ADAMS COUNTY
COLORADO

Community & Economic Development Department
Planning & Development
4430 S. Adams County Pkwy.
1st Floor, Suite W2000B
Brighton, CO 80601-8218
PHONE 720.523.6800 | FAX 720.523.6967
adcogov.org

Development Team Review Comments

The following comments have been provided by reviewers of your land use application. At this time, a resubmittal of your application is required before this case is ready to be scheduled for public hearing.

To prepare your resubmittal, you will be expected to provide:

- A response to each comment with a description of the revisions and the page of the response on the site plan;
- Any revised plans or renderings; and
- A list identifying any additional changes made to the original submission other than those required by staff.

Resubmittal documents must be provided electronically through e-mail or a flash drive delivered to the One-Stop Customer Service Center. The following items will be expected by our One-Stop Customer Service Center:

- One digital copy of all new materials
  - All digital materials shall be in a single PDF document
  - The single PDF document shall be bookmarked
  - If a Subdivision Improvements Agreement, Legal Description, or Development Agreement is required, then an additional Microsoft Word version of these documents shall also be provided
  - Electronic copies can be emailed to epermitcenter@adcogov.org as a PDF attachment. If the files are too large to attach, the email should include an unlocked Microsoft OneDrive link. Alternatively, the resubmittal can be delivered to the One-Stop counter on a flash drive.

BOARD OF COUNTY COMMISSIONERS

Eva J. Henry — DISTRICT 1
Charles "Chaz" Tedesco — DISTRICT 2
Emma Pinter — DISTRICT 3
Steve J. O'Dorisio — DISTRICT 4
Lynn E. Baca — DISTRICT 5

Community & Economic
Development Department
www.adcogov.org

ADAMS COUNTY
COLORADO

4430 South Adams County Parkway
1st Floor, Suite W2000
Brighton, CO 80601-8204
PHONE 720.523.6800
FAX 720.523.6998

Re-submittal Form

Case Name/ Number: PLT2023-00056

Case Manager: David DeBoskey

Re-submitted Items:

- ☐ Development Plan/ Site Plan
- ☐ Plat
- ☐ Parking/ Landscape Plan
- ☐ Engineering Documents
- ☐ Subdivision Improvements Agreement (Microsoft Word version)
- ☐ Other: _____

* **All re-submittals must have this cover sheet and a cover letter addressing review comments.**

Please note the re-submittal review period is 21 days.

The cover letter must include the following information:

- Restate each comment that requires a response
- Provide a response below the comment with a description of the revisions
- Identify any additional changes made to the original document

For County Use Only:

Date Accepted:

Staff (accepting intake):

Resubmittal Active: Engineering; Planner; Right-of-Way; Addressing; Building Safety;

Neighborhood Services; Environmental; Parks; Attorney; Finance; Plan Coordination

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FAX 720.523.6967
EMAIL: epermitcenter@adcogov.org

Development Review Team Comments

Date: 5/9/2024

Project Number: PLT2023-00056

Project Name: Berkeley Center Subdivision

Commenting Division: Plan Coordination 2nd Review

Name of Reviewer: David DeBoskey

Date: 05/09/2024

Email:

Resubmittal Required

BOARD OF COUNTY COMMISSIONERS

Eva J. Henry — DISTRICT 1
Charles "Chaz" Tedesco — DISTRICT 2
Emma Pinter — DISTRICT 3
Steve O'Dorisio — DISTRICT 4
Lynn Baca — DISTRICT 5

Commenting Division: Planner Review 2nd Review

Name of Reviewer: David DeBoskey

Date: 05/09/2024

Email:

Resubmittal Required

2nd Review

PLN3: Rezoning application has not been applied for within our system yet, which is fine, but we recommend t it is applied for during this subdivision review process (before the subdivision goes to it's hearings). If not, it will impact the subdivision criteria of approval. This can start a the same time as the next submittal of this application.KH RESPONSE: Noted, thank you. To be submitted after the submittal of the subdivision construction documents.

PLN5: Proposed lot line that zig zags separating lots 3 & 4 also creates mixed zoning on proposed parcels. When selecting new zones, please be sure that the proposed lots meet the minimum lot size and widths of the proposed zones. KH RESPONSE: Minimum lot size for both I-2 and C-5 have been verified and all lots meet minimum size requirements.

PLN9:Now that the Subdivision Engineering Review has been initiated, the SIA and those particulars will mostly be initiated and dictated by that review but will be apart of this review near the agreement's completion. So, look out for that within that review. KH RESPONSE: Noted, thank you.

PLN10: FYI: Public Land Dedication fee estimate cannot be accurately completed because of split zoning on site, but it is required prior to hearings. KH RESPONSE: Noted, thank you.

PLN11: In CDOT's letter they wanted to review aspects of the development: the Drainage Study, and the Traffic Study. When you coordinated with CDOT, did you send them those? We can, if you did not. We want to make sure they have no concerns given the project's close proximity to CDOT roadways.
KH RESPONSE: We have reviewed and addressed CDOT's comments. Adams County to forward submittal documents to CDOT.

PLN12: Attached is a letter from Xcel Energy that was not given earlier during the first staff comment packet, I apologize for not getting this to you when it came in. They are requesting a 10ft dry utility easement along the perimeter and their plat note.
KH RESPONSE: Active coordination occurring with Xcel over easement.

Commenting Division: ROW Review 2nd Review

Name of Reviewer: David Dittmer

Date: 05/07/2024

Email:

Resubmittal Required

ROW1: Within the Dedication Statement revise to read: ....SUBDIVIDED THE SAME INTO LOTS AND A TRACT...the purpose statement provides the rest of the information. KH RESPONSE: Updated.
ROW2: Need to provide a NOTE as to ownership and maintenance of the TRACT, and it's use. Include this in a Land Use Chart that provides the lot sizes, the tract size and total gr ac. (this was on previous submittals and was removed) (Move the TRACT TABLE from sheet 3 to sheet 1 as the note) KH RESPONSE: Updated.
ROW6: Define the use of the tract on sheet 3. KH RESPONSE: Updated.

Commenting Division: Development Engineering Review 2nd Review

Name of Reviewer: Laurie Clark

Date: 04/23/2024

Email:

Resubmittal Required

ENG1: Submit engineering documents (Drainage Report, Traffic Impact Study, Sediment & Erosion Control Plans and Construction Plans) via email to epermitcenter@adcogov.org, using the Subdivision Engineering Review application found at https://epermits.adcogov.org/submittal-checklists. The engineering documents will be formally reviewed separately from the subdivision case. KH RESPONSE: Submitted per direction.

Commenting Division: Application Intake 2nd Review

Name of Reviewer: Rayleen Swarts

Date: 04/18/2024

Email:

Complete

Commenting Division: Planner Review

Name of Reviewer: David DeBoskey

Date: 02/02/2024

Email:

Resubmittal Required

BOARD OF COUNTY COMMISSIONERS

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DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4	DISTRICT 5

PLN1: No action: Application for final plat minor subdivision to create four lots.

PLN2: On submitted project page, it states "Building Permit drawings will be submitted and processed in support of the Project." Can you explain this? We discourage the filing of building permits prior to completion of a subdivision on the same lot. We suggest you wait to file building permits until after the subdivision process is over.

We highly recommend this order of operations for this site: Subdivision, THEN Building permits/Change-In-Use permits. We can talk about this in the RCC meeting.

PLN3: As noted in the previous Conceptual Review Meeting (PRE2023-00049) "the industrially zoned property on the Northeast of the property has a split zoning of Industrial-1(I-1) and Industrial-2 (I-2) zoned property. Sec. 3-07-02 Summary of Dimensional Requirements requires that I-1 properties have at minimum lot size of 1 acre, I-2 properties require a minimum lot size of 2
acres. Additionally, staff would not be supportive of replating a lot with split zoning. Staff recommends rezoning the portion of land zoned I-2 into I-1 to be more in line with the adjacent properties fronting W. 64th Avenue".. to improve the conformance of the subdivision recommend the following that standad

This will require a Zoning Map Amendment (Rezoning) application, separate from this application but can be 1. processed as this application (once you submit a complete application for that rezoning application) and 2. Can go to hearings simultaneously.

A rezoning is not required, but it is a component of the criteria of the subdvision approval process.

PLN4: The minimum lot size and lot minimums for C-5 (Proposed lots 1,2,3) are 0ft for size and 100 ft for width. Meets standard.
The minimum lot size and lot minimums for I-1 (Proposed lot 4) are 0ft for size and 100 ft for width. Meets standard.

PLN5: If you decide you don't want to rezone that I-2 area and instead want to create another lot with that zoning, you must verify via survey that it would meet minimum lot width. I-2 minimum lot width is 125 feet. County maps indicate that it possibly is not that wide of a potential lot.

Why is the zig zag the lot line?
PLN6: This standard is met:
5-03-03-06 LOT DEPTH TO WIDTH RATIO
No lot shall have an average depth greater than three times the average width unless the lot width is a minimum of four-hundred-twenty-five (425) feet.

PLN7: The signature block on plat should be in this order, top to bottom:
OWNER
SURVEYOR
PLANNNING COMMISSION
BOARD OF COUNTY COMMISSIONERS
COUNTY ATTORNEY
CLERK AND RECORDER

PLN8: The submitted plat indicates the city of Denver multiple times. This is not Denver. Change this all throughout the plat document.

PLN9: Per Sec. 5-02-04 Subdivision Improvement agreement (SIA) will be required at resubmittal

PLN10: Public Land Dedication fees are required in the amount of $XX.XX. See attached spreadsheet. Do not pay these fees until you are scheduled for public hearing _____7.65 acres but I-2 size is undetermined so PLD fees are uncertain.

PLN11: Crestview Water & Sanitation District has a sanitary sewer main situated on the east property line of the part of the property facing Federal. This sanitary sewer main runs north-south. There is also a meter vault providing water to Pioneer Village Mobile Home Park located in the northeast corner of 63rd and Federal. Potholing will be required for this water service.

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DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4	DISTRICT 5

Commenting Division: Planner Review

Name of Reviewer: David DeBoskey

Date: 02/02/2024

Email:

Comment

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DISTRICT 1	DISTRICT 2	DISTRICT 3	DISTRICT 4	DISTRICT 5

For Future Development NOT for this subdivision.
PLN12: A fuel station is proposed for future development on the south east parcel. What is happening on the other proposed parcels?

PLN13: W. 64th Avenue is a section line, Per section 3-24-07-03-07 Minimum setback from Section line for Commercial-5 zoned lots will require a setback of 100 feet as part of any development on the northern properties. Per section 3-25-07-03-07 & 3-26-07-03-07 Minimum setback from Section line for the industrially zoned lots will require a setback of 145 feet from the section line.

PLN14: When developing the site, look at 4-09-02-04 Automobile Service stations for design standards specific for fuel stations.

PLN15: Per Section 4-19-06-01, All Commercially zoned areas on the site abut a residential neighborhood on the east of the subject property, therefore applicant will need to provide a landscape buffer in order to provide separation between the non-compatible uses.

Additionally, per section 4-19-07-01 Street Frontage Landscaping, applicant will need to landscape the areas along properly lines abutting public road right-of-way using one or a combination of the following landscape options:
1. Option 1: Install a twenty-five (25) foot wide area along the road right-of-way. Within the landscape area, one (1) tree and two (2) shrubs shall be planted per forty (40) linear feet of frontage. Drive aisles shall be counted as zero (0) feet in depth.
2. Option 2: Install a twenty (20) foot landscape area along the road right-of-way. Within the landscape area, one (1) tree and two (2) shrubs shall be planted per forty (40) linear feet of frontage. Drive aisles shall be counted as zero (0) feet in depth.
3. Option 3: Install a ten (10) foot landscape area along the road right-of-way. Within the landscape area, two (2) trees and five (5) shrubs shall be planted per forty (40) linear feet of frontage. Drive aisles shall be counted as zero (0) feet in depth.
4. Option 4: Install a five (5) foot landscape area along the road right-of-way. Within the landscape area, one (1) tree and two (2) shrubs shall be placed per forty (40) linear feet of frontage. A thirty (30) inch high decorative wall or the building shall be located between the parking area and the road frontage. Drive aisles shall be counted as zero (0) feet in depth.
5. Option 5: Install a landscape berm with a two (2) foot minimum average height. The berm shall have a slope of no greater than one (1) foot of rise to every four (4) feet of run. Within the landscape area, one (1) tree and five (5) shrubs shall be planted per sixty (60) linear feet of frontage.

PLN16: Per Section 4-19-07 Minimum Landscape Area: All developments shall be required to landscape a minimum of ten (10) percent of the lot area. At least fifty (50) percent of the required landscape area shall be placed so it abuts adjoining public rights-of-way, excluding alleys and drives.

PLN17: Per Sec. 4-11-01-04 Operational/ Physical compatibility standards, conditions may be imposed upon the approval of development applications when industrial uses are proposed adjacent to residentially zoned or used property to ensure new development will be compatible with existing neighborhood and uses, including, but not limited to, restrictions on:
1. Hours of operations and deliveries;
2. Location of activities generating potential adverse impacts on adjacent uses such as noise and glare;
3. Placement of trash receptacles;
4. Location and screening of loading and delivery zones;
5. Light intensity and hours of full illumination; and
6. Placement and illumination of outdoor vending machines.

Commenting Division: Development Engineering Review

Name of Reviewer: Laurie Clark

Date: 02/01/2024

Email:

Resubmittal Required

ENG1: According to the Federal Emergency Management Agency's January 20, 2016 Flood Insurance Rate Maps (FIRM Panels #08001C0584H and #08001C0592H), the project site is not located within a regulated 100-yr floodplain. A Floodplain Use Permit will not be required.

ENG2: A drainage report and drainage plans in accordance to Chapter 9 of the Adams County Development Review Manual are required to be completed by a registered professional engineer and submitted to Adams County for review and final approval. Drainage design shall have no adverse off-site impacts on neighboring properties or the public ROW.

ENG3: LOW IMPACT DEVELOPMENT (LID) STANDARDS AND REQUIREMENTS Section 9-01-03-14:
All construction projects shall reduce drainage impacts to the maximum extent practicable, and implement practices such as:

1. On-site structural and non-structural BMPs to promote infiltration, evapo-transpiration or use of stormwater,
2. Minimization of Directly Connected Impervious Area (MDCIA),
3. Green Infrastructure (GI),
4. Preservation of natural drainage systems that result in the infiltration, evapo-transpiration or use of stormwater in order to protect water quality and aquatic habitat.
5. Use of vegetation, soils, and roots to slow and filter stormwater runoff.
6. Management of stormwater as a resource rather than a waste product by creating functional, attractive, and environmentally friendly developments.
7. Treatment of stormwater flows as close to the impervious area as possible.

LID shall be designed and maintained to meet the standards of these Regulations and the Urban Drainage and Flood Control District's Urban Storm Drainage Criteria Manual, Volume 3.

ENG4: The applicant is required to complete a traffic trip generation analysis signed and stamped by a professional engineer. If the proposed scope of work shows the use of the site will generate over 20 vehicles per day, then a traffic impact study signed and stamped by a professional engineer will be required.

ENG5: The proposed site improvements are required to go through an engineering review process through the Subdivision application. The developer is required to submit for review and receive approval of all civil site construction plans and reports. Construction documents shall include, at a minimum, onsite and public improvements construction plans, drainage report, traffic impact study. All construction documents must meet the requirements of the Adams County Development Standards and Regulations. The developer shall submit to the Adams County One Stop Customer Center the following: Engineering Review Application, Engineering Review Fee, a copy of all construction documents, plans and reports in PDF format.

BOARD OF COUNTY COMMISSIONERS

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Emma Pinter — DISTRICT 3
Steve O'Dorisio — DISTRICT 4
Lynn Baca — DISTRICT 5

Commenting Division: Development Engineering Review

Name of Reviewer: Laurie Clark

Date: 02/01/2024

Email:

Comment

ENG6: Property IS in Adams County MS4 Stormwater Permit area. Because the proposed improvements disturb more than one (1) acre of land, OR are part of a larger development that disturbs over one (1) acre, a Stormwater Quality (SWQ) Permit WILL be required and the applicant would be required to prepare a Stormwater Management Plan (SWMP) using the Adams County ESC Template, and obtain both a County SWQ Permit and a State Permit COR400000. Builder/developer is responsible for adhering to all the regulations of Adams County Ordinance 11 regarding illicit discharge. Applicant is responsible for installation and maintenance of Erosion and Sediment Control BMPs.

ENG7: If the applicant proposes to import greater than 10 CY of soil to this site, additional permitting is required. Per Section 4-04-02-02, of the Adams County Development Standards and Regulations, a Temporary or Special Use Permit is required to ensure that only clean, inert soil is imported into any site within un-incorporated Adams County. A Conditional Use Permit will be required if the importation exceeds 500,000 CY.

ENG8: The developer is required to construct roadway improvements adjacent to the proposed site such as curb, gutter, and sidewalks. Additional roadway improvements will be determined based on the Traffic Impact Study and applicant is required to coordinate with CDOT.

ENG9: A Subdivision Improvements Agreement (SIA) will be required for all public improvements.

ENG10: No building permits will be issued until all public improvements have been constructed, inspected, and preliminarily accepted by the Adams County Public Works Department.

ENG11: The developer is responsible for the repair or replacement of any broken or damaged public infrastructure.

ENG12: All proposed drainage facilities with maintenance access shall be within dedicated easements.

ENG13: The engineering documents for the subdivision must be approved before development of individual lots within the proposed subdivision.

ENG14: Applicant is responsible for additional coordination with CDOT concerning bus corridor requirements for Federal Blvd.

Commenting Division: ROW Review

Name of Reviewer: David Dittmer

Date: 02/01/2024

Email:

Resubmittal Required

ROW1: Remove superfluous information in the Title
ROW2: Add the case number to top right-hand corner of all sheets (PLT2023-00056)
ROW3: Opening statement must be: OWNERSHIP AND DEDICATION CERTIFICATE, followed by the legal as provided, then the new m/b legal for the boundary of the new subdivision.
ROW4: Remove all mention of The City and County of Denver. We are not Denver. Revise all of the dedication statements, execution blocks, etc.
ROW5: Note 4 for the title commitment appears to be in error. The commitment provided is dated 10/12/2023 not 7/17/2023 and do not find the earlier date stated as effective as of that date.
ROW6: Must provide the approved Storm Water Facilities Statement as contained in the application guidelines and checklist.
ROW7: You must have CDOT approval of all access points from Federal Blvd. and county approved access permits on county ROW. If additional ROW dedication is required for either road pending engineering review of the traffic impact to the surrounding infrastructure, it can be dedicated by this plat to the county, and the county will deed to CDOT for anything along Federal.
ROW7: The order of appearance of signature/approval blocks:
OWNER
LIEN HOLDER ACCEPTANCE - If property is under a deed of trust the lien holder must approve the plat.
SURVEYOR
PLANNING COMMISSION
BOARD OF COUNTY COMMISSIONERS
COUNTY ATTORNEY'S OFFICE - Approved as to form
ROW8: Must provide an approved dedication statement. See application guidelines and checklist.
ROW9: Revise all dates to current year.
ROW10: Note 4 - Define a US foot per C.R.S. and PLS Bylaws
ROW11: Provide a copy of a recorded Statement of Authority for QuikTrip Corporation or a copy of the operating agreement to verify signatories ability to encumber the corporation.
ROW12: Review line weights. It may be the copy but there appear to be signature lines that are heavier than others.
SHEET 2:
ROW13: Sheet 2 is the existing conditions and parcel lines. Do not provide where the new lots are to be located on this sheet. These parcel lines must be vacated. The parcels must be referenced as to the legal descriptions provided on sheet 1. You must state parcel lines being vacated by this plat.
ROW14: Stay consistent with document citations. See 20' easement citation for book 454, page 55. Name the type of easement. This easement cannot be vacated.

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Commenting Division: ROW Review

Name of Reviewer: David Dittmer

Date: 02/01/2024

Email:

Comment

SHEET 3

ROW15: The easements that appear to be missing cannot be vacated by this plat and must remain in place. If needing to vacate these easements, it will be an agreement between the property owner and the owner of the utility easement. Once the vacation has been completed and recorded, cite the vacation reception number. If utilities are installed it will be at the owners expense to move these utilities and provide a new easement. The easement/ROW document cited above is exclusively for sanitary sewer. It can be crossed, but nothing can share the trench. Does the 9' wide drainage easement being dedicated abut the 5' wide utility easement as recorded at B1009567? The new one cannot lay on top of the existing.

ROW16: Use a heavy pen weight to draw attention to vacation and dedication statements.

ROW17: Pending access review and approvals from CDOT, it does not appear each lot will be allowed a separate access. Due to this, an access easement located within a TRACT will be required. This Tract will be owned and maintained by the owners or owners association due to individual ownership of the lots. Any Storm Water Quality facilities, detention area, must be located within a TRACT to be owned and maintained by the owners, or owners association, and dedicated to the county. Access to the detention area must be provided by an access easement. Due to individual ownership of the lots, utility easements must be provided for utilities to serve the individual lots. These should be along the front and rear lot lines, and pending comments from PSCO, side lot line easements may be necessary.

ROW

Commenting Division: Environmental Analyst Review

Name of Reviewer: Megan Grant

Date: 02/01/2024

Email:

Complete

ENV1.The subject parcel is located within the Adams County Mineral Conservation Overlay (MCO) district, the purpose of which is to establish reasonable and uniform limitations, safeguards, and controls for the conservation and wise utilization of natural resources and for rehabilitation of excavated land. Land within this classification is designated as containing commercial mineral deposits in sufficient size parcels and in areas where extraction and rehabilitation can be undertaken while still protecting the health, safety, and welfare of the inhabitants of the area and the County. Although this parcel is located within the MCO district and the parcel is greater than 5 acres, the parcel is previously developed and unlikely to provide a mineral resource of commercial quantity and quality; therefore, the MCO restrictions are exempted in this case.

Commenting Division: Neighborhood Services Review

Name of Reviewer: Cornelia Warnke

Date: 01/24/2024

Email:

Complete

There are no open violations at this location at this time. No comment.

Commenting Division: Addressing Review

Name of Reviewer: David Dittmer

Date: 01/11/2024

Email:

Complete

BOARD OF COUNTY COMMISSIONERS

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Steve O'Dorisio — DISTRICT 4
Lynn Baca — DISTRICT 5

Right of Way & Permits

1123 West 3rd Avenue
Denver, Colorado 80223
Telephone: **303.285.6612**
violeta.ciocanu@xcelenergy.com

January 17, 2024

Adams County Community and Economic Development Department
4430 South Adams County Parkway, 1st Floor, Suite W2000A
Brighton, CO 80601

Attn: David DeBoskey

Re: Berkeley Center Subdivision, Case # PLT2023-00056

Public Service Company of Colorado's (PSCo) Right of Way & Permits Referral Desk has reviewed the request for **Berkeley Center Minor Subdivision**. Please be advised that Public Service Company has existing natural gas distribution facilities along north property line and overhead electric distribution facilities along north, east, and west property boundaries.

For these *commercial/industrial/retail* lots, and to ensure that adequate utility easements are available within this development and per state statute §31-23-214 (3), PSCo requests that the following language or plat note is placed on the preliminary and final plats for the subdivision:

> *Ten-foot (10') wide dry utility easements are hereby granted around the perimeter of platted areas including lots, tracts, parcels and/or open space areas. These easements are dedicated to the Adams County for the benefit of the applicable utility providers for the installation, maintenance, and replacement of electric, gas, television, cable, and telecommunications facilities (Dry Utilities). Utility easements shall also be granted within any access easements and private streets in the subdivision. Permanent structures, improvements, objects, buildings, wells, water meters and other objects that may interfere with the utility facilities or use thereof (Interfering Objects) shall not be permitted within said utility easements and the utility providers, as grantees, may remove any Interfering Objects at no cost to such grantees, including, without limitation, vegetation. Public Service Company of Colorado (PSCo) and its successors reserve the right to require additional easements and to require the property owner to grant PSCo an easement on its standard form.*

Public Service Company also requests that all utility easements are depicted graphically on the preliminary and final plats. While these easements may accommodate certain utilities to be installed in the subdivision, some additional easements may be required as planning and building progresses.

The property owner/developer/contractor must complete the application process for any new natural gas or electric service, or modification to existing facilities via xcelenergy.com/InstallAndConnect. It is then the responsibility of the developer to contact the Designer assigned to the project for approval of design details.

Additional easements may need to be acquired by separate document. The Designer must contact the appropriate Right-of-Way Agent.

Not ready to apply? Our Builder Developer Representatives can provide you with capacity and process information during the concept phase of a project. Contact us at BDRCO@xcelenergy.com or learn more at Building and Remodeling (xcelenergy.com)

As a safety precaution, PSCo would like to remind the developer to contact Colorado 811 for utility locates prior to construction.

Violeta Ciocanu (Chokanu)
Right of Way and Permits
Public Service Company of Colorado dba Xcel Energy
Office: 303-285-6612 – Email: violeta.ciocanu@xcelenergy.com

BERKLEY CENTER SUBDIVISION

CASE NO. PLT2023-00056

A REPLAT OF LOT 1, BLOCK 1, ELLETT SUBDIVISION, LOT 1 BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION AND A PORTION OF THE NORTHWEST 1/4 OF THE NORTHEAST 1/4 OF SECTION 8, ALL LYING WITHIN THE NORTHEAST 1/4 SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO

SHEET 1 OF 3

PURPOSE STATEMENT:

THE PURPOSE OF THIS SUBDIVISION REPLAT IS TO COMBINE FIVE (5) INDIVIDUAL PARCELS INTO ONE SUBDIVISION AND CREATE 4 NEW LOTS AND 1 TRACT FOR COMMERCIAL DEVELOPMENT.

CERTIFICATE OF DEDICATION AND OWNERSHIP:

KNOW ALL MEN BY THESE PRESENTS THAT QUIKTRIP CORPORATION, AN OKLAHOMA CORPORATION, BEING THE SOLE OWNER OF THE FOLLOWING DESCRIBED TRACT OF LAND:

PARCEL A:

LOT 1, BLOCK 1, ELLETT SUBDIVISION, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THE NORTH 10 FEET THEREOF CONVEYED TO THE COUNTY OF ADAMS DESCRIBED IN RESOLUTION AND DEED RECORDED NOVEMBER 25, 1969 IN BOOK 1561 AT PAGE 44.

PARCEL B:

LOT 1, BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION, COUNTY OF ADAMS, STATE OF COLORADO.

PARCEL C:

A PARCEL OF LAND LOCATED IN THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THE NORTH LINE OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SAID POINT BEING 345.38 FEET EAST OF THE N1/4 CORNER OF SECTION 8 AND 320.00 FEET WEST OF THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE S 0°03'30" E DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE; THENCE S 90°00'00" W ALONG THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, A DISTANCE OF 270.38 FEET TO A POINT, SAID POINT BEING 75.00 FEET EAST OF 20.00 FEET SOUTH OF THE N1/4 CORNER OF SECTION 8; THENCE S 44°58'15" W A DISTANCE OF 28.28 FEET TO A POINT ON THE EAST RIGHT-OF-WAY LINE OF FEDERAL BOULEVARD, SAID POINT BEING 55.00 FEET EAST AND 40.00 FEET SOUTH OF THE N1/4 CORNER OF SECTION 8; THENCE S 0°03'30" E ALONG THE EAST RIGHT-OF-WAY LINE OF FEDERAL BOULEVARD, A DISTANCE OF 289.80 FEET TO THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE N 90°00'00" E ALONG THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8, A DISTANCE OF 141.89 FEET; THENCE N 0°31'25" W A DISTANCE OF 166.68 FEET; THENCE N 89°28'25" E DISTANCE OF 149.85 FEET; THENCE N 0°03'30" W A DISTANCE OF 141.76 FEET TO A POINT ON THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, AND 20.00 FEET SOUTH OF THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF ADAMS, STATE OF COLORADO, AS DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 6, 1907 IN BOOK 33 AT PAGE 220.

AND EXCEPT THAT PORTION TAKEN IN RULE AND ORDER RECORDED OCTOBER 15, 1971 IN BOOK 1745 AT PAGE 484.

ALSO EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO DESCRIBED IN DEED RECORDED DECEMBER 11, 1984 IN BOOK 2945 AT PAGE 579.

AND FURTHER EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 20051107001229480.

PARCEL D:

A PARCEL OF LAND LOCATED IN THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THE NORTH LINE OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SAID POINT BEING 345.38 FEET EAST OF THE N1/4 CORNER OF SECTION 8, AND 320.00 FEET WEST OF THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE S 0°03'30" E DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE AND THE POINT OF BEGINNING; THENCE S 90°00'00" E A DISTANCE OF 30.00 FEET; THENCE S 0°03'30" W A DISTANCE OF 309.80 FEET TO A POINT ON THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8; THENCE S 90°00'00" W ALONG THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8, A DISTANCE OF 178.49 FEET; THENCE N 0°31'25" W A DISTANCE OF 166.68 FEET; THENCE N 89°28'25" E A DISTANCE OF 149.85 FEET; THENCE N 0°03'30" W A DISTANCE OF 141.76 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVE., AND THE TRUE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 20051107001229480.

PARCEL E:

A PARCEL OF LAND BEING A PORTION OF THE EAST 290.00 FEET OF THE N1/2, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

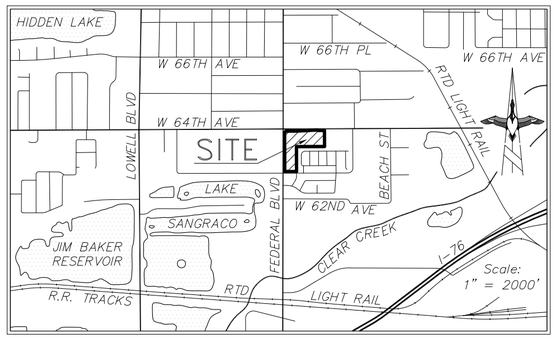
BEGINNING AT THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, THENCE SOUTH ALONG THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, WHICH IS THE TRUE POINT OF BEGINNING; THENCE CONTINUING SOUTH ALONG THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 309.80 FEET TO THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4; THENCE WEST ALONG THE SOUTH LINE A DISTANCE OF 290.00 FEET; THENCE NORTH AND PARALLEL TO THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 309.80 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE; THENCE EAST ALONG THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, A DISTANCE OF 290.00 FEET TO THE TRUE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 20051107001229480.

ALL OF WHICH BEING DESCRIBED BY METES AND BOUNDS AS FOLLOWS:

A PARCEL OF LAND LYING WITHIN THE NORTHWEST 1/4 OF THE NORTHEAST 1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTH 1/4 CORNER OF SAID SECTION 8, FROM WHICH THE NORTH LINE OF THE NORTHEAST 1/4 OF SAID SECTION 8 BEARS NORTH 89°49'13" EAST, WITH ALL BEARINGS CONTAINED HEREIN BEING REFERENCED TO SAID NORTH LINE; THENCE ALONG THE WEST LINE OF SAID NORTHEAST 1/4, SOUTH 00°18'56" EAST, A DISTANCE OF 65.02 FEET; THENCE DEPARTING SAID WEST LINE, NORTH 89°41'04" EAST, A DISTANCE OF 55.00 FEET TO THE EASTERLY RIGHT-OF-WAY OF NORTH FEDERAL BOULEVARD, A 110.00-FOOT-WIDE PUBLIC RIGHT-OF-WAY, BEING THE EAST LINE OF THE PARCEL OF LAND DESCRIBED IN THE RULE AND ORDER RECORDED OCTOBER 15, 1971 IN BOOK 1745, PAGE 484 IN THE OFFICE OF THE CLERK AND RECORDER FOR SAID COUNTY AND THE POINT OF BEGINNING; THENCE ALONG THE SOUTHERLY RIGHT-OF-WAY OF WEST 64TH AVENUE, A PUBLIC RIGHT-OF-WAY WITH A WIDTH THAT VARIES, THE FOLLOWING FOURTEEN (14) COURSES: 1) NORTH 44°45'13" EAST, A DISTANCE OF 35.17 FEET;



VICINITY MAP

SHEET INDEX:

CERTIFICATE OF DEDICATION AND OWNERSHIP (continued):

2) NORTH 89°49'13" EAST, A DISTANCE OF 195.35 FEET; 3) NORTH 86°54'53" EAST, A DISTANCE OF 7.84 FEET; 4) SOUTH 03°05'07" EAST, A DISTANCE OF 1.00 FEET; 5) NORTH 86°54'56" EAST, A DISTANCE OF 210.82 FEET; 6) SOUTH 48°07'00" EAST, A DISTANCE OF 1.95 FEET; 7) NORTH 86°52'59" EAST, A DISTANCE OF 5.90 FEET; 8) NORTH 41°52'59" EAST, A DISTANCE OF 1.96 FEET; 9) NORTH 86°54'49" EAST, A DISTANCE OF 141.57 FEET; 10) NORTH 03°05'11" WEST, A DISTANCE OF 1.00 FEET; 11) NORTH 86°54'53" EAST, A DISTANCE OF 0.79 FEET TO THE BEGINNING OF A TANGENT CURVE CONCAVE SOUTHERLY, HAVING A RADIUS OF 970.00 FEET; 12) EASTERLY ALONG SAID TANGENT CURVE THROUGH A CENTRAL ANGLE OF 01°14'55", AN ARC LENGTH OF 21.14 FEET; 13) SOUTH 00°18'56" EAST, A DISTANCE OF 9.60 FEET; 14) NORTH 89°49'13" EAST, A DISTANCE OF 133.05 FEET TO THE EAST LINE OF LOT 1, BLOCK 1, ELLETT SUBDIVISION PER THE PLAT RECORDED NOVEMBER 17, 1969 AT RECEPTION NO. 878049 IN SAID OFFICE OF THE CLERK AND RECORDER, BEING 10.00 FEET SOUTH OF THE NORTHEAST CORNER OF SAID LOT 1, BEING THE SOUTHEAST CORNER OF THE PARCEL DESCRIBED IN THE RESOLUTION AND DEED RECORDED NOVEMBER 25, 1969 IN BOOK 1561, PAGE 44 IN SAID OFFICE OF THE CLERK AND RECORDER; THENCE ALONG SAID EAST LINE OF LOT 1, SOUTH 00°18'09" EAST, A DISTANCE OF 299.70 FEET TO THE SOUTHEAST CORNER OF SAID LOT 1; THENCE ALONG THE SOUTH LINE OF SAID LOT 1 AND THE WESTERLY PROLONGATION THEREOF, BEING THE NORTH LINE OF LOT 2, BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION PER THE PLAT RECORDED JULY 2, 1991 AT RECEPTION NO. B1009567 IN SAID OFFICE OF THE CLERK AND RECORDER, SOUTH 89°50'23" WEST, A DISTANCE OF 523.60 FEET TO THE NORTHWEST CORNER OF SAID LOT 2, BEING THE NORTHEAST CORNER OF LOT 1, BLOCK 1, SAID LEXI PAPPAGEORGE SUBDIVISION; THENCE ALONG THE WEST LINE OF SAID LOT 2, BEING THE EAST LINE OF LOT 1, SOUTH 00°18'56" EAST, A DISTANCE OF 464.98 FEET TO THE SOUTHWEST CORNER OF LOT 2, BEING THE SOUTHEAST CORNER OF LOT 1; THENCE ALONG THE SOUTH LINE OF SAID LOT 1, BEING THE NORTHERLY RIGHT-OF-WAY OF WEST 63RD AVENUE, A 60.00-FOOT-WIDE PUBLIC RIGHT-OF-WAY, SOUTH 89°44'10" WEST, A DISTANCE OF 220.00 FEET TO THE SOUTHWEST CORNER OF LOT 1, BEING THE INTERSECTION OF THE NORTHERLY RIGHT-OF-WAY OF WEST 63RD AVENUE AND THE EASTERLY RIGHT-OF-WAY OF NORTH FEDERAL BOULEVARD; THENCE ALONG THE WEST LINE OF SAID LOT 1 AND THE NORTHERLY PROLONGATION THEREOF, BEING THE EASTERLY RIGHT-OF-WAY OF NORTH FEDERAL BOULEVARD, A 110.00-FOOT-WIDE PUBLIC RIGHT-OF-WAY, NORTH 00°18'56" WEST, A DISTANCE OF 729.93 FEET TO THE POINT OF BEGINNING.

CONTAINS 322,193 SQUARE FEET OR 7.397 ACRES, MORE OR LESS.

HAVE BY THESE PRESENTS LAID OUT, PLATTED AND SUBDIVIDED THE SAME INTO FOUR LOTS AND ONE TRACT AS SHOWN ON THIS PLAT UNDER THE NAME AND STYLE OF BERKLEY CENTER SUBDIVISION AND THE UNDERSIGNED DOES HEREBY DEDICATE, GRANT AND CONVEY TO ADAMS COUNTY THOSE DRAINAGE AND ACCESS EASEMENTS AS SHOWN ON THE PLAT; AND FURTHER RESTRICTS THE USE OF ALL PUBLIC EASEMENTS TO ADAMS COUNTY AND/OR ITS ASSIGNS, PROVIDED HOWEVER, THAT THE SOLE RIGHT AND AUTHORITY TO RELEASE OR QUIT CLAIM ALL OR ANY SUCH PUBLIC EASEMENTS SHALL REMAIN EXCLUSIVELY VESTED IN ADAMS COUNTY.

GENERAL NOTES:

1. BEARINGS ARE BASED ON THE THE STATE PLANE COORDINATE SYSTEM ESTABLISHED FOR THE COLORADO NORTH ZONE 0502, NORTH AMERICAN DATUM (NAD) OF 1983. DISTANCES SHOWN HEREON ARE GROUND UNITS, BEING THE NORTH LINE OF THE NORTHEAST 1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, WHICH BEARS NORTH 89°49'13" EAST BETWEEN THE FOUND MONUMENTS SHOWN AND DESCRIBED HEREON.
2. THIS PROPERTY IS NOT LOCATED WITHIN THE 100-YEAR FLOODPLAIN AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) FOR ADAMS COUNTY COLORADO MAP NUMBER 08001C0592H, REVISED DATE MARCH 5, 2007.
3. THIS SURVEY DOES NOT CONSTITUTE A TITLE SEARCH BY ALTURA LAND CONSULTANTS, LLC TO DETERMINE OWNERSHIP OR EASEMENTS OF RECORD. FOR ALL INFORMATION REGARDING EASEMENTS, RIGHTS OF WAY AND TITLE OF RECORDS, ALTURA LAND CONSULTANTS, LLC RELIED UPON TITLE COMMITMENT NO. NCS-1180566-CO, WITH AN EFFECTIVE DATE OF JULY 17, 2023 AS PREPARED BY FIRST AMERICAN, TO DELINEATE THE AFORESAID INFORMATION.
4. PER C.R.S. 38-51-106, "ALL LINEAL UNITS DEPICTED ON THIS LAND SURVEY PLAT ARE U.S. SURVEY FEET. ONE METER EQUALS 39.37/12 U.S. SURVEY FEET, EXACTLY, ACCORDING TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY."
5. THE FIELD WORK FOR THIS SURVEY WAS PERFORMED BY ALTURA LAND CONSULTANTS, LLC ON JULY 14, 2023.
6. 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 CERTIFICATION SHOWN HEREON.

GENERAL NOTES (continued):

7. ANY PERSON WHO KNOWINGLY REMOVES, ALTERS OR DEFACES ANY PUBLIC LAND SURVEY MONUMENT OF LAND MONUMENT OR ACCESSORY, COMMITS A CLASS TWO (2) MISDEMEANOR PURSUANT TO STATE STATUE 18-4-508, C.R.S.
8. PER THE STATE OF COLORADO BOARD OF LICENSURE FOR ARCHITECTS, PROFESSIONAL ENGINEERS, AND PROFESSIONAL LAND SURVEYORS RULE 1.6.B.2 THE WORD "CERTIFY"AS USED HEREON MEANS AN EXPRESSION OF PROFESSIONAL OPINION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EXPRESSED OR IMPLIED. THE SURVEY REPRESENTED HAS BEEN PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE AND IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF.

STORM DRAINAGE FACILITIES STATEMENT:

THE POLICY OF THE COUNTY REQUIRES THAT MAINTENANCE ACCESS SHELL BE PROVIDED TO ALL STORM DRAINAGE FACILITIES TO ASSURE CONTINUOUS CAPABILITY OF THE SYSTEM. THE PROPERTY OWNERS SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL DRAINAGE FACILITIES INCLUDING INLETS, PIPES, CULVERTS, CHANNELS, DITCHES, HYDRAULIC STRUCTURES, AND DETENTION BASINS LOCATED ON THEIR LAND UNLESS MODIFIED BY THE SUBDIVISION DEVELOPMENT AGREEMENT. SHOULD THE OWNER FAIL TO MAINTAIN SAID FACILITIES, THE COUNTY SHALL HAVE THE RIGHT TO ENTER SAID LAND FOR THE SOLE PURPOSE OF OPERATIONS AND MAINTENANCE. ALL SUCH MAINTENANCE COST WILL BE ASSESSED TO THE PROPERTY OWNERS.

CERTIFICATE OF OWNERSHIP:

IN WITNESS THEREOF, QUIKTRIP CORPORATION, AN OKLAHOMA CORPORATION, HAS CAUSED THESE PRESENTS TO BE EXECUTED THIS ___ DAY OF _____, 2024

OWNER: QUIKTRIP CORPORATION, AN OKLAHOMA CORPORATION

BY:_____
JASON ACORD

TITLE: REGIONAL DIRECTOR OF REAL ESTATE / ASSISTANT SECRETARY

STATE OF KANSAS)
)SS
COUNTY OF JOHNSON)

THE FOREGOING PLAT AND DEDICATION WAS ACKNOWLEDGED BEFORE ME THIS ___ DAY OF _____ A.D. 2024, BY JASON ACORD AS DIRECTOR OR REAL ESTATE / ASSISTANT SECRETARY FOR QUICK TRIP CORPORATION, AN OKLAHOMA CORPORATION.

WITNESS MY HAND AND OFFICIAL SEAL.

_____
NOTARY PUBLIC

MY COMMISSION EXPIRES: _____

SURVEYOR'S CERTIFICATE:

I, JESUS A. LUGO, A LICENSED PROFESSIONAL LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THIS PLAT WAS MADE BY ME OR UNDER MY DIRECT SUPERVISION ON THE 12TH DAY OF DECEMBER, 2023, AND THAT THE ACCOMPANYING MAP ACCURATELY AND PROPERLY SHOWS SAID SUBDIVISION.

SIGNED THIS __ DAY OF _____, 2024.

_____
LICENSED PROFESSIONAL LAND SURVEYOR
LICENSE NUMBER 38081

PLANNING COMMISSION APPROVAL:

RECOMMENDED FOR APPROVAL BY THE ADAMS COUNTY PLANNING COMMISSION THIS ___ DAY OF _____, 2024.

_____
CHAIR

BOARD OF COUNTY COMMISSIONERS' APPROVAL:

APPROVED BY THE ADAMS COUNTY BOARD OF COMMISSIONERS THIS ___ DAY OF _____, 2024.

_____
CHAIR

ADAMS COUNTY ATTORNEY'S OFFICE:

_____
APPROVED AS TO FORM

CLERK AND RECORDER'S CERTIFICATE:

THIS FINAL PLAT WAS FILED FOR RECORD IN THE OFFICE OF THE ADAMS COUNTY CLERK AND RECORDER, IN THE STATE OF COLORADO, AT _____M., ON THIS ___ DAY OF _____, A.D. 2024.

_____ _____
DEPUTY CLERK AND RECORDER RECEPTION NUMBER

COVER SHEET

ALTURA
LAND CONSULTANTS
6950 South Tucson Way, Unit C
Centennial, Colorado 80112
Phone: (720) 488-1303

PREPARED	12/12/23
1ST SUBMITTAL	4/1/24

SHEET 1 OF 3

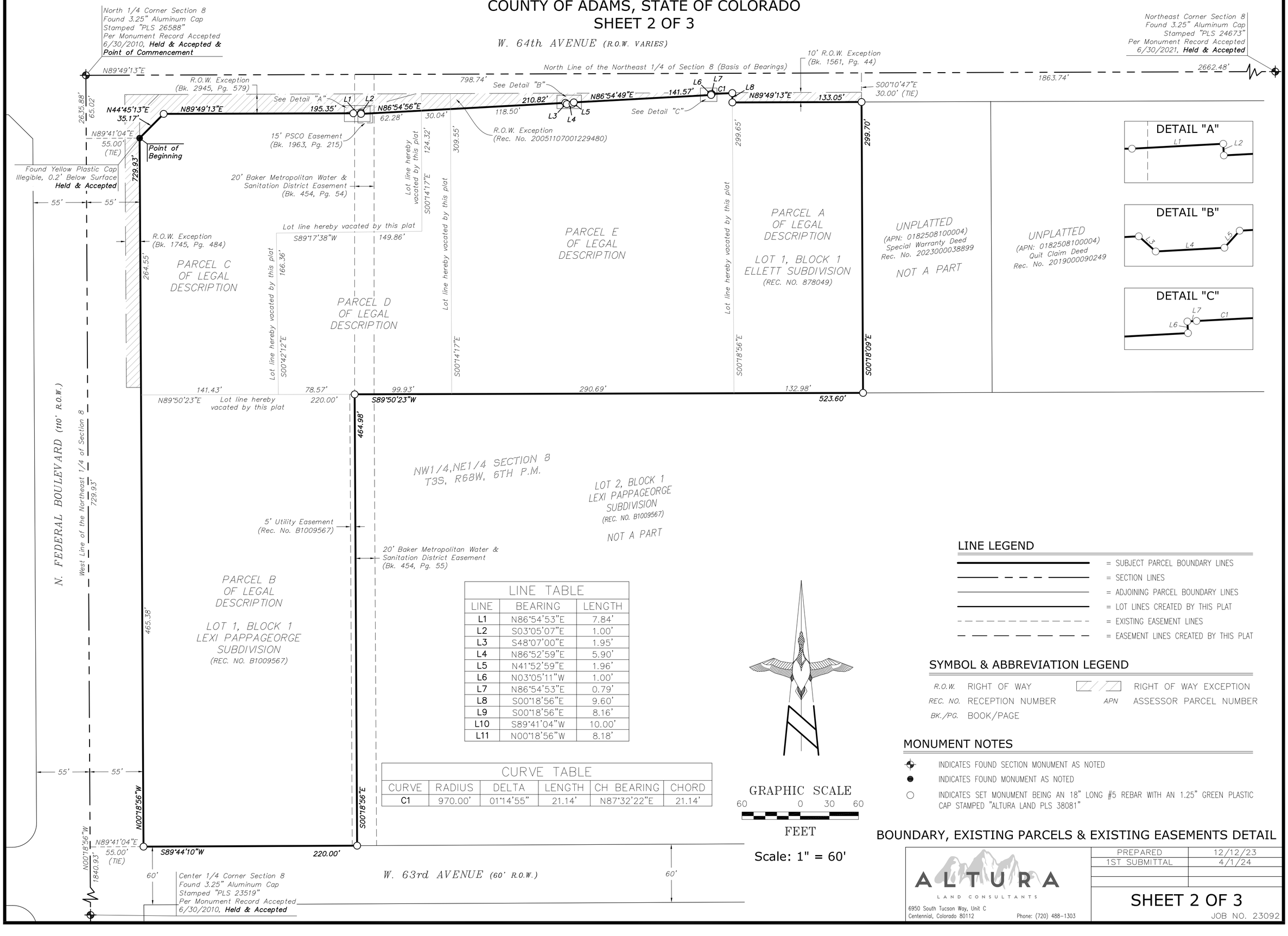
JOB NO. 23092

BERKLEY CENTER SUBDIVISION

CASE NO. PLT2023-00056

A REPLAT OF LOT 1, BLOCK 1, ELLETT SUBDIVISION, LOT 1 BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION AND A PORTION OF THE NORTHWEST 1/4 OF THE NORTHEAST 1/4 OF SECTION 8, ALL LYING WITHIN THE NORTHEAST 1/4 SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO

SHEET 2 OF 3



LINE TABLE		
LINE	BEARING	LENGTH
L1	N86°54'53"E	7.84'
L2	S03°05'07"E	1.00'
L3	S48°07'00"E	1.95'
L4	N86°52'59"E	5.90'
L5	N41°52'59"E	1.96'
L6	N03°05'11"W	1.00'
L7	N86°54'53"E	0.79'
L8	S00°18'56"E	9.60'
L9	S00°18'56"E	8.16'
L10	S89°41'04"W	10.00'
L11	N00°18'56"W	8.18'

CURVE TABLE					
CURVE	RADIUS	DELTA	LENGTH	CH BEARING	CHORD
C1	970.00'	01°14'55"	21.14'	N87°32'22"E	21.14'

GRAPHIC SCALE

60 0 30 60

FEET

Scale: 1" = 60'

LINE LEGEND

- = SUBJECT PARCEL BOUNDARY LINES
- = SECTION LINES
- = ADJOINING PARCEL BOUNDARY LINES
- = LOT LINES CREATED BY THIS PLAT
- = EXISTING EASEMENT LINES
- = EASEMENT LINES CREATED BY THIS PLAT

SYMBOL & ABBREVIATION LEGEND

R.O.W.	RIGHT OF WAY		RIGHT OF WAY EXCEPTION
REC. NO.	RECEPTION NUMBER	APN	ASSESSOR PARCEL NUMBER
BK./PG.	BOOK/PAGE		

MONUMENT NOTES

- INDICATES FOUND SECTION MONUMENT AS NOTED
- INDICATES FOUND MONUMENT AS NOTED
- INDICATES SET MONUMENT BEING AN 18" LONG #5 REBAR WITH AN 1.25" GREEN PLASTIC CAP STAMPED "ALTURA LAND PLS 38081"

BOUNDARY, EXISTING PARCELS & EXISTING EASEMENTS DETAIL

ALTURA
LAND CONSULTANTS
6950 South Tucson Way, Unit C
Centennial, Colorado 80112
Phone: (720) 488-1303

PREPARED	12/12/23
1ST SUBMITTAL	4/1/24

SHEET 2 OF 3

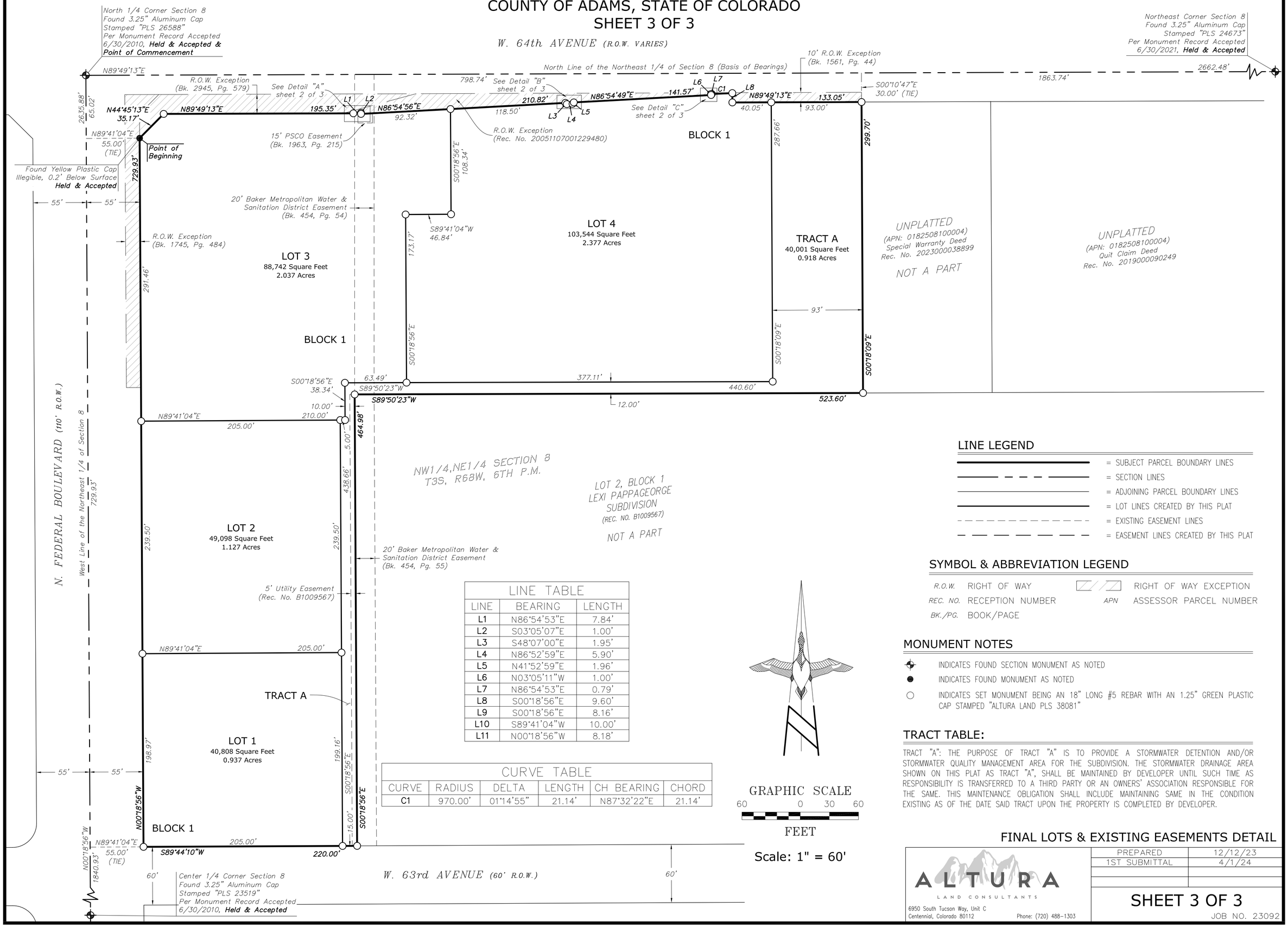
JOB NO. 23092

BERKLEY CENTER SUBDIVISION

CASE NO. PLT2023-00056

A REPLAT OF LOT 1, BLOCK 1, ELLETT SUBDIVISION, LOT 1 BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION AND A PORTION OF THE NORTHWEST 1/4 OF THE NORTHEAST 1/4 OF SECTION 8, ALL LYING WITHIN THE NORTHEAST 1/4 SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO

SHEET 3 OF 3



LINE TABLE		
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L5	N41°52'59"E	1.96'
L6	N03°05'11"W	1.00'
L7	N86°54'53"E	0.79'
L8	S00°18'56"E	9.60'
L9	S00°18'56"E	8.16'
L10	S89°41'04"W	10.00'
L11	N00°18'56"W	8.18'

CURVE TABLE					
CURVE	RADIUS	DELTA	LENGTH	CH BEARING	CHORD
C1	970.00'	01°14'55"	21.14'	N87°32'22"E	21.14'

GRAPHIC SCALE

60 0 30 60

FEET

Scale: 1" = 60'

LINE LEGEND

- = SUBJECT PARCEL BOUNDARY LINES
- = SECTION LINES
- = ADJOINING PARCEL BOUNDARY LINES
- = LOT LINES CREATED BY THIS PLAT
- = EXISTING EASEMENT LINES
- = EASEMENT LINES CREATED BY THIS PLAT

SYMBOL & ABBREVIATION LEGEND

R.O.W.	RIGHT OF WAY		RIGHT OF WAY EXCEPTION
REC. NO.	RECEPTION NUMBER	APN	ASSESSOR PARCEL NUMBER
BK./PG.	BOOK/PAGE		

MONUMENT NOTES

- INDICATES FOUND SECTION MONUMENT AS NOTED
- INDICATES FOUND MONUMENT AS NOTED
- INDICATES SET MONUMENT BEING AN 18" LONG #5 REBAR WITH AN 1.25" GREEN PLASTIC CAP STAMPED "ALTURA LAND PLS 38081"

TRACT TABLE:

TRACT "A": THE PURPOSE OF TRACT "A" IS TO PROVIDE A STORMWATER DETENTION AND/OR STORMWATER QUALITY MANAGEMENT AREA FOR THE SUBDIVISION. THE STORMWATER DRAINAGE AREA SHOWN ON THIS PLAT AS TRACT "A", SHALL BE MAINTAINED BY DEVELOPER UNTIL SUCH TIME AS RESPONSIBILITY IS TRANSFERRED TO A THIRD PARTY OR AN OWNERS' ASSOCIATION RESPONSIBLE FOR THE SAME. THIS MAINTENANCE OBLIGATION SHALL INCLUDE MAINTAINING SAME IN THE CONDITION EXISTING AS OF THE DATE SAID TRACT UPON THE PROPERTY IS COMPLETED BY DEVELOPER.

FINAL LOTS & EXISTING EASEMENTS DETAIL

ALTURA
LAND CONSULTANTS
6950 South Tucson Way, Unit C
Centennial, Colorado 80112
Phone: (720) 488-1303

PREPARED	12/12/23
1ST SUBMITTAL	4/1/24

SHEET 3 OF 3

JOB NO. 23092

Traffic & Safety
Region 1
2829 W Howard Place, 2nd Floor
Denver, Colorado 80204

COLORADO
Department of Transportation
Region 1

Project Name: Berkley Center Subdivision

Print Date: 6/5/2024 **Highway**: 287 **Mile Marker**: 287.751

A comment response letter is REQUIRED along with the next submittal.

Review POC: Eyl, Aaron

Environmental Comments:

For ANY ground disturbance/work within CDOT ROW---

Required:

Arch/History/Paleo:

Since this is a permit, a file search for Arch, Paleo and History is required. If the file search identifies anything, a more extensive report will be required. If nothing is identified, then the file search should be sufficient. For the file search contact:

Cultural/History File Search: https://www.historycolorado.org/file-access Email: hc_filesearch@state.co.us

Paleo File Search: Colorado University Museum of Natural History - https://www.colorado.edu/cumuseum/research-collections/paleontology/policies-procedure) Email: jacob.vanveldhuizen@colorado.edu and from the Denver Museum of Nature and Science – Email: kristen.mackenzie@dmns.org https://www.dmns.org/science/earth-sciences/earth-sciences-collections/

KH RESPONSE: File search is actively being coordinated.

Hydraulics Comments:

JB 5/28/24

The proposed conditions mainly keep historic drainage patterns. There is no increase in stormwater discharge into CDOT ROW/Federal Boulevard based on the offsite discussion on page 10 in the drainage report.

No further drainage comments or concerns at this time.

KH RESPONSE: Thank you for your review.

Permits Comments:

5/23/24 SB Any utilities being relocate to facilitate the access work will require their own individual permits and any landscaping will require it's own permits

KH RESPONSE: Understood.

5.30.24

-There are a total of 8 existing access along Federal at this site. 6 of these accesses will need to be closed. Each closure requires an access permit. The other 2 accesses will also require access permits. These are for the proposed RIRO accesses. These accesses would be considerad a relocation on the access permit application.

KH RESPONSE: Noted, we will gather all relevant permits related to access along Federal.

-The east side of the 64th ave and Federal intersection will also require an access permit. Per the traffic study the volume will increase by more then 20%. Because 64th ave is a county street the county would be the permittee on the permit application. KH RESPONSE: Noted, will update to county on permit application

-The full movement access located on 64th ave is off system and will not require a permit.
KH RESPONSE: Noted, thank you
-The access permit application can be found at the following link:
https://www.codot.gov/business/permits/accesspermits/forms/cdot0137 KH RESPONSE: Thank you

-The state highway access permit will cover any access work, sidewalk work, street lighting, and stormwater work. Any work outside of that including, but not limited to, landscaping, survey, or utility work will require a separate permit. Application is made online at the following link:
https://cdotpermits.force.com/portal/s/login/?ec=302&startURL=%2Fportal%2Fs%2F -- Aaron Eyl 5.30.24

KH RESPONSE: Thank you

Residential Engineer Comments:

5/24/24 - AMP

Portions of the CDOT M standard drawings M-608-1 (10 sheets) and M-609-1 (4 sheets) are shown in the plans. Key and relevant information and notes are found on the other sheets, so the entire 10- and 4-sheet sets should be included. KH RESPONSE: Updated callouts to reference CDOT details in plans.

Add this note to the plans: "Any and all work within CDOT right-of-way must be performed according to the standards set forth in the latest editions of the CDOT M&S Standard Plans and Standard Specifications for Road and Bridge Construction." KH RESPONSE: Note added to plans on sheet C002 section General Notes.

The existing curb ramp at 63rd Ave. is too far from the intersection such that pedestrian visibility may be reduced. The proposed ramp need not match the existing location but should be located closer to Federal Boulevard.
KH RESPONSE: Existing Ramp is 18.3' off curb, proposed ramp is 12.8' off of curb. In the proposed condition the ramp is closer to Federal and there is no other location to place ramp as overhead electric and stop sign limit location.

Right Of Way Comments:

Jim Daley Comment - 05/21/24: There are no ROW dedications shown on provided plat, so assume no ROW changes will be made. If ROW is to be dedicated it should be transferred by Plat to the Municipality/County first, and deeded to CDOT at a later date. There are no A-Lines on the ROW shown on ROW plans, so no access control line modifications required based on this information (uploaded highlighted CDOT ROW plans to this permit).
KH RESPONSE: No ROW is being dedicated.

5/31/24 KM - No concerns from Property Mgmt based on the current submission.

KH RESPONSE: Thank you for your review

Traffic Comments:

Comments from CDOT R1 Traffic & Safety – 6/5/24

General Comments

The construction plans need to include details of the driveway / intersection geometrics including curb ramp, driveway access, and other geometric and traffic control details.
KH RESPONSE: Provided, please see updated submittal application sheet C115.
Traffic Impact Study Comments

The statement on page 1, first paragraph, about the subdivision being completed in the next several years does not appear to be consistent with a 2026 short-term buildout horizon. The analysis needs to include a short-term buildout scenario that corresponds to the year during or after full buildout of the development.KH RESPONSE: Updated

Per section 4.4 and 4.1 of the State Highway Access Code (SHAC), minimum driveway access spacing is 325' with a 45 mph speed limit. The distance between the two proposed driveways on Federal is only 275'. Please try to move the south driveway on Federal further to the south to meet the minimum spacing requirement. If the SHAC requirement can't be met, a variance will be required from CDOT. KH RESPONSE: Variance to be provided with additional coordination w/ CDOT.

In the second bullet on page 2 of the TIS (and elsewhere in the document), the 20% increase discussed in the first sentence refers to the site-generated vehicle trips, not roadway ADT. The second sentence about traffic increasing on the east leg of the Federal & 64th Ave intersection is not really relevant. Permits are required for all of the proposed access locations based on the first sentence in Section 2.3(3) of the SHAC which states "to obtain permission to construct, modify, relocate, or close a vehicular access… a state highway access permit is required." KH RESPONSE: Permits to be provided.

On page 6 of the TIS, it might be desirable to include the figure in the List of Figures. KH RESPONSE: Updated.

Trip Generation (4.1)

Please reformat the Trip Generation Summary Report in Appendix C of the TIS. Even when printed at 11x17 it is difficult to work with. Text size should be Arial 11pt or equivalent height. Show the percent assumptions for internal capture and pass-by trip reductions. Make the colors of the columns consistent across the Total Trips, Net Trips after IC, and Net Trips after IC and PB tables. KH RESPONSE: Updated.

Please check the pass-by calculation in the PM peak for ITE code 934 Fast Food Restaurant w/Drive Thru. The pass-by percentage should be 50% for the PM peak but it appears a larger percentage was used (82/76 ? 37/34). Minor comment. KH RESPONSE: Updated.

It appears a 76% reduction in vehicle trips was assumed in the AM and PM peak hours for Land Use Code 945. However, according to Tables E.37 and E.38 in the Trip Generation Manual, the pass-by trip reductions should be 62% and 56%, respectively. KH RESPONSE: Updated.

Please state the assumptions used to calculate daily and AM peak hour trips for Land Use Code 948, Automated Car Wash, since the Trip Generation Manual only shows a trip rate for the PM peak hour. KH RESPONSE: Updated.

Table 1 should include 4 rows that show the detail for the Total Trips after Internal Capture and Pass-by, similar to the 4 rows for Trips after Internal Capture. Also add 5 rows to the top of Table 1 showing the initial gross trips generated from the base trip rates / fitted curves. KH RESPONSE: Updated.

Trip Distribution (4.2)

No comments.

Traffic Assignment (4.3)

No comments.

Traffic Operations Analysis (5.0)

In Section 5.2, please add the delay and LOS results for the individual approaches in addition to the overall intersection results in Table 3. Add a statement that all individual approaches operate at an acceptable LOS in existing, background, and buildout conditions for 2026 and 2045. KH RESPONSE: Updated.

Consider adding two more items to Table 3 showing 2026 and 2045 Background + Pass-by project trips and corresponding delay and LOS since the development is not responsible for impacts to the local roadway system from pass-by trips, similar to background trips. This is not absolutely necessary given the extra Synchro runs and analyses, but it would provide information about the magnitude of the development's responsibilities at intersection #1 for example. KH RESPONSE: Updated.

Turn Bay Length Analysis (5.3)

On page 26, second sentence of the first bullet under intersection #1, the required deceleration length at 45 mph should be 435’ per Table 4-6 of the SHAC and possibly longer when adjusting for grade. The subsequent statement that the SB left turn lane doesn’t meet SHAC requirements in the existing condition is somewhat misleading because it provides 225’ of storage where only about 70’ is required.
KH RESPONSE: Updated.
The last sentence of that bullet is also somewhat misleading. In our opinion, the existing median could be modified to significantly shorten the SBLT taper to increase storage. On of our primary safety concerns with left turn lanes is the possibility of LT queue spillback into the inside thru lane. These crashes can involve dangerous high-speed differentials between vehicles. It appears up to 90 – 100’ of additional storage could be achieved, which would meet/exceed the 275’ storage requirement. Modification of the median would be the responsibility of the developer given the additional traffic the proposed development will generate for the SBLT movement.
KH RESPONSE: Additional coordination required to discuss this requirement.
Vehicle Queuing Analysis (5.4)

Please update the queuing analysis based on any changes to the assumptions mentioned above (e.g., pass-by reductions) and update Table 5. Of primary interest are the SBLT queue lengths. KH RESPONSE: Updated.

Conclusions and Recommendations (6.0)

Update this section base on comments above. Add information about the SBLT lane and median modifications as appropriate. KH RESPONSE: Updated.

Signs

On pages 2, 24, 29, and possibly others, the text states that an R1-1 STOP sign should be placed on the right side of the driveways on Federal for egress/exiting traffic and R3-2 No Left Turn signs should be placed below the STOP signs. In our opinion, R6-1R ONE WAY signs should be installed on the Federal median directly in front of the 2 driveway openings. The R3-2 No Left Turn signs are considered optional/supplemental.
KH RESPONSE: Signs added to plans with correct reference to sign detail.
END – 6/5/24 EB

Other Comments:

6/3: Install 8' sidewalk along Federal Blvd (CDOT ROW) to match CDOT's plans for Federal Blvd BRT construction. 5' sidewalk does not meet CDOT's plans/requirements. Maintain 8' sidewalk width approaching curb ramps. Curb ramp width shall match sidewalk width at 8' per PROWAG.

6/3: Plans show attached sidewalk. Install 8' detached sidewalk so sidewalk does not conflict with overhead electric poles. Landscaping plans may need to be modified to accommodate 8' sidewalk.

KH RESPONSE: Sidewalk updated to 8' width. Sidewalk jogs around overhead electric poles at those locations but is not detached overall. Conflict with overhead electric lines and landscaping in this area would occur, sidewalk to remain attached.

CONSTRUCTION DOCUMENTS FOR
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, CO
FEDERAL BLVD. & W. 64TH AVE.

Sheet List Table	
Sheet Number	Sheet Title
C001	COVER SHEET
C002	GENERAL NOTES
C030	DEMOLITION PLAN
C100	OVERALL SITE PLAN
C101	DETAILED SITE PLAN
C102	DETAILED SITE PLAN
C103	DETAILED SITE PLAN
C104	DETAILED SITE PLAN
C110	OVERALL GRADING PLAN
C111	DETAILED GRADING
C112	DETAILED GRADING
C113	DETAILED GRADING
C114	DETAILED GRADING
C115	DRIVEWAY DETAILED GRADING
C300	STORM SEWER PLAN & PROFILE
C500	SITE DETAILS
C501	SITE DETAILS
C502	SITE DETAILS
L100	OVERALL LANDSCAPE PLAN
L101	DETAILED LANDSCAPE PLAN
L102	DETAILED LANDSCAPE PLAN
L103	DETAILED LANDSCAPE PLAN
L200	LANDSCAPE NOTES

LEGAL DESCRIPTION:

PARCEL A:
LOT 1, BLOCK 1, ELLETT SUBDIVISION, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THE NORTH 10 FEET THEREOF CONVEYED TO THE COUNTY OF ADAMS DESCRIBED IN RESOLUTION AND DEED RECORDED NOVEMBER 25, 1969 IN BOOK 1561 AT PAGE 44.

PARCEL B:
LOT 1, BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION, COUNTY OF ADAMS, STATE OF COLORADO.

PARCEL C:
A PARCEL OF LAND LOCATED IN THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THE NORTH LINE OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SAID POINT BEING 345.38 FEET EAST OF THE N1/4 CORNER OF SECTION 8 AND 320.00 FEET WEST OF THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE S 0°03'30" E DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE; THENCE S 90°00'00" W ALONG THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, A DISTANCE OF 270.38 FEET TO A POINT, SAID POINT BEING 75.00 FEET EAST OF 20.00 FEET SOUTH OF THE N1/4 CORNER OF SECTION 8; THENCE S 44°58'15" W A DISTANCE OF 28.28 FEET TO A POINT ON THE EAST RIGHT-OF-WAY LINE OF FEDERAL BOULEVARD, SAID POINT BEING 55.00 FEET EAST AND 40.00 FEET SOUTH OF THE N1/4 CORNER OF SECTION 8; THENCE S 0°03'30" E ALONG THE EAST RIGHT-OF-WAY LINE OF FEDERAL BOULEVARD, A DISTANCE OF 289.80 FEET TO THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE N 90°00'00" E ALONG THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8, A DISTANCE OF 141.89 FEET; THENCE N 0°31'25" W A DISTANCE OF 166.68 FEET; THENCE N 89°28'25" E DISTANCE OF 149.85 FEET; THENCE N 0°03'30" W A DISTANCE OF 141.76 FEET TO A POINT ON THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, AND 20.00 FEET SOUTH OF THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF ADAMS, STATE OF COLORADO, AS DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 6, 1907 IN BOOK 33 AT PAGE 220.

AND EXCEPT THAT PORTION TAKEN IN RULE AND ORDER RECORDED OCTOBER 15, 1971 IN BOOK 1745 AT PAGE 484.

ALSO EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO DESCRIBED IN DEED RECORDED DECEMBER 11, 1984 IN BOOK 2945 AT PAGE 579.

AND FURTHER EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 2005110700122948O.

PARCEL D:
A PARCEL OF LAND LOCATED IN THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

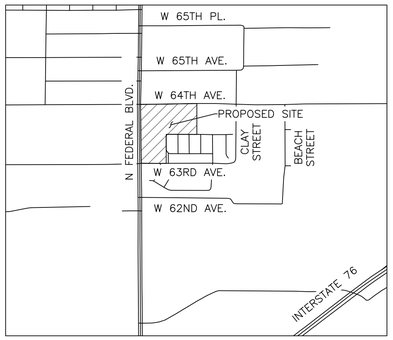
BEGINNING AT A POINT THE NORTH LINE OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SAID POINT BEING 345.38 FEET EAST OF THE N1/4 CORNER OF SECTION 8, AND 320.00 FEET WEST OF THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE S 0°03'30" E DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE AND THE POINT OF BEGINNING; THENCE S 90°00'00" E A DISTANCE OF 30.00 FEET; THENCE S 0°03'30" W A DISTANCE OF 309.80 FEET TO A POINT ON THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8; THENCE S 90°00'00" W ALONG THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8, A DISTANCE OF 178.49 FEET; THENCE N 0°31'25" W A DISTANCE OF 166.68 FEET; THENCE N 89°28'25" E A DISTANCE OF 149.85 FEET; THENCE N 0°03'30" W A DISTANCE OF 141.76 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVE., AND THE TRUE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 2005110700122948O.

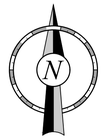
PARCEL E:
A PARCEL OF LAND BEING A PORTION OF THE EAST 290.00 FEET OF THE N1/2, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, THENCE SOUTH ALONG THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, WHICH IS THE TRUE POINT OF BEGINNING; THENCE CONTINUING SOUTH ALONG THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 309.80 FEET TO THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4; THENCE WEST ALONG THE SOUTH LINE A DISTANCE OF 290.00 FEET; THENCE NORTH AND PARALLEL TO THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 309.80 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE; THENCE EAST ALONG THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, A DISTANCE OF 290.00 FEET TO THE TRUE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 2005110700122948O.



VICINITY MAP
Not to Scale



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DENVER, CO 80229
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CRESTVIEW WATER AND SANITATION DISTRICT
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STORM/SANITARY UTILITIES
CRESTVIEW WATER AND SANITATION DISTRICT
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GREENWOOD VILLAGE, CO 80111
TEL: (303) 228-2319
CONTACT: CHRIS HEPLER, PLA

WETLANDS NOTICE:

ANY DEVELOPMENT, EXCAVATION, CONSTRUCTION, OR FILLING IN A U.S. CORPS OF ENGINEERS DESIGNATED WETLAND IS SUBJECT TO LOCAL, STATE AND FEDERAL APPROVALS. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS AND/OR RESTRICTIONS AND ANY VIOLATION WILL BE SUBJECT TO FEDERAL PENALTY. THE CONTRACTOR SHALL HOLD THE OWNER/ DEVELOPER, THE ENGINEER AND THE LOCAL GOVERNING AGENCIES HARMLESS AGAINST SUCH VIOLATION.

WARRANTY/DISCLAIMER:

THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER THE ENGINEER NOR ITS PERSONNEL CAN OR DO WARRANT THESE DESIGNS OR PLANS AS CONSTRUCTED EXCEPT IN THE SPECIFIC CASES WHERE THE ENGINEER INSPECTS AND CONTROLS THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

NOTICE TO BIDDERS:

ALL QUESTIONS REGARDING THE PREPARATION OF THE GENERAL CONTRACTOR'S BID SHALL BE DIRECTED TO THE OWNER'S CONSTRUCTION REPRESENTATIVE. SUBCONTRACTORS MUST DIRECT THEIR QUESTIONS THROUGH THE GENERAL CONTRACTOR. THE CONSULTING ARCHITECT AND/OR THE CONSULTING ENGINEER SHALL NOT BE CONTACTED DIRECTLY WITHOUT PRIOR AUTHORIZATION FROM THE OWNER/DEVELOPER.

FLOOD CERTIFICATION:

THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAPS NO. 08001C0584H AND NO.08001C0592H, EFFECTIVELY DATED 03/05/2007, INDICATES THIS PARCEL OF LAND TO BE LOCATED IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN).

BENCHMARKS:

VERTICAL RELIEF WAS MADE FROM AN ON THE GROUND SURVEY, CONTOURS SHOWN HERON ARE AT 1' INTERVALS USING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV 88), GEOID 12A. SITE VERTICAL WAS ESTABLISHED BY USING COUNTY OF DENVER BENCH MARK "156B" LOCATED AT THE SOUTHEAST CORNER OF 50TH AVENUE AND FEDERAL BOULEVARD.

ELEVATION = 5379.63 FEET (NAVD 1988)

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE STATE PLANE COORDINATE SYSTEM ESTABLISHED FOR THE COLORADO NORTH ZONE 0502, NORTH AMERICAN DATUM (NAD) OF 1983. DISTANCES SHOWN HEREON ARE GROUND UNITS. BEING THE NORTH LINE OF THE NORTHEAST 1/4 OF SECTION 8, BEARING S89°49'13"W, BETWEEN MONUMENTS SHOWN HEREON.

NO.	REVISION	BY	DATE	APPR

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
3325 SOUTH TIMBERLINE ROAD, SUITE 130
Fort Collins, Colorado 80525 (970) 822-7911

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3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.
COVER SHEET

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
C001

811 Know what's below. Call before you dig.

K:\DEN_Civil\096888037_QuikTrip 4270 Adams County_Berkely Center Subdivision\CADD\PlanSheets\CDs\096888037_CV.dwg
THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

CASE NO. PLT2023-0056

GENERAL NOTES

1. IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. ANY CONSTRUCTION OBSERVATION BY THE ENGINEER OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.
2. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL NECESSARY PERMITS HAVE BEEN OBTAINED FROM THE GOVERNING AGENCIES AND COORDINATING ALL GOVERNING AGENCY INSPECTIONS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RAZING AND REMOVAL OF THE EXISTING STRUCTURES, RELATED UTILITIES, PAVING, AND ANY OTHER EXISTING IMPROVEMENTS AS NOTED. REFERENCE SITE WORK SPECIFICATIONS.
4. CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS. DISPOSAL WILL BE IN ACCORDANCE WITH ALL LOCAL, STATE AND/OR FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.
5. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR DAMAGE TO ADJACENT PROPERTIES AND NEW CONSTRUCTION IN PLACE DURING THE CONSTRUCTION PHASES OF THIS PROJECT. ANY DISTURBED IMPROVEMENTS SHALL BE REPLACED IN KIND AT THE CONTRACTORS EXPENSE.
6. ANY QUANTITIES PROVIDED ON THESE PLANS ARE FOR GENERAL REFERENCE PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE QUANTITIES REQUIRED FOR CONSTRUCTION.
7. THE EXISTING FEATURES SHOWN ON THESE PLANS ARE THOSE NOTED IN THE FIELD AND THOSE TAKEN FROM RECORD DRAWINGS. THERE IS NO GUARANTEE THAT ALL FEATURES (ABOVE OR BELOW GROUND) ARE SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING FEATURES PRIOR TO BIDDING THE PROJECT.
8. THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION BY CONTACTING THE LOCAL UTILITY COMPANIES AND/OR UTILIZING THE LOCAL ONE-CALL SYSTEM. ANY DAMAGE DONE TO EXISTING UTILITIES (THAT ARE TO REMAIN IN PLACE) DURING CONSTRUCTION OPERATIONS WILL BE THE CONTRACTOR'S RESPONSIBILITY AND REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. ALL SITE WORK FOR THIS PROJECT SHALL MEET OR EXCEED THE OWNERS CONTRACT DOCUMENTS AND SPECIFICATIONS. ALL WORK SHALL MEET OR EXCEED THE RELEVANT UTILITY COMPANIES AND REGULATORY AGENCIES, CONTRACT DOCUMENTS AND SPECIFICATIONS. ALL WORK WITHIN PUBLIC AND STATE RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE GOVERNING AGENCIES STANDARDS AND SPECIFICATIONS.
10. TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE PROPER TRAFFIC CONTROL IS IN PLACE FOR EACH PHASE OF CONSTRUCTION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR PROPERLY MAINTAINING TRAFFIC CONTROL DEVICES THROUGHOUT THE DURATION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL PLANS TO THE CITY AND DEPARTMENT OF TRANSPORTATION AS REQUIRED.
11. ANY AND ALL WORK WITHIN CDOT RIGHT-OF-WAY MUST BE PERFORMED ACCORDING TO THE STANDARDS SET FORTH IN THE LATEST EDITIONS OF THE CDOT M&S STANDARD PLANS AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

ENGINEERING DEMOLITION NOTES

1. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THIS PROJECT IS CONSTRUCTED IN ACCORDANCE WITH THESE DOCUMENTS AND IN COMPLIANCE WITH CODES INDICATED HEREIN. THE QUALITY OF WORKMANSHIP AND INSTALLATION OF MATERIALS SPECIFIED BY THE OWNER OR ENGINEER ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CEC WILL NOT BE HELD RESPONSIBLE FOR ANY SUBSTANDARD OR INSUFFICIENT WORKMANSHIP, MATERIALS OR SERVICES PROVIDED IN THE EXECUTION OF ANY PHASE OF CONSTRUCTION OF THIS PROJECT.
2. ALL MATERIALS ARE TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND ALL GENERAL CONTRACTORS ARE TO ENSURE THAT ALL MANUFACTURER'S WARRANTIES SHALL BE HONORED.
3. ALL DEMOLITION MATERIALS NOT REUSED OR RELOCATED SHALL BE REMOVED BY THE CONTRACTOR. COORDINATE WITH THE OWNER REGARDING MATERIALS TO BE SALVAGED BY THE OWNER.
4. GENERAL CONTRACTOR IS RESPONSIBLE FOR RECEIVING, UNLOADING, STORING AND PROTECTING OF EXISTING MATERIALS TO BE REUSED ON-SITE OR OWNER SUPPLIED MATERIALS AND EQUIPMENT UNTIL IT HAS BEEN INSTALLED AND ACCEPTED BY THE OWNER.
5. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR ENSURING THE SAFETY OF ALL PERSONS ON THE JOB SITE AT ALL TIMES INCLUDING (BUT NOT LIMITED TO) ALL GENERAL CONTRACTORS, VENDORS, DESIGN STAFF PROFESSIONALS AND INSPECTION PERSONNEL.
6. ALL DEMOLITION SHALL BE CARRIED OUT IN A SAFE MANNER AND IN STRICT ACCORDANCE WITH OSHA REGULATIONS.
7. DURING DEMOLITION AND RECONSTRUCTION, THE CONTRACTOR SHALL COORDINATE ANY SAFETY BARRIERS AND/OR BARRICADES USED.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ADEQUATE SHORING, BRACING AND SUPPORT SYSTEMS AND TO KEEP EXISTING SYSTEMS INTACT AND IN SAFE CONDITION DURING THE REMOVAL OF ITEMS AND NEW CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR MEANS AND METHODS OF DEMOLITION AND NEW CONSTRUCTION.
9. ALL CONDITIONS SHOWN TO BE "EXISTING" SHALL BE VERIFIED IN THE FIELD BY THE GENERAL CONTRACTOR PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES SHALL BE NOTED AND SUBMITTED TO THE OWNER AND THE ENGINEER FOR REVIEW. CHANGES TO THE ORIGINAL DESIGN OF THIS PROJECT DUE TO EXISTING SITE CONDITIONS MUST BE APPROVED BY BOTH THE OWNER AND THE ENGINEER PRIOR TO MAKING ANY CHANGES.
10. THE CONTRACTOR SHALL FIELD VERIFY THE EXTENT OF DEMOLITION.
11. WHEN UTILITIES ARE REMOVED, THE CONTRACTOR SHALL CAP AND SEAL UTILITIES AS DIRECTED BY THE ENGINEER AND AS PER COUNTY STANDARDS.
12. THE CONTRACTOR SHALL USE A WET SAW FOR SLAB SAWING. NO JACK HAMMERS WILL BE ALLOWED WITHOUT PRIOR APPROVAL FROM THE OWNER.

ENGINEERING DRAINAGE AND STORM NOTES

1. ON-SITE DRAINAGE HAS BEEN PROVIDED TO MAINTAIN THE EXISTING DRAINAGE PATTERNS.
2. ALL BEDDING SHALL BE ASTM C-33 NO. 67 STONE. THE BEDDING SHALL BE 6-8" DEEP UNDER THE PIPE AND BACKFILLED TO SPRING LINE, EXCEPT IN AREAS OF UNSUITABLE BACKFILL, THEN BEDDING MATERIAL SHALL BE PLACED TO A LEVEL 12" ABOVE PIPE.
3. A MINIMUM CLEARANCE OF TWENTY-FOUR (24) INCHES IS REQUIRED WHENEVER A WATER MAIN CROSSES OVER A SANITARY SEWER. CONCRETE ENCASEMENT OF THE SANITARY SEWER WILL BE REQUIRED IF THE CLEARANCE IS LESS THAN TWENTY-FOUR (24) INCHES AND WILL BE INSTALLED. ENCASEMENT WILL EXTEND TEN (10) FEET EITHER SIDE OF THE CROSSING FOR A TOTAL LENGTH OF TWENTY (20) FEET.
4. PRECAST STRUCTURES MAY BE USED AT CONTRACTORS OPTION.
5. IF DEWATERING IS REQUIRED, THE CONTRACTOR SHALL OBTAIN ANY APPLICABLE REQUIRED PERMITS. THE CONTRACTOR IS TO COORDINATE WITH THE OWNER PRIOR TO EXCAVATION.

ENGINEERING SITE NOTES

1. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL PROPERTY CORNERS.
2. CONTRACTOR SHALL MATCH PROPOSED CURB AND GUTTER, CONCRETE, AND PAVEMENT TO EXISTING GRADE AT ALL TIE IN LOCATIONS.
3. CONTRACTOR SHALL REMOVE PAVEMENT AND CONCRETE IN ACCORDANCE WITH DETAILS AND SPECIFICATIONS OF ADAMS COUNTY AND AS DIRECTED BY THE ENGINEER.
4. THE EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.
5. CONTRACTOR SHALL PROVIDE PIPE BOLLARDS SHOWN ON SITE PLAN FOR PROTECTION OF ALL ABOVE GROUND UTILITIES AND APPURTENANCES IN DRIVE AREA, AS WELL AS TO PROTECT ALL ACCESSIBLE SIGNS.
6. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ACTUAL LOCATION OF ALL UTILITY ENTRANCES, TO INCLUDE, SANITARY SEWER LATERALS, DOMESTIC AND FIRE PROTECTION WATER SERVICE, ELECTRICAL, AND TELEPHONE SERVICE. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES IN SUCH A MANNER AS TO AVOID CONFLICTS AND ASSURE PROPER DEPTHS ARE ACHIEVED, AS WELL AS, COORDINATE WITH ANY UTILITY COMPANIES FOR APPROVED LOCATIONS AND SCHEDULING OF TIE-INS/CONNECTIONS TO THEIR FACILITIES.
7. CONTRACTOR IS RESPONSIBLE FOR REPAIRING THE DAMAGE DONE TO ANY EXISTING ITEM DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO, DRAINAGE, UTILITIES, PAVEMENT, STRIPING, CURB, ETC. REPAIRS SHALL BE EQUAL TO, OR BETTER THAN, EXISTING CONDITIONS. CONTRACTOR IS RESPONSIBLE TO DOCUMENT ALL EXISTING DAMAGE AND NOTIFY CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION START.
8. CONTRACTOR TO REMOVE OR RELOCATE, WHEN APPLICABLE, ALL EXISTING BUILDINGS, FOUNDATIONS, BASEMENTS, CONNECTING IMPROVEMENTS, DRAIN PIPES, SANITARY SEWER PIPES, POWER POLES, AND GUY WIRES, WATER METERS AND WATER LINES, WELLS, SIDEWALKS, SIGN POLES, UNDERGROUND GAS, SEPTIC TANKS, AND ASPHALT, SHOWN AND NOT SHOWN, WITHIN CONSTRUCTION LIMITS AND WHERE NEEDED, TO ALLOW FOR NEW CONSTRUCTION AS SHOWN.
9. ALL PAINT USED FOR PARKING STRIPING SHALL BE PER SITE SPECIFIC SPECIFICATIONS.
10. CONTRACTOR SHALL IDENTIFY CONSTRUCTION WATER SOURCE AND INCLUDE THE COST IN THE BASE BID.

ENGINEERING GRADING NOTES

1. CONTOURS ON SIDEWALKS AND PRIVATE/PUBLIC ROADWAYS ARE TO FINISH GRADE.
2. FOR GROUND TREATMENT OF ALL OPEN AREAS WITHIN THE PROJECT SITE, REFER TO LANDSCAPE PLANS.
3. FIELD DENSITY TESTS SHALL BE TAKEN AT A FREQUENCY AS REQUIRED IN THE SPECIFICATIONS.
4. SOD OR SEED/MULCH MUST BE INSTALLED AND MAINTAINED ON EXPOSED SLOPES WITHIN 48 HOURS OF COMPLETING FINAL GRADING, AND AT ANY OTHER TIME AS NECESSARY, TO PREVENT EROSION, SEDIMENTATION OR TURBID DISCHARGES.
5. THE CONTRACTOR MUST CONSTRUCT AND MAINTAIN A PERMANENT VEGETATIVE PROTECTIVE COVER FOR EROSION AND SEDIMENT CONTROL ON ALL LAND SURFACES EXPOSED OR DISTURBED BY CONSTRUCTION OF THE PERMITTED PROJECT. THE PROTECTIVE COVER MUST BE INSTALLED WITHIN FOURTEEN DAYS AFTER FINAL GRADING OF THE AFFECTED LAND SURFACE. A PERMANENT VEGETATIVE COVER MEETING THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT'S (CDPHE'S) GENERAL PERMIT COVERAGE REQUIREMENT MUST BE ESTABLISHED.
6. THE CONTRACTOR SHALL GRADE THE SITE TO THE ELEVATIONS INDICATED AND SHALL REGRADE WASHOUTS WHERE THEY OCCUR AFTER EVERY RAINFALL UNTIL A GRASS STAND OR OTHER FINAL LANDSCAPE PLANTING IS WELL ESTABLISHED.
7. THE CONTRACTOR SHALL ENSURE THAT ISLAND PLANTING AREAS AND OTHER PLANTING AREAS ARE NOT COMPACTED AND DO NOT CONTAIN COMPACTED BASE MATERIAL. THE CONTRACTOR SHALL ALSO EXCAVATE AND REMOVE ALL UNDESIRABLE MATERIAL FROM ALL AREAS ON THE SITE TO BE PLANTED.

GENERAL CONSTRUCTION NOTES

1. A PRE-CONSTRUCTION MEETING IS REQUIRED PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. TO SCHEDULE A PRE-CONSTRUCTION MEETING CONTACT THE ADAMS COUNTY CONSTRUCTION INSPECTOR SUPERVISOR AT 720-523-6965.
2. ALL CONCRETE CURB, GUTTER AND WALK MUST BE POURED MONOLITHICALLY USING 4,500 PSI CONCRETE WITH FIBER MESH.
3. ALL MATERIAL SUBMITTALS MUST BE APPROVED, STAMPED AND SIGNED, BY THE ENGINEER OF RECORD AND, SUBMITTED TO THE ADAMS COUNTY CONSTRUCTION INSPECTOR FOR APPROVAL PRIOR TO CONSTRUCTION/INSTALLATION.
4. THE CONTRACTOR IS REQUIRED TO SUBMIT COPIES OF ALL CONCRETE AND ASPHALT TICKETS TO THE ADAMS COUNTY CONSTRUCTION INSPECTOR.
5. THE CONTRACTOR IS RESPONSIBLE FOR ALL QUALITY CONTROL TESTING AND, IS REQUIRED TO SUBMIT ALL TEST RESULTS TO THE ADAMS COUNTY CONSTRUCTION INSPECTOR.
6. THE CONTRACTOR IS REQUIRED TO REMOVE A MINIMUM OF TWO (2) FEET OF EXISTING ASPHALT FOR ALL CURB AND GUTTER REPLACEMENT.
7. ALL UTILITY CUTS IN EXISTING STREETS ARE REQUIRED TO BE BACKFILLED WITH FLOWFILL AND, PATCHED WITH A MINIMUM OF 9-INCH ASPHALT PATCH.
8. A COPY OF THE GEOTECHNICAL REPORT SPECIFYING THE PAVEMENT THICKNESS DESIGN MUST BE SUBMITTED FOR REVIEW.
9. PERMITS WILL BE REQUIRED FOR THE INSTALLATION OF ALL UTILITIES. THE DEVELOPER/CONTRACTOR/ENGINEER, MUST SUPPLY THE LINEAL FOOTAGES AND THE NUMBER OF SERVICE CUTS REQUIRED FOR ALL UTILITIES.
10. PERMITS WILL BE REQUIRED FOR THE INSTALLATION OF ALL CONCRETE AND ASPHALT FACILITIES. PRIOR TO THE ISSUANCE OF THESE PERMITS, THE DEVELOPER/CONTRACTOR/ENGINEER, MST SUPPLY THE SQUARE YARDAGE/SQUARE FOOTAGES OF ALL CONCRETE AND ASPHALT BEING INSTALLED.
11. THE SIA MUST BE COMPLETED WITH APPROPRIATE COLLATERAL, ALONG WITH THE PROPOSED PLAT, PRIOR TO THE ISSUANCE OF ANY ROW ACCESS/CONSTRUCTION PERMIT.
12. NO C.O.'S WILL BE ISSUED FOR ANY BUILDING CONSTRUCTION UNTIL ALL ROW IMPROVEMENTS HAVE BEEN COMPLETED AND HAVE BEEN GRANTED PRELIMINARY ACCEPTANCE.
13. UPON COMPLETION OF ALL CONSTRUCTION, A DRAINAGE CERTIFICATION LETTER, AND APPROPRIATE AS-BUILT CONSTRUCTION DRAWINGS AND INFORMATION WILL BE REQUIRED. THIS LETTER WILL BE STAMPED AND SIGNED BY THE ORIGINAL DESIGN ENGINEER.

ENGINEERING CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE APPROPRIATE APPROVING AUTHORITIES, SPECIFICATIONS AND REQUIREMENTS. CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING TO DETERMINE EXISTING CONDITIONS. CONTRACTOR SHALL CLEAR AND GRUB ALL AREAS UNLESS OTHERWISE INDICATED, REMOVING TREES, STUMPS, ROOTS, MUCK AND ALL OTHER DELETERIOUS MATERIAL.
2. ALL EXISTING UTILITIES SHOWN ARE LOCATED ACCORDING TO THE INFORMATION AVAILABLE TO THE ENGINEER AT THE TIME THE DRAWINGS WERE PREPARED AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR THE ENGINEER. GUARANTEE IS NOT MADE THAT ALL EXISTING UNDERGROUND UTILITIES ARE SHOWN OR THAT THE LOCATION OF THOSE SHOWN ARE ENTIRELY ACCURATE. THE LOCATIONS SHOWN ARE FOR BIDDING PURPOSES ONLY. FINDING THE ACTUAL LOCATIONS OF ANY EXISTING UTILITIES IS THE CONTRACTOR'S RESPONSIBILITY AND SHALL BE DONE BEFORE HE COMMENCES ANY WORK IN THE VICINITY. FURTHERMORE, THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE OWNER OR ENGINEER WILL ASSUME NO LIABILITY FOR ANY DAMAGES SUSTAINED OR COST INCURRED BECAUSE OF THE OPERATIONS IN THE VICINITY OF EXISTING UTILITIES OR STRUCTURES, NOR FOR TEMPORARY BRACING AND SHORING OF SAME. IF IT IS NECESSARY TO SHORE, BRACE, SWING OR RELOCATE A UTILITY, THE UTILITY COMPANY OR DEPARTMENT AFFECTED SHALL BE CONTACTED AND THEIR PERMISSION OBTAINED REGARDING THE METHOD TO USE FOR SUCH WORK.
3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE BURIED OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 48 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION.
4. CONTRACTOR SHALL CONTACT UTILITY NOTIFICATION CENTER FOR THE LOCATION OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF CONSTRUCTION (1-800-922-1987).
5. CONSTRUCTION SHALL COMPLY WITH ALL GOVERNING CODES AND BE CONSTRUCTED TO SAME.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL REQUIRED CONSTRUCTION PERMITS AND BONDS PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE COUNTY APPROVED DOCUMENTS INCLUDING PLANS, SPECIFICATIONS, SPECIAL CONDITIONS AND COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, AND EROSION CONTROL PLANS AND INSPECTION REPORTS (SWMP).
8. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE OWNER AND ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE CEC.
9. ALL COPIES OF COMPACTION, CONCRETE AND OTHER REQUIRED TEST RESULTS ARE TO BE SENT TO THE OWNER AND CIVIL ENGINEER CONSULTANT OF RECORD DIRECTLY FROM THE TESTING AGENCY.
10. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO ANNOUNCED BUILDING POSSESSION AND THE FINAL CONNECTION OF SERVICES.
11. RECORD SURVEY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUBMITTING TO THE ENGINEER A CERTIFIED RECORD SURVEY SIGNED AND SEALED BY A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF COLORADO DEPICTING THE ACTUAL FIELD LOCATION OF ALL CONSTRUCTED IMPROVEMENTS THAT ARE REQUIRED BY THE JURISDICTIONAL AGENCIES FOR THE CERTIFICATION PROCESS. SEE THE SPECIAL CONDITIONS INCLUDED IN THE CONTRACT DOCUMENTS FOR IMPROVEMENTS THAT REQUIRE A RECORD SURVEY. ALL SURVEY COST WILL BE THE CONTRACTORS RESPONSIBILITY.
12. THE CONTRACTOR SHALL FURNISH ALL NECESSARY MATERIALS, EQUIPMENT, MACHINERY, TOOLS, MEANS OF TRANSPORTATION AND LABOR NECESSARY TO COMPLETE THE WORK IN FULL AND COMPLETE IN ACCORDANCE WITH THE SHOWN, DESCRIBED AND REASONABLY INTENDED REQUIREMENTS OF THE CONTRACT DOCUMENTS AND JURISDICTIONAL AGENCY REQUIREMENTS. IN THE EVENT THAT THE CONTRACT DOCUMENTS AND THE JURISDICTIONAL AGENCY REQUIREMENTS ARE NOT IN AGREEMENT, THE MOST STRINGENT SHALL GOVERN.
13. THE CONTRACTOR SHALL RESTORE ALL DISTURBED VEGETATION IN KIND, UNLESS SHOWN OTHERWISE.
14. ALL PAVING, CONSTRUCTION, MATERIALS, AND WORKMANSHIP IN THE ADAMS COUNTY RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH CDOT STANDARDS & SPECIFICATIONS, CURRENT EDITION.
15. CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGGERS, AND ALL OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY IN ACCORDANCE WITH MUTCD CONSTRUCTION AREA TRAFFIC CONTROL.
16. CONTRACTOR TO VERIFY ELEVATIONS OF ALL EXISTING IMPROVEMENTS WHERE CONNECTIONS ARE TO BE MADE AND SHALL ADVISE ENGINEER OF ALL DISCREPANCIES PRIOR TO CONSTRUCTION.
17. CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING AND MAINTAINING AS-BUILT INFORMATION (WHICH SHALL BE RECORDED) AS CONSTRUCTION PROGRESSES OR AT THE COMPLETION OF APPROPRIATE CONSTRUCTION INTERVAL(S) AND SHALL BE RESPONSIBLE FOR PROVIDING ALL APPLICABLE DATA OBTAINED TO THE OWNER AND ENGINEER FOR THE PURPOSE OF PREPARING FINAL AS-BUILT (RECORD) DRAWINGS. ALL AS-BUILT DATA SHALL BE COLLECTED BY A STATE OF COLORADO PROFESSIONAL LAND SURVEYOR WHOSE SERVICES ARE ENGAGED BY THE CONTRACTOR. AS-BUILT INFORMATION FOR FITTINGS AND OTHER BURIED APPURTENANT FEATURES SHALL INCLUDE SWING TIES TO THE FEATURE FROM TWO OF THE CLOSEST BUILDING CORNERS.

ENGINEERING PAVING NOTES

1. CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
2. UNLESS OTHERWISE INDICATED ON THE PLANS OR THE SPECIFICATIONS, ALL CONCRETE USED ON THE SITE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,500 PSI IN 28 DAYS.
3. ALL CONCRETE SIDEWALKS SHALL HAVE CONTROL JOINTS CUT ON 5' CENTERS AND EXPANSION JOINTS PLACED ON 100' CENTERS, SEE ADAMS COUNTY CONCRETE SIDEWALK DETAIL. CONCRETE PAVEMENT JOINTS SHALL BE SPACED AT 12' CENTERS MAXIMUM OR AS DIRECTED BY THE COUNTY.
4. ALL AREAS INDICATED AS PAVEMENT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE TYPICAL PAVEMENT SECTIONS AS INDICATED ON THE DRAWINGS. ROW PAVEMENT SHALL BE AS DIRECTED BY THE COUNTY.
5. WHERE EXISTING PAVEMENT IS INDICATED TO BE REMOVED AND REPLACED, THE CONTRACTOR SHALL SAW CUT FULL DEPTH FOR A SMOOTH AND STRAIGHT JOINT AND REPLACE THE PAVEMENT WITH THE SAME TYPE AND DEPTH OF MATERIAL AS EXISTING OR AS INDICATED BY THE COUNTY.
6. WHERE NEW PAVEMENT MEETS THE EXISTING PAVEMENT, THE CONTRACTOR SHALL SAW CUT THE EXISTING PAVEMENT FULL DEPTH FOR A SMOOTH AND STRAIGHT JOINT AND MATCH THE EXISTING PAVEMENT ELEVATION WITH THE PROPOSED PAVEMENT UNLESS OTHERWISE INDICATED.

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FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.
GENERAL NOTES

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PROJECT NO. 096888037

SHEET C002

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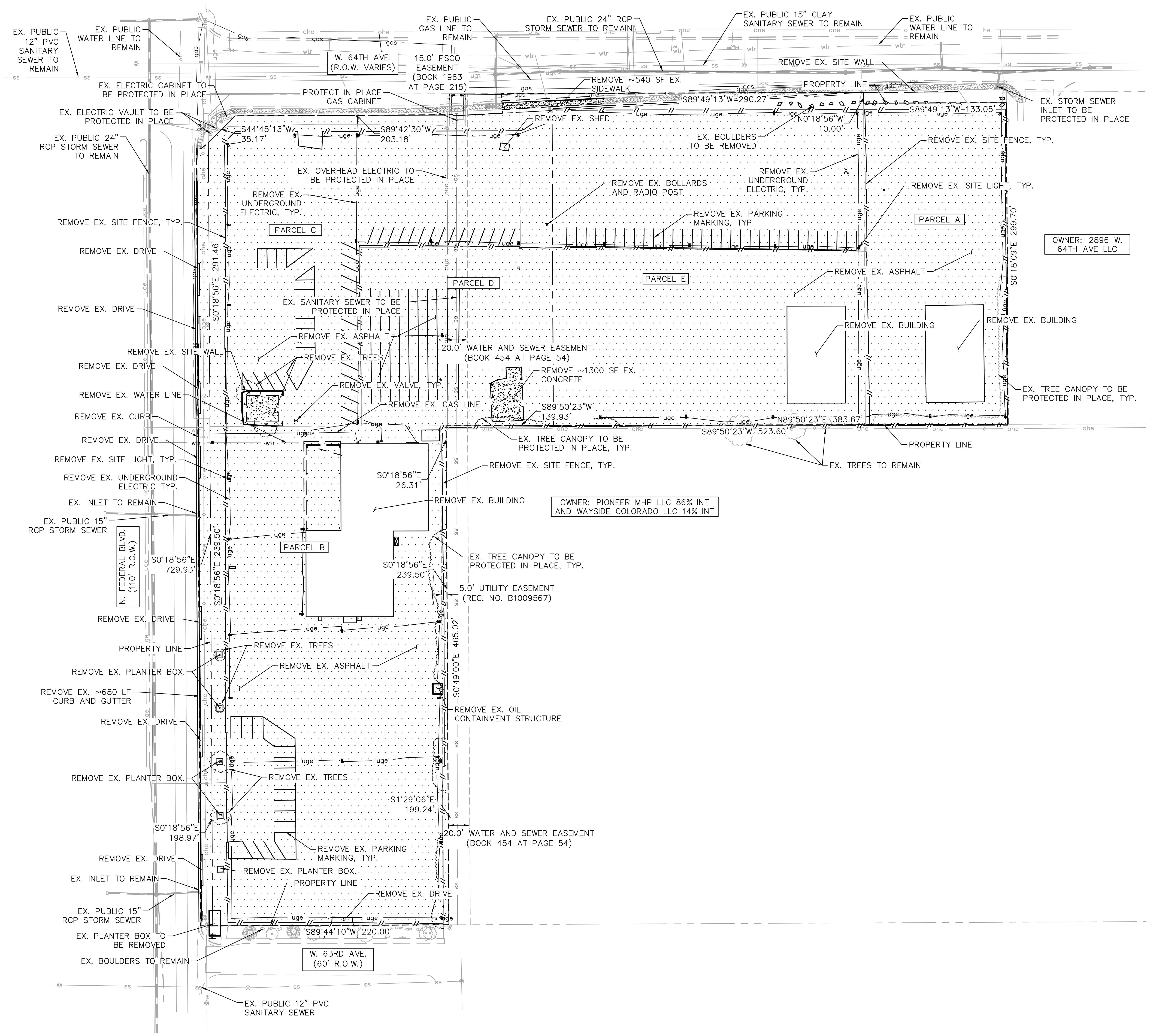
CASE NO. PLT2023-0056



EXISTING LEGEND

	PROPERTY LINE
	LIMITS OF DISTURBANCE
ohe	OVERHEAD ELECTRIC
ugfo	UNDERGROUND FIBER OPTIC
gas	GAS LINE
wtr	WATER LINE
ss	SEWER LINE
uge	UNDERGROUND ELECTRIC
	LIGHT POLE
	UTILITY MANHOLE
	UTILITY METER
	UTILITY VALVE
	TRAFFIC CONTROL BOX
	CURB LINE
	ASPHALT TO BE REMOVED
	EX. CONCRETE TO BE REMOVED
	SAWCUT LINE

MISCELLANEOUS DEMOLITION NOTES

1. ALL ITEMS IN BOLD ARE TO BE DEMOLISHED.
2. ALL TREES AND SHRUBS (EXCEPT THOSE SPECIFIED TO REMAIN) ON PROPERTY TO BE REMOVED.
3. CONTRACTOR SHALL COORDINATE WITH XCEL ENERGY FOR THE REMOVAL OF EXISTING OVERHEAD ELECTRIC AND ELECTRICAL STRUCTURES.

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DEMOLITION PLAN

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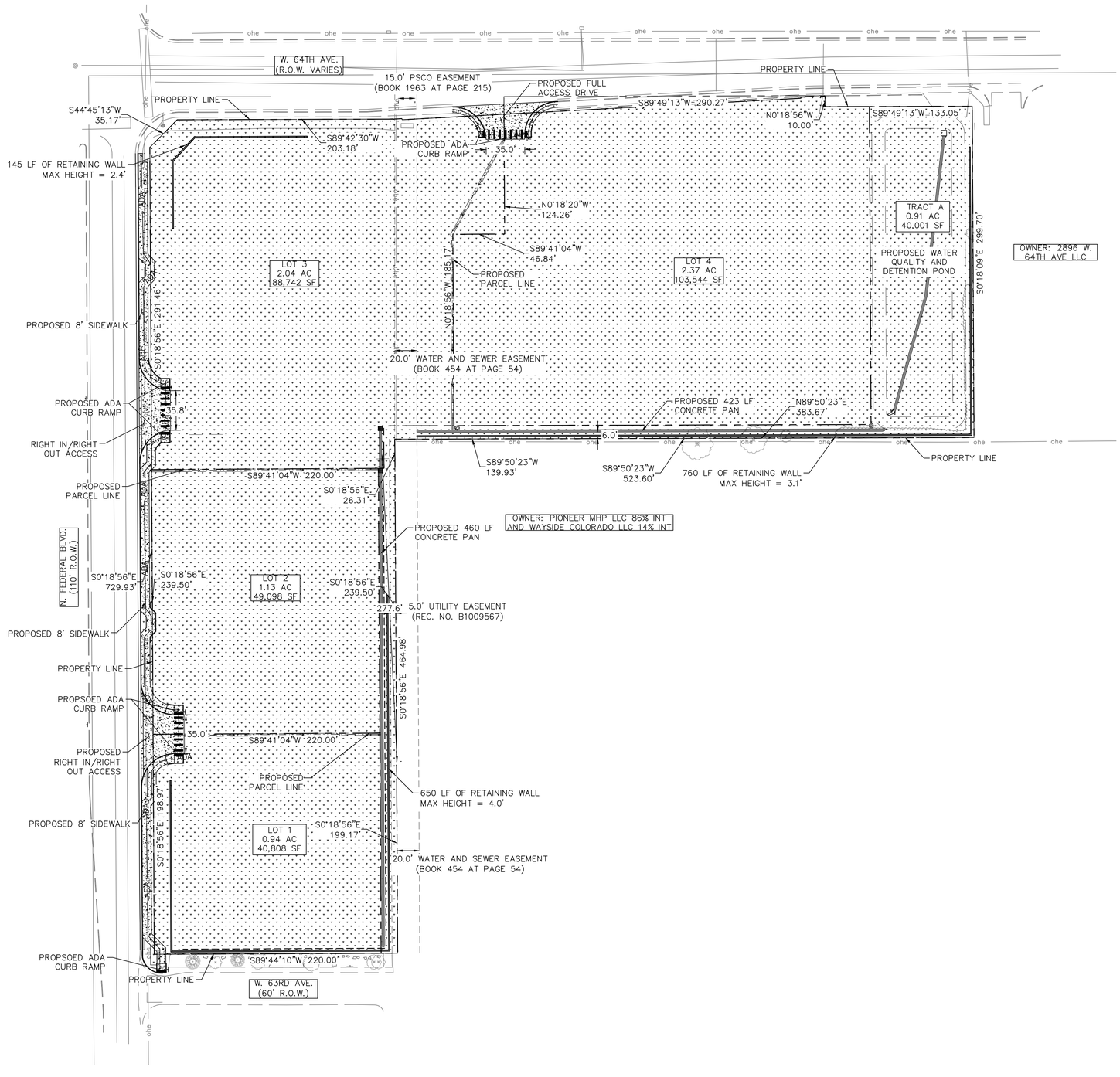

SITE LEGEND

- PROPERTY LINE
- CONCRETE CURB AND GUTTER
- ADA — ACCESSIBLE ROUTE
- EASEMENT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING

MISCELLANEOUS SITE NOTES

1. SEE SHEETS C101-104 FOR DETAILED SITE PLAN.
2. SEE DETAILS FOR ADDITIONAL INFORMATION REGARDING CURBS, WALKS, AND PAVEMENT SECTIONS.
3. ALL SIGNAGE AND STRIPING SHALL CONFORM TO THE CURRENT VERSION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND ADAMS COUNTY DESIGN STANDARDS.
4. ALL SIDEWALKS TO BE 5' WIDE UNLESS OTHERWISE NOTED.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

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OVERALL SITE PLAN

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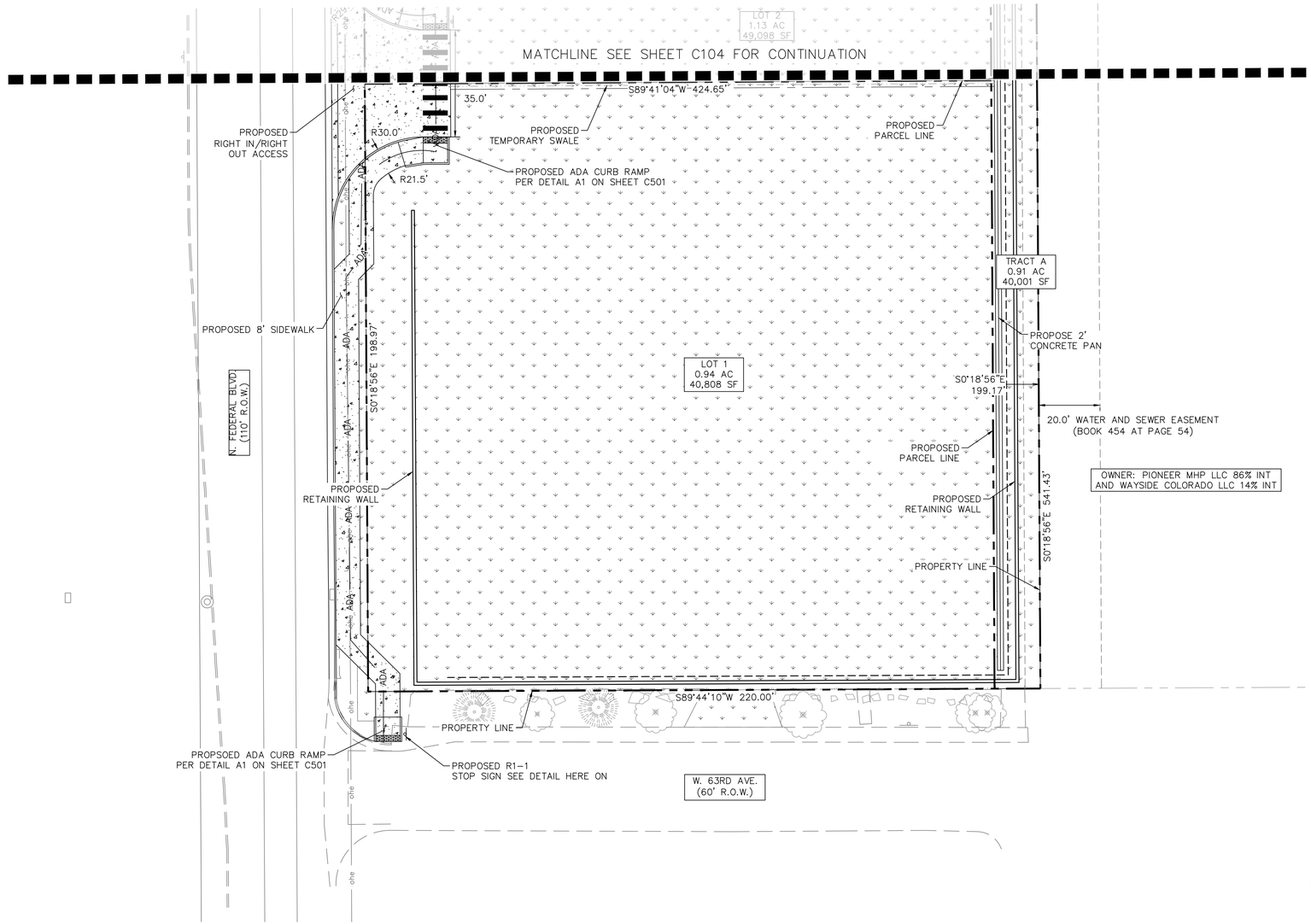

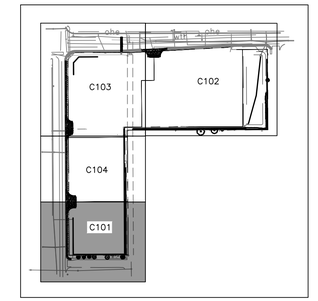

SITE LEGEND

- PROPERTY LINE
- CONCRETE CURB AND GUTTER
- ADA — ACCESSIBLE ROUTE
- EASEMENT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING

STANDARD RED STOP SIGN
R1-1 30"X30"

STANDARD ONE WAY
4R6-1 (54"X18")

GRAPHIC SCALE IN FEET
0 10 20 40

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DETAILED SITE PLAN

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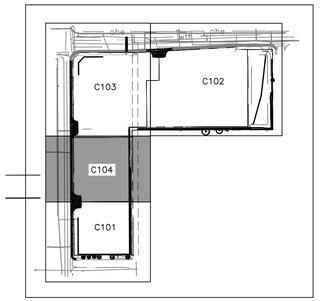

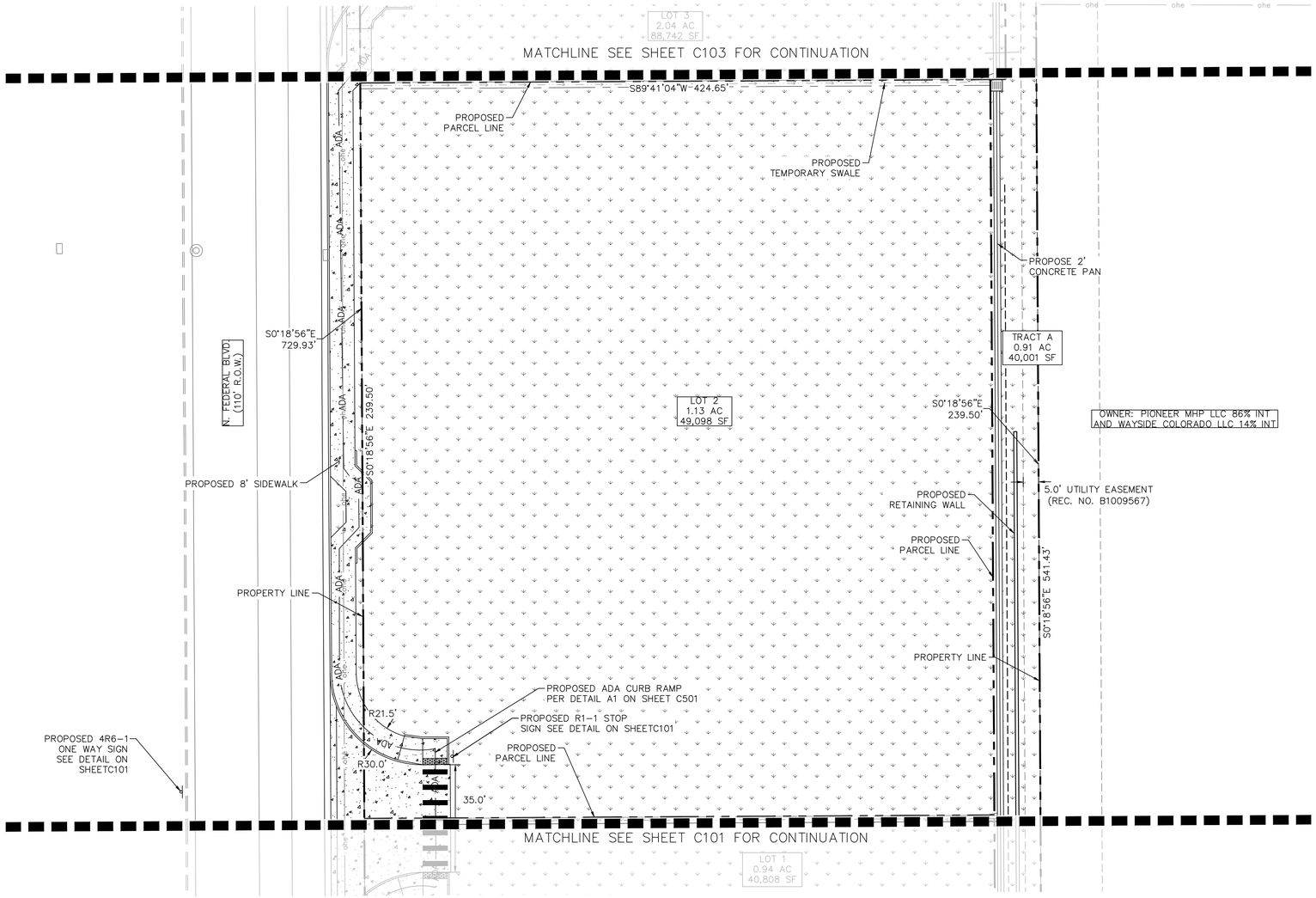

SITE LEGEND

- PROPERTY LINE
- CONCRETE CURB AND GUTTER
- ADA — ACCESSIBLE ROUTE
- EASEMENT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING

STANDARD RED STOP SIGN
R1-1 30"X30"

STANDARD ONE WAY
4R6-1 (54"X18")

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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DETAILED SITE PLAN

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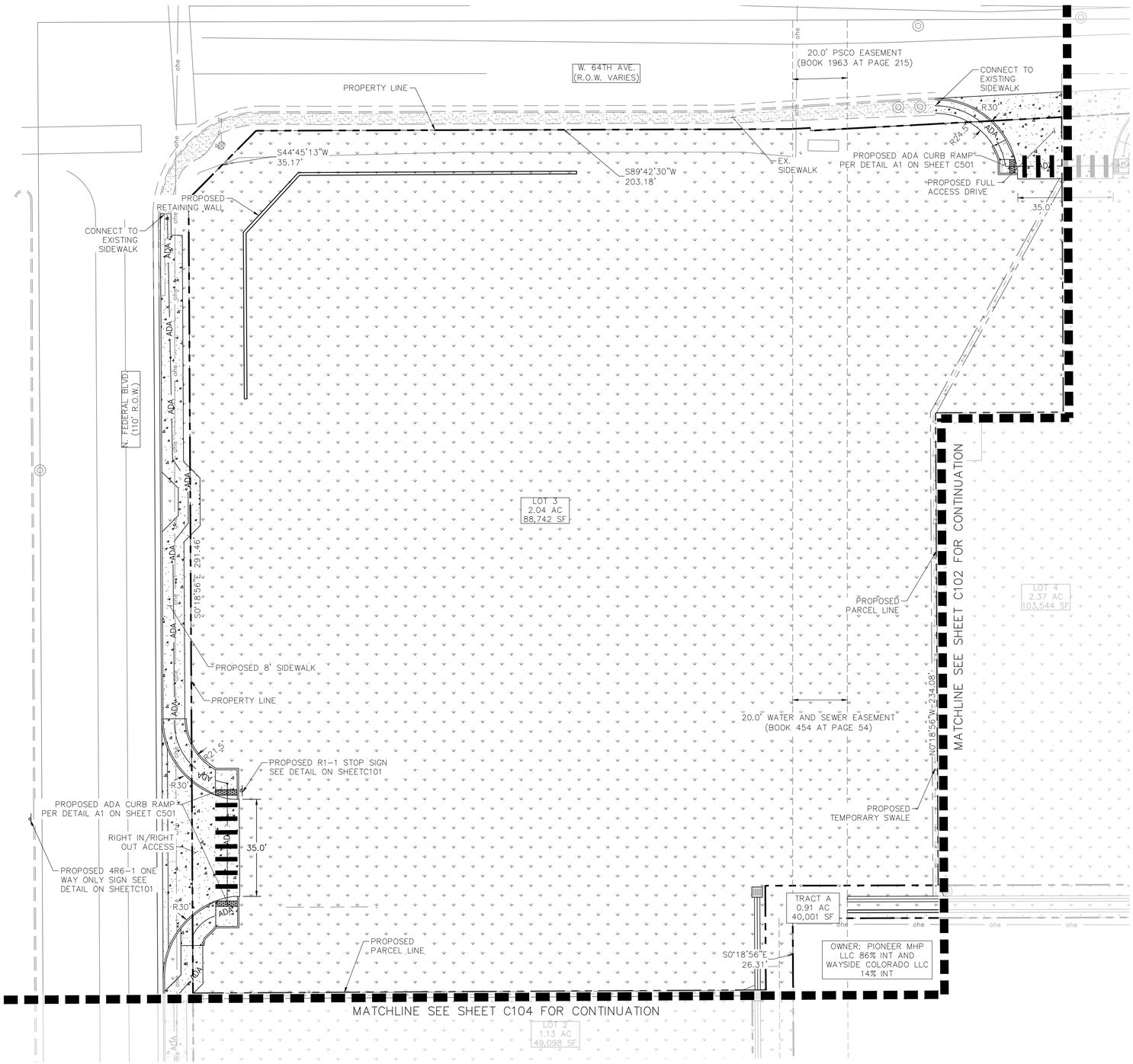
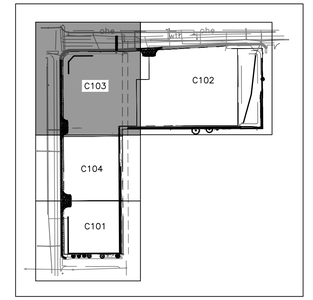
CASE NO. PLT2023-0056





SITE LEGEND

- PROPERTY LINE
- CONCRETE CURB AND GUTTER
- ADA — ACCESSIBLE ROUTE
- EASEMENT LINE
- PROPOSED CONCRETE
- PROPOSED LANDSCAPING

STANDARD RED STOP SIGN
R1-1 30"X30"

STANDARD ONE WAY
4R6-1 (54"X18")

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3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

DETAILED SITE PLAN

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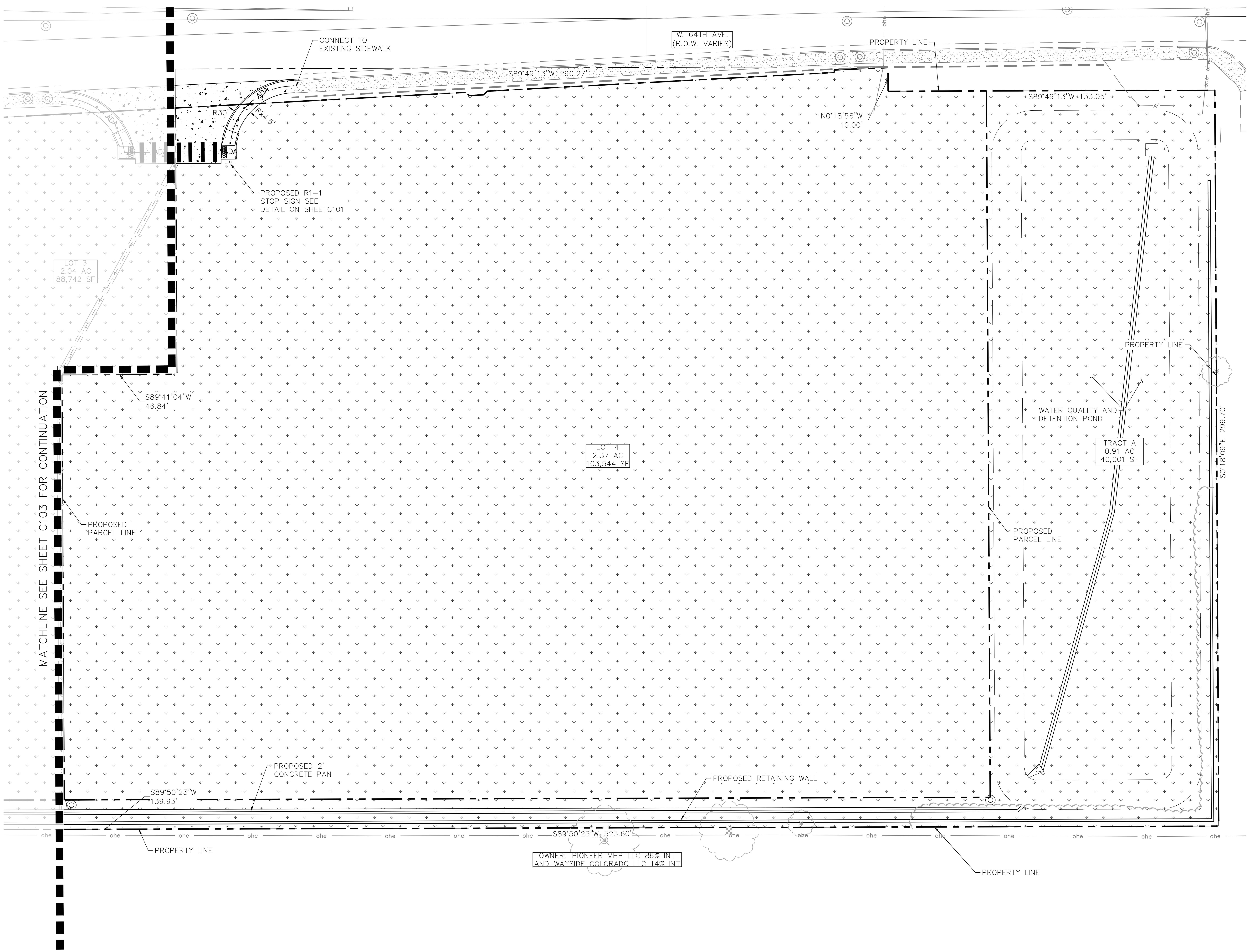
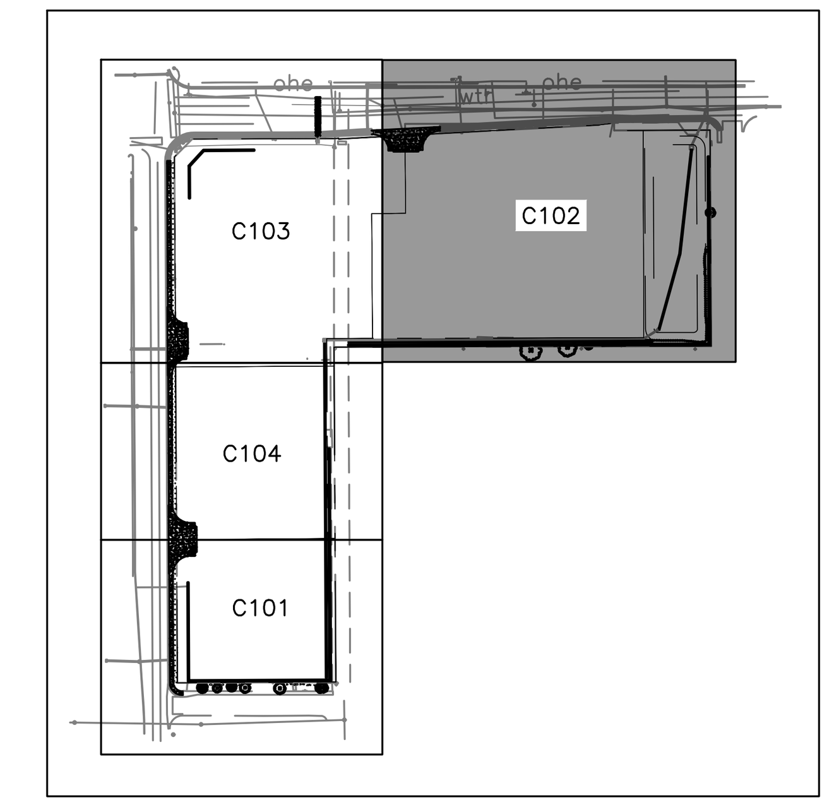
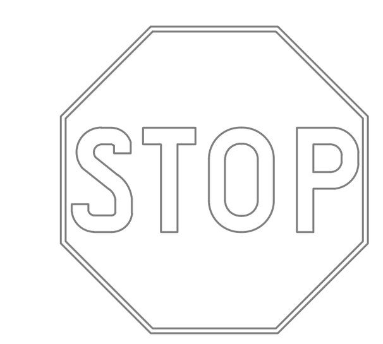
CASE NO. PLT2023-0056



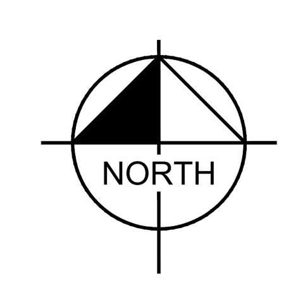


SITE LEGEND

— — —	PROPERTY LINE
═══	CONCRETE CURB AND GUTTER
— ADA —	ACCESSIBLE ROUTE
– – –	EASEMENT LINE
(pattern)	PROPOSED CONCRETE
(pattern)	PROPOSED LANDSCAPING



STANDARD RED STOP SIGN
R1-1 30"X30"



GRAPHIC SCALE IN FEET
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DETAILED SITE PLAN

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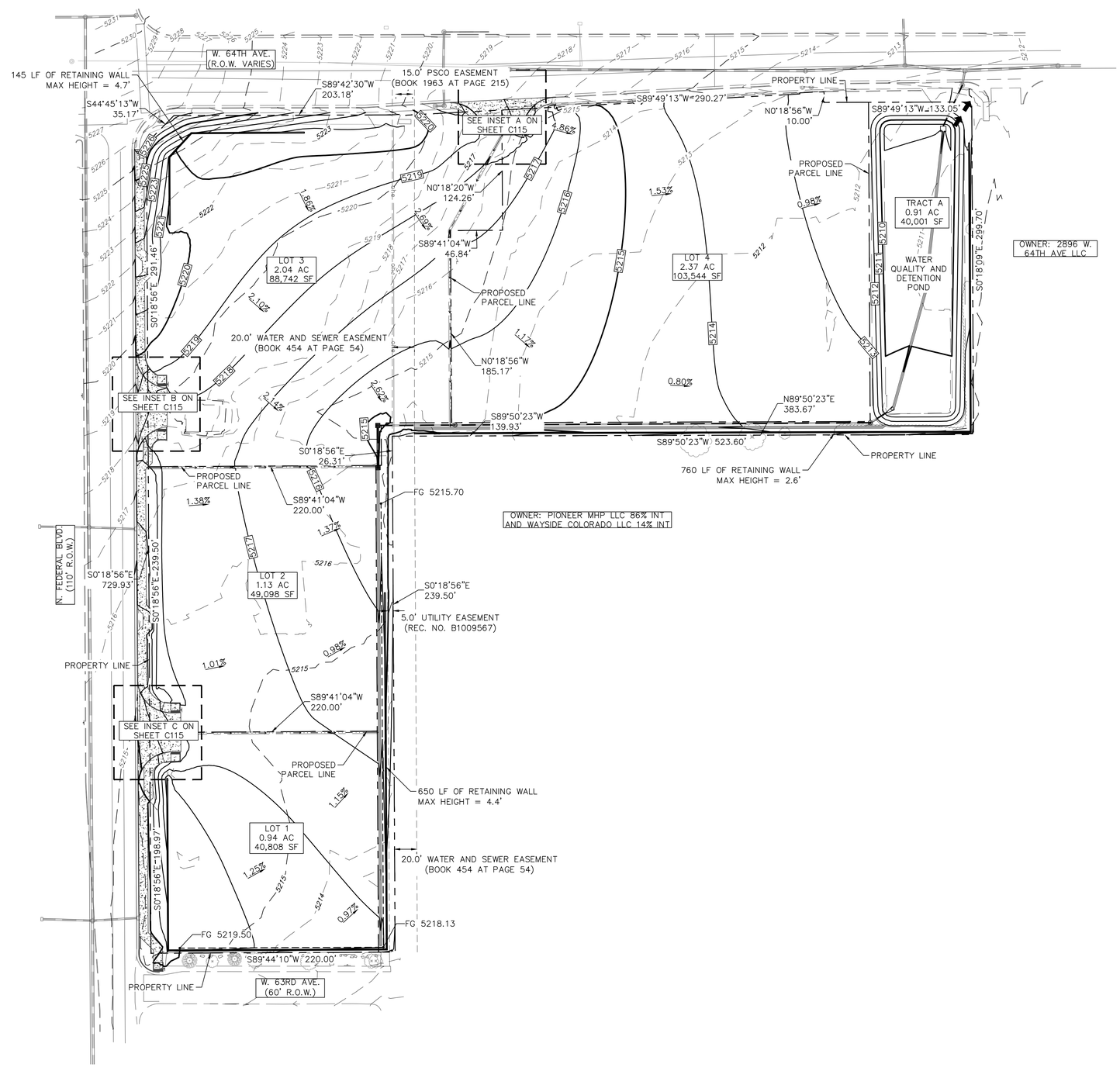

GRADING LEGEND

PROPERTY LINE	
XXXX	MAJOR CONTOUR (NEW)
XXXX	MINOR CONTOUR (NEW)
XXXX	MAJOR CONTOUR (EXISTING)
XXXX	MINOR CONTOUR (EXISTING)
LIMITS OF DISTURBANCE	
TW XXXX.XX / BW XXXX.XX	TOP OF WALL ELEVATION (NEW) / BOTTOM OF WALL ELEVATION (NEW)
TC XXXX.XX / FL XXXX.XX	TOP OF CURB ELEVATION (NEW) / FLOWLINE ELEVATION (NEW)
FG XXXX.XX	FINISHED GRADE ELEVATION (NEW)
SW XXXX.XX	SIDEWALK ELEVATION (NEW)
ME XXXX.XX	SPOT ELEVATION (EXISTING)
	STORM GRATE (NEW)
	GRADE BREAK
	EASEMENT LINE

BENCHMARKS

VERTICAL RELIEF WAS MADE FROM AN ON THE GROUND SURVEY, CONTOURS SHOWN HEREON ARE AT 1' INTERVALS USING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAD88), GEOID 12A. SITE VERTICAL WAS ESTABLISHED BY USING COUNTY OF DENVER BENCH MARK "1568" LOCATED AT THE SOUTHEAST CORNER OF 50TH AVENUE AND FEDERAL BOULEVARD.

UNADJUSTED EARTHWORK QUANTITIES

CUT: 4,414 CY
FILL: 15,284 CY
NET: 10,870 CY (FILL)

QUANTITIES NOTED ARE UNADJUSTED AND DO NOT ACCOUNT FOR OVER-EXCAVATION, PAVEMENT SECTIONS, OR SHRINK/WELL.

MISCELLANEOUS GRADING NOTES

1. GAS CANOPY INSTALLER SHALL INSTALL THE CANOPY COLUMN DRAIN PIPE AND OVERFLOW FITTING. THE STORM WATER INSTALLER SHALL CONNECT THEIR PIPING TO THE GAS INSTALLER'S OVERFLOW FITTING.
2. WHEN PLAN GRADES DEPICT RUNOFF TO BE DIRECTED AWAY FROM THE CURB, USE DRAIN AWAY CURB (SPILL CURB) ALTERNATE. (RE: "CURB DETAIL-BARRIER" DETAIL)
3. SEE CITY OF LAKEWOOD GRADING NOTES ON SHEET C002 OF THIS PLAN SET.

GRAPHIC SCALE IN FEET
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OVERALL GRADING PLAN

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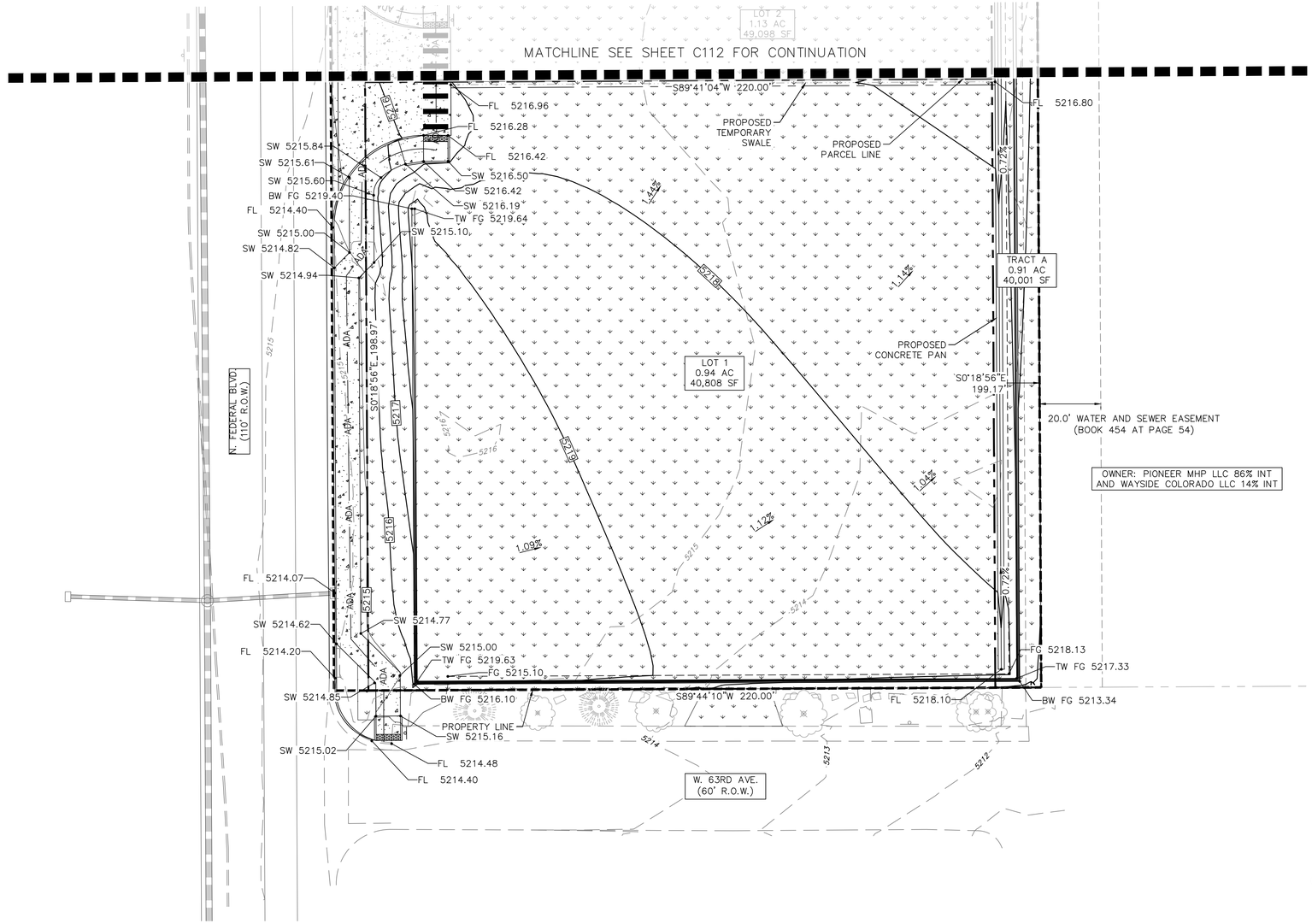

GRADING LEGEND

- PROPERTY LINE
- XXXX — MAJOR CONTOUR (NEW)
- XXXX — MINOR CONTOUR (NEW)
- XXXX — MAJOR CONTOUR (EXISTING)
- XXXX — MINOR CONTOUR (EXISTING)
- LIMITS OF DISTURBANCE
- TW XXXX.XX — TOP OF WALL ELEVATION (NEW)
- BW XXXX.XX — BOTTOM OF WALL ELEVATION (NEW)
- FL XXXX.XX — FLOWLINE ELEVATION (NEW)
- FG XXXX.XX — FINISHED GRADE ELEVATION (NEW)
- SW XXXX.XX — SIDEWALK ELEVATION (NEW)
- ME XXXX.XX — SPOT ELEVATION (EXISTING)
- STORM GRATE (NEW)
- GRADE BREAK
- EASEMENT LINE

BENCHMARKS

VERTICAL RELIEF WAS MADE FROM AN ON THE GROUND SURVEY, CONTOURS SHOWN HEREON ARE AT 1' INTERVALS USING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAD88), GEOID 12A. SITE VERTICAL WAS ESTABLISHED BY USING COUNTY OF DENVER BENCH MARK "156B" LOCATED AT THE SOUTHEAST CORNER OF 50TH AVENUE AND FEDERAL BOULEVARD.

UNADJUSTED EARTHWORK QUANTITIES

CUT: 4,414 CY
FILL: 15,284 CY
NET: 10,870 CY (FILL)

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3. SEE CITY OF LAKEWOOD GRADING NOTES ON SHEET C002 OF THIS PLAN SET.

NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

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DRAWN BY: AIA
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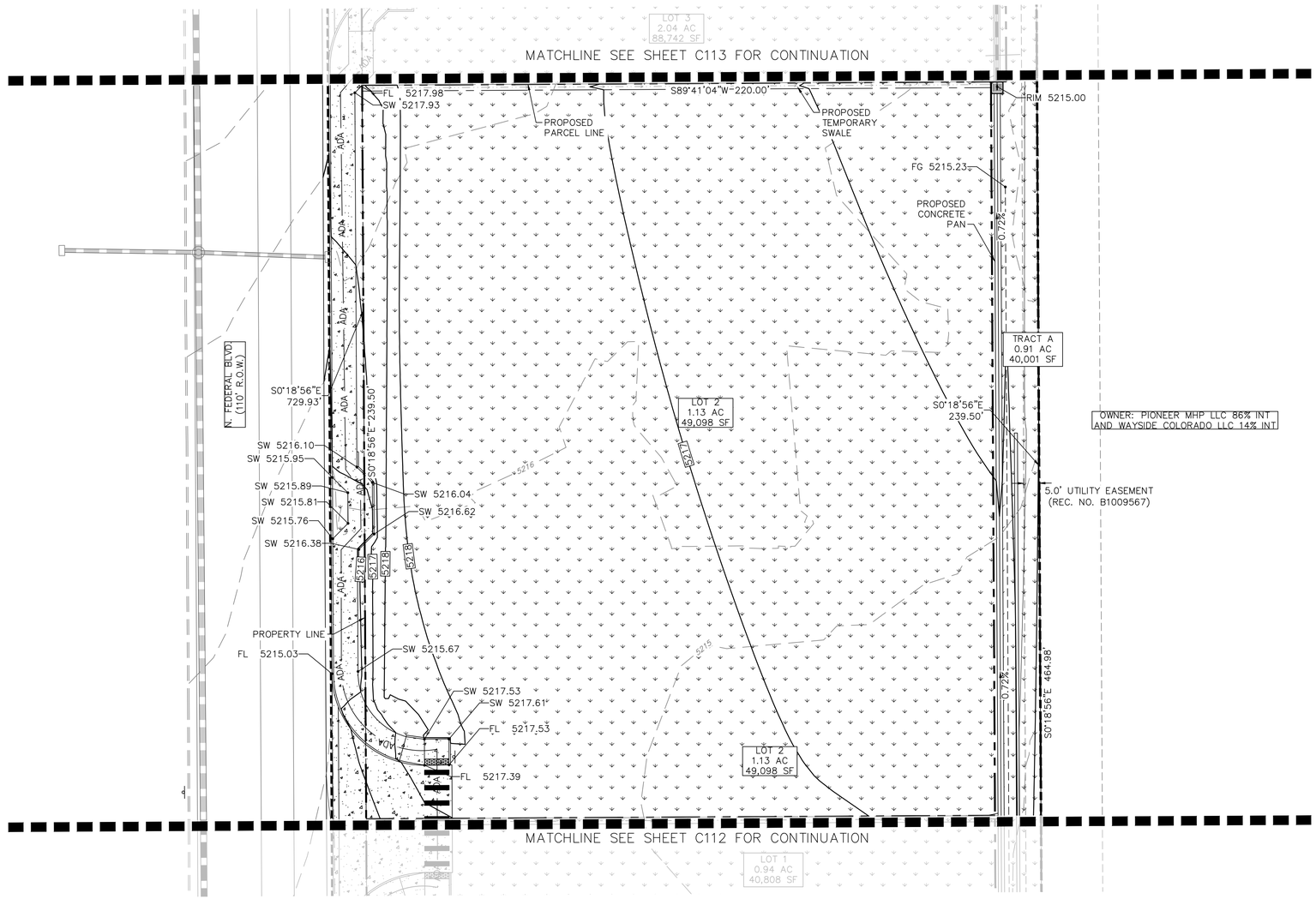

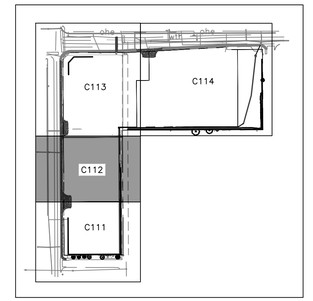

GRADING LEGEND

- PROPERTY LINE
- XXXX — MAJOR CONTOUR (NEW)
- XXXX — MINOR CONTOUR (NEW)
- XXXX — MAJOR CONTOUR (EXISTING)
- XXXX — MINOR CONTOUR (EXISTING)
- LIMITS OF DISTURBANCE
- TW XXXX.XX — TOP OF WALL ELEVATION (NEW)
- BW XXXX.XX — BOTTOM OF WALL ELEVATION (NEW)
- FL XXXX.XX — FLOWLINE ELEVATION (NEW)
- FG XXXX.XX — FINISHED GRADE ELEVATION (NEW)
- SW XXXX.XX — SIDEWALK ELEVATION (NEW)
- ME XXXX.XX — SPOT ELEVATION (EXISTING)
- STORM GRATE (NEW)
- GRADE BREAK
- EASEMENT LINE

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NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

MISCELLANEOUS GRADING NOTES

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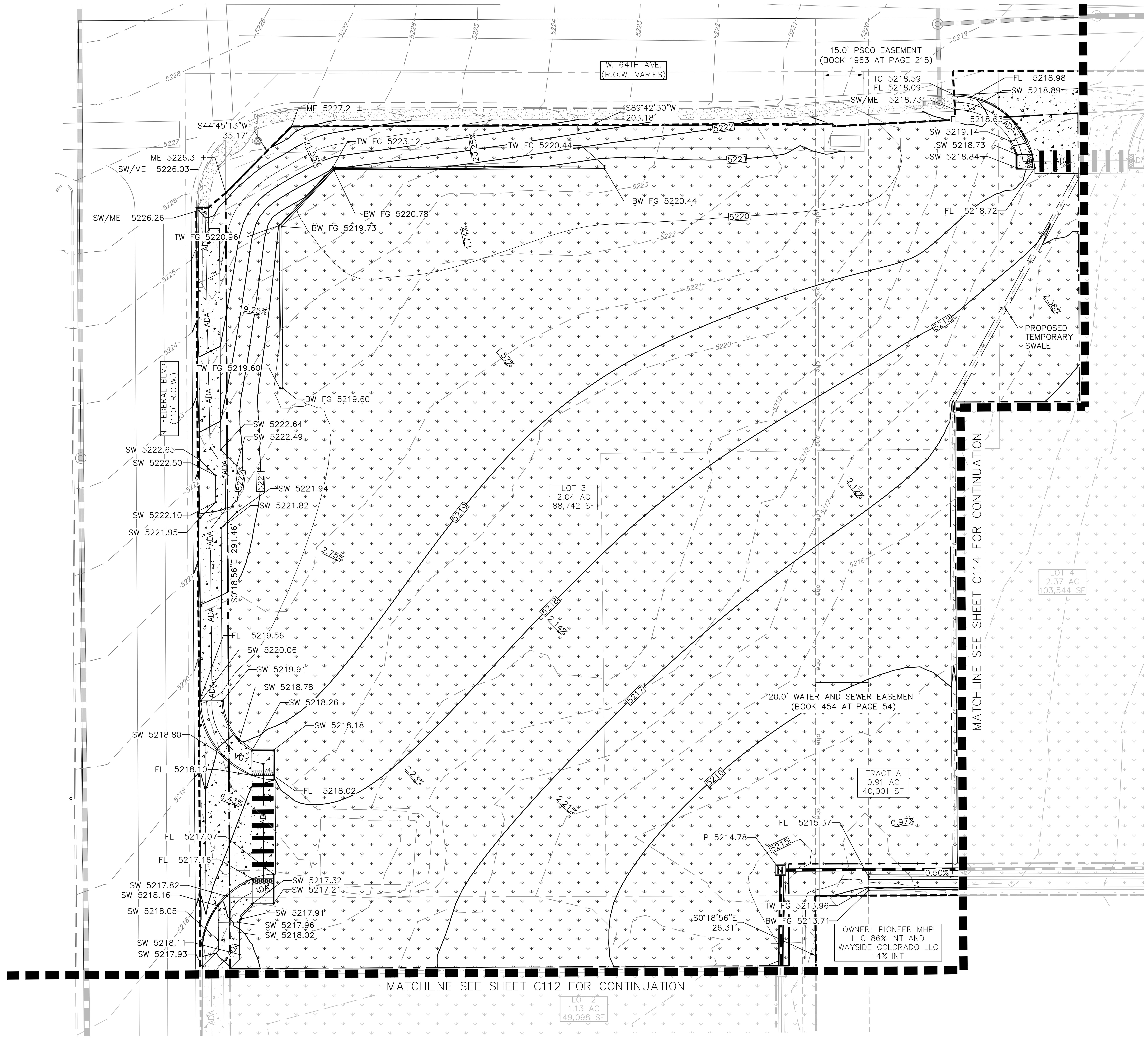

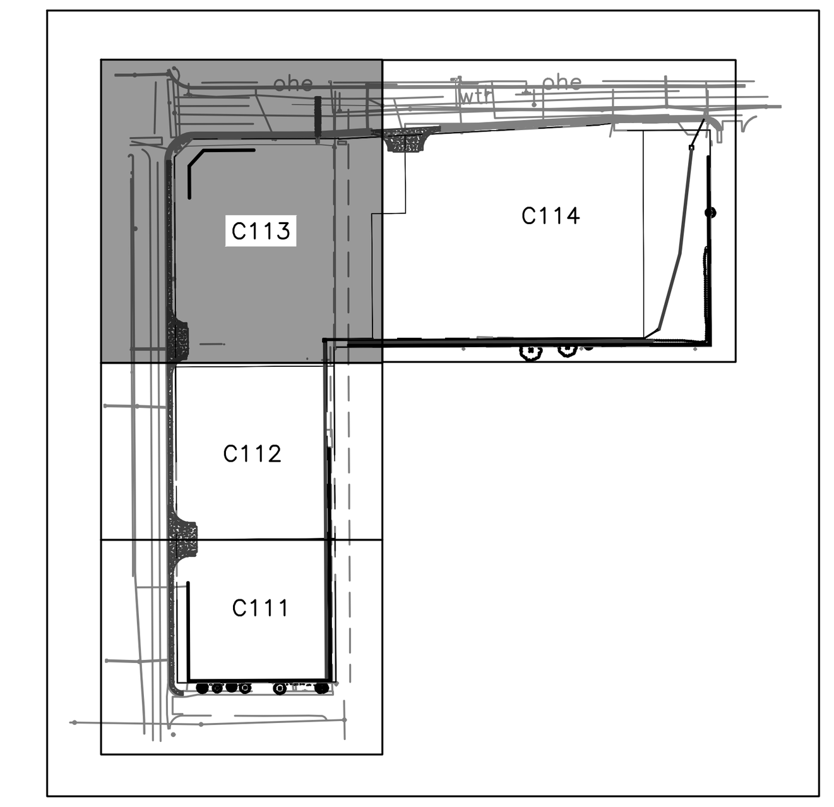

GRADING LEGEND

- PROPERTY LINE
- XXXX — MAJOR CONTOUR (NEW)
- XXXX — MINOR CONTOUR (NEW)
- XXXX — MAJOR CONTOUR (EXISTING)
- XXXX — MINOR CONTOUR (EXISTING)
- LIMITS OF DISTURBANCE
- TW XXXX.XX — TOP OF WALL ELEVATION (NEW)
- BW XXXX.XX — BOTTOM OF WALL ELEVATION (NEW)
- FL XXXX.XX — FLOWLINE ELEVATION (NEW)
- FG XXXX.XX — FINISHED GRADE ELEVATION (NEW)
- SW XXXX.XX — SIDEWALK ELEVATION (NEW)
- ME XXXX.XX — SPOT ELEVATION (EXISTING)
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- GRADE BREAK
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BENCHMARKS

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UNADJUSTED EARTHWORK QUANTITIES

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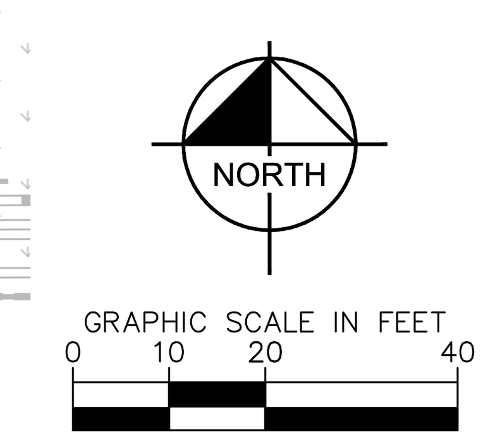

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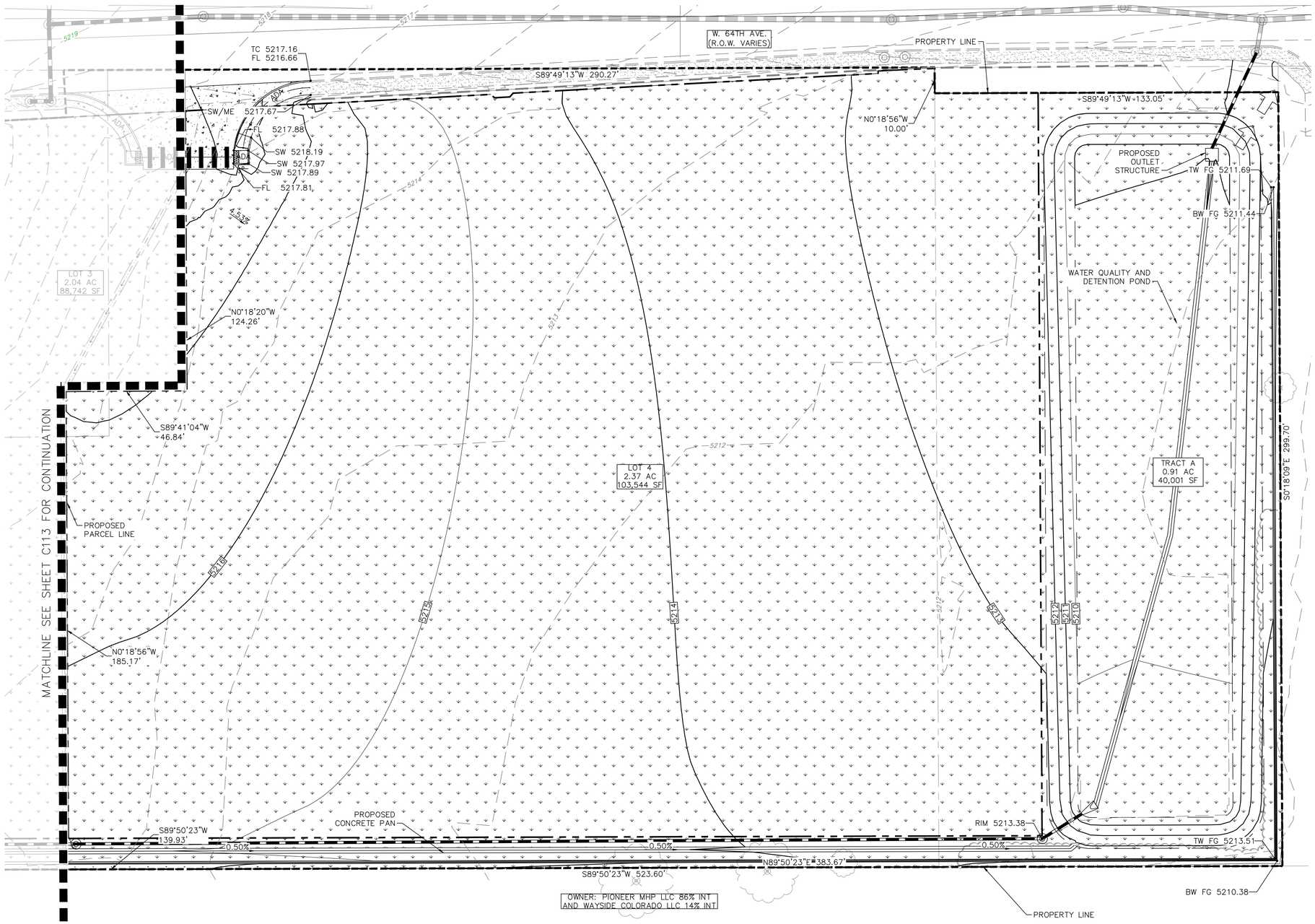

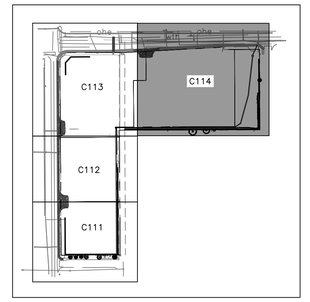

GRADING LEGEND

- PROPERTY LINE
- XXXX — MAJOR CONTOUR (NEW)
- XXXX — MINOR CONTOUR (NEW)
- XXXX — MAJOR CONTOUR (EXISTING)
- XXXX — MINOR CONTOUR (EXISTING)
- LIMITS OF DISTURBANCE
- TW XXXX.XX — TOP OF WALL ELEVATION (NEW)
- BW XXXX.XX — BOTTOM OF WALL ELEVATION (NEW)
- FL XXXX.XX — FLOWLINE ELEVATION (NEW)
- FG XXXX.XX — FINISHED GRADE ELEVATION (NEW)
- SW XXXX.XX — SIDEWALK ELEVATION (NEW)
- ME XXXX.XX — SPOT ELEVATION (EXISTING)
- STORM GRATE (NEW)
- GRADE BREAK
- EASEMENT LINE

BENCHMARKS

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FILL: 15,284 CY
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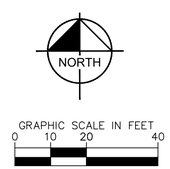

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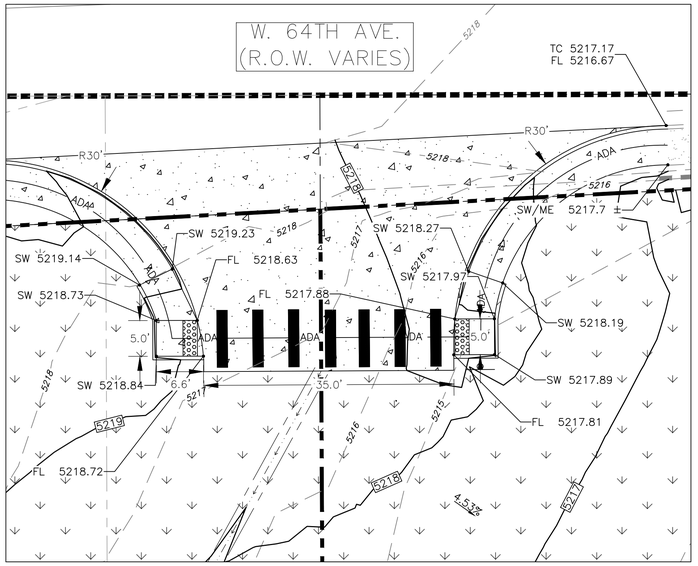
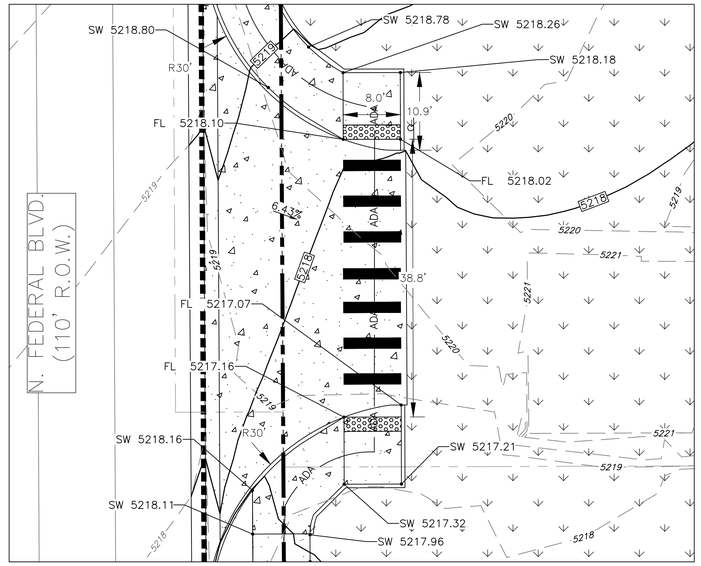
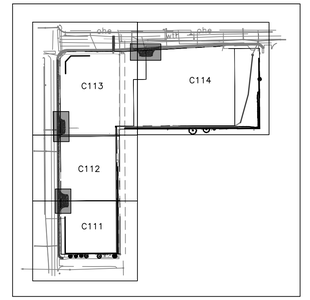
INSET A



INSET B





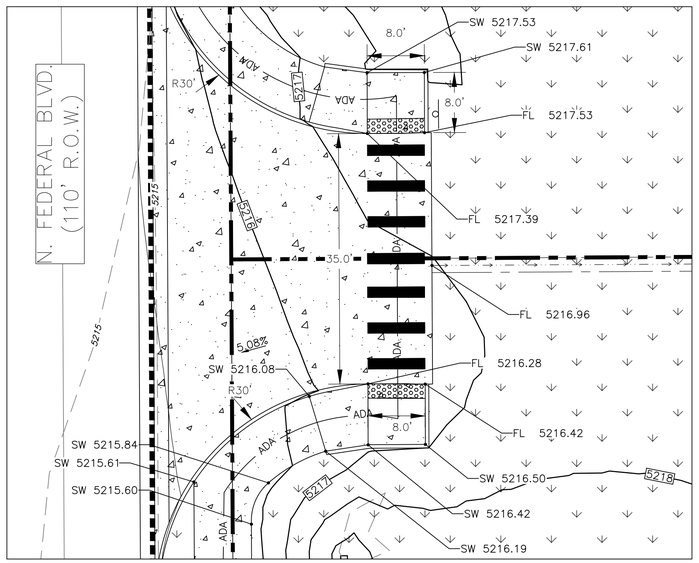
GRADING LEGEND

- PROPERTY LINE
- XXXX — MAJOR CONTOUR (NEW)
- XXXX — MINOR CONTOUR (NEW)
- XXXX — MAJOR CONTOUR (EXISTING)
- XXXX — MINOR CONTOUR (EXISTING)
- LIMITS OF DISTURBANCE
- TW XXXX.XX — TOP OF WALL ELEVATION (NEW)
- BW XXXX.XX — BOTTOM OF WALL ELEVATION (NEW)
- FL XXXX.XX — FLOWLINE ELEVATION (NEW)
- FG XXXX.XX — FINISHED GRADE ELEVATION (NEW)
- SW XXXX.XX — SIDEWALK ELEVATION (NEW)
- ME XXXX.XX — SPOT ELEVATION (EXISTING)
- STORM GRATE (NEW)
- GRADE BREAK

NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

INSET C



NORTH

GRAPHIC SCALE IN FEET
0 5 10 20

BENCHMARKS

VERTICAL RELIEF WAS MADE FROM AN ON THE GROUND SURVEY, CONTOURS SHOWN HEREON ARE AT 1' INTERVALS USING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAD88), GEOID 12A. SITE VERTICAL WAS ESTABLISHED BY USING COUNTY OF DENVER BENCH MARK "156B" LOCATED AT THE SOUTHEAST CORNER OF 50TH AVENUE AND FEDERAL BOULEVARD.

UNADJUSTED EARTHWORK QUANTITIES

CUT: 4,414 CY
FILL: 15,284 CY
NET: 10,870 CY (FILL)

QUANTITIES NOTED ARE UNADJUSTED AND DO NOT ACCOUNT FOR OVER-EXCAVATION, PAVEMENT SECTIONS, OR SHRINK/WELL.

MISCELLANEOUS GRADING NOTES

1. GAS CANOPY INSTALLER SHALL INSTALL THE CANOPY COLUMN DRAIN PIPE AND OVERFLOW FITTING. THE STORM WATER INSTALLER SHALL CONNECT THEIR PIPING TO THE GAS INSTALLER'S OVERFLOW FITTING.
2. WHEN PLAN GRADES DEPICT RUNOFF TO BE DIRECTED AWAY FROM THE CURB, USE DRAIN AWAY CURB (SPILL CURB) ALTERNATE. (RE: "CURB DETAIL-BARRIER" DETAIL)
3. SEE CITY OF LAKEWOOD GRADING NOTES ON SHEET C002 OF THIS PLAN SET.

NO.	REVISION	BY	DATE	APPR

Kimley»Horn

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DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

DRIVEWAY DETAILED GRADING

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PROJECT NO.
096888037

SHEET
C115

811 Know what's below. Call before you dig.

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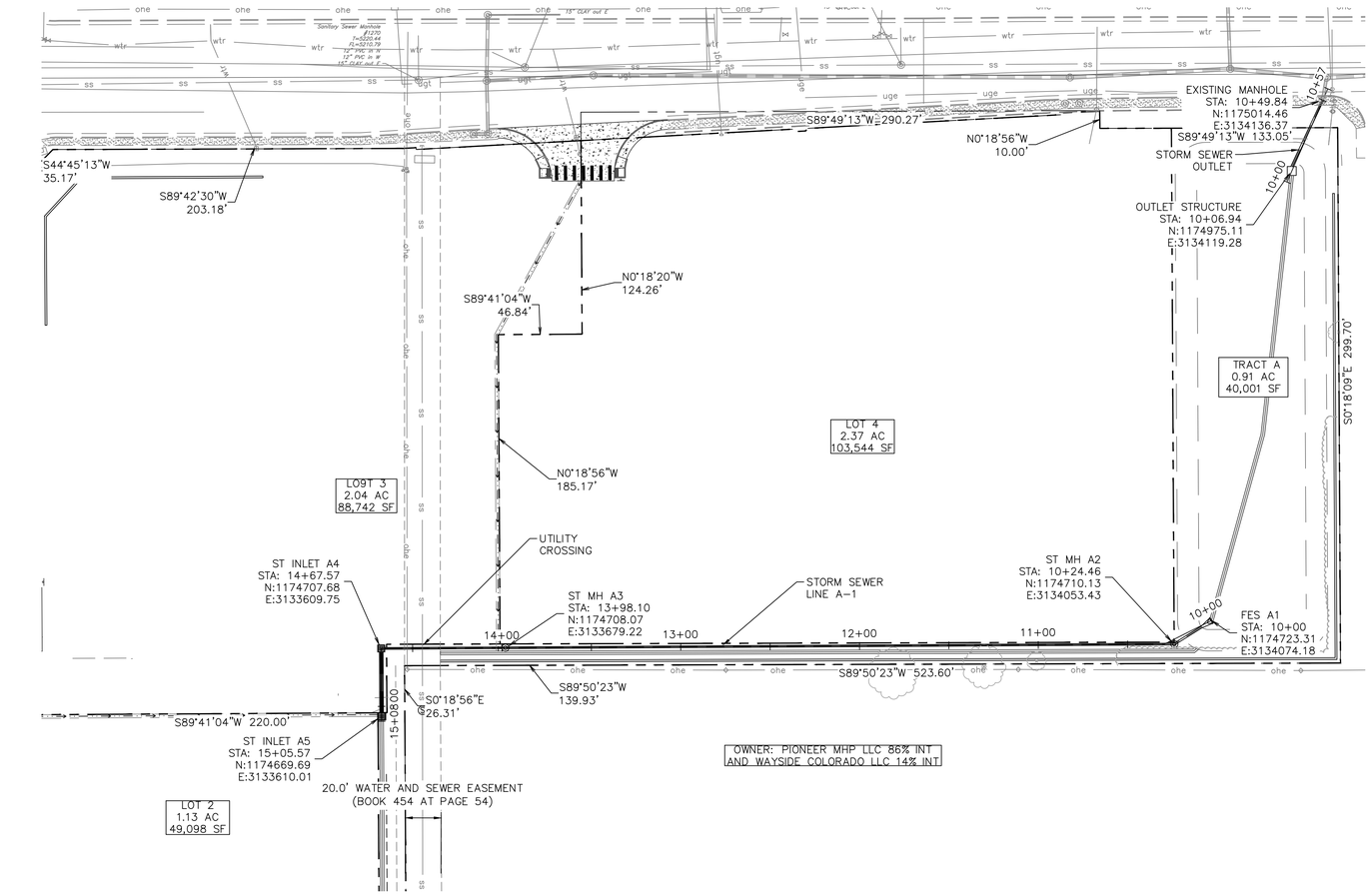


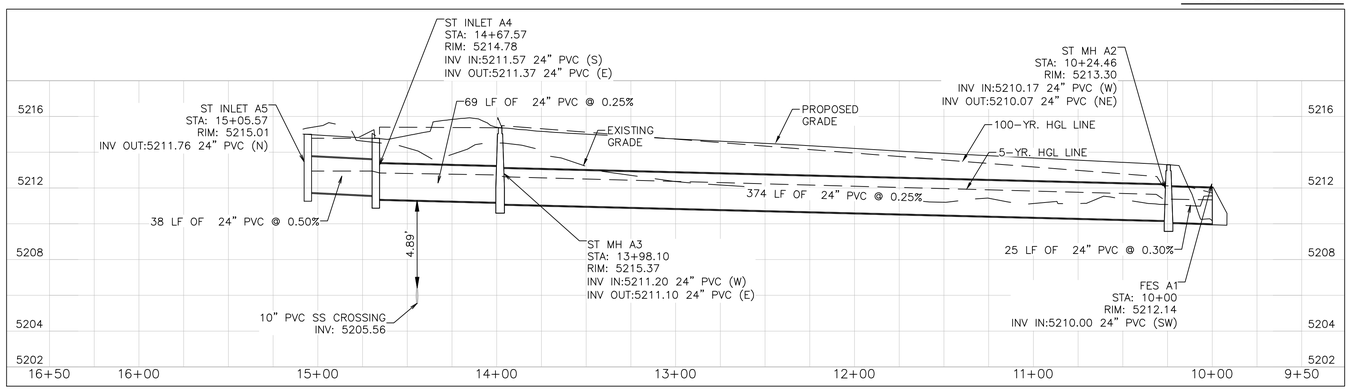
STORM SEWER LEGEND

- ST — STORM PIPE (< 10" NEW)
- CD — BACK OF CURB DRAIN
- STORM PIPE (> 12" NEW)
- STORM PIPE (> 12" EXISTING)
- STORM GRATE (NEW)

UTILITY INSTALLATION CONSIDERATIONS

1. PRIOR TO THE CONSTRUCTION OF, OR CONNECTION TO ANY STORM DRAIN, SANITARY SEWER, OR ANY OTHER ELEVATION SENSITIVE UTILITY, THE CONTRACTOR SHALL EXCAVATE, VERIFY AND CALCULATE ALL POINTS OF CONNECTIONS AND ALL UTILITY CROSSINGS. THE CONTRACTOR SHALL INFORM THE ENGINEER AND THE OWNER OF ANY CONFLICT OR REQUIRED DEVIATIONS FROM THE PLAN. THE ENGINEER AND OWNER WILL BE HELD HARMLESS IN THE EVENT THE ENGINEER AND OWNER ARE NOT NOTIFIED OF A DESIGN CONFLICT.
2. AS POSSIBLE, ALL PROPOSED UTILITIES SHALL BE ROUTED THROUGH PERVIOUS AREAS – SPECIFICALLY AVOIDING ON-SITE PAVED AREAS DESIGNATED FOR PARKING, ACCESS, AND VEHICULAR TRAFFIC FLOW.
3. REFER TO THIS SHEET FOR LOCATION, AND DETAIL SHEETS FOR TRENCHING, BACKFILL, AND PLACEMENT DETAILS.
4. PATCHES ON ASPHALT STREETS NOT BE LESS THAN 2 FEET IN ANY DIMENSION. CUTS SHALL NOT LEAVE NOT LEAVE STRIPS OF EXISTING PAVEMENT LESS THAN 3 FEET IN WIDTH FROM THE EDGE OF THE NEW PATCH TO THE LIP OF THE GUTTER, EDGE OF PAVED ROADWAY SURFACE, OR EDGES OF EXISTING PATCHES. PATCHES ON ALL STREETS SHALL BE 4 SIDED, WITH SIDES EITHER PARALLEL OR PERPENDICULAR TO TRAFFIC.
5. ANY ROADWAY STRIPING THAT IS REMOVED AS A RESULT OF THE UTILITY IMPROVEMENTS MUST BE RESTORED IN ACCORDANCE WITH CITY OF LAKEWOOD TRANSPORTATION ENGINEERING DIVISION REQUIREMENTS.
6. STORM SEWER SHALL BE CONCRETE ENCASED FOR 10 FEET ON EITHER SIDE OF WATER SERVICE CROSSING.
7. CONTRACTOR TO POTHOLE AND VERIFY LOCATION OF EXISTING WATER MAIN AT SANITARY SEWER CROSSING. MINIMUM 1.5-FEET VERTICAL CLEARANCE IS TO BE MAINTAINED.
8. ALL SANITARY SEWER & STORM SEWER JOINTS WITHIN 10-FEET EITHER SIDE OF A WATER CROSSING WHERE THE WATER IS CROSSING UNDERNEATH SHALL BE ENCASED IN CONCRETE 6-INCH THICK AROUND THE FULL CIRCUMFERENCE OF THE JOINT (TYP.).

STORM SEWER LINE A-1



VERTICAL 0 2 4 8

GRAPHIC SCALE IN FEET
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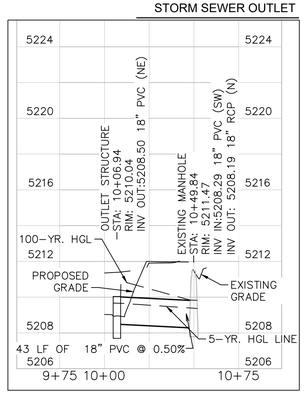
HORIZONTAL

STORM SEWER OUTLET



VERTICAL 0 2 4 8

GRAPHIC SCALE IN FEET
0 20 40 80
HORIZONTAL

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STORM SEWER PLAN & PROFILE

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Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
C300

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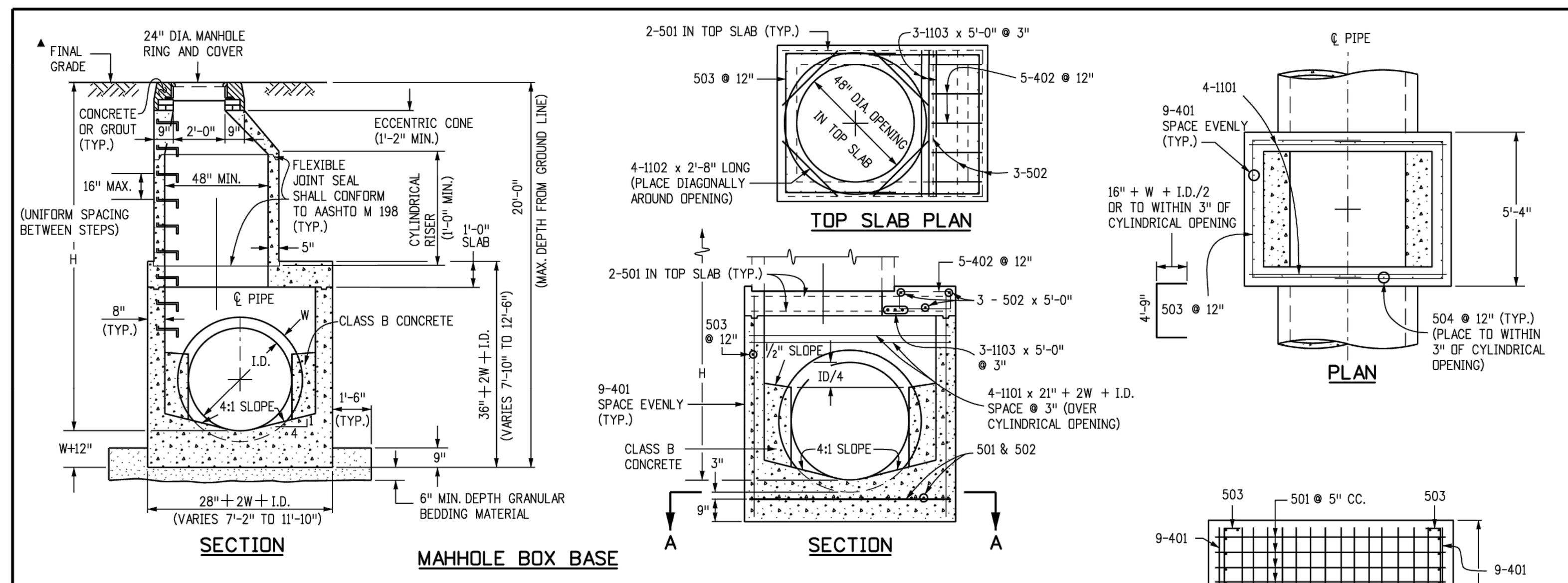
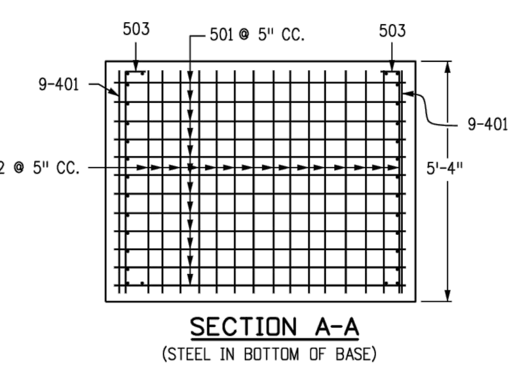
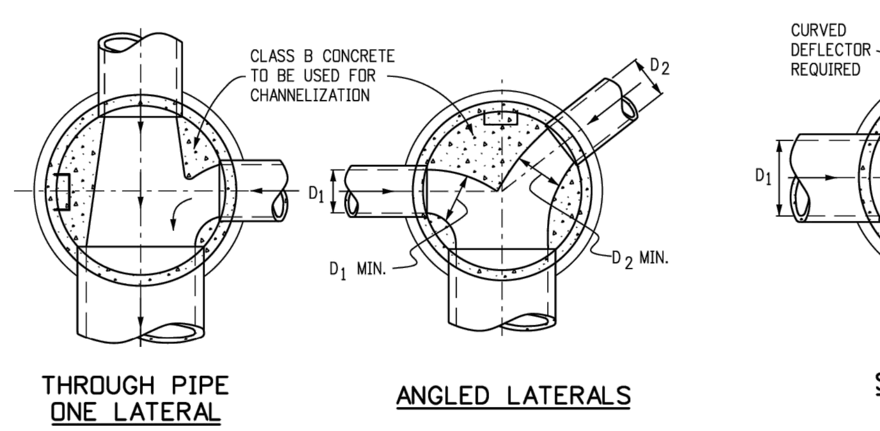
CASE NO. PLT2023-0056





MARK	SIZE	TYPE	WT. #/FT.	BARS	I.D. 54"	60"	66"	72"	84"	96"	FORMULAS
401	4	I	0.668	NO. REQ'D. LENGTH WEIGHT *	18 8'-1" 97.2	18 8'-8" 104.2	18 9'-3" 111.2	18 9'-10" 118.2	18 11'-0" 132.3	18 12'-2" 146.3	401 BAR LENGTH = 32" + 2W + I.D.
402	4	III	0.668	NO. REQ'D. LENGTH WEIGHT *	5 5'-5" 18.1	5 6'-0" 20.0	5 6'-7" 22.0	5 7'-2" 23.9	5 8'-4" 27.8	5 9'-6" 31.7	402 BAR LENGTH = I.D. + 2W
501	5	I	1.043	NO. REQ'D. LENGTH WEIGHT *	17 7'-5" 131.5	17 8'-0" 141.8	17 8'-7" 152.2	17 9'-2" 162.5	17 10'-4" 183.2	17 11'-6" 203.9	501 BAR LENGTH = 24" + I.D. + 2W
502	5	I	1.043	NO. REQ'D. LENGTH WEIGHT *	22 5'-0" 114.7	23 5'-0" 119.9	25 5'-0" 130.4	26 5'-0" 135.6	29 5'-0" 151.2	32 5'-0" 166.9	502 NUMBER BARS REQ'D. = $3 + \left(\frac{24+I.D.+2W}{@\ 5"}+1\right)$
503	5	II	1.043	NO. REQ'D. LENGTH WEIGHT *	16 12'-10" 214.2	16 13'-5" 223.9	18 14'-0" 262.8	18 14'-7" 273.8	20 15'-9" 328.5	24 16'-11" 423.5	503 NUMBER BARS REQ'D. = $2\left(\frac{13+I.D.+2W}{@\ 12"}+1\right)$ BAR LENGTH = 4'-9"+2(16+W+I.D./2)
504	5	I	1.043	NO. REQ'D. LENGTH WEIGHT *	12 8'-1" 101.2	14 8'-8" 126.6	14 9'-3" 135.1	16 9'-10" 164.1	18 11'-0" 206.5	20 12'-2" 253.8	504 NUMBER BARS REQ'D. = $2\left(\frac{2W+I.D.-4}{@\ 12"}+1\right)$ BAR LENGTH = 32"+2W+I.D.
1101	11	I	5.313	NO. REQ'D. LENGTH WEIGHT *	4 7'-2" 152.3	4 7'-9" 164.7	4 8'-4" 177.1	4 8'-11" 189.5	4 10'-1" 214.3	4 11'-3" 239.1	1101 BAR LENGTH = 21" + I.D. + 2W
1102	11	I	5.313	NO. REQ'D. LENGTH WEIGHT *	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	4 2'-8" 56.7	4 56.7 2'-8"	BENDING TYPE I STRAIGHT
1103	11	I	5.313	NO. REQ'D. LENGTH WEIGHT *	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	3 5'-0" 79.7	TYPE II 4'-9" 16"+W+I.D./2
* REINFORCING STEEL TOTAL					965.6	1,037.5	1,127.2	1,204.0	1,380.2	1,601.6	TYPE III 12" 12" 7" I.D.+2W-38"
CONCRETE - CUBIC YARDS - TOTAL					6.0	6.6	7.3	8.0	9.5	11.1	
NOTE: QUANTITIES ARE BASED ON SAME SIZE PIPE ENTRANCE TO AND EXIT FROM, BASE AND A 4 FT. MANHOLE ENTRANCE INTO TOP SLAB OF BASE.											

QUANTITIES FOR CONCRETE MANHOLE BOX BASE



TYPICAL CHANNELIZATION DETAILS

GENERAL NOTES

1. SINCE ALL PIPE ENTRIES INTO THE BASE ARE VARIABLE, THE DIMENSIONS SHOWN ARE TYPICAL. ACTUAL DIMENSIONS AND QUANTITIES FOR CONCRETE AND REINFORCEMENT SHALL BE AS REQUIRED IN THE WORK.
2. THE PRECAST FLAT TOP MAY BE USED ON ANY MANHOLE. THE ECCENTRIC CONE MAY BE USED WHEN THE MANHOLE "H" HEIGHT IS AT LEAST 8 FT.
3. THE MANHOLE RING FRAME SHALL BE SET IN A BED OF GROUT. THE FRAME SHALL BE SURROUNDED WITH A CEMENT GROUT IN UNPAVED AREA, OR A CONCRETE COLLAR IN PAVED AREA. SEE DETAILS ON SHEETS 2 AND 3.
4. DESIGN OF BOX BASE IS BASED ON STRAIGHT RUNS OF PIPE OR CHANGE IN DIRECTION OF LESS THAN 45°. SPECIAL DESIGN IS REQUIRED FOR 45° OR GREATER.
5. PRECAST MANHOLES AND REINFORCEMENT SHALL CONFORM TO AASHTO M 199 (ASTM C 478).
6. CAST-IN-PLACE MANHOLES SHALL BE CLASS B CONCRETE.
7. STEPS SHALL BE REQUIRED WHEN THE MANHOLE DEPTH EXCEEDS 3 FT.-6 IN. AND SHALL CONFORM TO AASHTO M 199.
8. ALL REINFORCING STEEL SHALL BE GRADE 60 AND EPOXY COATED. VERTICAL STEEL SHALL BE PLACED AT CENTERLINE OF WALL. ALL BARS SHALL HAVE A 2 IN. MINIMUM CLEARANCE.
9. ALL PIPE ENTRIES INTO THE BASE OF MANHOLE SHALL BE CONNECTED BY OPEN CHANNELIZATION ADJUSTED FOR PIPE SIZE, SHAPE, SLOPE, AND DIRECTION OF FLOW. DETAILS SHOWN ARE TYPICAL FOR INSTALLATIONS WITH ALL INVERTS OF SAME RELATIVE ELEVATION. FOR EXCESSIVE ELEVATION DIFFERENCE BETWEEN INVERTS, SPECIAL BASE/CHANNEL DETAILS WILL BE SHOWN ON THE PLANS.
10. FLOW CHANNELS AND INVERTS SHALL BE FORMED BY SHAPING WITH CLASS B CONCRETE OR APPROVED GROUT.
11. STUB-OUTS SHALL EXTEND 2 FT. MINIMUM BEYOND OUTSIDE WALL SURFACE OF MANHOLE AND BE SATISFACTORILY PLUGGED.
12. THE SLOPE OF THE MANHOLE COVER SHALL MATCH THE ROADWAY PROFILE AND CROSS SLOPE.

▲ WHEN FINAL GRADE IS PAVEMENT SURFACE, RECESS MANHOLE RING AND COVER ¼" MIN. TO ½" MAX.

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Last Modification Date: 07/04/12 Initials: LTA	(R-X)		
Full Path: www.coloradodot.info/business/designsupport	(R-X)		
Drawing File Name: M06040200103.dgn	(R-X)		
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)		

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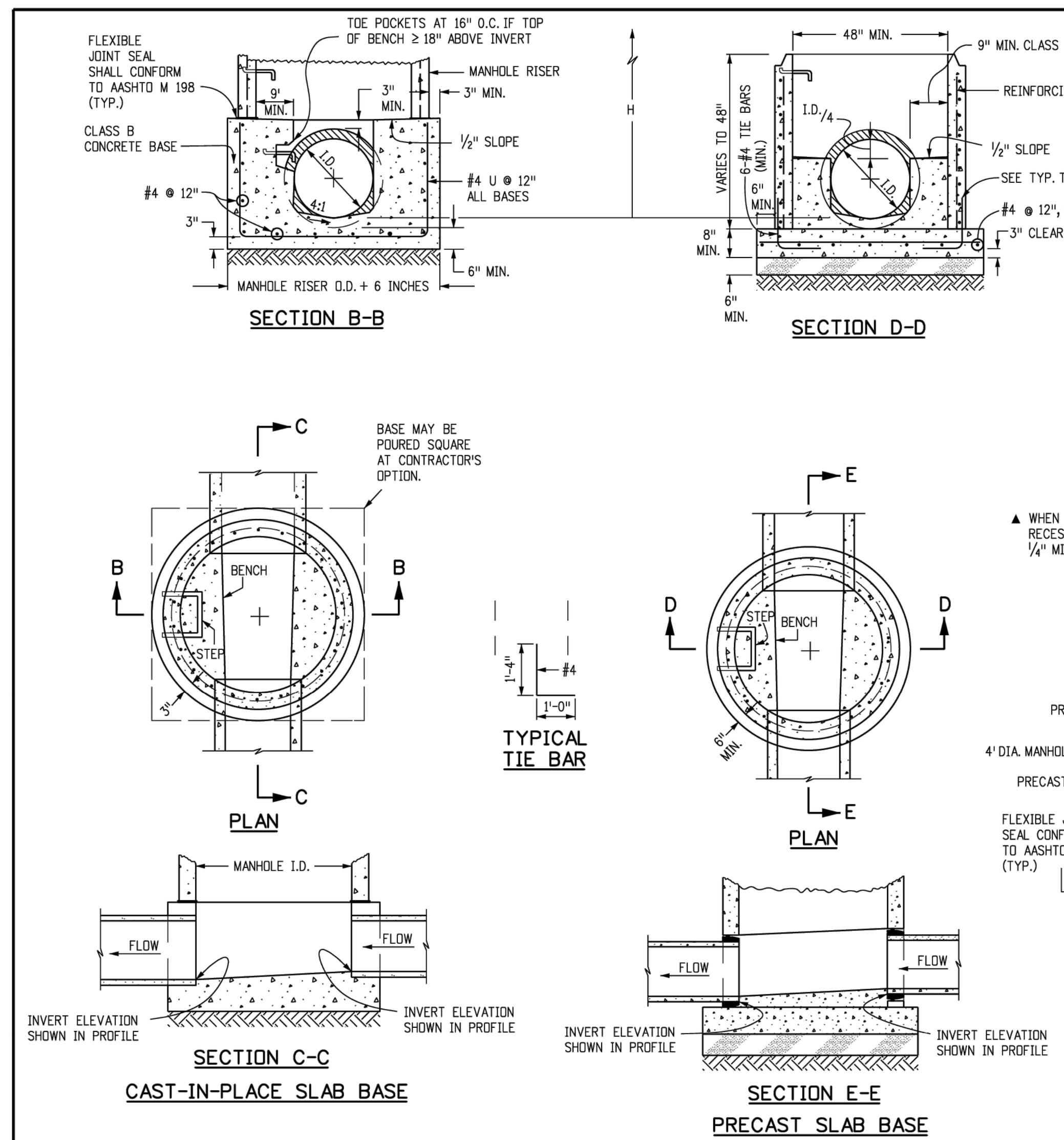
Project Development Branch DD/LTA

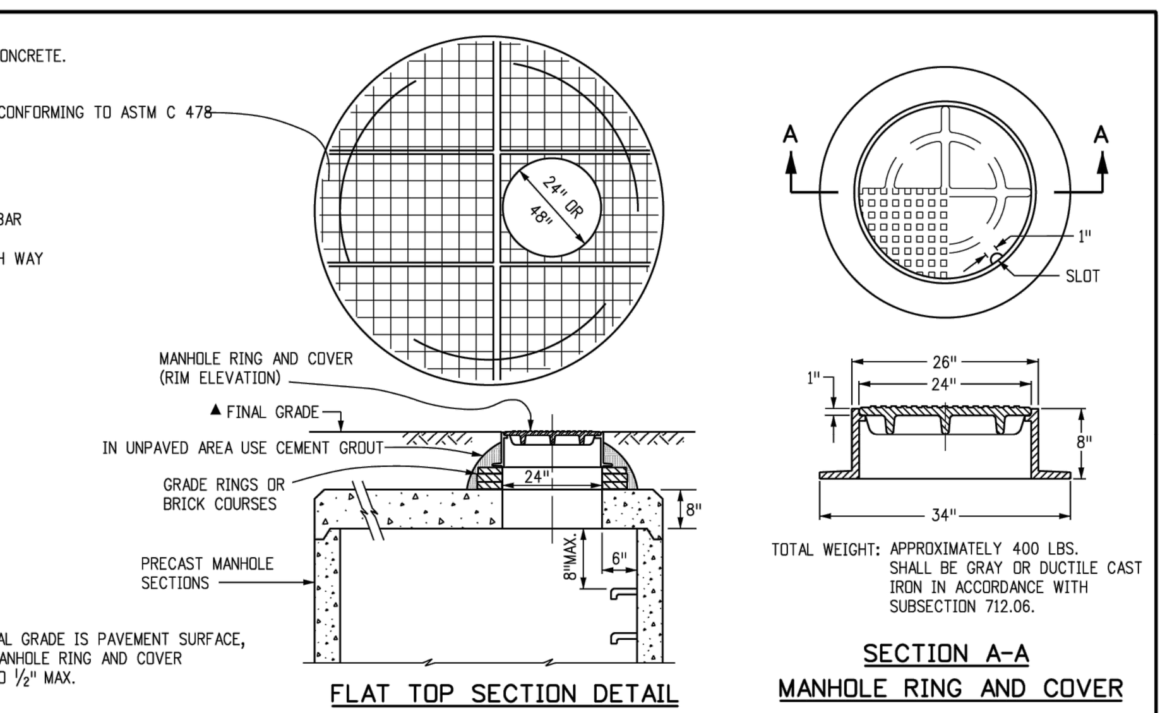
MANHOLES

Issued By: Project Development Branch July 4, 2012

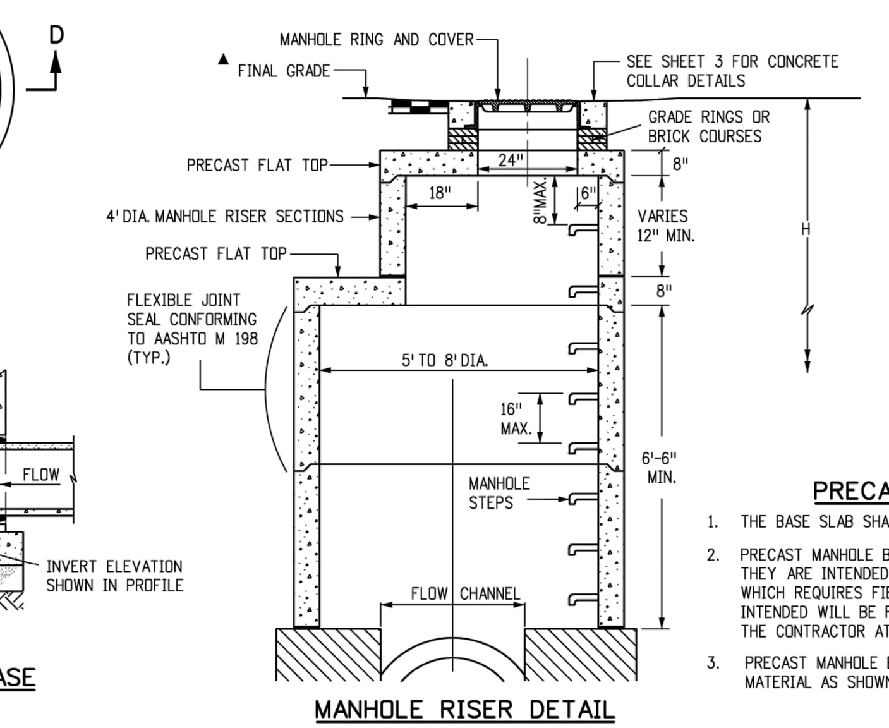
STANDARD PLAN NO. M-604-20
Sheet No. 1 of 3

H1 CDOT MANHOLE
NTS SN:





▲ WHEN FINAL GRADE IS PAVEMENT SURFACE, RECESS MANHOLE RING AND COVER ¼" MIN. TO ½" MAX.



LEGEND

- ▨ SUITABLE SUBGRADE
- ▨ GRANULAR BEDDING MATERIAL
- ▨ CONCRETE

PRECAST MANHOLE BASES NOTES:

1. THE BASE SLAB SHALL BE POURED MONOLITHICALLY WITH BOTTOM RISER SECTION.
2. PRECAST MANHOLE BASES SHALL FIT THE CONDITIONS AND LOCATIONS FOR WHICH THEY ARE INTENDED WITHOUT ANY FIELD MODIFICATIONS. ANY MANHOLE BASE WHICH REQUIRES FIELD CUTTING OR MODIFICATION IN ORDER TO FIT THE LOCATIONS INTENDED WILL BE REJECTED BY THE ENGINEER AND REMOVED AND REPLACED BY THE CONTRACTOR AT NO COST TO THE DEPARTMENT.
3. PRECAST MANHOLE BASES SHALL BE BEDDED ON AN APPROVED GRANULAR BEDDING MATERIAL AS SHOWN ABOVE.

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MANHOLES

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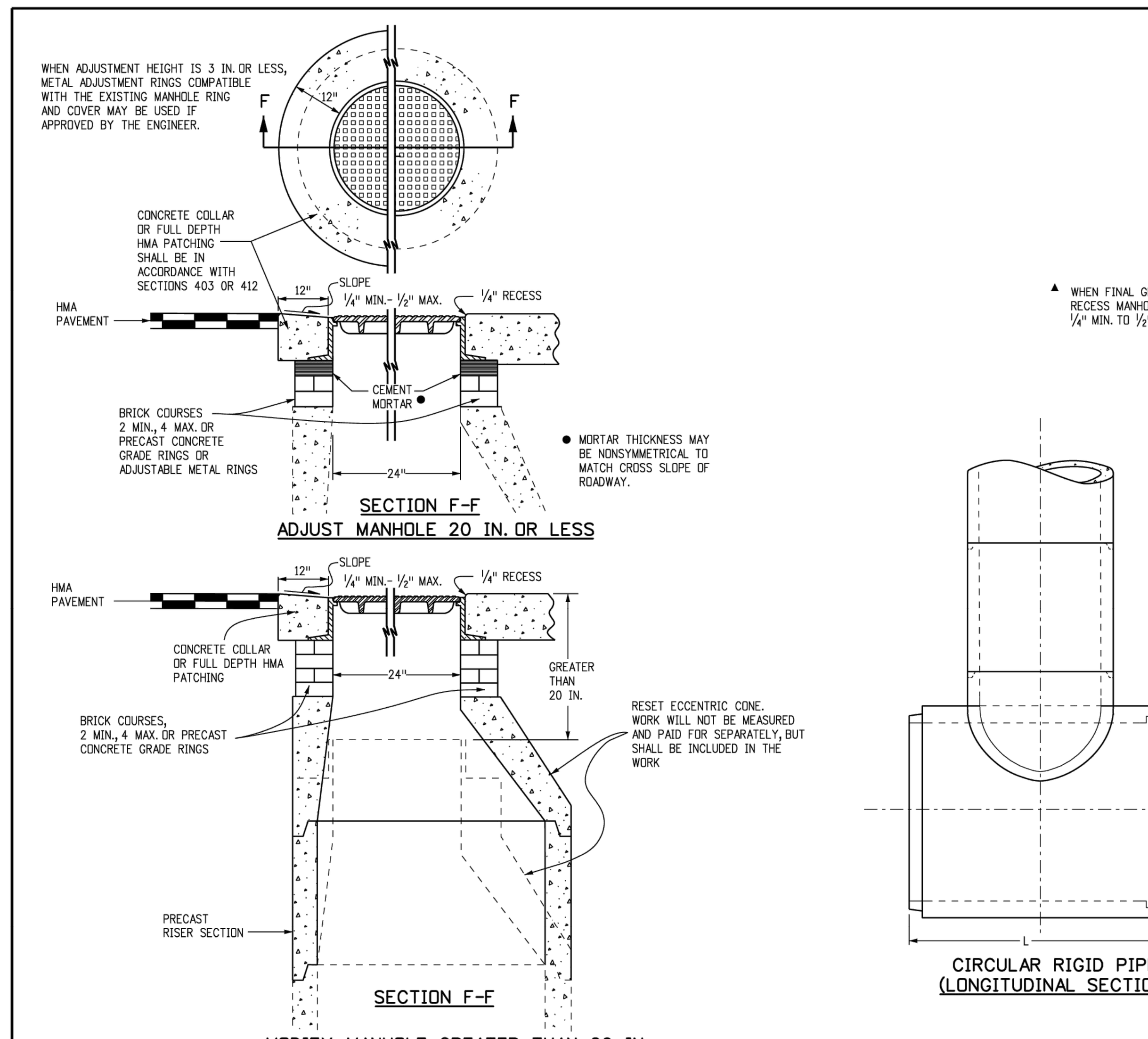
STANDARD PLAN NO. M-604-20
Sheet No. 2 of 3

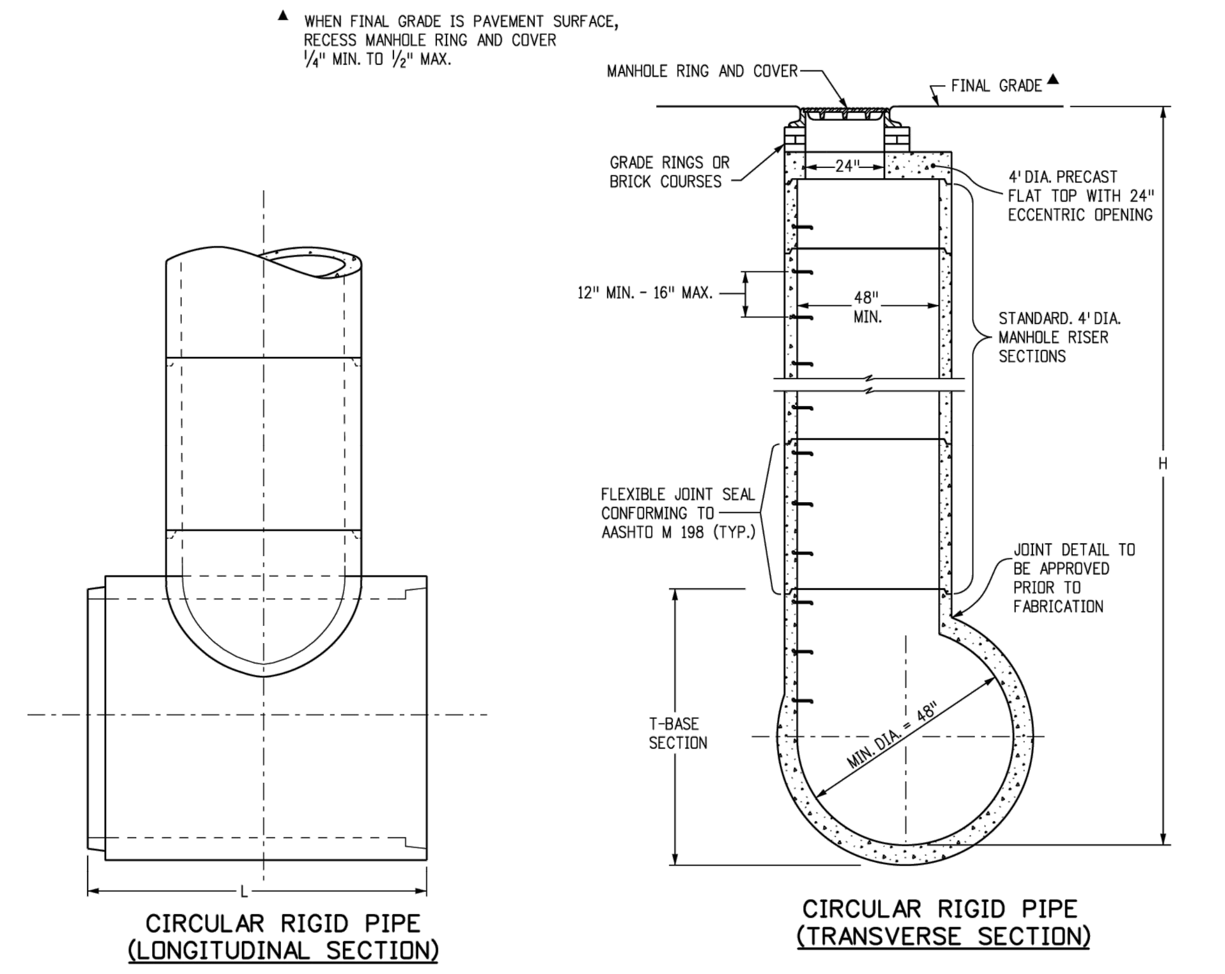
H8 CDOT MANHOLE
NTS SN:



T-BASE MANHOLES NOTES

1. THE T-BASE SECTION SHALL BE SHOP-FABRICATED FOR DELIVERY TO THE CONSTRUCTION SITE AS A COMPLETE UNIT.
2. THESE DETAILS SHOW ONLY THE CONCEPTUAL AND STANDARD DIMENSIONAL REQUIREMENTS FOR TYPE T-BASE MANHOLES. THE CONTRACTOR SHALL FURNISH DETAILED SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION. THE DETAILS SHOWN HEREIN APPLY ONLY TO 48 IN. AND GREATER DIAMETER PIPES.
3. EXCEPT FOR CLASS OF PIPE, SPECIFICATIONS FOR THE MANHOLE SHALL BE THE SAME AS THOSE REQUIRED FOR THE ADJOINING PIPE.
4. THE T-BASE SECTION SHALL MAINTAIN ITS INTERNAL SHAPE AND FLOW AREA. GROUTING OR FILLING SHALL BE APPLIED SO AS TO NOT DISTURB THE NORMAL FLOW OR REDUCE THE AREA.

▲ WHEN FINAL GRADE IS PAVEMENT SURFACE, RECESS MANHOLE RING AND COVER ¼" MIN. TO ½" MAX.



MANHOLE T-BASE

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MANHOLES

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STANDARD PLAN NO. M-604-20
Sheet No. 3 of 3

A1 CDOT MANHOLE
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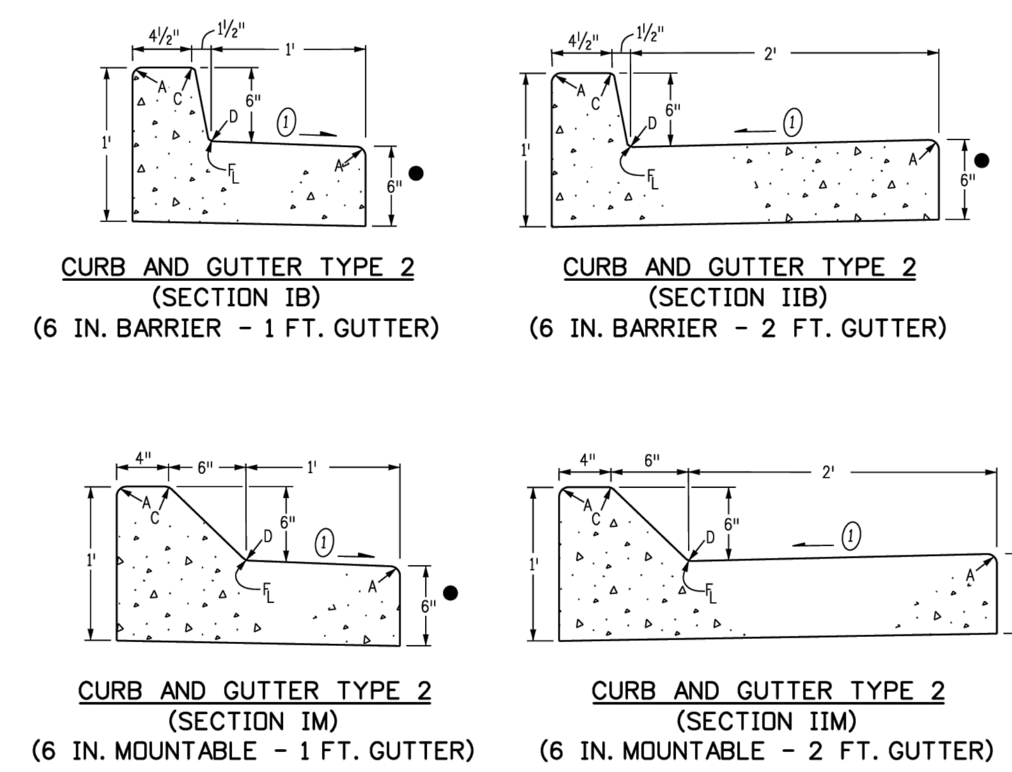
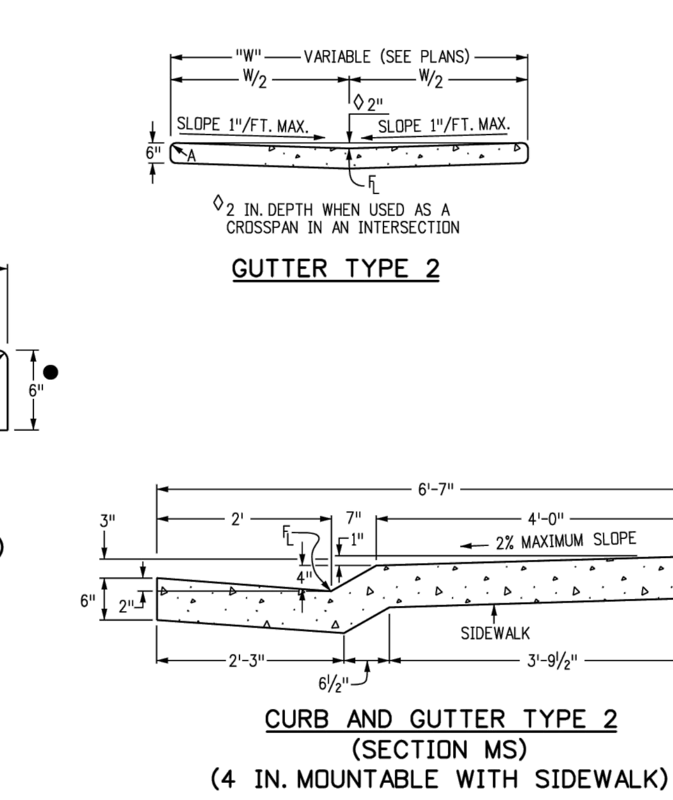
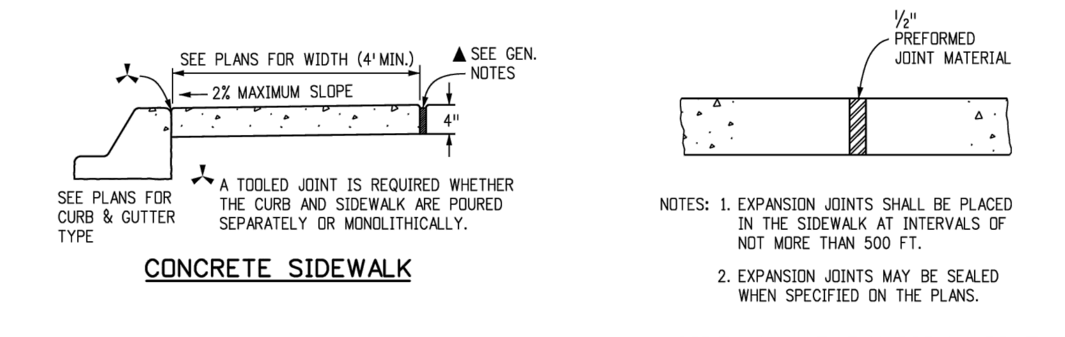






GENERAL NOTES

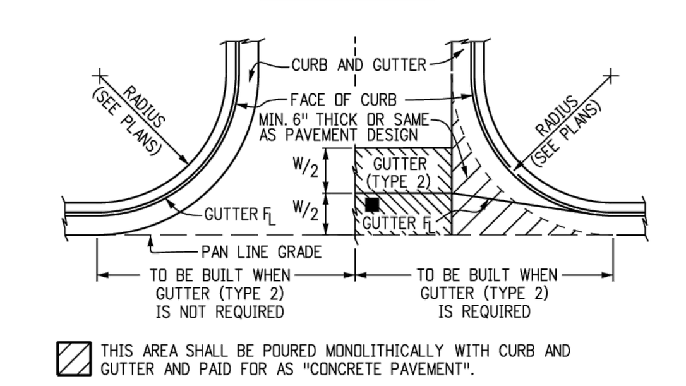
1. ON ROADWAY CURVES WITH A RADIUS OF 1,900 FT. OR LESS, CURBS AND GUTTERS ARE TO BE PLACED ON THE ARC OF THE CURVE, UNLESS OTHERWISE NOTED ON THE PLANS. A MAXIMUM CHORD LENGTH OF 10 FT. MAY BE USED WHEN THE CURVE RADIUS IS GREATER THAN 1,900 FT.
2. CONCRETE SHALL BE CLASS B.
3. PROFILE GRADE OF CURBS AND GUTTERS SHALL BE LOCATED AT THE FLOW LINE.
4. CURB TYPE 4 (KEY-WAY) MAY BE USED IN LIEU OF CURB AND GUTTER TYPE 2 (SECTIONS IB AND IM) UNLESS OTHERWISE SPECIFIED ON THE PLANS.
5. GUTTER CROSS SLOPES MAY BE ADJUSTED TO FACILITATE DRAINAGE FOR PROFILE GRADES AS SHOWN ON THE PLANS.
6. THICKNESS OF CURB AND GUTTER SECTION SHALL MATCH CONCRETE PAVEMENT THICKNESS IF SHOWN ON THE PLANS. CURB AND GUTTER SHALL BE CLASS P CONCRETE IF PLACED MONOLITHICALLY WITH CONCRETE PAVEMENT.
7. INCREASE SIDEWALK THICKNESS TO 6 IN. AT LOCATIONS SHOWN ON THE PLANS.
8. MINIMUM SIDEWALK WIDTH IS 4 FT.

▲ EXPANSION JOINTS SHALL BE INSTALLED WHEN ABUTTING EXISTING CONCRETE OR FIXED STRUCTURE. EXPANSION JOINT MATERIAL SHALL BE ½ IN. THICK AND SHALL EXTEND THE FULL DEPTH OF CONTACT SURFACE.

(1) GUTTER CROSS SLOPES SHALL BE ½ IN./FT. WHEN DRAINING AWAY FROM CURB AND 1IN./FT. WHEN DRAINING TOWARD CURB.

● WHEN TIE BARS ARE REQUIRED, THE GUTTER THICKNESS SHALL BE INCREASED TO THE PAVEMENT THICKNESS (T). BARS SHALL BE EPOXY-COATED #4 CONFORMING TO AASHTO M 284 AND SPACED AT 3 FT. INTERVALS. THEY SHALL BE INSERTED T/2 AND 1#2 LENGTH INTO THE GUTTER.

LEGEND FOR RADII
A = ⅛" TO ¼"
B = 1"
C = 1½"
D = 1½" TO 2"



CONSTRUCTION OF CONCRETE GUTTERS AT INTERSECTION

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Last Modification Date: 07/19/12 Initials: LTA	(R-X)	07/09/09	Added Note 2 to Sidewalk Expansion Joint detail.
Full Path: www.dot.state.co.us/DesignSupport/		07/09/09	Revised General Note 4.
Drawing File Name: 609010104.dgn	(R-X)	07/09/09	Rev sheets 1 and 2. Add sheet 4.
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English	(R-X)	07/19/12	Changed Tie Bar spacing from 30" to 36".

Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, Colorado 80222
Phone: (303) 757-9083
Fax: (303) 757-9820
Project Development Branch DD/LTA

CURB, GUTTERS, AND SIDEWALKS

Issued By: Project Development Branch on July 04, 2006

STANDARD PLAN NO. M-609-1
Sheet No. 1 of 4

A8 CDOT CURB AND GUTTER
NTS SN:

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Fort Collins, Colorado 80525 (970) 822-7911
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3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

############

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Kimley-Horn and Associates, Inc.

PROJECT NO. 096888037

SHEET C500

K:\DEN_Civil\096888037_QuikTrip 4270 Adams County_Berkely Center Subdivision\CADD\PlanSheets\CDs\096888037_DT.dwg

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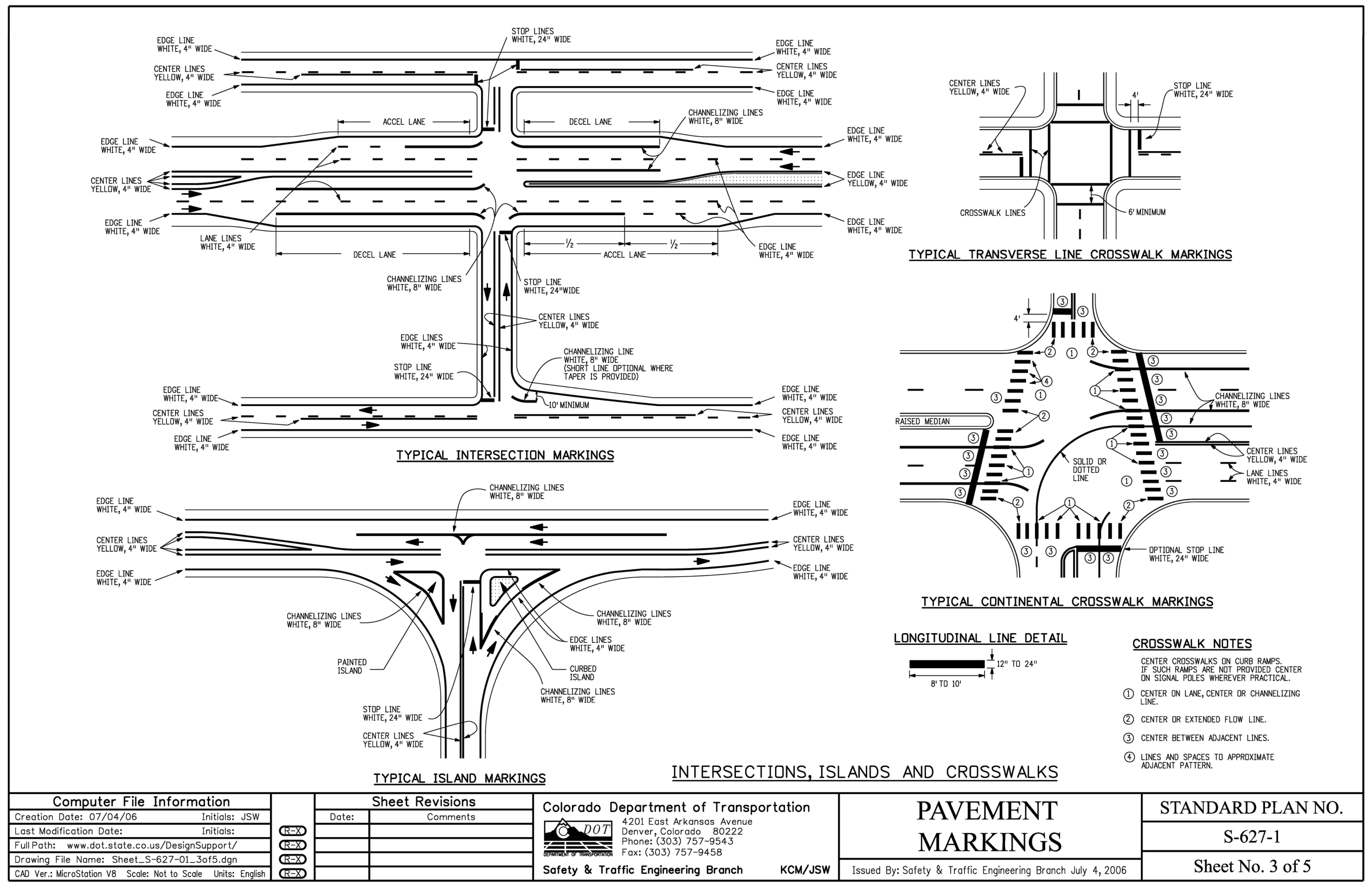
CASE NO. PLT2023-0056



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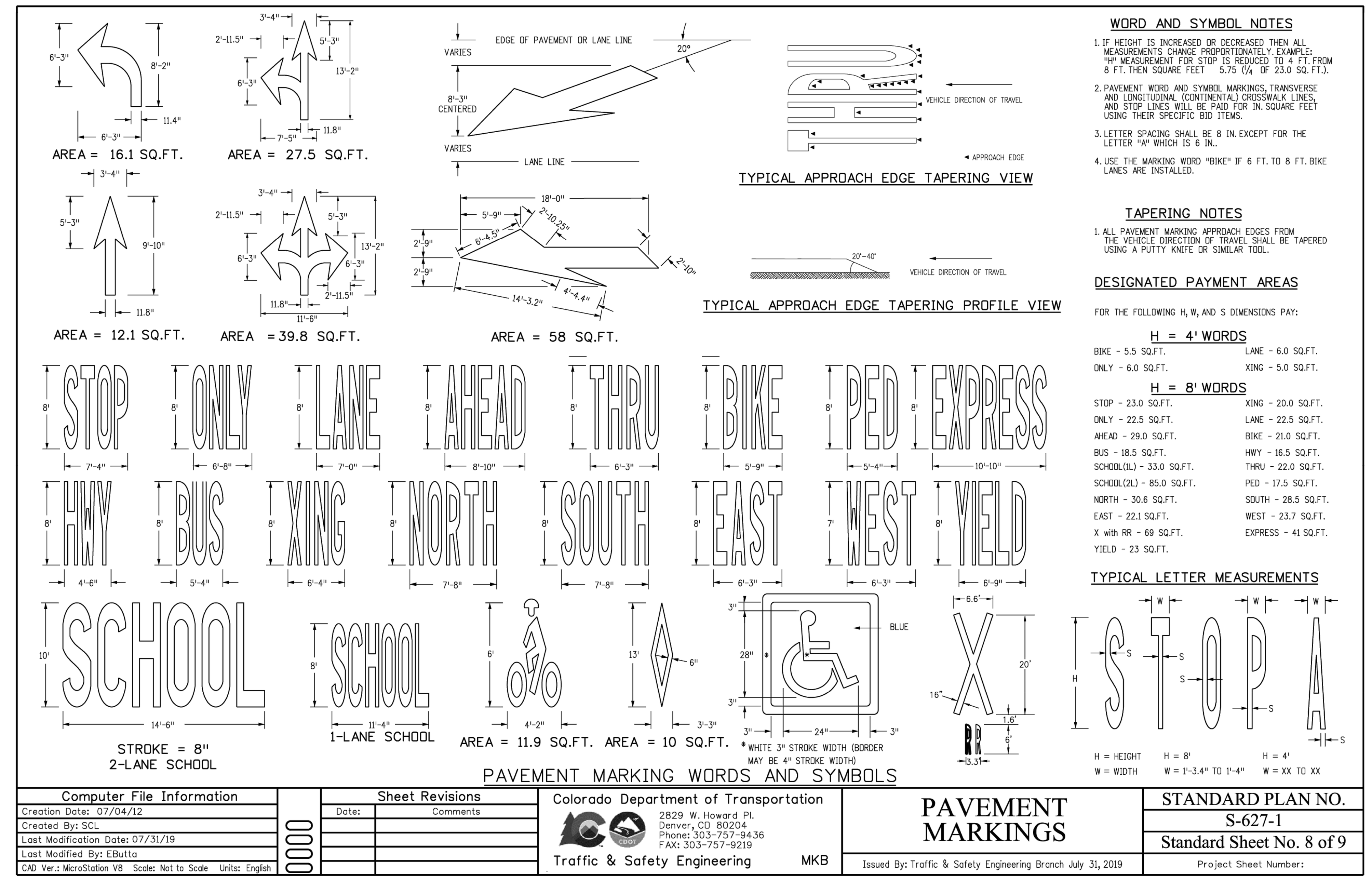
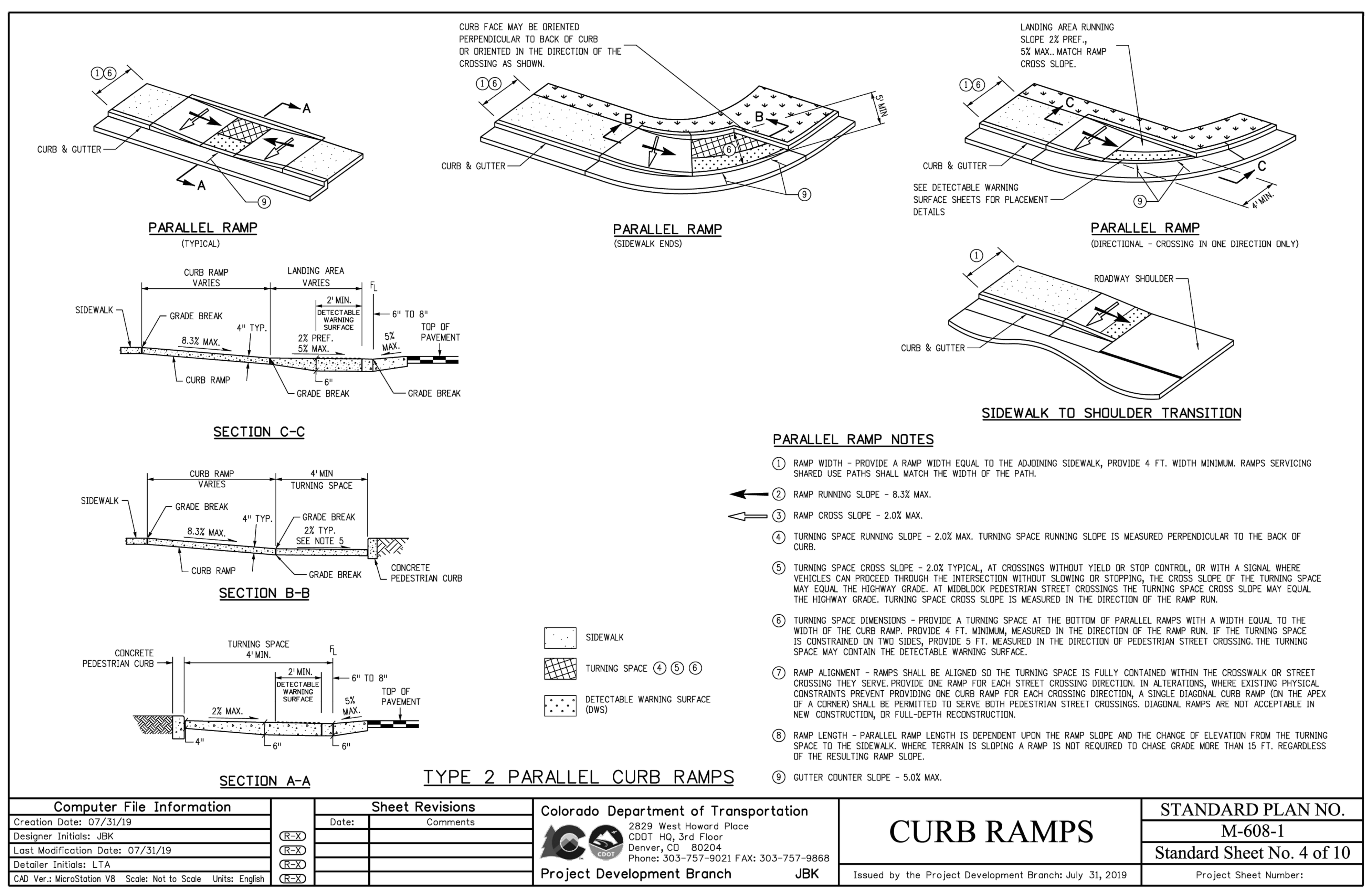
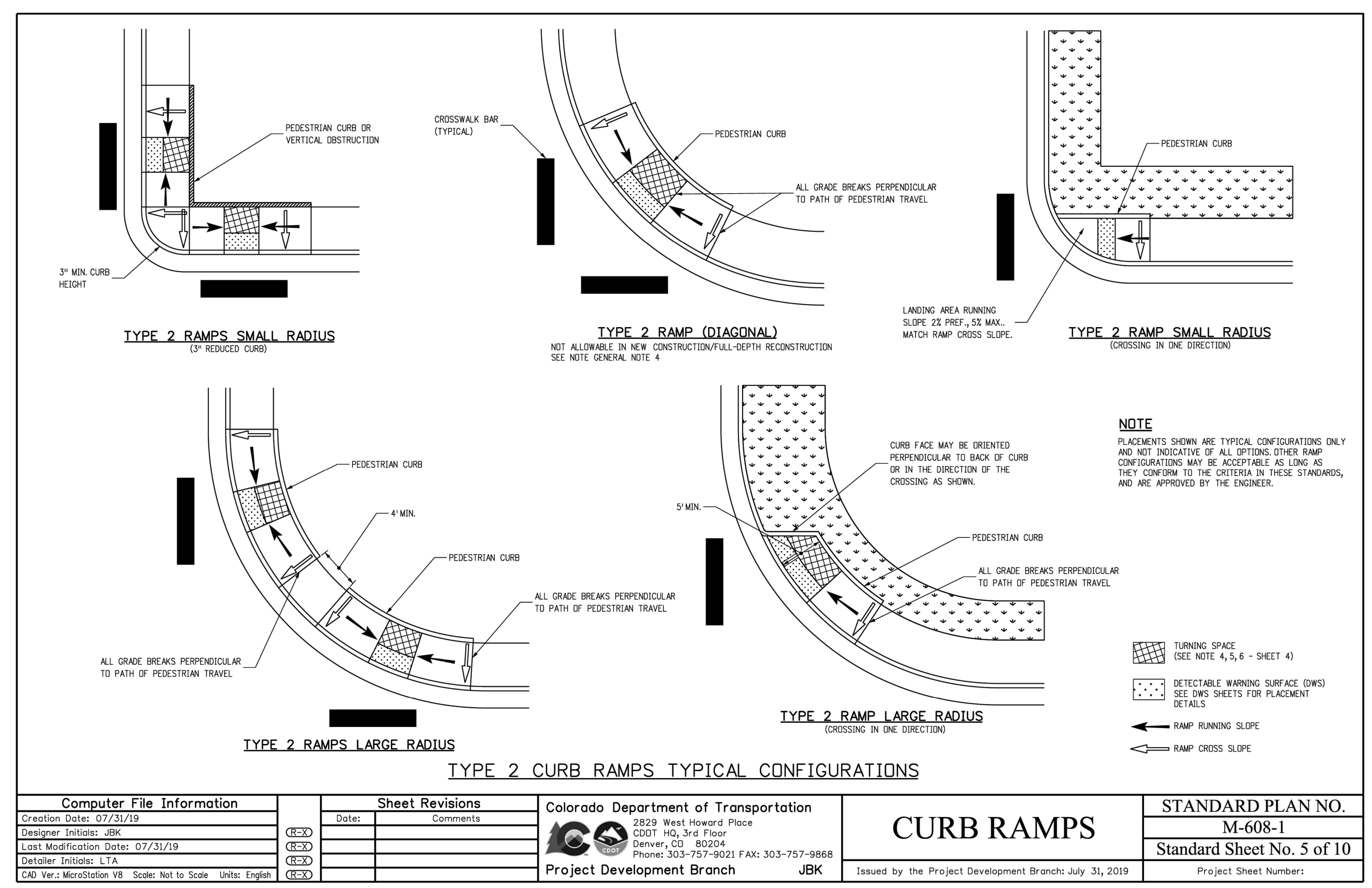


H1	PAVEMENT MARKINGS	
NTS	SN:	
H8	PAVEMENT MARKINGS	
NTS	SN:	





A1	CDOT CURB RAMPS	
NTS	SN:	
A8	CDOT CURB RAMPS	
NTS	SN:	

NO.	REVISION	BY	DATE	APPR.

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08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

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PROJECT NO.
096888037

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C501

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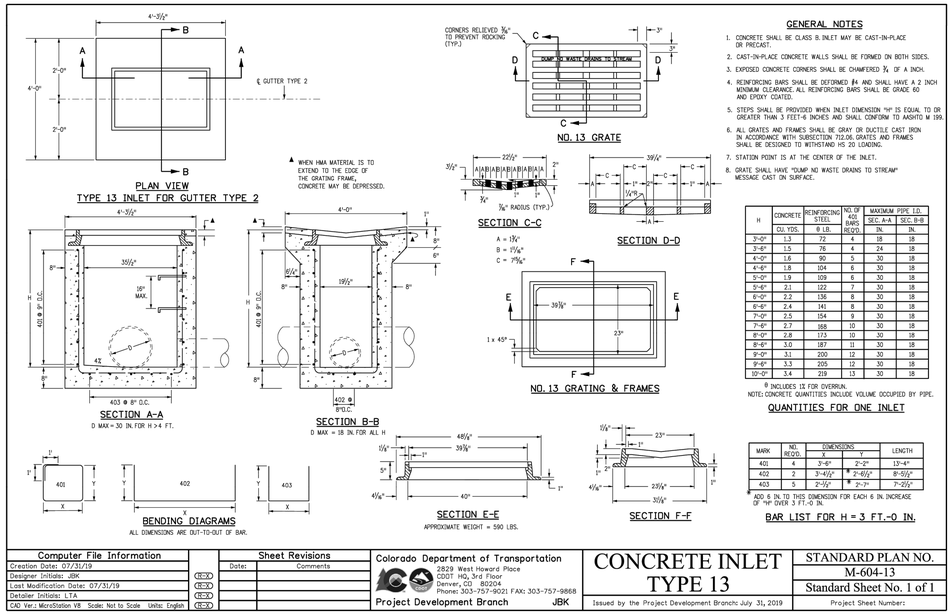


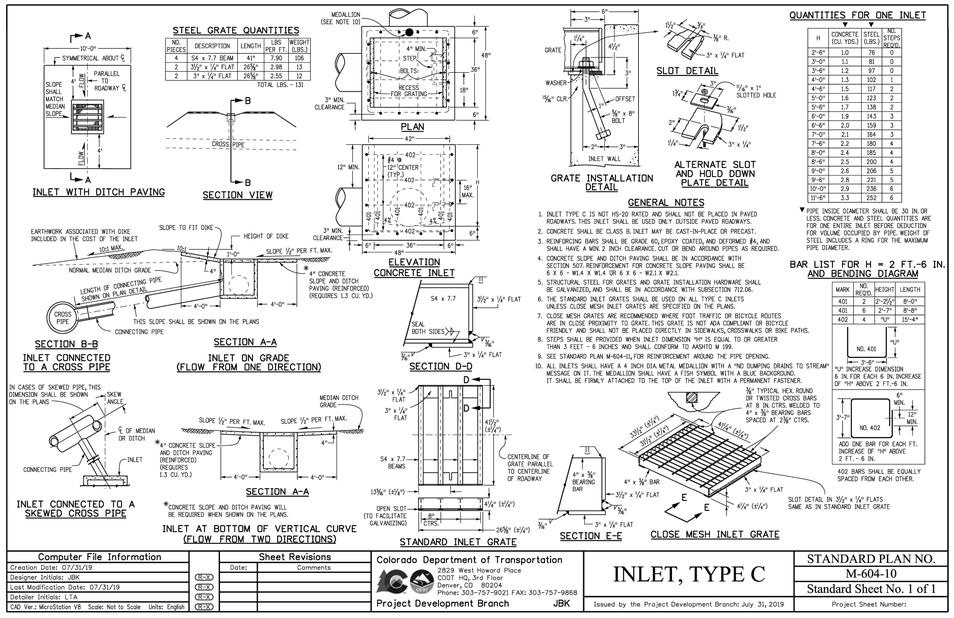
Computer File Information		Sheet Revisions	
Creation Date: 07/31/19		Date:	Comments
Designer Initials: JBK			
Last Modification Date: 07/31/19			
Detailer Initials: LTA			
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English			

Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

CONCRETE INLET TYPE 13

STANDARD PLAN NO. M-604-13
Standard Sheet No. 1 of 1
Issued by the Project Development Branch: July 31, 2019
Project Sheet Number:

H1 | CDOT INLET TYPE 13
NTS | SN:



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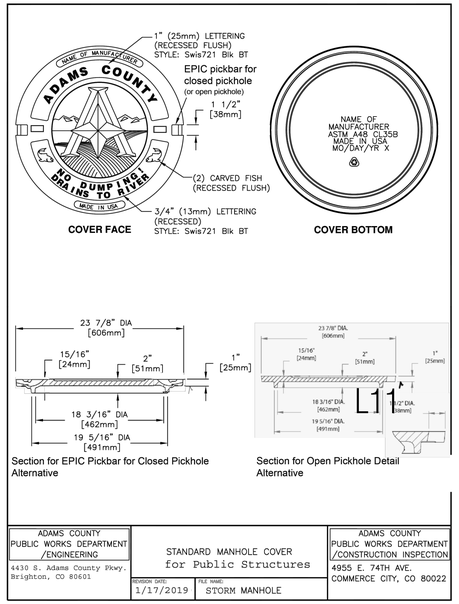
Colorado Department of Transportation
2829 West Howard Place
CDOT HQ, 3rd Floor
Denver, CO 80204
Phone: 303-757-9021 FAX: 303-757-9868
Project Development Branch JBK

INLET, TYPE C

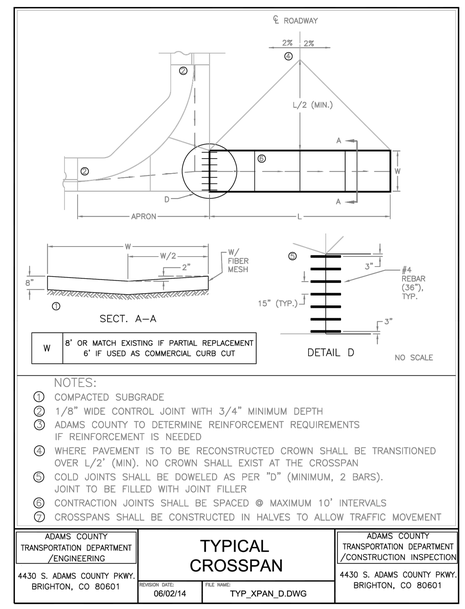
STANDARD PLAN NO.
Standard Sheet No. 1 of 1
Issued by the Project Development Branch: July 31, 2019
Project Sheet Number:

A1 | CDOT INLET TYPE C
NTS | SN:



ADAMS COUNTY PUBLIC WORKS DEPARTMENT /ENGINEERING	STANDARD MANHOLE COVER for Public Structures	ADAMS COUNTY PUBLIC WORKS DEPARTMENT /CONSTRUCTION INSPECTION
4430 S. Adams County Pkwy. Brighton, CO 80601	REVISION DATE: 1/17/2019 FILE NAME: STORM MANHOLE	4955 E. 74TH AVE. COMMERCE CITY, CO 80022

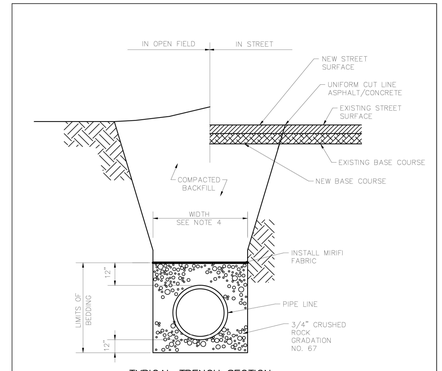
H8 | STANDARD MANHOLE COVER
NTS | SN:



W | 8' OR MATCH EXISTING IF PARTIAL REPLACEMENT
6' IF USED AS COMMERCIAL CURB CUT

ADAMS COUNTY TRANSPORTATION DEPARTMENT /ENGINEERING	TYPICAL CROSSPAN	ADAMS COUNTY TRANSPORTATION DEPARTMENT /CONSTRUCTION INSPECTION
4430 S. ADAMS COUNTY PKWY. BRIGHTON, CO 80601	REVISION DATE: 06/02/14 FILE NAME: TYP_XPAN_D.DWG	4430 S. ADAMS COUNTY PKWY. BRIGHTON, CO 80601

A8 | TYP. CROSSPAN
NTS | SN:

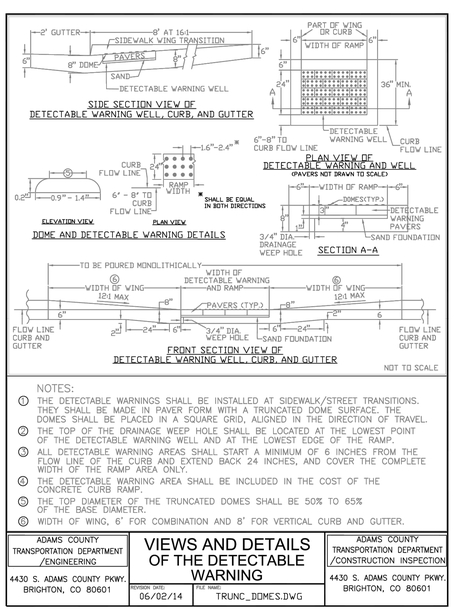


CRESTVIEW WATER & SANITATION DISTRICT

TYPICAL TRENCH

Scale: NONE Date: APRIL 2023
Revised: . Detail:

H12 | TYP. TRENCH
NTS | SN:



ADAMS COUNTY TRANSPORTATION DEPARTMENT /ENGINEERING	VIEWS AND DETAILS OF THE DETECTABLE WARNING	ADAMS COUNTY TRANSPORTATION DEPARTMENT /CONSTRUCTION INSPECTION
4430 S. ADAMS COUNTY PKWY. BRIGHTON, CO 80601	REVISION DATE: 06/02/14 FILE NAME: TRUNC_DOMES.DWG	4430 S. ADAMS COUNTY PKWY. BRIGHTON, CO 80601

A12 | DETECTABLE WARNING
NTS | SN:

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FORT COLLINS, COLORADO 80525 (970) 822-7911

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DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.
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SHEET C502

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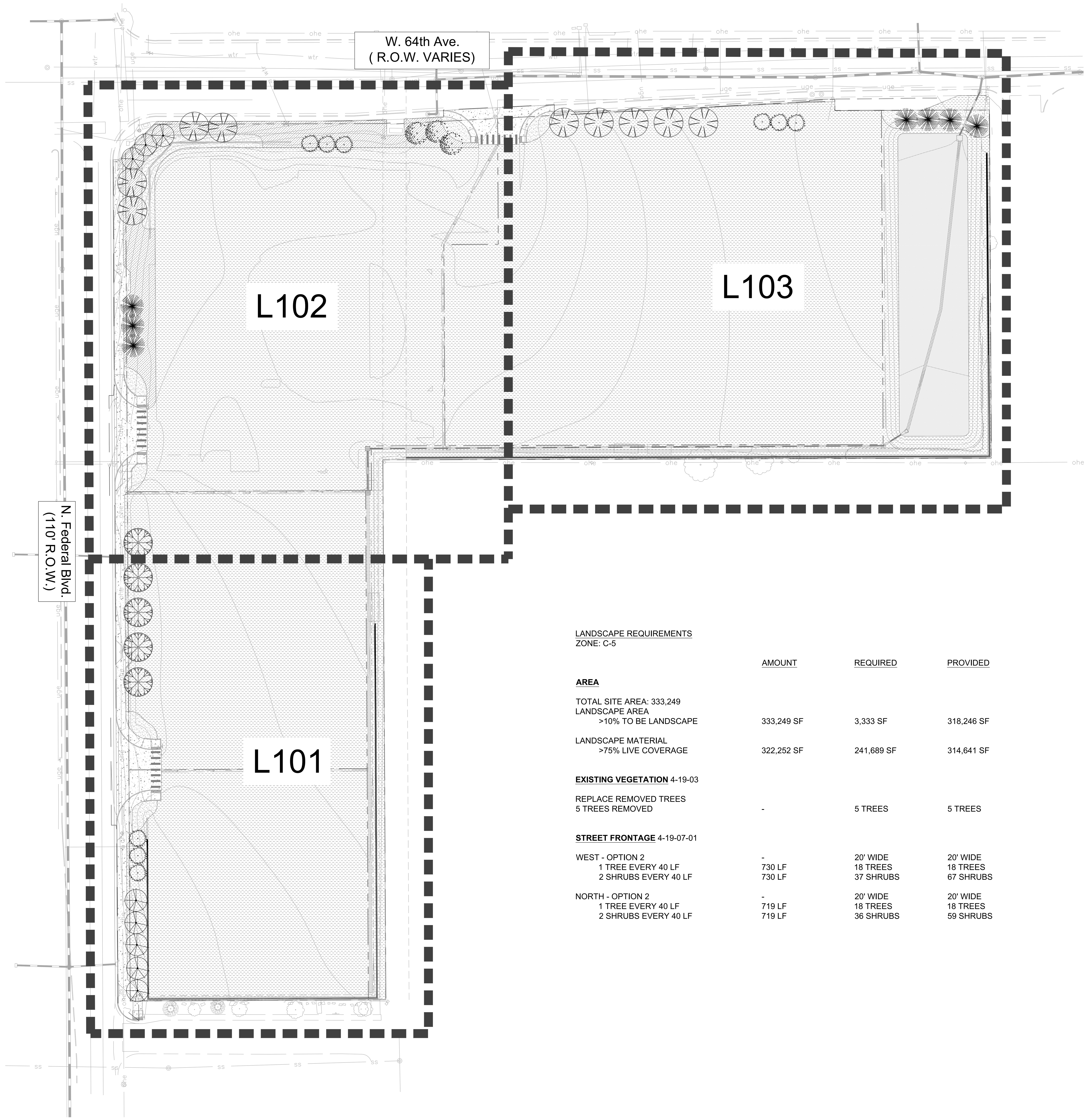
CASE NO. PLT2023-0056



SITE LEGEND

Symbol	Description
	PROPERTY LINE
	CONCRETE CURB AND GUTTER
	MOUNTABLE CURB W/RADIUS PROTECTOR (INTERNAL TO SITE ONLY)
#	PARKING SPACE INDICATOR
	AREA LIGHT
	MULTIPLE PRODUCT DISPENSER WITH CANOPY COLUMNS AND BOLLARDS
TFR	TRANSFORMER
	FUEL SYSTEM ACCESS MANWAY

Landscape Schedule

USE	SYMBOL	COMMON NAME *Botanical Name*	MINIMUM SIZE/ HEIGHT/SPREAD	QUANTITIES	COMMENTS
SHRUBS		MANZANITA 'PANCHITO' *Arctostaphylos manzanita*	HEIGHT/SPREAD 18"ø X 48" HT MIN 5 GAL.	28	SEE LANDSCAPE PLAN AND ASSOCIATED DETAILS FOR LANDSCAPE BED LOCATIONS AND SHRUB SPACING
		RUSSIAN SAGE *Perovskia atriplicifolia*	HEIGHT/SPREAD 48"ø X 48" HT MIN 5 GAL.	52	
		PAWNEE BUTTES SAND CHERRY *Prunus basseyi 'Pawnee Buttes'*	HEIGHT/SPREAD 18"ø X 72" HT MIN 5 GAL.	9	
		SPANISH GOLD BROOM *Cytisus purgon 'Spanish Gold'*	HEIGHT/SPREAD 48"ø X 72" HT MIN 5 GAL.	16	
		ARCADIA JUNIPER *Juniperus sabina 'Arcadia'*	HEIGHT/SPREAD 24"ø X 48" HT MIN 5 GAL.	20	
		REEDGRASS *Calamagrostis Acutiflora 'Karl'*	HEIGHT/SPREAD 30"ø X 30" HT MIN 1 GAL.	10	
FRONTAGE TREES		STREET KEEPER HONEYLOCUST *Gleditsia tricanthos 'Draves'*	2" CALIPER 45'X20'	9	SEE LANDSCAPE PLAN AND ASSOCIATED DETAILS FOR TREE PLACEMENT, AND PLANTING SPECIFICATIONS CONTRACTOR TO VERIFY TREE TYPE, LOCATION, SIZE, HEIGHT, AND SPREAD WITH QT REPRESENTATIVE PRIOR TO INSTALLATION
		LACEBARK ELM *Ulmus Parvifolia*	2" CALIPER 40'X30'	8	
FILL TREES		ARISTOCRAT PEAR *Pyrus Calleryana*	2" CALIPER 15'X12'	3	
		RED MAPLE *Acer rubrum*	2" CALIPER 40'X30'	5	
SCREENING TREES		PINYON PINE *Pinus edulis*	6' MINIMUM HT 25'X15'	7	
		BLACK HILLS SPRUCE *Picea glauca 'Densata'*	6' MINIMUM HT 20'X10'	9	
MISC		DETENTION POND SEED MIX		15,619 S.F.	
		KEN-TEX BLUEGRASS		11,131 S.F.	
		NATIVE SHORT GRASS SEED MIX		289,060 S.F.	
		2"-3" RIVER ROCK MULCH		5,344 S.F.	

LANDSCAPE REQUIREMENTS
ZONE: C-5

	AMOUNT	REQUIRED	PROVIDED
AREA			
TOTAL SITE AREA: 333,249			
LANDSCAPE AREA			
>10% TO BE LANDSCAPE	333,249 SF	3,333 SF	318,246 SF
LANDSCAPE MATERIAL			
>75% LIVE COVERAGE	322,252 SF	241,689 SF	314,641 SF
EXISTING VEGETATION 4-19-03			
REPLACE REMOVED TREES			
5 TREES REMOVED	-	5 TREES	5 TREES
STREET FRONTAGE 4-19-07-01			
WEST - OPTION 2	-	20' WIDE	20' WIDE
1 TREE EVERY 40 LF	730 LF	18 TREES	18 TREES
2 SHRUBS EVERY 40 LF	730 LF	37 SHRUBS	67 SHRUBS
NORTH - OPTION 2	-	20' WIDE	20' WIDE
1 TREE EVERY 40 LF	719 LF	18 TREES	18 TREES
2 SHRUBS EVERY 40 LF	719 LF	36 SHRUBS	59 SHRUBS

N

50 25 0 50 100

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NO.	REVISION	BY	DATE	APPR.

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FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AMC
DRAWN BY: AMC
CHECKED BY: CPH
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

OVERALL LANDSCAPE PLAN

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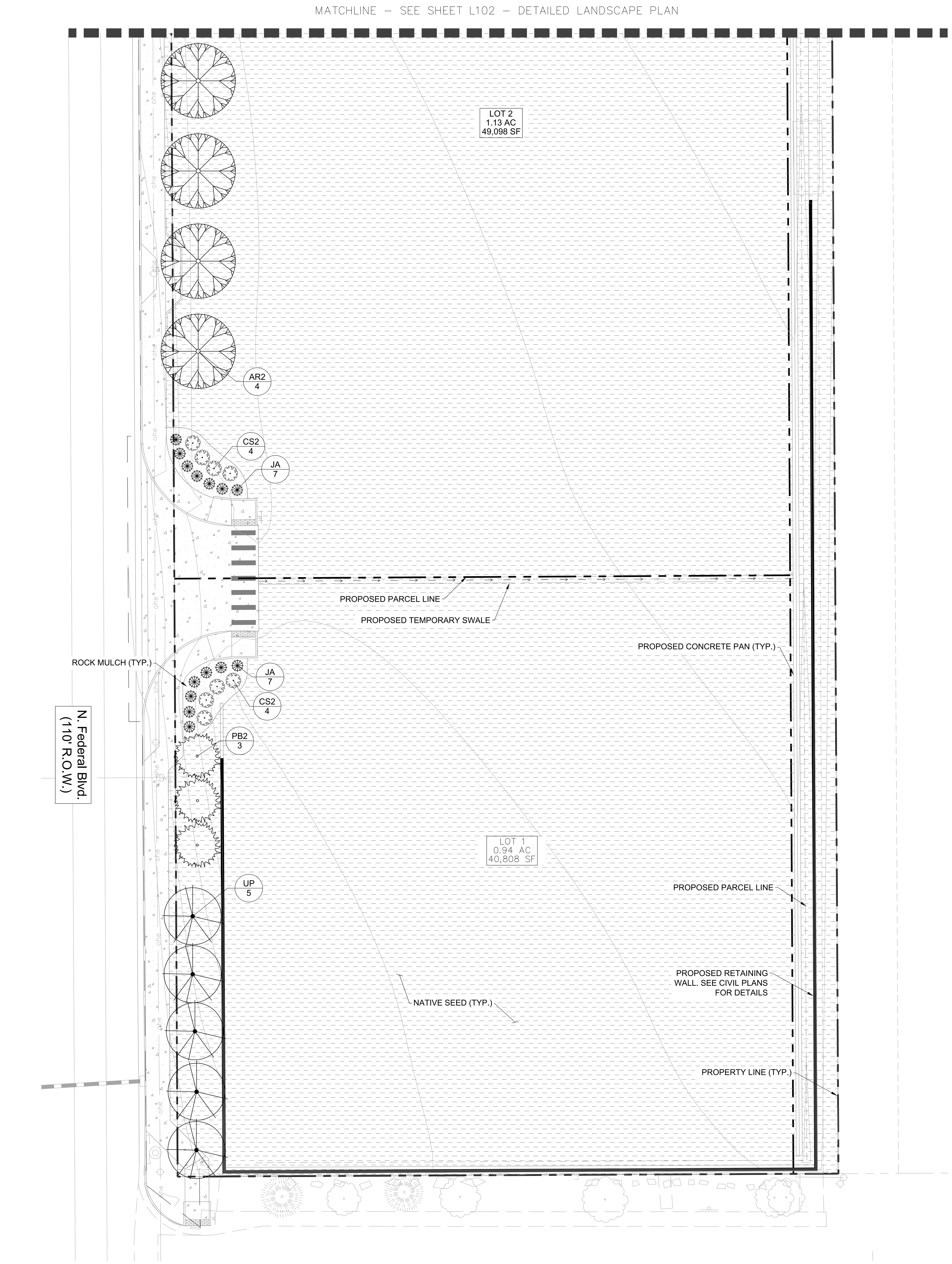
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
L100



SITE LEGEND

- PROPERTY LINE
- CONCRETE CURB AND GUTTER
- MOUNTABLE CURB W/RADIUS PROTECTOR (INTERNAL TO SITE ONLY)
- PARKING SPACE INDICATOR
- AREA LIGHT
- MULTIPLE PRODUCT DISPENSER WITH CANOPY COLUMNS AND BOLLARDS
- TFR TRANSFORMER
- FUEL SYSTEM ACCESS MANWAY

Landscape Schedule

USE	SYMBOL	COMMON NAME *Botanical Name*	MINIMUM SIZE/ HEIGHT/SPREAD	QUANTITIES	COMMENTS
SHRUBS		MANZANITA 'PANCHITO' *Arctostaphylos manzanita*	HEIGHT/SPREAD 18"ø X 48" HT MIN 5 GAL.	28	SEE LANDSCAPE PLAN AND ASSOCIATED DETAILS FOR LANDSCAPE BED LOCATIONS AND SHRUB SPACING
		RUSSIAN SAGE *Perovskia atriplicifolia*	HEIGHT/SPREAD 48"ø X 48" HT MIN 5 GAL.	52	
		PAWNEE BUTTES SAND CHERRY *Prunus basseyi 'Pawnee Buttes'*	HEIGHT/SPREAD 18"ø X 72" HT MIN 5 GAL.	9	
		SPANISH GOLD BROOM *Cytisus purgon 'Spanish Gold'*	HEIGHT/SPREAD 48"ø X 72" HT MIN 5 GAL.	16	
		ARCADIA JUNIPER *Juniperus sabina 'Arcadia'*	HEIGHT/SPREAD 24"ø X 48" HT MIN 5 GAL.	20	
		REEDGRASS *Calamagrostis Acutiflora 'Karl'*	HEIGHT/SPREAD 30"ø X 30" HT MIN 1 GAL.	10	
FRONTAGE TREES		STREET KEEPER HONEYLOCUST *Gleditsia tricanthos 'Draves'*	2" CALIPER 45'X20'	9	SEE LANDSCAPE PLAN AND ASSOCIATED DETAILS FOR TREE PLACEMENT, AND PLANTING SPECIFICATIONS CONTRACTOR TO VERIFY TREE TYPE, LOCATION, SIZE, HEIGHT, AND SPREAD WITH QT REPRESENTATIVE PRIOR TO INSTALLATION
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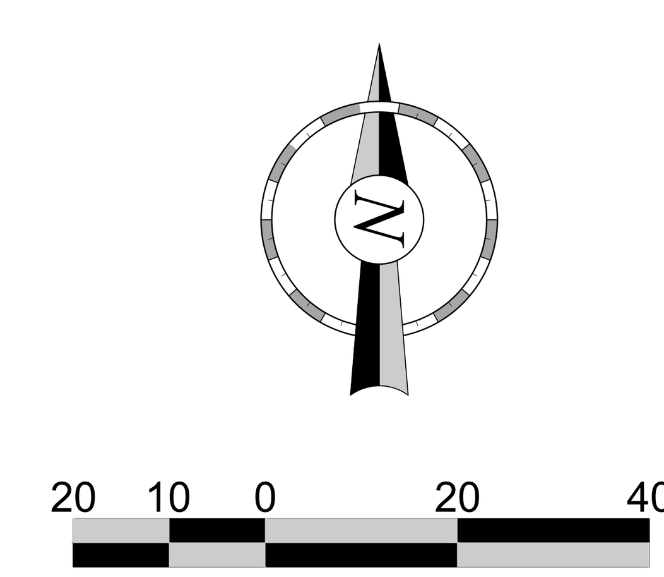
		BLACK HILLS SPRUCE *Picea glauca 'Densata'*	6' MINIMUM HT 20'X10'	9	
MISC		DETENTION POND SEED MIX		15,619 S.F.	
		KEN-TEX BLUEGRASS		11,131 S.F.	
		NATIVE SHORT GRASS SEED MIX		289,060 S.F.	
		2"-3" RIVER ROCK MULCH		5,344 S.F.	



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FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AMC
DRAWN BY: AMC
CHECKED BY: CPH
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

DETAILED LANDSCAPE PLAN

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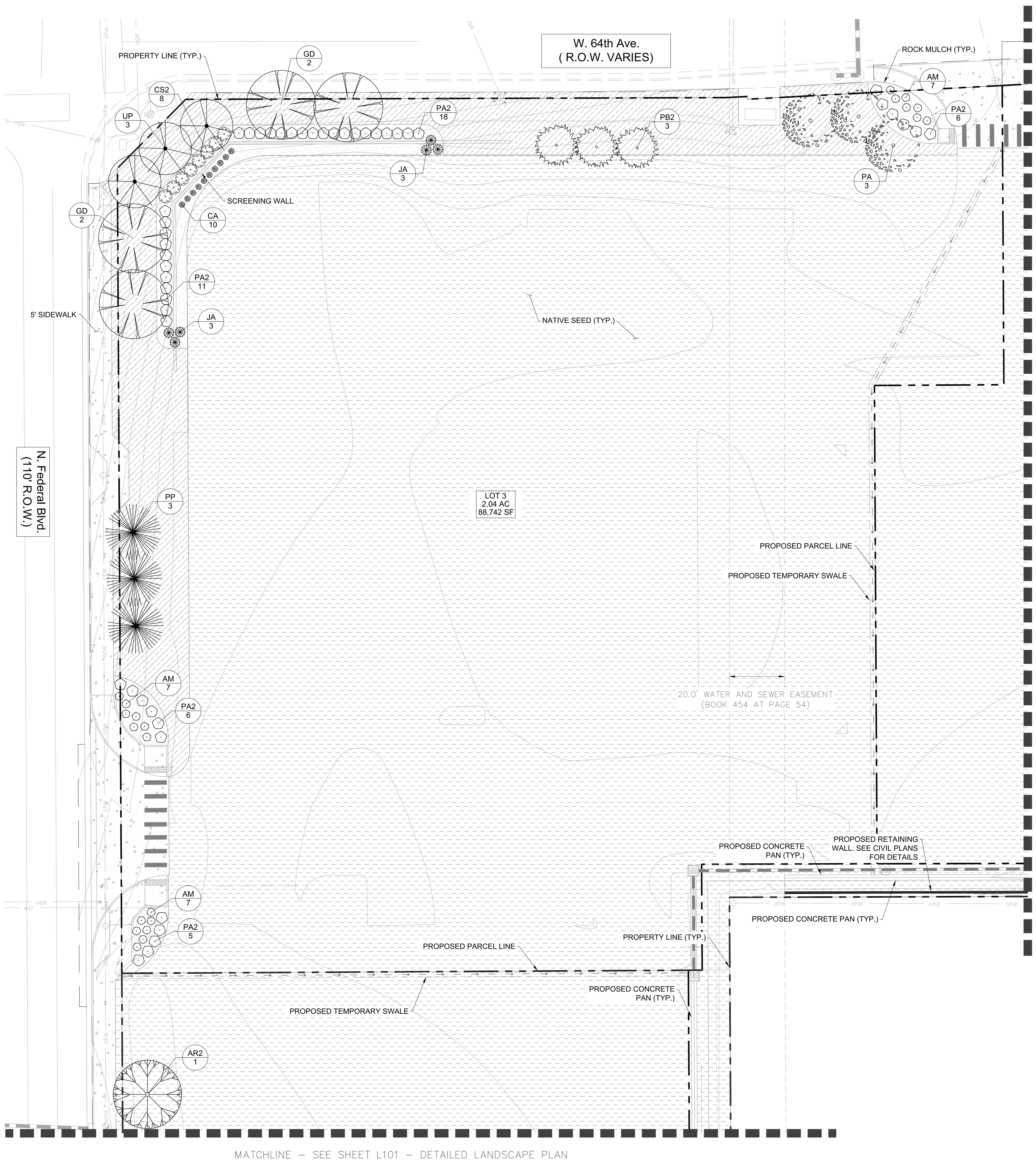
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
L101

CASE NO. PLT2023-0056



SITE LEGEND

	PROPERTY LINE
	CONCRETE CURB AND GUTTER
	MOUNTABLE CURB W/RADIUS PROTECTOR (INTERNAL TO SITE ONLY)
#	PARKING SPACE INDICATOR
	AREA LIGHT
	MULTIPLE PRODUCT DISPENSER WITH CANOPY COLUMNS AND BOLLARDS
TFR	TRANSFORMER
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Landscape Schedule

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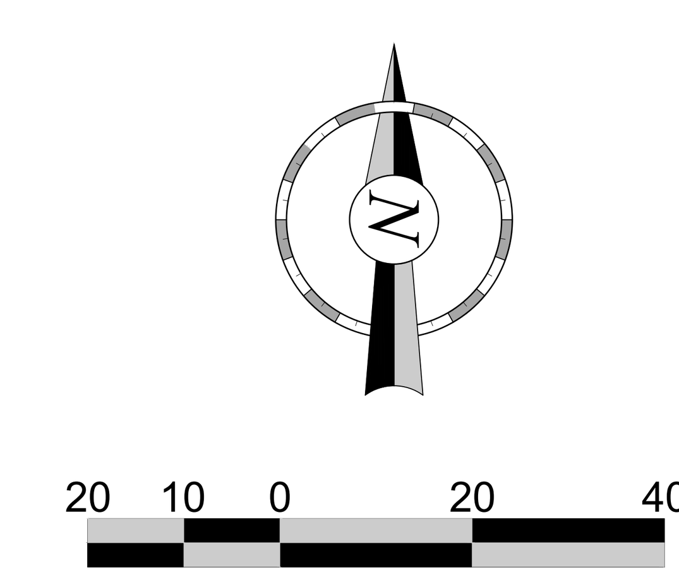
		KEN-TEX BLUEGRASS		11,131 S.F.	
		NATIVE SHORT GRASS SEED MIX		289,060 S.F.	
		2"-3" RIVER ROCK MULCH		5,344 S.F.	



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FORT COLLINS, COLORADO 80525 (970)-822-7911

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CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

DETAILED LANDSCAPE PLAN

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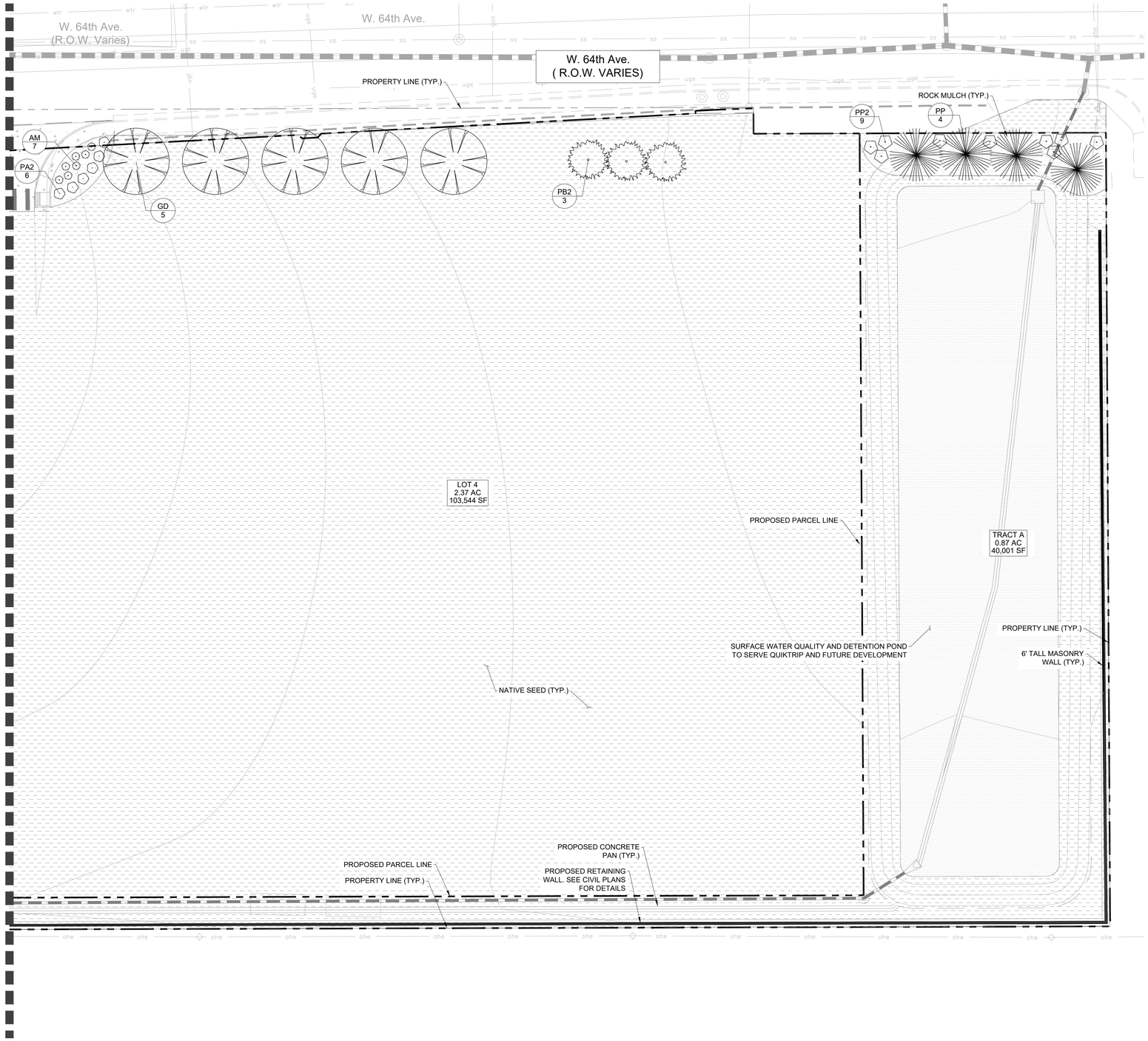
PROJECT NO.
096888037

SHEET
L102



MATCHLINE – SEE SHEET L102 – DETAILED LANDSCAPE PLAN

SITE LEGEND

- PROPERTY LINE
- CONCRETE CURB AND GUTTER
- MOUNTABLE CURB W/RADIUS PROTECTOR (INTERNAL TO SITE ONLY)
- PARKING SPACE INDICATOR
- AREA LIGHT
- MULTIPLE PRODUCT DISPENSER WITH CANOPY COLUMNS AND BOLLARDS
- TRANSFORMER (TFR)
- FUEL SYSTEM ACCESS MANWAY

Landscape Schedule

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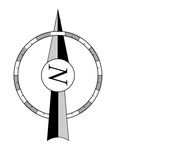
		ARCADIA JUNIPER *Juniperus sabina 'Arcadia'*	HEIGHT/SPREAD 24"ø X 48" HT MIN 5 GAL.	20	
		REEDGRASS *Calamagrostis Acutiflora 'Karl'*	HEIGHT/SPREAD 30"ø X 30" HT MIN 1 GAL.	10	
FRONTAGE TREES		STREET KEEPER HONEYLOCUST *Gleditsia tricanthos 'Draves'*	2" CALIPER 45'X20'	9	SEE LANDSCAPE PLAN AND ASSOCIATED DETAILS FOR TREE PLACEMENT, AND PLANTING SPECIFICATIONS CONTRACTOR TO VERIFY TREE TYPE, LOCATION, SIZE, HEIGHT, AND SPREAD WITH QT REPRESENTATIVE PRIOR TO INSTALLATION
		LACEBARK ELM *Ulmus Parvifolia*	2" CALIPER 40'X30'	8	
FILL TREES		ARISTOCRAT PEAR *Pyrus Calleryana*	2" CALIPER 15'X12'	3	
		RED MAPLE *Acer rubrum*	2" CALIPER 40'X30'	5	
SCREENING TREES		PINYON PINE *Pinus edulis*	6' MINIMUM HT 25'X15'	7	
		BLACK HILLS SPRUCE *Picea glauca 'Densata'*	6' MINIMUM HT 20'X10'	9	
MISC		DETENTION POND SEED MIX		15,619 S.F.	
		KEN-TEX BLUEGRASS		11,131 S.F.	
		NATIVE SHORT GRASS SEED MIX		289,060 S.F.	
		2"-3" RIVER ROCK MULCH		5,344 S.F.	



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NO.	REVISION	BY	DATE	APPR

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CHECKED BY: CPH
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.
DETAILED LANDSCAPE PLAN

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

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L103

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CASE NO. PLT2023-0056

GENERAL LANDSCAPE SPECIFICATIONS

A. SCOPE OF WORK

1. THE WORK CONSISTS OF: FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, TRANSPORTATION, AND ANY OTHER APPURTENANCES NECESSARY FOR THE COMPLETION OF THIS PROJECT AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN.

2. WORK SHALL INCLUDE MAINTENANCE AND WATERING OF ALL CONTRACT PLANTING AREAS UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER.

B. PROTECTION OF EXISTING STRUCTURES

1. ALL EXISTING BUILDINGS, WALKS, WALLS, PAVING, PIPING, OTHER SITE CONSTRUCTION ITEMS, AND PLANTING ALREADY COMPLETED OR ESTABLISHED AND DESIGNATED TO REMAIN SHALL BE PROTECTED FROM DAMAGE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. ALL DAMAGE RESULTING FROM NEGLIGENCE SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE OWNER, AT NO COST TO THE OWNER.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL NECESSARY BEST MANAGEMENT PRACTICES (BMP) DEVICES ACCORDING TO ALL REGULATORY AGENCY'S STANDARDS THROUGH THE DURATION OF ALL CONSTRUCTION ACTIVITIES.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MAINTENANCE OF TRAFFIC (MOT) THAT MAY BE REQUIRED FOR THE PROJECT.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, WHETHER PUBLIC OR PRIVATE, PRIOR TO EXCAVATION. THE OWNER AND DESIGN PROFESSIONAL SHALL NOT BE RESPONSIBLE FOR THE ACCURACY AND COMPLETENESS OF ANY SUCH INFORMATION OR DATA. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR; REVIEWING AND CHECKING ALL SUCH INFORMATION AND DATA; LOCATING ALL UNDERGROUND FACILITIES DURING CONSTRUCTION; THE SAFETY AND PROTECTION THEREOF; REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK. THE COST OF ALL WILL BE CONSIDERED AS HAVING BEEN INCLUDED IN THE CONTRACT PRICE. THE CONTRACTOR SHALL NOTIFY ANY AFFECTED UTILITY COMPANIES OR AGENCIES IN WRITING AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.

C. PROTECTION OF EXISTING PLANT MATERIALS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL UNAUTHORIZED CUTTING OR DAMAGE TO TREES AND SHRUBS EXISTING OR OTHERWISE, CAUSED BY CARELESS EQUIPMENT OPERATION, MATERIAL STOCKPILING, ETC... THIS SHALL INCLUDE COMPACTION BY DRIVING OR PARKING INSIDE THE DRIP-LINE AND SPILLING OIL, GASOLINE, OR OTHER DELETERIOUS MATERIALS WITHIN THE DRIP-LINE. NO MATERIALS SHALL BE BURNED ON SITE. EXISTING TREES KILLED OR DAMAGED SO THAT THEY ARE MISSHAPEN AND/OR UNSIGHTLY SHALL BE REPLACED AT THE COST TO THE CONTRACTOR OF FOUR HUNDRED DOLLARS ($400) PER CALIPER INCH ON AN ESCALATING SCALE WHICH ADDS AN ADDITIONAL TWENTY (20) PERCENT PER INCH OVER FOUR (4) INCHES CALIPER AS FIXED AND AGREED LIQUIDATED DAMAGES. CALIPER SHALL BE MEASURED SIX (6) INCHES ABOVE GROUND LEVEL FOR TREES UP TO AND INCLUDING FOUR (4) INCHES IN CALIPER AND TWELVE (12) INCHES ABOVE GROUND LEVEL FOR TREES OVER FOUR (4) INCHES IN CALIPER.

2. SEE TREE MITIGATION PLAN AND NOTES, IF APPLICABLE.

D. MATERIALS

1. GENERAL

MATERIAL SAMPLES LISTED BELOW SHALL BE SUBMITTED FOR APPROVAL, ON SITE OR AS DETERMINED BY THE OWNER. UPON APPROVAL, DELIVERY OF MATERIALS MAY COMMENCE.

MATERIAL	SAMPLE SIZE
MULCH	ONE (1) CUBIC FOOT
TOPSOIL MIX	ONE (1) CUBIC FOOT
PLANTS	ONE (1) OF EACH VARIETY (OR TAGGED IN NURSERY)

2. PLANT MATERIALS

a. FURNISH NURSERY-GROWN PLANTS TRUE TO GENUS, SPECIES, VARIETY, CULTIVAR, STEM FORM, SHEARING, AND OTHER FEATURES INDICATED IN PLANT SCHEDULE SHOWN ON DRAWINGS AND COMPLYING WITH ANSI Z60.1 AND THE COLORADO NURSERY ACT; AND WITH HEALTHY ROOT SYSTEMS DEVELOPED BY TRANSPLANTING OR ROOT PRUNING. PROVIDE WELL-SHAPED, FULLY BRANCHED, HEALTHY, VIGOROUS STOCK, DENSELY FOLIATED WHEN IN LEAF AND FREE OF DISEASE, PESTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN SCALD, INJURIES, ABRASIONS, AND DISFIGUREMENT.

b. TREES FOR PLANTING IN ROWS SHALL BE UNIFORM IN SIZE AND SHAPE.

c. NO SUBSTITUTIONS SHALL BE MADE WITHOUT WRITTEN PERMISSION FROM THE PROJECT LANDSCAPE ARCHITECT. ANY ROW TREES MUST BE APPROVED BY OFFICE OF THE CITY FORESTER.

d. PROVIDE PLANTS OF SIZES, GRADES, AND BALL OR CONTAINER SIZES COMPLYING WITH ANSI Z60.1 AND COLORADO NURSERY ACT FOR TYPES AND FORM OF PLANTS REQUIRED. PLANTS OF A LARGER SIZE MAY BE USED IF ACCEPTABLE TO PROJECT LANDSCAPE ARCHITECT WITH A PROPORTIONATE INCREASE IN SIZE OF ROOTS OR BALLS.

e. PLANTS SHALL BE SUBJECT TO INSPECTION AND APPROVAL AT THE PLACE OF GROWTH, OR UPON DELIVERY TO THE SITE, AS DETERMINED BY THE OWNER, FOR QUALITY, SIZE, AND VARIETY. SUCH APPROVAL SHALL NOT IMPAIR THE RIGHT OF INSPECTION AND REJECTION AT THE SITE DURING PROGRESS OF THE WORK OR AFTER COMPLETION FOR SIZE AND CONDITION OF ROOT BALLS OR ROOTS, LATENT DEFECTS OR INJURIES. REJECTED PLANTS SHALL BE REMOVED IMMEDIATELY FROM THE SITE. NOTICE REQUESTING INSPECTION SHALL BE SUBMITTED IN WRITING BY THE CONTRACTOR AT LEAST ONE (1) WEEK PRIOR TO ANTICIPATED DATE.

f. TREES WITH DAMAGED, CROOKED, OR MULTIPLE LEADERS; TIGHT VERTICAL BRANCHES WHERE BARK IS SQUEEZED BETWEEN TWO BRANCHES OR BETWEEN BRANCH AND TRUNK ("INCLUDED BARK"); CROSSING TRUNKS; CUT-OFF LIMBS MORE THAN $\frac{3}{4}$ INCH (19 MM) IN DIAMETER; OR WITH STEM GIRDLING ROOTS WILL BE REJECTED.

g. FURNISH TREES AND SHRUBS WITH ROOTS BALLS MEASURED FROM TOP OF ROOT BALL, WHICH SHALL BEGIN AT ROOT FLARE ACCORDING TO ANSI Z60.1 AND COLORADO NURSERY ACT. ROOT FLARE SHALL BE VISIBLE BEFORE PLANTING.

h. LABEL AT LEAST ONE PLANT OF EACH VARIETY, SIZE, AND CALIPER WITH A SECURELY ATTACHED, WATERPROOF TAG BEARING LEGIBLE DESIGNATION OF COMMON NAME AND FULL SCIENTIFIC NAME, INCLUDING GENUS AND SPECIES. INCLUDE NOMENCLATURE FOR HYBRID, VARIETY, OR CULTIVAR, IF APPLICABLE FOR THE PLANT AS SHOWN ON DRAWINGS.

i. IF FORMAL ARRANGEMENTS OR CONSECUTIVE ORDER OF PLANTS IS SHOWN ON DRAWINGS, SELECT STOCK FOR UNIFORM HEIGHT AND SPREAD, AND NUMBER THE LABELS TO ASSURE SYMMETRY IN PLANTING.

E. SOIL MIXTURE

1. CONTRACTOR SHALL TEST EXISTING SOIL AND AMEND AS NECESSARY IN ACCORDANCE WITH THE GUIDELINES BELOW:

2. SOIL MIXTURE SHALL CONSIST OF TWO PARTS OF TOPSOIL AND ONE PART SAND, AS DESCRIBED BELOW. CONTRACTOR TO SUBMIT SAMPLES AND PH TESTING RESULTS OF SOIL MIXTURE FOR OWNER'S REPRESENTATIVE APPROVAL PRIOR TO PLANT INSTALLATION OPERATIONS COMMENCE.

a. TOPSOIL FOR USE IN PREPARING SOIL MIXTURE FOR BACKFILLING PLANT OPENINGS SHALL BE FERTILE, FRIABLE, AND OF A LOAMY CHARACTER; REASONABLY FREE OF SUBSOIL, CLAY LUMPS, BRUSH WEEDS AND OTHER LITTER; FREE OF ROOTS, STUMPS, STONES LARGER THAN 2" IN ANY DIRECTION, AND OTHER EXTRANEOUS OR TOXIC MATTER HARMFUL TO PLANT GROWTH. IT SHALL CONTAIN THREE (3) TO FIVE (5) PERCENT DECOMPOSED ORGANIC MATTER, HAVE A PH BETWEEN 5.5 AND 8.0, AND SOLUBLE SALTS LESS THAN 3.0 MMHOS/CM. SUBMIT SOIL SAMPLE AND PH TESTING RESULTS FOR APPROVAL.

b. SAND SHALL BE COARSE, CLEAN, WELL-DRAINING, NATIVE SAND.

3. TREES SHALL BE PLANTED IN THE EXISTING NATIVE SOIL ON SITE, UNLESS DETERMINED TO BE UNSUITABLE - AT WHICH POINT THE CONTRACTOR SHALL CONTACT THE PROJECT LANDSCAPE ARCHITECT TO DISCUSS ALTERNATE RECOMMENDATION PRIOR TO PLANTING.

F. WATER

1. WATER NECESSARY FOR PLANTING AND MAINTENANCE SHALL BE OF SATISFACTORY QUALITY TO SUSTAIN ADEQUATE PLANT GROWTH AND SHALL NOT CONTAIN HARMFUL, NATURAL OR MAN-MADE ELEMENTS DETRIMENTAL TO PLANTS. WATER MEETING THE ABOVE STANDARD SHALL BE OBTAINED ON THE SITE FROM THE OWNER, IF AVAILABLE, AND THE CONTRACTOR SHALL BE RESPONSIBLE TO MAKE ARRANGEMENTS FOR ITS USE BY HIS TANKS, HOSES, SPRINKLERS, ETC.... IF SUCH WATER IS NOT AVAILABLE AT THE SITE, THE CONTRACTOR SHALL PROVIDE SATISFACTORY WATER FROM SOURCES OFF THE SITE AT NO ADDITIONAL COST TO THE OWNER.

* WATERING/IRRIGATION RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

G. FERTILIZER

1. CONTRACTOR SHALL PROVIDE FERTILIZER APPLICATION SCHEDULE TO OWNER, AS APPLICABLE TO SOIL TYPE, PLANT INSTALLATION TYPE, AND SITE'S PROPOSED USE. SUGGESTED FERTILIZER TYPES SHALL BE ORGANIC OR OTHERWISE NATURALLY-DERIVED.

* FERTILIZER RESTRICTIONS MAY APPLY - REFER TO PROPERTY'S JURISDICTIONAL AUTHORITY.

H. MULCH

1. MULCH MATERIAL SHALL BE MOISTENED AT THE TIME OF APPLICATION TO PREVENT WIND DISPLACEMENT, AND APPLIED AT A DEPTH OF THREE (3) INCHES. CLEAR MULCH FROM EACH PLANT'S CROWN (BASE) OR AS SHOWN IN PLANTING DETAILS. UNLESS OTHERWISE NOTED ON PLANS, MULCH SHALL BE DOUBLE SHREDDED HARDWOOD MULCH DARK BROWN FINES BY MOUNTAIN HIGH SAVATREE OR APPROVED EQUAL. DYED MULCH IS NOT ACCEPTABLE. SUBMIT SAMPLES TO PROJECT LANDSCAPE ARCHITECT FOR APPROVAL. MULCH SHALL BE PROVIDED OVER THE ENTIRE AREA OF EACH SHRUB BED, GROUND COVER, VINE BED, AND TREE RING (6' MINIMUM) PLANTED UNDER THIS CONTRACT, AS WELL AS FOR ANY EXISTING LANDSCAPE AREAS AS SHOWN ON PLANS.

I. DIGGING AND HANDLING

1. ALL TREES SPECIFIED SHALL BE BALLED AND BURLAPPED (B&B) UNLESS OTHERWISE APPROVED BY PROJECT LANDSCAPE ARCHITECT.

2. PROTECT ROOTS OR ROOT BALLS OF PLANTS AT ALL TIMES FROM SUN, DRYING WINDS, WATER AND FREEZING, AS NECESSARY UNTIL PLANTING. PLANT MATERIALS SHALL BE ADEQUATELY PACKED TO PREVENT DAMAGE DURING TRANSIT. TREES TRANSPORTED MORE THAN TEN (10) MILES OR WHICH ARE NOT PLANTED WITHIN THREE (3) DAYS OF DELIVERY TO THE SITE SHALL BE SPRAYED WITH AN ANTITRANSPIRANT PRODUCT ("WILTPRUF" OR EQUAL) TO MINIMIZE TRANSPIRATIONAL WATER LOSS.

3. B&B, AND FIELD GROWN (FG) PLANTS SHALL BE DUG WITH FIRM, NATURAL BALLS OF SOIL OF SUFFICIENT SIZE TO ENCOMPASS THE FIBROUS AND FEEDING ROOTS OF THE PLANTS. NO PLANTS MOVED WITH A ROOT BALL SHALL BE PLANTED IF THE BALL IS CRACKED OR BROKEN. PLANTS SHALL NOT BE HANDLED BY STEMS.

J. CONTAINER GROWN STOCK

1. ALL CONTAINER GROWN MATERIAL SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED PLANTS ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE OF GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.

2. AN ESTABLISHED CONTAINER GROWN PLANT SHALL BE TRANSPLANTED INTO A CONTAINER AND GROWN IN THAT CONTAINER SUFFICIENTLY LONG ENOUGH FOR THE NEW FIBROUS ROOTS TO HAVE DEVELOPED SO THAT THE ROOT MASS WILL RETAIN ITS SHAPE AND HOLD TOGETHER WHEN REMOVED FROM THE CONTAINER. CONTAINER GROWN STOCK SHALL NOT BE HANDLED BY THEIR STEMS.

3. ROOT BOUND PLANTS ARE NOT ACCEPTABLE AND WILL BE REJECTED.

K. MATERIALS LIST

1. QUANTITIES NECESSARY TO COMPLETE THE WORK ON THE DRAWINGS SHALL BE FURNISHED BY THE CONTRACTOR. QUANTITY ESTIMATES HAVE BEEN MADE CAREFULLY, BUT THE LANDSCAPE ARCHITECT OR OWNER ASSUMES NO LIABILITY FOR OMISSIONS OR ERRORS. SHOULD A DISCREPANCY OCCUR BETWEEN THE PLANS AND THE PLANT LIST QUANTITY, THE PLANS SHALL GOVERN. ALL DIMENSIONS AND/OR SIZES SPECIFIED SHALL BE THE MINIMUM ACCEPTABLE SIZE.

L. FINE GRADING

1. FINE GRADING UNDER THIS CONTRACT SHALL CONSIST OF FINAL FINISHED GRADING OF LAWN AND PLANTING AREAS THAT HAVE BEEN DISTURBED DURING CONSTRUCTION.

2. THE CONTRACTOR SHALL FINE GRADE THE LAWN AND PLANTING AREAS TO BRING THE ROUGH GRADE UP TO FINAL FINISHED GRADE ALLOWING FOR THICKNESS OF SOD AND/OR MULCH DEPTH.

3. ALL PLANTING AREAS SHALL BE GRADED AND MAINTAINED FOR POSITIVE DRAINAGE TO SURFACE/SUBSURFACE STORM DRAIN SYSTEMS. AREAS ADJACENT TO BUILDINGS SHALL SLOPE AWAY FROM THE BUILDINGS. REFER TO CIVIL ENGINEER'S PLANS FOR FINAL GRADES, IF APPLICABLE.

M. PLANTING PROCEDURES

1. THE CONTRACTOR SHALL CLEAN WORK AND SURROUNDING AREAS OF ALL RUBBISH OR OBJECTIONABLE MATTER DAILY. ALL MORTAR, CEMENT, BUILDING MATERIALS, AND TOXIC MATERIAL SHALL BE COMPLETELY REMOVED FROM PLANTING AREAS. THESE MATERIALS SHALL NOT BE MIXED WITH THE SOIL. SHOULD THE CONTRACTOR FIND SUCH SOIL CONDITIONS IN PLANTING AREAS WHICH WILL ADVERSELY AFFECT THE PLANT GROWTH, THE CONTRACTOR SHALL IMMEDIATELY CALL IT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE. FAILURE TO DO SO BEFORE PLANTING SHALL MAKE THE CORRECTIVE MEASURES THE RESPONSIBILITY OF THE CONTRACTOR.

2. VERIFY LOCATIONS OF ALL UTILITIES, CONDUITS, SUPPLY LINES AND CABLES, INCLUDING BUT NOT LIMITED TO: ELECTRIC, GAS (LINES AND TANKS), WATER, SANITARY SEWER, STORMWATER SYSTEMS, CABLE, AND TELEPHONE. PROPERLY MAINTAIN AND PROTECT EXISTING UTILITIES. CALL COLORADO (811) TO LOCATE UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

3. CONTRACTOR IS RESPONSIBLE TO REMOVE ALL EXISTING AND IMPORTED LIMEROCK AND LIMEROCK SUB-BASE FROM ALL PLANTING AREAS TO A MINIMUM DEPTH OF 36" OR TO NATIVE SOIL. CONTRACTOR IS RESPONSIBLE TO BACKFILL THESE PLANTING AREAS TO ROUGH FINISHED GRADE WITH CLEAN TOPSOIL FROM AN ON-SITE SOURCE OR AN IMPORTED SOURCE. IF LIMEROCK OR OTHER ADVERSE CONDITIONS OCCUR IN PLANTED AREAS AFTER 36" DEEP EXCAVATION BY THE CONTRACTOR, AND POSITIVE DRAINAGE CAN NOT BE ACHIEVED, CONTRACTOR SHALL UTILIZE POOR DRAINAGE CONDITION PLANTING DETAIL.

4. FURNISH NURSERY'S CERTIFICATE OF COMPLIANCE WITH ALL REQUIREMENTS AS SPECIFIED HEREIN. INSPECT AND SELECT PLANT MATERIALS BEFORE PLANTS ARE DUG AT NURSERY OR GROWING SITE.

5. COMPLY WITH APPLICABLE FEDERAL, STATE, COUNTY, AND LOCAL REGULATIONS GOVERNING LANDSCAPE MATERIALS AND WORK. UPON ARRIVAL AT THE SITE, PLANTS SHALL BE THOROUGHLY WATERED AND PROPERLY MAINTAINED UNTIL PLANTED. PLANTS STORED ONSITE SHALL NOT REMAIN UNPLANTED OR APPROPRIATELY HEALED IN FOR A PERIOD EXCEEDING TWENTY-FOUR (24) HOURS. AT ALL TIMES WORKMANLIKE METHODS CUSTOMARY IN ACCEPTED HORTICULTURAL PRACTICES AS USED IN THE TRADE SHALL BE EXERCISED.

6. WORK SHALL BE COORDINATED WITH OTHER TRADES TO PREVENT CONFLICTS. COORDINATE PLANTING WITH IRRIGATION WORK TO ASSURE AVAILABILITY OF WATER AND PROPER LOCATION OF IRRIGATION APPURTENANCES AND PLANTS.

7. ALL PLANTING OPENINGS SHALL BE EXCAVATED TO SIZE AND DEPTH IN ACCORDANCE WITH ANSI Z60.1-2014 AMERICAN STANDARD FOR NURSERY STOCK.

8. TEST ALL TREE OPENINGS WITH WATER BEFORE PLANTING TO ASSURE PROPER DRAINAGE PERCOLATION IS AVAILABLE. NO ALLOWANCE WILL BE MADE FOR LOST PLANTS DUE TO IMPROPER DRAINAGE. IF POOR DRAINAGE EXISTS, UTILIZE "POOR DRAINAGE CONDITION" PLANTING DETAIL.

9. TREES SHALL BE SET PLUMB AND HELD IN POSITION UNTIL THE PLANTING MIXTURE HAS BEEN FLUSHED INTO PLACE WITH A SLOW, FULL HOSE STREAM. ALL PLANTING SHALL BE PERFORMED BY PERSONNEL FAMILIAR WITH PLANTING PROCEDURES AND UNDER THE SUPERVISION OF A QUALIFIED LANDSCAPE FOREMEN.

10. PRIOR TO EXCAVATION OF TREE OPENINGS, AN AREA EQUAL TO TWO TIMES THE DIAMETER OF THE ROOT BALL SHALL BE ROTO-TILLED TO A DEPTH EQUAL TO THE DEPTH OF THE ROOT BALL.

11. EXCAVATION OF TREE OPENINGS SHALL BE PERFORMED USING EXTREME CARE TO AVOID DAMAGE TO SURFACE AND SUBSURFACE ELEMENTS SUCH AS UTILITIES OR HARDSCAPE ELEMENTS, FOOTERS AND PREPARED SUB-BASES.

12. IN CONTINUOUS SHRUB AND GROUND COVER BEDS, THE ROTO-TILLED PERIMETER SHOULD EXTEND TO A DISTANCE OF ONE FOOT BEYOND THE DIAMETER OF A SINGLE ROOT BALL. THE BED SHALL BE TILLED TO A DEPTH EQUAL TO THE ROOT BALL DEPTH PLUS 6".

13. TREE OPENINGS FOR WELL DRAINED SOILS SHALL BE DUG SO THAT THE BOTTOM OF THE ROOT BALL WILL REST ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL WILL BE FLUSH WITH FINISH GRADE. IN POORLY DRAINED SOILS THE TREE OPENING SHALL BE DUG SO THAT THE ROOT BALL RESTS ON UNDISTURBED SOIL AND THE TOP OF THE ROOT BALL IS 1" ABOVE FINISH GRADE. PLANT PIT WALLS SHALL BE SCARIFIED PRIOR TO PLANT INSTALLATION.

14. TAKE ALL NECESSARY PRECAUTIONS TO AVOID DAMAGE TO BUILDINGS AND BUILDING STRUCTURES WHILE INSTALLING TREES.

15. SOIL MIXTURE SHALL BE AS SPECIFIED IN SECTION 'E'.

16. TREES AND SHRUBS SHALL BE SET STRAIGHT AT AN ELEVATION THAT, AFTER SETTLEMENT, THE PLANT CROWN WILL STAND ONE (1) TO TWO (2) INCHES ABOVE GRADE. EACH PLANT SHALL BE SET IN THE CENTER OF THE PIT. SOIL MIXTURE SHALL BE BACK FILLED, THOROUGHLY TAMPED AROUND THE BALL, AND SETTLED BY WATER (AFTER TAMPING).

17. AMEND PINE AND OAK PLANT OPENINGS WITH ECTOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. ALL OTHER PLANT OPENINGS SHALL BE AMENDED WITH ENDOMYCORRHIZAL SOIL APPLICATION PER MANUFACTURER'S RECOMMENDATION. PROVIDE PRODUCT INFORMATION SUBMITTAL PRIOR TO INOCULATION.

18. FILL HOLE WITH SOIL MIXTURE, MAKING CERTAIN ALL SOIL IS SATURATED. TO DO THIS, FILL HOLE WITH WATER AND ALLOW TO SOAK MINIMUM TWENTY (20) MINUTES, STIRRING IF NECESSARY TO GET SOIL THOROUGHLY WET. PACK LIGHTLY WITH FEET, ADD MORE WET SOIL MIXTURE. DO NOT COVER TOP OF BALL WITH SOIL MIXTURE.

19. ALL BURLAP, ROPE, WIRES, BASKETS, ETC.., SHALL BE REMOVED FROM THE SIDES AND TOPS OF BALLS, BUT NO BURLAP SHALL BE PULLED FROM UNDERNEATH.

20. TREES SHALL BE PRUNED, IN ACCORDANCE WITH ANSI A-300, TO PRESERVE THE NATURAL CHARACTER OF THE PLANT. ALL SOFT WOOD OR SUCKER GROWTH AND ALL BROKEN OR BADLY DAMAGED BRANCHES SHALL BE REMOVED WITH A CLEAN CUT. ALL PRUNING TO BE PERFORMED BY CERTIFIED ARBORIST.

21. SHRUBS AND GROUND COVER PLANTS SHALL BE EVENLY SPACED IN ACCORDANCE WITH THE DRAWINGS AND AS INDICATED ON THE PLANT LIST. MATERIALS INSTALLED SHALL MEET MINIMUM SPECIMEN REQUIREMENTS OR QUANTITIES SHOWN ON PLANS, WHICHEVER IS GREATER. CULTIVATE ALL PLANTING AREAS TO A MINIMUM DEPTH OF 6", REMOVE AND DISPOSE ALL DEBRIS. MIX TOP 4" THE PLANTING SOIL MIXTURE AS SPECIFIED IN SECTION E. THOROUGHLY WATER ALL PLANTS AFTER INSTALLATION.

22. TREE GUYING AND BRACING SHALL BE INSTALLED BY THE CONTRACTOR IN ACCORDANCE WITH THE PLANS TO INSURE STABILITY AND MAINTAIN TREES IN AN UPRIGHT POSITION. IF THE CONTRACTOR AND OWNER DECIDE TO WAIVE THE TREE GUYING AND BRACING, THE OWNER SHALL NOTIFY THE PROJECT LANDSCAPE ARCHITECT IN WRITING AND AGREE TO INDEMNIFY AND HOLD HARMLESS THE PROJECT LANDSCAPE ARCHITECT IN THE EVENT UNSUPPORTED TREES PLANTED UNDER THIS CONTRACT FALL AND DAMAGE PERSON OR PROPERTY.

23. ALL PLANT BEDS SHALL BE KEPT FREE OF NOXIOUS WEEDS UNTIL FINAL ACCEPTANCE OF WORK. IF DIRECTED BY THE OWNER, "ROUND-UP" SHALL BE APPLIED FOR WEED CONTROL BY QUALIFIED PERSONNEL TO ALL PLANTING AREAS IN SPOT APPLICATIONS PER MANUFACTURER'S RECOMMENDATIONS. PRIOR TO FINAL INSPECTION, TREAT ALL PLANTING BEDS WITH AN APPROVED PRE-EMERGENT HERBICIDE AT AN APPLICATION RATE RECOMMENDED BY THE MANUFACTURER. (AS ALLOWED BY JURISDICTIONAL AUTHORITY)

N. LAWN SODDING

1. THE WORK CONSISTS OF LAWN BED PREPARATION, SOIL PREPARATION, AND SODDING COMPLETE, IN STRICT ACCORDANCE WITH THE SPECIFICATIONS AND THE APPLICABLE DRAWINGS TO PRODUCE A TURF GRASS LAWN ACCEPTABLE TO THE OWNER.

2. ALL AREAS THAT ARE TO BE SODDED SHALL BE CLEARED OF ANY ROUGH GRASS, WEEDS, AND DEBRIS BY MEANS OF A SOD CUTTER TO A DEPTH OF THREE (3) INCHES, AND THE GROUND BROUGHT TO AN EVEN GRADE. THE ENTIRE SURFACE SHALL BE ROLLED WITH A ROLLER WEIGHING NOT MORE THAN ONE-HUNDRED (100) POUNDS PER FOOT OF WIDTH. DURING THE ROLLING, ALL DEPRESSIONS CAUSED BY SETTLEMENT SHALL BE FILLED WITH ADDITIONAL SOIL, AND THE SURFACE SHALL BE REGRADED AND ROLLED UNTIL PRESENTING A SMOOTH AND EVEN FINISH TO THE REQUIRED GRADE.

3. PREPARE LOOSE BED FOUR (4) INCHES DEEP. HAND RAKE UNTIL ALL BUMPS AND DEPRESSIONS ARE REMOVED. WET PREPARED AREA THOROUGHLY.

4. SODDING

a. THE CONTRACTOR SHALL SOD ALL AREAS THAT ARE NOT PAVED OR PLANTED AS DESIGNATED ON THE DRAWINGS WITHIN THE CONTRACT LIMITS, UNLESS SPECIFICALLY NOTED OTHERWISE.

b. SOD PANELS SHALL BE LAID TIGHTLY TOGETHER SO AS TO MAKE A SOLID SODDED LAWN AREA. SOD SHALL BE LAID UNIFORMLY AGAINST THE EDGES OF ALL CURBS AND OTHER HARDSCAPE ELEMENTS, PAVED AND PLANTED AREAS. ADJACENT TO BUILDINGS, A 24 INCH STONE MULCH STRIP SHALL BE PROVIDED. IMMEDIATELY FOLLOWING SOD LAYING, THE LAWN AREAS SHALL BE ROLLED WITH A LAWN ROLLER CUSTOMARILY USED FOR SUCH PURPOSES, AND THEN THOROUGHLY IRRIGATED. IF, IN THE OPINION OF THE OWNER, TOP-DRESSING IS NECESSARY AFTER ROLLING TO FILL THE VOIDS BETWEEN THE SOD PANELS AND TO EVEN OUT INCONSISTENCIES IN THE SOD, CLEAN SAND, AS APPROVED BY THE OWNER'S REPRESENTATIVE, SHALL BE UNIFORMLY SPREAD OVER THE ENTIRE SURFACE OF THE SOD AND THOROUGHLY WATERED IN. FERTILIZE INSTALLED SOD AS ALLOWED BY PROPERTY'S JURISDICTIONAL AUTHORITY.

5. DURING DELIVERY, PRIOR TO, AND DURING THE PLANTING OF THE LAWN AREAS, THE SOD PANELS SHALL AT ALL TIMES BE PROTECTED FROM EXCESSIVE DRYING AND UNNECESSARY EXPOSURE OF THE ROOTS TO THE SUN. ALL SOD SHALL BE STACKED SO AS NOT TO BE DAMAGED BY SWEATING OR EXCESSIVE HEAT AND MOISTURE.

6. LAWN MAINTENANCE

a. WITHIN THE CONTRACT LIMITS, THE CONTRACTOR SHALL PRODUCE A DENSE, WELL ESTABLISHED LAWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR AND RE-SODDING OF ALL ERODED, SUNKEN OR BARE SPOTS (LARGER THAN 12"X12") UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. REPAIRED SODDING SHALL BE ACCOMPLISHED AS IN THE ORIGINAL WORK, INCLUDING REGRADING IF NECESSARY.

b. CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SOD/LAWN UNTIL ACCEPTANCE BY THE OWNER'S REPRESENTATIVE. PRIOR TO AND UPON ACCEPTANCE, CONTRACTOR TO PROVIDE WATERING/IRRIGATION SCHEDULE TO OWNER. OBSERVE ALL APPLICABLE WATERING RESTRICTIONS AS SET FORTH BY THE PROPERTY'S JURISDICTIONAL AUTHORITY.

O. EDGING

a. CONTRACTOR SHALL INSTALL 4"X$\frac{1}{8}$" ROLLED TOP STEEL EDGING BETWEEN ALL SOD/SEED AREAS AND PLANTING BEDS.

P. CLEANUP

1. UPON COMPLETION OF ALL PLANTING WORK AND BEFORE FINAL ACCEPTANCE, THE CONTRACTOR SHALL REMOVE ALL MATERIAL, EQUIPMENT, AND DEBRIS RESULTING FROM CONTRACTORS WORK. ALL PAVED AREAS SHALL BE CLEANED AND THE SITE LEFT IN A NEAT AND ACCEPTABLE CONDITION AS APPROVED BY THE OWNER'S REPRESENTATIVE.

Q. PLANT MATERIAL MAINTENANCE

1. ALL PLANTS AND PLANTING INCLUDED UNDER THIS CONTRACT SHALL BE MAINTAINED BY WATERING, CULTIVATING, SPRAYING, PRUNING, AND ALL OTHER OPERATIONS (SUCH AS RE-STAKING OR REPAIRING GUY SUPPORTS) NECESSARY TO INSURE A HEALTHY PLANT CONDITION BY THE CONTRACTOR UNTIL CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.

R. FINAL INSPECTION AND ACCEPTANCE OF WORK

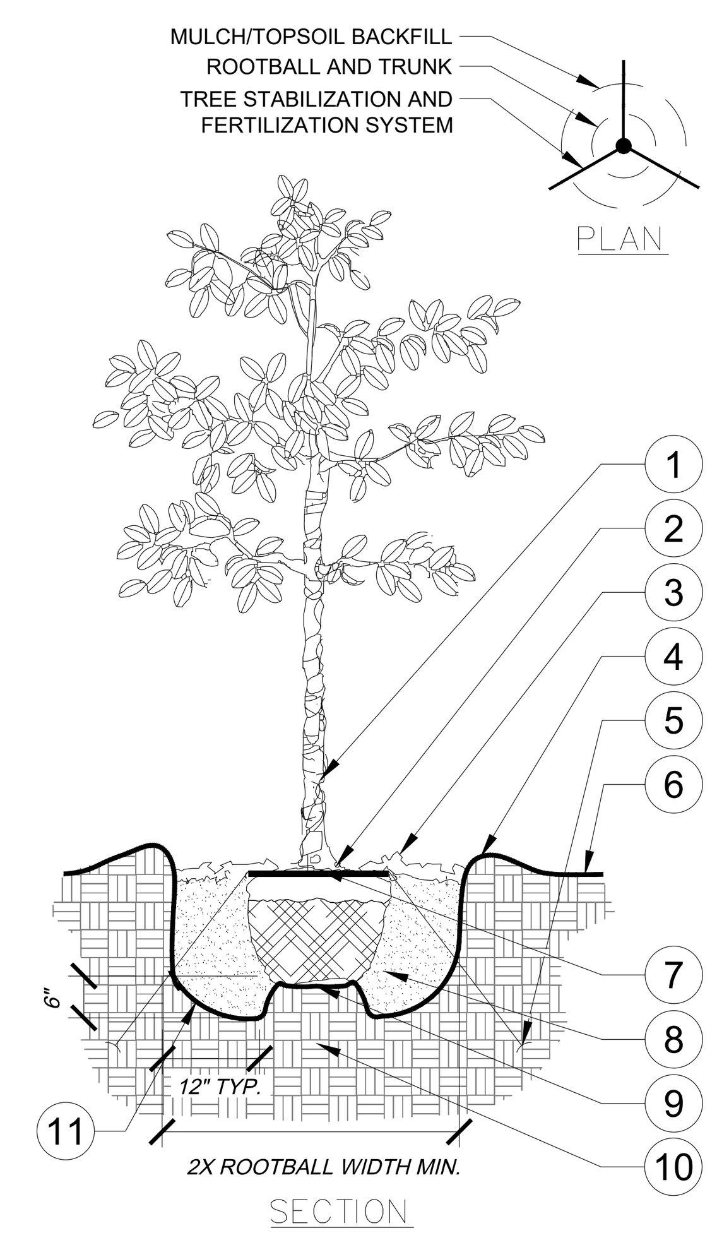
1. FINAL INSPECTION AT THE END OF THE WARRANTY PERIOD SHALL BE ON PLANTING, CONSTRUCTION AND ALL OTHER INCIDENTAL WORK PERTAINING TO THIS CONTRACT. ANY REPLACEMENT AT THIS TIME SHALL BE SUBJECT TO THE SAME ONE (1) YEAR WARRANTY (OR AS SPECIFIED BY THE LANDSCAPE ARCHITECT OR OWNER IN WRITING) BEGINNING WITH THE TIME OF REPLACEMENT AND ENDING WITH THE SAME INSPECTION AND ACCEPTANCE HEREIN DESCRIBED.

S. WARRANTY

1. THE LIFE AND SATISFACTORY CONDITION OF ALL PLANT MATERIAL INSTALLED (INCLUDING SOD) BY THE LANDSCAPE CONTRACTOR SHALL BE WARRANTED BY THE CONTRACTOR FOR A MINIMUM OF ONE (1) CALENDAR YEAR COMMENCING AT THE TIME OF CERTIFICATION OF ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.

2. ANY PLANT NOT FOUND IN A HEALTHY GROWING CONDITION AT THE END OF THE WARRANTY PERIOD SHALL BE REMOVED FROM THE SITE AND REPLACED AS SOON AS WEATHER CONDITIONS PERMIT. ALL REPLACEMENTS SHALL BE PLANTS OF THE SAME KIND AND SIZE AS SPECIFIED IN THE PLANT LIST. THEY SHALL BE FURNISHED PLANTED AND MULCHED AS SPECIFIED AT NO ADDITIONAL COST TO THE OWNER.

3. IN THE EVENT THE OWNER DOES NOT CONTRACT WITH THE CONTRACTOR FOR LANDSCAPE AND IRRIGATION MAINTENANCE, THE CONTRACTOR SHOULD VISIT THE PROJECT SITE PERIODICALLY DURING THE ONE (1) YEAR WARRANTY PERIOD TO EVALUATE MAINTENANCE PROCEDURES BEING PERFORMED BY THE OWNER. CONTRACTOR SHALL NOTIFY THE OWNER IN WRITING OF MAINTENANCE PROCEDURES OR CONDITIONS WHICH THREATEN VIGOROUS AND HEALTHY PLANT GROWTH.

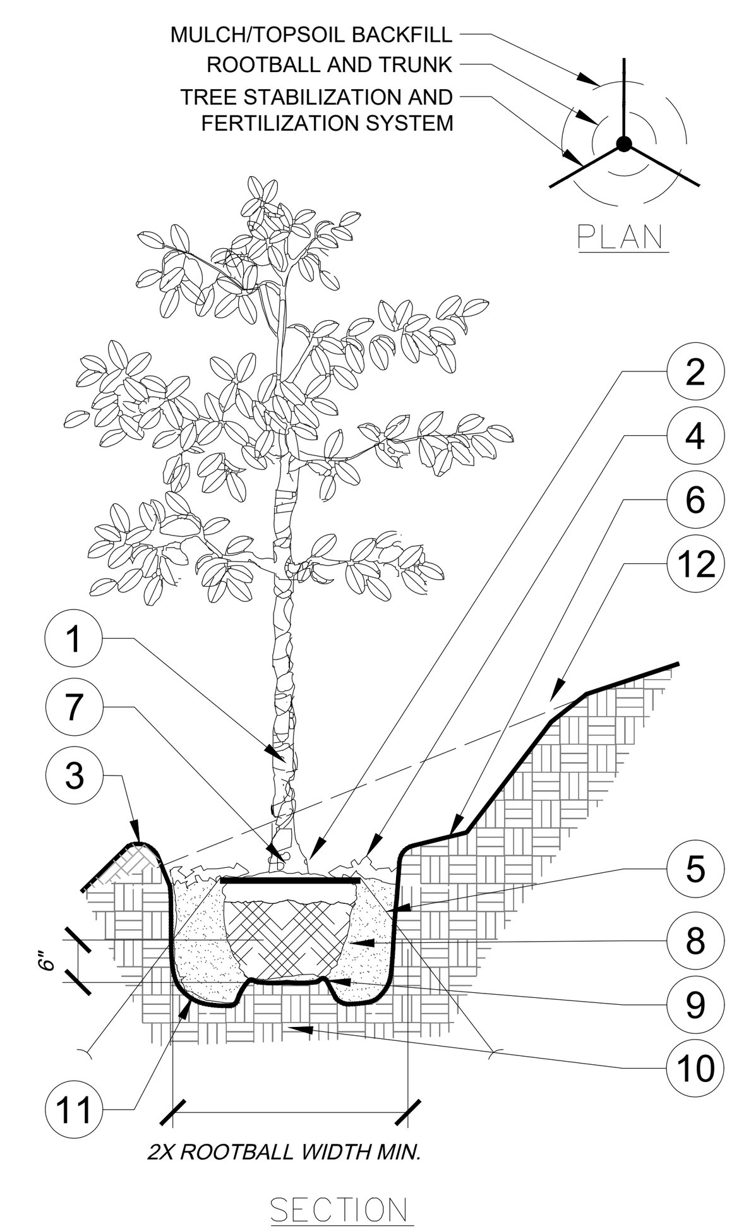


1. TRUNK/ROOT BALL TO BE CENTERED AND PLUMB/LEVEL IN PLANTING PIT.
2. 6" DIA. CLEAR OF MULCH AT TRUNK FLARE.
3. 3" MINIMUM MULCH AS SPECIFIED. WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES SHALL BE 6' DIAMETER (MIN.) OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
4. 4" HIGH BERM, FIRMLY COMPACTED.
5. ANCHOR SYSTEM INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
6. FINISHED GRADE. (SEE GRADING PLAN)
7. TOP OF ROOTBALL MIN. 1" ABOVE FINISHED GRADE.
8. PREPARED PLANTING SOIL AS SPECIFIED.
9. TOP OF ROOTBALL SHALL BE 1" ABOVE FINISHED GRADE. ROOTBALLS GREATER THAN 24" DIAMETER SHALL BE PLACED ON MOUND OF UNDISTURBED SOIL TO PREVENT SETTLING. ROOTBALLS SMALLER THAN 24" IN DIAMETER MAY SIT ON COMPACTED EARTH.
10. UNDISTURBED NATIVE SOIL.
11. SCARIFY BOTTOM AND SIDES OF PLANTING PIT.

NOTES:

A. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
B. REMOVE BURLAP, WIRE AND STRAPS (ANYTHING THAT COULD GIRDLE TREE OR RESTRICT ROOT GROWTH) ON UPPER 1/3 OF ROOTBALL.
C. PRUNE ALL TREES IN ACCORDANCE WITH ANSI A-300.

1 L200 TREE PLANTING
SECTION / PLAN NTS

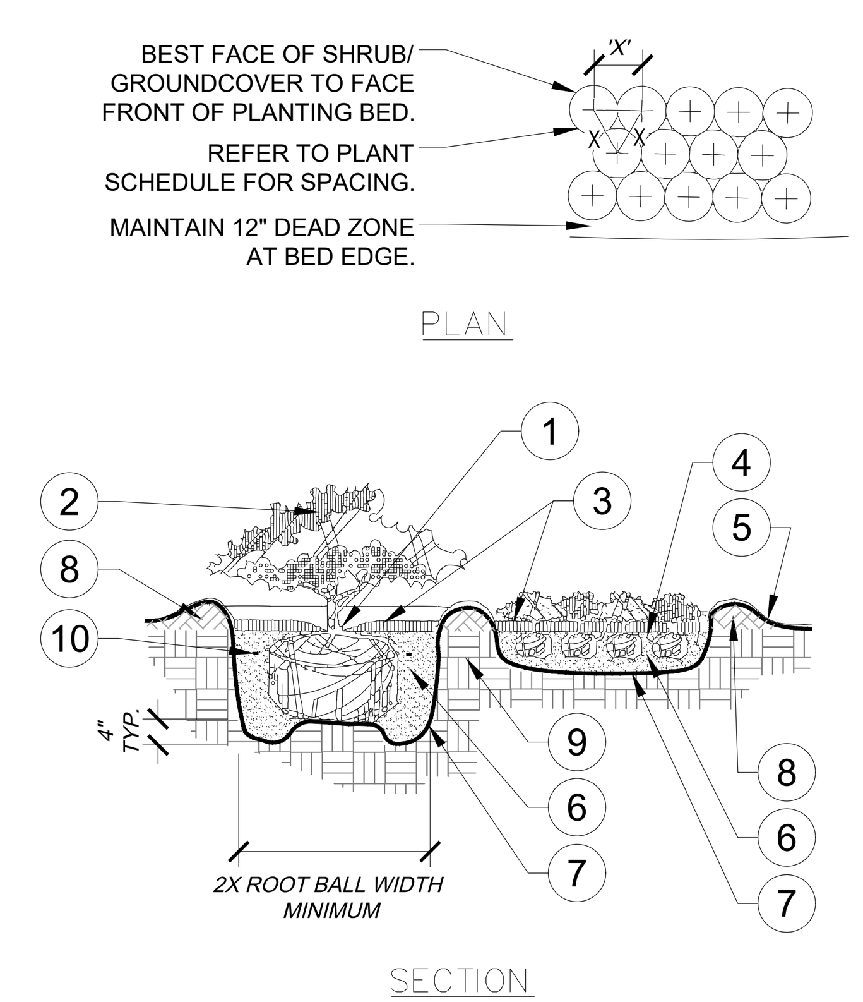


1. TRUNK/ROOT BALL TO BE CENTERED AND PLUMB/LEVEL IN PLANTING PIT.
2. 6" DIA. CLEAR OF MULCH AT TRUNK FLARE.
3. 4" HIGH BERM, FIRMLY COMPACTED NATIVE SOIL.
4. 3" MINIMUM OF MULCH AS SPECIFIED. WHERE TREES ARE PLACED IN SOD, MULCH RING FOR TREES SHALL BE 6' DIAMETER (MIN.) OR AS DIRECTED BY OWNER'S REPRESENTATIVE.
5. 8' x 2" TREATED LODGE POLE PINE TREE STAKES, TWO (2) PER TREE; AVOID PENETRATING ROOT BALL. 14 GAUGE, ANNEALED STEEL GUY WIRE. STAPLE ENDS TO INSIDE OF TREE STAKE. ADJUST TENSION BY TURNING WIRE PAIRS FROM THE MIDDLE
6. 4" MIN. OF TOPSOIL TO BRING TO FINISHED GRADE. (SEE GRADING PLAN)
7. TOP OF ROOTBALL MIN. 1" ABOVE FINISHED GRADE.
8. PREPARED PLANTING SOIL AS SPECIFIED.
9. ROOTBALLS GREATER THAN 24" DIAMETER SHALL BE PLACED ON MOUND OF UNDISTURBED SOIL TO PREVENT SETTLING. ROOTBALLS SMALLER THAN 24" IN DIAMETER MAY SIT ON COMPACTED EARTH.
10. UNDISTURBED NATIVE SOIL.
11. SCARIFY BOTTOM AND SIDES OF PLANT OPENING.
12. CUT BACK SLOPE TO PROVIDE A FLAT SURFACE FOR PLANTING.

NOTES:

A. FINAL TREE STAKING DETAILS AND PLACEMENT TO BE APPROVED BY OWNER.
B. REMOVE BURLAP, WIRE AND STRAPS (ANYTHING THAT COULD GIRDLE TREE OR RESTRICT ROOT GROWTH) ON UPPER 1/3 OF ROOTBALL.
C. PRUNE ALL TREES IN ACCORDANCE WITH ANSI A-300.

2 L200 TREE PLANTING ON A SLOPE
SECTION / PLAN NTS

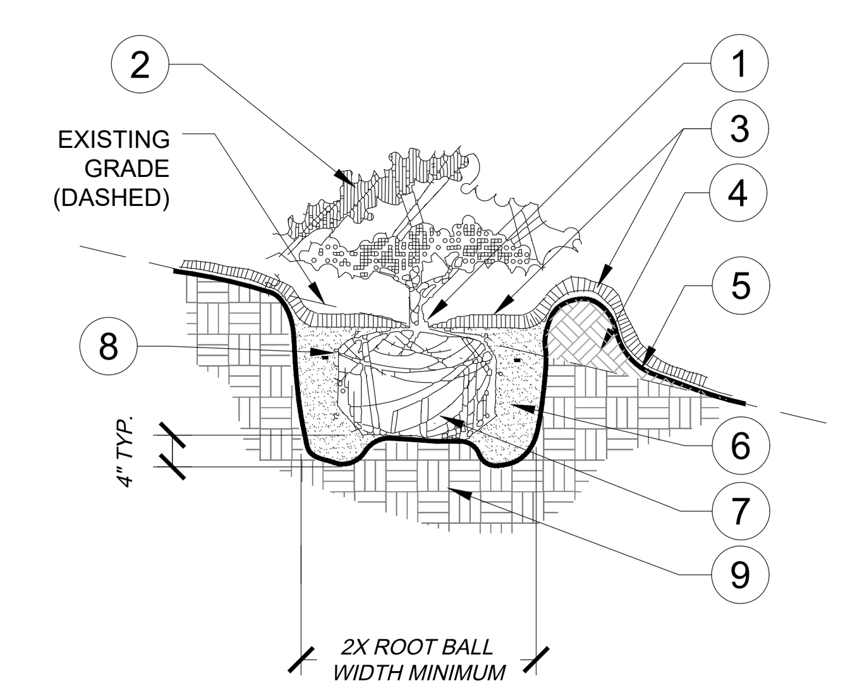


1. TOP OF ROOTBALLS TO BE PLANTED AT GRADE OR SLIGHTLY ABOVE SURROUNDING SOIL. 2" DIA. CLEAR OF MULCH AT TRUNK FLARE.
2. PRUNE ALL SHRUBS TO ACHIEVE A UNIFORM MASS/HEIGHT.
3. 4" MULCH LAYER AS SPECIFIED.
4. EXCAVATE ENTIRE BED SPECIFIED FOR GROUNDCOVER BED.
5. FOR CONDITIONS WITH FINISHED GRADE OF 4:1 MAX SLOPE ON ALL SIDES (SEE GRADING PLAN).
6. PREPARED PLANTING SOIL AS SPECIFIED. (SEE LANDSCAPE NOTES) NOTE: WHEN GROUND-COVERS AND SHRUBS USED IN MASSES, ENTIRE BED TO BE AMENDED WITH PLANTING SOIL MIX AS SPECIFIED.
7. SCARIFY PLANT OPENING SIDES AND BOTTOM.
8. 4" HIGH BERM FIRMLY COMPACTED.
9. UNDISTURBED NATIVE SOIL.
10. FERTILIZER TABLETS (MAX 3" DEEP)

NOTES:

A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANTING AREAS PRIOR TO INSTALLATION.
B. WHEN SHRUBS ARE PRUNED IN MASSES, PRUNE ALL SHRUBS TO ACHIEVE UNIFORM MASS / HEIGHT.
C. ALL SHRUBS AND GROUNDCOVERS SHALL BE PLUMB VERTICALLY, UNLESS OTHERWISE DIRECTED BY PROJECT LANDSCAPE ARCHITECT.
D. PRE-EMERGENT HERBICIDE TO BE APPLIED PRIOR TO PLANT INSTALLATION.

3 L200 SHRUB/GROUNDCOVER PLANTING
SECTION / PLAN NTS



1. TOP OF ROOTBALLS TO BE PLANTED AT GRADE OR SLIGHTLY ABOVE SURROUNDING SOIL. 2" DIA. CLEAR OF MULCH AT TRUNK FLARE.
2. PRUNE SHRUBS AS DIRECTED BY OWNER'S REPRESENTATIVE.
3. 4" MINIMUM OF MULCH AS SPECIFIED. WHERE SHRUBS ARE PLACED IN MASSES, MULCH SHALL BE SPREAD IN A CONTINUOUS BED.
4. SOIL BERM TO HOLD WATER. TOP OF PLANTING PIT 'BERM' TO BE LEVEL ACROSS PIT. SLOPE DOWNHILL PORTION OF BERM AS REQUIRED TO MEET EXISTING GRADE. MULCH OVER EXPOSED TOPSOIL.
5. FINISHED GRADE (SEE GRADING PLAN)
6. PREPARED PLANTING SOIL AS SPECIFIED. (SEE LANDSCAPE NOTES).
7. SCARIFY SIDES AND BOTTOM OF PLANTING PIT.
8. FERTILIZER TABLETS (MAX 3" DEEP).
9. UNDISTURBED NATIVE SOIL

NOTES:

A. CONTRACTOR SHALL ASSURE PERCOLATION OF ALL PLANT OPENINGS PRIOR TO INSTALLATION.
B. WHEN SHRUBS ARE PRUNED IN MASSES, PRUNE ALL SHRUBS TO ACHIEVE UNIFORM MASS / HEIGHT.
C. ALL SHRUBS AND GROUNDCOVERS SHALL BE PLUMB VERTICALLY, UNLESS OTHERWISE DIRECTED BY OWNERS REPRESENTATIVE.
D. PRE-EMERGENT HERBICIDE TO BE APPLIED PRIOR TO PLANT INSTALLATION.

4 L200 SHRUB/GROUNDCOVER PLANTING ON A SLOPE
SECTION NTS

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn
© 2024 KIMLEY-HORN AND ASSOCIATES, INC.
3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AMC
DRAWN BY: AMC
CHECKED BY: CPH
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.
LANDSCAPE NOTES

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
L200

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THIS DOCUMENT, TOGETHER WITH THE CONCEPTS AND DESIGNS PRESENTED HEREIN, AS AN INSTRUMENT OF SERVICE, IS INTENDED ONLY FOR THE SPECIFIC PURPOSE AND CLIENT FOR WHICH IT WAS PREPARED. REUSE OF AND IMPROPER RELIANCE ON THIS DOCUMENT WITHOUT WRITTEN AUTHORIZATION AND ADAPTATION BY KIMLEY-HORN AND ASSOCIATES, INC. SHALL BE WITHOUT LIABILITY TO KIMLEY-HORN AND ASSOCIATES, INC.

EROSION CONTROL DOCUMENTS FOR
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, CO
FEDERAL BLVD. & 64TH AVE.

SHEET LIST TABLE

LEGAL DESCRIPTION:

PARCEL A:
LOT 1, BLOCK 1, ELLETT SUBDIVISION, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THE NORTH 10 FEET THEREOF CONVEYED TO THE COUNTY OF ADAMS DESCRIBED IN RESOLUTION AND DEED RECORDED NOVEMBER 25, 1969 IN BOOK 1561 AT PAGE 44.

PARCEL B:
LOT 1, BLOCK 1, LEXI PAPPAGEORGE SUBDIVISION, COUNTY OF ADAMS, STATE OF COLORADO.

PARCEL C:
A PARCEL OF LAND LOCATED IN THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT THE NORTH LINE OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SAID POINT BEING 345.38 FEET EAST OF THE N1/4 CORNER OF SECTION 8 AND 320.00 FEET WEST OF THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE S 0°03'30" E DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE; THENCE S 90°00'00" W ALONG THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, A DISTANCE OF 270.38 FEET TO A POINT, SAID POINT BEING 75.00 FEET EAST OF 20.00 FEET SOUTH OF THE N1/4 CORNER OF SECTION 8; THENCE S 44°58'15" W A DISTANCE OF 28.28 FEET TO A POINT ON THE EAST RIGHT-OF-WAY LINE OF FEDERAL BOULEVARD, SAID POINT BEING 55.00 FEET EAST AND 40.00 FEET SOUTH OF THE N1/4 CORNER OF SECTION 8; THENCE S 0°03'30" E ALONG THE EAST RIGHT-OF-WAY LINE OF FEDERAL BOULEVARD, A DISTANCE OF 289.80 FEET TO THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE N 90°00'00" E ALONG THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8, A DISTANCE OF 141.89 FEET; THENCE N 0°31'25" W A DISTANCE OF 166.68 FEET; THENCE N 89°28'25" E DISTANCE OF 149.85 FEET; THENCE N 0°03'30" W A DISTANCE OF 141.76 FEET TO A POINT ON THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, AND 20.00 FEET SOUTH OF THE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF ADAMS, STATE OF COLORADO, AS DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 6, 1907 IN BOOK 33 AT PAGE 220.

AND EXCEPT THAT PORTION TAKEN IN RULE AND ORDER RECORDED OCTOBER 15, 1971 IN BOOK 1745 AT PAGE 484.

ALSO EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE STATE DEPARTMENT OF HIGHWAYS, DIVISION OF HIGHWAYS, STATE OF COLORADO DESCRIBED IN DEED RECORDED DECEMBER 11, 1984 IN BOOK 2945 AT PAGE 579.

AND FURTHER EXCEPTING THEREFROM THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 2005110700122948O.

PARCEL D:
A PARCEL OF LAND LOCATED IN THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

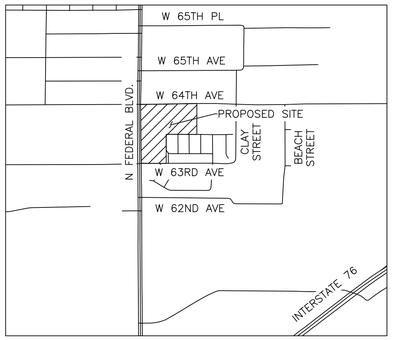
BEGINNING AT A POINT THE NORTH LINE OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, SAID POINT BEING 345.38 FEET EAST OF THE N1/4 CORNER OF SECTION 8, AND 320.00 FEET WEST OF THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8; THENCE S 0°03'30" E DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE AND THE POINT OF BEGINNING; THENCE S 90°00'00" E A DISTANCE OF 30.00 FEET; THENCE S 0°03'30" W A DISTANCE OF 309.80 FEET TO A POINT ON THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8; THENCE S 90°00'00" W ALONG THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4, OF SECTION 8, A DISTANCE OF 178.49 FEET; THENCE N 0°31'25" W A DISTANCE OF 166.68 FEET; THENCE N 89°28'25" E A DISTANCE OF 149.85 FEET; THENCE N 0°03'30" W A DISTANCE OF 141.76 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVE., AND THE TRUE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 2005110700122948O.

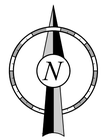
PARCEL E:
A PARCEL OF LAND BEING A PORTION OF THE EAST 290.00 FEET OF THE N1/2, NW1/4, NE1/4 OF SECTION 8, TOWNSHIP 3 SOUTH, RANGE 68 WEST, OF THE 6TH P.M., MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF THE N1/2, NW1/4, NW1/4, NE1/4 OF SECTION 8, THENCE SOUTH ALONG THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 20.00 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, WHICH IS THE TRUE POINT OF BEGINNING; THENCE CONTINUING SOUTH ALONG THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 309.80 FEET TO THE SOUTH LINE OF THE N1/2, NW1/4, NW1/4, NE1/4; THENCE WEST ALONG THE SOUTH LINE A DISTANCE OF 290.00 FEET; THENCE NORTH AND PARALLEL TO THE EAST LINE OF THE N1/2, NW1/4, NW1/4, NE1/4 A DISTANCE OF 309.80 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE; THENCE EAST ALONG THE SOUTH RIGHT-OF-WAY LINE OF 64TH AVENUE, A DISTANCE OF 290.00 FEET TO THE TRUE POINT OF BEGINNING, COUNTY OF ADAMS, STATE OF COLORADO.

EXCEPT THAT PORTION CONVEYED TO THE COUNTY OF ADAMS, STATE OF COLORADO DESCRIBED IN WARRANTY DEED RECORDED NOVEMBER 7, 2005 AT RECEPTION NO. 2005110700122948O.



VICINITY MAP
Not to Scale



MUNICIPAL CONTACT LIST:

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FIRE DEPARTMENT
ADAMS COUNTY FIRE PROTECTION DISTRICT
8055 NORTH WASHINGTON ST.
DENVER, CO 80229
TEL: 303-539-6800

WATER UTILITIES
CRESTVIEW WATER AND SANITATION DISTRICT
TEL: 303-429-1881

STORM/SANITARY UTILITIES
CRESTVIEW WATER AND SANITATION DISTRICT
TEL: 303-429-1881

ELECTRIC COMPANY
XCEL ENERGY
TEL: (800) 895-4999

GAS COMPANY
XCEL ENERGY
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QT CIVIL PROJECT MANAGER
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(918) 615-7685
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KANSAS CITY, MO 64105
TEL: (913) 389-7866
CONTACT: AMANDA SPITZER

LANDSCAPE ARCHITECT
KIMLEY-HORN AND ASSOCIATES, INC.
6200 SOUTH SYRACUSE WAY, SUITE 300
GREENWOOD VILLAGE, CO 80111
TEL: (303) 228-2319
CONTACT: CHRIS HEPLER, PLA

GENERAL NOTES:

1. IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS. ANY CONSTRUCTION OBSERVATION BY THE ENGINEER OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.
2. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL NECESSARY PERMITS HAVE BEEN OBTAINED FROM THE GOVERNING AGENCIES AND COORDINATING ALL GOVERNING AGENCY INSPECTIONS REQUIRED THROUGHOUT THE DURATION OF THE PROJECT.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR RAZING AND REMOVAL OF THE EXISTING STRUCTURES, RELATED UTILITIES, PAVING, AND ANY OTHER EXISTING IMPROVEMENTS AS NOTED. REFERENCE SITE WORK SPECIFICATIONS.
4. CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS. DISPOSAL WILL BE IN ACCORDANCE WITH ALL LOCAL, STATE AND/OR FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.
5. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR DAMAGE TO ADJACENT PROPERTIES AND NEW CONSTRUCTION IN PLACE DURING THE CONSTRUCTION PHASES OF THIS PROJECT. ANY DISTURBED IMPROVEMENTS SHALL BE REPLACED IN KIND AT THE CONTRACTORS EXPENSE.
6. ANY QUANTITIES PROVIDED ON THESE PLANS ARE FOR GENERAL REFERENCE PURPOSES ONLY. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE QUANTITIES REQUIRED FOR CONSTRUCTION.
7. THE EXISTING FEATURES SHOWN ON THESE PLANS ARE THOSE NOTED IN THE FIELD AND THOSE TAKEN FROM RECORD DRAWINGS. THERE IS NO GUARANTEE THAT ALL FEATURES (ABOVE OR BELOW GROUND) ARE SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL EXISTING FEATURES PRIOR TO BIDDING THE PROJECT.
8. THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO BEGINNING CONSTRUCTION BY CONTACTING THE LOCAL UTILITY COMPANIES AND/OR UTILIZING THE LOCAL ONE-CALL SYSTEM. ANY DAMAGE DONE TO EXISTING UTILITIES (THAT ARE TO REMAIN IN PLACE) DURING CONSTRUCTION OPERATIONS WILL BE THE CONTRACTOR'S RESPONSIBILITY AND REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. ALL SITE WORK FOR THIS PROJECT SHALL MEET OR EXCEED THE OWNERS CONTRACT DOCUMENTS AND SPECIFICATIONS. ALL WORK SHALL MEET OR EXCEED THE RELEVANT UTILITY COMPANIES AND REGULATORY AGENCIES, CONTRACT DOCUMENTS AND SPECIFICATIONS. ALL WORK WITHIN PUBLIC AND STATE RIGHT OF WAY SHALL BE IN ACCORDANCE WITH THE GOVERNING AGENCIES STANDARDS AND SPECIFICATIONS.
10. TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), CURRENT EDITION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE PROPER TRAFFIC CONTROL IS IN PLACE FOR EACH PHASE OF CONSTRUCTION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR PROPERLY MAINTAINING TRAFFIC CONTROL DEVICES THROUGHOUT THE DURATION OF THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TRAFFIC CONTROL PLANS TO THE CITY AND DEPARTMENT OF TRANSPORTATION AS REQUIRED.

WETLANDS NOTICE:

ANY DEVELOPMENT, EXCAVATION, CONSTRUCTION, OR FILLING IN A U.S. CORPS OF ENGINEERS DESIGNATED WETLAND IS SUBJECT TO LOCAL, STATE AND FEDERAL APPROVALS. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS AND/OR RESTRICTIONS AND ANY VIOLATION WILL BE SUBJECT TO FEDERAL PENALTY. THE CONTRACTOR SHALL HOLD THE OWNER/ DEVELOPER, THE ENGINEER AND THE LOCAL GOVERNING AGENCIES HARMLESS AGAINST SUCH VIOLATION.

WARRANTY/DISCLAIMER:

THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER THE ENGINEER NOR ITS PERSONNEL CAN OR DO WARRANT THESE DESIGNS OR PLANS AS CONSTRUCTED EXCEPT IN THE SPECIFIC CASES WHERE THE ENGINEER INSPECTS AND CONTROLS THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

NOTICE TO BIDDERS:

ALL QUESTIONS REGARDING THE PREPARATION OF THE GENERAL CONTRACTOR'S BID SHALL BE DIRECTED TO THE OWNER'S CONSTRUCTION REPRESENTATIVE. SUBCONTRACTORS MUST DIRECT THEIR QUESTIONS THROUGH THE GENERAL CONTRACTOR. THE CONSULTING ARCHITECT AND/OR THE CONSULTING ENGINEER SHALL NOT BE CONTACTED DIRECTLY WITHOUT PRIOR AUTHORIZATION FROM THE OWNER/DEVELOPER.

FLOOD CERTIFICATION:

THE FEDERAL EMERGENCY MANAGEMENT AGENCY, FLOOD INSURANCE RATE MAPS NO. 08001C0584H AND NO.08001C0592H, EFFECTIVELY DATED 03/05/2007, INDICATES THIS PARCEL OF LAND TO BE LOCATED IN ZONE X (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN).

BENCHMARKS:

VERTICAL RELIEF WAS MADE FROM AN ON THE GROUND SURVEY, CONTOURS SHOWN HERON ARE AT 1' INTERVALS USING THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAV 88), GEOID 12A. SITE VERTICAL WAS ESTABLISHED BY USING COUNTY OF DENVER BENCH MARK "156B" LOCATED AT THE SOUTHEAST CORNER OF 50TH AVENUE AND FEDERAL BOULEVARD.

ELEVATION = 5379.63 FEET (NAVD 1988)

BASIS OF BEARINGS:

BEARINGS ARE BASED ON THE STATE PLANE COORDINATE SYSTEM ESTABLISHED FOR THE COLORADO NORTH ZONE 0502, NORTH AMERICAN DATUM (NAD) OF 1983. DISTANCES SHOWN HEREON ARE GROUND UNITS. BEING THE NORTH LINE OF THE NORTHEAST 1/4 OF SECTION 8, BEARING S89°49'13"W, BETWEEN MONUMENTS SHOWN HEREON.

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3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
DATE: 08/07/2024

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PROJECT NO.
096888037

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ADAMS COUNTY EROSION CONTROL PLAN – GENERAL NOTES

1. ALL CONSTRUCTION PROJECTS, REGARDLESS OF THE SIZE, SHALL INSTALL, MAINTAIN AND REPAIR STORMWATER POLLUTION CONTROL MEASURES (CMS) TO EFFECTIVELY MINIMIZE EROSION, SEDIMENT TRANSPORT, AND THE RELEASE OF POLLUTANTS RELATED TO CONSTRUCTION ACTIVITY. CMS EXAMPLE INCLUDE: SEDIMENT CONTROL LOGS (SCL), SILT FENCE (SF), DIKES/SWALES, SEDIMENT TRAPS (ST), INLET PROTECTION (IP), OUTLET PROTECTION (OP), CHECK DAMS (CD), SEDIMENT BASINS (SB), TEMPORARY/PERMANENT SEEDING AND MULCHING (MU), SOIL ROUGHENING, MAINTAINING EXISTING VEGETATION AND PROTECTION OF TREES. CMS MUST BE SELECTED, DESIGNED, ADEQUATELY SIZED, INSTALLED AND MAINTAINED IN ACCORDANCE WITH GOOD ENGINEERING, HYDROLOGIC AND POLLUTION CONTROL PRACTICES. CMS/BMPS INSTALLATION AND MAINTENANCE DETAILS SHALL CONFORM TO URBAN DRAINAGE FLOOD CONTROL CRITERIA MANUAL VOLUME 3, OR THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) ITEM CODE BOOK. CMS MUST FILTER, SETTLE, CONTAIN OR STRAIN POLLUTANTS FROM STORMWATER FLOWS IN ORDER TO PREVENT BYPASS OF FLOWS WITHOUT TREATMENT. CMS MUST BE APPROPRIATE TO TREAT THE RUNOFF FROM THE AMOUNT OF DISTURBED AREA, THE EXPECTED FLOW RATE, DURATION, AND FLOW CONDITIONS (I.E., SHEET OR CONCENTRATED FLOW). CMS/BMPS SHALL BE SPECIFIED IN THE SWMP (IF APPLICABLE), AND THE LOCATIONS SHOWN ON THE EC PLAN.

2. PRIOR TO CONSTRUCTION, PROJECTS DISTURBING 1 OR MORE ACRES OF LAND, OR ANY PROJECT BELONGING TO A COMMON PLAN OF DEVELOPMENT DISTURB 1 OR MORE ACRES, MUST OBTAIN:
   2.1. A GENERAL PERMIT FOR STORMWATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES, FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, AND
   2.2. AN ADAMS COUNTY STORMWATER QUALITY PERMIT WITHIN THE UNINCORPORATED ADAMS COUNTY MS4 AREA.

3. PERMITTED PROJECTS SHALL DEVELOP A STORMWATER MANAGEMENT PLAN (SWMP), AKA EROSION AND SEDIMENT CONTROL PLAN (ESCP), IN COMPLIANCE WITH CDPHE MINIMUM REQUIREMENTS. THE APPROVED SWMP, INCLUDING EROSION CONTROL (EC) PLAN (SITE MAP), SHALL BE KEPT ON SITE AND UPDATED AT ALL TIMES. THE QUALIFIED STORMWATER MANAGER IS RESPONSIBLE FOR IMPLEMENTING THE SWMP AND CMS (AKA BMPS) DURING CONSTRUCTION.

4. PERMITTED PROJECTS SHALL PERFORM REGULAR STORMWATER INSPECTIONS EVERY 7 CALENDAR DAYS; OR EVERY CALENDAR DAYS AND WITHIN 24 HOURS AFTER ANY PRECIPITATION OR SNOWMELT EVENT THAT CAUSES SURFACE EROSION. INSPECTION FREQUENCY CAN BE REDUCED FOR POST STORM EVENT INSPECTIONS AT TEMPORARILY IDLE SITES AND ALSO FOR STORMWATER INSPECTIONS AT COMPLETED SITES WAITING FOR FINAL STABILIZATION. INSPECTION REPORTS MUST IDENTIFY ANY INCIDENTS OF NON COMPLIANCE.

5. TRACKING OF DIRT ONTO PAVED PUBLIC OR PRIVATE PAVED ROADS IS NOT ALLOWED. THE USE OF DIRT RAMPS TO ENTER/EXIT FROM AN UNPAVED INTO A PAVED AREA IS PROHIBITED. VEHICLE TRACKING CONTROLS SHALL BE IMPLEMENTED, OTHERWISE ENTRANCE AREA MUST DRAIN THRU A CM TOWARDS THE PRIVATE SITE.

6. TRUCK LOADS OF FILL MATERIAL IMPORTED TO OR CUT MATERIAL EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT LOSS OF THE MATERIAL DURING TRANSPORTATION ON PUBLIC ROW. HAUL ROUTES MUST BE PERMITTED BY THE COUNTY. NO MATERIAL SHALL BE TRANSPORTED TO ANOTHER SITE WITHOUT APPLICABLE PERMITS.

7. CONTROL MEASURES DESIGNED FOR CONCRETE WASHOUT WASTE MUST BE IMPLEMENTED. THIS INCLUDES WASHOUT WASTE DISCHARGED TO THE GROUND AND WASHOUT WASTE FROM CONCRETE TRUCKS AND MASONRY OPERATIONS.

8. TEMPORARY CMS/BMPS SHALL BE REMOVED AFTER THE SITE HAS REACHED FINAL STABILIZATION.

9. DEWATERING OPERATIONS DISCHARGING OFF SITE INTO ANY WATERS CONVEYANCE SYSTEMS INCLUDING WETLANDS, IRRIGATION DITCHES, CANALS, RIVERS, STREAMS OR STORM SEWER SYSTEMS, REQUIRE A STATE CONSTRUCTION DEWATERING PERMIT.

10. PERMITTED PROJECTS SHALL KEEP THE CDPHE'S STORMWATER DISCHARGE PERMIT, STORMWATER MANAGEMENT PLAN (SWMP) AND INSPECTION LOGS AVAILABLE ON SITE THROUGHOUT THE DURATION OF THE PROJECT, AND FOR AN ADDITIONAL 3 YEARS AFTER PERMIT CLOSE OUT.

11. PERMITTED LANDOWNER AND/OR CONTRACTOR SHALL CLOSE THE STATE AND CITY/COUNTY PERMIT ONCE FINAL STABILIZATION IS REACHED. STORMWATER INSPECTIONS SHALL CONTINUE UNTIL INACTIVATION NOTICE IS FILED WITH CDPHE.

MAINTENANCE STANDARD NOTES:

1. MAINTAIN AND REPAIR CMS ACCORDING TO APPROVED EROSION CONTROL PLAN (CIVIL DRAWING) TO ASSURE THEY CONTINUE PERFORMING AS ORIGINALLY INTENDED.

2. CMS/BMPS REQUIRING MAINTENANCE OR ADJUSTMENT SHALL BE REPAIRED IMMEDIATELY AFTER OBSERVATION OF THE FAILING BMP.

3. CMS SHALL BE CLEANED WHEN SEDIMENT LEVELS ACCUMULATE TO HALF THE DESIGN UNLESS OTHERWISE SPECIFIED.

4. SWMP AND EC PLAN SHALL BE CONTINUOUSLY UPDATED TO REFLECT NEW OR REVISED CMS/BMPS DUE TO CHANGES IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE, TO ACCURATELY REFLECT THE ACTUAL FIELD CONDITIONS. A NOTATION SHALL BE MADE IN THE SWMP, INCLUDING DATE OF CHANGES IN THE FIELD, IDENTIFICATION OF THE CMS REMOVED, MODIFIED OR ADDED, AND THE LOCATIONS OF THOSE CMS. UPDATES MUST BE MADE WITHIN 72 HOURS FOLLOWING THE CHANGE.

5. MAINTAIN VEHICLE TRACKING CONTROL (VTC), IF SEDIMENT TRACKING OCCURS, CLEAN UP IMMEDIATELY. SWEEP BY HAND OR THE USE STREET SWEEPERS (WITH VACUUM SYSTEM). FLUSHING OFF PAVED SURFACES WITH WATER IS PROHIBITED.

6. CWA MUST BE CLEANED ONCE WASTE ACCUMULATION REACHES ⅓ OF THE WET STORAGE CAPACITY OF THE STRUCTURE. LEGALLY DISPOSED OF CONCRETE WASTE. DO NOT BURY ON-SITE.

7. CLEAN-UP SPILLS IMMEDIATELY AFTER DISCOVERY, OR CONTAIN UNTIL APPROPRIATE CLEANUP METHODS CAN BE EMPLOYED.FOLLOW MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP, ALONG WITH PROPER DISPOSAL METHODS. RECORDS OF SPILLS, LEAKS, OR OVERFLOWS THAT RESULT IN DISCHARGE OF POLLUTANTS MUST BE DOCUMENTED AND MAINTAINED.

8. REMOVE SEDIMENT FROM STORM SEWER INFRASTRUCTURE (PONDS, STORM PIPES, OUTLETS, INLETS, ROADSIDE DITCHES, ETC.), AND RESTORE VOLUME CAPACITY UPON COMPLETION OF PROJECT OR PRIOR TO INITIAL ACCEPTANCE OF PUBLIC IMPROVEMENTS (IF APPLICABLE). DO NOT FLUSH SEDIMENT OFFSITE, CAPTURE ON-SITE AND DISPOSED OF AT AN APPROVED LOCATION.

PERFORMANCE STANDARD NOTES:

1. STORMWATER RUNOFF FROM DISTURBED AREAS MUST FLOW TO AT LEAST ONE (1) CM TO MINIMIZE SEDIMENT IN THE DISCHARGE. DO NOT ALLOW SEDIMENT TO LEAVE THE SITE. THE BEST WAY TO PREVENT SEDIMENT OR POLLUTANTS FROM ENTERING THE STORM SEWER SYSTEM IS TO STABILIZE THE SITE AS QUICKLY AS POSSIBLE, PREVENTING EROSION AND STOPPING SEDIMENT RUN OFF AT ITS SOURCE.

2. PHASE CONSTRUCTION TO MINIMIZE DISTURBED AREAS, INCLUDING DISTURBANCE OF STEEP SLOPES. (I.E. THE ENTIRE PROJECT SITE SHOULD NOT BE DISTURBED IF CONSTRUCTION WILL ONLY BE OCCURRING IN ONE PARTICULAR SECTION OF THE SITE).LIMIT SOIL EXPOSURE TO THE SHORTEST POSSIBLE PERIOD OF TIME. PROTECT NATURAL FEATURES AND EXISTING VEGETATION WHENEVER POSSIBLE. REMOVAL OF EXISTING VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATIONS. MAINTAIN PRE-EXISTING VEGETATION (OR EQUIVALENT CMS) FOR AREAS WITHIN 50 HORIZONTAL FT OF RECEIVING WATERS.

3. SOIL COMPACTION MUST BE MINIMIZED FOR AREAS WHERE INFILTRATION CMS WILL OCCUR OR WHERE FINAL STABILIZATION WILL BE ACHIEVED THROUGH VEGETATIVE COVER.

4. ALL SOIL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT THE LOSS OF MATERIAL DURING TRANSPORT.

5. DUST EMISSIONS RESULTING FROM GRADING ACTIVITIES OR WIND SHALL BE CONTROLLED.

6. INSTALL CONSTRUCTION FENCE (ORANGE) TO PROTECT WETLANDS AND OTHER SENSITIVE AREAS AND TO PREVENT ACCESS, AND TO DELINEATE THE LIMITS OF CONSTRUCTION. DO NOT USE SILT FENCE TO PROTECT WETLANDS SINCE TRENCHING MAY IMPACT THESE AREAS.

7. CMS INTENDED TO CAPTURE OVERLAND, LOW VELOCITY SHEET FLOW AT A FAIRLY LEVEL GRADE SHALL ONLY BE INSTALLED ALONG CONTOURS.

8. INSTALL CMS, SUCH AS CHECK DAMS, PERPENDICULAR TO THE CONCENTRATED FLOWS TO REDUCE FLOW VELOCITY.

9. STORM DRAIN INLETS WITHIN AND ADJACENT TO THE CONSTRUCTION SITE MUST BE PROTECTED. ANY PONDING OF STORMWATER AROUND INLET PROTECTION MUST NOT CAUSE EXCESSIVE FLOODING OR DAMAGE ADJACENT AREAS OR STRUCTURES.

10. INSTALL VEHICLE TRACKING CONTROL (VTC) TO ENTER/EXIT UNPAVED AREA. DO NOT USE RECYCLED CRUSHED CONCRETE OR ASPHALT MILLINGS FOR VEHICLE TRACKING PADS.

11. STRAW BALES SHALL NOT BE USED FOR PRIMARY EROSION OR SEDIMENT CONTROL (I.E. STRAW BALES MAY BE USED FOR REINFORCEMENT BEHIND ANOTHER BMP SUCH AS SILT FENCE).

12. OUTLETS SYSTEMS (SUCH AS SKIMMER OR PERFORATED RISER PIPE) SHALL BE INSTALLED TO WITHDRAW WATER FROM OR NEAR THE SURFACE LEVEL WHEN DISCHARGING FROM BASINS. WATER CANNOT DRAIN FROM THE BOTTOM OF THE POND.

13. TEMPORARY STABILIZATION MUST BE IMPLEMENTED FOR EARTH DISTURBING ACTIVITIES ON ANY PORTION OF THE SITE WHERE LAND DISTURBING ACTIVITIES HAVE PERMANENTLY OR TEMPORARILY CEASED (FOR MORE THAN 14 CALENDAR DAYS). TEMPORARY STABILIZATION METHODS EXAMPLES: TARPS, SOIL TACKIFIER, AND HYDROSEED. TEMPORARY STABILIZATION REQUIREMENT MAY EXCEED THE 14-DAY SCHEDULE WHEN EITHER THE FUNCTION OF THE SPECIFIC AREA REQUIRES IT TO REMAIN DISTURBED, OR, PHYSICAL CHARACTERISTICS OF THE TERRAIN AND CLIMATE PREVENT STABILIZATION AS LONG AS THE CONSTRAINTS AND ALTERNATIVE SCHEDULE IS DOCUMENTED ON THE SWMP, AND LOCATIONS ARE IDENTIFIED ON THE EC PLAN (SITE MAP).

14. RUNOFF FROM STOCKPILE AREA MUST BE CONTROLLED. SOILS THAT WILL BE STOCKPILED FOR MORE THAN 30 DAYS SHALL BE PROTECTED FROM WIND AND WATER EROSION WITHIN 14 DAYS OF STOCKPILE CONSTRUCTION INSTALL CMS/BMPS 5 FT AWAY FROM THE TOE OF THE STOCKPILE'S SLOPE.

15. WATER USE TO CLEAN CONCRETE TRUCKS SHALL BE DISCHARGED INTO A CONCRETE WASHOUT AREA (CWA). THE PREDEFINED CONTAINMENT AREA MUST BE IDENTIFIED WITH A SIGN, AND SHALL ALLOW THE LIQUIDS TO EVAPORATE OR DRY OUT. CWA DISCHARGES THAT MAY REACH GROUNDWATER MUST FLOW THROUGH SOIL THAT HAS BUFFERING CAPACITY PRIOR TO REACHING GROUNDWATER. THE CONCRETE WASHOUT LOCATION SHALL BE NOT BE LOCATED IN AN AREA WHERE SHALLOW GROUNDWATER MAY BE PRESENT AND WOULD RESULT IN BUFFERING CAPACITY NOT BEING ADEQUATE, SUCH AS NEAR NATURAL DRAINAGES, SPRINGS, OR WETLANDS. IN THIS CASE, A LINER UNDERNEATH IS NEEDED FOR AREAS WITH HIGH GROUNDWATER LEVELS. CWA SHALL NOT BE PLACED IN LOW AREAS, DITCHES OR ADJACENT TO STATE WATERS. PLACE CWA 50 FT AWAY FROM STATE WATERS.

16. WASTE, SUCH AS BUILDING MATERIALS, WORKERS TRASH AND CONSTRUCTION DEBRIS, MUST BE PROPERLY MANAGED TO PREVENT STORMWATER POLLUTION.

17. INSTALL STABILIZED STAGING AREA (SSA) TO STORE MATERIALS, CONSTRUCTION TRAILER, ETC.

18. IF CONDITIONS IN THE FIELD WARRANT ADDITIONAL CMS/BMPS TO THE ONES ORIGINALLY APPROVED ON THE SWMP OR EC PLAN (CIVIL DRAWING), THE LANDOWNER OR CONTRACTOR SHALL IMPLEMENT MEASURES DETERMINED NECESSARY, AS DIRECTED BY THE COUNTY.

19. PERMANENT CMS/BMPS FOR SLOPES, CHANNELS, DITCHES, OR DISTURBED LAND AREA SHALL BE PERFORMED IMMEDIATELY AFTER FINAL GRADING. CONSIDER THE USE EROSION CONTROL BLANKETS ON SLOPES 3:1 OR STEEPER AND AREAS WITH CONCENTRATED FLOWS SUCH AS SWALES, LONG CHANNELS AND ROADSIDE DITCHES.

20. THE DISCHARGE OF SANITARY WASTE INTO THE STORM SEWER SYSTEM IS PROHIBITED. PORTABLE TOILETS MUST BE PROVIDED, SECURED AND PLACED ON PERMEABLE SURFACES, AWAY FROM THE CURBSIDE, STORM INLETS AND/OR DRAINAGE WAYS.

21. REMOVE TEMPORARY CMS/BMPS ONCE FINAL STABILIZATION IS REACHED, UNLESS OTHERWISE AUTHORIZED.

22. FINAL STABILIZATION MUST BE IMPLEMENTED. FINAL STABILIZATION IS REACHED WHEN ALL SOIL DISTURBING ACTIVITIES HAVE BEEN COMPLETED, AND EITHER A UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED WITH AN INDIVIDUAL PLANT DENSITY OF AT LEAST 70% OF PRE-DISTURBANCE LEVELS, OR EQUIVALENT PERMANENT ALTERNATIVE METHOD HAS BEEN IMPLEMENTED.

23. PROVIDE SPILL PREVENTION AND CONTAINMENT MEASURES FOR CONSTRUCTION MATERIALS, WASTE AND FUEL STORAGE AREAS. BULK STORAGE (55 GALLONS OR GREATER) OF PETROLEUM PRODUCTS AND LIQUID CHEMICALS MUST HAVE SECONDARY CONTAINMENT, OR EQUIVALENT PROTECTION, IN ORDER TO CONTAIN SPILLS AND TO PREVENT SPILLED MATERIAL FROM ENTERING STATE WATERS.

24. REPORT SPILLS OR RELEASES OF CHEMICAL, OIL, PETROLEUM PRODUCT, SEWAGE, ETC., WHICH MAY REACH THE STORM SEWER OR ENTER STATE WATERS WITHIN 24-HOURS FROM TIME OF DISCOVERY. GUIDANCE AVAILABLE AT WWW.CDPHE.STATE.CO.US/EMP/SPILLSANDRELEASED.HTM. STATE OF COLORADO SPILL-LINE: 1-877-518-5608. ADAMS COUNTY STORMWATER HOTLINE: 720-523-6400; PUBLIC WORKS 303-453-8787 AND THE TRI-COUNTY HEALTH DEPARTMENT AT 303-220-9200.

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GENERAL NOTES

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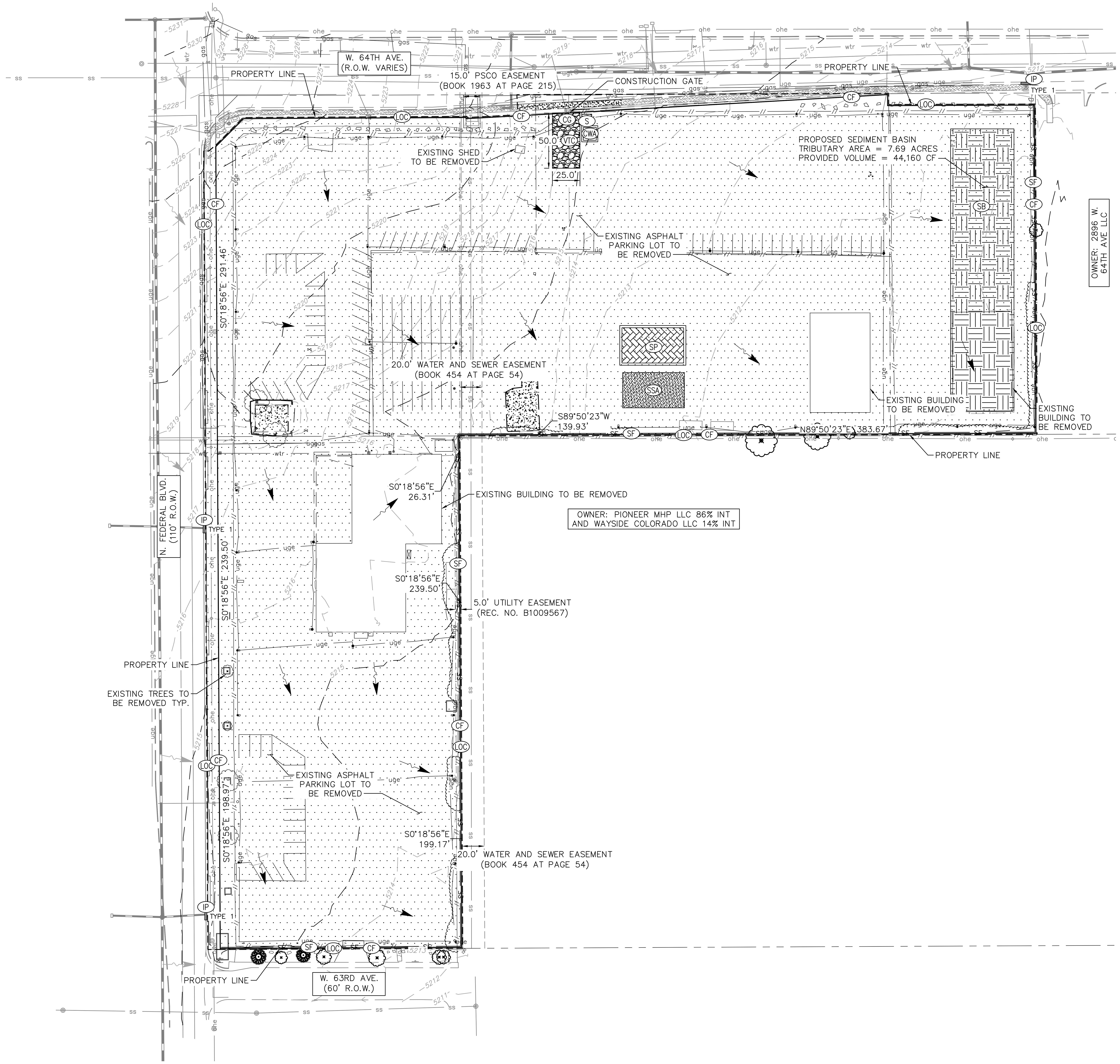

OWNERSHIP / CONTRACTOR SUMMARY

OWNER/DEVELOPER:
BRITTANY SIKORSKI
QUIKTRIP CORPORATION
12000 WASHINGTON ST, STE 175
THORNTON, CO 80241
(303) 248-0436

SITE OPERATOR/GENERAL CONTRACTOR:
TBD

SUPERINTENDENT:
TBD

ACREAGE SUMMARY

IMPERVIOUS AREA	±7.59 ACRES
LANDSCAPE AREA	±0.07 ACRES
TOTAL DISTURBED	±7.66 ACRES

EROSION CONTROL INITIAL LEGEND

- PROPERTY LINE
- EASEMENT LINE (EXISTING)
- XXXX MAJOR CONTOUR (EXISTING)
- XXXX MINOR CONTOUR (EXISTING)
- SF SILT FENCE PER UDFCD DTL SC-1
- CF CONSTRUCTION FENCE
- LOC LIMITS OF CONSTRUCTION
- SB SEDIMENT BASIN PER UDFCD DTL SC-7
- VTC VEHICLE TRACKING CONTROL PER UDFCD DTL SM-4
- SP STOCK PILE
- SSA STABILIZED STAGING AREA PER UDFCD DTL SM-6
- CWA CONCRETE WASH AREA PER UDFCD DTL MM-1
- SS STREET SWEEPING PER UDFCD DTL SM-7
- S SWMP SIGN POSTING
- IP INLET PROTECTION, TYPE 1
- CG CONSTRUCTION GATE
- EXISTING FLOW DIRECTION

EROSION CONTROL NOTES

1. STABILIZED STAGING AREA, STOCKPILE AREA, PORTABLE TOILETS, AND CONCRETE WASHOUT LOCATIONS SHALL BE DETERMINED BY THE DEVELOPER/CONTRACTOR AND UPDATED WITHIN THE STORMWATER MANAGEMENT PLAN AS REQUIRED BY THE CITY ISSUED STORMWATER DISCHARGE PERMIT.
2. SEDIMENT BASIN AND DIVERSION DITCHES SHALL BE PROVIDED AFTER DEMOLITION BUT PRIOR TO EARTHWORK MOVING ACTIVITIES. REFER TO PLAN FOR LOCATIONS.
3. DEVELOPER/CONTRACTOR SHALL REFER TO THE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT FOR INSPECTION AND BMP MAINTENANCE REQUIREMENTS.
4. SILT FENCE SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING. ALONG THE EXISTING BACK OF SIDEWALK. IMMEDIATELY UPON INSTALLATION OF THE PROPOSED CURB & GUTTER ALONG SHERIDAN AND MISSISSIPPI, CONTRACTOR SHALL RE-INSTALL SILT FENCE AT THE BACK OF CURB TO PREVENT SEDIMENT FROM ENTERING THOSE STREETS. CONTRACTOR MAY USE SEDIMENT CONTROL LOGS (SCL) IN PLACE OF SILT FENCE IN THIS AREA AS LONG AS THE SCL PREVENTS SEDIMENT FROM ENTERING THE EXISTING STREETS.
5. CONSTRUCTION FENCE SHALL BE PLACED APPROXIMATELY 2-FEET OFF THE EXISTING EDGE OF SIDEWALK.
6. STORMWATER QUALITY BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED TO MINIMIZE SOIL EROSION, SEDIMENTATION, INCREASED POLLUTANT LOADS, AND CHANGED WATER FLOW CHARACTERISTICS RESULTING FROM LAND DISTURBING ACTIVITY, TO THE MAXIMUM EXTENT PRACTICABLE, SO AS TO MINIMIZE POLLUTION OF RECEIVING WATERS.
7. REFER TO SHEET C030 FOR DEMOLITION PLAN. INITIAL BMPS SHALL BE INSTALLED PRIOR TO DEMOLITION WORK BEGINNING.
8. PEDESTRIAN DETOURS REQUIRE APPROVAL FROM THE CITY OF LAKEWOOD TRANSPORTATION ENGINEERING DIVISION.
9. CONTRACTOR MUST CONTACT RTD PRIOR TO ANY PEDESTRIAN DETOURS AND PRIOR TO ANY WORK ON THE EXISTING RTD BUS STOP.

SEQUENCE OF CONSTRUCTION PLANS

1. NOTIFY CITY INSPECTOR OF INTENT TO INSTALL PERIMETER BMPS.
2. INSTALL PERIMETER SEDIMENT CONTROL BMPS, INCLUDING SILT FENCE, INLET PROTECTION, AND VEHICLE TRACKING CONTROL.
3. CONTACT CITY INSPECTOR FOR AN INSPECTION ONCE PERIMETER EROSION CONTROL MEASURES ARE IN PLACE.
4. DEMOLITION PERMIT AND GRADING PERMIT ARE REQUIRED PRIOR TO DEMOLITION ACTIVITIES.
5. PROCEED WITH DEMOLITION ACTIVITIES. REFER TO SHEET C030 FOR EXISTING CONDITIONS AND DEMOLITION PLAN.
6. OBTAIN GRADING PERMIT FROM THE COUNTY.
7. STRIP TOPSOIL AND STOCKPILE;
8. PROCEED TO INTERIM STORMWATER MANAGEMENT PLAN.

NORTH

GRAPHIC SCALE IN FEET
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CONSTRUCTION DOCUMENTS
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EROSION CONTROL PLAN - INITIAL

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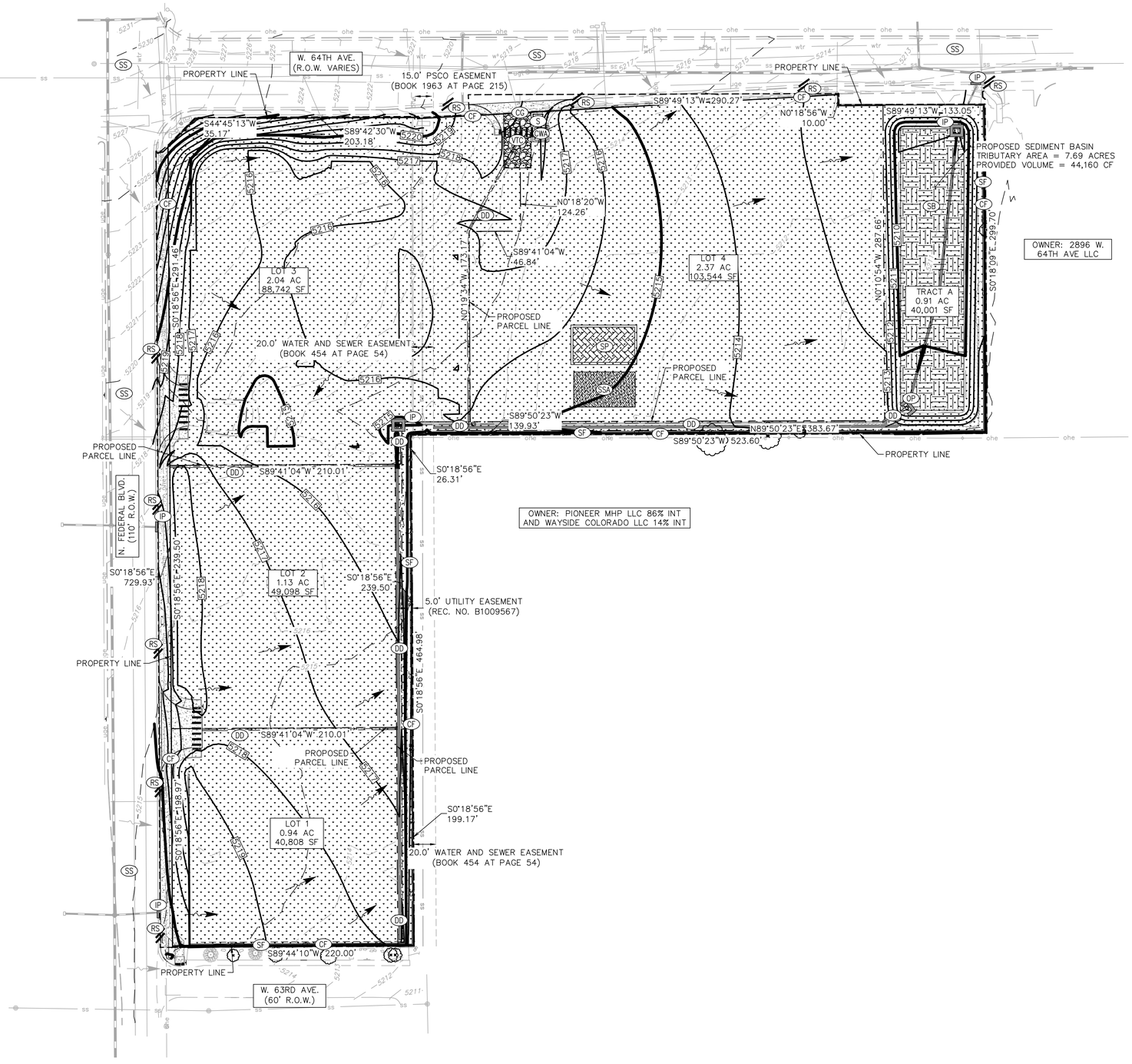

EROSION CONTROL INTERIM LEGEND

- PROPERTY LINE
- EASEMENT LINE (EXISTING)
- MAJOR CONTOUR (EXISTING)
- MINOR CONTOUR (EXISTING)
- MAJOR CONTOUR (NEW)
- MINOR CONTOUR (NEW)
- PROPOSED FLOW DIRECTION
- STORM GRATE (NEW)
- SF — SILT FENCE PER UDFCD DTL SC-1
- CF — CONSTRUCTION FENCE
- LOC — LIMITS OF DISTURBANCE
- SB — SEDIMENT BASIN PER UDFCD DTL SC-7
- VTC — VEHICLE TRACKING CONTROL PER UDFCD DTL SM-4
- SP — STOCK PILE
- SSA — STABILIZED STAGING AREA PER UDFCD DTL SM-6
- IP — INLET PROTECTION (TYPE 1 OR TYPE 3) PER UDFCD DTL SC-6
- OP — OUTLET PROTECTION
- CWA — CONCRETE WASH AREA PER UDFCD DTL MM-1
- SS — STREET SWEEPING PER UDFCD DTL SM-7
- S — SWMP SIGN POSTING
- RS — ROCK SOCKS PER UDFCD DTL SC-5
- CC — CONSTRUCTION GATE
- DD — DIVERSION DITCH

EROSION CONTROL NOTES

1. STABILIZED STAGING AREA, STOCKPILE AREA, PORTABLE TOILETS, AND CONCRETE WASHOUT LOCATIONS SHALL BE DETERMINED BY THE DEVELOPER/CONTRACTOR AND UPDATED WITHIN THE STORMWATER MANAGEMENT PLAN AS REQUIRED BY THE CITY ISSUED STORMWATER DISCHARGE PERMIT.
2. SEDIMENT BASIN AND DIVERSION DITCHES SHALL BE PROVIDED AFTER DEMOLITION BUT PRIOR TO EARTHWORK MOVING ACTIVITIES. REFER TO PLAN FOR LOCATIONS.
3. DEVELOPER/CONTRACTOR SHALL REFER TO THE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT FOR INSPECTION AND BMP MAINTENANCE REQUIREMENTS.
4. SILT FENCE SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING. ALONG THE EXISTING BACK OF SIDEWALK. IMMEDIATELY UPON INSTALLATION OF THE PROPOSED CURB & GUTTER ALONG SHERIDAN AND MISSISSIPPI, CONTRACTOR SHALL RE-INSTALL SILT FENCE AT THE BACK OF CURB TO PREVENT SEDIMENT FROM ENTERING THOSE STREETS. CONTRACTOR MAY USE SEDIMENT CONTROL LOGS (SCL) IN PLACE OF SILT FENCE IN THIS AREA AS LONG AS THE SCL PREVENTS SEDIMENT FROM ENTERING THE EXISTING STREETS.
5. CONSTRUCTION FENCE SHALL BE PLACED APPROXIMATELY 2-FEET OFF THE EXISTING EDGE OF SIDEWALK.
6. STORMWATER QUALITY BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED TO MINIMIZE SOIL EROSION, SEDIMENTATION, INCREASED POLLUTANT LOADS, AND CHANGED WATER FLOW CHARACTERISTICS RESULTING FROM LAND DISTURBING ACTIVITY, TO THE MAXIMUM EXTENT PRACTICABLE, SO AS TO MINIMIZE POLLUTION OF RECEIVING WATERS.
7. REFER TO SHEET C030 FOR DEMOLITION PLAN. INITIAL BMPS SHALL BE INSTALLED PRIOR TO DEMOLITION WORK BEGINNING.
8. PEDESTRIAN DETOURS REQUIRE APPROVAL FROM ADAMS COUNTY.
9. CONTRACTOR MUST CONTACT RTD PRIOR TO ANY PEDESTRIAN DETOURS AND PRIOR TO ANY WORK ON THE EXISTING RTD BUS STOP.

SEQUENCE OF CONSTRUCTION PLANS

1. NOTIFY CITY INSPECTOR OF INTENT TO INSTALL PERIMETER BMPS.
2. INSTALL PERIMETER SEDIMENT CONTROL BMPS, INCLUDING SILT FENCE, INLET PROTECTION, AND VEHICLE TRACKING CONTROL.
3. CONTACT CITY INSPECTOR FOR AN INSPECTION ONCE PERIMETER EROSION CONTROL MEASURES ARE IN PLACE.
4. DEMOLITION PERMIT AND GRADING PERMIT ARE REQUIRED PRIOR TO DEMOLITION ACTIVITIES.
5. PROCEED WITH DEMOLITION ACTIVITIES. REFER TO SHEET C030 FOR EXISTING CONDITIONS AND DEMOLITION PLAN.
6. OBTAIN GRADING PERMIT FROM THE COUNTY.
7. STRIP TOPSOIL AND STOCKPILE;
8. PROCEED TO INTERIM STORMWATER MANAGEMENT PLAN.

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FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
DATE: 08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

EROSION CONTROL PLAN - INTERIM

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
EC141

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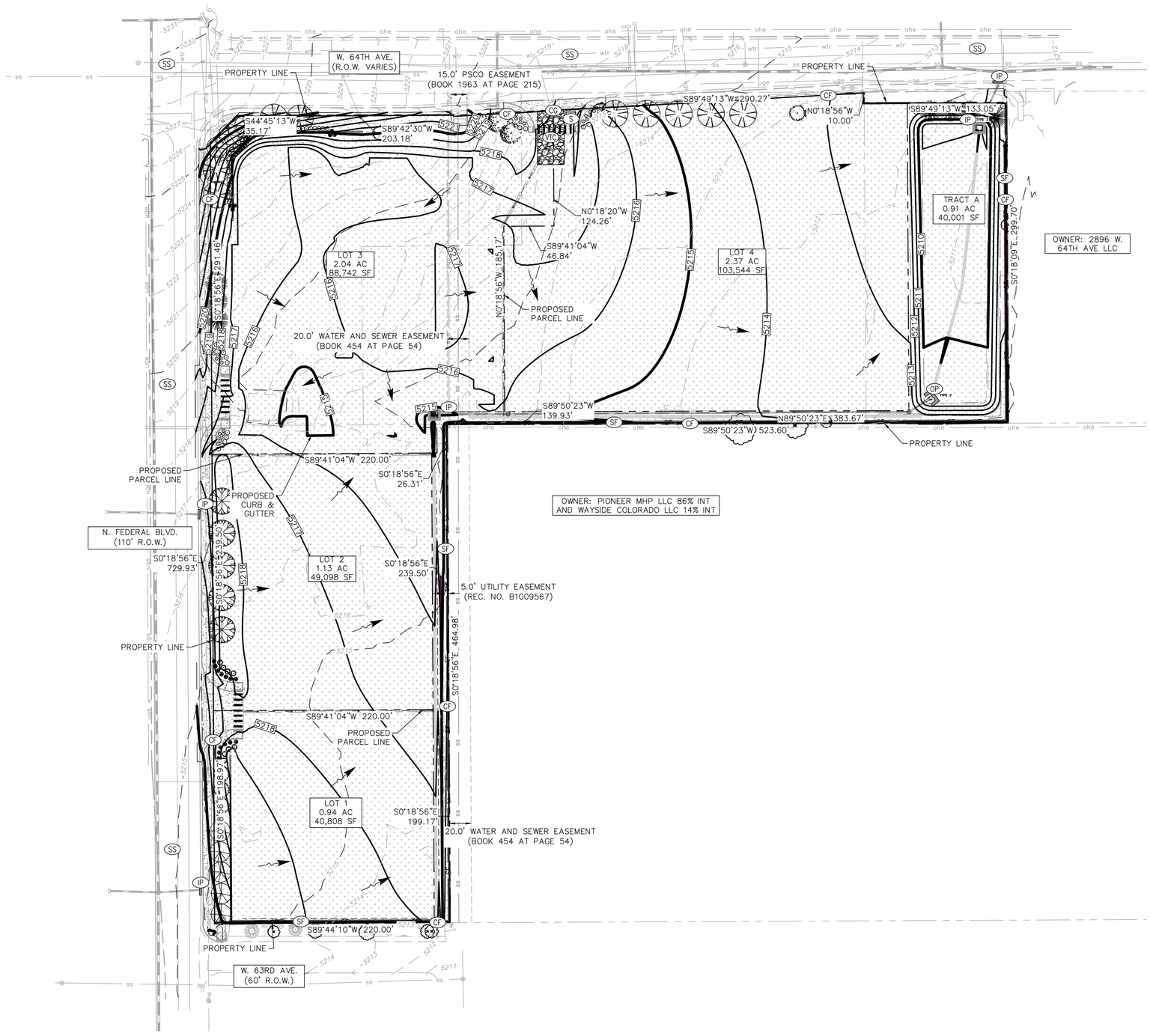

EROSION CONTROL FINAL LEGEND

- PROPERTY LINE
- EASEMENT LINE (EXISTING)
- MAJOR CONTOUR (EXISTING)
- MINOR CONTOUR (EXISTING)
- MAJOR CONTOUR (NEW)
- MINOR CONTOUR (NEW)
- PROPOSED FLOW DIRECTION
- STORM GRATE (NEW)
- CF — CONSTRUCTION FENCE
- LOC — LIMITS OF DISTURBANCE
- SCL — SEDIMENT CONTROL LOG PER UDFCD DTL SC-2
- IP — INLET PROTECTION (TYPE 1) PER UDFCD DTL SC-6
- SS — STREET SWEEPING PER UDFCD DTL SM-7
- PS — PERMANENT SEEDING (RE: LANDSCAPE PLAN)
- RS — ROCK SOCKS PER UDFCD DTL SC-5

EROSION CONTROL NOTES

1. STABILIZED STAGING AREA, STOCKPILE AREA, PORTABLE TOILETS, AND CONCRETE WASHOUT LOCATIONS SHALL BE DETERMINED BY THE DEVELOPER/CONTRACTOR AND UPDATED WITHIN THE STORMWATER MANAGEMENT PLAN AS REQUIRED BY THE CITY ISSUED STORMWATER DISCHARGE PERMIT.
2. SEDIMENT BASIN AND DIVERSION DITCHES SHALL BE PROVIDED AFTER DEMOLITION BUT PRIOR TO EARTHWORK MOVING ACTIVITIES. REFER TO PLAN FOR LOCATIONS.
3. DEVELOPER/CONTRACTOR SHALL REFER TO THE STORMWATER MANAGEMENT PLAN (SWMP) FOR THIS PROJECT FOR INSPECTION AND BMP MAINTENANCE REQUIREMENTS.
4. SILT FENCE SHALL BE INSTALLED PRIOR TO CLEARING AND GRUBBING. ALONG THE EXISTING BACK OF SIDEWALK. IMMEDIATELY UPON INSTALLATION OF THE PROPOSED CURB & GUTTER ALONG SHERIDAN AND MISSISSIPPI, CONTRACTOR SHALL RE-INSTALL SILT FENCE AT THE BACK OF CURB TO PREVENT SEDIMENT FROM ENTERING THOSE STREETS. CONTRACTOR MAY USE SEDIMENT CONTROL LOGS (SCL) IN PLACE OF SILT FENCE IN THIS AREA AS LONG AS THE SCL PREVENTS SEDIMENT FROM ENTERING THE EXISTING STREETS.
5. CONSTRUCTION FENCE SHALL BE PLACED APPROXIMATELY 2-FEET OFF THE EXISTING EDGE OF SIDEWALK.
6. STORMWATER QUALITY BEST MANAGEMENT PRACTICES SHALL BE IMPLEMENTED TO MINIMIZE SOIL EROSION, SEDIMENTATION, INCREASED POLLUTANT LOADS, AND CHANGED WATER FLOW CHARACTERISTICS RESULTING FROM LAND DISTURBING ACTIVITY, TO THE MAXIMUM EXTENT PRACTICABLE, SO AS TO MINIMIZE POLLUTION OF RECEIVING WATERS.
7. REFER TO SHEET CO30 FOR DEMOLITION PLAN. INITIAL BMPS SHALL BE INSTALLED PRIOR TO DEMOLITION WORK BEGINNING.
8. PEDESTRIAN DETOURS REQUIRE APPROVAL FROM THE CITY OF LAKEWOOD TRANSPORTATION ENGINEERING DIVISION.
9. CONTRACTOR MUST CONTACT RTD PRIOR TO ANY PEDESTRIAN DETOURS AND PRIOR TO ANY WORK ON THE EXISTING RTD BUS STOP.

SEQUENCE OF CONSTRUCTION PLANS

1. NOTIFY CITY INSPECTOR OF INTENT TO INSTALL PERIMETER BMPS.
2. INSTALL PERIMETER SEDIMENT CONTROL BMPS, INCLUDING SILT FENCE, INLET PROTECTION, AND VEHICLE TRACKING CONTROL.
3. CONTACT CITY INSPECTOR FOR AN INSPECTION ONCE PERIMETER EROSION CONTROL MEASURES ARE IN PLACE.
4. DEMOLITION PERMIT AND GRADING PERMIT ARE REQUIRED PRIOR TO DEMOLITION ACTIVITIES.
5. PROCEED WITH DEMOLITION ACTIVITIES. REFER TO SHEET CO30 FOR EXISTING CONDITIONS AND DEMOLITION PLAN.
6. OBTAIN GRADING PERMIT FROM THE COUNTY.
7. STRIP TOPSOIL AND STOCKPILE;
8. PROCEED TO INTERIM STORMWATER MANAGEMENT PLAN.

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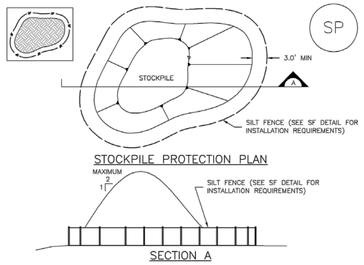
Stockpile Management (SP) MM-2



SP–1. STOCKPILE PROTECTION

STOCKPILE PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION OF STOCKPILES.
   –TYPE OF STOCKPILE PROTECTION.

2. INSTALL PERIMETER CONTROLS IN ACCORDANCE WITH THEIR RESPECTIVE DESIGN DETAILS. SILT FENCE IS SHOWN IN THE STOCKPILE PROTECTION DETAILS; HOWEVER, OTHER TYPES OF PERIMETER CONTROLS INCLUDING SEDIMENT CONTROL LOGS OR ROCK SOCKS MAY BE SUITABLE IN SOME CIRCUMSTANCES. CONSIDERATIONS FOR DETERMINING THE APPROPRIATE TYPE OF PERIMETER CONTROL FOR A STOCKPILE INCLUDE WHETHER THE STOCKPILE IS LOCATED ON A PERVIOUS OR IMPERVIOUS SURFACE, THE RELATIVE HEIGHTS OF THE PERIMETER CONTROL AND STOCKPILE, THE ABILITY OF THE PERIMETER CONTROL TO CONTAIN THE STOCKPILE WITHOUT FAILING IN THE EVENT THAT MATERIAL FROM THE STOCKPILE SHIFTS OR SLUMPS AGAINST THE PERIMETER, AND OTHER FACTORS.

3. STABILIZE THE STOCKPILE SURFACE WITH SURFACE ROUGHENING, TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS, OR SOIL BINDERS. SOILS STOCKPILED FOR AN EXTENDED PERIOD (TYPICALLY FOR MORE THAN 60 DAYS) SHOULD BE SEEDED AND MULCHED WITH A TEMPORARY GRASS COVER ONCE THE STOCKPILE IS PLACED (TYPICALLY WITHIN 14 DAYS). USE OF MULCH ONLY OR A SOIL BINDER IS ACCEPTABLE IF THE STOCKPILE WILL BE IN PLACE FOR A MORE LIMITED TIME PERIOD (TYPICALLY 30–60 DAYS).

4. FOR TEMPORARY STOCKPILES ON THE INTERIOR PORTION OF A CONSTRUCTION SITE, WHERE OTHER DOWNGRADIENT CONTROLS, INCLUDING PERIMETER CONTROL, ARE IN PLACE, STOCKPILE PERIMETER CONTROLS MAY NOT BE REQUIRED.

MM-2 Stockpile Management (SM)

STOCKPILE PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

STOCKPILE PROTECTION MAINTENANCE NOTES

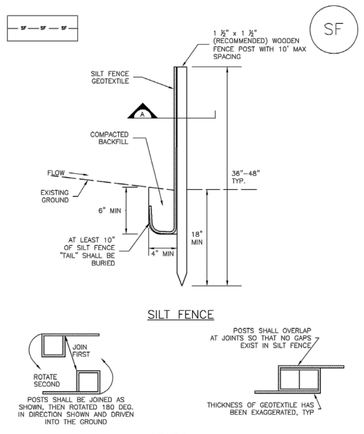
4. IF PERIMETER PROTECTION MUST BE MOVED TO ACCESS SOIL STOCKPILE, REPLACE PERIMETER CONTROLS BY THE END OF THE WORKDAY.

5. STOCKPILE PERIMETER CONTROLS CAN BE REMOVED ONCE ALL THE MATERIAL FROM THE STOCKPILE HAS BEEN USED.

(DETAILS ADAPTED FROM PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

Silt Fence (SF) SC-1



SF–1. SILT FENCE

SC-1 Silt Fence (SF)

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2–5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J–HOOK." THE "J–HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' – 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF THE SILT FENCE SHALL BE REMOVED AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 6".

5. REPAIR OR REPLACE SILT FENCE WHEN THERE ARE SIGNS OF WEAR, SUCH AS SAGGING, TEARING, OR COLLAPSE.

6. SILT FENCE IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION, OR IS REPLACED BY AN EQUIVALENT PERIMETER SEDIMENT CONTROL BMP.

7. WHEN SILT FENCE IS REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

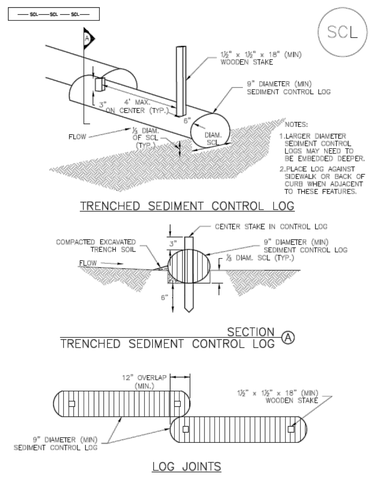
H1	STOCKPILE MANAGEMENT DETAIL
NTS	SN:

H4	STOCKPILE MANAGEMENT DETAIL
NTS	SN:

H8	SILT FENCE DETAIL
NTS	SN:

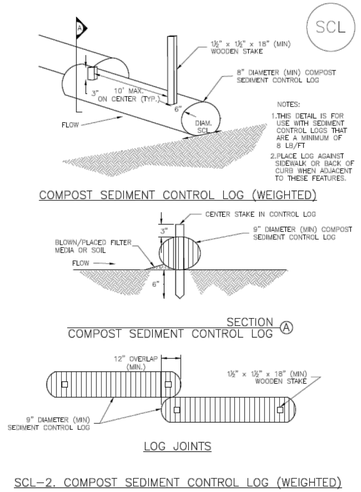
H12	SILT FENCE DETAIL
NTS	SN:

Sediment Control Log (SCL) SC-2



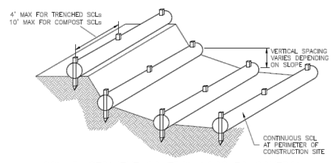
SCL–1. TRENCHED SEDIMENT CONTROL LOG

SC-2 Sediment Control Log (SCL)



SCL–2. COMPOST SEDIMENT CONTROL LOG (WEIGHTED)

Sediment Control Log (SCL) SC-2



SCL–3. SEDIMENT CONTROL LOGS TO CONTROL SLOPE LENGTH

A1	SEDIMENT CONTROL LOG DETAIL
NTS	SN:

A4	SEDIMENT CONTROL LOG DETAIL

A8	SEDIMENT CONTROL LOG DETAIL
	SN:

NO.	REVISION	BY	DATE	APPR

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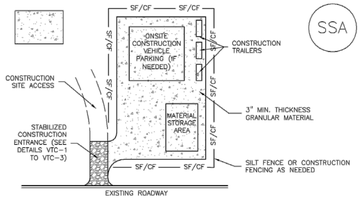
Stabilized Staging Area (SSA) SM-6



SSA-1. STABILIZED STAGING AREA

STABILIZED STAGING AREA INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF STAGING AREA(S).
   –CONTRACTOR MAY ADJUST LOCATION AND SIZE OF STAGING AREA WITH APPROVAL FROM THE LOCAL JURISDICTION.

2. STABILIZED STAGING AREA SHOULD BE APPROPRIATE FOR THE NEEDS OF THE SITE. OVERSIZING RESULTS IN A LARGER AREA TO STABILIZE FOLLOWING CONSTRUCTION.

3. STAGING AREA SHALL BE STABILIZED PRIOR TO OTHER OPERATIONS ON THE SITE.

4. THE STABILIZED STAGING AREA SHALL CONSIST OF A MINIMUM 3" THICK GRANULAR MATERIAL.

5. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

6. ADDITIONAL PERIMETER BMPs MAY BE REQUIRED INCLUDING BUT NOT LIMITED TO SILT FENCE AND CONSTRUCTION FENCING.

STABILIZED STAGING AREA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY IF RUTTING OCCURS OR UNDERLYING SUBGRADE BECOMES EXPOSED.

H1 | STABILIZED STAGING AREA DETAIL
NTS | SN:

SM-6 Stabilized Staging Area (SSA)

STABILIZED STAGING AREA MAINTENANCE NOTES

5. STABILIZED STAGING AREA SHALL BE ENLARGED IF NECESSARY TO CONTAIN PARKING, STORAGE, AND UNLOADING/LOADING OPERATIONS.

6. THE STABILIZED STAGING AREA SHALL BE REMOVED AT THE END OF CONSTRUCTION. THE GRANULAR MATERIAL SHALL BE REMOVED OR, IF APPROVED BY THE LOCAL JURISDICTION, USED ON SITE, AND THE AREA COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

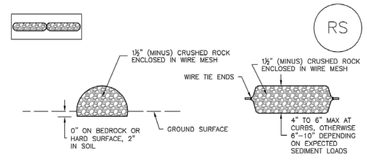
NOTE: MANY MUNICIPALITIES PROHIBIT THE USE OF RECYCLED CONCRETE AS GRANULAR MATERIAL FOR STABILIZED STAGING AREAS DUE TO DIFFICULTIES WITH RE-ESTABLISHMENT OF VEGETATION IN AREAS WHERE RECYCLED CONCRETE WAS PLACED.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

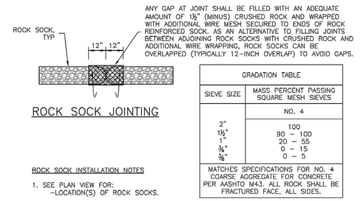
(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO, NOT AVAILABLE IN AUTOCAD)

H4 | STABILIZED STAGING AREA DETAIL
NTS | SN:

SC-5 Rock Sock (RS)



ROCK SOCK SECTION ROCK SOCK PLAN



ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 – 100
1"	20 – 55
¾"	0 – 15
⅜"	0 – 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   –LOCATION(S) OF ROCK SOCKS.

2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).

3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½". RECOMMENDED MINIMUM ROLL WIDTH OF 48"

4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2' CENTERS ON ENDS OF SOCKS.

5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS-1. ROCK SOCK PERIMETER CONTROL

H8 | ROCK SOCK DETAIL
NTS | SN:

Rock Sock (RS) SC-5

ROCK SOCK MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP. TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

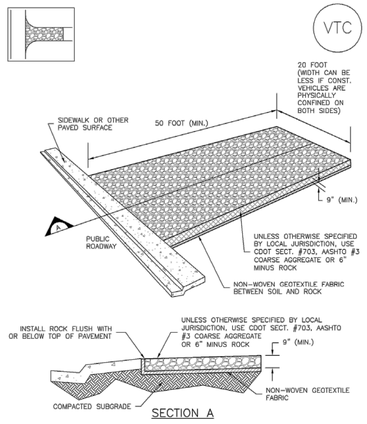
(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

H12 | ROCK SOCK DETAIL
NTS | SN:

Vehicle Tracking Control (VTC) SM-4



SECTION A

VTC-1. AGGREGATE VEHICLE TRACKING CONTROL

A1 | VEHICLE TRACKING CONTROL DETAIL
NTS | SN:

SM-4 Vehicle Tracking Control (VTC)

STABILIZED CONSTRUCTION ENTRANCE/EXIT INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   –LOCATION OF CONSTRUCTION ENTRANCE(S)/EXIT(S).
   –TYPE OF CONSTRUCTION ENTRANCE(S)/EXITS(S) (WITH/WITHOUT WHEEL WASH, CONSTRUCTION MAT OR TRM).

2. CONSTRUCTION MAT OR TRM STABILIZED CONSTRUCTION ENTRANCES ARE ONLY TO BE USED ON SHORT DURATION PROJECTS (TYPICALLY RANGING FROM A WEEK TO A MONTH) WHERE THERE WILL BE LIMITED VEHICULAR ACCESS.

3. A STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE LOCATED AT ALL ACCESS POINTS WHERE VEHICLES ACCESS THE CONSTRUCTION SITE FROM PAVED RIGHT-OF-WAYS.

4. STABILIZED CONSTRUCTION ENTRANCE/EXIT SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

5. A NON-WOVEN GEOTEXTILE FABRIC SHALL BE PLACED UNDER THE STABILIZED CONSTRUCTION ENTRANCE/EXIT PRIOR TO THE PLACEMENT OF ROCK.

6. UNLESS OTHERWISE SPECIFIED BY LOCAL JURISDICTION, ROCK SHALL CONSIST OF DOT SECT. #703, AASHTO #3 COARSE AGGREGATE OR 6" (MINUS) ROCK.

STABILIZED CONSTRUCTION ENTRANCE/EXIT MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SHALL BE REAPPLIED OR REGRADED AS NECESSARY TO THE STABILIZED ENTRANCE/EXIT TO MAINTAIN A CONSISTENT DEPTH.

5. SEDIMENT TRACKED ONTO PAVED ROADS IS TO BE REMOVED THROUGHOUT THE DAY AND AT THE END OF THE DAY BY SHOVELING OR SWEEPING. SEDIMENT MAY NOT BE WASHED DOWN STORM SEWER DRAINS.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM CITY OF BROOMFIELD, COLORADO, NOT AVAILABLE IN AUTOCAD)

A4 | VEHICLE TRACKING CONTROL DETAIL
NTS | SN:

Street Sweeping and Vacuuming (SS) SM-7

Description

Street sweeping and vacuuming remove sediment that has been tracked onto roadways to reduce sediment transport into storm drain systems or a surface waterway.

Appropriate Uses

Use this practice at construction sites where vehicles may track sediment offsite onto paved roadways.

Design and Installation

Street sweeping or vacuuming should be conducted when there is noticeable sediment accumulation on roadways adjacent to the construction site. Typically, this will be concentrated at the entrance/exit to the construction site. Well-maintained stabilized construction entrances, vehicle tracking controls and tire wash facilities can help reduce the necessary frequency of street sweeping and vacuuming.

On smaller construction sites, street sweeping can be conducted manually using a shovel and broom. Never wash accumulated sediment on roadways into storm drains.

Photograph SS-1. A street sweeper removes sediment and potential pollutants along the curb line at a construction site. Photo courtesy of Tom Gore.

Maintenance and Removal

- Inspect paved roads around the perimeter of the construction site on a daily basis and more frequently, as needed. Remove accumulated sediment, as needed.
- Following street sweeping, check inlet protection that may have been displaced during street sweeping.
- Inspect area to be swept for materials that may be hazardous prior to beginning sweeping operations.

Street Sweeping/ Vacuuming	
Functions	
Erosion Control	No
Sediment Control	Yes
Site/Material Management	Yes

A8 | STREET SWEEPING & VACUUMING DETAIL
NTS | SN:

NO.	REVISION	BY	DATE	APPR

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DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
DATE: 08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.
EROSION CONTROL DETAILS

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PROJECT NO.
096888037

SHEET
EC551

811 Know what's below. Call before you dig.

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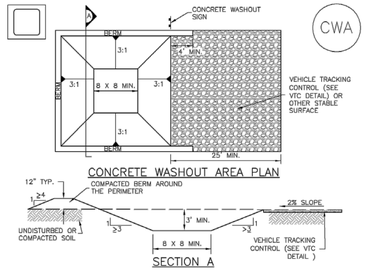
Concrete Washout Area (CWA) MM-1



CONCRETE WASHOUT AREA PLAN

SECTION A

CWA-1. CONCRETE WASHOUT AREA

CWA INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -CWA INSTALLATION LOCATION.

2. DO NOT LOCATE AN UNLINED CWA WITHIN 400' OF ANY NATURAL DRAINAGE PATHWAY OR WATERBODY. DO NOT LOCATE WITHIN 1,000' OF ANY WELLS OR DRINKING WATER SOURCES. IF SITE CONSTRAINTS MAKE THIS INFEASIBLE, OR IF HIGHLY PERMEABLE SOILS EXIST ON SITE, THE CWA MUST BE INSTALLED WITH AN IMPERMEABLE LINER (16 MIL MIN. THICKNESS) OR SURFACE STORAGE ALTERNATIVES USING PREFABRICATED CONCRETE WASHOUT DEVICES OR A LINED ABOVE GROUND STORAGE ARE SHOULD BE USED.

3. THE CWA SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE.

4. CWA SHALL INCLUDE A FLAT SUBSURFACE PIT THAT IS AT LEAST 8' BY 8' SLOPES LEADING OUT OF THE SUBSURFACE PIT SHALL BE 3:1 OR FLATTER. THE PIT SHALL BE AT LEAST 3' DEEP.

5. BERM SURROUNDING SIDES AND BACK OF THE CWA SHALL HAVE MINIMUM HEIGHT OF 1'.

6. VEHICLE TRACKING PAD SHALL BE SLOPED 2% TOWARDS THE CWA.

7. SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CWA, AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CWA TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.

8. USE EXCAVATED MATERIAL FOR PERIMETER BERM CONSTRUCTION.

MM-1 Concrete Washout Area (CWA)

CWA MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. THE CWA SHALL BE REPAIRED, CLEANED, OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR CONCRETE WASTE. CONCRETE MATERIALS, ACCUMULATED IN PIT, SHALL BE REMOVED ONCE THE MATERIALS HAVE REACHED A DEPTH OF 2'.

5. CONCRETE WASHOUT WATER, WASTED PIECES OF CONCRETE AND ALL OTHER DEBRIS IN THE SUBSURFACE PIT SHALL BE TRANSPORTED FROM THE JOB SITE IN A WATER-TIGHT CONTAINER AND DISPOSED OF PROPERLY.

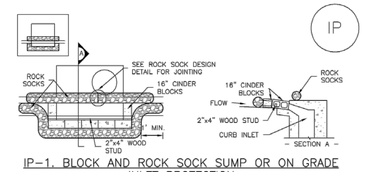
6. THE CWA SHALL REMAIN IN PLACE UNTIL ALL CONCRETE FOR THE PROJECT IS PLACED.

7. WHEN THE CWA IS REMOVED, COVER THE DISTURBED AREA WITH TOP SOIL, SEED AND MULCH OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF PARKER, COLORADO, NOT AVAILABLE IN AUTOCAD).

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

SC-6 Inlet Protection (IP)



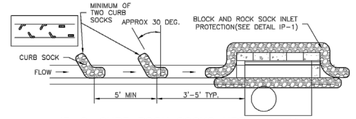
IP-1. BLOCK AND ROCK SOCK SUMP OR ON GRADE INLET PROTECTION

BLOCK AND CURB SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. CONCRETE "CINDER" BLOCKS SHALL BE LAID ON THEIR SIDES AROUND THE INLET IN A SINGLE ROW, ABUTTING ONE ANOTHER WITH THE OPEN END FACING AWAY FROM THE CURB.

3. GRAVEL BAGS SHALL BE PLACED AROUND CONCRETE BLOCKS, CLOSELY ABUTTING ONE ANOTHER AND JOINTED TOGETHER IN ACCORDANCE WITH ROCK SOCK DESIGN DETAIL.



IP-2. CURB ROCK SOCKS UPSTREAM OF INLET PROTECTION

CURB ROCK SOCK INLET PROTECTION INSTALLATION NOTES

1. SEE ROCK SOCK DESIGN DETAIL INSTALLATION REQUIREMENTS.

2. PLACEMENT OF THE SOCK SHALL BE APPROXIMATELY 30 DEGREES FROM PERPENDICULAR IN THE OPPOSITE DIRECTION OF FLOW.

3. SOCKS ARE TO BE FLUSH WITH THE CURB AND SPACED A MINIMUM OF 5 FEET APART.

4. AT LEAST TWO CURB SOCKS IN SERIES ARE REQUIRED UPSTREAM OF ON-GRADE INLETS.

NOTE:

CONCRETE BLOCKS SHALL NOT BE USED FOR INLET PROTECTION WITHIN THE RIGHT-OF-WAY.

SC-6 Inlet Protection (IP)

GENERAL INLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF INLET PROTECTION.
   -TYPE OF INLET PROTECTION (IP.1, IP.2, IP.3, IP.4, IP.5, IP.6)

2. INLET PROTECTION SHALL BE INSTALLED PROMPTLY AFTER INLET CONSTRUCTION OR PAVING IS COMPLETE (TYPICALLY WITHIN 48 HOURS). IF A RAINFALL/RUNOFF EVENT IS FORECAST, INSTALL INLET PROTECTION PRIOR TO ONSET OF EVENT.

3. MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

INLET PROTECTION MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED UPSTREAM OF INLET PROTECTION SHALL BE REMOVED AS NECESSARY TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN STORAGE VOLUME REACHES 50% OF CAPACITY, A DEPTH OF 6" WHEN SILT FENCE IS USED, OR ¼ OF THE HEIGHT FOR STRAW BALES.

5. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS PERMANENTLY STABILIZED, UNLESS THE LOCAL JURISDICTION APPROVES EARLIER REMOVAL OF INLET PROTECTION IN STREETS.

6. WHEN INLET PROTECTION AT AREA INLETS IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOP SOIL, SEEDED AND MULCHED, OR OTHERWISE STABILIZED IN A MANNER APPROVED BY THE LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF INLET PROTECTION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY PROPRIETARY INLET PROTECTION METHODS ON THE MARKET. UDFCD NEITHER ENDORSES NOR DISCOURAGES USE OF PROPRIETARY INLET PROTECTION; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

NOTE: SOME MUNICIPALITIES DISCOURAGE OR PROHIBIT THE USE OF STRAW BALES FOR INLET PROTECTION. CHECK WITH LOCAL JURISDICTION TO DETERMINE IF STRAW BALE INLET PROTECTION IS ACCEPTABLE.

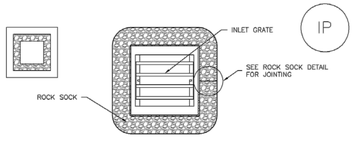
H1	CONCRETE WASHOUT AREA DETAIL
NTS	SN:

H4	CONCRETE WASHOUT AREA DETAIL
NTS	SN:

H8	INLET PROTECTION DETAIL
NTS	SN:

H12	INLET PROTECTION DETAIL
NTS	SN:

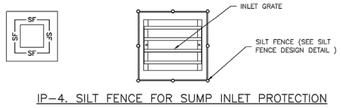
Inlet Protection (IP) SC-6



IP-3. ROCK SOCK SUMP/AREA INLET PROTECTION

ROCK SOCK SUMP/AREA INLET PROTECTION INSTALLATION NOTES
1. SEE ROCK SOCK DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF ROCK SOCKS FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.



IP-4. SILT FENCE FOR SUMP INLET PROTECTION

SILT FENCE INLET PROTECTION INSTALLATION NOTES

1. SEE SILT FENCE DESIGN DETAIL FOR INSTALLATION REQUIREMENTS.

2. POSTS SHALL BE PLACED AT EACH CORNER OF THE INLET AND AROUND THE EDGES AT A MAXIMUM SPACING OF 3 FEET.

3. STRAW WATTLES/SEDIMENT CONTROL LOGS MAY BE USED IN PLACE OF SILT FENCE FOR INLETS IN PERVIOUS AREAS. INSTALL PER SEDIMENT CONTROL LOG DETAIL.

Sediment Basin (SB) SC-7

SEDIMENT BASIN MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SEDIMENT ACCUMULATED IN BASIN SHALL BE REMOVED AS NEEDED TO MAINTAIN BMP EFFECTIVENESS, TYPICALLY WHEN SEDIMENT DEPTH REACHES ONE FOOT (I.E., TWO FEET BELOW THE SPILLWAY CREST).

5. SEDIMENT BASINS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS ACCEPTED BY THE LOCAL JURISDICTION.

6. WHEN SEDIMENT BASINS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAILS ADAPTED FROM DOUGLAS COUNTY, COLORADO)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

SC-7 Sediment Basin (SB)

TABLE SB-1. SIZING INFORMATION FOR STANDARD SEDIMENT BASIN

Upstream Drainage Area (rounded to nearest acre), (ac)	Basin Bottom Width (W), (ft)	Spillway Crest Length (CL), (ft)	Hole Diameter (HD), (in)
1	12 ½	2	9/32
2	21	3	13/64
3	28	5	¼
4	33 ½	6	9/32
5	38 ½	8	11/32
6	43	9	23/64
7	47 ¼	11	25/32
8	51	12	27/32
9	55	13	⅞
10	58 ¼	15	15/64
11	61	16	29/32
12	64	18	1
13	67 ½	19	1 1/64
14	70 ½	21	1 ⅛
15	73 ¼	22	1 5/64

27/32 INCH HOLE IS REQUIRED FOR THIS SITE

SEDIMENT BASIN INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION OF SEDIMENT BASIN.
   -TYPE OF BASIN (STANDARD BASIN OR NONSTANDARD BASIN).
   -FOR STANDARD BASIN, BOTTOM WIDTH W, CREST LENGTH CL, AND HOLE DIAMETER, HD.
   -FOR NONSTANDARD BASIN, SEE CONSTRUCTION DRAWINGS FOR DESIGN OF BASIN INCLUDING RISER HEIGHT H, NUMBER OF COLUMNS N, HOLE DIAMETER HD AND PIPE DIAMETER D.

2. FOR STANDARD BASIN, BOTTOM DIMENSION MAY BE MODIFIED AS LONG AS BOTTOM AREA IS NOT REDUCED.

3. SEDIMENT BASINS SHALL BE INSTALLED PRIOR TO ANY OTHER LAND-DISTURBING ACTIVITY THAT RELIES ON ON BASINS AS AS A STORMWATER CONTROL.

4. EMBANKMENT MATERIAL SHALL CONSIST OF SOIL FREE OF DEBRIS, ORGANIC MATERIAL, AND ROCKS OR CONCRETE GREATER THAN 3 INCHES AND SHALL HAVE A MINIMUM OF 15 PERCENT BY WEIGHT PASSING THE NO. 200 SIEVE.

5. EMBANKMENT MATERIAL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D698.

6. PIPE SCH 40 OR GREATER SHALL BE USED.

7. THE DETAILS SHOWN ON THESE SHEETS PERTAIN TO STANDARD SEDIMENT BASIN(S) FOR DRAINAGE AREAS LESS THAN 15 ACRES. SEE CONSTRUCTION DRAWINGS FOR EMBANKMENT, STORAGE VOLUME, SPILLWAY, OUTLET, AND OUTLET PROTECTION DETAILS FOR ANY SEDIMENT BASIN(S) THAT HAVE BEEN INDIVIDUALLY DESIGNED FOR DRAINAGE AREAS LARGER THAN 15 ACRES.

A1	INLET PROTECTION DETAIL
NTS	SN:

A1	SEDIMENT BASIN DETAIL
NTS	SN:

A1	SEDIMENT BASIN DETAIL
NTS	SN:

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SHEET
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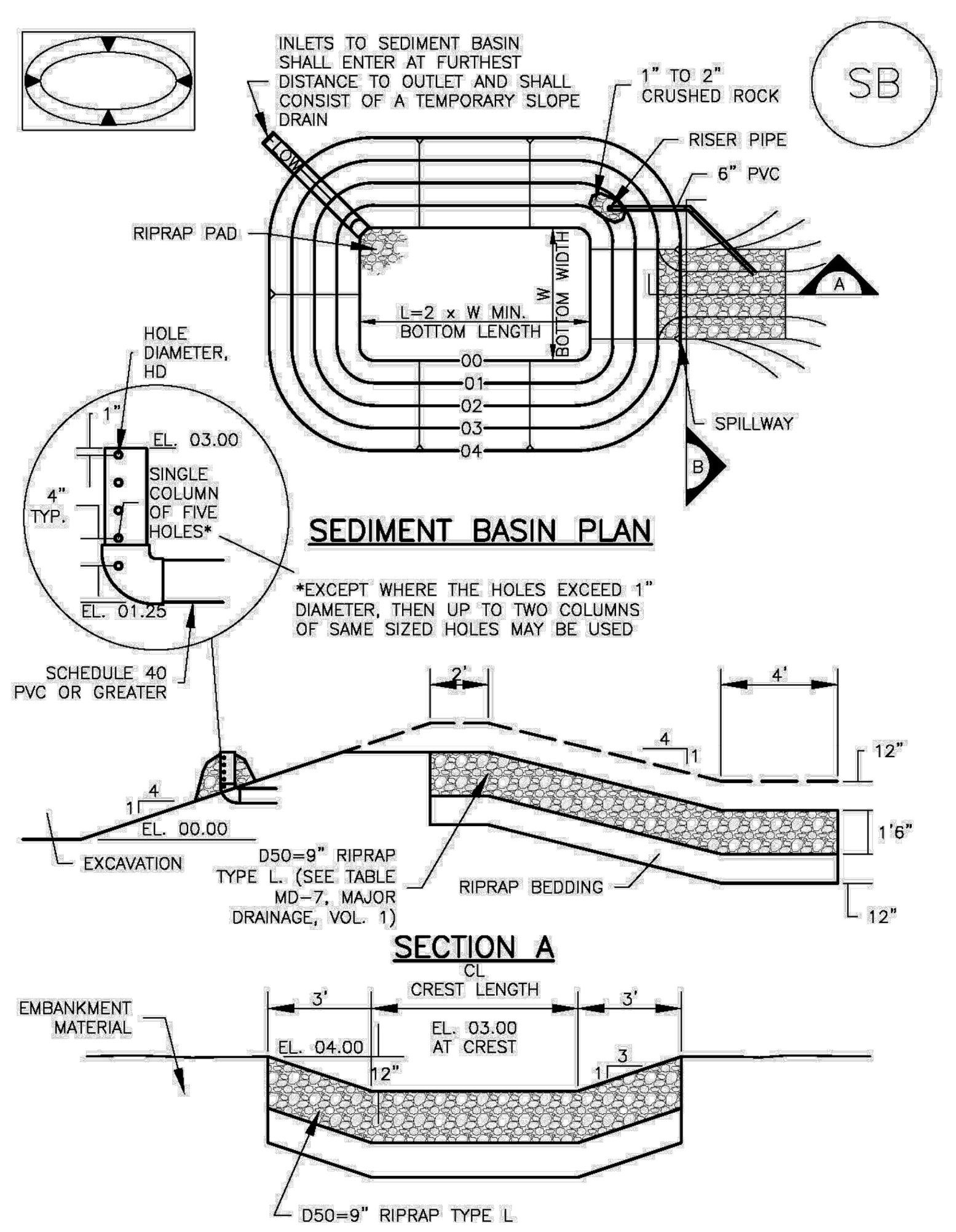
Sediment Basin (SB) — SC-7



H1 SEDIMENT BASIN DETAIL
NTS | SN:

Earth Dikes and Drainage Swales (ED/DS) — EC-10

EARTH DIKE AND DRAINAGE SWALE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. SWALES SHALL REMAIN IN PLACE UNTIL THE END OF CONSTRUCTION; IF APPROVED BY LOCAL JURISDICTION, SWALES MAY BE LEFT IN PLACE.

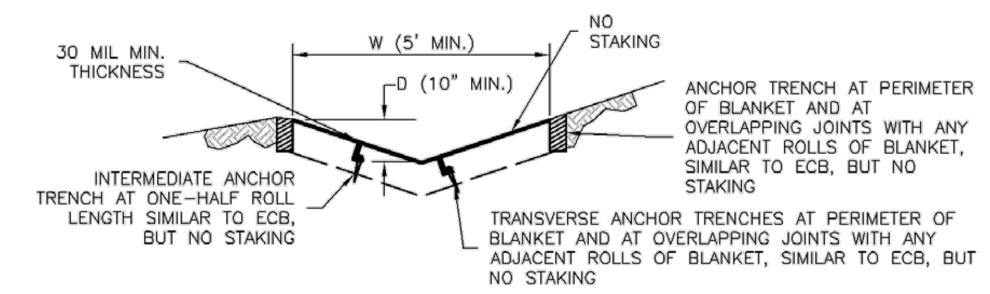
5. WHEN A SWALE IS REMOVED, THE DISTURBED AREA SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED IN A MANNER APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM DOUGLAS COUNTY, COLORADO AND THE CITY OF COLORADO SPRINGS, COLORADO, NOT AVAILABLE IN AUTOCAD)

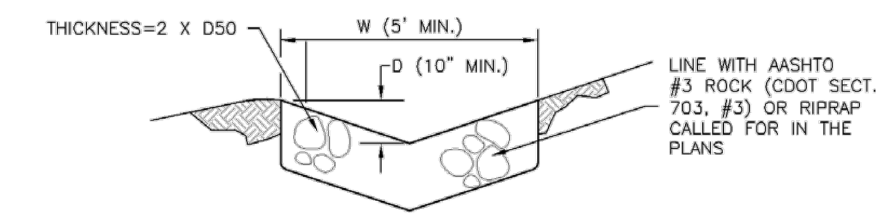
NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

H4 DIVERSION DITCH DETAIL
NTS | SN:

EC-10 — Earth Dikes and Drainage Swales (ED/DS)



DS-4. SYNTHETIC LINED SWALE



DS-5. RIPRAP LINED SWALE

EARTH DIKE AND DRAINAGE SWALE INSTALLATION NOTES

1. SEE SITE PLAN FOR:
   - LOCATION OF DIVERSION SWALE
   - TYPE OF SWALE (UNLINED, COMPACTED AND/OR LINED).
   - LENGTH OF EACH SWALE.
   - DEPTH, D, AND WIDTH, W DIMENSIONS.
   - FOR ECB/TRM LINED DITCH, SEE ECB DETAIL.
   - FOR RIPRAP LINED DITCH, SIZE OF RIPRAP, D50.

2. SEE DRAINAGE PLANS FOR DETAILS OF PERMANENT CONVEYANCE FACILITIES AND/OR DIVERSION SWALES EXCEEDING 2-YEAR FLOW RATE OR 10 CFS.

3. EARTH DIKES AND SWALES INDICATED ON SWMP PLAN SHALL BE INSTALLED PRIOR TO LAND-DISTURBING ACTIVITIES IN PROXIMITY.

4. EMBANKMENT IS TO BE COMPACTED TO 90% OF MAXIMUM DENSITY AND WITHIN 2% OF OPTIMUM MOISTURE CONTENT ACCORDING TO ASTM D698.

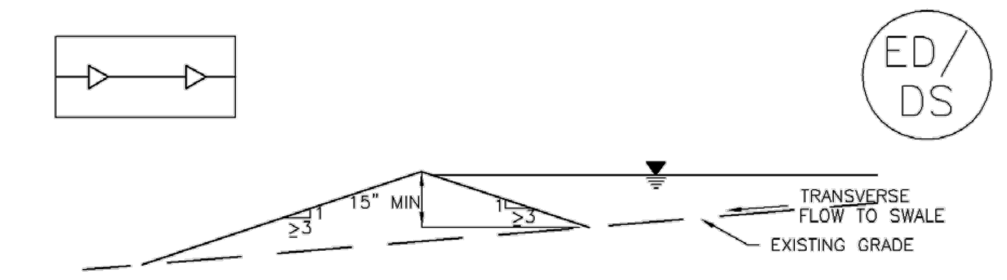
5. SWALES ARE TO DRAIN TO A SEDIMENT CONTROL BMP.

6. FOR LINED DITCHES, INSTALLATION OF ECB/TRM SHALL CONFORM TO THE REQUIREMENTS OF THE ECB DETAIL.

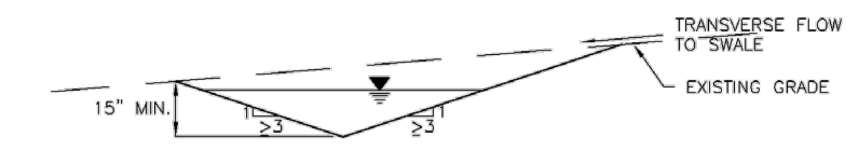
7. WHEN CONSTRUCTION TRAFFIC MUST CROSS A DIVERSION SWALE, INSTALL A TEMPORARY CULVERT WITH A MINIMUM DIAMETER OF 12 INCHES.

H8 DIVERSION DITCH DETAIL
NTS | SN:

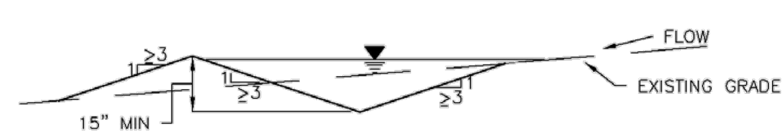
Earth Dikes and Drainage Swales (ED/DS) — EC-10



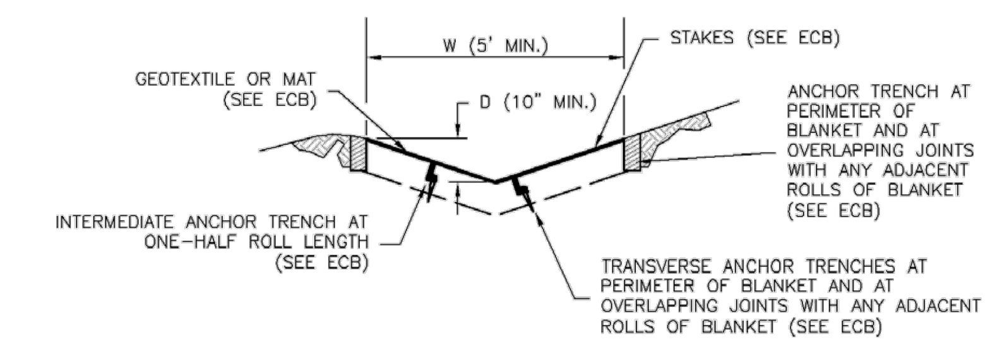
ED-1. COMPACTED UNLINED EARTH DIKE FORMED BY BERM



DS-1. COMPACTED UNLINED EXCAVATED SWALE



DS-2. COMPACTED UNLINED SWALE FORMED BY CUT AND FILL



DS-3. ECB LINED SWALE (CUT AND FILL OR BERM)

H12 DIVERSION DITCH DETAIL
NTS | SN:

EC-2 — Temporary and Permanent Seeding (TS/PS)

Table TS/PS-1. Minimum Drill Seeding Rates for Various Temporary Annual Grasses

Species[a] (Common name)	Growth Season[b]	Pounds of Pure Live Seed (PLS)/acre[c]	Planting Depth (inches)
1. Oats	Cool	35 - 50	1 - 2
2. Spring wheat	Cool	25 - 35	1 - 2
3. Spring barley	Cool	25 - 35	1 - 2
4. Annual ryegrass	Cool	10 - 15	½
5. Millet	Warm	3 - 15	½ - ¾
6. Winter wheat	Cool	20–35	1 - 2
7. Winter barley	Cool	20–35	1 - 2
8. Winter rye	Cool	20–35	1 - 2
9. Triticale	Cool	25–40	1 - 2

[a] Successful seeding of annual grass resulting in adequate plant growth will usually produce enough dead-plant residue to provide protection from wind and water erosion for an additional year. This assumes that the cover is not disturbed or mowed closer than 8 inches.

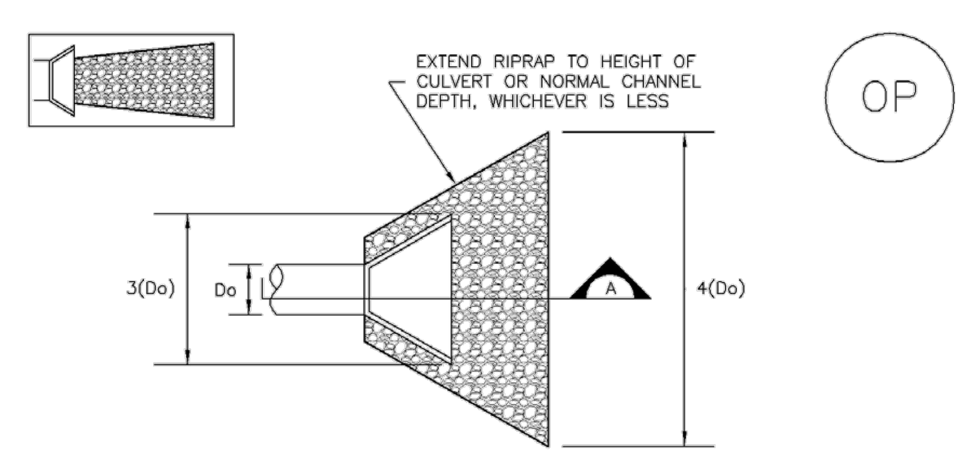
Hydraulic seeding may be substituted for drilling only where slopes are steeper than 3:1 or where access limitations exist. When hydraulic seeding is used, hydraulic mulching should be applied as a separate operation, when practical, to prevent the seeds from being encapsulated in the mulch.

[b] See Table TS/PS-2 for seeding dates. Irrigation, if consistently applied, may extend the use of cool season species during the summer months.

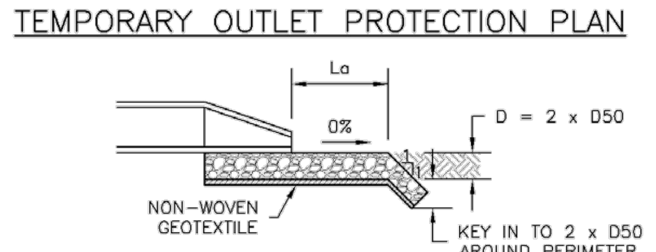
[c] Seeding rates should be doubled if seed is broadcast, or increased by 50 percent if done using a Brillion Drill or by hydraulic seeding.

A1 TEMPORARY & PERMANENT SEEDING DETAIL
NTS | SN:

EC-8 — Temporary Outlet Protection (TOP)



TEMPORARY OUTLET PROTECTION PLAN



SECTION A

TABLE OP-1. TEMPORARY OUTLET PROTECTION SIZING TABLE

PIPE DIAMETER, Do (INCHES)	DISCHARGE, Q (CFS)	APRON LENGTH, La (FT)	RIPRAP D50 DIAMETER MIN (INCHES)
8	2.5 5	5 10	4 6
12	5 10	10 13	4 6
18	10 20 30 40	10 16 23 26	6 9 12 16
24	30 40 50 60	16 26 26 30	9 9 12 16

OP-1. TEMPORARY OUTLET PROTECTION

A4 TEMPORARY OUTLET PROTECTION DETAIL
NTS | SN:

Temporary Outlet Protection (TOP) — EC-8

TEMPORARY OUTLET PROTECTION INSTALLATION NOTES

1. SEE PLAN VIEW FOR
   - LOCATION OF OUTLET PROTECTION.
   - DIMENSIONS OF OUTLET PROTECTION.

2. DETAIL IS INTENDED FOR PIPES WITH SLOPE ≤ 10%. ADDITIONAL EVALUATION OF RIPRAP SIZING AND OUTLET PROTECTION DIMENSIONS REQUIRED FOR STEEPER SLOPES.

3. TEMPORARY OUTLET PROTECTION INFORMATION IS FOR OUTLETS INTENDED TO BE UTILIZED LESS THAN 2 YEARS.

TEMPORARY OUTLET PROTECTION INSPECTION AND MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

(DETAILS ADAPTED FROM AURORA, COLORADO AND PREVIOUS VERSION OF VOLUME 3, NOT AVAILABLE IN AUTOCAD)

A8 TEMPORARY OUTLET PROTECTION DETAIL
NTS | SN:

NO.	REVISION	BY	DATE	APPR.

Kimley»Horn
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3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970)-822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
DATE: 08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

EROSION CONTROL DETAILS

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO. 096888037

SHEET EC553

811 Know what's below. Call before you dig.

K:\DEN_Civil\096888037_QuikTrip 4270 Adams County_Berkely Center Subdivision\CADD\PlanSheets\Erosion Control\096888037_EC_DT.dwg

LEVEL 3 STORM DRAINAGE STUDY

Berkely Center Subdivision
(64th & Federal)
Adams County, Colorado

Prepared for:

QuikTrip Corporation
4705 South 129th East Ave
Tulsa, OK 74134-7008
(918) 615-7685

Prepared by:

Kimley-Horn and Associates, Inc.
3325 South Timberline Road,
Suite 130, CO 80525
(970) 822-7911

Project #: 096888037

Prepared: August 07, 2024

Kimley»Horn

CERTIFICATION

ENGINEER'S STATEMENT

"I hereby certify that this report for the drainage design of Berkely Center Subdivision was prepared by me or under my direct supervision in accordance with the provisions of Adams County Storm Drainage Design and Technical Criteria for the owners thereof. I understand that Adams County does not and will not assume liability for drainage facilities designed by others."

_____ _____

James Waller , P.E.
Colorado Registered PE #60876

Date

OWNER STATEMENT

"QuikTrip Corporation hereby certifies that the drainage facilities for Berkley Center Subdivision shall be constructed according to the design presented in this report. I understand that Adams County does not and will not assume liability for the drainage facilities designed and/ or certified by my engineer. I understand that Adams County reviews drainage plans pursuant to Colorado Revised Statues Title 30, Article 28; but cannot, on behalf of Berkley Center Subdivision, guarantee that final drainage design review will absolve QuikTrip Corporation and/ or their successors and/ or assigns the future liability for improper design. I further understand that approval of the Final Plat and/ or Final Development Plan does not imply approval of my engineer's drainage design."

_____ _____

(Property Owner Signature) Date

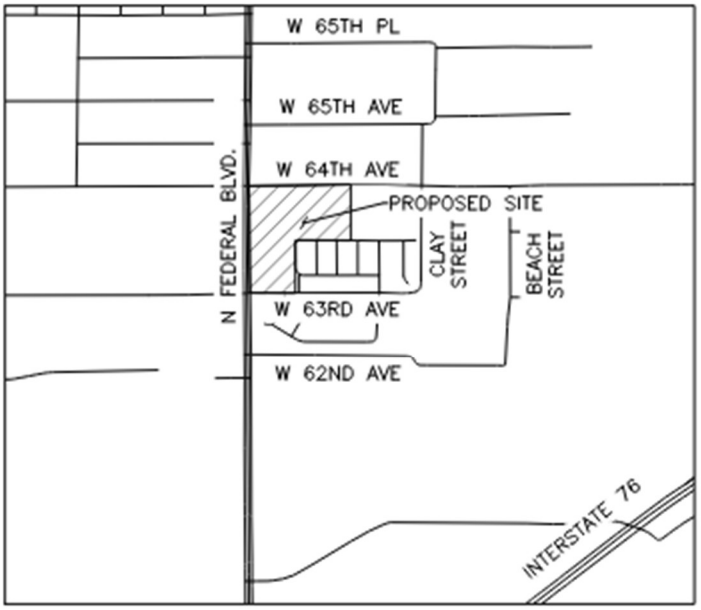
Name:	QuikTrip Corporation
Address:	12000 Washington Street, Suite 175
	Thornton, CO 80241
Phone:	(303) 248-0436
Contact:	Brittany Sikorski

CONTENTS

GENERAL LOCATION AND PROJECT DESCRIPTION

LOCATION

The Site is located at the at Southeast corner of Federal Boulevard and West 64th Avenue in Adams County, Colorado. The Site totals approximately 7.41 acres. The site is bounded by Federal Boulevard to the west, West 64th Avenue to the north, commercial development to the east, West 63rd Avenue to the south, and mobile residential community to the southeast. A vicinity map has been included below for reference.



VICINITY MAP
Not to Scale

PROJECT DESCRIPTION

The existing site is planned to be subdivided into five (5) lots totaling 7.41 acres, with a total disturbed area of 7.68 acres. The lot on the corner of Federal Blvd. and 64th Avenue will be a subdivision with five (5) proposed lots to be developed at a future date. The site is zoned Commercial-5 (C-5) and the proposed lots will include business suburban, and light industrial.

EXISTING CONDITIONS

The existing site is currently a vacant used car sales lot. The majority of the site is covered with asphalt pavement, ~90% of the total area. The remaining site area is classified as roofed area with minimal landscaping onsite. The existing drainage pattern generally sheet flows from the northwest to the southeast with slopes ranging from 1%-8%. Along the Project frontage, Federal Blvd slopes to the south at 1%-3% and 64th Ave slopes to the east around 1%-5%. There are no existing onsite detention or water quality facilities, and all drainage patterns flow offsite. The historic runoff pattern within the adjacent rights-of-way will be maintained and will not be negatively the proposed Project.

FLOOD STUDIES

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 08001C0584H (effective March 5, 2007) and C0592H, the Site is entirely located in "Zone X", which is considered an area of minimal flood hazard, outside of the regulatory floodplain. The FEMA FIRM associated with the Site is included in **Appendix A**. A portion of the offsite area south of the site is located within zone AE and no construction is proposed within this area.

SOIL REPORT

An NRCS soil study for the project was obtained to determine the soil characteristics of the site. The result of this study shows that the majority of the site is Wet alluvial land at approximately 78%, 22% Loamy alluvial land which are classified as hydraulic soil groups D, C respectively. The NRCS soil report can be found in **Appendix B** of this report.

MAJOR DRAINAGE BASIN DESCRIPTION

According to the Mile High Flood District (MHFD), this project is located within the Clear Creek Watershed (Basin ID 4300). This basin is a tributary of First Creek. The overall drainage basin is generally undeveloped and drainage facilities immediately downstream of this site are in place.

EXISTING SUB-BASIN DESCRIPTION

For more detailed information on the sub-basins, please reference the *Existing Drainage Plan* in **Appendix E.** In addition, **Table 2** following this section provides additional detail for rational calculation summaries and outfalls. With no existing onsite detention and water quality, all basins in the existing sub-basins outfall offsite. Existing hydrologic calculations are included in **Appendix C**.

Sub-Basin EX-1

Sub-basin EX-1 is a 7.26-acre area that contains the majority of the existing site. This area is comprised of minimal to no vegetation and asphalt paving. There are three (3) existing buildings onsite providing 0.53 acres of roof coverage. Runoff from subbasin EX-1 sheet flows southeast across the site and outfalls into the residential community.

Sub-Basin EX-2
Sub-basin EX-2 is a 0.28-acre area that consists of asphalt paving along the western portion of the site. Runoff from Basin EX-2 sheet flows west offsite onto Federal Blvd. and is conveyed south along Federal Blvd. via curb and gutter to an existing Denver 13 Combination inlet (Design Point 1).

Sub-Basin EX-3
Sub-basin EX-3 is a 0.07-acre area that consists of asphalt paving along the northern portion of the site. Runoff from Basin EX-3 sheet flows North offsite onto 64th Ave. and is conveyed east along 64th Ave. via curb and gutter to an existing Denver 13 Combination inlet (Design Point 2).

Sub-Basin EX-4
Sub-basin EX-4 is a 0.05-acre area that consists of native vegetation along the northern portion of the site. Runoff from basin EX-3 sheet flows north offsite onto 64th Avenue and is conveyed east along 64th Avenue via curb and gutter to existing Denver 13 Combination inlet (Design Point 2).

Table 2: Existing Rational Calcs Summary

RATIONAL CALCULATIONS SUMMARY					
DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	IMPERVIOUSNESS %	PEAK FLOWS (CFS)	
				Q5	Q100
On-Site Basins					
	EX-1	7.26	98%	28.48	58.71
1	EX-2	0.28	100%	1.12	2.30
2	EX-3	0.07	100%	0.21	0.43
2	EX-4	0.05	2%	0.00	0.15

DEVELOPED SITE DRAINAGE CONDITIONS
The proposed drainage design will incorporate the use of drainage swales and/or concrete pans to convey runoff to a local inlet. Once the flows have been captured by the inlet, the runoff will be routed via underground storm pipe to the proposed regional extended detention basin (EDB) for treatment.

The site has been divided into seven (7) onsite basins and three (3) offsite subbasins. All of the onsite subbasins will be captured and conveyed to the proposed EDB with the exception of subbasins OF-E1 and OF-AB1. After runoff is released from the EDB, runoff will outfall to the existing storm system in 64th Avenue. For more detailed information on the sub-basins, please reference the *Proposed Drainage Plan* in **Appendix A. Table 3** following this section provides additional detail for rational calculation summaries and outfalls. Proposed hydrologic calculations are included in **Appendix D.**

PROPOSED SUB-BASIN DESCRIPTION

ONSITE

Sub-Basin A-1
Sub-basin A-1 is a 0.89-acre area that is designed for future development consistent with allowed uses in applicable zoning. Subbasin A-1 has an assumed imperviousness of 75% based on **Table 6.3** in Adams County Stormwater Drainage Design and Stormwater Quality Control Regulations manual ("the Manual"). Runoff will be conveyed via overland flows into a concrete pan on the eastern side of the site and routed north through B-1 to design point C in Basin C-1. A temporary swale will be installed to convey all runoff from A-1 to the pan.

Sub-Basin B-1
Sub-basin B-1 is a 1.12-acre area that is designed for future development consistent with allowed uses in applicable zoning. Subbasin B-1 has an assumed imperviousness of 75% based on **Table 6.3** in The Manual. Runoff will be conveyed via overland flows into a concrete pan on the eastern side of the site and routed north through to design point C in Basin C-1. A temporary swale will be installed to convey all runoff from B-1 to the pan.

Sub-Basin C-1
Sub-basin C-1 is a 2.04-acre area that is designed for future development consistent with allowed uses in applicable zoning. Subbasin C-1 has an assumed imperviousness of 75% based on **Table 6.3** in the manual. Runoff will be conveyed via overland flows to design point C in Basin C-1. A temporary swale will be installed to convey all runoff from C-1 to the pan. During the 100-year event, inlet A-4 will overtop and follow drainage patterns east across basin D-1 into basin E-1.

Sub-Basin D-1
Sub-basin D-1 is a 2.37-acre area that is designed for future development consistent with allowed uses in applicable zoning. Subbasin D-1 has an assumed imperviousness of 80% based on **Table 6.3** in the Manual. The runoff will be conveyed via sheet flow to the proposed EDB at the east side of the site.

Sub-Basin OF-AB1
Sub-basin OF-AB1 is a 0.13-acre area that is comprised of landscaping and pavement along the western portion of the site. Flows on the surface will not be captured by proposed storm infrastructure and will be routed offsite to Federal Blvd. where it will be routed via curb and gutter to EX Design Point 1.

Sub-Basin E-1
Sub-basin E-1 is a 0.76-acre area that is comprised of the proposed EDB that will serve future development sites. Flows will be conveyed to the concrete pan in the previous basins and then into the proposed EDB and treated for water quality and detention (Design Point 1). Flows will then be released at historic flow rates to the existing storm system at Existing Design point 2.

Sub-Basin OF-E1
Sub-basin OF-E1 is a 0.10-acre area that is comprised of landscaping along the eastern portion of the site. Flows on the surface will not be captured by proposed storm infrastructure and will be routed offsite to the existing residential community following existing drainage patterns.

OFFSITE

Sub-Basin OS-C1
Sub-basin OS-C1 is a 0.10-acre offsite area that is comprised of landscaping and pavement along the west side of the site. Flows on the surface will be conveyed by overland flows into proposed Basin C-1 and follow the respective drainage patterns of each basin. See Basin C-1 for proposed drainage patterns.

Sub-Basin OF-AB2
Sub-basin OF-AB3 is a 0.10-acre offsite area that is comprised of landscaping and pavement along the eastern side of the site. Flows on the surface will not be captured by proposed storm infrastructure and will be routed offsite east to Federal Blvd. where they will be routed via curb and gutter to EX Design Point 1.

Sub-Basin OS-D1
Sub-basin OS-D1 is a 0.06-acre offsite area that is comprised of landscaping and pavement along the northern side of the site. Flows on the surface will be conveyed by overland flows into proposed Basin D-1 and follow the respective drainage patterns of the basin.

Table 3: Proposed Rational Calcs Summary Table

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	IMPERVIOUSNESS %	PEAK FLOWS (CFS)	
				Q5	Q100
On-Site Basins					
	A1	0.89	75%	2.55	4.87
	B1	1.12	75%	3.10	5.92
	C1	2.04	75%	6.03	11.51
	D1	2.37	80%	8.07	15.40
	E1	0.76	2%	0.03	2.56
	OF-E1	0.10	2%	0.00	0.46
	OF-AB1	0.12	24%	0.12	0.65
TOTAL		7.41	67%	**19.90**	41.37
Off-Site Basins					
OS-C1	OS-C1	0.10	58%	0.25	0.69
OF-AB2	OF-AB2	0.10	71%	0.31	0.75
OS-D1	OS-D1	0.06	16%	0.04	0.29
TOTAL		**0.26**	**54%**	**0.60**	**1.74**

The total tributary area to the Pond is 7.34 acres. The total runoff to the Pond from these basins is 17.14 cfs in the 5-year storm event and 36.72 in the 100-year storm event.

Table 4: Pond Tributary Areas

	Tributary Basins	Tributary Area (ac)	Imperviousness	Q_5 (cfs)	Q_{100} (cfs)
Tributary to Pond	A-E1,OS-C1,OS-D1	7.34	68%	20.07	41.24
Tributary Offsite	OF-E1,OF-AB1,OF-AB2	0.33	25%	0.43	1.86

DRAINAGE FACILITY DESIGN

GENERAL CONCEPT

Stormwater runoff will be conveyed in conformance with historic drainage patterns, flowing into the storm sewer systems on site, and ultimately into Clear Creek. Developed runoff will be collected via curb and gutter, concrete pans, and storm sewer inlets. The onsite storm system will convey to the EDB located at the eastern edge of the site for water quality and detention storage of the excess urban runoff volume (EURV) and 100-yr event.

OFFSITE FEDERAL BLVD.

In the existing condition, the tributary area outfalling to Design Point 1 along Federal Blvd. is 0.28 acres with a runoff of 1.12 cfs in the 5-year storm event and 2.30 in the 100-year storm event. In the proposed condition, the tributary area (OF-AB1,OF-AB2) outfalling to Design Point 1 is 0.23 acres with a runoff of 0.43 cfs for the 5-year storm event and 1.40 cfs in the 100-year storm event discharges. The proposed condition decreases flow from the existing condition, therefore the proposed improvements will not negatively impact the downstream storm infrastructure at Design Point 1.

OFFSITE 64TH AVE

In the existing condition, the tributary area outfalling to Design Point 1 along 64th Avenue is 0.12 acres with a runoff of 0.21 cfs in the 5-year storm event and 0.58 in the 100-year storm event. In the proposed condition, there are no proposed areas outfalling to 64th Avenue The proposed condition decreases flow from the existing condition, therefore the proposed improvements will not negatively impact the downstream storm infrastructure at Design Point 1.

OFFSITE SOUTHEAST (RESIDENTIAL SUBDIVISION)

In the existing condition, the tributary area outfalling to Design Point 1 along Federal Blvd. is 7.26 acres with a runoff of 28.48 cfs in the 5-year storm event and 58.71 in the 100-year storm event. In the proposed condition, the tributary area (OF-E1) outfalling to offsite is 0.10 acres with a runoff of 0.00 cfs for the 5-year storm event and 0.46 cfs in the 100-year storm event discharges. The proposed condition decreases flow from the existing condition; therefore the proposed improvements will not negatively impact the downstream storm infrastructure.

ONSITE

In the existing condition, there are no means for onsite detention or water quality. All stormwater sheet flows southeast across the site to the residential subdivision with a totaling flow of 28.48 cfs in the 5-year storm event and 58.71 cfs in the 100-year storm event. In the proposed condition, the flows will be redirected to the EDB on the eastern side of the site through curb and gutters, concrete pans, and proposed storm pipe. The areas tributary to the EDB (A1-E1, OS-C1, OS-D1) are 7.34 acres with a total flow of 20.07 cfs in the 5-year storm event and 41.24 cfs in the 100-year storm event. A minimum of 1’ of freeboard is provided in the pond from the 100-year water surface elevation (WSE) and the top of pond. Detention calculations are provided in **Appendix D**. The pond will have a controlled release that will discharge flows at historic rates via outlet structures to the public storm sewer systems. This pond outfall pipe will also be sized to provide capacity for the 100-year storm event. Clear Creek is the ultimate tributary for the site. An emergency overflow path is also provided for runoff to convey flows from the pond to the 64th Avenue right-of-way.

DETENTION POND DESIGN

According to adams county Drainage Manual, Detention of flood flows is required for all development and redevelopment projects and should be designed to control the 5-year and 100-year recurrence interval floods. The total tributary area to the proposed detention pond is 7.34-acres including Sub-basins A1, B1, C1, D1, E1, Pond,OS-C1,OS-D1, with a weighted imperviousness of 68%. The 100-year detention volume required for the pond is 0.396 acre-feet with proposed conditions of the site, as calculated by the MHFD detention spreadsheet included in **Appendix C**. 8

The proposed detention pond is designed to have a bottom elevation of 5209.00 and a top spillway elevation of 5212.00. The pond is a Swirl-Bay design per City and County of Denver Detail Figure 13.1S. The proposed pond will provide a total volume of 0.904 acre-feet. The outlet structure has been designed to meet the Water Quality Capture Volume (WQCV) and drain time requirements in conformance with the Manual. The proposed orifice plate provides a WQCV release rate of 0.10 cfs and a drain time of 40 hours. The 5-year flows are controlled by the orifice plate with a release rate of 0.60 cfs. The 100-year flows are controlled by the overflow weir structure and restrictor plate on the outlet pipe providing a release rate of 8.40 cfs. The release rates with the proposed development are less than those in the existing condition and drain times are in conformance with those in the Manual. Orifice plate and outlet sizing calculations are provided in **Appendix D**.

PERMANENT STORMWATER QUALITY

Permanent water quality will be provided in the on-site surface water quality and detention pond in accordance Mile High Flood District and Adams County code. Each detention facility is sized adequately to treat and release the water quality capture volume (WQCV) in at least 40 hours per the adams county Drainage Manual. The total WQCV for the disturbed Project area is 0.16 acre-feet. The owner will provide long term operation and maintenance of the detention and water quality facilities. Approximately 4.5% of the total disturbed area is discharging without being treated, which is in compliance with the 20% maximum requirement, see **Appendix C** for PSC calculations.

CONCLUSIONS

The stormwater drainage design for the project has been done in accordance with the standards set forth in the Adams County Storm Drainage Design and Stormwater Quality Control Regulations and the Urban Storm Drainage Criteria Manual. Stormwater runoff will be safely conveyed through a series of private storm sewer networks without negatively impacting adjacent properties or the existing infrastructure.

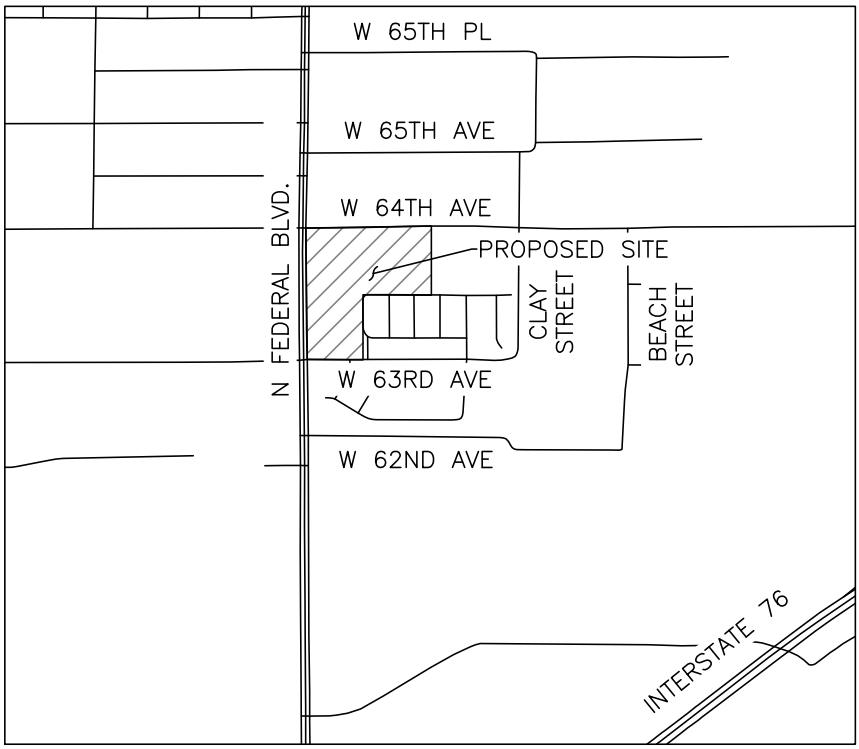
REFERENCES

1. Storm Water Drainage Design and Stormwater Quality Control Regulations, Dated December, 8 2020, prepared by Adams County.
2. Urban Storm Drainage Criteria Manual, Volumes 1-3, prepared by Mile High Flood District, Updated October 2019.
3. Flood Insurance Rate Map, Adams County, Colorado and Incorporated Areas, Map Number 08001C0592H, Revised March 5, 2007, prepared by the Federal Emergency Management Agency (FEMA)

APPENDIX A – MAPS

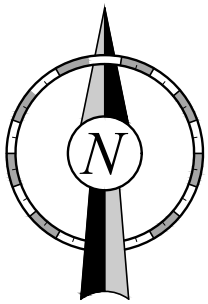
Kimley»Horn

Berkley Center Subdivision



VICINITY MAP

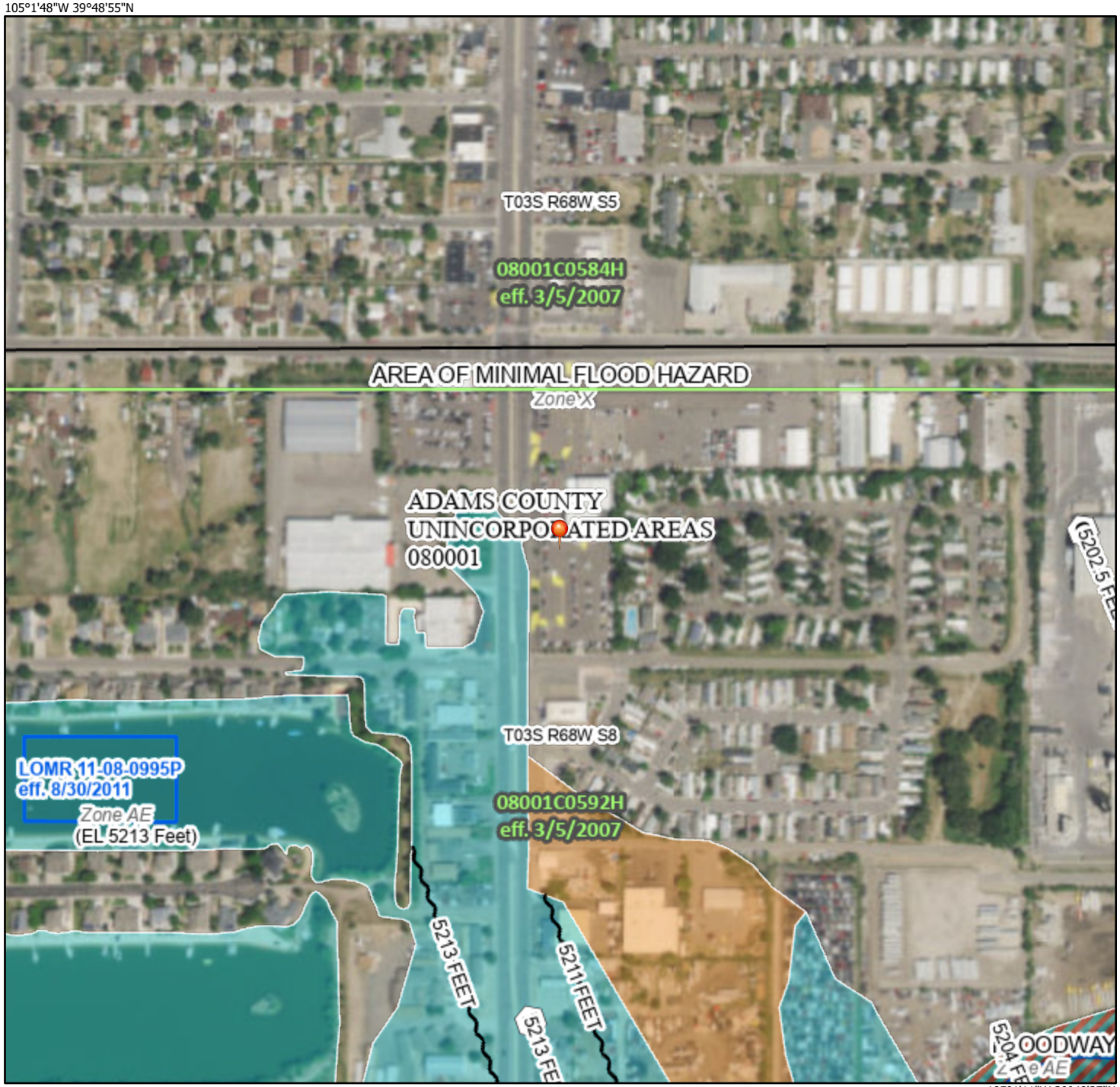
Not to Scale



National Flood Hazard Layer FIRMette

FEMA

105°1'48"W 39°48'55"N



105°1'11"W 39°48'27"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/20/2023 at 6:44 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

APPENDIX B – SOILS INFORMATION

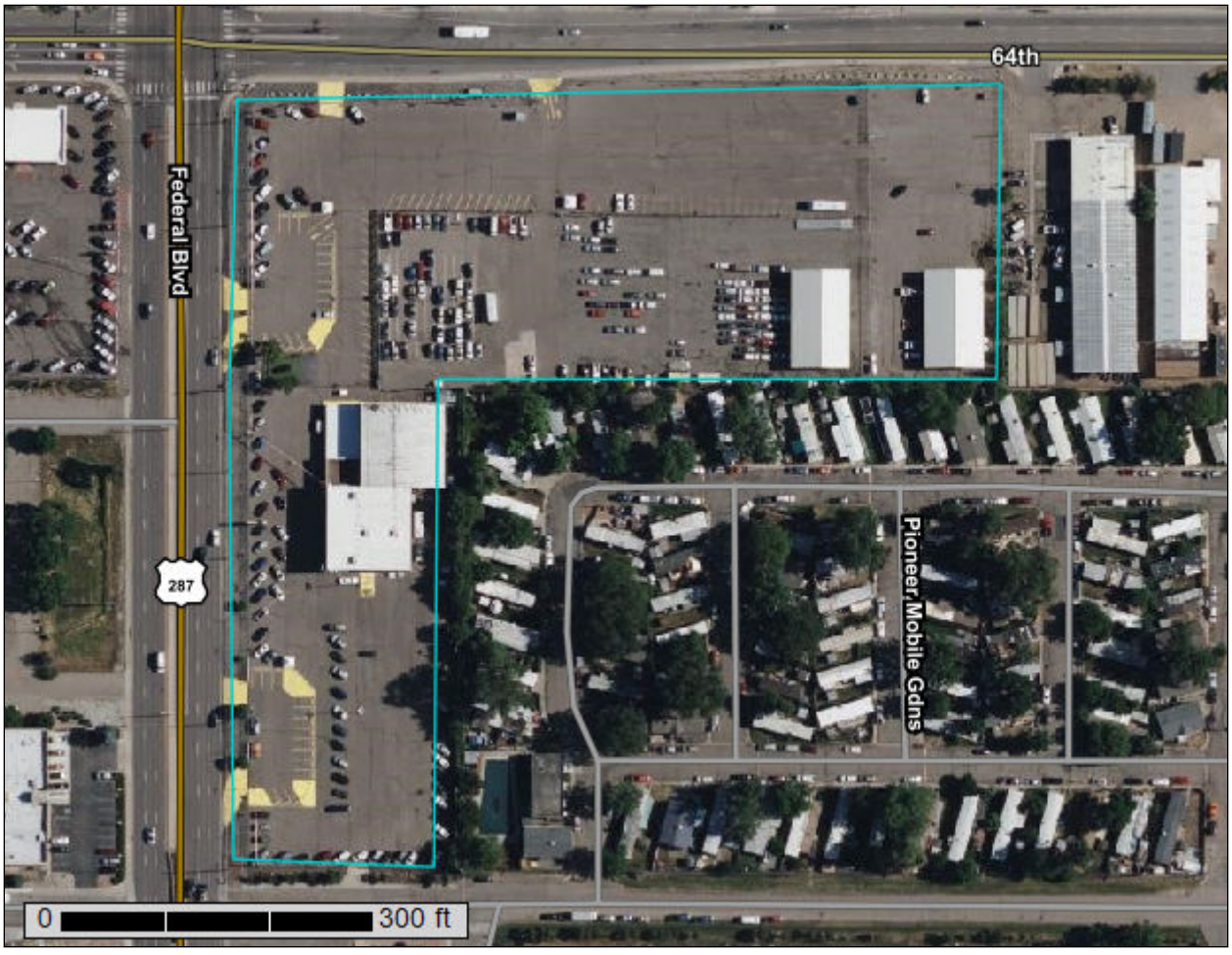
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Adams County Area, Parts of Adams and Denver Counties, Colorado



August 31, 2023

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:1,750 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 25 50 100 150

Feet: 0 50 100 200 300

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

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 1:20,000.

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:
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: Adams County Area, Parts of Adams and Denver Counties, Colorado
Survey Area Data: Version 19, Sep 1, 2022

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

Date(s) aerial images were photographed: Jul 1, 2020—Jul 2, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND

MAP INFORMATION

imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Gr	Gravelly land-Shale outcrop complex	0.0	0.2%
Lw	Loamy alluvial land, moderately wet	1.5	21.6%
Wt	Wet alluvial land	5.3	78.2%
Totals for Area of Interest		**6.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The

delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Adams County Area, Parts of Adams and Denver Counties, Colorado

Gr—Gravelly land-Shale outcrop complex

Map Unit Setting

National map unit symbol: 34vy
Elevation: 4,400 to 5,500 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 46 to 54 degrees F
Frost-free period: 120 to 160 days

Map Unit Composition

Gravelly land: 65 percent
Shale outcrop: 35 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Gravelly Land

Setting

Landform: Hillslopes
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Colluvium derived from mixed and/or slope alluvium derived from mixed

Typical profile

H1 - 0 to 3 inches: gravelly sand
H2 - 3 to 60 inches: gravelly sand

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7s
Hydrologic Soil Group: A
Ecological site: R067BY063CO - Gravel Breaks
Hydric soil rating: No

Description of Shale Outcrop

Typical profile

H1 - 0 to 60 inches: unweathered bedrock

Properties and qualities

Slope: 15 to 45 percent
Depth to restrictive feature: 0 inches to paralithic bedrock
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Available water supply, 0 to 60 inches: Very low (about 0.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8s
Hydrologic Soil Group: D
Ecological site: R067BY045CO - Shaly Plains
Hydric soil rating: No

Lw—Loamy alluvial land, moderately wet

Map Unit Setting

National map unit symbol: 34w5
Elevation: 4,000 to 5,500 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 135 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition

Loamy alluvial land: 70 percent
Minor components: 30 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Loamy Alluvial Land

Setting

Landform: Drainageways
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile

H1 - 0 to 6 inches: variable
H2 - 6 to 36 inches: stratified loam to clay loam
H3 - 36 to 60 inches: sand

Properties and qualities

Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 6.00 in/hr)
Depth to water table: About 18 to 36 inches
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 6.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C
Hydric soil rating: No

Minor Components

Nunn

Percent of map unit: 12 percent
Hydric soil rating: No

Satanta
Percent of map unit: 12 percent
Landform: Paleoterraces
Hydric soil rating: No

Fluvaquentic haplustolls
Percent of map unit: 6 percent
Landform: Sloughs
Hydric soil rating: Yes

Wt—Wet alluvial land

Map Unit Setting
National map unit symbol: 34xj
Elevation: 4,000 to 5,600 feet
Mean annual precipitation: 12 to 14 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 125 to 155 days
Farmland classification: Not prime farmland

Map Unit Composition
Wet alluvial land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Wet Alluvial Land

Setting
Landform: Flood plains
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from mixed

Typical profile
H1 - 0 to 8 inches: variable
H2 - 8 to 36 inches: stratified sandy loam to clay
H3 - 36 to 60 inches: sand

Properties and qualities
Slope: 0 to 1 percent
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to high (0.06 to 6.00 in/hr)
Depth to water table: About 6 to 24 inches
Calcium carbonate, maximum content: 15 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Low (about 4.8 inches)

Interpretive groups
Land capability classification (irrigated): 5w

Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: D
Ecological site: R067BY038CO - Wet Meadow
Hydric soil rating: Yes

APPENDIX C – HYDROLOGY

Kimley»Horn

STANDARD FORM SF-1
EXISTING RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: Berkely Center Subdivision
PROJECT NUMBER: 096888037
CALCULATED BY: AIA
CHECKED BY: JPW

DATE: 3/29/2024

SOIL: Hydrologic Soil Group D

LAND USE:	LANDSCAPE AREA	ROOF AREA	ASPHALT AREA	CONCRETE AREA	BUSINESS SUBURBAN	INDUSTRIAL LIGHT
2-YEAR COEFF.	0.01	0.79	0.83	0.79	0.79	0.79
5-YEAR COEFF.	0.05	0.81	0.85	0.81	0.81	0.81
10-YEAR COEFF.	0.15	0.83	0.87	0.83	0.83	0.83
100-YEAR COEFF.	0.49	0.87	0.89	0.87	0.87	0.87
IMPERVIOUS %	2%	90%	100%	90%	75%	80%

DESIGN BASIN	DESIGN POINT	LANDSCAPE AREA (AC)	ROOF AREA (AC)	ASPHALT AREA (AC)	CONCRETE AREA (AC)	BUSINESS AREA (AC)	INDUSTRIAL AREA (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
On-Site Basins													
EX-1		0.07	0.53	6.66	0.05	0.00	0.00	**7.29**	0.82	0.84	0.86	0.89	98%
EX-2	1	0.00	0.00	0.28	0.00	0.00	0.00	**0.28**	0.83	0.85	0.87	0.89	100%
EX-3	2	0.00	0.00	0.07	0.00	0.00	0.00	**0.07**	0.83	0.85	0.87	0.89	100%
EX-4	2	0.05	0.00	0.00	0.00	0.00	0.00	**0.05**	0.01	0.05	0.15	0.49	2%
		0.12	**0.53**	**7.01**	**0.05**	**0.00**	**0.00**	7.68	**0.82**	**0.84**	**0.86**	**0.88**	98%
BASIN SUBTOTAL		**2%**	**7%**	**91%**	**1%**	**0%**	**0%**	**100%**					

Kimley»Horn

STANDARD FORM SF-2
Existing Time of Concentration

PROJECT NAME: **Berkely Center Subdivision**
PROJECT NUMBER: **096888037**
CALCULATED BY: **AIA**
CHECKED BY: **JPW**

DATE: 3/29/2024

SUB-BASIN DATA			INITIAL TIME (T_i)			TRAVEL TIME (T_t)					Tc CHECK (URBANIZED BASINS)					FINAL Tc
DESIGN BASIN (1)	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	T_i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C_v (9)	VEL fps (11)	T_t Min. (12)	COMP. tc (13)	TOTAL LENGTH (14)	TOTAL SLOPE (15)	TOTAL IMP. (16)	Tc Min. (17)	Min.
On-Site Basins																
EX-1	7.29	0.84	200	0.5%	8.5		0.5%	20.0	1.4		8.5	200	0.5%	98%	11.3	8.5
EX-2	0.28	0.85	20	0.5%	2.6		0.5%	20.0	1.4		2.6	20	0.5%	100%	9.2	5.0
EX-3	0.07	0.85	10	1.0%	1.4		1.0%	20.0	2.0		1.4	10	1.0%	100%	9.1	5.0
EX-4	0.05	0.05	10	2.0%	4.8		2.0%	20.0	2.8		4.8	10	2.0%	2%	25.8	5.0

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L_i}}{S_o^{0.33}} \qquad t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t} \qquad t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$$

Kimley»Horn

STANDARD FORM SF-3
EXISTING STORM DRAINAGE DESIGN - RATIONAL METHOD 5 YEAR EVENT

PROJECT NAME: Berkely Center Subdivision
PROJECT NUMBER: 096888037
CALCULATED BY: AIA
CHECKED BY: JPW

DATE: 3/29/2024

P_1 (1-Hour Rainfall) = **1.42**

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY	tt (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Basins																					
		EX-1	7.29	0.82	8.46	5.98	4.09	24.48													
		1	EX-2	0.28	0.83	5.00	0.23	4.82	1.12													
		2	EX-3	0.07	0.83	5.00	0.06	4.82	0.27													
		2	EX-4	0.05	0.01	5.00	0.00	4.82	0.00													

Kimley»Horn

STANDARD FORM SF-3
EXISTING STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Berkely Center Subdivision
PROJECT NUMBER: 096888037
CALCULATED BY: AIA
CHECKED BY: JPW

DATE: 3/29/2024

P_1 (1-Hour Rainfall) = **2.71**

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY	tt (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Basins																					
			EX-1	7.29	0.89	8.46	6.46	7.81	50.47												
		1	EX-2	0.28	0.89	5.00	0.25	9.19	2.30												
		2	EX-3	0.07	0.89	5.00	0.06	9.19	0.55												
		2	EX-4	0.05	0.49	5.00	0.02	9.19	0.21												

Kimley»Horn

PROJECT NAME: Berkely Center Subdivision DATE: 3/29/2024
PROJECT NUMBER: 096888037
CALCULATED BY: AIA
CHECKED BY: JPW

EXISTING RATIONAL CALCULATIONS SUMMARY

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	IMPERVIOUSNESS %	PEAK FLOWS (CFS)	
				Q5	Q100
On-Site Basins					
	EX-1	7.29	98%	24.48	50.47
1	EX-2	0.28	100%	1.12	2.30
2	EX-3	0.07	100%	0.27	0.55
2	EX-4	0.05	2%	0.00	0.21

Kimley»Horn

STANDARD FORM SF-1
PROPOSED RUNOFF COEFFICIENTS - IMPERVIOUS CALCULATION

PROJECT NAME: Berkely Center Subdivision
PROJECT NUMBER: 0968888037
CALCULATED BY: AIA
CHECKED BY: JPW

DATE: 8/1/2024

SOIL: Hydrologic Soil Group D

LAND USE:	LANDSCAPE AREA	ROOF AREA	ASPHALT AREA	CONCRETE AREA	BUSINESS SUBURBAN	INDUSTRIAL LIGHT
2-YEAR COEFF.	0.01	0.79	0.83	0.79	0.79	0.79
5-YEAR COEFF.	0.05	0.81	0.85	0.81	0.81	0.81
10-YEAR COEFF.	0.15	0.83	0.87	0.83	0.83	0.83
100-YEAR COEFF.	0.49	0.87	0.89	0.87	0.87	0.87
IMPERVIOUS %	2%	90%	100%	90%	75%	80%

DESIGN BASIN	DESIGN POINT	LANDSCAPE AREA (AC)	ROOF AREA (AC)	ASPHALT AREA (AC)	CONCRETE AREA (AC)	BUSINESS AREA (AC)	INDUSTRIAL AREA (AC)	TOTAL AREA (AC)	C(2)	C(5)	C(10)	C(100)	Imp %
On-Site Basins													
A1	C	0.00	0.00	0.00	0.00	0.89	0.00	**0.89**	0.75	0.75	0.75	0.75	75%
B1	C	0.00	0.00	0.00	0.00	1.12	0.00	**1.12**	0.75	0.75	0.75	0.75	75%
C1	C	0.00	0.00	0.00	0.00	2.04	0.00	**2.04**	0.75	0.75	0.75	0.75	75%
D1		0.00	0.00	0.00	0.00	0.00	2.37	**2.37**	0.80	0.80	0.80	0.80	80%
E1		0.76	0.00	0.00	0.00	0.00	0.00	**0.76**	0.01	0.05	0.15	0.49	2%
OF-E1		0.10	0.00	0.00	0.00	0.00	0.00	**0.10**	0.01	0.05	0.15	0.49	2%
OF-AB1		0.09	0.00	0.00	0.03	0.00	0.00	**0.12**	0.20	0.24	0.32	0.58	24%
		0.95	**0.00**	**0.00**	**0.03**	**4.05**	**2.37**	**7.41**	0.67	0.68	0.69	0.73	67%
BASIN SUBTOTAL		**13%**	**0%**	**0%**	**0%**	**55%**	**32%**	**1.00**					
Off-Site Basins													
OS-C1		0.04	0.00	0.00	0.07	0.00	0.00	**0.10**	0.51	0.54	0.27	0.73	58%
OF-AB2		0.02	0.00	0.00	0.08	0.00	0.00	**0.10**	0.62	0.65	0.25	0.79	71%
OS-D1		0.05	0.00	0.00	0.01	0.00	0.00	**0.06**	0.13	0.17	0.41	0.55	16%
		0.11	**0.00**	**0.00**	**0.16**	**0.00**	**0.00**	**0.26**	**0.47**	**0.50**	**0.74**	**0.71**	**54%**
BASIN SUBTOTAL		**41%**	**0%**	**0%**	**59%**	**0%**	**0%**	**100%**					

STANDARD FORM SF-2
Proposed Time of Concentration

PROJECT NAME: **Berkely Center Subdivision**
PROJECT NUMBER: **0968888037**
CALCULATED BY: **AIA**
CHECKED BY: **JPW**

DATE: 8/1/2024

SUB-BASIN DATA			INITIAL TIME (T_i)			TRAVEL TIME (T_t)					Tc CHECK (URBANIZED BASINS)					FINAL Tc
DESIGN BASIN (1)	AREA Ac (2)	C5 (3)	LENGTH Ft (4)	SLOPE % (5)	T_i Min. (6)	LENGTH Ft. (7)	SLOPE % (8)	C_v (9)	VEL fps (11)	T_t Min. (12)	COMP. tc (13)	TOTAL LENGTH (14)	TOTAL SLOPE (15)	TOTAL IMP. (16)	Tc Min. (17)	Min.
On-Site Basins																
A1	0.89	0.75	250	2.0%	8.1	175	0.5%	20.0	1.4	2.1	10.1	425	1.4%	75%	16.3	10.1
B1	1.12	0.75	275	2.0%	8.4	230	0.5%	21.0	1.5	2.6	11.0	505	1.3%	75%	17.0	11.0
C1	2.04	0.75	300	2.0%	8.8	50	0.5%	22.0	1.6	0.5	9.4	350	1.8%	75%	15.5	9.4
D1	2.37	0.80	300	2.0%	7.6		50.0%	23.0	16.3		7.6	300	2.0%	80%	14.2	7.6
E1	0.76	0.05	75	5.0%	9.7	200	0.5%	24.0	1.7	2.0	11.7	275	1.7%	2%	29.4	11.7
OF-E1	0.10	0.05	5	2.0%	3.4		50.0%	25.0	17.7		3.4	5	2.0%	2%	25.7	5.0
OF-AB1	0.12	0.24	10	2.0%	4.0		50.0%	26.0	18.4		4.0	10	2.0%	24%	22.0	5.0
Off-Site Basins																
OS-C1	0.10	0.54	10	2.0%	2.6		2.0%	15.0	2.1		2.6	10	2.0%	58%	16.2	5.0
OF-AB2	0.10	0.65	10	102.0%	0.6		2.0%	16.0	2.3		0.6	10	102.0%	71%	13.9	5.0
OS-D1	0.06	0.17	10	202.0%	0.9		2.0%	17.0	2.4		0.9	10	202.0%	16%	23.3	5.0

$$t_i = \frac{0.395(1.1 - C_5)\sqrt{L_i}}{S_o^{0.33}}$$

$$t_t = \frac{L_t}{60K\sqrt{S_o}} = \frac{L_t}{60V_t}$$

$$t_c = (26 - 17i) + \frac{L_t}{60(14i + 9)\sqrt{S_t}}$$

STANDARD FORM SF-3
PROPOSED STORM DRAINAGE DESIGN - RATIONAL METHOD X YEAR EVENT

PROJECT NAME: Berkely Center Subdivision
PROJECT NUMBER: 0968888037
CALCULATED BY: AIA
CHECKED BY: JPW

DATE: 8/1/2024

P_1 (1-Hour Rainfall) = 1.42

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	tc (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY	tt (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Basins																					
		A1	0.89	0.75	10.12	0.67	3.82	2.55													
		B1	1.12	0.75	11.03	0.84	3.69	3.10													
		C1	2.04	0.75	9.36	1.53	3.94	6.03													
		D1	2.37	0.80	7.56	1.90	4.26	8.07													
		E1	0.76	0.01	11.71	0.01	3.60	0.03													
		OF-E1	0.10	0.01	5.00	0.00	4.82	0.00													
		OF-AB1	0.12	0.20	5.00	0.02	4.82	0.12													
Off-Site Basins																					
		OS-C1	0.10	0.51	5.00	0.05	4.82	0.25													
		OF-AB2	0.10	0.62	5.00	0.06	4.82	0.31													
		OS-D1	0.06	0.13	5.00	0.01	4.82	0.04													

Kimley»Horn

STANDARD FORM SF-3
PROPOSED STORM DRAINAGE DESIGN - RATIONAL METHOD 100 YEAR EVENT

PROJECT NAME: Berkely Center Subdivision
PROJECT NUMBER: 0968888037
CALCULATED BY: AIA
CHECKED BY: JPW

DATE: 8/1/2024

P_1 (1-Hour Rainfall) = 2.71

STORM LINE	DESIGN POINT	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		DESIGN BASIN	AREA (AC)	RUNOFF COEFF	t_c (min)	C*A(ac)	I (in/hr)	Q (cfs)	tc(max)	S(C*A) (ac)	I (in/hr)	Q (cfs)	SLOPE (%)	STREET FLOW(cfs	DESIGN FLOW(cfs)	SLOPE (%)	PIPE SIZE (in)	LENGTH (ft)	VELOCITY	tt (min)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
On-Site Basins																					
		A1	0.89	0.75	10.12	0.67	7.30	4.87													
		B1	1.12	0.75	11.03	0.84	7.05	5.92													
		C1	2.04	0.75	9.36	1.53	7.52	11.51													
		D1	2.37	0.80	7.56	1.90	8.12	15.40													
		E1	0.76	0.49	11.71	0.37	6.87	2.56													
		OF-E1	0.10	0.49	5.00	0.05	9.19	0.46													
		OF-AB1	0.12	0.58	5.00	0.07	9.19	0.65													
Off-Site Basins																					
		OS-C1	0.10	0.73	5.00	0.08	9.19	0.69													
		OF-AB2	0.10	0.79	5.00	0.08	9.19	0.75													
		OS-D1	0.06	0.55	5.00	0.03	9.19	0.29													

Kimley»Horn

PROJECT NAME: Berkely Center Subdivision DATE: 8/1/2024
PROJECT NUMBER: 0968888037
CALCULATED BY: AIA
CHECKED BY: JPW

PROPOSED RATIONAL CALCULATIONS SUMMARY

DESIGN POINT	TRIBUTARY BASINS	TRIBUTARY AREA (AC)	IMPERVIOUSNESS %	PEAK FLOWS (CFS)	
				Q5	Q100
On-Site Basins					
	A1	0.89	75%	2.55	4.87
	B1	1.12	75%	3.10	5.92
	C1	2.04	75%	6.03	11.51
	D1	2.37	80%	8.07	15.40
	E1	0.76	2%	0.03	2.56
	OF-E1	0.10	2%	0.00	0.46
	OF-AB1	0.12	24%	0.12	0.65
TOTAL		7.41	67%	**19.90**	41.37
Off-Site Basins					
OS-C1	OS-C1	0.10	58%	0.25	0.69
OF-AB2	OF-AB2	0.10	71%	0.31	0.75
OS-D1	OS-D1	0.06	16%	0.04	0.29
TOTAL		**0.26**	**54%**	**0.60**	**1.74**

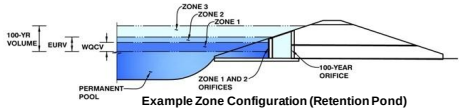
APPENDIX D – HYDRAULICS

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)

Project: QT 4270

Basin ID: PROPOSED POND



Example Zone Configuration (Retention Pond)

Watershed Information

Selected BMP Type =	EDB	
Watershed Area =	7.34	acres
Watershed Length =	1,000	ft
Watershed Length to Centroid =	630	ft
Watershed Slope =	0.015	ft/ft
Watershed Imperviousness =	67.00%	percent
Percentage Hydrologic Soil Group A =	2.0%	percent
Percentage Hydrologic Soil Group B =	36.0%	percent
Percentage Hydrologic Soil Groups C/D =	62.0%	percent
Target WQCV Drain Time =	40.0	hours
Location for 1-hr Rainfall Depths =	User Input	

After providing required inputs above including 1-hour rainfall depths, click 'Run CUHP' to generate runoff hydrographs using the embedded Colorado Urban Hydrograph Procedure.

			Optional User Overrides	
Water Quality Capture Volume (WQCV) =	0.160	acre-feet		acre-feet
Excess Urban Runoff Volume (EURV) =	0.501	acre-feet		acre-feet
2-yr Runoff Volume (P1 = 1 in.) =	0.391	acre-feet	1.00	inches
5-yr Runoff Volume (P1 = 1.42 in.) =	0.631	acre-feet	1.42	inches
10-yr Runoff Volume (P1 = 1.68 in.) =	0.788	acre-feet	1.68	inches
25-yr Runoff Volume (P1 = 1.69 in.) =	0.813	acre-feet		inches
50-yr Runoff Volume (P1 = 2.35 in.) =	1.227	acre-feet	2.35	inches
100-yr Runoff Volume (P1 = 2.71 in.) =	1.473	acre-feet	2.71	inches
500-yr Runoff Volume (P1 = 3.14 in.) =	1.751	acre-feet		inches
Approximate 2-yr Detention Volume =	0.356	acre-feet		
Approximate 5-yr Detention Volume =	0.553	acre-feet		
Approximate 10-yr Detention Volume =	0.667	acre-feet		
Approximate 25-yr Detention Volume =	0.629	acre-feet		
Approximate 50-yr Detention Volume =	0.805	acre-feet		
Approximate 100-yr Detention Volume =	0.898	acre-feet		

Define Zones and Basin Geometry

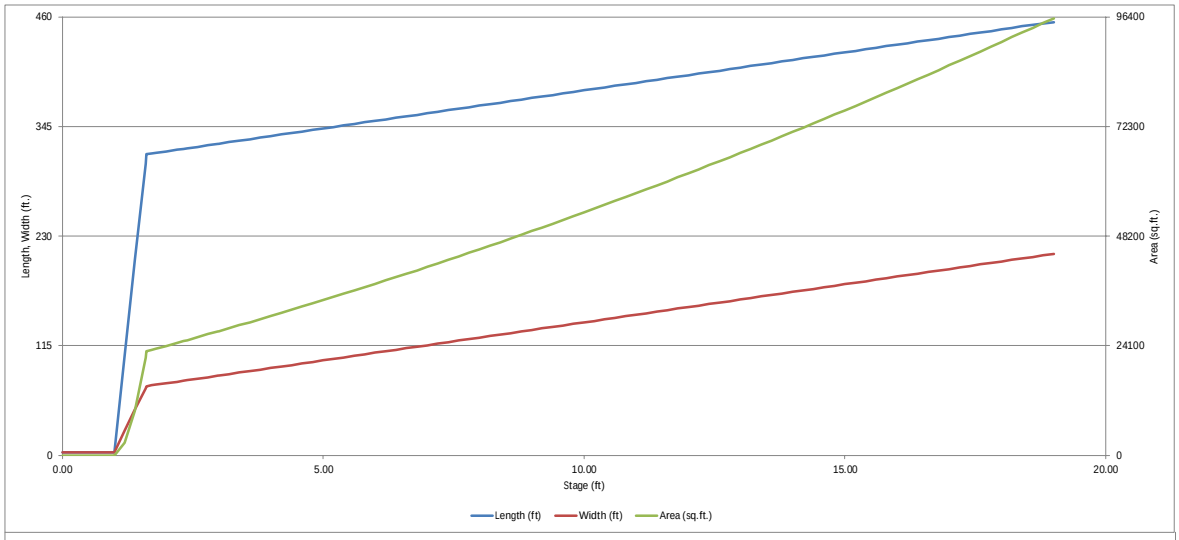
Zone 1 Volume (WQCV) =	0.160	acre-feet
Zone 2 Volume (EURV - Zone 1) =	0.341	acre-feet
Zone 3 Volume (100-year - Zones 1 & 2) =	0.396	acre-feet
Total Detention Basin Volume =	0.898	acre-feet
Initial Surcharge Volume (ISV) =	6	ft^3
Initial Surcharge Depth (ISD) =	0.50	ft
Total Available Detention Depth (H_{total}) =	3.00	ft
Depth of Trickle Channel (H_{TC}) =	0.50	ft
Slope of Trickle Channel (S_{TC}) =	0.002	ft/ft
Slopes of Main Basin Sides (S_{main}) =	4	H:V
Basin Length-to-Width Ratio (R_{LW}) =	4.5	
Initial Surcharge Area (A_{ISV}) =	12	ft^2
Surcharge Volume Length (L_{ISV}) =	3.5	ft
Surcharge Volume Width (W_{ISV}) =	3.5	ft
Depth of Basin Floor (H_{FLOOR}) =	0.62	ft
Length of Basin Floor (L_{FLOOR}) =	315.9	ft
Width of Basin Floor (W_{FLOOR}) =	72.4	ft
Area of Basin Floor (A_{FLOOR}) =	22,860	ft^2
Volume of Basin Floor (V_{FLOOR}) =	4,835	ft^3
Depth of Main Basin (H_{MAIN}) =	1.38	ft
Length of Main Basin (L_{MAIN}) =	327.0	ft
Width of Main Basin (W_{MAIN}) =	83.4	ft
Area of Main Basin (A_{MAIN}) =	27,268	ft^2
Volume of Main Basin (V_{MAIN}) =	34,543	ft^3
Calculated Total Basin Volume (V_{total}) =	0.904	acre-feet

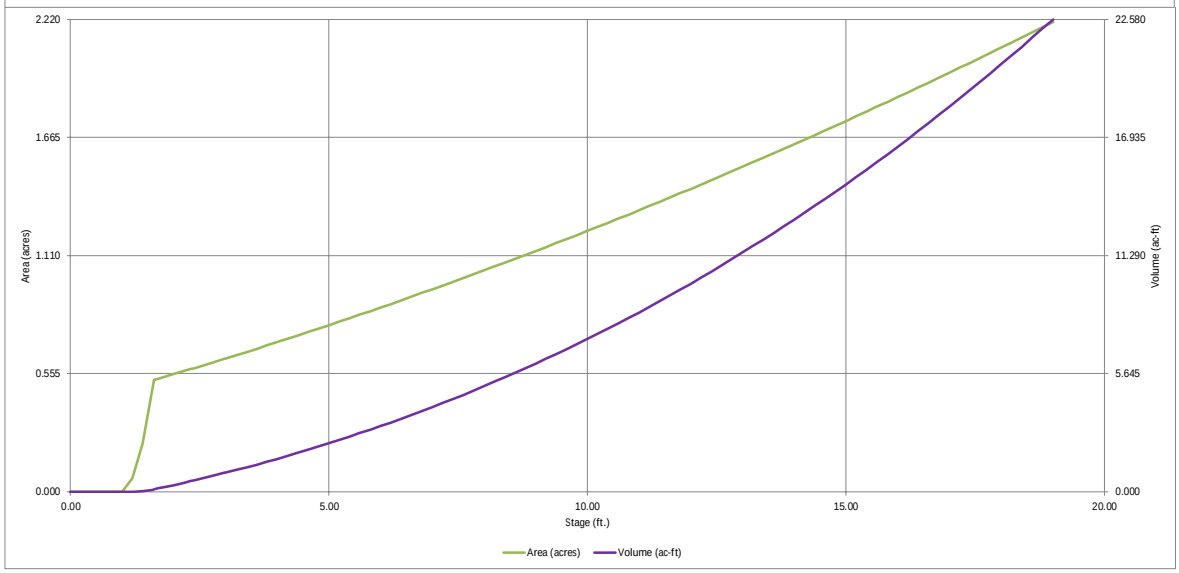
Depth Increment = 0.20 ft

Stage - Storage Description	Stage (ft)	Optional Override Stage (ft)	Length (ft)	Width (ft)	Area (ft^2)	Optional Override Area (ft^2)	Area (acre)	Volume (ft^3)	Volume (ac-ft)
Top of Micropool	0.00		3.5	3.5	12		0.000		
ISV	0.50		3.5	3.5	12		0.000	6	0.000
	0.60		3.5	3.5	12		0.000	7	0.000
	0.80		3.5	3.5	12		0.000	10	0.000
	1.00		3.5	3.5	12		0.000	12	0.000
	1.20		104.3	25.7	2,678		0.061	206	0.005
	1.40		205.1	47.9	9,824		0.226	1,382	0.032
	1.60		305.9	70.1	21,450		0.492	4,435	0.102
Floor	1.62		315.9	72.4	22,860		0.525	4,878	0.112
Zone 1 (WQCV)	1.72		316.7	73.2	23,171		0.532	7,179	0.165
	1.80		317.4	73.8	23,421		0.538	9,043	0.208
	2.00		319.0	75.4	24,049		0.552	13,790	0.317
	2.20		320.6	77.0	24,683		0.567	18,663	0.428
Zone 2 (EURV)	2.33		321.6	78.0	25,097		0.576	21,899	0.503
	2.40		322.2	78.6	25,321		0.581	23,663	0.543
	2.60		323.8	80.2	25,965		0.596	28,792	0.661
	2.80		325.4	81.8	26,614		0.611	34,050	0.782
Zone 3 (100-year)	2.99		326.9	83.3	27,235		0.625	39,165	0.899
	3.00		327.0	83.4	27,268		0.626	39,438	0.905
	3.20		328.6	85.0	27,927		0.641	44,957	1.032
	3.40		330.2	86.6	28,592		0.656	50,609	1.162
	3.60		331.8	88.2	29,261		0.672	56,394	1.295
	3.80		333.4	89.8	29,936		0.687	62,314	1.431
	4.00		335.0	91.4	30,615		0.703	68,369	1.570
	4.20		336.6	93.0	31,300		0.719	74,560	1.712
	4.40		338.2	94.6	31,990		0.734	80,889	1.857
	4.60		339.8	96.2	32,685		0.750	87,357	2.005
	4.80		341.4	97.8	33,385		0.766	93,963	2.157
	5.00		343.0	99.4	34,090		0.783	100,711	2.312
	5.20		344.6	101.0	34,801		0.799	107,600	2.470
	5.40		346.2	102.6	35,516		0.815	114,631	2.632
	5.60		347.8	104.2	36,237		0.832	121,807	2.796
	5.80		349.4	105.8	36,962		0.849	129,126	2.964
	6.00		351.0	107.4	37,693		0.865	136,592	3.136
	6.20		352.6	109.0	38,429		0.882	144,204	3.310
	6.40		354.2	110.6	39,170		0.899	151,964	3.489
	6.60		355.8	112.2	39,916		0.916	159,873	3.670
	6.80		357.4	113.8	40,668		0.934	167,931	3.855
	7.00		359.0	115.4	41,424		0.951	176,140	4.044
	7.20		360.6	117.0	42,186		0.968	184,501	4.236
	7.40		362.2	118.6	42,952		0.986	193,015	4.431
	7.60		363.8	120.2	43,724		1.004	201,682	4.630
	7.80		365.4	121.8	44,501		1.022	210,505	4.833
	8.00		367.0	123.4	45,283		1.040	219,483	5.039
	8.20		368.6	125.0	46,070		1.058	228,618	5.248
	8.40		370.2	126.6	46,863		1.076	237,912	5.462
	8.60		371.8	128.2	47,660		1.094	247,364	5.679
	8.80		373.4	129.8	48,463		1.113	256,976	5.899
	9.00		375.0	131.4	49,270		1.131	266,749	6.124
	9.20		376.6	133.0	50,083		1.150	276,684	6.352
	9.40		378.2	134.6	50,901		1.169	286,783	6.584
	9.60		379.8	136.2	51,724		1.187	297,045	6.819
	9.80		381.4	137.8	52,552		1.206	307,473	7.059
	10.00		383.0	139.4	53,385		1.226	318,066	7.302
	10.20		384.6	141.0	54,224		1.245	328,827	7.549
	10.40		386.2	142.6	55,067		1.264	339,756	7.800
	10.60		387.8	144.2	55,916		1.284	350,854	8.055
	10.80		389.4	145.8	56,769		1.303	362,123	8.313
	11.00		391.0	147.4	57,628		1.323	373,562	8.576
	11.20		392.6	149.0	58,492		1.343	385,174	8.842
	11.40		394.2	150.6	59,361		1.363	396,960	9.113
	11.60		395.8	152.2	60,236		1.383	408,919	9.387
	11.80		397.4	153.8	61,115		1.403	421,054	9.666
	12.00		399.0	155.4	61,999		1.423	433,366	9.949
	12.20		400.6	157.0	62,889		1.444	445,854	10.235
	12.40		402.2	158.6	63,784		1.464	458,522	10.526
	12.60		403.8	160.2	64,683		1.485	471,368	10.821
	12.80		405.4	161.8	65,588		1.506	484,395	11.120
	13.00		407.0	163.4	66,498		1.527	497,604	11.423
	13.20		408.6	165.0	67,414		1.548	510,995	11.731
	13.40		410.2	166.6	68,334		1.569	524,570	12.042
	13.60		411.8	168.2	69,259		1.590	538,329	12.358
	13.80		413.4	169.8	70,190		1.611	552,274	12.678
	14.00		415.0	171.4	71,125		1.633	566,405	13.003
	14.20		416.6	173.0	72,066		1.654	580,724	13.332
	14.40		418.2	174.6	73,012		1.676	595,232	13.665
	14.60		419.8	176.2	73,963		1.698	609,929	14.002
	14.80		421.4	177.8	74,919		1.720	624,817	14.344
	15.00		423.0	179.4	75,880		1.742	639,897	14.690
	15.20		424.6	181.0	76,847		1.764	655,170	15.041
	15.40		426.2	182.6	77,818		1.786	670,636	15.396
	15.60		427.8	184.2	78,795		1.809	686,297	15.755
	15.80		429.4	185.8	79,777		1.831	702,155	16.119
	16.00		431.0	187.4	80,763		1.854	718,208	16.488
	16.20		432.6	189.0	81,755		1.877	734,460	16.861
	16.40		434.2	190.6	82,752		1.900	750,911	17.239
	16.60		435.8	192.2	83,755		1.923	767,562	17.621
	16.80		437.4	193.8	84,762		1.946	784,413	18.008
	17.00		439.0	195.4	85,774		1.969	801,467	18.399
	17.20		440.6	197.0	86,792		1.992	818,723	18.795
	17.40		442.2	198.6	87,815		2.016	836,184	19.196
	17.60		443.8	200.2	88,842		2.040	853,849	19.602
	17.80		445.4	201.8	89,875		2.063	871,721	20.012
	18.00		447.0	203.4	90,913		2.087	889,800	20.427
	18.20		448.6	205.0	91,957		2.111	908,087	20.847
	18.40		450.2	206.6	93,005		2.135	926,583	21.271
	18.60		451.8	208.2	94,058		2.159	945,289	21.701
	18.80		453.4	209.8	95,117		2.184	964,207	22.135
	19.00		455.0	211.4	96,180		2.208	983,336	22.574

DETENTION BASIN STAGE-STORAGE TABLE BUILDER

MHFD-Detention, Version 4.04 (February 2021)



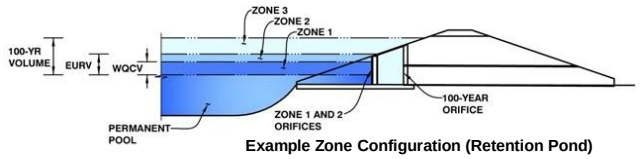


DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Project: QT 4270

Basin ID: PROPOSED POND



Example Zone Configuration (Retention Pond)

	Estimated Stage (ft)	Estimated Volume (ac-ft)	Outlet Type
Zone 1 (WQCV)	1.72	0.160	Orifice Plate
Zone 2 (EURV)	2.33	0.341	Orifice Plate
Zone 3 (100-year)	2.99	0.396	Weir&Pipe (Restrict)
Total (all zones)		0.898	

User Input: Orifice at Underdrain Outlet (typically used to drain WQCV in a Filtration BMP)

Underdrain Orifice Invert Depth =	N/A	ft (distance below the filtration media surface)	Underdrain Orifice Area =	N/A	ft²
Underdrain Orifice Diameter =	N/A	inches	Underdrain Orifice Centroid =	N/A	feet

Calculated Parameters for Underdrain

User Input: Orifice Plate with one or more orifices or Elliptical Slot Weir (typically used to drain WQCV and/or EURV in a sedimentation BMP)

Invert of Lowest Orifice =	0.00	ft (relative to basin bottom at Stage = 0 ft)	WQ Orifice Area per Row =	N/A	ft²
Depth at top of Zone using Orifice Plate =	2.40	ft (relative to basin bottom at Stage = 0 ft)	Elliptical Half-Width =	N/A	feet
Orifice Plate: Orifice Vertical Spacing =	9.60	inches	Elliptical Slot Centroid =	N/A	feet
Orifice Plate: Orifice Area per Row =	N/A	inches	Elliptical Slot Area =	N/A	ft²

Calculated Parameters for Plate

User Input: Stage and Total Area of Each Orifice Row (numbered from lowest to highest)

	Row 1 (required)	Row 2 (optional)	Row 3 (optional)	Row 4 (optional)	Row 5 (optional)	Row 6 (optional)	Row 7 (optional)	Row 8 (optional)
Stage of Orifice Centroid (ft)	0.00	0.80	1.60					
Orifice Area (sq. inches)	0.44	0.78	4.90					

	Row 9 (optional)	Row 10 (optional)	Row 11 (optional)	Row 12 (optional)	Row 13 (optional)	Row 14 (optional)	Row 15 (optional)	Row 16 (optional)
Stage of Orifice Centroid (ft)								
Orifice Area (sq. inches)								

User Input: Vertical Orifice (Circular or Rectangular)

	Not Selected	Not Selected				
Invert of Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Area =	N/A	N/A
Depth at top of Zone using Vertical Orifice =	N/A	N/A	ft (relative to basin bottom at Stage = 0 ft)	Vertical Orifice Centroid =	N/A	N/A
Vertical Orifice Diameter =	N/A	N/A	inches			

Calculated Parameters for Vertical Orific

User Input: Overflow Weir (Dropbox with Flat or Sloped Grate and Outlet Pipe OR Rectangular/Trapezoidal Weir (and No Outlet Pipe)

	Zone 3 Weir	Not Selected				
Overflow Weir Front Edge Height, Ho =	2.40	N/A	ft (relative to basin bottom at Stage = 0 ft)	Height of Grate Upper Edge, H_t =	2.40	N/A
Overflow Weir Front Edge Length =	3.00	N/A	feet	Overflow Weir Slope Length =	4.00	N/A
Overflow Weir Grate Slope =	0.00	N/A	H:V	Grate Open Area / 100-yr Orifice Area =	8.28	N/A
Horiz. Length of Weir Sides =	4.00	N/A	feet	Overflow Grate Open Area w/o Debris =	8.35	N/A
Overflow Grate Type =	Type C Grate	N/A		Overflow Grate Open Area w/ Debris =	4.18	N/A
Debris Clogging % =	50%	N/A	%			

Calculated Parameters for Overflow Wei

User Input: Outlet Pipe w/ Flow Restriction Plate (Circular Orifice, Restrictor Plate, or Rectangular Orifice)

	Zone 3 Restrictor	Not Selected				
Depth to Invert of Outlet Pipe =	0.50	N/A	ft (distance below basin bottom at Stage = 0 ft)	Outlet Orifice Area =	1.01	N/A
Outlet Pipe Diameter =	18.00	N/A	inches	Outlet Orifice Centroid =	0.48	N/A
Restrictor Plate Height Above Pipe Invert =	10.00		inches	Half-Central Angle of Restrictor Plate on Pipe =	1.68	N/A

Calculated Parameters for Outlet Pipe w/ Flow Restriction Plat

User Input: Emergency Spillway (Rectangular or Trapezoidal)

Spillway Invert Stage=	3.00	ft (relative to basin bottom at Stage = 0 ft)	Spillway Design Flow Depth=	0.38	feet
Spillway Crest Length =	25.00	feet	Stage at Top of Freeboard =	4.38	feet
Spillway End Slopes =	5.00	H:V	Basin Area at Top of Freeboard =	0.73	acres
Freeboard above Max Water Surface =	1.00	feet	Basin Volume at Top of Freeboard =	1.84	acre-ft

Calculated Parameters for Spillway

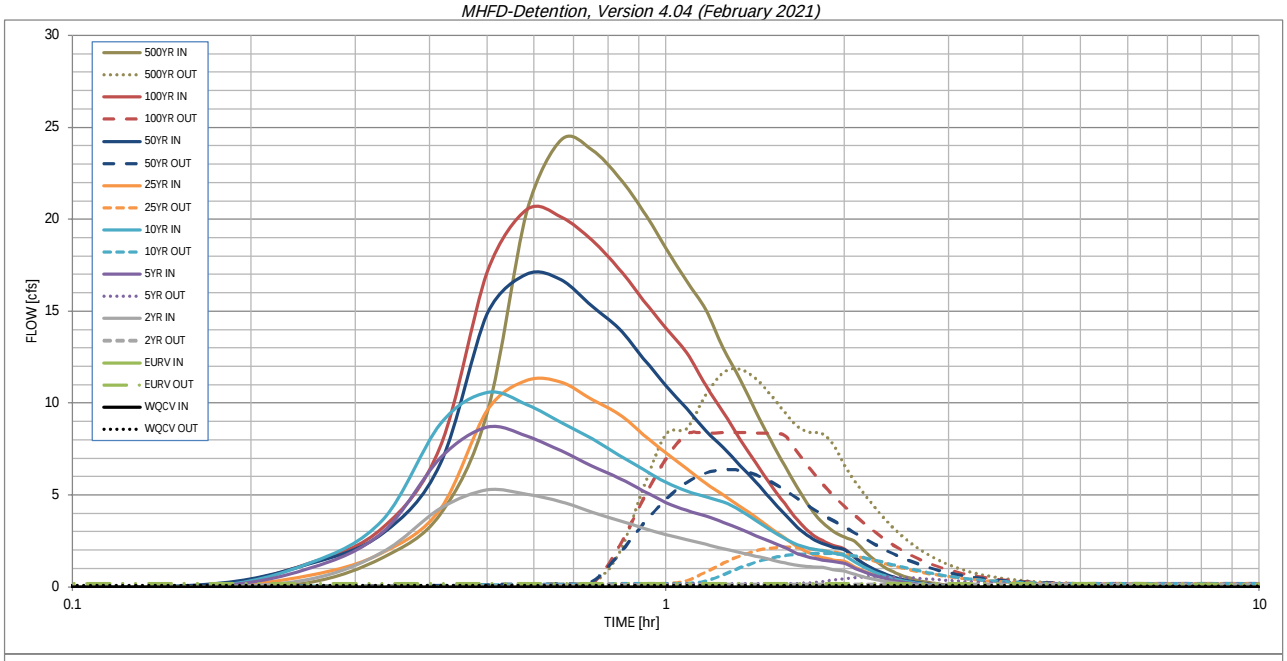
Routed Hydrograph Results

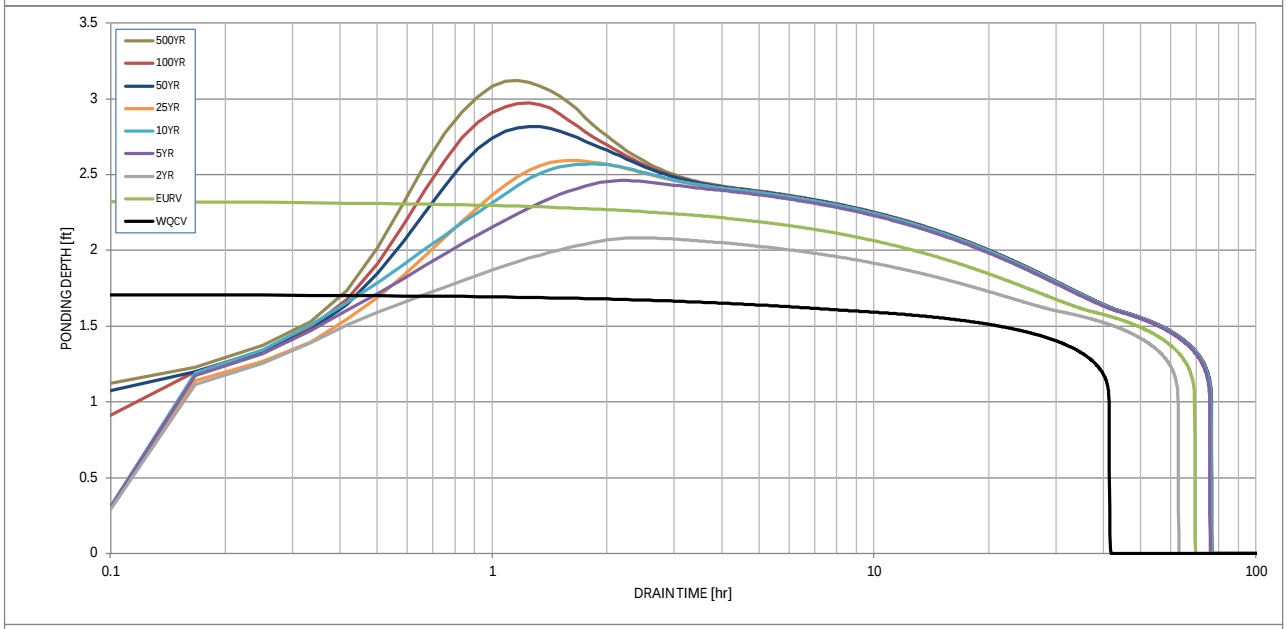
The user can override the default CUHP hydrographs and runoff volumes by entering new values in the Inflow Hydrographs table (Columns W through AF).

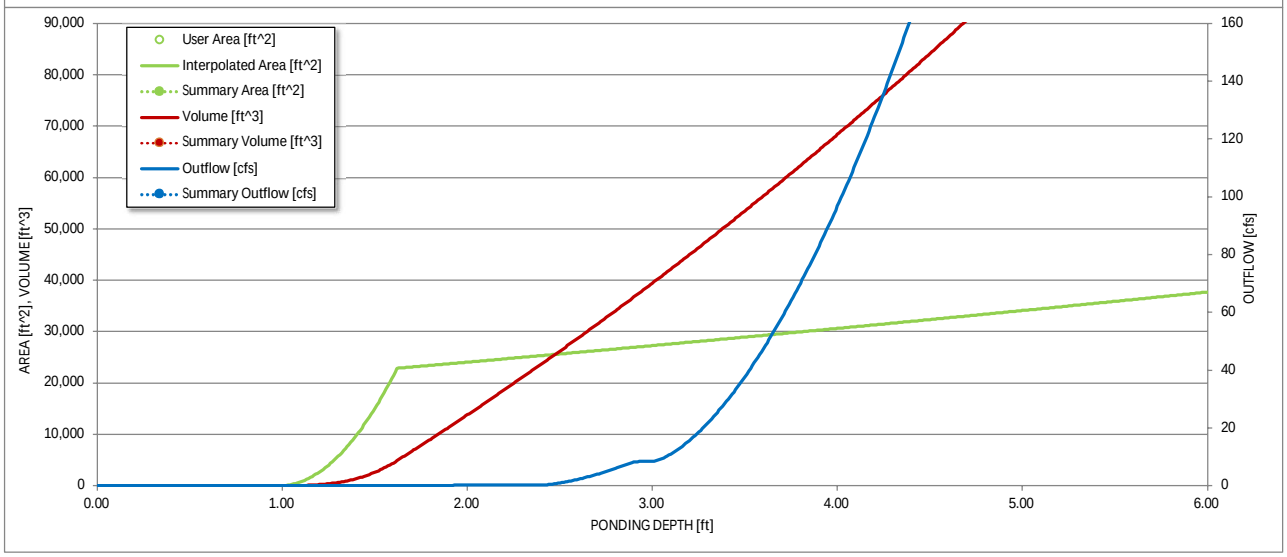
Design Storm Return Period =	WQCV	EURV	2 Year	5 Year	10 Year	25 Year	50 Year	100 Year
One-Hour Rainfall Depth (in) =	N/A	N/A	1.00	1.42	1.68	1.69	2.35	2.71
CUHP Runoff Volume (acre-ft) =	0.160	0.501	0.391	0.631	0.788	0.813	1.227	1.473
Inflow Hydrograph Volume (acre-ft) =	N/A	N/A	0.391	0.631	0.788	0.813	1.227	1.473
CUHP Predevelopment Peak Q (cfs) =	N/A	N/A	0.1	1.6	2.6	3.4	6.4	8.5
OPTIONAL Override Predevelopment Peak Q (cfs) =	N/A	N/A						
Predevelopment Unit Peak Flow, q (cfs/acre) =	N/A	N/A	0.01	0.22	0.35	0.46	0.88	1.16
Peak Inflow Q (cfs) =	N/A	N/A	5.3	8.7	10.6	11.3	17.0	20.6
Peak Outflow Q (cfs) =	0.1	0.2	0.2	0.6	1.8	2.2	6.4	8.4
Ratio Peak Outflow to Predevelopment Q =	N/A	N/A	N/A	0.4	0.7	0.6	1.0	1.0
Structure Controlling Flow =	Plate	Plate	Plate	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Overflow Weir 1	Outlet Plate 1
Max Velocity through Grate 1 (fps) =	N/A	N/A	N/A	0.0	0.2	0.2	0.7	1.0
Max Velocity through Grate 2 (fps) =	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Time to Drain 97% of Inflow Volume (hours) =	40	64	58	69	68	68	64	62
Time to Drain 99% of Inflow Volume (hours) =	41	67	61	73	73	73	72	71
Maximum Ponding Depth (ft) =	1.72	2.33	2.08	2.46	2.57	2.60	2.82	2.97
Area at Maximum Ponding Depth (acres) =	0.53	0.58	0.56	0.59	0.59	0.60	0.61	0.62
Maximum Volume Stored (acre-ft) =	0.165	0.503	0.361	0.578	0.643	0.655	0.794	0.887

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)







S-A-V-D Chart Axis Override	X-axis	Left Y-Axis	Right Y-Axis
minimum bound			
maximum bound			

DETENTION BASIN OUTLET STRUCTURE DESIGN

Outflow Hydrograph Workbook Filename:

Inflow Hydrographs

The user can override the calculated inflow hydrographs from this workbook with inflow hydrographs developed in a separate program.

	SOURCE	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP	CUHP
Time Interval	TIME	WQCV [cfs]	EURV [cfs]	2 Year [cfs]	5 Year [cfs]	10 Year [cfs]	25 Year [cfs]	50 Year [cfs]	100 Year [cfs]	500 Year [cfs]
5.00 min	0:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.08	0.25
	0:15:00	0.00	0.00	0.42	1.00	1.28	0.63	1.24	1.27	1.62
	0:20:00	0.00	0.00	1.91	2.99	3.67	1.87	2.92	3.23	3.97
	0:25:00	0.00	0.00	4.29	7.02	8.89	4.24	6.71	7.65	9.49
	0:30:00	0.00	0.00	5.29	8.69	10.59	9.61	14.86	17.13	20.45
	0:35:00	0.00	0.00	5.05	8.20	9.92	11.25	17.03	20.55	24.35
	0:40:00	0.00	0.00	4.64	7.40	8.96	11.13	16.70	20.12	23.79
	0:45:00	0.00	0.00	4.09	6.60	8.07	10.21	15.28	18.86	22.28
	0:50:00	0.00	0.00	3.62	5.93	7.18	9.40	14.06	17.32	20.45
	0:55:00	0.00	0.00	3.21	5.24	6.39	8.30	12.45	15.62	18.45
	1:00:00	0.00	0.00	2.85	4.61	5.70	7.30	10.96	14.09	16.64
	1:05:00	0.00	0.00	2.59	4.17	5.23	6.44	9.70	12.76	15.08
	1:10:00	0.00	0.00	2.32	3.87	4.91	5.63	8.51	10.97	12.99
	1:15:00	0.00	0.00	2.09	3.53	4.63	5.01	7.59	9.52	11.30
	1:20:00	0.00	0.00	1.88	3.15	4.19	4.37	6.61	8.05	9.55
	1:25:00	0.00	0.00	1.69	2.80	3.63	3.80	5.72	6.74	7.99
	1:30:00	0.00	0.00	1.49	2.46	3.11	3.21	4.81	5.59	6.62
	1:35:00	0.00	0.00	1.31	2.16	2.66	2.67	3.98	4.55	5.39
	1:40:00	0.00	0.00	1.18	1.83	2.31	2.20	3.25	3.64	4.32
	1:45:00	0.00	0.00	1.11	1.61	2.11	1.83	2.70	2.95	3.51
	1:50:00	0.00	0.00	1.07	1.48	1.98	1.62	2.38	2.53	3.02
	1:55:00	0.00	0.00	0.96	1.38	1.86	1.48	2.17	2.26	2.70
	2:00:00	0.00	0.00	0.86	1.28	1.70	1.39	2.02	2.07	2.47
	2:05:00	0.00	0.00	0.68	1.02	1.35	1.10	1.60	1.61	1.92
	2:10:00	0.00	0.00	0.53	0.79	1.05	0.85	1.23	1.21	1.45
	2:15:00	0.00	0.00	0.42	0.62	0.81	0.65	0.94	0.91	1.09
	2:20:00	0.00	0.00	0.32	0.47	0.62	0.50	0.72	0.69	0.82
	2:25:00	0.00	0.00	0.25	0.36	0.47	0.38	0.55	0.53	0.63
	2:30:00	0.00	0.00	0.19	0.27	0.35	0.29	0.41	0.40	0.47
	2:35:00	0.00	0.00	0.14	0.20	0.26	0.21	0.31	0.30	0.36
	2:40:00	0.00	0.00	0.11	0.15	0.20	0.16	0.23	0.23	0.27
	2:45:00	0.00	0.00	0.08	0.11	0.15	0.12	0.17	0.17	0.20
	2:50:00	0.00	0.00	0.05	0.07	0.10	0.09	0.12	0.12	0.14
	2:55:00	0.00	0.00	0.03	0.05	0.06	0.06	0.08	0.08	0.09
	3:00:00	0.00	0.00	0.02	0.03	0.04	0.03	0.05	0.05	0.05
	3:05:00	0.00	0.00	0.01	0.01	0.02	0.02	0.02	0.02	0.03
	3:10:00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
	3:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	3:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:05:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:10:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:15:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:20:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:25:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:30:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:35:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:40:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:45:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:50:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5:55:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	6:00:00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

DETENTION BASIN OUTLET STRUCTURE DESIGN

MHFD-Detention, Version 4.04 (February 2021)

Summary Stage-Area-Volume-Discharge Relationships

The user can create a summary S-A-V-D by entering the desired stage increments and the remainder of the table will populate automatically.

The user should graphically compare the summary S-A-V-D table to the full S-A-V-D table in the chart to confirm it captures all key transition points.

Stage - Storage Description	Stage [ft]	Area [ft^2]	Area [acres]	Volume [ft^3]	Volume [ac-ft]	Total Outflow [cfs]

For best results, include the stages of all grade slope changes (e.g. ISV and Floor) from the S-A-V table on Sheet 'Basin'.

Also include the inverts of all outlets (e.g. vertical orifice, overflow grate, and spillway, where applicable).

MHFD-Inlet, Version 5.03 (August 2023)

INLET MANAGEMENT

Worksheet Protected

INLET NAME	Inlet A-4	Inlet A-5
Site Type (Urban or Rural)	URBAN	URBAN
Inlet Application (Street or Area)	AREA	AREA
Hydraulic Condition	Swale	Swale
Inlet Type	CDOT Type C (Depressed)	CDOT Type C (Depressed)

USER-DEFINED INPUT

User-Defined Design Flows

Minor Q_{known} (cfs)	6.2	5.7
Major Q_{known} (cfs)	12.2	10.8

Bypass (Carry-Over) Flow from Upstream — Inlets must be organized from upstream (left) to downstream (right) in order for byp

Receive Bypass Flow from:	No Bypass Flow Received	No Bypass Flow Received
Minor Bypass Flow Received, Q_b (cfs)	0.0	0.0
Major Bypass Flow Received, Q_b (cfs)	0.0	0.0

Watershed Characteristics

Subcatchment Area (acres)		
Percent Impervious		
NRCS Soil Type		

Watershed Profile

Overland Slope (ft/ft)		
Overland Length (ft)		
Channel Slope (ft/ft)		
Channel Length (ft)		

Minor Storm Rainfall Input

Design Storm Return Period, T_r (years)		
One-Hour Precipitation, P_1 (inches)		
C_1		
C_2		
C_3		
User-defined C		
User-defined 5-yr C_5		
User-defined T_c		

Major Storm Rainfall Input

Design Storm Return Period, T_r (years)		
One-Hour Precipitation, P_1 (inches)		
C_1		
C_2		
C_3		
User-defined C		
User-defined 5-yr C_5		
User-defined T_c		

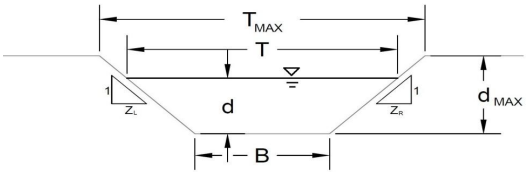
CALCULATED OUTPUT

Minor Total Design Peak Flow, Q (cfs)	6.2	5.7
Major Total Design Peak Flow, Q (cfs)	12.2	10.8
Minor Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0
Major Flow Bypassed Downstream, Q_b (cfs)	0.0	0.0

AREA INLET IN A SWALE

QT 4270

Inlet A-4



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses SCS Method)

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.013	
Channel Invert Slope	S_O =	0.0050	ft/ft
Bottom Width	B =	3.42	ft
Left Side Slope	Z1 =	12.50	ft/ft
Right Side Sloe	Z2 =	12.50	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- Non-Cohesive
- Cohesive
- Paved

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	15.00	15.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.90	0.90	ft

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Top Width Criterion	Q_{allow} =	14.9	14.9	cfs
MAJOR STORM Allowable Capacity is based on Top Width Criterion	d_{allow} =	0.46	0.46	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	6.2	12.2	cfs
Water Depth	d =	0.31	0.42	ft

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

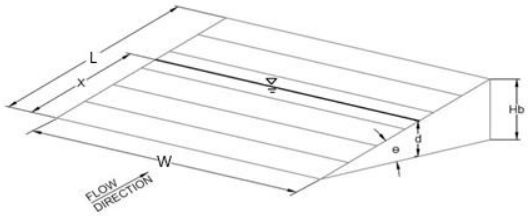
AREA INLET IN A SWALE

QT 4270

Inlet A-4

Inlet Design Information (Input)

Type of Inlet	CDOT Type C (Depressed)	Inlet Type =	CDOT Type C (Depressed)	
Angle of Inclined Grate (must be <= 30 degrees)		θ =	0.00	degrees
Width of Grate		W =	3.00	ft
Length of Grate		L =	3.00	ft
Open Area Ratio		A_{RATIO} =	0.70	
Height of Inclined Grate		H_B =	0.00	ft
Clogging Factor		C_f =	0.50	
Grate Discharge Coefficient		C_d =	0.84	
Orifice Coefficient		C_o =	0.56	
Weir Coefficient		C_w =	1.81	

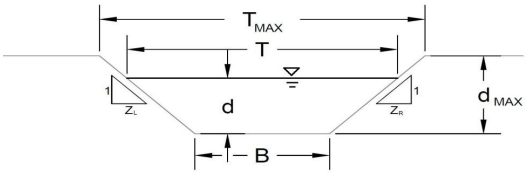


		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	1.31	1.42	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	16.3	17.0	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

AREA INLET IN A SWALE

QT 4270

Inlet A-5



This worksheet uses the NRCS vegetal retardance method to determine Manning's n for grass-lined channels.

An override Manning's n can be entered for other channel materials.

Analysis of Trapezoidal Channel (Grass-Lined uses SCS Method)

NRCS Vegetal Retardance (A, B, C, D, or E)	A, B, C, D, or E =		
Manning's n (Leave cell D16 blank to manually enter an n value)	n =	0.013	
Channel Invert Slope	S_O =	0.0050	ft/ft
Bottom Width	B =	3.42	ft
Left Side Slope	Z1 =	12.50	ft/ft
Right Side Sloe	Z2 =	12.50	ft/ft

Check one of the following soil types:

Soil Type:	Max. Velocity (V_{MAX})	Max Froude No. (F_{MAX})
Non-Cohesive	5.0 fps	0.60
Cohesive	7.0 fps	0.80
Paved	N/A	N/A

Choose One:
- ○ Non-Cohesive
- ○ Cohesive
- ◉ Paved

		Minor Storm	Major Storm	
Maximum Allowable Top Width of Channel for Minor & Major Storm	T_{MAX} =	15.00	15.00	ft
Maximum Allowable Water Depth in Channel for Minor & Major Storm	d_{MAX} =	0.50	0.50	ft

Allowable Channel Capacity Based On Channel Geometry

		Minor Storm	Major Storm	
MINOR STORM Allowable Capacity is based on Top Width Criterion	Q_{allow} =	14.9	14.9	cfs
MAJOR STORM Allowable Capacity is based on Top Width Criterion	d_{allow} =	0.46	0.46	ft

Water Depth in Channel Based On Design Peak Flow

Design Peak Flow	Q_o =	5.7	10.8	cfs
Water Depth	d =	0.29	0.40	ft

Minor storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

Major storm max. allowable capacity GOOD - greater than the design flow given on sheet 'Inlet Management'

AREA INLET IN A SWALE

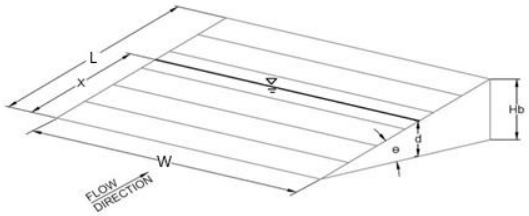
QT 4270

Inlet A-5

Inlet Design Information (Input)

Type of Inlet	CDOT Type C (Depressed)	Inlet Type =	CDOT Type C (Depressed)

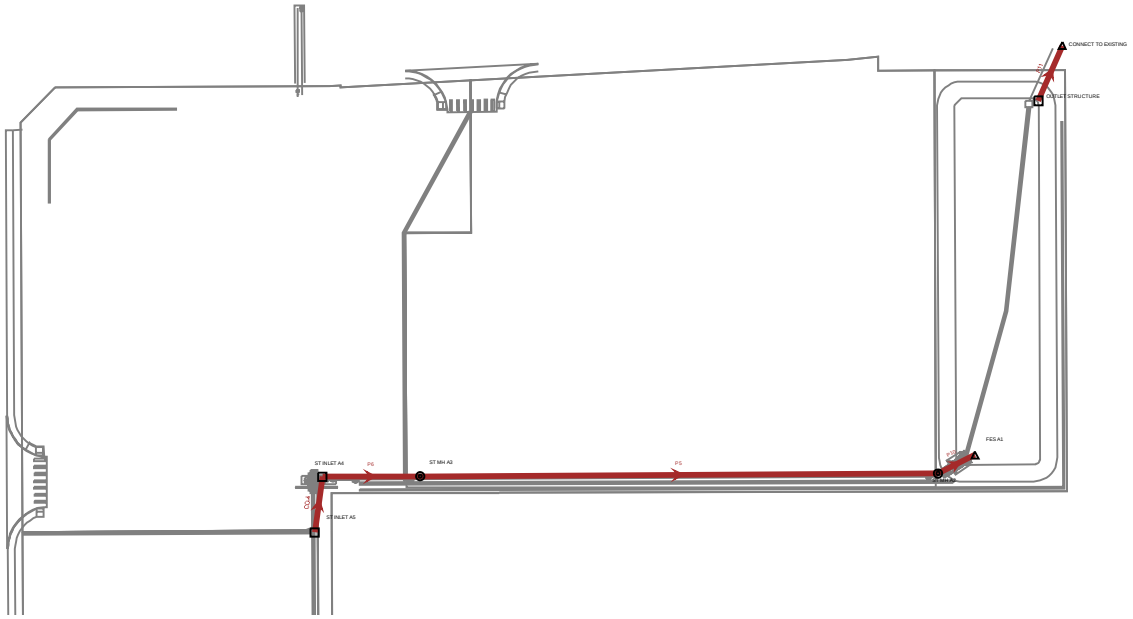
Angle of Inclined Grade (must be <= 30 degrees)	θ =	0.00	degrees
Width of Grade	W =	3.00	ft
Length of Grade	L =	3.00	ft
Open Area Ratio	A_{RATIO} =	0.70	
Height of Inclined Grade	H_B =	0.00	ft
Clogging Factor	C_f =	0.50	
Grade Discharge Coefficient	C_d =	0.84	
Orifice Coefficient	C_o =	0.56	
Weir Coefficient	C_w =	1.81	



		MINOR	MAJOR	
Water Depth at Inlet (for depressed inlets, 1 foot is added for depression)	d =	1.29	1.40	
Total Inlet Interception Capacity (assumes clogged condition)	Q_a =	16.2	16.8	cfs
Bypassed Flow	Q_b =	0.0	0.0	cfs
Capture Percentage = Qa/Qo	C% =	100	100	%

Berkley Center Subdivision

Overall view



Berkley Center Subdivision

5-Year Storm Event

Catch Basin Table - Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet Location	Headloss Coefficient (Standard)	Flow (Total Out) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
ST INLET A4	5,214.79	5,211.38	In Sag	0.700	11.89	5,213.13	5,212.90
OUTLET STRUCTURE	5,210.00	5,208.50	In Sag	0.000	0.60	5,208.80	5,208.80

Berkley Center Subdivision

5-Year Storm Event

Conduit Table - Time: 0.00 hours

Label	Material	Diameter (in)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Velocity (ft/s)	Flow (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
P5	PVC	24.0	5,210.18	368.7	0.002	5.21	11.89	5,212.47	5,211.68
P6	PVC	24.0	5,211.21	69.5	0.002	5.21	11.89	5,212.90	5,212.81
P10	PVC	24.0	5,210.01	29.4	0.002	5.21	11.89	5,211.41	5,211.25
P11	PVC	18.0	5,208.30	42.9	0.005	3.04	0.60	5,208.80	5,208.55

Berkley Center Subdivision

5-Year Storm Event

Manhole Table - Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert in 1) (ft)	Elevation (Invert) (ft)	Elevation (Invert Out) (ft)	Headloss Coefficient (Standard)	Flow (Total Out) (cfs)	Depth (Out) (ft)	Hydraulic Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)
ST MH A3	5,215.38	5,211.21	5,211.11	5,211.11	0.800	11.89	1.36	5,212.47	5,212.81
ST MH A2	5,213.34	5,210.18	5,210.08	5,210.08	0.600	11.89	1.33	5,211.41	5,211.68

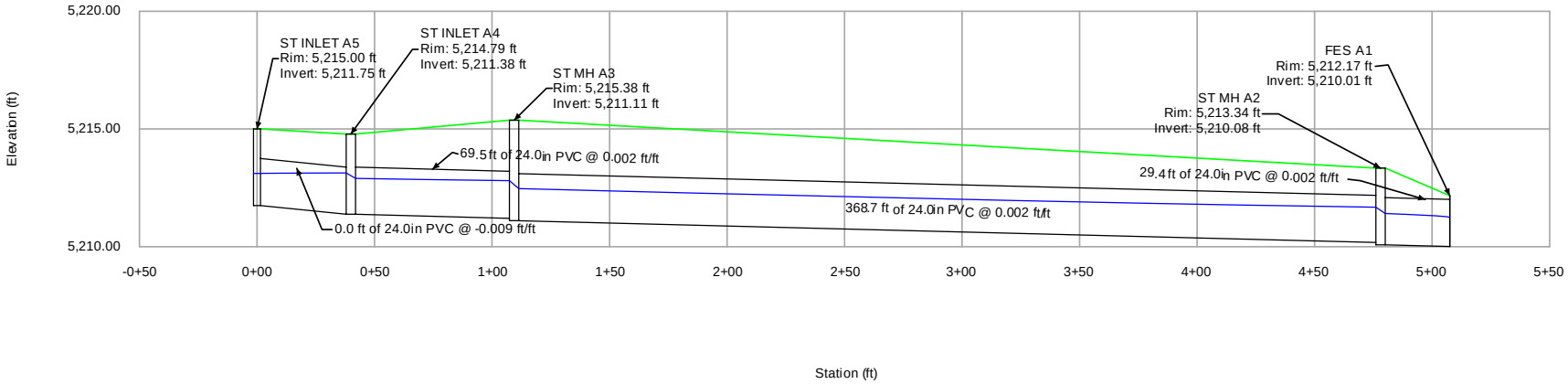
Berkley Center Subdivision

5-Year Storm Event

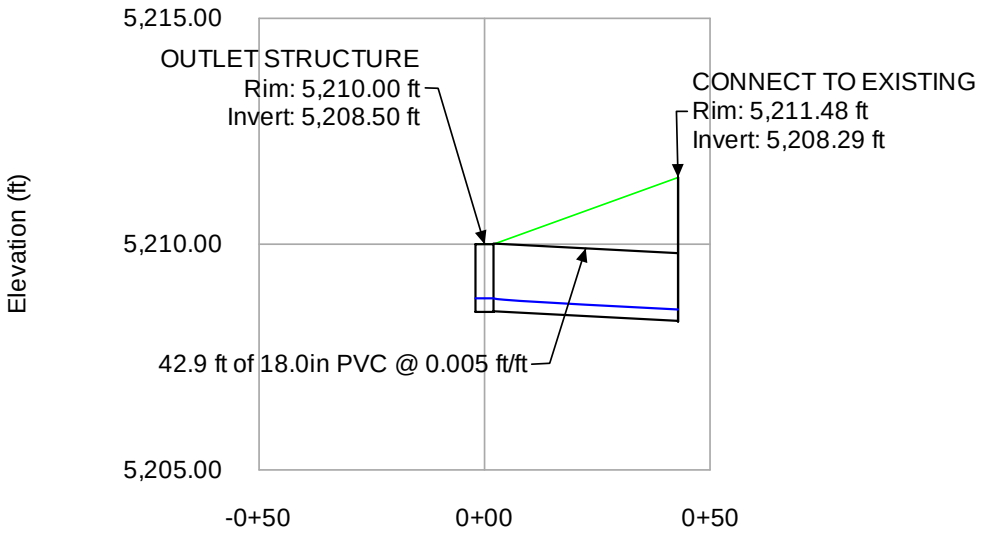
Outfall Table - Time: 0.00 hours

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (cfs)
FES A1	5,212.17	5,210.01	User Defined Tailwater	5,210.96	5,211.25	11.89
CONNECT TO EXISTING	5,211.48	5,208.29	Free Outfall	0.00	5,208.55	0.60

Berkley Center Subdivision
STORM LINE A1 PROFILE (5-Year Storm Event)



Berkley Center Subdivision
OUTLET PROFILE (5-Year Storm Event)



Berkley Center Subdivision

100-Year Storm Event

Catch Basin Table - Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet Location	Headloss Coefficient (Standard)	Flow (Total Out) (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
ST INLET A4	5,214.79	5,211.38	In Sag	0.700	22.95	5,215.37	5,214.79
OUTLET STRUCTURE	5,210.00	5,208.50	In Sag	0.000	20.50	5,210.00	5,210.00

Berkley Center Subdivision

100-Year Storm Event

Conduit Table - Time: 0.00 hours

Label	Material	Diameter (in)	Invert (Stop) (ft)	Length (Scaled) (ft)	Slope (Calculated) (ft/ft)	Velocity (ft/s)	Flow (cfs)	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)
P5	PVC	24.0	5,210.18	368.7	0.002	7.31	22.95	5,214.79	5,212.54
P6	PVC	24.0	5,211.21	69.5	0.002	7.31	22.95	5,215.80	5,215.38
P10	PVC	24.0	5,210.01	29.4	0.002	7.31	22.95	5,212.04	5,211.72
P11	PVC	18.0	5,208.30	42.9	0.005	11.60	20.50	5,210.77	5,209.80

Berkley Center Subdivision

100-Year Storm Event

Manhole Table - Time: 0.00 hours

Label	Elevation (Rim) (ft)	Elevation (Invert in 1) (ft)	Elevation (Invert) (ft)	Elevation (Invert Out) (ft)	Headloss Coefficient (Standard)	Flow (Total Out) (cfs)	Depth (Out) (ft)	Hydraulic Grade Line (Out) (ft)	Hydraulic Grade Line (In) (ft)
ST MH A3	5,215.38	5,211.21	5,211.11	5,211.11	0.800	22.95	3.68	5,214.79	5,215.45
ST MH A2	5,213.34	5,210.18	5,210.08	5,210.08	0.600	22.95	1.96	5,212.04	5,212.54

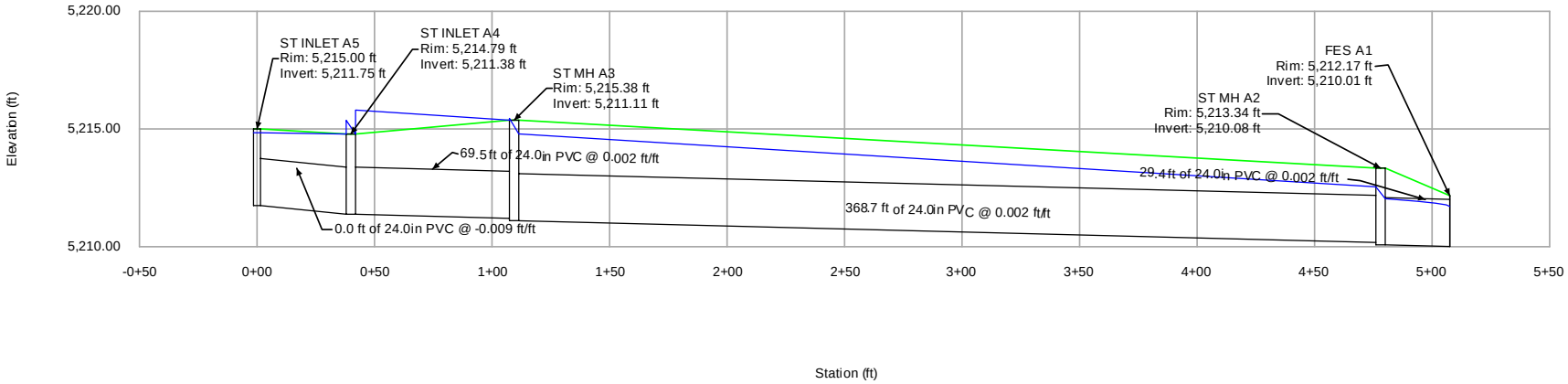
Berkley Center Subdivision

100-Year Storm Event

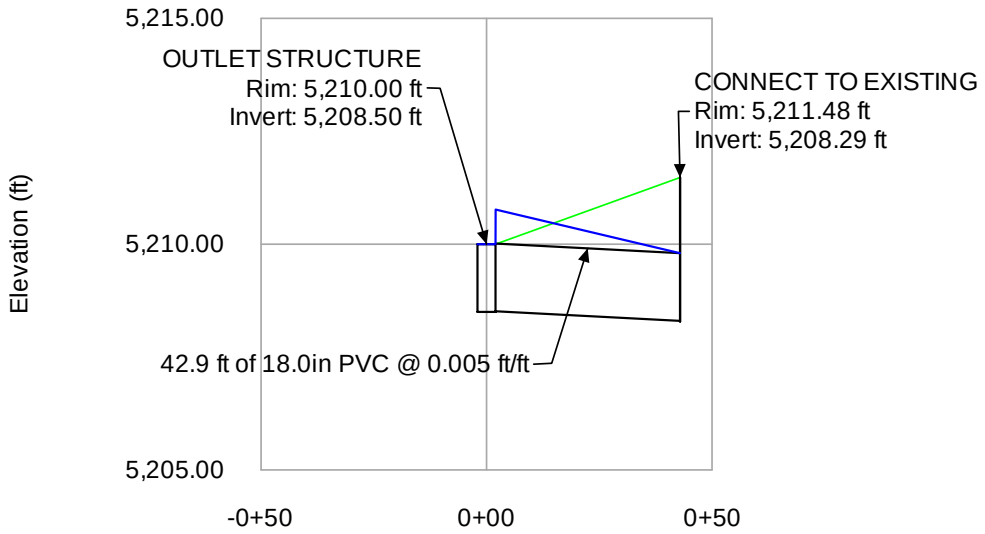
Outfall Table - Time: 0.00 hours

Label	Elevation (Ground) (ft)	Elevation (Invert) (ft)	Boundary Condition Type	Elevation (User Defined Tailwater) (ft)	Hydraulic Grade (ft)	Flow (Total Out) (cfs)
FES A1	5,212.17	5,210.01	User Defined Tailwater	5,211.47	5,211.72	22.95
CONNECT TO EXISTING	5,211.48	5,208.29	Crown	0.00	5,209.80	20.50

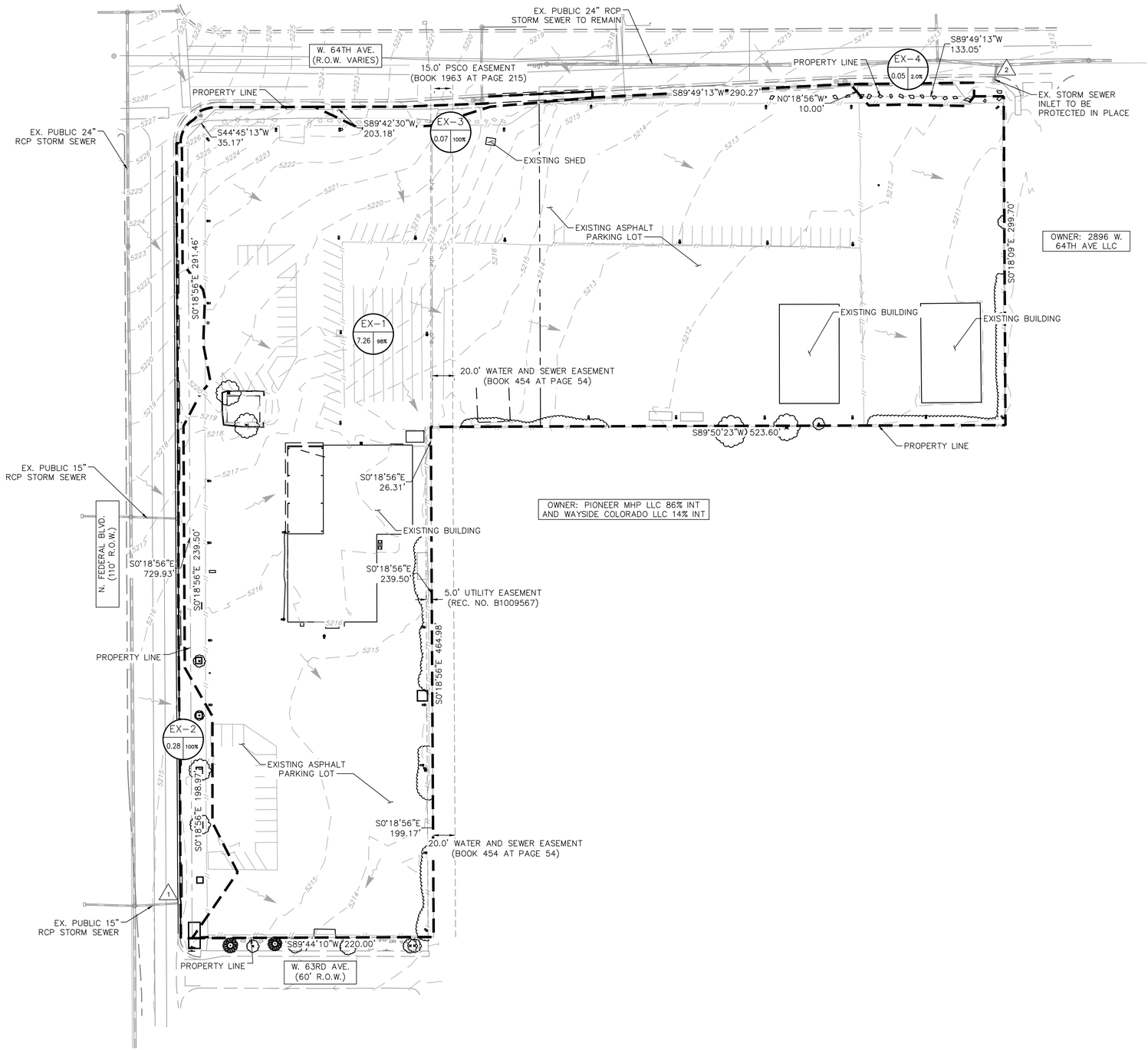
Berkley Center Subdivision
STORM LINE A1 PROFILE (100-Year Storm Event)



Berkley Center Subdivision
STORM LINE A1 PROFILE (100-Year Storm Event)



APPENDIX E – DRAINAGE MAPS



PROPOSED DRAINAGE LEGEND

# = BASIN DESIGNATION
AC = AREA IN ACRES
I = % IMPERVIOUSNESS
# = DESIGN POINT
EXISTING BASIN BOUNDARY
EXISTING FLOW DIRECTION

DRAINAGE NOTES

1. NO BUILDING, STRUCTURE FENCE, OR FILL WILL BE CONSTRUCTED IN THE DETENTION AREAS. NO CHANGES OR ALTERATIONS AFFECTING THE HYDRAULIC CHARACTERISTICS OF THE DETENTION AREAS OR AFFECTING WATER QUALITY FEATURES WILL BE MADE WITHOUT APPROVAL OF THE CITY ENGINEER.
2. MAINTENANCE AND OPERATION OF THE DETENTION AREAS AND WATER QUALITY FEATURES WILL REMAIN THE RESPONSIBILITY OF THE PROPERTY OWNER. IF THE PROPERTY OWNER FAILS IN THIS RESPONSIBILITY, THE CITY HAS THE RIGHT TO ENTER THE PROPERTY, MAINTAIN THE DETENTION AREAS AND WATER QUALITY FEATURES, AND OBTAIN REIMBURSEMENT FOR THE COSTS THAT ARE INCURRED.
3. THE DETENTION POND VOLUMES, WATER QUALITY FEATURES, AND ALL RELATED DRAINAGE APPURTENANCES (INCLUDING BASIN BOUNDARIES) SHALL BE CERTIFIED BY A COLORADO REGISTERED PROFESSIONAL ENGINEER PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR ANY STRUCTURE ON THE SITE OR IN THE DEVELOPMENT.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

811 Know what's below. Call before you dig.

NO.	REVISION	BY	DATE	APPR

Kimley»Horn

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3325 SOUTH TIMBERLINE ROAD, SUITE 130
FORT COLLINS, COLORADO 80525 (970) 822-7911

DESIGNED BY: AIA
DRAWN BY: AIA
CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
FEDERAL BLVD. & W. 64TH AVE.

EXISTING DRAINAGE MAP

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
1

K:\DEN_Civil\096888037_QuikTrip 4270 Adams County_Berkely Center Subdivision\CADD\PlanSheets\Drainage\096888037_DREX.dwg
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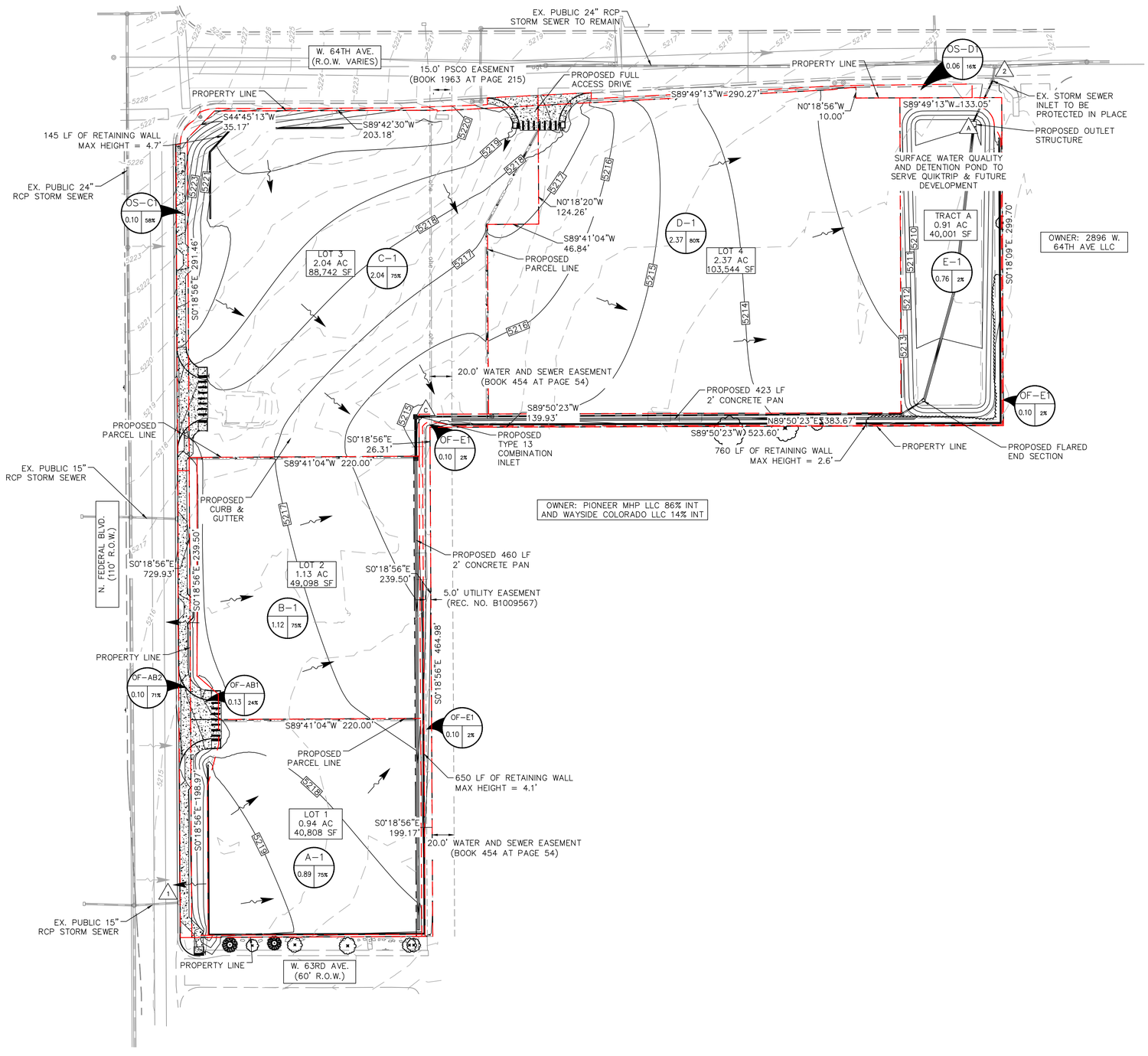

PROPOSED DRAINAGE LEGEND

- # / AC / I — # = BASIN DESIGNATION; AC = AREA IN ACRES; I = % IMPERVIOUSNESS
- # — # = DESIGN POINT
- PROPOSED BASIN BOUNDARY
- EXISTING FLOW DIRECTION
- PROPOSED FLOW DIRECTION

DRAINAGE NOTES

1. NO BUILDING, STRUCTURE FENCE, OR FILL WILL BE CONSTRUCTED IN THE DETENTION AREAS. NO CHANGES OR ALTERATIONS AFFECTING THE HYDRAULIC CHARACTERISTICS OF THE DETENTION AREAS OR AFFECTING WATER QUALITY FEATURES WILL BE MADE WITHOUT APPROVAL OF THE CITY ENGINEER.
2. MAINTENANCE AND OPERATION OF THE DETENTION AREAS AND WATER QUALITY FEATURES WILL REMAIN THE RESPONSIBILITY OF THE PROPERTY OWNER. IF THE PROPERTY OWNER FAILS IN THIS RESPONSIBILITY, THE CITY HAS THE RIGHT TO ENTER THE PROPERTY, MAINTAIN THE DETENTION AREAS AND WATER QUALITY FEATURES, AND OBTAIN REIMBURSEMENT FOR THE COSTS THAT ARE INCURRED.
3. THE DETENTION POND VOLUMES, WATER QUALITY FEATURES, AND ALL RELATED DRAINAGE APPURTENANCES (INCLUDING BASIN BOUNDARIES) SHALL BE CERTIFIED BY A COLORADO REGISTERED PROFESSIONAL ENGINEER PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY FOR ANY STRUCTURE ON THE SITE OR IN THE DEVELOPMENT.

NORTH

GRAPHIC SCALE IN FEET
0 25 50 100

NO.	REVISION	BY	DATE	APPR

Kimley»Horn

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CHECKED BY: JPW
08/07/2024

BERKELY CENTER SUBDIVISION
CONSTRUCTION DOCUMENTS
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PROPOSED DRAINAGE MAP

PRELIMINARY
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Kimley-Horn and Associates, Inc.

PROJECT NO.
096888037

SHEET
2

811 Know what's below. Call before you dig.

K:\DEN_Civil\096888037_QuikTrip 4270 Adams County_Berkely Center Subdivision\CADD\PlanSheets\Drainage\096888037_DRPROP.dwg
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APPENDIX F – LEVEL 3 REPORT CHECKLIST

Level 3 – Storm Drainage Study Report				
Item No.	Submitted[1]	County Use Only		
		Rejected	N/A	
1.	☑	☐	☐	Cover sheet – Including project name, proponent's name, address, and telephone number, Project Engineer, and date of submittal.
2.	☑	☐	☐	Table of contents - Show the page numbers for each section of the report, including appendices.
3.	☑	☐	☐	Project Description – • Describe the type of permit(s) for which the applicant is applying, the size and location of the project site, address or parcel number, and legal description of the property, property zoning, etc. • Describe other permits required. • Describe the project, including proposed land use, site improvements, construction of impervious surfaces, and landscaping.
4.	☑	☐	☐	Existing Conditions - include references to relevant reports such as basin plans, flood studies, groundwater studies, wetland designation, sensitive area designation, environmental impact statements, water quality report, etc.
5.	☑	☐	☐	Existing Conditions - where such reports impose additional conditions on the applicant, those conditions shall be included in the report. In addition, an existing drainage report or master plan (County approved source) may be used as a baseline and updated with the proposed information.
6.	☑	☐	☐	Developed site drainage conditions - describe the land cover resulting from the proposed project; describe the potential stormwater quantity and quality impacts resulting from the proposed project; describe the proposal for the collection and conveyance of site runoff from the project site, for the control of any increase in stormwater quantity resulting from the project , and for the control of stormwater quality.
7.	☑	☐	☐	Hydrological Analysis – including assumptions, computations, and results.
8.	☑	☐	☐	Describe the drainage basin(s) to which the project site contributes runoff, and identify the receiving waters for each of these drainage basins.
9.	☑	☐	☐	Soils hydrological group(s)
10.	☑	☐	☐	Description of upstream basins - identify any sources of runoff to the project site. This should be based on a field investigation. Any existing drainage or erosion problems upstream which may have an impact on the proposed development should be noted.
11.	☐	☐	☐	Downstream Drainage Analysis – the initial drainage report submittal shall include a Level 1 Downstream Drainage Analysis. Any further analysis of downstream conditions required beyond the Level 1 analysis shall be submitted as part of this Drainage Report.

ATTACHMENT #7 CONTINUED

12.	☐	☐	☐	Geotechnical Report - either supervised or prepared by a registered professional engineer (sealed, signed and dated).
13.	☑	☐	☐	Basin map(s) – showing boundaries of project, any offsite contributing drainage basins, onsite drainage basins, approximate locations of all major drainage structures within the basins, and depict the course of stormwater origination from the subject property and extending all the way to the closest receiving body of water. Reference the source of the topographic base map, the scale of the map, and include a north arrow.
14.	☑	☐	☐	Hydraulic design computations - supporting the design of proposed conveyance, quantity and quality control facilities, and verifying the capacity of existing drainage facilities. These computations may include capacity and backwater analysis required either as part of the proposed drainage design or as a part of the downstream drainage investigation, and flood routing computations required for the design of detention/retention storage facilities, for wetland impact analysis, or for flood plain analysis.
15.	☐	☐	☐	Erosion and Sedimentation Control - include a description of proposed erosion control objectives and strategies; a description of erosion control facilities and other temporary water quality facilities proposed; a description of the revegetation plan for the project site; identification of areas of concern regarding soil stability and/or water quality impacts; computations for the sizing of temporary stormwater conveyance and quantity control facilities; computations for the design and sizing of proposed sediment containment facilities, etc.
16.	☑	☐	☐	Appendices – include copies of any additional relevant reports, prepared by others, which support or corroborate the findings, conclusions, or assumptions contained in the Drainage Report; copies of any additional permits (or completed permit applications) required for the project.
				Vicinity Map
17.	☑	☐	☐	Sheet Size – 11" x 17" or 8½" x 11"
18.	☑	☐	☐	Project Title Sheet
19.	☑	☐	☐	Project Site Plan
20.	☑	☐	☐	Title Block – include name and address of proposed project/development, submittal date, title of drawing, and page number.
21.	☑	☐	☐	Drawing Information – • North arrow indicator • Section-Township-Range • Drawing Scale • Symbol Legend
22.	☑	☐	☐	Drawing Scale – as necessary to clearly present details.

ATTACHMENT #7 CONTINUED

23.	☑	☐	☐	Project site topography, land cover and land use; abutting property land cover and land use.
24.	☑	☐	☐	Offsite drainage to the property; creeks, lakes, ponds, wetlands, ravines, gullies, steep slopes, springs, and other environmentally sensitive areas on or adjacent to the project site.
25.	☑	☐	☐	General soils conditions present within the project site.
26.	☑	☐	☐	Existing natural and manmade drainage facilities within and immediately adjacent to the project site.
27.	☑	☐	☐	Points of discharge for drainage from the project site.
28.	☑	☐	☐	Impact on adjacent properties. Location(s) of downstream outfall points.
29.	☐	☐	☐	Signed statement from engineer, developer

Developer's Comments (please reference the item number for each comment)

County's Comments

[1] To be checked by the Developer. If a "submitted" box is not checked, the Applicant must explain (in comment box above) or the application may be rejected for insufficient information.

Traffic Impact Study

Berkley Center Subdivision

Adams County, Colorado

Prepared for:

QuikTrip Corporation

Kimley»Horn

T R A F F I C I M P A C T S T U D Y

Berkley Center Subdivision

Adams County, Colorado

Prepared for
QuikTrip Corporation
12000 Washington Street, Suite 175
Thornton, CO 80241

Prepared by
Tyler E. Smith, P.E
Kimley-Horn and Associates, Inc.
6200 South Syracuse Way
Suite 300
Greenwood Village, Colorado 80111
(303) 228-2300

April 2024

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TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 EXECUTIVE SUMMARY

This report has been prepared to document the results of a Traffic Impact Study for the Berkley Center Subdivision proposed to be located on the southeast corner of the 64th Avenue and Federal Boulevard (US-287) intersection in Adams County, Colorado. The Berkley Center Subdivision is proposed to include 37,920 square feet of general light industrial space, a 5,200 square foot fast food restaurant, a 5,312 square foot convenience store with a 16 fueling position gas station, and a one (1) tunnel car wash. It is expected that the Berkley Center Subdivision will be completed in the next several years; therefore, analysis was conducted for the 2026 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The following intersection of 64th Avenue and Federal Boulevard (US-287) (#1) was incorporated into this traffic study in accordance with Adams County and State of Colorado Department of Transportation (CDOT) standards and requirements.

In addition, the proposed full movement access along the south side of 64th Avenue (#2), and the two proposed right-in/right-out accesses along the east side of Federal Boulevard (US-287) (#3 and #4) were evaluated.

Regional access to the Berkley Center Subdivision will be provided by Interstate 76, Interstate 25, and US Highway 36 (US-36). Primary access will be provided by 64th Avenue and Federal Avenue (US-287). Direct access will be provided by the proposed full movement access along the south side of 64th Avenue (#2), approximately 350 feet east of Federal Boulevard (US-287), measured center to center, and the two proposed right-in/right-out accesses along the east side of Federal Boulevard (US-287) (#3 and #4), approximately 325 feet and 600 feet south of 64th Avenue, measured center to center.

The Berkley Center Subdivision project is expected to generate approximately 9,406 daily weekday driveway trips, with 808 of these trips occurring during the morning peak hour and 634 trips occurring during the afternoon peak hour. Accounting for pass-by, expected net new (non

pass-by) trips to the surrounding street network results in approximately 3,470 weekday daily trips, of which 333 trips and 257 trips are anticipated during the weekday morning and afternoon peak hours, respectively.

Based on the analysis presented in this report, Kimley-Horn believes the overall Berkley Center Subdivision project will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following conclusions and recommendations:

- With completion of the Berkley Center Subdivision project, one full movement access is proposed along the south side of 64th Avenue and two right-in/right-out accesses are proposed along the east side of Federal Boulevard (US-287). It is recommended that a R1-1 "STOP" sign be installed on the exiting approaches of all three proposed accesses. A R3-2 "No Left Turn" sign is also recommended to be placed underneath the recommended "STOP" sign to further restrict exiting left turn movements at the two right-in/right-out accesses along Federal Boulevard (US-287).

- The threshold for requiring an access permit along Colorado Department of Transportation (CDOT) roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on traffic projections, the addition of project traffic on the east leg of the 64th Avenue and Federal Boulevard (US-287) intersection is anticipated to increase existing traffic by more than 20 percent. Therefore, an access permit is anticipated to be needed at this intersection as development occurs. Additionally, since the two right-in/right-out accesses along Federal Boulevard (US-287) are new accesses, CDOT access permits are anticipated to be needed for these two accesses.

- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of Adams County, CDOT, and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

2.0 INTRODUCTION

Kimley-Horn has prepared this report to document the results of a Traffic Impact Study for the Berkley Center Subdivision proposed to be located on the southeast corner of the 64th Avenue and Federal Boulevard (US-287) intersection in Adams County, Colorado. A vicinity map illustrating the Berkley Center Subdivision development location is shown in **Figure 1**. The Berkley Center Subdivision is proposed to include 37,920 square feet of general light industrial space, a 5,200 square foot fast food restaurant, a 5,312 square foot convenience store with a 16 fueling position gas station, and a one (1) tunnel car wash. A conceptual site plan of the project is attached in **Appendix F**. It is expected that the Berkley Center Subdivision will be completed in the next several years; therefore, analysis was conducted for the 2026 short-term buildout horizon as well as the 2045 long-term twenty-year planning horizon.

The purpose of this traffic study is to identify project traffic generation characteristics to determine potential project traffic related impacts on the local street system and to develop the necessary mitigation measures required for the identified traffic impacts. The following intersection of 64th Avenue and Federal Boulevard (US-287) (#1) was incorporated into this traffic study in accordance with Adams County and CDOT standards and requirements.

In addition, the proposed full movement access along the south side of 64th Avenue (#2), and the two proposed right-in/right-out accesses along the east side of Federal Boulevard (US-287) (#3 and #4) were evaluated.

Regional access to the Berkley Center Subdivision will be provided by Interstate 76, Interstate 25, and US Highway 36 (US-36). Primary access will be provided by 64th Avenue and Federal Avenue (US-287). Direct access will be provided by the proposed full movement access along the south side of 64th Avenue (#2), approximately 350 feet east of Federal Boulevard (US-287), measured center to center, and the two proposed right-in/right-out accesses along the east side of Federal Boulevard (US-287) (#3 and #4), approximately 325 feet and 600 feet south of 64th Avenue, measured center to center.

FIGURE 1
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
VICINITY MAP

3.1 Existing Study Area

The existing site is comprised of vacant car dealership. To the north of the site is a gas station, industrial uses, and single-family homes. A trailer park is located south of the project while industrial uses and a car dealership are located to the west of the site. East of the project site is a trailer park and industrial uses.

3.2 Existing Roadway Network

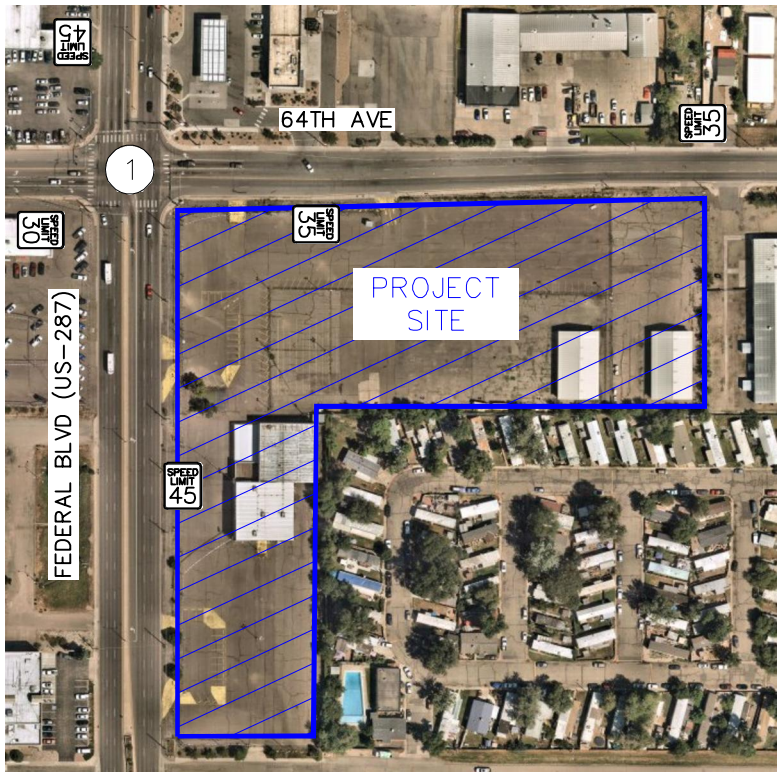
Federal Boulevard (US-287) extends north/south with three through lanes in each direction and a raised median. The posted speed limit along US-287 near the site is 45 miles per hour. CDOT classifies Federal Boulevard as a NR-A: Non-Rural Principal Highway.

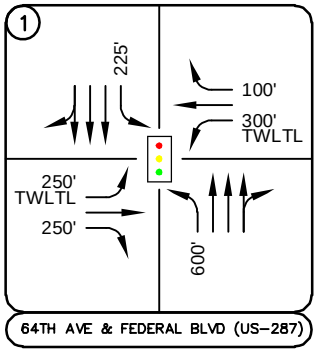
64th Avenue extends in the east/west direction with one through lane in each direction and contains a center two-way left turn lane. It has a posted speed limit of 30 miles per hour west of Federal Boulevard (US-287) and a speed limit of 35 miles per hour east of Federal Boulevard (US-287).

The signalized intersection of 64th Avenue and Federal Boulevard (US-287) (#1) operates with protected-permissive left turn phasing on all four approaches. The northbound and southbound Federal Boulevard approaches provide a left turn lane and three through lanes with the outside lane being a shared through/right turn lane. The eastbound and westbound 64th Avenue approaches consist of one left turn lane, one through lane, and a right turn lane. An aerial photo of the existing intersection configuration is below (north is up).

64th Avenue & Federal Boulevard (US-287) (#1)

The existing intersection lane configuration and control for the study area intersection are shown in **Figure 2**.





LEGEND

X Study Area Key Intersection

Signalized Intersection

SPEED LIMIT XX Roadway Speed Limit

100' Turn Lane Length (feet)

FIGURE 2
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
EXISTING GEOMETRY AND CONTROL

3.3 Existing Traffic Volumes

Existing turning movement counts were conducted at the study intersections on Tuesday, October 31, 2023 during the weekday morning and afternoon peak hours. The counts were conducted during the morning and afternoon peak hours of adjacent street traffic in 15-minute intervals from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM on this count date. The existing intersection traffic volumes are shown in **Figure 3** with count sheets provided in **Appendix A**.

3.4 Unspecified Development Traffic Growth

According to information provided on the website for the Colorado Department of Transportation (CDOT), the 20-year growth factor along Federal Boulevard (US-287) in the vicinity of the site is between 1.16 and 1.19. The 20-year growth factor equates to average annual growth rate of 0.81 percent. Traffic information from the CDOT Online Transportation Information System (OTIS) website is included in **Appendix B**. This annual growth rate was used to estimate near-term 2026 and long-term 2045 traffic volume projections at the key intersections. Background traffic volumes for 2026 and 2045 are shown in **Figures 4** and **5**, respectively.

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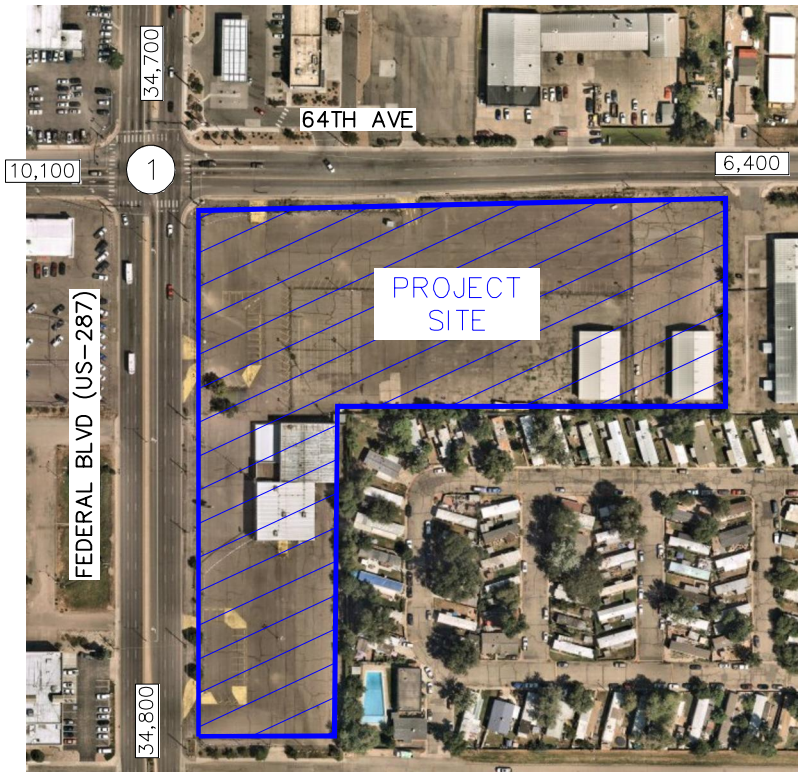
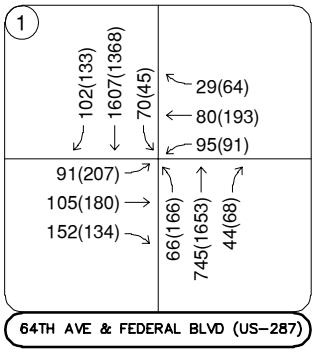
NORTH
NTS 096888037





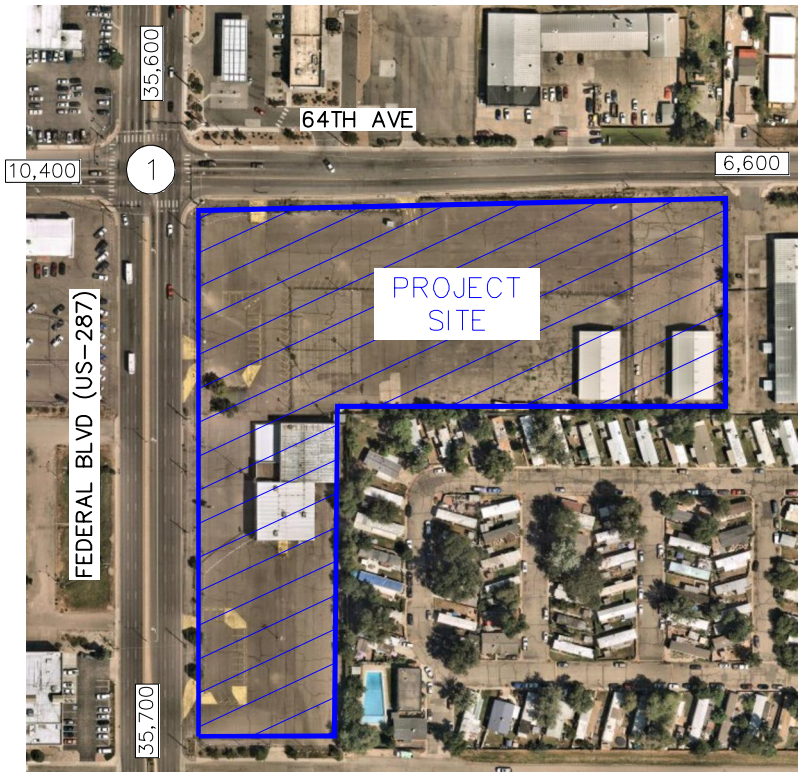
Tuesday, October 31, 2023
7:45 to 8:45AM (4:15 to 5:15PM)

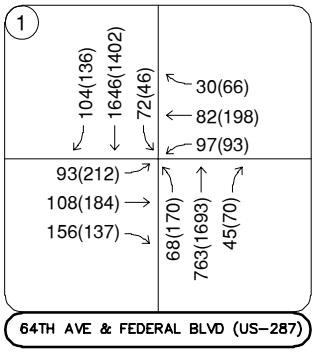
LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

FIGURE 3
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
2023 EXISTING TRAFFIC VOLUMES

Kimley»Horn

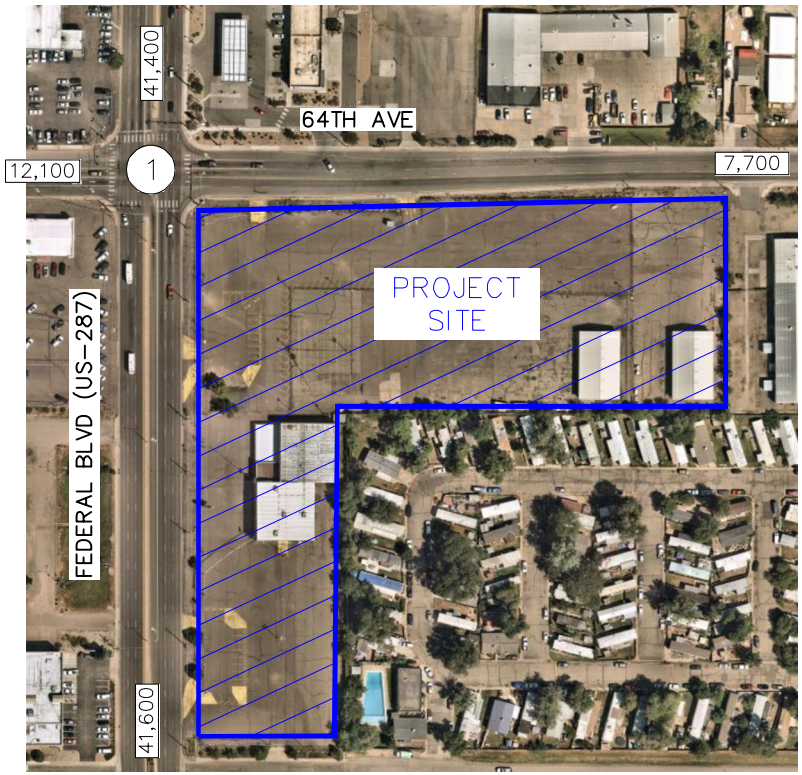


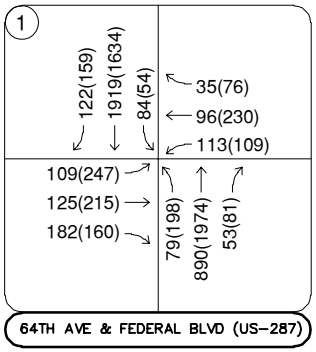


LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

FIGURE 4
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
2026 BACKGROUND TRAFFIC VOLUMES





LEGEND

(X)	Study Area Key Intersection
XXX(XXX)	Weekday AM(PM) Peak Hour Traffic Volumes
XX,X00	Estimated Daily Traffic Volume

FIGURE 5
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
2045 BACKGROUND TRAFFIC VOLUMES

4.1 Trip Generation

Site-generated traffic estimates are determined through a process known as trip generation. Rates and equations are applied to the proposed land use to estimate traffic generated by the development during a specific time interval. The acknowledged source for trip generation rates is the *Trip Generation Manual*[1] published by the Institute of Transportation Engineers (ITE). ITE has established trip rates in nationwide studies of similar land uses. For this study, Kimley-Horn used the ITE Trip Generation Report average rates/fitted curve equations that apply to General Light Industrial (ITE Land Use Code 110), Fast-Food Restaurant with Drive Through (ITE Land Use Code 934), Convenience Store/Gas Station (ITE Land Use Code 945), and Automated Car Wash (ITE Land Use Code 948) for traffic associated with the development.

Since the full buildout of the Berkley Center Subdivision project is proposed to contain a mix of uses, internal capture trips are expected to occur on site as well. These internal capture trips are shared trips from vehicles already within the internal street network. These shared trips reduce the number of total external trips. The trips were calculated by CDOT procedures, limiting morning peak hour trips to two (2) percent internal capture and the afternoon peak hour trips to eight (8) percent internal capture.

Since the project is a commercial development, pass-by trips are expected. These pass-by trips are vehicles already on the street network that will be attracted to the project site en route to a final destination. The pass-by percentages were obtained from the ITE “Trip Generation Manual”, Eleventh Edition.

The Berkley Center Subdivision project is expected to generate approximately 9,406 daily weekday driveway trips, with 808 of these trips occurring during the morning peak hour and 634 trips occurring during the afternoon peak hour. Accounting for pass-by, expected net new (non pass-by) trips to the surrounding street network results in approximately 3,470 weekday daily trips, of which 333 trips and 257 trips are anticipated during the weekday morning and afternoon

[1] Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition, Washington DC, 2021.

peak hours, respectively. Calculations were based on the procedure and information provided in the ITE *Trip Generation Manual, 11th Edition – Volume 1: User's Guide and Handbook*, 2021. **Table 1** summarizes the estimated trip generation for the Berkley Center Subdivision. The trip generation worksheets are included in **Appendix C**.

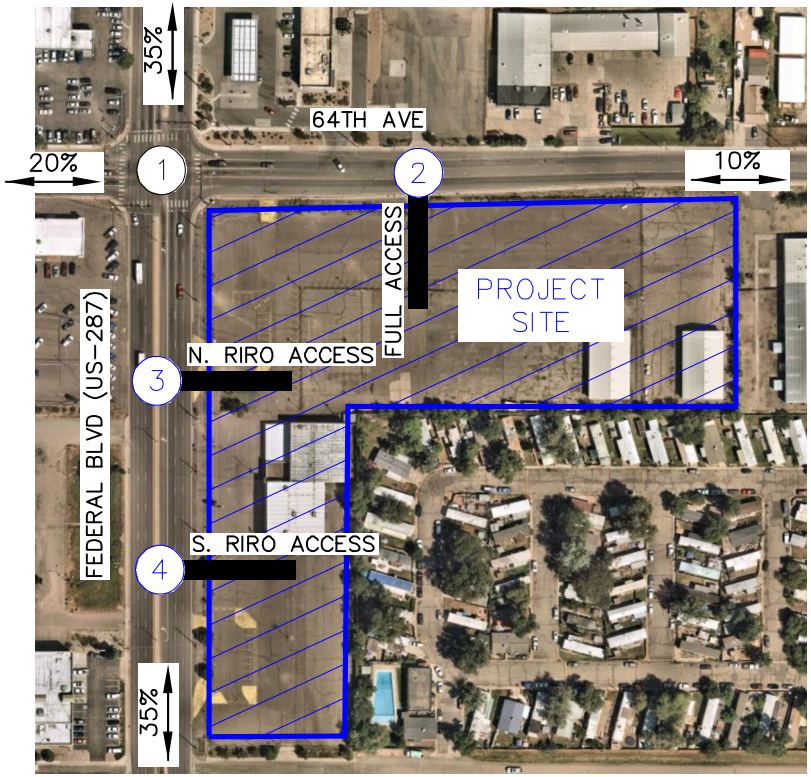
Table 1 – Berkley Center Subdivision Traffic Generation

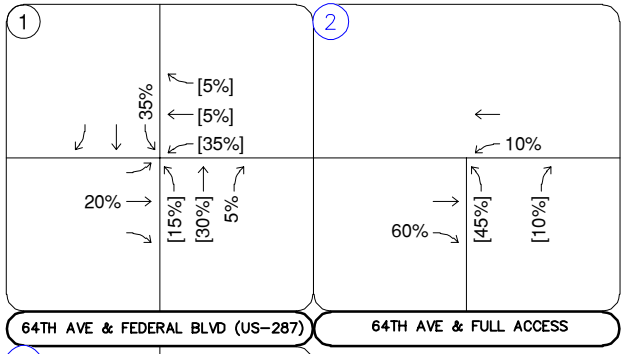
Land Use and Size	Weekday Vehicle Trips						
	Daily	AM Peak Hour			PM Peak Hour		
		In	Out	Total	In	Out	Total
General Light Industrial (110) – 37,920 Square Feet	178	25	4	29	2	17	19
Fast-Food Restaurant w/ DT (934) – 5,200 Square Feet	2,237	116	112	227	82	76	158
Convenience Store/Gas Station (945) – 5,312 Square Feet/16 Fueling Positions	6,273	237	238	475	192	193	385
Automated Car Wash (948) – 1 Tunnel	718	38	38	76	36	36	72
Total Trips after Internal Capture	**9,406**	**416**	**392**	**808**	**312**	**322**	**634**
Total Trips after Internal Capture and Pass-By	**3,470**	**179**	**155**	**333**	**123**	**134**	**257**

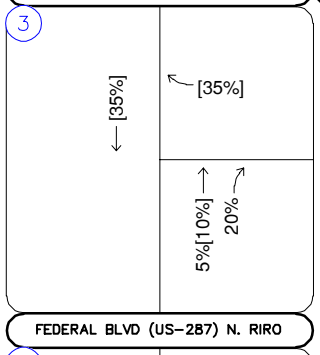
4.2 Trip Distribution

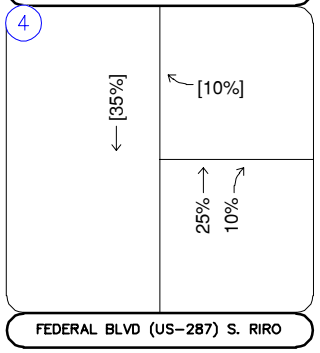
Distribution of site traffic on the street system was based on the area street system characteristics, existing traffic patterns, existing and anticipated surrounding demographic information, and the proposed access system for the project. The directional distribution of traffic is a means to quantify the percentage of site-generated traffic that approaches the site from a given direction and departs the site back to the original source. The non pass-by project trip distribution for the proposed development is illustrated in **Figure 6**.

Since the project is a commercial development, a certain amount of traffic attracted to the gas station and fast-food restaurant will already be passing by the site. This pass-by distribution is a means to quantify the amount of traffic arriving to the site from a given direction and then leaving the site in the same original direction of travel, continuing the driver's trip. The expected weekday morning and afternoon peak hour pass-by trip distributions were calculated based on actual traffic volumes. Directional differences in the morning and afternoon peak hours were accounted for in the pass-by distributions as shown in **Figures 7** and **8**, respectively.









LEGEND

(X) Study Area Key Intersection

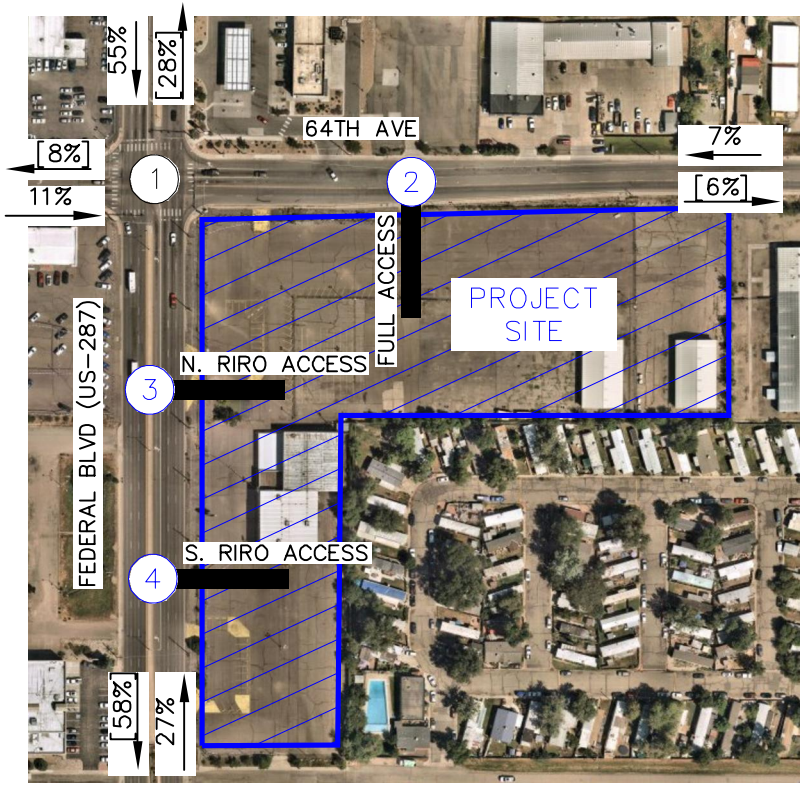
(X) Project Access Intersection

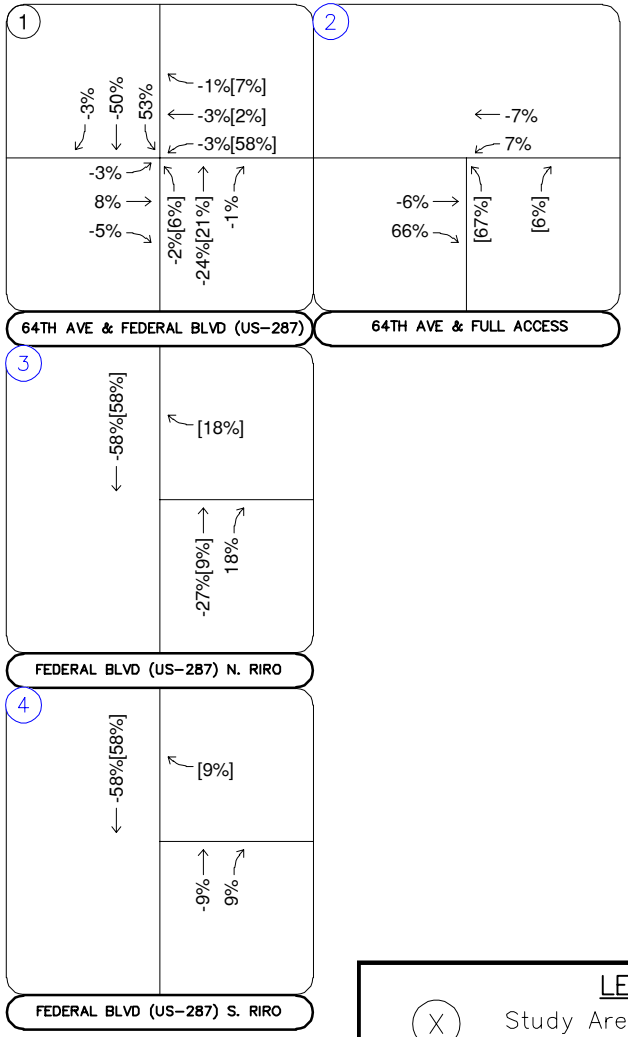
XX% External Trip Distribution Percentage

XX%[XX%] Entering[Exiting] Trip Distribution Percentage

FIGURE 6
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
NON PASS-BY PROJECT TRIP DISTRIBUTION

Kimley»Horn
NORTH
NTS 096888037





LEGEND

(X) Study Area Key Intersection

(X) Project Access Intersection

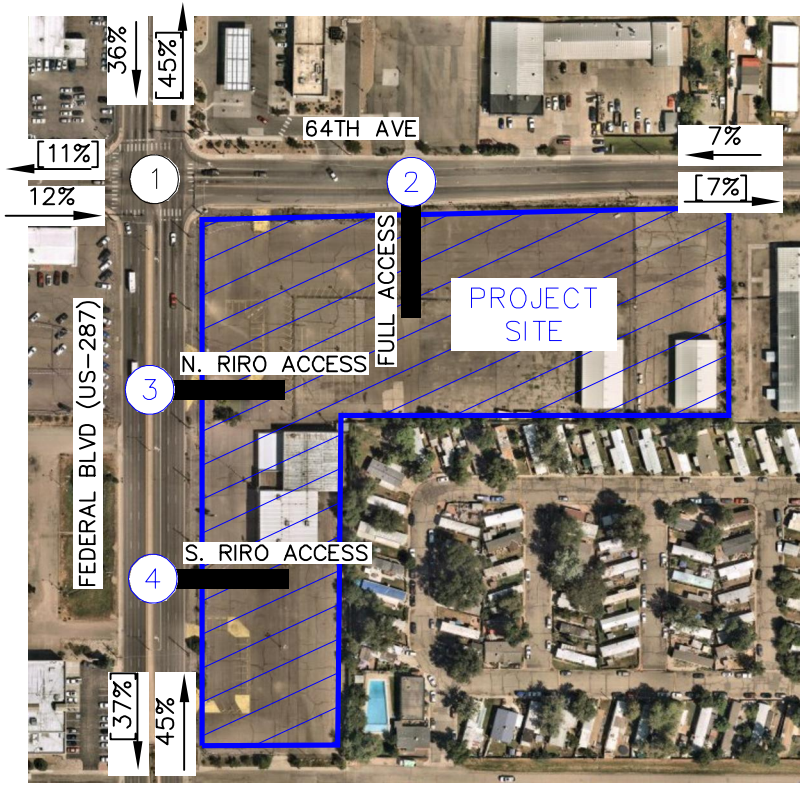
XX% External Trip Distribution Percentage

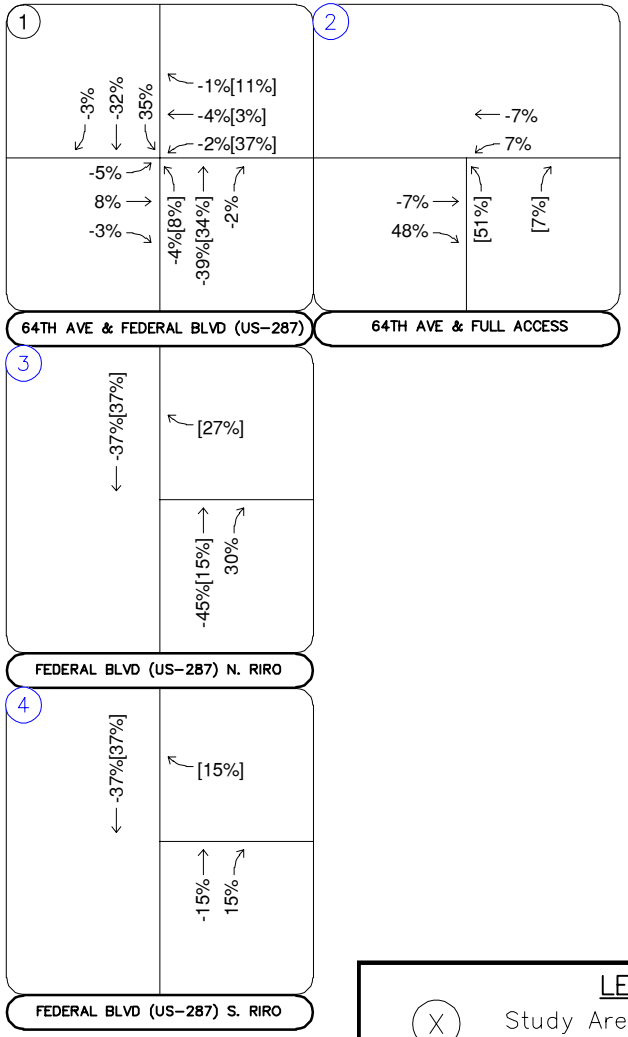
XX%[XX%] Entering[Exiting] Trip Distribution Percentage

FIGURE 7
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
AM PASS-BY PROJECT TRIP DISTRIBUTION

Kimley»Horn

Kimley»Horn NORTH
NTS 096888037





LEGEND

- (X) Study Area Key Intersection
- (X) Project Access Intersection
- XX% External Trip Distribution Percentage
- XX%[XX%] Entering[Exiting] Trip Distribution Percentage

FIGURE 8
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
PM PASS-BY PROJECT TRIP DISTRIBUTION

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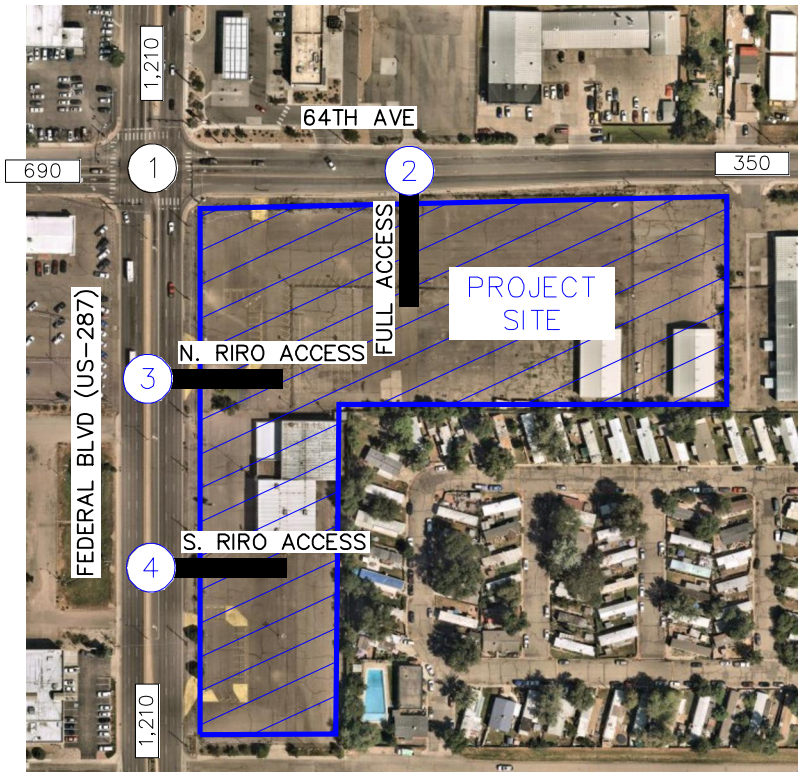
4.3 Traffic Assignment

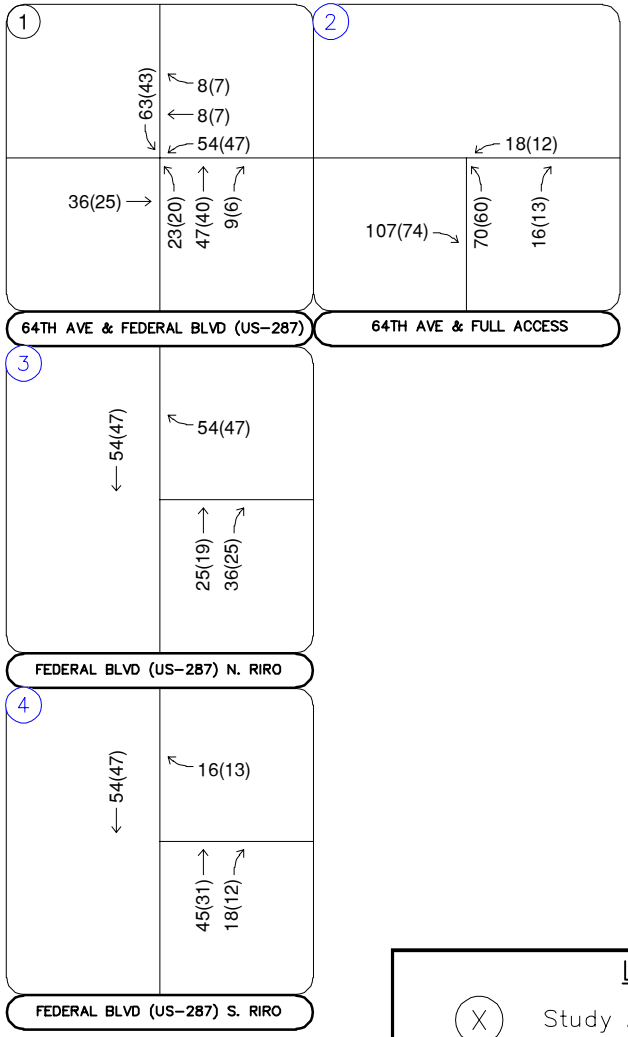
Project traffic assignment was obtained by applying the project trip distribution to the estimated traffic generation of the development shown in **Table 1**. Project non pass-by traffic assignment is shown in **Figure 9**, while **Figure 10** illustrates the expected pass-by traffic assignment for the Berkley Center Subdivision development.

4.4 Total (Background Plus Project) Traffic

Site traffic volumes were added to the background volumes to represent estimated traffic conditions for the short-term 2026 buildout horizon and long-term 2045 twenty-year planning horizon. These total traffic volumes for the study area are illustrated for the 2026 and 2045 horizon years in **Figures 11** and **12**, respectively.

Kimley»Horn NORTH
NTS 096888037





LEGEND

(X) Study Area Key Intersection

(X) Project Access Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

FIGURE 9
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
NON PASS-BY PROJECT TRAFFIC ASSIGNMENT

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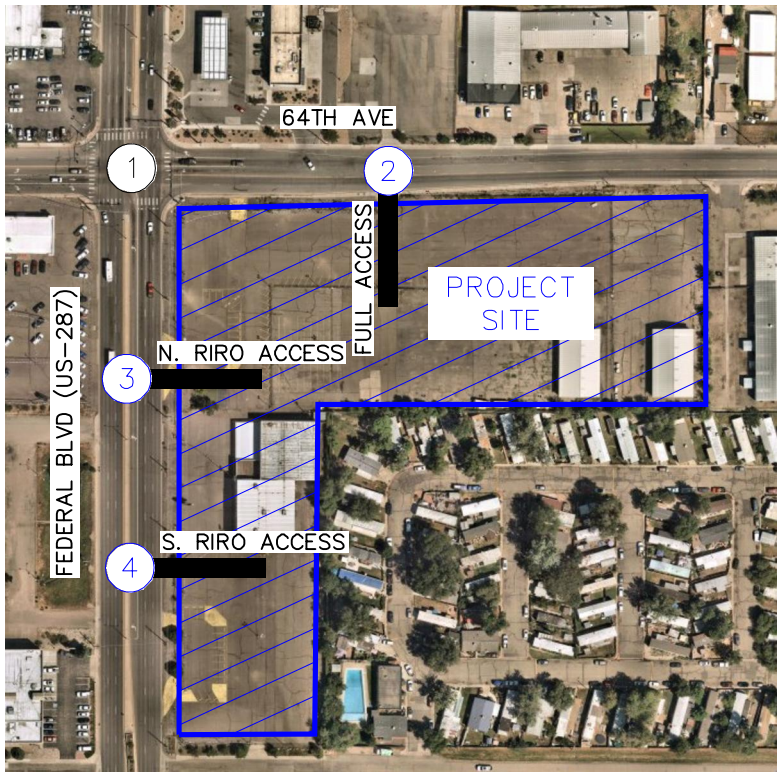
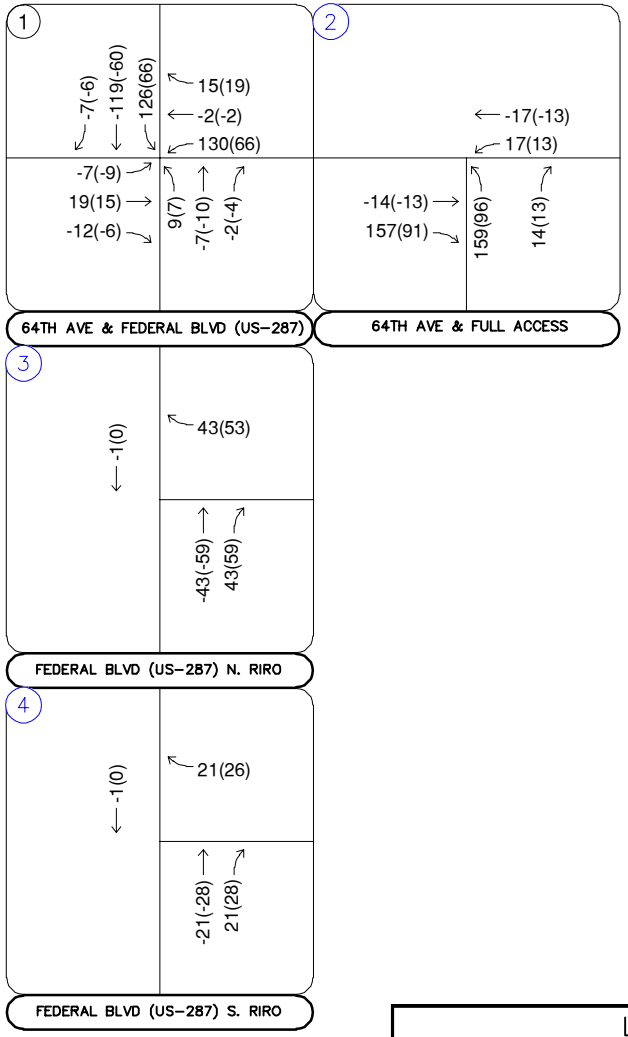




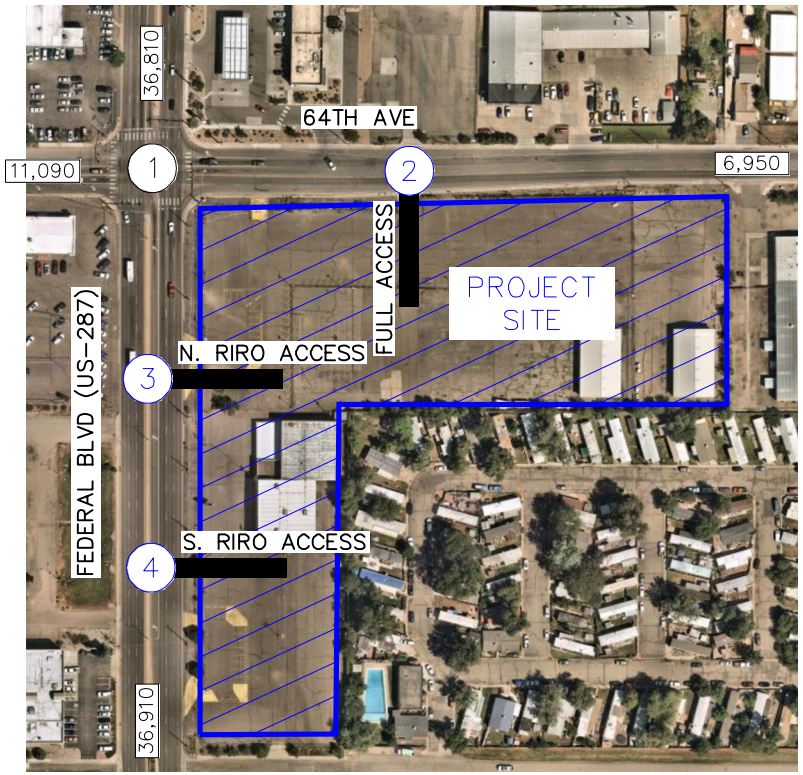
LEGEND

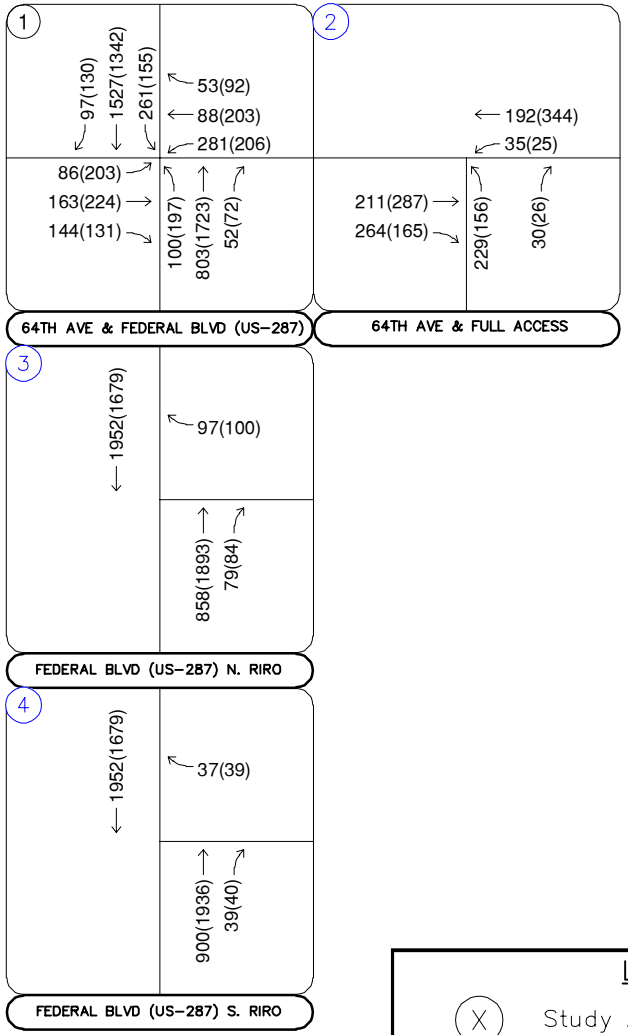
(X) Study Area Key Intersection

(X) Project Access Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

FIGURE 10
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
PASS-BY PROJECT TRAFFIC ASSIGNMENT





LEGEND

(X) Study Area Key Intersection

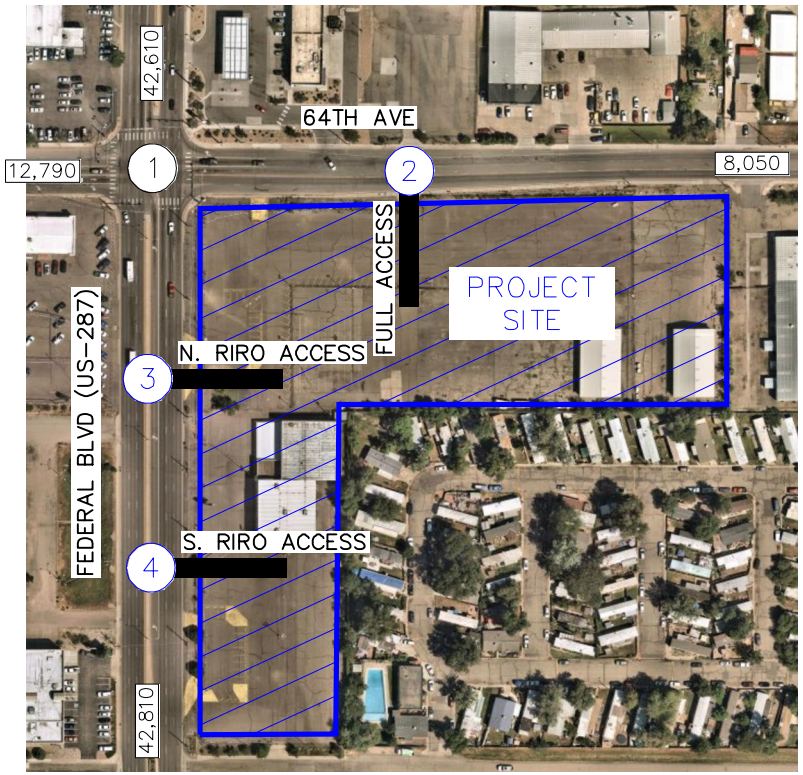
(X) Project Access Intersection

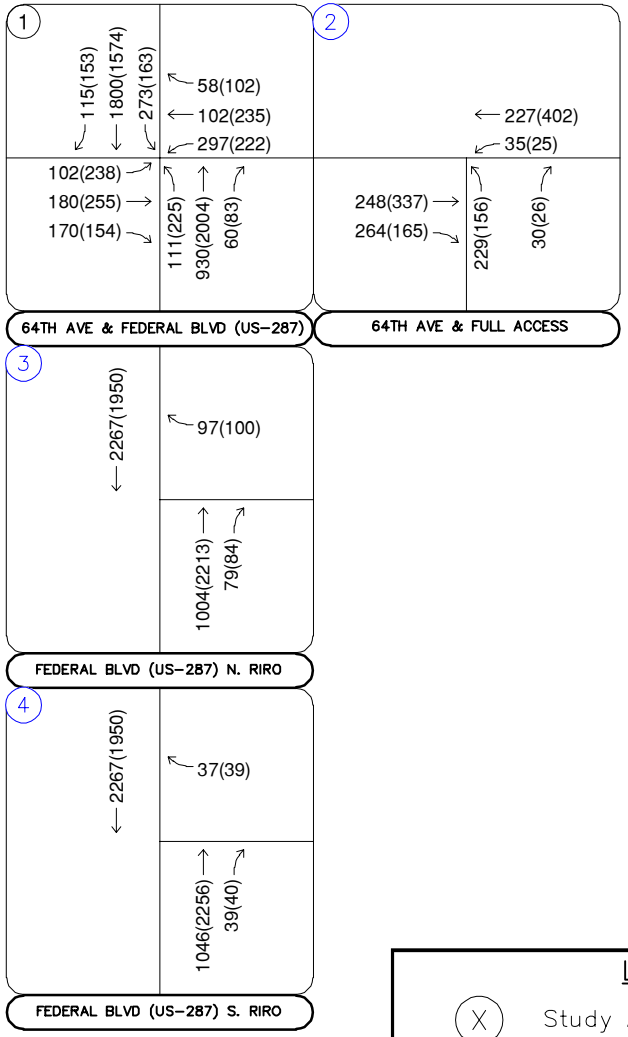
XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

FIGURE 11
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
2026 TOTAL TRAFFIC VOLUMES

Kimley»Horn
NORTH
NTS 096888037





LEGEND

(X) Study Area Key Intersection

(X) Project Access Intersection

XXX(XXX) Weekday AM(PM) Peak Hour Traffic Volumes

XX,X00 Estimated Daily Traffic Volume

FIGURE 12
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
2045 TOTAL TRAFFIC VOLUMES

Kimley»Horn

Kimley-Horn's analysis of traffic operations in the site vicinity was conducted to determine potential capacity deficiencies in the 2026 and 2045 development horizons at the identified key intersections. The acknowledged source for determining overall capacity is the *Highway Capacity Manual (HCM)*[2].

5.1 Analysis Methodology

Capacity analysis results are listed in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion). For intersections and roadways in this study area, standard traffic engineering practice recommends overall intersection LOS D and movement/approach LOS E as the minimum desirable thresholds for acceptable operations. **Table 2** shows the definition of level of service for signalized and unsignalized intersections.

Table 2 – Level of Service Definitions

Level of Service	Signalized Intersection Average Total Delay (sec/veh)	Unsignalized Intersection Average Total Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10 and ≤ 20	> 10 and ≤ 15
C	> 20 and ≤ 35	> 15 and ≤ 25
D	> 35 and ≤ 55	> 25 and ≤ 35
E	> 55 and ≤ 80	> 35 and ≤ 50
F	> 80	> 50

Definitions provided from the Highway Capacity Manual, Sixth Edition, Transportation Research Board, 2016.

Study area intersections were analyzed based on average total delay analysis for signalized and unsignalized intersections. Under the unsignalized analysis, the LOS for a two-way stop-controlled intersection is determined by the computed or measured control delay and is defined for each minor movement. LOS for a two-way stop-controlled intersection is not defined for the intersection as a whole. LOS for signalized intersections are defined for each approach and for the overall intersection.

[2] Transportation Research Board, *Highway Capacity Manual*, Sixth Edition, Washington DC, 2016.

5.2 Key Intersection Operational Analysis

Calculations for the operational level of service at the key intersections for the study area are provided in **Appendix D**. The existing year analysis is based on the lane geometry and intersection control shown in **Figure 2.** Existing peak hour factors were utilized in the existing, 2026, and 2045 horizon analysis years. The existing heavy vehicle percentages obtained from the turning movement counts were also used in each horizon year. Based on increased national attention given to establishing appropriate yellow and all-red clearance intervals to improve intersection safety, these have been calculated and are applied for approaches at the signalized intersections. The increase in yellow and all red time sacrifices intersection capacity for improved safety. Synchro traffic analysis software was used to analyze the signalized and unsignalized key intersections for HCM level of service.

64th Avenue & Federal Boulevard (US-287)

The signalized intersection of 64th Avenue and Federal Boulevard (US-287) (#1) operates with protected-permissive left turn phasing on all four approaches. The intersection operates acceptably at LOS C during both peak hours under existing conditions. With project traffic, this intersection is anticipated to continue operating at an acceptable level of service throughout the 2045 horizon. Therefore, no improvements or modifications are anticipated to be needed at this intersection based on the addition of project traffic and this operational level of service analysis. **Table 3** provides the results of the LOS analysis conducted at this intersection.

Table 3 – 64th Avenue & Federal Boulevard (US-287) (#1) LOS Results

Scenario	AM Peak Hour		PM Peak Hour	
	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
2023 Existing	23.7	C	29.3	C
2026 Background	24.3	C	30.2	C
2026 Background Plus Project	34.1	C	35.0	D
2045 Background	28.9	C	38.7	D
2045 Background Plus Project	40.1	D	47.2	D

Project Accesses

With completion of the Berkley Center Subdivision project, one full movement access is proposed along the south side of 64th Avenue (#2) and two right-in/right-out accesses are proposed along the east side of Federal Boulevard (US-287) (#3 and #4). It is recommended that a R1-1 "STOP" sign be installed on the exiting approaches of all three proposed project accesses. A R3-2 "No Left Turn" sign is also recommended to be placed underneath the recommended "STOP" sign to further restrict exiting left turn movements at the two right-in/right-out accesses along Federal Boulevard (US-287) (#3 and #4). **Table 4** provides the results of the level of service for this project accesses. As shown in the table, the project accesses are anticipated to have all movements operating with acceptable LOS C or better during the peak hours in both the buildout year 2026 and the 2045 long-term horizons.

Table 4 – Project Access Level of Service Results

Intersection	2026 Total				2045 Total			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS	Delay (sec/ veh)	LOS
64th Ave Full Access (#2)								
Northbound Approach	15.8	C	15.0	C	17.0	C	16.4	C
Westbound Left	8.6	A	8.5	A	8.8	A	8.7	A
Federal Blvd N. RIRO (#3)								
Westbound Right	10.9	B	15.0	C	11.2	B	18.2	C
Federal Blvd S. RIRO (#4)								
Westbound Right	10.4	B	13.9	B	10.7	B	15.6	C

5.3 CDOT Turn Bay Length Analysis

The threshold for requiring an access permit along Colorado Department of Transportation (CDOT) roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on traffic projections, the addition of project traffic on the east leg of the 64th Avenue and Federal Boulevard (US-287) (#1) intersection is anticipated to increase existing traffic by more than 20 percent. Therefore, an access permit is anticipated to be needed at this intersection as development occurs. Additionally, since the two right-in/right-out accesses along Federal Boulevard (US-287) (#3 and #4) are new accesses, access permits are anticipated to be needed for these two accesses.

Auxiliary turn lanes along CDOT controlled highways are to be implemented based on volume threshold requirements set forth in the State Highway Access Code. Further, turn lane lengths should be designed based on the State Highway Access Code. Federal Boulevard (US-287) is categorized as a Non-Rural Principal Highway (NR-A) and has a posted speed limit of 45 miles per hour adjacent to the site. According to the State Highway Access Code for category Non-Rural Principal Highway (NR-A) roadways, the turn lane warrants are as follows:

- A left turn deceleration lane and taper with storage length is required for any access with a projected peak hour ingress turning volume greater than 10 vph. The taper length will be included within the required deceleration length.
- A right turn deceleration lane and taper is required for any access with a projected peak hour ingress turning volume greater than 25 vph. The taper length will be included within the required deceleration length.
- Right turn acceleration lane and taper is required for any access with a projected peak hour right turning volume greater than 50 vph when the posted speed on the highway is greater than 40 mph. The taper length will be included within the required acceleration length.
- Right turn deceleration and acceleration lanes are generally not required on roadways with three or more travel lanes in the direction of the right turn.

Based on the traffic volume projections, turn lane requirements at the project access intersections along Federal Boulevard (US-287) are as follows:

64th Avenue & Federal Boulevard (US-287) (#1)

- A southbound left turn lane **is** warranted and exists based on existing traffic volumes being 70 southbound left turns during the peak hour and the threshold being 10 vph. Based on the 45 mile per hour speed limit, the deceleration length is 275 feet, plus a 160-foot taper. The existing southbound left turn lane provides 225 feet of storage with a 150-foot taper. The storage requirement is 275 feet in 2026 and 2045 based on the projected left turning volume. The existing southbound left turn lane does not meet CDOT access code requirements. However, this southbound left turn lane is built to the maximum length due to the back-to-back turn left turn lane to the north.
- Due to Federal Boulevard (US-287) having three northbound and southbound through lanes, right turn deceleration and acceleration lanes are not required at this intersection based on the CDOT access code.

Federal Boulevard (US-287) North Right-In/Right-Out Access (#3)

- Due to Federal Boulevard (US-287) having three northbound and southbound through lanes, right turn deceleration and acceleration lanes are not required at this access based on the CDOT access code.

Federal Boulevard (US-287) South Right-In/Right-Out Access (#4)

- Due to Federal Boulevard (US-287) having three northbound and southbound through lanes' right turn deceleration and acceleration lanes are not required at this access based on the CDOT access code.

5.4 Vehicle Queuing Analysis

A vehicle queuing analysis was conducted for the study area intersections. The queuing analysis was performed using Synchro presenting the results of the 95th percentile queue lengths. Results are shown in the following **Table 5** with calculations provided within the level of service operational sheets of **Appendix D** for unsignalized intersections and **Appendix E** for signalized intersections.

Table 5 – Turn Lane Queuing Analysis Results

Intersection Turn Lane	Existing Turn Lane Length (feet)	2026 Calculated Queue (feet)	2026 Recommended Length (feet)	2045 Calculated Queue (feet)	2045 Recommended Length (feet)
64th Ave & Federal Blvd (#1)					
Eastbound Left	250'/TWLTL	189'	250'/TWLTL	239'	250'/TWLTL
Eastbound Right	250'	56'	250'	61'	250'
Westbound Left	300'/TWLTL	317'	300'/TWLTL	367'	300'/TWLTL
Westbound Right	100'	25'	100'	29'	100'
Northbound Left	600'	209'	600'	262'	600'
Southbound Left	225'	201'	225'	223'	225'
64th Ave Full Access (#2)					
Westbound Left	TWLTL	25'	TWLTL	25'	TWLTL

TWLTL = Two-Way Left Turn Lane

As shown in **Table 5**, all vehicle queues are anticipated to remain within the existing turn lane lengths or center two way left turn lane throughout the 2045 horizon.

5.5 Improvement Summary

Based on the results of the intersection operational and vehicle queuing analysis, the key intersection recommended improvements and control are shown in **Figure 13**.

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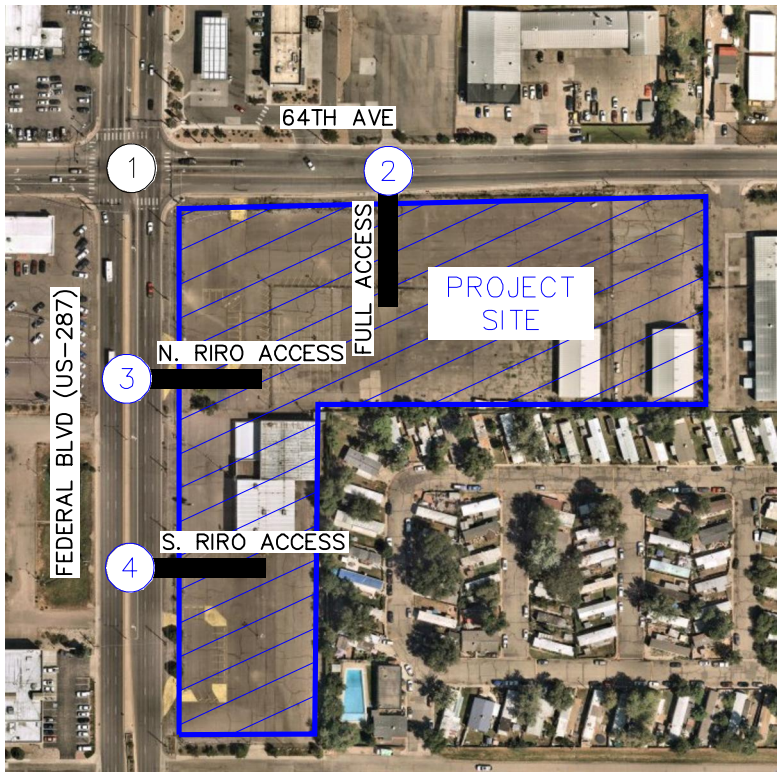
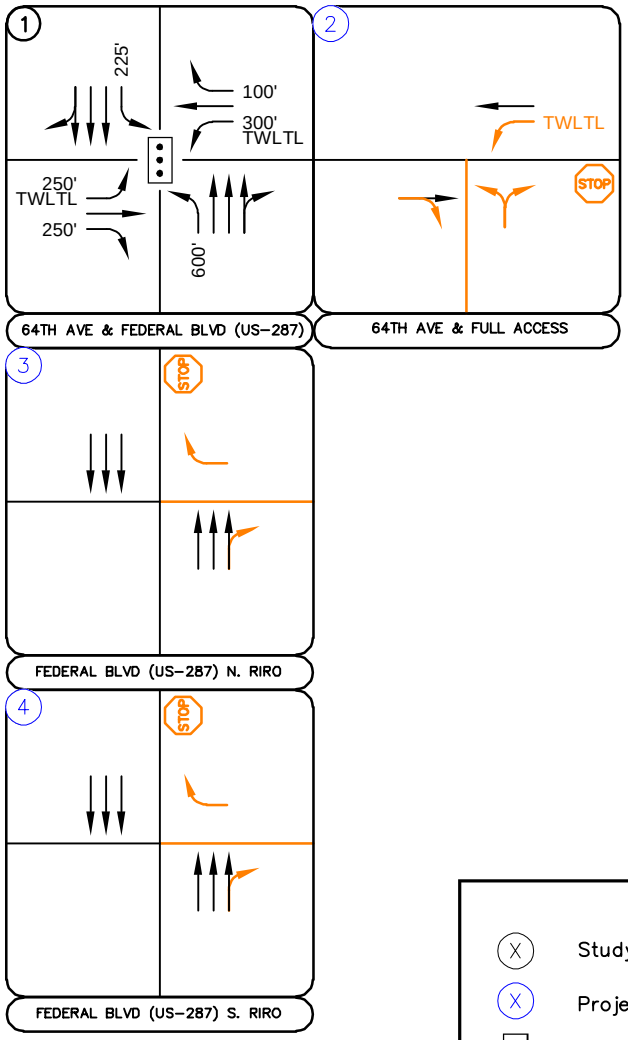
NORTH
NTS 096888037





LEGEND

- X — Study Area Key Intersection
- X — Project Access Intersection
- Signalized Intersection
- STOP — Stop Controlled Approach
- Improvement
- 100' Turn Lane Length (feet)

FIGURE 13
BERKLEY CENTER SUBDIVISION
ADAMS COUNTY, COLORADO
RECOMMENDED GEOMETRY AND CONTROL

Kimley»Horn

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis presented in this report, Kimley-Horn believes the overall Berkley Center Subdivision project will be successfully incorporated into the existing and future roadway network. Analysis of the existing street network, the proposed project development, and expected traffic volumes resulted in the following conclusions and recommendations:

- With completion of the Berkley Center Subdivision project, one full movement access is proposed along the south side of 64th Avenue and two right-in/right-out accesses are proposed along the east side of Federal Boulevard (US-287). It is recommended that a R1-1 "STOP" sign be installed on the exiting approaches of all three proposed accesses. A R3-2 "No Left Turn" sign is also recommended to be placed underneath the recommended "STOP" sign to further restrict exiting left turn movements at the two right-in/right-out accesses along Federal Boulevard (US-287).

- The threshold for requiring an access permit along Colorado Department of Transportation (CDOT) roadways occurs when project traffic is anticipated to increase the existing access traffic volumes by more than 20 percent. Based on traffic projections, the addition of project traffic on the east leg of the 64th Avenue and Federal Boulevard (US-287) intersection is anticipated to increase existing traffic by more than 20 percent. Therefore, an access permit is anticipated to be needed at this intersection as development occurs. Additionally, since the two right-in/right-out accesses along Federal Boulevard (US-287) are new accesses, CDOT access permits are anticipated to be needed for these two accesses.

- Any onsite or offsite improvements should be incorporated into the Civil Drawings and conform to standards of Adams County, CDOT, and the Manual on Uniform Traffic Control Devices (MUTCD) – 2009 Edition.

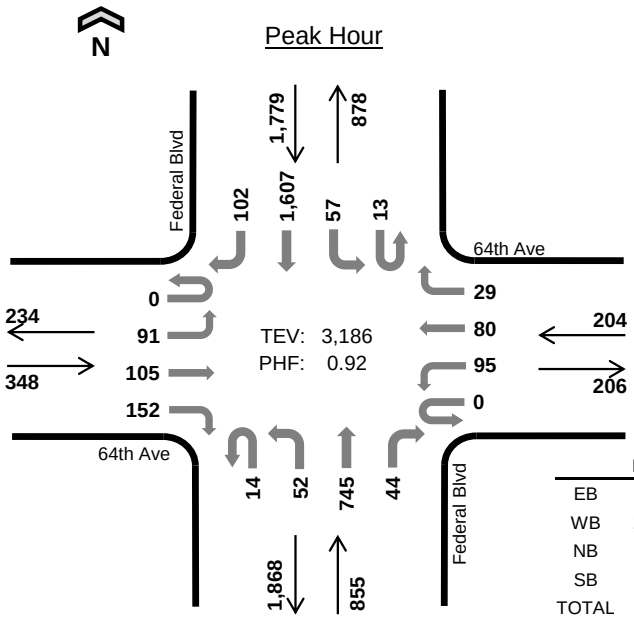
APPENDICES

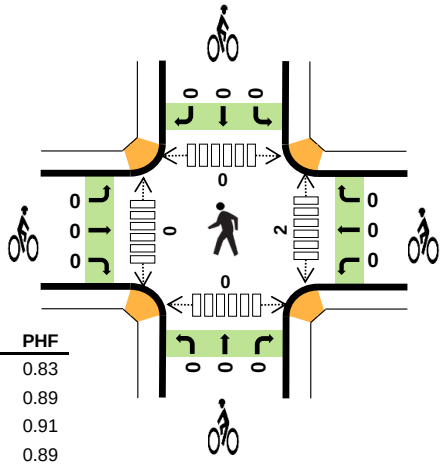
APPENDIX A

Intersection Count Sheets

Federal Blvd
64th Ave

Date: 10/31/2023
Count Period: 7:00 AM to 9:00 AM
Peak Hour: 7:45 AM to 8:45 AM





	HV %:	PHF
EB	2.6%	0.83
WB	11.8%	0.89
NB	4.0%	0.91
SB	2.6%	0.89
TOTAL	3.6%	0.92

Two-Hour Count Summaries

Interval Start	64th Ave Eastbound				64th Ave Westbound				Federal Blvd Northbound				Federal Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	29	51	33	0	11	17	8	2	3	120	11	2	20	337	4	648	0
7:15 AM	0	14	27	38	0	13	15	13	7	4	179	9	2	9	428	15	773	0
7:30 AM	0	25	38	37	0	17	23	4	2	10	162	12	0	10	366	28	734	0
7:45 AM	**0**	**23**	**31**	**33**	**0**	**23**	**13**	**8**	**3**	**12**	**203**	**15**	**2**	**14**	**337**	**26**	**743**	2,898
8:00 AM	**0**	**28**	**28**	**49**	**0**	**25**	**15**	**6**	**3**	**17**	**145**	**5**	**2**	**17**	**448**	**25**	**813**	3,063
8:15 AM	**0**	**18**	**20**	**34**	**0**	**25**	**23**	**9**	**3**	**15**	**204**	**13**	**6**	**14**	**453**	**29**	**866**	3,156
8:30 AM	**0**	**22**	**26**	**36**	**0**	**22**	**29**	**6**	**5**	**8**	**193**	**11**	**3**	**12**	**369**	**22**	**764**	**3,186**
8:45 AM	0	29	20	33	0	14	26	8	9	19	174	10	2	7	357	23	731	3,174
Count Total	0	188	241	293	0	150	161	62	34	88	1,380	86	19	103	3,095	172	6,072	0
Peak Hour All	**0**	**91**	**105**	**152**	**0**	**95**	**80**	**29**	**14**	**52**	**745**	**44**	**13**	**57**	**1,607**	**102**	**3,186**	**0**
Peak Hour HV	**0**	**1**	**7**	**1**	**0**	**13**	**7**	**4**	**1**	**1**	**25**	**7**	**0**	**4**	**41**	**2**	**114**	**0**
Peak Hour HV%	**-**	**1%**	**7%**	**1%**	**-**	**14%**	**9%**	**14%**	**7%**	**2%**	**3%**	**16%**	**0%**	**7%**	**3%**	**2%**	**4%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
7:00 AM	1	2	2	8	*13*	0	0	0	0	*0*	0	0	0	0	*0*
7:15 AM	2	3	6	8	*19*	0	0	0	0	*0*	0	0	0	0	*0*
7:30 AM	2	2	8	5	*17*	0	0	0	0	*0*	0	0	0	0	*0*
7:45 AM	**2**	**4**	**8**	**13**	***27***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:00 AM	**3**	**7**	**6**	**14**	***30***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:15 AM	**0**	**7**	**8**	**11**	***26***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
8:30 AM	**4**	**6**	**12**	**9**	***31***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**0**	***2***
8:45 AM	2	5	14	9	*30*	0	0	0	0	*0*	0	0	0	0	*0*
Count Total	16	36	64	77	*193*	0	0	0	0	*0*	2	0	0	0	*2*
Peak Hour	**9**	**24**	**34**	**47**	***114***	**0**	**0**	**0**	**0**	***0***	**2**	**0**	**0**	**0**	***2***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	64th Ave Eastbound				64th Ave Westbound				Federal Blvd Northbound				Federal Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	0	0	1	0	0	1	1	0	0	2	0	0	2	6	0	13	0
7:15 AM	0	0	1	1	0	0	1	2	0	0	5	1	0	1	7	0	19	0
7:30 AM	0	0	1	1	0	0	0	2	0	1	6	1	0	0	5	0	17	0
7:45 AM	**0**	**0**	**2**	**0**	**0**	**2**	**2**	**0**	**1**	**0**	**6**	**1**	**0**	**1**	**11**	**1**	**27**	76
8:00 AM	**0**	**1**	**1**	**1**	**0**	**6**	**1**	**0**	**0**	**0**	**6**	**0**	**0**	**0**	**14**	**0**	**30**	93
8:15 AM	**0**	**0**	**0**	**0**	**0**	**2**	**3**	**2**	**0**	**0**	**7**	**1**	**0**	**2**	**9**	**0**	**26**	100
8:30 AM	**0**	**0**	**4**	**0**	**0**	**3**	**1**	**2**	**0**	**1**	**6**	**5**	**0**	**1**	**7**	**1**	**31**	**114**
8:45 AM	0	0	2	0	0	0	4	1	0	1	9	4	0	1	8	0	30	117
Count Total	0	1	11	4	0	13	13	10	1	3	47	13	0	8	67	2	193	0
Peak Hour	**0**	**1**	**7**	**1**	**0**	**13**	**7**	**4**	**1**	**1**	**25**	**7**	**0**	**4**	**41**	**2**	**114**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	64th Ave Eastbound			64th Ave Westbound			Federal Blvd Northbound			Federal Blvd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:00 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:15 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
8:30 AM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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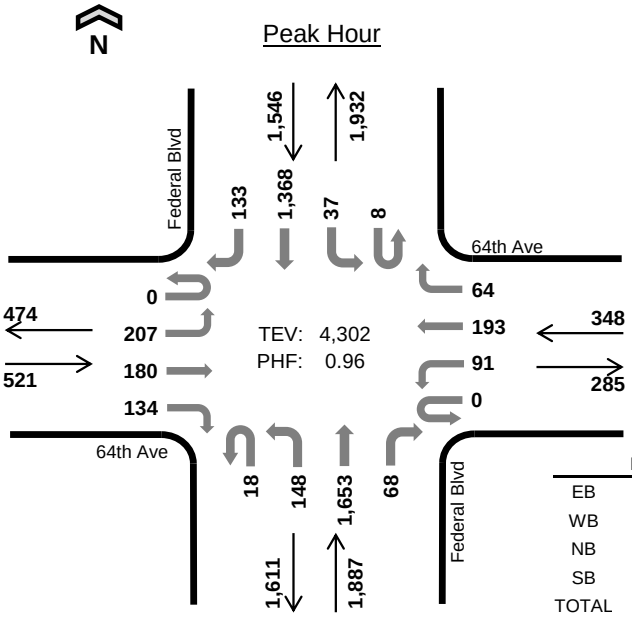
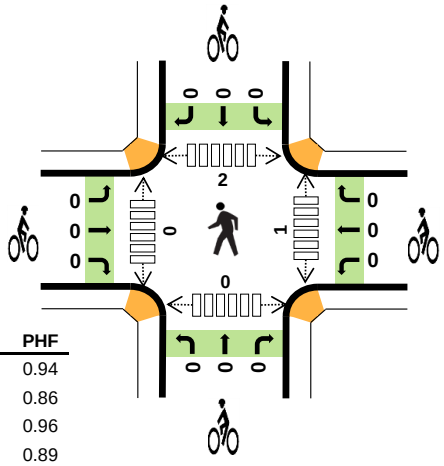
Federal Blvd
64th Ave



Date: 10/31/2023
Count Period: 4:00 PM to 6:00 PM
Peak Hour: 4:15 PM to 5:15 PM



	HV %:	PHF
EB	1.7%	0.94
WB	3.2%	0.86
NB	1.5%	0.96
SB	2.0%	0.89
TOTAL	1.8%	0.96

Two-Hour Count Summaries

Interval Start		64th Ave Eastbound				64th Ave Westbound				Federal Blvd Northbound				Federal Blvd Southbound				15-min Total	Rolling One Hour
		UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM		0	45	43	34	0	23	39	31	7	37	411	17	3	13	328	29	1,060	0
4:15 PM		**0**	**56**	**48**	**31**	**0**	**27**	**56**	**18**	**7**	**40**	**426**	**16**	**1**	**11**	**290**	**37**	**1,064**	0
4:30 PM		**0**	**51**	**37**	**32**	**0**	**23**	**41**	**14**	**3**	**36**	**390**	**17**	**4**	**9**	**362**	**31**	**1,050**	0
4:45 PM		**0**	**54**	**49**	**35**	**0**	**24**	**50**	**16**	**3**	**39**	**407**	**23**	**3**	**8**	**325**	**29**	**1,065**	4,239
5:00 PM		**0**	**46**	**46**	**36**	**0**	**17**	**46**	**16**	**5**	**33**	**430**	**12**	**0**	**9**	**391**	**36**	**1,123**	**4,302**
5:15 PM		0	47	50	29	0	15	43	12	8	34	434	17	3	7	338	21	1,058	4,296
5:30 PM		0	43	30	22	0	14	28	16	0	41	468	10	2	13	318	26	1,031	4,277
5:45 PM		0	51	32	28	0	14	35	17	8	34	393	13	2	13	272	22	934	4,146
Count Total		0	393	335	247	0	157	338	140	41	294	3,359	125	18	83	2,624	231	8,385	0
Peak Hour	**All**	**0**	**207**	**180**	**134**	**0**	**91**	**193**	**64**	**18**	**148**	**1,653**	**68**	**8**	**37**	**1,368**	**133**	**4,302**	**0**
	HV	**0**	**1**	**3**	**5**	**0**	**4**	**5**	**2**	**0**	**2**	**21**	**5**	**0**	**6**	**24**	**1**	**79**	**0**
	HV%	**-**	**0%**	**2%**	**4%**	**-**	**4%**	**3%**	**3%**	**0%**	**1%**	**1%**	**7%**	**0%**	**16%**	**2%**	**1%**	**2%**	**0**

Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
4:00 PM	5	8	8	5	*26*	0	0	0	0	*0*	1	0	0	0	*1*
4:15 PM	**3**	**3**	**9**	**11**	***26***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:30 PM	**4**	**3**	**10**	**7**	***24***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**0**	**0**	*0*
4:45 PM	**2**	**5**	**5**	**7**	***19***	**0**	**0**	**0**	**0**	***0***	**0**	**0**	**1**	**0**	*1*
5:00 PM	**0**	**0**	**4**	**6**	***10***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**1**	**0**	***2***
5:15 PM	1	1	9	3	*14*	0	0	0	0	*0*	3	0	2	0	*5*
5:30 PM	1	1	5	4	*11*	0	0	0	0	*0*	0	3	2	0	*5*
5:45 PM	3	4	6	9	*22*	0	0	0	0	*0*	0	4	0	0	*4*
Count Total	19	25	56	52	*152*	0	0	0	0	*0*	5	7	6	0	*18*
Peak Hour	**9**	**11**	**28**	**31**	***79***	**0**	**0**	**0**	**0**	***0***	**1**	**0**	**2**	**0**	***3***

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Two-Hour Count Summaries - Heavy Vehicles

Interval Start	64th Ave Eastbound				64th Ave Westbound				Federal Blvd Northbound				Federal Blvd Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
4:00 PM	0	0	3	2	0	1	2	5	0	0	5	3	0	1	4	0	26	0
4:15 PM	**0**	**1**	**0**	**2**	**0**	**0**	**2**	**1**	**0**	**2**	**6**	**1**	**0**	**2**	**8**	**1**	**26**	0
4:30 PM	**0**	**0**	**2**	**2**	**0**	**2**	**1**	**0**	**0**	**0**	**7**	**3**	**0**	**2**	**5**	**0**	**24**	0
4:45 PM	**0**	**0**	**1**	**1**	**0**	**2**	**2**	**1**	**0**	**0**	**5**	**0**	**0**	**1**	**6**	**0**	**19**	95
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**1**	**0**	**1**	**5**	**0**	**10**	**79**
5:15 PM	0	0	1	0	0	1	0	0	0	3	5	1	0	0	2	1	14	67
5:30 PM	0	0	1	0	0	0	0	1	0	2	3	0	0	0	4	0	11	54
5:45 PM	0	0	2	1	0	1	1	2	0	1	4	1	0	2	7	0	22	57
Count Total	0	1	10	8	0	7	8	10	0	8	38	10	0	9	41	2	152	0
Peak Hour	**0**	**1**	**3**	**5**	**0**	**4**	**5**	**2**	**0**	**2**	**21**	**5**	**0**	**6**	**24**	**1**	**79**	**0**

Two-Hour Count Summaries - Bikes

Interval Start	64th Ave Eastbound			64th Ave Westbound			Federal Blvd Northbound			Federal Blvd Southbound			15-min Total	Rolling One Hour
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT		
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:30 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
4:45 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
5:00 PM	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Count Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Peak Hour	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Note: U-Turn volumes for bikes are included in Left-Turn, if any.

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APPENDIX B

Future Traffic Projections

CDOT OTIS: QT 4270

ROUTE	REFPT	ENDREFPT	LENGTH	AADT	AADTYR	YR20FACTOR	GROWTH RATE	DHV	LOCATION
287C	286.913	287.803	0.843	33000	2022	1.16	0.74%	10	ON SH 287 FEDERAL BLVD N/O I-76 DENVER
287C	287.803	288.815	0.999	33000	2022	1.19	0.87%	10	ON SH 287 FEDERAL BLVD S/O 72ND AVE WESTMINSTER
						AVERAGE	0.81%		

APPENDIX C

Trip Generation Worksheets

Trip Generation Planner (ITE 11th Edition) - Summary Report

Kimley»Horn

Weekday Trip Generation ***Project Name*** **QT 4270**
Trips Based on Average Rates/Equations ***Project Number*** **196140009**

ITE Code	Internal Capture Land Use	Land Use Description	Independent Variable	Setting/Location	No. of Units	Avg Rate or Eq	Rates: Daily Rate	Rates: AM Rate	Rates: PM Rate	Total Trips: Daily Trips	Total Trips: AM Trips	Total Trips: PM Trips	Total Trips: AM Trips In	Total Trips: AM Trips Out	Total Trips: PM Trips In	Total Trips: PM Trips Out	Net Trips after Internal Capture: Daily Trips	Net Trips after Internal Capture: AM Trips	Net Trips after Internal Capture: PM Trips	Net Trips after Internal Capture: AM Trips In	Net Trips after Internal Capture: AM Trips Out	Net Trips after Internal Capture: PM Trips In	Net Trips after Internal Capture: PM Trips Out	Net Trips after Internal Capture & Pass-By: Daily Trips	Net Trips after Internal Capture & Pass-By: AM Trips	Net Trips after Internal Capture & Pass-By: PM Trips	Net Trips after Internal Capture & Pass-By: AM Trips In	Net Trips after Internal Capture & Pass-By: AM Trips Out	Net Trips after Internal Capture & Pass-By: PM Trips In	Net Trips after Internal Capture & Pass-By: PM Trips Out
110	Office	General Light Industrial	1,000 Sq Ft	General Urban/Suburban	37.92	Eq	N/A	N/A	N/A	194	30	20	26	4	2	18	178	29	18	25	4	2	17	178	29	18	25	4	2	17
934	Restaurant	Fast-Food Restaurant w/ D.T.	1,000 Sq Ft	General Urban/Suburban	5.2	Avg	467.48	44.61	33.03	2,432	232	172	118	114	89	83	2,237	227	158	116	112	82	76	1,006	114	71	58	56	37	34
945	Retail	Convenience Store/Gas Station	1,000 Sq Ft	General Urban/Suburban	5.312	Avg	1283.38	91.35	78.95	6,818	485	419	242	243	209	210	6,273	475	385	237	238	192	193	1,568	114	96	57	57	48	48
948	Retail	Automated Car Wash	Car Wash Tunnel(s)	General Urban/Suburban	1	Avg	*	*	77.50	780	78	78	39	39	39	39	718	76	72	38	38	36	36	718	76	72	38	38	36	36
									Grand Total	10,224	825	689	425	400	339	350	9,406	808	634	417	392	312	322	3,470	333	257	179	155	123	134
																	92%	98%	92%	98%	98%	92%	92%							

Kimley»Horn

Project	QT 4270				
Subject	Trip Generation for General Light Industrial				
Designed by	TES	*Date*	November 01, 2023	*Job No.*	096888037
Checked by		*Date*		*Sheet No.*	1 *of* 1

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Fitted Curve Equations

Land Use Code - General Light Industrial (110)

Independent Variable - 1000 Square Feet Gross Floor Feet (X)
Gross Floor Area = 37,920
X = 37.9
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (100 Series Page 32)

Average Weekday
T = 0.68(X) + 3.81
T = 0.68 * 38 + 3.81

Directional Distribution: 88% ent. 12% exit.
T = 30 Average Vehicle Trip Ends
26 entering 4 exiting

26 + 4 = 30
(*) TRIP END WAS CHANGED BY 1 TO SATISFY THE TOTAL

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (100 Series Page 33)

Average Weekday
Ln(T) = 0.72 Ln(X) + 0.38
Ln(T) = 0.72 * Ln(38) + 0.38

Directional Distribution: 14% ent. 86% exit.
T = 20 Average Vehicle Trip Ends
2 entering 17 exiting

2 + 18 = 20

Weekday (100 Series Page 31)

Daily Weekday
T = 3.76 (X) + 50.47
(T) = 3.76 * 37.92 + 50.47

Directional Distribution: 50% entering, 50% exiting
T = 194 Average Vehicle Trip Ends
97 entering 97 exiting

97 + 97 = 194

Kimley»Horn

Project	QT 4270				
Subject	Trip Generation for Fast-Food Restaurant with Drive-Through Window				
Designed by	TES	*Date*	November 01, 2023	*Job No.*	09688037
Checked by		*Date*		*Sheet No.*	of

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rates

Land Use Code - Fast-Food Restaurant with Drive-Through Window (934)

Independent Variable - 1000 Square Feet (X)
SF = 5,200
X = 5.200
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series Page 726)

Directional Distribution: 51% ent. 49% exit.
(T) = 44.61 (X) T = 232 Average Vehicle Trip Ends
(T) = 44.61 * (5.2) 118 entering 114 exiting

118 + 114 = 232

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 727)

Directional Distribution: 52% ent. 48% exit.
(T) = 33.03 (X) T = 172 Average Vehicle Trip Ends
(T) = 33.03 * (5.2) 89 entering 83 exiting

89 + 83 = 172

Weekday (900 Series Page 725)

Directional Distribution: 50% ent. 50% exit.
(T) = 467.48 (X) T = 2432 Average Vehicle Trip Ends
(T) = 467.48 * (5.2) 1216 entering 1216 exiting

1216 + 1216 = 2432

Non Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)

AM Peak Hour = 50% Non-Pass By PM Peak Hour = 45% Non-Pass By

	IN	Out	Total
AM Peak	58	56	114
PM Peak	37	34	71
Daily	503	503	1006

PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per Trip Generation Manual, 11th Edition)

AM Peak Hour = 50% Pass By PM Peak Hour = 55% Pass By

	IN	Out	Total
AM Peak	58	56	114
PM Peak	45	42	87
Daily	616	616	1231

PM Peak Hour Rate Applied to Daily

Kimley»Horn

Project	QT 4270				
Subject	Trip Generation for Convenience Store/Gas Station - VFP (16-24)				
Designed by	TES	*Date*	November 01, 2023	*Job No.*	096888037
Checked by		*Date*		*Sheet No.*	of

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Convenience Store/Gas Station - VFP (16-24) (945)

Independent Variable - 1,000 Square Feet (X)

SF= 5,312
X = 5.312
T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (900 Series page 901)

Average Weekday
T = 91.35 (X)
T = 91.35 * 5.312

Directional Distribution: 50% ent. 50% exit.
T = 485 Average Vehicle Trip Ends
242 entering 243 exiting

242 + 243 = 485

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series page 902)

Average Weekday
T = 78.95 (X)
T = 78.95 * 5.312

Directional Distribution: 50% ent. 50% exit.
T = 419 Average Vehicle Trip Ends
209 entering 210 exiting

209 + 210 = 419

Weekday (900 Series page 900)

Average Weekday
T = 1283.38 (X)
T = 1283.38 * 5.312

Directional Distribution: 50% entering, 50% exiting
T = 6818 Average Vehicle Trip Ends
3409 entering 3409 exiting

3409 + 3409 = 6818

Non Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)

PM Peak Hour = 25% Non-Pass By AM Peak Hour = 24% Non-Pass By

	IN	Out	Total	
AM Peak	57	57	114	
PM Peak	48	48	96	
Daily	784	784	1568	PM Peak Hour Rate Applied to Daily

Pass-By Trip Volumes (Per ITE Trip Generation Manual, 11th Edition)

PM Peak Hour = 75% Pass By AM Peak Hour = 76% Pass By

	IN	Out	Total	
AM Peak	180	181	361	
PM Peak	144	145	289	
Daily	2352	2352	4705	PM Peak Hour Rate Applied to Daily

Kimley»Horn

Project	QT 4270				
Subject	Trip Generation for Automated Car Wash				
Designed by	TES	*Date*	November 01, 2023	*Job No.*	09688037
Checked by		*Date*		*Sheet No.*	of

TRIP GENERATION MANUAL TECHNIQUES

ITE Trip Generation Manual 11th Edition, Average Rate Equations

Land Use Code - Automated Car Wash (948)

Independent Variable - Number of Car Wash Tunnels (X)

# of Car Wash Tunnels = 1

X = 1.0

T = Average Vehicle Trip Ends

Peak Hour of Adjacent Street Traffic, One Hour Between 7 and 9 a.m. (Utilized PM Peak Hour Rates)

Directional Distribution: 50% ent. 50% exit.

T = 77.50(X) T = 78 Average Vehicle Trip Ends

T = 77.50 * 1 39 entering 39 exiting

Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 p.m. (900 Series Page 931)

Directional Distribution: 50% ent. 50% exit.

T = 77.50(X) T = 78 Average Vehicle Trip Ends

T = 77.50 * 1 39 entering 39 exiting

Weekday (10% K-Factor from PM Peak Hour)

Average Weekday

Directional Distribution: 50% ent. 50% exit.

T = 780 Average Vehicle Trip Ends

(T) = PM Peak Total / K Factor 0.1 390 entering 390 exiting

390 + 390 = 780

APPENDIX D

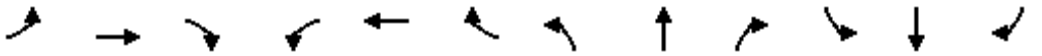
Intersection Analysis Worksheets

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	91	105	152	95	80	29	66	745	70	1607
Future Volume (vph)	91	105	152	95	80	29	66	745	70	1607
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	11.0	24.0	24.0	23.0	36.0	36.0	12.0	35.0	38.0	61.0
Total Split (%)	9.2%	20.0%	20.0%	19.2%	30.0%	30.0%	10.0%	29.2%	31.7%	50.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	105	152	95	80	29	66	745	44	70	1607	102
Future Volume (veh/h)	91	105	152	95	80	29	66	745	44	70	1607	102
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1722	1722	1722	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	99	114	165	103	87	32	72	810	48	76	1747	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	12	12	12	4	4	4	3	3	3
Cap, veh/h	267	228	193	240	260	220	206	2762	163	436	2774	176
Arrive On Green	0.04	0.12	0.12	0.07	0.15	0.15	0.04	0.57	0.57	0.04	0.57	0.57
Sat Flow, veh/h	1767	1856	1572	1640	1722	1459	1753	4853	287	1767	4868	309
Grp Volume(v), veh/h	99	114	165	103	87	32	72	558	300	76	1211	647
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1640	1722	1459	1753	1675	1789	1767	1689	1800
Q Serve(g_s), s	5.0	6.9	12.3	6.5	5.4	2.3	2.0	10.3	10.4	2.1	28.9	29.0
Cycle Q Clear(g_c), s	5.0	6.9	12.3	6.5	5.4	2.3	2.0	10.3	10.4	2.1	28.9	29.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		0.17
Lane Grp Cap(c), veh/h	267	228	193	240	260	220	206	1907	1018	436	1924	1025
V/C Ratio(X)	0.37	0.50	0.85	0.43	0.34	0.15	0.35	0.29	0.29	0.17	0.63	0.63
Avail Cap(c_a), veh/h	267	278	236	359	431	365	228	1907	1018	839	1924	1025
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	49.2	51.6	42.0	45.6	44.2	14.6	13.4	13.4	10.2	17.3	17.3
Incr Delay (d2), s/veh	0.9	1.7	21.7	1.2	0.8	0.3	1.0	0.4	0.7	0.2	1.6	2.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	3.3	6.0	2.7	2.4	0.8	0.8	3.9	4.3	0.8	11.2	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.6	50.9	73.3	43.2	46.3	44.5	15.6	13.7	14.1	10.4	18.9	20.3
LnGrp LOS	D	D	E	D	D	D	B	B	B	B	B	C
Approach Vol, veh/h		378			222			930			1934	
Approach Delay, s/veh		59.3			44.6			14.0			19.0	
Approach LOS		E			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	74.3	14.4	20.7	10.5	74.4	11.0	24.1
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	32.0	29.0	17.0	18.0	6.0	55.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	4.1	12.4	8.5	14.3	4.0	31.0	7.0	7.4
Green Ext Time (p_c), s	0.2	5.3	0.1	0.4	0.0	15.2	0.0	0.5

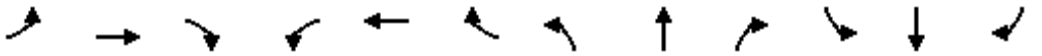
Intersection Summary	
HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	207	180	134	91	193	64	166	1653	45	1368
Future Volume (vph)	207	180	134	91	193	64	166	1653	45	1368
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	22.0	25.0	25.0	22.0	25.0	25.0	21.0	58.0	15.0	52.0
Total Split (%)	18.3%	20.8%	20.8%	18.3%	20.8%	20.8%	17.5%	48.3%	12.5%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	207	180	134	91	193	64	166	1653	68	45	1368	133
Future Volume (veh/h)	207	180	134	91	193	64	166	1653	68	45	1368	133
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	216	188	140	95	201	67	173	1722	71	47	1425	139
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	295	346	293	266	235	199	266	2620	108	190	2305	225
Arrive On Green	0.12	0.18	0.18	0.06	0.13	0.13	0.07	0.52	0.52	0.03	0.49	0.49
Sat Flow, veh/h	1781	1870	1585	1767	1856	1572	1781	5030	207	1781	4730	461
Grp Volume(v), veh/h	216	188	140	95	201	67	173	1165	628	47	1025	539
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1767	1856	1572	1781	1702	1833	1781	1702	1787
Q Serve(g_s), s	12.2	10.9	9.5	5.5	12.7	4.7	5.8	29.9	30.0	1.6	26.5	26.5
Cycle Q Clear(g_c), s	12.2	10.9	9.5	5.5	12.7	4.7	5.8	29.9	30.0	1.6	26.5	26.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.26
Lane Grp Cap(c), veh/h	295	346	293	266	235	199	266	1773	955	190	1659	871
V/C Ratio(X)	0.73	0.54	0.48	0.36	0.85	0.34	0.65	0.66	0.66	0.25	0.62	0.62
Avail Cap(c_a), veh/h	321	346	293	394	294	249	370	1773	955	265	1659	871
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	44.3	43.7	41.9	51.3	47.8	19.4	20.9	20.9	17.6	22.6	22.6
Incr Delay (d2), s/veh	7.6	1.7	1.2	0.8	17.8	1.0	2.7	1.9	3.5	0.7	1.7	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	5.2	3.8	2.5	7.1	1.9	2.5	12.1	13.4	0.7	10.8	11.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	46.1	44.9	42.7	69.1	48.8	22.1	22.9	24.5	18.3	24.3	25.9
LnGrp LOS	D	D	D	D	E	D	C	C	C	B	C	C
Approach Vol, veh/h		544			363			1966			1611	
Approach Delay, s/veh		45.7			58.4			23.3			24.6	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	68.5	13.3	28.2	14.0	64.5	20.3	21.2
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	16.0	19.0	15.0	46.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	3.6	32.0	7.5	12.9	7.8	28.5	14.2	14.7
Green Ext Time (p_c), s	0.0	13.0	0.1	0.8	0.3	10.3	0.1	0.5

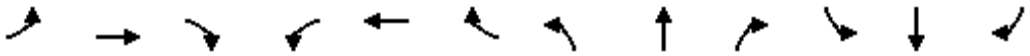
Intersection Summary	
HCM 6th Ctrl Delay	29.3
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	93	108	156	97	82	30	68	763	72	1646
Future Volume (vph)	93	108	156	97	82	30	68	763	72	1646
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	11.0	24.0	24.0	23.0	36.0	36.0	12.0	35.0	38.0	61.0
Total Split (%)	9.2%	20.0%	20.0%	19.2%	30.0%	30.0%	10.0%	29.2%	31.7%	50.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	108	156	97	82	30	68	763	45	72	1646	104
Future Volume (veh/h)	93	108	156	97	82	30	68	763	45	72	1646	104
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1722	1722	1722	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	101	117	170	105	89	33	74	829	49	78	1789	113
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	12	12	12	4	4	4	3	3	3
Cap, veh/h	270	233	198	243	266	226	200	2743	162	426	2754	174
Arrive On Green	0.04	0.13	0.13	0.07	0.15	0.15	0.04	0.57	0.57	0.04	0.57	0.57
Sat Flow, veh/h	1767	1856	1572	1640	1722	1459	1753	4853	286	1767	4870	307
Grp Volume(v), veh/h	101	117	170	105	89	33	74	571	307	78	1239	663
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1640	1722	1459	1753	1675	1789	1767	1689	1800
Q Serve(g_s), s	5.0	7.1	12.7	6.6	5.5	2.3	2.1	10.7	10.8	2.2	30.2	30.4
Cycle Q Clear(g_c), s	5.0	7.1	12.7	6.6	5.5	2.3	2.1	10.7	10.8	2.2	30.2	30.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		0.17
Lane Grp Cap(c), veh/h	270	233	198	243	266	226	200	1893	1011	426	1910	1018
V/C Ratio(X)	0.37	0.50	0.86	0.43	0.33	0.15	0.37	0.30	0.30	0.18	0.65	0.65
Avail Cap(c_a), veh/h	270	278	236	360	431	365	221	1893	1011	829	1910	1018
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.5	48.9	51.4	41.6	45.2	43.9	15.5	13.7	13.7	10.4	17.9	17.9
Incr Delay (d2), s/veh	0.9	1.7	23.0	1.2	0.7	0.3	1.1	0.4	0.8	0.2	1.7	3.2
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	2.8	3.4	6.3	2.8	2.4	0.9	0.9	4.1	4.5	0.9	11.8	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	50.6	74.4	42.8	45.9	44.2	16.6	14.1	14.5	10.6	19.6	21.2
LnGrp LOS	D	D	E	D	D	D	B	B	B	B	B	C
Approach Vol, veh/h		388			227			952			1980	
Approach Delay, s/veh		59.7			44.2			14.4			19.8	
Approach LOS		E			D			B			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.6	73.8	14.5	21.1	10.6	73.9	11.0	24.6
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	32.0	29.0	17.0	18.0	6.0	55.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	4.2	12.8	8.6	14.7	4.1	32.4	7.0	7.5
Green Ext Time (p_c), s	0.2	5.3	0.1	0.4	0.0	15.0	0.0	0.5

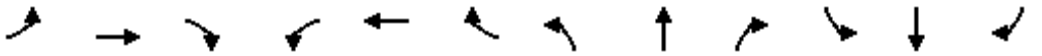
Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	212	184	137	93	198	66	170	1693	46	1402
Future Volume (vph)	212	184	137	93	198	66	170	1693	46	1402
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	22.0	25.0	25.0	22.0	25.0	25.0	21.0	58.0	15.0	52.0
Total Split (%)	18.3%	20.8%	20.8%	18.3%	20.8%	20.8%	17.5%	48.3%	12.5%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	184	137	93	198	66	170	1693	70	46	1402	136
Future Volume (veh/h)	212	184	137	93	198	66	170	1693	70	46	1402	136
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	221	192	143	97	206	69	177	1764	73	48	1460	142
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	299	353	299	269	240	203	261	2596	107	183	2277	221
Arrive On Green	0.12	0.19	0.19	0.06	0.13	0.13	0.07	0.52	0.52	0.03	0.48	0.48
Sat Flow, veh/h	1781	1870	1585	1767	1856	1572	1781	5029	208	1781	4732	460
Grp Volume(v), veh/h	221	192	143	97	206	69	177	1193	644	48	1050	552
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1767	1856	1572	1781	1702	1833	1781	1702	1788
Q Serve(g_s), s	12.5	11.1	9.7	5.6	13.0	4.8	5.9	31.3	31.4	1.6	27.8	27.8
Cycle Q Clear(g_c), s	12.5	11.1	9.7	5.6	13.0	4.8	5.9	31.3	31.4	1.6	27.8	27.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.26
Lane Grp Cap(c), veh/h	299	353	299	269	240	203	261	1757	946	183	1638	860
V/C Ratio(X)	0.74	0.54	0.48	0.36	0.86	0.34	0.68	0.68	0.68	0.26	0.64	0.64
Avail Cap(c_a), veh/h	320	353	299	395	294	249	362	1757	946	258	1638	860
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.9	44.0	43.4	41.6	51.2	47.6	20.7	21.6	21.6	18.3	23.4	23.4
Incr Delay (d2), s/veh	8.2	1.7	1.2	0.8	18.6	1.0	3.1	2.1	3.9	0.7	1.9	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	5.3	3.9	2.5	7.3	1.9	2.6	12.7	14.2	0.7	11.4	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	45.8	44.6	42.4	69.8	48.5	23.8	23.8	25.6	19.1	25.3	27.0
LnGrp LOS	D	D	D	D	E	D	C	C	C	B	C	C
Approach Vol, veh/h		556			372			2014			1650	
Approach Delay, s/veh		45.6			58.7			24.4			25.7	
Approach LOS		D			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.0	67.9	13.5	28.6	14.2	63.7	20.5	21.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	16.0	19.0	15.0	46.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	3.6	33.4	7.6	13.1	7.9	29.8	14.5	15.0
Green Ext Time (p_c), s	0.0	12.6	0.1	0.8	0.3	10.1	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	86	163	144	281	88	53	100	803	261	1527
Future Volume (vph)	86	163	144	281	88	53	100	803	261	1527
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	11.0	24.0	24.0	23.0	36.0	36.0	12.0	35.0	38.0	61.0
Total Split (%)	9.2%	20.0%	20.0%	19.2%	30.0%	30.0%	10.0%	29.2%	31.7%	50.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	163	144	281	88	53	100	803	52	261	1527	97
Future Volume (veh/h)	86	163	144	281	88	53	100	803	52	261	1527	97
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1722	1722	1722	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	93	177	157	305	96	58	109	873	57	284	1660	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	12	12	12	4	4	4	3	3	3
Cap, veh/h	280	221	188	318	378	320	207	2076	135	433	2382	151
Arrive On Green	0.04	0.12	0.12	0.14	0.22	0.22	0.05	0.43	0.43	0.11	0.49	0.49
Sat Flow, veh/h	1767	1856	1572	1640	1722	1459	1753	4820	314	1767	4870	308
Grp Volume(v), veh/h	93	177	157	305	96	58	109	606	324	284	1151	614
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1640	1722	1459	1753	1675	1784	1767	1689	1800
Q Serve(g_s), s	5.0	11.1	11.7	17.0	5.5	3.9	4.1	15.1	15.2	10.2	31.7	31.7
Cycle Q Clear(g_c), s	5.0	11.1	11.7	17.0	5.5	3.9	4.1	15.1	15.2	10.2	31.7	31.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.18	1.00		0.17
Lane Grp Cap(c), veh/h	280	221	188	318	378	320	207	1443	768	433	1652	881
V/C Ratio(X)	0.33	0.80	0.84	0.96	0.25	0.18	0.53	0.42	0.42	0.66	0.70	0.70
Avail Cap(c_a), veh/h	280	278	236	318	431	365	208	1443	768	713	1652	881
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.6	51.4	51.7	41.0	38.7	38.1	21.6	23.7	23.8	16.5	23.7	23.8
Incr Delay (d2), s/veh	0.7	12.2	18.7	39.6	0.4	0.3	2.4	0.9	1.7	1.7	2.5	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	5.9	5.6	5.0	2.4	1.4	1.8	6.1	6.7	4.2	12.9	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	63.7	70.4	80.6	39.1	38.3	24.0	24.6	25.5	18.1	26.2	28.3
LnGrp LOS	D	E	E	F	D	D	C	C	C	B	C	C
Approach Vol, veh/h		427			459			1039			2049	
Approach Delay, s/veh		62.1			66.6			24.8			25.7	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	57.7	23.0	20.3	12.0	64.7	11.0	32.3
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	32.0	29.0	17.0	18.0	6.0	55.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	12.2	17.2	19.0	13.7	6.1	33.7	7.0	7.5
Green Ext Time (p_c), s	0.8	4.8	0.0	0.6	0.0	13.3	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	203	224	131	206	203	92	197	1723	155	1342
Future Volume (vph)	203	224	131	206	203	92	197	1723	155	1342
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	22.0	25.0	25.0	22.0	25.0	25.0	21.0	58.0	15.0	52.0
Total Split (%)	18.3%	20.8%	20.8%	18.3%	20.8%	20.8%	17.5%	48.3%	12.5%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	203	224	131	206	203	92	197	1723	72	155	1342	130
Future Volume (veh/h)	203	224	131	206	203	92	197	1723	72	155	1342	130
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	211	233	136	215	211	96	205	1795	75	161	1398	135
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	306	266	226	292	269	228	279	2382	99	219	2174	210
Arrive On Green	0.12	0.14	0.14	0.12	0.14	0.14	0.08	0.47	0.47	0.06	0.46	0.46
Sat Flow, veh/h	1781	1870	1585	1767	1856	1572	1781	5027	210	1781	4735	457
Grp Volume(v), veh/h	211	233	136	215	211	96	205	1215	655	161	1005	528
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1767	1856	1572	1781	1702	1833	1781	1702	1788
Q Serve(g_s), s	11.9	14.6	9.7	12.3	13.2	6.7	7.2	35.0	35.1	5.7	27.2	27.2
Cycle Q Clear(g_c), s	11.9	14.6	9.7	12.3	13.2	6.7	7.2	35.0	35.1	5.7	27.2	27.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.26
Lane Grp Cap(c), veh/h	306	266	226	292	269	228	279	1613	868	219	1563	821
V/C Ratio(X)	0.69	0.88	0.60	0.74	0.78	0.42	0.73	0.75	0.75	0.74	0.64	0.64
Avail Cap(c_a), veh/h	335	296	251	316	294	249	361	1613	868	238	1563	821
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	50.4	48.3	38.3	49.5	46.7	21.8	25.8	25.9	24.6	24.9	24.9
Incr Delay (d2), s/veh	5.3	22.6	3.4	8.1	12.1	1.2	5.5	3.3	6.0	10.4	2.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	8.5	4.0	6.0	7.0	2.7	3.3	14.6	16.4	2.9	11.2	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	73.0	51.6	46.4	61.6	48.0	27.2	29.1	31.9	35.1	27.0	28.8
LnGrp LOS	D	E	D	D	E	D	C	C	C	D	C	C
Approach Vol, veh/h		580			522			2075			1694	
Approach Delay, s/veh		57.2			52.8			29.8			28.3	
Approach LOS		E			D			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.7	62.9	20.4	23.1	15.5	61.1	20.1	23.4
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	16.0	19.0	15.0	46.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	7.7	37.1	14.3	16.6	9.2	29.2	13.9	15.2
Green Ext Time (p_c), s	0.1	10.8	0.1	0.4	0.3	9.9	0.1	0.5

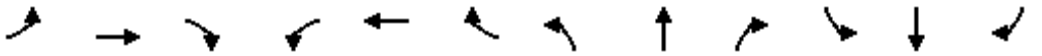
Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	109	125	182	113	96	35	79	890	84	1919
Future Volume (vph)	109	125	182	113	96	35	79	890	84	1919
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	11.0	24.0	24.0	23.0	36.0	36.0	12.0	35.0	38.0	61.0
Total Split (%)	9.2%	20.0%	20.0%	19.2%	30.0%	30.0%	10.0%	29.2%	31.7%	50.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	125	182	113	96	35	79	890	53	84	1919	122
Future Volume (veh/h)	109	125	182	113	96	35	79	890	53	84	1919	122
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1722	1722	1722	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	118	136	198	123	104	38	86	967	58	91	2086	133
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	12	12	12	4	4	4	3	3	3
Cap, veh/h	291	263	223	262	309	262	161	2614	156	362	2626	167
Arrive On Green	0.04	0.14	0.14	0.08	0.18	0.18	0.04	0.54	0.54	0.04	0.54	0.54
Sat Flow, veh/h	1767	1856	1572	1640	1722	1459	1753	4848	290	1767	4868	309
Grp Volume(v), veh/h	118	136	198	123	104	38	86	668	357	91	1443	776
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1640	1722	1459	1753	1675	1788	1767	1689	1800
Q Serve(g_s), s	5.0	8.1	14.8	7.5	6.3	2.6	2.6	13.8	13.8	2.7	41.3	41.8
Cycle Q Clear(g_c), s	5.0	8.1	14.8	7.5	6.3	2.6	2.6	13.8	13.8	2.7	41.3	41.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.16	1.00		0.17
Lane Grp Cap(c), veh/h	291	263	223	262	309	262	161	1806	964	362	1822	971
V/C Ratio(X)	0.41	0.52	0.89	0.47	0.34	0.14	0.53	0.37	0.37	0.25	0.79	0.80
Avail Cap(c_a), veh/h	291	278	236	364	431	365	180	1806	964	763	1822	971
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	47.7	50.6	39.2	43.0	41.5	24.3	15.9	15.9	12.2	22.2	22.4
Incr Delay (d2), s/veh	0.9	1.6	30.0	1.3	0.6	0.3	2.7	0.6	1.1	0.4	3.6	6.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	3.9	7.7	3.1	2.8	1.0	1.4	5.4	5.9	1.1	16.6	18.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	49.3	80.6	40.6	43.6	41.7	27.0	16.5	17.0	12.5	25.9	29.2
LnGrp LOS	D	D	F	D	D	D	C	B	B	B	C	C
Approach Vol, veh/h		452			265			1111			2310	
Approach Delay, s/veh		61.7			41.9			17.5			26.5	
Approach LOS		E			D			B			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.8	70.7	15.5	23.0	10.7	70.7	11.0	27.6
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	32.0	29.0	17.0	18.0	6.0	55.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	4.7	15.8	9.5	16.8	4.6	43.8	7.0	8.3
Green Ext Time (p_c), s	0.2	5.7	0.2	0.2	0.0	9.5	0.0	0.6

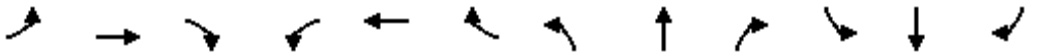
Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	247	215	160	109	230	76	198	1974	54	1634
Future Volume (vph)	247	215	160	109	230	76	198	1974	54	1634
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	22.0	25.0	25.0	22.0	25.0	25.0	21.0	58.0	15.0	52.0
Total Split (%)	18.3%	20.8%	20.8%	18.3%	20.8%	20.8%	17.5%	48.3%	12.5%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	247	215	160	109	230	76	198	1974	81	54	1634	159
Future Volume (veh/h)	247	215	160	109	230	76	198	1974	81	54	1634	159
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	257	224	167	114	240	79	206	2056	84	56	1702	166
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	318	391	331	284	271	230	236	2443	100	147	2077	202
Arrive On Green	0.13	0.21	0.21	0.07	0.15	0.15	0.08	0.49	0.49	0.04	0.44	0.44
Sat Flow, veh/h	1781	1870	1585	1767	1856	1572	1781	5033	205	1781	4731	460
Grp Volume(v), veh/h	257	224	167	114	240	79	206	1389	751	56	1223	645
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1767	1856	1572	1781	1702	1833	1781	1702	1788
Q Serve(g_s), s	14.2	12.9	11.2	6.5	15.2	5.4	7.6	42.5	42.9	2.0	37.8	38.0
Cycle Q Clear(g_c), s	14.2	12.9	11.2	6.5	15.2	5.4	7.6	42.5	42.9	2.0	37.8	38.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.26
Lane Grp Cap(c), veh/h	318	391	331	284	271	230	236	1653	890	147	1494	785
V/C Ratio(X)	0.81	0.57	0.50	0.40	0.89	0.34	0.87	0.84	0.84	0.38	0.82	0.82
Avail Cap(c_a), veh/h	318	391	331	395	294	249	313	1653	890	218	1494	785
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	42.6	42.0	39.5	50.3	46.1	26.9	26.8	26.9	25.4	29.5	29.5
Incr Delay (d2), s/veh	14.4	2.0	1.2	0.9	24.8	0.9	18.6	5.3	9.6	1.6	5.1	9.4
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	7.4	6.2	4.5	2.9	8.9	2.2	4.3	18.0	20.5	0.9	16.2	18.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.6	44.7	43.2	40.4	75.1	47.0	45.5	32.2	36.5	27.0	34.6	39.0
LnGrp LOS	D	D	D	D	E	D	D	C	D	C	C	D
Approach Vol, veh/h		648			433			2346			1924	
Approach Delay, s/veh		46.6			60.8			34.7			35.8	
Approach LOS		D			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	64.3	14.4	31.1	15.8	58.7	22.0	23.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	16.0	19.0	15.0	46.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	4.0	44.9	8.5	14.9	9.6	40.0	16.2	17.2
Green Ext Time (p_c), s	0.0	6.2	0.1	0.7	0.3	5.0	0.0	0.3

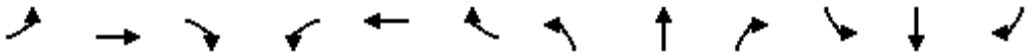
Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	102	180	170	297	102	58	111	930	273	1800
Future Volume (vph)	102	180	170	297	102	58	111	930	273	1800
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	11.0	24.0	24.0	23.0	36.0	36.0	12.0	35.0	38.0	61.0
Total Split (%)	9.2%	20.0%	20.0%	19.2%	30.0%	30.0%	10.0%	29.2%	31.7%	50.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	102	180	170	297	102	58	111	930	60	273	1800	115
Future Volume (veh/h)	102	180	170	297	102	58	111	930	60	273	1800	115
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1722	1722	1722	1841	1841	1841	1856	1856	1856
Adj Flow Rate, veh/h	111	196	185	323	111	63	121	1011	65	297	1957	125
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	3	12	12	12	4	4	4	3	3	3
Cap, veh/h	296	251	213	323	405	343	170	1962	126	395	2303	147
Arrive On Green	0.04	0.14	0.14	0.14	0.24	0.24	0.05	0.41	0.41	0.12	0.47	0.47
Sat Flow, veh/h	1767	1856	1572	1640	1722	1459	1753	4825	310	1767	4867	310
Grp Volume(v), veh/h	111	196	185	323	111	63	121	701	375	297	1356	726
Grp Sat Flow(s),veh/h/ln	1767	1856	1572	1640	1722	1459	1753	1675	1785	1767	1689	1800
Q Serve(g_s), s	5.0	12.3	13.8	17.0	6.3	4.1	4.8	18.9	18.9	11.2	42.4	42.8
Cycle Q Clear(g_c), s	5.0	12.3	13.8	17.0	6.3	4.1	4.8	18.9	18.9	11.2	42.4	42.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.17	1.00		0.17
Lane Grp Cap(c), veh/h	296	251	213	323	405	343	170	1362	726	395	1598	851
V/C Ratio(X)	0.37	0.78	0.87	1.00	0.27	0.18	0.71	0.52	0.52	0.75	0.85	0.85
Avail Cap(c_a), veh/h	296	278	236	323	431	365	170	1362	726	661	1598	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	50.2	50.8	40.6	37.5	36.7	27.6	26.7	26.7	19.5	27.8	27.9
Incr Delay (d2), s/veh	0.8	12.2	25.9	50.1	0.4	0.3	12.8	1.4	2.6	2.9	5.8	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	6.5	7.0	6.6	2.7	1.5	2.6	7.8	8.5	4.8	17.9	20.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.2	62.4	76.8	90.7	37.9	36.9	40.5	28.1	29.4	22.4	33.6	38.5
LnGrp LOS	D	E	E	F	D	D	D	C	C	C	C	D
Approach Vol, veh/h		492			497			1197			2379	
Approach Delay, s/veh		63.7			72.1			29.8			33.7	
Approach LOS		E			E			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	54.8	23.0	22.2	12.0	62.8	11.0	34.2
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	32.0	29.0	17.0	18.0	6.0	55.0	5.0	30.0
Max Q Clear Time (g_c+I1), s	13.2	20.9	19.0	15.8	6.8	44.8	7.0	8.3
Green Ext Time (p_c), s	0.8	4.3	0.0	0.4	0.0	8.5	0.0	0.7

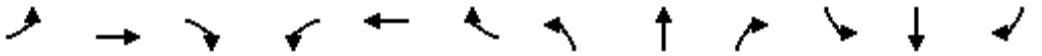
Intersection Summary	
HCM 6th Ctrl Delay	40.1
HCM 6th LOS	D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	238	255	154	222	235	102	225	2004	163	1574
Future Volume (vph)	238	255	154	222	235	102	225	2004	163	1574
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	pm+pt	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases	4		4	8		8	2		6	
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	11.0	24.0	24.0	11.0	24.0	24.0	11.0	24.0	11.0	24.0
Total Split (s)	22.0	25.0	25.0	22.0	25.0	25.0	21.0	58.0	15.0	52.0
Total Split (%)	18.3%	20.8%	20.8%	18.3%	20.8%	20.8%	17.5%	48.3%	12.5%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	4.0	4.0	4.0	4.0
All-Red Time (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	None	C-Max

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 1: Federal Blvd (US-287) & 64th Ave



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	238	255	154	222	235	102	225	2004	83	163	1574	153
Future Volume (veh/h)	238	255	154	222	235	102	225	2004	83	163	1574	153
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1856	1856	1856	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	248	266	160	231	245	106	234	2088	86	170	1640	159
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	3	3	3	2	2	2	2	2	2
Cap, veh/h	318	293	249	299	279	236	263	2241	92	197	1987	192
Arrive On Green	0.13	0.16	0.16	0.13	0.15	0.15	0.10	0.45	0.45	0.07	0.42	0.42
Sat Flow, veh/h	1781	1870	1585	1767	1856	1572	1781	5031	207	1781	4734	458
Grp Volume(v), veh/h	248	266	160	231	245	106	234	1411	763	170	1179	620
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1767	1856	1572	1781	1702	1833	1781	1702	1788
Q Serve(g_s), s	13.9	16.8	11.4	13.1	15.5	7.4	9.5	47.1	47.5	6.6	36.9	37.0
Cycle Q Clear(g_c), s	13.9	16.8	11.4	13.1	15.5	7.4	9.5	47.1	47.5	6.6	36.9	37.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		0.26
Lane Grp Cap(c), veh/h	318	293	249	299	279	236	263	1516	817	197	1429	750
V/C Ratio(X)	0.78	0.91	0.64	0.77	0.88	0.45	0.89	0.93	0.93	0.86	0.82	0.83
Avail Cap(c_a), veh/h	319	296	251	312	294	249	312	1516	817	203	1429	750
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	49.7	47.4	37.4	49.9	46.5	28.4	31.5	31.6	28.5	30.9	30.9
Incr Delay (d2), s/veh	11.7	29.4	5.5	11.0	24.0	1.3	23.2	11.6	19.1	29.4	5.5	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	10.2	4.9	6.5	9.0	3.0	5.6	21.2	24.7	4.3	15.9	17.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	79.1	52.9	48.4	74.0	47.8	51.6	43.1	50.8	57.9	36.4	41.1
LnGrp LOS	D	E	D	D	E	D	D	D	D	E	D	D
Approach Vol, veh/h		674			582			2408			1969	
Approach Delay, s/veh		61.7			59.0			46.4			39.8	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.6	59.4	21.1	24.8	17.7	56.4	21.9	24.0
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	9.0	52.0	16.0	19.0	15.0	46.0	16.0	19.0
Max Q Clear Time (g_c+I1), s	8.6	49.5	15.1	18.8	11.5	39.0	15.9	17.5
Green Ext Time (p_c), s	0.0	2.3	0.1	0.1	0.2	5.6	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	211	264	35	192	229	30
Future Vol, veh/h	211	264	35	192	229	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	12	2	2
Mvmt Flow	229	287	38	209	249	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	516	0	658	373
Stage 1	-	-	-	-	373	-
Stage 2	-	-	-	-	285	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1034	-	446	739
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	763	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1034	-	429	739
Mov Cap-2 Maneuver	-	-	-	-	599	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	735	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	612	-	-	1034	-
HCM Lane V/C Ratio	0.46	-	-	0.037	-
HCM Control Delay (s)	15.8	-	-	8.6	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.4	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	287	165	25	344	156	26
Future Vol, veh/h	287	165	25	344	156	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	2
Mvmt Flow	312	179	27	374	170	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	491	0	830	402
Stage 1	-	-	-	-	402	-
Stage 2	-	-	-	-	428	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1065	-	342	756
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	657	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1065	-	334	756
Mov Cap-2 Maneuver	-	-	-	-	534	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	641	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	557	-	-	1065	-
HCM Lane V/C Ratio	0.355	-	-	0.026	-
HCM Control Delay (s)	15	-	-	8.5	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	248	264	35	227	229	30
Future Vol, veh/h	248	264	35	227	229	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	3	2	2	12	2	2
Mvmt Flow	270	287	38	247	249	33

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	557	0	737	414
Stage 1	-	-	-	-	414	-
Stage 2	-	-	-	-	323	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	991	-	396	708
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	734	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	991	-	381	708
Mov Cap-2 Maneuver	-	-	-	-	565	-
Stage 1	-	-	-	-	699	-
Stage 2	-	-	-	-	706	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.2	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	579	-	-	991	-
HCM Lane V/C Ratio	0.486	-	-	0.038	-
HCM Control Delay (s)	17	-	-	8.8	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	2.6	-	-	0.1	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	337	165	25	402	156	26
Future Vol, veh/h	337	165	25	402	156	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	3	2	2
Mvmt Flow	366	179	27	437	170	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	545	0	947	456
Stage 1	-	-	-	-	456	-
Stage 2	-	-	-	-	491	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1006	-	279	707
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	615	-
Platoon blocked, %	-	-	1	-	1	1
Mov Cap-1 Maneuver	-	-	1006	-	272	707
Mov Cap-2 Maneuver	-	-	-	-	488	-
Stage 1	-	-	-	-	686	-
Stage 2	-	-	-	-	598	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	16.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	511	-	-	1006	-
HCM Lane V/C Ratio	0.387	-	-	0.027	-
HCM Control Delay (s)	16.4	-	-	8.7	-
HCM Lane LOS	C	-	-	A	-
HCM 95th %tile Q(veh)	1.8	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	97	858	79	0	1952
Future Vol, veh/h	0	97	858	79	0	1952
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	3
Mvmt Flow	0	105	933	86	0	2122

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	510	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*712	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*712	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	712	-
HCM Lane V/C Ratio	-	-	0.148	-
HCM Control Delay (s)	-	-	10.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	100	1893	84	0	1679
Future Vol, veh/h	0	100	1893	84	0	1679
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	109	2058	91	0	1825

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1075	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*469	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*469	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	469	-
HCM Lane V/C Ratio	-	-	0.232	-
HCM Control Delay (s)	-	-	15	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.9	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	97	1004	79	0	2267
Future Vol, veh/h	0	97	1004	79	0	2267
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	3
Mvmt Flow	0	105	1091	86	0	2464

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	589	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*690	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*690	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.2	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	690	-
HCM Lane V/C Ratio	-	-	0.153	-
HCM Control Delay (s)	-	-	11.2	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.5	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	100	2213	84	0	1950
Future Vol, veh/h	0	100	2213	84	0	1950
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	109	2405	91	0	2120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1248	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*381	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*381	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	18.2	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	381	-
HCM Lane V/C Ratio	-	-	0.285	-
HCM Control Delay (s)	-	-	18.2	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	1.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	37	900	39	0	1952
Future Vol, veh/h	0	37	900	39	0	1952
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	3
Mvmt Flow	0	40	978	42	0	2122

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	510	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*712	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*712	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	712	-
HCM Lane V/C Ratio	-	-	0.056	-
HCM Control Delay (s)	-	-	10.4	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	39	1936	40	0	1679
Future Vol, veh/h	0	39	1936	40	0	1679
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	42	2104	43	0	1825

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1074	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*447	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*447	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	447	-
HCM Lane V/C Ratio	-	-	0.095	-
HCM Control Delay (s)	-	-	13.9	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.3	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	37	1046	39	0	2267
Future Vol, veh/h	0	37	1046	39	0	2267
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	4	2	2	3
Mvmt Flow	0	40	1137	42	0	2464

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	590	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*668	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*668	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	668	-
HCM Lane V/C Ratio	-	-	0.06	-
HCM Control Delay (s)	-	-	10.7	-
HCM Lane LOS	-	-	B	-
HCM 95th %tile Q(veh)	-	-	0.2	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	39	2256	40	0	1950
Future Vol, veh/h	0	39	2256	40	0	1950
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	42	2452	43	0	2120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1248	0	0	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	*381	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*381	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

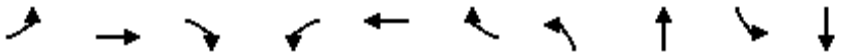
Approach	WB	NB	SB
HCM Control Delay, s	15.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBT
Capacity (veh/h)	-	-	381	-
HCM Lane V/C Ratio	-	-	0.111	-
HCM Control Delay (s)	-	-	15.6	-
HCM Lane LOS	-	-	C	-
HCM 95th %tile Q(veh)	-	-	0.4	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

APPENDIX E

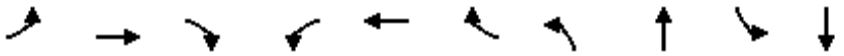
Queue Analysis Worksheets



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	93	177	157	305	96	58	109	930	284	1765
v/c Ratio	0.39	0.74	0.38	0.95	0.25	0.12	0.67	0.50	0.68	0.75
Control Delay	37.2	68.7	2.6	75.2	38.8	0.5	43.8	29.9	22.9	28.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.2	68.7	2.6	75.2	38.8	0.5	43.8	29.9	22.9	28.6
Queue Length 50th (ft)	51	132	0	194	60	0	37	201	108	407
Queue Length 95th (ft)	91	208	0	#317	107	0	#151	283	177	469
Internal Link Dist (ft)		861			391			203		296
Turn Bay Length (ft)	250		250	300		100	600		225	
Base Capacity (vph)	239	276	443	321	424	503	162	1861	578	2354
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.64	0.35	0.95	0.23	0.12	0.67	0.50	0.49	0.75

Intersection Summary

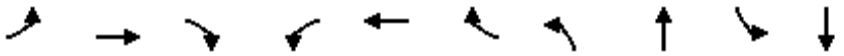
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	233	136	215	211	96	205	1870	161	1533
v/c Ratio	0.67	0.84	0.39	0.72	0.76	0.27	0.80	0.82	0.81	0.73
Control Delay	42.0	75.6	10.8	45.8	67.3	4.6	44.7	33.4	56.8	32.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	75.6	10.8	45.8	67.3	4.6	44.7	33.4	56.8	32.4
Queue Length 50th (ft)	121	176	0	124	157	0	104	492	77	378
Queue Length 95th (ft)	189	#301	56	193	#261	20	#209	564	#201	439
Internal Link Dist (ft)		861			391			203		296
Turn Bay Length (ft)	250		250	300		100	600		225	
Base Capacity (vph)	337	294	365	315	292	362	283	2281	200	2105
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.79	0.37	0.68	0.72	0.27	0.72	0.82	0.81	0.73

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

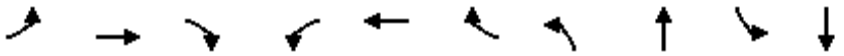


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	111	196	185	323	111	63	121	1076	297	2082
v/c Ratio	0.45	0.78	0.44	1.03	0.28	0.13	0.76	0.60	0.76	0.90
Control Delay	39.5	71.3	5.0	93.3	39.0	0.6	53.9	32.8	32.6	35.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	71.3	5.0	93.3	39.0	0.6	53.9	32.8	32.6	35.7
Queue Length 50th (ft)	60	146	0	~206	69	0	45	250	130	533
Queue Length 95th (ft)	105	#244	22	#367	121	0	#177	340	223	609
Internal Link Dist (ft)		861			391			203		296
Turn Bay Length (ft)	250		250	300		100	600		225	
Base Capacity (vph)	245	276	443	315	424	503	159	1785	548	2326
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.71	0.42	1.03	0.26	0.13	0.76	0.60	0.54	0.90

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	248	266	160	231	245	106	234	2174	170	1799
v/c Ratio	0.81	0.91	0.42	0.80	0.85	0.30	0.87	0.98	0.86	0.89
Control Delay	52.1	85.1	10.4	52.4	75.9	5.6	51.7	46.7	65.4	40.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	85.1	10.4	52.4	75.9	5.6	51.7	46.7	65.4	40.9
Queue Length 50th (ft)	146	205	0	135	186	0	126	630	82	480
Queue Length 95th (ft)	#239	#362	61	#234	#324	29	#262	#749	#213	#568
Internal Link Dist (ft)		861			391			203		296
Turn Bay Length (ft)	250		250	300		100	600		225	
Base Capacity (vph)	318	295	386	300	292	362	283	2228	197	2011
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.90	0.41	0.77	0.84	0.29	0.83	0.98	0.86	0.89

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

APPENDIX F

Conceptual Site Plan

OWNER: 2896 W. 64TH AVE LLC

PROPERTY LINE

PARCEL D
3.12 AC
135,941 SF

PARCEL C
2.06 AC
89,766 SF

PARCEL B
1.21 AC
52,690 SF

PARCEL A
1.00 AC
43,795 SF

EXCEPTION
(BK. 1561, PG. 44)

LOT 1 BLOCK 1
ELLETT SUBDIVISION
PARCEL E

EXCEPTION
(REC. NO. 20051107001229480)

"RIGHT-OF-WAY EXCEPTION IS NOT CORRECT IN TITLE REPORT FOR PARCEL E"

EXCEPTION
(BK. 2945, PG. 579)

20' WATER & SEWER EASEMENT
(BK. 454, PG. 54)

15' PSCO EASEMENT
(BK. 1963, PG. 215)

20' EASEMENT
(BK. 454, PG. 55)

5' UTILITY EASEMENT
(REC. NO. B1009567)

5' UTILITY EASEMENT
(REC. NO. B1009567)

SURFACE WATER QUALITY AND DETENTION POND TO SERVE QUIKTRIP AND FUTURE DEVELOPMENT

PROPOSED PARCEL LINE

PROPOSED CONCRETE PAN

TRASH ENCLOSURE

AIR STATION

FUEL CANOPY

FUEL TANKS
5-15,000 GAL

QT VERTICAL MONUMENT SIGN, MV-E2PGQ-CC, 20' HT X 5'-5 1/2" W X 58.6 SF (RE: L1-C500)

FULL ACCESS

RIGHT IN/RIGHT OUT ACCESS

RIGHT IN/RIGHT OUT ACCESS

5' SIDEWALK

W. 64th Ave.
(R.O.W. VARIES)

N. Federal Blvd.
(110' R.O.W.)

W. 63rd Ave.
(60' R.O.W.)

OWNER: PIONEER MHP, LLC 86% INT
AND WAYSIDE COLORADO LLC 14% INT

Storm Sewer Manhole #1193
T=5211.79
FL=5207.34
18" RCP in N
24" RCP in W
24" RCP out E

Storm Sewer Manhole #1172
T=5211.74
FL=5207.39
18" RCP in S
24" RCP in W
24" RCP out E

Storm Sewer Manhole #1150
T=5212.56
FL=5208.05
18" RCP in N
24" RCP in W
24" RCP out E

Storm Sewer Manhole #1131
T=5213.31
FL=5208.86
18" RCP in S
24" RCP in W
24" RCP out E

Sanitary Sewer Manhole #1240
T=5215.39
FL=5205.59
12" PVC in N
15" CLAY in W
15" CLAY out E

Storm Sewer Manhole #1020
T=5218.50
FL=5211.10
18" RCP in W
18" RCP out E

Sanitary Sewer Manhole #1019
T=5219.09
FL=5209.04
6" PVC in NW
15" CLAY in W
15" CLAY out E

Storm Sewer Manhole #1271
T=5220.24
FL=5212.29
6" PVC in E
18" RCP out S

Storm Sewer Manhole #1018
T=5219.37
FL=5211.47
18" RCP in N
18" RCP in S
18" RCP out E

Storm Sewer Manhole #1017
T=5218.91
FL=5213.46
18" RCP out N

Sanitary Sewer Manhole #1270
T=5220.44
FL=5210.79
12" PVC in N
12" PVC in W
15" CLAY out E

Storm Sewer Manhole #1300
T=5230.67
FL=5227.57
18" RCP out W

Storm Sewer Manhole #1789
T=5231.56
FL=5225.16
24" RCP in N
18" RCP in E
18" RCP in W
24" RCP out S

Sanitary Sewer Manhole #1288
T=5228.25
FL=5218.25
12" PVC in W
12" PVC out E

Storm Sewer Manhole #1759
T=5223.39
FL=5212.74
24" RCP in N
24" RCP out S

Storm Sewer Manhole #1171
T=5211.89
FL=5208.19
18" RCP out N

Storm Sewer Manhole #1171
T=5211.29
FL=5211.29
6" RCP out N

Storm Sewer Manhole #1748
T=5217.45
FL=5211.60
24" RCP in N
15" RCP in E
15" RCP in W
24" RCP out S

Storm Drain #1896
T=5216.28
FL=5213.28
15" RCP out E

Storm Sewer Manhole #1534
T=5216.20
FL=5212.90
15" RCP out W

Storm Drain #1650
T=5212.03
15" RCP out W

Storm Drain #1899
T=5214.21
FL=5211.51
15" RCP out E

Sanitary Sewer Manhole #1816
T=5210.23
FL=5202.68
12" PVC in N
12" PVC in W
12" PVC out S

Sanitary Sewer Manhole #1799
T=5214.50
FL=5203.55
12" PVC in W
12" PVC out E

Storm Sewer Manhole #1728
T=5215.99
FL=5210.19
24" RCP in N
15" RCP in E
15" RCP in W
24" RCP out S

Sanitary Sewer Manhole #1893
T=5214.76
FL=5204.46
12" PVC in W
12" PVC out E

50 25 0 50 100

PRELIMINARY
FOR REVIEW ONLY
NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.: 096888037

Kimley»Horn
© 2023 KIMLEY-HORN AND ASSOCIATES, INC.
3801 Automation Way, Suite 210
Fort Collins, Colorado 80525 (970) 822-7911

QUIKTRIP STORE NO. 4270
ADAMS COUNTY, CO
FEDERAL BLVD. & W 64TH AVE.

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PROTOTYPE:	P-113
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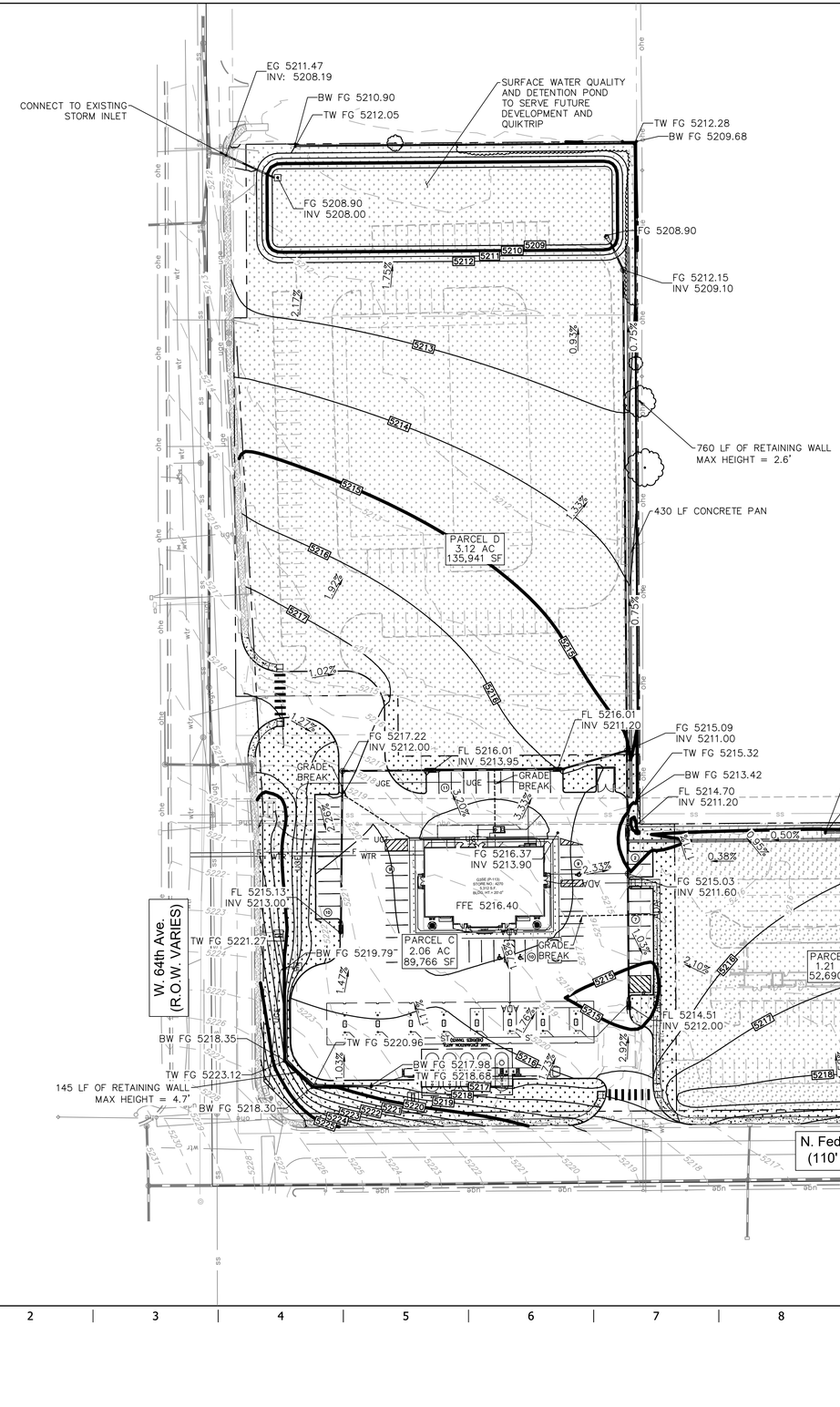
VERSION:	001
DESIGNED BY:	AIA
DRAWN BY:	AIA
REVIEWED BY:	JPW

REV	DATE	DESCRIPTION

ORIGINAL ISSUE DATE:

SHEET TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
1



GRADING LEGEND

XXXX	MAJOR CONTOUR (NEW)
XXXX	MINOR CONTOUR (NEW)
XXX	MAJOR CONTOUR (EXISTING)
XXX	MINOR CONTOUR (EXISTING)
FG XXXX.XX	FINISHED GRADE ELEVATION (NEW)
MF XXXX.XX	SPOT ELEVATION (EXISTING)
	STORM GRATE (NEW)

UNADJUSTED EARTHWORK
CUT: 10586 CY
FILL: 13343 CY
NET: 2757 CY (FILL)

THE EARTHWORK QUANTITIES SHOWN ARE FOR REFERENCE ONLY AND DO NOT ACCOUNT FOR OVER EXCAVATION, PAVEMENT SECTIONS, OR SHRINK/SWELL.

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NOT FOR CONSTRUCTION
Kimley»Horn
Kimley-Horn and Associates, Inc.

PROJECT NO.: 096888037

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REVIEWED BY:	JPW

REV	DATE	DESCRIPTION

ORIGINAL ISSUE DATE:

SHEET TITLE:
PRELIMINARY GRADING PLAN

SHEET NUMBER:
POND-1