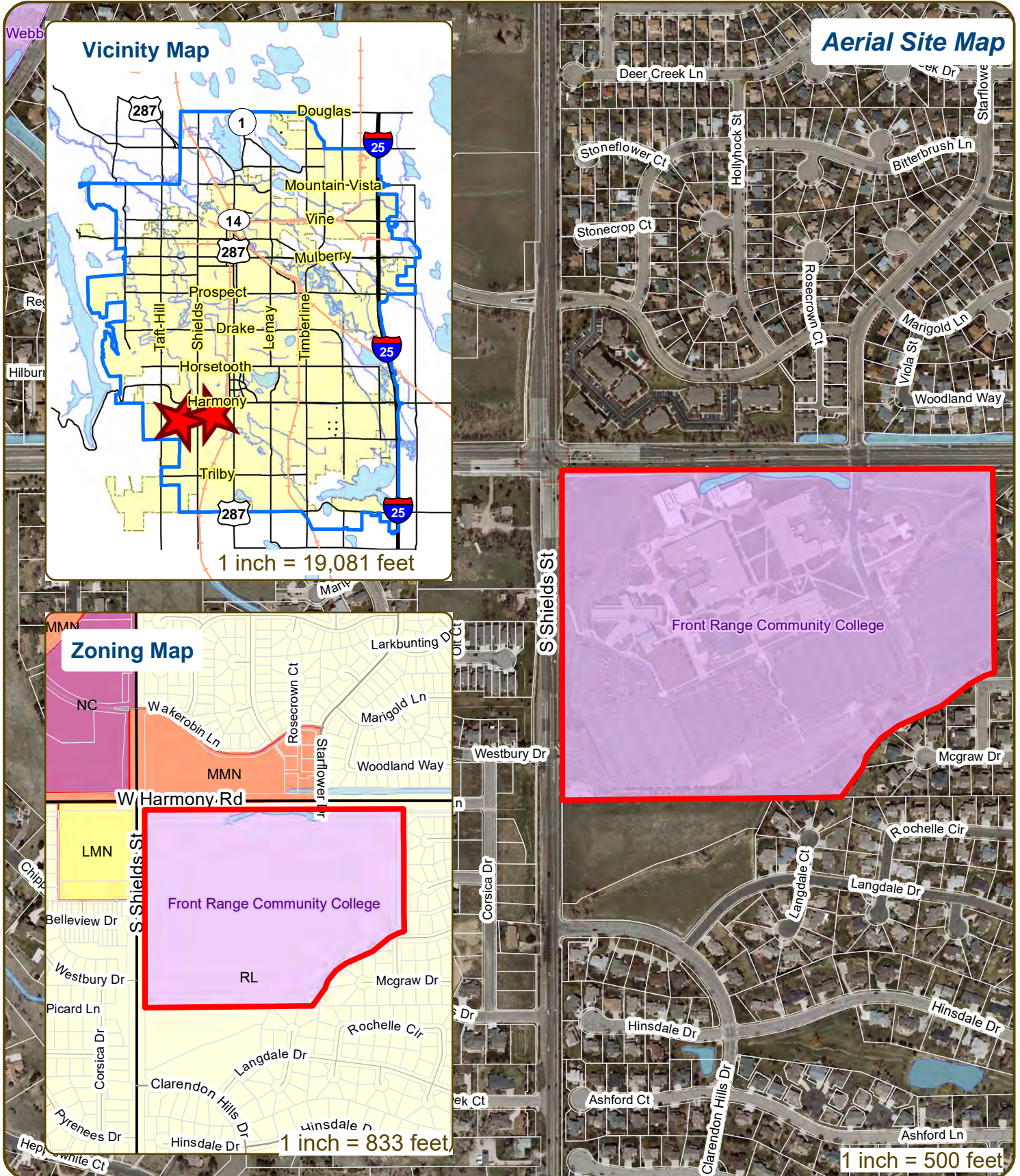


4616 S Shields St FRCC Health Care Careers Center



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Front Range Community College (FRCC) - Larimer Campus
Health Care Careers Center
City of Fort Collins Site Plan Advisory Review - Preliminary Design Review Application

1: \$500 fee (being processed as a State check)

2. Project Narrative

(a) What are you proposing / use?

Front Range Community College (a member of the State of Colorado Community College System schools on State-owned land) proposes to construct a 55,333 GSF Health Care Careers Center (HCCC) on the northwest corner of the Larimer Campus, located at Shields Street and Harmony Road. The new HCCC will address healthcare workforce needs in Northern Colorado and reflects the growing demand for healthcare training from area healthcare providers. The facility will be two stories and enable the College to provide state of the art simulation and skills training labs, classrooms, student commons, and student collaboration spaces. The programs housed in the facility will include Registered Nursing, Licensed Practical Nursing, Medical Assisting, Certified Nurse's Aide, Phlebotomy, Medical Careers Exploration, Pharmacy Technician, Clinical Lab Technician, Emergency Medical Services, Dental Assisting, Holistic Health and Health and Wellness, as well as the planned Bachelor of Nursing (BSN) degree. Phase I funding (total of \$18.8M) has been authorized by the State and is sufficient to start design and begin construction. Phase II funding of \$15.6M is expected by May 2019. The College selected the design-build team of Haselden Construction / Hord Coplan Macht. It is imperative that the construction begin in April 2019 so that the facility can be completed by June 2020 to utilize allocated State funds and open for fall 2020 classes.

(b) What improvements and uses currently exist on the site?

The HCCC will be constructed on the 51 acre FRCC Larimer Campus at a vacant lot at the northwest corner of the campus near the intersection of Harmony Road and Shields Street. Adjacent to the proposed building site are a number of instructional buildings and the Harmony Library. The proposed site will be sufficient to house a two-story facility with an approximate 23,000 square foot footprint with pedestrian access plazas that will tie in to the existing east/west and north/south pedestrian campus walkways, which also serve as emergency vehicle access and delivery drives. An existing observatory structure at the south edge of the proposed building site will be relocated to another site on campus. An existing city funded pollinator garden west of the Sunlight Peak building will be protected in place throughout construction.

Reference Exhibit 5 Site and Landscape Plan.

(c) Describe the site circulation (auto and pedestrian), parking and how it coordinates with the existing neighborhood

There exists within the campus a well-established pedestrian circulation system which will remain unchanged and serve to provide pedestrian access to the building. This system of wide, paved sidewalks also serves as the emergency fire access pathway and for vehicle deliveries. The building site at the corner of Shields Street and Harmony Road will also be accessible by the established sidewalks which run adjacent to the streets.

FRCC will not be constructing additional parking in association with the HCCC project. The Larimer campus currently has 1,863 existing parking spaces, including 41 handicap parking spaces. Based on the parking requirements per the City of Fort Collins zoning code, higher education institutions are required to provide (1) parking space for every 1,000 SF of area available in all campus buildings. Existing square footage on campus totals 216,917 SF and the new HCCC building will provide an additional estimated 55,000 SF for a new total of 322,916 SF on campus. This indicates that 323 parking spaces are required, which is significantly below the number of spaces currently on campus. Also based on zoning code, there should be 29 handicap spaces provided, which is well below the existing 41 spaces available currently. Based on these calculations the existing capacity of the current campus parking lots are more than sufficient.

While some programs are being relocated from leased space off campus to the HCCC, the majority of the nursing and allied health programs already exist on the campus in existing buildings. The intersections located at Shields Street and Westbury Drive as well as Harmony Road and Starflower Drive will continue to serve as the entry points into the campus. Upon completion, the HCCC will have a designated drop off area in front of the building for students and visitors.

Reference Exhibit 4 Campus Map for site circulation details

The College proposes to create a temporary curb cut at an existing (but no longer used) bus stop located on Shields Street adjacent to the building site. Construction traffic will utilize this curb cut as a 'right-in, right out' access point. Utilizing this point of entry, which will not impede traffic as it provides a pull-off area for delivery trucks, will facilitate delivery of building materials which will otherwise have to navigate through the large parking lots. The contractor will organize deliveries to occur at times that will not conflict with morning or afternoon rush hour time periods. This proposed temporary curb cut will be critical to ensure that access to the adjacent Harmony Library (a joint FRCC and Poudre Library District facility) is maintained unobstructed during construction. A failure to approve this curb cut will mean that delivery trucks will likely stage in front of the Harmony Library, which will affect public access. An existing parking lot south of the proposed building site (north of the Harmony Library) will serve as the materials storage area, contractor offices, and contractor parking. During construction this area will be fenced off as part of the construction site.

Reference Exhibit 3 Construction Site Plan for the temporary curb location,

(d) Describe site design and architecture

The proposed structure will be two stories and provide sufficient setbacks from the existing streets to meet city zoning requirements. The north edge of the facility will align with the existing setbacks off Harmony as established by the adjacent Sunlight Peak and Challenger Point buildings. (see Exhibit 4 Campus Map). The west edge of the facility will be set back farther from Shields Street than required by zoning so that the new HCCC is more tightly integrated with existing campus buildings.

The building materials will contextualize and complement the existing FRCC campus buildings. Given the location on Shields Street and Harmony Road its anticipated that the

building will include a degree of branding as well as signage provisions for promoting campus programs.

The new building will have a center atrium form that will be more prominent than other campus buildings to provide daylight to the interior of the building, and also serve as a visible anchor at the corner of the Harmony/Shields Intersection, and act as a gateway to the campus.

The site design will include a pedestrian plaza integrated into the east/west and north/south pedestrian walkways that are also used for emergency fire department access and for deliveries on campus. The primary student entry will directly face the intersection of these two pathways. The new south entry plaza will be designed around an existing city funded pollinator garden which will remain undisturbed throughout construction. The site design will maintain the landscaped open space between the streets and the building.

Reference Exhibits 6, 7, 8 and 9

(e) How is your proposal compatible with the surrounding area?

FRCC is celebrating its 50th anniversary this year. The Larimer County Voc-Tec Center merged with FRCC to become FRCC's Larimer Campus in the summer of 1988. FRCC was established long before the development of the surrounding residential neighborhoods, and the College has worked closely with the Clarendon Hills and Coventry Homeowners' Associations (HOAs) to the south and east of the campus to ensure the College continues to be a good neighbor. The construction of the southwest parking lot five years ago was completed as a SPAR project and included a joint development agreement with the Clarendon Hills HOA. When the College constructed the Little Bear Peak automotive and welding facility, which opened in January 2015, it also worked closely with the City as a SPAR project to ensure the optimal design for the adjacent Coventry HOA. The HCCC project will sit close to the intersection of Shield Street and Harmony Road, providing an anchor at this major city intersection, and thus will have little impact on the surrounding neighborhoods.

(f) Is water detention provided? If so, where? (show on site plan)

Detention for the Front Range Community College Larimer Campus is provided by a large detention pond at the northeast corner of the campus along Harmony Road at the intersection of Starflower Drive. A depression exists on the proposed site, which used to function as a temporary detention pond. This depression will be eliminated when the site is regraded. The large detention pond at the northeast corner of campus was built to accommodate the entire FRCC campus drainage. A study was performed in April 2018 by Crestone Consultants (which included a summary of a previous Master Storm Water Drainage Plans developed by Interwest Consulting) to analyze the impact of future development on the detention pond. Per the study the temporary detention pond on the project site is no longer needed as it was determined that the existing infrastructure and the northeast detention pond have the capacity to capture and detain approximately 70,000 square feet of additional impervious area associated with construction of the HCCC and other future improvements. Based on the latest building footprint for HCCC, we will be adding just less than 40,000 square feet of impervious cover.

Refer to Exhibit 1 Site Plan for location of detention pond and Exhibit 10 Crestone Drainage Study.

(g) How does the site drain now (on and off site)? Will it change? If so what will change?

Runoff generated by the existing project site currently is conveyed to the northeast detention pond via a system of underground storm drains and grassy swales. Runoff from the proposed building site will be captured via a system of underground storm and roof drains and released into the existing conveyance system which discharges into the northeast detention pond. The detention pond releases runoff into a channel that runs parallel to Harmony Road. The detention was developed in coordination with the City of Fort Collins and not only serves as a detention pond for the Larimer Campus but also serves the City of Fort Collins as it receives runoff from sites 'upstream' of the College. Reference answer to question (f) for additional information.

Refer to Exhibit 1 Site Plan for location of detention pond and Exhibit 10 Crestone Drainage Study.

(h) What is being proposed to treat run-off?

Runoff generated by the project will be treated for water quality by the existing grassy swales and in the permanent detention pond, where the outlet structure will treat runoff by means of extended detention.

Treatment of storm water during construction will include protection strategies provided in the construction documents by the civil engineer, and the contractor will provide vehicle traffic control protection measures on site throughout construction.

(i) How does the proposal impact natural features?

The project site is currently undeveloped and generally consists of grassy open space with few trees. The development of the HCCC will result in the clearing of a portion of the grassy open space and the site will be regraded to provide accessible access to the new HCCC. Existing trees in the landscaped green space along Harmony Road and Shields Street will be protected throughout construction.

(j) Do any existing structures have automatic fire sprinklers? Will the new structures have fire sprinklers?

All instructional buildings on the campus, as well as the adjacent Harmony Library are fully sprinkled. The new facility will also be fully sprinkled.

(k) Are there any unusual factors and/or characteristics present that may restrict or affect your proposal?

No, there are no unusual factors or characteristics and the site is sufficient in size to accommodate the proposed two-story structure.

(l) Have you previously submitted an application?

No, the College has not previously submitted an application related to the HCCC.

(m) What specific questions, if any, do you want addressed?

The approval of a temporary construction access (right in – right out) at the abandoned bus pull-off area along Shields will be very beneficial to the project and ensure safe passage to the construction site while not burdening the existing campus vehicle access points at Shields Street and Westbury Drive or Harmony Road and Starflower Drive. A temporary curb cut will also ensure that construction traffic does not affect the Harmony Library.

Reference Exhibit 3 Construction Site Plan

It is critical for the timing of the project and the targeted HCCC completion date of June 2020 that the College have the project presented at the November 2018 Planning and Zoning Board meeting. As was the case with the prior SPAR projects, including the southwest parking lot and the Little Bear Peak building, FRCC (a member of the State of Colorado Community College System schools on State-owned land) anticipates being able to receive unanimous Planning and Zoning Board approval at the November meeting. The College endeavors to demonstrate that the **location** of the building is considered optimal by the College and the City, the **character** of the proposed facility is compatible with the surrounding area, and the **extent** of the proposed development aligns with the other facilities on the campus.

3) Site Plan: Please include the following:

(a) Proposed site boundary and adjacent property uses

Reference Exhibit 1 Schematic Site Plan which reflects the project site, boundary, and adjacent uses

(b) Proposed circulation system, and how it ties into existing infrastructure (pedestrian and auto)

Reference Exhibit 4 campus map

(c) Existing and proposed landscaping (will trees be removed?)

Existing trees will be protected where possible during construction. Adjacent to the construction site is an existing city funded pollinator garden. This important asset will be protected throughout construction. The landscaped open space along Shields Street and Harmony Road will remain in place and will also be protected throughout construction.

Reference Exhibit 5 Site and Landscaping Plan

(d) Existing and proposed buildings (will they remain? If they change, how?)

There are no existing buildings on the proposed site.

Reference Exhibit 4 Campus map for adjacent buildings

(e) Existing natural features (will these be impacted by the proposal?)

There are no existing natural features. The existing depression on the site will be regraded to meet the requirements of the building for accessibility.

Reference Exhibit 1 Schematic Site Plan

(f) On and off-site improvements

Improvements associated with the HCCC site include a new education building, utilities, drainage, and associated drives and hardscape to serve the building. There are no offsite improvements proposed with the HCCC.

Reference Exhibit 1 Schematic Site Plan

(g) Location of detention, drainage, and water quality features

Reference Exhibit 1 Schematic Site Plan for locations of existing drainage, detention, and water quality improvements that will serve the proposed HCCC.

This infrastructure is also described in sections 2f-2g of the PDR Narrative.

(h) Emergency vehicle access and fire hydrant locations

The College has met with representatives of Poudre Fire (Jim Lynxwiler and Andrew Rosen) to discuss how best to incorporate their emergency access to the site, as well as the location of a new fire hydrant which will be integrated with the existing fire line which runs through the campus. In addition, the College will install new emergency access signage as requested by Poudre Fire and has already enhanced the existing fire lane by removing two impediments and trimming trees to provide better clearance for fire trucks.

Reference Exhibit 2 Fire Lane Exhibit which shows existing emergency vehicle access and fire hydrants

Attachments:

Exhibit 01: Schematic Site Plan

Exhibit 02: Fire Lane Exhibit

Exhibit 03: Construction Site Plan

Exhibit 04: Campus Map

Exhibit 05: Site and Landscaping Plan

Exhibit 06: South Building Elevation

Exhibit 07: North Building Elevation

Exhibit 08: Site Aerial View from Northwest

Exhibit 09: Campus Aerial View from Northwest

Exhibit 10: Crestone Drainage Study

EXHIBIT 01 - SCHEMATIC SITE PLAN

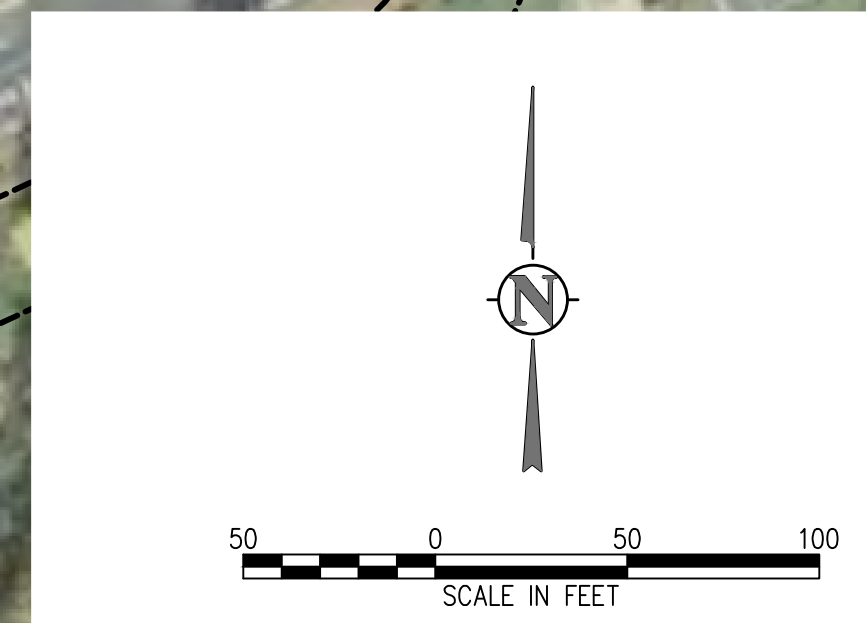


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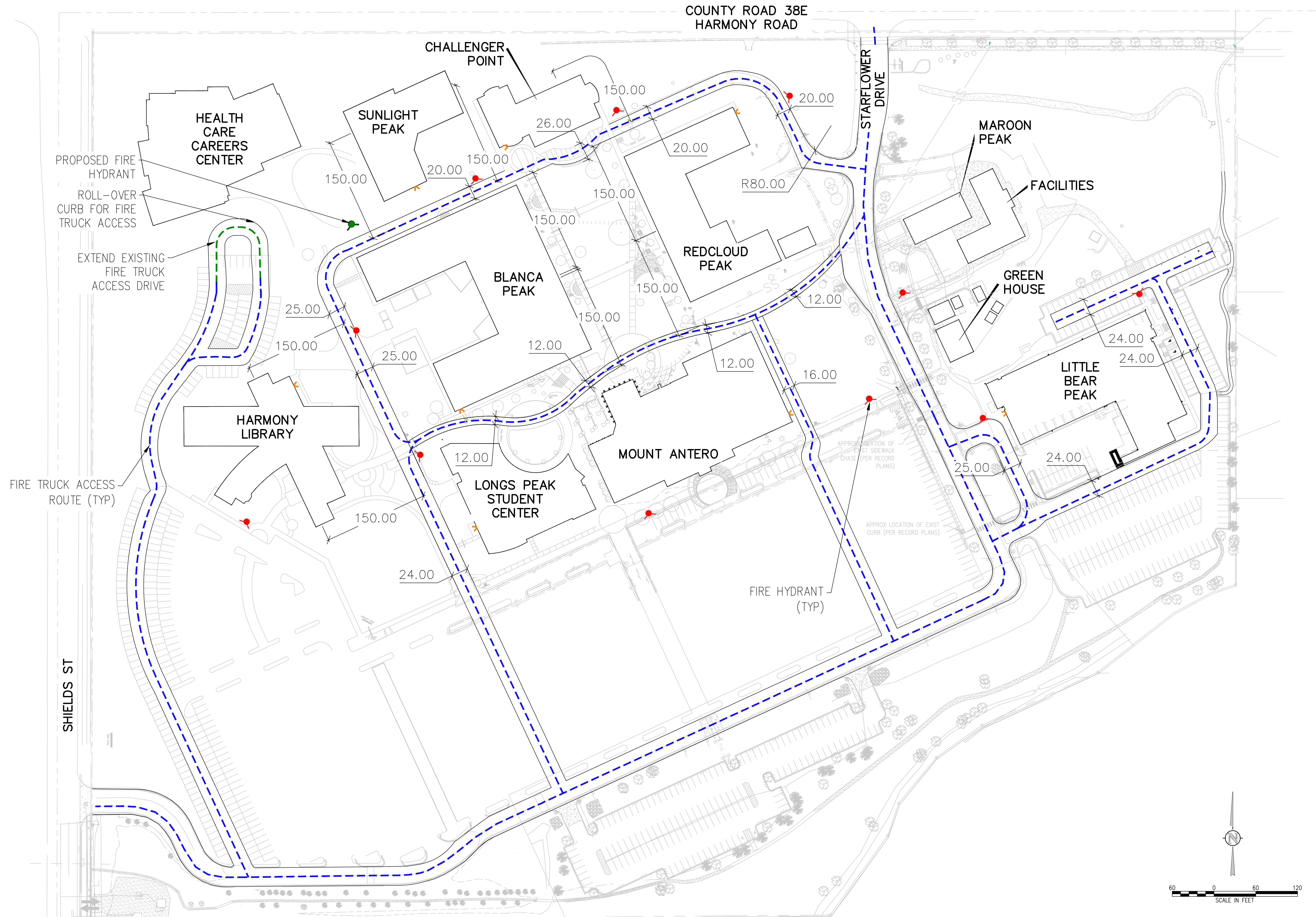
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DRAWN BY:	KRB
CHECKED BY:	KAT
JOB #:	1990.10.7c
DATE:	MAY 2018
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FRONT RANGE COMMUNITY COLLEGE
LARIMER CAMPUS - 2018 CIVIL PROJECTS
PROPOSED HEALTH EDUCATION BUILDING
SCHEMATIC SITE PLAN

SHEET NO.	EXH 1
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FRONT RANGE COMMUNITY COLLEGE
 HEALTH CARE CAREERS CENTER
 FIRE LANE EXHIBIT

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FRCC Healthcare Careers Center Site Access and Logistics Plan

Sidewalk to Remain Open During Construction

Primary Staging and Laydown Area

Existing Pollinator Garden Protected During Construction

Crane Access

Approximate Building Footprint

Project Site

Contractor Parking / Secondary Staging and Laydown Area

Construction Trailer

Existing Trees Protected During Construction

Primary Construction Vehicle Access Path

Gate

Road Cut at North End of Existing RTD Apron on Shields Right Turn in and right turn out Only. Existing pedestrian/bike path to be temporarily relocated to the south.

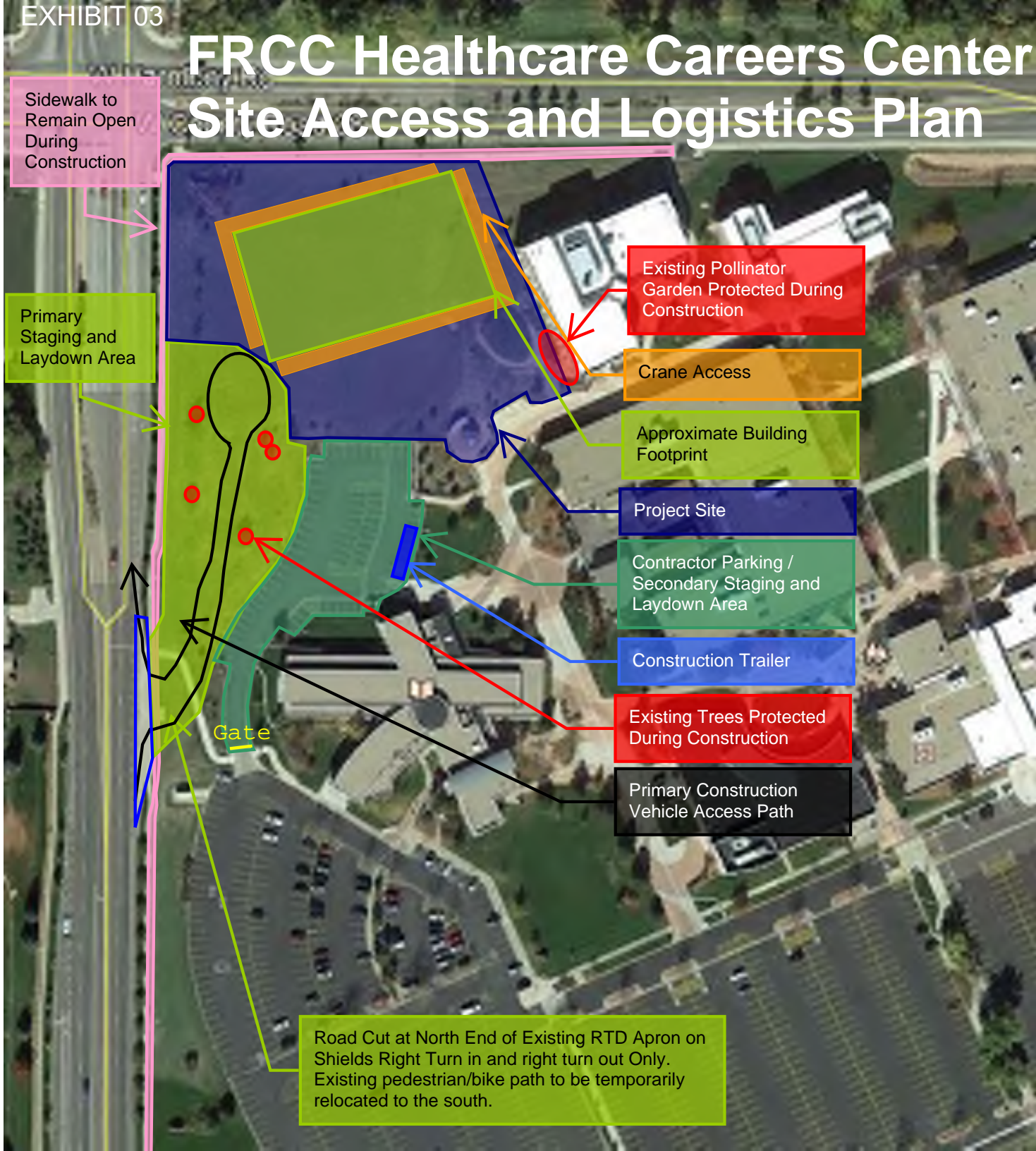


EXHIBIT 04 - CAMPUS MAP

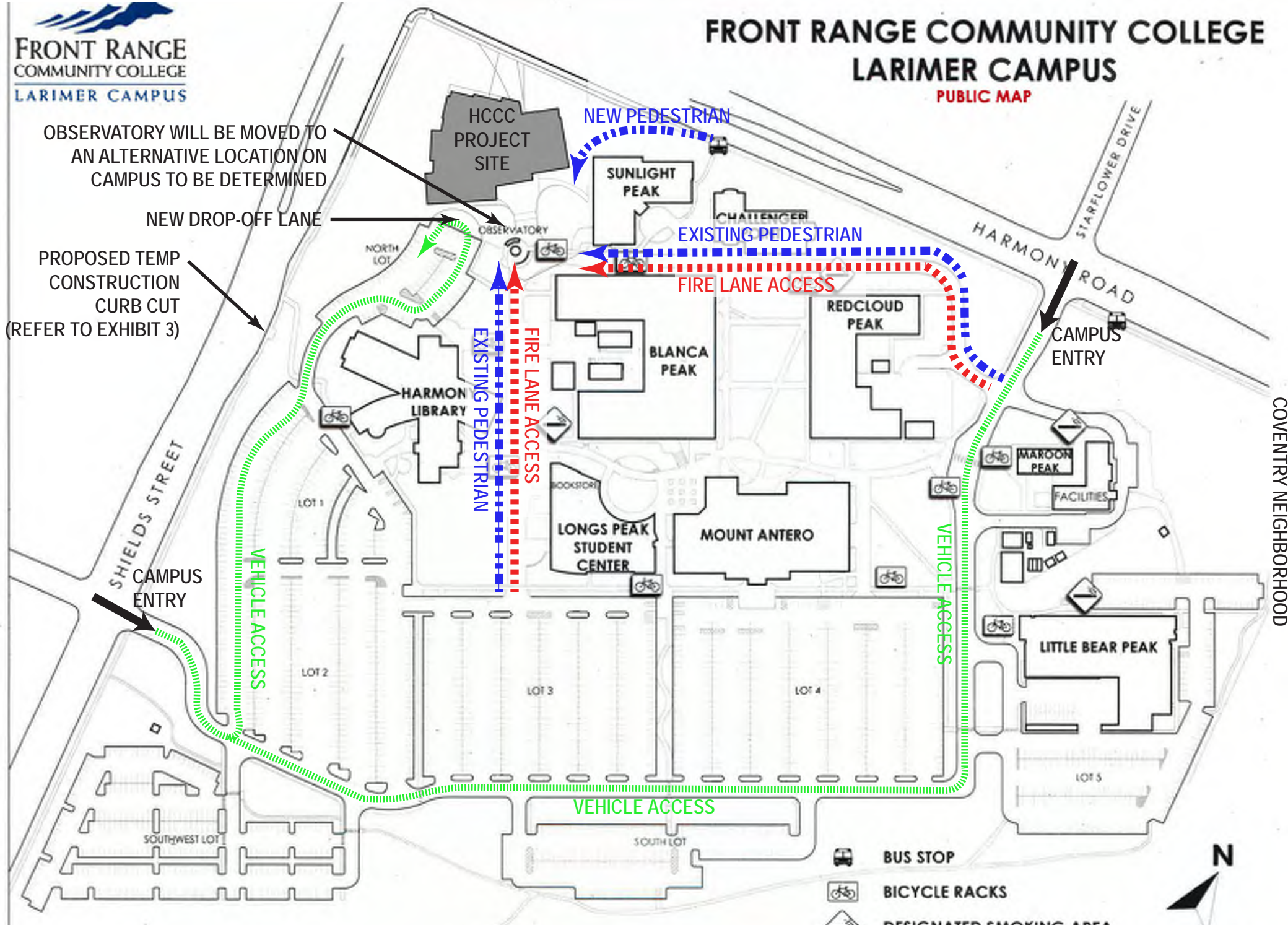


FRONT RANGE COMMUNITY COLLEGE LARIMER CAMPUS PUBLIC MAP

OBSERVATORY WILL BE MOVED TO AN ALTERNATIVE LOCATION ON CAMPUS TO BE DETERMINED

NEW DROP-OFF LANE

PROPOSED TEMP CONSTRUCTION CURB CUT (REFER TO EXHIBIT 3)



- BUS STOP
- BICYCLE RACKS
- DESIGNATED SMOKING AREA



CLARENDON HILLS HOA

Revised August, 2016
Campus Security & Preparedness

FRONT RANGE COMMUNITY COLLEGE - HEALTH CARE CAREERS CENTER
EXHIBIT 05 - SITE AND LANDSCAPE PLAN



EXHIBIT 06 - SOUTH ELEVATION



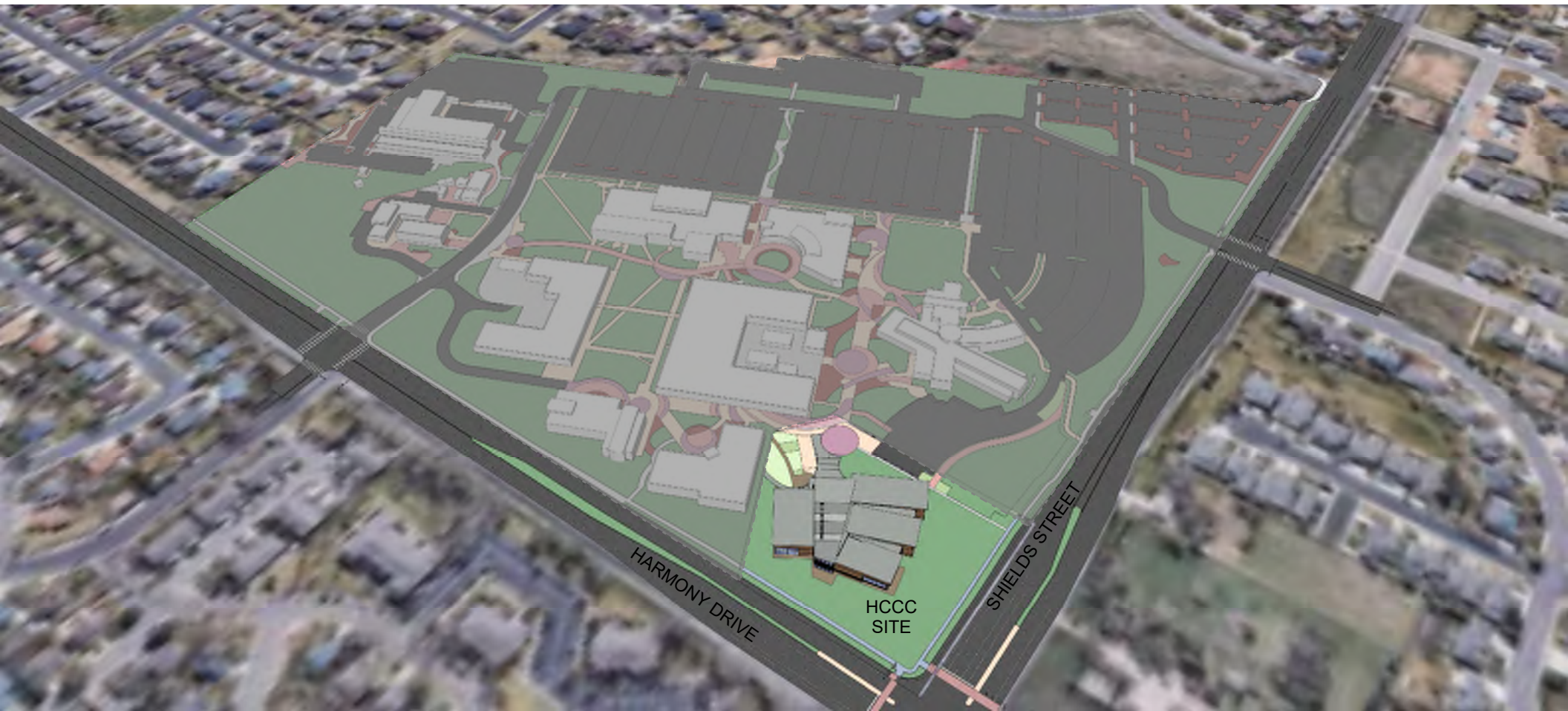
EXHIBIT 07 - NORTH ELEVATION



EXHIBIT 08 - AERIAL HCCC SITE FROM NORTHWEST



EXHIBIT 09 - CAMPUS AERIAL VIEW FROM NORTHWEST





April 23, 2018

Mr. Dennis DeRemer
Director of Facilities – Larimer Campus
Front Range Community College
4616 S. Shields Street
Fort Collins, CO 80526

Re: Larimer Campus - Northwest Detention Pond Status
Crestone Project No.: 13020

Dear Mr. DeRemer:

Per your request on April 17, 2018, we've prepared this letter to identify the status of the existing detention pond located west of the Sunlight Peak (SP) building and north of the Observatory and Harmony Library Parking Lot at the northwest corner of the Larimer Campus.

We've reviewed the following Master Drainage Studies for the Larimer Campus in the preparation of this letter:

1. *Master Drainage Study – Front Range Community College Campus*, prepared by Interwest Consulting Group, dated December 1, 2010 revised. (AKA 2010 Master Study)
2. *Master Drainage Study – Front Range Community College Campus*, prepared by Interwest Consulting Group, dated May 22, 2014. (AKA 2014 Master Study)

A summary of the 2010 Master Study as it pertains to the subject detention pond has been provided as follows:

2010 Master Study Summary:

The subject detention pond was constructed with the Harmony Library Parking Lot project in 2010/2011 to help mitigate any effects from the parking lot development on the existing storm sewer system.

The 2010 Master Study identified the existing storm sewer system which the Harmony Library Park Lot is tributary to (i.e. Storm System 1) as being undersized. The subject detention pond is located within Basin A1 and is required to be installed to attenuate developed flows from the interim condition Basin A1 until improvements to the campus' storm drainage conveyance and storage systems are constructed.

Required storm drainage conveyance improvements include the construction of a new storm pipe (36") located on the north side of the SP building which will convey the developed flows from Basin A1 east to the existing riprap channel adjacent to Harmony Road which outfalls to the campus' North Detention Pond located at the northeast corner of the campus.

Required storage improvements include increasing the North Detention Pond volume by raising the pond's spillway elevation and providing additional pond excavation to account for the additional

imperviousness proposed throughout the campus and to provide additional water quality capture volume. Additionally, the 2010 Master Study includes modifying the North Detention Pond outlet structure to accommodate the additional water quality capture volume and detained volumes.

Please refer to select excerpts and maps attached to this letter from the 2010 Master Study.

In 2011, the storm drainage conveyance and storage systems identified in the 2010 Master Study were constructed. This includes the 36" storm pipe conveyance for Basin A1 as well as the North Detention Pond storage improvements and outlet structure modifications.

A summary of the 2014 Master Study as it pertains to the subject detention pond has been provided as follows:

2014 Master Study Summary:

The 2014 Master Study states, "In the current condition, Basin A1 drains to a temporary pond. This temporary pond drains north to the existing 36" RCP Storm System located to the northeast that conveys the flow east to the Northern Channel adjacent to Harmony Road at the northeast corner of the SP building and finally to the North Detention Pond. This temporary pond can be removed at any time, the existing storm pipes and swales are adequate to receive undetained water now and with future building. This entire basin will drain to the existing 36" RCP Storm System."

Please refer to select excerpts and maps attached to this letter from the 2014 Master Study.

Based on the 2014 Master Study, all improvements which were required to be installed for the removal of the subject detention pond have been constructed and the subject detention pond may be removed at any time.

Please Note - The 2014 Master Study identifies conveyance and storage capacity allowances provided by the existing storm drainage system for future identified planned improvement areas. The study also identifies triggers for future improvements to the storm drainage conveyance and storage systems, including improvements for North Detention Pond. We recommend that Front Range Community College provide a complete copy of the 2014 Master Study to all perspective designers for their review and use in preparing their respective designs of future improvements throughout the Larimer Campus.

Should you have any questions, please feel free to call me at your convenience at (303) 997-6113.

Sincerely,

Crestone Consultants, LLC



Joseph M. Erjavec, P.E.
Principal
Attachment(s)

Attachment A – 2010 Master Study
Select pages from *Master Drainage Study - Front Range Community College Campus*,
prepared by Interwest Consulting Group, dated December 1, 2010 revised



MASTER DRAINAGE STUDY

Front Range Community College Campus

Prepared for:

The FWA Group, Architects
3665 JFK Parkway
Building 2, Suite 103
Fort Collins, Colorado 80528

Prepared by:

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

August 31, 2010
Revised October 11, 2010
Revised December 1, 2010

Job Number 1124-086-00

4.4 Hydraulic Criteria

All hydraulic calculations within this report have been prepared in accordance with the City of Fort Collins Drainage Criteria and are included in Appendix C of this report.

4.5 Summary of Existing Conditions

Using the current conditions of the study area draining to existing Storm System 1, it is under capacity by 12 cfs. Currently, the system is conveying the 10-year storm.

Assuming complete build out of the study area draining to existing Storm System 2, it is under capacity by 24 cfs. Currently, the system is conveying the 2-year storm.

Assuming complete build out of the study area draining to existing Storm System 3, it is under capacity by 84 cfs. Currently, the system is conveying the 10-year storm.

Assuming that the entire site is completely built out (68% impervious) and using the EPA SWMM 5.0 software, the peak runoff from the site to the pond is about 118 cfs. The existing pond, based on a current topographic survey, has 2.2 Ac-ft of storage (not including water quality capture volume). The 100-yr water surface elevation and spillway is at elevation 5063.0'. With today's pond size and the 1996 design release rate of 23.7 cfs, 79.4 cfs would spill over the spillway to the drainage channel adjacent to the Coventry Subdivision. Please refer to Appendix D for pond calculations.

5. DRAINAGE FACILITY DESIGN

5.1 Specific Flow Routing

A summary of the drainage patterns within each basin is provided in the following paragraphs. The Interim Drainage Plan and Master Drainage Plan maps are located in the back pocket of this study.

Basins A and A1 include the northwest portion of the site. These basins contain portions of HL, BP and RP buildings and all of SP and CP buildings. With current conditions, basins A and A1 consist of 7.9 acres. Flows from these two basins currently enter Storm System 1. Basin A1 will have an *interim* and *ultimate* (future) condition and is the area north of HL building. A parking lot is currently being proposed for this area and will occur during the *interim* condition. Basin A1 also has space for an additional building in the future and will then be considered completely built out. For the purposes of this report, basin A1 will then be considered in its *ultimate* condition.

In the *interim* condition, **basin A1** is 2.7 acres and drains to a temporary pond. This temporary pond will release to storm system 1 at the historic rate. The temporary pond will drain to existing Storm System 1. In the *ultimate* condition, **basin A1** is 4.1 acres and will drain to a new storm pipe (36") located to the northeast that will convey the flow east to the riprap channel adjacent to Harmony Road at the NE corner of the science building

Basin B is 3.2 acres and includes the center portion of the site. This basin includes portions of buildings BP, RP, LP and MA. Flows from this basin enter existing Storm System 2.

Basin C is 14.3 acres and includes the student parking lots. It is located in the south central area of the site. Flows in this area will be routed in existing Storm System 3.

Basin D, D1 and D2 are a total of 9.2 acres and consist of the southern portion of the site and are bound on the south by the existing irrigation ditch that is located immediately north of the southern boundary and on the north by the student parking lots. **Basin D** is 3.4 acres and consists of mostly landscape area and drive aisles. It drains via overland flow to the existing grass lined ditch and culverts under the drive aisle located adjacent to the student parking lot on the east. **Basins D1 and D2** are 5.8 acres and consist of the southern portion of the site and are bound on the south by the existing irrigation ditch that is located immediately north of the southern boundary and on the north by the student parking lots. These two basins drain north by surface flow to an existing grass lined ditch located adjacent to the southern side of the student parking lots. The channel and culverts then convey flow to the existing detention pond. This portion of the site is currently undeveloped; however, construction of a parking lot is currently proposed.

Basin E is 4.2 acres and is located in the southeast portion of the site and includes a parking lot. Flow from this basin sheets to the northeast and into the existing detention pond.

Basin F is 7.8 acres consists of the north and northwest portion of the site and includes the northern riprap channel and detention and water quality pond.

5.2 Interim Conditions

Currently, parking lots are planned for areas in basins A1, D1 and D2. The parking lot in basins D1 and D2 is designed to drain north via curb cut and inlet to the existing grass lined ditch located adjacent to the southern side of the existing student parking lots. Culverts are sized to pass this flow and the additional offsite flow from Shields under the two drive aisles that access the new parking lot. Please refer to Appendix C for hydraulic calculations.

A parking lot is also planned for basin A1. As mentioned above, the storm system that basins A and A1 drain to is currently undersized and it is proposed that during ultimate build out of the campus, a new storm system be installed northeast of the basin; however, during this interim condition a small temporary detention pond be built in the NW corner in order to reduce the flows from the proposed parking lot. This flow would be introduced via swale to existing Storm System 1. This pond negates impacts on the existing system from the new parking lot.

The temporary detention pond has a storage capacity of 0.17 ac-ft at WSEL=5073.8. The outlet system for this temporary pond will regulate the release rate to 2.4 cfs through the 8" outlet pipe.

5.3 Proposed Improvements

The ideal size of Storm System 1 to safely convey the 100-year flow is a 36" RCP. Currently, the system is conveying the 10-year storm. This area was recently paved and the addition of a new storm system north of SL and CP will relieve some of the pressure on this system and no improvement will be necessary. The ideal size of Storm System 2

to safely convey the 100-year flow is a 30" RCP. Currently, the system is conveying the 2-year storm. The ideal size of Storm System 3 to safely convey the 100-year flow is a 48" RCP. Currently, the system is conveying the 10-year storm. Storm systems 2 and 3 should be upsized if and when these corridors are rehabilitated.

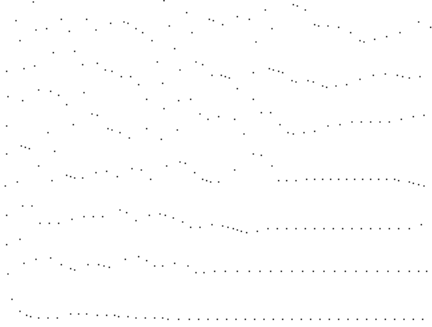
Small storm sewers are not an issue as long as there are clear overland relief paths for the water once the storm pipe is overwhelmed. Cross sections in the three corridors have been surveyed and are included in Appendix C. In areas where overland relief does not exist, the replacement of these pipes should be planned. Please refer to the back pocket for an exhibit of these cross sections as they related to each corridor.

In the final build out condition (parking lot and/or additional building) of the NW area of basin A, we recommend that the flow path be modified such that instead of entering Storm System 1, it enters a new storm pipe located to the northeast that will convey the flow east to the riprap channel adjacent to Harmony Road at the NE corner of the science building. A 36" RCP pipe system is proposed for this improvement. This pipe will eliminate the need for the temporary pond and will remove flows from the existing storm system 1. Please refer to Appendix C for an Exhibit of this system.

The two, 27-inch culverts under Starflower Drive (Harmony entrance) have been analyzed with the offsite flows from Harmony and the developed flows from the site. Based on recent topographic survey from the site, flows from the entire 10-year event will pass through the culvert. However, during the 100-year event, 21.7 cfs will overtop Starflower Drive, travel to the curb cut on the east side of Starflower and flow down to the channel on the east side of the culverts where it will then be conveyed to the detention pond. Please refer to Appendix C for culvert analysis.

The water quality capture volume of the entire developed site with 68% impervious value is calculated to be 1.1 Ac-ft

Ideally, in order to detain 100-year developed flow to the 23.7 cfs release rate (the 1996 release rate), the pond would need a spillway at 5065.3' and a volume of 6.1 Ac-ft (excludes 1.1 Ac-ft WQCV). Unfortunately, the area of the pond is not large enough to obtain this volume or spillway elevation. Therefore, it is proposed to raise the spillway to 5064.0' and with some further excavation of the pond 5.4 Ac-ft of storage (includes 1.1



FUTURE 36" STORM SYSTEM

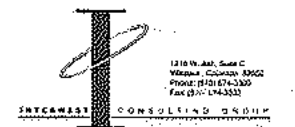


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10 Executive Park Road
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FRONT RANGE COMMUNITY COLLEGE PARKING LOT EXPANSION

LARIMER CAMPUS
 4516 S. SHIELDS STREET
 FORT COLLINS, CO 80527

MARK	DATE	DESCRIPTION
ASH 12	11/03/2010	ENTIRE SHEET

PROJECT NO:

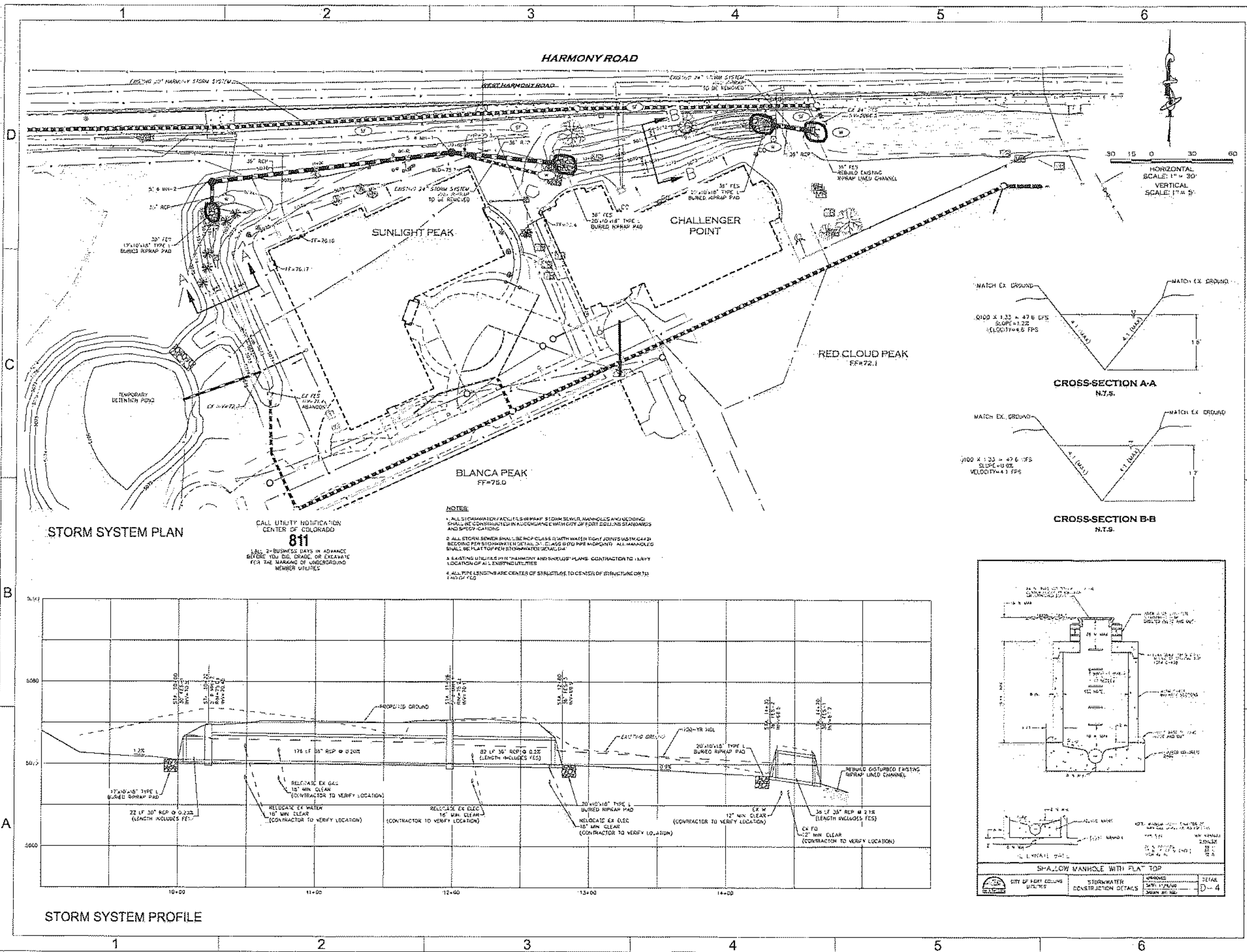
DRAWN BY: JDS
 APPROVED BY: MPO

THESE DRAWINGS AND THE PROJECT MANUAL ARE INSTRUMENTS OF SERVICE AND REMAIN THE PROPERTY OF THE FWA GROUP ARCHITECTS. UNAUTHORIZED DUPLICATION OR REUSE WITHOUT WRITTEN CONSENT IS PROHIBITED.

SHEET TITLE

STORM SYSTEM PLAN & PROFILE

SHEET NUMBER

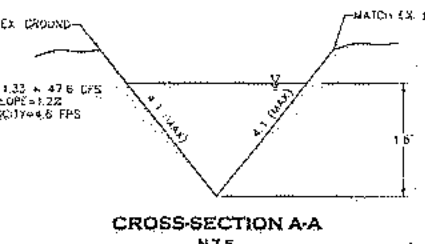


STORM SYSTEM PLAN

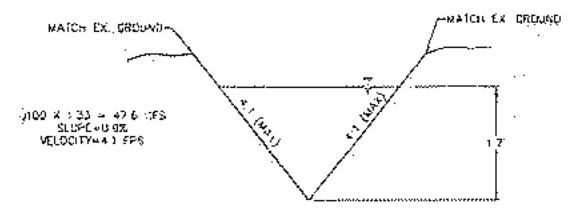
CALL UTILITY NOTIFICATION
 CENTER OF COLORADO
811
 CALL 2-BUSINESS DAYS IN ADVANCE
 BEFORE YOU DIG, DRILL, OR EXCAVATE
 FOR THE MARKING OF UNDERGROUND
 MEMBER UTILITIES

- NOTES:**
1. ALL STORMWATER FACILITIES (RIPPRAP, STORM SEWER, MANHOLES AND BEDDING) SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF FORT COLLINS STANDARDS AND SPECIFICATIONS.
 2. ALL STORM SEWER SHALL BE RCP CLASS 4 WITH WATER TIGHT JOINTS (ASTM A442) BEDDING PER STORMWATER DETAIL 3.1. CLASS B (10" PIPE MINIMUM). ALL MANHOLES SHALL BE FLAT TOP PER STORMWATER DETAIL 3.4.
 3. EXISTING UTILITIES PER "HARMONY AND CHALLENGER" PLANS. CONTRACTOR TO VERIFY LOCATION OF ALL EXISTING UTILITIES.
 4. ALL PIPE LENGTHS ARE CENTERS OF STRUCTURE TO CENTER OF STRUCTURE UNLESS INDICATED OTHERWISE.

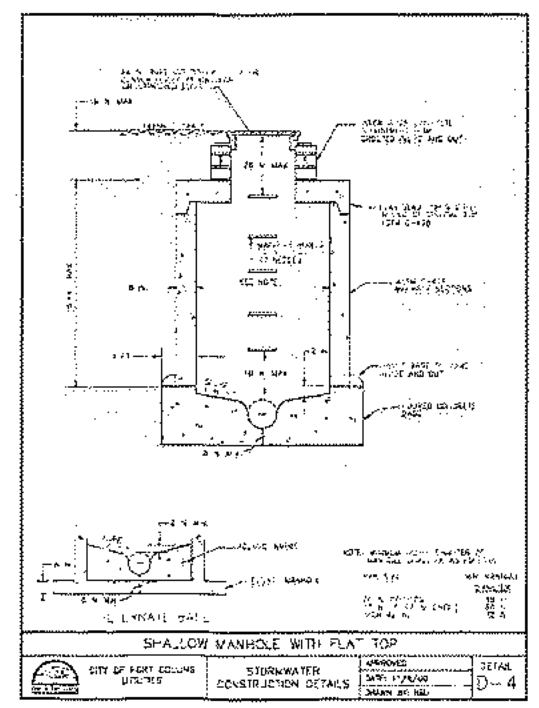
STORM SYSTEM PROFILE



CROSS-SECTION A-A N7.5.



CROSS-SECTION B-B N.T.S.



SHALLOW MANHOLE WITH FLAT TOP
 CITY OF FORT COLLINS UTILITIES
 STORMWATER CONSTRUCTION DETAILS
 SHEET 12/10/10
 DRAWN BY: JDS

STORM SYSTEM PROFILE



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 Westminster, Colorado 80050
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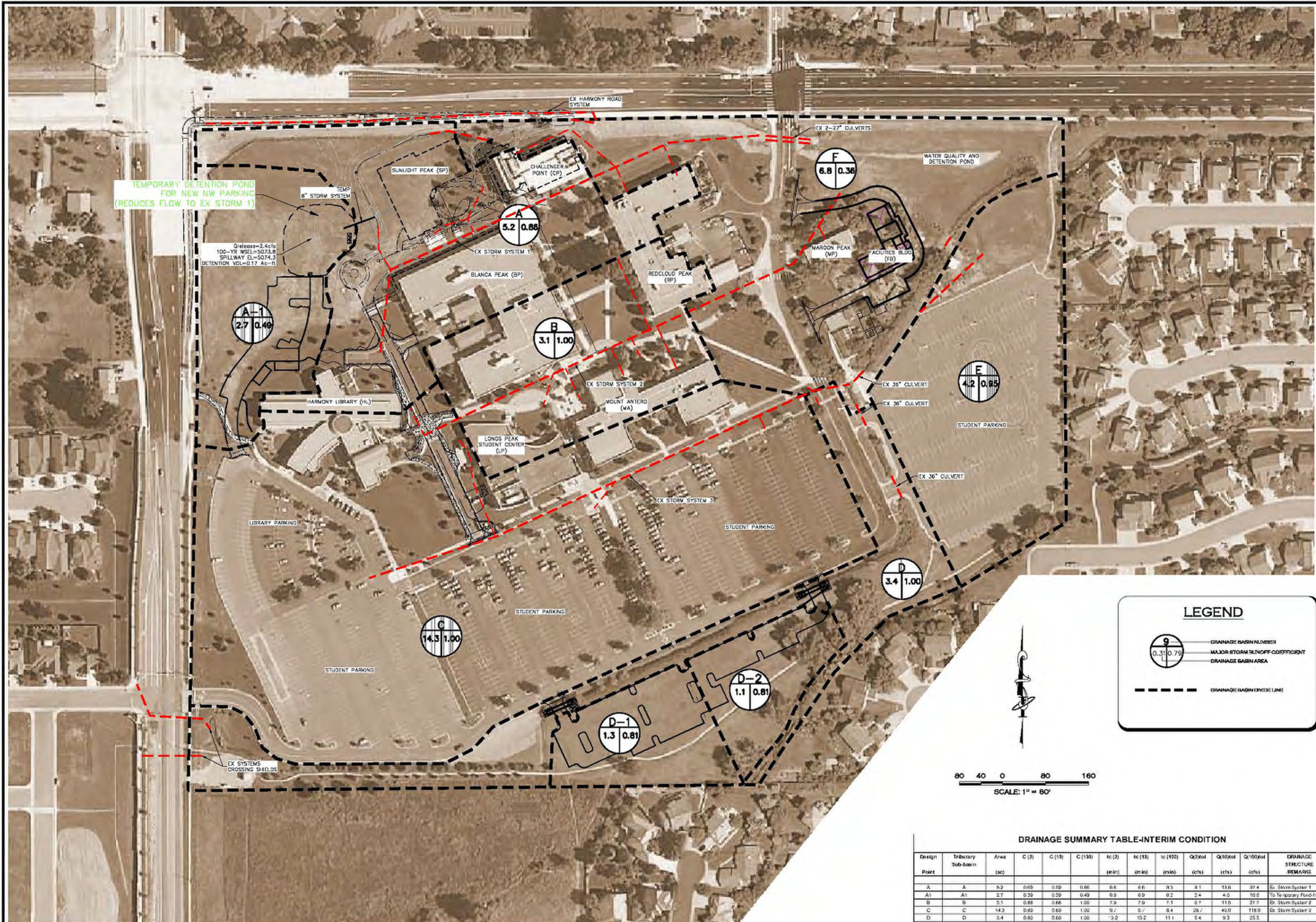
INTEREST CONSULTING GROUP

PREPARED FOR
FRONT RANGE COMMUNITY COLLEGE
 4616 SOUTH SHIELDS
 FORT COLLINS, CO 80527

FRONT RANGE COMMUNITY COLLEGE
MASTER DRAINAGE PLAN

DATE: 08/18/10
 SCALE (SHEET): 1"=80'
 SCALE (PLOT): N/A
 DESIGNED BY: IS
 CHECKED BY: MPO

PROJ. NO. 1124-08800



DRAINAGE SUMMARY TABLE-INTERIM CONDITION

Design Point	Tributary Sub-basin	Area (ac)	C (2)	C (15)	C (100)	tc (2) (min)	tc (15) (min)	tc (100) (min)	Q ₂ /ft ² (cfs)	Q ₁₅ /ft ² (cfs)	Q ₁₀₀ /ft ² (cfs)	DRAINAGE STRUCTURE REMARKS
A	A	6.2	0.69	0.50	0.86	0.8	0.8	0.3	8.1	13.0	37.4	Ex. Storm System 1
A1	A1	2.7	0.39	0.30	0.49	0.9	0.9	0.2	2.4	4.0	10.0	To Temporary Pond-Inlets
B	B	3.1	0.88	0.66	1.00	7.9	7.9	7.1	6.7	11.0	27.7	Ex. Storm System 2
C	C	14.3	0.80	0.60	1.00	0.7	0.7	8.4	28.7	40.0	110.0	Ex. Storm System 2
D	D	3.4	0.80	0.60	1.00	3.2	10.2	11.1	5.4	9.3	25.5	
D1	D1	1.3	0.65	0.55	0.81	0.6	10.0	7.9	1.6	3.1	5.9	To New Out-let
D2	D2	1.1	0.65	0.55	0.81	0.6	10.0	7.9	1.5	2.6	7.5	To New Inlet
E	E	4.2	0.75	0.75	0.95	6.5	6.5	5.0	8.4	14.3	40.1	
F	F	6.8	0.35	0.28	0.35	8.7	10.7	10.7	3.2	5.5	14.1	
-	TOTAL	42.2	0.60	NA	0.83	NA	NA	15.7	NA	NA	255.2	

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PREPARED FOR
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 4616 SOUTH SHIELDS
 FORT COLLINS, CO 80527

FRONT RANGE COMMUNITY COLLEGE
INTERIM DRAINAGE PLAN

DATE: 08/18/10
 SCALE (H): 1"=80'
 SCALE (V): NA
 DESIGNED BY: IS
 CHECKED BY: MPO

PROJ. NO. 1124-08800

Attachment B – 2014 Master Study
Select pages from *Master Drainage Study - Front Range Community College Campus*,
prepared by Interwest Consulting Group, dated May 22, 2014



MASTER DRAINAGE STUDY

Front Range Community College Campus

Prepared for:

Front Range Community College
4616 S Shields St
Fort Collins, Colorado 80526

Prepared by:

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

May 22, 2014

Job Number 1124-086-00

May 22, 2014



Ms. Julia Fitzpatrick
Front Range Community College
4616 South Shields Street
Fort Collins, CO 80526

**Executive Summary – Master Drainage Study for the Front Range Community College
Larimer Campus**

The purpose of this Master Drainage Study is to provide a comprehensive drainage plan that indicates site requirements for new development on the campus as well as identifying and defining solutions to drainage problems which may occur as a result of past improvements.

Currently, the campus contains approximately 47 acres. The current conditions of the portion of the site draining to the detention pond located in the northeast corner of the campus include 41.9 acres which is 61% impervious. The pond has capacity for 70,000 square feet of additional impervious area (an increase to 65% imperviousness) before modifications to the pond will be necessary.

There are two main areas that need improvements:

1. The three major existing storm sewer systems onsite are currently sized for the 2 to 10 year storm event. Flooding in these three corridors could occur during larger storm events. If and when these areas are repaved or otherwise improved, the storm pipes should be upsized. Please refer to the attached FRCC Storm System Key Map for the location of related systems 1, 2 and 3.

2. If development to the campus increases the overall imperviousness above 65%, the pond located in the northeast corner of the campus will need to be re-analyzed and potentially modified based on results. Modifications may include changes to the pond grading, outlet structure and spillway elevations in order to maintain the pre-development 100-yr historic release rate. The 100-year historic release rate does not meet current City Standards, but is an industry standard and defensible.

Please refer to the complete Master Drainage Plan for further details. If you have questions or comments, please feel free to call me to discuss.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael Oberlander".

Michael Oberlander, PE, LEED-AP



the current peak runoff from the site to the pond is about 178.4 cfs. The existing pond, based on a current topographic survey, has 3.1 Ac-ft of storage (not including water quality capture volume). The 100-yr water surface elevation is at elevation 5063.8' and spillway is at elevation 5063.9'. With today's pond size and the historic 100-year release rate of 42 cfs, 0 cfs would spill over the spillway to the drainage channel adjacent to the Coventry Subdivision. Please refer to Appendix D for the North Detention Pond calculations.

The South Detention Pond is located in the southeast portion of the campus adjacent the Clarendon Hills and Coventry Subdivisions. This pond treats water quality and detains flow from the newest parking lot. The pond releases to the Southern channel that directs flow to the North Detention Pond. The South Detention Pond releases 0.6 cfs and is a negligible impact to the overall release from the North Pond.

5. DRAINAGE FACILITY DESIGN

5.1 Specific Flow Routing

A summary of the drainage patterns within each basin is provided in the following paragraphs. The Master Drainage Plan Current Condition map is located in the back pocket of this study.

Basins A and A1 include the northwest portion of the site. These basins contain portions of HL, BP and RP buildings and all of SP and CP buildings. With current conditions, basins A and A1 consist of 8.0 acres.

Basin A is 3.8 acres and flow from this basin enters Storm System 1 and is conveyed east to the North Detention Pond. **Basin A1** is 4.2 acres and is the area west of the SP building, consists of a parking lot and has space for an additional impervious area in the future. Once an improvement adding hard surface is completed, it will then be considered completely built out. For the purposes of this report, basin A1 will be considered in its *current* condition. In the *current* condition, basin A1 drains to a temporary pond. This temporary pond drains north to the existing 36" RCP Storm System located to the northeast that conveys the flow east to the Northern Channel adjacent to Harmony Road at the northeast corner of the SP building and finally to the

North Detention Pond. This temporary pond can be removed at any time, the existing storm pipes and swales are adequate to receive undetained water now and with future building. This entire basin will drain to the existing 36" RCP Storm System.

Basin B is 3.2 acres and includes the center portion of the site. This basin includes portions of buildings BP, RP, LP and MA. Flows from this basin enter existing Storm System 2 and are conveyed east to the North Detention Pond.

Basin C is 14.3 acres and includes the student parking lots located in the center of the site. Flows in this area will be routed east in existing Storm System 3 to the North Detention Pond.

Basin D is a total of 5.5 acres and consists of the south central portion of the site. It consists of parking lots and the existing Southern Channel. This basin drains north via curb cut and inlet in the parking lot to the existing grass lined Southern Channel located between the existing student parking lots. Culverts are sized to pass this flow and the additional offsite flow from the Westbury Pond and Shields under the two drive aisles that access the parking lot.

Basin E is 4.2 acres and is located in the east portion of the site. The majority of this basin is a parking lot. Flow from this basin sheets to the northeast and into the existing North Detention Pond. If an addition of a building does occur in the future, it will occur in the existing parking lot and will include removal of pavement and will not affect the overall site imperviousness of this basin.

Basin F is 6.7 acres and consists of the northeast portion of the site and includes the Northern Channel and the North Detention Pond. It also contains the MP and FB buildings.

Basin G is 5.2 acres and is located in the southwest portion of the campus. This basin includes the southern parking lot and is north of the irrigation ditch and is considered the Southwest Parking Lot Expansion. The basin drains via a self-contained storm system to a detention and water quality pond located in the southeast portion of the campus adjacent the Clarendon Hills and Coventry Subdivisions. The pond detains this basin's 100-year event to historic 2-year flows and is sized to also handle runoff from a future phase of

parking area. The total 100-year developed release rate for the Southwest Parking Lot Expansion is slightly over the 10-year historic runoff. Construction of a parking lot and South Detention Pond in this basin is currently underway (2014). Design of this area is included in JVA Consulting Engineers, “FRCC Larimer Campus—South Parking Lot (Phase I & II) Final Drainage Letter”, dated January 12, 2014 in Appendix E of this document. Because of the detention provided in Basin G, this acreage is not included in the North Detention Pond volume calculations.

5.2 Proposed Improvements

The current conditions of the portions of the site draining to the existing North Detention Pond include 41.9 acres at 61% imperviousness. The existing pond, based on a current topographic survey, has 3.1 ac-ft of storage (not including water quality capture volume). The required water quality capture volume is 1.0 ac-ft and is achieved at elevation 5061.8’ based on the as-built shots of the water quality outlet structure. With today’s pond size and the historic 100-year release rate of 42 cfs, the 100-yr water surface elevation is at elevation 5063.8’ and spillway is at elevation 5063.9’. The entire site is detained and 0 cfs spills over the spillway to the drainage channel adjacent to the Coventry Subdivision. Currently, the pond has capacity for 70,000 square feet of additional impervious area allowing for Future Impervious Areas A and B to be completed without needing to upgrade the North Detention Pond or water quality outlet structure. These improvements equate to the 41.9 acres having 65% imperviousness. With these conditions, the required water quality capture volume will be 1.1 ac-ft at elevation 5061.8’. With today’s pond size and the historic 100-year release rate of 42 cfs, the 100-year water surface and spillway elevation will be at elevation 5063.9’. Please refer to Appendix D for pond calculations.

Please refer to the Master Drainage Plan Current Conditions map located in the back pocket for two delineated areas where future impervious areas could be located. Area A is located in the northwest corner of the site within Basin A1. Area B is in Basin F and is located in the flat area adjacent to the Mount Antero Building.

If changes to the 41.9 acres that drain to the North Detention Pond cause a percent imperviousness to be greater than 65%, the pond must be reanalyzed using EPA SWMM 5.0 software and a new water quality and detention volume must be calculated. Changes



SCALE: 1" = 100'

100 50 0 100 200

SCALE: 1" = 100'

LEGEND

DRAINAGE BASIN NUMBER
 MAJOR STORM RUNOFF COEFFICIENT
 DRAINAGE BASIN AREA

DRAINAGE BASIN DIVIDE LINE

DRAINAGE SUMMARY TABLE-CURRENT CONDITION

Design Point	Tributary Sub-basin	Area (ac)	C (2)	C (10)	C (100)	tc (2) (min)	tc (10) (min)	tc (100) (min)	Q(2)tot (cfs)	Q(10)tot (cfs)	Q(100)tot (cfs)	DRAINAGE STRUCTURE /REMARKS
A	A	3.82	0.74	0.74	0.92	9.4	9.4	7.9	6.5	11.0	30.0	Ex. Storm System 1
A1	A1	4.22	0.37	0.37	0.46	10.1	10.1	9.4	3.5	5.9	15.5	Ex. 36" System and Northern Channel
B	B	3.15	0.75	0.75	0.94	8.7	8.7	7.5	5.6	9.5	25.7	Ex. Storm System 2
C	C	14.34	0.84	0.84	1.00	10.2	10.2	8.4	26.6	45.4	118.9	Ex. Storm System 3
D	D	5.50	0.46	0.46	0.58	17.0	17.0	15.7	4.4	7.6	20.1	Ex. Culverts and S. Channel
E	E	4.24	0.76	0.76	0.95	6.5	6.5	5.0	8.4	14.4	40.2	Sheet to Ex. North Det. Pond
F	F	6.65	0.51	0.51	0.64	18.7	18.7	18.7	5.6	9.5	24.6	Ex. North Detention Pond
G	G	5.17	0.68	0.68	0.83	12.4	12.4	10.8	6.9	11.9	32.1	Ex. South Detention Pond

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INTEREST CONSULTING GROUP

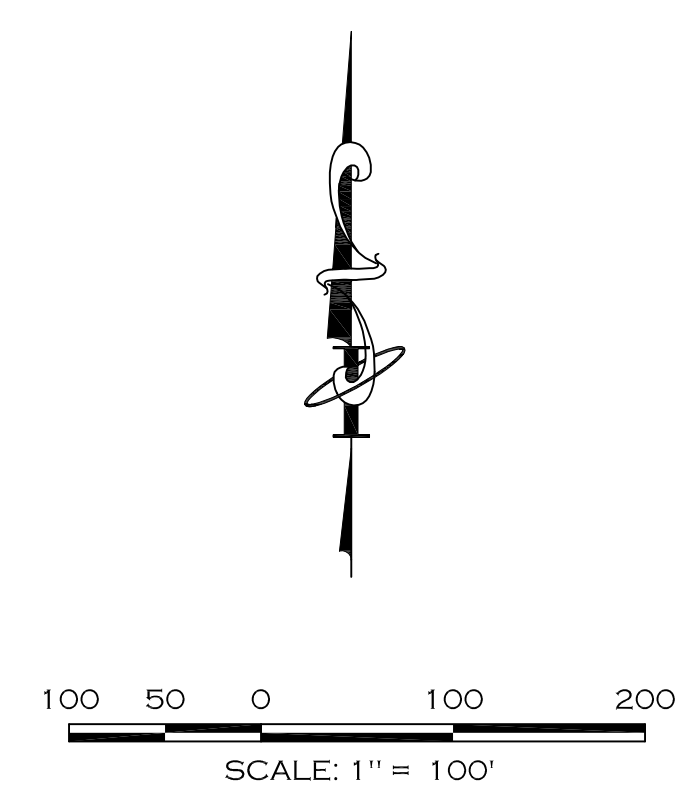
PREPARED FOR
FRONT RANGE COMMUNITY COLLEGE
4616 SOUTH SHIELDS
FORT COLLINS, CO 80527

FRONT RANGE COMMUNITY COLLEGE
MASTER DRAINAGE PLAN
CURRENT CONDITION

DATE: 4/7/16/14	SCALE (H): 1"=100'	SCALE (V): N/A	DESIGNED BY: ES	CHECKED BY: MPO
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PROJ. NO. 1124-086-00

1 OF 2



DATE: 4/7/16/14
SCALE (H): 1"=100'
SCALE (V): N/A
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