ADMINISTRATIVE HEARING OFFICER

STAFF REPORT

PROJECT: Harmony Cottages, PDP150030

APPLICANT: Russ Lee
Ripley Design, Inc.
419 Canyon Ave.
Suite 200
Fort Collins, CO 80524

OWNERS: Harmony Limited, LLC
PO Box 271519
Fort Collins, CO 80527

PROJECT DESCRIPTION:
This is a request for a Project Development Plan for Habitat for Humanity to construct 44 two-family and 4 single-family dwelling units on a 4.45 acre site located southeast of the intersection of Harmony Road and Taft Hill Road. The LMN zoning district allows twelve dwelling units per gross acre of land for affordable housing projects. Habitat for Humanity seeks to provide housing for people whose income is between 35% and 60% of the Fort Collins average median income (AMI) and therefore qualifies as an affordable housing project. With 48 total dwelling units, the proposed density is 10.79 dwelling units per acre. This site is located in the LMN (Low Density Mixed Use Neighborhood District).

RECOMMENDATION: Staff recommends approval of Harmony Cottages PDP150030 with conditions.

EXECUTIVE SUMMARY:
Staff finds the proposed Harmony Cottages Project Development Plan complies with the applicable requirements of the City of Fort Collins Land Use Code (LUC), more specifically:

- The Project Development Plan complies with the process located in Division 2.2 – Common Development Review Procedures for Development Applications of Article 2 – Administration.

- The Modification of Standard to Section 3.5.2(E)(1) – setback from arterial streets - that is proposed with this Project Development Plan meets the applicable requirements of Section 2.8.2(H), in that the granting of the Modification would not be detrimental to the public good, the plan will promote the general purpose of the standard for which the modification is requested equally or better than would a plan which complies with the standard for which a modification is requested, and the granting of a modification from the strict application of this standard would, without impairing the intent and purpose of this Land Use Code, substantially alleviate an existing, defined and described problem of city-wide concern.

- The Project Development Plan complies with relevant standards of Article 3 – General Development Standards.

- The Project Development Plan complies with relevant standards located in Division 4.5, Low Density Mixed-Use Neighborhood (LMN) of Article 4 – Districts.

While the proposed plan complies with the applicable requirements of the City of Fort Collins Land Use Code, the site plan currently does not match up with the proposed civil engineering documents and plat. Staff recommends approval of the proposed plan with the condition that all documents match at the time of recordation.

COMMENTS:

1. Background

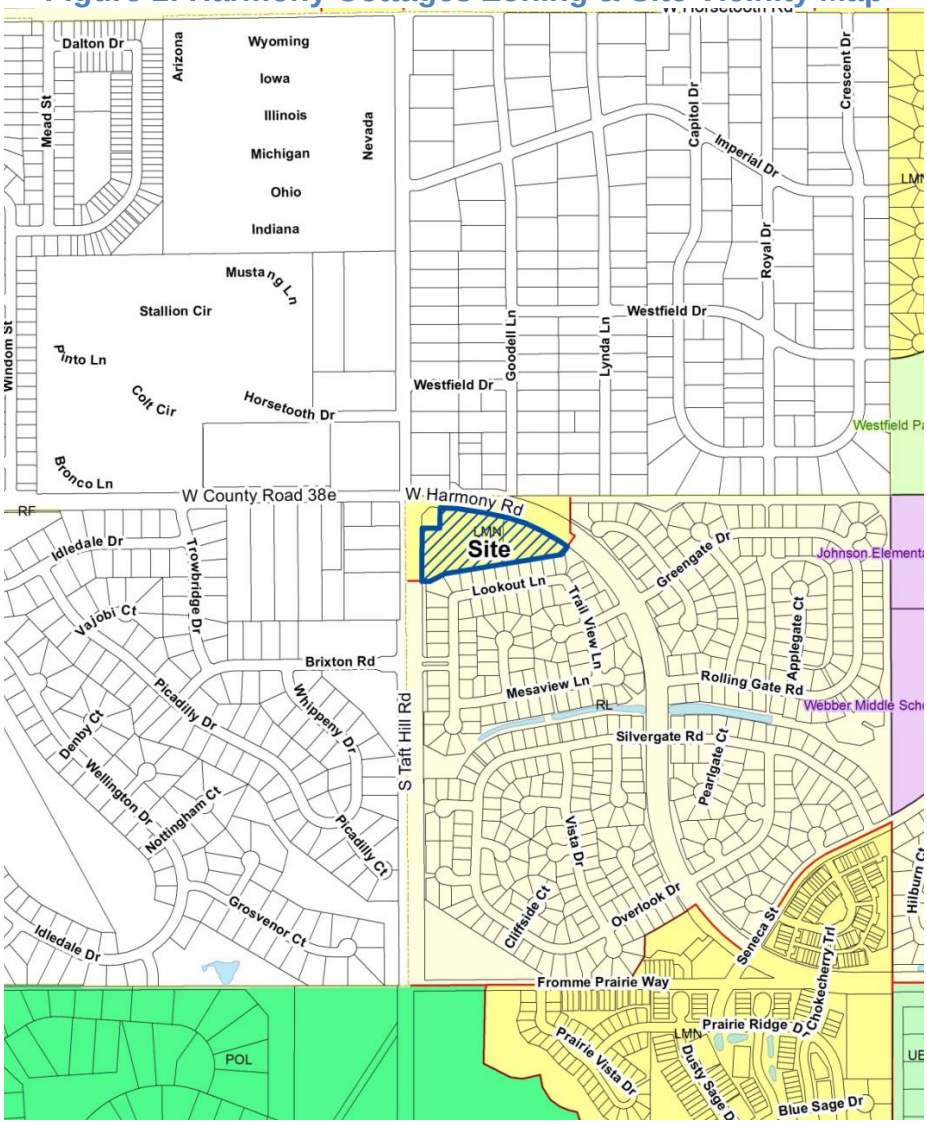
The property was annexed into the City as part of the Horsetooth – Harmony West Annexation on June 3, 1980. In 2005, Habitat for Humanity pursued a project on the property called Innovation Island. Innovation Island was a development that separated the 4.45 acres of land into two lots. As proposed, Innovation Island would have consisted of 27 multi-family units with 61 parking spaces on 3.16 acres on Lot 1. Lot 2 was to be developed as multi-family residential or commercial as part of a later phase of development. The Innovation Island PDP sought entitlement for the development of Lot 1. The Innovation Island PDP was approved by the Planning & Zoning Board on November 17, 2005. The decision of the Planning & Zoning Board was appealed to City Council on January 17, 2006. City Council upheld the Planning & Zoning Board's decision. Despite gaining this approval, the Innovation Island development did not move forward and the PDP lapsed in 2009.

The surrounding zoning and land uses are as follows:

Direction	Zone District	Existing Land Uses
North	County	Single-family detached residential, multi-family
South	Low Density Residential (RL)	Single-family detached residential
East	Low Density Residential (RL)	Single-family detached residential
West	County	Single-family detached residential, gas station and convenience store, mobile home park

Below is a zoning and site vicinity map.

Figure 1: Harmony Cottages Zoning & Site Vicinity Map



2. Compliance with Section 2.8.2(H) of the Land Use Code - Modification of Standards

Modification Description:
The applicant requests a Modification to Section *3.5.2(E)(1) – Setback from Arterial Streets* to set the proposed buildings back from Harmony Road and Taft Hill Road 15 feet where 30 feet is required.

Land Use Code Standard Proposed to be Modified (areas underlined and bolded for emphasis):

Land Use Code 3.5.2(E)(1):

> ***The minimum setback of every residential building*** *and of every detached accessory building that is incidental to the residential building* ***shall be thirty (30) feet from any arterial street right-of-way****, except for those buildings regulated by Section 3.8.30 of this Code, which buildings must comply with the setback regulations set forth in Section 3.8.30.*

Land Use Code Modification Criteria:

"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, and that:

(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; or

(2) the granting of a modification from the strict application of any standard would, without impairing the intent and purpose of this Land Use Code, substantially alleviate an existing, defined and described problem of city-wide concern or would result in a substantial benefit to the city by reason of the fact that the proposed project would substantially address an important community need specifically and expressly defined and described in the city's Comprehensive Plan or in an adopted policy, ordinance or resolution of the City Council, and the strict application of such a standard would render the project practically infeasible; or

(3) by reason of exceptional physical conditions or other extraordinary and exceptional situations, unique to such property, including, but not limited to, physical conditions such as exceptional narrowness, shallowness or topography, or physical conditions which hinder the owner's ability to install a solar energy system, the strict application of the standard sought to be modified would result

in unusual and exceptional practical difficulties, or exceptional or undue hardship upon the owner of such property, provided that such difficulties or hardship are not caused by the act or omission of the applicant; or

(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.

Any finding made under subparagraph (1), (2), (3) or (4) above shall be supported by specific findings showing how the plan, as submitted, meets the requirements and criteria of said subparagraph (1), (2), (3) or (4).

Summary of Applicant's Justification:
The applicant requests that the Modification be approved and provides the following justification based upon Criterion 1 (proposal is equal or better than provisions in the Land Use Code):

Applicant's Justification for Criterion 1:

- *In order to mitigate the proximity of the single family attached houses to the Harmony and Taft Hill road ways, the applicant is proposing to more than double the amount of landscape required along the street scape. The code would require 17 trees along Harmony Road and 8 trees along Taft Hill. In order to provide a visual buffer from the houses and the roads, the applicant is proposing 44 trees along Harmony and 16 along Taft Hill. That would more than double the required landscape.*
- *The existing right-of-ways along Harmony and Taft Hill are also larger than the City standard providing a greater distance from the homes and the road than would be typical in the City. The typical park way along a 4 lane arterial is 16' (the area between the back walk and the road). The park way along Harmony is 24' and the park way along Taft Hill it is 55'. With a 30' set back along an arterial and a typical 16' parkway, the code would require single family homes to be set back 46' from the arterial road. The current design is close to meeting or exceeding that dimension. The homes along Harmony will be setback from the road between 39' and 44'. That is only 2'-7' closer than the current standards would require. The homes along Taft Hill are set back 72' from the road way exceeding the required 46' set back by 26'.*
- *Lastly, if the units along Harmony and Taft Hill were a 3-plex unit rather that a duplex, the code would allow the homes to be 15' from the right of way matching the closest set back shown on the plans.*

Applicant's Justification for Criterion 2:

Development of the Harmony Cottages project would result in a substantial benefit to the City because the proposed community would address the need for affordable housing as expressed in City Plan. City Plan contains overarching policy statements that promote balanced and integrated living patterns. Topics addressed include the goal of a mix of housing types in all City sectors. Additionally, affordable housing is encouraged to be dispersed throughout the City.

The City also has an Affordable Housing Strategic Plan, which establishes priorities and strategies for the City's affordable housing programs and informs the Consolidated Plan and Annual Action Plans required by HUD. The most recent plan (2015) identifies four priorities to address affordable housing needs:

- *Increase the inventory of affordable units*
- *Preserve existing affordable housing units*
- *Increase housing and facilities for people with special needs*

To meet the definition of Affordable Housing in the City of Fort Collins, 10% of units must be set-aside for households earning less than 80% of Area Median Income (AMI) adjusted for household size. The Applicant is proposing to set aside 100% of the dwelling units for households earning less than 60% of AMI. In addition the properties will be deed income restricted for 20 years. The first homeowner will have to qualify earning between 35-60% AMI and then, if resold, the new buyer would need to earn less than 80% AMI.

Staff Finding:

Staff finds that the request for a Modification of Standard to section 3.5.2(E)(1) is justified by the applicable standards in 2.8.2(H)(1) and 2.8.2(H)(2).

A. The granting of the Modification would not be detrimental to the public good;
B. The project design satisfies 2.8.2(H)(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*; and
C. The project design satisfies 2.8.2(H)(2): *the granting of a modification from the strict application of any standard would, without impairing the intent and purpose of this Land Use Code, substantially alleviate an existing, defined and described problem of city-wide concern or would result in a substantial benefit to the city by reason of the fact that the proposed project would substantially address an important community need specifically and expressly*

defined and described in the City's Comprehensive Plan or in an adopted policy, ordinance or resolution of the City Council, and the strict application of such a standard would render the project practically infeasible

Staff Finding for Criterion 1:

Staff finds that the proposed plan meets the intent of the Code section equal to or better than would a plan that complies with the standard for which this modification is requested. The purpose of the setback standards for single-family houses along arterial streets is to provide safety for residents and minimize the impact of road noise. Two factors provide increased safety and minimize road noise in lieu of the typical 30' setback. One is the increased landscaping provided along both Harmony Road and Taft Hill Road. The proposed landscape plan shows double the landscaping required along Taft Hill Road and more than double the required landscaping required along Harmony Road. The increased landscaping is complemented by a white picket fence to further delineate the edge of the lots.

The other factor that aids the safety and minimizes noise from arterial roads is the distance of the buildings from the nearest traffic lanes on Harmony Road and Taft Hill Road. Harmony Road is unique in that the parkway abutting this parcel is 24 feet wide as opposed to the typical 16 foot parkway along most arterials. This means the buildings of this development are 8 feet further away from the nearest travel lane than is typical. While this means some buildings are still 7 feet closer to the nearest travel lane than is typical, the additional landscaping and fencing reduces the impact of Harmony Road on the development. The buildings are even further away from the nearest travel lane on Taft Hill Road since Taft Hill has yet to be widened. According to the City's latest Capital Improvement Plan, the widening of Taft Hill Road between the Growth Management Area boundary and Harmony Road would cost approximately $8.5 million. This project is identified as a long-term or forecasted need. Like many of the projects identified in the Capital Improvement Plan, the widening of Taft Hill Road from the Growth Management Area boundary is unfunded. As such, it is unclear at this time when Taft Hill Road will be widened. In its current condition, the buildings are 72' away from the nearest travel lane on Taft Hill Road, which vastly exceeds the typical 46 feet when accounting for the setback, sidewalk, and parkway seen on most arterials.

Staff also finds that the proposal as shown with single-family attached units with a decreased setback to be equal to or better than a plan that would show multi-

family units with a 15 foot setback. Multi-family buildings only require a 15 foot setback from arterial streets per Land Use Code section 3.8.30(E)(3), which supersedes the standard outlined in 3.5.2(E)(1). The proposed plan could comply with the minimum setback standard by changing the unit type to triplexes. Staff finds that a plan featuring triplexes with a 15 foot setback would be inferior to the current plan. The current plan allows each unit to have more access to air and light due to the required side yard setbacks between each duplex. In a triplex configuration, the middle unit would likely have less access to air and light and would result in a less livable and desirable unit for potential home owners. The scale of duplexes also more closely matches the existing character of the neighborhood.

In summary, staff finds the proposed site plan is equal to or better than a plan that meets Land Use Code section 3.5.2(E)(1). The proposed plan addresses safety and noise issues through enhanced landscaping and fencing. The proposed buildings will also be further away from the nearest travel lanes along Harmony Road and Taft Hill road than usual due to the unique parkway strips along these roadways. The proposed site plan will also allow for more livable units that are more compatible with the surrounding area than would a similar plan featuring triplexes.

Staff Finding for Criterion 2:

Staff finds the proposed development meets goals identified in City Plan, Fort Collins' comprehensive plan, as well as the Affordable Housing Strategic Plan, which was adopted by City Council unanimously in August 2015.

City Plan has numerous principles and policy objectives that target an increased supply of affordable housing in Fort Collins. Some of these policies include but are not limited to:

Principle LIV 7: *A variety of housing types and densities for all income levels shall be available throughout the Growth Management Area.*

Policy LIV 7.4 – 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.

Principle LIV 8: *The City will encourage the creation and expansion of affordable housing opportunities and preservation of the existing affordable housing supply.*

Policy LIV 8.1 – Support Affordable Housing Programs

Support the development and provision of affordable housing in the community by maintaining and allocating funding for affordable housing services and programs including management of a competitive process for federal and local funding, development incentives, homebuyer assistance, and the Land Bank program.

The recently adopted Affordable Housing Strategic Plan also aims to increase the amount of affordable housing in Fort Collins. One of the overarching goals of the Affordable Housing Strategic Plan is that publicly assisted affordable housing will consist of 10% of the housing stock by 2040. To reach this overall goal, the City must meet a short-term goal of having publicly assisted affordable housing consist of 6% of the housing stock by 2020. To reach this goal with the projected growth of the community, 94 affordable, owner-occupied units would need to be built by 2020. This project would help fulfill a substantial portion of this goal.

Staff finds that the modification request for relief from the 30' setback requirement from arterial streets is justified due to the proposed plan's alignment with an important community need expressed within City Plan and the Affordable Housing Strategic Plan.

3. <u>Compliance with Article 3 of the Land Use Code – General Development Standards:</u>

The project complies with all applicable General Development Standards as follows:

A. *Section 3.2.1(D) – Tree Planting Standards*

All developments must establish groves and belts of trees along all city streets, in and around parking lots, and in all landscape areas that are located within 50 feet of any building or structure in order to establish at least a partial urban tree canopy. The proposed landscape plan shows trees that line the private drive that runs through the development that will provide a tree canopy along the street. Each shared green space between the units feature trees that will further enhance the tree canopy on the site.

B. *Section 3.2.1(D)(2) – Street Trees*

Developments that front on streets with a landscape parkway must provide canopy shade trees at 30-40 foot spacing in the center of such parkway areas. The proposed landscape plan shows canopy shade trees along Harmony Road and Taft Hill Road with 40 foot spacing between each canopy shade tree.

C. *Section 3.2.1(D)(3) – Minimum Species Diversity*

To prevent uniform insect or disease susceptibility and eventual uniform senescence on a development site or in the adjacent area or the district, species diversity is required and extensive monocultures are prohibited. The maximum percentage of any one species when there are 60 or more trees on site is 15%. No species consists of more than 15% of the overall amount of trees provided.

D. *Section 3.2.1(D)(4) – Tree Species and Minimum Sizes*

All trees provided must meet the minimum sizes as follows:

Type	*Minimum Size*
Canopy Shade Tree	2.0" caliper balled and burlapped or equivalent
Evergreen Tree	6.0' height balled and burlapped or equivalent
Ornamental Tree	1.5" caliper balled and burlapped or equivalent
Shrubs	5 gallon or adequate size consistent with design intent
Canopy Shad Tree as a street tree on a Residential Local Street Only	1.25" caliper container or equivalent

The trees shown on the landscape all meet these minimum requirements.

E. *Section 3.2.1(E)(3) – Water Conservation*

All landscape plans must be designed to incorporate water conservation materials and techniques in order to meet the Xeriscape principals established in the Land Use Code. Total annual water use shall not exceed 15 gallons/square foot over the site. The landscape plan meets

the Xeriscape principals in the Land Use Code and has an annual water use of 12.54 gallons/square foot over the site.

F. *Section 3.2.2(C)(1) – Safety Considerations*

To the maximum extent feasible, pedestrians shall be separated from vehicles and bicycles. The proposed development will have an extensive system of sidewalks separated from the roadway by a curb. These walkways allow pedestrians to move within the site without encountering vehicles or bicycles.

G. *Section 3.2.2(C)(5) – Walkways*

Walkways must be located and aligned to directly and continuously connect areas or point of pedestrian origin and destination. Each walkway shown on the proposed site plan connects to the entry of each duplex and single-family home. These walkways connect to the street like private drive that runs through the site. All of the walkways end up leading to the sidewalks on Harmony Road and Taft Hill Road.

H. *Section 3.2.2(C)(6) – Direct On-Site Access to Pedestrian and Bicycle Destinations*

Pedestrian and bicycle facilities provided on site must connect to or allow for direct connections to major pedestrian and bicycle destinations. The sidewalk network connects to the sidewalks on Harmony Road and Taft Hill Road, which provide direct connections to major destinations.

I. *Section 3.2.2(C)(8) – Transportation Impact Study*

A Transportation Impact Study is required for developments that could have an impact on the traffic conditions surrounding the development. The applicant supplied a Transportation Impact Study in accordance with the City's guidelines.

J. *Section 3.2.2(D) – Access and Parking Lot Requirements*

The proposal meets the requirements outlined in Land Use Code section 3.2.2(D) including the separation of vehicles and pedestrians, unobstructed vehicle access, location of off-street parking areas, pavement material, and lighting.

K. *Section 3.2.2(J) – Setbacks*

The minimum setbacks for a vehicle use area are 15 feet along an arterial street and 5 feet along a lot line. All of the vehicle use areas meet these minimum requirements.

L. *Section 3.2.2(K) – Parking Lots – Required Number of Off-Street Spaces for Type of Use*

The table below shows the amount of off-street parking spaces required and the amount provided by unit type.

Table 1 - Off-Street Parking Summary

Unit Type	# of Units	Parking Required	Parking Provided
Duplex, 2-bed	13	23	23
Duplex, 3-bed	26	52	52
Duplex, 4-bed	5	15	15
Single-family detached	4	8	8
Total	**48**	**98**	**98**

M. *Section 3.2.3 – Solar Access, Orientation, Shading*

All development shall be designed throughout to accommodate active and/or passive solar installations to the extent reasonably feasible while minimizing the casting of shadows onto adjacent developments. The architectural elevations show solar panels on the roofs of each duplex and are located to minimize casting shadows on the neighborhood to the south.

N. *Section 3.2.4 – Site Lighting*

The proposed lighting plan is consistent with the requirements of the Land Use Code in regards to the general standard, lighting levels and design standards.

O. *Section 3.3.1(B) – Lots*

No lot in a subdivision shall have less area than required under the applicable zoning requirements. Each lot must also have vehicular access

to a public street. All lots meet the minimum dimensional standards outlined in Section 4.5 of the Land Use Code.

P. *Section 3.5.1 – Building and Project Compatibility*

New developments shall be compatible with the established architectural character of the area. This includes using similar materials, buildings that are of a similar size, height, bulk, mass, and scale, and minimizing the infringement on adjacent property owners' privacy.

The neighborhood immediately to the south of this development consists of a mix of one and two-story single-family detached dwellings. Most of the houses consist of wood siding with brick accents and pitched roofs. All of the duplexes have attached garages. Some of the houses also feature small front porches. The proposed architecture for Harmony Cottages is one and two-story structures with siding and pitched roof forms. Each duplex will also contain covered porches. While the adjacent subdivision does not contain any duplexes, the duplexes as part of this proposal are designed to look like single-family houses with distinct roof forms for each side of the duplex. The duplexes are also comparably sized to the single-family houses in the adjacent. All of the buildings along the southern property line are also oriented to minimize privacy issues for adjacent property owners. These qualities work in concert to create a development that will be compatible with the existing neighborhoods.

The proposed site and landscape plan also show extra attention to buffering from adjacent uses. While the proposed residential use is consistent with the adjacent residential uses, the proposed development is denser than the surrounding neighborhoods. To improve the transition between the proposed development and adjacent neighborhood to the south, the landscape plan shows groves of trees that act as a buffer. These tree groves provide visual relief to the adjacent neighborhood and soften the transition from duplexes to single-family detached homes.

Q. *Section 3.5.2(D) – Relationship of Dwellings to Streets and Parking*

Every front door shall face the adjacent street to the extent reasonably feasible. Alternatively, front doors may face onto a major walkway spine as long as the front door is no more than 350 feet from a street sidewalk. Most of the front doors face onto a shared green space with walkways that

connect to the sidewalk on the "street-like" private drive that serves the development. None of these front doors are more than 350 feet from the nearest street sidewalk. Lots 14-21 and 41-48 have front doors that connect directly to the sidewalks along Harmony Road and Taft Hill Road, respectively.

R. *Section 3.5.2(E)(3) – Side and Rear Yard Setbacks*

For residential buildings, the minimum side yard setback is 5 feet and the minimum rear yard setback is 8 feet. Each building complies with the 5 foot side yard setback and the 8 foot rear yard setback.

S. *Section 3.5.2(F) – Garage Doors*

Garage doors should be integrated into the development to prevent the streetscape from being dominated by protruding garage doors. The proposed garage doors face an alley and have windows so that the garage appears to be a part of the living portion of the house.

T. *Section 3.6.6 – Emergency Access*

All proposed developments shall provide adequate access for emergency vehicles and for those persons rendering fire protection and emergency services. The proposed development's emergency access plan has gained preliminary approval from Poudre Fire Authority for meeting all applicable code requirements.

4. <u>Compliance with Article 4 of the Land Use Code – Division 4.5, Low Density Mixed-Use Neighborhood (LMN):</u>

The project complies with all applicable Article 4 standards as follows:

A. *Section 4.5(B)(2)(a) – Permitted Uses*

The proposed use, single-family attached dwellings, is permitted in the LMN zone district and is consistent with the district's intent to be a setting for a predominance of low density housing.

B. *Section 4.5(D)(1)(b) – Density*

The maximum density of any development shall be 9 dwelling units per acre except for affordable housing projects containing 10 acres or less,

which can have a density of 12 dwelling units per acre. The proposed development is a certified affordable housing development with a proposed density of 10.79 dwelling units per acre on a 4.45 acre site.

C. *Section 4.5(E)(3) – Maximum Residential Building Height*

The maximum height for single-family and two-family structures is two and a half stories. All of the proposed buildings will be two stories or one story in height.

5. Public Outreach Summary

As part of this project, the applicant conducted two neighborhood meetings. The first meeting was held December 3, 2015 at Global Village Academy. This meeting was structured as an open house to gather information about the proposed development, the Habitat for Humanity program, and the process the proposed development would go through. The applicant had not yet submitted a formal development review proposal to the City at the time of the neighborhood meeting. 32 neighborhood members attended their meeting and provided feedback on the preliminary proposal. Due to the number of concerns raised at the first neighborhood meeting, the applicant coordinated a second neighborhood meeting in collaboration with an HOA adjacent to the development site. This meeting was held on February 18th, 2016. Over 80 neighborhood members attended the second meeting. The structure of the second meeting was a more traditional neighborhood meeting format where the applicant and City representatives gave presentations on the project and the development review process followed by a question and answer period. Neighbors raised similar concerns at both neighborhood meetings. Most of the concerns fell in the following categories:

- Overall density of the project is too high
- Increased traffic due to the development on Taft Hill and Harmony will negatively impact current residents of the area
- Concern about potential cut-through traffic through the existing neighborhoods to the south
- Desire for additional access point on Taft Hill Road so that there are two entrances and exits for the development
- Worried about the development's impact on home values
- Safety concerns for kids that will be walking to nearby schools

6. Findings of Fact/Conclusion:

In evaluating the request for the Harmony Cottages Project Development Plan, Staff makes the following findings of fact:

A. The Modification of Standard to Section 3.5.2(E)(1) that is proposed with this Project Development Plan meets the applicable requirements of Section 2.8.2(H), in that the granting of the Modification would not be detrimental to the public good, the plan will promote the general purpose of the standard for which the modification is requested equally or better than would a plan which complies with the standard for which a modification is requested, and the granting of a modification from the strict application of this standard would, without impairing the intent and purpose of this Land Use Code, substantially alleviate an existing, defined and described problem of city-wide concern.

B. The Project Development Plan complies with relevant standards located in Article 3 – General Development Standards.

C. The Project Development Plan complies with relevant standards located in Division 4.5, Low Density Mixed-Use Neighborhood (LMN) of Article 4 – Districts.

While the proposed plan complies with the applicable requirements of the City of Fort Collins Land Use Code, the site plan currently does not match up with the proposed civil engineering documents and plat. Staff recommends approval of the proposed plan with the condition that all documents match at the time of recordation.

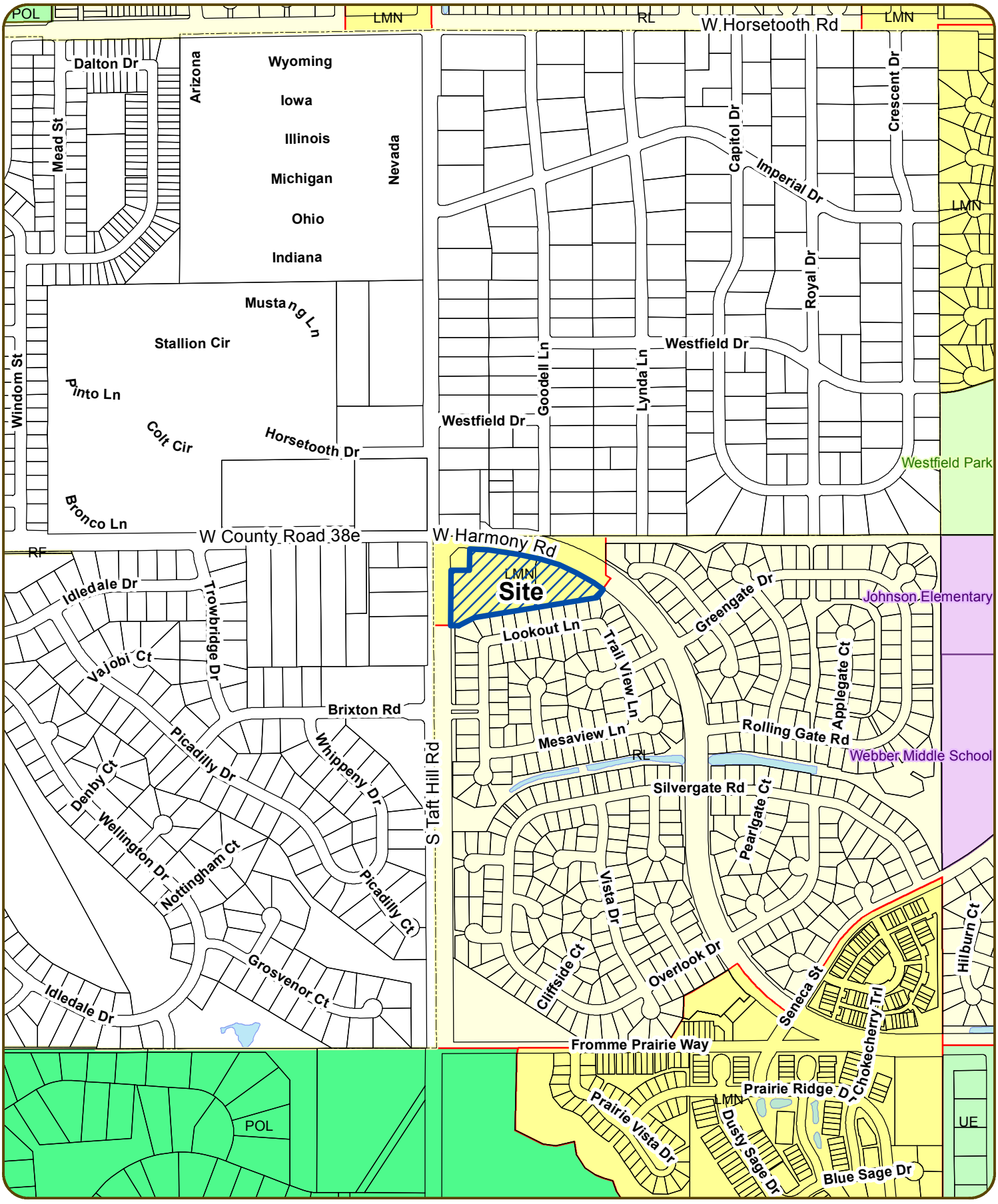
RECOMMENDATION:

Staff recommends approval of Harmony Cottages, PDP150030 with the condition that the civil engineering documents and plat match the proposed site plan at the time of recordation.

ATTACHMENTS:

1. Zoning & Site Vicinity Map
2. Statement of Planning Objectives
3. Harmony Cottages Subdivision Plat
4. Harmony Cottages Planning Document Set (includes site plan, landscape plan, photometric plan, and elevations)
5. Modification Request

6. Traffic Impact Analysis
7. Geotechnical Report
8. Drainage Report
9. Harmony Cottages Utility Plan Set
10. Neighborhood meeting summary – December 3, 2015
11. Neighborhood meeting summary – February 18, 2016
12. Habitat for Humanity Program Description



1 inch = 667 feet

Harmony Cottages
Vicinity Map

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RIPLEY DESIGN INC.

land planning ■ landscape architecture ■ urban design ■ entitlement

December 15, 2015

Planning Objectives

Harmony Cottages PDP

The Applicant, Habitat for Humanity, is proposing to construct 44 single-family and 4 two-family dwelling units on 4.45 acres located southeast of the intersection of Harmony Road and Taft Hill Road. The property is zoned Low Density Mixed Use Neighborhood District (LMN). There is a small parcel of land located on the corner that is owned by the South Fort Collins Loveland Water District that is not part of the project. A County residential development known as Westfield is located to the north and Woodridge Subdivision is immediately adjacent to the property on the south.

In 2005 Habitat for Humanity proposed a project called Innovation Island, a multi-family and commercial development located on this site. The project was approved by the Planning and Zoning Board and the City Council upheld the approval in a subsequent Appeal process, however, the project as proposed turned out to be financially infeasible. Additional dwelling units were required to make the project work financially.

The LMN zoning allows twelve dwelling units per gross acre of land for affordable housing projects. Habitat seeks to provide housing for people whose income is between 35% and 60% of the Fort Collins average median income (AMI) and therefore qualifies as an affordable housing project. With 48 total dwelling units, the proposed density is 10.79 dwelling units per acre.

Access is from Harmony Road via a street-like private drive located approximately 581 feet east of Taft Hill Road with an emergency access located 201 feet east of Taft Hill Road. All the dwelling units are alley-loaded and most of them face on to green courts or park space. Four buildings face Harmony Road and four buildings face Taft Hill Road. In both cases additional landscaping has been provided to insure that these units are adequately buffered from the arterial streets. On-street parking is proposed along the south side of the street-like private drive and the alley courts provide access to single car garages. The alley courts also include an additional parking space for each unit. Trash collection will be provided for individual units accessed from the alleys.

There are existing public street sidewalks along both Taft Hill Road and Harmony Road. Since the units along Taft Hill Road are setback approximately 60 feet from the public

sidewalk, an additional sidewalk is proposed in front of the dwelling units. This private walk in turn connects to the public street sidewalk at both the north and south edges of the property. There are several connections to the public street sidewalk along Harmony Road as well.

The green courts are defined by sidewalks making them attractive and readily accessible for residents and visitors. The project is defined by picket fencing along both Harmony and Taft Hill Road street frontages. Additional picket fencing is located internal to the site partially enclosing green courts. A bus stop is located at the main entrance to the project and community mail boxes are located nearby the entrance as well. A private park space with a small playground is centrally located and shared by all residents.

The site drains to the south with storm water collected in a swale that parallels the south property line. The drainage swale and associated landscaping provide water quality treatment for the storm water before it leaves the site at the southeast corner and enters the City's storm water system. The area will be seeded with native grasses and provides a 15-25 foot average buffer area between the Harmony Cottages project and Woodridge Subdivision to the south.

Although a neighborhood meeting was not required, a neighborhood Open House was held December 3rd to give existing neighborhood residents an opportunity to see the proposed plan and provide comment. The comments and questions along with responses were recorded and submitted to the City.

The project as designed meets all the performance standards in the LMN District. The General Development Standards in Chapter 3 of the Land Use Code are also met with one exception. The Applicant is requesting a Modification to the 30-foot setback along Harmony Road. The request and justification is included in the submittal package.

City Plan Principles and Policies achieved by the project include the following:

- Community and neighborhood livability policies having to do with compact urban development, safe attractive neighborhoods, creating housing options for all household types and income levels, and creating an attractive community image.
- Safety and Wellness policies having to do with providing opportunities to lead active and healthy lifestyles, and providing a safe place to live, learn and play.
- Transportation policies having to do with providing access to alternative modes of transportation.

HARMONY COTTAGES

Being a Replat of Lots 1 and 2, Innovation Island,
Situate in the Southwest Quarter of Section 34, Township 7 North, Range 69 West of the 6th P.M.,
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:

Lots One (1) and Two (2), Innovation Subdivision recorded June 14, 2007 a Reception No. 20070045148 of the Records of Larimer County, located in the Southwest Quarter (SW1/4) of Section Thirty-four (34), Township Seven North (T.7N.), Range Sixty-nine West (R.69W.) of the Sixth Principal Meridian (6th P.M.), City of Fort Collins, County of Larimer, State of Colorado.

. . . (which above described tract contains 4.450 acres, more or less)

for themselves and their successors in interest Harmony Limited, LLC, a Colorado limited liability, have caused the above described land to be surveyed and subdivided into lots, tracts and streets as shown on this Plat to be known as HARMONY COTTAGES, 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.

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.

VACATION STATEMENT

Know all men by these presents that we the undersigned, being the sole owner(s) of the land described herein, and as shown on the attached map do hereby vacate the Lots and easements of the previous platting of the above described parcel of land and do hereby rededicate as shown hereon.

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.

OWNER: Harmony Limited, LLC, a Colorado limited liability

By:_____ Date:_____
(name)(title)

NOTARIAL CERTIFICATE

STATE OF _____)
ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me by _____ as _____

of _____, this_____ , day of_____ , 20___.

My commission expires _____

Witness my hand and official seal. (SEAL)

_____
Notary Public

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.: _____

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 Planning the City of Fort Collins, Colorado this _____ day of

_____A.D., 20____.

_____
Director of Planning

_____
City Clerk

BASIS OF BEARINGS AND LINEAL UNIT DEFINITION

Assuming the West line of the Southwest Quarter of Section 34, T.7N., R.69W., as bearing South 00°23'27" East being a Grid Bearing of the Colorado State Plane Coordinate System, North Zone, North American Datum 1983/2007, a distance of 2669.16 feet with all other bearings contained herein relative thereto.

The lineal dimensions as contained herein are based upon the "U.S. Survey Foot."

NOTICE

According to Colorado law you must commence any legal action based upon any defect in this survey within three years after you first discover such defect. In no event may any action based upon any defect in this survey be commenced more than ten years from the date of the certification shown hereon. (13-80-105 C.R.S. 2012)

TITLE COMMITMENT NOTE

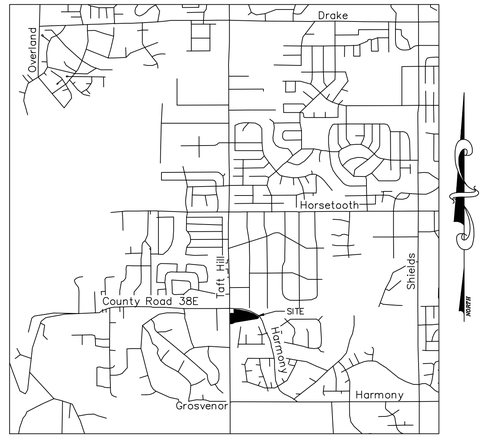
This survey does not constitute a title search by King Surveyors to determine ownership or easements of record. For all information regarding easements, rights-of-way and title of records, King Surveyors relied upon Title Commitment Number FCC25133816, dated September 10, 2015 as prepared by Land Title Guarantee Company to delineate the aforesaid information.

FLOOD PLAIN NOTE

Entire property is in flood zone 'X', "areas determined to be outside the 0.2% annual chance of floodplain" per City of Fort Collins website fcgov.com and per FEMA flood map 08069C1000F revised May 12, 2012 "Panel Not Printed". For further information, call City of Fort Collins Utilities, phone (970) 221-6700.

ZONING NOTE

The entire property is in Zone Low Density Mixed-Use Neighborhood District (L-M-N).



VICINITY MAP
(NOT TO SCALE)

OUTLOT	DESCRIPTION	OWNED & MAINTAINED BY
OUTLOT A	UTILITY, DRAINAGE, ACCESS AND EMERGENCY ACCESS EASEMENT (PRIVATE DRIVE)	HOMEOWNERS ASSOCIATION
OUTLOT B	ACCESS EASEMENT / OPEN SPACE	HOMEOWNERS ASSOCIATION
OUTLOT C	UTILITY, DRAINAGE AND ACCESS EASEMENT / OPEN SPACES	HOMEOWNERS ASSOCIATION

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.

SURVEYOR'S STATEMENT

I, Ronnie L. Edwards, a Colorado Licensed 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.

PRELIMINARY

_____
Ronnie L. Edwards – On Behalf Of King Surveyors
Colorado Licensed Professional
Land Surveyor #38480

LINE TABLE		
LINE	BEARING	LENGTH
L1	S35°17'43"W	56.87'
L2	S89°46'19"W	45.11'
L3	N18°17'16"E	13.27'
L4	S18°17'16"W	13.35'
L5	N18°17'16"E	12.92'
L6	N27°07'09"E	22.09'
L7	N80°38'17"E	7.76'
L8	S78°51'30"W	5.12'
L9	N78°17'20"E	14.77'
L10	N29°05'19"E	9.98'
L11	N00°23'27"W	14.12'
L12	S81°08'46"W	18.13'
L13	S10°09'27"W	33.12'
L14	N10°09'27"E	7.02'
L15	N80°41'26"E	19.19'
L16	N46°44'19"E	7.34'
L17	N78°18'13"E	20.01'
L18	S00°00'32"W	9.07'
L19	S61°36'58"W	13.39'
L20	S67°18'58"W	8.91'
L21	N10°08'41"E	7.00'
L22	S79°51'19"E	10.00'
L23	N88°41'19"E	13.51'
L24	S10°08'41"W	7.00'

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	CH BEARING
C1	382.50'	1760.76'	12°26'48"	381.75'	S80°54'42"E
C2	354.02'	1015.00'	19°59'03"	352.23'	N64°41'47"W
C3	185.73'	130.00'	81°51'24"	170.33'	N59°12'58"E
C4	135.06'	433.00'	17°52'19"	134.52'	N88°47'29"W
C5	49.32'	1015.00'	2°47'03"	49.32'	N73°17'47"W
C6	16.50'	1015.00'	0°55'53"	16.50'	N71°26'19"W
C7	16.50'	1015.00'	0°55'54"	16.50'	N70°30'25"W
C8	271.69'	1015.00'	15°20'13"	270.88'	N62°22'22"W
C9	162.15'	113.50'	81°51'24"	148.71'	N59°12'58"E
C10	122.38'	113.50'	61°46'45"	116.54'	N49°10'39"E
C11	39.77'	113.50'	20°04'39"	39.57'	S89°53'39"E
C12	209.30'	146.50'	81°51'24"	191.95'	N59°12'58"E
C13	54.90'	146.50'	21°28'16"	54.58'	N29°01'24"E
C14	43.91'	146.50'	17°10'20"	43.74'	N48°20'42"E
C15	49.91'	146.50'	19°31'18"	49.67'	N66°41'31"E
C16	3.71'	146.50'	1°27'04"	3.71'	S80°34'51"E
C17	116.53'	449.50'	14°51'13"	116.20'	N87°16'56"W
C18	17.55'	449.50'	2°14'14"	17.55'	N80°58'27"W
C19	60.74'	449.50'	7°44'30"	60.69'	N85°57'49"W
C20	38.24'	449.50'	4°52'29"	38.23'	S87°43'42"W
C21	107.12'	416.50'	14°44'10"	106.83'	N87°13'25"W
C22	27.37'	416.50'	3°45'55"	27.37'	N81°44'17"W
C23	34.09'	416.50'	4°41'24"	34.08'	N85°57'57"W
C24	45.66'	416.50'	6°16'51"	45.63'	S88°32'56"W
C25	143.86'	28.50'	289°13'04"	33.01'	S06°11'32"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	CH BEARING
C26	5.53'	28.50'	11°06'27"	5.52'	N47°08'14"W
C27	32.39'	28.50'	65°06'54"	30.67'	N85°14'54"W
C28	35.94'	28.50'	72°15'27"	33.61'	S26°03'56"W
C29	11.22'	28.50'	22°33'54"	11.15'	S21°20'44"E
C30	30.18'	28.50'	60°39'53"	28.79'	S62°57'37"E
C31	28.61'	28.50'	57°30'29"	27.42'	N57°57'11"E
C32	16.13'	15.00'	61°36'33"	15.36'	N40°57'42"E
C33	55.82'	1727.78'	1°51'03"	55.81'	N86°08'51"W
C34	74.59'	1753.76'	2°26'13"	74.59'	N83°16'04"W
C35	74.51'	1753.76'	2°26'03"	74.50'	N79°50'16"W
C36	20.01'	1753.76'	0°39'13"	20.01'	N78°17'38"W
C37	74.62'	1753.76'	2°26'16"	74.61'	N76°44'54"W
C38	28.00'	25.00'	64°10'31"	26.56'	S21°55'47"E
C39	11.63'	15.00'	44°25'38"	11.34'	N32°21'30"E
C40	11.63'	15.00'	44°25'37"	11.34'	S12°04'08"E
C41	61.90'	1760.76'	2°00'51"	61.90'	N86°07'41"W
C42	20.08'	1760.76'	0°39'12"	20.07'	N84°47'39"W
C43	300.53'	1760.76'	9°46'45"	300.16'	N79°34'41"W
C44	210.90'	1007.63'	11°59'32"	210.52'	N64°02'01"W
C45	30.59'	1007.63'	1°44'21"	30.59'	N69°09'36"W
C46	25.92'	1007.63'	1°28'25"	25.92'	N67°33'13"W
C47	25.92'	1007.63'	1°28'25"	25.92'	N66°04'48"W
C48	26.97'	1007.63'	1°32'02"	26.97'	N64°34'35"W
C49	26.99'	1007.63'	1°32'05"	26.99'	N63°02'31"W
C50	25.26'	1007.63'	1°26'10"	25.26'	N61°33'24"W

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	CH BEARING
C51	25.26'	1007.63'	1°26'11"	25.26'	N60°07'13"W
C52	24.00'	1007.63'	1°21'53"	24.00'	N58°43'11"W
C53	31.08'	25.00'	71°13'17"	29.11'	S33°28'28"E
C54	181.12'	831.00'	12°29'17"	180.77'	N62°50'27"W
C55	13.25'	831.00'	0°54'50"	13.25'	N68°37'41"W
C56	23.95'	831.00'	1°39'04"	23.95'	N67°20'44"W
C57	23.94'	831.00'	1°39'03"	23.94'	N65°41'41"W
C58	23.98'	831.00'	1°39'13"	23.98'	N64°02'32"W
C59	23.98'	831.00'	1°39'13"	23.98'	N62°23'19"W
C60	24.00'	831.00'	1°39'17"	24.00'	N60°44'04"W
C61	24.01'	831.00'	1°39'20"	24.01'	N59°04'46"W
C62	24.00'	831.00'	1°39'17"	24.00'	N57°25'27"W
C63	5.97'	25.00'	13°40'45"	5.95'	N78°36'24"W
C64	56.87'	146.50'	22°14'27"	56.51'	N87°34'23"E
C65	125.78'	811.00'	8°53'10"	125.65'	N67°19'26"W
C66	8.79'	5.00'	100°46'37"	7.70'	S26°03'52"W
C67	52.33'	811.00'	3°41'50"	52.32'	N69°55'06"W
C68	44.84'	811.00'	3°10'04"	44.83'	N66°29'09"W
C69	28.61'	811.00'	2°01'16"	28.61'	N63°53'30"W
C70	26.70'	17.00'	90°00'00"	24.04'	S44°59'28"E
C71	12.56'	836.00'	0°51'39"	12.56'	N57°49'34"W
C72	7.89'	5.00'	90°26'56"	7.10'	N36°04'55"W
C73	27.26'	68.00'	22°58'14"	27.08'	S02°20'35"E
C74	26.65'	68.00'	22°27'17"	26.48'	S02°05'06"E
C75	0.61'	68.00'	0°30'57"	0.61'	S13°34'13"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD	CH BEARING
C76	29.12'	55.60'	30°00'27"	28.79'	N01°10'32"E
C77	22.88'	55.60'	23°34'28"	22.72'	N02°02'28"W
C78	6.24'	55.60'	6°26'00"	6.24'	N12°57'46"E
C79	42.48'	29.80'	81°41'02"	38.98'	S24°39'45"E
C80	17.31'	29.80'	33°16'29"	17.06'	S00°27'29"E
C81	25.18'	29.80'	48°24'34"	24.44'	S41°18'00"E
C82	11.46'	15.00'	43°46'57"	11.19'	S32°40'49"W
C83	123.93'	340.00'	20°53'06"	123.25'	S00°20'48"W
C84	25.67'	340.00'	4°19'36"	25.67'	S08°37'33"W
C85	30.47'	340.00'	5°08'07"	30.46'	S03°53'41"W
C86	30.80'	340.00'	5°11'27"	30.79'	S01°16'05"E
C87	36.98'	340.00'	6°13'57"	36.97'	S06°58'47"E
C88	211.20'	1015.00'	11°55'19"	210.82'	N60°39'55"W
C89	11.78'	15.00'	44°59'08"	11.48'	N11°47'23"W
C90	131.25'	360.00'	20°53'20"	130.52'	S00°15'31"W
C91	13.71'	360.00'	2°10'58"	13.71'	S09°36'42"W
C92	24.16'	360.00'	3°50'45"	24.16'	S06°35'51"W
C93	24.03'	360.00'	3°49'29"	24.03'	S02°45'44"W
C94	24.01'	360.00'	3°49'16"	24.00'	S01°03'39"E
C95	24.09'	360.00'	3°50'04"	24.09'	S04°53'19"E
C96	21.24'	360.00'	3°22'48"	21.23'	S08°29'45"E
C97	17.13'	25.00'	39°15'19"	16.80'	S19°38'10"W
C98	25.72'	1000.00'	1°28'26"	25.72'	N69°01'41"W
C99	4.74'	146.50'	1°51'12"	4.74'	N19°12'52"E

KING SURVEYORS
650 E. Garden Drive | Windsor, Colorado 80550
phone: (970) 686-5011 | email: info@KingSurveyors.com

DATE: 12/9/2015
FILE NAME: 20151072SUB
SCALE: 1"=30'
DRAWN BY: CSK
CHECKED BY: RE

REVISIONS:	DATE:
REVISED PER CITY COMMENTS	CSK 1/18/16

HARMONY COTTAGES
FOR
HARMONY LIMITED, LLC
P.O. BOX 271519
FORT COLLINS, CO 80527

PROJECT #: 20151072

1

SHEET 1 OF 2

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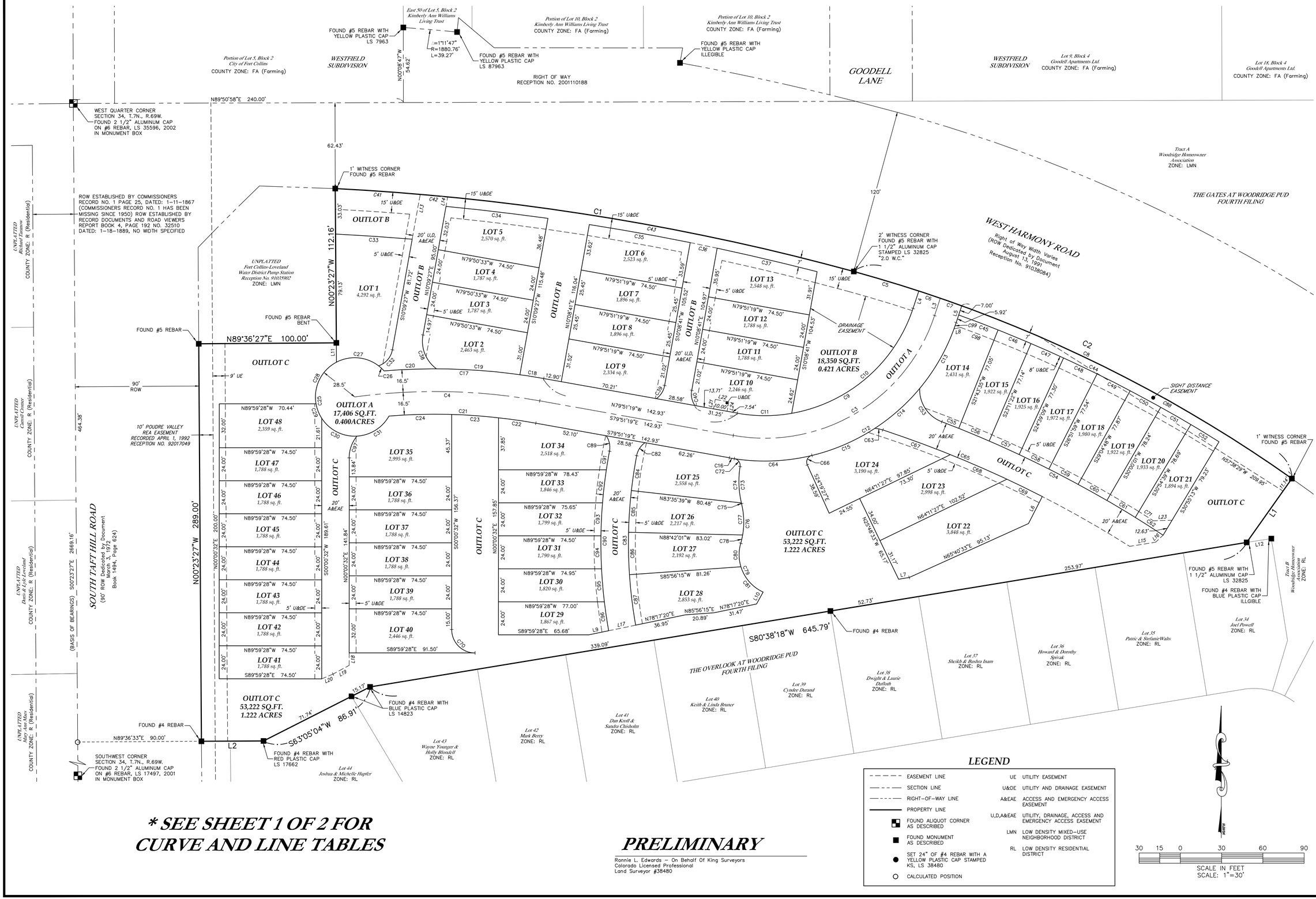
HARMONY COTTAGES



LEGEND

EASEMENT LINE	UE UTILITY EASEMENT
SECTION LINE	U&DE UTILITY AND DRAINAGE EASEMENT
RIGHT-OF-WAY LINE	A&EAE ACCESS AND EMERGENCY ACCESS EASEMENT
PROPERTY LINE	U,D,A&EAE UTILITY, DRAINAGE, ACCESS AND EMERGENCY ACCESS EASEMENT
FOUND ALIQUOT CORNER AS DESCRIBED	LMN LOW DENSITY MIXED-USE NEIGHBORHOOD DISTRICT
FOUND MONUMENT AS DESCRIBED	RL LOW DENSITY RESIDENTIAL DISTRICT
SET 24" OF #4 REBAR WITH A YELLOW PLASTIC CAP STAMPED KS, LS 38480	
CALCULATED POSITION	

30 15 0 30 60 90

SCALE IN FEET
SCALE: 1"=30'

* SEE SHEET 1 OF 2 FOR CURVE AND LINE TABLES

PRELIMINARY

Ronnie L. Edwards – On Behalf Of King Surveyors
Colorado Licensed Professional
Land Surveyor #38480

DATE: 12/9/2015
FILE NAME: 20151072SUB
SCALE: 1"=30'
DRAWN BY: CSK
CHECKED BY: RE

KING SURVEYORS
650 E. Garden Drive | Windsor, Colorado 80550
phone: (970) 686-5011 | email: info@KingSurveyors.com

REVISIONS:	DATE:
REVISED PER CITY COMMENTS	CSK 1/18/16

HARMONY COTTAGES
FOR
HARMONY LIMITED, LLC
P.O. BOX 271519
FORT COLLINS, CO 80527

PROJECT #: 20151072

2
SHEET 2 OF 2

O:\20151072\DRAWING\20151072SUB.dwg, 1/19/2016 4:00:57 PM

HARMONY COTTAGES

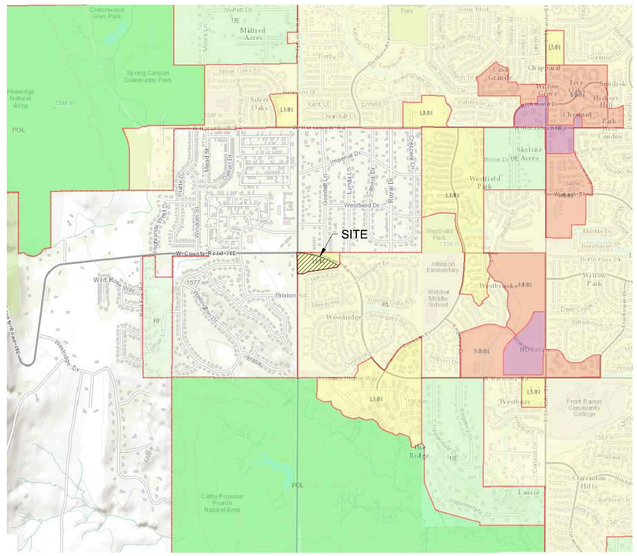
Project Development Plan

GENERAL NOTES

1. THE PROJECT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FINAL PLANS, AMENDMENTS TO THE PLANS MUST BE REVIEWED AND APPROVED BY THE CITY PRIOR TO THE IMPLEMENTATION OF ANY CHANGES TO THE PLANS.
2. REFER TO FINAL UTILITY PLANS FOR EXACT LOCATIONS AND CONSTRUCTION INFORMATION FOR STORM DRAINAGE STRUCTURES, UTILITY MAINS AND SERVICES, PROPOSED TOPOGRAPHY, STREET IMPROVEMENTS.
3. REFER TO THE SUBDIVISION PLAT AND UTILITY PLANS FOR EXACT LOCATIONS, AREAS AND DIMENSIONS OF ALL EASEMENTS, LOTS, TRACTS, STREETS, WALKS AND OTHER SURVEY INFORMATION.
4. ALL CONSTRUCTION OF COMMON AREAS AND PUBLIC INFRASTRUCTURE WITHIN THIS DEVELOPMENT PLAN WILL BE COMPLETED IN ONE PHASE. EACH SINGLE FAMILY ATTACHED AND DETACHED HOME, AND THE LANDSCAPE ASSOCIATED WITH EACH LOT, SHALL BE CONSTRUCTED IN PHASES ON AN INDIVIDUAL BASIS.
5. A MODIFICATION TO THE 30' SINGLE FAMILY SET BACK FROM AN ARTERIAL (SEE SECTION 3.5.2(E)(1)) HAS BEEN PROVIDED WITH THIS PDP SUBMITTAL.
6. ALL SINGLE FAMILY DETACHED HOMES SHALL MEET OR EXCEED THE GARAGE DOOR STANDARDS AS OUTLINED IN 3.5.2(E) OF THE LAND USE CODE.
7. A MINIMUM OF TWO HOUSING MODELS SHALL BE REQUIRED. THESE HOUSING MODELS SHALL MEET OR EXCEED THE STANDARDS AS OUTLINED IN 3.5.2(C) OF THE LAND USE CODE.
8. ALL EXTERIOR LIGHTING PROVIDED SHALL COMPLY WITH THE FOOT-CANDLE REQUIREMENTS IN SECTION 3.2.4 OF THE LAND USE CODE AND SHALL USE A CONCEALED, FULLY SHIELDED LIGHT SOURCE WITH SHARP CUT-OFF CAPABILITY SO AS TO MINIMIZE UP-LIGHT, SPILL LIGHT, GLARE AND UNNECESSARY DIFFUSION.
9. SIGNAGE AND ADDRESSING ARE NOT PERMITTED WITH THIS PLANNING DOCUMENT AND MUST BE APPROVED BY SEPARATE CITY PERMIT PRIOR TO CONSTRUCTION. SIGNS MUST COMPLY WITH CITY SIGN CODE UNLESS A SPECIFIC VARIANCE IS GRANTED BY THE CITY.
10. THE PROPERTY OWNER FOR EACH RESIDENTIAL LOT IS RESPONSIBLE FOR LANDSCAPE MAINTENANCE AND SNOW REMOVAL INSIDE THEIR PROPERTY BOUNDARY. ALL OTHER LANDSCAPE MAINTENANCE AND SNOW REMOVAL SHALL BE THE RESPONSIBILITY OF A HOME OWNER'S ASSOCIATION.
11. FIRE HYDRANTS MUST MEET OR EXCEED POUDRE FIRE AUTHORITY STANDARDS UNLESS AN APPROVED VARIANCE IS PROVIDED BY THE POUDRE FIRE AUTHORITY. ALL BUILDINGS MUST PROVIDE AN APPROVED FIRE EXTINGUISHING SYSTEM.
12. ALL SIDEWALKS AND RAMPS MUST CONFORM TO CITY STANDARDS. ACCESSABLE RAMPS MUST BE PROVIDED AT ALL STREET AND DRIVE INTERSECTIONS AND AT ALL DESIGNATED ACCESSABLE PARKING SPACES. ACCESSABLE PARKING SPACES MUST SLOPE NO MORE THAN 1:48 IN ANY DIRECTION. ALL ACCESSIBLE ROUTES MUST SLOPE NO MORE THAN 1:20 IN DIRECTION OF TRAVEL AND WITH NO MORE THAN 1:48 CROSS SLOPE.
13. PRIVATE CONDITIONS, COVENANTS, AND RESTRICTIONS (CC&R'S), OR ANY OTHER PRIVATE RESTRICTIVE COVENANT IMPOSED ON LANDOWNERS WITHIN THE DEVELOPMENT, MAY NOT BE CREATED OR ENFORCED HAVING THE EFFECT OF PROHIBITING OR LIMITING THE INSTALLATION OF XERISCAPE LANDSCAPING, SOLAR/PHOTO-VOLTAIC COLLECTORS (IF MOUNTED FLUSH UPON ANY ESTABLISHED ROOF LINE), CLOTHES LINES (IF LOCATED IN BACK YARDS), ODOR-CONTROLLED COMPOST BINS, OR WHICH HAVE THE EFFECT OF REQUIRING THAT A PORTION OF ANY INDIVIDUAL LOT BE PLANTED IN TURF GRASS.
14. ANY DAMAGED CURB, GUTTER AND SIDEWALK EXISTING PRIOR TO CONSTRUCTION, AS WELL AS STREETS, SIDEWALKS, CURBS AND GUTTERS, DESTROYED, DAMAGED OR REMOVED DUE TO CONSTRUCTION OF THIS PROJECT, SHALL BE REPLACED OR RESTORED TO CITY OF FORT COLLINS STANDARDS AT THE DEVELOPER'S EXPENSE PRIOR TO THE ACCEPTANCE OF COMPLETED IMPROVEMENTS AND/OR PRIOR TO THE ISSUANCE OF THE FIRST CERTIFICATE OF OCCUPANCY.
15. FIRE LANE MARKING: A FIRE LANE MARKING PLAN MUST BE REVIEWED AND APPROVED BY THE FIRE OFFICIAL PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, WHERE REQUIRED BY THE FIRE CODE OFFICIAL, APPROVED SIGNS OR OTHER APPROVED NOTICES THAT INCLUDE THE WORDS NO PARKING FIRE LANE SHALL BE PROVIDED FOR FIRE APPARATUS ACCESS ROADS TO IDENTIFY SUCH ROADS OR PROHIBIT THE OBSTRUCTION THEREOF. THE MEANS BY WHICH FIRE LANES ARE DESIGNATED SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION AT ALL TIMES AD BE REPLACED OR REPAIRED WHEN NECESSARY TO PROVIDE ADEQUATE VISIBILITY.
16. PREMISE IDENTIFICATION: AN ADDRESSING PLAN IS REQUIRED TO BE REVIEWED AND APPROVED BY THE CITY AND POUDRE FIRE AUTHORITY PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, UNLESS THE PRIVATE DRIVE IS NAMED, MONUMENT SIGNAGE MAY BE REQUIRED TO ALLOW WAY-FINDING, ALL BUILDINGS SHALL HAVE ADDRESS NUMBERS, BUILDING NUMBERS OR APPROVED BUILDING IDENTIFICATION PLACED IN A POSITION THAT IS PLAINLY LEGIBLE, VISIBLE FROM THE STREET OR ROAD FRONTING THE PROPERTY, AND POSTED WITH A MINIMUM OF SIX-INCH NUMERALS ON A CONTRASTING BACKGROUND, WHERE ACCESS IS BY MEANS OF A PRIVATE ROAD AND THE BUILDING CANNOT BE VIEWED FROM THE PUBLIC WAY, A MONUMENT, POLE OR OTHER SIGN OR MEANS SHALL BE USED TO IDENTIFY THE STRUCTURE.

VICINITY MAP

SCALE: 1" = 1500'



LEGAL DESCRIPTION

HARMONY COTTAGES LOCATED IN THE SOUTHWEST QUARTER OF SECTION THIRTY-FOUR (34), TOWNSHIP SEVEN NORTH (T.7N.), RANGE SIXTY-NINE WEST (R.69W.) OF THE SIXTH PRINCIPAL MERIDIAN (6TH P.M.), CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO.

PLANNING CERTIFICATE

APPROVED BY THE DIRECTOR OF COMMUNITY DEVELOPMENT AND NEIGHBORHOOD SERVICES OF THE CITY OF FORT COLLINS, COLORADO ON THIS _____ DAY OF _____, 20__.

_____
Director Signature

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 _____ DAY OF _____ A.D., 20 _____. BY

_____
(PRINT NAME)

AS _____.

MY COMMISSION EXPIRES: _____

WITNESS MY HAND AND OFFICIAL SEAL.

_____ _____
NOTARY PUBLIC ADDRESS

LAND USE CHART

EXISTING ZONING	L-M-N

DENSITY

GROSS / NET (GROSS AREA AND NET AREA ARE THE SAME)

AREA	193833 SF (4.45 AC)
TOTAL DWELLING UNITS	48
DENSITY	10.79 DU/AC

AREA COVERAGE

GROSS / NET (GROSS AREA AND NET AREA ARE THE SAME)

	H.O.A.	HOME OWNER	TOTAL AREA (SF)	TOTAL AREA (ACRES)	% OF GROSS PDP AREA
BUILDING COVERAGE	0	55200	55200	1.27	28.48
DRIVES AND PARKING*	29768	15361	45129	1.04	23.28
OPEN SPACE AND LANDSCAPE	36307	32436	68743	1.58	35.47
DETENTION	13132	0	13132	0.30	6.77
HARDSCAPE	9099	993	10092	0.23	5.21
ACTIVE RECREATIONAL USE	1537	0	1537	0.04	0.79
PUBLIC STREET RIGHT-OF-WAY	0	0	0	0.00	0.00
TOTAL GROSS COVERAGE	**89843 SF**	**103990 SF**	**193833 SF**	**4.45 AC**	**100.00**

*ALL DRIVES AND ALLEYS IN THE DEVELOPMENT WILL BE PRIVATE AND MANAGED BY AN HOA. HOME OWNER WILL ONLY BE RESPONSIBLE FOR THEIR INDIVIDUAL DRIVEWAY AND ATTACHED PARKING SPOT.

UNIT TYPE SUMMARY

	DWELLING UNITS	TOTAL BEDROOMS	REQUIRED PARKING
SINGLE FAMILY ATTACHED (2-BED)	13	26	23
SINGLE FAMILY ATTACHED (3-BED)	26	78	52
SINGLE FAMILY ATTACHED (4-BED)	5	20	15
SINGLE FAMILY DETACHED	4	8	8
TOTAL	**48**	**132**	**98**

*SINGLE FAMILY ATTACHED BEDROOM COUNT MAY CHANGE, BUT THE RATIO WILL NEVER EXCEED THE REQUIRED OFF STREET PARKING.

LOT SUMMARY

	# OF LOTS	TOTAL LOT AREA	% OF GROSS PDP AREA
SINGLE FAMILY ATTACHED	44	90330	46.60
SINGLE FAMILY DETACHED	4	13660	7.05
OUTLOTS A, B AND C		89843	46.35

BUILDING HEIGHT

	MAXIMUM HEIGHT	STORIES
SINGLE FAMILY ATTACHED	MAIN BLDG: 30'-0"	2
SINGLE FAMILY DETACHED	MAIN BLDG: 30'-0"	1-2

PROJECT PARKING

	PROVIDED	*REQUIRED
OFF STREET PARKING	50	
SINGLE FAMILY ATTACHED GARAGE PARKING	44	
SINGLE FAMILY DETACHED GARAGE PARKING	4	
TOTAL	**98**	**98**

SHEET INDEX

HARMONY COTTAGES

PROJECT DEVELOPMENT PLAN

FORT COLLINS, CO

PREPARED BY:

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■ ■ urban design ■ entitlement ■

419 Canyon Ave. Suite 200 Fort Collins, CO 80521
phone 970.224.5828 | fax 970.225.6657 | www.ripleydesigninc.com

APPLICANT

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DEVELOPER

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Fort Collins, CO 80527
p. 970.232.3605

ARCHITECT

GREG FISHER ARCHITECT, PLLC
Greg Fisher
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Fort Collins, Colorado, 80524
p. 970.484.8433

ENGINEER

INTERWEST CONSULTING GROUP
Bob Almirall
1218 Ash Street #C
Windsor, CO 80550
p. 970.460.8487

NORTH

ORIGINAL SIZE 24X36

ISSUED

No.	DESCRIPTION	DATE
01	PDP	12/16/15
02	PDP REVISION	01/20/16
03	PDP REVISION	03/21/16

REVISIONS

No.	DESCRIPTION	DATE

COVER

SEAL:

ENTITLEMENT DRAWINGS NOT FOR CONSTRUCTION

PROJECT No.:	R15-067
DRAWN BY:	SC
REVIEWED BY:	RL

DRAWING NUMBER:

1 OF 6

Plotted By: Sam Coutts **Layout:** 1 OF 6 COVER **Printed On:** 3/21/2016 2:23 PM **File Name:** 1 OF 5 COVER.dwg

NOTES

1. PLAYGROUND SIZE AND LAYOUT WILL ADJUST TO ACCOMMODATE THE FULL ZONES OF THE CHOSEN PLAY EQUIPMENT.
2. PARALLEL PARKING SHALL BE ON THE NORTH SIDE OF THE PRIVATE DRIVE. NO PARKING SHALL BE ALLOWED ON THE SOUTH SIDE.
3. EACH DUPLEX UNIT HAS ONE OFF-STREET PARKING SPACE AND ONE GARAGE PARKING SPACE.

LEGEND

N25°00'00"W 70.00'	= PROPERTY BOUNDARY
	= DRAINAGE OR UTILITY EASEMENT
	= BUILDING SETBACK
x x	= EXISTING FENCE
	= PROPOSED 30" TALL PICKET FENCE
	= PROPOSED 6' TALL PRIVACY FENCE
FO FO FO	= FIBER OPTIC UTILITY
G G G	= GAS UTILITY
OE OE OE	= OVERHEAD ELECTRIC UTILITY
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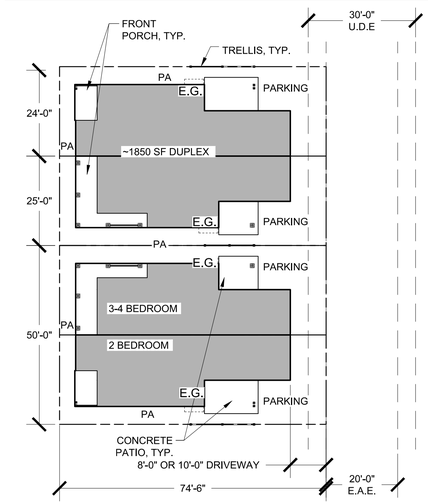
PA	= PLANTING AREA
B.O.C.	=BACK OF CURB
E.G.	=ELECTRIC / GAS METERS
	= STREET LIGHT SEE PHOTOMETRIC PLAN SHEET 5 OF 6

TYPICAL DUPLEX LOT



HARMONY COTTAGES

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INTERWEST CONSULTING GROUP
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NORTH

0 15 30 60

SCALE: 1"=30'-0"

ORIGINAL SIZE 24X36

ISSUED

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01	PDP	12/16/15
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REVISIONS

No.	DESCRIPTION	DATE

SITE PLAN

SEAL:

ENTITLEMENT DRAWINGS NOT FOR CONSTRUCTION

PROJECT No.:	R15-067
DRAWN BY:	SC
REVIEWED BY:	RL

DRAWING NUMBER:

2 OF 6

Plotted By: Sam Coutts **Layout:** 2 OF 6 SITE PLAN **Printed On:** 3/21/2016 2:23 PM **File Name:** Site Plan.dwg

A PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY TREES OR SHRUBS AS NOTED ON THIS PLAN ARE PLANTED, PRUNED OR REMOVED IN THE PUBLIC RIGHT-OF-WAY. THIS INCLUDES ZONES BETWEEN THE SIDEWALK AND CURB, MEDIANS AND OTHER CITY PROPERTY. THIS PERMIT SHALL APPROVE THE LOCATION AND SPECIES TO BE PLANTED. FAILURE TO OBTAIN THIS PERMIT IS A VIOLATION OF THE CITY OF FORT COLLINS CODE SUBJECT TO CITATION (SECTION 27-31) AND MAY ALSO RESULT IN REPLACING OR RELOCATING TREES AND A HOLD ON CERTIFICATE OF OCCUPANCY.

MATERIAL LEGEND

SYMBOL	DESCRIPTION	QTY
	SHRUB AND PERENIAL PLANTING AREA (MODERATE HYDROZONE)	19,910 SF
	HOA IRRIGATED TURF (HIGH HYDROZONE)	59,655 SF
	DRYLAND SEED (LOW HYDROZONE)	3,387 SF
	PLAY SURFACING	1,521 SF
	ROCK MULCH (MODERATE HYDROZONE)	560 SF
	RIPARIAN SEED (LOW HYDROZONE)	2,205 SF

*RIPARIAN SEED AND PLANTINGS TO COMPLY WITH THE CITY OF FORT COLLINS LANDSCAPE DESIGN STANDARDS AND GUIDELINES FOR STORM WATER DETENTION FACILITIES

TREES	COMMON NAME
CS	NORTHERN CATALPA
GI	THORNLESS COMMON HONEYLOCUST
JB	BLUE POINT JUNIPER
JG	GRAY GLEAM JUNIPER
JS	SKYROCKET JUNIPER
MS	SPRING SNOW CRAB APPLE
PF	COLORADO SPRUCE
PIN	AUSTRIAN BLACK PINE
PIS	SOUTHWESTERN WHITE PINE
PA2	AUTUMN BLAZE PEAR
PC2	CHANTICLEER PEAR
QM	BURR OAK
QP	ENGLISH OAK
TG	GREENSPIRE LITTLELEAF LINDEN
ULA	ACCOLADE ELM

SHRUBS	COMMON NAME
AB	BAILEY COMPACT AMUR MAPLE
AAR	REGENT SERVICEBERRY
AA	SASKATOON SERVICEBERRY
BTN	DWARF REDLEAF JAPANESES BARBERRY
BTA	REDLEAF JAPANESE BARBERRY
BA	NANHO WHITE BUTTERFLY BUSH
PON	DWARF NINEBARK
PC	DWARF ALBERTA SPRUCE
PG	DWARF GLOBE GREEN SPRUCE
RD	DON JUAN CLIMBING ROSE
SM2	DAKOTA GOLDCHARM SPIREA
SVR	RENAISSANCE VANHOUTTE SPIREA
SGO	GOLDMOUND SPIREA
SM	MISS KIM LILAC

ORNAMENTAL GRASS	COMMON NAME
BGB	BLONDE AMBITION GRAMA GRASS
CAK	FEATHER REED GRASS
PV	SWITCH GRASS

PERENNIAL	COMMON NAME
AC	HYBRID YARROW
AC2	ANISE HYSSOP
AF	FRINGED WORMWOOD
HO	STELLA DE ORO DAYLILY
HR	HYBRID CORAL BELLS
RFO	BLACK-EYED SUSAN
SA2	AUTUMN JOY SEDUM

*SEE SHEET 4 OF 6 FOR COMPLETE PLANT SCHEDULE

WEST HARMONY ROAD

SOUTH TAFT HILL ROAD

FUTURE RIGHT TURN LANE WILL BE SHOWN ON FINAL PLANS

FUTURE B.O.C.

FUTURE WALK

STREET TREES PLACED TO ACCOMODATE FUTURE EXPANSION OF TAFT HILL ROAD. FINAL TREE LOCATION WILL BE COORDINATED WITH THE CITY.

6' TALL PRIVACY FENCE

30" TALL PICKET FENCE, TYP.

40'-0"

MONUMENT SIGN

SINGLE FAMILY DETACHED LOT

GREEN COURT

DETENTION / WATER QUALITY

PARK

PLAYGROUND

SITE DISTANCE EASEMENT

WATER QUALITY

SINGLE FAMILY DETACHED ENVELOPE, TYP.

SHRUB BED FOR PARKING SCREENING

SINGLE FAMILY ATTACHED (DUPLEX) UNIT. TYPICAL LANDSCAPE PLAN TO BE PROVIDED AT FINAL COMPLIANCE

2 - PA2
1 - PA2
4 - CS
QM - 3
PA2 - 1
1 - PA2
3 - PC2
JS - 3
SM - 1
PC2 - 1
3 - PIS
PON - 6
SGO - 3
PA2 - 1
BA - 3
BTA - 3
BGB - 6
GI - 2
3 - BA
3 - BTA
4 - JG
5 - BGB
BGB - 15
SM - 9
PC2 - 1
SGO - 2
PON - 6
JB - 3
2 - SGO
6 - PON
6 - BTA
11 - RFO
5 - BGB
7 - SM
JG - 3
6 - SVR
9 - CAK
1 - PA2
6 - SVR
11 - CAK
1 - PC2
4 - SVR
3 - SGO
4 - BGB
1 - PA2
5 - CAK
10 - SGO
8 - BGB
1 - PC2
7 - BTN
9 - BGB
1 - PC2
4 - GI
8 - SGO
7 - BGB
1 - PC2
7 - BTN
3 - ULA
9 - BGB
1 - PA2
5 - SGO
5 - BGB
3 - SGO
3 - PC2
1 - PF
PA2 - 3
1 - TG
1 - TG
1 - QP
1 - QP
QP - 1
1 - TG
1 - TG
1 - TG
1 - QP
QP - 1
TG - 1
1 - QP
TG - 1
QP - 1
QM - 1
QP - 1
TG - 1
1 - QP
1 - TG
AAR - 3
GI - 3
SM - 9
AB - 4
3 - GI
PIN - 4
BTA - 9
AB - 4
QM - 2
BTA - 9
AAR - 3
MS - 3
SM - 9
AAR - 3
ULA - 3
PA2 - 3
MS - 3
4 - PB2
3 - MS
4 - PB2
3 - CS
3 - QM
PIS - 3

LEGEND

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△	= STREET LIGHT SEE PHOTOMETRIC PLAN SHEET 5 OF 6

NORTH
0 15 30 60
SCALE: 1"=30'-0"
ORIGINAL SIZE 24X36

HARMONY COTTAGES

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REVISIONS

No.	DESCRIPTION	DATE

LANDSCAPE PLAN

SEAL:

ENTITLEMENT DRAWINGS NOT FOR CONSTRUCTION

PROJECT No.:	R15-067
DRAWN BY:	SC
REVIEWED BY:	RL

DRAWING NUMBER:

3 OF 6

Plotted By: Sam Coutts **Layout:** 3 OF 6 LANDSCAPE PLAN **Printed On:** 3/21/2016 2:23 PM **File Name:** LANDSCAPE NOTES.dwg

PLANT SCHEDULE

TREES	QTY	BOTANICAL NAME / COMMON NAME	CONT	CAL	SIZE
CS	7	CATALPA SPECIOSA / NORTHERN CATALPA	B & B	2"	
GI	15	GLEDITSIA TRIACANTHOS INERMIS / THORNLESS COMMON HONEYLOCUST	B & B	2"	
JB	3	JUNIPERUS CHINENSIS `BLUE POINT` / BLUE POINT JUNIPER 6` HT.	B & B		
JG	7	JUNIPERUS SCOPULORUM `GRAY GLEAM` / GRAY GLEAM JUNIPER	-		6` HT.
JS	3	JUNIPERUS SCOPULORUM `SKYROCKET` / SKYROCKET JUNIPER	-		6` HT.
MS	3	MALUS X `SPRING SNOW` / SPRING SNOW CRAB APPLE 1.5	B & B		
PF	1	PICEA PUNGENS `FAT ALBERT` / COLORADO SPRUCE 6` HT.	B & B		
PIN	8	PINUS NIGRA / AUSTRIAN BLACK PINE	-		6` HT.
PIS	10	PINUS STROBIFORMIS / SOUTHWESTERN WHITE PINE	-		6` HT
PA2	15	PYRUS CALLERYANA `AUTUMN BLAZE` / AUTUMN BLAZE PEAR	B & B	1.5"	
PC2	12	PYRUS CALLERYANA `CHANTICLEER` / CHANTICLEER PEAR	B & B	1.5"	
QM	9	QUERCUS MACROCARPA / BURR OAK	B & B	2"	
QP	10	QUERCUS ROBUR `PYRAMICH` TM / ENGLISH OAK	15 GAL		
TG	13	TILIA CORDATA `GREENSPIRE` / GREENSPIRE LITTLELEAF LINDEN	B & B	2"	
ULA	5	ULMUS X `ACCOLADE` / ACCOLADE ELM	B & B	2"	

SHRUBS	QTY	BOTANICAL NAME / COMMON NAME	SIZE
AB	8	ACER GINNALA `BAILEY COMPACT` / BAILEY COMPACT AMUR MAPLE	5 GAL
AAR	9	AMELANCHIER ALNIFOLIA `REGENT` / REGENT SERVICEBERRY MULTI-STEM	5 GAL
AA	1	AMELANCHIER ALNIFOLIA `REGENT` / SASKATOON SERVICEBERRY SINGLE STEM	5 GAL
BTN	14	BERBERIS THUNBERGII `ATROPURPUREA NANA` / DWARF REDLEAF JAPANSES BARBERRY	5 GAL
BTA	30	BERBERIS THUNBERGII `ATROPURPUREA` / REDLEAF JAPANESE BARBERRY	5 GAL
BA	6	BUDDLEJA DAVIDII `NANHO ALBA` / NANHO WHITE BUTTERFLY BUSH	5 GAL
PON	18	PHYSOCARPUS OPULIFOLIUS `NANUS` / DWARF NINEBARK	5 GAL
PC	3	PICEA GLAUCA `CONICA` / DWARF ALBERTA SPRUCE	5 GAL
PG	9	PICEA PUNGENS `GLOBE` / DWARF GLOBE GREEN SPRUCE	5 GAL
RD	3	ROSA CLIMBING ROSES `DON JUAN` / DON JUAN CLIMBING ROSE	5 GAL
SM2	12	SPIRAEA JAPONICA `MERTYANN` TM / DAKOTA GOLDCHARM SPIREA	5 GAL
SVR	16	SPIRAEA X VANHOUTTEI `RENAISSANCE` / RENAISSANCE VANHOUTTE SPIREA	5 GAL
SGO	36	SPIRAEA X `GOLDMOUND` / GOLDMOUND SPIREA	5 GAL
SM	38	SYRINGA PATULA `MISS KIM` / MISS KIM LILAC	5 GAL

ORNAMENTAL GRASS	QTY	BOTANICAL NAME / COMMON NAME	SIZE
BGB	90	BOUTELOUA GRACILIS `BLONDE AMBITION` / BLONDE AMBITION GRAMA GRASS	1 GAL
CAK	35	CALAMAGROSTIS X ACUTIFLORA `KARL FOERSTER` / FEATHER REED GRASS	1 GAL
PV	8	PANICUM VIRGATUM / SWITCH GRASS	1 GAL

PERENNIAL	QTY	BOTANICAL NAME / COMMON NAME	SIZE
AC	9	ACHILLEA X `CORONATION GOLD` / HYBRID YARROW	1 GAL
AC2	12	AGASTACHE X `CORANADO RED` / ANISE HYSSOP	1 GAL
AF	10	ARTEMISIA FRIGIDA / FRINGED WORMWOOD	1 GAL
HO	5	HEMEROCALLIS X `STELLA DE ORO` / STELLA DE ORO DAYLILY	1 GAL
HR	11	HEUCHERA X `CHOCOLATE RUFFLES` TM / HYBRID CORAL BELLS	1 GAL
RFO	18	RUDBECKIA FULGIDA `GOLDSTURM` / BLACK-EYED SUSAN (YELLOW FLOWER, MID-SUMMER)	1 GAL
SA2	13	SEDUM X `AUTUMN JOY` / AUTUMN JOY SEDUM	1 GAL

CONCEPTUAL WATER QUALITY PLANTINGS
AMELANCHIER ALNIFOLIA `REGENT` / SASKATOON SERVICEBERRY
CHRYSOTHAMNUS NAUSEOSUS / DWARF BLUE RABBITBRUSH
CORNUS SERICEA `ARTIC FIRE` / ARTIC FIRE DOGWOOD
PANICUM VIRGATUM / SWITCH GRASS
PRUNUS BESSEYI / SAND CHERRY
PRUNUS TRILOBA / FLOWERING PLUM
RHUS TRILOBATA / SKUNKBUSH SUMAC
RIBES ALPINUM / ALPINE CURRANT
SYMPHORICARPOS ALBUS / COMMON WHITE SNOWBERRY

SEED MIXES

DRYLAND NATIVE SEED			
SPECIES	PREFERRED VARIETIES	SEEDED RATE LBS./ACRE (DRILLED)	PLS SEEDED / ACRE
LEYMUS CINEREUS / GREAT BASIN WILDRYE	MANGAR	3	285000
NASSELLA VIRIDULA / GREEN NEEDLE GRASS	LODROM	2	362000
ACHNATHERUM HYMENOIDES / INDIAN RICEGRASS	PALOMA, NEZPAR	1	188000
ELYMUS TRACHYCAULUS / SLENDER WHEATGRASS	PRIMAR, REVENUE	2	320000
ELYMUS LANCEOLATUS / THICKSPIKE WHEATGRASS	CRITANA	3	580500
PASCOPYRUM SMITHII WESTERN WHEATGRASS	ARRIBA, BARTON	4	504000
TOTAL: ~51 SEEDS / SF		15	2239500

WATER QUALITY NATIVE SEED			
SPECIES	PREFERRED VARIETIES	SEEDED RATE LBS./ACRE (DRILLED)	PLS SEEDED / ACRE
LEYMUS CINEREUS / GREAT BASIN WILDRYE	MANGAR	3	285000
NASSELLA VIRIDULA / GREEN NEEDLE GRASS	LODROM	2	362000
ACHNATHERUM HYMENOIDES / INDIAN RICEGRASS	PALOMA, NEZPAR	1	188000
ELYMUS TRACHYCAULUS / SLENDER WHEATGRASS	PRIMAR, REVENUE	2	320000
ELYMUS LANCEOLATUS / THICKSPIKE WHEATGRASS	CRITANA	3	580500
PASCOPYRUM SMITHII WESTERN WHEATGRASS	ARRIBA, BARTON	4	504000
SCHIZACHYRIUM SCOPARIUM / LITTLE BLUESTEM	BLAZE	3	285000
TOTAL: ~58 SEEDS / SF		18	2524500

PLACEMENT NOTES:
SET SHRUB PLUMB, SPACE PLANTS, AND PLACE FOR BEST EFFECT
SET TOP OF ROOTBALL 1-2" HIGHER THAN ADJACENT GRADE
4" HIGH WATER SAUCER
BACKFILL WITH BLEND OF EXISTING SOIL AND A MAX. 20% (BY VOL.) ORGANIC MATERIAL. WATER THOROUGHLY TO SETTLE AND REMOVE AIR POCKETS
SCARIFY SIDES AND USE 1:1 SLOPE
2 X BALL DIA.

PRUNING NOTES:
DO NOT HEAVILY PRUNE SHRUB AT PLANTING. PRUNE ONLY DEAD OR BROKEN BRANCHES. IF FORM IS COMPROMISED BY PRUNING, REPLACE SHRUB
4" DEEP MULCH RING 3' IN DIA. PLACE ON GEOTEXTILE WEED BARRIER, 1" OF MULCH ON TOP OF ROOT BALL
REMOVE CONTAINER (INCLUDING FIBER CONTAINERS), BASKETS, WIRE, ETC. FROM THE ROOT BALL. BREAK UP ENCIRCLING ROOTS WITH SHARP KNIFE OR SPADE. SPLIT BOTTOM OF ROOT BALL. PLACE ON UNDISTURBED SOIL TO PREVENT SETTLEMENT. PRIOR TO MULCHING, LIGHTLY TAMP SOIL AROUND THE ROOT BALL IN 6" LIFTS TO BRACE SHRUB. DO NOT OVER COMPACT. WHEN THE PLANTING HOLE HAS BEEN BACKFILLED, POUR WATER AROUND THE ROOT BALL TO SETTLE THE SOIL.

2 SHRUB PLANTING DETAIL
SCALE: NTS OP-HA-04

GENERAL LANDSCAPE NOTES

1. PLANT QUALITY: ALL PLANT MATERIAL SHALL BE A-GRADE OR NO. 1 GRADE - FREE OF ANY DEFECTS, OF NORMAL HEALTH, HEIGHT, LEAF DENSITY AND SPREAD APPROPRIATE TO THE SPECIES AS DEFINED BY THE AMERICAN ASSOCIATION OF NURSERYMEN (AAN) STANDARDS. ALL TREES SHALL BE BALL AND BURLAP OR EQUIVALENT, UPRIGHT JUNIPERS MAY BE IN CONTAINER, PLANTS MAY BE DOWNSIZED TO THE FOLLOWING SIZES.
   -CANOPY TREES (AS STREET TREE) = 1.25" CAL. -CANOPY TREES = 1.0" CAL.
   -ORNAMENTAL TREES = 1.0" CAL. -EVERGREEN TREES = 4.0' HT. -SHRUBS = 1 GALLON CONT.
2. IRRIGATION: ALL LANDSCAPE AREAS WITHIN THE SITE INCLUDING TURF, SEED, SHRUB BEDS AND TREE AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC IRRIGATION SYSTEM. THE IRRIGATION PLAN MUST BE REVIEWED AND APPROVED BY THE CITY OF FORT COLLINS WATER UTILITIES DEPARTMENT PRIOR TO THE ISSUANCE OF A BUILDING PERMIT. ALL TURF AND SEED AREAS SHALL BE IRRIGATED WITH AN AUTOMATIC POP-UP IRRIGATION SYSTEM, ALL SHRUB BEDS AND TREES SHALL BE IRRIGATED WITH AN AUTOMATIC DRIP (TRICKLE) IRRIGATION SYSTEM, OR WITH AN ACCEPTABLE ALTERNATIVE APPROVED BY THE CITY WITH THE IRRIGATION PLANS. THE IRRIGATION SYSTEM SHALL BE ADJUSTED TO MEET THE WATER REQUIREMENTS OF THE INDIVIDUAL PLANT MATERIAL.
3. TOPSOIL: TO THE MAXIMUM EXTENT FEASIBLE, TOPSOIL THAT IS REMOVED DURING CONSTRUCTION ACTIVITY SHALL BE CONSERVED FOR LATER USE ON AREAS REQUIRING REVEGETATION AND LANDSCAPING,
4. SOIL AMENDMENTS: SOIL AMENDMENTS SHALL BE PROVIDED AND DOCUMENTED IN ACCORDANCE WITH CITY CODE SECTION 12-132, THE SOIL IN ALL LANDSCAPE AREAS, INCLUDING PARKWAYS AND MEDIANS, SHALL BE THOUGHLY 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, PRIOR TO THE ISSUANCE OF ANY CERTIFICATE OF OCCUPANCY, A WRITTEN CERTIFICATION MUST BE SUBMITTED TO THE CITY THAT ALL PLANTED AREAS, OR AREAS TO BE PLANTED, HAVE BEEN THOROUGHLY LOOSENED AND THE SOIL AMENDED, CONSISTENT WITH THE REQUIREMENTS SET FORTH IN SECTION 12-132.
5. INSTALLATION AND GUARANTEE: ALL LANDSCAPING SHALL BE INSTALLED ACCORDING TO SOUND HORTICULTURAL PRACTICES IN A MANNER DESIGNED TO ENCOURAGE QUICK ESTABLISHMENT AND HEALTHY GROWTH. ALL LANDSCAPING FOR EACH PHASE MUST BE EITHER INSTALLED OR THE INSTALLATION MUST BE SECURED WITH AN IRREVOCABLE LETTER OF CREDIT, PERFORMANCE BOND, OR ESCROW ACCOUNT FOR 125% OF THE VALUATION OF THE MATERIALS AND LABOR PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR ANY BUILDING IN SUCH PHASE.
6. MAINTENANCE: TREES AND VEGETATION, IRRIGATION SYSTEMS, FENCES, WALLS AND OTHER LANDSCAPE ELEMENTS WITH THE FINAL PLANS SHALL BE CONSIDERED AS ELEMENTS OF THE PROJECT IN THE SAME MANNER AS PARKING, BUILDING MATERIALS AND OTHER SITE DETAILS, THE APPLICANT, LANDOWNER OR SUCCESSORS IN INTEREST SHALL BE JOINTLY AND SEVERALLY RESPONSIBLE FOR THE REGULAR MAINTENANCE OF ALL LANDSCAPING ELEMENTS IN GOOD CONDITION, ALL LANDSCAPING SHALL BE MAINTAINED FREE FROM DISEASE, PESTS, WEEDS AND LITTER, AND ALL LANDSCAPE STRUCTURES SUCH AS FENCES AND WALLS SHALL BE REPAIRED AND REPLACED PERIODICALLY TO MAINTAIN A STRUCTURALLY SOUND CONDITION.
7. REPLACEMENT: ANY LANDSCAPE ELEMENT THAT DIES, OR IS OTHERWISE REMOVED, SHALL BE PROMPTLY REPLACED IN ACCORDANCE WITH THE REQUIREMENTS OF THESE PLANS.
8. THE FOLLOWING SEPARATIONS SHALL BE PROVIDED BETWEEN TREES/SHRUBS AND UTILITIES:
   40 FEET BETWEEN CANOPY TREES AND STREET LIGHTS
   15 FEET BETWEEN ORNAMENTAL TREES AND STREETLIGHTS
   10 FEET BETWEEN TREES AND PUBLIC WATER, SANITARY AND STORM SEWER MAIN LINES
   6 FEET BETWEEN TREES AND PUBLIC WATER, SANITARY AND STORM SEWER SERVICE LINES,
   4 FEET BETWEEN SHRUBS AND PUBLIC WATER AND SANITARY AND STORM SEWER LINES
   4 FEET BETWEEN TREES AND GAS LINES
9. ALL STREET TREES SHALL BE PLACED A MINIMUM EIGHT (8) FEET AWAY FROM THE EDGES OF DRIVEWAYS AND ALLEYS PER LUC 3.2.1(D)(2)(a).
10. 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 EASEMENTS WITH THE EXCEPTION OF DECIDUOUS TREES PROVIDED THAT THE LOWEST BRANCH IS AT LEAST 6' FROM GRADE. ANY FENCES WITHIN THE SIGHT DISTANCE TRIANGLE OR EASEMENT MUST BE NOT MORE THAN 30" IN HEIGHT AND OF AN OPEN DESIGN.
11. COMMON OPEN SPACE AREAS AND LANDSCAPING WITHIN RIGHT OF WAYS, STREET MEDIANS, AND TRAFFIC CIRCLES ADJACENT TO COMMON OPEN SPACE AREAS ARE REQUIRED TO BE MAINTAINED BY A PROPERTY OWNERS ASSOCIATION. THE PROPERTY OWNERS ASSOCIATION IS RESPONSIBLE FOR SNOW REMOVAL ON ALL ADJACENT STREET AND PRIVATE DRIVE SIDEWALKS AND SIDEWALKS IN COMMON OPEN SPACE AREAS.
12. THE FINAL LANDSCAPE PLAN SHALL BE COORDINATED WITH ALL OTHER FINAL PLAN ELEMENTS SO THAT THE PROPOSED GRADING, STORM DRAINAGE, AND OTHER DEVELOPMENT IMPROVEMENTS DO NOT CONFLICT WITH NOR PRECLUDE INSTALLATION AND MAINTENANCE OF LANDSCAPE ELEMENTS ON THIS PLAN.
13. LANDSCAPING WITHIN RESIDENTIAL LOTS ARE REQUIRED TO BE MAINTAINED BY THE PROPERTY OWNER OF THE RESIDENTIAL LOT, AND THE PROPERTY OWNER IS RESPONSIBLE FOR SNOW REMOVAL ON THE RESIDENTIAL LOT.
14. THE DEVELOPER SHALL ENSURE THAT THE FINAL LANDSCAPE PLAN IS COORDINATED WITH ALL OTHER FINAL PLAN ELEMENTS SO THAT THE PROPOSED GRADING, STORM DRAINAGE, AND OTHER DEVELOPMENT IMPROVEMENTS DO NOT CONFLICT WITH NOR PRECLUDE INSTALLATION AND MAINTENANCE OF LANDSCAPE ELEMENTS ON THIS PLAN.
15. MINOR CHANGES IN SPECIES AND PLANT LOCATIONS MAY BE MADE DURING CONSTRUCTION -- AS REQUIRED BY SITE CONDITIONS OR PLANT AVAILABILITY. OVERALL QUANTITY, QUALITY, AND DESIGN CONCEPT MUST BE CONSISTENT WITH THE APPROVED PLANS. IN THE EVENT OF CONFLICT WITH THE QUANTITIES INCLUDED IN THE PLANT LIST, SPECIES AND QUANTITIES ILLUSTRATED SHALL BE PROVIDED. ALL CHANGES OF PLANT SPECIES AND LOCATION MUST HAVE WRITTEN APPROVAL BY THE CITY PRIOR TO INSTALLATION.
16. ALL PLANTING BEDS SHALL BE MULCHED TO A MINIMUM DEPTH OF THREE INCHES.
17. IRRIGATED TURF SHALL BE TEXAS BLUEGRASS/KENTUCKY BLUEGRASS HYBRID REVEILLE OR APPROVED EQUAL.
18. EDGING BETWEEN GRASS AND SHRUB BEDS SHALL BE 18" X 4" ROLLED TOP STEEL SET LEVEL WITH TOP OF SOD OR APPROVED EQUAL.
19. ATTACHED SINGLE FAMILY AND COMMON OPEN SPACE DETAILED LANDSCAPE PLANS WILL BE PROVIDED AT FINAL PLAN LEVEL.

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

PREVAILING WIND 120°
* GUYING PLAN
* PLANT SO THAT TOP OF ROOT BALL IS 2" HIGHER THAN FINISHED GRADE

GROMMETED NYLON STRAPS
GALVANIZED WIRE TWIST TO TIGHTEN
6' STEEL T-POSTS (SEE SCHEDULE) DRIVEN (MIN. 24") FIRMLY INTO UNDISTURBED SOIL OUTSIDE ROOTBALL.
SCARIFY SIDES OF PLANTING HOLE LEAVING 1:1 SLOPE
REMOVE ALL WIRE, TWINE BURLAP, MESH AND CONTAINERS FROM ENTIRE ROOT BALL AND TRUNK
4" DEEP MULCH RING PLACED A MINIMUM OF 6' IN DIAMETER, DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK
ROUND-TOPPED SOIL BERM 4" HIGH X 8" WIDE ABOVE ROOT BALL SURFACE SHALL BE CONSTRUCTED AROUND THE ROOT BALL. BERM SHALL BEGIN AT ROOT BALL PERIPHERY. (OMIT IN TURF AREAS)
BACKFILL WITH BLEND OF EXISTING SOIL AND A MAXIMUM 20% (BY VOL.) ORGANIC MATERIAL TAMP SOIL AROUND ROOT BALL W/ FOOT PRESSURE SO THAT IT DOESN'T SHIFT. WATER THOROUGHLY TO SETTLE AND REMOVE AIR POCKETS. PRIOR TO MULCHING, LIGHTLY TAMP SOIL AROUND THE ROOT BALL IN 6" LIFTS TO BRACE TREE. DO NOT OVER COMPACT. WHEN THE PLANTING HOLE HAS BEEN BACKFILLED, POUR WATER AROUND THE ROOT BALL TO SETTLE THE SOIL.
3 X BALL DIA.

3 CONIFER TREE PLANTING DETAIL - STEEL POSTS
SCALE: NTS L-PL-13

STREET TREE NOTES

1. A PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY TREES OR SHRUBS AS NOTED ON THIS PLAN ARE PLANTED, PRUNED OR REMOVED IN THE PUBLIC RIGHT-OF-WAY, THIS INCLUDES ZONES BETWEEN THE SIDEWALK AND CURB, MEDIANS AND OTHER CITY PROPERTY. 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.
2. CONTACT THE CITY FORESTER TO INSPECT ALL STREET TREE PLANTINGS AT THE COMPLETION OF EACH PHASE OF THE DEVELOPMENT. ALL MUST BE INSTALLED AS SHOWN ON THE LANDSCAPE PLAN. APPROVAL OF STREET TREE PLANTING IS REQUIRED BEFORE FINAL APPROVAL OF EACH PHASE.
3. STREET LANDSCAPING, INCLUDING STREET TREES, SHALL BE SELECTED IN ACCORDANCE WITH ALL CITY CODES AND POLICIES. ALL TREE PRUNING AND REMOVAL WORKS SHALL BE PERFORMED BY A CITY OF FORT COLLINS LICENSED ARBORS WHERE REQUIRED BY CODE.STREET TREES SHALL BE SUPPLIED AND PLANTED BY THE DEVELOPER USING A QUALIFIED LANDSCAPE CONTRACTOR.
4. 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, WITH AN APPROVED SPECIES AND OF ACCEPTABLE CONDITION PRIOR TO ACCEPTANCE.
5. SUBJECT TO WRITTEN APPROVAL BY THE CITY – STREET TREE LOCATIONS MAY BE ADJUSTED TO ACCOMMODATE DRIVEWAY LOCATIONS, UTILITY SEPARATIONS BETWEEN TREES, STREET SIGNS AND STREET LIGHTS. STREET TREES TO BE CENTERED IN THE MIDDLE OF THE LOT TO THE EXTENT FEASIBLE. QUANTITIES SHOWN ON PLAN MUST BE INSTALLED UNLESS A REDUCTION IS APPROVED BY THE CITY TO MEET SEPARATION STANDARDS.

A PERMIT MUST BE OBTAINED FROM THE CITY FORESTER BEFORE ANY TREES OR SHRUBS AS NOTED ON THIS PLAN ARE PLANTED, PRUNED OR REMOVED IN THE PUBLIC RIGHT-OF-WAY. THIS INCLUDES ZONES BETWEEN THE SIDEWALK AND CURB, MEDIANS AND OTHER CITY PROPERTY. THIS PERMIT SHALL APPROVE THE LOCATION AND SPECIES TO BE PLANTED. FAILURE TO OBTAIN THIS PERMIT IS A VIOLATION OF THE CITY OF FORT COLLINS CODE SUBJECT TO CITATION (SECTION 27-31) AND MAY ALSO RESULT IN REPLACING OR RELOCATING TREES AND A HOLD ON CERTIFICATE OF OCCUPANCY.

WATER USE TABLE

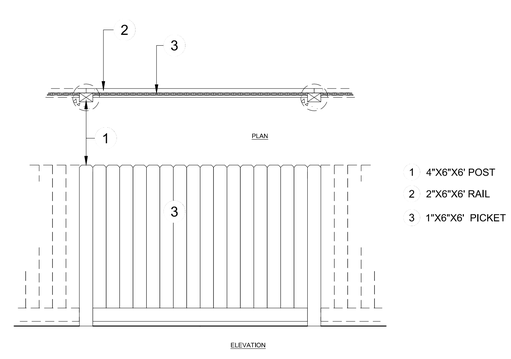
HYDROZONE	AREA (SF)	WATER NEEDED (GALLONS/SF)	ANNUAL WATER USE (GALLONS)
HIGH	51668.00	18	930,024.00
MODERATE	20524.00	10	205,240.00
LOW	24106.00	3	72318.00
VERY LOW	0.00	0	0.00
TOTAL	96,298	12.5401	1,207,582

ANNUAL WATER USE NOT TO EXCEED 15 GAL./SF. AVERAGE OVER THE SITE

LEGEND

SYMBOL	DESCRIPTION	QTY
	SHRUB AND PERENIAL PLANTING AREA (MODERATE HYDROZONE)	19,910 SF
	HOA IRRIGATED TURF (HIGH HYDROZONE)	59,655 SF
	DRYLAND SEED (LOW HYDROZONE)	3,387 SF
	PLAY SURFACING	1,521 SF
	ROCK MULCH (MODERATE HYDROZONE)	560 SF
	RIPARIAN SEED (LOW HYDROZONE)	2,205 SF
	PRIVATE IRRIGATED TURF (HIGH HYDROZONE)	10,581 SF

*RIPARIAN SEED AND PLANTINGS TO COMPLY WITH THE CITY OF FORT COLLINS LANDSCAPE DESIGN STANDARDS AND GUIDELINES FOR STORM WATER DETENTION FACILITIES



1 4"X6"X6' POST
2 2"X6"X6' RAIL
3 1"X6"X6' PICKET

4 TYPICAL 6` PRIVACY FENCE
NTS OP-HA-01

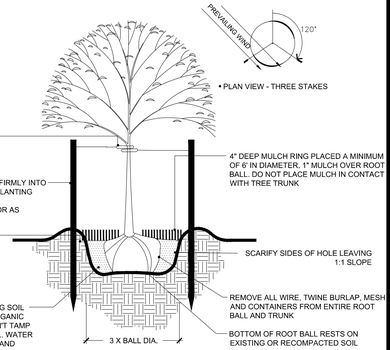
REQUIRED LANDSCAPE

REQUIRED LANDSCAPE			
	PROVIDED	REQUIRED	DIFFERENCE
TAFT STREET TREES	8	8	0
TAFT BUFFER TREES*	7	0	7
HARMONY STREET TREES	18	17	1
HARMONY BUFFER TREES*	25	0	25
FULL TREE STOCKING**	29	29	0
ADDITIONAL TREES	10	0	10
TOTAL	**97**	**54**	43

*ARTERIAL STREETS SHALL HAVE AN UPGRADED QUANTITY PER THE SETBACK MODIFICATION REQUEST.
**FULL TREE STOCKING CALCULATED BY 1 CANOPY TREE / 40 LF AND 1 EVERGREEN/ORNAMENTAL TREE / 30 LF OF HIGH VISIBILITY BUILDING FACADE

SPECIES DIVERSITY

TREE SPECIES DIVERSITY		
	# OF TREES	% OF TOTAL
CATALPA SPECIOSA	4	3.74
GLEDITSIA TRIACANTHOS INERMIS	12	11.21
GYMNOCLADUS DIOICA 'EPRESSO'	3	2.80
JUNIPERUS CHINENSIS 'BLUE POINT'	7	6.54
JUNIPERUS SCOPULORUM 'GRAY GLEAM'	3	2.80
JUNIPERUS SCOPULORUM 'SKYROCKET'	3	2.80
MALUS X 'SPRING SNOW'	1	0.93
PICEA PUNGENS 'FAT ALBERT'	6	5.61
PINUS FLEXILIS	4	3.74
PINUS PONDEROSA	12	11.21
PYRUS CALLERYANA 'AUTUMN BLAZE'	12	11.21
PYRUS CALLERYANA 'CHANTICLEER'	6	5.61
QUERUCS MACROCARPA	10	9.35
QUERCUS ROBUS 'PYRAMICH'	10	9.35
TILIA CORDATA 'GREENSPIRE'	5	4.67
ULMUS X 'FRONTIER'	9	8.41
TOTAL	**107**	**100.00**

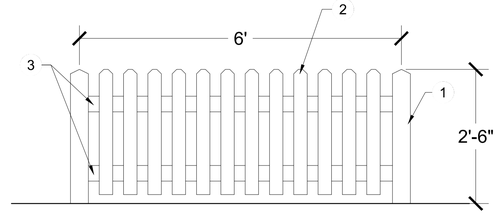


NOTES:
SET SO THAT TOP OF ROOT 1-2" HIGHER THAN FINISHED GRADE
MARK NORTH SIDE OF TREE IN NURSERY AND ROTATE TREE TO FACE NORTH AT THE SITE WHENEVER POSSIBLE
2 STRAND 12 GAUGE GAL. WIRE (TWIST TO TIGHTEN) & GROMMETED NYLON STRAPS
STEEL T-POSTS DRIVEN (MIN. 24") FIRMLY INTO UNDISTURBED SOIL OUTSIDE OF PLANTING HOLE BEFORE BACKFILLING
STAKE ABOVE FIRST BRANCHES OR AS NECESSARY FOR FIRM SUPPORT
ROUND TOPPED SOIL BERM 4" HIGH X 8" WIDE ABOVE ROOT BALL SURFACE SHALL BE CONSTRUCTED AROUND THE ROOT BALL. BERM SHALL BEGIN AT ROOT BALL PERIPHERY. (OMIT IN TURF AREAS)
BACKFILL WITH BLEND OF EXISTING SOIL AND A MAXIMUM 20% (BY VOL.) ORGANIC MATERIAL PLACE FIRMLY BUT DON'T TAMP OR COMPACT AROUND ROOT BALL. WATER WATER THOROUGHLY TO SETTLE AND REMOVE AIR POCKETS, PRIOR TO MULCHING, LIGHTLY TAMP SOIL AROUND THE ROOT BALL IN 6" LIFTS TO BRACE TREE. DO NOT OVER COMPACT. WHEN THE PLANTING HOLE HAS BEEN BACKFILLED, POUR WATER AROUND THE ROOT BALL TO SETTLE THE SOIL.

4" DEEP MULCH RING PLACED A MINIMUM OF 6' IN DIAMETER, 1" MULCH OVER ROOT BALL. DO NOT PLACE MULCH IN CONTACT WITH TREE TRUNK
SCARIFY SIDES OF HOLE LEAVING 1:1 SLOPE
REMOVE ALL WIRE, TWINE BURLAP, MESH AND CONTAINERS FROM ENTIRE ROOT BALL AND TRUNK
BOTTOM OF ROOT BALL RESTS ON EXISTING OR RECOMPACTED SOIL
3 X BALL DIA

1 TREE PLANTING DETAIL - STEEL POSTS
SCALE: NTS L-PL-12

1 4" X 4" X 30" POST W/ CAP
2 7/8" X 3" X 28" VINYL PICKET W/ DOG EAR CAP
3 2" X 4" VINYL TOP AND BOTTOM RAIL



NOTE: FENCE MATERIAL TO BE WHITE VINYL OR COMPOSITE MATERIAL

5 TYPICAL 30" PICKET FENCE
NTS OP-HA-03

HARMONY COTTAGES

PROJECT DEVELOPMENT PLAN

FORT COLLINS, CO

PREPARED BY:

RIPLEY DESIGN INC.
■ land planning ■ landscape architecture ■
■ urban design ■ entitlement ■
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ORIGINAL SIZE 24X36

ISSUED

No.	DESCRIPTION	DATE
01	PDP	12/16/15
02	PDP REVISION	01/20/16
03	PDP REVISION	03/21/16

REVISIONS

No.	DESCRIPTION	DATE

LANDSCAPE NOTES

SEAL:

ENTITLEMENT DRAWINGS NOT FOR CONSTRUCTION

PROJECT No.:	R15-067
DRAWN BY:	SC
REVIEWED BY:	RL

DRAWING NUMBER:

4 OF 6

Plotted By: Sam Coutts **Layout:** 4 OF 6 LANDSCAPE NOTES **Printed On:** 3/21/2016 2:23 PM **File Name:** LANDSCAPE NOTES.dwg

Schedule

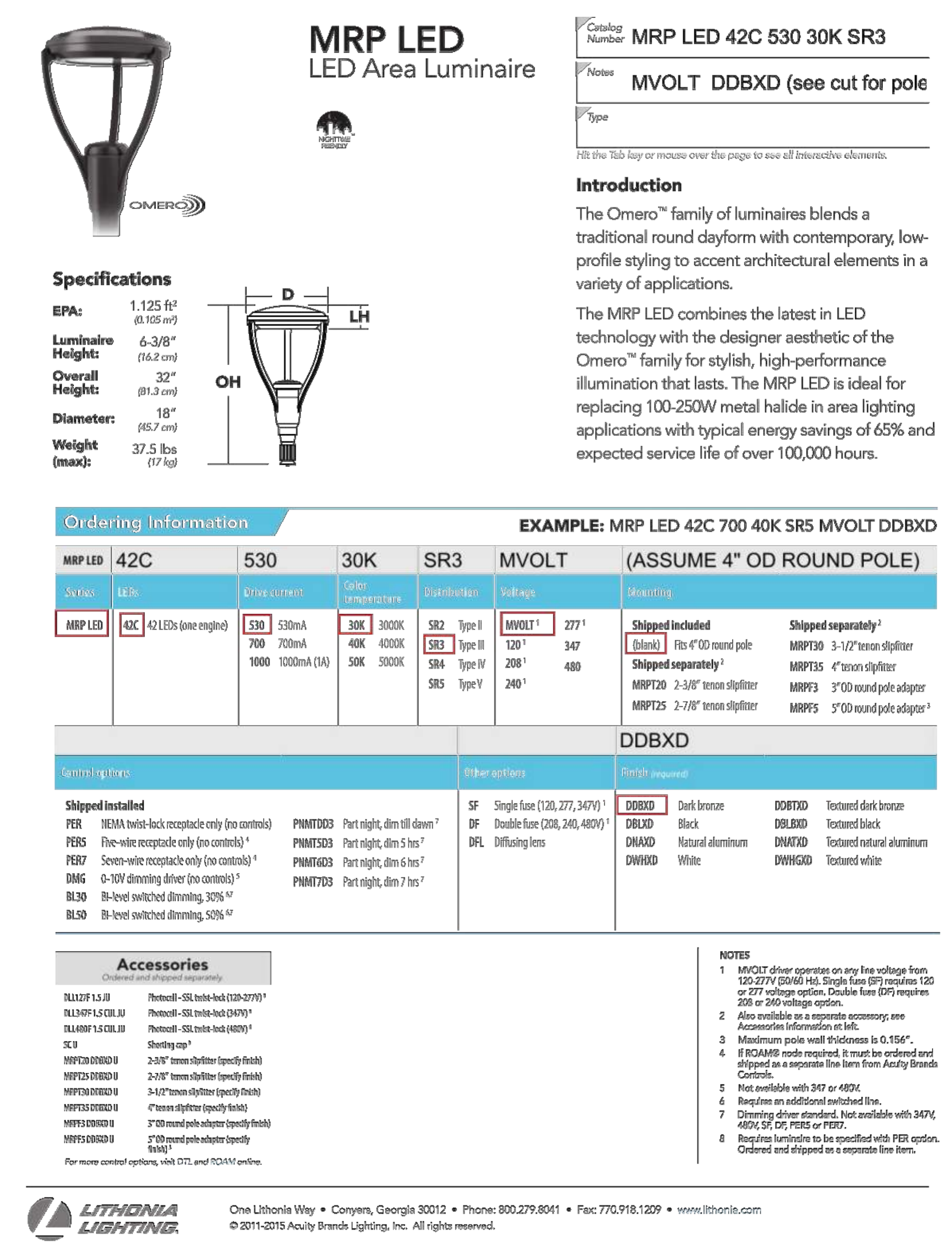
Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Number Lamps	Filename	Lumens per Lamp	LLF	Wattage
	B	4	Lithonia Lighting	MRP LED 42C 530 30K SR3 MVOLT	MRP POST TOP LIGHT 42 LEDs 530 mA DRIVE CURRENT 30K COLOR TEMP TYPE 3 DISTRIBUTION	HLM LIGHT ENGINE	1	MRP_LED_42C_530_30K_SR3_MVOLT.ies	5435.504	0.85	75

Luminaire Locations

		Location						Aim		
No.	Label	X	Y	Z	MH	Orientation	Tilt	X	Y	Z
3	B	3108301.00	1436598.00	20.00	20.00	357.88	0.00	3108301.00	1436598.00	0.00
4	B	3108378.00	1436659.00	20.00	20.00	135.00	0.00	3108378.00	1436659.00	0.00
6	B	3108154.00	1436665.00	20.00	20.00	187.94	0.00	3108154.00	1436665.00	0.00
9	B	3107982.00	1436663.00	20.00	20.00	112.61	0.00	3107982.00	1436663.00	0.00

Statistics

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Calc Zone #1	+	0.3 fc	1.8 fc	0.0 fc	N/A	N/A
Stat Zone # 1	×	0.6 fc	1.8 fc	0.0 fc	N/A	N/A



NORTH
0 15 30 60
SCALE: 1"=30'-0"
ORIGINAL SIZE 24X36

Plotted By: Sam Coutts Layout: 5 OF 6 PHOTOMETRIC PLAN Printed On: 3/21/2016 2:24 PM File Name: 5 OF 5 PHOTOMETRIC PLAN.dwg

HARMONY COTTAGES

PROJECT DEVELOPMENT PLAN

FORT COLLINS, CO

PREPARED BY:

RIPLEY DESIGN INC.

■ land planning ■ landscape architecture ■
■ urban design ■ entitlement ■

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ISSUED

No.	DESCRIPTION	DATE
01	PDP	12/16/15
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REVISIONS

No.	DESCRIPTION	DATE

PHOTOMETRIC PLAN

SEAL:

ENTITLEMENT DRAWINGS NOT FOR CONSTRUCTION

PROJECT No.: R15-067
DRAWN BY: SC
REVIEWED BY: RL

DRAWING NUMBER:

5 OF 6

1 Front Elevation
3/16" = 1'-0"

2 Rear Elevation
3/16" = 1'-0"

3 Left Side Elevation
3/16" = 1'-0"

4 Right Side Elevation
3/16" = 1'-0"

MATERIALS LEGEND

W-BB	BOARD & BATTEN SIDING IN VARYING COLORS
W-LS	LAP SIDING IN VARYING COLORS
R-CS	COMPOSITION SHINGLES IN GRAY COLOR

KEYNOTES

1	FASCIA & TRIM IN WHITE COLOR
2	TRADITIONAL STYLE WINDOWS IN WHITE COLOR
3	TRADITIONAL COLUMNS OF VARYING STYLE IN WHITE COLOR
4	TRADITIONAL RAILINGS OF VARYING STYLE IN WHITE COLOR
5	TRADITIONAL PICKET FENCES OF VARYING STYLE IN WHITE COLOR
6	POTOENTIAL SOLAR PHOTO-VOLTAIC SYSTEM ARRAYS - TYPICAL

HARMONY COTTAGES

PROJECT DEVELOPMENT PLAN

Architect
Greg D. Fisher
3115 Clyde St. | Fort Collins, CO 80524 | 90.484.8433

DRAWN BY: GDF
CURRENT ISSUE: 12/16/15

PDP: 12/16/15
HEARING: 3/21/15

Building Elevations

6 of 6

3/21/2016 1:27:47 PM

RIPLEY DESIGN INC.

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Habitat for Humanity Harmony Cottages Modification Request

DIVISION 3.5.2(E)(1) RESIDENTIAL SETBACKS

Setback from Arterial Streets. The minimum setback of every residential building and of every detached accessory building that is incidental to the residential building shall be thirty (30) feet from any arterial street right-of-way, except for those buildings regulated by Section 3.8.30 of this Code, which buildings must comply with the setback regulations set forth in Section 3.8.30.

Reason for Request

Habitat for Humanity is seeking to fill a need for affordable housing in Fort Collins. As stated later in this document, Habitat seeks to build single family attached and detached houses for people whose income is between 35% and 60% of the Fort Collins average median income (AMI).

With the dramatic increase in home and land prices in Fort Collins, it is crucial the City has attainable housing for it's citizens who fall in the modest income category. For a community to be healthy, housing needs to be available for the certified nursing assistant, the local barista, the single parent and a myriad of other professionals who are crucial to our economy but can not afford to enter the costly and competitive Fort Collins housing market. In order to bring the price of these needed homes to a level these citizen can afford, the density of Harmony Cottages needs to be at a certain level to cover the cost of development infrastructure. In order to get to that density, there are a few of the single family attached units that will be closer than the 30' right of way off set required in section 3.5.2(E)(1). In addition, if these units were a multifamily product (3-plex or greater) the current separation from the right of way would meet code.

Below we have laid out our justifications for the modification. Our arguments center around an enhanced landscape buffer to mitigate the proximity to Harmony and Taft Hill roads and the ability of the project to fulfill the need for affordable housing as stated in City Plan and the City's Affordable Housing Strategic Plan.

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; and 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;

The standard set forth in section 3.5.2(E)(1) is to provide an adequate buffer from arterials and single family dwellings. Below are two plan elements incorporated into the Harmony Cottages design that will meet or exceed the intent of the standard set forth in this section.

In order to mitigate the proximity of the single family attached houses to the Harmony and Taft Hill road ways, we are proposing to more than double the amount of landscape required along the street scape. The code would require 17 trees along Harmony Road and 8 trees along Taft Hill. In order to provide a visual buffer from the houses and the roads, we are proposing to provide 44 trees along Harmony and 16 along Taft Hill. That would more than double the required landscape.

The existing right-of-ways along Harmony and Taft Hill are also larger than the City standard providing a greater distance from the homes and the road than would be typical in the City. The typical park way along a 4 lane arterial is 16' (the area between the back walk and the road). The park way along Harmony is 24' and the park way along Taft Hill it is 55'.

With a 30' set back along an arterial and a typical 16' parkway, the code would require single family homes to be set back 46' from the arterial road. Our current design is very close to meeting or exceeding that dimension. The homes along Harmony will be setback from the road between 39' and 44'. That is only 2'-7' closer than the current standards would require. The homes along Taft Hill are set back 72' from the road way exceeding the required 46' set back by 26'.

Lastly, if the units along Harmony and Taft Hill were a 3-plex unit rather that a duplex, the code would allow the homes to be 15' from the right of way matching the closest set back shown on the plans.

Therefore, due the substantial increase in the streetscape landscape, the separation of the homes from the road ways and the fact that a 3-plex unit would comply with the Code, the applicant believes the proposed development promotes the standard set forth in section 3.5.2(E)(1) equal to or better than a plan that would comply with the code.

(2) the granting of a modification from the strict application of any standard would, without impairing the intent and purpose of this Land Use Code, substantially alleviate an existing, defined and described problem of city-wide concern or would result in a substantial benefit to the city by reason of the fact that the proposed project would substantially address an important community need specifically and expressly defined and described in the city's Comprehensive Plan or in an adopted policy, ordinance or resolution of the City Council, and the strict application of such a standard would render the project practically infeasible;

Development of the Harmony Cottages project would result in a substantial benefit to the City because the proposed community would address the need for affordable housing as expressed in City Plan. City Plan contains overarching policy statements that promote balanced and integrated living patterns. Topics addressed include the goal of a mix of housing types in all City sectors. Additionally, affordable housing is encouraged to be dispersed throughout the City.

The City also has an *Affordable Housing Strategic Plan*, which establishes priorities and strategies for the City's affordable housing programs and informs the Consolidated Plan and Annual Action Plans required by HUD. The most recent plan (2010) identifies four priorities to address affordable housing needs:

- Increase the inventory of affordable units;
- Preserve existing affordable housing units, and;
- Increase housing and facilities for people with special needs;

To meet the definition of Affordable Housing in the City of Fort Collins, 10% of units must be set-aside for households earning less than 80% of Area Median Income (AMI) adjusted for household size.

The Applicant is proposing to set aside 100% of the dwelling units for households earning less than 60% of AMI. In addition the properties will be deed income restricted for 20 years. The first homeowner will have to qualify earning between 35-60% AMI and then, if resold, the new buyer would need to earn less than 80% AMI.

Conclusion

Affordable housing will become an increasingly important issue within the City of Fort Collins as the property values continue to rise. By filling this City wide need and providing an enhanced landscape buffer between homes and the adjacent arterials, the applicant believes the proposed plans meet the modification requirements set forth in section 2.8.2 of the Land use Code.

DELICH ASSOCIATES Traffic & Transportation Engineering
2272 Glen Haven Drive Loveland, Colorado 80538
Phone: (970) 669-2061 Fax: (970) 669-5034

MEMORANDUM

TO: Rod Arndt, Harmony Limited
Sara Coutts, The Neenan Company
Linda Ripley/Russ Lee, Ripley Design Inc.
Martina Wilkinson, City of Fort Collins

FROM: Matt Delich

DATE: November 25, 2015

SUBJECT: Harmony Cottages Transportation Impact Study
(File: 1587ME01)

This memorandum constitutes a transportation impact study for Harmony Cottages. The Harmony Cottages site is located in the southeast quadrant of the Taft Hill/Harmony-Larimer County Road 38E (LCR38E) intersection, and is shown in Figure 1. The current site plan for Harmony Cottages is shown in Figure 2. Harmony Cottages is proposed as 48 single family dwelling units (44 duplexes and 4 detached houses). Primary access to the Harmony Cottages site will be via a full-movement access to/from Harmony Road, approximately 640 feet east of Taft Hill Road. The scope of this memorandum was discussed with Martina Wilkinson, City of Fort Collins Traffic Operations. Since the trip generation is expected to be low, a memorandum analyzing impacts to the Taft Hill/Harmony-LCR38E intersection was requested. A base assumptions form and related information is provided in Appendix A.

Harmony Road is to the north of (adjacent to) the proposed Harmony Cottages site. It is an east-west street classified as a four-lane arterial east of Taft Hill Road, and LCR38E is classified as a two-lane arterial west of Taft Hill Road according to the Fort Collins Master Street plan. Currently, Harmony Road has a four-lane cross section with center median lane adjacent to the Harmony Cottages site. At the Taft Hill/Harmony-LCR38E intersection, Harmony Road has eastbound and westbound left-turn lanes, a through lane in each direction, and a westbound right-turn lane. The Taft Hill/Harmony-LCR38E intersection has signal control. The posted speed limit in this area of Harmony Road is 40 mph.

Taft Hill Road is to the west of (adjacent to) the proposed Harmony Cottages site. It is a north-south street classified as a four-lane arterial according to the Fort Collins Master Street Plan. Currently, Taft Hill Road has a two-lane cross section with center median lane adjacent to the Harmony Cottages site. At the Taft Hill/Harmony-LCR38E intersection, Taft Hill Road has a northbound left-turn lane, dual southbound left-turn lanes, one through lane in each direction, and a southbound right-turn lane. The posted speed limit in this area of Taft Hill Road is 40 mph.

The existing geometry at the Taft Hill/Harmony-LCR38E intersection is shown in Figure 3. Recent peak hour traffic counts at the Taft Hill/Harmony-LCR38E intersection are shown in Figure 4. Traffic counts at the Taft Hill/Harmony-LCR38E intersection were obtained in June 2014 by the City of Fort Collins. Raw traffic count data is provided in Appendix B. Using the volumes shown in Figure 4, the current peak hour operation at the Taft Hill/Harmony-LCR38E intersection is shown in Table 1. Calculation forms for these analyses are provided in Appendix C. The Taft Hill/Harmony-LCR38E intersection was analyzed using the signalized intersection techniques from the 2010 Highway Capacity Manual (2010 HCM). 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 "low density mixed-use" on the Fort Collins Structure Plan. In areas termed "low density mixed-use," 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 D. At arterial/arterial and arterial/collector or local stop sign controlled intersections, acceptable operation is considered to be at level of service F for any approach leg. At collector/local stop sign controlled intersections, acceptable operation is considered to be at level of service C for any approach leg. As can be seen in Table 1, the Taft Hill/Harmony intersection is currently operating acceptably with existing control and geometry. It is important to note that a northbound right-turn lane and an eastbound right-turn lane are required using the existing traffic volumes at the Taft Hill/Harmony-LCR38E intersection.

Trip Generation, 9th Edition, ITE was used to estimate the daily and peak hour trip generation for Harmony Cottages. From this reference, the equations for Single Family Detached (Code 210) were used to estimate the daily and peak hour trip generation as shown in Table 2. The trip generation resulted in 534 daily trip ends, 43 morning peak hour trip ends, and 54 afternoon peak hour trip ends. The trip distribution for Harmony Cottages is shown in Figure 5. Figure 6 shows the site generated peak hour traffic.

Background traffic projections for the short range (2020) future horizon were obtained by factoring the current traffic volumes by two percent per year. Figure 7 shows the short range (2020) background peak hour traffic at the Taft Hill/Harmony-LCR38E intersection. The traffic volumes generated by the proposed Harmony Cottages were added to the background traffic volumes to produce the total traffic volume forecasts for the short range (2020) future. Figure 8 shows the short range (2020) total peak hour traffic at the key intersections.

Figure 9 shows a schematic of the short range (2020) geometry. As mentioned earlier, a northbound right-turn lane and an eastbound right-turn lane are required using the existing traffic volumes at the Taft Hill/Harmony-LCR38E intersection. However, only the northbound right-turn lane is shown on Figure 9, since it is the only warranted auxiliary lane required to achieve acceptable operation at the Taft Hill/Harmony-

LCR38E intersection. The project will not have eastbound right-turning traffic at this intersection. The eastbound right-turn lane is not necessary to achieve acceptable operation at this intersection. The median area on Harmony Road, east of the Site Access, should be re-striped with a westbound left-turn lane. That left-turn lane should provide 50 feet of storage and 435 feet of deceleration (including 200 feet of bay taper). According to LCUASS, Figure 8-4, an eastbound right-turn lane is not required on Harmony Road approaching the Site Access.

Table 3 shows the short range (2020) background morning and afternoon peak hour operation at the Taft Hill/Harmony-LCR38E intersection. The Taft Hill/Harmony-LCR38E intersection will operate at acceptable levels of service, except for the northbound leg during the afternoon peak hour. With the warranted northbound right-turn lane and an adjustment in the signal timing, all movements at the Taft Hill/Harmony-LCR38E intersection will operate acceptably. Calculation forms for these analyses are provided in Appendix D. The analyses were not run with an eastbound right-turn lane, since this lane was not necessary to achieve acceptable operation.

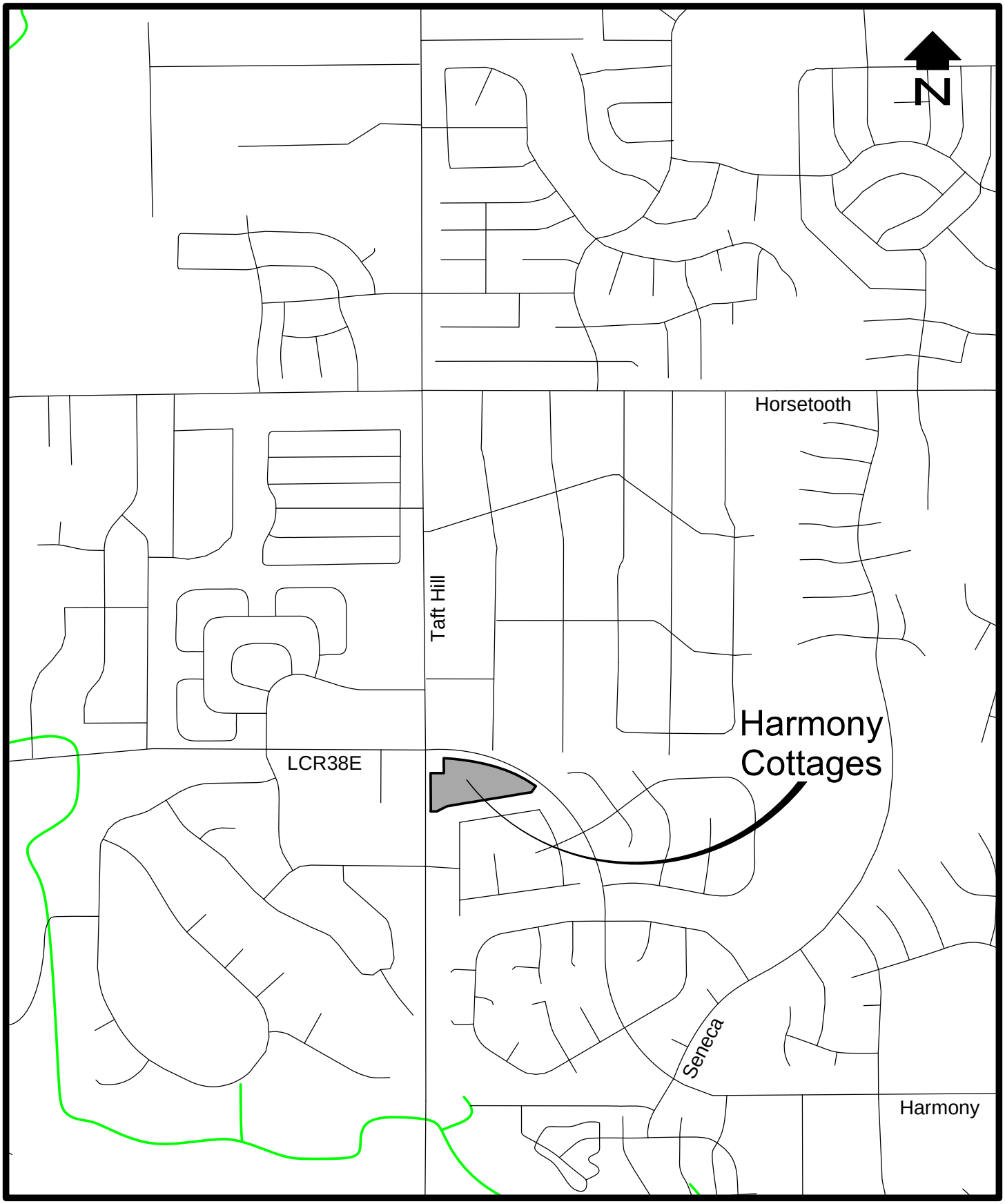
Table 4 shows the short range (2020) total morning and afternoon peak hour operation at the Taft Hill/Harmony-LCR38E and Harmony/Site Access intersections. As with the background operation, the Taft Hill/Harmony-LCR38E intersection will operate at acceptable levels of service, except for the northbound leg during the afternoon peak hour. With the warranted northbound right-turn lane and an adjustment in the signal timing, all movements at the Taft Hill/Harmony-LCR38E intersection will operate acceptably. The Harmony/Site Access intersection will operate at acceptable levels of service. Calculation forms for these analyses are provided in Appendix E. The analyses were not run with an eastbound right-turn lane, since this lane was not necessary to achieve acceptable operation.

The Harmony Cottages site is in an area within which the City requires pedestrian and bicycle level of service evaluations. Appendix F shows a map of the area that is within 1320 feet of the Harmony Cottages site. The Harmony Cottages site is located within an area termed as “all other areas,” which sets the pedestrian level of service threshold at LOS C for all measured categories. There are four destination areas within 1320 feet of the proposed Harmony Cottages: 1) the commercial area to the northwest, 2) the residential neighborhood to the north of Harmony Road, 3) the residential neighborhood to the south and southeast, and 4) the residential neighborhood to the southwest. Appendix F contains a Pedestrian LOS Worksheet. Destination areas 1, 2, and 4 are not in the City of Fort Collins. Sidewalks either do not exist or are sporadic in these areas. The continuity measure would be achieved when sidewalks are built in these areas.

Based upon Fort Collins bicycle LOS criteria, there are no destination areas within 1320 feet of the Harmony Cottages site.

Currently, this area is served by Transfort Route 12 along Harmony Road and Taft Hill Road. The transit service is acceptable.

It is concluded that the Taft Hill/Harmony-LCR38E and Harmony/Site Access intersections will operate acceptably with recommended geometry and control. The Taft Hill/Harmony-LCR38E intersection will meet the Fort Collins criteria of level of service D or better during the peak hours with regard to operation with an adjustment in the signal timing. No further transportation analyses are required at this time.



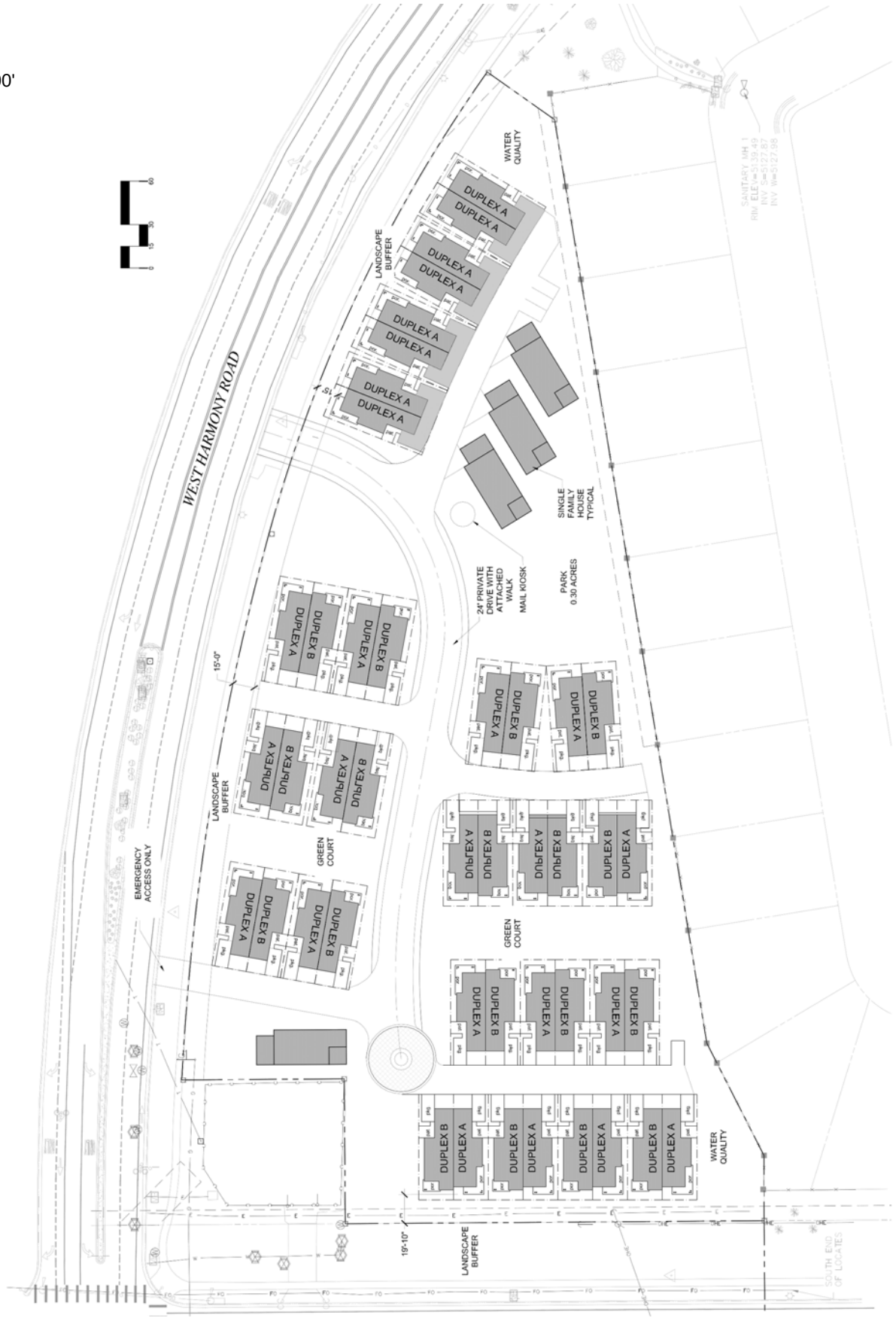
SCALE: 1"=1000'

SITE LOCATION

Figure 1

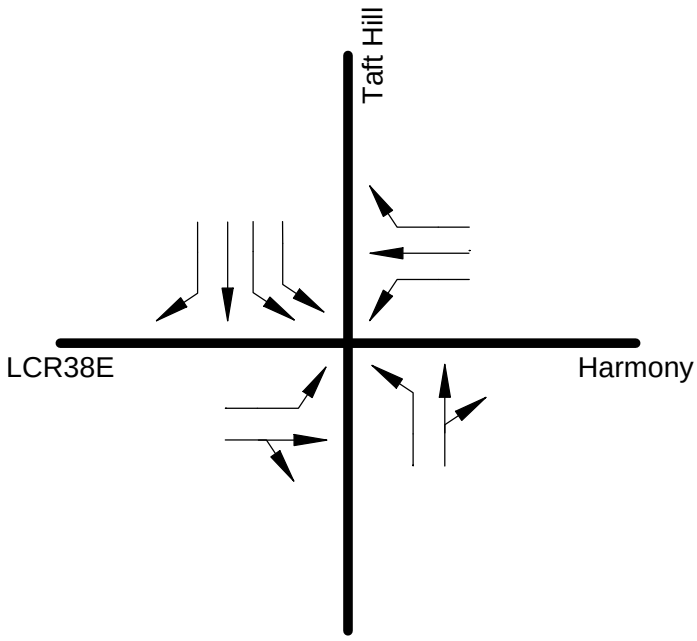
DELICH ASSOCIATES

SCALE: 1"=100'

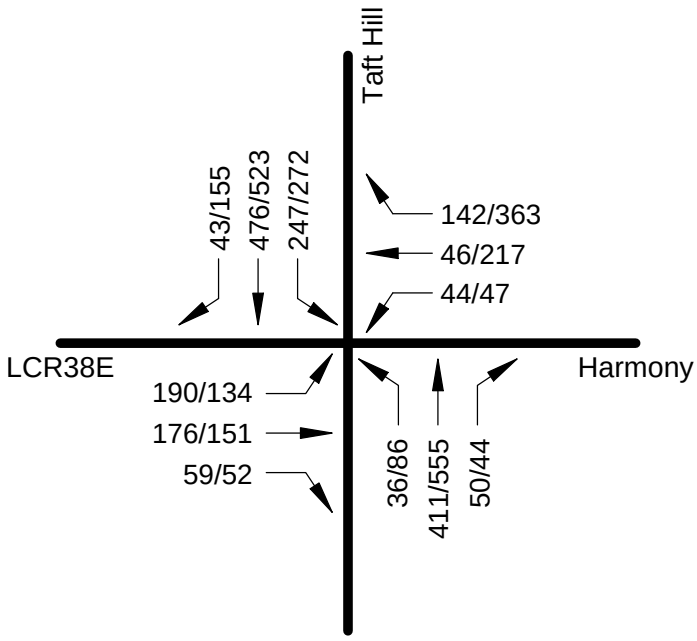


SITE PLAN

Figure 2



EXISTING INTERSECTION GEOMETRY Figure 3

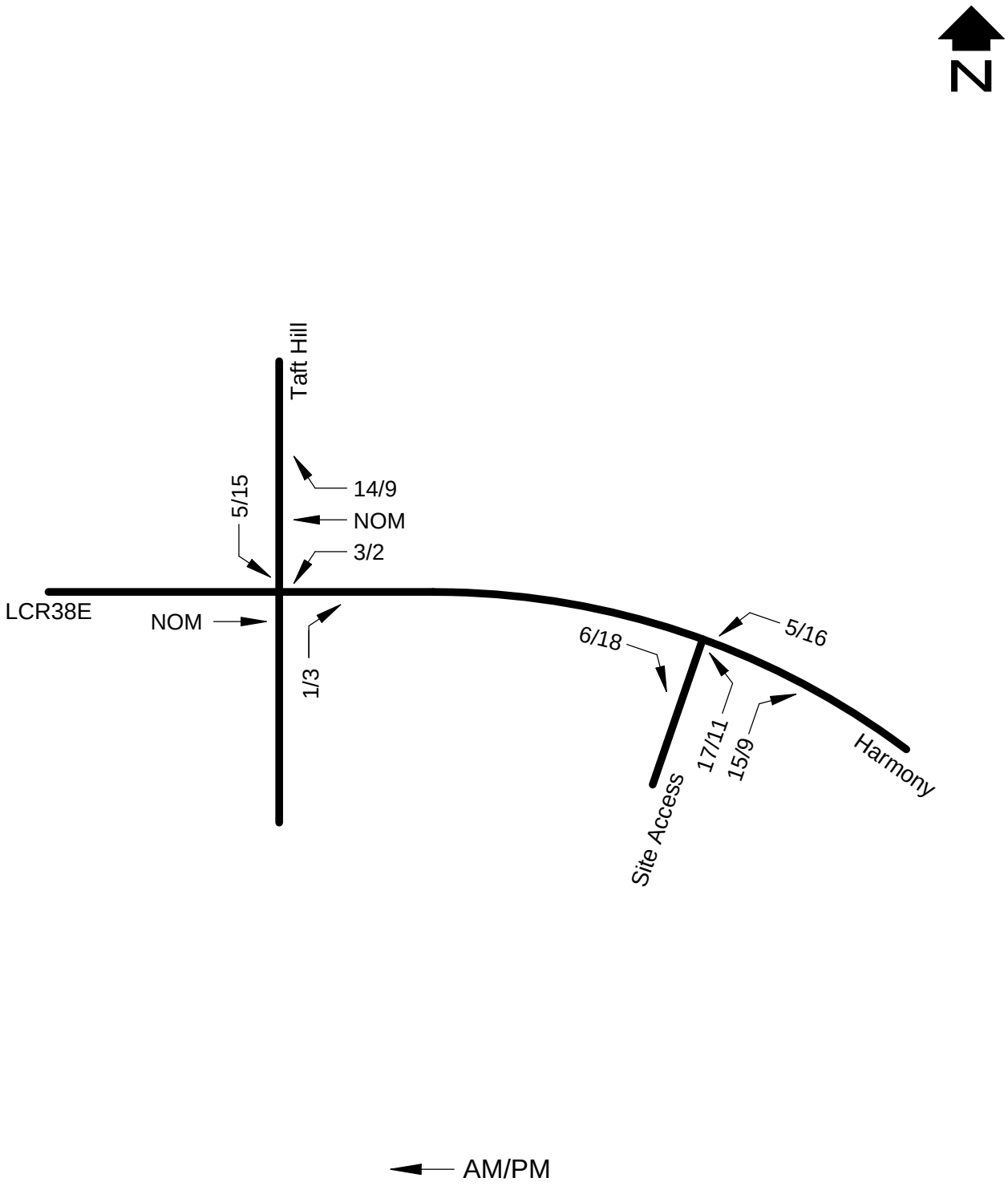


RECENT PEAK HOUR TRAFFIC

Figure 4

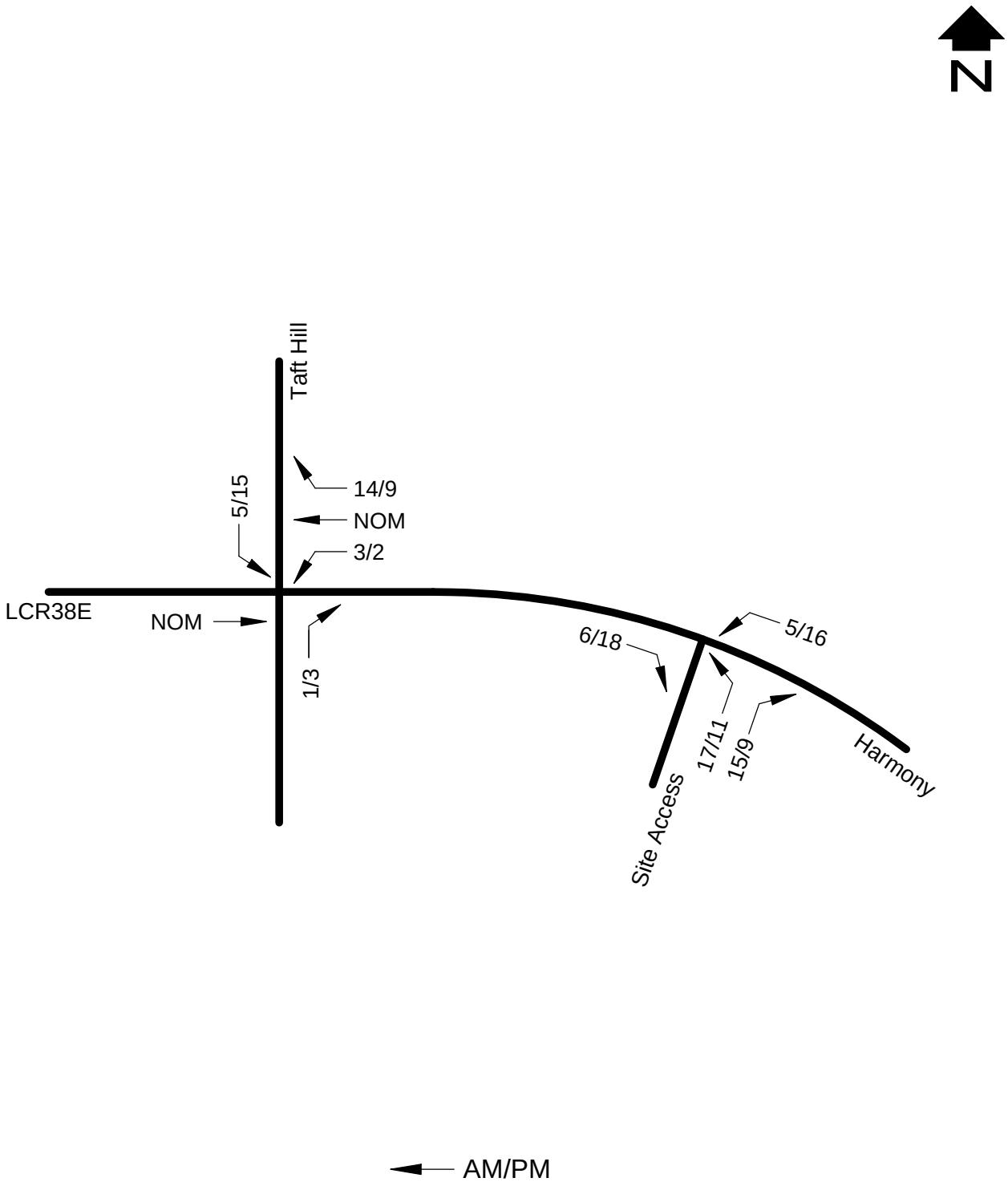
TABLE 1 Current Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Taft Hill/Harmony-LCR38E (signal)	EB LT	C	C
	EB T/RT	D	D
	EB APPROACH	D	C
	WB LT	C	C
	WB T	D	D
	WB RT	A	D
	WB APPROACH	D	D
	NB LT	D	D
	NB T/RT	C	D
	NB APPROACH	C	D
	SB LT	C	D
	SB T	B	B
	SB RT	A	B
	SB APPROACH	C	C
	OVERALL	C	C

TABLE 2 Trip Generation for Harmony Cottages												
Code	**Use**	**Size**	**AWDTE**		**AM Peak Hour**				**PM Peak Hour**			
			Rate	**Trips**	**Rate**	**In**	**Rate**	**Out**	**Rate**	**In**	**Rate**	**Out**
210	Single Family	48 D.U.	EQ	534	EQ	11	EQ	32	EQ	34	EQ	20



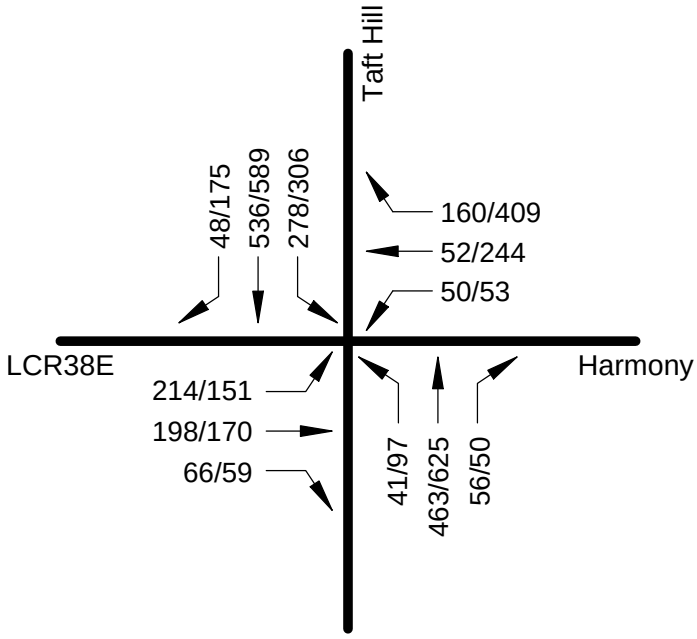
SITE GENERATED PEAK HOUR TRAFFIC

Figure 5



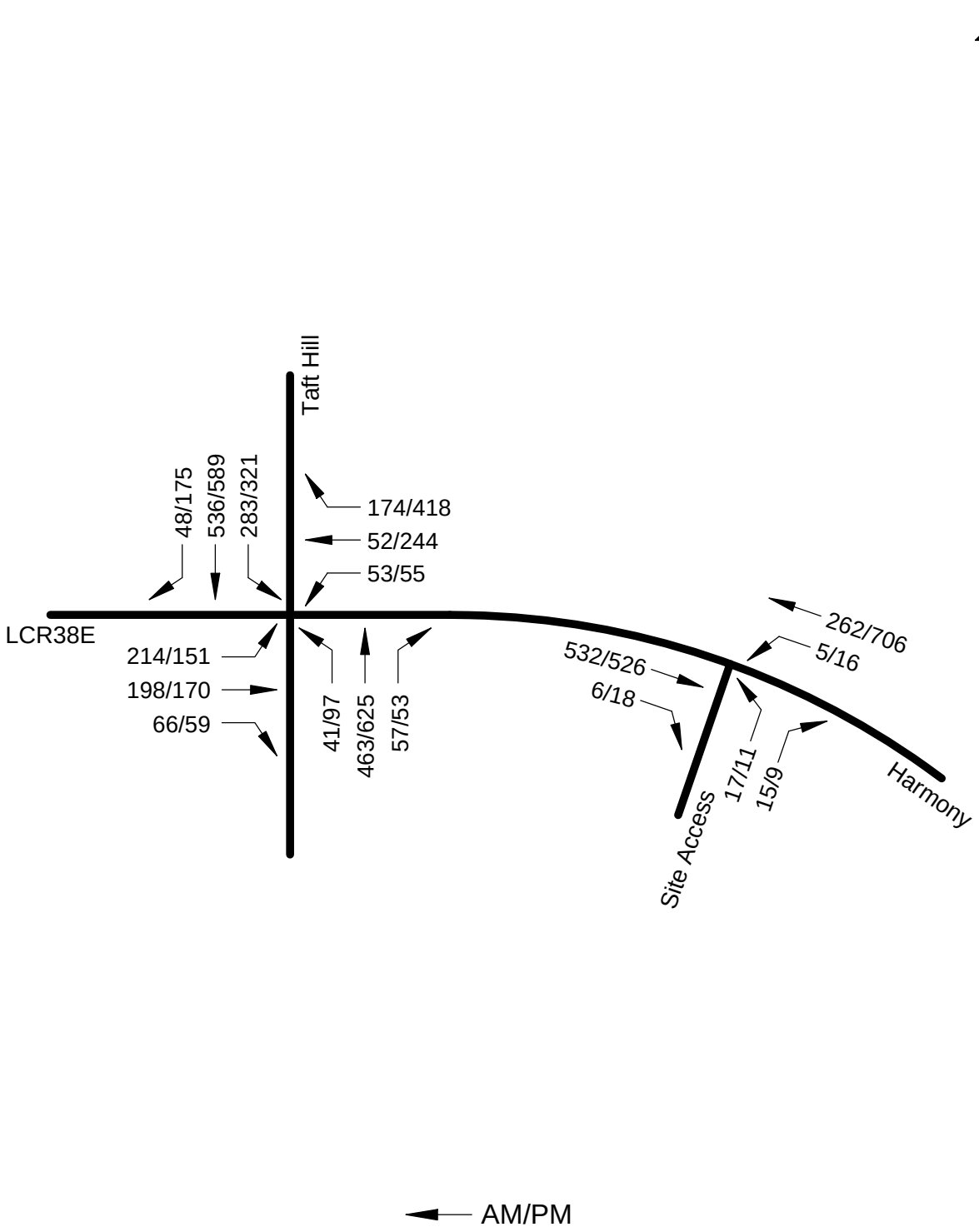
SITE GENERATED PEAK HOUR TRAFFIC

Figure 6



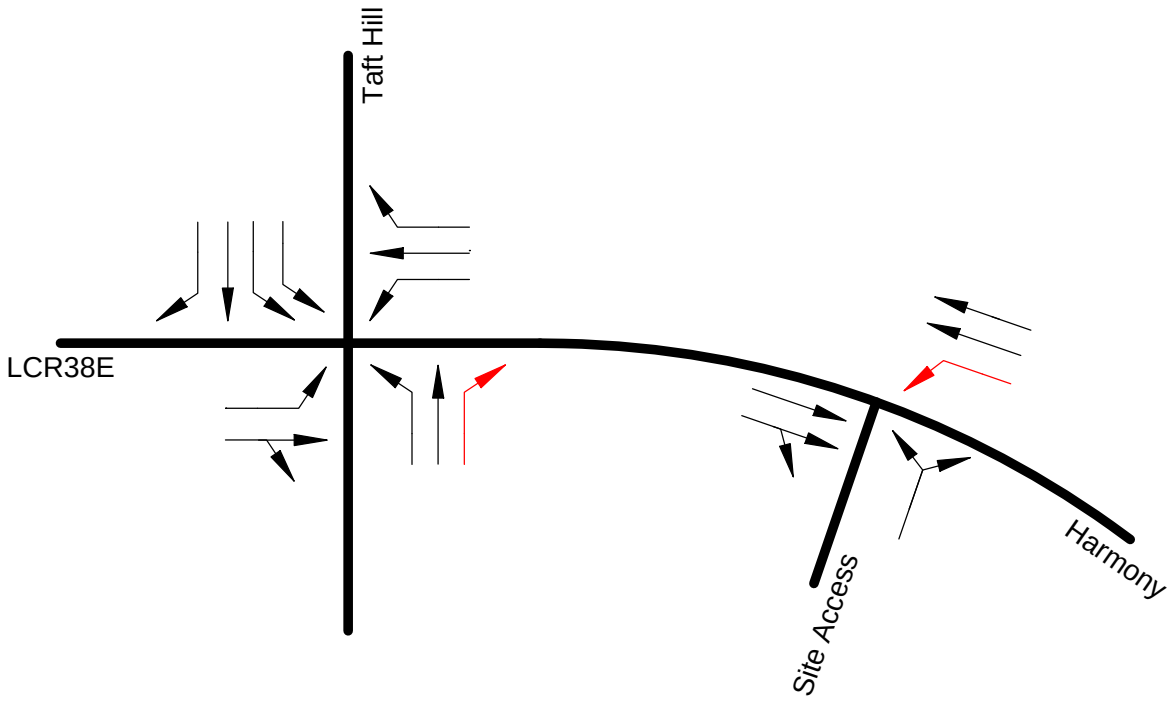
SHORT RANGE (2020) BACKGROUND
PEAK HOUR TRAFFIC

Figure 7



SHORT RANGE (2020) TOTAL PEAK HOUR TRAFFIC

Figure 8



SHORT RANGE (2020) RECOMMENDED GEOMETRY

Figure 9

TABLE 3 Short Range (2020) Background Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Taft Hill/Harmony-LCR38E (signal) (Existing Geometry and City Timing)	EB LT	C	C
	EB T/RT	D	D
	EB APPROACH	D	C
	WB LT	C	C
	WB T	D	D
	WB RT	A	D
	WB APPROACH	C	D
	NB LT	D	E (55.5 secs)
	NB T/RT	C	F (64.9 secs)
	NB APPROACH	C	E (63.7 secs)
	SB LT	D	D
	SB T	B	C
	SB RT	A	B
	SB APPROACH	C	C
	OVERALL	C	D
Taft Hill/Harmony-LCR38E (signal) (With NB RT-Lane and Adjusted Timing)	EB LT	C	C
	EB T/RT	D	D
	EB APPROACH	D	C
	WB LT	C	C
	WB T	D	D
	WB RT	A	D
	WB APPROACH	C	D
	NB LT	D	D
	NB T	C	D
	NB RT	A	A
	NB APPROACH	C	D
	SB LT	D	D
	SB T	B	C
	SB RT	A	B
	SB APPROACH	C	C
	OVERALL	C	D

TABLE 4 Short Range (2020) Total Peak Hour Operation			
Intersection	**Movement**	**Level of Service**	
		AM	**PM**
Taft Hill/Harmony-LCR38E (signal) (Existing Geometry and City Timing)	EB LT	C	C
	EB T/RT	D	D
	EB APPROACH	D	C
	WB LT	C	C
	WB T	D	D
	WB RT	A	D
	WB APPROACH	C	D
	NB LT	D	E (55.5 secs)
	NB T/RT	C	F (66.2 secs)
	NB APPROACH	C	E (64.8 secs)
	SB LT	D	D
	SB T	B	C
	SB RT	A	B
	SB APPROACH	C	C
	OVERALL	C	D
Taft Hill/Harmony-LCR38E (signal) (with NB RT-Lane and Adjusted Timing)	EB LT	C	C
	EB T/RT	D	D
	EB APPROACH	D	C
	WB LT	C	C
	WB T	D	D
	WB RT	A	D
	WB APPROACH	C	D
	NB LT	D	D
	NB T	C	D
	NB RT	A	A
	NB APPROACH	C	D
	SB LT	D	D
	SB T	B	C
	SB RT	A	B
	SB APPROACH	C	C
	OVERALL	C	D
Harmony/Site Access (stop sign)	NB LT/RT	B	C
	WB LT	A	A

APPENDIX A

Attachment A
Transportation Impact Study
Base Assumptions

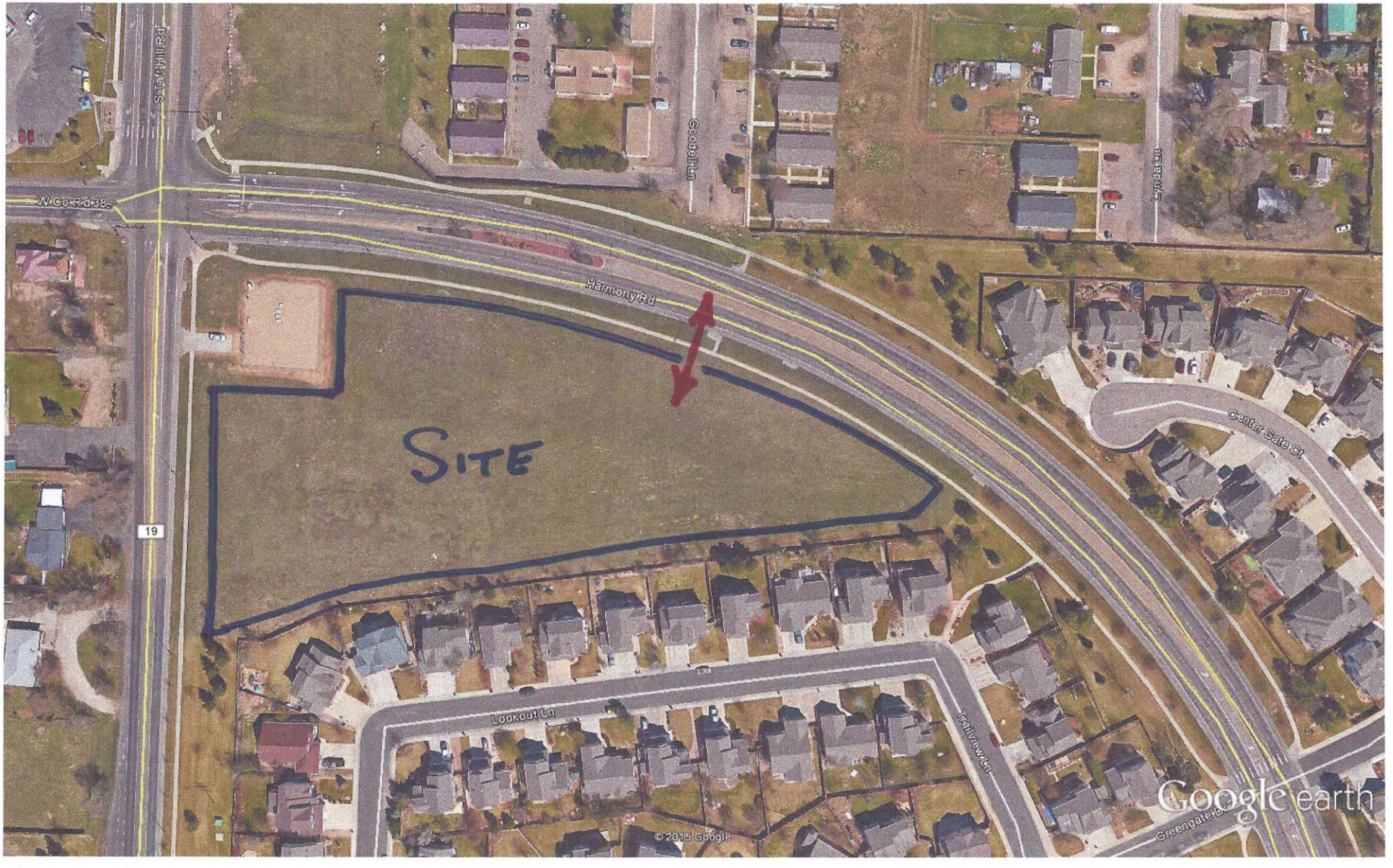
Project Information				
Project Name	HARMONY COTTAGES (HABITAT FOR HUMANITY)			
Project Location	SE QUADRANT OF HARMONY/TAFT HILL			
TIS Assumptions				
Type of Study	Full: NO		Intermediate: MEMO	
Study Area Boundaries	North: HARMONY		South: HARMONY	
	East: SITE ACCESS		West: TAFT HILL	
Study Years	Short Range: 2020		Long Range: N/A	
Future Traffic Growth Rate	2%/YEAR			
Study Intersections	1. All access drives		5.	
	2. HARMONY/TAFT HILL		6.	
	3.		7.	
	4.		8.	
Time Period for Study	(AM: 7:00-9:00)	(PM: 4:00-6:00)	Sat Noon: NO	
Trip Generation Rates	PER ITE			
Trip Adjustment Factors	Passby: N/A		Captive Market: N/A	
Overall Trip Distribution	SEE ATTACHED SKETCH			
Mode Split Assumptions	N/A			
Committed Roadway Improvements	NOT AWARE OF ANY			
Other Traffic Studies	NOT AWARE OF ANY			
Areas Requiring Special Study				

Date: OCTOBER 29, 2015

Traffic Engineer: DELICH ASSOCIATES

Local Entity Engineer: [signature] 10.30.15

1587 BAF



Google earth

feet 900

meters 200

30 S
180
900'

Habitat for Humanity

NEENAN architruction

Greg D. Fisher

DESCRIPTION	SPACES
PRIVATE DRIVE	6
SPACES ADJACENT TO DRIVEWAYS	35
GARAGE SPACES	46
TOTAL	87 SPACES

UNIT TYPE	QUANTITY
DUPLEX	42
POUDRE SCHOOL DISTRICT BLDG.	4
TOTAL	46 UNITS

GREEN COURT EXAMPLES

RIPLEY DESIGN INC.
land planning
landscape architecture
urban design
entitlement

HABITAT FOR HUMANITY

CONCEPT E

401 West Mountain Ave., Suite 100
Fort Collins, Colorado 80521
970.224.5828
www.ripleydesigninc.com

TRIP GENERATION (T.G., 9TH ED.)

42 DUPLEX D.U. PLUS 4 S.F. D.U. = 46 D.U.

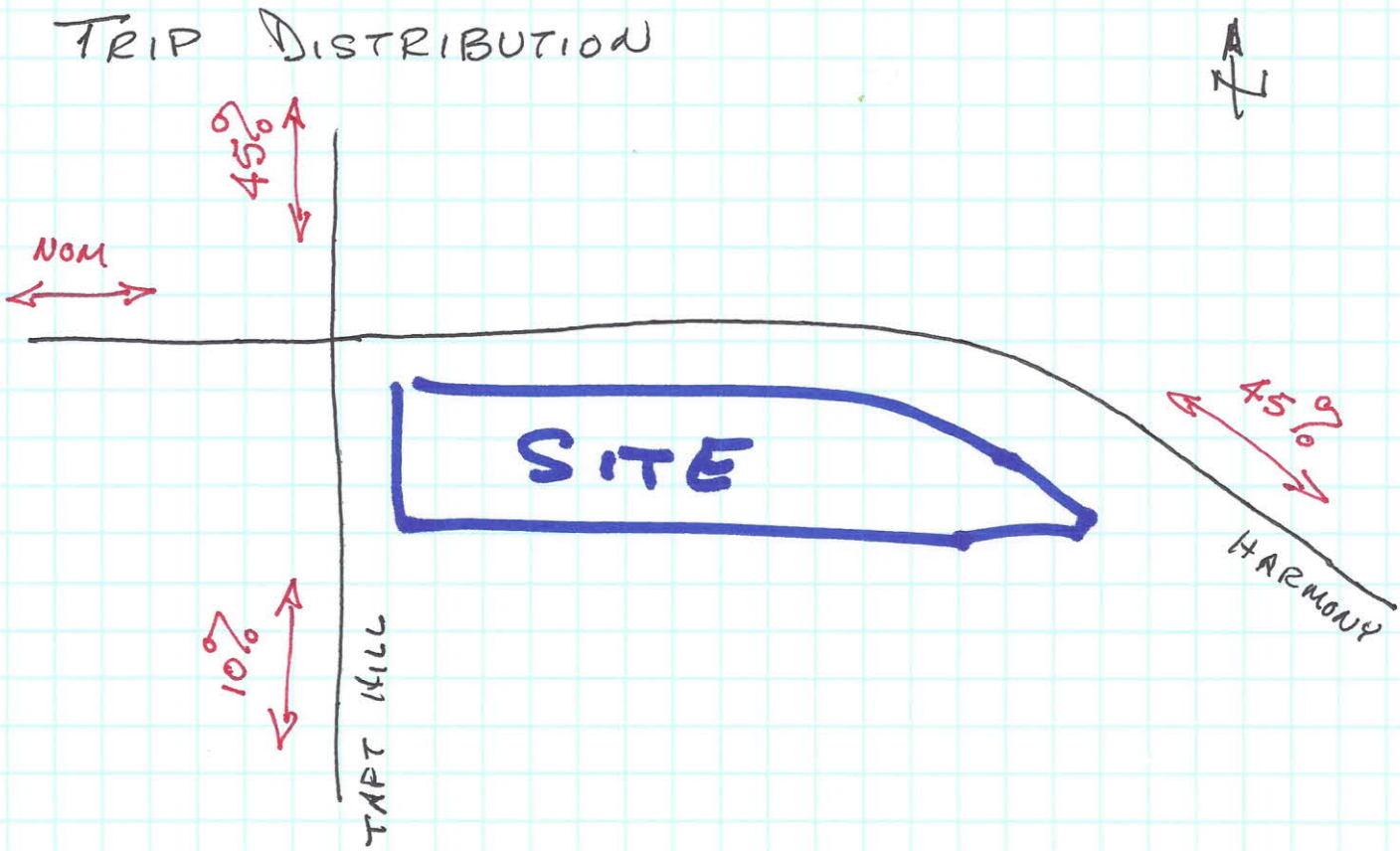
USE CODE 210

DAILY $Ln(T) = 0.92 Ln X + 2.72 = 514$ TE
$R^2 = 0.95$
RATE (9.52) = 438 TE

AM $T = 0.70 X + 9.74 = 42$ TE
$R^2 = 0.89$
RATE (0.75) = 35 TE
IN (25%) = 11
OUT (75%) = 31

PM $Ln(T) = 0.90 Ln X + 0.51 = 52$ TE
$R^2 = 0.91$
RATE (1.0) = 46 TE
IN (63%) = 33
OUT (37%) = 19

TRIP DISTRIBUTION



APPENDIX B

DELICH ASSOCIATES
2272 GLEN HAVEN DRIVE
LOVELAND, CO 80538
Phone: (970) 669-2061

TABULAR SUMMARY OF VEHICLE COUNTS

Date: 6/12/2014 Observer: City of Fort Collins

Day: Thursday Jurisdiction: Fort Collins

Intersection: Taft Hill/Harmony-LCR38E

R = right turn
S = straight
L = left turn

Time	Northbound: Taft Hill				Southbound: Taft Hill				Total	Eastbound: LCR38E				Westbound: Harmony				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	3	108	16	127	64	139	10	213	340	52	41	26	119	6	16	37	59	178	518
7:45	15	127	19	161	69	132	9	210	371	49	61	13	123	14	8	47	69	192	563
8:00	9	91	5	105	60	96	8	164	269	43	35	10	88	13	11	29	53	141	410
8:15	9	85	10	104	54	109	16	179	283	46	39	10	95	11	11	29	51	146	429
7:30-8:30	36	411	50	497	247	476	43	766	1263	190	176	59	425	44	46	142	232	657	1920
PHF	0.6	0.81	0.66	0.77	0.89	0.86	0.67	0.9		0.91	0.72	0.57	0.86	0.79	0.72	0.76	0.84		0.85
4:30	20	138	9	167	66	114	31	211	378	30	36	14	80	8	51	77	136	216	594
4:45	23	139	11	173	64	146	36	246	419	39	37	13	89	7	64	78	149	238	657
5:00	28	124	15	167	64	126	48	238	405	31	36	9	76	18	49	100	167	243	648
5:15	15	154	9	178	78	137	40	255	433	34	42	16	92	14	53	108	175	267	700
4:30-5:30	86	555	44	685	272	523	155	950	1635	134	151	52	337	47	217	363	627	964	2599
PHF	0.77	0.9	0.73	0.96	0.87	0.9	0.81	0.93		0.86	0.9	0.81	0.92	0.65	0.85	0.84	0.9		0.93

APPENDIX C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	190	176	59	44	46	142	36	411	50	247	476	43
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	1824	1863	1863	1863	1863	1863	1824	1863	1863	1863
Adj Flow Rate, veh/h	224	207	54	52	54	0	42	484	54	291	560	0
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	2	1	1
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	391	251	65	202	207	176	118	695	78	574	1015	862
Arrive On Green	0.11	0.18	0.17	0.05	0.11	0.00	0.07	0.42	0.41	0.17	0.54	0.00
Sat Flow, veh/h	1774	1425	372	1774	1863	1583	1774	1647	184	3442	1863	1583
Grp Volume(v), veh/h	224	0	261	52	54	0	42	0	538	291	560	0
Grp Sat Flow(s),veh/h/ln	1774	0	1797	1774	1863	1583	1774	0	1830	1721	1863	1583
Q Serve(g_s), s	9.8	0.0	12.6	2.3	2.4	0.0	2.0	0.0	21.7	6.9	17.6	0.0
Cycle Q Clear(g_c), s	9.8	0.0	12.6	2.3	2.4	0.0	2.0	0.0	21.7	6.9	17.6	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	391	0	317	202	207	176	118	0	773	574	1015	862
V/C Ratio(X)	0.57	0.00	0.82	0.26	0.26	0.00	0.36	0.00	0.70	0.51	0.55	0.00
Avail Cap(c_a), veh/h	391	0	359	258	310	264	177	0	773	574	1015	862
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	29.5	0.0	35.8	33.2	36.6	0.0	40.2	0.0	21.3	34.1	13.3	0.0
Incr Delay (d2), s/veh	2.0	0.0	13.1	0.7	0.7	0.0	1.8	0.0	5.1	0.7	2.2	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	4.9	0.0	7.4	1.1	1.3	0.0	1.1	0.0	12.0	3.3	9.6	0.0
LnGrp Delay(d),s/veh	31.6	0.0	48.9	33.9	37.3	0.0	42.0	0.0	26.5	34.8	15.5	0.0
LnGrp LOS	C		D	C	D		D		C	C	B	
Approach Vol, veh/h		485			106			580			851	
Approach Delay, s/veh		40.9			35.6			27.6			22.1	
Approach LOS		D			D			C			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	9.0	53.0	7.1	20.9	19.0	43.0	13.0	15.0
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	40.0	6.0	17.0	9.0	37.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	4.0	19.6	4.3	14.6	8.9	23.7	11.8	4.4
Green Ext Time (p_c), s	0.0	3.0	0.0	0.2	0.0	1.6	0.0	0.7

Intersection Summary	
HCM 2010 Ctrl Delay	28.9
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

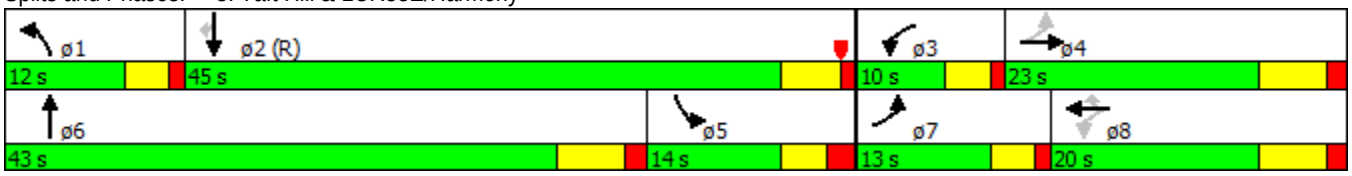
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	Max	None	None
Maximum Split (s)	12	45	10	23	14	43	13	20
Maximum Split (%)	13.3%	50.0%	11.1%	25.6%	15.6%	47.8%	14.4%	22.2%
Minimum Split (s)	11	23	10	23	11	26	11	20
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	88	10	55	65	41	88	55	68
End Time (s)	10	55	65	88	55	41	68	88
Yield/Force Off (s)	6	50	61	82	50	35	64	82
Yield/Force Off 170(s)	6	40	61	70	50	22	64	67
Local Start Time (s)	33	45	0	10	76	33	0	13
Local Yield (s)	41	85	6	27	85	70	9	27
Local Yield 170(s)	41	75	6	15	85	57	9	12

Intersection Summary

Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 55 (61%), Referenced to phase 2:SBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	134	151	52	47	217	363	86	555	44	272	523	155
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	1824	1863	1863	1863	1863	1863	1824	1863	1863	1863
Adj Flow Rate, veh/h	144	162	42	51	233	76	92	597	44	292	562	76
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	2	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	272	291	75	273	304	258	145	668	49	634	955	812
Arrive On Green	0.08	0.20	0.19	0.04	0.16	0.16	0.08	0.39	0.38	0.18	0.51	0.51
Sat Flow, veh/h	1774	1427	370	1774	1863	1583	1774	1714	126	3442	1863	1583
Grp Volume(v), veh/h	144	0	204	51	233	76	92	0	641	292	562	76
Grp Sat Flow(s),veh/h/ln	1774	0	1797	1774	1863	1583	1774	0	1840	1721	1863	1583
Q Serve(g_s), s	6.1	0.0	9.7	2.2	11.4	4.0	4.8	0.0	31.0	7.2	20.0	2.3
Cycle Q Clear(g_c), s	6.1	0.0	9.7	2.2	11.4	4.0	4.8	0.0	31.0	7.2	20.0	2.3
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	272	0	366	273	304	258	145	0	717	634	955	812
V/C Ratio(X)	0.53	0.00	0.56	0.19	0.77	0.29	0.63	0.00	0.89	0.46	0.59	0.09
Avail Cap(c_a), veh/h	272	0	435	345	451	383	149	0	717	634	955	812
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.8	0.0	34.1	31.0	38.0	34.9	42.2	0.0	27.2	34.5	16.1	11.8
Incr Delay (d2), s/veh	2.0	0.0	1.3	0.3	4.5	0.6	8.1	0.0	15.9	0.5	2.7	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	3.1	0.0	5.0	1.1	6.2	1.8	2.7	0.0	18.8	3.5	10.9	1.1
LnGrp Delay(d),s/veh	30.7	0.0	35.4	31.3	42.5	35.6	50.4	0.0	43.1	35.1	18.8	12.1
LnGrp LOS	C		D	C	D	D	D		D	D	B	B
Approach Vol, veh/h		348			360			733			930	
Approach Delay, s/veh		33.4			39.5			44.0			23.4	
Approach LOS		C			D			D			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	52.7	7.1	24.4	21.5	42.0	11.0	20.5
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	7.0	40.0	7.0	22.0	9.0	36.0	7.0	22.0
Max Q Clear Time (g_c+I1), s	6.8	22.0	4.2	11.7	9.2	33.0	8.1	13.4
Green Ext Time (p_c), s	0.0	3.2	0.0	1.2	0.0	0.8	0.0	1.1

Intersection Summary	
HCM 2010 Ctrl Delay	33.7
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

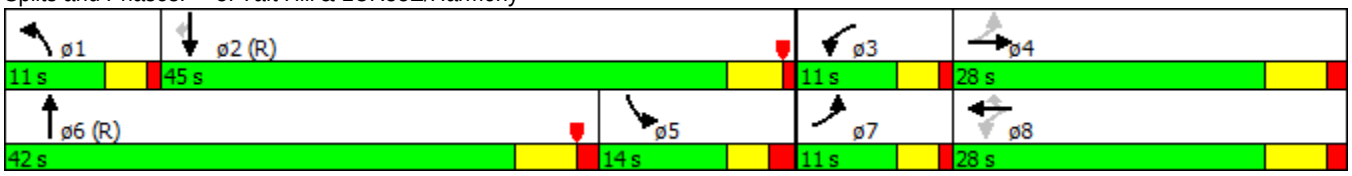
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	45	11	28	14	42	11	28
Maximum Split (%)	11.6%	47.4%	11.6%	29.5%	14.7%	44.2%	11.6%	29.5%
Minimum Split (s)	11	23	10	25	11	26	11	28
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	21	66	77	52	10	66	77
End Time (s)	21	66	77	10	66	52	77	10
Yield/Force Off (s)	17	61	73	4	61	46	73	4
Yield/Force Off 170(s)	17	51	73	87	61	33	73	84
Local Start Time (s)	53	64	14	25	0	53	14	25
Local Yield (s)	60	9	21	47	9	89	21	47
Local Yield 170(s)	60	94	21	35	9	76	21	32

Intersection Summary

Cycle Length	95
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 52 (55%), Referenced to phase 2:SBT and 6:NBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



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)			
	Commercial corridors	Other corridors within:		
		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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	214	198	66	50	52	160	41	463	56	278	536	48
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	1824	1863	1863	1863	1863	1863	1824	1863	1863	1863
Adj Flow Rate, veh/h	252	233	63	59	61	0	48	545	61	327	631	0
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	2	1	1
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	415	274	74	206	247	210	118	695	78	500	974	828
Arrive On Green	0.11	0.19	0.18	0.05	0.13	0.00	0.07	0.42	0.41	0.15	0.52	0.00
Sat Flow, veh/h	1774	1413	382	1774	1863	1583	1774	1646	184	3442	1863	1583
Grp Volume(v), veh/h	252	0	296	59	61	0	48	0	606	327	631	0
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	1863	1583	1774	0	1830	1721	1863	1583
Q Serve(g_s), s	10.0	0.0	14.3	2.5	2.6	0.0	2.3	0.0	25.8	8.1	22.0	0.0
Cycle Q Clear(g_c), s	10.0	0.0	14.3	2.5	2.6	0.0	2.3	0.0	25.8	8.1	22.0	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	415	0	348	206	247	210	118	0	773	500	974	828
V/C Ratio(X)	0.61	0.00	0.85	0.29	0.25	0.00	0.41	0.00	0.78	0.65	0.65	0.00
Avail Cap(c_a), veh/h	415	0	359	255	310	264	177	0	773	500	974	828
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.8	0.0	35.1	31.6	35.0	0.0	40.3	0.0	22.5	36.3	15.5	0.0
Incr Delay (d2), s/veh	2.5	0.0	17.1	0.8	0.5	0.0	2.2	0.0	7.8	3.1	3.3	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	1.1	0.0	8.7	1.3	1.4	0.0	1.2	0.0	14.6	4.0	12.1	0.0
LnGrp Delay(d),s/veh	31.3	0.0	52.3	32.3	35.5	0.0	42.5	0.0	30.3	39.4	18.8	0.0
LnGrp LOS	C		D	C	D		D		C	D	B	
Approach Vol, veh/h		548			120			654			958	
Approach Delay, s/veh		42.6			33.9			31.2			25.8	
Approach LOS		D			C			C			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	9.0	51.1	7.5	22.4	17.1	43.0	13.0	16.9
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	40.0	6.0	17.0	9.0	37.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	4.3	24.0	4.5	16.3	10.1	27.8	12.0	4.6
Green Ext Time (p_c), s	0.0	3.3	0.0	0.1	0.0	1.6	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	31.9
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

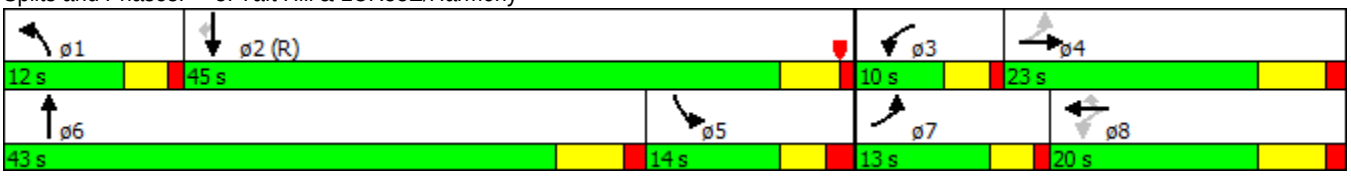
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	Max	None	None
Maximum Split (s)	12	45	10	23	14	43	13	20
Maximum Split (%)	13.3%	50.0%	11.1%	25.6%	15.6%	47.8%	14.4%	22.2%
Minimum Split (s)	11	23	10	23	11	26	11	20
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44.5	56.5	11.5	21.5	87.5	44.5	11.5	24.5
End Time (s)	56.5	11.5	21.5	44.5	11.5	87.5	24.5	44.5
Yield/Force Off (s)	52.5	6.5	17.5	38.5	6.5	81.5	20.5	38.5
Yield/Force Off 170(s)	52.5	86.5	17.5	26.5	6.5	68.5	20.5	23.5
Local Start Time (s)	33	45	0	10	76	33	0	13
Local Yield (s)	41	85	6	27	85	70	9	27
Local Yield 170(s)	41	75	6	15	85	57	9	12

Intersection Summary

Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 11.5 (13%), Referenced to phase 2:SBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	151	170	59	53	244	409	97	625	50	306	589	175
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	1824	1863	1863	1863	1863	1863	1824	1863	1863	1863
Adj Flow Rate, veh/h	162	183	49	57	262	158	104	672	51	329	633	78
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	2	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	270	308	82	275	336	285	149	666	51	575	919	781
Arrive On Green	0.08	0.22	0.21	0.05	0.18	0.18	0.08	0.39	0.38	0.17	0.49	0.49
Sat Flow, veh/h	1774	1417	379	1774	1863	1583	1774	1710	130	3442	1863	1583
Grp Volume(v), veh/h	162	0	232	57	262	158	104	0	723	329	633	78
Grp Sat Flow(s),veh/h/ln	1774	0	1796	1774	1863	1583	1774	0	1840	1721	1863	1583
Q Serve(g_s), s	6.8	0.0	11.0	2.4	12.7	8.6	5.4	0.0	37.0	8.4	24.8	2.5
Cycle Q Clear(g_c), s	6.8	0.0	11.0	2.4	12.7	8.6	5.4	0.0	37.0	8.4	24.8	2.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	270	0	391	275	336	285	149	0	717	575	919	781
V/C Ratio(X)	0.60	0.00	0.59	0.21	0.78	0.55	0.70	0.00	1.01	0.57	0.69	0.10
Avail Cap(c_a), veh/h	270	0	435	341	451	383	149	0	717	575	919	781
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.1	0.0	33.5	29.6	37.1	35.5	42.3	0.0	29.0	36.4	18.5	12.8
Incr Delay (d2), s/veh	3.7	0.0	1.8	0.4	6.1	1.7	13.2	0.0	35.9	1.4	4.2	0.3
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	3.6	0.0	5.7	1.2	7.1	3.9	3.2	0.0	25.8	4.1	13.7	1.1
LnGrp Delay(d),s/veh	31.7	0.0	35.3	30.0	43.3	37.1	55.5	0.0	64.9	37.8	22.7	13.1
LnGrp LOS	C		D	C	D	D	E		F	D	C	B
Approach Vol, veh/h		394			477			827			1040	
Approach Delay, s/veh		33.8			39.7			63.7			26.7	
Approach LOS		C			D			E			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	50.9	7.5	25.7	19.9	42.0	11.0	22.1
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	7.0	40.0	7.0	22.0	9.0	36.0	7.0	22.0
Max Q Clear Time (g_c+I1), s	7.4	26.8	4.4	13.0	10.4	39.0	8.8	14.7
Green Ext Time (p_c), s	0.0	3.4	0.0	1.6	0.0	0.0	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	41.2
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

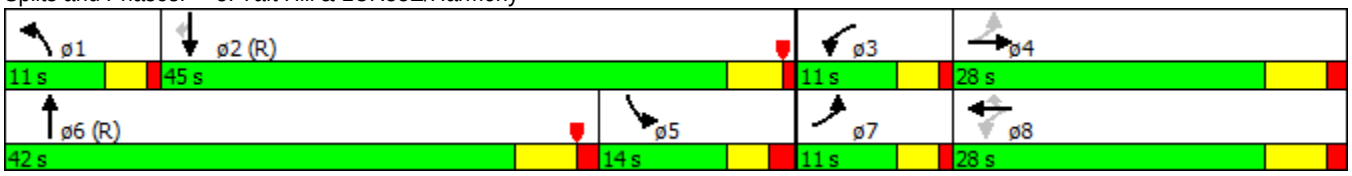
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	45	11	28	14	42	11	28
Maximum Split (%)	11.6%	47.4%	11.6%	29.5%	14.7%	44.2%	11.6%	29.5%
Minimum Split (s)	11	23	10	25	11	26	11	28
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	21	66	77	52	10	66	77
End Time (s)	21	66	77	10	66	52	77	10
Yield/Force Off (s)	17	61	73	4	61	46	73	4
Yield/Force Off 170(s)	17	51	73	87	61	33	73	84
Local Start Time (s)	53	64	14	25	0	53	14	25
Local Yield (s)	60	9	21	47	9	89	21	47
Local Yield 170(s)	60	94	21	35	9	76	21	32

Intersection Summary

Cycle Length	95
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 52 (55%), Referenced to phase 2:SBT and 6:NBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	214	198	66	50	52	160	41	463	56	278	536	48
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	1824	1863	1863	1863	1863	1863	1788	1863	1863	1863
Adj Flow Rate, veh/h	252	233	63	59	61	0	48	545	0	327	631	0
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	1
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	415	274	74	206	247	210	118	786	625	500	974	828
Arrive On Green	0.11	0.19	0.18	0.05	0.13	0.00	0.07	0.42	0.00	0.15	0.52	0.00
Sat Flow, veh/h	1774	1413	382	1774	1863	1583	1774	1863	1520	3442	1863	1583
Grp Volume(v), veh/h	252	0	296	59	61	0	48	545	0	327	631	0
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	1863	1583	1774	1863	1520	1721	1863	1583
Q Serve(g_s), s	10.0	0.0	14.3	2.5	2.6	0.0	2.3	21.5	0.0	8.1	22.0	0.0
Cycle Q Clear(g_c), s	10.0	0.0	14.3	2.5	2.6	0.0	2.3	21.5	0.0	8.1	22.0	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	415	0	348	206	247	210	118	786	625	500	974	828
V/C Ratio(X)	0.61	0.00	0.85	0.29	0.25	0.00	0.41	0.69	0.00	0.65	0.65	0.00
Avail Cap(c_a), veh/h	415	0	359	255	310	264	177	786	625	500	974	828
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	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.8	0.0	35.1	31.6	35.0	0.0	40.3	21.2	0.0	36.3	15.5	0.0
Incr Delay (d2), s/veh	2.5	0.0	17.1	0.8	0.5	0.0	2.2	5.0	0.0	3.1	3.3	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	1.1	0.0	8.7	1.3	1.4	0.0	1.2	12.1	0.0	4.0	12.1	0.0
LnGrp Delay(d),s/veh	31.3	0.0	52.3	32.3	35.5	0.0	42.5	26.2	0.0	39.4	18.8	0.0
LnGrp LOS	C		D	C	D		D	C		D	B	
Approach Vol, veh/h		548			120			593			958	
Approach Delay, s/veh		42.6			33.9			27.5			25.8	
Approach LOS		D			C			C			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	9.0	51.1	7.5	22.4	17.1	43.0	13.0	16.9
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	40.0	6.0	17.0	9.0	37.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	4.3	24.0	4.5	16.3	10.1	23.5	12.0	4.6
Green Ext Time (p_c), s	0.0	3.3	0.0	0.1	0.0	1.6	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	30.9
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

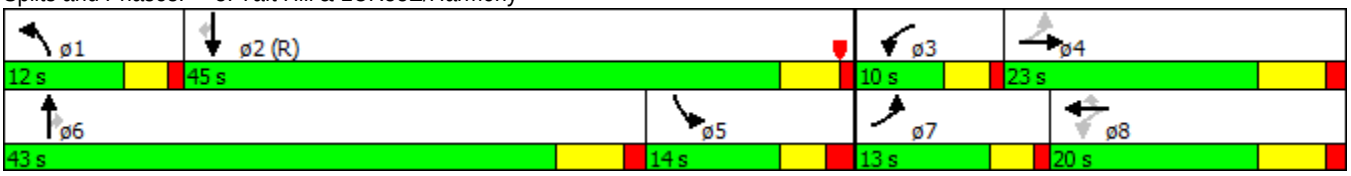
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	Max	None	None
Maximum Split (s)	12	45	10	23	14	43	13	20
Maximum Split (%)	13.3%	50.0%	11.1%	25.6%	15.6%	47.8%	14.4%	22.2%
Minimum Split (s)	11	23	10	23	11	26	11	20
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44.5	56.5	11.5	21.5	87.5	44.5	11.5	24.5
End Time (s)	56.5	11.5	21.5	44.5	11.5	87.5	24.5	44.5
Yield/Force Off (s)	52.5	6.5	17.5	38.5	6.5	81.5	20.5	38.5
Yield/Force Off 170(s)	52.5	86.5	17.5	26.5	6.5	68.5	20.5	23.5
Local Start Time (s)	33	45	0	10	76	33	0	13
Local Yield (s)	41	85	6	27	85	70	9	27
Local Yield 170(s)	41	75	6	15	85	57	9	12

Intersection Summary

Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 11.5 (13%), Referenced to phase 2:SBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	151	170	59	53	244	409	97	625	50	306	589	175
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	1824	1863	1863	1863	1863	1863	1788	1863	1863	1863
Adj Flow Rate, veh/h	162	183	49	57	262	171	104	672	0	329	633	77
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	309	83	275	336	286	157	745	608	538	910	774
Arrive On Green	0.08	0.22	0.21	0.05	0.18	0.18	0.09	0.40	0.00	0.16	0.49	0.49
Sat Flow, veh/h	1774	1417	379	1774	1863	1583	1774	1863	1520	3442	1863	1583
Grp Volume(v), veh/h	162	0	232	57	262	171	104	672	0	329	633	77
Grp Sat Flow(s),veh/h/ln	1774	0	1796	1774	1863	1583	1774	1863	1520	1721	1863	1583
Q Serve(g_s), s	6.8	0.0	11.0	2.4	12.7	9.4	5.4	32.2	0.0	8.5	25.0	2.5
Cycle Q Clear(g_c), s	6.8	0.0	11.0	2.4	12.7	9.4	5.4	32.2	0.0	8.5	25.0	2.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	391	275	336	286	157	745	608	538	910	774
V/C Ratio(X)	0.60	0.00	0.59	0.21	0.78	0.60	0.66	0.90	0.00	0.61	0.70	0.10
Avail Cap(c_a), veh/h	269	0	435	341	451	383	168	745	608	538	910	774
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	33.5	29.6	37.1	35.8	41.9	26.8	0.0	37.4	18.8	13.0
Incr Delay (d2), s/veh	3.7	0.0	1.8	0.4	6.1	2.0	8.6	16.2	0.0	2.0	4.4	0.3
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	3.6	0.0	5.7	1.2	7.1	4.3	3.0	19.8	0.0	4.2	13.9	1.1
LnGrp Delay(d),s/veh	31.7	0.0	35.3	30.0	43.2	37.8	50.5	43.0	0.0	39.4	23.2	13.3
LnGrp LOS	C		D	C	D	D	D	D		D	C	B
Approach Vol, veh/h		394			490			776			1039	
Approach Delay, s/veh		33.8			39.8			44.0			27.6	
Approach LOS		C			D			D			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	11.4	50.4	7.5	25.7	18.8	43.0	11.0	22.2
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	39.0	7.0	22.0	8.0	37.0	7.0	22.0
Max Q Clear Time (g_c+I1), s	7.4	27.0	4.4	13.0	10.5	34.2	8.8	14.7
Green Ext Time (p_c), s	0.0	3.2	0.0	1.6	0.0	0.8	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	35.4
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

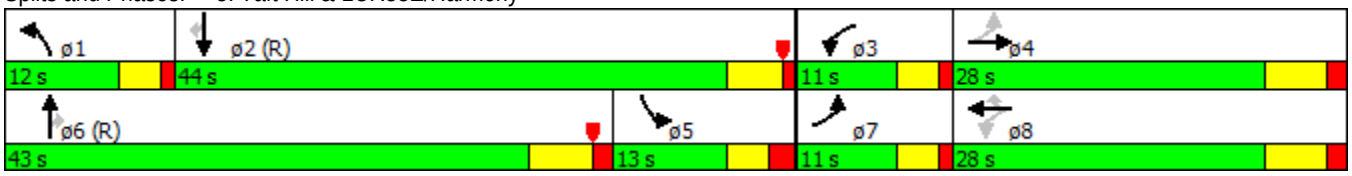
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	44	11	28	13	43	11	28
Maximum Split (%)	12.6%	46.3%	11.6%	29.5%	13.7%	45.3%	11.6%	29.5%
Minimum Split (s)	11	23	10	25	11	26	11	28
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	9	21	65	76	52	9	65	76
End Time (s)	21	65	76	9	65	52	76	9
Yield/Force Off (s)	17	60	72	3	60	46	72	3
Yield/Force Off 170(s)	17	50	72	86	60	33	72	83
Local Start Time (s)	52	64	13	24	0	52	13	24
Local Yield (s)	60	8	20	46	8	89	20	46
Local Yield 170(s)	60	93	20	34	8	76	20	31

Intersection Summary

Cycle Length	95
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 52 (55%), Referenced to phase 2:SBT and 6:NBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



APPENDIX E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	214	198	66	53	52	174	41	463	57	283	536	48
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	1824	1863	1863	1863	1863	1863	1824	1863	1863	1863
Adj Flow Rate, veh/h	252	233	63	62	61	0	48	545	61	333	631	0
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	2	1	1
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	418	274	74	209	250	213	118	695	78	493	971	825
Arrive On Green	0.11	0.19	0.18	0.05	0.13	0.00	0.07	0.42	0.41	0.14	0.52	0.00
Sat Flow, veh/h	1774	1413	382	1774	1863	1583	1774	1646	184	3442	1863	1583
Grp Volume(v), veh/h	252	0	296	62	61	0	48	0	606	333	631	0
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	1863	1583	1774	0	1830	1721	1863	1583
Q Serve(g_s), s	10.0	0.0	14.3	2.7	2.6	0.0	2.3	0.0	25.8	8.3	22.1	0.0
Cycle Q Clear(g_c), s	10.0	0.0	14.3	2.7	2.6	0.0	2.3	0.0	25.8	8.3	22.1	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	418	0	348	209	250	213	118	0	773	493	971	825
V/C Ratio(X)	0.60	0.00	0.85	0.30	0.24	0.00	0.41	0.00	0.78	0.68	0.65	0.00
Avail Cap(c_a), veh/h	418	0	359	255	310	264	177	0	773	493	971	825
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	0.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.6	0.0	35.1	31.3	34.9	0.0	40.3	0.0	22.5	36.6	15.6	0.0
Incr Delay (d2), s/veh	2.4	0.0	17.1	0.8	0.5	0.0	2.2	0.0	7.8	3.6	3.4	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	1.1	0.0	8.7	1.3	1.4	0.0	1.2	0.0	14.6	4.2	12.1	0.0
LnGrp Delay(d),s/veh	31.1	0.0	52.3	32.1	35.4	0.0	42.5	0.0	30.3	40.2	19.0	0.0
LnGrp LOS	C		D	C	D		D		C	D	B	
Approach Vol, veh/h		548			123			654			964	
Approach Delay, s/veh		42.5			33.7			31.2			26.3	
Approach LOS		D			C			C			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	9.0	50.9	7.7	22.4	16.9	43.0	13.0	17.1
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	40.0	6.0	17.0	9.0	37.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	4.3	24.1	4.7	16.3	10.3	27.8	12.0	4.6
Green Ext Time (p_c), s	0.0	3.3	0.0	0.1	0.0	1.6	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	32.0
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

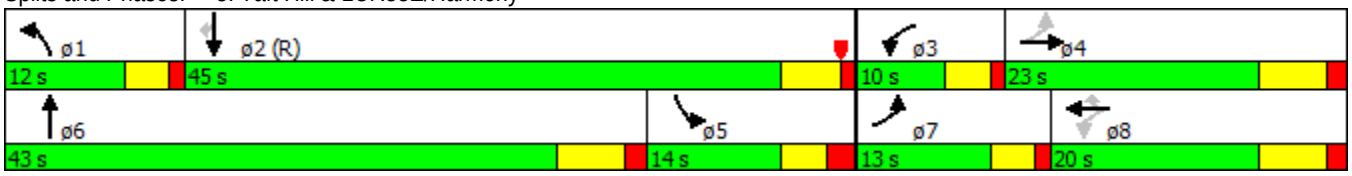
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	Max	None	None
Maximum Split (s)	12	45	10	23	14	43	13	20
Maximum Split (%)	13.3%	50.0%	11.1%	25.6%	15.6%	47.8%	14.4%	22.2%
Minimum Split (s)	11	23	10	23	11	26	11	20
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44.5	56.5	11.5	21.5	87.5	44.5	11.5	24.5
End Time (s)	56.5	11.5	21.5	44.5	11.5	87.5	24.5	44.5
Yield/Force Off (s)	52.5	6.5	17.5	38.5	6.5	81.5	20.5	38.5
Yield/Force Off 170(s)	52.5	86.5	17.5	26.5	6.5	68.5	20.5	23.5
Local Start Time (s)	33	45	0	10	76	33	0	13
Local Yield (s)	41	85	6	27	85	70	9	27
Local Yield 170(s)	41	75	6	15	85	57	9	12

Intersection Summary

Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	80

Offset: 11.5 (13%), Referenced to phase 2:SBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	151	170	59	55	244	418	97	625	53	321	589	175
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	1824	1863	1863	1863	1863	1863	1824	1863	1863	1863
Adj Flow Rate, veh/h	162	183	49	59	262	171	104	672	54	345	633	78
Adj No. of Lanes	1	1	0	1	1	1	1	1	0	2	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	307	82	276	336	286	149	663	53	574	918	781
Arrive On Green	0.08	0.22	0.21	0.05	0.18	0.18	0.08	0.39	0.38	0.17	0.49	0.49
Sat Flow, veh/h	1774	1417	379	1774	1863	1583	1774	1702	137	3442	1863	1583
Grp Volume(v), veh/h	162	0	232	59	262	171	104	0	726	345	633	78
Grp Sat Flow(s),veh/h/ln	1774	0	1796	1774	1863	1583	1774	0	1839	1721	1863	1583
Q Serve(g_s), s	6.8	0.0	11.1	2.5	12.7	9.4	5.4	0.0	37.0	8.8	24.8	2.5
Cycle Q Clear(g_c), s	6.8	0.0	11.1	2.5	12.7	9.4	5.4	0.0	37.0	8.8	24.8	2.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	389	276	336	286	149	0	716	574	918	781
V/C Ratio(X)	0.60	0.00	0.60	0.21	0.78	0.60	0.70	0.00	1.01	0.60	0.69	0.10
Avail Cap(c_a), veh/h	269	0	435	340	451	383	149	0	716	574	918	781
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	0.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	33.6	29.5	37.1	35.8	42.3	0.0	29.0	36.7	18.5	12.8
Incr Delay (d2), s/veh	3.7	0.0	1.8	0.4	6.1	2.0	13.2	0.0	37.1	1.8	4.2	0.3
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	3.6	0.0	5.7	1.2	7.1	4.3	3.2	0.0	26.1	4.3	13.7	1.1
LnGrp Delay(d),s/veh	31.7	0.0	35.4	29.9	43.2	37.8	55.5	0.0	66.2	38.4	22.7	13.1
LnGrp LOS	C		D	C	D	D	E		F	D	C	B
Approach Vol, veh/h		394			492			830			1056	
Approach Delay, s/veh		33.9			39.7			64.8			27.1	
Approach LOS		C			D			E			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	50.8	7.6	25.6	19.8	42.0	11.0	22.2
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	7.0	40.0	7.0	22.0	9.0	36.0	7.0	22.0
Max Q Clear Time (g_c+I1), s	7.4	26.8	4.5	13.1	10.8	39.0	8.8	14.7
Green Ext Time (p_c), s	0.0	3.4	0.0	1.6	0.0	0.0	0.0	1.4

Intersection Summary	
HCM 2010 Ctrl Delay	41.6
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

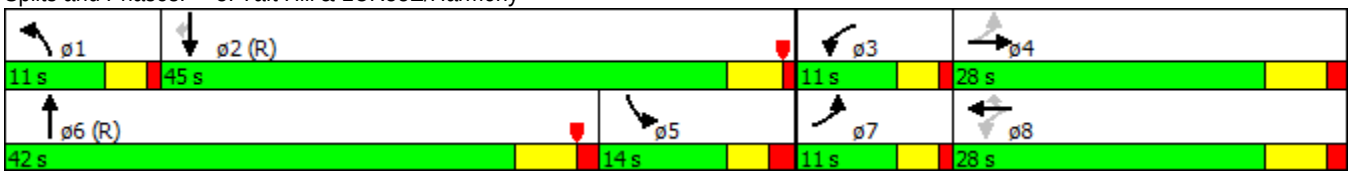
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	11	45	11	28	14	42	11	28
Maximum Split (%)	11.6%	47.4%	11.6%	29.5%	14.7%	44.2%	11.6%	29.5%
Minimum Split (s)	11	23	10	25	11	26	11	28
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	10	21	66	77	52	10	66	77
End Time (s)	21	66	77	10	66	52	77	10
Yield/Force Off (s)	17	61	73	4	61	46	73	4
Yield/Force Off 170(s)	17	51	73	87	61	33	73	84
Local Start Time (s)	53	64	14	25	0	53	14	25
Local Yield (s)	60	9	21	47	9	89	21	47
Local Yield 170(s)	60	94	21	35	9	76	21	32

Intersection Summary

Cycle Length	95
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 52 (55%), Referenced to phase 2:SBT and 6:NBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	214	198	66	53	52	174	41	463	57	283	536	48
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	1824	1863	1863	1863	1863	1863	1788	1863	1863	1863
Adj Flow Rate, veh/h	252	233	63	62	61	0	48	545	0	333	631	0
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	1
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	418	274	74	209	250	213	118	786	625	493	971	825
Arrive On Green	0.11	0.19	0.18	0.05	0.13	0.00	0.07	0.42	0.00	0.14	0.52	0.00
Sat Flow, veh/h	1774	1413	382	1774	1863	1583	1774	1863	1520	3442	1863	1583
Grp Volume(v), veh/h	252	0	296	62	61	0	48	545	0	333	631	0
Grp Sat Flow(s),veh/h/ln	1774	0	1795	1774	1863	1583	1774	1863	1520	1721	1863	1583
Q Serve(g_s), s	10.0	0.0	14.3	2.7	2.6	0.0	2.3	21.5	0.0	8.3	22.1	0.0
Cycle Q Clear(g_c), s	10.0	0.0	14.3	2.7	2.6	0.0	2.3	21.5	0.0	8.3	22.1	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	418	0	348	209	250	213	118	786	625	493	971	825
V/C Ratio(X)	0.60	0.00	0.85	0.30	0.24	0.00	0.41	0.69	0.00	0.68	0.65	0.00
Avail Cap(c_a), veh/h	418	0	359	255	310	264	177	786	625	493	971	825
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	0.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.6	0.0	35.1	31.3	34.9	0.0	40.3	21.2	0.0	36.6	15.6	0.0
Incr Delay (d2), s/veh	2.4	0.0	17.1	0.8	0.5	0.0	2.2	5.0	0.0	3.6	3.4	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	1.1	0.0	8.7	1.3	1.4	0.0	1.2	12.1	0.0	4.2	12.1	0.0
LnGrp Delay(d),s/veh	31.1	0.0	52.3	32.1	35.4	0.0	42.5	26.2	0.0	40.2	19.0	0.0
LnGrp LOS	C		D	C	D		D	C		D	B	
Approach Vol, veh/h		548			123			593			964	
Approach Delay, s/veh		42.5			33.7			27.5			26.3	
Approach LOS		D			C			C			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	9.0	50.9	7.7	22.4	16.9	43.0	13.0	17.1
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	40.0	6.0	17.0	9.0	37.0	9.0	14.0
Max Q Clear Time (g_c+I1), s	4.3	24.1	4.7	16.3	10.3	23.5	12.0	4.6
Green Ext Time (p_c), s	0.0	3.3	0.0	0.1	0.0	1.6	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	31.0
HCM 2010 LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

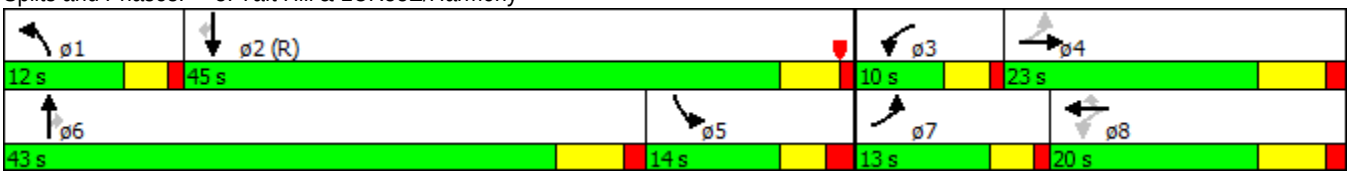
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	Max	None	None
Maximum Split (s)	12	45	10	23	14	43	13	20
Maximum Split (%)	13.3%	50.0%	11.1%	25.6%	15.6%	47.8%	14.4%	22.2%
Minimum Split (s)	11	23	10	23	11	26	11	20
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	44.5	56.5	11.5	21.5	87.5	44.5	11.5	24.5
End Time (s)	56.5	11.5	21.5	44.5	11.5	87.5	24.5	44.5
Yield/Force Off (s)	52.5	6.5	17.5	38.5	6.5	81.5	20.5	38.5
Yield/Force Off 170(s)	52.5	86.5	17.5	26.5	6.5	68.5	20.5	23.5
Local Start Time (s)	33	45	0	10	76	33	0	13
Local Yield (s)	41	85	6	27	85	70	9	27
Local Yield 170(s)	41	75	6	15	85	57	9	12

Intersection Summary

Cycle Length	90
Control Type	Actuated-Coordinated
Natural Cycle	75

Offset: 11.5 (13%), Referenced to phase 2:SBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	151	170	59	55	244	418	97	625	53	321	589	175
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	1824	1863	1863	1863	1863	1863	1788	1863	1863	1863
Adj Flow Rate, veh/h	162	183	49	59	262	183	104	672	0	345	633	77
Adj No. of Lanes	1	1	0	1	1	1	1	1	1	2	1	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	269	307	82	276	337	286	157	745	608	537	910	773
Arrive On Green	0.08	0.22	0.21	0.05	0.18	0.18	0.09	0.40	0.00	0.16	0.49	0.49
Sat Flow, veh/h	1774	1417	379	1774	1863	1583	1774	1863	1520	3442	1863	1583
Grp Volume(v), veh/h	162	0	232	59	262	183	104	672	0	345	633	77
Grp Sat Flow(s),veh/h/ln	1774	0	1796	1774	1863	1583	1774	1863	1520	1721	1863	1583
Q Serve(g_s), s	6.8	0.0	11.1	2.5	12.7	10.2	5.4	32.2	0.0	8.9	25.0	2.5
Cycle Q Clear(g_c), s	6.8	0.0	11.1	2.5	12.7	10.2	5.4	32.2	0.0	8.9	25.0	2.5
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	269	0	389	276	337	286	157	745	608	537	910	773
V/C Ratio(X)	0.60	0.00	0.60	0.21	0.78	0.64	0.66	0.90	0.00	0.64	0.70	0.10
Avail Cap(c_a), veh/h	269	0	435	340	451	383	168	745	608	537	910	773
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.0	0.0	33.6	29.5	37.1	36.0	41.9	26.8	0.0	37.6	18.8	13.1
Incr Delay (d2), s/veh	3.7	0.0	1.8	0.4	6.0	2.4	8.6	16.2	0.0	2.6	4.4	0.3
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	3.6	0.0	5.7	1.2	7.1	4.7	3.0	19.8	0.0	4.5	13.9	1.1
LnGrp Delay(d),s/veh	31.7	0.0	35.4	29.9	43.1	38.4	50.5	43.0	0.0	40.2	23.2	13.3
LnGrp LOS	C		D	C	D	D	D	D		D	C	B
Approach Vol, veh/h		394			504			776			1055	
Approach Delay, s/veh		33.9			39.9			44.0			28.1	
Approach LOS		C			D			D			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	11.4	50.4	7.6	25.6	18.8	43.0	11.0	22.2
Change Period (Y+Rc), s	4.0	5.0	4.0	6.0	5.0	6.0	4.0	6.0
Max Green Setting (Gmax), s	8.0	39.0	7.0	22.0	8.0	37.0	7.0	22.0
Max Q Clear Time (g_c+I1), s	7.4	27.0	4.5	13.1	10.9	34.2	8.8	14.7
Green Ext Time (p_c), s	0.0	3.3	0.0	1.6	0.0	0.8	0.0	1.5

Intersection Summary	
HCM 2010 Ctrl Delay	35.6
HCM 2010 LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

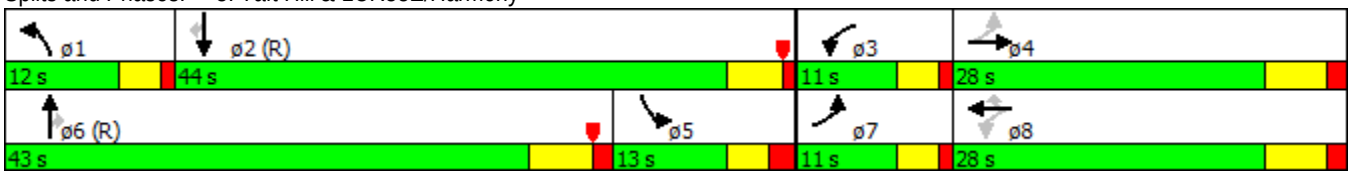
Phase Number	1	2	3	4	5	6	7	8
Movement	NBL	SBT	WBL	EBTL	SBL	NBT	EBL	WBTL
Lead/Lag	Lead	Lag	Lead	Lag	Lag	Lead	Lead	Lag
Lead-Lag Optimize	Yes	Yes			Yes	Yes		
Recall Mode	None	C-Max	None	None	None	C-Max	None	None
Maximum Split (s)	12	44	11	28	13	43	11	28
Maximum Split (%)	12.6%	46.3%	11.6%	29.5%	13.7%	45.3%	11.6%	29.5%
Minimum Split (s)	11	23	10	25	11	26	11	28
Yellow Time (s)	3	4	3	4.5	3	4.5	3	4.5
All-Red Time (s)	1	1	1	1.5	2	1.5	1	1.5
Minimum Initial (s)	5	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)		10		12		13		15
Dual Entry	Yes	Yes	No	Yes	No	Yes	No	Yes
Inhibit Max	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Start Time (s)	9	21	65	76	52	9	65	76
End Time (s)	21	65	76	9	65	52	76	9
Yield/Force Off (s)	17	60	72	3	60	46	72	3
Yield/Force Off 170(s)	17	50	72	86	60	33	72	83
Local Start Time (s)	52	64	13	24	0	52	13	24
Local Yield (s)	60	8	20	46	8	89	20	46
Local Yield 170(s)	60	93	20	34	8	76	20	31

Intersection Summary

Cycle Length	95
Control Type	Actuated-Coordinated
Natural Cycle	90

Offset: 52 (55%), Referenced to phase 2:SBT and 6:NBT, Start of Red

Splits and Phases: 3: Taft Hill & LCR38E/Harmony



Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	532	6	5	262	17	15
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	-	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	626	7	6	308	20	18

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	633	0	795	316
Stage 1	-	-	-	-	629	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	946	-	325	680
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	846	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	946	-	323	680
Mov Cap-2 Maneuver	-	-	-	-	323	-
Stage 1	-	-	-	-	494	-
Stage 2	-	-	-	-	841	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	14.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	428	-	-	946	-
HCM Lane V/C Ratio	0.088	-	-	0.006	-
HCM Control Delay (s)	14.2	-	-	8.8	-
HCM Lane LOS	B	-	-	A	-
HCM 95th %tile Q(veh)	0.3	-	-	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	200		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.998				0.936	
Flt Protected			0.950		0.974	
Satd. Flow (prot)	3532	0	1770	3539	1698	0
Flt Permitted			0.950		0.974	
Satd. Flow (perm)	3532	0	1770	3539	1698	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	541			402	166	
Travel Time (s)	12.3			9.1	3.8	

Intersection Summary

Area Type: Other

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Vol, veh/h	526	18	16	706	11	9
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	-	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	584	20	18	784	12	10

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	604	0	1022	302
Stage 1	-	-	-	-	594	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	970	-	232	694
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	625	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	970	-	228	694
Mov Cap-2 Maneuver	-	-	-	-	228	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	613	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	16.8
HCM LOS			C

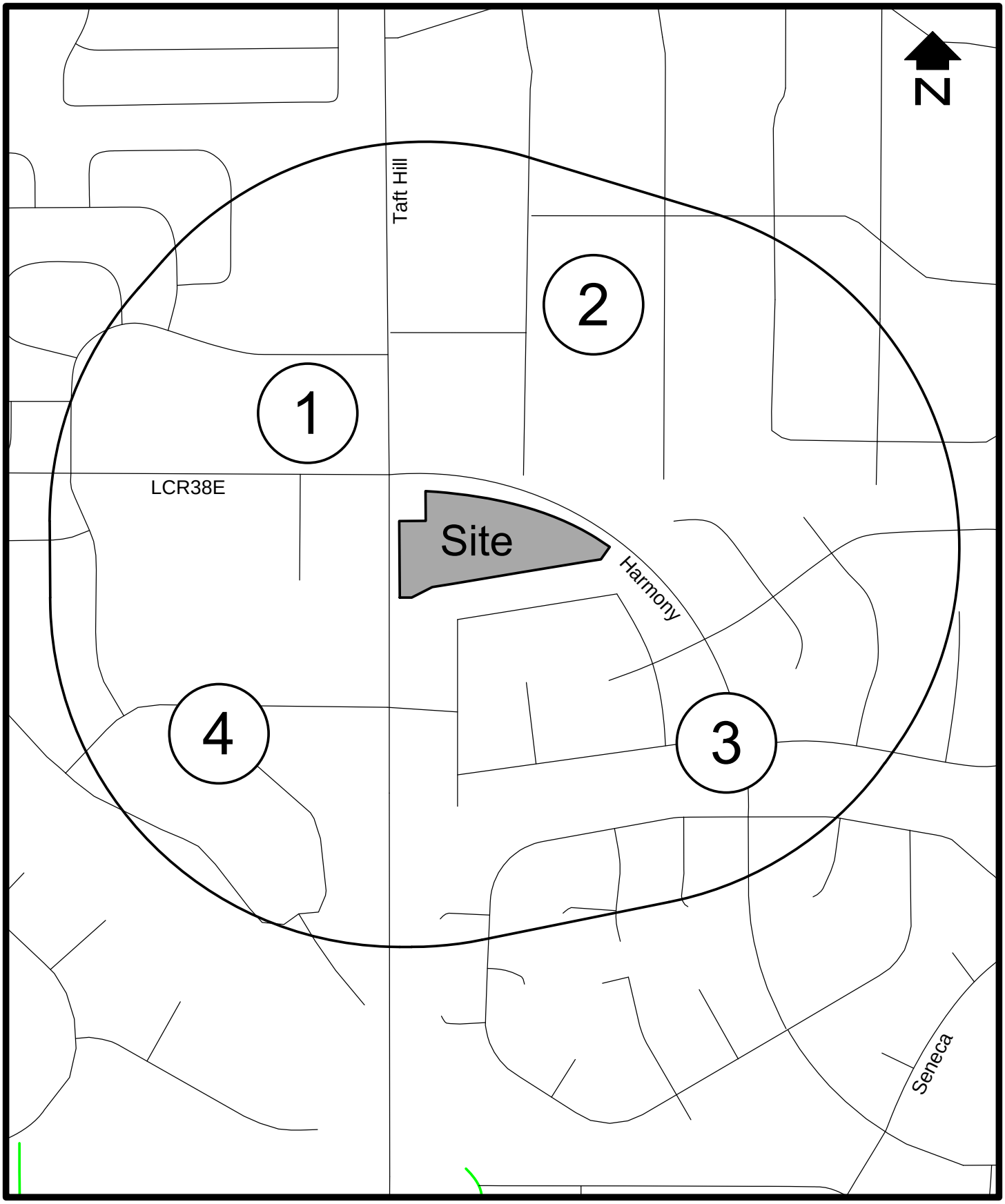
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	327	-	-	970	-
HCM Lane V/C Ratio	0.068	-	-	0.018	-
HCM Control Delay (s)	16.8	-	-	8.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

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	200		0	0
Storage Lanes		0	1		1	0
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.995				0.939	
Flt Protected			0.950		0.973	
Satd. Flow (prot)	3522	0	1770	3539	1702	0
Flt Permitted			0.950		0.973	
Satd. Flow (perm)	3522	0	1770	3539	1702	0
Link Speed (mph)	30			30	30	
Link Distance (ft)	541			402	166	
Travel Time (s)	12.3			9.1	3.8	

Intersection Summary

Area Type: Other

APPENDIX F



SCALE: 1"=500'

PEDESTRIAN INFLUENCE AREA

Pedestrian LOS Worksheet

Project Location Classification: All Other Areas

	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 uses to the northwest of the site	Commercial	Minimum	C	C	C	C	C
			Actual	A	B	B	C	B
			Proposed	A	B	B	C	B
2	Neighborhood to the north of the site	Residential	Minimum	C	C	C	C	C
			Actual	A	D	B	C	C
			Proposed	A	D	B	C	C
3	Neighborhood to the south and southeast of the site	Residential	Minimum	C	C	C	C	C
			Actual	A	B	B	B	B
			Proposed	A	B	B	B	B
4	Neighborhood to the southwest of the site	Residential	Minimum	C	C	C	C	C
			Actual	B	D	B	C	C
			Proposed	B	D	B	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					

November 30, 2015

EARTH ENGINEERING CONSULTANTS, LLC

Habitat for Humanity
c/o JB Consulting Services
1619 Streamside Drive
Fort Collins, Colorado 80525

Attn: Mr. John Barberio (johnb@jbconsultingservices.com)

Re: Geotechnical Exploration Report
Habitat for Humanity
West Harmony Road and South Taft Hill Road
Fort Collins, Colorado
EEC Project No. 1152114

Mr. Barberio:

Earth Engineering Consultants, LLC (EEC) personnel have completed the supplemental geotechnical exploration for the proposed Habitat for Humanity project at the southeast corner of West Harmony Road and South Taft Hill Road in Fort Collins. A geotechnical exploration on this property was completed by others in 2005. The supplemental exploration was completed to help evaluate current conditions at the site to provide updated recommendations considering current site conditions and current codes and standards. The subsurface exploration completed as a part of the 2005 exploration on this property was evaluated and considered when developing the recommendations contained in this report.

We understand this project involves development of approximately 21 duplex buildings on the referenced parcel for Habitat for Humanity. The new buildings are expected to be single story or two-story wood-framed structures, a portion of which may include basements. We anticipate maximum wall and column loads be on the order of 2½ kips per lineal foot and 50 kips, respectively. Small grade changes are expected to develop the site grades. On-site paved drive and parking areas will be constructed as a part of this project. The site layout for the proposed development is indicated on the attached boring location diagram.

As a part of the 2005 geotechnical exploration, nine (9) soil borings were completed on this property extending to depths ranging from approximately 10 to 25 feet below current site grades. To develop supplemental, current geotechnical data, four (4) additional borings were advanced to depths of approximately 15 feet below present site grades. The locations of the previously

completed and currently completed exploration borings are indicated on the attached boring location diagram. The locations of those borings should be considered accurate only to the degree implied by the methods used to make the field measurements.

To develop additional information on groundwater levels, field slotted PVC piezometers were installed at the four (4) boring locations completed as a part of the current exploration. Those temporary piezometers were monitored for an approximate 2-week period after installation. Results of the field monitoring are indicated on the upper right hand corner of the boring logs.

Moisture content tests and visual/tactual evaluation of recovered samples was completed in the laboratory as a part of the geotechnical evaluation. Dry density tests were completed on selected samples and the unconfined strength of appropriate samples was estimated using a calibrated hand penetrometer. Swell/consolidation tests were completed on selected samples to evaluate the soils' tendency to change volume with variation in moisture content and load. Results of the outlined tests are indicated on the attached boring logs and summary sheets.

Based on results of the field borings and laboratory testing, subsurface conditions can be generalized as follows. Sparse vegetation and/or topsoil was observed at ground surface at the boring locations. The vegetation/topsoil in borings P-1, P-2 and P-3 were underlain by brown to reddish brown sandy lean clay. The sandy lean clay in boring P-3 transitioned to clayey sand at a depth of approximately 4 feet and in boring P-2 to sands and gravels at a depth of approximately 12 feet. Sand and gravel was encountered beneath the vegetation/topsoil in boring P-4 extending to a depth of approximately 10 feet. Claystone, siltstone bedrock was encountered beneath the overburden soils in borings P-1, P-3 and P-4 at depths ranging from approximately 9½ to 14½ feet. The overburden lean clay soils showed low to moderate plasticity and low to moderate swell potential with the underlying claystone, siltstone bedrock exhibiting high plasticity and high swell. Test borings were terminated at depths of approximately 15 feet below present site grades in claystone bedrock (borings P-1, P-3 and P4) or sands and gravel (boring P-2).

Groundwater observations were completed at the time of drilling and in the field slotted PVC piezometers for approximately 2 weeks after installation. No free water was observed in the test borings at the time of completion or in the field piezometers during the monitoring period.

Zones of perched and/or trapped water may be encountered at times throughout the year in more permeable zones in the subgrade soils. Perched groundwater is commonly encountered in soils overlying less permeable weathered bedrock. Fluctuations in the location and amount of perched water can also vary over time depending on variations in hydrologic conditions and other conditions not apparent at the time of this report.

ANALYSIS AND RECOMMENDATIONS

General Observations

The near surface cohesive soils show low to moderate plasticity and low to moderate swell potential at current moisture and density conditions. Those conditions are somewhat variable across the site. To reduce the potential for post-construction heaving of site improvements, moderately expansive soils in building and pavement areas should be removed, moisture conditioned and replaced as controlled fill. The depth of the overexcavations could vary across the site depending on the expansion potential of the subgrade soils and on acceptable movement in floor slabs and pavement areas.

The underlying claystone bedrock also shows moderate to high swell potential and moderate to high plasticity. As such, care should be taken to maintain separation from the bedrock for any below grade areas to reduce potential for post-construction heaving of foundations and/or floor slabs. In general, a separation of 4 feet from the bedrock surface should be maintained for footings and floor slabs.

Site Preparation

All existing vegetation and/or topsoil should be removed from site improvement areas. In addition, any moderately expansive cohesive soils should also be removed. The site cohesive soils could be reused as fill in the improvement areas although care will be necessary to see that acceptable moisture contents are maintained in the subgrade soils prior to completion of the overlying improvements to maintain low swell potential for foundation, floor slab and pavement support.

After stripping and removing all moderately expansive materials and prior to placement of any fill, floor slab or pavements, we recommend the in-place soils be scarified to a minimum depth of 9 inches, adjusted in moisture content and compacted to at least 95% of the material's standard Proctor maximum dry density as determined in accordance ASTM Specification D698. The moisture content of the scarified material should be adjusted to within the range of ±2% of standard Proctor optimum moisture at the time of compaction.

Fill soils required to develop the site subgrades should consist of approved, low volume change materials which are free from organic matter and debris. We believe the site materials could be used for general site fill although care will be necessary to maintain the moisture in the subgrade soils to reduce potential for post-construction movement/heaving of the overlying improvements. Site cohesive materials should be placed in loose lifts not to exceed 9 inches thick, adjusted in moisture content as recommended for the scarified soils and compacted to be at least 95% of standard Proctor maximum dry density.

Care should be taken after placement of fill materials to avoid disturbing the in-place materials and to prevent wetting and drying of those materials. Soils which are disturbed by the construction activities or materials which become wet and unstable or dry and desiccated should be removed and replaced or reworked in place prior to placement of the overlying improvements.

Foundations

Based on materials observed at the boring locations, in our opinion, the site structures could be supported on conventional footing foundations bearing in the natural stiff to very stiff sandy lean clay soils or medium dense granular soils. For design of footing foundations bearing on suitable stiff to very stiff low volume change natural lean clays or medium dense granular to essentially granular soils, we recommend using a net allowable total load soil bearing pressure not to exceed 1,500 psf. The net bearing pressure refers to the pressure at foundation bearing level in excess of the minimum surrounding overburden pressure. A minimum dead load pressure would not be required in the low volume change cohesive soils or essentially non-volume change granular soils.

Exterior foundations and foundations in unheated areas should be located at least 30 inches below adjacent exterior grades to provide frost protection. Footing foundations should maintain a separation of at least 4 feet from the underlying claystone bedrock. We recommend formed continuous footings have a minimum width of 16 inches and isolated column foundations have a minimum width of 30 inches.

Care should be taken at the time of construction to see that footing foundations are supported on suitable strength natural soils. Soils which are loosened or disturbed by the construction activities or materials which become dry and desiccated or wet and softened should be removed and replaced with acceptable backfill soils prior to construction of the footing foundations.

We estimate the long-term settlement of footing foundations designed and constructed as outlined above would be less than 1 inch.

Floor Slabs

Floor slab subgrades should be prepared as outlined above for site preparation. Care should be taken after preparation of the floor slab subgrades to prevent wetting or drying of the prepared materials. Cohesive subgrade soils which are allowed to become dry and desiccated can result in increased swell potential and heaving of floor slabs supported on those materials. Care should also be taken to avoid disturbing the in-place subgrade materials and to prevent wetting or drying of the subgrades.

Below Grade Areas

We recommend a perimeter drain system be installed around all below grade areas to intercept surface infiltration and prevent surface infiltration water from entering the below grade areas. In general a perimeter drain system would consist of perforated metal or plastic pipe placed around the exterior perimeter of the below grade area and sloped to drain to a sump area where it can be removed without reverse flow into the system. The drain line should be surrounded by an appropriate/granular filter material to prevent fines from entering the system.

Below grade walls would be subject to lateral earth pressures. We recommend using an at-rest lateral earth pressure for design of the below grade walls which are restrained from movement. For backfill soils consisting of the site cohesive materials, we recommend using an equivalent fluid pressure of 60 pounds pcf assuming positive drainage to prevent development of hydrostatic loads on below grade walls. Surcharge loads, point loads, or hydrostatic loads would be an addition to the recommended equivalent fluid pressure. The outlined equivalent fluid pressure does not include a factor of safety nor an allowance for hydrostatic loads.

Seismic

The site subgrades are variable with layered cohesive and granular soils overlying claystone bedrock. The depth to the bedrock is variable. Based on the 2012 International Building Code, we recommend a Site Classification of D be used for seismic design.

Site Pavements

We anticipate site pavements be private paved drives with low volumes of predominately light traffic. However, some truck traffic, including weekly trash pick-up would be anticipated to utilize the site pavements.

Subgrades for the pavements should be prepared as outlined in the *Site Preparation* section of this report. Cohesive subgrade soils at elevated moisture contents can result in instability/pumping of the subgrades. If instability is noted in the pavement subgrades at the time of paving, consideration could be given to stabilizing the subgrades with the addition of Class C fly ash. Structural credit for a fly ash subgrade could be considered in design of the pavement sections, although with the minimum pavement design proposed, the use of a stabilized subgrade would not reduce the overlying pavement sections.

We recommend pavement sections consist of at least 4 inches of hot bituminous pavement (HBP) overlying 6 inches of aggregate base coarse (ABC). As an alternative, a section of 5½ inches Portland cement concrete could also be used. In the turnaround area at the west end of the site, thicker pavement sections would be appropriate and we suggest consideration be given to

Portland cement concrete in this area to help resist degradation from any trash truck traffic. Pavements should be designed in accordance with Larimer County Urban Area Street Standards.

Other Considerations

Positive drainage should be developed across and away from the pavements and away from the residences to prevent wetting of the subgrade and varying materials. If subgrade of varying materials become wetted subsequent to construction, it can result in premature failure of the overlying improvements. We recommend at least 1 inch per foot for the first 10 feet away from the structures in landscape areas although flatter slopes with positive drainage could be used in hardscape areas.

GENERAL COMMENTS

The analysis and recommendations presented in this report are based upon the data obtained from the soil borings performed at the indicated locations and from any other information discussed in this report. This report does not reflect any variations, which may occur between borings or across the site. The nature and extent of such variations may not become evident until construction. If variations appear evident, it will be necessary to re-evaluate the recommendations of this report.

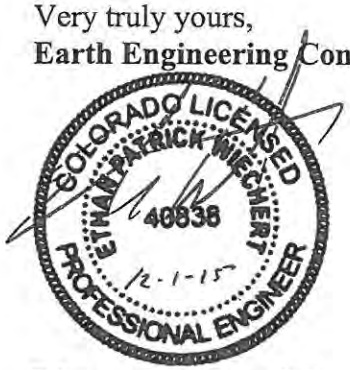
It is recommended that the geotechnical engineer be retained to review the plans and specifications so comments can be made regarding the interpretation and implementation of our geotechnical recommendations in the design and specifications. It is further recommended that the geotechnical engineer be retained for testing and observations during earthwork phases to help determine that the design requirements are fulfilled.

This report has been prepared for the exclusive use of Habitat for Humanity c/o JB Consulting Services for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranty, expressed or implied, is made. In the event that any changes in the nature, design, or location of the project as outlined in this report are planned, the conclusions and recommendations contained in this report shall not

be considered valid unless the changes are reviewed and the conclusions of this report are modified or verified in writing by the geotechnical engineer.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we can be of further service to you in any other way, please do not hesitate to contact us.

Very truly yours,
Earth Engineering Consultants, LLC



Ethan P. Wiechert, P.E.
Senior Project Engineer

Reviewed by: Lester L. Litton, P.E.
Principal Engineer

DRILLING AND EXPLORATION

DRILLING & SAMPLING SYMBOLS:

SS: Split Spoon - 13/8" I.D., 2" O.D., unless otherwise noted
ST: Thin-Walled Tube - 2" O.D., unless otherwise noted
R: Ring Barrel Sampler - 2.42" I.D., 3" O.D. unless otherwise noted
PA: Power Auger
HA: Hand Auger
DB: Diamond Bit = 4", N, B
AS: Auger Sample
HS: Hollow Stem Auger
PS: Piston Sample
WS: Wash Sample
FT: Fish Tail Bit
RB: Rock Bit
BS: Bulk Sample
PM: Pressure Meter
WB: Wash Bore

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. split spoon, except where noted.

WATER LEVEL MEASUREMENT SYMBOLS:

WL : Water Level
WCI: Wet Cave in
DCI: Dry Cave in
AB : After Boring
WS : While Sampling
WD : While Drilling
BCR: Before Casing Removal
ACR: After Casting Removal

Water levels indicated on the boring logs are the levels measured in the borings at the time indicated. In pervious soils, the indicated levels may reflect the location of ground water. In low permeability soils, the accurate determination of ground water levels is not possible with only short term observations.

DESCRIPTIVE SOIL CLASSIFICATION

Soil Classification is based on the Unified Soil Classification system and the ASTM Designations D-2488. Coarse Grained Soils have move than 50% of their dry weight retained on a #200 sieve; they are described as: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are 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 relative in-place density and fine grained soils on the basis of their consistency. Example: Lean clay with sand, trace gravel, stiff (CL); silty sand, trace gravel, medium dense (SM).

CONSISTENCY OF FINE-GRAINED SOILS

Unconfined Compressive Strength, Qu, psf	Consistency
< 500	Very Soft
500 - 1,000	Soft
1,001 - 2,000	Medium
2,001 - 4,000	Stiff
4,001 - 8,000	Very Stiff
8,001 - 16,000	Very Hard

RELATIVE DENSITY OF COARSE-GRAINED SOILS:

N-Blows/ft	Relative Density
0-3	Very Loose
4-9	Loose
10-29	Medium Dense
30-49	Dense
50-80	Very Dense
80 +	Extremely Dense

PHYSICAL PROPERTIES OF BEDROCK

DEGREE OF WEATHERING:

Slight	Slight decomposition of parent material on joints. May be color change.
Moderate	Some decomposition and color change throughout.
High	Rock highly decomposed, may be extremely broken.

HARDNESS AND DEGREE OF CEMENTATION:

Limestone and Dolomite:

Hard	Difficult to scratch with knife.
Moderately Hard	Can be scratched easily with knife.
Hard	Cannot be scratched with fingernail.
Soft	Can be scratched with fingernail.

Shale, Siltstone and Claystone:

Hard	Can be scratched easily with knife, cannot be scratched with fingernail.
Moderately Hard	Can be scratched with fingernail.
Soft	Can be easily dented but not molded with fingers.

Sandstone and Conglomerate:

Well Cemented	Capable of scratching a knife blade.
Cemented	Can be scratched with knife.
Poorly Cemented	Can be broken apart easily with fingers.

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests					Soil Classification: Group Symbol	Soil Classification: Group Name
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	$Cu \geq 4$ and $1 < Cc \leq 3$ [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	Fines classify as ML or MH		GM	Silty gravel [G,H]
			Fines Classify as CL or CH		GC	Clayey Gravel [F,G,H]
	Sands 50% or more coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines	$Cu \geq 6$ and $1 < Cc \leq 3$ [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	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		CL	Lean clay [K,L,M]
			PI<4 or plots below "A" Line		ML	Silt [K,L,M]
		organic	Liquid Limit - oven dried / Liquid Limit - not dried	<0.75	OL	Organic clay [K,L,M,N] / 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 / Liquid Limit - not dried	<0.75	OH	Organic clay [K,L,M,P] / Organic silt [K,L,M,O]
Highly organic soils		Primarily organic matter, dark in color, and organic odor			PT	Peat

[A]Based on the material passing the 3-in. (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 required 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] $Cu = D_{60}/D_{10}$ $Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}}$

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

[G]If fines classify as CL-ML, use dual symbol GC-CM, 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 plots 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.

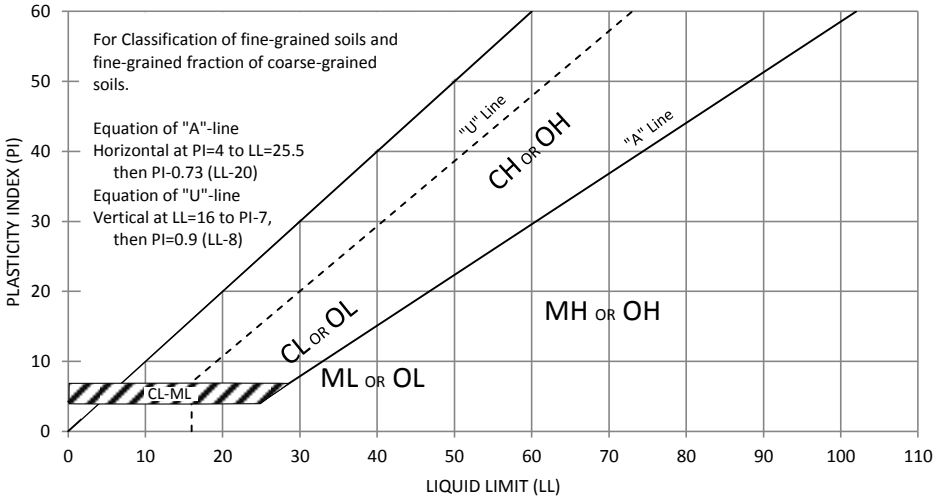
[M]If soil contains ≥30% plus No. 200 predominantly gravel, add "gravelly" to group name.

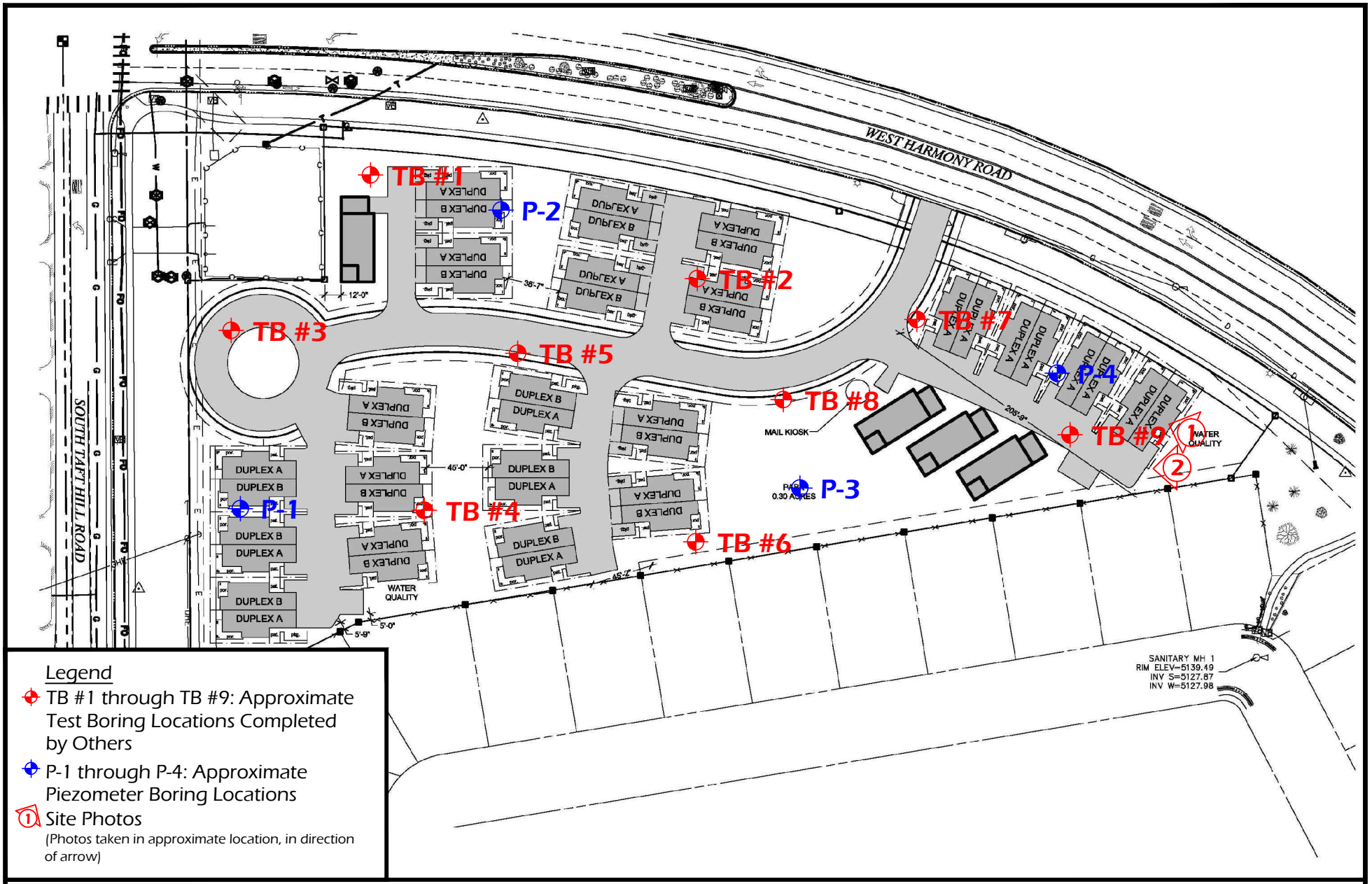
[N]PI≥4 and plots on or above "A" line.

[O]PI≤4 or plots below "A" line.

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

[Q]PI plots below "A" line.





Boring Location Diagram
Habitat for Humanity - Ft Collins, Colorado
EEC Project Number: 1152114
November 2015

EARTH ENGINEERING CONSULTANTS, LLC

HABITAT FOR HUMANITY
FORT COLLINS, COLORADO
EEC PROJECT NO. 1152114
NOVEMBER 2015

HABITAT FOR HUMANITY - HARMONY & TAFT

FORT COLLINS, COLORADO

PROJECT NO: 1152114	**LOG OF BORING P-1 (PIEZOMETER)**		**DATE: NOVEMBER 2015**
RIG TYPE: CME55	*SHEET 1 OF 1*		**WATER DEPTH**
FOREMAN: DG	**START DATE**	**11/11/2015**	**WHILE DRILLING** **None**
AUGER TYPE: 4" CFA	**FINISH DATE**	**11/11/2015**	**AFTER DRILLING** **N/A**
SPT HAMMER: AUTOMATIC	**SURFACE ELEV**	**N/A**	**24 HOUR** **None**

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
SPARSE VEGETATION		1									
SANDY LEAN CLAY (CL)		2									
brown / red											
stiff to very stiff											% @ 150 psf
with calcareous deposits	CS	3	**22**	**9000+**	**15.2**	**104.9**	**39**	**17**	**54.3**	**1200 psf**	**1.2%**
		4									
	SS	**5**	**18**	**7000**	**7.8**						
		6									
		7									
		8									
cemented zone		9									
	CS	**10**	**35**	**9000+**	**7.8**	**127.7**	**31**	**19**	**67.6**	**>8000 psf**	**14.0%**
CLAYSTONE / SILTSTONE		11									
brown / grey / rust											
with calcareous deposits		12									
		13									
		14									
	SS	**15**	**50**	**9000+**	**15.0**						
BOTTOM OF BORING DEPTH 15.5'		16									
		17									
		18									
		19									
		20									
		21									
		22									
		23									
		24									
		25									

Earth Engineering Consultants, LLC

HABITAT FOR HUMANITY - HARMONY & TAFT

FORT COLLINS, COLORADO

PROJECT NO: 1152114	**LOG OF BORING P-2 (PIEZOMETER)**		**DATE: NOVEMBER 2015**
RIG TYPE: CME55	*SHEET 1 OF 1*		**WATER DEPTH**
FOREMAN: DG	**START DATE**	**11/11/2015**	**WHILE DRILLING** **None**
AUGER TYPE: 4" CFA	**FINISH DATE**	**11/11/2015**	**AFTER DRILLING** **N/A**
SPT HAMMER: AUTOMATIC	**SURFACE ELEV**	**N/A**	**24 HOUR** **None**

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
SANDY LEAN CLAY (CL) brown / red very stiff to stiff with traces of gravel		1 2 3 4									
	CS	**5**	**16**	**9000+**	**7.5**	**112.6**	**29**	**14**	**28.4**	**<500 psf**	**None**
		6 7 8 9									
red with calcareous deposits	SS	**10**	**11**	**2000**	**18.0**						
		11 12									
SAND & GRAVEL (SP/GP) red medium dense		13 14									
	CS	**15**	**32**	**--**	**3.4**	**122.2**					
BOTTOM OF BORING DEPTH 15.0'		16 17 18 19 **20** 21 22 23 24 **25**									

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HABITAT FOR HUMANITY - HARMONY & TAFT

FORT COLLINS, COLORADO

PROJECT NO: 1152114	**LOG OF BORING P-3 (PIEZOMETER)**		**DATE: NOVEMBER 2015**
RIG TYPE: CME55	*SHEET 1 OF 1*		**WATER DEPTH**
FOREMAN: DG	**START DATE**	**11/11/2015**	**WHILE DRILLING** **None**
AUGER TYPE: 4" CFA	**FINISH DATE**	**11/11/2015**	**AFTER DRILLING** **N/A**
SPT HAMMER: AUTOMATIC	**SURFACE ELEV**	**N/A**	**24 HOUR** **None**

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
SPARSE VEGETATION		1									
SANDY LEAN CLAY (CL)		2									
brown											
very stiff											% @ 150 psf
with traces of gravel	CS	3	**36**	**9000+**	**5.9**	**127.8**	**28**	**15**	**53.1**	**1300 psf**	**3.2%**
		4									
	SS	**5**	**18**	**9000+**	**7.0**						
CLAYEY SAND (SC)		6									
brown / red											
medium dense to dense		7									
		8									
cemented zone		9									
red, with gravel											
	CS	**10**	**45**	**9000**	**2.1**	**131.5**					
		11									
		12									
		13									
		14									
CLAYSTONE / SILTSTONE	SS	**15**	**35/8"**	**9000+**	**15.6**						
brown / grey / rust											
BOTTOM OF BORING DEPTH 15.5'		16									
		17									
		18									
		19									
		20									
		21									
		22									
		23									
		24									
		25									

Earth Engineering Consultants, LLC

HABITAT FOR HUMANITY - HARMONY & TAFT

FORT COLLINS, COLORADO

PROJECT NO: 1152114	**LOG OF BORING P-4 (PIEZOMETER)**		**DATE: NOVEMBER 2015**
RIG TYPE: CME55	*SHEET 1 OF 1*		**WATER DEPTH**
FOREMAN: DG	**START DATE**	**11/11/2015**	**WHILE DRILLING** **None**
AUGER TYPE: 4" CFA	**FINISH DATE**	**11/11/2015**	**AFTER DRILLING** **N/A**
SPT HAMMER: AUTOMATIC	**SURFACE ELEV**	**N/A**	**24 HOUR** **None**

SOIL DESCRIPTION	TYPE	D (FEET)	N (BLOWS/FT)	QU (PSF)	MC (%)	DD (PCF)	A-LIMITS LL	A-LIMITS PI	-200 (%)	SWELL PRESSURE	SWELL % @ 500 PSF
SPARSE VEGETATION		1									
SAND & GRAVEL (SP/GP)		2									
brown / red		3									
medium dense		4									
	CS	**5**	**14**	**--**	**2.8**		**28**	**14**	**14.1**		
		6									
		7									
		8									
		9									
CLAYEY SAND & GRAVEL (SC), brown / red	SS	**10**	**38/10"**	**9000+**	**13.8**						
CLAYSTONE		11									
brown / grey / rust		12									
		13									
		14									
	CS	**15**	**50/5"**	**9000+**	**12.1**	**123.4**					
BOTTOM OF BORING DEPTH 15.0'		16									
		17									
		18									
		19									
		20									
		21									
		22									
		23									
		24									
		25									

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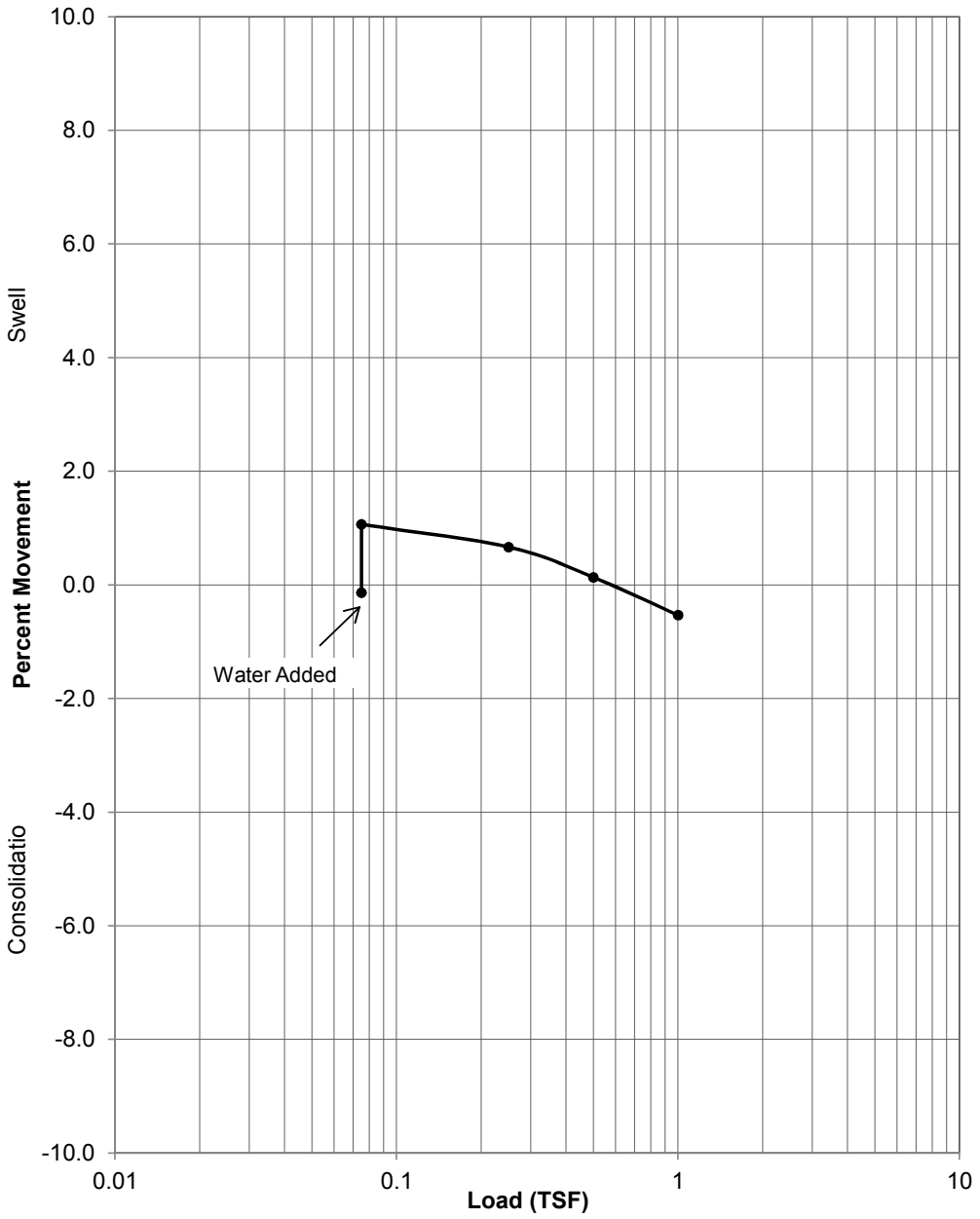
SWELL / CONSOLIDATION TEST RESULTS

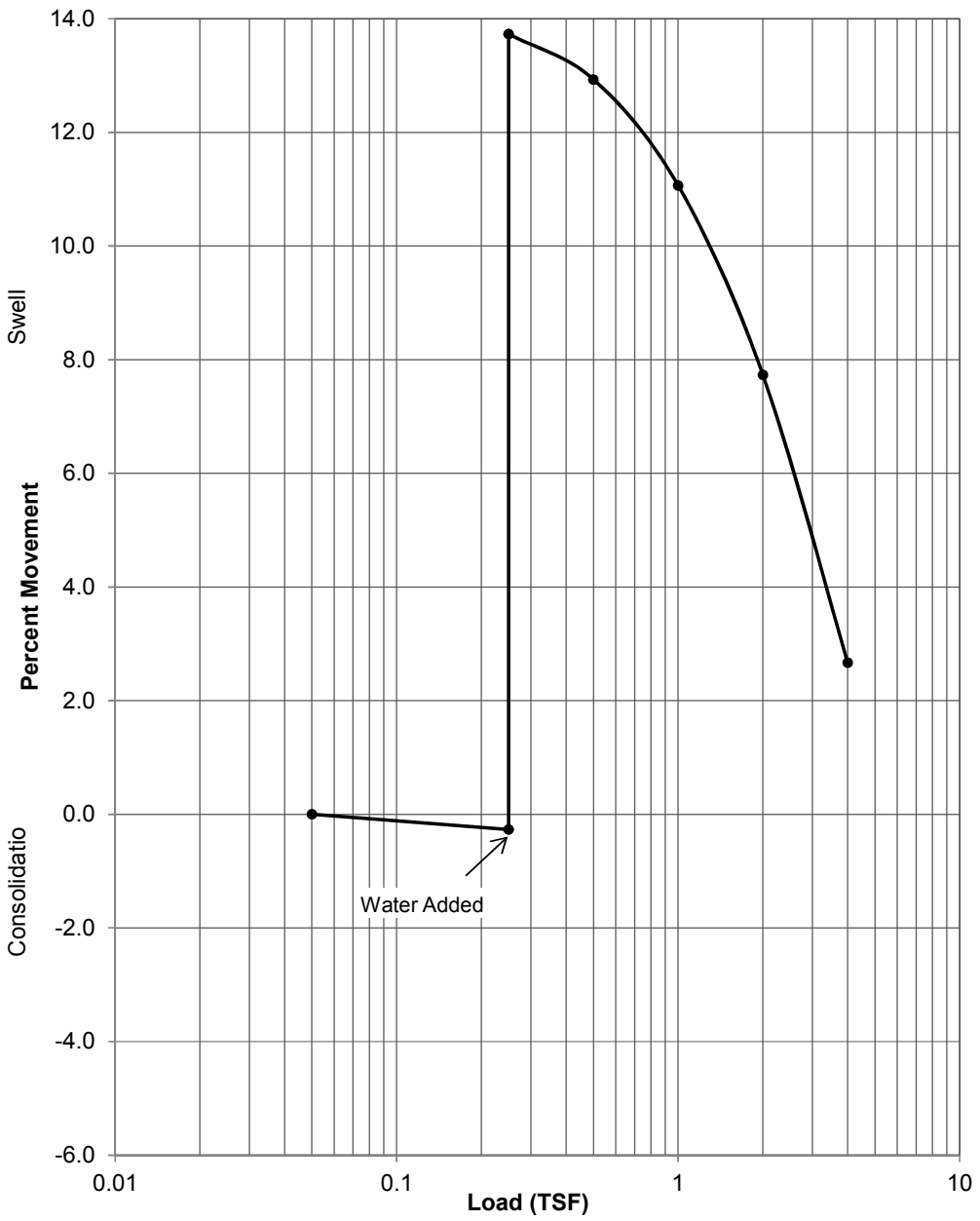
Material Description:	Brown / Red Sandy Lean Clay (CL)	
Sample Location:	Boring 1, Sample 1, Depth 2'	
Liquid Limit: 39	Plasticity Index: 17	% Passing #200: 54.3%
Beginning Moisture: 15.2%	Dry Density: 101.3 pcf	Ending Moisture: 25.5%
Swell Pressure: 1200 psf	% Swell @ 150: 1.2%	



Project: Habitat for Humanity - Harmony & Taft
Location: Fort Collins, Colorado
Project #: 1152114
Date: November 2015

SWELL / CONSOLIDATION TEST RESULTS

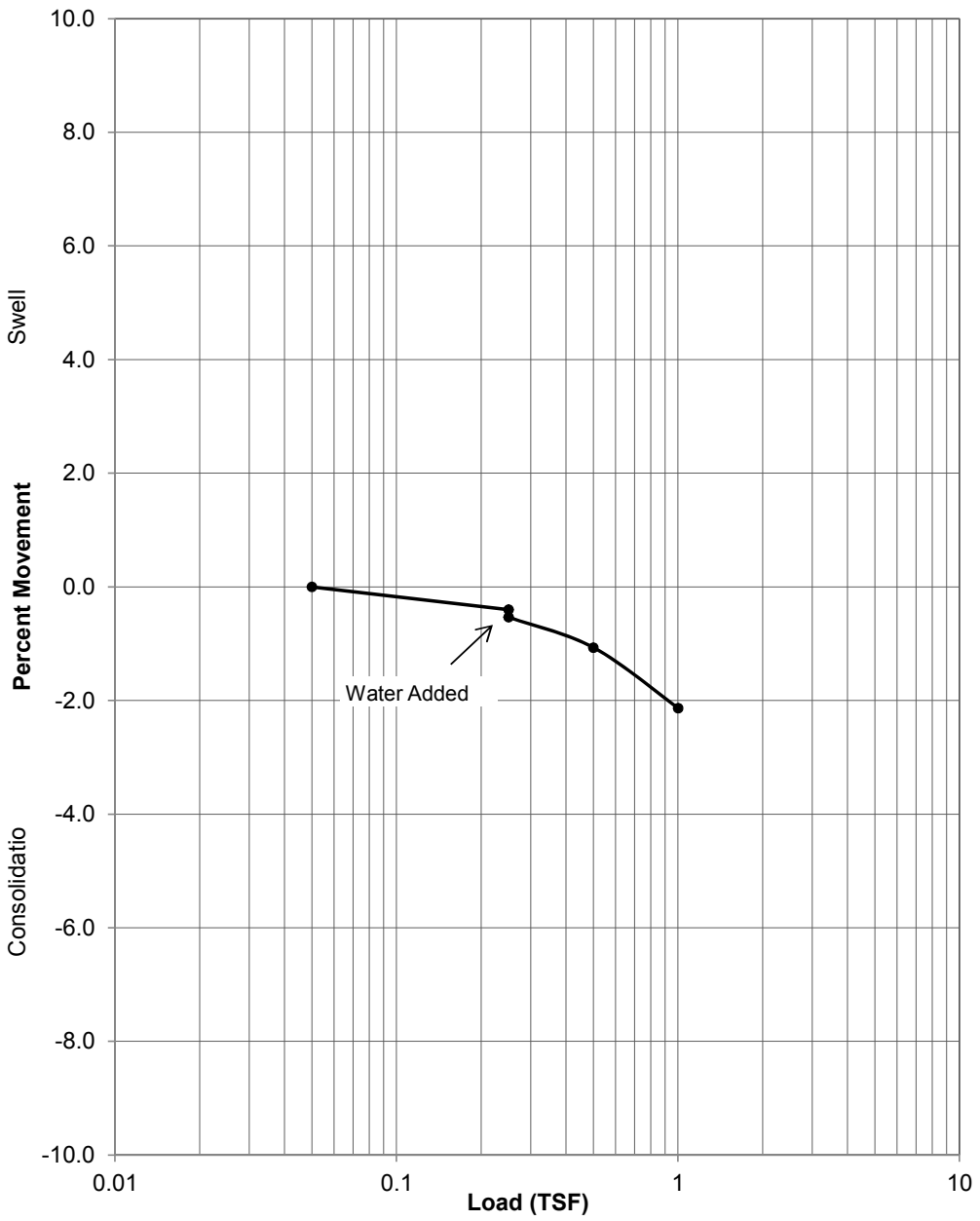
Material Description:	Brown/Grey/Rust Claystone/Siltstone	
Sample Location:	Boring 1, Sample 3, Depth 9'	
Liquid Limit: 31	Plasticity Index: 19	% Passing #200: 67.6%
Beginning Moisture: 7.8%	Dry Density: 132 pcf	Ending Moisture: 17.6%
Swell Pressure: >8,000 psf	% Swell @ 500: 14.0%	



Project: Habitat for Humanity - Harmony & Taft
Location: Fort Collins, Colorado
Project #: 1152114
Date: November 2015

SWELL / CONSOLIDATION TEST RESULTS

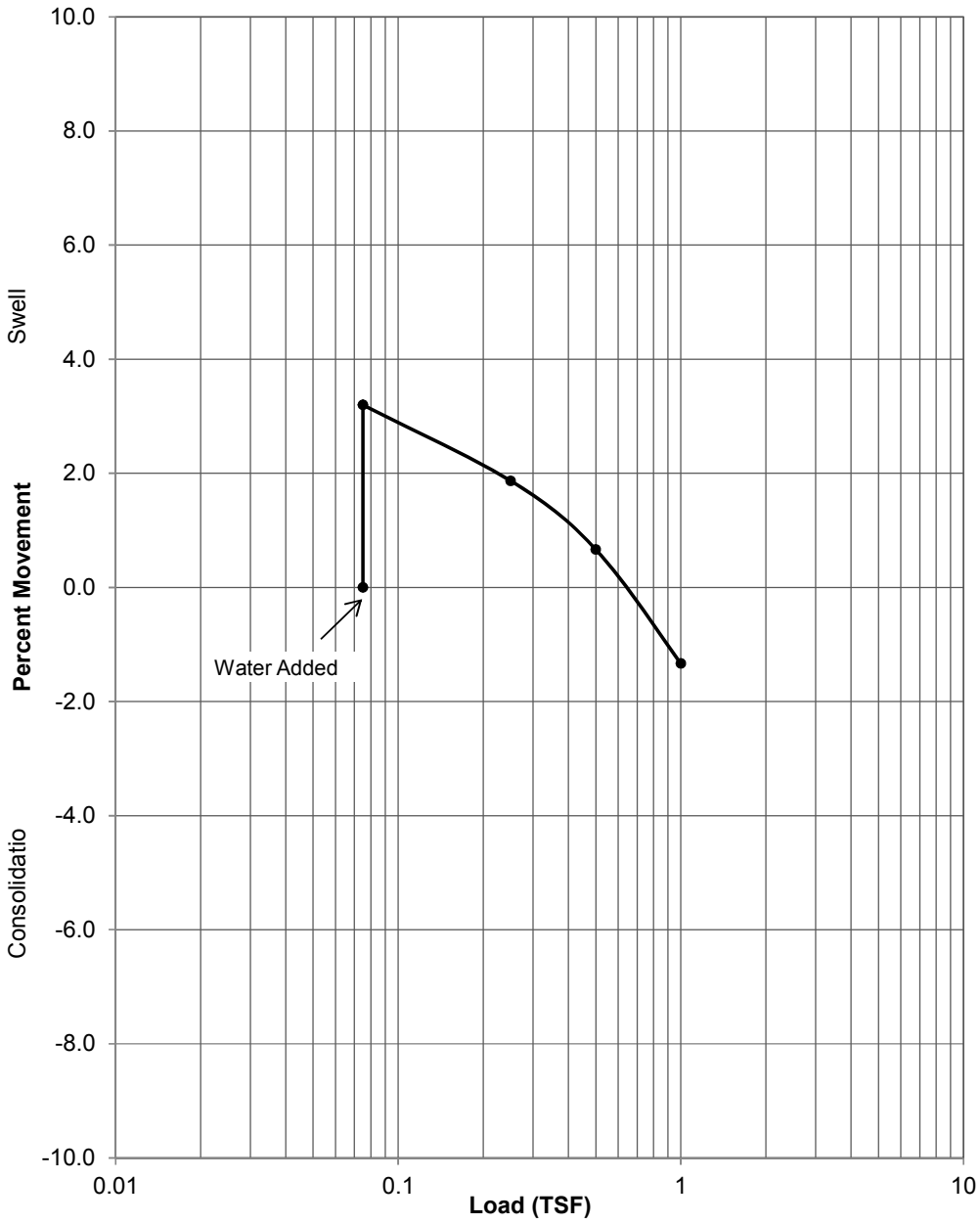
Material Description:	Brown / Red Sandy Lean Clay (CL)		
Sample Location:	Boring 2, Sample 1, Depth 4'		
Liquid Limit: 29	Plasticity Index: 14	% Passing #200: 28.4%	
Beginning Moisture: 7.5%	Dry Density: 123.3 pcf	Ending Moisture: 13.5%	
Swell Pressure: <500 psf	% Swell @ 500:	None	



Project: Habitat for Humanity - Harmony & Taft
Location: Fort Collins, Colorado
Project #: 1152114
Date: November 2015

SWELL / CONSOLIDATION TEST RESULTS

Material Description: Brown Sandy Lean Clay (CL)		
Sample Location: Boring 3, Sample 1, Depth 2'		
Liquid Limit: 28	Plasticity Index: 15	% Passing #200: 53.1%
Beginning Moisture: 5.9%	Dry Density: 124.8 pcf	Ending Moisture: 13.6%
Swell Pressure: 1300 psf	% Swell @ 150: 3.2%	



Project: Habitat for Humanity - Harmony & Taft
Location: Fort Collins, Colorado
Project #: 1152114
Date: November 2015

PRELIMINARY DRAINAGE REPORT

Harmony Cottages

Prepared for:

Habitat for Humanity
4001 S. Taft Hill Road
Fort Collins, CO 80525
(970) 223-4522

Prepared by:

Interwest Consulting Group
1218 West Ash, Suite A
Windsor, Colorado 80550
(970) 674-3300

January 20, 2016

Job Number 1255-028-00

January 20, 2016

Ms. Heather McDowell
City of Fort Collins Stormwater
700 Wood Street
Fort Collins, CO 80522-0580

RE: Preliminary Drainage Report for Harmony Cottages

Dear Heather,

I am pleased to submit for your review and approval, this Preliminary Drainage Report for the Harmony Cottages development. I certify that this report for the drainage design was prepared in accordance with the criteria in the City of Fort Collins Storm Drainage Manual.

I appreciate your time and consideration in reviewing this submittal. Please call if you have any questions.

Sincerely,

Erika Schneider, P.E.
Colorado Professional
Engineer No. 41777

Skylar Brower
Colorado Professional
Engineer No. 44248

TABLE OF CONTENTS

1. GENERAL LOCATION AND DESCRIPTION

1.1 Location

The Harmony Cottages development is located in Fort Collins. It is located in the Southwest ¼ of Section 34, Township 7 North, Range 69 West of the 6th Principal Meridian in the City of Fort Collins, Larimer County, Colorado. Please refer to the vicinity map in Appendix A.

The project site is located in the southeast corner of Harmony Road (County Road 38E) and Taft Hill Road in southwest Fort Collins, Colorado. The site is bounded by Harmony Road on the north and east, Taft Hill Road on the west, and The Overlook at Woodridge Fourth Filing on the south. Adjacent to the northeast corner of the site is a water pump station owned by the Fort Collins-Loveland Water District. The legal description of the site is a replat of Lots 1 and 2, Innovation Island.

1.2 Description of Property

The project is a site development of a Habitat for Humanity neighborhood. The property consists of 4.45 acres of land and lots will be designed for single family and duplex housing units with private drive through aisles and parking areas.

The site currently consists of open space and is sparsely vegetated with native plants and grasses. Offsite flow contributing to the site includes adjacent public street right-of-way and the FCLWD parcel.

The soils in the area are predominately Altan-Satanta loams (86.3%), 0-3 percent slopes (soil number 3), Hydrologic Soil Group B and Fort Collins loam (13.7%), 0-3 percent slopes (soil number 35), Hydrologic Soil Group C as reported in the Soil Survey of Larimer County Area, Colorado.

According to FEMA Panel 08069C1000F there are no mapped FEMA Floodways on this property. Please refer to Appendix G for the NRCS soils report and FEMA information.

1.3 Floodplain Submittal Requirements

Because the project is not within any FEMA or City of Fort Collins mapped floodway, a Floodplain Submittal is not required and a "City of Fort Collins Floodplain Review Checklist for 50% Submittals" has not been included with this report.

2. DRAINAGE BASINS AND SUB-BASINS

2.1 Major Basin Description

The site is located on the upper end of the Mail Creek Drainage Basin. This site is known as sub-basin 89 in the master drainage plan and there are no offsite flows that pass through this site. The impervious area for the site was assumed to be 95% in the master plan. Excerpts from the "Mail Creek Basin Master Drainage Plan Hydrology Technical Appendix" are included in Appendix F of this report.

This site is also included in the "Master Drainage Study for Woodridge" (1991) and the "Final Drainage and Erosion Control Study for the Overlook at Woodridge, Fourth Filing" (1995). In the Final Drainage Report for the Overlook at Woodridge Fourth Filing, this site is known as Basin 1 and 2A. These basins were considered to be neighborhood commercial sites with a C-value of 0.85. Fully developed commercial flows from this site were considered in the stormwater system plan design for the Overlook at Woodridge. Excerpts from the "Final Drainage and Erosion Control Study for the Overlook at Woodridge, Fourth Filing" report are included in Appendix F of this report.

2.2 Sub-basin Description

The southern portion of the site drains to an existing swale which carries stormwater runoff along the south property line to a depression and into a concrete pipe located in Tract A of the Overlook at Woodridge. The remaining portion of the site drains via overland flow to the curb and gutter along Harmony Road and into two existing 15' type R inlets on the south side of Harmony Road. All of the stormwater runoff from the site is conveyed to the existing stormwater conveyance system in Harmony Road which passes to the existing concrete lined drainage channel north of Seneca Drive and then to the existing regional detention pond located adjacent to Webber Middle School.

3. DRAINAGE DESIGN CRITERIA

3.1 Regulations

This report was prepared to meet or exceed the "City of Fort Collins Storm Drainage Design Criteria Manual" specifications. Where applicable, the criteria established in the "Urban Storm Drainage Criteria Manual" (UDFCD), developed by the Denver Regional Council of Governments, has been used.

3.2 Directly Connected Impervious Area (DCIA) Discussion

Urban Drainage and Flood Control District (UDFCD) recommends a Four Step Process for receiving water protection that focuses on reducing runoff volumes, treating the water quality capture volume (WQCV), stabilizing drainageways and implementing long-term source controls. The Four Step Process applies to the management of smaller, frequently occurring events.

Step 1: Employ Runoff Reduction Practices

To reduce runoff peaks, volumes, and pollutant loads from urbanizing areas, implement Low Impact Development (LID) strategies, including Minimizing Directly Connected Impervious Areas (MDCIA).

Runoff for the northern portion of the site will be routed through porous pavement systems and a rain garden reducing runoff from impervious surfaces over permeable areas to slow runoff and increase the time of concentration and promote infiltration. Runoff from the southern portion of the site will be routed through porous pavement systems, a grass swale, and a second rain garden thereby slowing runoff and also promoting infiltration.

Step 2: Implement BMPs that Provide a Water Quality Capture Volume with Slow Release

95% of the proposed impervious area will be routed through an LID facility; therefore, no additional water quality capture volume is proposed with these improvements.

Step 3: Stabilize Drainageways

Natural Drainageways are subject to bed and bank erosion due to increases in frequency, duration, rate and volume of runoff during and following development. Because the site will drain to an existing storm system, bank stabilization is unnecessary with this project.

Step 4: Implement Site Specific and Other Source Control BMPs

Proactively controlling pollutants at their source by preventing pollution rather than removing contaminants once they have entered the stormwater system or receiving waters is important when protecting storm systems and receiving waters. This can be accomplished through site specific needs such as construction site runoff control, post-construction runoff control and pollution prevention / good housekeeping. It will be the responsibility of the contractor to develop a procedural best management practice for the site.

3.3 Development Criteria Reference and Constraints

The runoff from this site has been routed to conform to the requirements of the City Stormwater Department and the Mail Creek Basin Master Drainage Plan. Water quality capture volume will be provided on site. The impervious area for the site was assumed to be 95% in the master plan. The proposed weighted average impervious area for the proposed site is 50% which is less than the master plan.

Fully developed commercial flows from this site were considered in the stormwater system plan design for the Overlook at Woodridge. The correlating basins 1 and 2A were considered to be neighborhood commercial sites with a C-value of 0.85. The proposed weighted average C-value of the proposed site is 0.55 which is less than the original design and therefore, downstream stormwater system will have capacity. Please refer to supporting documentation in Appendix F.

	Correlating Basin ID	**%I**	**C-value**
Master Plan	89	95	-
Woodridge 4th	1, 2A	-	0.85
Site	A, B	50	0.55

Runoff reduction practices (LID techniques) are also required. No less than fifty percent of any newly added impervious area must be treated using one or a combination of LID techniques. The project adds 110,940 sf of new impervious area. Using the porous paver and rain garden LID techniques, 163,604 sf of new impervious area (147%) will be treated which exceeds the 50% requirement. In anticipation of the new LID code which will require 75% of newly added impervious area to be treated by an LID technique, the rain gardens have been sized to treat the entire site with the assumption that the porous pavers are removed. Using the rain garden LID technique, 105,796 sf of new impervious area (95%) will be treated which exceed the 75% requirement.

No less than twenty five percent of any newly added pavement areas must be treated using a permeable pavement technology. The project adds 27,679 sf of new pavement area. This project will incorporate 7,427 sf of porous pavers which is 27% of the newly added pavement which exceeds the required 25%. As previously mentioned, this project is set up to provide the option of removing the porous pavers during final design with the assumption that the newly proposed LID code is implemented by the City.

Please refer to Appendix E for LID calculations and information.

3.4 Hydrologic Criteria

Runoff computations were prepared for the 2- and 10-year minor and 100-year major storm frequency utilizing the rational method.

All hydrologic calculations associated with the basins are included in Appendix B of this report. Standard Form 8 (SF-8) provides time of concentration calculations for all sub-basins. Standard Form 9 (SF-9) provides a summary of the design flows for all Sub-basins and Design Points associated with this site.

3.5 Hydraulic Criteria

All hydraulic calculations will be presented in the final drainage report and prepared in accordance with the City of Fort Collins Drainage Criteria.

3.6 Floodplain Regulations Compliance

The project is not within any FEMA or City of Fort Collins mapped floodway; therefore, Floodplain Regulations Compliance is not required.

3.7 Modifications of Criteria

There are no Modifications of Criteria at this time.

4. DRAINAGE FACILITY DESIGN

4.1 General Concept

The proposed site generally follows the existing drainage patterns and is divided into two major drainage basins. The site will be further divided into more sub-basins during final compliance.

4.2 Specific Details

A summary of the drainage patterns within each basin is provided in the following paragraphs. Please refer to Appendix A for the drainage plan.

Basin A is 1.77 acres and includes the southern portion of the proposed site and a small off-site area adjacent to Taft Hill Road. Stormwater is conveyed via overland flow to the proposed grass swale that runs west to east along the southern property boundary. This south swale discharges into the proposed rain garden in the southeast corner of the property located at design point a. The outlet pipe for the rain garden discharges to the existing storm drain inlet #21 located on the south side of Harmony Road.

Basin B is 2.85 acres and includes the northern portion of the site and offsite area from the FCLWD parcel and area adjacent to Taft Hill Road. This basin is conveyed via overland flow to the porous paver systems and rain garden located at the southwest corner of the intersection of the driveway and Harmony Road. The outlet pipe for the rain garden discharges to the existing 15' Type R inlet #10 located on the south side of Harmony Road.

Basin OS-3 is 0.32 acres and includes the north half of the roofs of 5 lots from the Overlook at Woodridge, P.U.D. Fourth Filing adjacent to basin A. This basin sheet flows to the southern grass swale.

Basin OS-10 is 0.94 acres and includes the south half of the roadway of Harmony Road adjacent to basin B and a small portion of the site adjacent to Harmony Road. This off-site basin will be further divided showing on-site and off-site areas during final compliance. This basin is conveyed via gutter flow to the existing 15' Type R inlet #10 in Harmony Road.

Basin OS-21 is 0.54 acres and includes the south half of the roadway of Harmony Road adjacent to basin A and a small portion of the site adjacent to Harmony Road. This off-site basin will be further divided showing on-site and off-site areas during final compliance. This basin is conveyed via gutter flow to the existing 15' Type R inlet #21 in Harmony Road.

4.3 Stormwater Detention

Developed commercial flows from this site were accounted for in the design of the storm drainage detention pond for the Overlook at Woodridge Fourth Filing (1995). Since the time that the Final Drainage Study for the Overlook was completed, the City of Fort Collins (CFC) has modified their stormwater design criteria to include stormwater quality enhancement requirements and the use of a larger design storm based on a 1998 precipitation study. The peak discharge using the old rainfall data for the site only (4.45 acres) and a C 100-year value of 1.00 was calculated to be 40.1-cfs. The required detention volume under the new rainfall conditions with a release rate set to the peak discharge under the old rainfall conditions and a developed C 100-year value of 0.70 was calculated. The result was a detention requirement of -0.04 ac-ft with a storm duration of 5 minutes. Therefore, adequate stormwater detention is being provided and additional detention is not required based on the increase in the design rainfall rates.

4.4 Water Quality Treatment

Water quality enhancement is being provided for fully developed conditions. Four water quality enhancement measures will be used on this site. 95% of the impervious area on

site will be directed to an LID facility. Therefore, no water quality capture volume is required for this site.

The first water quality enhancement measure is the rain garden in the east corner of the site which is referred to as rain garden A. The rain garden is a depressed landscape area designed to capture and infiltrate the water quality capture volume. This area has an average depth of 12", has a flat bottom and will include landscape plantings in 12" depth of a sand media mixture. Water will be held in the depressed area and slowly drain through the sand media and then hit a 4" perforated pipe in gravel bedding which will discharge ultimately to the existing storm system in Harmony Road. This rain garden will treat 0.02 ac-ft of the water quality capture volume.

The second water quality enhancement measure is the rain garden adjacent to Harmony and the main driveway which is referred to as rain garden B. The rain garden is a depressed landscape area designed to capture and infiltrate the water quality capture volume. This area has an average depth of 12", has a flat bottom and will include landscape plantings in 12" depth of a sand media mixture. Water will be held in the depressed area and slowly drain through the sand media and then hit a 4" perforated pipe in gravel bedding which will discharge ultimately to the existing storm system in Harmony Road. This rain garden will treat 0.04 ac-ft of the water quality capture volume.

The third water quality enhancement measure is the grass swale located along the south property line. The swale has been designed to have a low longitudinal slope in order to convey flow in a slow and shallow manner promoting sedimentation and filtration and limiting erosion. The bottom of the swale is not concrete lined in order to further enhance pollutant removal. The swale will be constructed with a 'soft pan' bottom consisting of a sand/topsoil mix or will be constructed with an underdrain in order to minimize standing water in the swale.

The fourth water quality enhancement measure is the porous pavement systems located throughout the pavement area. These systems allow the movement of water into the layers below the pavement surface where treatment and slow release occurs. These systems also reduce the effective imperviousness of the site.

There is a small portion of the site immediately adjacent to Harmony Road which will not

pass through a water quality feature but will flow directly to the street gutter and into the stormwater system. The majority of this area is landscaped with grass and plantings and only a small amount of impervious area from the sidewalk and roof is included. Since the source of the majority of pollutants in stormwater runoff comes from driveway and parking areas, this small amount of untreated runoff should have a negligible effect on the overall pollutant load. Several off-site areas will be conveyed through the site and treated on-site including the FCLWD parcel and the area adjacent to Taft Hill Road and this property.

5. CONCLUSIONS

5.1 Compliance with Standards

All computations that have been completed within this report are in compliance with the City of Fort Collins Storm Drainage Design Criteria Manual.

5.2 Drainage Concept

The proposed drainage concepts presented in this report and on the construction plans adequately provides for stormwater quantity and quality treatment of proposed impervious areas. Conveyance elements have been designed to pass required flows and to minimize future maintenance.

If, at the time of construction, groundwater is encountered, a Colorado Department of Health Construction Dewatering Permit will be required.

6. REFERENCES

1. City of Fort Collins, "Fort Collins Stormwater Criteria Manual Amendments to the Urban Drainage and Flood Control District Criteria Manual", adopted December 2011.

2. Urban Drainage and Flood Control District, "Urban Storm Drainage Criteria Manual", Volumes 1 and 2, dated June 2001, and Volume 3 dated November 2015.

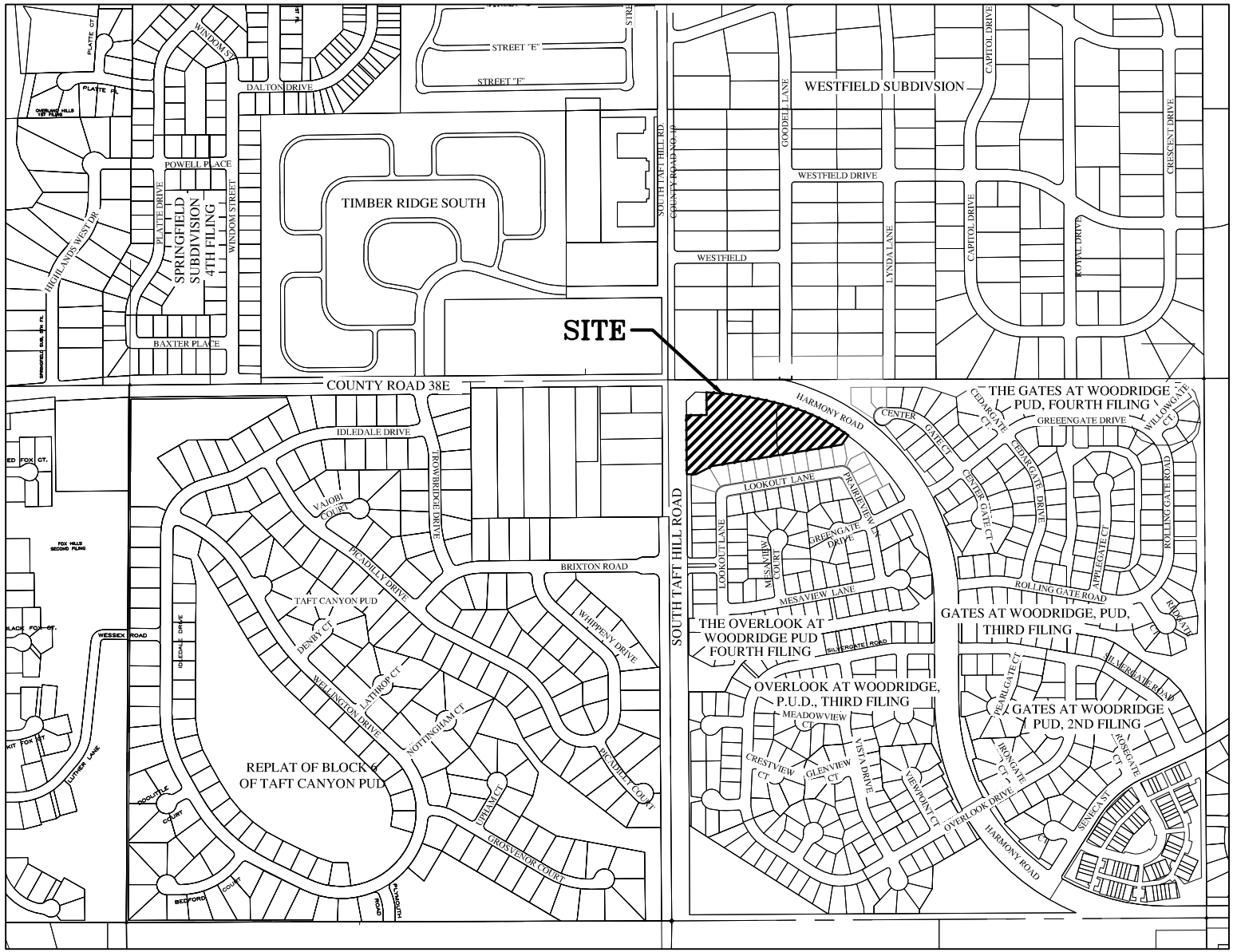
3. Ayers Associates, “Alternative Analysis for the Design of the Mason Street Outfall”, dated November 2010.

4. RBD, Inc. Engineering Consultants, “Preliminary/Master Drainage Study for Woodridge”, dated December 2, 1991.

5. RBD, Inc. Engineering Consultants, “Final Drainage and Erosion Control Study for the Overlook at Woodridge Fourth Filing, Phase One”, dated June 14, 1995.

APPENDIX A

VICINITY MAP AND DRAINAGE PLAN



VICINITY MAP

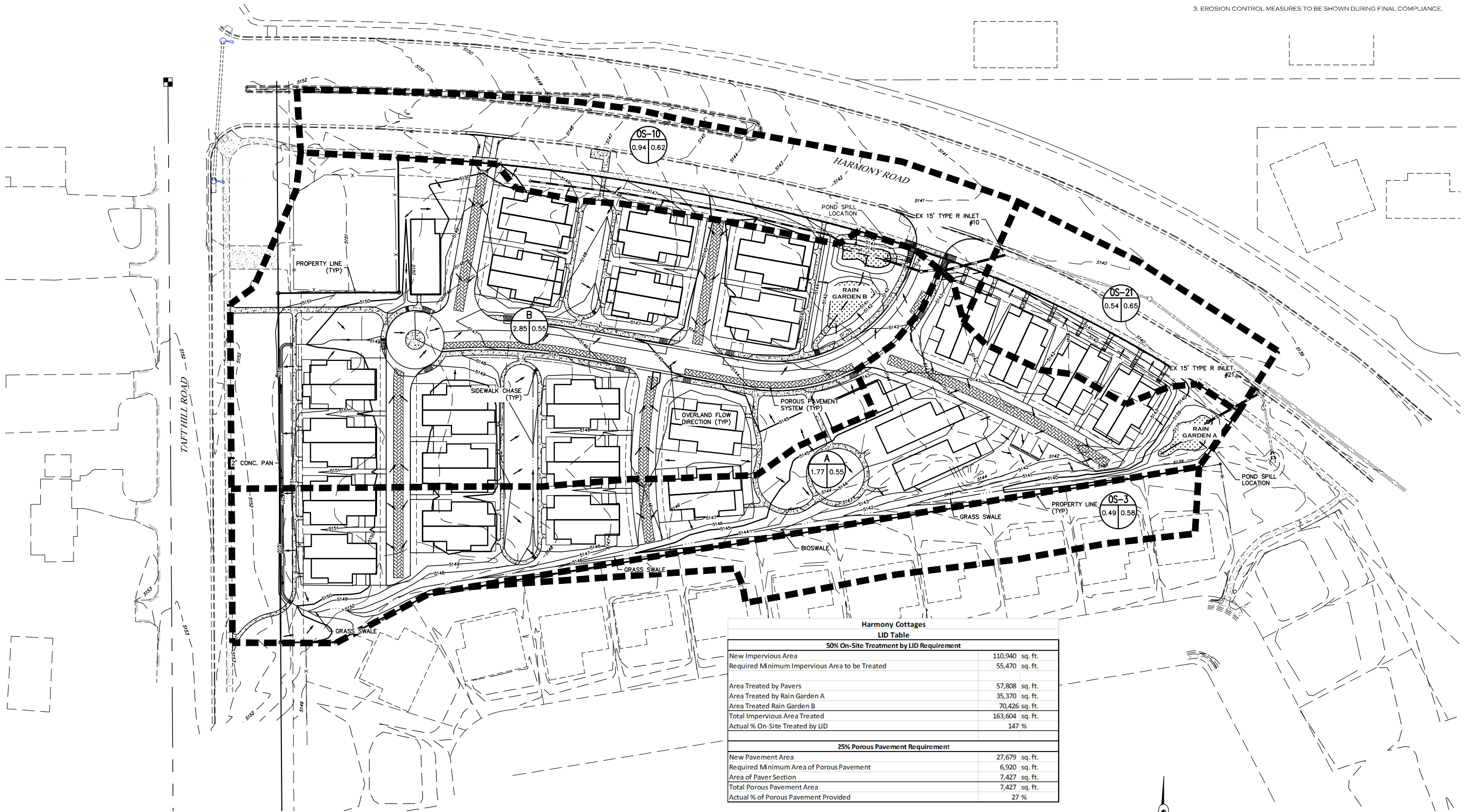
APPROX. 1"=1000'

NOTES:

1. SEE LANDSCAPE PLAN FOR PLANTINGS THROUGHOUT THE SITE.

2. THE TOP OF FOUNDATION ELEVATION SHOWN IS HIGHER THAN THE MINIMUM ELEVATION REQUIRED FOR PROTECTION FROM THE 100-YR STORM.

3. EROSION CONTROL MEASURES TO BE SHOWN DURING FINAL COMPLIANCE.



Harmony Cottages
LID Table

50% On-Site Treatment by LID Requirement		
New Impervious Area	110,940	sq. ft.
Required Minimum Impervious Area to be Treated	55,470	sq. ft.
Area Treated by Pavers	57,808	sq. ft.
Area Treated by Rain Garden A	35,370	sq. ft.
Area Treated Rain Garden B	70,426	sq. ft.
Total Impervious Area Treated	163,604	sq. ft.
Actual % On-Site Treated by LID	147	%
25% Porous Pavement Requirement		
New Pavement Area	27,679	sq. ft.
Required Minimum Area of Porous Pavement	6,920	sq. ft.
Area of Paver Section	7,427	sq. ft.
Total Porous Pavement Area	7,427	sq. ft.
Actual % of Porous Pavement Provided	27	%

LEGEND

- PROPOSED DRAINAGE BASIN DIVIDE LINE
- 1 / 0.37 | 0.63 — DRAINAGE BASIN NUMBER / MINOR STORM RUNOFF COEFFICIENT / DRAINAGE BASIN AREA
- 1 — DESIGN POINT
- PROPOSED DIRECTION OF OVERLAND FLOW

DRAINAGE SUMMARY TABLE

Design Point	Tributary Sub-basin	Area (ac)	C (10)	C (100)	tc (10) (min)	tc (100) (min)	Q(2)tot (cfs)	Q(10)tot (cfs)	Q(100)tot (cfs)	REMARKS
a	A	1.77	0.55	0.69	7.7	6.8	2.4	4.1	10.9	WQ Pond
b	B	2.85	0.55	0.69	14.0	12.5	3.0	5.2	13.8	Rain Garden
10	OS-10	0.94	0.62	0.78	8.6	7.8	1.4	2.4	6.3	Ex Inlet #10
21	OS-21	0.54	0.65	0.81	5.0	5.0	1.0	1.7	4.3	Ex Inlet #21
3	OS-3	0.49	0.58	0.73	8.6	7.6	0.7	1.2	3.6	Bioswale

SCALE: 1" = 40'

PRELIMINARY
NOT FOR CONSTRUCTION

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

INTERWEST CONSULTING GROUP
1218 W. Ash, Suite A
Windsor, Colorado 80550
Phone: (970) 674-3300
Fax: (970) 674-3303

PREPARED FOR
HABITAT FOR HUMANITY
4001 S. TAFT HILL ROAD
FORT COLLINS, CO 80525
PHONE: 970.223.4522

PROJECT NAME
HARMONY COTTAGES

DRAINAGE PLAN

DATE: 01/20/16
SCALE (H): 1"=40'
SCALE (V): N/A
DESIGNED BY: SB
CHECKED BY: RA

PROJ. NO. 1255-028-00

APPENDIX B

HYDROLOGIC COMPUTATIONS

RUNOFF COEFFICIENTS & % IMPERVIOUS

LOCATION: *Harmony Cottages*
PROJECT NO: *1255-028-00*
COMPUTATIONS BY: *es*
DATE: *12/8/2015*

Recommended Runoff Coefficients from Table RO-11 of City of Fort Collins Stormwater Code, Volume I
Recommended % Impervious from Table RO-3 Urban Storm Drainage Criteria Manual, Volume I

Type B Soils

	Runoff coefficient C	% Impervious
Streets, parking lots (asphalt):	0.95	100
Sidewalks (concrete):	0.95	96
Roofs:	0.95	90
Pavers:	0.50	40
Lawns, sandy soil (Flat <2%) :	0.10	0

SUBBASIN DESIGNATION	TOTAL AREA (ac.)	TOTAL AREA (sq.ft)	ROOF AREA (sq.ft)	PAVED AREA (sq.ft)	PAVERS AREA (sq.ft)	CONCRETE AREA (sq.ft)	LANDSCAPE AREA (sq.ft)	RUNOFF COEFF. (C)	% Impervious	REMARKS
Existing										
Lot	4.45	193,839	*0*	*0*	*0*	*0*	*193,839*	0.10	0	
Proposed										
Lot	4.45	193,839	46,267	*6,641*	*7,427*	47,000	*86,504*	0.55	50	
1, 2A	6.54	BASED ON WOODRIDGE 4TH FILING						0.85		
89	5.90	BASED ON MASTER DRAINAGE PLAN							95	

Equations

- Calculated C coefficients & % Impervious are area weighted

$C = \Sigma (Ci\ Ai) / At$

Ci = runoff coefficient for specific area, Ai
Ai = areas of surface with runoff coefficient of Ci
n = number of different surfaces to consider
At = total area over which C is applicable; the sum of all Ai's

RUNOFF COEFFICIENTS & % IMPERVIOUS

LOCATION: *Harmony Cottages*
PROJECT NO: *1255-028-00*
COMPUTATIONS BY: *es*
DATE: *12/8/2015*

Recommended Runoff Coefficients from Table RO-11 of City of Fort Collins Stormwater Code, Volume I
Recommended % Impervious from Table RO-3 Urban Storm Drainage Criteria Manual, Volume I

Type B Soils

	Runoff coefficient C	% Impervious
Streets, parking lots (asphalt):	0.95	100
Sidewalks (concrete):	0.95	96
Roofs:	0.95	90
Gravel or Pavers:	0.50	40
Lawns, sandy soil (Flat <2%) :	0.10	0

SUBBASIN DESIGNATION	TOTAL AREA (ac.)	TOTAL AREA (sq.ft)	ROOF AREA (sq.ft)	PAVED AREA (sq.ft)	PAVERS AREA (sq.ft)	SIDEWALK AREA (sq.ft)	LANDSCAPE AREA (sq.ft)	RUNOFF COEFF. (C)	% Impervious	REMARKS
A	1.77	*77,160*	*BASED ON OVERALL LOT CALCS*					0.55	50	
B	2.85	*124,007*						0.55	50	
OS-10	0.94	*41,146*	223	*22,062*	*0*	3,121	*15,739*	0.62	61	
OS-21	0.54	*23,355*	3,310	*9,154*	*0*	2,593	*8,298*	0.65	63	
OS-3	0.49	*21,503*	*BASED ON WOODRIDGE 4TH FILING*					0.58		

Equations

- Calculated C coefficients & % Impervious are area weighted

$C = \Sigma (Ci\ Ai) / At$

Ci = runoff coefficient for specific area, Ai
Ai = areas of surface with runoff coefficient of Ci
n = number of different surfaces to consider
At = total area over which C is applicable; the sum of all Ai's

STANDARD FORM SF-2

TIME OF CONCENTRATION - 2 and 10 YR

LOCATION: Harmony Cottages
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/8/2015

2 and 10-yr storm *Cf = 1.00* from Table RO-12 of City of Fort Collins Stormwater Code, Volume I

SUB-BASIN DATA			INITIAL /OVERLAND TIME (ti)				TRAVEL TIME / GUTTER OR CHANNEL FLOW (tt)						tc CHECK (URBANIZED BASIN)		FINAL tc	REMARKS
DESIGN PONIT	SUBBASIN(s) (1)	Area (ac) (2)	C (3)	Length (ft) (4)	Slope (%) (5)	ti (min) (6)	Length (ft) (7)	Slope (%) (8)	n Manning rough.	Vel. (ft/s) (9)	tt (min) (10)	tc = ti + tt (11)	Total L (ft) (12)	tc=(l/180)+10 (min) (13)	(min) (14)	
a	A	1.77	0.55	*20*	*2.0*	3.7	*650*	*1.8*	*0.016*	2.7	4.1	7.7	670	13.7	7.7	
b	B	2.85	0.55	*50*	*2.0*	5.8	*880*	*1.5*	*0.022*	1.8	8.2	14.0	930	15.2	14.0	
10	OS-10	0.94	0.62	*12*	*2.0*	2.4	*575*	*0.6*	*0.016*	1.6	6.2	8.6	587	13.3	8.6	
21	OS-21	0.54	0.65	*12*	*2.0*	2.3	*225*	*0.6*	*0.016*	1.6	2.4	4.7	237	11.3	5.0	
10	B+OS-10	3.79	0.57	*50*	*2.0*	5.6	*1455*	*1.1*	*0.020*	1.8	13.8	19.4	1505	18.4	18.4	
21	A+OS-21	2.31	0.57	*20*	*2.0*	3.5	*875*	*1.5*	*0.016*	2.4	6.0	9.5	895	15.0	9.5	
3	OS-3	0.49	0.58	*20*	*2.0*	3.5	*600*	*1.8*	*0.022*	2.0	5.1	8.6	620	13.4	8.6	

EQUATIONS:

$tc = ti + tt$

$ti = [1.87 (1.1 - CC_f) L^{0.5}] / S^{1/3}$

tt = L/Vel.

Velocity from Manning's Equation with R=0.1 (corresponds to Figure 3-3 of City of Fort Collins Design Manual)

final tc = minimum of ti + tt and urbanized basin check
min. tc = 5 min. due to limits of IDF curves

STANDARD FORM SF-2

TIME OF CONCENTRATION - 100 YR

LOCATION: Harmony Cottages
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/8/2015

100-yr storm *Cf = 1.25* from Table RO-12 of City of Fort Collins Stormwater Code, Volume I

SUB-BASIN DATA			INITIAL /OVERLAND TIME (ti)					TRAVEL TIME / GUTTER OR CHANNEL FLOW (tt)						tc CHECK (URBANIZED BASIN)		FINAL tc	REMARKS
DESIGN PONIT	SUBBASIN(s)	Area (ac)	C	C*Cf	Length (ft)	Slope (%)	ti (min)	Length (ft)	Slope (%)	n Manning rough.	Vel. (ft/s)	tt (min)	tc = ti + tt	Total L (ft)	tc=(l/180)+10 (min)	(min)	
	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)		(9)	(10)	(11)	(12)	(13)	(14)	
a	A	1.77	0.55	0.69	20	2.0	2.7	650	1.8	0.016	2.7	4.1	6.8	670	13.7	6.8	
b	B	2.85	0.55	0.69	50	2.0	4.3	880	1.5	0.022	1.8	8.2	12.5	930	15.2	12.5	
10	OS-10	0.94	0.62	0.78	12	2.0	1.6	575	0.6	0.016	1.6	6.2	7.8	587	13.3	7.8	
21	OS-21	0.54	0.65	0.81	12	2.0	1.5	225	0.6	0.016	1.6	2.4	3.9	237	11.3	5.0	
10	B+OS-10	3.79	0.57	0.71	50	2.0	4.1	1455	1.1	0.020	1.8	13.8	17.9	1505	18.4	17.9	
21	A+OS-21	2.31	0.57	0.72	20	2.0	2.5	875	1.5	0.016	2.4	6.0	8.6	895	15.0	8.6	
3	OS-3	0.49	0.58	0.73	20	2.0	2.5	600	1.8	0.022	2.0	5.1	7.6	620	13.4	7.6	

EQUATIONS:

$tc = ti + tt$

$ti = [1.87 (1.1 - CC_f) L^{0.5}] / S^{1/3}$

tt = L/Vel.

Velocity from Manning's Equation with R=0.1 (corresponds to Figure 3-3 of City of Fort Collins Design Manual)

final tc = minimum of ti + tt and urbanized basin check

min. tc = 5 min. due to limits of IDF curves

RATIONAL METHOD PEAK RUNOFF
(City of Fort Collins, 2-Yr Storm)

LOCATION: Harmony Cottages
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/8/2015

2 yr storm, Cf = 1.00

	DIRECT RUNOFF						CARRY OVER		TOTAL	REMARKS
Design Point	Tributary Sub-basin	A (ac)	C Cf	tc (min)	i (in/hr)	Q (2) (cfs)	from Design Point	Q (2) (cfs)	Q(2)tot (cfs)	
a	A	1.77	0.55	7.7	2.45	2.4			2.4	WQ Pond
b	B	2.85	0.55	14.0	1.93	3.0			3.0	Rain Garden
10	OS-10	0.94	0.62	8.6	2.36	1.4			1.4	Ex Inlet #10
21	OS-21	0.54	0.65	5.0	2.85	1.0			1.0	Ex Inlet #21
10	B+OS-10	3.79	0.57	18.4	1.69	3.6			3.6	Ex Inlet #10
21	A+OS-21	2.31	0.57	9.5	2.27	3.0			3.0	Ex Inlet #21
3	OS-3	0.49	0.58	8.6	2.36	0.7			0.7	Bioswale

$Q = C_f C i A$

Q = peak discharge (cfs)
C = runoff coefficient
C_f = frequency adjustment factor
i = rainfall intensity (in/hr) from City of Fort Collins IDF curve (4/16/99)
A = drainage area (acres)

$i = 24.221 / (10 + tc)^{0.7968}$

RATIONAL METHOD PEAK RUNOFF
(City of Fort Collins, 10-Yr Storm)

LOCATION: Harmony Cottages
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/8/2015

10 yr storm, Cf = 1.00

	DIRECT RUNOFF						CARRY OVER		TOTAL	REMARKS
Design Point	Tributary Sub-basin	A (ac)	C Cf	tc (min)	i (in/hr)	Q (10) (cfs)	from Design Point	Q (10) (cfs)	Q(10)tot (cfs)	
a	A	1.77	0.55	7.7	4.19	4.1			4.1	WQ Pond
b	B	2.85	0.55	14.0	3.29	5.2			5.2	Rain Garden
10	OS-10	0.94	0.62	8.6	4.03	2.4			2.4	Ex Inlet #10
21	OS-21	0.54	0.65	5.0	4.87	1.7			1.7	Ex Inlet #21
10	B+OS-10	3.79	0.57	18.4	2.88	6.2			6.2	Ex Inlet #10
21	A+OS-21	2.31	0.57	9.5	3.88	5.1			5.1	Ex Inlet #21
3	OS-3	0.49	0.58	8.6	4.04	1.2			1.2	Bioswale

$Q = C_f\ C\ i A$

Q = peak discharge (cfs)
C = runoff coefficient
C_f = frequency adjustment factor
i = rainfall intensity (in/hr) from City of Fort Collins IDF curve (4/16/99)
A = drainage area (acres)

$i = 41.44 / (10 + tc)^{0.7974}$

RATIONAL METHOD PEAK RUNOFF
(City of Fort Collins, 100-Yr Storm)

LOCATION: Harmony Cottages
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/8/2015

100 yr storm, Cf = 1.25

	DIRECT RUNOFF						CARRY OVER		TOTAL	REMARKS
Des. Point	Area Design.	A (ac)	C Cf	tc (min)	i (in/hr)	Q (100) (cfs)	from Design Point	Q (100) (cfs)	Q(100)tot (cfs)	
a	A	1.77	0.69	6.8	8.92	10.9			10.9	WQ Pond
b	B	2.85	0.69	12.5	7.06	13.8			13.8	Rain Garden
10	OS-10	0.94	0.78	7.8	8.52	6.3			6.3	Ex Inlet #10
21	OS-21	0.54	0.81	5.0	9.95	4.3			4.3	Ex Inlet #21
10	B+OS-10	3.79	0.71	17.9	5.95	16.0			16.0	Ex Inlet #10
21	A+OS-21	2.31	0.72	8.6	8.24	13.6			13.6	Ex Inlet #21
3	OS-3	0.49	0.73	7.6	9.95	3.6			3.6	Bioswale

$Q = C\,i\,A$

Q = peak discharge (cfs)
C = runoff coefficient
i = rainfall intensity (in/hr) from City of Fort Collins IDF curve (4/16/99)
A = drainage area (acres) $i = 84.682 / (10 + tc)^{0.7975}$

DRAINAGE SUMMARY TABLE

Design Point	Tributary Sub-basin	Area (ac)	C (10)	C (100)	tc (10) (min)	tc (100) (min)	Q(2)tot (cfs)	Q(10)tot (cfs)	Q(100)tot (cfs)	REMARKS
a	A	1.77	0.55	0.69	7.7	6.8	2.4	4.1	10.9	WQ Pond
b	B	2.85	0.55	0.69	14.0	12.5	3.0	5.2	13.8	Rain Garden
10	OS-10	0.94	0.62	0.78	8.6	7.8	1.4	2.4	6.3	Ex Inlet #10
21	OS-21	0.54	0.65	0.81	5.0	5.0	1.0	1.7	4.3	Ex Inlet #21
3	OS-3	0.49	0.58	0.73	8.6	7.6	0.7	1.2	3.6	Bioswale

Table RO-3—Recommended Percentage Imperviousness Values

Land Use or Surface Characteristics	Percentage Imperviousness
Business:	
Commercial areas	95
Neighborhood areas	85
Residential:	
Single-family	*
Multi-unit (detached)	60
Multi-unit (attached)	75
Half-acre lot or larger	*
Apartments	80
Industrial:	
Light areas	80
Heavy areas	90
Parks, cemeteries	5
Playgrounds	10
Schools	50
Railroad yard areas	15
Undeveloped Areas:	
Historic flow analysis	2
Greenbelts, agricultural	2
Off-site flow analysis (when land use not defined)	45
Streets:	
Paved	100
Gravel (packed)	40
Drive and walks	90
Roofs	90
Lawns, sandy soil	0
Lawns, clayey soil	0

* See Figures RO-3 through RO-5 for percentage imperviousness.

$$C_A = K_A + \left(1.31i^3 - 1.44i^2 + 1.135i - 0.12\right) \text{ for } C_A \geq 0, \text{ otherwise } C_A = 0 \qquad \text{(RO-6)}$$

$$C_{CD} = K_{CD} + \left(0.858i^3 - 0.786i^2 + 0.774i + 0.04\right) \qquad \text{(RO-7)}$$

$$C_B = \left(\mathrm{C_A} + C_{CD}\right)/2$$

(b) For a Project Plan or Final Plan submittal, runoff coefficients based on the proposed land surface types must be used. Since the actual runoff coefficients may be different from those specified in Table RO-10, Table RO-11 lists coefficients for the different types of land surfaces. The runoff coefficient used for design must be based on the actual conditions of the proposed site.

Table RO-10
Rational Method Minor Storm Runoff Coefficients for Zoning Classifications

Description of Area or Zoning	*Coefficient*
R-F	0.3
U-E	0.3
L-M-In	0.55
R-L, N-C-L	0.6
M-M-N, N-C-M	0.65
N-C-B	0.7
Business:	
C-C-N, C-C-R, C-N, N-C, C-S	0.95
R-D-R, C-C, C-L	0.95
D, C	0.95
H-C	0.95
C-S	0.95
Industrial:	
E	0.85
I	0.95
Undeveloped:	
R-C, T	0.2
P-O-L	0.25

For guidance regarding zoning districts and classifications of such districts please refer to Article Four of the City Land Use Code, as amended.

Table RO-11
Rational Method Runoff Coefficients for Composite Analysis

Character of Surface	*Runoff Coefficient*
Streets, parking lots, drives:	
Asphalt	0.95
Concrete	0.95
Gravel	0.5
Roofs	0.95
Recycled asphalt	0.8
Lawns, sandy soil:	
Flat <2%	0.1
Average 2 to 7%	0.15
Steep >7%	0.2
Lawns, heavy soil:	
Flat <2%	0.2
Average 2 to 7%	0.25
Steep >7%	0.35

(4) A new *Section 2.9* is added, to read as follows:

APPENDIX C

HYDRAULIC CALCULATIONS
(PROVIDED AT FINAL)

APPENDIX D

STORMWATER DETENTION POND ANALYSIS

RATIONAL METHOD PEAK RUNOFF
(City of Fort Collins, 100-Yr Storm - OLD rainfall)

LOCATION: **Harmony Cottages**
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/5/2015

100 yr storm, Cf = 1.25

	DIRECT RUNOFF						CARRY OVER		TOTAL	REMARKS
Des. Point	Area Design.	A (ac)	C Cf	tc (min)	i (in/hr)	Q (100) (cfs)	from Design Point	Q (100) (cfs)	Q(100)tot (cfs)	
1	site	4.45	1.00	5.00	9.00	40.05			40.1	Allowable release under
										old reainfall conditions

Q = C i A

Q = peak discharge (cfs)
C = runoff coefficient
i = rainfall intensity (in/hr) from OLD City of Fort Collins IDF curve
A = drainage area (acres)

OLD CITY OF FORT COLLINS IDF DATA

INTERPOLATED VALUES FOR 100 YEAR INTENSITIES

Tc	Value (IN./HR.)
5.00	9.0
5.10	9.0
5.20	8.9
5.30	8.9
5.40	8.9
5.50	8.8
5.60	8.8
5.70	8.7
5.80	8.7
5.90	8.7
6.00	8.6
6.10	8.6
6.20	8.6
6.30	8.5
6.40	8.5
6.50	8.5
6.60	8.4
6.70	8.4
6.80	8.4
6.90	8.3
7.00	8.3
7.10	8.2
7.20	8.2
7.30	8.2
7.40	8.1
7.50	8.1
7.60	8.1
7.70	8.0
7.80	8.0
7.90	8.0
8.00	7.9
8.10	7.9
8.20	7.8
8.30	7.8
8.40	7.8
8.50	7.7
8.60	7.7
8.70	7.7
8.80	7.6
8.90	7.6
9.00	7.6
9.10	7.5
9.20	7.5
9.30	7.5
9.40	7.4
9.50	7.4
9.60	7.3
9.70	7.3
9.80	7.3
9.90	7.2
10.00	7.2

DETENTION VOLUME CALCULATIONS
Rational Volumetric (FAA) Method
100-Year Event

LOCATION: **Harmony Cottages**
PROJECT NO: 1255-028-00
COMPUTATIONS BY: es
DATE: 12/5/15

Equations:

Developed flow = Q_D = CIA
Vol. In = Vi = T C I A = T Q_D
Vol. Out = Vo =K Q_{PO} T
storage = S = Vi - Vo

Area trib. to pond =	*4.45*	acre
C (100) =	*0.70*	
Developed C A =	3.1	acre - site only
Release rate, Q_{PO} =	***40.1***	**cfs**
K =	*0.9*	(from fig 2.1)

Rainfall intensity from City of Fort Collins IDF Curve with updated (3.67") rainfall

Storm Duration, T (min)	Rainfall Intensity, I (in/hr)	Q_D (cfs)	Vol. In Vi (ft^3)	Vol. Out Vo (ft^3)	Storage S (ft^3)	Storage S (ac-ft)
5	**9.95**	**31.0**	**9298**	**10814**	**-1515**	**-0.03**
10	7.77	24.2	14515	21627	-7112	-0.16
20	5.62	17.5	21010	43254	-22244	-0.51
30	4.47	13.9	25054	64881	-39827	-0.91
40	3.74	11.6	27960	86508	-58548	-1.34
50	3.23	10.1	30220	108135	-77915	-1.79
60	2.86	8.9	32069	129762	-97693	-2.24
70	2.57	8.0	33634	151389	-117755	-2.70
80	2.34	7.3	34993	173016	-138023	-3.17
90	2.15	6.7	36195	194643	-158448	-3.64
100	1.99	6.2	37273	216270	-178997	-4.11
110	1.86	5.8	38251	237897	-199646	-4.58
120	1.75	5.4	39148	259524	-220376	-5.06
130	1.65	5.1	39977	281151	-241174	-5.54
140	1.56	4.9	40747	302778	-262031	-6.02
150	1.48	4.6	41467	324405	-282938	-6.50
160	1.41	4.4	42144	346032	-303888	-6.98
170	1.35	4.2	42783	367659	-324876	-7.46
180	1.29	4.0	43388	389286	-345898	-7.94

Required Storage Volume:	**-1515**	**ft^3**
	-0.03	**acre-ft**

APPENDIX E

WATER QUALITY
AND
LID INFORMATION

Design Procedure Form: Rain Garden (RG)

Designer: sb
Company: Interwest Consulting Group
Date: January 19, 2016
Project: Harmony Cottages
Location: Basin A

1. Basin Storage Volume

A) Effective Imperviousness of Tributary Area, I_a (100% if all paved and roofed areas upstream of rain garden): I_a = 50.0 %

B) Tributary Area's Imperviousness Ratio ($i = I_a/100$): i = 0.500

C) Water Quality Capture Volume (WQCV) for a 12-hour Drain Time ($WQCV = 0.8 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i)$): WQCV = 0.17 watershed inches

D) Contributing Watershed Area (including rain garden area): Area = 77,160 sq ft

E) Water Quality Capture Volume (WQCV) Design Volume, Vol = (WQCV / 12) * Area: V_{WQCV} = 1,061 cu ft

F) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm: d_6 = ____ in

G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume: $V_{WQCV\ OTHER}$ = ____ cu ft

H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired): $V_{WQCV\ USER}$ = ____ cu ft

2. Basin Geometry

A) WQCV Depth (12-inch maximum): D_{WQCV} = 12 in

B) Rain Garden Side Slopes (Z = 4 min., horiz. dist per unit vertical) (Use "0" if rain garden has vertical walls): Z = 4.00 ft / ft

C) Mimimum Flat Surface Area: A_{Min} = 707 sq ft

D) Actual Flat Surface Area: A_{Actual} = 725 sq ft

E) Area at Design Depth (Top Surface Area): A_{Top} = 1400 sq ft

F) Rain Garden Total Volume ($V_T = ((A_{Top} + A_{Actual}) / 2) * Depth$): V_T = 1,063 cu ft

3. Growing Media

Choose One
- ○ 18" Rain Garden Growing Media
- ◉ Other (Explain):

Standard City of Fort Collins Spec

4. Underdrain System

A) Are underdrains provided?

Choose One
- ◉ YES
- ○ NO

B) Underdrain system orifice diameter for 12 hour drain time

i) Distance From Lowest Elevation of the Storage Volume to the Center of the Orifice: y = ____ ft

ii) Volume to Drain in 12 Hours: Vol_{12} = N/A cu ft

iii) Orifice Diameter, 3/8" Minimum: D_O = N/A in

Design Procedure Form: Rain Garden (RG)

Designer: sb
Company: Interwest Consulting Group
Date: January 19, 2016
Project: Harmony Cottages
Location: Basin A

5. Impermeable Geomembrane Liner and Geotextile Separator Fabric A) Is an impermeable liner provided due to proximity of structures or groundwater contamination?	Choose One ○ YES ◉ NO
6. Inlet / Outlet Control A) Inlet Control	Choose One ○ Sheet Flow- No Energy Dissipation Required ◉ Concentrated Flow- Energy Dissipation Provided
7. Vegetation	Choose One ○ Seed (Plan for frequent weed control) ◉ Plantings ○ Sand Grown or Other High Infiltration Sod
8. Irrigation A) Will the rain garden be irrigated?	Choose One ○ YES ○ NO

Notes:

Design Procedure Form: Rain Garden (RG)

Designer: sb
Company: Interwest Consulting Group
Date: January 19, 2016
Project: Harmony Cottages
Location: Basin B

1. Basin Storage Volume	
A) Effective Imperviousness of Tributary Area, I_a (100% if all paved and roofed areas upstream of rain garden)	I_a = 50.0 %
B) Tributary Area's Imperviousness Ratio ($i = I_a/100$)	i = 0.500
C) Water Quality Capture Volume (WQCV) for a 12-hour Drain Time ($WQCV = 0.8 * (0.91 * i^3 - 1.19 * i^2 + 0.78 * i)$)	WQCV = 0.17 watershed inches
D) Contributing Watershed Area (including rain garden area)	Area = 124,007 sq ft
E) Water Quality Capture Volume (WQCV) Design Volume Vol = (WQCV / 12) * Area	V_{WQCV} = 1,705 cu ft
F) For Watersheds Outside of the Denver Region, Depth of Average Runoff Producing Storm	d_6 = in
G) For Watersheds Outside of the Denver Region, Water Quality Capture Volume (WQCV) Design Volume	$V_{WQCV\ OTHER}$ = cu ft
H) User Input of Water Quality Capture Volume (WQCV) Design Volume (Only if a different WQCV Design Volume is desired)	$V_{WQCV\ USER}$ = cu ft
2. Basin Geometry	
A) WQCV Depth (12-inch maximum)	D_{WQCV} = 12 in
B) Rain Garden Side Slopes (Z = 4 min., horiz. dist per unit vertical) (Use "0" if rain garden has vertical walls)	Z = 4.00 ft / ft
C) Mimimum Flat Surface Area	A_{Min} = 1137 sq ft
D) Actual Flat Surface Area	A_{Actual} = 1465 sq ft
E) Area at Design Depth (Top Surface Area)	A_{Top} = 2567 sq ft
F) Rain Garden Total Volume ($V_T = ((A_{Top} + A_{Actual}) / 2) * Depth$)	V_T = 2,016 cu ft
3. Growing Media	Choose One: ○ 18" Rain Garden Growing Media ◉ Other (Explain): Standard City of Fort Collins Spec
4. Underdrain System	
A) Are underdrains provided?	Choose One: ◉ YES ○ NO
B) Underdrain system orifice diameter for 12 hour drain time	
i) Distance From Lowest Elevation of the Storage Volume to the Center of the Orifice	y = ft
ii) Volume to Drain in 12 Hours	Vol_{12} = N/A cu ft
iii) Orifice Diameter, 3/8" Minimum	D_O = N/A in

Design Procedure Form: Rain Garden (RG)

Designer: sb
Company: Interwest Consulting Group
Date: January 19, 2016
Project: Harmony Cottages
Location: Basin B

5. Impermeable Geomembrane Liner and Geotextile Separator Fabric A) Is an impermeable liner provided due to proximity of structures or groundwater contamination?	Choose One ○ YES ◉ NO
6. Inlet / Outlet Control A) Inlet Control	Choose One ○ Sheet Flow- No Energy Dissipation Required ◉ Concentrated Flow- Energy Dissipation Provided
7. Vegetation	Choose One ○ Seed (Plan for frequent weed control) ◉ Plantings ○ Sand Grown or Other High Infiltration Sod
8. Irrigation A) Will the rain garden be irrigated?	Choose One ○ YES ○ NO

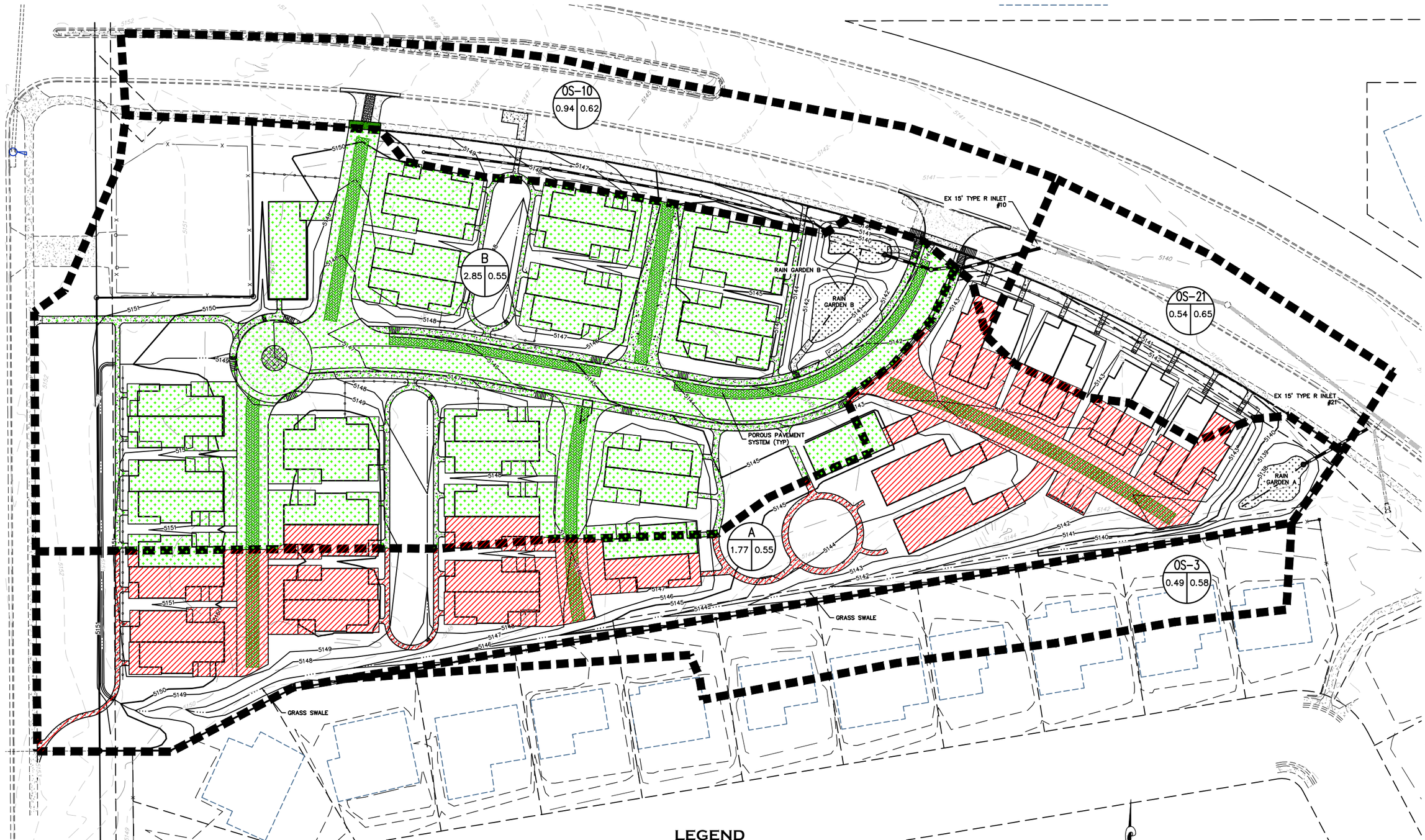
Notes:

Harmony Cottages
LID Table

50% On-Site Treatment by LID Requirement		
New Impervious Area	110,940	sq. ft.
Required Minimum Impervious Area to be Treated	55,470	sq. ft.
Area Treated by Pavers	57,808	sq. ft.
Area Treated by Rain Garden A	35,370	sq. ft.
Area Treated Rain Garden B	70,426	sq. ft.
Total Impervious Area Treated	163,604	sq. ft.
Actual % On-Site Treated by LID	147	%
25% Porous Pavement Requirement		
New Pavement Area	27,679	sq. ft.
Required Minimum Area of Porous Pavement	6,920	sq. ft.
Area of Paver Section	7,427	sq. ft.
Total Porous Pavement Area	7,427	sq. ft.
Actual % of Porous Pavement Provided	27	%

Harmony Cottages
LID Table

75% On-Site Treatment by LID Requirement		
New Impervious Area	110,940	sq. ft.
Required Minimum Impervious Area to be Treated	83,205	sq. ft.
Area Treated by Rain Garden A	35,370	sq. ft.
Area Treated by Rain Garden B	70,426	sq. ft.
Total Impervious Area Treated	105,796	sq. ft.
Actual % On-Site Treated by LID	95	%



Harmony Cottages LID Table		
75% On-Site Treatment by LID Requirement		
New Impervious Area	110,940	sq. ft.
Required Minimum Impervious Area to be Treated	83,205	sq. ft.
Area Treated by Rain Garden A	35,370	sq. ft.
Area Treated by Rain Garden B	70,426	sq. ft.
Total Impervious Area Treated	105,796	sq. ft.
Actual % On-Site Treated by LID	95	%

LEGEND

IMPERVIOUS AREA TREATED BY RAIN GARDEN A (35,370 SF, 32% OF TOTAL IMP. AREA)

IMPERVIOUS AREA TREATED BY RAIN GARDEN (70,426 SF, 63% OF TOTAL IMP. AREA)

30 0 15 60

SCALE: 1" = 60'

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

INTERWEST CONSULTING GROUP
1218 W. Ash, Suite A
Windsor, Colorado, 80550
Phone: (970) 674-3300
Fax: (970) 674-3303

PREPARED FOR
HABITAT FOR HUMANITY
4001 S. TAFT HILL ROAD
FORT COLLINS, CO 80525
PHONE: 970.223.4522

PROJECT NAME
HARMONY COTTAGES

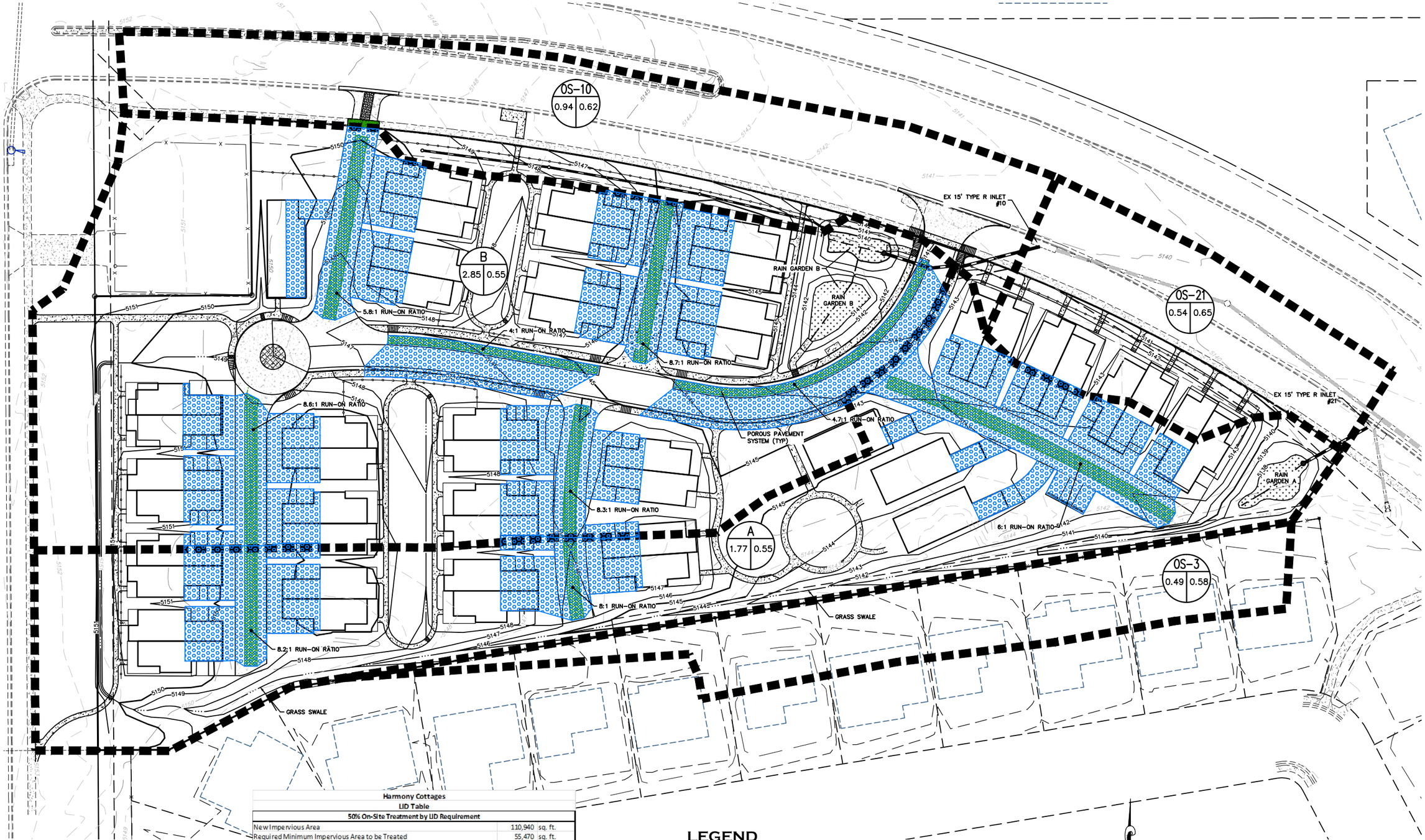
LID EXHIBIT - RAIN GARDENS

DATE: 01/20/16
SCALE (H): 1"=60'
SCALE (V): N/A
DESIGNED BY: RA
CHECKED BY: RA

PROJ. NO. 1255-028-00

1

N:\INTERWEST PROJECTS\2015 PROJECTS\1255-028-00 (HARMONY COTTAGES)\DESIGN DOCUMENTS\DRAWINGS\1255-028-00 LID EXHIBIT.DWG, 1/19/2016 8:32 AM



Harmony Cottages
LID Table

50% On-Site Treatment by LID Requirement		
New Impervious Area	110,940	sq. ft.
Required Minimum Impervious Area to be Treated	55,470	sq. ft.
Area Treated by Pavers	24,994	sq. ft.
Area Treated by Rain Garden A	35,370	sq. ft.
Area Treated Rain Garden B	70,426	sq. ft.
Total Impervious Area Treated	130,790	sq. ft.
Actual % On-Site Treated by LID	118	%
25% Porous Pavement Requirement		
New Pavement Area	27,679	sq. ft.
Required Minimum Area of Porous Pavement	6,920	sq. ft.
Area of Paver Section	7,427	sq. ft.
Total Porous Pavement Area	7,427	sq. ft.
Actual % of Porous Pavement Provided	27	%

LEGEND

AREA TREATED BY POROUS PAVEMENT LID (57,808 SF, 52%)

NOTE: AVERAGE RUN-ON AREA IS 8:1 WHICH EXCEEDS RECOMMENDED 3:1 MAXIMUM. RUNOFF WILL BE TREATED A SECOND TIME BY THE DOWNSTREAM RAIN GARDENS.

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

INTERWEST CONSULTING GROUP
1218 W. Ash, Suite A
Windsor, Colorado 80550
Phone: (970) 674-3300
Fax: (970) 674-3303

PREPARED FOR
HABITAT FOR HUMANITY
4001 S. TAFT HILL ROAD
FORT COLLINS, CO 80525
PHONE: 970.223.4522

PROJECT NAME
HARMONY COTTAGES

LID EXHIBIT - POROUS PAVEMENT

DATE: 01/20/16
SCALE (H): 1"=60'
SCALE (V): N/A
DESIGNED BY: RA
CHECKED BY: RA

PROJ. NO. 1255-028-00

APPENDIX F

EXCERPTS FROM REFERENCE REPORTS

MAIL CREEK BASIN MASTER DRAINAGE PLAN

HYDROLOGY TECHNICAL APPENDIX

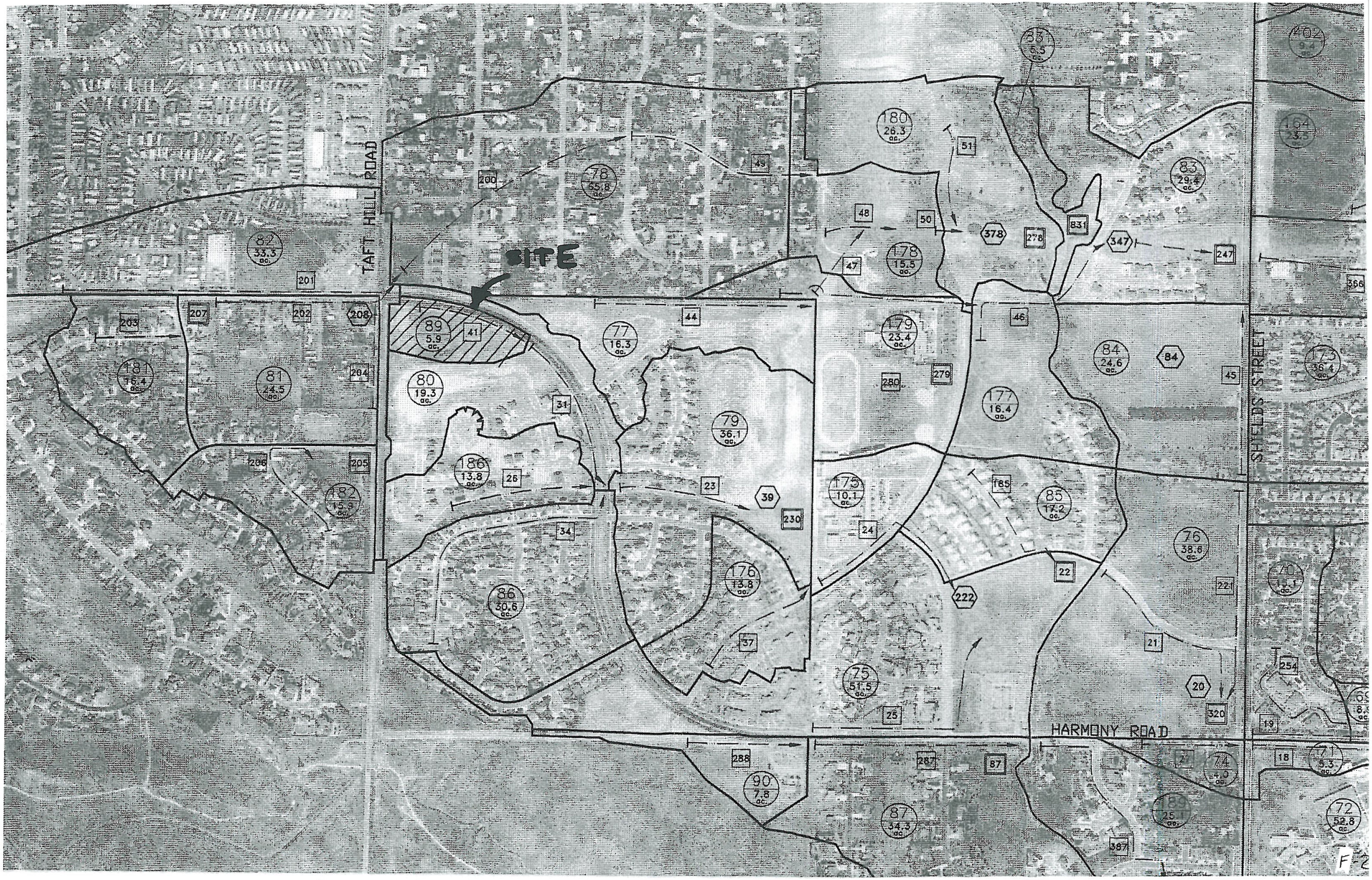
PREPARED FOR:

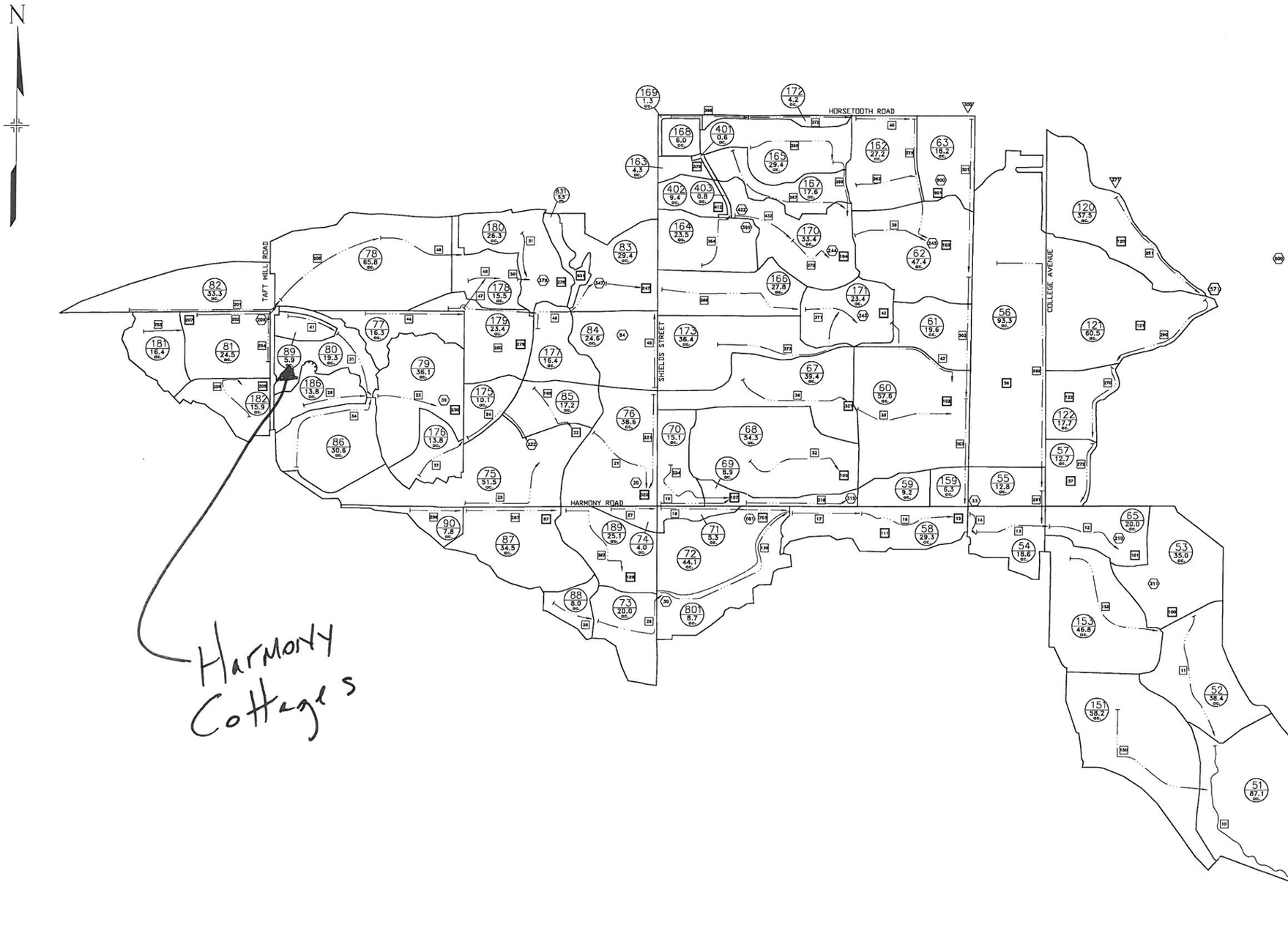
City of Fort Collins Utilities
700 Wood Street
Fort Collins, CO 80521

PREPARED BY:

Sear-Brown
209 South Meldrum
Fort Collins, CO 80521

April 22, 2002


SITE
TAFT HILL ROAD
SHIELDS STREET
HARMONY ROAD
F 2



0 750 1500 3000

SCALE IN FEET

URS
1225 17TH STREET
SUITE 200
DENVER, CO 80202
Tel: 303-293-8080, Fax: 303-299-8711

FOR AND ON BEHALF OF URS, INC.

CITY OF FORT COLLINS

MAIL CREEK BASIN
SUB-BASIN DIAGRAM
FIGURE E-2

DESIGNED BY: PVR	SCALE	DATE ISSUED:	11/07/02
DRAWN BY: CLM	HORIZ:	SHEET NO. 1 OF 1 SHEETS	
CHECKED BY: PVR	VERT.		

C:\Documents and Settings\eschneider\Local Settings\Temporary Internet Files\OLKGF\ManhattanSubbasinMap.dwg May 23, 2007 - 3:43pm

MHP-176cfs.in

```
    2   1   1   2
    3   4
WATERSHED
Manhattan Pond Final Design (176cfs Tailwater) - MAIL CREEK BASIN, 100-YEAR STORM, DEVELOPED CONDITIONS 2002
REVISED 31, March, 2005   ICON ENGINEERING
    1 1000  000   5.    1   1.                                                    1
   24   5.
  1.0 1.14 1.33 2.23 2.84 5.49 9.95 4.12 2.48 1.46
 1 .92 1.06  1.0  .95  .91  .87  .84  .81  .78  .75
       .71  .69  .67
*
* Prepared for:  City of Fort Collins
* SWMM developed condition, existing facilities, 100-yr recurrence interval
*
        -2                 Ac  %I  %S .016 .250   .1   .3  .51   .5     .0018
    1   51   104309. 87.1 30.7 .040
    1  151  1506675.58.23 30.0 .023
    1   52   113717. 38.4 17.0 .064
    1   53  2113630. 35.0 24.5 .032
    1  153  1526377.46.85 35.0 .014
    1   54   142895. 18.6 95.0 .048
    1   55  2612150. 12.8 95.0 .016
    1   56   567665. 93.3 95.0 .016
    1   57   571908. 12.7 95.0.0088
    1  120  1204538. 37.5 95.0.0088
    1  121  1216757. 60.5 95.0.0088
    1  122  1222659. 17.7 95.0.0088
    1   58  1112242. 29.3 28.9 .032
    1   59   161214.  9.2 30.0.0134
    1  159   331725.  6.3 83.3  .01
    1   60   357608. 57.6 35.0 .016
    1   61   422308. 19.6 30.0 .016
    1   62   386572. 47.4 37.6 .016
    1  162  3622465. 27.2 42.0 .015
    1  163  3791498. 4.29 80.0 .010
    1  401  3671863. 0.63100.0 .015
    1   63  9002763. 18.2 95.0 .010
    1  165  3654581. 29.4 37.0 .016
    1  166  3664325. 27.8 47.8  .01
    1  167  3673647. 17.6 37.0  .01
    1  168  3681188.  6.0 95.0  .01
    1  169  3681836.  1.3100.0  .02
    1  170  3703640. 33.4 36.5  .01
    1  171  3712315. 23.4 47.8  .01
    1  172  3722304.  4.2 72.4  .01
    1  173  3734663. 36.4 32.0  .01
    1  164  3642093. 23.5 65.3  .01
    1  402  4122594. 9.43 80.0  .01
       403  4321241. 0.76100.0 .015
    1   65  2103960. 20.0 37.6 .064
    1   67   367462. 39.4 36.0.0088
    1   68   326758. 54.3 32.0 .016
    1   69  3182756.  8.9 49.8 .011
    1   70  2543289. 15.1 53.9 .016
    1   71   181536.  5.3 36.7.0143
    1   72  6015055. 44.1 60.0 .020
    1  801  139 997.  8.7  5.0 .020
    1   73   292908. 20.0 35.0 .035
    1   74   27 543.  4.0 35.0.0104
    1   75   255341. 51.5 45.3.0134
    1  175   243143. 10.1 50.0 .015
    1   76  2214804. 38.6 38.0 .016
    1  176   374011. 13.8 53.5 .019
    1   77   441780. 16.3 35.0 .012
    1  177   462043. 16.4 38.0  .02
    1   78  4910616 65.8 25.0 .016
*  WESTFIELD PARK
    1  178   481276. 15.5 25.0 .035
    1   79   395615. 36.1 35.0 .019
    1  179  2803390. 23.4 50.0 .020
    1   80   314208. 19.3 35.0 .032
    1  186   263004. 13.8 35.0 .032
    1   81  2042482. 24.5 30.0 .016
    1  181  2033570. 16.4 30.0 .016
    1  182  2063144. 15.9 35.0 .016
    1   82  2013022. 33.3 59.9.0091
*   DIVIDE BASIN 83 TO REFLECT FLOW TO POND 831
    1   83  3477115. 29.4 35.0  .02
    1  831  8311711.  5.5 35.0  .02
    1   84   843065. 24.6 38.0.0072
    1   85  1852138. 17.2 38.0 .016
    1   86   345330. 30.6 40.0 .032
    1   87  2871938. 34.5 23.0  .02
    1   88   28 813.  8.0 23.0.0154
*   1   89   411283.  5.9 95.0 .032   Assumed 95% I
    1  180   514243. 26.3 38.0 .012
       90  288 788.  7.8 23.0 .020
      189  3873647. 25.1 35.0 .013

    0
    1    1
   62
       10    1  0 1    10.0    3400.    .011     4.0     4.0    .044    12.0
      150   10  0 1    48.0    1850.    .015    50.0    50.0    .020     5.0
       11   10  0 1    10.0    1900.    .013     2.5     2.5    .060    16.0
       12  210  0 1    10.0    1000.    .011     2.0     2.0    .060    12.0
```

FINAL DRAINAGE AND EROSION CONTROL STUDY FOR THE OVERLOOK AT WOODRIDGE FOURTH FILING PHASE ONE FORT COLLINS, COLORADO

June 14, 1995

Prepared for:

Woodcraft Homes
3665 JFK Parkway
Building 1, Suite 300
Fort Collins, Colorado 80525-3153

Prepared by:

RBD, Inc. Engineering Consultants
209 South Meldrum
Fort Collins, Colorado 80521
(303) 482-5922

RBD Job No. 434-011

FINAL DRAINAGE AND EROSION CONTROL STUDY FOR THE OVERLOOK AT WOODRIDGE FOURTH FILING PHASE ONE FORT COLLINS, COLORADO

I. GENERAL LOCATION AND DESCRIPTION

A. Location

The Overlook at Woodridge Fourth Filing P.U.D. is bounded by Taft Hill Road (County Road 19) on the west, Imperial Estates on the north, future Harmony Road and The Gates Fourth Filing to the east, and by the Overlook Third Filing on the south.

The site location can also be described as situated in the Southwest 1/4 of Section 34, Township 7 North, Range 69 West of the 6th P.M., City of Fort Collins, Larimer County, Colorado. The site location can be seen on Exhibit 1 in the Appendix.

B. Description of Property

The Fourth Filing of the Overlook at Woodridge contains approximately 32.8 acres, more or less. Presently, the property is undeveloped. The property is being proposed for planned unit development within the City of Fort Collins Zoning District and will be developed consistent with the Overlook First through Third Filings at Woodridge. Native grasses presently cover the property. The topography of the site generally slopes from west to east at approximately 1.5 percent.

II. DRAINAGE BASINS

A. Major Basin Description

The majority of the proposed development lies within Basin 80 (see SWMM portion of Appendix) of the McClellands and Mail Creek Major Drainageway Plan prepared by Cornell Consulting Company. A natural drainageway runs from west to east along the southern edge of the project boundary within Basin 80. Runoff from Basin 80 is routed by open channels and culverts along the northern boundary of the Gates First, Second and Third Filings, along the north side of Seneca Street past Webber Junior High School, and then along the east side of

Regency Drive to the existing Regional Detention Pond. This development will also include improvements to a portion of the existing Taft Hill Road, although these off-site improvements are not seeking Phase One approval.

B. Sub-basin Description

The Overlook Fourth Filing has been divided into 15 sub-basins. Fourteen (14) of these basins will drain to Basin 80 of the McClellands and Mail Creek Master Plan, while the remaining Basin O-2 drains into the historic Basin 77 of the McClellands and Mail Creek Master Plan. Except for the off-street portions of Basins 1 and 2A, all 15 basins will be developed consisting of proposed residential housing and street improvements, including improvements to Taft Hill Road and to Harmony Road. Basins 1 and 2A will be developed as neighborhood commercial sites at a later time. These sub-basins are shown on the Drainage and Erosion Control Plan in the back pocket of this report.

C. SWMM Revisions

The portion of the City of Fort Collins' SWMM model for a 100-year storm event within the Mail Creek Basin--tributary to Seneca Street (conveyance element 24)--was updated to reflect field conditions, phasing, and proposed storm drainage system modifications.

Basins 75, 77 through 80, 86, 175, 176, 179, and 186 were added or updated to account for the presently developed Woodridge subdivisions (Overlook and Gates First through Third Filings) and the proposed Overlook Fourth Filing Phase One subdivision. Conveyance elements 23, 26, 31, 34, 37, 44, 47, 49, and 230 were also added or updated to be consistent with present and proposed conditions.

III. DRAINAGE DESIGN CRITERIA

A. Regulations

The City of Fort Collins Storm Drainage Design Criteria is being used for the subject site.

B. Development Criteria Reference and Constraints

The 1990 Preliminary Drainage Report for Webber Junior High School states that the channel and culvert system along the north side of Seneca Street and the east side of Regency Drive was sized for undetained off-site 100 year developed runoff from Basins 79, 80, and 85. Recent SWMM analysis for Basins 79 and 80, by the City of Fort Collins, has determined that the existing channel, culverts and Seneca Street (downstream of the subject site) will receive greater 100-year

The proposed drainage, erosion control, and grading plans are included in the back pocket of this report.

B. Specific Details

The Overlook at Woodridge has been broken down into 15 sub-basins. The sub-basin designations correspond to the basin designations of the Preliminary/Master Drainage Study for the Woodridge development. Specific details of off-site basins will be addressed again in the final report for the entire Overlook Fourth Filing development.

Runoff from sub-basins 1, 2A, 2B, 3A, 3B, 3C, 12, and 13 will be conveyed easterly towards Harmony Road by a combination of gutter flows and a storm drain system. At Harmony Road, developed runoff will be conveyed via storm drains within the Harmony Road alignment to the Woodridge regional channel. Inlets at the low point of Harmony Road (D.P. 120 and D.P. 130) intercept the remaining street flow from the above basins, as well as remaining street flow from the Overlook and Gates Third Filings. The storm drains will daylight in the regional channel downstream of the Harmony Road crossing.

To complete the storm drain design from the Overlook Third Filing Final Drainage and Erosion Control Study, a curb inlet will be constructed within the Third Filing at the northwest corner of the Harmony Road and Silvergate Road intersection. A curb inlet will be required at this point (D.P. 11) as curb and gutter flows exceed City criteria. Third Filing storm drain flows will be piped from this inlet across Harmony Road to the regional channel.

Runoff from sub-basins 4A, 4B, and 4C will be conveyed to the regional channel by a combination of gutter flows and a short storm drain system (using 21- and 30-inch pipe). This storm drain will daylight in the regional channel immediately upstream of the Harmony Road crossing (D.P. 55).

Runoff from sub-basins 5A, 5B, and 5C is primarily generated within the most upstream portion of the regional channel itself and flows eastward along the channel alignment. Runoff is combined with flows from sub-basins 4A, 4B, and 4C at D.P. 55.

Storm water runoff collected in the regional channel will be directed easterly to the two existing 42-inch culverts immediately north of Seneca Street. From that point, flows travel via open channels and additional 42-inch culverts to the Regional Detention Pond at Wake Robin Lane and Regency Drive.

Two swales along the south edge of the Overlook Fourth Filing site allow sidewalk access to the pedestrian walkway system within the regional drainage

IBD, Inc.

#434-011

STORM DRAINAGE SYSTEM PRELIMINARY DESIGN DATA

SUBDIVISION OVERLOOK No. 4 STORM 2 yr (developed) cf = 1.00
CALCULATED BY DKT DATE 06/05/95

D.P. LOC.	BASINS	LENGTH (ft)	tci (min)	FLOW TIME (tt) STREET (min)	FLOW TIME (tt) PIPE (min)	tc' (min)	C	INTENSI (in/hr)	AREA (ac)	DIRECT RUNOFF (cfs)	OTHER RUNOFF (cfs)	TOTAL RUNOFF (cfs)	STREET SLOPE (%)	STREET CAPACIT (cfs)	PIPE SLOPE (%)	PIPE SIZE (in)	PIPE CAPACIT (cfs)	STREET DESIGN (cfs)	STREET VELOCIT (ft/s)	PIPE DESIGN (cfs)	PIPE VELOCIT (ft/s)	REMARKS
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2	0-2		19.8			19.8	0.95	1.87	2.78	4.9		4.9	0.60	8.4								
2	Upstrea										37.5	37.5										SWMM hydrology=4.4 cfs
2	0-2 & upstream basins		19.8			19.8	0.95	1.87	2.78	4.9	33.8	38.7										4.4 cfs into 10' inlet #14 from SWMM model; use 2 10' inlets for 100-year; Lagged flow=38.7 cfs from SWMM model
10	1		5.6			5.6	0.85	3.13	1.90	5.1		5.1	0.60	8.4	0.60	15	5.0	0.6	1.5	4.5	4.1	See regional channel section for pipe hydraulics
21	2A		7.0			7.0	0.85	2.85	4.54	11.2												4.5 cfs into 15' inlet #10,
21	1,2A	225	5.6	2.6		8.2	0.85	2.69	6.54	15.0	-4.5	10.5	0.60	8.4	0.60	21	12.3	3.0	1.5	12.0	5.2	3.0 cfs carryover; tL: 10->21; inlet moved 25' N of D.P.
21-23		410	8.2	4.7		12.8																7.5 cfs into 15' inlet #21, 3.0 cfs carryover; Total pipe flow=12.0 cfs; tL: 21->23
23	2B		15.5			15.5	0.35	2.09	1.72	1.3			0.60									
23	1,2A,2B		15.5			15.5	0.75	2.09	8.26	12.9	-12.0	0.9	0.60	8.4	0.60	21	12.3	0.9	1.5	12.0	5.2	
32	3A		23.4			23.4	0.50	1.71	5.52	4.7		4.7	0.60	5.4								
23	1,2A,2B, 3A	220	23.4	2.5		25.9	0.85	1.63	13.76	14.5	-12.0	2.5	0.60	8.4	0.60	21	12.3	2.5	1.5	12.0	5.2	U/S street slope 1.00%; tL: 32->23
38	3C		10.5			10.5	0.48	2.48	0.72	0.9		0.9	2.40	10.7	0.60	15	5.0	sump		0.9	2.9	0.9 cfs into 5' inlet #38, 0 cfs carryover
35	3B		17.2			17.2	0.58	2.00	4.91	5.7		5.7	1.00	8.9				sump				5.7 cfs into 10' inlet #35, 0 cfs carryover; use 15' inlet for 100-yr
35-35		35	10.5		0.2	10.7		2.48					0.60									tL: 38->35
35	3B,3C		17.2			17.2	0.57	2.00	5.63	6.4		6.4			0.60	18	8.1	sump		6.6	4.5	Total pipe flow=6.6 cfs; Lagged pipe flow=6.4 cfs
35-23		280	17.2		1.0	18.2		1.94					0.60									tL: 35->23
23	1,2A,2B, 3A,3B,3C		25.9			25.9	0.62	1.63	19.41	19.7	-17.2	2.5	0.60	8.4	0.60	24	17.5	2.5	1.5	17.2	5.7	Total pipe flow=18.6 cfs; Lagged pipe flow=17.2 cfs
43	4A		12.6			12.6	0.53	2.29	4.14	5.0		5.0	1.45	8.4								
46	4B		8.1			8.1	0.64	2.70	1.35	2.3		2.3	2.00	9.5								
46	4C		7.8			7.8	0.62	2.73	0.77	1.3		1.3	0.71	5.5								
46	4A,4B,4C	207	12.6	1.9		14.7	0.56	2.16	6.26	7.6		7.6	0.55	13.0	3.57	15	12.2	sump		7.6	9.0	tL: 43->46; 7.6 cfs into 10' inlet #46, 0 cfs carryover; use 15' inlet for 100-yr
50			18.6			18.6	0.25	1.92	1.53	0.7												
51	5A		13.7			13.7	0.50	2.22	1.53	1.7		1.7	0.75	8.0								1.7 cfs into 5' inlet #51

F-10

IBD, Inc.

#434-011

STORM DRAINAGE SYSTEM PRELIMINARY DESIGN DATA

SUBDIVISION OVERLOOK No. 4 STORM 100 yr (developed) cf = 1.25
CALCULATED BY DKT DATE 06/05/95

D.P. LOC. 1	BASINS 2	LENGTH (ft) 3	tci (min) 4	FLOW TIME (tt) STREET (min) 5	FLOW TIME (tt) PIPE (min) 6	tc' (min) 7	C 8	INTENSI (in/hr) 9	AREA (ac) 10	DIRECT RUNOFF (cfs) 11	OTHER RUNOFF (cfs) 12	TOTAL RUNOFF (cfs) 13	STREET SLOPE (%) 14	STREET CAPACIT (cfs) 15	PIPE SLOPE (%) 16	PIPE SIZE (in) 17	PIPE CAPACIT (cfs) 18	STREET DESIGN (cfs) 19	STREET VELOCIT (ft/s) 20	PIPE DESIGN (cfs) 21	PIPE VELOCIT (ft/s) 22	REMARKS 23
2	0-2		18.9			18.9	0.95	5.42	2.78	17.9		17.9	0.60	125.9								17.9 cfs into 2 10' inlets #14 & #16
2	upstream																					from SWMM model
2	0-2 & upstream basins		18.9			18.9	0.95	5.42	2.78	17.9	182.6 171.5	182.6 189.4										Lagged flow=189.4 cfs from SWMM model
10	1		5.6			5.6	0.85	6.80	1.90	17.6		17.6	0.60	125.9	0.60	21	12.3	6.9	1.5	10.9	5.1	See regional channel section for pipe hydraulics
21	2A		7.0			7.0	0.85	6.30	4.64	40.9												10.9 cfs into 15' inlet #10,
21	1,2A	225	5.6	2.6		8.2	0.85	7.80	6.54	54.2	-10.9	43.3	0.60	125.9	0.60	30	31.8	30.9	1.5	28.9	6.5	8.6 cfs carryover tL: 10->21 Inlet moved 25' N of D.P.
21-23		410	8.2	4.7		12.8																18.0 cfs into 15' inlet #21,
23	2B		14.2			14.2	0.35	6.19	1.72	4.7			0.60									30.9 cfs carryover
23	1,2A,2B		14.2			14.2	0.75	6.19	8.26	47.7	-28.9	18.8	0.60	125.9	0.60	30	31.8	18.8	1.5	28.9	6.5	Total pipe flow=28.9 cfs tL: 21->23
32	3A		21.1			21.1	0.50	5.07	5.52	17.5		17.5	0.60	43.2								
23	1,2A,2B, 3A	220	21.1	2.5		23.6	0.65	4.84	13.78	54.0	-28.9	25.1	0.60	125.9	0.60	30	31.8	25.1	1.5	28.9	6.5	U/S street slope 1.00% tL: 32->23
38	3C		8.7			8.7	0.45	7.70	0.72	3.3		3.3	2.40	86.3	0.60	15	5.0	sump		3.3	3.8	3.3 cfs into 5' inlet #38,
35	3B		15.3			15.3	0.58	6.03	4.91	21.5		21.5	1.00	55.7				sump				0 cfs carryover
35-35		36	8.7		0.2	8.9		7.60														21.5 cfs into 15' inlet #35,
35	3B,3C		15.3			15.3	0.57	6.03	5.63	24.1		24.1	0.60		0.61	27	24.2	sump		24.1	6.3	0 cfs carryover tL: 38->35 Total pipe flow=25.0 cfs
15-23		280	15.3		0.7	16.0		5.80														Lagged pipe flow=24.1 cfs
23	1,2A,2B, 3A,3B,3C		23.6			23.6	0.62	4.84	19.41	73.3	-53.0	20.3	0.60	125.9	0.65	36	53.8	20.3	1.5	53.0	7.8	tL: 35->23 Total pipe flow=53.9 cfs
43	4A		11.3			11.3	0.53	6.95	4.14	19.1		19.1	1.46	67.3								Lagged pipe flow=53.0 cfs
46	4B		5.9			5.9	0.64	8.30	1.35	9.0		9.0	2.00	78.8								
46	4C		8.3			8.3	0.62	8.50	0.77	5.1		5.1	0.71	47.0								
46	4A,4B,4C	207	11.3	1.9		13.2	0.56	6.45	6.26	28.5		28.5	0.88	52.3	2.00	24	32.0	sump		28.5	10.2	tL: 43->46 28.5 cfs into 15' inlet #46,
50			17.2			17.2	0.25	5.62	1.53	2.7												0 cfs carryover
51	5A		11.3			11.3	0.50	6.95	1.53	5.6		5.6	0.76	48.6								
53	5B		21.0			21.0	0.31	5.07	3.40	6.7		6.7										5.6 cfs into 5' inlet #51
1-53		505	11.3	2.6	drainway	14.1							3.00									
53	5A,5B		21.0			21.0	0.37	5.07	4.93	11.5		11.5										tL: 51->53 @ 3.05 ft/s flow in channel

UDINLET: INLET HYDARULICS AND SIZING
DEVELOPED BY
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD

USER:KEVIN GINGERY-RDB INC FT. COLLINS COLORADO.....
ON DATE 05-26-1994 AT TIME 12:18:27

*** PROJECT TITLE: Overlook #4 2-year

*** CURB OPENING INLET HYDRAULICS AND SIZING:

From Overlook at Woodridge Report

INLET ID NUMBER: 10

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH	(ft)=	15.00
REQUIRED CURB OPENING LENGTH	(ft)=	16.78
IDEAL CURB OPENNING EFFICIENCY	=	0.98
ACTURAL CURB OPENNING EFFICIENCY	=	0.95

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE	(%) =	0.60
STREET CROSS SLOPE	(%) =	2.00
STREET MANNING N	=	0.016
GUTTER DEPRESSION	(inch)=	2.00
GUTTER WIDTH	(ft) =	2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET	(ft) =	13.56
GUTTER FLOW DEPTH	(ft) =	0.44
FLOW VELOCITY ON STREET	(fps)=	2.53
FLOW CROSS SECTION AREA	(sq ft)=	2.01
GRATE CLOGGING FACTOR	(%)=	50.00
CURB OPENNING CLOGGING FACTOR	(%)=	10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY	(cfs)=		5.01
BY FAA HEC-12 METHOD:	DESIGN FLOW	(cfs)=	5.10 ← Q_2
	FLOW INTERCEPTED	(cfs)=	4.83
	CARRY-OVER FLOW	(cfs)=	0.27
BY DENVER UDFCD METHOD:	DESIGN FLOW	(cfs)=	5.10
	FLOW INTERCEPTED	(cfs)=	4.51
	CARRY-OVER FLOW	(cfs)=	0.59

UDINLET: INLET HYDARULICS AND SIZING
DEVELOPED BY
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD

USER:KEVIN GINGERY-RDB INC FT. COLLINS COLORADO.....
ON DATE 05-26-1994 AT TIME 12:18:59

*** PROJECT TITLE: Overlook #4 100-year

*** CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 10

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH	(ft)=	15.00
REQUIRED CURB OPENING LENGTH	(ft)=	36.06
IDEAL CURB OPENNING EFFICIENCY	=	0.62
ACTURAL CURB OPENNING EFFICIENCY	=	0.57

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE	(%) =	0.60
STREET CROSS SLOPE	(%) =	2.00
STREET MANNING N	=	0.016
GUTTER DEPRESSION	(inch)=	2.00
GUTTER WIDTH	(ft) =	2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET	(ft) =	23.50
GUTTER FLOW DEPTH	(ft) =	0.64
FLOW VELOCITY ON STREET	(fps)=	3.40
FLOW CROSS SECTION AREA	(sq ft)=	5.69
GRATE CLOGGING FACTOR	(%)=	50.00
CURB OPENNING CLOGGING FACTOR	(%)=	10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY	(cfs)=	12.09		
BY FAA HEC-12 METHOD:	DESIGN FLOW	(cfs)=		19.50
	FLOW INTERCEPTED	(cfs)=		11.12
	CARRY-OVER FLOW	(cfs)=		8.38
BY DENVER UDFCD METHOD:	DESIGN FLOW	(cfs)=		19.50
	FLOW INTERCEPTED	(cfs)=		10.88
	CARRY-OVER FLOW	(cfs)=		8.62

UDINLET: INLET HYDARULICS AND SIZING
DEVELOPED BY
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD

USER:KEVIN GINGERY-RDB INC FT. COLLINS COLORADO.....
ON DATE 05-26-1994 AT TIME 13:18:44

** PROJECT TITLE: Overlook #4 2-year

*** CURB OPENING INLET HYDRAULICS AND SIZING:

INLET ID NUMBER: 21

From Overlook at Woodridge Report

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH	(ft)=	15.00
REQUIRED CURB OPENING LENGTH	(ft)=	25.52
IDEAL CURB OPENNING EFFICIENCY	=	0.80
ACTURAL CURB OPENNING EFFICIENCY	=	0.74

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE	(%) =	0.60
STREET CROSS SLOPE	(%) =	2.00
STREET MANNING N	=	0.016
GUTTER DEPRESSION	(inch)=	2.00
GUTTER WIDTH	(ft) =	2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET	(ft) =	18.44
GUTTER FLOW DEPTH	(ft) =	0.54
FLOW VELOCITY ON STREET	(fps)=	2.96
FLOW CROSS SECTION AREA	(sq ft)=	3.57
GRATE CLOGGING FACTOR	(%)=	50.00
CURB OPENNING CLOGGING FACTOR	(%)=	10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY	(cfs)=	8.37	
BY FAA HEC-12 METHOD: DESIGN FLOW	(cfs)=		10.50
FLOW INTERCEPTED	(cfs)=		7.79
CARRY-OVER FLOW	(cfs)=		2.71
BY DENVER UDFCD METHOD: DESIGN FLOW	(cfs)=		10.50
FLOW INTERCEPTED	(cfs)=		7.53
CARRY-OVER FLOW	(cfs)=		2.97

UDINLET: INLET HYDARULICS AND SIZING
DEVELOPED BY
DR. JAMES GUO, CIVIL ENG DEPT. U OF COLORADO AT DENVER
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD&FCD

USER:KEVIN GINGERY-RDB INC FT. COLLINS COLORADO.....
ON DATE 05-26-1994 AT TIME 13:19:09

*** PROJECT TITLE: Overlook #4 100-year

*** CURB OPENING INLET HYDRAULICS AND SIZING:

100-yr

INLET ID NUMBER: 21

INLET HYDRAULICS: ON A GRADE.

GIVEN INLET DESIGN INFORMATION:

GIVEN CURB OPENING LENGTH	(ft)=	15.00
REQUIRED CURB OPENING LENGTH	(ft)=	59.26
IDEAL CURB OPENNING EFFICIENCY	=	0.41
ACTURAL CURB OPENNING EFFICIENCY	=	0.37

STREET GEOMETRIES:

STREET LONGITUDINAL SLOPE	(%) =	0.60
STREET CROSS SLOPE	(%) =	2.00
STREET MANNING N	=	0.016
GUTTER DEPRESSION	(inch)=	2.00
GUTTER WIDTH	(ft) =	2.00

STREET FLOW HYDRAULICS:

WATER SPREAD ON STREET	(ft) =	33.63
GUTTER FLOW DEPTH	(ft) =	0.84
FLOW VELOCITY ON STREET	(fps)=	4.24
FLOW CROSS SECTION AREA	(sq ft)=	11.47
GRATE CLOGGING FACTOR	(%)=	50.00
CURB OPENNING CLOGGING FACTOR	(%)=	10.00

INLET INTERCEPTION CAPACITY:

IDEAL INTERCEPTION CAPACITY (cfs)= 19.98

BY FAA HEC-12 METHOD:	DESIGN FLOW	(cfs)=	48.90
	FLOW INTERCEPTED	(cfs)=	18.20
	CARRY-OVER FLOW	(cfs)=	30.70
BY DENVER UDFCD METHOD:	DESIGN FLOW	(cfs)=	48.90
	FLOW INTERCEPTED	(cfs)=	17.99
	CARRY-OVER FLOW	(cfs)=	30.91

Harmony Road W. FE

16/

UDINLET: STREET FLOW ANALYSIS
DEVELOPED BY
DR JAMES GUO, CIVIL ENG DEPT, U OF COLORADO AT DENVER
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD$FCD

SER:KEVIN GINGERY-RDB INC FT. COLLINS COLORADO.....
N DATE 05-26-1994 AT TIME 13:37:39

Carryover flow at inlet #10

** STREET GUTTER HYDRAULICS

GIVEN GUTTER GEOMETRIES:

LONGITUDINAL SLOPE	(%) =	0.60
CROSS SLOPE	(%) =	2.00
DEPRESSION AT GUTTER	(inch)=	2.00
GUTTER WIDTH	(feet)=	2.00
STREET MANNING ROUGHNESS N	=	0.016

STREET UNDER THE GIVEN FLOW:

PEAK RUNOFF FLOW RATE	(cfs)=	0.60
FLOW CARRIED BY GUTTER	(cfs)=	0.58
FLOW CARRIED BY STREET	(cfs)=	0.02
WATER SPREAD ON STREET	(ft) =	3.71
GUTTER FLOW DEPTH	(in) =	2.89
AVERAGE FLOW VELOCITY	(fps)=	1.97

UDINLET: STREET FLOW ANALYSIS
DEVELOPED BY
DR JAMES GUO, CIVIL ENG DEPT, U OF COLORADO AT DENVER
SUPPORTED BY METRO DENVER CITIES/COUNTIES AND UD$FCD

USER:KEVIN GINGERY-RDB INC FT. COLLINS COLORADO.....
ON DATE 05-26-1994 AT TIME 13:37:52

Flow approaching inlet #21

*** STREET GUTTER HYDRAULICS

GIVEN GUTTER GEOMETRIES:

LONGITUDINAL SLOPE	(%) =	0.60
CROSS SLOPE	(%) =	2.00
DEPRESSION AT GUTTER	(inch)=	2.00
GUTTER WIDTH	(feet)=	2.00
STREET MANNING ROUGHNESS N	=	0.016

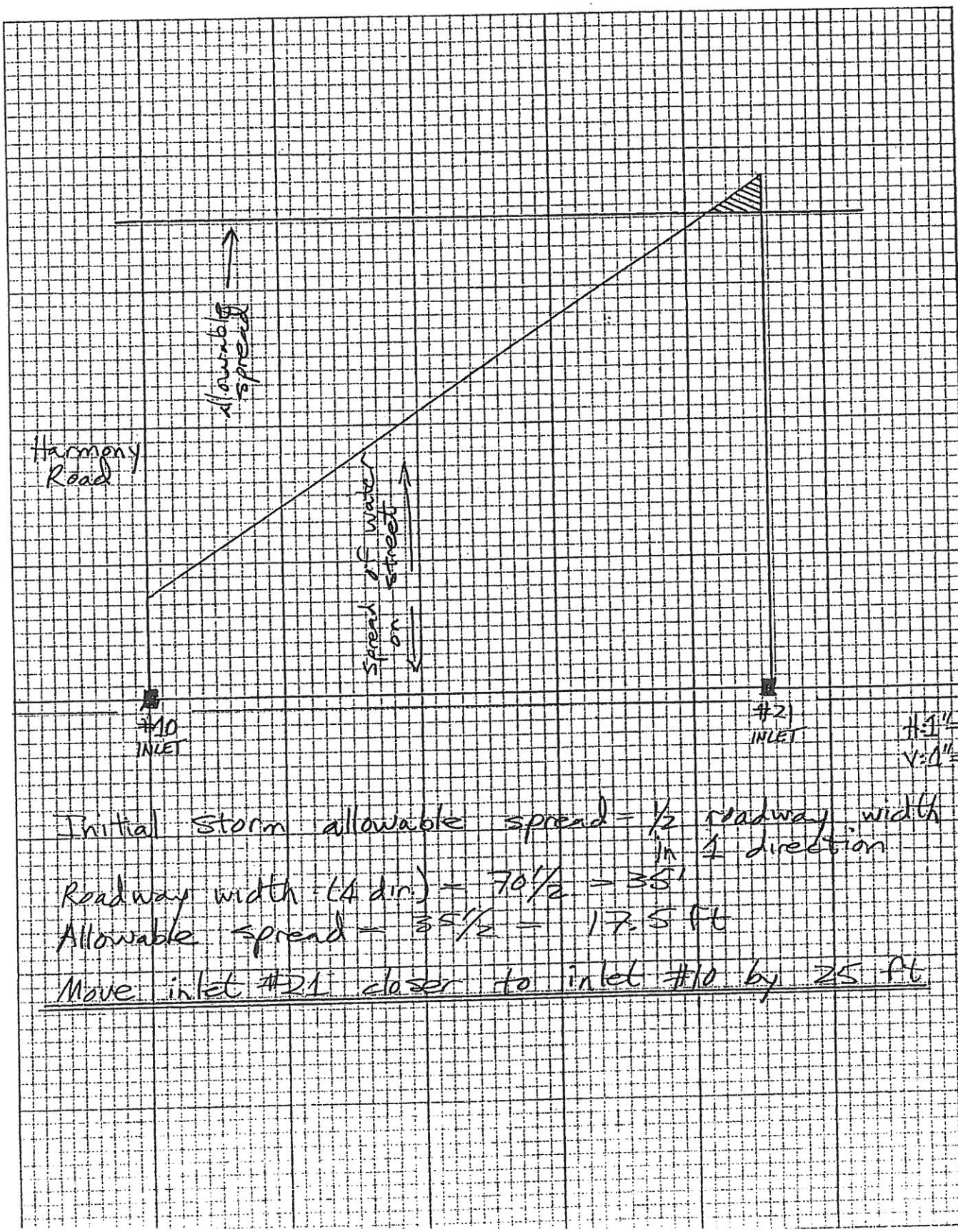
STREET UNDER THE GIVEN FLOW:

PEAK RUNOFF FLOW RATE	(cfs)=	10.50
FLOW CARRIED BY GUTTER	(cfs)=	3.59
FLOW CARRIED BY STREET	(cfs)=	6.92
WATER SPREAD ON STREET	(ft) =	18.41
GUTTER FLOW DEPTH	(in) =	6.42
AVERAGE FLOW VELOCITY	(fps)=	2.96

Overlook at Woodridge

RBD INC
Engineering Consultants

CLIENT Woodcraft JOB NO. 434-011
PROJECT Overlot #4 CALCULATIONS FOR Drainage
MADE BY DKT DATE 26 May 94 CHECKED BY ____ DATE ____ SHEET 17 OF ____



Initial storm allowable spread = ½ roadway width in 1 direction

Roadway width (4 din.) = 70 ft = 35'

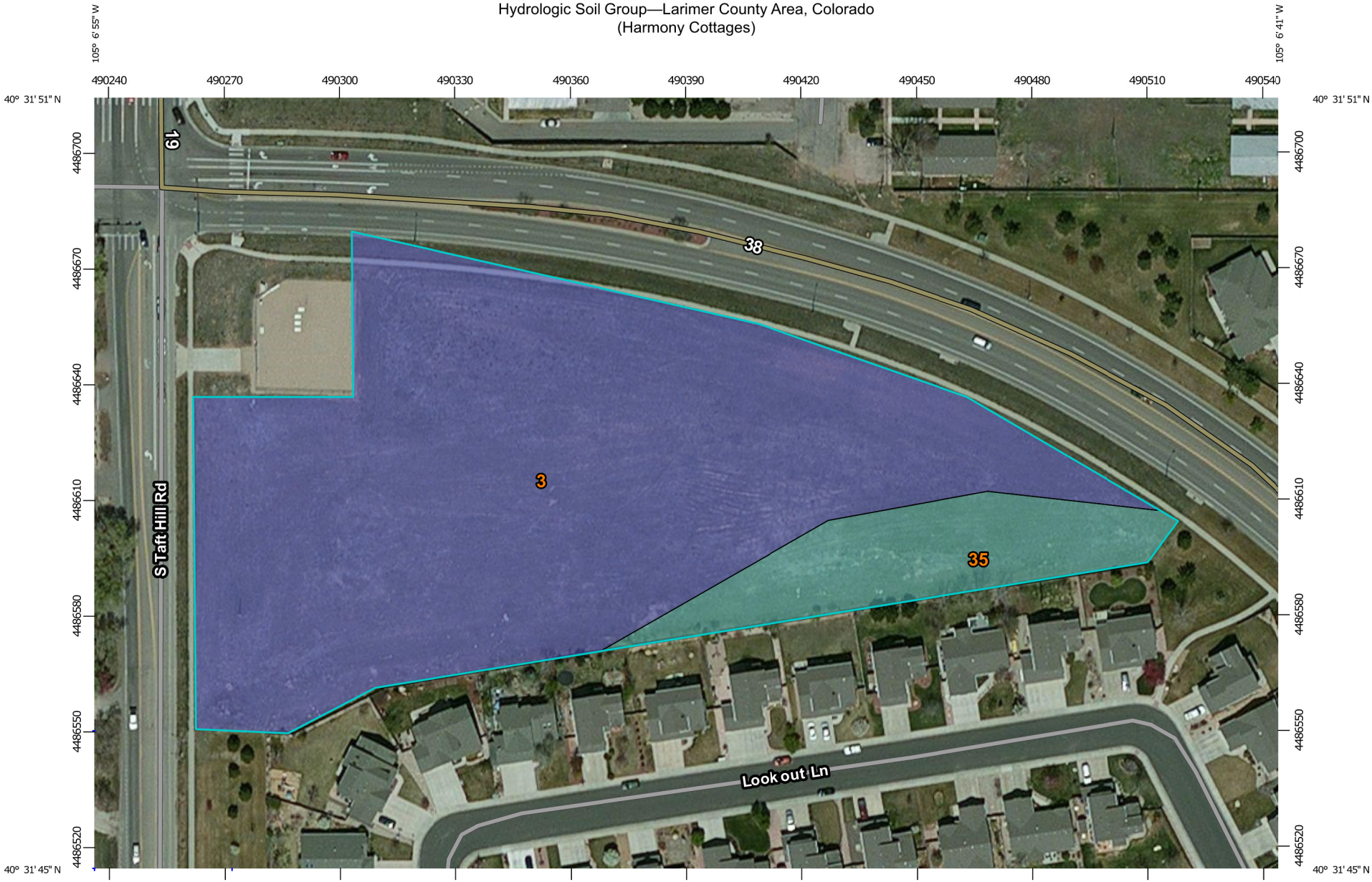
Allowable spread = 35' ½ = 17.5 ft

Move inlet #21 closer to inlet #10 by 25 ft

APPENDIX G

SOIL REPORT
AND
FEMA INFORMATION

Hydrologic Soil Group—Larimer County Area, Colorado
(Harmony Cottages)



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Lines

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Soil Rating Points

A
A/D
B
B/D
C
C/D
D
Not rated or not available

Water Features

Streams and Canals

Transportation

Rails
Interstate Highways
US Routes
Major Roads
Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Larimer County Area, Colorado
Survey Area Data: Version 10, Sep 22, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Apr 22, 2011—Apr 28, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Larimer County Area, Colorado (CO644)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Altvan-Satanta loams, 0 to 3 percent slopes	B	4.1	86.3%
35	Fort Collins loam, 0 to 3 percent slopes	C	0.6	13.7%
Totals for Area of Interest			**4.7**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher

FEMA's National Flood Hazard Layer (Official)

Data from Flood Insurance Rate Maps (FIRMs) where available digitally. Try http://bit.ly/1bPpUjq (Unofficial) if this map is down

scott.mcafee@fema.dhs.gov | National Geospatial-Intelligence Agency (NGA); Delta State University; Esri

UTILITY PLANS FOR

HARMONY COTTAGES

BEING A REPLAT OF LOTS 1 AND 2, INNOVATION ISLAND

SITUATE IN THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 7 NORTH, RANGE 69 WEST OF THE 6TH P.M., CITY OF FORT COLLINS, COUNTY OF LARIMER, STATE OF COLORADO

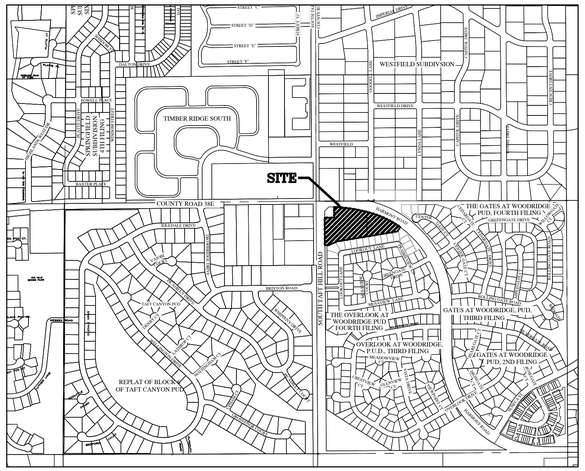
JANUARY 2016

LEGEND

	EXISTING TELEPHONE LINE		PROPOSED TELEPHONE LINE
OHT	EXISTING OVERHEAD TELEPHONE LINE	OHT	PROPOSED OVERHEAD TELEPHONE LINE
FO	EXISTING FIBER OPTIC LINE	FO	PROPOSED FIBER OPTIC LINE
CTV	EXISTING CABLE TV	CTV	PROPOSED CABLE TV
	EXISTING ELECTRIC LINE		PROPOSED ELECTRIC LINE
OHE	EXISTING OVERHEAD ELECTRIC LINE	OHE	PROPOSED OVERHEAD ELECTRIC LINE
	EXISTING GAS		PROPOSED GAS
OHU	EXISTING OVERHEAD UTILITY	OHU	PROPOSED OVERHEAD UTILITY
	EXISTING SANITARY SEWER MAIN		PROPOSED SANITARY SEWER MANHOLE
	EXISTING MANHOLE		PROPOSED WATER VALVE
	EXISTING WATER MAIN		PROPOSED FIRE HYDRANT
	EXISTING WATER VALVE		PROPOSED STORM SEWER MANHOLE
	EXISTING FIRE HYDRANT		PROPOSED STORM INLET
	EXISTING STORM SEWER		PROPOSED FLOWLINE, CURB & GUTTER
	EXISTING STORM SEWER INLET		PROPOSED CONCRETE
	EXISTING FLOWLINE, CURB & GUTTER	XXX	PROPOSED SPOT ELEVATION
	EXISTING CONCRETE	XXXX	PROPOSED MINOR CONTOUR
XXX	EXISTING SPOT ELEVATION	XXXX	PROPOSED MAJOR CONTOUR
XXXX	EXISTING MINOR CONTOUR		PROPOSED UTILITY POLE
XXXX	EXISTING MAJOR CONTOUR		PROPOSED STREET LIGHT
	EXISTING UTILITY POLE		PROPOSED LIGHT POLES
	EXISTING STREET LIGHT		PROPOSED FENCE
	EXISTING GUY WIRE		PROPOSED WATER SERVICE W/ CURB STOP AND METER PIT
	EXISTING FENCE	CO	PROPOSED SANITARY SEWER SERVICE W/ CLEANOUT
	EXISTING WOOD POST		PROPOSED DIRECTION OF OVERLAND FLOW
	EXISTING METAL POST		PROPOSED SWALE
			PROPOSED EMERGENCY OVERFLOW ROUTE
			LIMITS OF DEVELOPMENT (LOD)
			PROPOSED HANDICAP RAMP
			PHASE LINE

ABBREVIATION LIST

AD	ALGEBRAIC DIFFERENCE	LF	LINEAR FEET
AE	ACCESS EASEMENT	LP	LOW POINT
ARV	AIR RELEASE VALVE	LT	LEFT
BOV	BLOW OFF VALVE	MH	MANHOLE
BW	BOTTOM OF WALL	OHE	OVERHEAD ELECTRIC
CL	CENTERLINE	OHT	OVERHEAD TELEPHONE
CMP	CORRUGATED METAL PIPE	OHU	OVERHEAD UTILITY
CO	CLEAN OUT	PE	PEDESTRIAN EASEMENT
DE	DRAINAGE EASEMENT	PC	POINT OF CURVATURE
E	ELECTRIC	PCR	POINT OF CURB RETURN
EAE	EMERGENCY ACCESS EASEMENT	PI	POINT OF INTERSECTION
EG	EXISTING GROUND	PT	POINT OF TANGENCY
EL	ELEVATION	PVC	POLYVINYL CHLORIDE
EOA	EDGE OF ASPHALT	RCP	REINFORCED CONCRETE PIPE
EX	EXISTING	RD	ROOF DRAIN
ESMT	EASEMENT	ROW	RIGHT-OF-WAY
F	FIRE LINE	RT	RIGHT
FES	FLARED END SECTION	S	SANITARY SEWER
FF	FINISHED FLOOR	STA	STATION
FG	FINISHED GRADE	SD	STORM DRAIN PIPE
FH	FIRE HYDRANT	SDMH	STORM DRAIN MANHOLE
FL	FLOWLINE	SMH	SANITARY SEWER MANHOLE
FO	FIBER OPTIC	T	TELEPHONE
G	GAS	TB	THRUST BLOCK
GB	GRADE BREAK	TBC	TOP BACK OF CURB
GD	GROUND	TCE	TEMPORARY CONSTRUCTION EASEMENT
GV	GATE VALVE	TC	TOP OF CONCRETE
HDPE	HIGH DENSITY POLYETHYLENE	TF	TOP OF FOUNDATION
HP	HIGH POINT	TW	TOP OF WALL
IE	IRRIGATION EASEMENT	TYP	TYPICAL
INV	INVERT	UE	UTILITY EASEMENT
IRR	IRRIGATION	VB	VALVE BOX
		VCP	VITRIFIED CLAY PIPE
		VPC	VERTICAL POINT OF CURVATURE
		VPI	VERTICAL POINT OF INTERSECTION
		VPT	VERTICAL POINT OF TANGENCY
		W	WATERLINE



VICINITY MAP

APPROX. 1"=1000'

PROJECT DATUM: NAVD88

CITY OF FORT COLLINS BENCHMARK #8-98
ON A SIGNAL POLE BASE AT THE S.E. CORNER OF SOUTH TAFT HILL RD AND NEW HARMONY RD (CR 38E).
ELEV=5154.87

CITY OF FORT COLLINS BENCHMARK #21-94
NORTHWEST CORNER OF COUNTY ROAD 38E AND WINDOM ST., ON THE SOUTHWEST CORNER OF THE CONCRETE BASE TO A FIBER OPTICS UNIT.
ELEV=5179.26

PLEASE NOTE: THIS PLAN SET IS USING NAVD88 FOR A VERTICAL DATUM. SURROUNDING DEVELOPMENTS HAVE USED NGVD29 UNADJUSTED FOR THEIR VERTICAL DATUMS.

IF NGVD29 UNADJUSTED DATUM IS REQUIRED FOR ANY PURPOSE, THE FOLLOWING EQUATIONS SHOULD BE USED:
NGVD 29 UNADJUSTED = NAVD88 - 3.19'

UTILITY CONTACTS:

CITY OF FORT COLLINS
700 WOOD STREET
FORT COLLINS, COLORADO 80522

WATER/WASTEWATER
SHANE BOYLE
PH. 970.221.6339

STORMWATER
WES LAMARQUE
PH. 970.416.2418

LIGHT & POWER
JANET MCTAGUE
PH. 970.224.6154

NATURAL GAS
XCEL ENERGY
CONTACT: STEPHANIE RICH
PH. 970.225.7828

TELEPHONE SERVICE
CENTURY LINK (QWEST)
CONTACT: BOB RULLI
PH. 970.377.6403

TV SERVICE
COMCAST
CONTACT: DON KAPPERMAN
PH. 970.484.7166

INDEX OF SHEETS

SHEET NO.	DESCRIPTION OF SHEETS
1	COVER SHEET
2	UTILITY PLAN
3	GRADING PLAN
4	DRAINAGE PLAN
5	DETAILS

CLIENT
HABITAT FOR HUMANITY
4001 S. TAFT HILL ROAD
FORT COLLINS, COLORADO 80526
PH. 970.223.4522

ENGINEER
INTERWEST CONSULTING GROUP
1218 W. ASH, SUITE A
WINDSOR, COLORADO 80550
PH. 970.674.3300

PLANNER
RIPLEY DESIGN, INC.
419 CANYON AVE. SUITE 200
FORT COLLINS, CO 80521
PH. 970.224.5828

SURVEYOR
KING SURVEYORS
9299 EASTMAN PARK DRIVE
WINDSOR, COLORADO 80550
PH. 970.686.5011

INDEMNIFICATION STATEMENT:

THESE PLANS HAVE BEEN REVIEWED BY THE LOCAL ENTITY FOR CONCEPT ONLY. THE REVIEW DOES NOT IMPLY RESPONSIBILITY BY THE REVIEWING DEPARTMENT, THE LOCAL ENTITY ENGINEER, OR THE LOCAL ENTITY 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 IN ANY REASON AS ACCEPTANCE OF FINANCIAL RESPONSIBILITY BY THE LOCAL ENTITY FOR ADDITIONAL QUANTITIES OF ITEMS SHOWN THAT MAY BE REQUIRED DURING THE CONSTRUCTION PHASE.

PRELIMINARY
NOT FOR CONSTRUCTION

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
CALL 2-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

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.

CITY OF FORT COLLINS, COLORADO
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: _____ NATURAL RESOURCES _____ DATE

INTERWEST CONSULTING GROUP
1218 W. Ash, Suite C
Windsor, Colorado 80550
Phone: (970) 674-3300
Fax: (970) 674-3303

PREPARED FOR
HABITAT FOR HUMANITY
4001 S. TAFT HILL ROAD
FORT COLLINS, CO 80525
PHONE: 970.223.4522

PROJECT NAME
HARMONY COTTAGES

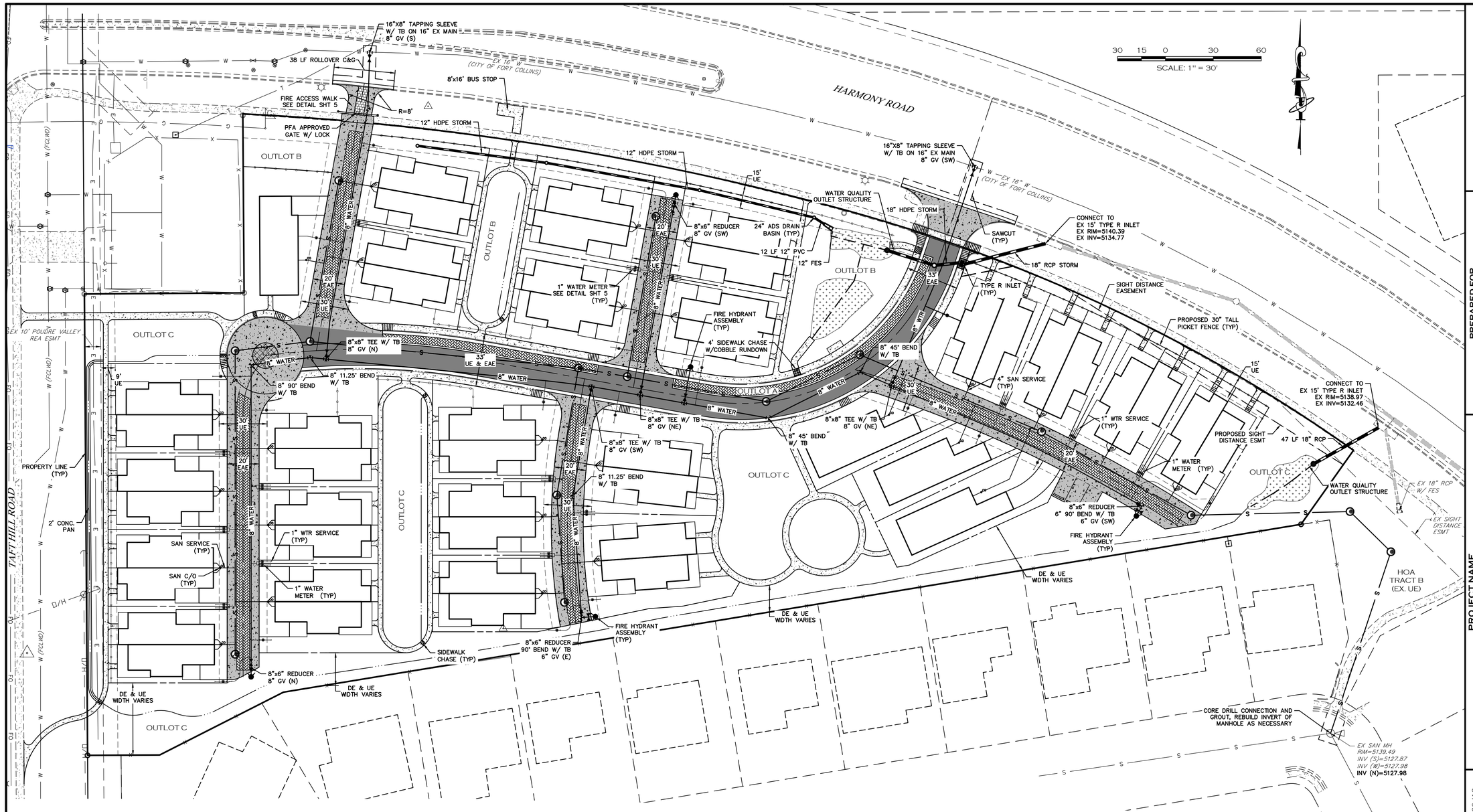
COVER SHEET

DATE: 01/20/16
SCALE (H): N/A
SCALE (V): N/A
DESIGNED BY: SB
CHECKED BY: RA

PROJ. NO. 1255-028-00

1 OF 5

K:\INTERWEST PROJECTS\2015 PROJECTS\1255-028-00 (HARMONY COTTAGES)\DRAWINGS\DRAWINGS PLANS\1255-028-00 COVSHEET.DWG, 1/19/2016 5:48 PM



NOTES:

1. ALL STORM SEWER, SANITARY SEWER, AND WATER 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 LOCAL ENGINEER.

2. STORM SEWER PIPE SHALL BE RCP OR PVC WITH WATER TIGHT JOINTS AS SPECIFIED ON THE PLAN. ALL STORM SEWER SHALL BE INSPECTED BY THE CITY OF FORT COLLINS.

3. LENGTH OF PIPE IS MEASURED FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE AND INCLUDES THE FLARED END SECTION.

4. WATER MAINS SHALL BE PVC (C-900) AS SPECIFIED BY THE CITY OF FORT COLLINS STANDARD PLANS AND SPECIFICATIONS.

5. ALL WATER SERVICES SHALL BE INSTALLED AT A MINIMUM OF 5-FEET BELOW FINISHED FLOOR ELEVATION AND SHALL BE TYPE K COPPER AS SPECIFIED BY THE CITY OF FORT COLLINS STANDARD PLANS AND SPECIFICATIONS.

6. ALL SANITARY SEWER PIPE SHALL BE PVC (SDR 35) UNLESS OTHERWISE NOTED ON THE PLAN. SEWER PIPE SHALL BE AS SPECIFIED BY THE CITY OF FORT COLLINS STANDARD PLANS AND SPECIFICATIONS.

8. LIMITS OF STREET CUT SHOWN ARE APPROXIMATE. FINAL LIMITS ARE TO BE DETERMINED IN THE FIELD BY CITY ENGINEER INSPECTOR. ALL REPAIRS TO BE IN ACCORDANCE WITH CITY STREET REPAIR STANDARDS.

9. CITY OF FORT COLLINS LIGHT & POWER (L&P) SHALL INSTALL PRIMARY LINE FROM CONNECTION POINT TO ELECTRIC VAULT, SECONDARY LINES FROM VAULT TO METER, AND BUILDING METER. CONTRACTOR SHALL COORDINATE WITH FORT COLLINS METER GROUP FOR METER LOCATION. CONTACT CITY OF FORT COLLINS LIGHT & POWER FOR THEIR CURRENT REQUIREMENTS.

10. ANY DAMAGED CURB, GUTTER AND SIDEWALK EXISTING PRIOR TO CONSTRUCTION, AS WELL AS STREETS, SIDEWALKS, CURBS AND GUTTERS, DESTROYED, DAMAGED OR REMOVED DUE TO CONSTRUCTION OF THIS PROJECT, SHALL BE REPLACED OR RESTORED TO CITY OF FORT COLLINS STANDARDS AT THE DEVELOPER'S EXPENSE PRIOR TO THE ACCEPTANCE OF COMPLETED IMPROVEMENTS AND/OR PRIOR TO THE ISSUANCE OF THE FIRST CERTIFICATE OF OCCUPANCY.

11. ALL PRIVATE DRIVE AND PRIVATES ALLEYS SHALL BE PRIVATELY MAINTAINED.

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- RAIN GARDEN W/ BIORETENTION MEDIA
- PROPOSED PERMEABLE PAVER
- PROPOSED ASPHALT
- PROPOSED CONCRETE PAVEMENT
- PROPOSED STAMPED CONCRETE PAVEMENT
- PROPOSED CONCRETE

CALL UTILITY NOTIFICATION CENTER OF COLORADO
811
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 & WASTEWATER UTILITY _____ DATE
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PREPARED FOR
HABITAT FOR HUMANITY
4001 S. TAFT HILL ROAD
FORT COLLINS, CO 80525
PHONE: 970.223.4522

PROJECT NAME
HARMONY COTTAGES

UTILITY PLAN

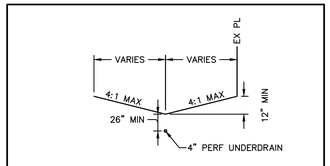
DATE: 01/20/16
SCALE (H): 1"=30'
SCALE (V): N/A
DESIGNED BY: SB
CHECKED BY: RA

PROJ. NO. 1255-028-00

2 OF 5

NOTES:

1. TFE = TOP OF FOUNDATION ELEVATION, GE=GARAGE ELEVATION
2. CONTRACTOR RESPONSIBLE FOR ALL SURFACE REPAIR/REPLACEMENT TO RESTORE SIDEWALKS, PAVEMENT, CURB/GUTTER AND SOD AREAS DISTURBED BY NEW WORK. REPAIR/REPLACEMENTS SHALL BE COMPLETED PER CITY OF FORT COLLINS STANDARDS AT CONTRACTOR EXPENSE.
3. SIDEWALKS ADJACENT TO STREETS, DRIVES, PARKING LOTS AND ACCESS SLOPE 2% TOWARDS THE CURB LINE.
4. ALL SUBGRADE TO BE PLACED/COMPACTED PER GEOTECHNICAL ENGINEER RECOMMENDATIONS. ALL PAVEMENT SECTIONS PER GEOTECHNICAL ENGINEER RECOMMENDATIONS.
5. SEE LANDSCAPE PLANS FOR REVEGETATION METHODS.



NOTE: PORTIONS OF THE GRASS SWALE ARE FLATTER THAN 2%. SOFT PAN OR UNDERDRAIN WILL BE REQUIRED. TO BE DETERMINED WITH FINAL PLANS.

GRASS SWALE
TYPICAL SECTION

LEGEND

RAIN GARDEN W/ BIORETENTION MEDIA

PROPOSED POROUS PAVER

CALL UTILITY NOTIFICATION CENTER OF COLORADO
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PROJECT NAME
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GRADING PLAN

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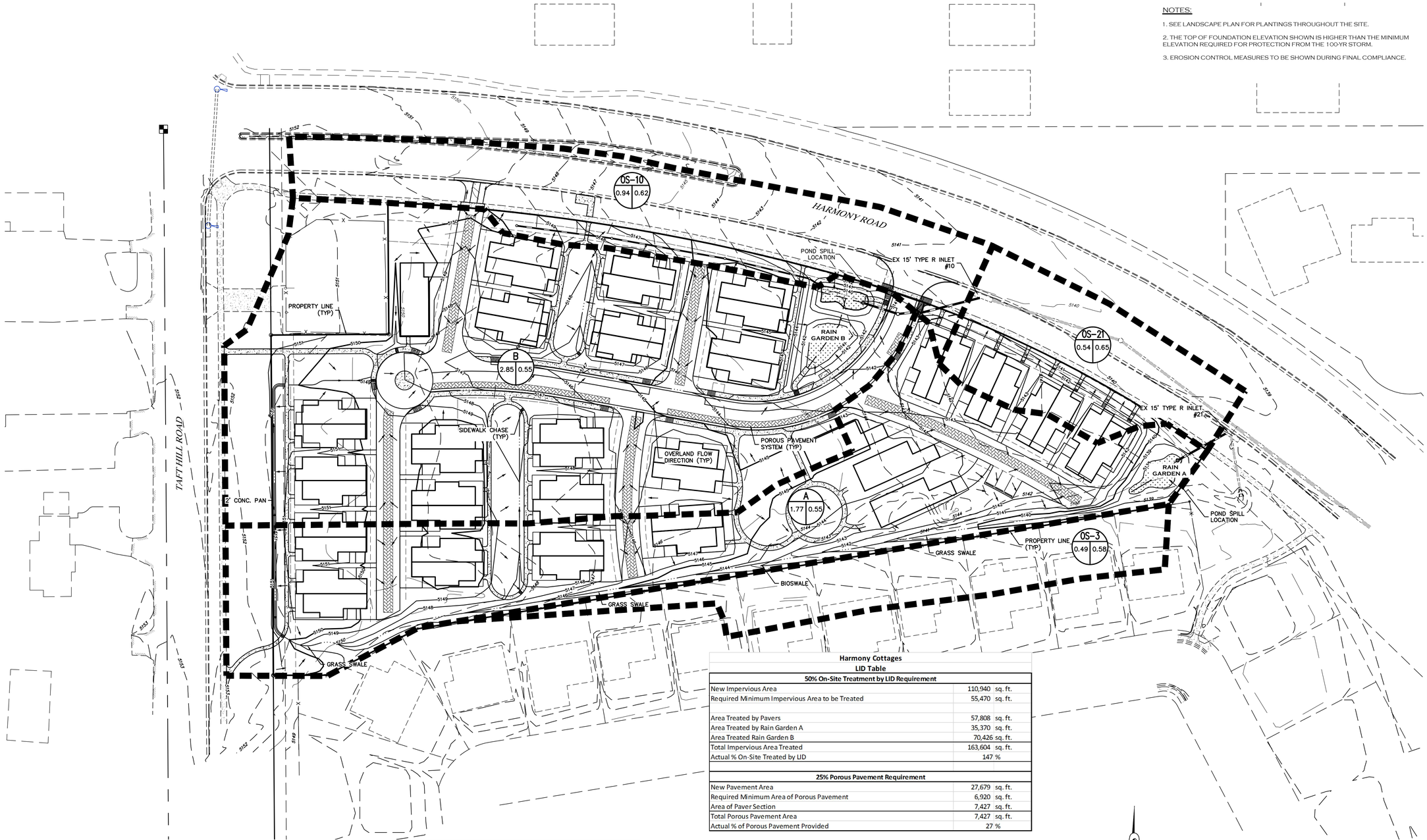
PROJ. NO. 1255-028-00

3 OF 5

NOTES:

1. SEE LANDSCAPE PLAN FOR PLANTINGS THROUGHOUT THE SITE.
2. THE TOP OF FOUNDATION ELEVATION SHOWN IS HIGHER THAN THE MINIMUM ELEVATION REQUIRED FOR PROTECTION FROM THE 100-YR STORM.
3. EROSION CONTROL MEASURES TO BE SHOWN DURING FINAL COMPLIANCE.



Harmony Cottages
LID Table

50% On-Site Treatment by LID Requirement		
New Impervious Area	110,940	sq. ft.
Required Minimum Impervious Area to be Treated	55,470	sq. ft.
Area Treated by Pavers	57,808	sq. ft.
Area Treated by Rain Garden A	35,370	sq. ft.
Area Treated Rain Garden B	70,426	sq. ft.
Total Impervious Area Treated	163,604	sq. ft.
Actual % On-Site Treated by LID	147	%
25% Porous Pavement Requirement		
New Pavement Area	27,679	sq. ft.
Required Minimum Area of Porous Pavement	6,920	sq. ft.
Area of Paver Section	7,427	sq. ft.
Total Porous Pavement Area	7,427	sq. ft.
Actual % of Porous Pavement Provided	27	%

PRELIMINARY
NOT FOR CONSTRUCTION

LEGEND

- PROPOSED DRAINAGE BASIN DIVIDE LINE
- 1 / 0.37 0.63 — DRAINAGE BASIN NUMBER; MINOR STORM RUNOFF COEFFICIENT; DRAINAGE BASIN AREA
- 1 — DESIGN POINT
- PROPOSED DIRECTION OF OVERLAND FLOW

DRAINAGE SUMMARY TABLE

Design Point	Tributary Sub-basin	Area (ac)	C (10)	C (100)	tc (10) (min)	tc (100) (min)	Q(2)tot (cfs)	Q(10)tot (cfs)	Q(100)tot (cfs)	REMARKS
a	A	1.77	0.55	0.69	7.7	6.8	2.4	4.1	10.9	WQ Pond
b	B	2.85	0.55	0.69	14.0	12.5	3.0	5.2	13.8	Rain Garden
10	OS-10	0.94	0.62	0.78	8.6	7.8	1.4	2.4	6.3	Ex Inlet #10
21	OS-21	0.54	0.65	0.81	5.0	5.0	1.0	1.7	4.3	Ex Inlet #21
3	OS-3	0.49	0.58	0.73	8.6	7.6	0.7	1.2	3.6	Bioswale

40 20 0 40 80
SCALE: 1" = 40'

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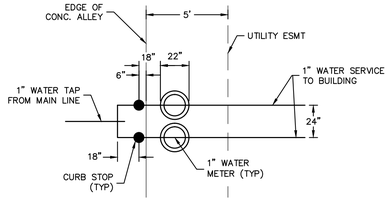
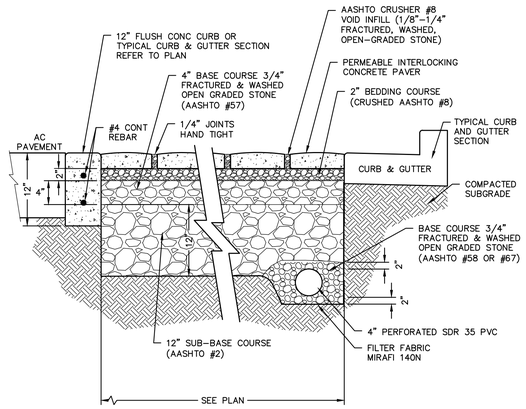
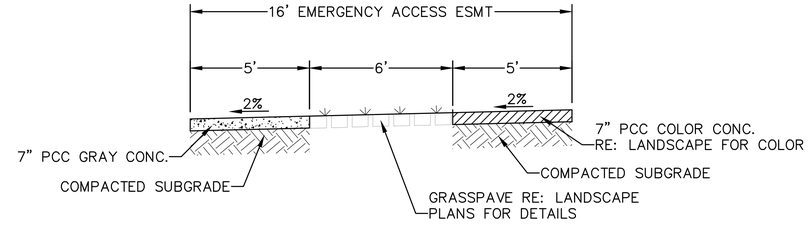


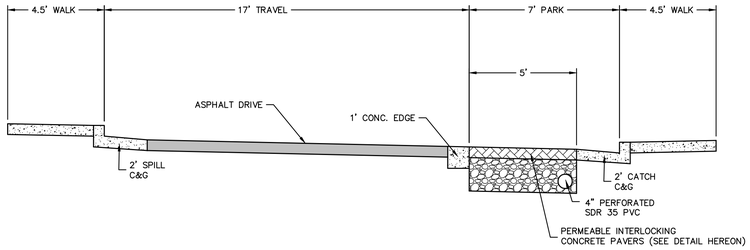
WATER METER TYPICA LAYOUT
N.T.S.



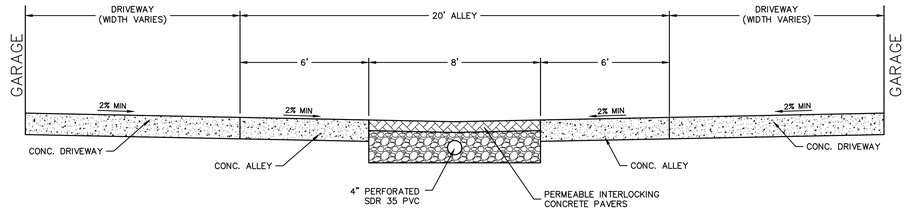
PERMEABLE INTERLOCKING CONCRETE PAVER SECTION
N.T.S.



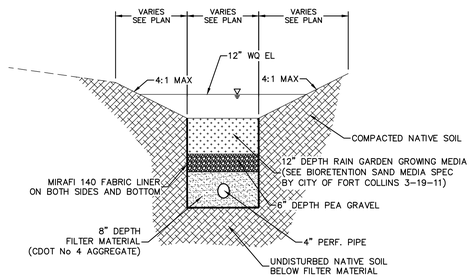
FIRE ACCESS WALK
N.T.S.



PRIVATE DRIVE TYPICAL SECTION
N.T.S.



PRIVATE ALLEY TYPICAL SECTION
N.T.S.



RAIN GARDEN TYPICAL SECTION
N.T.S.

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DETAILS

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5 OF 5

COMMENTS FROM HARMONY COTTAGES NEIGHBORHOOD MEETING DECEMBER 3RD 2105

- The "meeting" felt very much like no one wanted anyone's input - done deal. TOO MUCH in a very small space.
- We are very concerned with the amount of buildings in a small space. Existing home values will decrease. Entrance onto harmony will create even more traffic & safety issues. Meeting was misrepresented in the letter, it was not represented as an "open house" forum. Concerns in regards to maintaining the integrity of the neighborhood - i.e.: HOA, etc. Existing neighborhood has very high standards. WORRIED!
- Thanks for having such a nice meeting. Lots of good info. Project looks good.
- HUGE traffic concerns, dangerous intersections - too many units in an already congested area - will use existing roads increasing dangerous traffic in neighborhood!
- Outer Roads Harmony & S. Taft. Have so much traffic, worried about safety for kids, intersection borders county area, no sidewalks on E. Side or West Side. Not a Logical place for these homes.
- Make intersection at Harmony and Taft more pedestrian friendly.
- Traffic flow, as they can't go left on Harmony. All traffic trying to get through left will go through our neighborhood. Speeding cars will cause a more dangerous environment for children, pets, and families.
- 1. Two-story homes much too close to existing houses on Lookout Lane.2. Too many vehicles- 92 for that size area. 3. Our property values will be very adversely effected.
- Not enough parking with having kids whom drive. Will the people that move in there keep it up? HOA In 30 years will their kids of whoever else going to keep it up?
- Our house values are going to go down! Thanks a lot.
- What's estimated time of construction? Will it be in phases? Will a family be designated before build starts?
- Believe the annual income on Habitat chart is false/ misleading.
- TOO MANY UNITS PROPOSED FOR THIS SITE. Lack of support for low income families to access basic services 1. no access to bus. 2. no grocery within walking distance. 3. no shopping.
- THERE IS ALREADY AN ABUNDANCE OF LOW INCOME OF HOUSING WITHIN 1/4 MILE OF THIS INTERSECTION. LACK OF BUFFER BETWEEN EXISTING HOMES THAT WILL BE ADVERSELY AFFECTED.

- Harmony & Taft ALREADY OVERBURDENED WITH TRAFFIC DUE TO POOR PLANNING. LOOKOUT LANE ALREADY USED AS WAY AROUND INTERSECTION. See Taft between Harmony & Horsetooth lots of money spent to achieve no relief in vehicle traffic. One lane each way.
- Concern with traffic and safety. 1. Too many cars going too fast 2. no better place to enter the site but there are too many houses proposed to enter the site.
- Our home values will go down
- I love the playground and green spaces very family friendly
- Need 2 entrances and exits
- Green court is a great idea
- Looks like a real neighborhood
- I like the look of separated duplexes
- All schools are already overcapacity you will be bringing in children to schools that cannot maintain their success with the addition of so many families
- Concern with traffic increase on Harmony close to major intersection
- Kids and busy street
- Geographically isolated from resources (employment, stores, etc.)
- 1 transportation bus system nearby
- Bad bad idea
- Impact on schools
- Traffic at Harmony and Taft already very problematic and dangerous. Cannot support traffic of 48 more dwellings- wrecks occur regularly in the general area. No nearby grocery stores to support. School right down the street dangerous to kids and to traffic
- Too many buildings in this small space. No buffer between existing neighborhood & this will kill our home property value.
- School impact? Traffic will be unsafe and congested
- Home values will decrease in nearby neighbors
- Concentration of low income housing is an idea stuck in the 60's it has never worked
- I love the individual roofs
- The intersection with Harmony and Taft is extremely problematic, in part due to just 2 way street (Taft) between Horsetooth and Harmony. There are major squeeze plays with this area routinely. Very bad situation for traffic in adding 48 additional units at this location.
- Not enough street parking
- Bad design, bad left turn design- traffic will increase on Lookout Lane.

- Ditto concern about traffic onto Harmony (Exit onto S. Taft Hill would be worse morning and evening rush)
- You have to put an ingress/ egress on Taft Hill Rd. If you don't our street Lookout Lane will be used to get around to get onto Taft Hill Rd.
- Concerned about traffic increasing on adjacent neighborhood. Too many cars coming and going.
- Concerned about Traffic in the adjacent neighborhood. Cars cutting thru neighborhood rather than waiting to turn left off of W. Harmony.
- Site plan seems over built, consider reducing # of units to increase separation distance from adjacent homes back of lot lines.
- Impressive design- like the green space
- How do children walk/ bus to school?
- Speed limit on Harmony?
- Only one entrance/ exit for 122 people (2.53 per household)
- Drainage
- Not near any employment offices that people would work
- Traffic increase in our neighborhood
- Dangerous turning west onto Harmony
- We didn't want it then and we don't want it now
- What about our real-estate values
- Too much traffic for all these kids safety
- Harmony U turns

Harmony Cottages Neighborhood Meeting Summary

Date: February 18, 2016

Facilitator: Patsi Maroney (City of Fort Collins – Neighborhood Services)

Presenters: Clay Frickey (City of Fort Collins – Planning Services)
Martina Wilkinson (City of Fort Collins - Traffic Operations)
Russ Lee (Applicant)
Kristin Candella (Applicant)
Greg Fisher (Applicant)
Sara Coutts (Applicant)
Matt Delich (Applicant)
Skylar Brower (Applicant)

City Presentation Summary:

- This is the second neighborhood meeting designed to follow up from first neighborhood meeting and address concerns
- Next step is public hearing
- Current submittal has addressed emergency access, traffic, setback concerns
- City is aware of traffic issues and has adjusted signal timing at Harmony and Taft Hill to reduce cut through traffic in the morning

Applicant Presentation Summary:

- Applicant team has worked hard to address main concerns identified at first neighborhood meeting
    - Habitat program
    - Impact of product
    - Density
- Habitat serves important niche and builds community through home ownership
- The architecture has been designed to integrate into community and will be high quality product
- Impact of product reduced
    - Landscaping along Taft Hill and Harmony
    - Turf along property line
    - Shifting houses north
    - Sidewalks and fencing
    - 42% of site is open space

Questions and Answers

Question: How will the ingress and egress to the site work? Will it be limited to right in, right out only?

Response (City): The ingress and egress to the site will allow for left turns in and out. The left turn out will occur in 2 stages.

Question: What is a 2 stage turn?

Response (City): It means the vehicle turning left will first enter into the center lane and then merge into traffic from there.

Question: It's my understanding that the Habitat for Humanity project at Rigden Farm was part of the original design and part of the HOA. Since this proposed development won't be a part of our HOA, how will it be regulated?

Response (Applicant): Actually, the Habitat project at Rigden is part of a sub-association that came later and wasn't part of the original design. For this development, the owners will form their own HOA. We are working with a management company right now on developing the HOA.

Question: During the presentation on traffic you mentioned there will be 1 car per minute entering and leaving the site. Is this based on the 1 car garage shown for each building or is this based on the number of units?

Response (Applicant): Actually, there will be two parking spots per home, 1 garage spot and 1 in front of each house.

Response (City): We base traffic predictions on the number of units in the development. We know, for example, that single-family homes tend to generate a certain amount of trips per day and use that to predict the estimated traffic impact. At peak hour in the PM, we estimate that the development will generate 54 trips.

Question: For the light at Seneca, I see problems coming out of my neighborhood. I already have a difficult time getting out of my neighborhood. People will go on other streets to avoid the traffic.

Response (City): We look at delays at intersections at peak hours and we have minimum Level of Service standards. We grade Level of Service like we do for grades at school. The Level of Service for that intersection will be a C or D, which is acceptable by City standards.

Question: I live on Silvergate and have a terrible time getting out during the day now. This development will impact us. You say this won't cause cut through traffic but since we're experiencing cut through traffic right now what will you do to stop it?

Response (City): Traffic delays are going to happen and we will do our best to manage the signal timing at Harmony and Taft Hill to prevent cut through traffic. We also have the Neighborhood Traffic Mitigation Program to help your neighborhood out if you have lots of cut through traffic. We can

conduct speed studies and studies of trip origins and destinations to see how traffic is impacting your neighborhood. Based on the results of the study, we might look in to installing speed bumps or signs to slow traffic down. The nice thing is that this program is funded by the City so you will not have to pay for any of these improvements.

Question: What is the baseline for the Level of Service at Harmony and Taft Hill?

Response (Applicant): It is a C right now and will be a C or a D with this development.

Question: Is the water quality feature detention or retention?

Response (Applicant): Neither, the water will go to a detention area off site. We will be treating for water quality with Low Impact Development. The water on the site will drain within 24 hours, the water goes through fast.

Question: Have you looked at the hydrology for the site? There are problems with water in basements in wet years right now. I'm concerned that digging basements for these homes will impact our neighborhood. I want to make sure that flows won't go to our neighborhood.

Response (Applicant): We've done 2 geotechnical studies, one in 2006 and one last year. Neither showed a water table within 15'. We won't do many basements due to the soil. If we do basements, they will be in the northwest corner of the site.

Question: Since traffic is at a C or D level right now, what are we doing before this project goes in to improve traffic? Have you considered a right turn on northbound Taft Hill or an access point for this development on Taft Hill?

Response (City): Yes, we have considered both. We wouldn't allow an access point on Taft Hill since it would be too close to the intersection. We have also looked at a right turn lane on northbound Taft Hill but would prefer to do that improvement as part of the project to widen Taft Hill to 4 lanes. The City prefers to do projects that are a part of a larger capital project rather than small pieces.

Comment: The way to solve the Taft Hill traffic problem is to make Shields 4 lanes since it goes all the way through Loveland. The thing is with this site is that if it were any good, we would have a bank or some other better use on it by now. I'm concerned about the safety of kids. Right now, kids can't go anywhere because the sidewalks are incomplete along Taft Hill north of here. There's been no consideration for kids at the intersection. You should find a different property that is better for kids. There's no grocery store, schools, or transit nearby. Plus I've seen more and more cars on Taft Hill over the past 10 years and this isn't going to help. Also, this will hurt the property values in our neighborhood, which means the City will lose tax revenue and I don't think the City wants that.

Comment: Taft Hill being 2 lanes is a problem right now so what is the hold up in getting it widened? I also don't like the left turn situation onto Harmony from the development.

Question: How wide will the streets be in the development?

Response (Applicant): The streets will be private with parking on one side of the street. **The private drive is 24' wide with parking on the north side of the drive only.**

Question: What will the value of the cottages be?

Response (Applicant): We're not sure yet but recent appraisals of our single-family homes elsewhere have been at $250,000. These homes have seen an appreciation of 20%.

Question: Will current occupancy ordinance apply to this development?

Response (Applicant): Yes, we will abide by the occupancy ordinance.

Question: How will kids get to school and access the school bus? What school will these kids go to?

Response (Applicant): We will follow up with you on that. **Access is designed to use the under pass across Harmony to the south. The site is within the walking zones of Johnson, Webber and Rocky. Rocky students would cross at crosswalk at Harmony and Taft. If bussing was needed it would be provided on east bound Harmony, most likely at the bus stop located to the north of this site and would be provided for Rocky only.**

Response (Principal): The kids in this development will go to Johnson Elementary.

Question: The current conditions for turning out on to Harmony from Greengate is a challenge. Could you adjust the signal timing at the Harmony and Taft Hill intersection to allow for more time for residents to turn on to Harmony?

Response (City): We will follow up with you at a later date.

Question: Where will guests park?

Response (Applicant): Each unit has an extra parking space and there will be parking on the north edge of the private street.

Question: Is the applicant seeking any variances?

Response (Applicant): Yes, normally the required setback along arterials is 30'. We are looking for a modification to allow the buildings to be 25' from the curb. We could comply with the 30' setback but would have to change unit types from duplexes to triplexes to make that work.

Question: Is the site plan contingent on the modification being granted? What happens if you don't get approval for that?

Response (Applicant): Yes, we would have to change to triplexes **or 4-plexes** if we don't get the modification.

Question: Could you walk us through how school buses will drop off kids on Harmony? Will buses stop on the wrong side of Harmony and force kids to cross the street?

Response (City): We're not sure on the route but I will follow up with you. The bus routes are determined by Poudre School District. Poudre School District does not allow crossover on arterial streets.

Response (Applicant): Development is within walk zone for all schools. Bus to Rocky would be on the proposed east bound Harmony bus stop.

Question: Has there been a study done on school buses backing traffic up?

Response (City): This is included in our traffic analysis. We include projected and existing buses in this analysis.

Question: How does ownership work? Can property owners turn these into rental properties?

Response (Applicant): No, they must be owner occupied and they come with a 20-year affordability term.

Comment: Most children will walk to school so there may not be bus service there.

Comment: Children will cross Harmony without using a crosswalk.

Comment: I have a comment on the impact to schools. I am worried about the capacity of schools in the area. These areas need to be attractive to families and the quality of our schools helps make this area attractive. Pushing schools over capacity will lower the quality of our schools.

Response (Applicant): I don't have a firm response to that comment but Poudre School District is routed on all development projects and they have not commented on this proposal.

Comment: Poudre School District may not care. What difference does it make if kids go to one school or another?

Response (Principal): Johnson is at 75% capacity right now.

Question: Greengate and Harmony has a turn lane. How will this development impact our access to that turn lane?

Response (Applicant): This won't impact Greengate's access.

Question: When they are turning left will they go into the median or the turn lane?

Response (Applicant): They will queue in the center turn lane before Greengate.

Comment: I have a backyard that faces Taft Hill and our backyard and patio are not attractive because of all of the traffic noise.

Question: Will the HOA have the same standards as our HOA?

Response (Applicant): We are still developing the HOA so we are not sure.

Question: Will the development share a fence with the abutting properties or will you build your own fence?

Response (Applicant): There will just be the existing fence.

Question: So then the HOA is on the hook if something happens to the fence? That doesn't seem right.

Response (Applicant): That's usually how it works. **Our HOA will share the expense of agreed maintenance of the fence.**

Question: I am curious about the sweat equity you talked about during the presentation. How long will construction take?

Response (Applicant): It depends on funding and volunteers but it could potentially take 6 years.

Comment: We've heard a lot of great stories about opportunities but we want answers to our questions.

Response (Applicant): We work hard on this every day, these things are a big concern to us, too.

Comment: That's what you said last time.

Response (Applicant): We need to look at some of these things in greater detail.

Response (City): Development is responsible for installing any needed sidewalks. We need to look at the signal timing and crosswalks and it will deal with pedestrians getting across Harmony safely.

Question: How will kids get to Johnson?

Response (Applicant): The underpass across Harmony.

Comment: We shouldn't have to worry about our own fence. You should put in your own fence.

Question: Will the single-family homes be 1 story or 2 stories?

Response (Applicant): The single-family homes will be 1 story and the duplexes will be 2 stories.

Comment: The most direct way to get to Johnson is to cross through the greenbelt. We would like to see the kids go some other direction.

Question: How much right of way is required to get Taft Hill to 4 lanes? Will we lose any trees?

Response (Applicant): The proposed sidewalk is located to be sited appropriately based on the Taft Hill expansion. The trees shown are behind the sidewalk so they will work with the road's expansion.

Question: So in other words we could have a construction site for 5-6 years, what is the process and timing for installing the landscaping?

Response (Applicant): The green belts and roads will be built right away following by the individual lots. **Roads and landscaping that would not be affected by house construction will be installed right away. House construction will be at least 6 years.**

Question: How about the street trees?

Response (Applicant): Yes, **street trees will be installed.**

Question: As for the home values, what were the values before the Habitat homes were built in Rigden and what were they after?

Response (Applicant): Recent appraisals of our single-family homes have been at $250,000. That is an appreciation of 20%.

Question: I appreciate everyone's concerns so far. Pedestrian safety is a concern for me. What happened to the trees on the south edge of the development?

Response (Applicant): We will look at trees on the property line. **Trees have been added to south property line.**

Comment: This is an odd property in that there are nice homes and low income housing nearby.

Comment: South Taft Hill becomes a drag racing strip. The entrance shown on Harmony will have lots of fast traffic, too.

Question: Since this will be a construction site for 6-7 years, where will volunteers park? This is not a good site.

Response (Applicant): Parking for volunteers will be available on site and at the Habitat Restore on northwest corner of Harmony and Taft. To respond to some of the construction questions, most of the intensive construction will be done at the beginning. This includes putting in the roads. We will also place fences early on to increase safety.

Comment: I have some words of support for the project. My father is a Habitat volunteer in Columbus, OH and he always comments on how these developments improve the neighborhoods around them. I'm a school teacher and I have kids that live in Habitat homes. Habitat homes increase their housing security, which results in improved school performance. I have fellow school teachers that have applied to live in a Habitat home and this provides a homeownership opportunity for them. Plus, students help build some of these homes and this gives them something to build their pride.

Question: Everyone here loves Habitat but not here. What is the process for the remainder of the project?

Response (City): The next step is to incorporate this feedback into the proposal. After that, the project will go to a public hearing for approval. Everyone who signed in will be notified via e-mail of this meeting. Every property owner within 800' of the development will also receive a letter in the mail two

weeks ahead of the scheduled hearing date. The decision maker is a hearing officer, which is a land use attorney from outside the community. At that meeting, the applicant and City will give presentations on the project and the City will provide a recommendation to the hearing officer. This meeting will open to the public to comment on the project and the hearing officer will take your concerns into consideration when making their decision. After the hearing, the decision maker has 10 business days to render a decision. Once the hearing officer renders a decision, everyone who provided testimony at the hearing will receive a notice of the decision. Those who are in the notification area or provided testimony can appeal the decision within 10 business days to City Council.

Comment: I can't even sit and enjoy my backyard that sits along Taft Hill due to all of the traffic. My living room and office are also quite noisy. Traffic also cuts through our neighborhood all the time.

Response (City): We want to talk to you in further detail and make sure we are monitoring the neighborhood at the right times. We want to address these issues.

Comment: People don't want to wait at the light and that is what causes a lot of the cut through traffic.

Response (City): We are trying to address that and thought it was going well. We need to take a closer look.

Comment: I would like to say that having experience with developers they say one thing and do another. This seems like a great idea just not here. Property values went way down in 2008 and we're worried about property values going down now and losing all of our retirement money.

Question: How can we help Habitat find a different property?

Question: What is the maximum length of a cul de sac in Fort Collins?

Response (Applicant): 660'.

Question: What is the distance from the entry to the end of the cul de sac at the southwest end of the site?

Response (Applicant): **Our street is a private drive, not a cul-de-sac. We have a second point of access less than 660'.**

Question: Is it big enough to do a turnaround for a bus?

Response (Applicant): I haven't used a bus turning template on this cul de sac so I am not sure. **PSD bus will use east bound Harmony.**

Comment: I appreciate everyone's concerns. I work at Poudre High School and I teach math. I've lived in the neighborhood for 15 years and had asked my realtor about this project since there was a rumor that there was low income housing coming to our neighborhood and what it would do to property values. He told me that our property values won't go down. I build homes in our geometry class and that has changed my perspective on Habitat homes. I'm a numbers guy so I'm not making this up, 1/3 of my class

has said they wish they could live in homes like the ones we build. In my opinion, we have the best neighborhood in Fort Collins but if we open up the picture a little bit, the trailer park to the north of us hasn't impacted our property values. I'm scared for the kids, too, but it looks like they have done a good job addressing our concerns. 1 car a minute will piss me off when I'm trying to get out of the neighborhood too but I'll deal with. It's also very hard to get land in Fort Collins. New teachers can't afford Fort Collins so I think we have to give a little on this project.

Comment: So with the decision maker that means that one person will decide whether this project happens or not.

Response (City): That's why we have a public hearing so the community can provide testimony to influence the decision. The decision maker can choose to attach conditions to the project's approval to address concerns of the community.

Comment: I don't like the decision maker scenario, City Council should vote on it.

Question: Has Habitat ever been denied in Fort Collins?

Response (Applicant): No.

Comment: I hear sirens all the time and I live 5 houses off Harmony. We should also look at boat traffic and emergency vehicles in the summer. This causes a lot of congestion. I'm concerned about the safety of kids in the summer.

Response (City): We will look into more enforcement for traffic on Harmony.

Question: How far are duplexes away from traffic?

Response (Applicant): The closest one is **39' from Harmony** and the unit furthest away is **52' from Taft**.

Comment: I thought the minimum offset was 25'.

Response (Applicant): It's 5' **for side yards**.

Question: Will there be windows on both sides of the houses?

Response (Applicant): Yes.

Comment: So the people living there can look right into our backyards, then.

Question: Shouldn't they locate the development in east Fort Collins due to all of the development out there?

Response (Applicant): Securing property in Fort Collins is difficult. I've been looking for a year for a lot for a Poudre School District home and I haven't been able to find one.

Question: Was this property purchased by HUD?

Response (Applicant): No.

Question: What is the cost of the water taps? I thought water taps were really expensive.

Response (Applicant): We're getting our water from City Utilities, not the South Fort Collins Loveland Water District.

Question: Who pays for the taps?

Response (Applicant): The developer pays for the taps.

Question: What about water pressure? I have pretty low water pressure right now and so I am concerned about this development impacting my water pressure.

Response (Applicant): Utilities will ensure there will be sufficient water pressure.

Question: I have a question about the covenants. So an attorney will write the covenants, but when will they be available? Will they be available before the hearing?

Response (Applicant): Covenants are based on our selection process to prospective owners so we probably won't have the covenants ready by the hearing. As a developer we stick around so if there are issues we can step in.

Comment: I just wanted to speak for a moment on something that happened recently. A car had missed the turn at Greengate and ran through two fences and into a house. We need to address the traffic issues in this area.

Comment: The car came within 10' of a woman's pillow.

Question: 48 units seem like awfully high density. Have fewer units been considered? Is there a possibility to reduce the number of units?

Response (Applicant): Density is there so they can provide an affordable product. We looked at many iterations but the density has not changed much due to affordability.

Question: How will you address all of the questions?

Response (City): I'll type up all of the notes and send them out to everyone who gave us their e-mail. We'll also make sure to address these comments with the proposal that goes to the hearing officer so they will be addressed at the public hearing.

Question: Does Habitat own the property?

Response (Applicant): No, the developer owns the property and we will buy it back **lot by lot**.

Question: Can you e-mail your staff report as well?

Response (City): Yes.

How Habitat Works

Habitat for Humanity brings people together to build homes, communities and hope. All are welcome to help with the work, regardless of race, religion, age, gender, political views or any of the other distinctions that too often divide people.

This grassroots effort is made possible through the generous donations of materials, funds, and labor from members of the Fort Collins community. With this leveraging of resources, Habitat is able to help partner families earning 35-60% of the area median income to build and buy their own home. For example, a family of 4 earning between $27,230 and $46,680 qualifies for the program income-wise.

Partner families pay a 0% interest fixed-rate mortgage payment that does not exceed 28% of their income and this helps to build more homes. If the first mortgage, the maximum affordable mortgage over 30 years, is less than the appraised value of the home then Habitat places a second deed of trust. This "silent second" on the home represents the difference. It is called a "silent second" because the homeowner pays no payments on this amount but, in the event the homeowner decides to sell the home, they would still owe what remains on their first deed of trust and also this "silent second." The second deed of trust would be paid back upon sale of the home to allow Habitat to build more homes.

Habitat homeowners also contribute $1,500 toward closing costs and up to 500 hours of "sweat equity" building their home and those of other families.

The lasting, generational impact of Habitat for Humanity is well-documented and includes educational and job attainment, health and wellness, and a sense of security and confidence in managing finances.

Partner Family Qualifications

To be eligible to purchase a Habitat home, families meet the following four criteria:

1. Residency - Live or work in Fort Collins (or surrounding rural areas), are a US citizen, or a legal permanent resident

2. Need of Housing- Housing is inadequate, unaffordable, unsafe, or not stable

3. Ability to Pay – Consistent income at 35-60% AMI, save $1,000 down payment

4. Willingness to Partner - Committed to giving 250-500 hours of "sweat equity" building homes or through other volunteer activities, including working at the ReStore. Sweat equity activities can be modified based on ability.

Meeting these minimum criteria helps ensure the success of families.

Fort Collins Habitat for Humanity (FCHFH) provides families the necessary resources to be successful homeowners. The Homeowner Services Manager facilitates family selection and then, after selection, provides case management, ongoing support services and education, and consultation throughout the term of the home loan. With a total of 60 homes in Fort Collins, there has only been 1 foreclosure or less than 2% of loans.

Prior to closing on their homes, partner families participate in a series of 6 homeowner education classes including the following: Homebuyer Education through Neighbor to Neighbor, Legal Aspects of Homeownership, and Financial Management. They also are required to participate in the 9-week Financial Peace University program

Green, Energy Efficient Homes

Each home is carefully designed to be aesthetically pleasing as well as energy efficient. We have built single-family homes, duplexes, and multi-family developments throughout Fort Collins.

Fort Collins Habitat for Humanity has built multiple LEED Gold certified homes and continues to build to these standards although not every home is certified. LEED standards have been incorporated into the design and construction, with energy efficiency components of Energy Star and much more.

Our homes include the following:
* Low VOCV paints, finishes, carpet
* Upgraded Low-E Windows
* Programmable Thermostats with Limits
* Energy Star Rated appliances
* CFL bulbs
* Insulated Foundation
* Upgraded HVAC
* Upgraded building shell with spray foam insulation
* Low flow shower heads and toilets

Another component of green building we are committed to is providing homeowner education about efficiency usage. This is included in the walk-through upon completion of the home.

How the Program Works

Fort Collins Habitat for Humanity builds homes in partnership with selected and qualified, modest-income households.

Habitat homeowners:

- Contribute a minimum of 250-500 hours of "sweat-equity" building their homes, the homes of others, and preparing to be successful homeowners.
- Consent to a criminal background check, sex offender registry check, credit check, and the Specially Designated Nationals and Blocked Persons check via the US Treasury.
- Complete homeowner education classes including:
  - Homebuyer Education Class provided by Neighbor to Neighbor
  - Financial Peace University, a nine week study on personal financial fitness and management
  - How to be a Good Neighbor
  - Home Maintenance
  - Legal Aspects of Homeownership
  - Media and PR Training
- Pay back a no-interest mortgage through affordable payments based on 28% of a household's gross monthly income.

Program Qualifications

Homeowner applicants must meet the following criteria:

1. Residency:

- Live or work in Fort Collins or the surrounding rural areas.
- Are a US citizen or a lawful permanent resident.

2. Have a need for housing:

- Unable to qualify for a conventional or government assisted loan, or
- Live in overcrowded conditions, or
- Live in unsafe housing, or
- Housing is temporary or transitional, or
- Rent is more than 30% of gross income.

3. Willingness to partner with Habitat:

- Complete classes once selected.
- Complete "sweat-equity" volunteer hours prior to closing on home.
- Save $1,500 toward closing costs.

4. Ability to pay for the home:

- Meet the income qualifications.
- Currently able to pay bills on time.
- Have had no bankruptcy in past 2 years.
- Have had no foreclosure in past 3 years.
- Have no outstanding liens or judgments.
- Complete mortgage application and fulfill all underwriting requirements. *

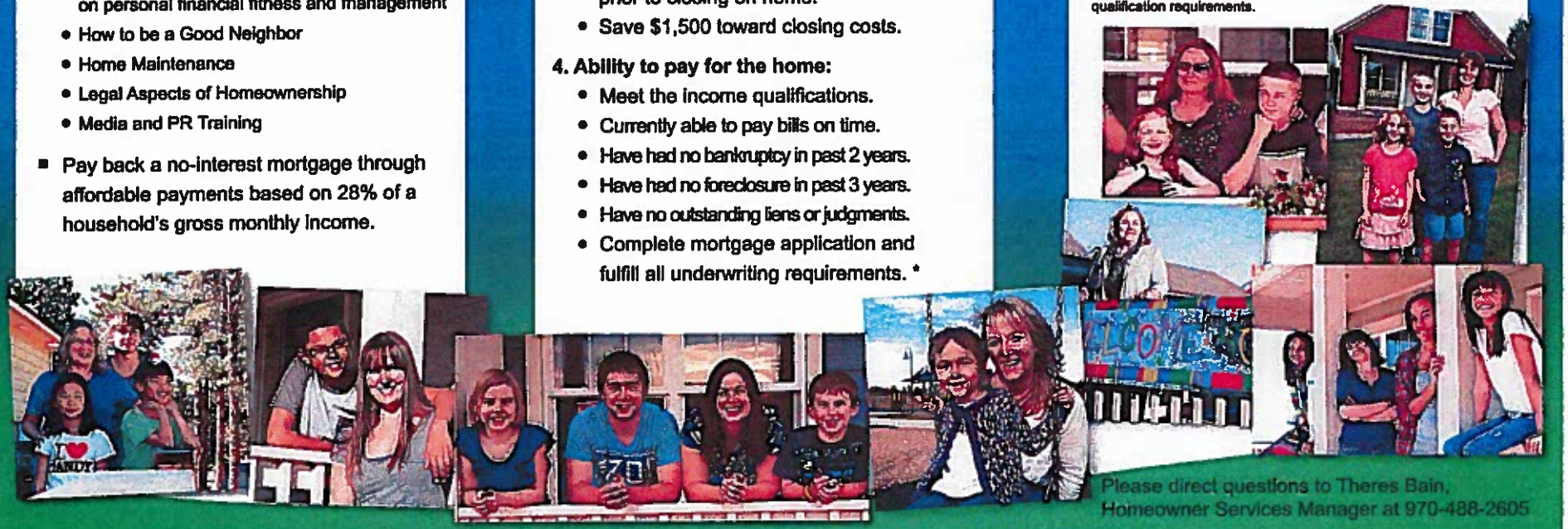
Income Qualifications

Applicants must have a steady income history. This can include income from reliable sources other than employment, such as social security. Current income guidelines are shown below.

household size	annual income	household size	annual income
1	$19,075-32,700	5	$29,435-50,460
2	$21,805-37,380	6	$31,605-54,180
3	$24,535-42,060	7	$33,775-57,900
4	$27,230-46,680	8	$35,945-61,620

household size	monthly income	household size	monthly income
1	$1,590 - 2,725	5	$2,453 - 4,205
2	$1,817 - 3,115	6	$2,634 - 4,515
3	$2,045 - 3,505	7	$2,815 - 4,825
4	$2,269 - 3,890	8	$2,995 - 5,135

* Fort Collins Habitat for Humanity operates in accordance with the Fair Housing Act, the Equal Credit Opportunity Act, and the Americans with Disabilities Act as well as ensuring compliance with all SAFE Act, Anti Money Laundering and TILA Loan Originator qualification requirements.



Please direct questions to Theres Bain, Homeowner Services Manager at 970-488-2605