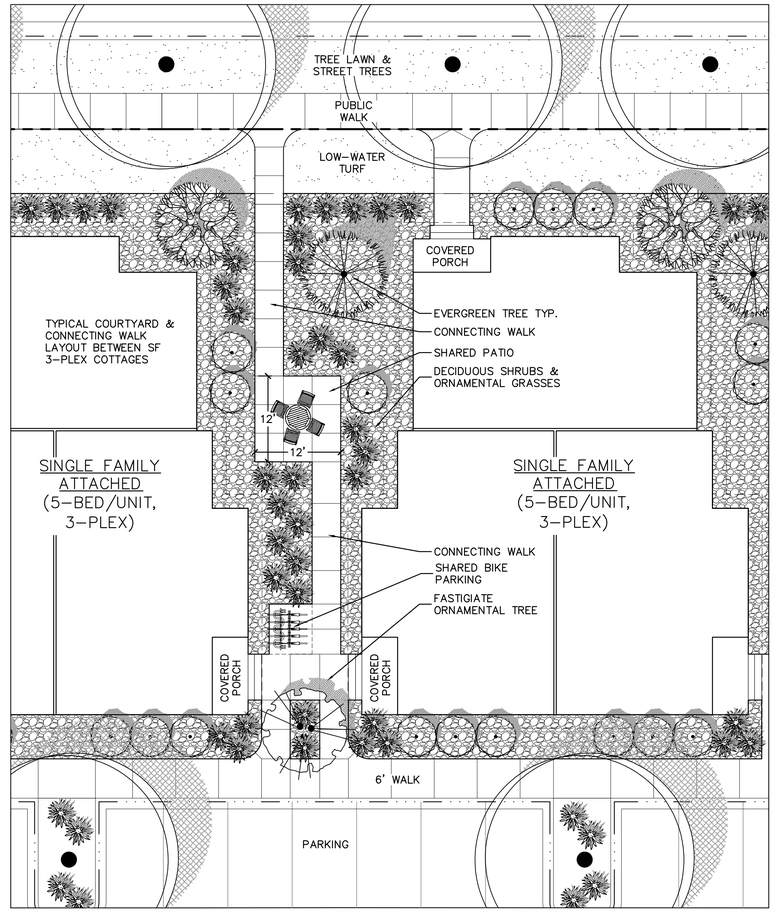
SINGLE FAMILY ATTACHED (5-BED/UNIT, 3-PLEX)

SINGLE FAMILY ATTACHED (5-BED/UNIT, 4-PLEX)

SINGLE FAMILY ATTACHED (4-BED/UNIT, 3 UNIT BLDG. SHOWN)

TYPICAL SHARED COURTYARD PLAN

SCALE: 1"=10'-0"



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REVISIONS

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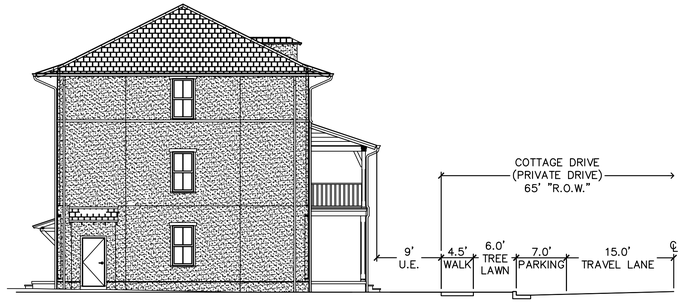
REVIEWED BY:	

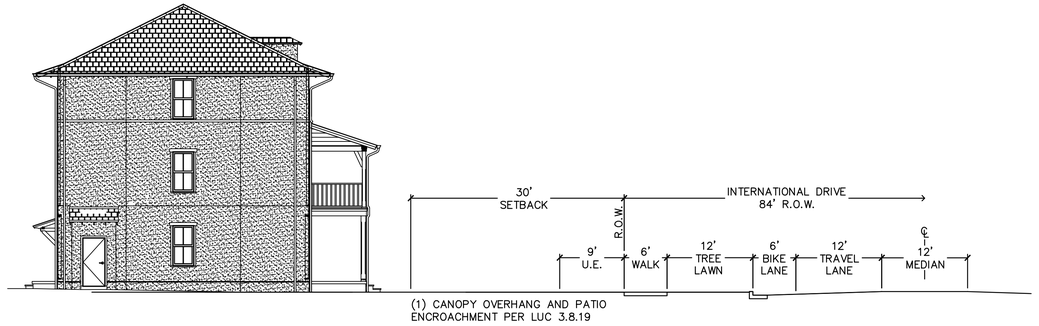
SITE PLAN SOUTHEAST

DRAWING NUMBER:

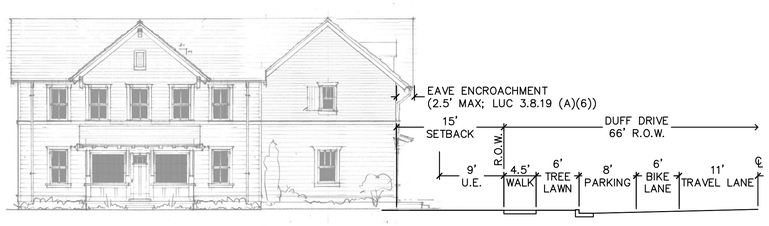
SP5.0



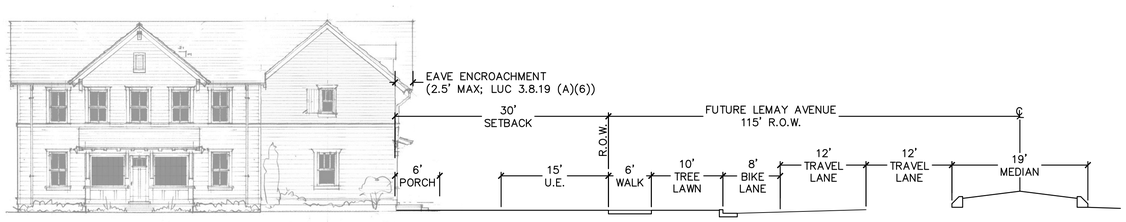
1 SINGLE-FAMILY ATTACHED 4-BED UNIT AT COTTAGE DRIVE
SCALE: 1"=10'-0"



2 SINGLE-FAMILY ATTACHED 5-BED UNIT AT INTERNATIONAL DRIVE
SCALE: 1"=10'-0"



3 SINGLE-FAMILY ATTACHED 5-BED UNIT AT DUFF DRIVE
SCALE: 1"=10'-0"



4 SINGLE-FAMILY ATTACHED 5-BED UNIT AT LEMAY AVENUE
SCALE: 1"=10'-0"

0 5 10 20
SCALE: 1"=10'-00"

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916 WILLSHIRE AVE.
FORT COLLINS, CO 80521
970.493.4394

PLANNER/LANDSCAPE ARCHITECT
RIPLEY DESIGN, INC.
LINDA RIPLEY, ASLA
401 W. MOUNTAIN AVE. SUITE 100
FORT COLLINS, CO 80521
970.224.5828

TRAFFIC ENGINEER
DELICH ASSOCIATES
MATT DELICH, P.E., PTOE
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
970.669.2061

ISSUED

No.	DESCRIPTION	DATE
1	PROJECT DEVELOPMENT PLAN	5-6-2014
2	PROJECT DEVELOPMENT PLAN	12-10-2014
3	PROJECT DEVELOPMENT PLAN	3-11-2015
4	PROJECT DEVELOPMENT PLAN	8-28-2015
5	PROJECT DEVELOPMENT PLAN	11-19-2015

REVISIONS

No.	DESCRIPTION	DATE

SEAL:

PROJECT No.:	
DRAWN BY:	
REVIEWED BY:	

SETBACK SECTIONS

DRAWING NUMBER:

SP6.0

SUMMARY TABLE

Basin ID	Basin Area (sq.ft.)	Basin Area (ac)	Minimized Directly Connected Impervious Areas (MDCIA)		Permeable Interlocking Concrete Pavement (PICP)		Bioretention Rain Gardens		Underground Proprietary BMP		100% Treatment Train
			Receiving Treatment?	LID Technique	Receiving Treatment?	Asphalt to PICP Run-on Ratio	Receiving Treatment?	Raingarden ID	Receiving Treatment?	Snout® (or equal)	
1	321,748	7.39	partial (low)	grass buffers	yes	2.6:1	partial (low)	3	yes	yes	**YES**
3	84,335	1.94	no	-	no	-	no	-	yes	yes	n/a
4	196,020	4.50	partial (low)	grass buffers	yes	1.9:1	partial (low)	1 & 2	yes	yes	**YES**
5	302,154	6.94	partial (low)	grass buffers	yes	2.8:1	partial (low)	5	yes	yes	**YES**
6	43,211	0.99	no	-	no	-	no	-	yes	yes	n/a
7	60,984	1.40	yes	multiple	yes	-	yes	all	yes	yes	**YES**
8	8,364	0.19	no	-	no	-	no	-	no	-	n/a
9	15,856	0.36	no	-	no	-	no	-	no	-	n/a
10	49,827	1.14	yes	rain garden	no	-	yes	6	yes	yes	**YES**
11	3,136	0.07	no	-	no	-	no	-	no	-	n/a
12	15,333	0.35	no	-	no	-	no	-	yes	yes	n/a
13	26,063	0.60	yes	rain garden	no	-	yes	4	yes	yes	**YES**
14a	227,295	5.22	no	-	no	-	no	-	no	-	n/a
14b	47,780	1.10	partial (med.)	rain garden	no	-	partial (med.)	1	yes	yes	**YES**



LEGEND:

- IMPERVIOUS ROOFTOPS
- LANDSCAPE BUFFER STRIPS
- IMPERVIOUS ASPHALT
- PERMEABLE PAVERS
- RAIN GARDENS
- SUMP STRUCTURE w/ SNOUT®
- WETLAND DETENTION POND

NOTES:

1. LANDSCAPE BUFFER STRIPS ARE NOT HIGHLIGHTED, BUT WILL BE PROVIDED THROUGHOUT TO THE EXTENT FEASIBLE. THE PRIMARY OBJECTIVE WITH THIS LOW-IMPACT DEVELOPMENT TECHNIQUE IS TO MINIMIZE THE DIRECTLY CONNECTED IMPERVIOUS AREAS; IN THIS CASE, ROOFTOPS.
2. A COMPREHENSIVE TREATMENT TRAIN APPROACH WILL ENSURE THAT ALL WATER IS TREATED PRIOR TO ENTERING THE WETLAND POND.
3. ALL ON-SITE PRIVATE BASINS RECEIVE 100% TREATMENT THROUGH MULTIPLE WATER QUALITY TECHNIQUES. WHILE EACH INDIVIDUAL COMPONENT MAY NOT BE SIZED TO TREAT THE ENTIRE BASIN AS A STAND-ALONE FACILITY, WHEN EVALUATED IN SERIES, THE WATER QUALITY TREATMENT TRAIN MEETS OR EXCEEDS MINIMUM REQUIREMENTS.
4. 25% OR MORE OF THE PRIVATE PAVING WILL BE COMPRISED OF PERMEABLE PAVEMENT.
5. 100% OF THE PRIVATE PROPERTY WILL BE TREATED BY ONE OR MORE LOW-IMPACT DEVELOPMENT TECHNIQUES.

NOVEMBER 16, 2015

NORTHERN ENGINEERING

\\ROCKIES\ENGINEERS\PROJECTS\039-001\DWG\EXHIBITS\039-001_WATER QUALITY EXHIBIT.DWG

Fort Collins, CO

CAPSTONE COTTAGES

WATER QUALITY | LID EXHIBIT

RIPLEY DESIGN INC.

land planning ■ landscape architecture ■ urban design ■ entitlement

November 19, 2015

Modification Request

DIVISION 4.6 MEDIUM DENSITY MIXED-USE NEIGHBORHOOD DISTRICT (M-M-N)

(D) ***Land Use Standards.***
(1) Density. *Residential developments in the Medium Density Mixed-Use Neighborhood District shall have an overall minimum average density of twelve (12) dwelling units per net acre of residential land except that residential developments (whether approved pursuant to overall development plans or project development plans) containing twenty (20) acres or less shall have an overall minimum average density of seven (7) dwelling units per net acre of residential land. The requirements of this paragraph shall not apply to mixed-use dwellings in multistory mixed-use buildings.*

Reason for the Request

The Applicant proposes cottage-style/townhome student-oriented housing northeast of the intersection of Lincoln and Lemay Avenues. The Cottage-style and Townhome units will meet the City's criteria for extra occupancy rental units and will be leased to 4-5 unrelated people. The project will be marketed to students but may also include tenants who are not attending college. The housing project will provide needed rental units for the growing student population in Fort Collins within a managed setting with recreational opportunities on-site. The low-profile design of the project allows it to easily blend with nearby single family housing and is a good design fit for the neighborhood.

Lower density enables the project to be sensitive to neighborhood compatibility by providing smaller scale buildings and lower building heights that blend visually with the neighborhood. The proposed lower density also allows for open space and ensures adequate on-site parking The project as proposed will allow for a mix of housing types in the neighborhood and will create a transition of residential density from the higher density Buffalo Run Apartments (16.78 dwelling units per acre) to a project with smaller buildings located closer to single-family neighborhoods (Andersonville/San Cristo/Alta Vista) northwest of the project site.

Justifications

The Land Use Code states that the decision-maker may grant a modification of standards only if it finds that the granting of the modification would not be detrimental to the public good;

Granting of the request for modification of the density requirement would be beneficial to the public good in that it will provide a logical and orderly pattern of development and allow for an appropriate transition between the existing single family neighborhoods to the north and the higher density multi-family development immediately to the south (see City Plan Policy LIV 29.5). In addition, the public is benefitted by the distribution of student housing throughout the community, instead of such uses being concentrated in neighborhoods directly adjacent to CSU (See West Central Neighborhoods Plan Implementation Actions).

. . .the decision-maker must also find that the Modification meets one of the following four criteria described in the LUC.

(1) the plan as submitted will promote the general purpose of the standard for which the modification is requested equally well or better than would a plan which complies with the standard for which a modification is requested;

We believe the proposed project at eight (8.1) dwelling units per acre will promote the general purpose of the density requirement for the M-M-N District equally well or better than a plan with the twelve (12) dwelling unit per acre, by fulfilling the purposes of the M-M-N district as set forth both in City Plan and in the following statements of the Land Use Code:

> *(A)* ***Purpose.*** *The Medium Density Mixed-Use Neighborhood District is intended to be a setting for concentrated housing within easy walking distance of transit and a commercial district. Secondarily, a neighborhood may also contain other moderate-intensity complementary and supporting land uses that serve the neighborhood. These neighborhoods will form a transition and a link between surrounding neighborhoods and the commercial core with a unifying pattern of streets and blocks. Buildings, streets, bike and walking paths, open spaces and parks will be configured to create an inviting and convenient living environment.*
>
> *This District is intended to function together with surrounding low density neighborhoods (typically the L-M-N zone district) and a central commercial core (typically an N-C or C-C zone district). The intent is for the component zone districts to form an integral, town-like pattern of development, and not merely a series of individual development projects in separate zone districts.*

The proposed project at 8.1 dwelling units per acre achieves the purpose of the M-M-N District by creating an area of concentrated housing within easy walking distance of transit and a commercial district (Mulberry and Lemay Crossings) that forms a transition and a link between surrounding neighborhoods and the commercial area to the south with a unifying pattern of streets and blocks. Buildings, streets, pedestrian paths, and open spaces are configured to

create an inviting and convenient living environment which appears to be a low to medium density neighborhood and is compatible with the single-family neighborhoods to the northwest.

(4) the plan as submitted will not diverge from the standards of the Land Use Code that are authorized by this Division to be modified except in a nominal, inconsequential way when considered from the perspective of the entire development plan, and will continue to advance the purposes of the Land Use Code as contained in Section 1.2.2.

The density standard in the M-M-N District allows for lower density in relation to the size of the development parcel. Twelve (12) dwelling units per net acre is required for projects containing over twenty (20) acres. Projects containing (20) acres or less are only required to have an overall minimum average density of seven (7) dwelling units per net acre. Because the proposed project (24.82 net acres) is only slightly larger than the 20-acre threshold for higher density, and will provide a density in excess of the minimum (minimum 7 du/ac), we believe that the modification is nominal and inconsequential when considered from the perspective of the whole plan, particularly when the lower density allows the use of a cottage-style product that is closer to the scale of a single family home and further helps with the ability to be able to provide onsite recreation, open areas and landscaping that contribute to the project's similarity in appearance to that of a single family neighborhood.

Finally, the plan as submitted will continue to advance the purpose of the Land Use Code to improve and protect the public health, safety and welfare as contained in in the following subsections of Section 1.2.2:

> *(F) encouraging patterns of land use which decrease trip length of automobile travel and encourage trip consolidation.*
>
> *(G) increasing public access to mass transit, sidewalks, trails, bicycle routes and other alternative modes of transportation.*
>
> *(J) improving the design, quality and character of new development.*
>
> *(K) fostering a more rational pattern of relationship among residential, business and industrial uses for the mutual benefit of all.*
>
> *(L) encouraging the development of vacant properties within established areas.*
>
> *(M) ensuring that development proposals are sensitive to the character of existing neighborhoods.*
>
> *(O) encouraging a wide variety of housing opportunities at various densities that are well-served by public transportation for people of all ages and abilities*

RESOLUTION 2015-004
OF THE COUNCIL OF THE CITY OF FORT COLLINS
AMENDING THE CITY'S STRUCTURE PLAN MAP

WHEREAS, the City has received an application to rezone certain property located northeast of the Lincoln Avenue/Lemay Avenue intersection; and

WHEREAS, the applicant for the Capstone Cottages Rezoning has requested an amendment to the City's Structure Plan Map so as to enable the rezoning of certain property located northeast of the Lincoln Avenue/Lemay Avenue intersection from the Industrial ("I") Zone District to the Medium Density Mixed-Use Neighborhood ("M-M-N") Zone District and to rezone certain property from the Medium Density Mixed-Use Neighborhood ("M-M-N") Zone District to the Industrial ("I") Zone District; and

WHEREAS, the City Council has received a favorable recommendation of the Planning and Zoning Board with regard the proposed amendment to the City's Structure Plan Map upon the basis that the existing map is in need of the proposed amendment and that the proposed amendment will promote the public welfare and will be consistent with the vision, goals, principles and policies of City Plan and the elements thereof; and

WHEREAS, the City Council has determined that the proposed amendment of the City's Structure Plan Map is in the best interests of the citizens of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS, as follows:

Section 1. That the City Council finds that the City's existing Structure Plan Map is in need of the amendment requested by the applicant for the Capstone Cottages Rezoning.

Section 2. That the City Council finds that the proposed amendment will promote the public welfare and will be consistent with the vision, goals, principles and policies of City Plan and the elements thereof.

Section 3. That the City Plan Structure Plan Map is hereby amended so as to appear as shown on Exhibit "A" attached hereto and incorporated herein by this reference.

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For additional information or an official copy, please contact City Clerk's Office City Hall West 300 LaPorte Avenue Fort Collins, CO 80521 USA

Passed and adopted at a regular meeting of the Council of the City of Fort Collins this 6th day of January, A.D. 2015.



Karen Weitkunat
Mayor

ATTEST:

Wanda Nelson
City Clerk

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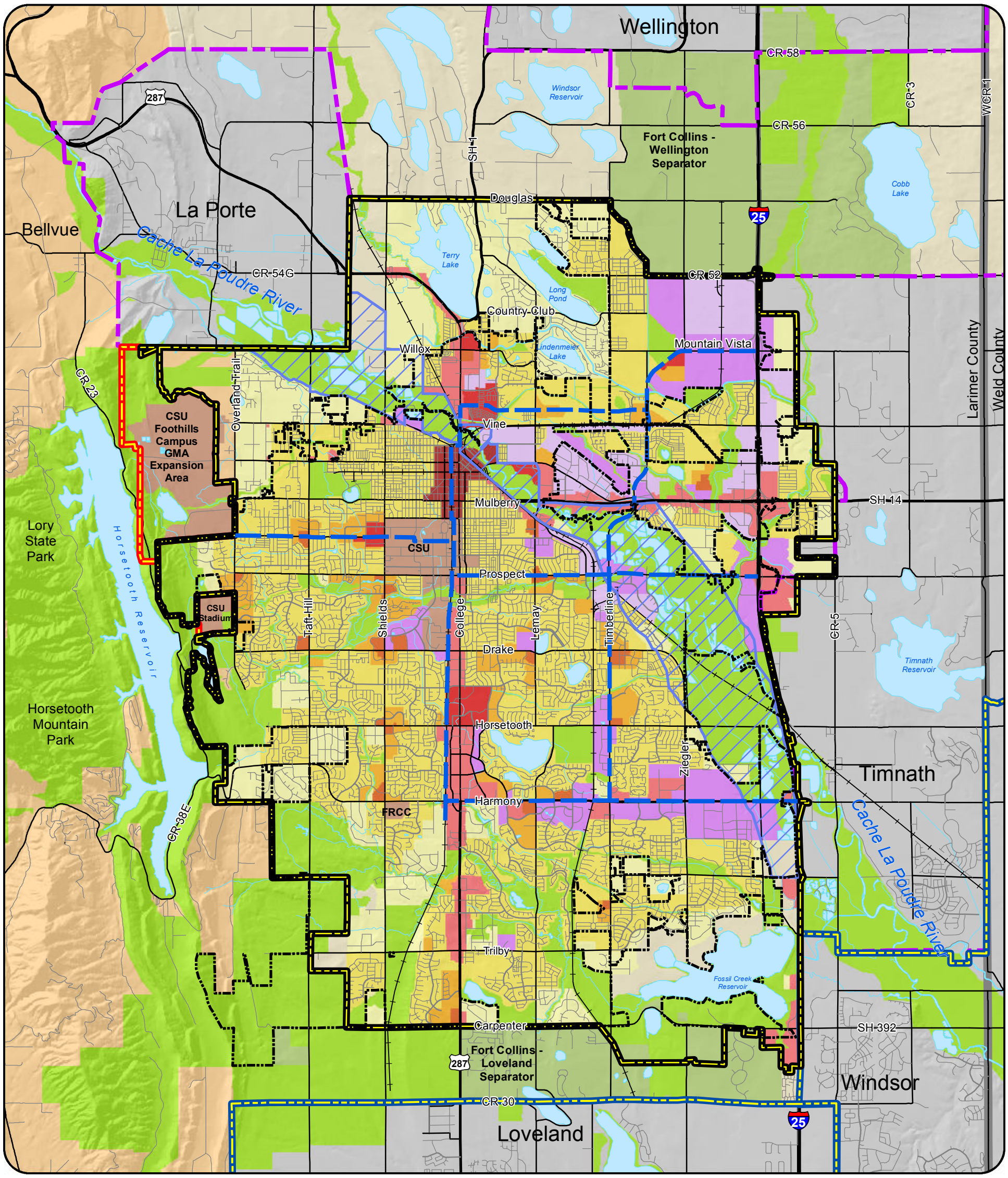
City Structure Plan

EXHIBIT A

Plan Fort Collins



Boundaries
- Fort Collins GMA
- Potential GMA Expansion
- Other City GMA
- Planning Area
- Adjacent Planning Areas
- City Limits

Districts
- Downtown District
- Community Commercial District
- General Commercial District
- Neighborhood Commercial District
- Campus District
- Employment District
- Industrial District

Neighborhoods
- Urban Estate
- Low Density Mixed-Use
- Medium Density Mixed-Use

Edges
- Community Separator
- Foothills
- Rural Lands

Corridors
- Open Lands, Parks and Water Corridors
- Poudre River Corridor
- Enhanced Travel Corridor (Transit)

N W E S

0 0.5 1 1.5 2 Miles

CITY OF FORT COLLINS
GEOGRAPHIC INFORMATION SYSTEM MAP PRODUCTS

These map products and all underlying data are developed for use by the City of Fort Collins for its internal purposes only, and were not designed or intended for general use by members of the public. The City makes no representation or warranty as to its accuracy, timeliness, or completeness, and in particular, its accuracy in labeling or displaying dimensions, contours, property boundaries, or placement of location of any map features thereon. THE CITY OF FORT COLLINS MAKES NO WARRANTY OF MERCHANTABILITY OR WARRANTY FOR FITNESS OF USE FOR PARTICULAR PURPOSE, EXPRESSED OR IMPLIED, WITH RESPECT TO THESE MAP PRODUCTS OR THE UNDERLYING DATA. Any users of these map products, map applications, or data, accepts them AS IS, WITH ALL FAULTS, and assumes all responsibility of the use thereof, and further covenants and agrees to hold the City harmless from and against all damage, loss, or liability arising from any use of this map product, in consideration of the City's having made this information available. Independent verification of all data contained herein should be obtained by any users of these products, or underlying data. The City disclaims, and shall not be held liable for any and all damage, loss, or liability, whether direct, indirect, or consequential, which arises or may arise from these map products or the use thereof by any person or entity.

Adopted: February 18, 1997
Amended: January 6, 2015

RESOLUTION 2015-005
OF THE COUNCIL OF THE CITY OF FORT COLLINS
AMENDING THE EAST MULBERRY CORRIDOR PLAN MAP

WHEREAS, the City has received an application to rezone certain property located northeast of the Lincoln Avenue/Lemay Avenue intersection; and

WHEREAS, the applicant for the Capstone Cottages Rezoning has requested an amendment to the East Mulberry Corridor Plan Map so as to enable the rezoning of certain property located northeast of the Lincoln Avenue/Lemay Avenue intersection from the Industrial ("I") Zone District to the Medium Density Mixed-Use Neighborhood ("M-M-N") Zone District and to rezone certain property from the Medium Density Mixed-Use Neighborhood ("M-M-N") Zone District to the Industrial ("I") Zone District; and

WHEREAS, the City Council has received a favorable recommendation of the Planning and Zoning Board with regard the proposed amendment to the East Mulberry Corridor Plan Map upon the basis that the existing map is in need of the proposed amendment and that the proposed amendment will promote the public welfare and will be consistent with the vision, goals, principles and policies of City Plan and the elements thereof; and

WHEREAS, the City Council has determined that the proposed amendment of the East Mulberry Corridor Plan Map is in the best interests of the citizens of the City.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS, as follows:

Section 1. That the City Council finds that the existing East Mulberry Corridor Plan Map is in need of the amendment requested by the applicant for the Capstone Cottages Rezoning.

Section 2. That the City Council finds that the proposed amendment will promote the public welfare and will be consistent with the vision, goals, principles and policies of City Plan and the elements thereof.

Section 3. That the East Mulberry Corridor Plan Map is hereby amended so as to appear as shown on Exhibit "A" attached hereto and incorporated herein by this reference.

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Passed and adopted at a regular meeting of the Council of the City of Fort Collins this 6th day of January, A.D. 2015.

Karen Weitkunat
Mayor

ATTEST:

Wanda Nelson
City Clerk

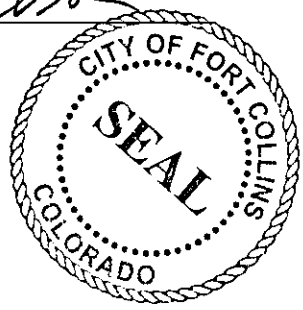

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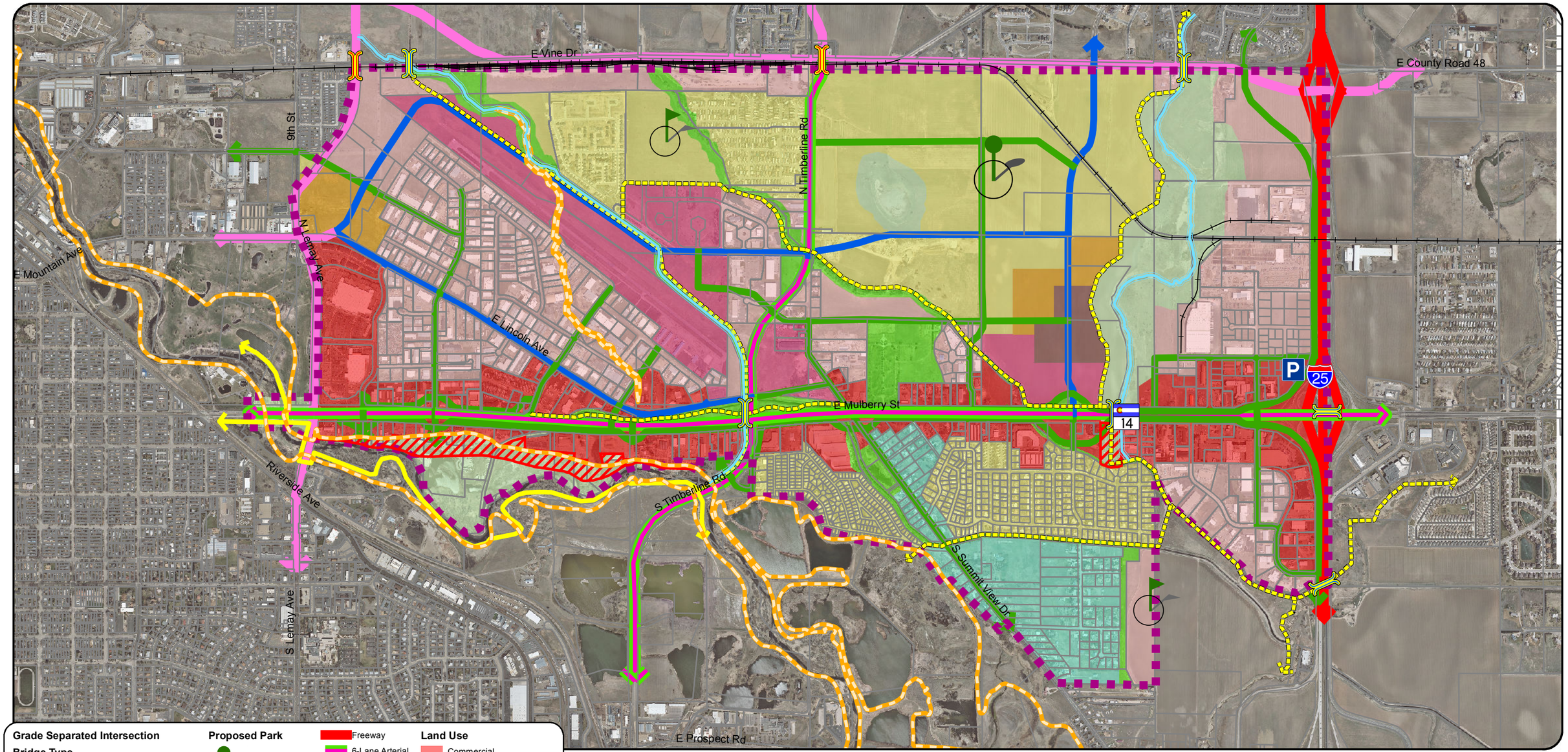
EXHIBIT A

East Mulberry Corridor Plan



Grade Separated Intersection

Bridge Type

- Bike
- Street

- Study Area Boundary
- Commercial Use (See Floodplain Reg's.)
- Major Street Names
- Product Corridor (City Regulated)

Proposed Park

- Neighborhood Park
- Mini Park

- Freeway
- 6-Lane Arterial
- 4-Lane Arterial
- 2-Lane Arterial
- 2-Lane Collector
- Park & Ride
- Channels
- Existing Trail
- Proposed Trails
- Railroads

Land Use

- Commercial
- Neighborhood Commercial
- Industrial
- Low Density Residential
- Medium Density Residential
- Urban Estate
- Natural Buffer
- Office / Employment
- Park/Cemetery

FRAMEWORK PLAN

Adopted: July 16, 2003
Amended: January 6, 2015

N W E S

Scale 1:18,000

0 500 1,000 1,500 2,000 Feet

ORDINANCE NO. 007, 2015
OF THE COUNCIL OF THE CITY OF FORT COLLINS
AMENDING THE ZONING MAP OF THE
CITY OF FORT COLLINS BY CHANGING THE ZONING
CLASSIFICATION FOR THAT CERTAIN PROPERTY KNOWN
AS THE CAPSTONE COTTAGES REZONING

WHEREAS, Division 1.3 of the Fort Collins Land Use Code (the "Land Use Code") establishes the Zoning Map and Zone Districts of the City; and

WHEREAS, Division 2.9 of the Land Use Code establishes procedures and criteria for reviewing the rezoning of land; and

WHEREAS, in accordance with the foregoing, the City Council has considered the rezoning of the property that is the subject of this ordinance, and has determined that said property should be rezoned as hereafter provided; and

WHEREAS, by Resolution 2015-004 and Resolution 2015-005, the City Council has heretofore made corresponding amendments to the City's Structure Plan Map and the East Mulberry Corridor Plan Map; and

WHEREAS, the City Council has further determined that the proposed rezoning is consistent with the City's Comprehensive Plan and/or is warranted by changed conditions within the neighborhood surrounding and including the subject property; and

WHEREAS, to the extent applicable, the City Council has also analyzed the proposed rezoning against the considerations as established in Section 2.9.4(H)(3) of the Land Use Code.

NOW THEREFORE, BE IT ORDAINED BY THE COUNCIL OF THE CITY OF FORT COLLINS:

Section 1. That the Zoning Map adopted by Division 1.3 of the Land Use Code is hereby amended by changing the zoning classification from Industrial ("I") Zone District, to Medium Density Mixed-Use Neighborhood ("M-M-N") Zone District and Medium Density Mixed-Use Neighborhood ("M-M-N") Zone District to Industrial ("I") Zone District, for the following described properties in the City known as the Capstone Cottages Rezoning:

Property to be Rezoned to the Medium Density Mixed-Use Neighborhood Zone District:

TRACTS OF LAND BEING A PORTION OF THE WEST HALF OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST OF THE 6TH P.M., CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

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CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, T7N, R68W AS BEARING NORTH 00° 33' 51" EAST AND WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO:

PARCEL 1:
COMMENCING AT THE WEST QUARTER CORNER OF SECTION 7; THENCE ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, NORTH 00° 33' 51" EAST, 993.60 FEET; THENCE, SOUTH 89° 26' 09" EAST, 30.00 FEET TO THE EAST RIGHT-OF-WAY LINE OF LEMAY AVENUE; THENCE, SOUTH 89° 26' 09" EAST, 206.89 FEET TO THE POINT OF BEGINNING; THENCE NORTH 37° 27' 48" EAST, 230.87 FEET; THENCE, SOUTH 60° 52' 44" EAST, 386.22 FEET; THENCE, NORTH 89° 26' 09" WEST, 477.85 FEET TO THE POINT OF BEGINNING, CONTAINING 44,112 SQUARE FEET OR 1.013 ACRES MORE OR LESS.

PARCEL 2:
COMMENCING AT THE WEST QUARTER CORNER OF SECTION 7; THENCE ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, NORTH 00° 33' 51" EAST, 993.60 FEET; THENCE SOUTH 89° 26' 09" EAST, 820.98 FEET; THENCE, SOUTH 00° 33' 51" WEST, 57.82 FEET TO THE POINT OF BEGINNING; THENCE, SOUTH 60° 52' 44" EAST, 589.12 FEET; THENCE, SOUTH 32° 39' 26" WEST, 30.06 FEET; THENCE, SOUTH 60° 52' 44" EAST, 100.57 FEET; THENCE, SOUTH 29° 07' 16" WEST, 300.00 FEET; THENCE, SOUTH 60° 52' 44" EAST, 206.10 FEET; THENCE, SOUTH 29° 07' 16" WEST, 560.00 FEET TO THE CENTERLINE OF LINCOLN AVENUE, THENCE ALONG SAID CENTERLINE THE FOLLOWING 2 COURSES AND DISTANCES: NORTH 60° 52' 44" WEST, 299.35 FEET; THENCE ALONG A CURVE CONCAVE TO THE SOUTHWEST HAVING A CENTRAL ANGLE OF 05° 20' 02" WITH A RADIUS OF 1156.00 FEET, AN ARC LENGTH OF 107.62 FEET AND THE CHORD OF WHICH BEARS NORTH 63° 32' 35" WEST, 107.58 FEET; THENCE DEPARTING SAID CENTERLINE, NORTH 00° 33' 51" EAST, 1018.98 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 509,229 SQUARE FEET OR 11.690 ACRES MORE OR LESS.

Property to be Rezoned to the Industrial Zone District:

A TRACT OF LAND BEING A PORTION OF THE WEST HALF OF SECTION 7, TOWNSHIP 7 NORTH, RANGE 68 WEST OF THE 6TH P.M., CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
CONSIDERING THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, T7N, R68W AS BEARING NORTH 00° 33' 51" EAST AND WITH ALL BEARINGS CONTAINED HEREIN RELATIVE THERETO:

PARCEL 3:
COMMENCING AT THE WEST QUARTER CORNER OF SECTION 7; THENCE ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, NORTH 00° 33' 51" EAST, 993.60 FEET; THENCE SOUTH 89° 26' 09" EAST, 820.98 FEET TO THE POINT OF

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BEGINNING; THENCE, SOUTH 00° 33' 51" WEST, 57.82 FEET; THENCE, NORTH 60° 52' 44" WEST, 120.95 FEET; THENCE, SOUTH 89° 26' 09" EAST, 106.23 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS 3,071 SQUARE FEET OR 0.070 ACRES MORE OR LESS.

Section 2. That the Sign District Map adopted pursuant to Section 3.8.7(E)of the Land Use Code be, and the same hereby is, changed and amended by showing that the above-described property to be rezoned into the Industrial Zone District is not included in the Residential Neighborhood Sign District and the property to be rezoned into the Medium Density Mixed-Use Neighborhood Zone District is included in the Residential Neighborhood Sign District.

Section 3. The City Manager is hereby authorized and directed to amend said Zoning Map in accordance with this Ordinance.

Introduced, considered favorably on first reading, and ordered published this 6th day of January, A.D. 2015, and to be presented for final passage on the 20th day of January, A.D. 2015.

Karen Weitkunat
Mayor

ATTEST:

CITY OF FORT COLLINS SEAL COLORADO

Wanda Nelson
City Clerk

Passed and adopted on final reading on the 20th day of January, A.D. 2015.

Karen Weitkunat
Mayor

ATTEST:

CITY OF FORT COLLINS SEAL COLORADO

Wanda Nelson
City Clerk

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RESOLUTION 2015-043
OF THE COUNCIL OF THE CITY OF FORT COLLINS
DETERMINING THAT A SINGLE-LANE, MODERN ROUNDABOUT IS THE PREFERRED ALTERNATIVE FOR THE INTERSECTION OF LINCOLN AVENUE AND THE NORTH-SOUTH EXTENSION OF "INTERNATIONAL BOULEVARD"

WHEREAS, the planned intersection of Lemay Avenue with the north-south extension of "International Boulevard" (to be renamed by City Council Resolution in a future action) has been identified as a possible intersection for implementation as a roundabout; and

WHEREAS, City staff has conducted an analysis of the establishment of a single-lane, modern roundabout at said intersection in accordance with Resolution 2001-120, which calls for an Intersection Alternative Analysis to be conducted before roundabout improvements are approved; and

WHEREAS, the Intersection Alternative Analysis reviewed by City staff considers the six criteria of safety, capacity, air quality, cost, alternative mode mobility and special requirements, and concludes that the single-lane, modern roundabout design is favored or neutral in every criteria; and

WHEREAS, the City Council's determination of the appropriateness of a single-lane, modern roundabout at this location is independent of the proposed Capstone Cottages development that may construct it, and this determination will continue in effect regardless of the outcome of that proposed development; and

WHEREAS, after public outreach and receipt of the recommendation from the Transportation Board, the City Council has determined that a single-lane, modern roundabout at the intersection of Lincoln Avenue and the north-south extension of "International Boulevard" is in the best interests of the City and should be authorized.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE CITY OF FORT COLLINS that the Intersection Alternative Analysis described in Resolution 2001-120 shows that a modern, single-lane roundabout is the preferred alternative for the intersection of Lincoln Avenue and the north-south extension of "International Boulevard", and that a roundabout as described is appropriate for construction at that location.

Passed and adopted at a regular meeting of the Council of the City of Fort Collins this 21st day of April, A.D. 2015.

CITY OF FORT COLLINS SEAL COLORADO

Mayor

ATTEST:

City Clerk

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CAPSTONE COTTAGES
TRANSPORTATION IMPACT STUDY

FORT COLLINS, COLORADO

MARCH 2015

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Project # 1495

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I. INTRODUCTION

This transportation impact study (TIS) addresses the capacity, geometric, and control requirements at and near the proposed Capstone Cottages development. The proposed Capstone Cottages site is located in the northeast quadrant of the Lemay/Lincoln intersection in Fort Collins, Colorado. Capstone Cottages is a student housing development.

During the course of the analysis, numerous contacts were made with the owner (Capstone Collegiate Communities), the project engineer (Northern Engineering), the project planning consultant (Ripley Design), and Fort Collins Traffic Engineering. The Transportation Impact Study Base Assumptions form and related documents are provided in Appendix A. This study generally conforms to the format set forth in the Fort Collins TIS Guidelines in the "Larimer County Urban Area Street Standards" (LCUASS). Due to the trip generation, this is a full transportation impact study. The study involved the following steps:

- Collect physical, traffic, and development data;
- Perform trip generation, trip distribution, and trip assignment;
- Determine peak hour traffic volumes;
- Conduct capacity and operational level of service analyses on key intersections;
- Analyze signal warrants;
- Conduct level of service evaluation of pedestrian, bicycle, and transit modes of transportation

This TIS is a revision of the "Capstone Cottages PDP Transportation Impact Study" dated March 2014 and the "Capstone Cottages Transportation Impact Study" dated December 2014. The revised TIS addresses City staff comments and the revised site plan.

II. EXISTING CONDITIONS

The location of the Capstone Cottages development is shown in Figure 1. It is important that a thorough understanding of the existing conditions be presented.

Land Use

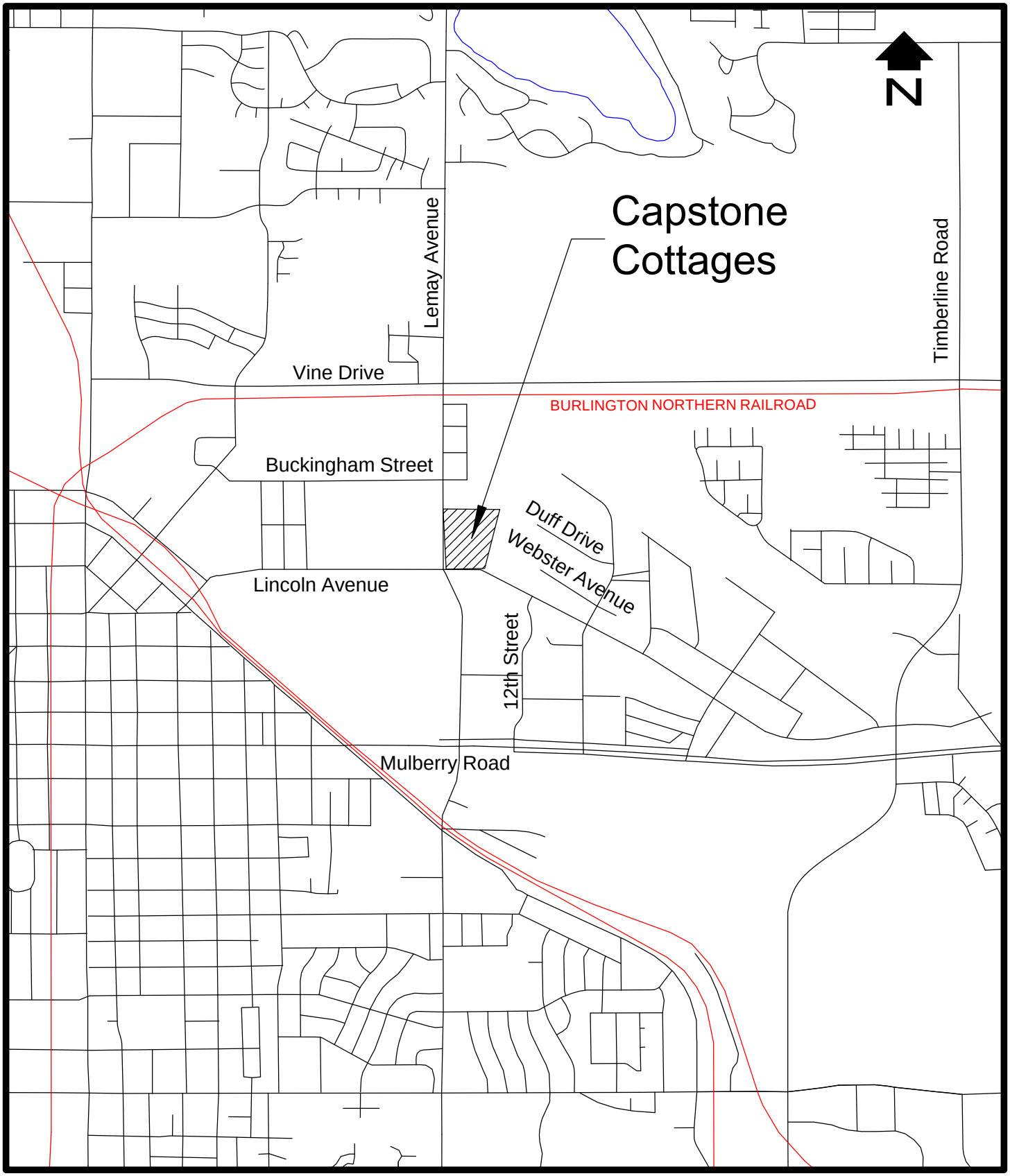
Land uses in the area are primarily residential, industrial, and commercial. There are residential uses to the north and south of the site. There are industrial uses to the east and west of the site. There are commercial uses to the south of the site. The proposed Capstone Cottages site is currently vacant. The center of Fort Collins lies to the southwest of the proposed Capstone Cottages site.

Streets

The primary streets near the Capstone Cottages site are Lemay Avenue, Lincoln Avenue, Buckingham Street, 12th Street, Duff Drive, Webster Avenue, Vine Drive, and future International Boulevard. Figure 2 shows a schematic of the existing geometry at the Lemay/Lincoln, Lemay/Buckingham, Lemay/Vine, Lincoln/Buffalo Run Access, and Lincoln/12th intersections.

Lemay Avenue is to the west of (adjacent to) the proposed Capstone Cottages site. It is a north-south street classified as a four-lane arterial according to the Fort Collins Master Street Plan. Currently, Lemay Avenue has a four-lane cross section, south of Lincoln and a two-lane cross section, north of Lincoln. At the Lemay/Lincoln intersection, Lemay Avenue has a northbound and a southbound left-turn lane, a through lane in each direction, and a northbound right-turn lane. At the Lemay/Buckingham intersection, Lemay Avenue has all movements combined into a single lane. At the Lemay/Vine intersection, Lemay Avenue has all movements combined into a single lane. The Lemay/Lincoln and Lemay/Vine intersections have signal control. The Lemay/Buckingham intersection has stop sign control on Buckingham. The posted speed limit in this area of Lemay Avenue is 35 mph, south of Lincoln Avenue, 30 mph from Lincoln to Vine Drive, and 35 mph, north of Vine Drive.

Lincoln Avenue is to the south of (adjacent to) the proposed Capstone Cottages site. It is an east-west street classified as a two-lane arterial according to the Fort Collins Master Street plan. Currently, Lincoln Avenue has a two-lane cross section. At the Lemay/Lincoln intersection, Lincoln Avenue has an eastbound and a westbound left-turn lane, a through lane in each direction, and an eastbound and a westbound right-turn lane. At the Lincoln/Buffalo Run Access intersection, Lincoln Avenue has a two-way left-turn lane and a through lane in each direction. At the Lincoln/12th intersection, Lincoln Avenue has all movements combined into a single lane. The Lincoln/Buffalo Run Access and Lincoln/12th intersections have stop sign control on Buffalo Run and 12th Street, respectively. The posted speed limit in this area of Lincoln Avenue is 35 mph.



SCALE: 1"=2000'

SITE LOCATION

Figure 1

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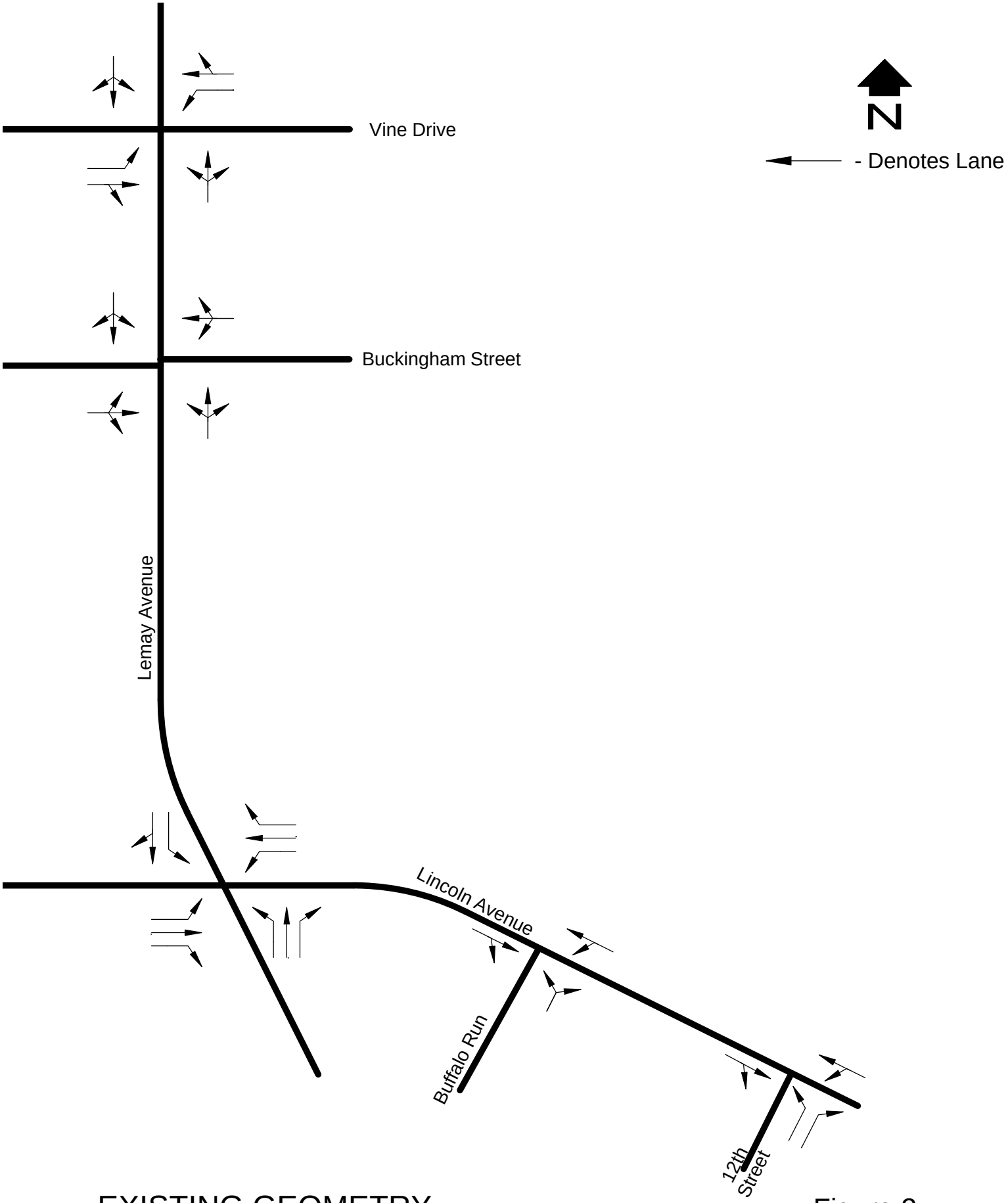


EXISTING GEOMETRY

Figure 2

Buckingham Street is to the north of the proposed Capstone Cottages site. It is an east-west street classified as a two-lane collector according to the Fort Collins Master Street plan. Currently, Buckingham Street has a two-lane cross section. At the Lemay/Buckingham intersection, Buckingham Street has all movements combined into a single lane. The east and west legs of Buckingham Street are offset by approximately 18 feet at the Lemay/Buckingham intersection. West of Lemay Avenue, Buckingham Street is approximately 32 feet wide. East of Lemay Avenue, Buckingham Street is approximately 18 feet wide. The posted speed limit in this area on Buckingham Street is 30 mph, west of Lemay Avenue and 25 mph, east of Lemay Avenue.

Vine Drive is to the north of the proposed Capstone Cottages site. It is an east-west street classified a two-lane collector according to the Fort Collins Master Street plan. Currently, Vine Drive has a two-lane cross section. At the Lemay/Vine intersection, Vine Drive has an eastbound and a westbound left-turn lane and a through/right-turn lane in each direction. The posted speed limit in this area of Vine Drive is 35 mph, west of Lemay Avenue and 45 mph, east of Lemay Avenue.

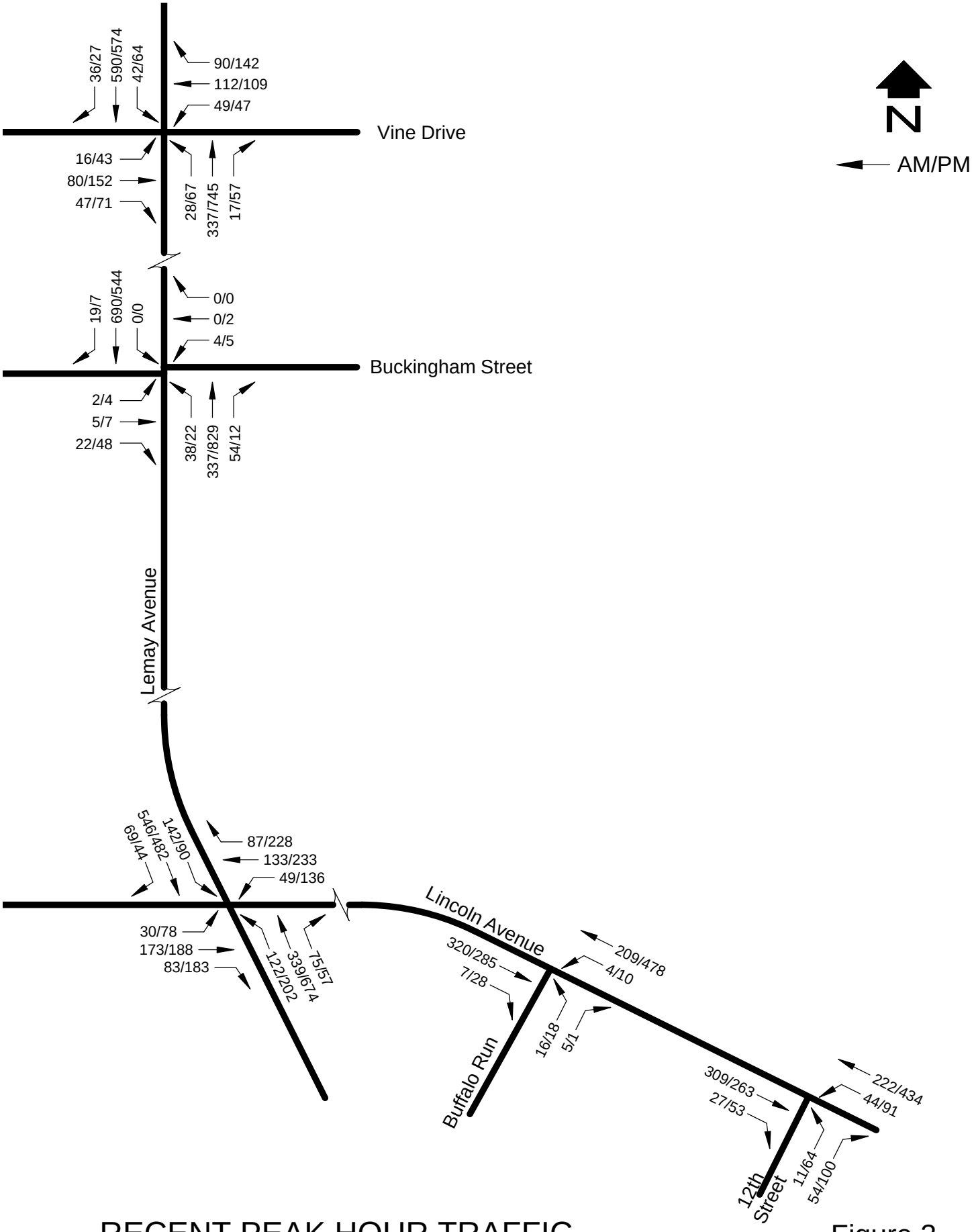
Twelfth Street is to the east of the proposed Capstone Cottages site. It is a north-south street classified a local street according to the Fort Collins Master Street plan. Twelfth Street only has a south leg at the Lincoln/12th intersection. Currently, 12th Street has a two-lane cross section with a two-way left-turn lane. At the Lincoln/12th intersection, 12th Street has two-way left turn lane and a right-turn lane. The posted speed limit in this area of 12th Street is 30 mph.

Duff Drive is to the east of the proposed Capstone Cottages site. It is a southeast-northwest street classified a two-lane collector according to the Fort Collins Master Street plan. Currently, Duff Drive has a two-lane cross section. Duff Drive terminates near the future International/Duff intersection. The posted speed limit in this area of Duff Drive is 25 mph.

Webster Avenue is to the east of the proposed Capstone Cottages site. It is a southeast-northwest street classified a local street according to the Fort Collins Master Street plan. Currently, Webster Avenue has a two-lane cross section. Webster Avenue terminates at the Capstone Property line. The posted speed limit in this area of Webster Avenue is 25 mph.

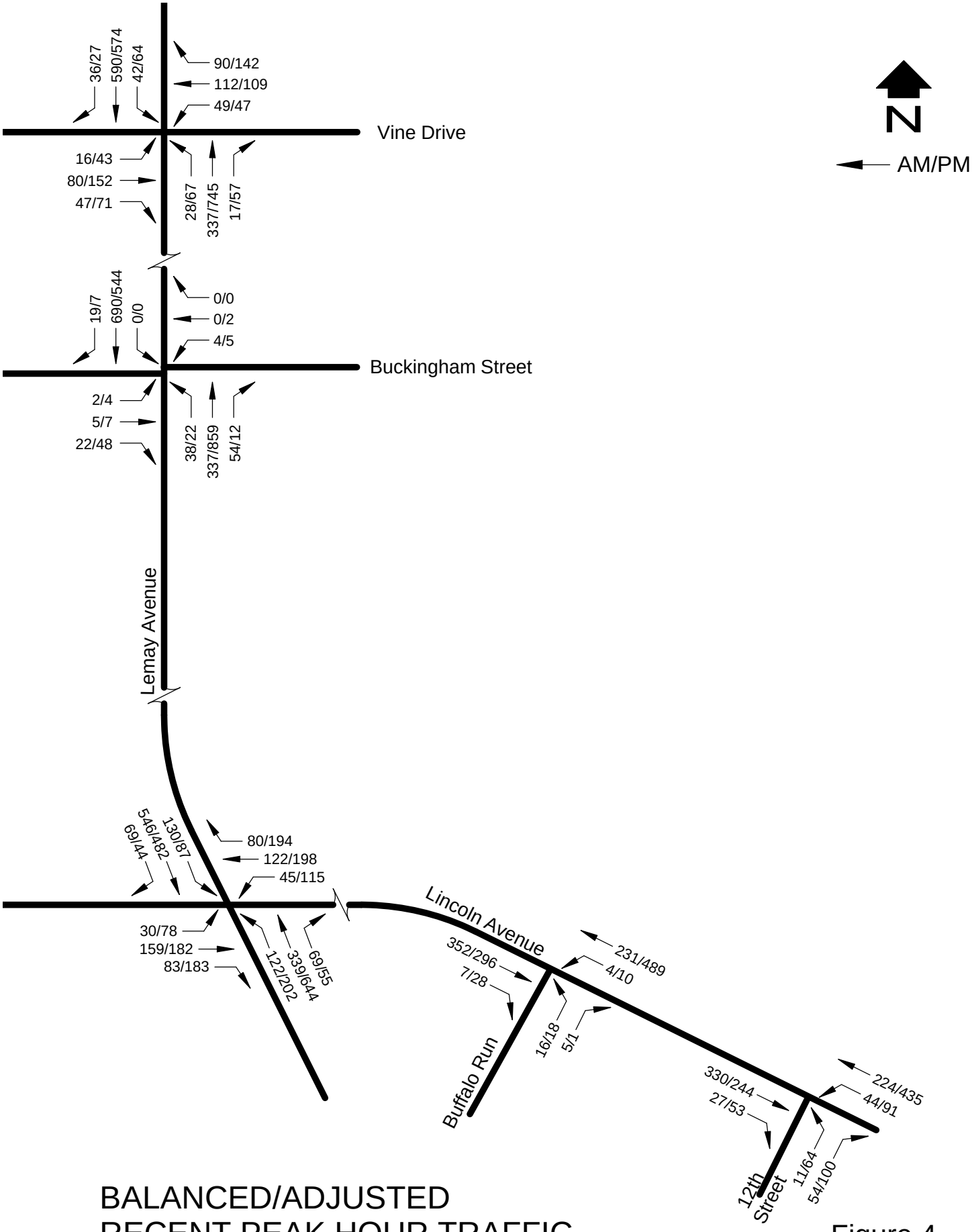
Existing Traffic

Recent morning and afternoon peak hour traffic volumes are shown in Figure 3. The traffic counts at the Lemay/Buckingham, Lemay/Vine, Lincoln/Buffalo Run Access, and Lincoln/12th intersections were obtained in February 2014. The traffic counts at the Lemay/Lincoln intersection were obtained in May 2014 by the City of Fort Collins. The traffic counts at the Lemay/Vine intersection were obtained in August 2012 by the City of Fort Collins. Raw traffic count data are provided in Appendix B. Since the counts



RECENT PEAK HOUR TRAFFIC

Figure 3



BALANCED/ADJUSTED RECENT PEAK HOUR TRAFFIC

Figure 4

were done on different days, the counts were adjusted/balanced. The adjusted/balanced recent peak hour traffic is shown in Figure 4. The Lemay/Vine intersection counts were not adjusted, since they are the basis of the Adequate Public Facilities analysis.

Existing Operation

The Lemay/Lincoln, Lemay/Buckingham, Lemay/Vine, Lincoln/Buffalo Run Access, and Lincoln/12th intersections were evaluated using techniques provided in the 2010 Highway Capacity Manual and 2000 Highway Capacity Manual (for Lemay/Vine intersection). Using the morning and afternoon peak hour traffic shown in Figure 4, the peak hour operation and the calculated delay for levels of service E & F are shown in Table 1. Calculation forms are provided in Appendix C. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during in the morning and afternoon peak hours, except the Lemay/Buckingham intersection in the afternoon peak hour. At the Lemay/Buckingham intersection, the calculated delay for the morning and afternoon peak hour westbound approach was commensurate with level of service E and F, respectively. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour eastbound left-turn lane was commensurate with level of service E. A description of level of service for signalized and unsignalized intersections from the 2010 Highway Capacity Manual is provided in Appendix C. Table 4-3 (revised per staff comments regarding type of intersection) showing the Fort Collins Motor Vehicle LOS Standards (Intersections) are also provided in Appendix C. This site is in an area termed “all other areas” on the Fort Collins Structure Plan. In areas termed “all other areas,” acceptable overall operation at signalized intersections during the peak hours is defined as level of service D or better. At signalized intersections, acceptable operation of any leg and any movement is level of service E. At arterial/arterial, arterial/collector or local stop sign controlled intersections, acceptable operation is considered to be at level of service E. At collector/local stop sign controlled intersections, acceptable operation is considered to be at level of service C for any approach leg.

Pedestrian Facilities

There are sidewalks along the south side of Lincoln Avenue along the Buffalo Run development. There are sidewalks along the west side of Lemay Avenue, between Lincoln Avenue and Vine Drive. There are sidewalks along the east side of Lemay Avenue, south of Lincoln Avenue. It is expected that as properties in this area are developed or redeveloped, sidewalks will be installed as part of the street/property infrastructure.

Bicycle Facilities

Bicycle lanes exist along Lincoln Avenue, Lemay Avenue, Buckingham Street, and Vine Drive within the study area.

TABLE 1 Current Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	A	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	A	A
	NB T	B	B
	NB RT	A	A
	NB APPROACH	A	B
	SB LT	A	B
	SB T/RT	A	A
	SB APPROACH	A	A
	OVERALL	B	C
Lemay/Buckingham (stop sign)	EB LT/T/RT	C	C
	WB LT/T/RT	E (40.2 secs)	F (51.3 secs)
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
Lemay/Vine (signal)	EB LT	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T/RT	D	D
	WB APPROACH	D	D
	SB LT/T/RT	A	A
	NB LT/T/RT	A	A
	OVERALL	B	B
Lincoln/Buffalo Run (stop sign)	NB LT/RT	B	C
	WB LT/T	A	A
Lincoln/12th (stop sign)	NB LT/RT	B	C
	WB LT/T	A	A

Transit Facilities

Currently, this area of Fort Collins is served by Transfort routes 5 and 14.

III. PROPOSED DEVELOPMENT

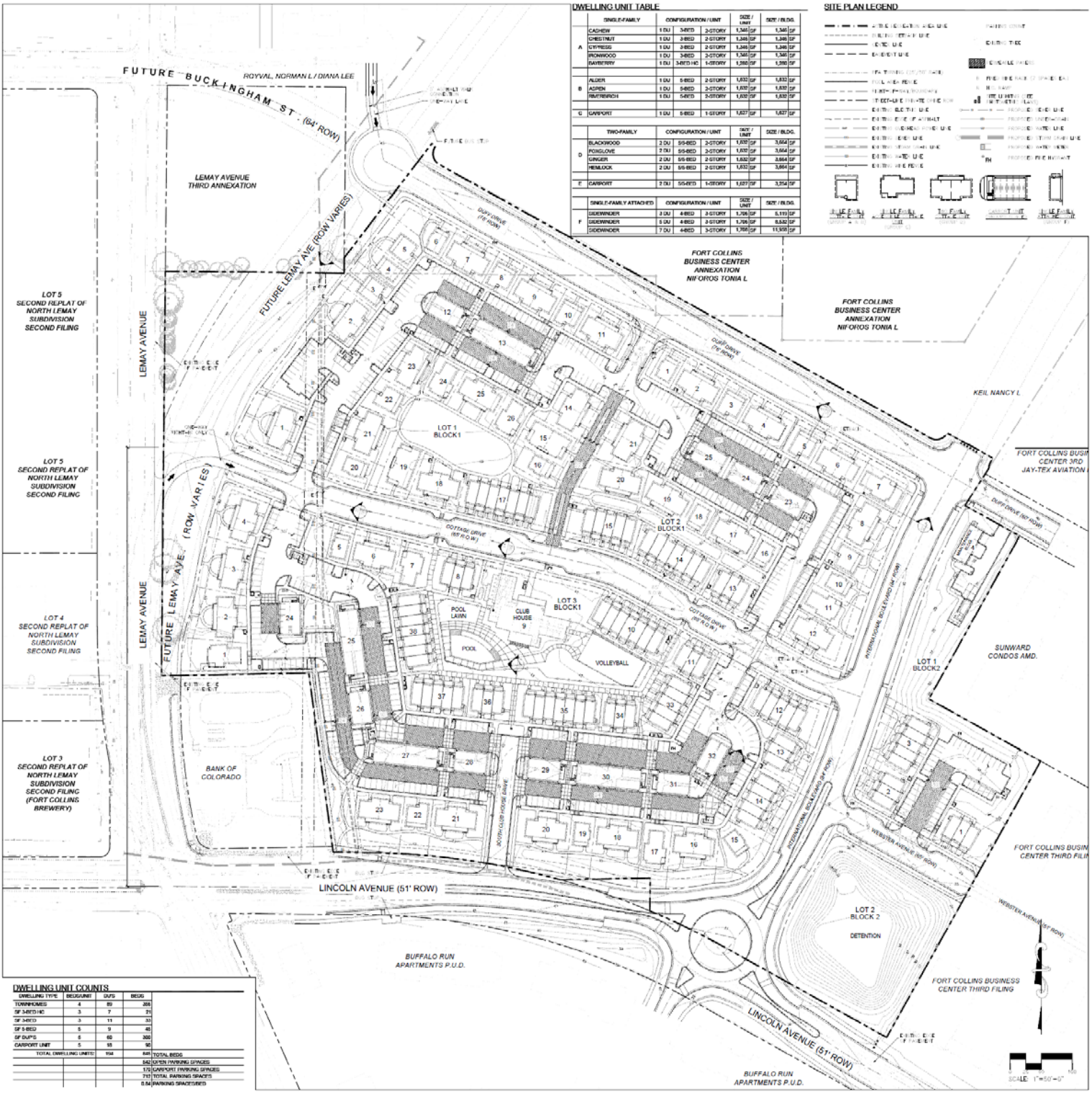
The Capstone Cottages is a student housing development with 860 beds (197 units). Figure 5 shows a site plan of the Capstone Cottages development. The short range analysis (Year 2019) includes the full development of the site and an appropriate increase in background traffic due to normal growth and other potential developments in the area. This development will build International Boulevard along the Capstone Cottages property. Duff Drive will also be built along the Capstone Cottages property. The long range future analysis year is considered to be 2035 and reflects the future realigned Lemay Avenue. In the short range (2019) future, the site plan shows that Capstone Cottages will have a right-in only access to Lemay Avenue and a full movement access to International Boulevard, and to Duff Drive. Capstone Cottages will have a right-in/right-out access to Lincoln Avenue. Webster Avenue will have right-in/right-out access to International Boulevard. There will be a temporary connection to the Anderson Place and San Cristo neighborhood to the north at the northwest end of Duff Drive, this will be a southbound only access. In the long range (2035) future, it is expected that the site access to Lemay Avenue would become right-in/right-out.

Trip Generation

Trip generation is important in considering the impact of a development such as this upon the existing and proposed street system. A compilation of trip generation information contained in Trip Generation, 9th Edition, ITE is customarily used to estimate the trips that would be generated by the proposed/expected uses at a site. However, the City of Fort Collins has performed a trip generation study for apartments in Fort Collins. Therefore, the trip generation rates calculated by the City will be used. Each unit will have 4 or 5 bedrooms. Therefore, a person/bed was used as the trip generation variable. A trip is defined as a one-way vehicle movement from origin to destination. Table 2 shows the expected trip generation on a daily and peak hour basis. The trip generation of Capstone Cottages development resulted in 2280 daily trip ends; 163 morning peak hour trip ends; and 361 afternoon peak hour trip ends.

TABLE 2
Capstone Cottages Trip Generation

Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
220	Apartment	860 beds	2.65	2280	0.04	34	0.15	129	0.27	232	0.15	129



SITE PLAN

Figure 5

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Trip Distribution

Trip distribution for the Capstone Cottages was based on existing/future travel patterns, land uses in the area, consideration of trip attractions/productions in the area, and engineering judgment. Figure 6 shows the trip distribution for the short range (2019) and long range (2035) analysis futures. The trip distribution was agreed to by City of Fort Collins staff in the scoping meeting.

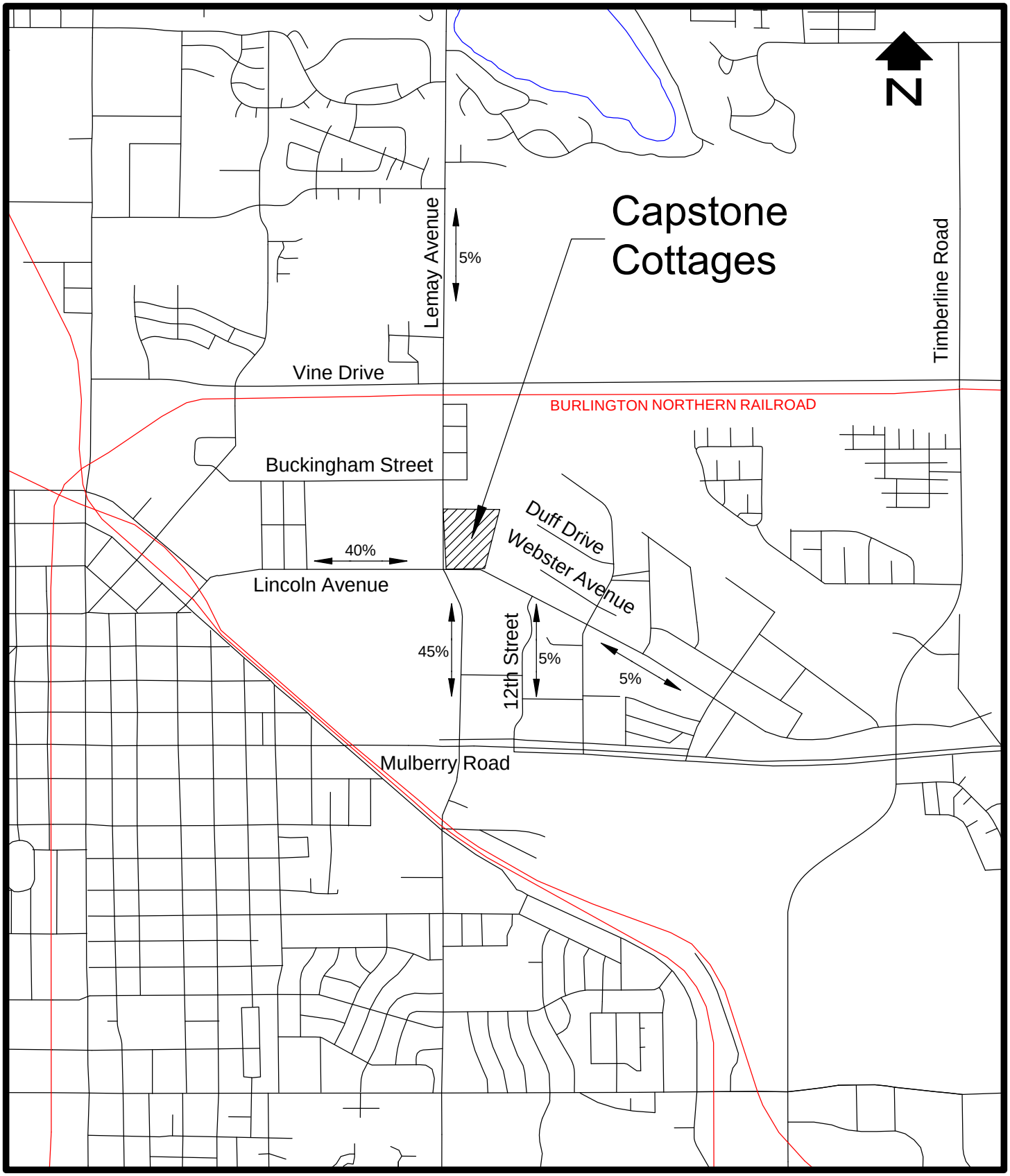
Background Traffic Projections

Figure 7 shows the short range (2019) background peak hour traffic projections. These forecasts assume that the current street network exists in this area. Background traffic projections for the short range were obtained by reviewing the North Front Range Regional Transportation Plan, engineering judgment, and various traffic studies prepared for this area of Fort Collins. Based upon these sources, it was determined that the traffic volumes would increase by approximately 1.5 percent per year. The Waterfield and Woodward Governor developments were added to the background traffic. The Lemay/Vine intersection traffic was increased due to approved projects in the area that are yet to be built or built out. This data was provided by Fort Collins City staff. While the north leg of the Lincoln/International intersection will be built with this development, the connection to Duff Drive and Webster Avenue will enable some traffic to/from the industrial park to have an alternative route to Lincoln Avenue. This is reflected in Figure 7.

Figure 8 shows the long range (2035) background peak hour traffic projections. This reflects completion of the Lemay Avenue overpass and completion of International Boulevard, as shown in the Fort Collins Master Street Plan.

Trip Assignment

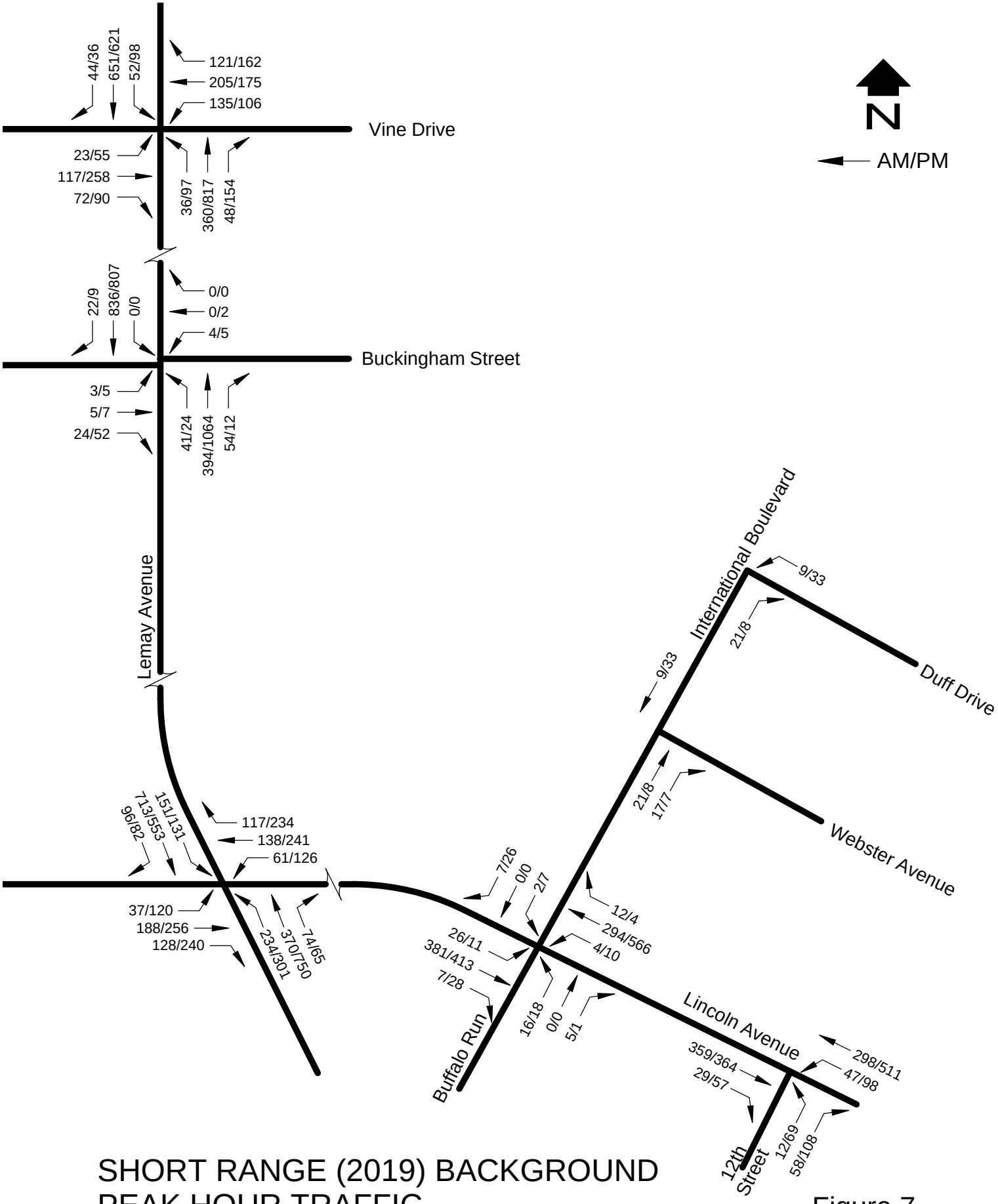
Trip assignment is how the generated and distributed trips are expected to be loaded on the street system. The assigned trips are the resultant of the trip distribution process. It is not likely that residents of the Capstone Cottages development would go east on either Duff Drive or Webster Avenue to go to their primary peak hour destination (Colorado State University). This would require out of direction travel which would result in longer travel time. While there may be limited attractions (Miramont Gym, for example) within the industrial park that may be used by the Capstone residents, it is not likely that these trips would occur in the peak hours. Figures 9 and 10 show the respective short range (2019) and long range (2035) site generated peak hour traffic assignment. Figures 11 and 12 show the respective short range (2019) and long range (2035) total (site plus background) peak hour traffic assignment.



SCALE: 1"=2000'

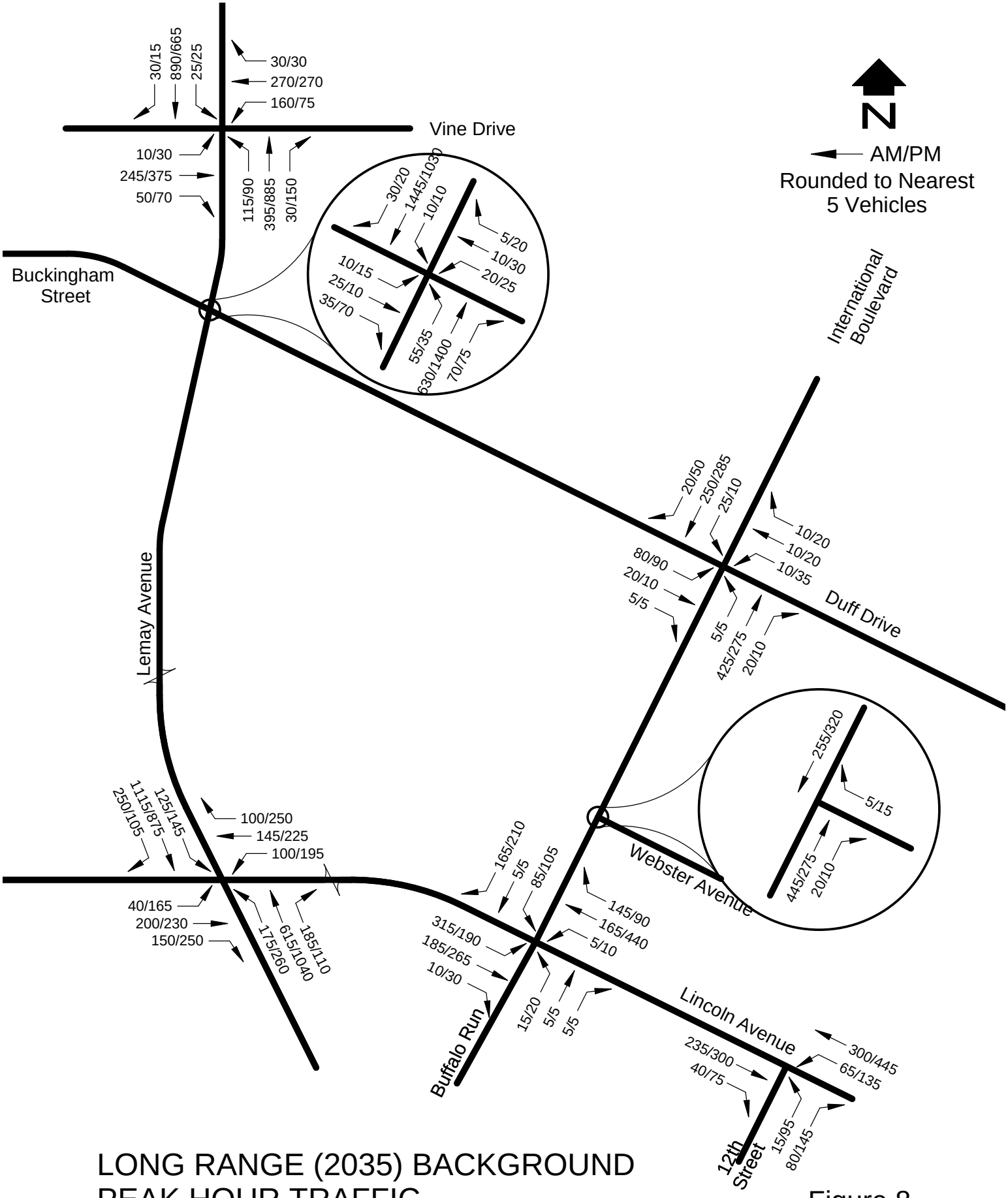
TRIP DISTRIBUTION

Figure 6



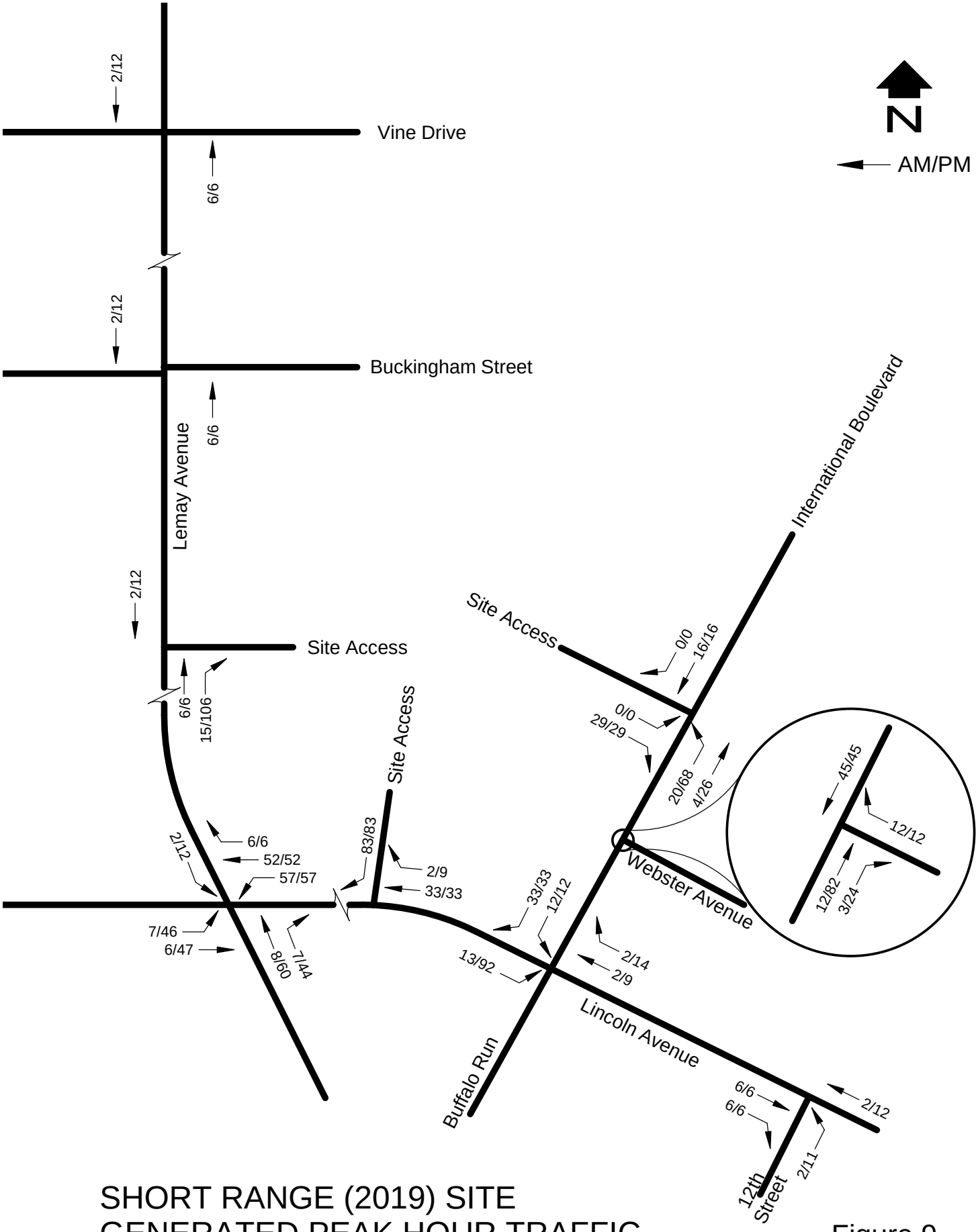
SHORT RANGE (2019) BACKGROUND PEAK HOUR TRAFFIC

Figure 7



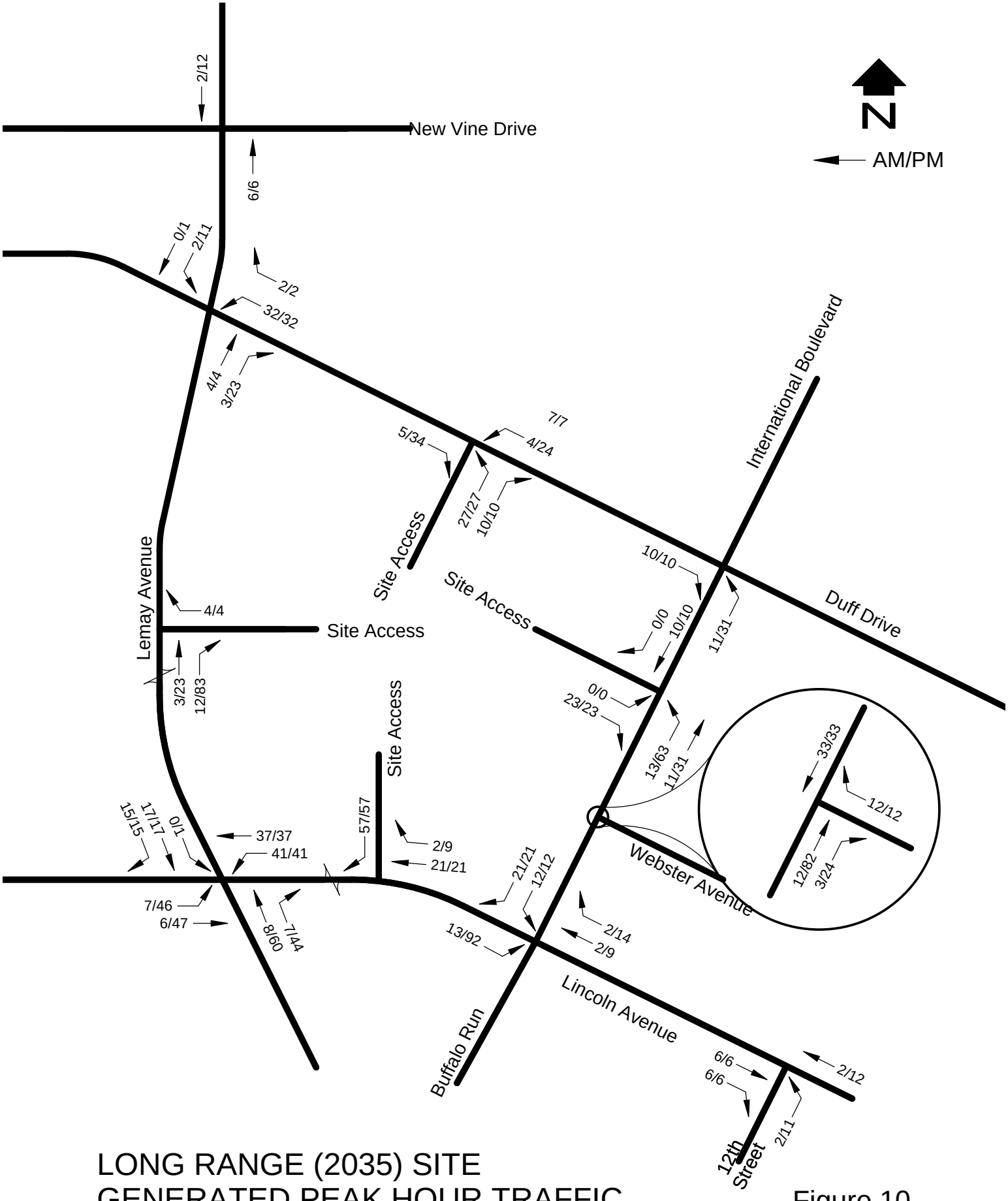
LONG RANGE (2035) BACKGROUND
PEAK HOUR TRAFFIC

Figure 8



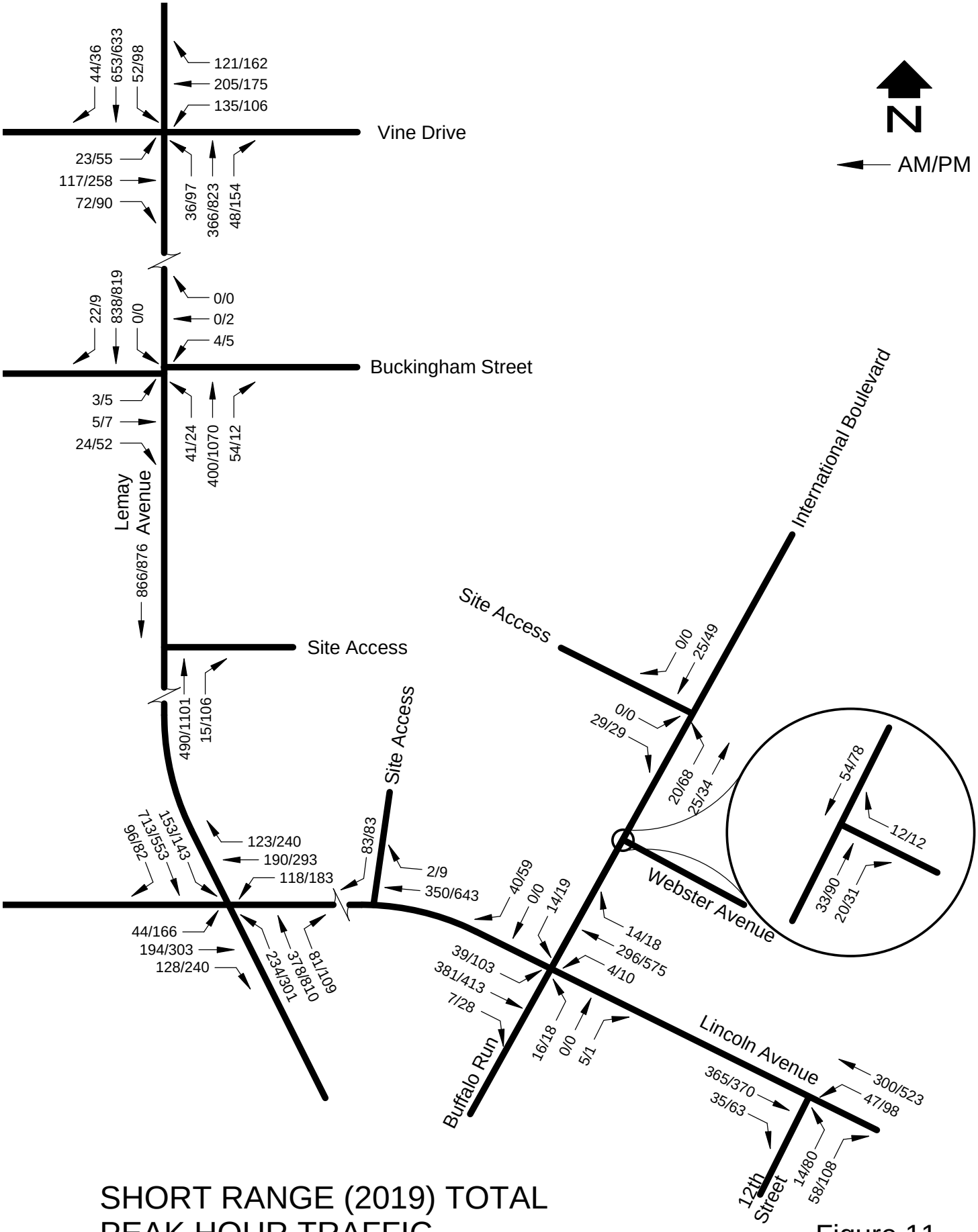
SHORT RANGE (2019) SITE GENERATED PEAK HOUR TRAFFIC

Figure 9



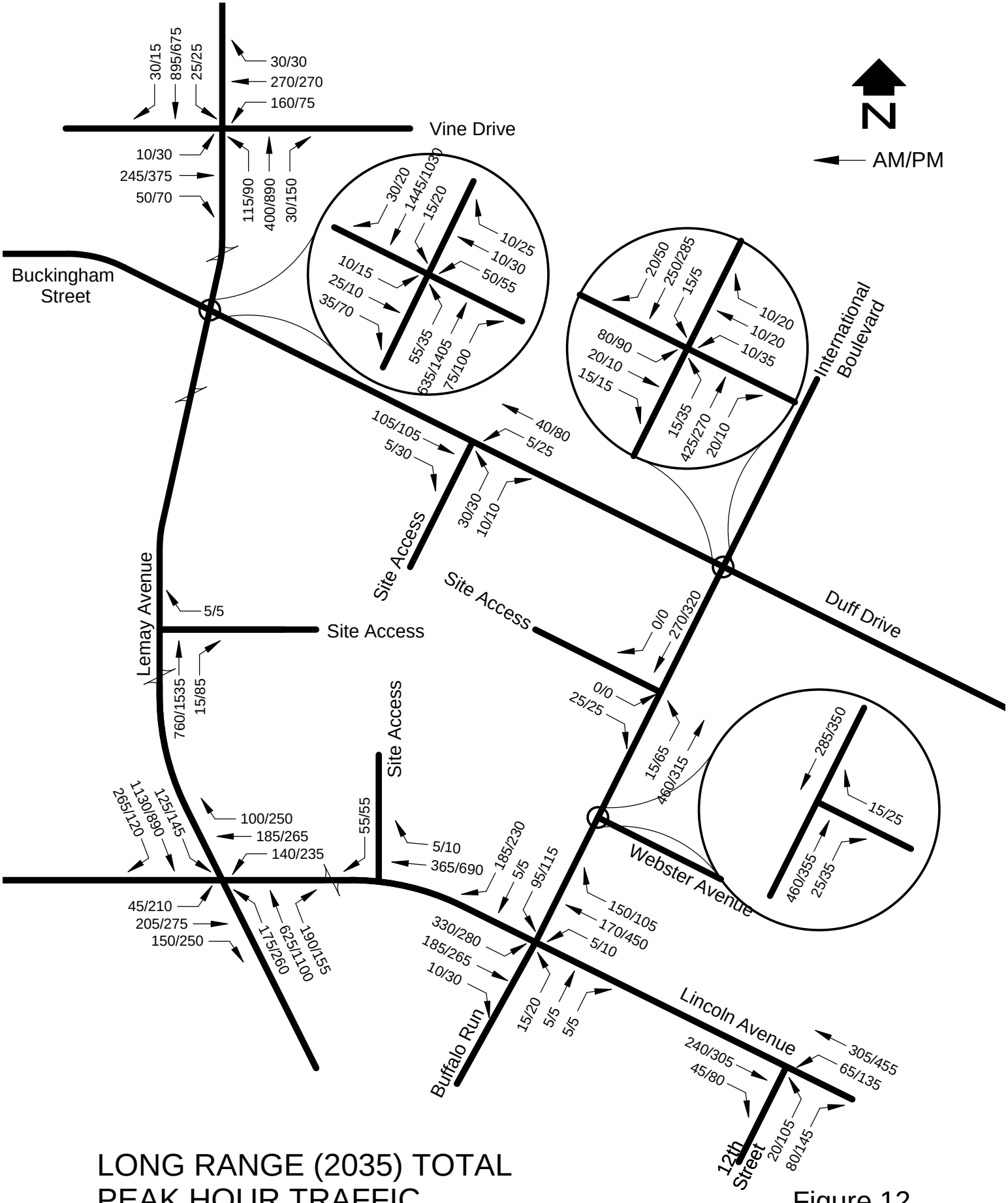
LONG RANGE (2035) SITE GENERATED PEAK HOUR TRAFFIC

Figure 10



SHORT RANGE (2019) TOTAL PEAK HOUR TRAFFIC

Figure 11



LONG RANGE (2035) TOTAL PEAK HOUR TRAFFIC

Figure 12

Signal Warrants

As a matter of policy, traffic signals are not installed at any location unless warrants are met according to the Manual on Uniform Traffic Control Devices. For the streets in the vicinity of the Capstone Cottages development, four hour and/or eight hour signal warrants are applicable. These warrants require much data and are applied when the traffic is actually on the area street system. It is acknowledged that peak hour signal warrants should not be applied, but since the peak hour forecasts are readily available in a traffic impact study, it is reasonable to use them to get an idea whether other signal warrants may be met. If peak hour signal warrants will not be met at a given intersection, it is reasonable to conclude that it is not likely that other signal warrants would be met. If peak hour signal warrants are met, it merely indicates that further evaluation should occur in the future as the development occurs. However, a judgment can be made that some intersections will likely meet other signal warrants.

Using the short range (2019) total peak hour traffic (Figure 11), none of the key unsignalized intersections will meet the lower threshold volume for the minor street approach (100 vehicles).

Using the long range (2035) total peak hour traffic (Figure 11), the peak hour signal warrant will not be met at the Lemay/Buckingham-Duff intersection. However, this intersection may be signalized in the long range (2035) future per discussions with the Traffic Operations staff. Therefore, the Lincoln/Buckingham-Duff intersection was analyzed with stop sign and signal control in the long range (2035) future. The peak hour signal warrant analyses are provided in Appendix D.

Operation Analysis

In the short range (2019) future, capacity analyses were performed at the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham, Lemay/Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, and International/Site Access intersections. The following operations tables reflect the level of service and the calculated delay for levels for service E and F. In the long range (2035) future, capacity analyses were performed at the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, International/Duff, and Duff/Site Access intersections. The Lincoln/International-Buffalo Run Access intersection was analyzed as a roundabout in the short range and long range futures.

Using the traffic volumes shown in Figure 7, the Lemay/Lincoln, Lemay/Buckingham, Lemay/Vine, Lincoln/International-Buffalo Run Access, Lincoln/12th, and International/Webster intersections operate in the short range (2019) background traffic future as indicated in Table 3. Calculation forms for these analyses are provided in Appendix E. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for the

TABLE 3 Short Range (2019) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	A	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	E (66.7 secs)	B
	NB T	B	C
	NB RT	A	B
	NB APPROACH	C	C
	SB LT	A	B
	SB T/RT	D	A
	SB APPROACH	D	B
	OVERALL	D	C
Lemay/Buckingham (stop sign)	EB LT/T/RT	D	E (42.3 secs)
	WB LT/T/RT	F (61.8 secs)	F (137.7 secs)
	NB LT/T/RT	B	A
	SB LT/T/RT	A	A
Lemay/Vine (signal)	EB LT	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPROACH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C	D
Lincoln/International-Buffalo Run (roundabout)	EB LT/T/RT	A	A
	WB LT/T/RT	A	B
	NB LT/T/RT	A	A
	SB LT/T/RT	A	A
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/T	B	D
International/Webster (stop sign)	WB RT	A	A

Lemay/Vine intersection in the afternoon peak hour and the Lemay/Buckingham intersection in the morning and afternoon peak hours. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour westbound left-turn will be commensurate with level of service F. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach was commensurate with level of service F in the morning and afternoon peak hours. Although the Lemay/Buckingham intersection operates at this level of service, a signal is not warranted in the short range (2019) future.

Using the traffic volumes shown in Figure 8, the Lemay/Lincoln, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, and International/Duff intersections operate in the long range (2035) background traffic future as indicated in Table 4. Calculation forms for these analyses are provided in Appendix F. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours with signal control at the Lemay/Buckingham-Duff intersection.

Using the traffic volumes shown in Figure 11, the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham, Lemay/Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, and International/Site Access intersections operate in the short range (2019) total traffic future as indicated in Table 5. Calculation forms for these analyses are provided in Appendix G. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for Lemay/Buckingham intersection in the morning and afternoon peak hours. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour westbound left-turn will be commensurate with level of service F. However, this project does not have a significant negative impact at the Lemay/Vine intersection since the project traffic causes less than a two percent increase in the intersection delay. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach will be commensurate with level of service F in the morning and afternoon peak hours. In an urban environment, along arterial streets, this level of delay is normal during the peak hours. No site generated traffic is added to the movements that operate at level of service F. Although the Lemay/Buckingham intersection operates at this level of service, a signal is not warranted in the short range (2019) future. However, a southbound only access from Buckingham to Duff Drive will be installed with this development which will give motorists from the neighborhood to the north the ability to avoid this intersection.

Using the traffic volumes shown in Figure 12, the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, and International/Duff intersections operate in the long range (2035) total traffic future as indicated in Table 6. Calculation forms for these analyses are provided in Appendix H. The key intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during morning and afternoon peak hours with signal control at the Lemay/Buckingham-Duff intersection.

TABLE 4 Long Range (2035) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	B	B
	NB T	B	C
	NB RT	B	B
	NB APPROACH	B	B
	SB LT	A	B
	SB T	D	A
	SB RT	C	A
	SB APPROACH	C	A
	OVERALL	C	C
Lemay/Buckingham-Duff (stop sign)	EB LT	F (242.1 secs)	F (- secs)
	EB T/RT	F (191.5 secs)	F (74.4 secs)
	EB APPROACH	F (198.7 secs)	F (- secs)
	WB LT	F (527.1 secs)	F (966.7 secs)
	WB T/RT	F (116.3 secs)	F (532.4 secs)
	WB APPROACH	F (351.0 secs)	F (677.2 secs)
	NB LT	B	B
	SB LT	A	B
Lemay/Buckingham-Duff (signal)	EB LT	C	C
	EB T/RT	C	C
	EB APPROACH	C	C
	WB LT	C	C
	WB RT	C	C
	WB APPROACH	C	C
	NB LT	A	A
	NB T	A	A
	NB RT	A	A
	NB APPROACH	A	A
	SB LT	A	A
	SB T	A	A
	SB RT	A	A
	SB APPROACH	A	A
	OVERALL	A	A

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TABLE 4
Long Range (2035) Background Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
Lemay/New Vine (signal)	EB LT	D	C
	EB T	E	D
	EB RT	D	C
	EB APPROACH	D	D
	WB LT	D	C
	WB T	D	D
	WB RT	C	C
	WB APPROACH	D	D
	NB LT	B	B
	NB T	B	B
	NB RT	B	B
	NB APPROACH	B	B
	SB LT	B	B
	SB T	B	B
	SB RT	B	B
	SB APPROACH	B	C
	OVERALL	C	C
Lincoln/International-Buffalo Run (roundabout)	EB LT/T/RT	B	B
	WB LT/T/RT	B	B
	NB LT/T/RT	A	A
	SB LT/T/RT	A	B
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/RT	B	D
International/Webster (stop sign)	WB RT	B	A
International/Duff (stop sign)	EB LT	C	C
	EB T/RT	C	B
	EB APPROACH	C	C
	WB LT	C	C
	WB T/RT	B	B
	WB APPROACH	C	B
	NB LT	A	A
	SB LT	A	A

TABLE 5 Short Range (2019) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	D
	EB RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	D	D
	WB APPROACH	D	D
	NB LT	E (73.2 secs)	B
	NB T	B	D
	NB RT	B	B
	NB APPROACH	D	C
	SB LT	B	C
	SB T/RT	D	A
	SB APPROACH	D	A
	OVERALL	D	C
Lemay/Buckingham (stop sign)	EB LT/T/RT	D	E (44.7 secs)
	WB LT/T/RT	F (63.7 secs)	F (148.0 secs)
	NB LT/T/RT	B	A
	SB LT/T/RT	A	A
Lemay/Vine (signal)	EB LT	D	D
	EB T/RT	D	D
	EB APPROACH	D	D
	WB LT	D	F (166.7 secs)
	WB T/RT	D	D
	WB APPROACH	D	E (75.0 secs)
	NB LT/T/RT	A	D
	SB LT/T/RT	B	C
	OVERALL	C	D
Lincoln/Site Access (RT-in/RT-out)	SB RT	B	C
Lincoln/International-Buffalo Run (roundabout)	NB LT/T/RT	A	B
	SB LT/T/RT	A	C
	EB LT/T/RT	A	A
	EB LT/T/RT	A	A
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/T	B	D
International/Webster (stop sign)	WB RT	A	A
International/Site Access (stop sign)	EB LT/RT	A	A
	NB LT/T	A	A

TABLE 6 Long Range (2035) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Lemay/Lincoln (signal)	EB LT	D	D
	EB T	D	E (59.8 secs)
	EB RT	D	D
	EB APPROACH	D	D
	WB LT	D	D
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	C	C
	NB T	B	C
	NB RT	B	B
	NB APPROACH	B	C
	SB LT	B	C
	SB T	D	D
	SB T	C	C
	SB APPROACH	C	D
	OVERALL	C	D
Lemay/Buckingham-Duff (stop sign)	EB LT	F (256.6 secs)	F (- secs)
	EB T/RT	F (203.4 secs)	F (80.5 secs)
	EB APPROACH	F (211.0 secs)	F (- secs)
	WB LT	F (1272.2 secs)	F (2135.4 secs)
	WB T/RT	F (96.6 secs)	F (568.4 secs)
	WB APPROACH	F (910.5 secs)	F (1351.9 secs)
	NB LT	B	B
	SB LT	A	B
Lemay/Buckingham-Duff (signal)	EB LT/T	C	C
	EB RT	C	C
	EB APPROACH	C	C
	WB LT	C	C
	WB RT	C	C
	WB APPROACH	C	C
	NB LT	A	A
	NB T	A	A
	NB RT	A	A
	NB APPROACH	A	A
	SB LT	A	A
	SB T	A	A
	SB RT	A	A
	SB APPROACH	A	A
	OVERALL	A	A

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TABLE 6
Long Range (2035) Total Peak Hour Operation

Intersection	Movement	Level of Service	
		AM	PM
Lemay/Site Access (stop sign)	WB RT	B	C
Lemay/New Vine (signal)	EB LT	D	C
	EB T	E	D
	EB RT	D	C
	EB APPROACH	D	D
	WB LT	D	C
	WB T	D	D
	WB RT	C	C
	WB APPROACH	D	D
	NB LT	B	B
	NB T	B	A
	NB RT	B	A
	NB APPROACH	B	A
	SB LT	B	B
	SB T	B	B
	SB RT	B	B
	SB APPROACH	B	B
	OVERALL	C	B
Lincoln/Site Access (stop sign)	SB RT	B	B
Lincoln/International-Buffalo Run (roundabout)	EB LT/T/RT	B	B
	WB LT/T/RT	B	C
	NB LT/T/RT	A	A
	SB LT/T/RT	A	B
Lincoln/12th (stop sign)	WB LT/T	A	A
	NB LT/RT	B	E (38.1 secs)
International/Webster (stop sign)	WB RT	B	B
International/Site Access (stop sign)	EB LT/RT	B	B
	NB LT	A	A
International/Duff (stop sign)	EB LT	C	C
	EB T/RT	B	B
	EB APPROACH	C	C
	WB LT	C	C
	WB T/RT	B	B
	WB APPROACH	C	C
	NB LT	A	A
	SB LT	A	A

Vine/Lemay Adequate Public Facilities

Proposed developments in Northeast Fort Collins are required to address the operation at the Vine/Lemay intersection. This intersection has operational and geometric constraints that may create an adequate public facilities (APF) issue. Succinctly, if this intersection does not meet the overall level of service (LOS) criteria, then a development may add traffic such that the overall intersection delay is not increased by more than 2 percent over the base condition. The intersection falls under the operational criteria of "All other areas." In this area, acceptable operation at signalized intersections during the peak hours is defined as level of service D or better for the overall intersection.

City of Fort Collins Traffic Operations staff has developed the base condition. The base condition is described as the current traffic (2012) plus traffic from those development projects that have a commitment at this intersection. Figure 7 shows the base condition peak hour traffic. Table 3 shows the operation at the Vine/Lemay intersection with the base condition traffic and using the 2000 Highway Capacity Manual techniques. In the morning and afternoon peak hours, this intersection meets the overall level of service criteria. Therefore, under the base condition, there is not an APF issue at this intersection.

Figure 11 shows the base condition plus the site traffic at the Vine/Lemay intersection. Table 5 shows the base condition plus site traffic operation at the Vine/Lemay intersection. In the morning and afternoon peak hours, this intersection continues to meet the overall level of service criteria. Therefore, there is not an APF issue at this intersection.

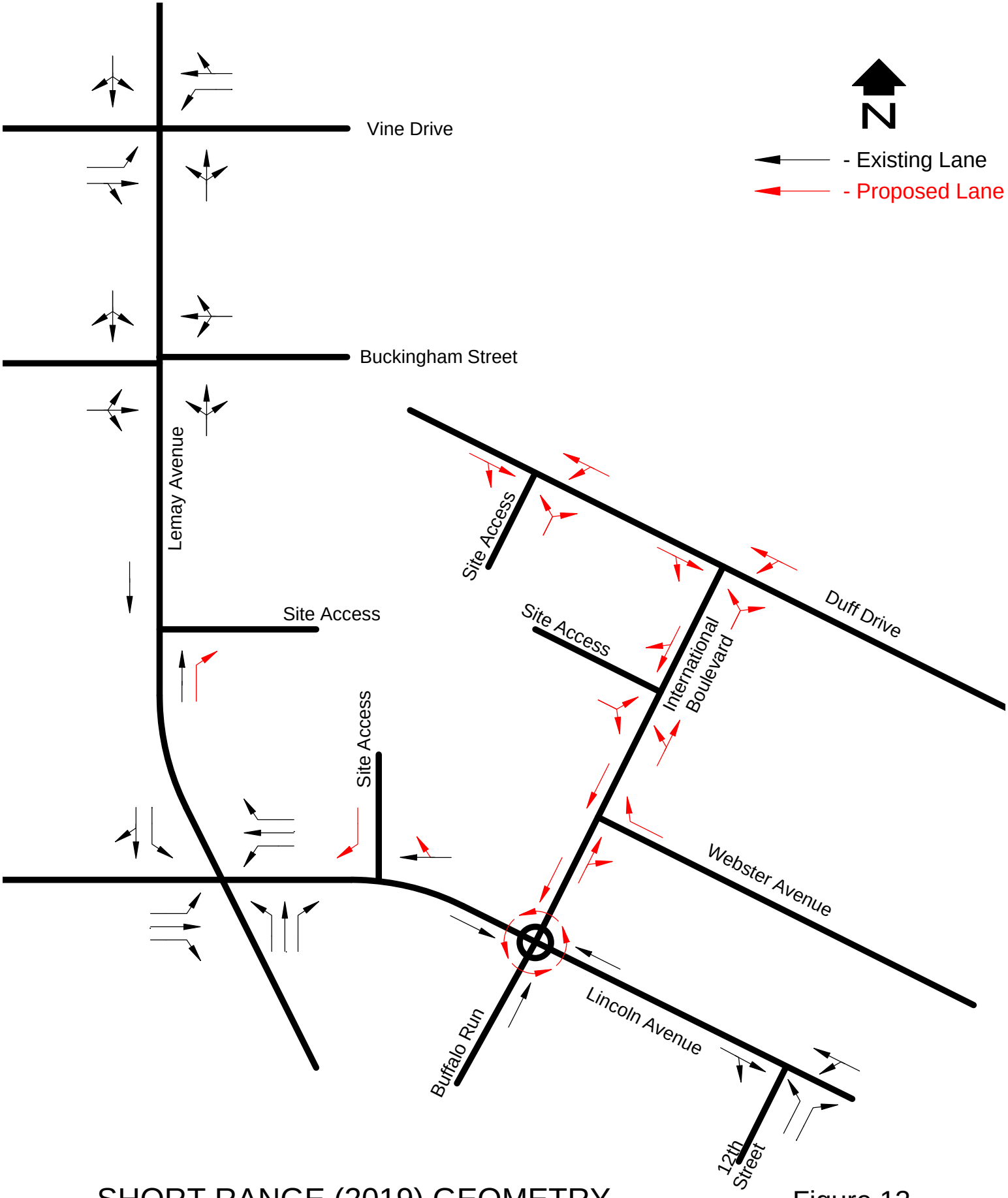
Geometry

Figure 13 shows a schematic of the short range (2019) geometry. This is existing geometry at the existing key intersections. At the Lemay/Site Access intersection, the approach volumes on Lemay Avenue meet the right-turn lane criteria in LCUASS, Figure 8-4. This project does not add traffic to other required lanes based on LCUASS.

Figure 14 shows a schematic of the long range (2035) geometry. In the long range (2035) future, it is expected that Lemay Avenue will be realigned north of the Lemay/Lincoln intersection and have two through lanes in each direction.

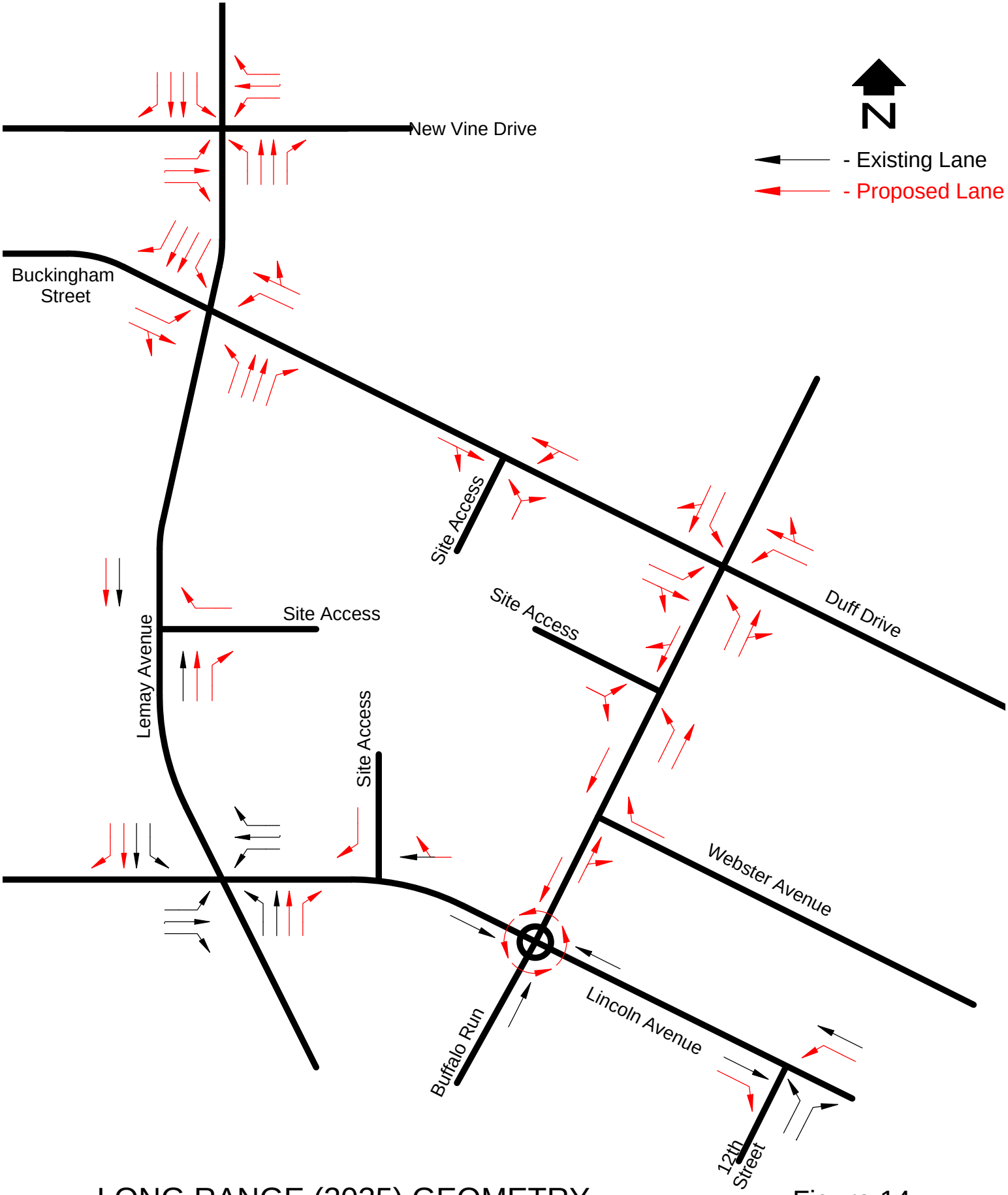
Pedestrian Level of Service

Appendix I shows a map of the area that is within 1320 feet of the Capstone Cottages development. There are four pedestrian destinations within 1320 feet of the Capstone Cottages development. These are: 1) the commercial area to the west of this site; 2) the residential area (Buffalo Run) and commercial (Walmart) areas to the south of this site; 3) the residential (Anderson Place/San Cristo) area to the north of this site;



SHORT RANGE (2019) GEOMETRY

Figure 13



LONG RANGE (2035) GEOMETRY

Figure 14

and 4) the industrial area to the east of this site. The Capstone Cottages site is located within an area termed as “transit corridor,” which sets the level of service threshold at LOS B for directness and security and LOS C for all other measured categories. Pedestrian level of service is achieved for pedestrian destinations. The Pedestrian LOS Worksheet is provided in Appendix I. Duff Drive and Webster Avenue, within the industrial area, do not have sidewalks. This industrial area is located outside of the Fort Collins city limits and has been in existence for decades. The practical limits of pedestrian improvements would be on and adjacent to the Capstone Cottages site itself. Capstone Cottages will have a sidewalk connection to the Anderson Place/San Cristo neighborhoods at the Buckingham and Duff Drive access.

Bicycle Level of Service

Appendix I shows a map of the area that is within 1320 feet of the Capstone Cottages development. There is one bicycle destination within 1320 feet of the Capstone Cottages development, the commercial to the south. The Bicycle LOS Worksheet is provided in Appendix I. The minimum level of service for this site is C. This site is connected to bike lanes on Lemay Avenue and Lincoln Avenue. Therefore, it is concluded that level of service A can be achieved.

Transit Level of Service

This area of Fort Collins is served by Transfort Routes 5 and 14.

IV. CONCLUSIONS

This study assessed the impacts of the Capstone Cottages on the street system in the vicinity of the proposed development in the short range (2019) and long range (2035) futures. As a result of this analysis, the following is concluded:

- The development of the Capstone Cottages is feasible from a traffic engineering standpoint. The Capstone Cottages development will generate approximately 2280 daily trips, 163 morning peak hour trip ends, and 361 afternoon peak hour trip ends.

- Current operation at the Lemay/Lincoln, Lemay/Vine, Lincoln/Buffalo Run, and Lincoln/12th intersections meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours. The Lemay/Buckingham intersection does not meet the standard in the afternoon peak hour.

- Using the short range (2019) total peak hour traffic forecasts, the peak hour signal warrant will not likely be met at any of the key unsignalized intersections. Using the long range (2035) total peak hour traffic forecasts, the peak hour signal warrant will not be met at the Lemay/Buckingham-Duff intersection. However, this intersection may be signalized in the long range (2035) future per discussions with the Traffic Operations staff.

- In the short range (2019) future, given development of the Capstone Cottages and an increase in background traffic, the Lincoln/Lemay, Lemay/Site Access, Lemay/Buckingham, Lemay/Vine, Lincoln/Site Access, Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, and International/Duff intersections will meet the City of Fort Collins Motor Vehicle LOS Standard during the morning and afternoon peak hours, except for the Lemay/Buckingham intersection in the morning and afternoon peak hours. At the Lemay/Vine intersection, the calculated delay for the afternoon peak hour westbound left-turn will be commensurate with level of service F. However, this project does not have a significant negative impact at the Lemay/Vine intersection since the project traffic causes less than a two percent increase in the intersection delay. At the Lemay/Buckingham intersection, the calculated delay for the westbound approach will be commensurate with level of service F in the morning and afternoon peak hours. In an urban environment, along arterial streets, this level of delay is normal during the peak hours. No site generated traffic is added to the movements that operate at level of service F. Although the Lemay/Buckingham intersection operates at this level of service, a signal is not warranted in the short range (2019) future. However, a southbound only access from Buckingham to Duff Drive will be installed with this development which will give motorists from the neighborhood to the north the ability to avoid this intersection.

- In the long range (2035) future, given development of the Capstone Cottages and an increase in background traffic, the Lemay/Lincoln, Lemay/Site Access, Lemay/Buckingham-Duff, Lemay/New Vine, Lincoln/Site Access,

Lincoln/International-Buffalo Run Access, Lincoln/12th, International/Webster, International/Site Access, and International/Duff intersections will meet the City of Fort Collins Motor Vehicle LOS Standard with signal control at the Lemay/Buckingham-Duff intersection.

- The Lemay/Vine intersection meets the overall level of service criteria with the short range (2019) total traffic. Therefore, there is not an APF issue at the Lemay/Vine intersection.

- The short range (2019) geometry is shown in Figure 13. The long range (2035) geometry is shown in Figure 14.

- Acceptable level of service is achieved for pedestrian, bicycle, and transit modes based upon the measures in the multi-modal transportation guidelines and future improvements to the street system in the area. The practical limits of pedestrian improvements would be on and adjacent to the Capstone Cottages site itself.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	360	48	52	651	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1884			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1685			1838	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	424	56	61	766	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	518	0	0	877	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1128			1239	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.31			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.46			0.71	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.6			11.1	
Progression Factor	1.00	1.00		1.00	1.00			0.82			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.3			3.4	
Delay (s)	38.3	35.9		54.2	45.9			8.4			14.6	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			8.4			14.6	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	817	154	98	621	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1873			1959	
Flt Permitted	0.23	1.00		0.21	1.00			0.86			0.74	
Satd. Flow (perm)	436	1974		400	1905			1619			1453	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	860	162	103	654	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	2	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1119	0	0	793	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1092			986	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.69			0.55	
v/c Ratio	0.53	0.71		1.11	0.68			1.02			0.80	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			13.6	
Progression Factor	1.00	1.00		1.00	1.00			0.70			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			29.1			7.0	
Delay (s)	49.5	47.5		166.7	46.0			42.7			20.6	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			42.7			20.6	
Approach LOS		D			E			D			C	

Intersection Summary

HCM 2000 Control Delay	42.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	366	48	52	653	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1884			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1687			1837	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	431	56	61	768	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	525	0	0	879	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1130			1239	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.31			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.46			0.71	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.7			11.2	
Progression Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.3			3.5	
Delay (s)	38.3	35.9		54.2	45.9			9.6			14.6	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			9.6			14.6	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	823	154	98	633	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1873			1959	
Flt Permitted	0.23	1.00		0.21	1.00			0.86			0.74	
Satd. Flow (perm)	436	1974		400	1905			1617			1456	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	866	162	103	666	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	2	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1125	0	0	805	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1091			988	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.70			0.55	
v/c Ratio	0.53	0.71		1.11	0.68			1.03			0.82	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			13.8	
Progression Factor	1.00	1.00		1.00	1.00			0.60			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			29.2			7.4	
Delay (s)	49.5	47.5		166.7	46.0			40.9			21.2	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			40.9			21.2	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	42.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	373	48	52	654	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1885			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1690			1835	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	439	56	61	769	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	533	0	0	880	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1132			1237	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.32			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.47			0.71	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.7			11.2	
Progression Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.3			3.5	
Delay (s)	38.3	35.9		54.2	45.9			9.6			14.7	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			9.6			14.7	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	830	154	98	644	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1873			1959	
Flt Permitted	0.23	1.00		0.21	1.00			0.86			0.74	
Satd. Flow (perm)	436	1974		400	1905			1614			1458	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	874	162	103	678	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	2	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1133	0	0	817	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1089			990	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.70			0.56	
v/c Ratio	0.53	0.71		1.11	0.68			1.04			0.83	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			14.1	
Progression Factor	1.00	1.00		1.00	1.00			0.61			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			32.3			7.8	
Delay (s)	49.5	47.5		166.7	46.0			44.1			21.9	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			44.1			21.9	
Approach LOS		D			E			D			C	

Intersection Summary			
HCM 2000 Control Delay	43.3	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	107.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	379	48	52	656	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1885			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1691			1834	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	446	56	61	772	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	540	0	0	883	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1132			1237	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.32			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.48			0.71	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.8			11.2	
Progression Factor	1.00	1.00		1.00	1.00			0.94			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.4			3.5	
Delay (s)	38.3	35.9		54.2	45.9			9.6			14.8	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			9.6			14.8	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	836	154	98	656	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1874			1960	
Flt Permitted	0.23	1.00		0.21	1.00			0.86			0.74	
Satd. Flow (perm)	436	1974		400	1905			1611			1461	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	880	162	103	691	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	1	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1139	0	0	831	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1087			992	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.71			0.57	
v/c Ratio	0.53	0.71		1.11	0.68			1.05			0.84	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			14.3	
Progression Factor	1.00	1.00		1.00	1.00			0.61			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			34.8			8.4	
Delay (s)	49.5	47.5		166.7	46.0			46.8			22.7	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			46.8			22.7	
Approach LOS		D			E			D			C	

Intersection Summary

HCM 2000 Control Delay	44.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	107.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	386	48	52	658	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1886			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1694			1833	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	454	56	61	774	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	548	0	0	885	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1134			1236	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.32			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.48			0.72	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.9			11.3	
Progression Factor	1.00	1.00		1.00	1.00			0.93			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.4			3.6	
Delay (s)	38.3	35.9		54.2	45.9			9.7			14.8	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			9.7			14.8	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	843	154	98	667	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1874			1960	
Flt Permitted	0.23	1.00		0.21	1.00			0.85			0.74	
Satd. Flow (perm)	436	1974		400	1905			1609			1462	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	887	162	103	702	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	1	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1146	0	0	842	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1086			992	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.71			0.58	
v/c Ratio	0.53	0.71		1.11	0.68			1.06			0.85	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			14.6	
Progression Factor	1.00	1.00		1.00	1.00			0.62			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			37.5			9.0	
Delay (s)	49.5	47.5		166.7	46.0			49.5			23.6	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			49.5			23.6	
Approach LOS		D			E			D			C	

Intersection Summary

HCM 2000 Control Delay	45.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.07		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	108.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX A

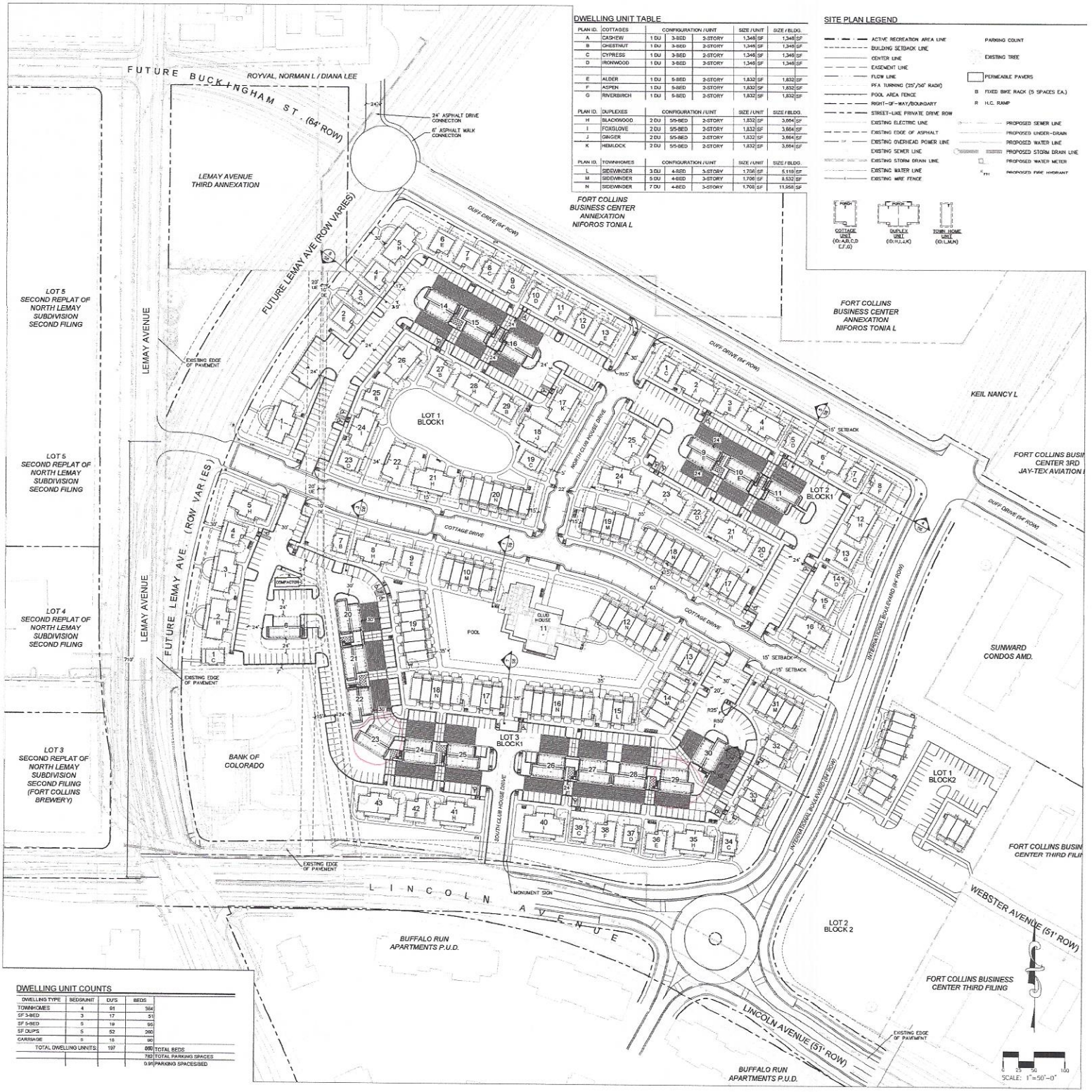
Attachment "A"
Transportation Impact Study
Base Assumptions

Project Information			
Project Name: Capstone Student Housing			
Project Location: northeast quadrant of Lemay Avenue/ Lincoln Avenue			
TIS Assumptions			
Type of Study	Full: Yes	Intermediate: No	
Study Area Boundaries	North: Vine Drive	South: Lincoln Avenue	
	East: International Blvd	West: Lemay Avenue	
Study Years	Short Range: 2019	Long Range: 2035	
Future Traffic Growth Rate	1.5% per year		
Study Intersections	1. Lemay/Lincoln	5. Lemay/vine	
	2. Lemay/Buckingham-Duff	6. Site Accesses	
	3. Lincoln/International	7.	
	4. International/Duff	8.	
Time Period for Study	AM: 7:00-9:00	PM: 4:00-6:00	Sat Noon:
Trip Generation Rates	Per City Data		
Trip Adjustment Factors	Passby: N/A	Captive Market: N/A	
Overall Trip Distribution	See Attached		
Mode Split Assumptions	N/A		
Committed Roadway Improvements	None Known		
Other Traffic Studies	Waterfield, Woodward		
Areas Requiring Special Study	APF at the Lemay/Vine intersection Roundabout analysis		

Date: November 18, 2014

Traffic Engineer: Delich Associates

Local Entity Engineer: 11.24.14



DWELLING UNIT TABLE

PLAN ID.	COTTAGES	CONFIGURATION / UNIT			SIZE / UNIT	SIZE / BLDG.
A	CASHEW	1 DU	3-BED	2-STORY	1,348 SF	1,348 SF
B	CHESTNUT	1 DU	3-BED	2-STORY	1,348 SF	1,348 SF
C	CYPRESS	1 DU	3-BED	2-STORY	1,348 SF	1,348 SF
D	IRONWOOD	1 DU	3-BED	2-STORY	1,348 SF	1,348 SF
E	ALDER	1 DU	5-BED	2-STORY	1,832 SF	1,832 SF
F	ASPEN	1 DU	5-BED	2-STORY	1,832 SF	1,832 SF
G	RIVERBIRCH	1 DU	5-BED	2-STORY	1,832 SF	1,832 SF

PLAN ID.	DUPLEXES	CONFIGURATION / UNIT			SIZE / UNIT	SIZE / BLDG.
H	BLACKWOOD	2 DU	5/5-BED	2-STORY	1,832 SF	3,664 SF
I	FOXGLOVE	2 DU	5/5-BED	2-STORY	1,832 SF	3,664 SF
J	GINGER	2 DU	5/5-BED	2-STORY	1,832 SF	3,664 SF
K	HEMLOCK	2 DU	5/5-BED	2-STORY	1,832 SF	3,664 SF

PLAN ID.	TOWNHOMES	CONFIGURATION / UNIT			SIZE / UNIT	SIZE / BLDG.
L	SIDEWINDER	3 DU	4-BED	3-STORY	1,706 SF	5,119 SF
M	SIDEWINDER	5 DU	4-BED	3-STORY	1,706 SF	8,532 SF
N	SIDEWINDER	7 DU	4-BED	3-STORY	1,708 SF	11,958 SF

SITE PLAN LEGEND

- ACTIVE RECREATION AREA LINE
- BUILDING SETBACK LINE
- CENTER LINE
- EASEMENT LINE
- FLOW LINE
- FFA TURNING (25'/50' RADII)
- POOL AREA FENCE
- RIGHT-OF-WAY/BOUNDARY
- STREET-LIKE PRIVATE DRIVE ROW
- EXISTING ELECTRIC LINE
- EXISTING EDGE OF ASPHALT
- EXISTING OVERHEAD POWER LINE
- EXISTING SEWER LINE
- EXISTING STORM DRAIN LINE
- EXISTING WATER LINE
- EXISTING WIRE FENCE
- PARKING COUNT
- EXISTING TREE
- PERMEABLE PAVERS
- B FIXED BIKE RACK (5 SPACES EA.)
- R H.C. RAMP
- PROPOSED SEWER LINE
- PROPOSED UNDER-DRAIN
- PROPOSED WATER LINE
- PROPOSED STORM DRAIN LINE
- PROPOSED WATER METER
- PROPOSED FIRE HYDRANT

COTTAGE UNIT (10: A,B,C,D E,F,G)

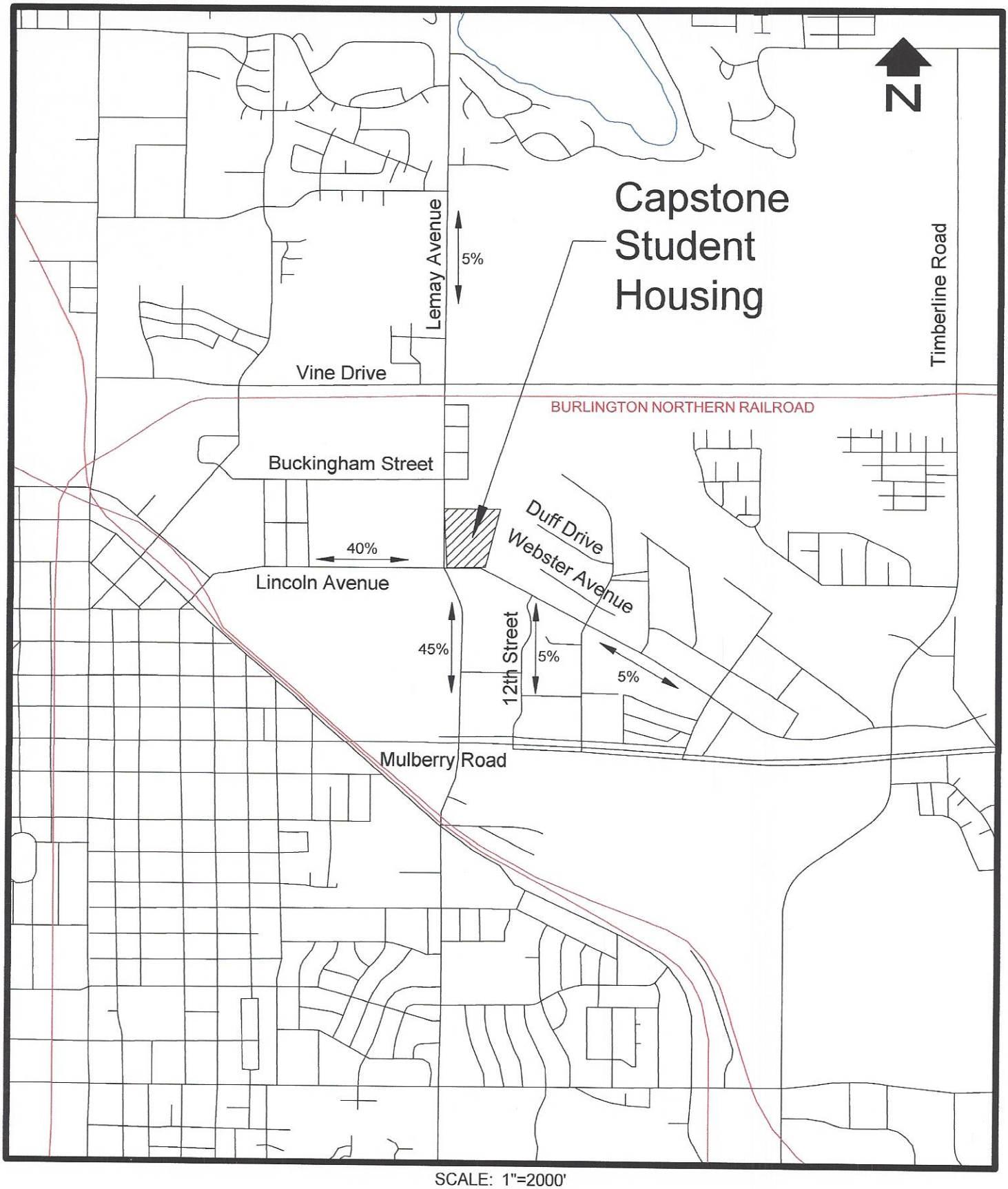
DUPLEX UNIT (5: H,I,J,K)

TOWN HOME UNIT (3: L,M,N)

DWELLING UNIT COUNTS

DWELLING TYPE	BEDS/UNIT	DU'S	BEDS	
TOWNHOMES	4	91	364	
SF 3-BED	3	17	51	
SF 5-BED	5	19	95	
SF DUPS	5	52	260	
GARAGE	0	18	69	
TOTAL DWELLING UNITS:		197	699	TOTAL BEDS
			780	TOTAL PARKING SPACES
			0.91	PARKING SPACES/BED

TABLE 2 Capstone Cottages PDP Trip Generation												
Code	Use	Size	AWDTE		AM Peak Hour				PM Peak Hour			
			Rate	Trips	Rate	In	Rate	Out	Rate	In	Rate	Out
220	Apartment	860 beds	2.65	2280	0.04	34	0.15	129	0.27	232	0.15	129



SCALE: 1"=2000'

TRIP DISTRIBUTION

Figure 6

DELICH ASSOCIATES

APPENDIX B

City of Fort Collins Traffic Operations
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580
Turning Movement Study

North/South Street: Lemay
East/West Street: Lincoln
Time: PHF
ICU Number: 73

File Name : Lemay & Lincoln 4-15-14
Site Code : 00000073
Start Date : 4/15/2014
Page No : 1

	Lemay Southbound				Lincoln Westbound				Lemay Northbound				Lincoln Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	10	**169**	**43**	**222**	14	21	8	43	17	82	30	129	22	44	**11**	77	471
07:45 AM	**28**	152	42	222	25	38	6	69	**36**	91	**38**	**165**	**23**	**59**	10	**92**	**548**
08:00 AM	15	103	30	148	**30**	35	**19**	**84**	15	70	28	113	19	36	8	63	408
08:15 AM	16	122	27	165	18	**39**	16	73	7	**96**	26	129	19	34	1	54	421
Total Volume	69	546	142	757	87	133	49	269	75	339	122	536	83	173	30	286	1848
% App. Total	9.1	72.1	18.8		32.3	49.4	18.2		14	63.2	22.8		29	60.5	10.5		
PHF	.616	.808	.826	.852	.725	.853	.645	.801	.521	.883	.803	.812	.902	.733	.682	.777	.843
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	7	81	22	110	30	40	**32**	102	16	115	44	175	**33**	49	8	90	477
12:15 PM	**14**	76	22	112	**33**	49	22	104	11	103	41	155	29	34	**15**	78	449
12:30 PM	10	**102**	21	**133**	33	42	17	92	**20**	**122**	53	**195**	28	**50**	11	89	**509**
12:45 PM	6	76	**28**	110	32	**52**	21	**105**	17	96	**55**	168	33	48	11	**92**	475
Total Volume	37	335	93	465	128	183	92	403	64	436	193	693	123	181	45	349	1910
% App. Total	8	72	20		31.8	45.4	22.8		9.2	62.9	27.8		35.2	51.9	12.9		
PHF	.661	.821	.830	.874	.970	.880	.719	.960	.800	.893	.877	.888	.932	.905	.750	.948	.938
Peak Hour Analysis From 02:00 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	7	**127**	24	**158**	56	52	31	139	7	165	46	218	41	39	11	91	606
04:45 PM	**15**	113	**25**	153	34	51	35	120	12	**180**	45	237	39	46	20	105	615
05:00 PM	12	126	19	157	**74**	64	**37**	**175**	**22**	154	48	224	41	43	**29**	113	669
05:15 PM	10	116	22	148	64	**66**	33	163	16	175	**63**	**254**	**62**	**60**	18	**140**	**705**
Total Volume	44	482	90	616	228	233	136	597	57	674	202	933	183	188	78	449	2595
% App. Total	7.1	78.2	14.6		38.2	39	22.8		6.1	72.2	21.7		40.8	41.9	17.4		
PHF	.733	.949	.900	.975	.770	.883	.919	.853	.648	.936	.802	.918	.738	.783	.672	.802	.920

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 2/20/2014 Observer: Andy

Day: Thursday Jurisdiction: Fort Collins

Intersection: Lemay/Buckingham

R = right turn
S = straight
L = left turn

Time	Northbound: Lemay				Southbound: Lemay				Total	Eastbound: Buckingham				Westbound: Buckingham				Total	Total
Begins	L	S	R	Total	L	S	R	Total	north/south	L	S	R	Total	L	S	R	Total	east/west	All
7:30	10	88	12	110	0	159	4	163	273	0	0	6	6	0	0	0	0	6	279
7:45	11	113	14	138	0	237	6	243	381	1	2	5	8	2	0	0	2	10	391
8:00	13	70	19	102	0	149	7	156	258	0	1	4	5	1	0	0	1	6	264
8:15	4	66	9	79	0	145	2	147	226	1	2	7	10	1	0	0	1	11	237
7:30-8:30	38	337	54	429	0	690	19	709	1138	2	5	22	29	4	0	0	4	33	1171
PHF	0.73	0.75	0.71	0.78	n/a	0.73	0.68	0.73		0.5	0.63	0.79	0.73	0.5	n/a	n/a	0.5		0.75
4:30	7	190	3	200	0	135	4	139	339	0	4	11	15	3	1	0	4	19	358
4:45	7	212	3	222	0	145	2	147	369	2	3	6	11	1	0	0	1	12	381
5:00	3	224	5	232	0	131	0	131	363	0	0	19	19	1	1	0	2	21	384
5:15	5	203	1	209	0	133	1	134	343	2	0	12	14	0	0	0	0	14	357
4:30-5:30	22	829	12	863	0	544	7	551	1414	4	7	48	59	5	2	0	7	66	1480
PHF	0.79	0.93	0.6	0.93	n/a	0.94	0.44	0.94		0.5	0.44	0.63	0.78	0.42	0.5	n/a	0.44		0.96

City of Fort Collins Traffic Operations
626 Linden Street, PO Box 580
Fort Collins, CO 80522-0580
Turning Movement Study

File Name : Lemay & Vine 8-9-12
Site Code : 00000127
Start Date : 8/9/2012
Page No : 2

	Lemay/9th Southbound				Vine Westbound				Lemay/9th Northbound				Vine Eastbound				
Start Time	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Int. Total
Peak Hour Analysis From 07:30 AM to 08:15 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	8	142	**12**	162	23	**33**	**20**	**76**	4	76	4	84	14	25	3	**42**	364
07:45 AM	9	**204**	11	**224**	**24**	27	13	64	3	**105**	**8**	**116**	7	**26**	**5**	38	**442**
08:00 AM	7	142	9	158	19	23	10	52	**6**	88	8	102	10	12	4	26	338
08:15 AM	**12**	102	10	124	24	29	6	59	4	68	8	80	**16**	17	4	37	300
Total Volume	36	590	42	668	90	112	49	251	17	337	28	382	47	80	16	143	1444
% App. Total	5.4	88.3	6.3		35.9	44.6	19.5		4.5	88.2	7.3		32.9	55.9	11.2		
PHF	.750	.723	.875	.746	.938	.848	.613	.826	.708	.802	.875	.823	.734	.769	.800	.851	.817
Peak Hour Analysis From 12:00 PM to 12:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 12:00 PM																	
12:00 PM	7	106	7	120	16	27	**11**	54	12	117	9	138	8	**28**	9	45	357
12:15 PM	5	124	12	141	17	24	8	49	**13**	113	**16**	142	15	16	13	44	376
12:30 PM	4	110	10	124	**24**	**32**	5	**61**	3	100	4	107	15	27	**15**	**57**	349
12:45 PM	**9**	**147**	**16**	**172**	15	15	10	40	11	**171**	13	**195**	**16**	15	10	41	**448**
Total Volume	25	487	45	557	72	98	34	204	39	501	42	582	54	86	47	187	1530
% App. Total	4.5	87.4	8.1		35.3	48	16.7		6.7	86.1	7.2		28.9	46	25.1		
PHF	.694	.828	.703	.810	.750	.766	.773	.836	.750	.732	.656	.746	.844	.768	.783	.820	.854
Peak Hour Analysis From 04:30 PM to 05:15 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	7	131	16	154	**48**	**32**	**16**	**96**	12	145	14	171	13	**43**	**15**	**71**	492
04:45 PM	**8**	**160**	15	183	33	23	10	66	**17**	198	**22**	**237**	18	31	8	57	543
05:00 PM	8	156	**21**	**185**	30	29	7	66	17	198	16	231	17	42	11	70	**552**
05:15 PM	4	127	12	143	31	25	14	70	11	**204**	15	230	**23**	36	9	68	511
Total Volume	27	574	64	665	142	109	47	298	57	745	67	869	71	152	43	266	2098
% App. Total	4.1	86.3	9.6		47.7	36.6	15.8		6.6	85.7	7.7		26.7	57.1	16.2		
PHF	.844	.897	.762	.899	.740	.852	.734	.776	.838	.913	.761	.917	.772	.884	.717	.937	.950

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 2/19/2014 Observer: Andy

Day: Wednesday Jurisdiction: Fort Collins

Intersection: Lincoln/Buffalo Run Access

R = right turn
S = straight
L = left turn

Time	Northbound: Buffalo Run				Southbound:				Total	Eastbound: Lincoln				Westbound: Lincoln				Total	Total
Begins	L	S	R	Total	L	S	R	Total	north/south	L	S	R	Total	L	S	R	Total	east/west	All
7:30	1		0	1				0	1		71	3	74	0	38		38	112	113
7:45	5		2	7				0	7		108	0	108	2	60		62	170	177
8:00	5		2	7				0	7		89	1	90	2	57		59	149	156
8:15	5		1	6				0	6		52	3	55	0	54		54	109	115
7:30-8:30	16	0	5	21	0	0	0	0	21	0	320	7	327	4	209	0	213	540	561
PHF	0.8	n/a	0.63	0.75	n/a	n/a	n/a	n/a		n/a	0.74	0.58	0.76	0.5	0.87	n/a	0.86		0.79
4:30	4		0	4				0	4		71	6	77	2	107		109	186	190
4:45	3		0	3				0	3		67	4	71	3	90		93	164	167
5:00	4		1	5				0	5		73	5	78	1	152		153	231	236
5:15	7		0	7				0	7		74	13	87	4	129		133	220	227
4:30-5:30	18	0	1	19	0	0	0	0	19	0	285	28	313	10	478	0	488	801	820
PHF	0.64	n/a	0.25	0.68	n/a	n/a	n/a	n/a		n/a	0.96	0.54	0.9	0.63	0.79	n/a	0.8		0.87

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 2/27/2014 Observer: Andy

Day: Thursday Jurisdiction: Fort Collins

Intersection: Lincoln/12th

R = right turn
S = straight
L = left turn

Time	Northbound: 12th				Southbound:				Total	Eastbound: Lincoln				Westbound: Lincoln				Total	Total
Begins	L	S	R	Total	L	S	R	Total	north/south	L	S	R	Total	L	S	R	Total	east/west	All
7:30	1		12	13				0	13		52	3	55	14	45		59	114	127
7:45	3		14	17				0	17		96	3	99	6	52		58	157	174
8:00	2		19	21				0	21		101	11	112	8	58		66	178	199
8:15	5		9	14				0	14		60	10	70	16	67		83	153	167
7:30-8:30	11	0	54	65	0	0	0	0	65	0	309	27	336	44	222	0	266	602	667
PHF	0.55	n/a	0.71	0.77	n/a	n/a	n/a	n/a		n/a	0.76	0.61	0.75	0.69	0.83	n/a	0.8		0.84
4:30	18		27	45				0	45		64	13	77	18	101		119	196	241
4:45	15		21	36				0	36		74	14	88	20	110		130	218	254
5:00	16		24	40				0	40		60	13	73	27	116		143	216	256
5:15	15		28	43				0	43		65	13	78	26	107		133	211	254
4:30-5:30	64	0	100	164	0	0	0	0	164	0	263	53	316	91	434	0	525	841	1005
PHF	0.89	n/a	0.89	0.91	n/a	n/a	n/a	n/a		n/a	0.89	0.95	0.9	0.84	0.94	n/a	0.92		0.98

APPENDIX C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	159	83	45	122	80	122	339	69	130	546	69
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		1.00	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1900
Adj Flow Rate, veh/h	35	187	0	53	144	0	144	399	27	153	642	76
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	247	210	188	267	219	541	1211	1027	674	1025	121
Arrive On Green	0.03	0.13	0.00	0.04	0.14	0.00	0.05	0.63	0.63	0.08	0.84	0.84
Sat Flow, veh/h	1845	1937	1647	1845	1937	1583	1845	1937	1643	1774	1630	193
Grp Volume(v), veh/h	35	187	0	53	144	0	144	399	27	153	0	718
Grp Sat Flow(s),veh/h/ln	1845	1937	1647	1845	1937	1583	1845	1937	1643	1774	0	1823
Q Serve(g_s), s	1.8	10.3	0.0	2.7	7.6	0.0	3.0	10.7	0.7	3.3	0.0	14.9
Cycle Q Clear(g_c), s	1.8	10.3	0.0	2.7	7.6	0.0	3.0	10.7	0.7	3.3	0.0	14.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	214	247	210	188	267	219	541	1211	1027	674	0	1146
V/C Ratio(X)	0.16	0.76	0.00	0.28	0.54	0.00	0.27	0.33	0.03	0.23	0.00	0.63
Avail Cap(c_a), veh/h	287	299	254	242	299	245	591	1211	1027	748	0	1146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.7	46.3	0.0	39.3	44.1	0.0	7.3	9.7	7.9	6.5	0.0	4.6
Incr Delay (d2), s/veh	0.4	8.6	0.0	0.8	1.7	0.0	0.3	0.7	0.0	0.2	0.0	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	6.1	0.0	1.4	4.2	0.0	1.5	5.9	0.3	1.6	0.0	7.9
LnGrp Delay(d),s/veh	40.1	55.0	0.0	40.1	45.8	0.0	7.6	10.5	7.9	6.7	0.0	7.2
LnGrp LOS	D	D		D	D		A	B	A	A		A
Approach Vol, veh/h		222			197			570			871	
Approach Delay, s/veh		52.6			44.3			9.6			7.1	
Approach LOS		D			D			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	74.2	7.8	19.0	9.4	73.8	6.6	20.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	59.0	7.0	16.0	10.0	57.0	7.0	16.0
Max Q Clear Time (g_c+I1), s	5.0	16.9	4.7	12.3	5.3	12.7	3.8	9.6
Green Ext Time (p_c), s	0.1	4.8	0.0	0.4	0.2	4.8	0.0	0.6

Intersection Summary	
HCM 2010 Ctrl Delay	17.2
HCM 2010 LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

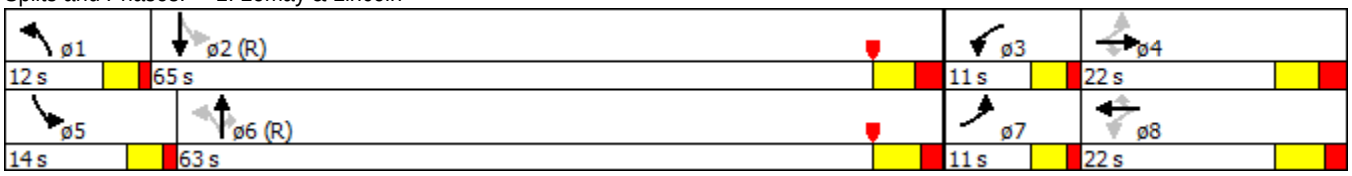
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	65	11	22	14	63	11	22
Maximum Split (%)	10.9%	59.1%	10.0%	20.0%	12.7%	57.3%	10.0%	20.0%
Minimum Split (s)	11	30	11	29	11	30	11	25
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	2
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	20	32	97	108	20	34	97	108
End Time (s)	32	97	108	20	34	97	108	20
Yield/Force Off (s)	28	91	104	14	30	91	104	14
Yield/Force Off 170(s)	28	74	104	1	30	74	104	2
Local Start Time (s)	39	51	6	17	39	53	6	17
Local Yield (s)	47	0	13	33	49	0	13	33
Local Yield 170(s)	47	93	13	20	49	93	13	21

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	85

Offset: 91 (83%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	78	182	183	115	198	194	202	644	55	87	482	44
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.97	0.99		0.97	1.00		1.00	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1900
Adj Flow Rate, veh/h	85	198	17	125	215	23	220	700	13	95	524	45
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	221	276	228	236	288	229	698	1188	1005	429	997	86
Arrive On Green	0.06	0.14	0.14	0.07	0.15	0.15	0.07	0.61	0.61	0.09	1.00	1.00
Sat Flow, veh/h	1845	1937	1600	1845	1937	1541	1845	1937	1639	1774	1687	145
Grp Volume(v), veh/h	85	198	17	125	215	23	220	700	13	95	0	569
Grp Sat Flow(s),veh/h/ln	1845	1937	1600	1845	1937	1541	1845	1937	1639	1774	0	1832
Q Serve(g_s), s	4.6	11.7	1.1	6.9	12.8	1.5	5.3	26.3	0.4	2.5	0.0	0.0
Cycle Q Clear(g_c), s	4.6	11.7	1.1	6.9	12.8	1.5	5.3	26.3	0.4	2.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	221	276	228	236	288	229	698	1188	1005	429	0	1083
V/C Ratio(X)	0.39	0.72	0.07	0.53	0.75	0.10	0.32	0.59	0.01	0.22	0.00	0.53
Avail Cap(c_a), veh/h	232	420	347	236	428	340	698	1188	1005	468	0	1083
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.6	49.2	44.6	40.9	48.9	44.1	7.4	14.1	9.1	10.6	0.0	0.0
Incr Delay (d2), s/veh	1.1	3.5	0.1	2.2	3.9	0.2	0.3	2.2	0.0	0.3	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	6.5	0.5	3.6	7.1	0.7	2.7	14.7	0.2	1.2	0.0	0.5
LnGrp Delay(d),s/veh	41.7	52.7	44.8	43.1	52.8	44.3	7.6	16.2	9.1	10.8	0.0	1.8
LnGrp LOS	D	D	D	D	D	D	A	B	A	B		A
Approach Vol, veh/h		300			363			933			664	
Approach Delay, s/veh		49.1			49.0			14.1			3.1	
Approach LOS		D			D			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	75.9	11.0	22.1	8.4	78.6	10.2	22.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	* 6
Max Green Setting (Gmax), s	7.0	61.0	7.0	25.0	7.0	61.0	7.0	* 26
Max Q Clear Time (g_c+I1), s	7.3	2.0	8.9	13.7	4.5	28.3	6.6	14.8
Green Ext Time (p_c), s	0.0	5.5	0.0	1.1	0.0	5.4	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	21.1
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

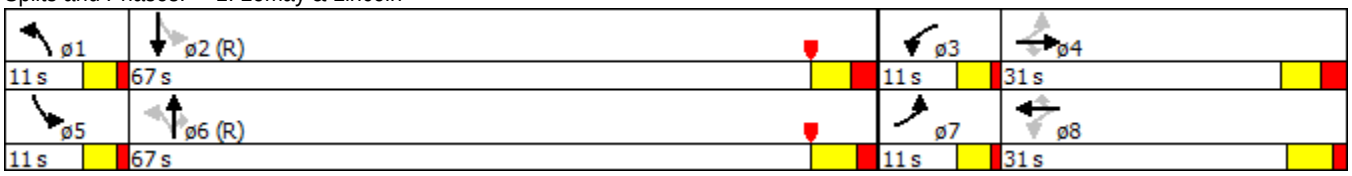
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	67	11	31	11	67	11	31
Maximum Split (%)	9.2%	55.8%	9.2%	25.8%	9.2%	55.8%	9.2%	25.8%
Minimum Split (s)	11	30	11	29	11	30	11	24.5
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	1.5
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	92	103	50	61	92	103	50	61
End Time (s)	103	50	61	92	103	50	61	92
Yield/Force Off (s)	99	44	57	86	99	44	57	86.5
Yield/Force Off 170(s)	99	27	57	73	99	27	57	74.5
Local Start Time (s)	48	59	6	17	48	59	6	17
Local Yield (s)	55	0	13	42	55	0	13	42.5
Local Yield 170(s)	55	103	13	29	55	103	13	30.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	2	5	22	4	0	0	38	337	54	0	690	19
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	6	26	5	0	0	45	396	64	0	812	22

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1341	1372	823	1357	1352	428	834	0	0	460	0	0
Stage 1	823	823	-	518	518	-	-	-	-	-	-	-
Stage 2	518	549	-	839	834	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	129	146	373	126	150	627	799	-	-	1101	-	-
Stage 1	368	388	-	541	533	-	-	-	-	-	-	-
Stage 2	541	516	-	360	383	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	122	135	373	107	139	627	799	-	-	1101	-	-
Mov Cap-2 Maneuver	122	135	-	107	139	-	-	-	-	-	-	-
Stage 1	340	388	-	500	492	-	-	-	-	-	-	-
Stage 2	500	477	-	330	383	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	40.2	0.9	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	799	-	-	258	107	1101	-	-
HCM Lane V/C Ratio	0.056	-	-	0.132	0.044	-	-	-
HCM Control Delay (s)	9.8	0	-	21.1	40.2	0	-	-
HCM Lane LOS	A	A	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.1	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.897						0.983			0.996	
Flt Protected		0.997			0.950			0.996				
Satd. Flow (prot)	0	1666	0	0	1770	0	0	1824	0	0	1855	0
Flt Permitted		0.997			0.950			0.996				
Satd. Flow (perm)	0	1666	0	0	1770	0	0	1824	0	0	1855	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		605			715			1281			1365	
Travel Time (s)		13.8			16.3			29.1			31.0	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	4	7	48	5	2	0	22	859	12	0	544	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	7	50	5	2	0	23	895	12	0	567	7

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1518	1523	570	1546	1521	901	574	0	0	907	0	0
Stage 1	570	570	-	947	947	-	-	-	-	-	-	-
Stage 2	948	953	-	599	574	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	98	118	521	93	118	337	999	-	-	750	-	-
Stage 1	506	505	-	314	340	-	-	-	-	-	-	-
Stage 2	313	338	-	488	503	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	93	112	521	77	112	337	999	-	-	750	-	-
Mov Cap-2 Maneuver	93	112	-	77	112	-	-	-	-	-	-	-
Stage 1	482	505	-	299	324	-	-	-	-	-	-	-
Stage 2	296	322	-	435	503	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.1	51.3	0.2	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	999	-	-	299	85	750	-	-
HCM Lane V/C Ratio	0.023	-	-	0.206	0.086	-	-	-
HCM Control Delay (s)	8.7	0	-	20.1	51.3	0	-	-
HCM Lane LOS	A	A	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.8	0.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.889						0.998			0.998	
Flt Protected		0.997			0.966			0.999				
Satd. Flow (prot)	0	1651	0	0	1799	0	0	1857	0	0	1859	0
Flt Permitted		0.997			0.966			0.999				
Satd. Flow (perm)	0	1651	0	0	1799	0	0	1857	0	0	1859	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			1312			1334	
Travel Time (s)		13.4			19.7			29.8			30.3	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	16	80	47	49	112	90	28	337	17	42	590	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.93			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1958		1770	1918			1904			1963	
Flt Permitted	0.35	1.00		0.55	1.00			0.92			0.95	
Satd. Flow (perm)	644	1958		1025	1918			1753			1872	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	19	94	55	58	132	106	33	396	20	49	694	42
RTOR Reduction (vph)	0	20	0	0	28	0	0	1	0	0	2	0
Lane Group Flow (vph)	19	129	0	58	210	0	0	448	0	0	783	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	19.9	19.9		19.9	19.9			79.6			80.1	
Effective Green, g (s)	20.9	20.9		20.9	20.9			80.6			81.1	
Actuated g/C Ratio	0.19	0.19		0.19	0.19			0.73			0.74	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	122	372		194	364			1284			1380	
v/s Ratio Prot		0.07			c0.11							
v/s Ratio Perm	0.03			0.06				0.26			c0.42	
v/c Ratio	0.16	0.35		0.30	0.58			0.35			0.57	
Uniform Delay, d1	37.2	38.6		38.3	40.5			5.3			6.5	
Progression Factor	1.00	1.00		1.00	1.00			0.82			1.00	
Incremental Delay, d2	1.7	1.6		2.4	4.4			0.7			1.7	
Delay (s)	38.9	40.2		40.7	44.9			5.1			8.2	
Level of Service	D	D		D	D			A			A	
Approach Delay (s)		40.1			44.1			5.1			8.2	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	72.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

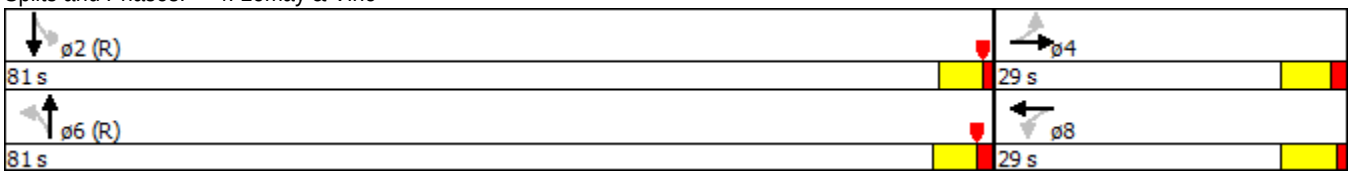
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	81	29	81	29
Maximum Split (%)	73.6%	26.4%	73.6%	26.4%
Minimum Split (s)	21.5	22.5	22	22.5
Yellow Time (s)	3.5	4	3.5	4.5
All-Red Time (s)	1	1.5	1.5	1
Minimum Initial (s)	7	7	7	7
Vehicle Extension (s)	6	6	6	6
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	10	10	10	10
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	47	76	47
End Time (s)	47	76	47	76
Yield/Force Off (s)	42.5	70.5	42	70.5
Yield/Force Off 170(s)	32.5	60.5	32	60.5
Local Start Time (s)	29	0	29	0
Local Yield (s)	105.5	23.5	105	23.5
Local Yield 170(s)	95.5	13.5	95	13.5

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	60

Offset: 47 (43%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	43	152	71	47	109	142	67	745	57	64	574	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.95		1.00	0.92			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1956		1770	1878			1897			1964	
Flt Permitted	0.28	1.00		0.34	1.00			0.90			0.85	
Satd. Flow (perm)	523	1956		641	1878			1714			1674	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	45	160	75	49	115	149	71	784	60	67	604	28
RTOR Reduction (vph)	0	15	0	0	42	0	0	2	0	0	1	0
Lane Group Flow (vph)	45	220	0	49	222	0	0	913	0	0	698	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	22.0	22.0		22.0	22.0			87.5			88.0	
Effective Green, g (s)	23.0	23.0		23.0	23.0			88.5			89.0	
Actuated g/C Ratio	0.19	0.19		0.19	0.19			0.74			0.74	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	100	374		122	359			1264			1241	
v/s Ratio Prot		0.11			c0.12							
v/s Ratio Perm	0.09			0.08				c0.53			0.42	
v/c Ratio	0.45	0.59		0.40	0.62			0.72			0.56	
Uniform Delay, d1	42.9	44.2		42.5	44.5			8.9			6.9	
Progression Factor	1.00	1.00		1.00	1.00			0.60			1.00	
Incremental Delay, d2	8.8	4.5		6.0	5.4			3.1			1.8	
Delay (s)	51.7	48.6		48.5	49.9			8.4			8.7	
Level of Service	D	D		D	D			A			A	
Approach Delay (s)		49.1			49.7			8.4			8.7	
Approach LOS		D			D			A			A	

Intersection Summary

HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

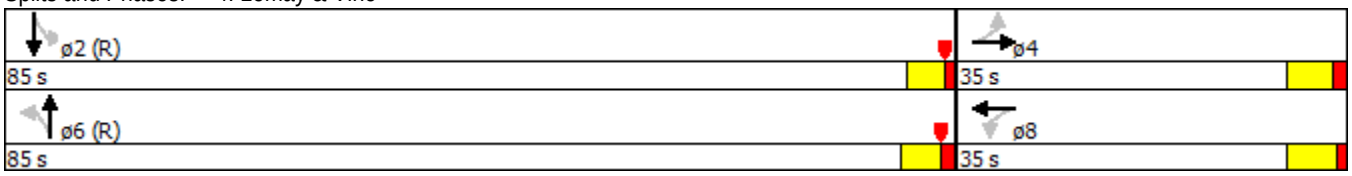
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	85	35	85	35
Maximum Split (%)	70.8%	29.2%	70.8%	29.2%
Minimum Split (s)	21.5	22.5	22	22.5
Yellow Time (s)	3.5	4	3.5	4.5
All-Red Time (s)	1	1.5	1.5	1
Minimum Initial (s)	7	7	7	7
Vehicle Extension (s)	6	6	6	6
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	10	10	10	10
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	48	13	48	13
End Time (s)	13	48	13	48
Yield/Force Off (s)	8.5	42.5	8	42.5
Yield/Force Off 170(s)	118.5	32.5	118	32.5
Local Start Time (s)	35	0	35	0
Local Yield (s)	115.5	29.5	115	29.5
Local Yield 170(s)	105.5	19.5	105	19.5

Intersection Summary

Cycle Length	120	
Control Type	Actuated-Coordinated	
Natural Cycle	65	

Offset: 13 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	352	7	4	231	16	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	414	8	5	272	19	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	422	0	699	418
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	281	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1137	-	406	635
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	767	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1137	-	404	635
Mov Cap-2 Maneuver	-	-	-	-	404	-
Stage 1	-	-	-	-	664	-
Stage 2	-	-	-	-	763	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	13.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	442	-	-	1137	-
HCM Lane V/C Ratio	0.056	-	-	0.004	-
HCM Control Delay (s)	13.6	-	-	8.2	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.997				0.968	
Flt Protected				0.999	0.963	
Satd. Flow (prot)	1857	0	0	1861	1736	0
Flt Permitted				0.999	0.963	
Satd. Flow (perm)	1857	0	0	1861	1736	0
Link Speed (mph)	35			30	30	
Link Distance (ft)	838			610	391	
Travel Time (s)	16.3			13.9	8.9	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	296	28	10	489	18	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	87	87	87	87	87	87
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	340	32	11	562	21	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	372	0	941	356
Stage 1	-	-	-	-	356	-
Stage 2	-	-	-	-	585	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1186	-	292	688
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	557	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1186	-	288	688
Mov Cap-2 Maneuver	-	-	-	-	288	-
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	550	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	18.1
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	297	-	-	1186	-
HCM Lane V/C Ratio	0.074	-	-	0.01	-
HCM Control Delay (s)	18.1	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.988				0.994	
Flt Protected				0.999	0.954	
Satd. Flow (prot)	1840	0	0	1861	1766	0
Flt Permitted				0.999	0.954	
Satd. Flow (perm)	1840	0	0	1861	1766	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	734			785	379	
Travel Time (s)	14.3			15.3	8.6	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	330	27	44	224	11	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	388	32	52	264	13	64

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	420	0	771	404
Stage 1	-	-	-	-	404	-
Stage 2	-	-	-	-	367	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1139	-	368	647
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	701	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1139	-	348	647
Mov Cap-2 Maneuver	-	-	-	-	348	-
Stage 1	-	-	-	-	674	-
Stage 2	-	-	-	-	664	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	12.4
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	565	-	-	1139	-
HCM Lane V/C Ratio	0.135	-	-	0.045	-
HCM Control Delay (s)	12.4	-	-	8.3	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.990				0.888	
Flt Protected				0.992	0.992	
Satd. Flow (prot)	1844	0	0	1848	1641	0
Flt Permitted				0.992	0.992	
Satd. Flow (perm)	1844	0	0	1848	1641	0
Link Speed (mph)	35			30	30	
Link Distance (ft)	610			612	360	
Travel Time (s)	11.9			13.9	8.2	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 3.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	244	53	91	435	64	100
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	249	54	93	444	65	102

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	303	0	906	276
Stage 1	-	-	-	-	276	-
Stage 2	-	-	-	-	630	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1258	-	307	763
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	531	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1258	-	277	763
Mov Cap-2 Maneuver	-	-	-	-	277	-
Stage 1	-	-	-	-	771	-
Stage 2	-	-	-	-	479	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	17.5
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	453	-	-	1258	-
HCM Lane V/C Ratio	0.369	-	-	0.074	-
HCM Control Delay (s)	17.5	-	-	8.1	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1.7	-	-	0.2	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.976				0.918	
Flt Protected				0.991	0.981	
Satd. Flow (prot)	1818	0	0	1846	1678	0
Flt Permitted				0.991	0.981	
Satd. Flow (perm)	1818	0	0	1846	1678	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

UNSIGNALIZED INTERSECTIONS

Level-of-Service	Average Total Delay sec/veh
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and ≤ 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

SIGNALIZED INTERSECTIONS

Level-of-Service	Average Total Delay sec/veh
A	≤ 10
B	> 10 and ≤ 20
C	> 20 and ≤ 35
D	> 35 and ≤ 55
E	> 55 and ≤ 80
F	> 80

Table 4-3
Fort Collins (GMA and City Limits)
Motor Vehicle LOS Standards (Intersections)

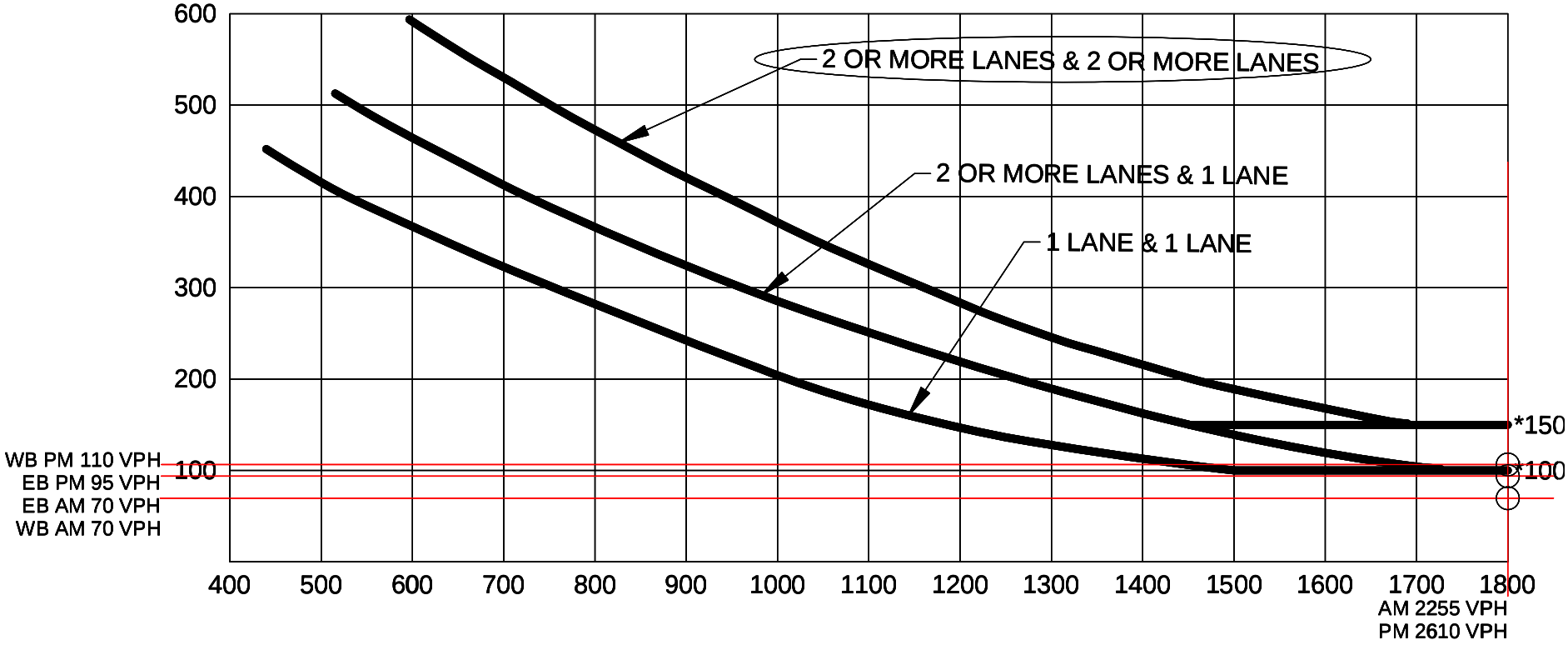
Intersection type	Land Use (from structure plan)			
		Other corridors within:		
	Commercial corridors	Mixed use districts	Low density mixed use residential	All other areas
Signalized intersections (overall)	D	E*	D	D
Any Leg	E	E	D	E
Any Movement	E	E	D	E
Stop sign control (arterial/arterial, arterial/collector or local-any approach leg)	N/A	F**	F**	E
Stop sign control (collector/local--any approach leg)	N/A	C	C	C

* mitigating measures required
** considered normal in an urban environment

APPENDIX D

FIGURE 4C-3. WARRANT 3, PEAK HOUR

MUTCD, 2003 EDITION, PAGE 4C-7



MAJOR STREET - TOTAL OF BOTH APPROACH - VEHICLES PER HOUR (VPH)

*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

LONG RANGE TOTAL PEAK HOUR WARRANT AT LEMAY/BUCKINGHAM-DUFF

APPENDIX E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	37	188	128	61	138	117	234	370	74	151	713	96
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1900
Adj Flow Rate, veh/h	44	221	0	72	162	2	275	435	32	178	839	54
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	244	285	242	209	317	256	293	1135	963	615	973	63
Arrive On Green	0.04	0.15	0.00	0.05	0.16	0.16	0.09	0.59	0.59	0.02	0.19	0.19
Sat Flow, veh/h	1845	1937	1647	1845	1937	1564	1845	1937	1642	1774	1729	111
Grp Volume(v), veh/h	44	221	0	72	162	2	275	435	32	178	0	893
Grp Sat Flow(s),veh/h/ln	1845	1937	1647	1845	1937	1564	1845	1937	1642	1774	0	1840
Q Serve(g_s), s	2.2	12.1	0.0	3.5	8.4	0.1	8.8	13.2	0.9	4.4	0.0	51.8
Cycle Q Clear(g_c), s	2.2	12.1	0.0	3.5	8.4	0.1	8.8	13.2	0.9	4.4	0.0	51.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	244	285	242	209	317	256	293	1135	963	615	0	1035
V/C Ratio(X)	0.18	0.78	0.00	0.34	0.51	0.01	0.94	0.38	0.03	0.29	0.00	0.86
Avail Cap(c_a), veh/h	309	352	299	244	352	284	293	1135	963	624	0	1035
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.7	45.2	0.0	36.7	42.0	38.5	29.8	12.2	9.6	9.4	0.0	40.7
Incr Delay (d2), s/veh	0.4	8.4	0.0	1.0	1.3	0.0	36.9	1.0	0.1	0.3	0.0	9.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	7.1	0.0	1.8	4.6	0.1	11.2	7.3	0.4	2.2	0.0	29.1
LnGrp Delay(d),s/veh	38.0	53.6	0.0	37.6	43.3	38.5	66.7	13.1	9.7	9.7	0.0	50.1
LnGrp LOS	D	D		D	D	D	E	B	A	A		D
Approach Vol, veh/h		265			236			742			1071	
Approach Delay, s/veh		51.0			41.5			32.8			43.4	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	66.9	8.9	21.2	10.4	69.5	7.1	23.0
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	9.0	55.0	7.0	19.0	7.0	57.0	7.0	19.0
Max Q Clear Time (g_c+I1), s	10.8	53.8	5.5	14.1	6.4	15.2	4.2	10.4
Green Ext Time (p_c), s	0.0	0.8	0.0	0.6	0.0	6.4	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	40.7
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

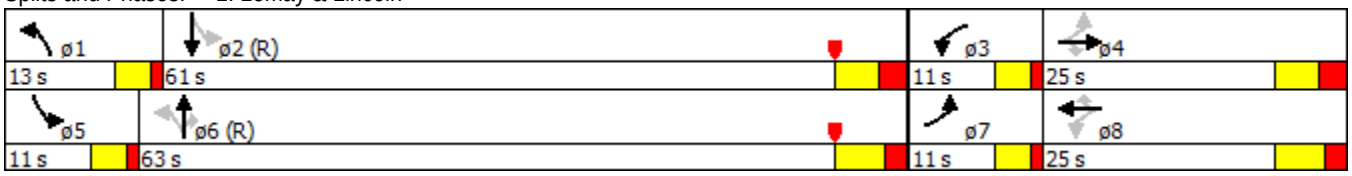
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize			Yes	Yes				
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	13	61	11	25	11	63	11	25
Maximum Split (%)	11.8%	55.5%	10.0%	22.7%	10.0%	57.3%	10.0%	22.7%
Minimum Split (s)	11	30	11	29	11	30	11	25
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	2
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	55	6	17	42	53	6	17
End Time (s)	55	6	17	42	53	6	17	42
Yield/Force Off (s)	51	0	13	36	49	0	13	36
Yield/Force Off 170(s)	51	93	13	23	49	93	13	24
Local Start Time (s)	42	55	6	17	42	53	6	17
Local Yield (s)	51	0	13	36	49	0	13	36
Local Yield 170(s)	51	93	13	23	49	93	13	24

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	125

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	120	256	240	126	241	234	301	750	65	131	53	82
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1900
Adj Flow Rate, veh/h	130	278	32	137	262	47	327	815	20	142	58	36
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	342	284	256	347	278	900	1059	895	309	574	356
Arrive On Green	0.08	0.18	0.18	0.08	0.18	0.18	0.07	0.55	0.55	0.10	0.90	0.90
Sat Flow, veh/h	1845	1937	1609	1845	1937	1548	1845	1937	1638	1774	1063	660
Grp Volume(v), veh/h	130	278	32	137	262	47	327	815	20	142	0	94
Grp Sat Flow(s),veh/h/ln	1845	1937	1609	1845	1937	1548	1845	1937	1638	1774	0	1723
Q Serve(g_s), s	6.8	16.6	2.0	7.1	15.4	3.1	8.0	39.5	0.7	4.2	0.0	0.7
Cycle Q Clear(g_c), s	6.8	16.6	2.0	7.1	15.4	3.1	8.0	39.5	0.7	4.2	0.0	0.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.38
Lane Grp Cap(c), veh/h	265	342	284	256	347	278	900	1059	895	309	0	931
V/C Ratio(X)	0.49	0.81	0.11	0.53	0.75	0.17	0.36	0.77	0.02	0.46	0.00	0.10
Avail Cap(c_a), veh/h	285	500	416	256	484	387	900	1059	895	321	0	931
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.7	47.5	41.5	36.8	46.7	41.7	11.4	21.3	12.5	17.5	0.0	2.7
Incr Delay (d2), s/veh	1.4	6.4	0.2	2.2	4.3	0.3	0.2	5.4	0.0	1.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	9.5	0.9	3.8	8.6	1.3	1.2	22.6	0.3	2.1	0.0	0.4
LnGrp Delay(d),s/veh	38.1	53.9	41.7	39.0	51.0	42.0	11.7	26.7	12.5	18.6	0.0	3.0
LnGrp LOS	D	D	D	D	D	D	B	C	B	B		A
Approach Vol, veh/h		440			446			1162			236	
Approach Delay, s/veh		48.3			46.4			22.2			12.4	
Approach LOS		D			D			C			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	69.8	13.0	26.2	10.2	70.6	12.7	26.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	7.0	54.0	9.0	30.0	7.0	54.0	10.0	29.0
Max Q Clear Time (g_c+I1), s	10.0	2.7	9.1	18.6	6.2	41.5	8.8	17.4
Green Ext Time (p_c), s	0.0	4.0	0.0	1.6	0.0	3.1	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C

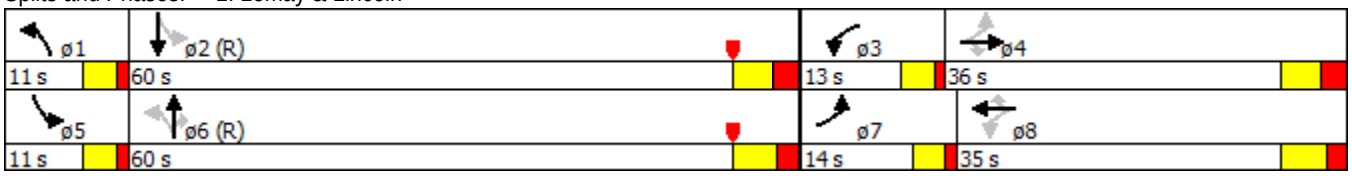
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	60	13	36	11	60	14	35
Maximum Split (%)	9.2%	50.0%	10.8%	30.0%	9.2%	50.0%	11.7%	29.2%
Minimum Split (s)	11	30	11	29	11	30	11	25
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	2
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	99	110	50	63	99	110	50	64
End Time (s)	110	50	63	99	110	50	64	99
Yield/Force Off (s)	106	44	59	93	106	44	60	93
Yield/Force Off 170(s)	106	27	59	80	106	27	60	81
Local Start Time (s)	55	66	6	19	55	66	6	20
Local Yield (s)	62	0	15	49	62	0	16	49
Local Yield 170(s)	62	103	15	36	62	103	16	37

Intersection Summary

Cycle Length	120	
Control Type	Actuated-Coordinated	
Natural Cycle	95	

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	5	24	4	0	0	41	394	54	0	836	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	6	28	5	0	0	48	464	64	0	984	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1588	1620	996	1606	1601	495	1009	0	0	527	0	0
Stage 1	996	996	-	592	592	-	-	-	-	-	-	-
Stage 2	592	624	-	1014	1009	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	87	103	297	85	106	575	687	-	-	1040	-	-
Stage 1	294	322	-	493	494	-	-	-	-	-	-	-
Stage 2	493	478	-	288	318	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	80	93	297	68	95	575	687	-	-	1040	-	-
Mov Cap-2 Maneuver	80	93	-	68	95	-	-	-	-	-	-	-
Stage 1	265	322	-	444	445	-	-	-	-	-	-	-
Stage 2	444	430	-	256	318	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.2	61.8	0.9	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	687	-	-	186	68	1040	-	-
HCM Lane V/C Ratio	0.07	-	-	0.202	0.069	-	-	-
HCM Control Delay (s)	10.6	0	-	29.2	61.8	0	-	-
HCM Lane LOS	B	A	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.2	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.901						0.985			0.997	
Flt Protected		0.995			0.950			0.996				
Satd. Flow (prot)	0	1670	0	0	1770	0	0	1827	0	0	1857	0
Flt Permitted		0.995			0.950			0.996				
Satd. Flow (perm)	0	1670	0	0	1770	0	0	1827	0	0	1857	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		605			715			1281			1365	
Travel Time (s)		13.8			16.3			29.1			31.0	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	7	52	5	2	0	24	1064	12	0	807	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	7	54	5	2	0	25	1108	12	0	841	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2011	2016	845	2041	2015	1115	850	0	0	1121	0	0
Stage 1	845	845	-	1165	1165	-	-	-	-	-	-	-
Stage 2	1166	1171	-	876	850	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	44	59	363	42	59	253	788	-	-	623	-	-
Stage 1	357	379	-	237	268	-	-	-	-	-	-	-
Stage 2	236	267	-	344	377	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	40	54	363	30	54	253	788	-	-	623	-	-
Mov Cap-2 Maneuver	40	54	-	30	54	-	-	-	-	-	-	-
Stage 1	327	379	-	217	245	-	-	-	-	-	-	-
Stage 2	214	245	-	287	377	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	42.3	137.7	0.2	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	788	-	-	161	34	623	-	-
HCM Lane V/C Ratio	0.032	-	-	0.414	0.214	-	-	-
HCM Control Delay (s)	9.7	0	-	42.3	137.7	0	-	-
HCM Lane LOS	A	A	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.8	0.7	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.890						0.999			0.999	
Flt Protected		0.996			0.966			0.999				
Satd. Flow (prot)	0	1651	0	0	1799	0	0	1859	0	0	1861	0
Flt Permitted		0.996			0.966			0.999				
Satd. Flow (perm)	0	1651	0	0	1799	0	0	1859	0	0	1861	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			1312			1334	
Travel Time (s)		13.4			19.7			29.8			30.3	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	360	48	52	651	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1884			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1685			1838	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	424	56	61	766	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	518	0	0	877	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1128			1239	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.31			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.46			0.71	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.6			11.1	
Progression Factor	1.00	1.00		1.00	1.00			0.82			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.3			3.4	
Delay (s)	38.3	35.9		54.2	45.9			8.4			14.6	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			8.4			14.6	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

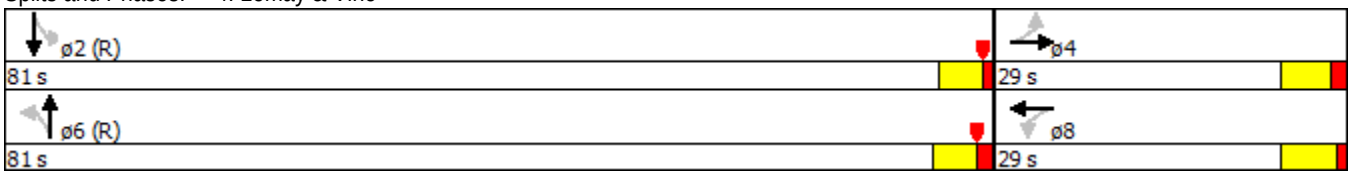
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	81	29	81	29
Maximum Split (%)	73.6%	26.4%	73.6%	26.4%
Minimum Split (s)	21.5	22.5	22	22.5
Yellow Time (s)	3.5	4	3.5	4.5
All-Red Time (s)	1	1.5	1.5	1
Minimum Initial (s)	7	7	7	7
Vehicle Extension (s)	6	6	6	6
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	10	10	10	10
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	47	76	47
End Time (s)	47	76	47	76
Yield/Force Off (s)	42.5	70.5	42	70.5
Yield/Force Off 170(s)	32.5	60.5	32	60.5
Local Start Time (s)	29	0	29	0
Local Yield (s)	105.5	23.5	105	23.5
Local Yield 170(s)	95.5	13.5	95	13.5

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	60

Offset: 47 (43%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	817	154	98	621	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1873			1959	
Flt Permitted	0.23	1.00		0.21	1.00			0.86			0.74	
Satd. Flow (perm)	436	1974		400	1905			1619			1453	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	860	162	103	654	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	2	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1119	0	0	793	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1092			986	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.69			0.55	
v/c Ratio	0.53	0.71		1.11	0.68			1.02			0.80	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			13.6	
Progression Factor	1.00	1.00		1.00	1.00			0.73			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			29.4			7.0	
Delay (s)	49.5	47.5		166.7	46.0			43.7			20.6	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			43.7			20.6	
Approach LOS		D			E			D			C	

Intersection Summary

HCM 2000 Control Delay	43.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	106.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

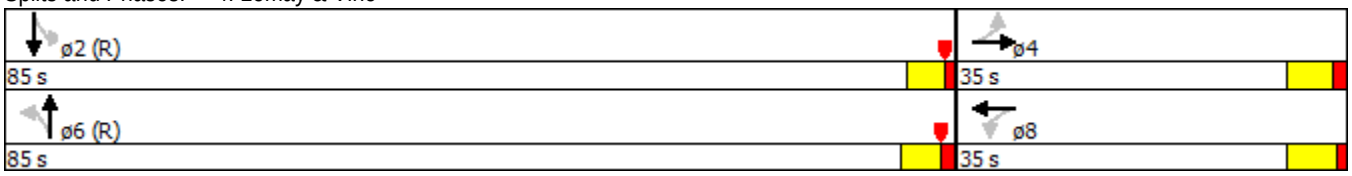
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	85	35	85	35
Maximum Split (%)	70.8%	29.2%	70.8%	29.2%
Minimum Split (s)	21.5	22.5	22	22.5
Yellow Time (s)	3.5	4	3.5	4.5
All-Red Time (s)	1	1.5	1.5	1
Minimum Initial (s)	7	7	7	7
Vehicle Extension (s)	6	6	6	6
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	10	10	10	10
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	48	13	48	13
End Time (s)	13	48	13	48
Yield/Force Off (s)	8.5	42.5	8	42.5
Yield/Force Off 170(s)	118.5	32.5	118	32.5
Local Start Time (s)	35	0	35	0
Local Yield (s)	115.5	29.5	115	29.5
Local Yield 170(s)	105.5	19.5	105	19.5

Intersection Summary

Cycle Length		120
Control Type	Actuated-Coordinated	
Natural Cycle		75

Offset: 13 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	487	365	25	10
Demand Flow Rate, veh/h	497	372	25	10
Vehicles Circulating, veh/h	7	51	491	377
Vehicles Exiting, veh/h	380	465	13	46
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.1	6.9	5.6	4.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	497	372	25	10
Cap Entry Lane, veh/h	1122	1074	692	775
Entry HV Adj Factor	0.980	0.981	1.000	1.000
Flow Entry, veh/h	487	365	25	10
Cap Entry, veh/h	1100	1054	692	775
V/C Ratio	0.443	0.346	0.036	0.013
Control Delay, s/veh	8.1	6.9	5.6	4.8
LOS	A	A	A	A
95th %tile Queue, veh	2	2	0	0

Intersection	
Intersection Delay, s/veh	10.3
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	519	666	22	37
Demand Flow Rate, veh/h	529	679	22	38
Vehicles Circulating, veh/h	19	33	504	696
Vehicles Exiting, veh/h	715	493	44	16
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.7	11.8	5.6	7.4
Approach LOS	A	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	529	679	22	38
Cap Entry Lane, veh/h	1109	1093	683	563
Entry HV Adj Factor	0.980	0.981	1.000	0.974
Flow Entry, veh/h	519	666	22	37
Cap Entry, veh/h	1087	1072	683	549
V/C Ratio	0.477	0.621	0.032	0.067
Control Delay, s/veh	8.7	11.8	5.6	7.4
LOS	A	B	A	A
95th %tile Queue, veh	3	5	0	0

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	359	29	47	298	12	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	422	34	55	351	14	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	456	0	900	439
Stage 1	-	-	-	-	439	-
Stage 2	-	-	-	-	461	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1105	-	309	618
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	635	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1105	-	290	618
Mov Cap-2 Maneuver	-	-	-	-	290	-
Stage 1	-	-	-	-	650	-
Stage 2	-	-	-	-	596	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	13.3
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	518	-	-	1105	-
HCM Lane V/C Ratio	0.159	-	-	0.05	-
HCM Control Delay (s)	13.3	-	-	8.4	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.990				0.888	
Flt Protected				0.993	0.992	
Satd. Flow (prot)	1844	0	0	1850	1641	0
Flt Permitted				0.993	0.992	
Satd. Flow (perm)	1844	0	0	1850	1641	0
Link Speed (mph)	35			30	30	
Link Distance (ft)	610			612	360	
Travel Time (s)	11.9			13.9	8.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	4.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	364	57	98	511	69	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	371	58	100	521	70	110

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	430	0	1122	401
Stage 1	-	-	-	-	401	-
Stage 2	-	-	-	-	721	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1129	-	228	649
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	482	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1129	-	200	649
Mov Cap-2 Maneuver	-	-	-	-	200	-
Stage 1	-	-	-	-	676	-
Stage 2	-	-	-	-	422	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	26.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	346	-	-	1129	-
HCM Lane V/C Ratio	0.522	-	-	0.089	-
HCM Control Delay (s)	26.2	-	-	8.5	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	2.9	-	-	0.3	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.982				0.917	
Flt Protected				0.992	0.981	
Satd. Flow (prot)	1829	0	0	1848	1676	0
Flt Permitted				0.992	0.981	
Satd. Flow (perm)	1829	0	0	1848	1676	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	4	0	21	17	0	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	5	0	25	20	0	11

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	46	35	0	0	45	0
Stage 1	35	-	-	-	-	-
Stage 2	11	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	964	1038	-	-	1563	-
Stage 1	987	-	-	-	-	-
Stage 2	1012	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	964	1038	-	-	1563	-
Mov Cap-2 Maneuver	964	-	-	-	-	-
Stage 1	987	-	-	-	-	-
Stage 2	1012	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	964	1563	-
HCM Lane V/C Ratio	-	-	0.005	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.940			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1751	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1751	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	328		624			253
Travel Time (s)	7.5		14.2			5.8

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	15	0	8	7	0	33
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	0	9	8	0	37

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	50	13	0	0	17	0
Stage 1	13	-	-	-	-	-
Stage 2	37	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	959	1067	-	-	1600	-
Stage 1	1010	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	959	1067	-	-	1600	-
Mov Cap-2 Maneuver	959	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	959	1600	-
HCM Lane V/C Ratio	-	-	0.017	-	-
HCM Control Delay (s)	-	-	8.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	1	0		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.936			
Flt Protected	0.950					
Satd. Flow (prot)	1770	0	1744	0	0	1863
Flt Permitted	0.950					
Satd. Flow (perm)	1770	0	1744	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	349		618			255
Travel Time (s)	7.9		14.0			5.8

Intersection Summary

Area Type: Other

APPENDIX F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	40	200	150	100	145	100	175	615	185	125	1115	250
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	0.99		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1863
Adj Flow Rate, veh/h	42	211	19	105	153	0	184	647	100	132	1174	178
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	263	282	235	237	348	285	300	2202	980	519	2075	902
Arrive On Green	0.04	0.15	0.15	0.07	0.18	0.00	0.07	0.60	0.60	0.02	0.19	0.19
Sat Flow, veh/h	1845	1937	1619	1845	1937	1583	1845	3681	1638	1774	3539	1539
Grp Volume(v), veh/h	42	211	19	105	153	0	184	647	100	132	1174	178
Grp Sat Flow(s),veh/h/ln	1845	1937	1619	1845	1937	1583	1845	1840	1638	1774	1770	1539
Q Serve(g_s), s	2.3	12.5	1.2	5.6	8.4	0.0	4.6	10.3	3.1	3.4	36.1	11.6
Cycle Q Clear(g_c), s	2.3	12.5	1.2	5.6	8.4	0.0	4.6	10.3	3.1	3.4	36.1	11.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	263	282	235	237	348	285	300	2202	980	519	2075	902
V/C Ratio(X)	0.16	0.75	0.08	0.44	0.44	0.00	0.61	0.29	0.10	0.25	0.57	0.20
Avail Cap(c_a), veh/h	321	387	324	262	428	350	395	2202	980	542	2075	902
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.3	49.2	44.3	38.5	43.8	0.0	17.8	11.8	10.3	9.1	34.6	24.7
Incr Delay (d2), s/veh	0.3	5.2	0.1	1.3	0.9	0.0	2.0	0.3	0.2	0.3	1.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	7.1	0.6	2.9	4.6	0.0	3.4	5.3	1.5	1.7	18.0	5.1
LnGrp Delay(d),s/veh	41.6	54.4	44.5	39.8	44.7	0.0	19.9	12.1	10.5	9.4	35.7	25.2
LnGrp LOS	D	D	D	D	D		B	B	B	A	D	C
Approach Vol, veh/h		272			258			931			1484	
Approach Delay, s/veh		51.7			42.7			13.5			32.1	
Approach LOS		D			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	75.3	11.4	22.4	9.4	76.8	7.2	26.6
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	* 6
Max Green Setting (Gmax), s	13.0	55.0	9.0	23.0	7.0	61.0	7.0	* 26
Max Q Clear Time (g_c+I1), s	6.6	38.1	7.6	14.5	5.4	12.3	4.3	10.4
Green Ext Time (p_c), s	0.3	8.8	0.0	0.8	0.1	12.8	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	28.9
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

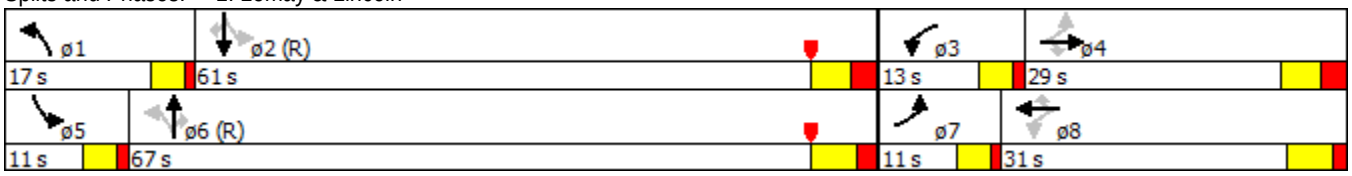
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	17	61	13	29	11	67	11	31
Maximum Split (%)	14.2%	50.8%	10.8%	24.2%	9.2%	55.8%	9.2%	25.8%
Minimum Split (s)	11	30	11	29	11	30	11	24.5
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	1.5
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	92	109	50	63	92	103	50	61
End Time (s)	109	50	63	92	103	50	61	92
Yield/Force Off (s)	105	44	59	86	99	44	57	86.5
Yield/Force Off 170(s)	105	27	59	73	99	27	57	74.5
Local Start Time (s)	48	65	6	19	48	59	6	17
Local Yield (s)	61	0	15	42	55	0	13	42.5
Local Yield 170(s)	61	103	15	29	55	103	13	30.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	165	230	250	195	225	250	260	1040	110	145	875	105
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1863
Adj Flow Rate, veh/h	174	242	109	205	237	120	274	1095	61	153	921	53
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	319	267	308	331	267	498	1949	867	334	1866	810
Arrive On Green	0.10	0.16	0.16	0.11	0.17	0.17	0.07	0.53	0.53	0.13	1.00	1.00
Sat Flow, veh/h	1845	1937	1623	1845	1937	1561	1845	3681	1637	1774	3539	1537
Grp Volume(v), veh/h	174	242	109	205	237	120	274	1095	61	153	921	53
Grp Sat Flow(s),veh/h/ln	1845	1937	1623	1845	1937	1561	1845	1840	1637	1774	1770	1537
Q Serve(g_s), s	9.2	14.3	7.2	10.9	13.9	8.3	8.0	23.9	2.2	4.8	0.0	0.0
Cycle Q Clear(g_c), s	9.2	14.3	7.2	10.9	13.9	8.3	8.0	23.9	2.2	4.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	306	319	267	308	331	267	498	1949	867	334	1866	810
V/C Ratio(X)	0.57	0.76	0.41	0.67	0.72	0.45	0.55	0.56	0.07	0.46	0.49	0.07
Avail Cap(c_a), veh/h	334	484	406	308	468	377	498	1949	867	338	1866	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.5	47.9	44.9	36.8	47.0	44.7	11.6	18.9	13.8	13.3	0.0	0.0
Incr Delay (d2), s/veh	1.9	3.7	1.0	5.4	3.0	1.2	1.3	1.2	0.2	1.0	0.9	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	8.0	3.3	6.0	7.7	3.7	0.5	12.5	1.0	2.3	0.2	0.0
LnGrp Delay(d),s/veh	38.4	51.6	45.9	42.1	50.0	45.9	12.9	20.1	14.0	14.3	0.9	0.2
LnGrp LOS	D	D	D	D	D	D	B	C	B	B	A	A
Approach Vol, veh/h		525			562			1430			1127	
Approach Delay, s/veh		46.0			46.2			18.5			2.7	
Approach LOS		D			D			B			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	68.3	16.0	24.7	10.7	68.5	15.2	25.5
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	7.0	52.0	12.0	29.0	7.0	52.0	13.0	28.0
Max Q Clear Time (g_c+I1), s	10.0	2.0	12.9	16.3	6.8	25.9	11.2	15.9
Green Ext Time (p_c), s	0.0	13.2	0.0	2.0	0.0	11.0	0.1	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	21.8
HCM 2010 LOS	C

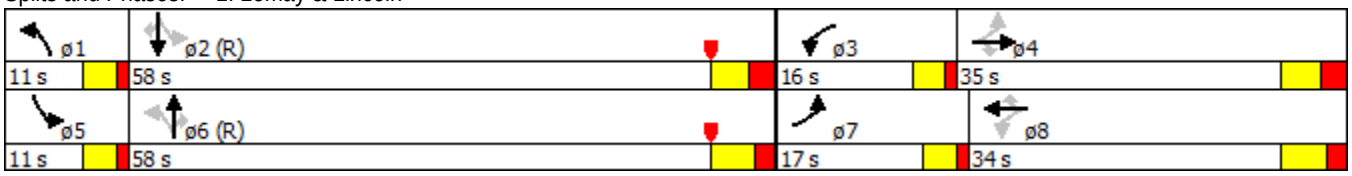
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	58	16	35	11	58	17	34
Maximum Split (%)	9.2%	48.3%	13.3%	29.2%	9.2%	48.3%	14.2%	28.3%
Minimum Split (s)	11	30	11	29	11	30	11	25
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	2
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	101	112	50	66	101	112	50	67
End Time (s)	112	50	66	101	112	50	67	101
Yield/Force Off (s)	108	44	62	95	108	44	63	95
Yield/Force Off 170(s)	108	27	62	82	108	27	63	83
Local Start Time (s)	57	68	6	22	57	68	6	23
Local Yield (s)	64	0	18	51	64	0	19	51
Local Yield 170(s)	64	103	18	38	64	103	19	39

Intersection Summary

Cycle Length	120	
Control Type	Actuated-Coordinated	
Natural Cycle	85	

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Intersection

Int Delay, s/veh 11.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	25	35	20	10	5	55	630	70	10	1445	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	150	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	26	37	21	11	5	58	663	74	11	1521	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1995	2321	761	1574	2321	332	1521	0	0	663	0	0
Stage 1	1542	1542	-	779	779	-	-	-	-	-	-	-
Stage 2	453	779	-	795	1542	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	36	37	348	74	37	664	435	-	-	922	-	-
Stage 1	120	175	-	355	404	-	-	-	-	-	-	-
Stage 2	556	404	-	347	175	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	24	32	348	~ 19	32	664	435	-	-	922	-	-
Mov Cap-2 Maneuver	24	32	-	~ 19	32	-	-	-	-	-	-	-
Stage 1	104	173	-	308	350	-	-	-	-	-	-	-
Stage 2	464	350	-	260	173	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	198.7	$ 351	1.1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	435	-	-	24	68	19	47	922	-	-
HCM Lane V/C Ratio	0.133	-	-	0.439	0.929	1.108	0.336	0.011	-	-
HCM Control Delay (s)	14.5	-	-	242.1	191.5	$ 527.1	116.3	9	-	-
HCM Lane LOS	B	-	-	F	F	F	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.3	4.6	2.9	1.2	0	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.912			0.953				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1699	0	1770	1775	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1699	0	1770	1775	0	1770	3539	1583	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			540			1334	
Travel Time (s)		13.4			19.7			12.3			30.3	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 18.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	10	70	25	30	20	35	1400	75	10	1030	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	150	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	11	74	26	32	21	37	1474	79	11	1084	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1931	2652	542	2115	2652	737	1084	0	0	1474	0	0
Stage 1	1105	1105	-	1547	1547	-	-	-	-	-	-	-
Stage 2	826	1547	-	568	1105	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	40	23	485	29	~ 23	361	639	-	-	453	-	-
Stage 1	225	285	-	119	174	-	-	-	-	-	-	-
Stage 2	332	174	-	475	285	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	21	485	~ 14	~ 21	361	639	-	-	453	-	-
Mov Cap-2 Maneuver	-	21	-	~ 14	~ 21	-	-	-	-	-	-	-
Stage 1	212	278	-	112	164	-	-	-	-	-	-	-
Stage 2	238	164	-	378	278	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 677.2	0.3	0.1
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	639	-	-	-	129	14	34	453	-	-
HCM Lane V/C Ratio	0.058	-	-	-	0.653	1.88	1.548	0.023	-	-
HCM Control Delay (s)	11	-	-	-	74.4	$ 966.7	$ 532.4	13.1	-	-
HCM Lane LOS	B	-	-	-	F	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	3.5	4	5.8	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		150	150		150	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.869			0.941				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1619	0	1770	1753	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1619	0	1770	1753	0	1770	3539	1583	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			540			1334	
Travel Time (s)		13.4			19.7			12.3			30.3	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	25	35	20	10	5	55	630	70	10	1445	30
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	11	26	1	21	11	0	58	663	65	11	1521	28
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	200	112	4	187	117	0	387	2846	1273	654	2846	1273
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1398	1782	69	1378	1863	0	332	3539	1583	724	3539	1583
Grp Volume(v), veh/h	11	0	27	21	11	0	58	663	65	11	1521	28
Grp Sat Flow(s),veh/h/ln	1398	0	1851	1378	1863	0	332	1770	1583	724	1770	1583
Q Serve(g_s), s	0.4	0.0	0.8	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.8	1.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	200	0	116	187	117	0	387	2846	1273	654	2846	1273
V/C Ratio(X)	0.06	0.00	0.23	0.11	0.09	0.00	0.15	0.23	0.05	0.02	0.53	0.02
Avail Cap(c_a), veh/h	368	0	339	353	342	0	387	2846	1273	654	2846	1273
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.86	0.86	0.86
Uniform Delay (d), s/veh	26.9	0.0	26.8	27.6	26.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	1.0	0.3	0.3	0.0	0.8	0.2	0.1	0.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.5	0.3	0.2	0.0	0.1	0.1	0.0	0.0	0.2	0.0
LnGrp Delay(d),s/veh	27.0	0.0	27.8	27.8	26.9	0.0	0.8	0.2	0.1	0.0	0.6	0.0
LnGrp LOS	C		C	C	C		A	A	A	A	A	A
Approach Vol, veh/h		38			32			786			1560	
Approach Delay, s/veh		27.5			27.5			0.2			0.6	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		52.2		7.8		52.2		7.8
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		40.0		10.0		40.0		10.0
Max Q Clear Time (g_c+I1), s		3.0		2.8		2.0		3.7
Green Ext Time (p_c), s		26.3		0.1		26.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	1.3
HCM 2010 LOS	A

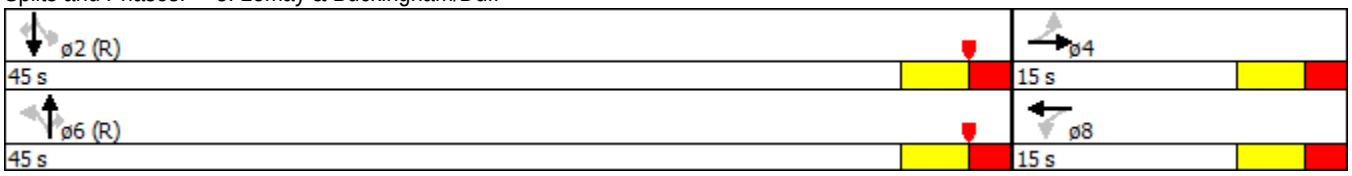
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	45	15	45	15
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	15	15	15	15
Yellow Time (s)	3	3	3	3
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	4	4	4	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	15	0	15	0
End Time (s)	0	15	0	15
Yield/Force Off (s)	55	10	55	10
Yield/Force Off 170(s)	55	10	55	10
Local Start Time (s)	15	0	15	0
Local Yield (s)	55	10	55	10
Local Yield 170(s)	55	10	55	10

Intersection Summary

Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	55

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 3: Lemay & Buckingham/Duff



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	10	70	25	30	20	35	1400	75	10	1030	20
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	16	11	2	26	32	1	37	1474	74	11	1084	16
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	190	104	19	205	122	4	528	2827	1265	386	2827	1265
Arrive On Green	0.07	0.07	0.07	0.07	0.07	0.07	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1370	1535	279	1395	1797	56	510	3539	1583	333	3539	1583
Grp Volume(v), veh/h	16	0	13	26	0	33	37	1474	74	11	1084	16
Grp Sat Flow(s),veh/h/ln	1370	0	1814	1395	0	1853	510	1770	1583	333	1770	1583
Q Serve(g_s), s	0.7	0.0	0.4	1.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.4	1.5	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.15	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	190	0	123	205	0	126	528	2827	1265	386	2827	1265
V/C Ratio(X)	0.08	0.00	0.11	0.13	0.00	0.26	0.07	0.52	0.06	0.03	0.38	0.01
Avail Cap(c_a), veh/h	348	0	332	366	0	340	528	2827	1265	386	2827	1265
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	27.3	0.0	26.2	26.9	0.0	26.5	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.2	0.0	0.4	0.3	0.0	1.1	0.3	0.7	0.1	0.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.2	0.4	0.0	0.6	0.0	0.3	0.0	0.0	0.1	0.0
LnGrp Delay(d),s/veh	27.5	0.0	26.6	27.2	0.0	27.6	0.3	0.7	0.1	0.1	0.4	0.0
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		29			59			1585			1111	
Approach Delay, s/veh		27.1			27.4			0.7			0.4	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.9		8.1		51.9		8.1
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		40.0		10.0		40.0		10.0
Max Q Clear Time (g_c+I1), s		2.0		3.7		2.0		3.5
Green Ext Time (p_c), s		29.8		0.1		29.8		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	1.4
HCM 2010 LOS	A

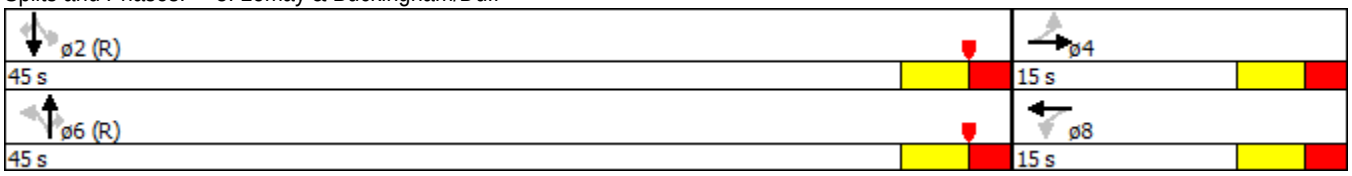
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	45	15	45	15
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	15	15	15	15
Yellow Time (s)	3	3	3	3
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	4	4	4	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	15	0	15	0
End Time (s)	0	15	0	15
Yield/Force Off (s)	55	10	55	10
Yield/Force Off 170(s)	55	10	55	10
Local Start Time (s)	15	0	15	0
Local Yield (s)	55	10	55	10
Local Yield 170(s)	55	10	55	10

Intersection Summary

Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 3: Lemay & Buckingham/Duff



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	245	50	160	270	30	115	395	30	25	890	30
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1882	1863	1863	1882	1788	1863	1937	1863	1863	1937	1863
Adj Flow Rate, veh/h	11	258	53	168	284	32	121	416	32	26	937	32
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	5	2	2	5	2	2	2	2	2	2	2
Cap, veh/h	241	357	296	299	507	403	363	2013	845	568	1911	801
Arrive On Green	0.02	0.19	0.19	0.10	0.27	0.27	0.06	0.55	0.55	0.03	0.52	0.52
Sat Flow, veh/h	1774	1882	1561	1774	1882	1497	1774	3681	1546	1774	3681	1543
Grp Volume(v), veh/h	11	258	53	168	284	32	121	416	32	26	937	32
Grp Sat Flow(s),veh/h/ln	1774	1882	1561	1774	1882	1497	1774	1840	1546	1774	1840	1543
Q Serve(g_s), s	0.6	15.4	3.4	8.7	15.6	1.9	3.6	6.9	1.1	0.8	19.7	1.2
Cycle Q Clear(g_c), s	0.6	15.4	3.4	8.7	15.6	1.9	3.6	6.9	1.1	0.8	19.7	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	357	296	299	507	403	363	2013	845	568	1911	801
V/C Ratio(X)	0.05	0.72	0.18	0.56	0.56	0.08	0.33	0.21	0.04	0.05	0.49	0.04
Avail Cap(c_a), veh/h	311	463	384	332	572	455	428	2013	845	622	1911	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	45.6	40.8	33.5	37.7	32.7	13.4	13.9	12.6	12.6	18.6	14.2
Incr Delay (d2), s/veh	0.1	9.9	1.0	1.7	3.5	0.3	0.5	0.2	0.1	0.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.0	1.6	4.4	8.6	0.8	1.8	3.6	0.5	0.4	10.3	0.5
LnGrp Delay(d),s/veh	38.1	55.5	41.8	35.3	41.2	33.0	13.9	14.1	12.7	12.6	19.5	14.3
LnGrp LOS	D	E	D	D	D	C	B	B	B	B	B	B
Approach Vol, veh/h		322			484			569			995	
Approach Delay, s/veh		52.6			38.6			14.0			19.2	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	66.3	15.8	27.3	7.3	69.6	6.2	36.8
Change Period (Y+Rc), s	5.0	* 5	5.0	5.5	5.0	5.0	5.0	5.5
Max Green Setting (Gmax), s	10.0	* 49	13.0	28.5	6.0	52.0	6.0	35.5
Max Q Clear Time (g_c+I1), s	5.6	21.7	10.7	17.4	2.8	8.9	2.6	17.6
Green Ext Time (p_c), s	0.1	17.6	0.1	4.3	0.0	23.8	0.0	5.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.4
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

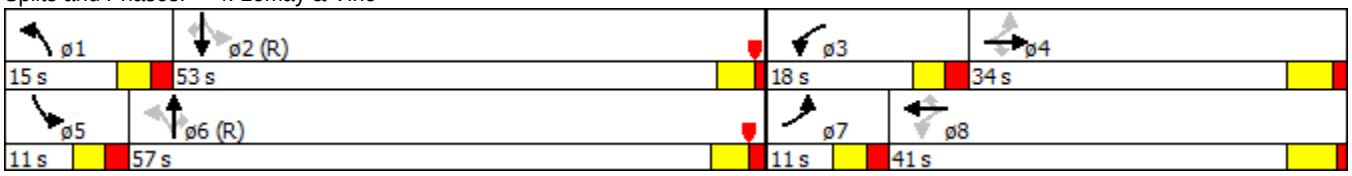
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	15	53	18	34	11	57	11	41
Maximum Split (%)	12.5%	44.2%	15.0%	28.3%	9.2%	47.5%	9.2%	34.2%
Minimum Split (s)	11	21.5	11	22.5	11	22	11	22.5
Yellow Time (s)	3	3.5	3	4	3	3.5	3	4.5
All-Red Time (s)	2	1	2	1.5	2	1.5	2	1
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	6	3	6	3	6	3	6
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		10		10		10		10
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	52	67	0	18	52	63	0	11
End Time (s)	67	0	18	52	63	0	11	52
Yield/Force Off (s)	62	115.5	13	46.5	58	115	6	46.5
Yield/Force Off 170(s)	62	105.5	13	36.5	58	105	6	36.5
Local Start Time (s)	52	67	0	18	52	63	0	11
Local Yield (s)	62	115.5	13	46.5	58	115	6	46.5
Local Yield 170(s)	62	105.5	13	36.5	58	105	6	36.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	375	70	75	270	30	90	885	150	25	665	15
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1882	1863	1863	1882	1788	1863	1937	1863	1863	1937	1863
Adj Flow Rate, veh/h	32	395	74	79	284	32	95	932	158	26	700	16
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	5	2	2	5	2	2	2	2	2	2	2
Cap, veh/h	290	508	422	224	551	438	419	1885	791	310	1805	757
Arrive On Green	0.03	0.27	0.27	0.05	0.29	0.29	0.07	0.68	0.68	0.03	0.49	0.49
Sat Flow, veh/h	1774	1882	1562	1774	1882	1497	1774	3681	1545	1774	3681	1543
Grp Volume(v), veh/h	32	395	74	79	284	32	95	932	158	26	700	16
Grp Sat Flow(s),veh/h/ln	1774	1882	1562	1774	1882	1497	1774	1840	1545	1774	1840	1543
Q Serve(g_s), s	1.5	23.3	4.4	3.8	15.1	1.9	3.1	14.6	4.5	0.9	14.4	0.6
Cycle Q Clear(g_c), s	1.5	23.3	4.4	3.8	15.1	1.9	3.1	14.6	4.5	0.9	14.4	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	508	422	224	551	438	419	1885	791	310	1805	757
V/C Ratio(X)	0.11	0.78	0.18	0.35	0.52	0.07	0.23	0.49	0.20	0.08	0.39	0.02
Avail Cap(c_a), veh/h	340	619	514	233	619	493	435	1885	791	365	1805	757
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.88	0.88	0.88	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	40.5	33.6	30.9	35.4	30.7	14.0	11.7	10.1	14.8	19.2	15.7
Incr Delay (d2), s/veh	0.2	9.6	0.7	0.9	2.7	0.3	0.2	0.8	0.5	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	13.4	2.0	1.9	8.2	0.8	1.5	7.5	2.0	0.4	7.4	0.3
LnGrp Delay(d),s/veh	30.7	50.0	34.3	31.9	38.1	30.9	14.2	12.5	10.6	14.9	19.9	15.8
LnGrp LOS	C	D	C	C	D	C	B	B	B	B	B	B
Approach Vol, veh/h		501			395			1185			742	
Approach Delay, s/veh		46.5			36.2			12.4			19.6	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	62.9	10.3	36.9	7.3	65.4	7.6	39.6
Change Period (Y+Rc), s	5.0	* 5	5.0	5.5	5.0	5.0	5.0	5.5
Max Green Setting (Gmax), s	6.0	* 50	6.0	38.5	6.0	49.0	6.0	38.5
Max Q Clear Time (g_c+I1), s	5.1	16.4	5.8	25.3	2.9	16.6	3.5	17.1
Green Ext Time (p_c), s	0.0	25.1	0.0	6.1	0.0	24.7	0.0	8.1

Intersection Summary	
HCM 2010 Ctrl Delay	23.7
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

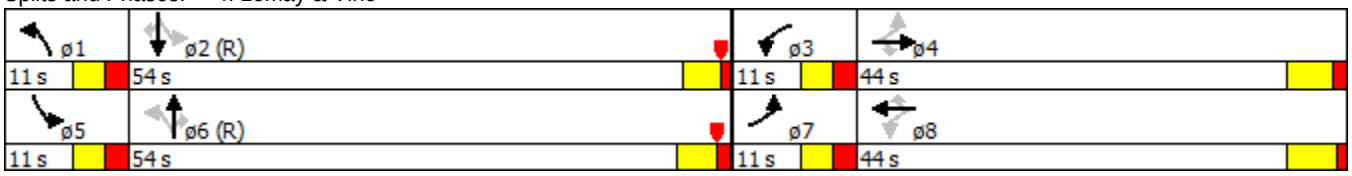
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	54	11	44	11	54	11	44
Maximum Split (%)	9.2%	45.0%	9.2%	36.7%	9.2%	45.0%	9.2%	36.7%
Minimum Split (s)	11	21.5	11	22.5	11	22	11	22.5
Yellow Time (s)	3	3.5	3	4	3	3.5	3	4.5
All-Red Time (s)	2	1	2	1.5	2	1.5	2	1
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	6	3	6	3	6	3	6
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		10		10		10		10
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	55	66	0	11	55	66	0	11
End Time (s)	66	0	11	55	66	0	11	55
Yield/Force Off (s)	61	115.5	6	49.5	61	115	6	49.5
Yield/Force Off 170(s)	61	105.5	6	39.5	61	105	6	39.5
Local Start Time (s)	55	66	0	11	55	66	0	11
Local Yield (s)	61	115.5	6	49.5	61	115	6	49.5
Local Yield 170(s)	61	105.5	6	39.5	61	105	6	39.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	538	332	26	268
Demand Flow Rate, veh/h	549	338	26	273
Vehicles Circulating, veh/h	101	360	629	198
Vehicles Exiting, veh/h	370	295	21	500
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.4	10.2	6.5	7.1
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	549	338	26	273
Cap Entry Lane, veh/h	1021	788	602	927
Entry HV Adj Factor	0.980	0.981	0.996	0.981
Flow Entry, veh/h	538	332	26	268
Cap Entry, veh/h	1001	773	600	910
V/C Ratio	0.538	0.429	0.043	0.295
Control Delay, s/veh	10.4	10.2	6.5	7.1
LOS	B	B	A	A
95th %tile Queue, veh	3	2	0	1

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	511	569	31	337
Demand Flow Rate, veh/h	522	580	31	343
Vehicles Circulating, veh/h	129	230	602	504
Vehicles Exiting, veh/h	718	403	49	306
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.4	14.5	6.4	13.2
Approach LOS	B	B	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	522	580	31	343
Cap Entry Lane, veh/h	993	898	619	683
Entry HV Adj Factor	0.980	0.981	0.997	0.982
Flow Entry, veh/h	511	569	31	337
Cap Entry, veh/h	973	880	617	670
V/C Ratio	0.526	0.646	0.050	0.502
Control Delay, s/veh	10.4	14.5	6.4	13.2
LOS	B	B	A	B
95th %tile Queue, veh	3	5	0	3

Intersection	
Int Delay, s/veh	2.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	235	40	65	300	15	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	247	42	68	316	16	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	247	0	700	247
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	453	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1319	-	405	792
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	640	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1319	-	384	792
Mov Cap-2 Maneuver	-	-	-	-	384	-
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	607	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	11.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	678	-	-	1319	-
HCM Lane V/C Ratio	0.147	-	-	0.052	-
HCM Control Delay (s)	11.2	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.5	-	-	0.2	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		200	200		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.887	
Flt Protected			0.950		0.992	
Satd. Flow (prot)	1863	1583	1770	1863	1639	0
Flt Permitted			0.950		0.992	
Satd. Flow (perm)	1863	1583	1770	1863	1639	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	7.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	300	75	135	445	95	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	250	250	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	316	79	142	468	100	153

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	316	0	1069	316
Stage 1	-	-	-	-	316	-
Stage 2	-	-	-	-	753	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1244	-	245	724
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	465	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1244	-	217	724
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	739	-
Stage 2	-	-	-	-	412	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	32.1
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	376	-	-	1244	-
HCM Lane V/C Ratio	0.672	-	-	0.114	-
HCM Control Delay (s)	32.1	-	-	8.3	-
HCM Lane LOS	D	-	-	A	-
HCM 95th %tile Q(veh)	4.7	-	-	0.4	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		250	250		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.918	
Flt Protected			0.950		0.981	
Satd. Flow (prot)	1863	1583	1770	1863	1678	0
Flt Permitted			0.950		0.981	
Satd. Flow (perm)	1863	1583	1770	1863	1678	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	5	445	20	0	255
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	468	21	0	268

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	747	479	0	0	489	0
Stage 1	479	-	-	-	-	-
Stage 2	268	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	381	587	-	-	1074	-
Stage 1	623	-	-	-	-	-
Stage 2	777	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	381	587	-	-	1074	-
Mov Cap-2 Maneuver	381	-	-	-	-	-
Stage 1	623	-	-	-	-	-
Stage 2	777	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	587	1074	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	11.2	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	100	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.994			
Flt Protected						
Satd. Flow (prot)	0	1611	1852	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	1852	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	725		617			505
Travel Time (s)	16.5		14.0			11.5

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	15	275	10	0	320
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	289	11	0	337

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	632	295	0	0	300	0
Stage 1	295	-	-	-	-	-
Stage 2	337	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	444	744	-	-	1261	-
Stage 1	755	-	-	-	-	-
Stage 2	723	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	444	744	-	-	1261	-
Mov Cap-2 Maneuver	444	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	723	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	744	1261	-
HCM Lane V/C Ratio	-	-	0.021	-	-
HCM Control Delay (s)	-	-	9.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	100	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.995			
Flt Protected						
Satd. Flow (prot)	0	1611	1853	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	1853	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	725		617			505
Travel Time (s)	16.5		14.0			11.5

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	80	20	5	10	10	10	5	425	20	25	250	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	84	21	5	11	11	11	5	447	21	26	263	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	795	795	263	797	784	458	263	0	0	468	0	0
Stage 1	316	316	-	468	468	-	-	-	-	-	-	-
Stage 2	479	479	-	329	316	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	305	320	776	305	325	603	1301	-	-	1094	-	-
Stage 1	695	655	-	575	561	-	-	-	-	-	-	-
Stage 2	568	555	-	684	655	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	286	311	776	281	316	603	1301	-	-	1094	-	-
Mov Cap-2 Maneuver	286	311	-	281	316	-	-	-	-	-	-	-
Stage 1	692	639	-	573	559	-	-	-	-	-	-	-
Stage 2	545	553	-	641	639	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.2	15.5	0.1	0.7
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1301	-	-	286	353	281	415	1094	-	-
HCM Lane V/C Ratio	0.004	-	-	0.294	0.075	0.037	0.051	0.024	-	-
HCM Control Delay (s)	7.8	-	-	22.8	16	18.3	14.1	8.4	-	-
HCM Lane LOS	A	-	-	C	C	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.2	0.1	0.2	0.1	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	150		0	150		150
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.971			0.925			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1809	0	1770	1723	0	1770	1850	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1809	0	1770	1723	0	1770	1850	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		414			1093			383			1126	
Travel Time (s)		9.4			24.8			8.7			25.6	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	90	10	5	35	20	20	5	275	10	5	285	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	11	5	37	21	21	5	289	11	5	300	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	637	622	300	623	616	295	300	0	0	300	0	0
Stage 1	311	311	-	305	305	-	-	-	-	-	-	-
Stage 2	326	311	-	318	311	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	390	403	740	398	406	744	1261	-	-	1261	-	-
Stage 1	699	658	-	705	662	-	-	-	-	-	-	-
Stage 2	687	658	-	693	658	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	362	400	740	385	403	744	1261	-	-	1261	-	-
Mov Cap-2 Maneuver	362	400	-	385	403	-	-	-	-	-	-	-
Stage 1	696	655	-	702	659	-	-	-	-	-	-	-
Stage 2	644	655	-	674	655	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.6	13.8	0.1	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1261	-	-	362	472	385	523	1261	-	-
HCM Lane V/C Ratio	0.004	-	-	0.262	0.033	0.096	0.081	0.004	-	-
HCM Control Delay (s)	7.9	-	-	18.4	12.9	15.3	12.5	7.9	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1	0.1	0.3	0.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	150		0	150		150
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.953			0.925			0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1775	0	1770	1723	0	1770	1852	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1775	0	1770	1723	0	1770	1852	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		414			1093			383			1126	
Travel Time (s)		9.4			24.8			8.7			25.6	

Intersection Summary

Area Type: Other

APPENDIX G

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	44	194	128	118	190	123	234	378	81	153	713	96
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		1.00	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1900
Adj Flow Rate, veh/h	52	228	2	139	224	10	275	445	37	180	839	54
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	292	245	244	351	284	285	1085	920	581	933	60
Arrive On Green	0.04	0.15	0.15	0.07	0.18	0.18	0.09	0.56	0.56	0.05	0.36	0.36
Sat Flow, veh/h	1845	1937	1625	1845	1937	1566	1845	1937	1642	1774	1729	111
Grp Volume(v), veh/h	52	228	2	139	224	10	275	445	37	180	0	893
Grp Sat Flow(s),veh/h/ln	1845	1937	1625	1845	1937	1566	1845	1937	1642	1774	0	1840
Q Serve(g_s), s	2.6	12.5	0.1	6.8	11.8	0.6	9.3	14.4	1.1	4.8	0.0	50.5
Cycle Q Clear(g_c), s	2.6	12.5	0.1	6.8	11.8	0.6	9.3	14.4	1.1	4.8	0.0	50.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.06
Lane Grp Cap(c), veh/h	231	292	245	244	351	284	285	1085	920	581	0	993
V/C Ratio(X)	0.22	0.78	0.01	0.57	0.64	0.04	0.96	0.41	0.04	0.31	0.00	0.90
Avail Cap(c_a), veh/h	287	352	295	244	352	285	285	1085	920	585	0	993
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.2	44.9	39.7	35.3	41.7	37.1	30.0	13.8	10.9	10.4	0.0	32.3
Incr Delay (d2), s/veh	0.5	8.9	0.0	3.1	3.8	0.0	43.2	1.1	0.1	0.3	0.0	12.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.4	0.1	3.6	6.7	0.3	11.8	8.0	0.5	2.4	0.0	29.1
LnGrp Delay(d),s/veh	37.7	53.9	39.7	38.4	45.5	37.1	73.2	15.0	11.0	10.7	0.0	44.9
LnGrp LOS	D	D	D	D	D	D	E	B	B	B		D
Approach Vol, veh/h		282			373			757			1073	
Approach Delay, s/veh		50.8			42.6			35.9			39.1	
Approach LOS		D			D			D			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	64.4	11.0	21.6	10.8	66.6	7.7	24.9
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	9.0	55.0	7.0	19.0	7.0	57.0	7.0	19.0
Max Q Clear Time (g_c+I1), s	11.3	52.5	8.8	14.5	6.8	16.4	4.6	13.8
Green Ext Time (p_c), s	0.0	1.5	0.0	0.7	0.0	6.5	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	40.0
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

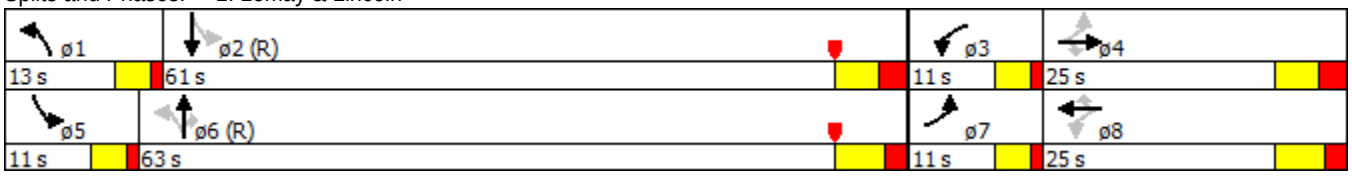
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	13	61	11	25	11	63	11	25
Maximum Split (%)	11.8%	55.5%	10.0%	22.7%	10.0%	57.3%	10.0%	22.7%
Minimum Split (s)	11	30	11	29	11	30	11	25
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	2
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	42	55	6	17	42	53	6	17
End Time (s)	55	6	17	42	53	6	17	42
Yield/Force Off (s)	51	0	13	36	49	0	13	36
Yield/Force Off 170(s)	51	93	13	23	49	93	13	24
Local Start Time (s)	42	55	6	17	42	53	6	17
Local Yield (s)	51	0	13	36	49	0	13	36
Local Yield 170(s)	51	93	13	23	49	93	13	24

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	125

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	166	303	240	183	293	240	301	810	109	143	553	82
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1900
Adj Flow Rate, veh/h	180	329	72	199	318	87	327	880	65	155	601	84
Adj No. of Lanes	1	1	1	1	1	1	1	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	401	334	259	385	308	581	988	835	238	812	113
Arrive On Green	0.09	0.21	0.21	0.08	0.20	0.20	0.07	0.51	0.51	0.13	1.00	1.00
Sat Flow, veh/h	1845	1937	1615	1845	1937	1551	1845	1937	1637	1774	1593	223
Grp Volume(v), veh/h	180	329	72	199	318	87	327	880	65	155	0	685
Grp Sat Flow(s),veh/h/ln	1845	1937	1615	1845	1937	1551	1845	1937	1637	1774	0	1816
Q Serve(g_s), s	9.2	19.5	4.4	10.0	18.9	5.7	8.0	49.0	2.4	5.0	0.0	0.0
Cycle Q Clear(g_c), s	9.2	19.5	4.4	10.0	18.9	5.7	8.0	49.0	2.4	5.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	271	401	334	259	385	308	581	988	835	238	0	925
V/C Ratio(X)	0.66	0.82	0.22	0.77	0.83	0.28	0.56	0.89	0.08	0.65	0.00	0.74
Avail Cap(c_a), veh/h	271	500	417	259	492	394	581	988	835	239	0	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.3	45.4	39.5	37.1	46.1	40.8	13.5	26.4	15.0	23.1	0.0	0.0
Incr Delay (d2), s/veh	6.0	8.6	0.3	12.9	8.9	0.5	1.2	12.0	0.2	6.1	0.0	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	11.4	2.0	2.4	11.0	2.5	2.3	29.4	1.1	2.8	0.0	1.4
LnGrp Delay(d),s/veh	41.3	54.0	39.8	50.0	55.0	41.3	14.7	38.4	15.2	29.2	0.0	5.3
LnGrp LOS	D	D	D	D	D	D	B	D	B	C		A
Approach Vol, veh/h		581			604			1272			840	
Approach Delay, s/veh		48.3			51.4			31.1			9.7	
Approach LOS		D			D			C			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	66.2	13.0	29.8	11.0	66.2	14.0	28.8
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	* 6
Max Green Setting (Gmax), s	7.0	54.0	9.0	30.0	7.0	54.0	10.0	* 30
Max Q Clear Time (g_c+I1), s	10.0	2.0	12.0	21.5	7.0	51.0	11.2	20.9
Green Ext Time (p_c), s	0.0	8.4	0.0	2.0	0.0	2.0	0.0	2.0

Intersection Summary	
HCM 2010 Ctrl Delay	32.4
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

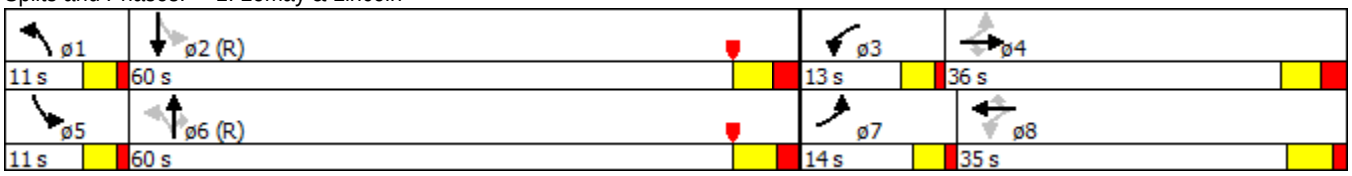
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	60	13	36	11	60	14	35
Maximum Split (%)	9.2%	50.0%	10.8%	30.0%	9.2%	50.0%	11.7%	29.2%
Minimum Split (s)	11	30	11	29	11	30	11	24.5
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	1.5
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	99	110	50	63	99	110	50	64
End Time (s)	110	50	63	99	110	50	64	99
Yield/Force Off (s)	106	44	59	93	106	44	60	93.5
Yield/Force Off 170(s)	106	27	59	80	106	27	60	81.5
Local Start Time (s)	55	66	6	19	55	66	6	20
Local Yield (s)	62	0	15	49	62	0	16	49.5
Local Yield 170(s)	62	103	15	36	62	103	16	37.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	95

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Intersection

Int Delay, s/veh 1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	3	5	24	4	0	0	41	400	54	0	838	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	6	28	5	0	0	48	471	64	0	986	26

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1598	1630	999	1615	1611	502	1012	0	0	534	0	0
Stage 1	999	999	-	599	599	-	-	-	-	-	-	-
Stage 2	599	631	-	1016	1012	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	86	102	295	83	104	569	685	-	-	1034	-	-
Stage 1	293	321	-	488	490	-	-	-	-	-	-	-
Stage 2	488	474	-	287	317	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	79	92	295	66	93	569	685	-	-	1034	-	-
Mov Cap-2 Maneuver	79	92	-	66	93	-	-	-	-	-	-	-
Stage 1	263	321	-	439	441	-	-	-	-	-	-	-
Stage 2	439	426	-	255	317	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.5	63.7	0.9	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	685	-	-	184	66	1034	-	-
HCM Lane V/C Ratio	0.07	-	-	0.205	0.071	-	-	-
HCM Control Delay (s)	10.7	0	-	29.5	63.7	0	-	-
HCM Lane LOS	B	A	-	D	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.7	0.2	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.901						0.985			0.997	
Flt Protected		0.995			0.950			0.996				
Satd. Flow (prot)	0	1670	0	0	1770	0	0	1827	0	0	1857	0
Flt Permitted		0.995			0.950			0.996				
Satd. Flow (perm)	0	1670	0	0	1770	0	0	1827	0	0	1857	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		605			715			659			1365	
Travel Time (s)		13.8			16.3			15.0			31.0	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	5	7	52	5	2	0	24	1070	12	0	819	9
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	7	54	5	2	0	25	1115	12	0	853	9

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2030	2035	858	2060	2034	1121	863	0	0	1127	0	0
Stage 1	858	858	-	1171	1171	-	-	-	-	-	-	-
Stage 2	1172	1177	-	889	863	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	42	57	357	40	57	251	779	-	-	620	-	-
Stage 1	352	374	-	235	267	-	-	-	-	-	-	-
Stage 2	234	265	-	338	372	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	38	52	357	28	52	251	779	-	-	620	-	-
Mov Cap-2 Maneuver	38	52	-	28	52	-	-	-	-	-	-	-
Stage 1	322	374	-	215	244	-	-	-	-	-	-	-
Stage 2	212	242	-	281	372	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	44.7	148	0.2	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	779	-	-	155	32	620	-	-
HCM Lane V/C Ratio	0.032	-	-	0.43	0.228	-	-	-
HCM Control Delay (s)	9.8	0	-	44.7	148	0	-	-
HCM Lane LOS	A	A	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.9	0.7	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.890						0.999			0.999	
Flt Protected		0.996			0.966			0.999				
Satd. Flow (prot)	0	1651	0	0	1799	0	0	1859	0	0	1861	0
Flt Permitted		0.996			0.966			0.999				
Satd. Flow (perm)	0	1651	0	0	1799	0	0	1859	0	0	1861	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			540			1334	
Travel Time (s)		13.4			19.7			12.3			30.3	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	117	72	135	205	121	36	366	48	52	653	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.94		1.00	0.94			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1955		1770	1941			1884			1961	
Flt Permitted	0.19	1.00		0.46	1.00			0.89			0.93	
Satd. Flow (perm)	361	1955		858	1941			1687			1837	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	27	138	85	159	241	142	42	431	56	61	768	52
RTOR Reduction (vph)	0	19	0	0	19	0	0	4	0	0	2	0
Lane Group Flow (vph)	27	204	0	159	364	0	0	525	0	0	879	0
Confl. Peds. (#/hr)									2	2		
Confl. Bikes (#/hr)						2			4			9
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	26.8	26.8		26.8	26.8			72.7			73.2	
Effective Green, g (s)	27.8	27.8		27.8	27.8			73.7			74.2	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.67			0.67	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	91	494		216	490			1130			1239	
v/s Ratio Prot		0.10			c0.19							
v/s Ratio Perm	0.07			0.19				0.31			c0.48	
v/c Ratio	0.30	0.41		0.74	0.74			0.46			0.71	
Uniform Delay, d1	33.2	34.3		37.7	37.8			8.7			11.2	
Progression Factor	1.00	1.00		1.00	1.00			0.95			1.00	
Incremental Delay, d2	5.1	1.6		16.5	8.0			1.3			3.5	
Delay (s)	38.3	35.9		54.2	45.9			9.6			14.6	
Level of Service	D	D		D	D			A			B	
Approach Delay (s)		36.1			48.3			9.6			14.6	
Approach LOS		D			D			A			B	

Intersection Summary

HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

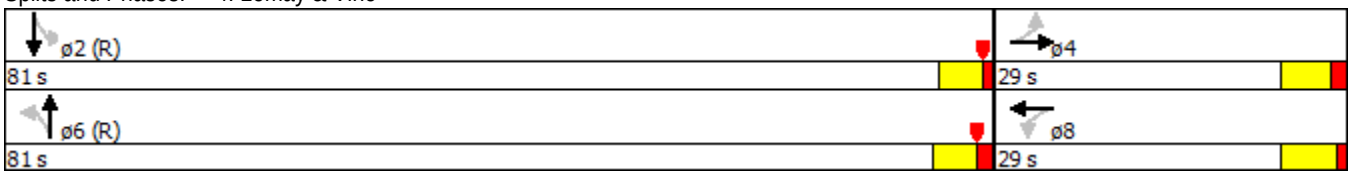
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Min	None	C-Min	None
Maximum Split (s)	81	29	81	29
Maximum Split (%)	73.6%	26.4%	73.6%	26.4%
Minimum Split (s)	21.5	22.5	22	22.5
Yellow Time (s)	3.5	4	3.5	4.5
All-Red Time (s)	1	1.5	1.5	1
Minimum Initial (s)	7	7	7	7
Vehicle Extension (s)	6	6	6	6
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	10	10	10	10
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	76	47	76	47
End Time (s)	47	76	47	76
Yield/Force Off (s)	42.5	70.5	42	70.5
Yield/Force Off 170(s)	32.5	60.5	32	60.5
Local Start Time (s)	29	0	29	0
Local Yield (s)	105.5	23.5	105	23.5
Local Yield 170(s)	95.5	13.5	95	13.5

Intersection Summary

Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	60

Offset: 47 (43%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	55	258	90	106	175	162	97	823	154	98	633	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	8	12	13	12	12	14	12
Total Lost time (s)	4.5	4.5		4.5	4.5			4.0			3.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	0.96		1.00	0.93			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1974		1770	1905			1873			1959	
Flt Permitted	0.23	1.00		0.21	1.00			0.86			0.74	
Satd. Flow (perm)	436	1974		400	1905			1617			1456	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	58	272	95	112	184	171	102	866	162	103	666	38
RTOR Reduction (vph)	0	10	0	0	28	0	0	5	0	0	2	0
Lane Group Flow (vph)	58	357	0	112	327	0	0	1125	0	0	805	0
Confl. Peds. (#/hr)							2					2
Confl. Bikes (#/hr)			2			4			3			5
Heavy Vehicles (%)	2%	5%	2%	2%	5%	2%	2%	2%	2%	2%	2%	2%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			6			2	
Permitted Phases	4			8			6			2		
Actuated Green, G (s)	29.5	29.5		29.5	29.5			80.0			80.5	
Effective Green, g (s)	30.5	30.5		30.5	30.5			81.0			81.5	
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.68			0.68	
Clearance Time (s)	5.5	5.5		5.5	5.5			5.0			4.5	
Vehicle Extension (s)	6.0	6.0		6.0	6.0			6.0			6.0	
Lane Grp Cap (vph)	110	501		101	484			1091			988	
v/s Ratio Prot		0.18			0.17							
v/s Ratio Perm	0.13			c0.28				c0.70			0.55	
v/c Ratio	0.53	0.71		1.11	0.68			1.03			0.82	
Uniform Delay, d1	38.5	40.7		44.8	40.3			19.5			13.8	
Progression Factor	1.00	1.00		1.00	1.00			0.65			1.00	
Incremental Delay, d2	11.0	6.8		121.9	5.7			29.5			7.4	
Delay (s)	49.5	47.5		166.7	46.0			42.2			21.2	
Level of Service	D	D		F	D			D			C	
Approach Delay (s)		47.8			75.0			42.2			21.2	
Approach LOS		D			E			D			C	

Intersection Summary

HCM 2000 Control Delay	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	106.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

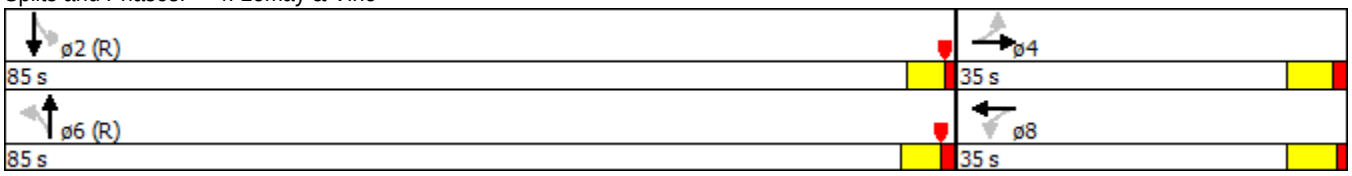
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Min	None
Maximum Split (s)	85	35	85	35
Maximum Split (%)	70.8%	29.2%	70.8%	29.2%
Minimum Split (s)	21.5	22.5	22	22.5
Yellow Time (s)	3.5	4	3.5	4.5
All-Red Time (s)	1	1.5	1.5	1
Minimum Initial (s)	7	7	7	7
Vehicle Extension (s)	6	6	6	6
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)	7	7	7	7
Flash Dont Walk (s)	10	10	10	10
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	48	13	48	13
End Time (s)	13	48	13	48
Yield/Force Off (s)	8.5	42.5	8	42.5
Yield/Force Off 170(s)	118.5	32.5	118	32.5
Local Start Time (s)	35	0	35	0
Local Yield (s)	115.5	29.5	115	29.5
Local Yield 170(s)	105.5	19.5	105	19.5

Intersection Summary

Cycle Length	120	
Control Type	Actuated-Coordinated	
Natural Cycle	75	

Offset: 13 (11%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	350	2	0	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	412	2	0	98

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	414	0	-	0	413	413
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1145	-	-	-	595	639
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1145	-	-	-	595	639
Mov Cap-2 Maneuver	-	-	-	-	595	-
Stage 1	-	-	-	-	668	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1145	-	-	-	639
HCM Lane V/C Ratio	-	-	-	-	0.153
HCM Control Delay (s)	0	-	-	-	11.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.999			0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1861	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1861	0	0	1611
Link Speed (mph)		35	30		30	
Link Distance (ft)		439	400		412	
Travel Time (s)		8.6	9.1		9.4	

Intersection Summary

Area Type: Other

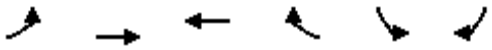
Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	643	9	0	83
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	714	10	0	92

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	724	0	-	0	719	719
Stage 1	-	-	-	-	719	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	879	-	-	-	395	428
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	879	-	-	-	395	428
Mov Cap-2 Maneuver	-	-	-	-	395	-
Stage 1	-	-	-	-	483	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	879	-	-	-	428
HCM Lane V/C Ratio	-	-	-	-	0.215
HCM Control Delay (s)	0	-	-	-	15.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1859	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1859	0	0	1611
Link Speed (mph)		35	35		30	
Link Distance (ft)		388	345		429	
Travel Time (s)		7.6	6.7		9.8	

Intersection Summary

Area Type: Other

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	502	369	25	65
Demand Flow Rate, veh/h	512	376	25	66
Vehicles Circulating, veh/h	23	66	522	379
Vehicles Exiting, veh/h	422	481	13	63
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.5	7.1	5.8	5.6
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	512	376	25	66
Cap Entry Lane, veh/h	1104	1058	670	773
Entry HV Adj Factor	0.981	0.981	1.000	0.985
Flow Entry, veh/h	502	369	25	65
Cap Entry, veh/h	1083	1038	670	762
V/C Ratio	0.464	0.355	0.037	0.085
Control Delay, s/veh	8.5	7.1	5.8	5.6
LOS	A	A	A	A
95th %tile Queue, veh	3	2	0	0

Intersection	
Intersection Delay, s/veh	13.1
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	621	692	22	87
Demand Flow Rate, veh/h	633	705	22	88
Vehicles Circulating, veh/h	32	137	621	706
Vehicles Exiting, veh/h	762	506	44	136
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.7	16.1	6.3	8.5
Approach LOS	B	C	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	633	705	22	88
Cap Entry Lane, veh/h	1094	985	607	558
Entry HV Adj Factor	0.980	0.981	1.000	0.989
Flow Entry, veh/h	621	692	22	87
Cap Entry, veh/h	1073	967	607	551
V/C Ratio	0.578	0.716	0.036	0.158
Control Delay, s/veh	10.7	16.1	6.3	8.5
LOS	B	C	A	A
95th %tile Queue, veh	4	6	0	1

Intersection	
Int Delay, s/veh	1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	365	35	47	300	14	58
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	429	41	55	353	16	68

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	471	0	914	450
Stage 1	-	-	-	-	450	-
Stage 2	-	-	-	-	464	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1091	-	303	609
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	633	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1091	-	284	609
Mov Cap-2 Maneuver	-	-	-	-	284	-
Stage 1	-	-	-	-	642	-
Stage 2	-	-	-	-	593	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.1	13.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	498	-	-	1091	-
HCM Lane V/C Ratio	0.17	-	-	0.051	-
HCM Control Delay (s)	13.7	-	-	8.5	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.988				0.891	
Flt Protected				0.993	0.991	
Satd. Flow (prot)	1840	0	0	1850	1645	0
Flt Permitted				0.993	0.991	
Satd. Flow (perm)	1840	0	0	1850	1645	0
Link Speed (mph)	35			30	30	
Link Distance (ft)	610			612	360	
Travel Time (s)	11.9			13.9	8.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	5.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	370	63	98	523	80	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	98	98	98	98	98	98
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	378	64	100	534	82	110

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	442	0	1144	410
Stage 1	-	-	-	-	410	-
Stage 2	-	-	-	-	734	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1118	-	221	642
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	475	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1118	-	193	642
Mov Cap-2 Maneuver	-	-	-	-	193	-
Stage 1	-	-	-	-	670	-
Stage 2	-	-	-	-	415	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	31.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	323	-	-	1118	-
HCM Lane V/C Ratio	0.594	-	-	0.089	-
HCM Control Delay (s)	31.2	-	-	8.5	0
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	3.6	-	-	0.3	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.981				0.923	
Flt Protected				0.992	0.979	
Satd. Flow (prot)	1827	0	0	1848	1683	0
Flt Permitted				0.992	0.979	
Satd. Flow (perm)	1827	0	0	1848	1683	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	12	33	20	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	14	39	24	0	64

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	115	51	0	0	62	0
Stage 1	51	-	-	-	-	-
Stage 2	64	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	881	1017	-	-	1541	-
Stage 1	971	-	-	-	-	-
Stage 2	959	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	881	1017	-	-	1541	-
Mov Cap-2 Maneuver	881	-	-	-	-	-
Stage 1	971	-	-	-	-	-
Stage 2	959	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1017	1541	-
HCM Lane V/C Ratio	-	-	0.014	-	-
HCM Control Delay (s)	-	-	8.6	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.949			
Flt Protected						
Satd. Flow (prot)	0	1611	1768	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	1768	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	328		624			506
Travel Time (s)	7.5		14.2			11.5

Intersection Summary

Area Type: Other

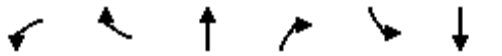
Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	12	90	31	0	78
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	100	34	0	87

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	204	117	0	0	134	0
Stage 1	117	-	-	-	-	-
Stage 2	87	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	784	935	-	-	1451	-
Stage 1	908	-	-	-	-	-
Stage 2	936	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	784	935	-	-	1451	-
Mov Cap-2 Maneuver	784	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	936	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.9	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	935	1451	-
HCM Lane V/C Ratio	-	-	0.014	-	-
HCM Control Delay (s)	-	-	8.9	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-



Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	0	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.966			
Flt Protected						
Satd. Flow (prot)	0	1611	1799	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	1799	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	349		618			510
Travel Time (s)	7.9		14.0			11.6

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	29	20	25	25	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	34	24	29	29	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	105	29	29	0	-	0
Stage 1	29	-	-	-	-	-
Stage 2	76	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	893	1046	1584	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	947	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	880	1046	1584	-	-	-
Mov Cap-2 Maneuver	880	-	-	-	-	-
Stage 1	994	-	-	-	-	-
Stage 2	933	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	3.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1584	-	1046	-	-
HCM Lane V/C Ratio	0.015	-	0.033	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected				0.978		
Satd. Flow (prot)	1611	0	0	1822	1863	0
Flt Permitted				0.978		
Satd. Flow (perm)	1611	0	0	1822	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	350			506	673	
Travel Time (s)	8.0			11.5	15.3	

Intersection Summary

Area Type: Other

Intersection

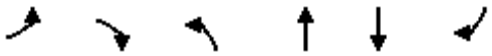
Int Delay, s/veh 4.2

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	0	29	68	34	49	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	76	38	54	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	243	54	54	0	-	0
Stage 1	54	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	745	1013	1551	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	843	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	708	1013	1551	-	-	-
Mov Cap-2 Maneuver	708	-	-	-	-	-
Stage 1	969	-	-	-	-	-
Stage 2	801	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1551	-	1013	-	-
HCM Lane V/C Ratio	0.049	-	0.032	-	-
HCM Control Delay (s)	7.4	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	0			0
Storage Lanes	1	0	0			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.865					
Flt Protected				0.968		
Satd. Flow (prot)	1611	0	0	1803	1863	0
Flt Permitted				0.968		
Satd. Flow (perm)	1611	0	0	1803	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	305			510	621	
Travel Time (s)	6.9			11.6	14.1	

Intersection Summary

Area Type: Other

APPENDIX H

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	45	205	150	140	185	100	175	625	190	125	1130	265
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		1.00	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1863
Adj Flow Rate, veh/h	47	216	-28	147	195	-59	184	658	149	132	1189	275
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	262	286	243	264	373	305	282	2139	952	486	2013	875
Arrive On Green	0.04	0.15	0.00	0.08	0.19	0.00	0.07	0.58	0.58	0.02	0.19	0.19
Sat Flow, veh/h	1845	1937	1647	1845	1937	1583	1845	3681	1638	1774	3539	1538
Grp Volume(v), veh/h	47	216	-28	147	195	-59	184	658	149	132	1189	275
Grp Sat Flow(s),veh/h/ln	1845	1937	1647	1845	1937	1583	1845	1840	1638	1774	1770	1538
Q Serve(g_s), s	2.6	12.8	0.0	7.8	10.8	0.0	4.8	10.9	5.0	3.6	36.8	18.5
Cycle Q Clear(g_c), s	2.6	12.8	0.0	7.8	10.8	0.0	4.8	10.9	5.0	3.6	36.8	18.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	262	286	243	264	373	305	282	2139	952	486	2013	875
V/C Ratio(X)	0.18	0.76	-0.12	0.56	0.52	-0.19	0.65	0.31	0.16	0.27	0.59	0.31
Avail Cap(c_a), veh/h	314	387	329	264	428	350	373	2139	952	507	2013	875
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	49.1	0.0	37.9	43.5	0.0	19.9	12.8	11.6	10.0	36.0	28.5
Incr Delay (d2), s/veh	0.3	5.7	0.0	2.6	1.1	0.0	2.6	0.4	0.4	0.3	1.3	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.3	0.0	4.2	5.9	0.0	3.7	5.7	2.3	1.8	18.4	8.1
LnGrp Delay(d),s/veh	41.2	54.7	0.0	40.5	44.6	0.0	22.5	13.2	11.9	10.3	37.3	29.5
LnGrp LOS	D	D		D	D		C	B	B	B	D	C
Approach Vol, veh/h		235			283			991			1596	
Approach Delay, s/veh		58.5			51.8			14.7			33.7	
Approach LOS		E			D			B			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	73.2	13.0	22.7	9.6	74.7	7.6	28.1
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	* 6
Max Green Setting (Gmax), s	13.0	55.0	9.0	23.0	7.0	61.0	7.0	* 26
Max Q Clear Time (g_c+I1), s	6.8	38.8	9.8	14.8	5.6	12.9	4.6	12.8
Green Ext Time (p_c), s	0.3	9.3	0.0	0.8	0.0	14.5	0.0	1.0

Intersection Summary	
HCM 2010 Ctrl Delay	31.2
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

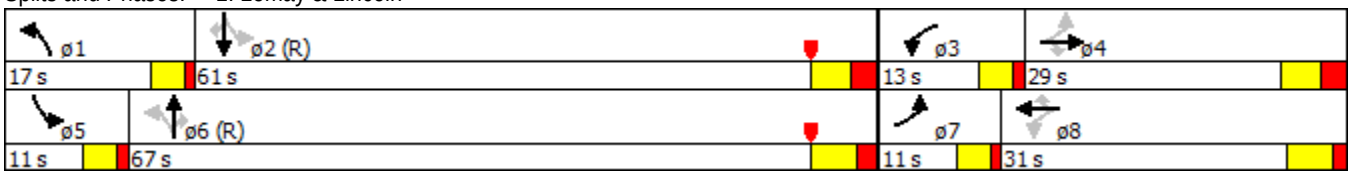
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	17	61	13	29	11	67	11	31
Maximum Split (%)	14.2%	50.8%	10.8%	24.2%	9.2%	55.8%	9.2%	25.8%
Minimum Split (s)	11	30	11	29	11	30	11	24.5
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	1.5
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	92	109	50	63	92	103	50	61
End Time (s)	109	50	63	92	103	50	61	92
Yield/Force Off (s)	105	44	59	86	99	44	57	86.5
Yield/Force Off 170(s)	105	27	59	73	99	27	57	74.5
Local Start Time (s)	48	65	6	19	48	59	6	17
Local Yield (s)	61	0	15	42	55	0	13	42.5
Local Yield 170(s)	61	103	15	29	55	103	13	30.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	210	275	250	235	265	250	260	1100	155	145	890	120
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1863	1937	1937	1937	1863	1863	1863
Adj Flow Rate, veh/h	221	289	77	247	279	99	274	1158	112	153	937	122
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	335	347	291	339	375	303	365	1791	796	293	1603	695
Arrive On Green	0.12	0.18	0.18	0.13	0.19	0.19	0.10	0.49	0.49	0.02	0.15	0.15
Sat Flow, veh/h	1845	1937	1625	1845	1937	1564	1845	3681	1637	1774	3539	1535
Grp Volume(v), veh/h	221	289	77	247	279	99	274	1158	112	153	937	122
Grp Sat Flow(s),veh/h/ln	1845	1937	1625	1845	1937	1564	1845	1840	1637	1774	1770	1535
Q Serve(g_s), s	11.5	17.3	4.9	12.7	16.3	6.5	8.9	28.3	4.5	5.3	29.6	8.3
Cycle Q Clear(g_c), s	11.5	17.3	4.9	12.7	16.3	6.5	8.9	28.3	4.5	5.3	29.6	8.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	335	347	291	339	375	303	365	1791	796	293	1603	695
V/C Ratio(X)	0.66	0.83	0.26	0.73	0.74	0.33	0.75	0.65	0.14	0.52	0.58	0.18
Avail Cap(c_a), veh/h	335	404	338	343	444	358	466	1791	796	332	1603	695
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.9	47.5	42.4	34.1	45.6	41.7	20.9	23.1	17.0	19.8	40.5	31.5
Incr Delay (d2), s/veh	4.7	12.3	0.5	7.6	5.6	0.6	5.0	1.8	0.4	1.4	1.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	10.4	2.2	7.1	9.3	2.9	5.0	14.8	2.1	2.7	14.9	3.7
LnGrp Delay(d),s/veh	39.6	59.8	42.9	41.7	51.2	42.3	26.0	24.9	17.3	21.2	42.1	32.0
LnGrp LOS	D	E	D	D	D	D	C	C	B	C	D	C
Approach Vol, veh/h		587			625			1544			1212	
Approach Delay, s/veh		50.0			46.0			24.5			38.4	
Approach LOS		D			D			C			D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.4	59.3	18.7	26.5	11.4	63.4	17.0	28.2
Change Period (Y+Rc), s	4.0	6.0	4.0	6.0	4.0	6.0	4.0	* 6
Max Green Setting (Gmax), s	18.0	43.0	15.0	24.0	10.0	51.0	13.0	* 27
Max Q Clear Time (g_c+I1), s	10.9	31.6	14.7	19.3	7.3	30.3	13.5	18.3
Green Ext Time (p_c), s	0.5	7.5	0.0	1.2	0.1	11.0	0.0	1.7

Intersection Summary	
HCM 2010 Ctrl Delay	35.9
HCM 2010 LOS	D

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

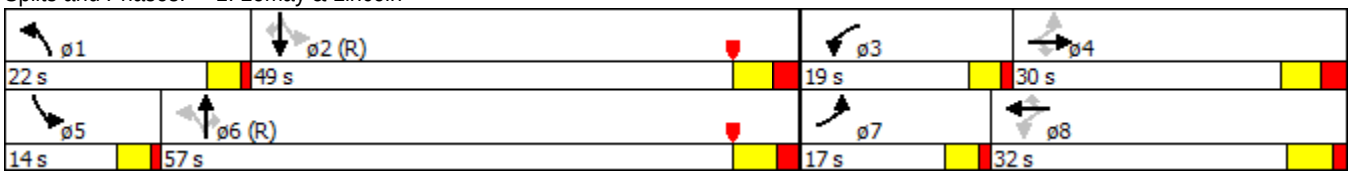
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	22	49	19	30	14	57	17	32
Maximum Split (%)	18.3%	40.8%	15.8%	25.0%	11.7%	47.5%	14.2%	26.7%
Minimum Split (s)	11	30	11	29	11	30	11	24.5
Yellow Time (s)	3	3.5	3	3.5	3	4	3	4
All-Red Time (s)	1	2.5	1	2.5	1	2	1	1.5
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	3	3	3	3	3	3	3
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		17		13		17		12
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	99	1	50	69	99	113	50	67
End Time (s)	1	50	69	99	113	50	67	99
Yield/Force Off (s)	117	44	65	93	109	44	63	93.5
Yield/Force Off 170(s)	117	27	65	80	109	27	63	81.5
Local Start Time (s)	55	77	6	25	55	69	6	23
Local Yield (s)	73	0	21	49	65	0	19	49.5
Local Yield 170(s)	73	103	21	36	65	103	19	37.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	85

Offset: 44 (37%), Referenced to phase 2:SBTL and 6:NBTL, Start of Yellow

Splits and Phases: 1: Lemay & Lincoln



Intersection

Int Delay, s/veh 31.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	10	25	35	45	10	10	55	635	75	15	1445	30
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	150	-	150	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	26	37	47	11	11	58	668	79	16	1521	32

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2008	2337	761	1589	2337	334	1521	0	0	668	0	0
Stage 1	1553	1553	-	784	784	-	-	-	-	-	-	-
Stage 2	455	784	-	805	1553	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	35	36	348	72	36	662	435	-	-	918	-	-
Stage 1	118	173	-	352	402	-	-	-	-	-	-	-
Stage 2	554	402	-	342	173	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	23	31	348	~ 17	31	662	435	-	-	918	-	-
Mov Cap-2 Maneuver	23	31	-	~ 17	31	-	-	-	-	-	-	-
Stage 1	102	170	-	305	348	-	-	-	-	-	-	-
Stage 2	458	348	-	254	170	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	211	$ 910.5	1	0.1
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	435	-	-	23	66	17	59	918	-	-
HCM Lane V/C Ratio	0.133	-	-	0.458	0.957	2.786	0.357	0.017	-	-
HCM Control Delay (s)	14.5	-	-	256.6	203.4	1272.2	96.6	9	-	-
HCM Lane LOS	B	-	-	F	F	F	F	A	-	-
HCM 95th %tile Q(veh)	0.5	-	-	1.4	4.7	6.5	1.3	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	200		150	200		150	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.912			0.925				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1699	0	1770	1723	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1699	0	1770	1723	0	1770	3539	1583	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			540			1334	
Travel Time (s)		13.4			19.7			12.3			30.3	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 53.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	15	10	70	55	30	25	35	1405	95	20	1030	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	150	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	11	74	58	32	26	37	1479	100	21	1084	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1955	2679	542	2142	2679	739	1084	0	0	1479	0	0
Stage 1	1126	1126	-	1553	1553	-	-	-	-	-	-	-
Stage 2	829	1553	-	589	1126	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	38	22	485	~ 28	~ 22	360	639	-	-	451	-	-
Stage 1	218	278	-	118	173	-	-	-	-	-	-	-
Stage 2	331	173	-	461	278	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	-	20	485	~ 13	~ 20	360	639	-	-	451	-	-
Mov Cap-2 Maneuver	-	20	-	~ 13	~ 20	-	-	-	-	-	-	-
Stage 1	205	265	-	111	163	-	-	-	-	-	-	-
Stage 2	233	163	-	358	265	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s		$ 1351.9	0.3	0.2
HCM LOS	-	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	639	-	-	-	124	13	35	451	-	-
HCM Lane V/C Ratio	0.058	-	-	-	0.679	4.453	1.654	0.047	-	-
HCM Control Delay (s)	11	-	-	-	80.5	$ 2135.4	$ 568.4	13.4	-	-
HCM Lane LOS	B	-	-	-	F	F	F	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	-	3.7	8.2	6.3	0.1	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	150		150	150		150
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Ped Bike Factor												
Frt		0.869			0.933				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1619	0	1770	1738	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1619	0	1770	1738	0	1770	3539	1583	1770	3539	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		590			866			540			1334	
Travel Time (s)		13.4			19.7			12.3			30.3	

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	25	35	45	10	10	55	635	75	15	1445	30
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	11	26	1	47	11	0	58	668	67	16	1521	28
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	227	146	6	214	152	0	381	2778	1243	685	2778	1243
Arrive On Green	0.08	0.08	0.08	0.08	0.08	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1398	1782	69	1378	1863	0	332	3539	1583	719	3539	1583
Grp Volume(v), veh/h	11	0	27	47	11	0	58	668	67	16	1521	28
Grp Sat Flow(s),veh/h/ln	1398	0	1851	1378	1863	0	332	1770	1583	719	1770	1583
Q Serve(g_s), s	0.4	0.0	0.8	2.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	0.0	0.8	2.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.04	1.00		0.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	227	0	151	214	152	0	381	2778	1243	685	2778	1243
V/C Ratio(X)	0.05	0.00	0.18	0.22	0.07	0.00	0.15	0.24	0.05	0.02	0.55	0.02
Avail Cap(c_a), veh/h	369	0	339	354	342	0	381	2778	1243	685	2778	1243
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	0.86	0.86	0.86
Uniform Delay (d), s/veh	25.8	0.0	25.7	27.0	25.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.6	0.5	0.2	0.0	0.8	0.2	0.1	0.1	0.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.4	0.8	0.2	0.0	0.1	0.1	0.0	0.0	0.3	0.0
LnGrp Delay(d),s/veh	25.9	0.0	26.2	27.5	25.6	0.0	0.8	0.2	0.1	0.1	0.7	0.0
LnGrp LOS	C		C	C	C		A	A	A	A	A	A
Approach Vol, veh/h		38			58			793			1565	
Approach Delay, s/veh		26.1			27.1			0.2			0.7	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		51.1		8.9		51.1		8.9
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		40.0		10.0		40.0		10.0
Max Q Clear Time (g_c+I1), s		2.0		2.8		2.0		4.8
Green Ext Time (p_c), s		26.9		0.1		26.9		0.1

Intersection Summary	
HCM 2010 Ctrl Delay	1.5
HCM 2010 LOS	A

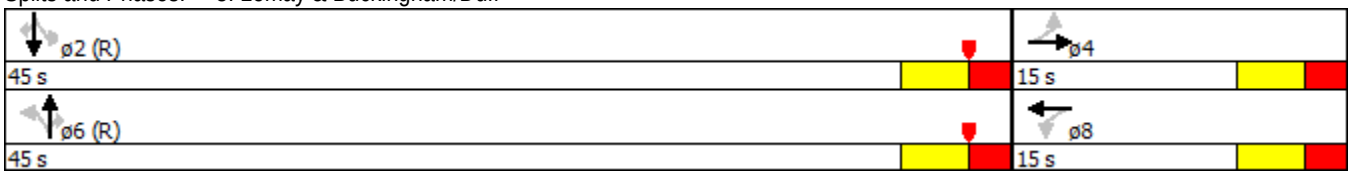
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	45	15	45	15
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	15	15	15	15
Yellow Time (s)	3	3	3	3
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	4	4	4	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	15	0	15	0
End Time (s)	0	15	0	15
Yield/Force Off (s)	55	10	55	10
Yield/Force Off 170(s)	55	10	55	10
Local Start Time (s)	15	0	15	0
Local Yield (s)	55	10	55	10
Local Yield 170(s)	55	10	55	10

Intersection Summary

Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	55

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 3: Lemay & Buckingham/Duff



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	15	10	70	55	30	25	35	1405	95	20	1030	20
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	16	11	5	58	32	2	37	1479	85	21	1084	18
Adj No. of Lanes	1	1	0	1	1	0	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	220	109	50	234	156	10	516	2748	1229	374	2748	1229
Arrive On Green	0.09	0.09	0.09	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00
Sat Flow, veh/h	1369	1214	552	1392	1735	108	510	3539	1583	328	3539	1583
Grp Volume(v), veh/h	16	0	16	58	0	34	37	1479	85	21	1084	18
Grp Sat Flow(s),veh/h/ln	1369	0	1765	1392	0	1844	510	1770	1583	328	1770	1583
Q Serve(g_s), s	0.7	0.0	0.5	2.4	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.7	0.0	0.5	2.9	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0
Prop In Lane	1.00		0.31	1.00		0.06	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	0	159	234	0	166	516	2748	1229	374	2748	1229
V/C Ratio(X)	0.07	0.00	0.10	0.25	0.00	0.20	0.07	0.54	0.07	0.06	0.39	0.01
Avail Cap(c_a), veh/h	348	0	324	364	0	338	516	2748	1229	374	2748	1229
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	2.00	2.00	2.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	0.94	0.94	0.94
Uniform Delay (d), s/veh	26.1	0.0	25.1	26.4	0.0	25.3	0.0	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.0	0.3	0.5	0.0	0.6	0.3	0.8	0.1	0.3	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.3	1.0	0.0	0.5	0.0	0.3	0.0	0.0	0.2	0.0
LnGrp Delay(d),s/veh	26.2	0.0	25.3	26.9	0.0	25.9	0.3	0.8	0.1	0.3	0.4	0.0
LnGrp LOS	C		C	C		C	A	A	A	A	A	A
Approach Vol, veh/h		32			92			1601			1123	
Approach Delay, s/veh		25.8			26.6			0.7			0.4	
Approach LOS		C			C			A			A	

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		50.6		9.4		50.6		9.4
Change Period (Y+Rc), s		5.0		5.0		5.0		5.0
Max Green Setting (Gmax), s		40.0		10.0		40.0		10.0
Max Q Clear Time (g_c+I1), s		2.0		3.7		2.0		4.9
Green Ext Time (p_c), s		30.1		0.2		30.1		0.2

Intersection Summary	
HCM 2010 Ctrl Delay	1.7
HCM 2010 LOS	A

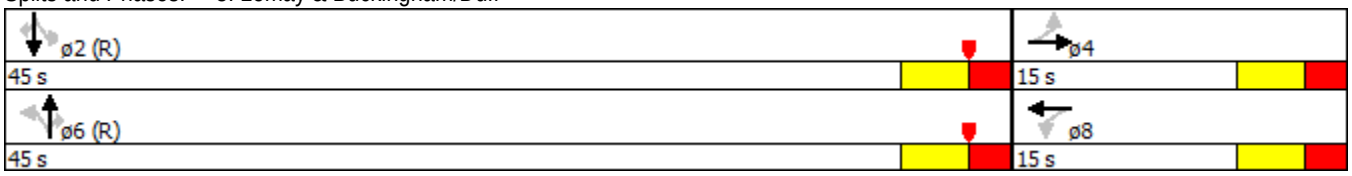
Phase Number	2	4	6	8
Movement	SBTL	EBTL	NBTL	WBTL
Lead/Lag				
Lead-Lag Optimize				
Recall Mode	C-Max	None	C-Max	None
Maximum Split (s)	45	15	45	15
Maximum Split (%)	75.0%	25.0%	75.0%	25.0%
Minimum Split (s)	15	15	15	15
Yellow Time (s)	3	3	3	3
All-Red Time (s)	2	2	2	2
Minimum Initial (s)	4	4	4	4
Vehicle Extension (s)	3	3	3	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)				
Flash Dont Walk (s)				
Dual Entry	Yes	Yes	Yes	Yes
Inhibit Max	Yes	Yes	Yes	Yes
Start Time (s)	15	0	15	0
End Time (s)	0	15	0	15
Yield/Force Off (s)	55	10	55	10
Yield/Force Off 170(s)	55	10	55	10
Local Start Time (s)	15	0	15	0
Local Yield (s)	55	10	55	10
Local Yield 170(s)	55	10	55	10

Intersection Summary

Cycle Length	60
Control Type	Actuated-Coordinated
Natural Cycle	40

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 3: Lemay & Buckingham/Duff



Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	5	760	15	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	800	16	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	800	400	0	0	800	0
Stage 1	800	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	322	600	-	-	819	-
Stage 1	403	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	322	600	-	-	819	-
Mov Cap-2 Maneuver	322	-	-	-	-	-
Stage 1	403	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	600	819	-
HCM Lane V/C Ratio	-	-	0.009	-	-
HCM Control Delay (s)	-	-	11.1	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		250	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3539	1583	0	3539
Flt Permitted						
Satd. Flow (perm)	0	1611	3539	1583	0	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	581		772			540
Travel Time (s)	13.2		17.5			12.3

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	5	1535	85	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	250	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	5	1616	89	0	0

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	1616	808	0	0	1616	0
Stage 1	1616	-	-	-	-	-
Stage 2	0	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	94	324	-	-	399	-
Stage 1	148	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	94	324	-	-	399	-
Mov Cap-2 Maneuver	94	-	-	-	-	-
Stage 1	148	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.3	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	324	399	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	16.3	0	-
HCM Lane LOS	-	-	C	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		250	0	
Storage Lanes	0	1		1	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95
Ped Bike Factor						
Frt		0.865		0.850		
Flt Protected						
Satd. Flow (prot)	0	1611	3539	1583	0	3539
Flt Permitted						
Satd. Flow (perm)	0	1611	3539	1583	0	3539
Link Speed (mph)	30		30			30
Link Distance (ft)	581		772			540
Travel Time (s)	13.2		17.5			12.3

Intersection Summary

Area Type: Other

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	245	50	160	270	30	115	400	30	25	895	30
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1882	1863	1863	1882	1788	1863	1937	1863	1863	1937	1863
Adj Flow Rate, veh/h	11	258	53	168	284	32	121	421	32	26	942	32
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	5	2	2	5	2	2	2	2	2	2	2
Cap, veh/h	241	357	296	299	507	403	362	2013	845	565	1911	801
Arrive On Green	0.02	0.19	0.19	0.10	0.27	0.27	0.06	0.55	0.55	0.03	0.52	0.52
Sat Flow, veh/h	1774	1882	1561	1774	1882	1497	1774	3681	1546	1774	3681	1543
Grp Volume(v), veh/h	11	258	53	168	284	32	121	421	32	26	942	32
Grp Sat Flow(s),veh/h/ln	1774	1882	1561	1774	1882	1497	1774	1840	1546	1774	1840	1543
Q Serve(g_s), s	0.6	15.4	3.4	8.7	15.6	1.9	3.6	7.0	1.1	0.8	19.8	1.2
Cycle Q Clear(g_c), s	0.6	15.4	3.4	8.7	15.6	1.9	3.6	7.0	1.1	0.8	19.8	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	241	357	296	299	507	403	362	2013	845	565	1911	801
V/C Ratio(X)	0.05	0.72	0.18	0.56	0.56	0.08	0.33	0.21	0.04	0.05	0.49	0.04
Avail Cap(c_a), veh/h	311	463	384	332	572	455	426	2013	845	619	1911	801
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.0	45.6	40.8	33.5	37.7	32.7	13.4	13.9	12.6	12.6	18.7	14.2
Incr Delay (d2), s/veh	0.1	9.9	1.0	1.7	3.5	0.3	0.5	0.2	0.1	0.0	0.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	9.0	1.6	4.4	8.6	0.8	1.8	3.6	0.5	0.4	10.3	0.5
LnGrp Delay(d),s/veh	38.1	55.5	41.8	35.3	41.2	33.0	14.0	14.1	12.7	12.6	19.6	14.3
LnGrp LOS	D	E	D	D	D	C	B	B	B	B	B	B
Approach Vol, veh/h		322			484			574			1000	
Approach Delay, s/veh		52.6			38.6			14.0			19.2	
Approach LOS		D			D			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	66.3	15.8	27.3	7.3	69.6	6.2	36.8
Change Period (Y+Rc), s	5.0	* 5	5.0	5.5	5.0	5.0	5.0	5.5
Max Green Setting (Gmax), s	10.0	* 49	13.0	28.5	6.0	52.0	6.0	35.5
Max Q Clear Time (g_c+I1), s	5.6	21.8	10.7	17.4	2.8	9.0	2.6	17.6
Green Ext Time (p_c), s	0.1	17.7	0.1	4.3	0.0	23.9	0.0	5.8

Intersection Summary	
HCM 2010 Ctrl Delay	26.4
HCM 2010 LOS	C

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

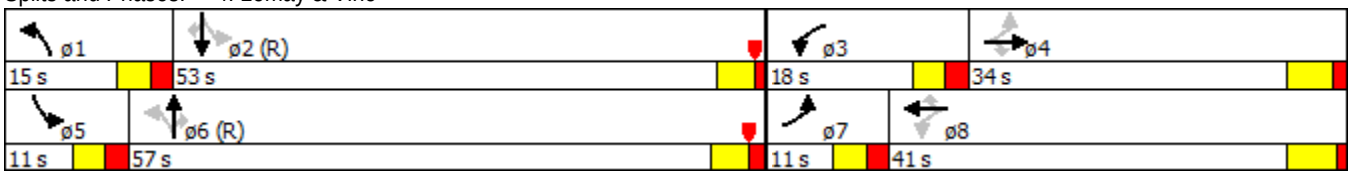
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	15	53	18	34	11	57	11	41
Maximum Split (%)	12.5%	44.2%	15.0%	28.3%	9.2%	47.5%	9.2%	34.2%
Minimum Split (s)	11	21.5	11	22.5	11	22	11	22.5
Yellow Time (s)	3	3.5	3	4	3	3.5	3	4.5
All-Red Time (s)	2	1	2	1.5	2	1.5	2	1
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	6	3	6	3	6	3	6
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		10		10		10		10
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	52	67	0	18	52	63	0	11
End Time (s)	67	0	18	52	63	0	11	52
Yield/Force Off (s)	62	115.5	13	46.5	58	115	6	46.5
Yield/Force Off 170(s)	62	105.5	13	36.5	58	105	6	36.5
Local Start Time (s)	52	67	0	18	52	63	0	11
Local Yield (s)	62	115.5	13	46.5	58	115	6	46.5
Local Yield 170(s)	62	105.5	13	36.5	58	105	6	36.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	30	375	70	75	270	30	90	890	150	25	675	15
Number	7	4	14	3	8	18	1	6	16	5	2	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1882	1863	1863	1882	1788	1863	1937	1863	1863	1937	1863
Adj Flow Rate, veh/h	32	395	74	79	284	32	95	937	158	26	711	16
Adj No. of Lanes	1	1	1	1	1	1	1	2	1	1	2	1
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	5	2	2	5	2	2	2	2	2	2	2
Cap, veh/h	290	508	422	224	551	438	414	1885	791	360	1805	756
Arrive On Green	0.03	0.27	0.27	0.05	0.29	0.29	0.10	1.00	1.00	0.03	0.49	0.49
Sat Flow, veh/h	1774	1882	1562	1774	1882	1497	1774	3681	1545	1774	3681	1543
Grp Volume(v), veh/h	32	395	74	79	284	32	95	937	158	26	711	16
Grp Sat Flow(s),veh/h/ln	1774	1882	1562	1774	1882	1497	1774	1840	1545	1774	1840	1543
Q Serve(g_s), s	1.5	23.3	4.4	3.8	15.1	1.9	3.1	0.0	0.0	0.9	14.6	0.6
Cycle Q Clear(g_c), s	1.5	23.3	4.4	3.8	15.1	1.9	3.1	0.0	0.0	0.9	14.6	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	290	508	422	224	551	438	414	1885	791	360	1805	756
V/C Ratio(X)	0.11	0.78	0.18	0.35	0.52	0.07	0.23	0.50	0.20	0.07	0.39	0.02
Avail Cap(c_a), veh/h	340	619	514	233	619	493	430	1885	791	415	1805	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.87	0.87	0.87	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.6	40.5	33.6	30.9	35.4	30.7	13.5	0.0	0.0	14.1	19.3	15.7
Incr Delay (d2), s/veh	0.2	9.6	0.7	0.9	2.7	0.3	0.2	0.8	0.5	0.1	0.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	13.4	2.0	1.9	8.2	0.8	1.5	0.2	0.1	0.4	7.6	0.3
LnGrp Delay(d),s/veh	30.7	50.0	34.3	31.9	38.1	30.9	13.8	0.8	0.5	14.2	20.0	15.8
LnGrp LOS	C	D	C	C	D	C	B	A	A	B	B	B
Approach Vol, veh/h		501			395			1190			753	
Approach Delay, s/veh		46.5			36.2			1.8			19.7	
Approach LOS		D			D			A			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.9	62.9	10.3	36.9	7.3	65.4	7.6	39.6
Change Period (Y+Rc), s	5.0	* 5	5.0	5.5	5.0	5.0	5.0	5.5
Max Green Setting (Gmax), s	6.0	* 50	6.0	38.5	6.0	49.0	6.0	38.5
Max Q Clear Time (g_c+I1), s	5.1	16.6	5.8	25.3	2.9	2.0	3.5	17.1
Green Ext Time (p_c), s	0.0	25.1	0.0	6.1	0.0	32.8	0.0	8.1

Intersection Summary	
HCM 2010 Ctrl Delay	19.2
HCM 2010 LOS	B

Notes

* HCM 2010 computational engine requires equal clearance times for the phases crossing the barrier.

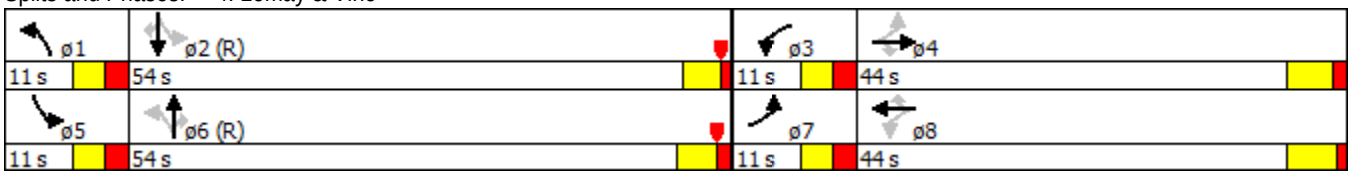
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBTL	WBL	EBTL	SBL	NBTL	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize								
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	54	11	44	11	54	11	44
Maximum Split (%)	9.2%	45.0%	9.2%	36.7%	9.2%	45.0%	9.2%	36.7%
Minimum Split (s)	11	21.5	11	22.5	11	22	11	22.5
Yellow Time (s)	3	3.5	3	4	3	3.5	3	4.5
All-Red Time (s)	2	1	2	1.5	2	1.5	2	1
Minimum Initial (s)	4	7	4	7	4	7	4	7
Vehicle Extension (s)	3	6	3	6	3	6	3	6
Minimum Gap (s)	3	3	3	3	3	3	3	3
Time Before Reduce (s)	0	0	0	0	0	0	0	0
Time To Reduce (s)	0	0	0	0	0	0	0	0
Walk Time (s)		7		7		7		7
Flash Dont Walk (s)		10		10		10		10
Dual Entry	No	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	55	66	0	11	55	66	0	11
End Time (s)	66	0	11	55	66	0	11	55
Yield/Force Off (s)	61	115.5	6	49.5	61	115	6	49.5
Yield/Force Off 170(s)	61	105.5	6	39.5	61	105	6	39.5
Local Start Time (s)	55	66	0	11	55	66	0	11
Local Yield (s)	61	115.5	6	49.5	61	115	6	49.5
Local Yield 170(s)	61	105.5	6	39.5	61	105	6	39.5

Intersection Summary

Cycle Length	120
Control Type	Actuated-Coordinated
Natural Cycle	70

Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Red

Splits and Phases: 4: Lemay & Vine



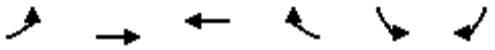
Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	365	5	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	384	5	0	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	389	0	-	0	387	387
Stage 1	-	-	-	-	387	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1170	-	-	-	616	661
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1170	-	-	-	616	661
Mov Cap-2 Maneuver	-	-	-	-	616	-
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	11
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1170	-	-	-	661
HCM Lane V/C Ratio	-	-	-	-	0.088
HCM Control Delay (s)	0	-	-	-	11
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.3



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1859	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1859	0	0	1611
Link Speed (mph)		35	35		30	
Link Distance (ft)		388	345		429	
Travel Time (s)		7.6	6.7		9.8	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 1.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	0	0	690	10	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	726	11	0	58

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	737	0	-	0	732	732
Stage 1	-	-	-	-	732	-
Stage 2	-	-	-	-	0	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	869	-	-	-	388	421
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	869	-	-	-	388	421
Mov Cap-2 Maneuver	-	-	-	-	388	-
Stage 1	-	-	-	-	476	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.9
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	869	-	-	-	421
HCM Lane V/C Ratio	-	-	-	-	0.138
HCM Control Delay (s)	0	-	-	-	14.9
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)		0%	0%		0%	
Storage Length (ft)	0			0	0	0
Storage Lanes	0			0	0	1
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt			0.998			0.865
Flt Protected						
Satd. Flow (prot)	0	1863	1859	0	0	1611
Flt Permitted						
Satd. Flow (perm)	0	1863	1859	0	0	1611
Link Speed (mph)		35	35		30	
Link Distance (ft)		388	345		429	
Travel Time (s)		7.6	6.7		9.8	

Intersection Summary

Area Type: Other

Intersection	
Intersection Delay, s/veh	10.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	553	342	26	300
Demand Flow Rate, veh/h	564	349	26	306
Vehicles Circulating, veh/h	112	375	655	204
Vehicles Exiting, veh/h	398	306	21	520
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	10.9	10.8	6.7	7.6
Approach LOS	B	B	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	564	349	26	306
Cap Entry Lane, veh/h	1010	777	587	921
Entry HV Adj Factor	0.981	0.981	0.996	0.980
Flow Entry, veh/h	553	342	26	300
Cap Entry, veh/h	991	762	585	903
V/C Ratio	0.558	0.449	0.044	0.332
Control Delay, s/veh	10.9	10.8	6.7	7.6
LOS	B	B	A	A
95th %tile Queue, veh	4	2	0	1

Intersection	
Intersection Delay, s/veh	16.0
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	606	596	31	368
Demand Flow Rate, veh/h	619	607	31	375
Vehicles Circulating, veh/h	139	327	709	515
Vehicles Exiting, veh/h	751	413	49	419
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	13.0	20.1	7.2	14.8
Approach LOS	B	C	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	619	607	31	375
Cap Entry Lane, veh/h	983	815	556	675
Entry HV Adj Factor	0.980	0.981	0.997	0.981
Flow Entry, veh/h	606	596	31	368
Cap Entry, veh/h	963	799	554	662
V/C Ratio	0.630	0.745	0.056	0.555
Control Delay, s/veh	13.0	20.1	7.2	14.8
LOS	B	C	A	B
95th %tile Queue, veh	5	7	0	3

Intersection	
Int Delay, s/veh	2.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	240	45	65	305	20	80
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	253	47	68	321	21	84

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	253	0	711	253
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	458	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1312	-	400	786
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	637	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1312	-	379	786
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	604	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.4	11.6
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	647	-	-	1312	-
HCM Lane V/C Ratio	0.163	-	-	0.052	-
HCM Control Delay (s)	11.6	-	-	7.9	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.6	-	-	0.2	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		200	200		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.892	
Flt Protected			0.950		0.990	
Satd. Flow (prot)	1863	1583	1770	1863	1645	0
Flt Permitted			0.950		0.990	
Satd. Flow (perm)	1863	1583	1770	1863	1645	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	8.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	305	80	135	455	105	145
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	200	200	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	321	84	142	479	111	153

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	321	0	1084	321
Stage 1	-	-	-	-	321	-
Stage 2	-	-	-	-	763	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1239	-	240	720
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	460	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1239	-	212	720
Mov Cap-2 Maneuver	-	-	-	-	212	-
Stage 1	-	-	-	-	735	-
Stage 2	-	-	-	-	407	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.9	38.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	359	-	-	1239	-
HCM Lane V/C Ratio	0.733	-	-	0.115	-
HCM Control Delay (s)	38.1	-	-	8.3	-
HCM Lane LOS	E	-	-	A	-
HCM 95th %tile Q(veh)	5.6	-	-	0.4	-

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		200	200		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.850			0.922	
Flt Protected			0.950		0.979	
Satd. Flow (prot)	1863	1583	1770	1863	1681	0
Flt Permitted			0.950		0.979	
Satd. Flow (perm)	1863	1583	1770	1863	1681	0
Link Speed (mph)	35			35	30	
Link Distance (ft)	785			763	404	
Travel Time (s)	15.3			14.9	9.2	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	15	460	25	0	285
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	16	484	26	0	300

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	797	497	0	0	511	0
Stage 1	497	-	-	-	-	-
Stage 2	300	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	356	573	-	-	1054	-
Stage 1	611	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	356	573	-	-	1054	-
Mov Cap-2 Maneuver	356	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	752	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	573	1054	-
HCM Lane V/C Ratio	-	-	0.028	-	-
HCM Control Delay (s)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	100	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.993			
Flt Protected						
Satd. Flow (prot)	0	1611	1850	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	1850	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	725		617			505
Travel Time (s)	16.5		14.0			11.5

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Vol, veh/h	0	25	355	35	0	350
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	374	37	0	368

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	760	392	0	0	411	0
Stage 1	392	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	374	657	-	-	1148	-
Stage 1	683	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	374	657	-	-	1148	-
Mov Cap-2 Maneuver	374	-	-	-	-	-
Stage 1	683	-	-	-	-	-
Stage 2	700	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	657	1148	-
HCM Lane V/C Ratio	-	-	0.04	-	-
HCM Control Delay (s)	-	-	10.7	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%		0%			0%
Storage Length (ft)	0	0		0	100	
Storage Lanes	0	1		0	0	
Taper Length (ft)	25				25	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt		0.865	0.988			
Flt Protected						
Satd. Flow (prot)	0	1611	1840	0	0	1863
Flt Permitted						
Satd. Flow (perm)	0	1611	1840	0	0	1863
Link Speed (mph)	30		30			30
Link Distance (ft)	725		617			505
Travel Time (s)	16.5		14.0			11.5

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	25	15	460	270	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	26	16	484	284	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	801	285	285	0	-	0
Stage 1	285	-	-	-	-	-
Stage 2	516	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	354	754	1277	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	599	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	350	754	1277	-	-	-
Mov Cap-2 Maneuver	350	-	-	-	-	-
Stage 1	763	-	-	-	-	-
Stage 2	591	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.2	0.2	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1277	-	722	-	-
HCM Lane V/C Ratio	0.012	-	0.038	-	-
HCM Control Delay (s)	7.9	-	10.2	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.870					
Flt Protected	0.998		0.950			
Satd. Flow (prot)	1617	0	1770	1863	1863	0
Flt Permitted	0.998		0.950			
Satd. Flow (perm)	1617	0	1770	1863	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	349			505	383	
Travel Time (s)	7.9			11.5	8.7	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Vol, veh/h	1	25	65	315	320	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	100	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	26	68	332	337	1

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	805	337	338	0	-	0
Stage 1	337	-	-	-	-	-
Stage 2	468	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	352	705	1221	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	630	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	332	705	1221	-	-	-
Mov Cap-2 Maneuver	332	-	-	-	-	-
Stage 1	723	-	-	-	-	-
Stage 2	595	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.6	1.4	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1221	-	676	-	-
HCM Lane V/C Ratio	0.056	-	0.04	-	-
HCM Control Delay (s)	8.1	-	10.6	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	0.1	-	-

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25		25			
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.870					
Flt Protected	0.998		0.950			
Satd. Flow (prot)	1617	0	1770	1863	1863	0
Flt Permitted	0.998		0.950			
Satd. Flow (perm)	1617	0	1770	1863	1863	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	349			505	383	
Travel Time (s)	7.9			11.5	8.7	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	80	20	15	10	10	10	15	425	20	15	250	20
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	84	21	16	11	11	11	16	447	21	16	263	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	795	795	263	802	784	458	263	0	0	468	0	0
Stage 1	295	295	-	489	489	-	-	-	-	-	-	-
Stage 2	500	500	-	313	295	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	305	320	776	302	325	603	1301	-	-	1094	-	-
Stage 1	713	669	-	561	549	-	-	-	-	-	-	-
Stage 2	553	543	-	698	669	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	286	311	776	275	316	603	1301	-	-	1094	-	-
Mov Cap-2 Maneuver	286	311	-	275	316	-	-	-	-	-	-	-
Stage 1	704	659	-	554	542	-	-	-	-	-	-	-
Stage 2	526	536	-	652	659	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.2	15.6	0.3	0.4
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1301	-	-	286	418	275	415	1094	-	-
HCM Lane V/C Ratio	0.012	-	-	0.294	0.088	0.038	0.051	0.014	-	-
HCM Control Delay (s)	7.8	-	-	22.8	14.4	18.6	14.1	8.3	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0.3	0.1	0.2	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	150		0	150		150
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.935			0.925			0.993				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1742	0	1770	1723	0	1770	1850	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1742	0	1770	1723	0	1770	1850	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		414			1093			383			1126	
Travel Time (s)		9.4			24.8			8.7			25.6	

Intersection Summary

Area Type: Other

Intersection

Int Delay, s/veh 4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vol, veh/h	90	10	15	35	20	20	35	275	10	5	285	50
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	150	-	-	150	-	-	150	-	-	150	-	150
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	95	11	16	37	21	21	37	289	11	5	300	53

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	700	685	300	692	679	295	300	0	0	300	0	0
Stage 1	311	311	-	368	368	-	-	-	-	-	-	-
Stage 2	389	374	-	324	311	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	354	371	740	358	374	744	1261	-	-	1261	-	-
Stage 1	699	658	-	652	621	-	-	-	-	-	-	-
Stage 2	635	618	-	688	658	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	320	359	740	334	362	744	1261	-	-	1261	-	-
Mov Cap-2 Maneuver	320	359	-	334	362	-	-	-	-	-	-	-
Stage 1	678	655	-	633	603	-	-	-	-	-	-	-
Stage 2	578	600	-	660	655	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19	15	0.9	0.1
HCM LOS	C	C		

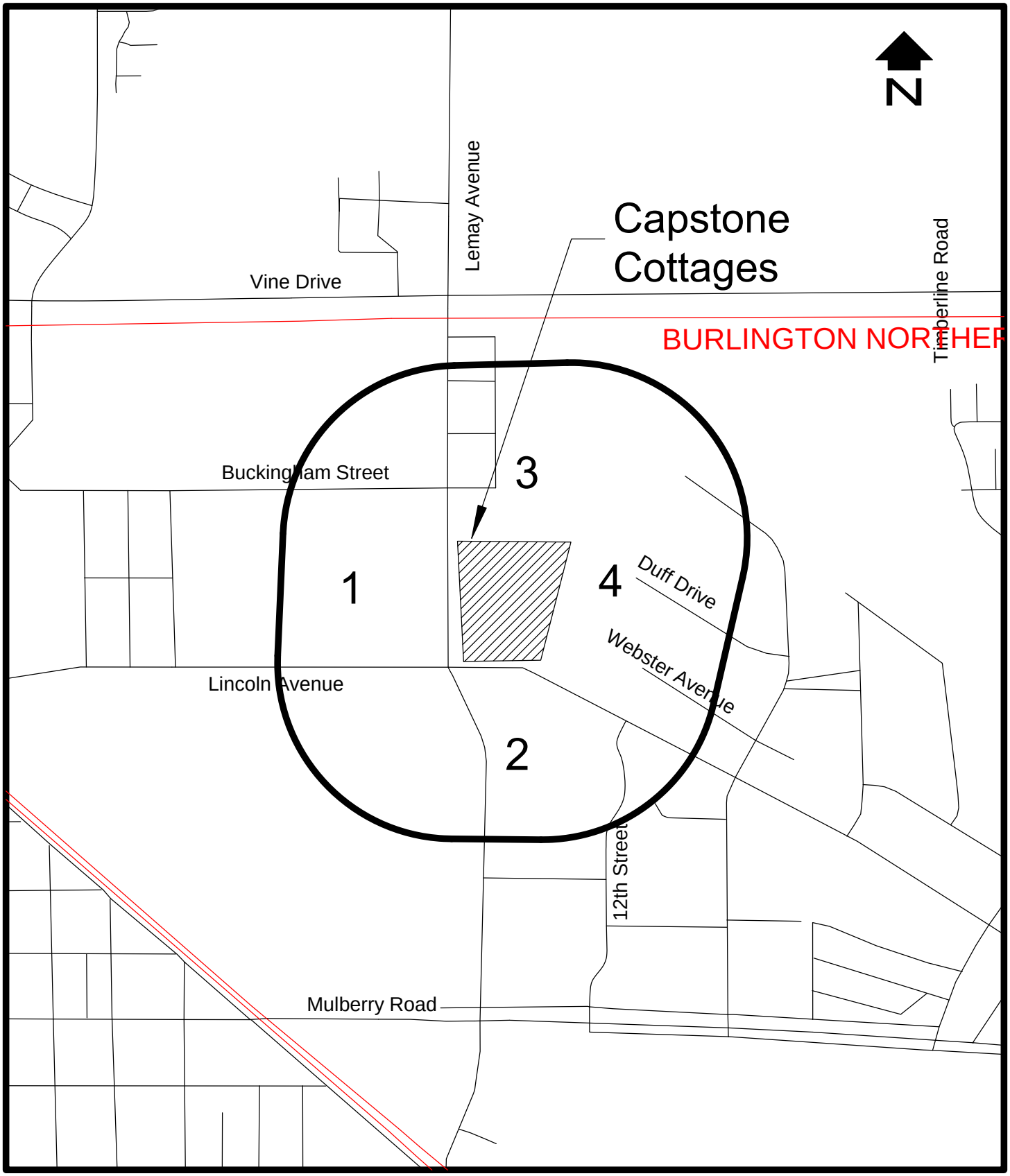
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1261	-	-	320	519	334	487	1261	-	-
HCM Lane V/C Ratio	0.029	-	-	0.296	0.051	0.11	0.086	0.004	-	-
HCM Control Delay (s)	7.9	-	-	20.9	12.3	17.1	13.1	7.9	-	-
HCM Lane LOS	A	-	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.2	0.4	0.3	0	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	150		0	150		0	150		0	150		150
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.911			0.925			0.994				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1697	0	1770	1723	0	1770	1852	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1697	0	1770	1723	0	1770	1852	0	1770	1863	1583
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		414			1093			383			1126	
Travel Time (s)		9.4			24.8			8.7			25.6	

Intersection Summary

Area Type: Other

APPENDIX I



SCALE: 1"=1000'

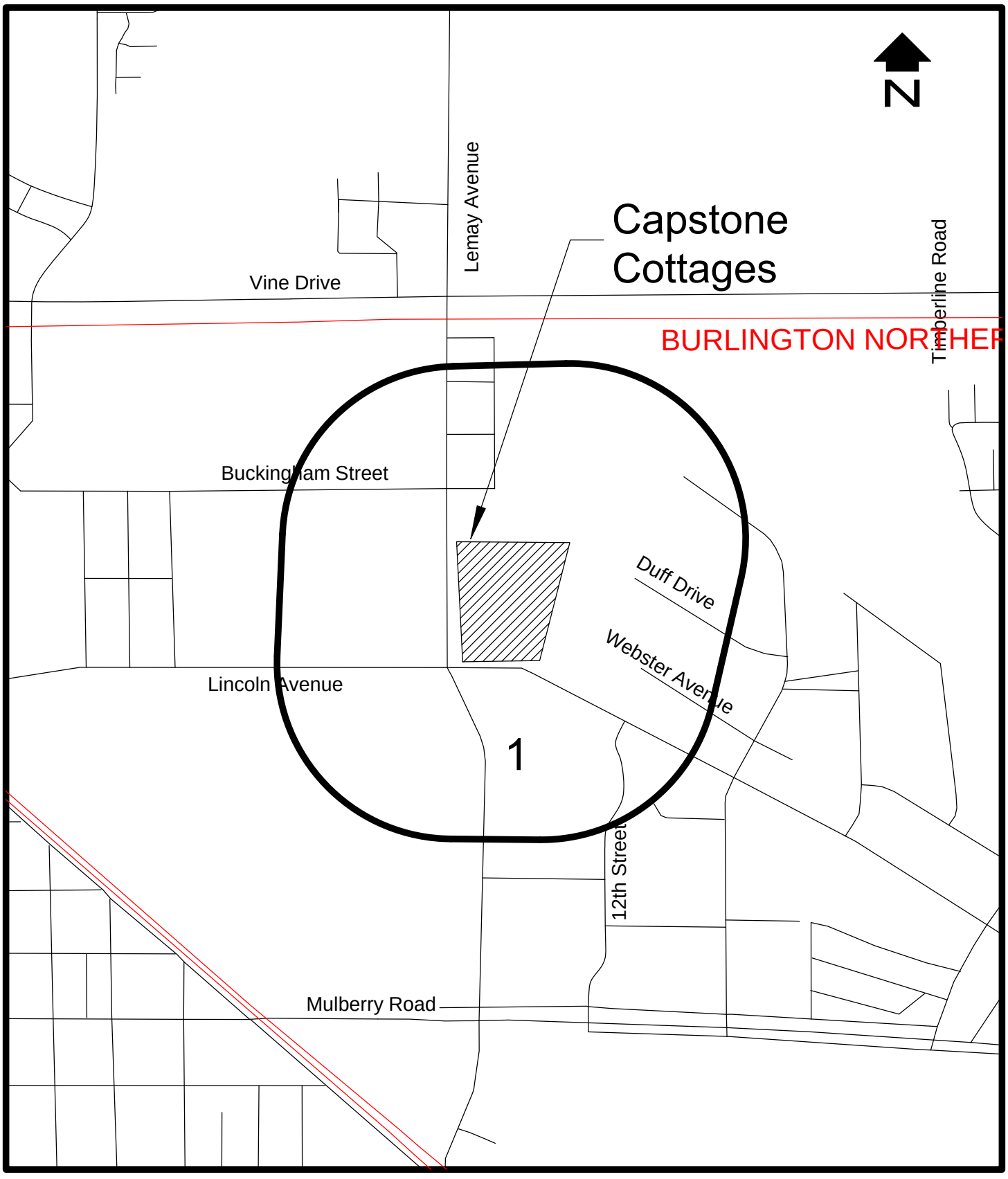
PEDESTRIAN INFLUENCE AREA

DELICH ASSOCIATES

Pedestrian LOS Worksheet

Project Location Classification: School Walking Area

	Description of Applicable Destination Area Within 1320'	Destination Area Classification		Level of Service (minimum based on project location classification)				
				Directness	Continuity	Street Crossings	Visual Interest & Amenities	Security
1	Commercial to the west	Commercial	Minimum	B	C	C	C	C
			Actual	A	C	B	B	C
			Proposed	A	C	B	B	C
2	Neighborhood and Commercial to the south	Residential/ Commercial	Minimum	B	C	C	C	C
			Actual	A	B	B	B	B
			Proposed	A	B	B	B	B
3	Neighborhood to the north	Residential	Minimum	B	C	C	C	C
			Actual	A	C	B	C	C
			Proposed	A	C	B	C	C
4	Industrial area to the east	Industrial	Minimum	B	C	C	C	C
			Actual	A	C	A	C	C
			Proposed	A	C	A	C	C
5			Minimum					
			Actual					
			Proposed					
6			Minimum					
			Actual					
			Proposed					
7			Minimum					
			Actual					
			Proposed					
8			Minimum					
			Actual					
			Proposed					
9			Minimum					
			Actual					
			Proposed					
10			Minimum					
			Actual					
			Proposed					



SCALE: 1"=1000'

BICYCLE INFLUENCE AREA

DELICH ASSOCIATES

Bicycle LOS Worksheet

				Level of Service – Connectivity		
				Minimum	Actual	Proposed
		Base Connectivity:		C	A	A
	Specific connections to priority sites:					
	Description of Applicable Destination Area Within 1320'	Destination Area Classification				
1	Commercial to the south	Commercial		C	A	A
2						
3						
4						

EXISTING ZONING: MEDIUM DENSITY MIXED-USE NEIGHBORHOOD (MMN)
LAND-USES PROPOSED: SINGLE-FAMILY, TWO-FAMILY & SINGLE-FAMILY ATTACHED

LAND USE SUMMARY FOR PDP	AREA (SF)	AREA (ACRES)	% OF GROSS PDP AREA
PDP GROSS AREA	1,232,108	28.29	100%
TOTAL ROW DEDICATED AREA	160,636	3.69	13%
NET DEVELOPABLE AREA	1,071,472	24.60	87%
INTERNATIONAL/LINCOLN R.O.W. (ARTERIAL)	91,077	2.09	7%
LEMAY R.O.W. (ARTERIAL)	69,559	1.60	6%
DUFF R.O.W.	69,506	1.60	6%
WEBSTER R.O.W.	15,390	0.35	1%
SITE DRIVES & PARKING AREA	309,763	7.11	25%
SITE WALKS & FLATWORK AREA	78,681	1.81	6%
SITE BUILDING COVERAGE AREA	345,164	7.92	28%
SITE OPEN SPACE AND LANDSCAPE AREA	337,864	7.76	27%
SITE ACTIVE RECREATIONAL USE AREA	51,132	1.17	
SITE PERMEABLE PAVER AREA REQ.	77,441		25%

RESIDENTIAL UNIT SUMMARY	TOTAL UNITS	TOTAL BEDS	BUILDING HEIGHT	FLOOR AREA PER UNIT (SF)	TOTAL FLOOR AREA/UNIT (SF)
SINGLE-FAMILY ATTACHED (4-BED/UNIT)	117	468	3-STORY	1710	200,070
SINGLE-FAMILY ATTACHED (5-BED/UNIT)	75	375	2-STORY	1832	137,400
TWO-FAMILY (5-BED/UNIT)	2	35	2-STORY	1985	3,970
SINGLE-FAMILY DETACHED (5-BED/UNIT)	7	10	2-STORY	1862	13,034
TOTALS:	201	888			354,474

TOTAL FLOOR AREA:	354,474	SF
TOTAL DEVELOPED AREA:	1,071,472	SF
FLOOR AREA RATIO:	0.331	FAR
RESIDENTIAL DENSITY (GROSS):	7.11	DUs/ACRE
RESIDENTIAL DENSITY (NET):	8.17	DUs/ACRE

BUILDING COVERAGE	TOTAL AREA COVERAGE PER UNIT TYPE (SF)	AREA (ACRES)	% OF GROSS PDP AREA
SINGLE-FAMILY ATTACHED (4-BED/UNIT)	82,775	1.90	6.72%
SINGLE-FAMILY ATTACHED (5-BED/UNIT)	76,353	1.75	6.20%
TWO-FAMILY (5-BED/UNIT)	7,714	0.18	0.63%
SINGLE-FAMILY DETACHED (5-BED/UNIT)	1,010	0.02	0.63%
CLUBHOUSE	8,010	0.18	0.65%
MAINTENANCE	1,440	0.03	0.12%
TRASH COMPACTOR	539	0.01	0.04%
TOTAL STRUCTURE COVERAGE AREA:	177,841	4.08	14.98%

PARKING CALCULATIONS	TOTAL UNITS	BEDS PER BLDG. TYPE	REQUIRED SPACES PER "MULTI-FAMILY" LUC. SEC. 3.2.2.(K)		REQUIRED SPACES PER "EXTRA-OCCUPANCY" LUC. SEC. 3.2.2.(K)(j)	
SINGLE-FAMILY ATTACHED (4-BED/UNIT)	117	468	3 SP / DU	351	0.75 / BED	351
SINGLE-FAMILY ATTACHED (5-BED/UNIT)	75	375	3 SP / DU	225	0.75 / BED	281
TWO-FAMILY (5-BED/UNIT)	2	35	3 SP / DU	6	0.75 / BED	26
SINGLE-FAMILY DETACHED (5-BED/UNIT)	7	10	3 SP / DU	21	0.75 / BED	8
TOTALS:	201	888		603		666

TOTAL REQUIRED PARKING SPACES PER MULTI-FAMILY REQ.:	603	
TOTAL REQUIRED PARKING SPACES PER EXTRA-OCCUPANCY REQ.:	666	
TOTAL PROVIDED PARKING SPACES (1):	738	
PARKING SPACES PER BEDROOM:	0.83	
REQUIRED HANDICAP PARKING SPACES:	15	(2% PARKING SPACES)
PROVIDED HANDICAP PARKING SPACES:	15	

BIKE PARKING	REQ. BIKE PARKING SPACES	PROVIDED BIKE PRK. SPACES	
RESIDENTIAL AREA BIKE PARKING (1 SP/BED):	888		
CLUB HOUSE BIKE PARKING (1 SP/2,000 SF):	5		
TOTAL REQUIRED BIKE PARKING:	893		
FIXED BIKE PARKING (40%):	357	357	51 RACKS PROVIDED @ 7 BIKES/RACK
ENCLOSED BIKE PARKING (60%):	536	536	COVERED PARKING PROVIDED AT PORCHES
	893	893	TOTAL BIKE PARKING PROVIDED

(1) TOTAL PARKING PROVIDED EXCLUDES AVAILABLE ON-STREET PARKING ON DUFF DRIVE AND WEBSTER DRIVE