

**6601 & 6625 COLORADO BLVD**  
**ZONE CHANGE APPLICATION - SITE DEVELOPMENT PLAN**

**LIST OF EXHIBITS:**

- Exhibit A:** Zone Change Narrative
- Exhibit B:** PUD
- Exhibit C:** Material Board
- Exhibit D:** Preliminary Drainage Report
- Exhibit E:** Traffic Impact Study

**EXHIBIT A**

**Zone Change Narrative**



November 4, 2022  
11/4/2022

City of Commerce City Planning Department  
7887 E 60<sup>th</sup> Ave  
Commerce City, CO 80022

RE: 6601 Colorado Boulevard Zone Change

This project narrative has been prepared to address the PUD Development Permit requirements set forth by the City for a zone change to the subject property located at 6601 Colorado Boulevard. Through the Zone change and the PUD DP processes, the team aims to convert the 11.55 Acre site from agricultural use (AG) to Light Industrial (I-1).

The property is currently being used primarily for vehicular storage. In addition, there are three single family residential buildings and small storage buildings on the property. A majority of the site is either open field area or gravel covered storage areas. Trees, shrubs, and other landscaped areas can be found throughout the site.

Adjacent properties to the north and south are zoned as various density industrial areas (I-1 through I-3) and the agricultural zoning limits the usability and value of the site. Per City GIS, the future land use for the site is noted as general industrial. As such, the property owner intends to complete a zone change to enable the future construction of a trucking terminal.

The Development Permit provides a generalized industrial building adhering to setback, sizing, and height requirements as laid out by City development code. West of the building and the paved parking areas, a gravel storage yard that can facilitate a variety of industrial uses is proposed. Two access points are shown along the Colorado Boulevard frontage. Of the entry points, the larger, 30 ft wide access path along the south property edge serves as the main means for truck and trailer circulation on the site to the gravel lot. No specific truck maneuvering pathways or parking are proposed for the gravel lot since specific uses of the site aren't known at this time.

Given no current arrangements for a future tenant, no anticipated vehicular/delivery activity has been estimated. Furthermore, no anticipated employee count or hours of operation are proposed under the Rezone or Development Permit. The aim of this permit is to enhance the value of the site by having an approved Development Permit in hand to enhance the speed and ease in which an industrial tenant can begin construction and occupy the site.



**EXHIBIT B**

**PUD**





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PLANNED UNIT DEVELOPMENT PERMIT  
LOT 1, TWO DUMMIES INDUSTRIAL SUBDIVISION

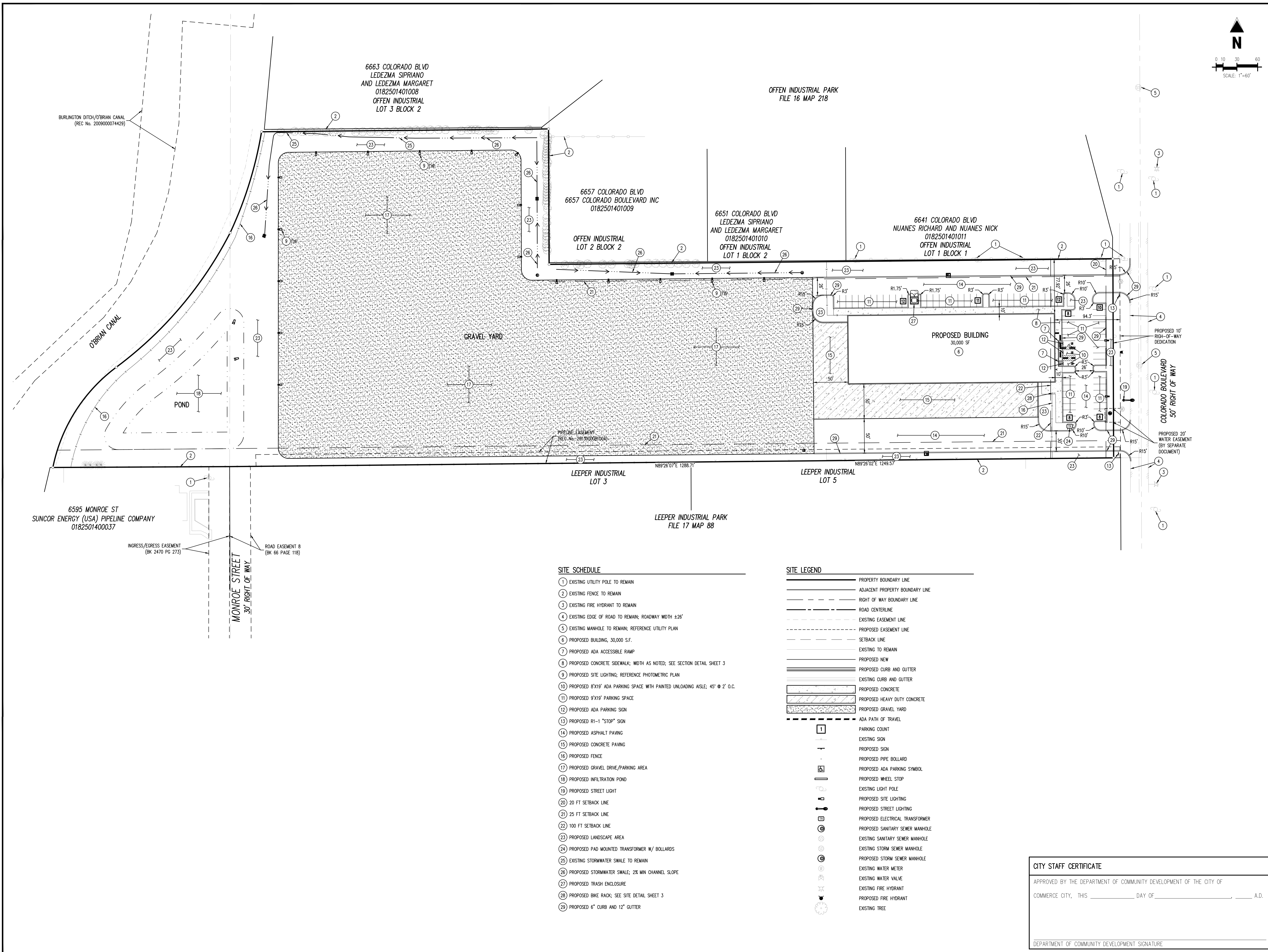
6801 COLORADO BOULEVARD  
COMMERCE CITY, COLORADO

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Project No:	6CH000001
Drawn By:	RDG
Checked By:	MJ
Date:	10/14/2022

## SITE PLAN

2





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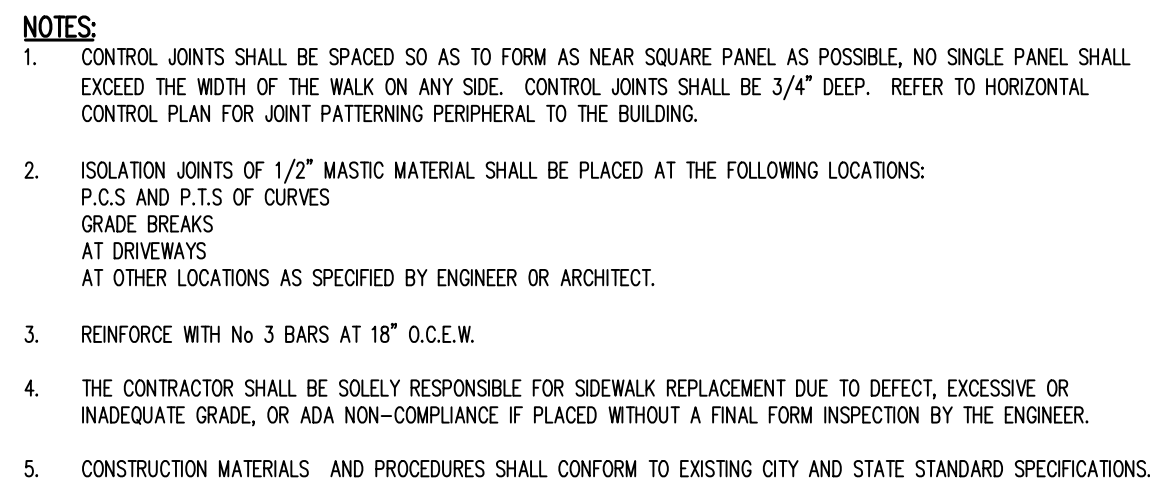
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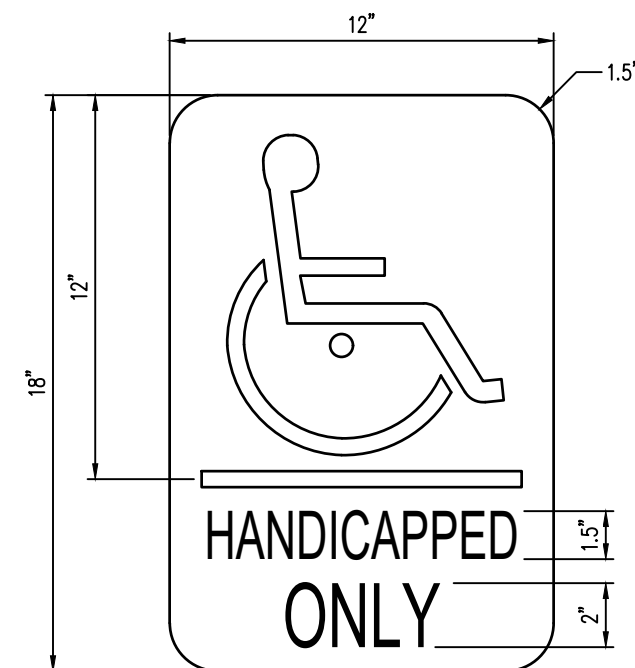
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## SITE DETAILS

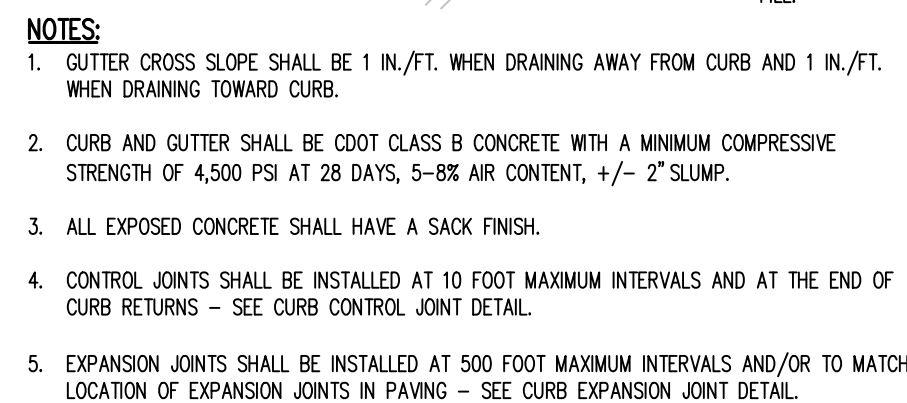


CONCRETE SIDEWALK, TYPICAL  
NOT TO SCALE

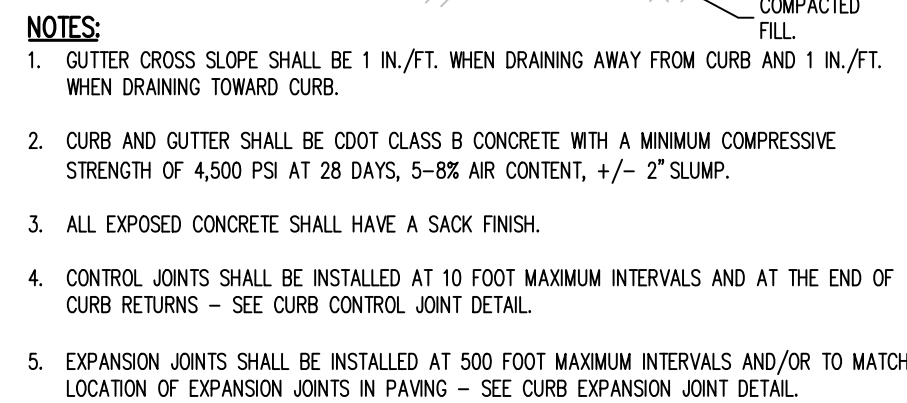


**MATERIAL:**  
0.060 ALUMINUM - WHITE BACKGROUND WITH BLUE COPY AND BORDER - SYMBOL HAS BLUE  
BACKGROUND, WHITE COPY WITH BLACK BORDER 1-1/2" RADIUS CORNERS WHITE 2 MOUNTING HOLES.

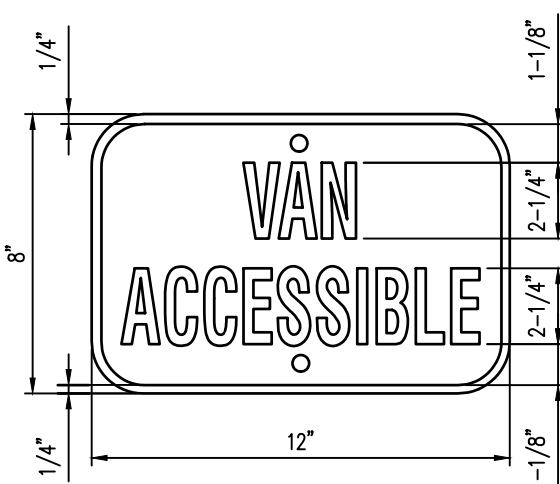
② HANDICAP PARKING SIGN  
NOT TO SCALE



CATCH CURB AND 1' WIDE GUTTER (PRIVATE)  
SCALE: 1 1/2" = 1'-0"



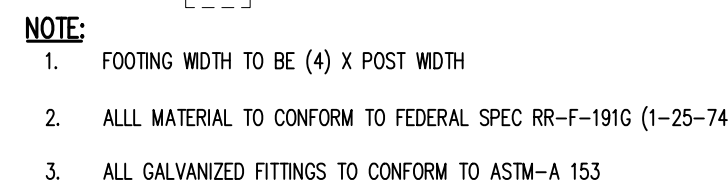
SPILL CURB AND 1' WIDE GUTTER (PRIVATE)  
SCALE: 1 1/2" = 1'-0"



**MATERIAL:**

1. 0.060 ALUMINUM - BLUE BACKGROUND WITH WHITE COPY AND BORDER, 1-1/2" RADIUS CORNERS, WHITE, 2 MOUNTING HOLES
2. SIGN USED WITH CORRESPONDING VAN SPACE.

③ "VAN ACCESSIBLE" SIGN  
NOT TO SCALE



CHAIN LINK FENCE  
NOT TO SCALE

FENCE HEIGHT	END & CORNER POSTS		LINE POSTS	
NOMINAL HEIGHT	B-1 BAR LENGTH	H-1 HEIGHT ABOVE GARAGE	B-2 BAR LENGTH	H-2 HEIGHT ABOVE GARAGE
6'-0"	6'-0"	6'-5/8"	8'-8"	5'-8-7/8"
8'-8"	11'-0"	8'-5/8"	10'-8"	7'-8-7/8"
10'-0"	13'-0"	10'-5/8"	12'-8"	9'-8-7/8"
12'-0"	15'-0"	12'-5/8"	14'-8"	11'-8-7/8"



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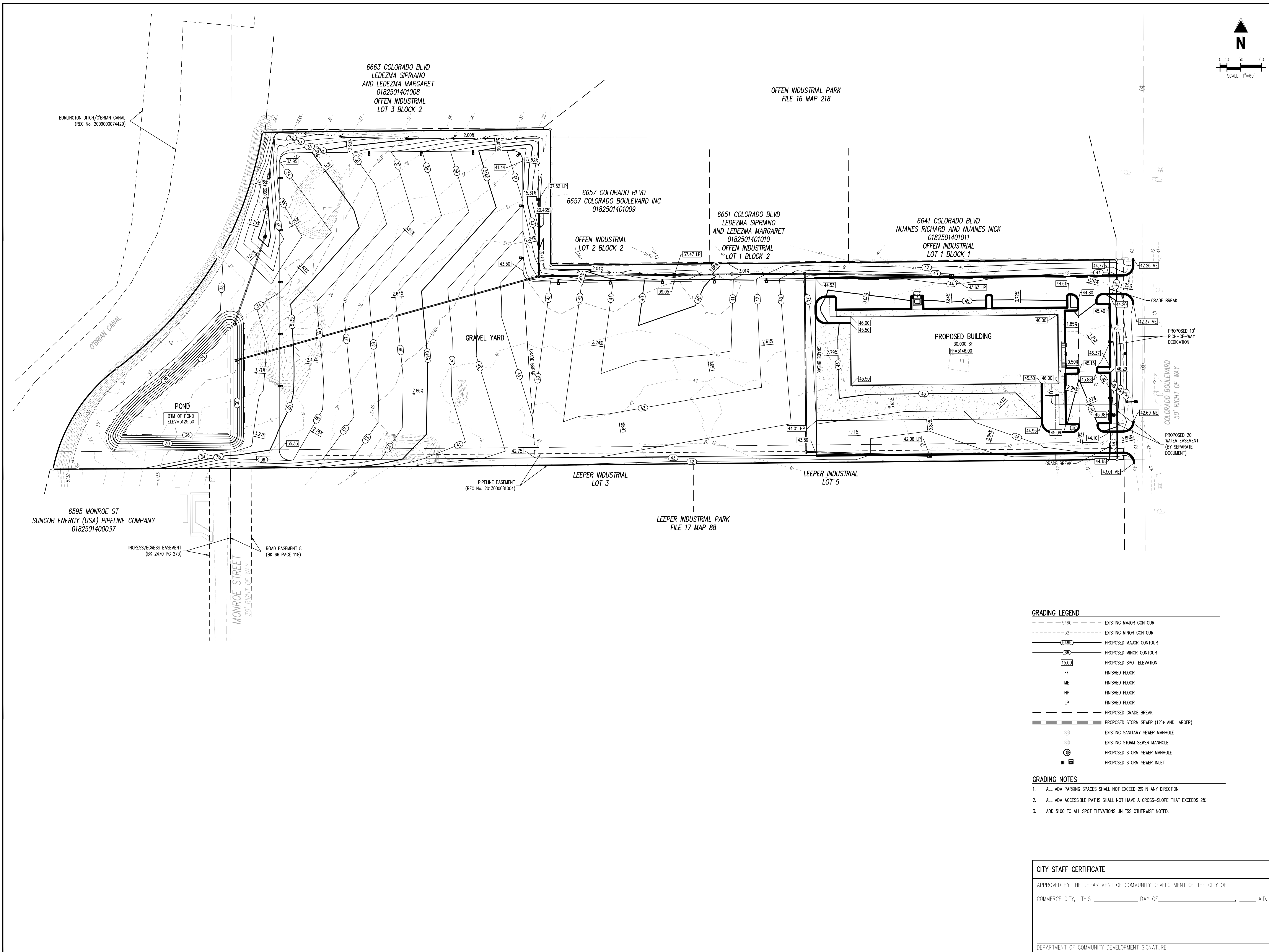
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LOT 1, TWO DUMMIES INDUSTRIAL SUBDIVISION

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COMMERCE CITY, COLORADO

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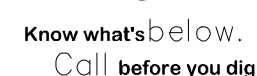
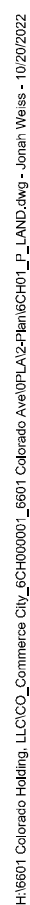
## GRADING PLAN





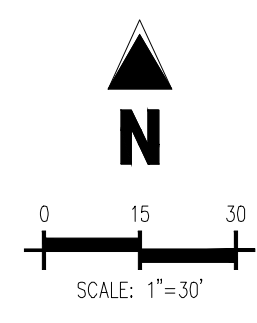






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of 11





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**CAUTION**  
UTILITIES EXIST WITHIN CONSTRUCTION  
LIMITS. CONTRACTOR IS RESPONSIBLE  
FOR IDENTIFYING THEIR LOCATION  
PRIOR TO CONSTRUCTION.







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LOT 1, TWO DUMMIES INDUSTRIAL SUBDIVISION

6601 COLORADO BOULEVARD  
COMMERCE CITY, COLORADO

#	Date	Issue / Description	Init.
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Project No:	6CH000001
Drawn By:	DEF
Checked By:	-
Date:	10/14/2022

LANDSCAPE DETAILS & NOTES



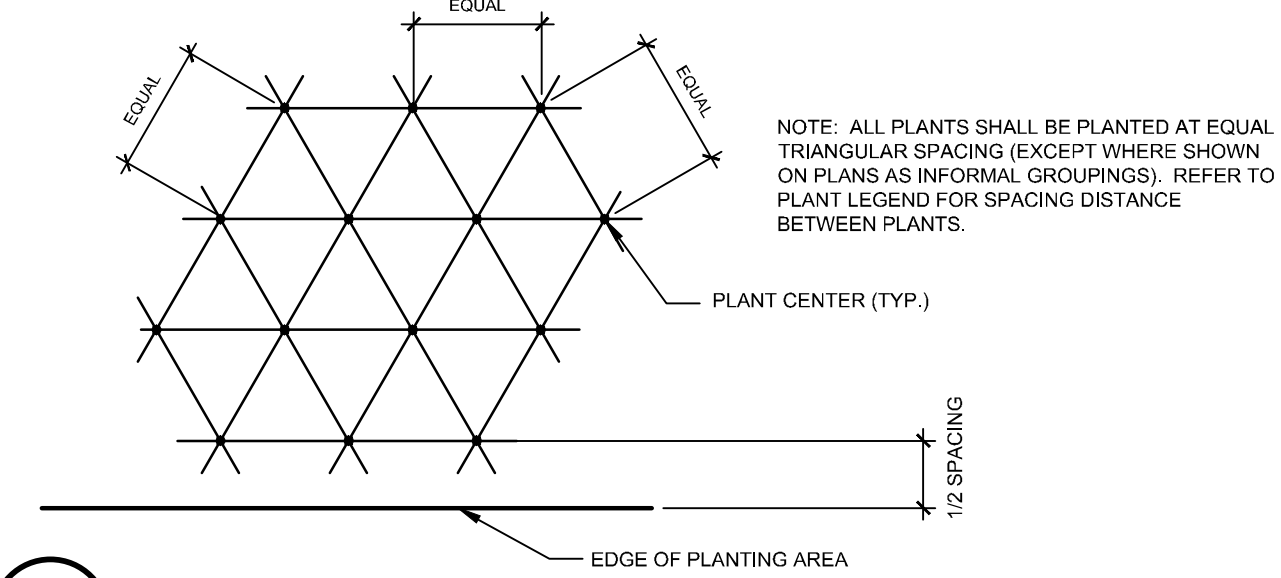
Know what's below.  
Call before you dig.

PLANTING NOTES

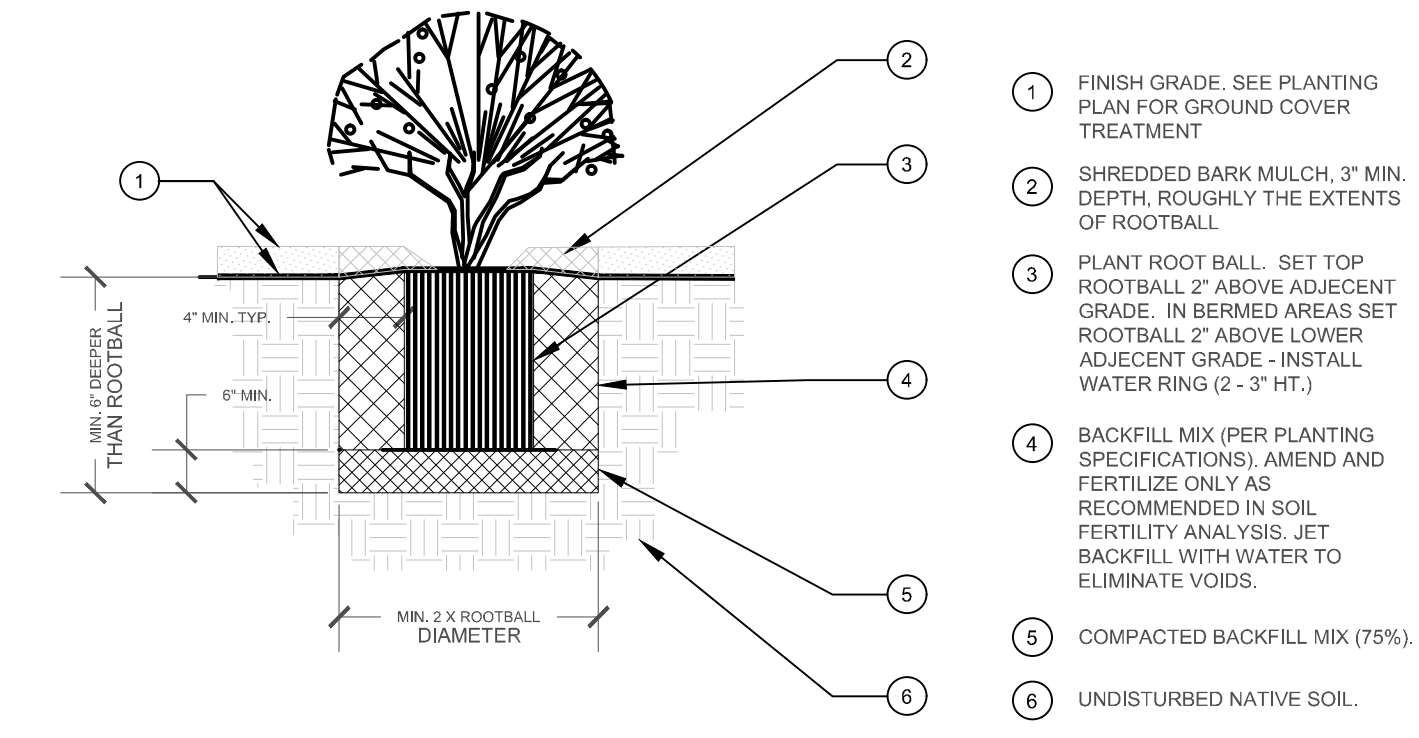
GENERAL

- ALL WORK SHALL CONFORM TO ALL APPLICABLE STATE AND LOCAL CODES, STANDARDS, AND SPECIFICATIONS.
  - LANDSCAPE DESIGN IS DIAGRAMMATIC IN NATURE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS OWN TAKEOFFS AND QUANTITY CALCULATIONS. IN THE EVENT OF A DISCREPANCY BETWEEN THE PLAN AND THE LANDSCAPE LEGEND, THE PLANT QUANTITY AS SHOWN ON THE PLAN SHALL TAKE PRECEDENCE AND NOTIFY THE LANDSCAPE ARCHITECT OF THESE DISCREPANCIES. MINOR ADJUSTMENTS TO THE LANDSCAPE MATERIAL AND LOCATIONS MAY BE PROPOSED FOR CITY CONSIDERATION AT THE CONSTRUCTION DOCUMENT STAGE TO RESPOND TO MARKET AND FIELD CONDITIONS. HOWEVER, THERE SHALL BE NO REDUCTION IN THE NUMBER AND SIZE OF MATERIALS.
  - CONTRACTOR SHALL MAKE HIMSELF AWARE OF THE LOCATIONS OF EXISTING AND PROPOSED UTILITIES, AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE UTILITIES AND/OR ANY INJURY TO ANY PERSON. THIS DRAWING IS PART OF A COMPLETE SET OF CONTRACT DOCUMENTS. UNDER NO CIRCUMSTANCES SHOULD THIS PLAN BE USED FOR CONSTRUCTION PURPOSES WITHOUT EXAMINING ACTUAL LOCATIONS OF UTILITIES ON SITE AND REVIEW ALL RELATED PLANS AND DOCUMENTS.
  - ALL UTILITY EASEMENTS SHALL REMAIN UNOBSTRUCTED AND FULLY ACCESSIBLE ALONG THEIR ENTIRE LENGTH FOR MAINTENANCE EQUIPMENT.
  - THE CONTRACTOR SHALL TAKE EXTREME CARE NOT TO DAMAGE ANY EXISTING PLANTS INDICATED AS "TO REMAIN". ANY SUCH PLANTS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH THE SAME SPECIES, SIZE, AND QUANTITY AT THE CONTRACTOR'S OWN EXPENSE, AND AS ACCEPTABLE TO THE OWNER. REFER TO THE TREE PROTECTION NOTES ON THE PLANS (AS APPLICABLE).
  - LANDSCAPE CONTRACTOR SHALL EXAMINE THE SITE CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND NOTIFY THE GENERAL CONTRACTOR IN WRITING OF UNSATISFACTORY CONDITIONS. IF SITE CONDITIONS OR PLANT AVAILABILITY REQUIRE CHANGES TO THE PLAN, THEN AN APPROVAL WILL BE OBTAINED FROM THE CITY. DO NOT PROCEED UNTIL CONDITIONS HAVE BEEN CORRECTED.
  - ALL CONSTRUCTION DEBRIS AND MATERIAL SHALL BE REMOVED AND CLEANED OUT PRIOR TO INSTALLATION OF TOPSOIL, TREES, SHRUBS, AND TURF.
  - FOR ALL INFORMATION ON SURFACE MATERIAL OF WALKS, DRIVES, AND PARKING LOTS, SEE THE SITE PLAN. SEE PHOTOMETRIC PLAN FOR FREE STANDING LIGHTING INFORMATION.
  - THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT ONE WEEK PRIOR TO BEGINNING CONSTRUCTION.
  - WINTER WATERING SHALL BE AT THE EXPENSE OF THE CONTRACTOR UNTIL SUCH TIME AS FINAL ACCEPTANCE IS RECEIVED.
  - ALL LANDSCAPE CONSTRUCTION PRACTICES, WORKMANSHIP, AND ETHICS SHALL BE IN ACCORDANCE WITH INDUSTRY STANDARDS SET FORTH IN THE CONTRACTORS HANDBOOK PUBLISHED BY THE COLORADO LANDSCAPE CONTRACTORS ASSOCIATION.
  - LANDSCAPE AND IRRIGATION WORK SHALL BE COMPLETED PRIOR TO THE ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY.
- FINISH GRADING AND SOIL PREPARATION
- CONTRACTOR SHALL CONSTRUCT AND MAINTAIN FINISH GRADES AS RECOMMENDED BY THE GEOTECHNICAL REPORT. ALL LANDSCAPE AREAS SHALL HAVE POSITIVE DRAINAGE AWAY FROM STRUCTURES AT THE MINIMUM SLOPE SPECIFIED IN THE REPORT. AREAS OF POTENTIAL PONDING SHALL BE REGRADED TO BLEND IN WITH THE SURROUNDING GRADES AND ELIMINATE PONDING POTENTIAL. SHOULD ANY CONFLICTS AND/OR DISCREPANCIES BETWEEN THE GEOTECHNICAL REPORT, THE GRADING PLANS, THESE NOTES, AND ACTUAL CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SUCH ITEMS TO THE ATTENTION OF THE LANDSCAPE ARCHITECT AND OWNER.
  - AFTER FINISH GRADES HAVE BEEN ESTABLISHED, IT IS RECOMMENDED THAT THE CONTRACTOR SHALL HAVE SOIL SAMPLES TESTED BY AN ESTABLISHED SOIL TESTING LABORATORY FOR THE FOLLOWING: GENERAL SOIL FERTILITY, PH, ORGANIC MATTER CONTENT, SALT (CEC), LIME, SODIUM ADSORPTION RATIO (SAR) AND BORON CONTENT. EACH SAMPLE SUBMITTED SHALL CONTAIN NO LESS THAN ONE QUART OF SOIL. CONTRACTOR SHALL ALSO SUBMIT THE PROJECT'S PLANT LIST TO THE LABORATORY ALONG WITH THE SOIL SAMPLES. THE SOIL REPORT PRODUCED BY THE LABORATORY SHALL CONTAIN RECOMMENDATIONS FOR THE FOLLOWING (AS APPROPRIATE): GENERAL SOIL PREPARATION AND BACKFILL MIXES, PRE-PLANT FERTILIZER APPLICATIONS, AND ANY OTHER SOIL RELATED ISSUES. THE REPORT SHALL ALSO PROVIDE A FERTILIZER PROGRAM FOR THE ESTABLISHMENT PERIOD AND FOR LONG-TERM MAINTENANCE.
  - THE CONTRACTOR SHALL RECOMMEND INSTALLATION OF SOIL AMENDMENTS AND FERTILIZERS PER THE SOILS REPORT FOR THE THE OWNER/OWNER'S REPRESENTATIVE CONSIDERATION.
  - AT A MINIMUM, ALL TOPSOIL SHALL BE AMENDED WITH NITROGEN STABILIZED ORGANIC AMENDMENT COMPOST AT A RATE OF 5.0 CUBIC YARDS AND AMMONIUM PHOSPHATE 16-20-0 AT A RATE OF 15 POUNDS PER THOUSAND SQUARE FEET OF LANDSCAPE AREA. COMPOST SHALL BE MECHANICALLY INTEGRATED INTO THE TOP 6" OF SOIL BY MEANS OF ROTOTILLING AFTER CROSS-RIPPING. GROUND COVER & PERENNIAL BED AREAS SHALL BE AMENDED AT A RATE OF 8 CUBIC FEET PER THOUSAND SQUARE FEET OF NITROGEN STABILIZED ORGANIC AMENDMENT AND 10 LBS. OF 12-12-12 FERTILIZER PER CU. YD., ROTOTILLED TO A DEPTH OF 6". NO MANURE OR ANIMAL-BASED PRODUCTS SHALL BE USED FOR ORGANIC AMENDMENTS.
- PLANTING
- ALL DECIDUOUS TREES SHALL HAVE FULL, WELL-SHAPED HEADS/ALL EVERGREENS SHALL BE UNSHEARED AND FULL TO THE GROUND, UNLESS OTHERWISE SPECIFIED. TREES WITH CENTRAL LEADERS WILL NOT BE ACCEPTED IF LEADER IS DAMAGED OR REMOVED. PRUNE ALL DAMAGED TWIGS AFTER PLANTING.
  - ALL PLANTS WITHIN A SPECIES SHALL HAVE SIMILAR SIZE, AND SHALL BE OF A FORM TYPICAL FOR THE SPECIES. ANY PLANT DEEMED UNACCEPTABLE BY THE LANDSCAPE ARCHITECT SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND SHALL BE REPLACED WITH AN ACCEPTABLE PLANT OF LIKE TYPE AND SIZE AT THE CONTRACTOR'S OWN EXPENSE. ANY PLANTS

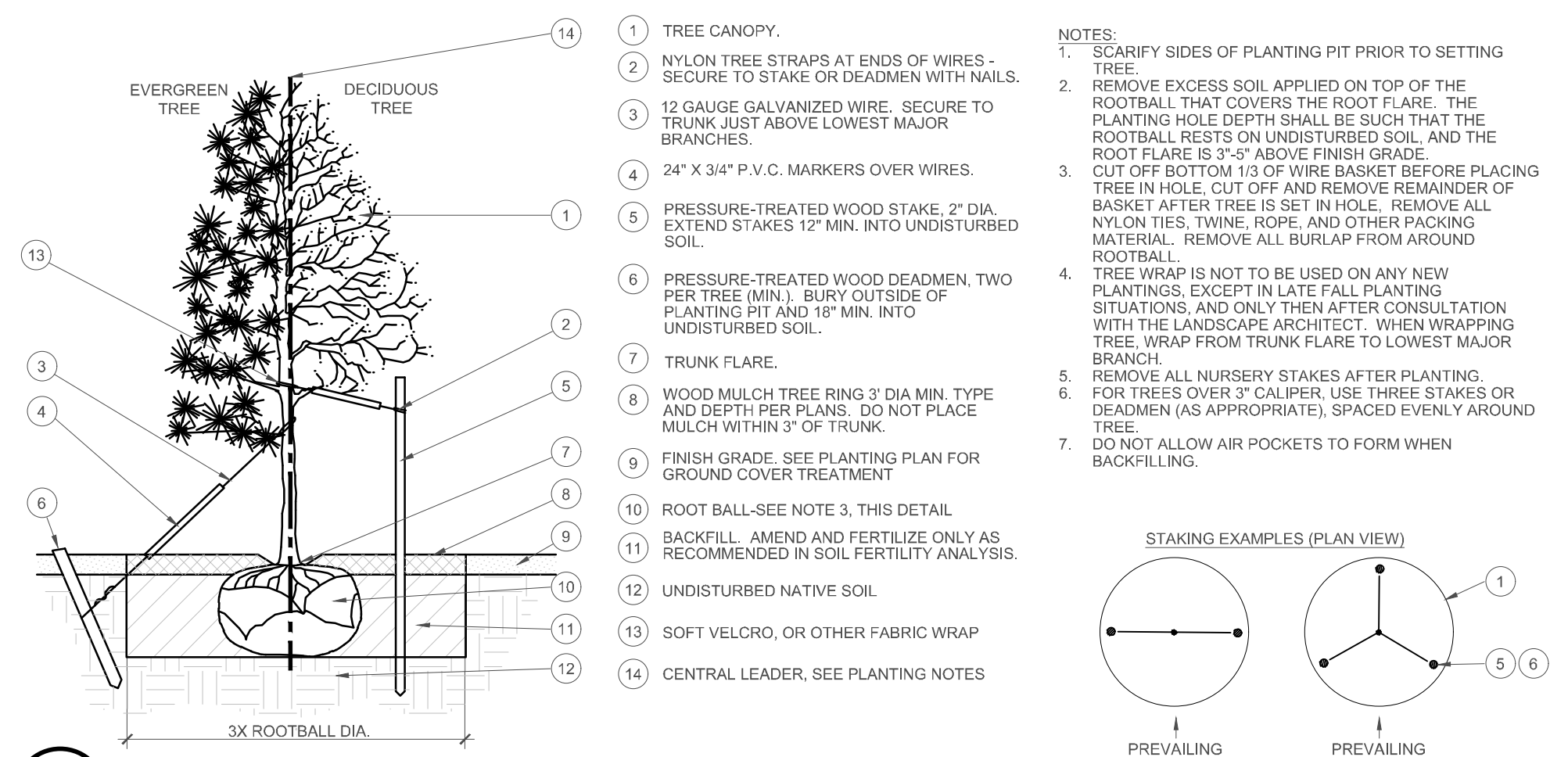
- APPEARING TO BE UNHEALTHY, EVEN IF DETERMINED TO STILL BE ALIVE, SHALL NOT BE ACCEPTED. THE LANDSCAPE ARCHITECT SHALL BE THE SOLE JUDGE AS TO THE ACCEPTABILITY OF PLANT MATERIAL.
- ALL TREES SHALL BE GUYED AND WOOD STAKED AS PER DETAILS. NO T-STAKES SHALL BE USED FOR TREES.
  - ALL PLANT MATERIALS SHALL BE TRUE TO TYPE, SIZE, SPECIES, QUALITY, AND FREE OF INJURY, BROKEN ROOT BALLS, PESTS, AND DISEASES, AS WELL AS CONFORM TO THE MINIMUM REQUIREMENTS DESCRIBED IN THE "AMERICAN STANDARD FOR NURSERY STOCK". FOLLOW GREENCO TREE PLANTING RECOMMENDATIONS FOR MINIMUM QUALITY REQUIREMENTS FOR TREES.
  - ALL TREE AND SHRUB BED LOCATIONS ARE TO BE STAKED OUT ON SITE FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
  - ALL TREES PLANTED ADJACENT TO PUBLIC AND/OR PEDESTRIAN WALKWAYS SHALL BE PRUNED CLEAR OF ALL BRANCHES BETWEEN GROUND AND A HEIGHT OF EIGHT (8) FEET FOR THAT PORTION OF THE PLAN LOCATED OVER THE SIDEWALK AND/OR ROAD.
  - ALL PLANT MATERIAL SHALL NOT BE PLANTED PRIOR TO INSTALLATION OF TOPSOIL.
  - ALL PLANT BEDS SHALL BE CONTAINED WITH STEEL EDGER. STEEL EDGER IS NOT REQUIRED ALONG CURBS, WALKS OR BUILDING FOUNDATIONS. ALL EDGING SHALL OVERLAP AT JOINTS A MINIMUM OF 6-INCHES, AND SHALL BE FASTENED WITH A MINIMUM OF 4 PINS PER EACH 10 FOOT SECTION. THE TOP OF ALL EDGING MATERIAL SHALL BE A ROLLED TOP AND 1/2 INCH ABOVE THE FINISHED GRADE OF ADJACENT LAWN OR MULCH AREAS. COLOR: GREEN.
  - THE DEVELOPER, HIS SUCCESSOR, OR ASSIGNEE SHALL BE RESPONSIBLE FOR ESTABLISHING AND CONTINUING A REGULAR PROGRAM OF MAINTENANCE FOR ALL LANDSCAPED AREAS. SEE LANDSCAPE GUARANTEE AND MAINTENANCE NOTE.
  - A 3-FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF ALL FIRE HYDRANTS.
  - LANDSCAPE CONTRACTOR TO SUBMIT SAMPLES OF MISCELLANEOUS LANDSCAPING MATERIALS TO THE LANDSCAPE ARCHITECTS AND OWNER'S REPRESENTATIVE FOR APPROVAL PRIOR TO INSTALLATION, IE., MULCH, EDGER, LANDSCAPE FABRIC, ETC.
- MULCHING
- AFTER ALL PLANTING IS COMPLETE, THE CONTRACTOR SHALL INSTALL A MINIMUM 4" THICK LAYER OF MULCH AS SPECIFIED IN THE PLANTING LEGEND. INSTALL A 4" THICK RING OF DOUBLE SHREDDED CEDAR BARK MULCH AROUND ALL PLANT MATERIAL IN ROCK MULCH BEDS WHERE LANDSCAPING IS SHOWN ON THE PLANS. WOOD MULCH RING SIZE SHALL BE THE CONTAINER SIZE OF THE SHRUBS, PERENNIALS, AND ORNAMENTAL GRASSES. TREE RING SIZE SHALL BE GREEN INDUSTRIES OF COLORADO INDUSTRY STANDARD WIDTH.
  - ALL MULCH SHALL BE HARVESTED IN A SUSTAINABLE MANNER FROM A LOCAL SOURCE.
  - INSTALL DEWITT PRO-5 WEED BARRIER FABRIC UNDER ALL ROCK MULCH SHRUB BEDS SPECIFIED ON THE PLANS ONLY. NO LANDSCAPE FABRIC SHALL BE USED IN WOOD MULCH AREAS. NO PLASTIC WEED BARRIERS SHALL BE SPECIFIED.
  - ABSOLUTELY NO EXPOSED GROUND SHALL BE LEFT SHOWING ANYWHERE ON THE PROJECT AFTER MULCH HAS BEEN INSTALLED.
  - ALL PLANTING AREAS WITH LESS THAN A 4:1 GRADIENT SHALL RECEIVE A LAYER OF MULCH, TYPE AND DEPTH PER PLANS. SUBMIT 1 CUBIC FOOT SAMPLE OF MULCH (ONE SAMPLE PER TYPE) TO LANDSCAPE ARCHITECT FOR APPROVAL PRIOR TO INSTALLATION. THE MULCH SHALL BE SPREAD EVENLY THROUGHOUT ALL PLANTING AREAS EXCEPT SLOPES 4:1 OR STEEPER, OR AS OTHERWISE DENOTED ON THE PLAN. ABSOLUTELY NO EXPOSED GROUND SHALL REMAIN IN AREAS TO RECEIVE MULCH AFTER MULCH HAS BEEN INSTALLED.
  - ALL PLANTING AREAS ON SLOPES OVER 4:1 SHALL RECEIVE COCONUT FIBER EROSION CONTROL NETTING FROM ROLLS. NETTING SHALL BE RCT-125, AS MANUFACTURED BY NORTH AMERICAN GREEN (OR EQUAL). INSTALL AND STAKE PER MANUFACTURER'S SPECIFICATIONS. SEE ALSO THE CIVIL ENGINEER'S EROSION CONTROL PLAN.



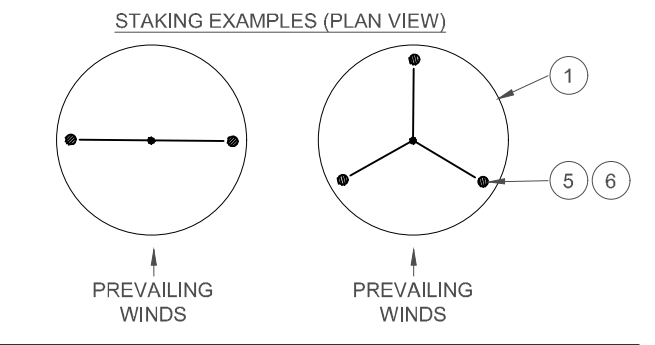
1 PLANT SPACING  
SCALE: NOT TO SCALE



1 SHRUB AND PERENNIAL DETAIL  
SCALE: NOT TO SCALE







2 TREE PLANTING DETAIL  
SCALE: NOT TO SCALE





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LUMINAIRE SCHEDULE								
SYMBOL	QTY	LABEL	MOUNT	MODEL NUMBER	DESCRIPTION	LLF	WATTS	LUMENS
	2	DL	RECESSED	LDN6-4Q/10-LO6AR-LS-EZ10	LITHONIA LIGHTING, LDN6 RECESSED DOWNLIGHT, 4000K COLOR TEMPERATURE, 1000 LUMENS, CLEAR, SEMI-SPECULAR FINISH, MOUNTED @ 10" OR APPROVED EQUAL	1.0	10.44	987
	17	WP1	WALL	RSX1-LED-P1-40K-R4MVOLT-W6A-DBDXB	LITHONIA LIGHTING, RSX1 LED AREA LUMINAIRE, 4000K COLOR TEMPERATURE, TYPE 4 DISTRIBUTION, P1 PACKAGE WALL BRACKET, DARK BRONZE COLOR MOUNTED @ 15" UNLESS NOTED OTHERWISE OR APPROVED EQUAL	1.0	51.34	7,189
	6	WP2	WALL	WPX1-LED-P1-40K-MVOLT-DBDXB	LITHONIA LIGHTING, WPX LED WALL LUMINAIRE, 4000K COLOR TEMPERATURE, BRONZE MOUNTED @ 8" OR APPROVED EQUAL	1.0	11.47	1,537
	21	S	POLE	RSX1-LED-P2-40K-R4-MVOLT-SPA-HS-DBDXB	LITHONIA LIGHTING, RSX1 LED AREA LUMINAIRE, 4000K COLOR TEMPERATURE, TYPE 4 DISTRIBUTION, P1 PACKAGE DARK BRONZE, WITH REAR SHIELD, MOUNTED @ 30" OR APPROVED EQUAL	1.0	72.95	9,972



[illegible]

Project No:	XXX#####
Drawn By:	Author
Checked By:	Checker

EXTERIOR MATERIAL SCHEDULE			
MARK	MATERIAL	MANUFACTURER	COLOR
BR-1	THIN BRICK VENEER	ENDICOTT	GREY BLEND
CMJ	THIN BRICK VENEER	ENDICOTT	GREY BLEND
MP-1	ARCHITECTURAL METAL WALL PANEL	MCBI FW-120-1	ALMOND
MR-1	STANDING SEAM METAL ROOF PANEL	CHEIF	GALVALUME
MT-1	METAL TRIM/ MISC METAL	MCBI	CHARCOAL GRAY

TOTAL AREA EAST FACADE = 2,816 SF

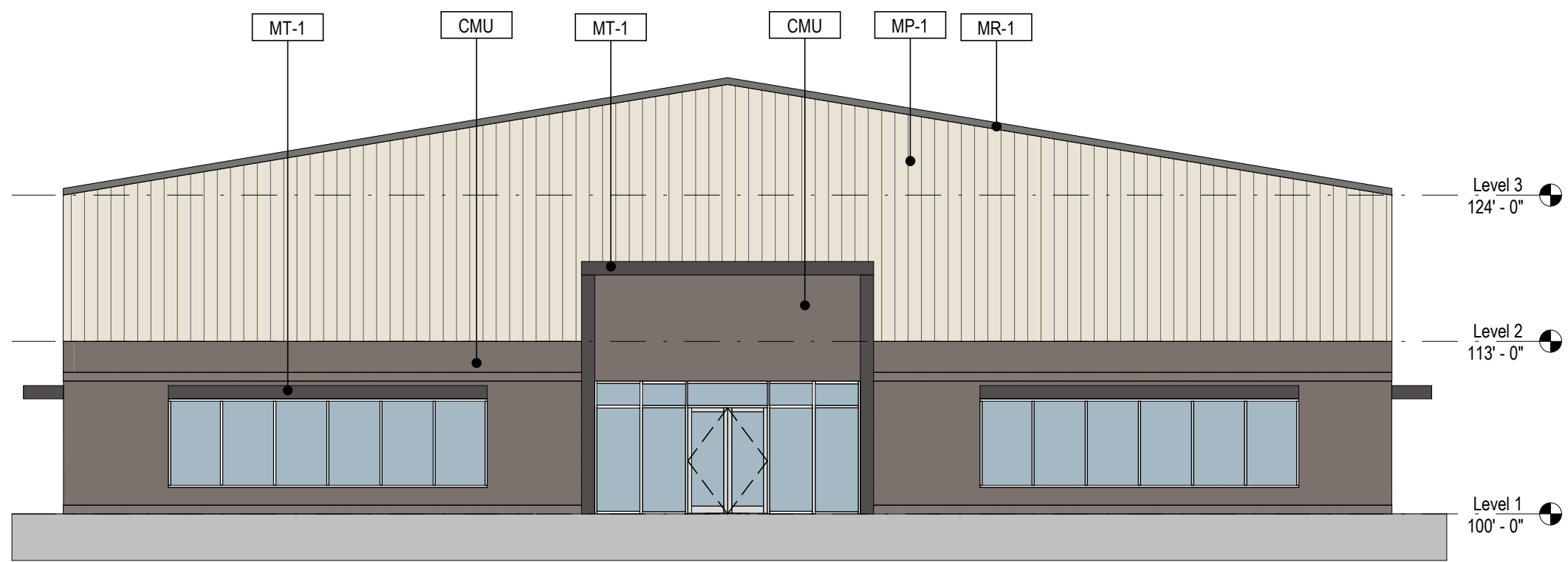
CMU = 912 SF / 33%

GLAZING = 520 SF / 18%

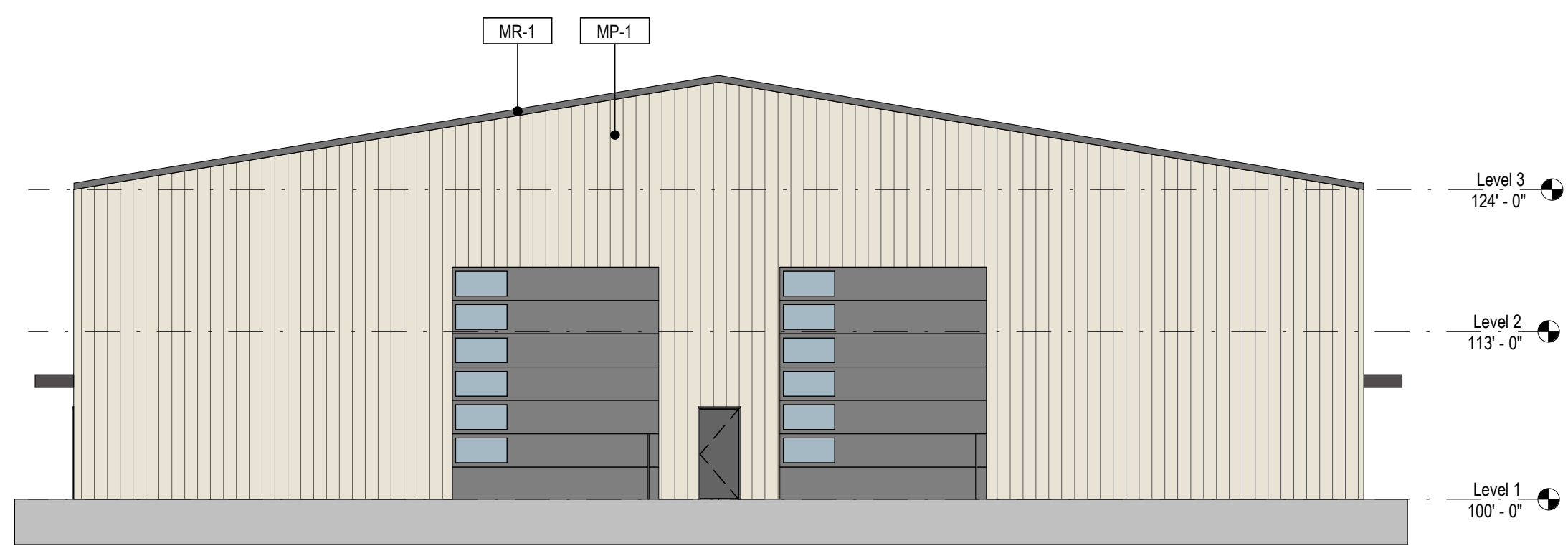
METAL PANEL = 1,384 SF / 49%

PER ZONING CODE :  
CMU + GLAZING MUST BE MIN. 50% OF FRONT FACADE

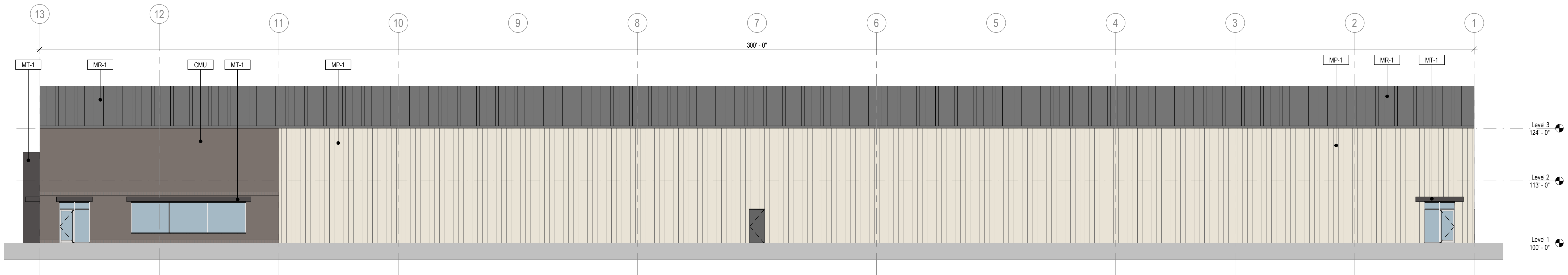
PROVIDED: 51%



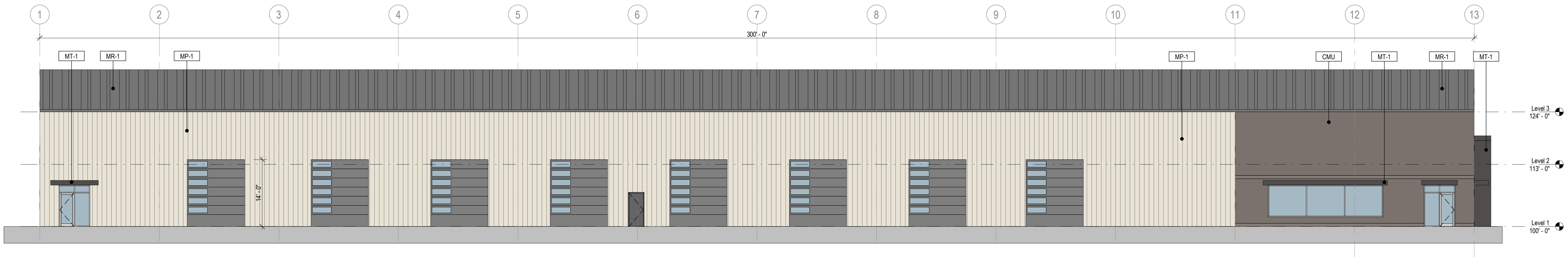
**1 EAST ELEVATION**  
SCALE: 3/32" = 1'-0"



2 WEST ELEVATION  
SCALE: 3/32" = 1'-0"



**3 NORTH ELEVATION**  
SCALE: 3/32" = 1'-0"

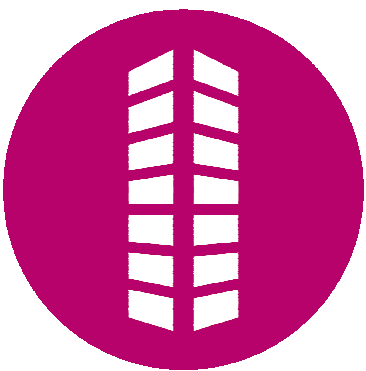


4 SOUTH ELEVATION  
SCALE: 3/32" = 1'-0"

**EXHIBIT C**

**Material Board**

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PLANNED UNIT DEVELOPMENT PERMIT  
TWO DUMMIES INDUSTRIAL SUBDIVISION

6601 COLORADO AVENUE  
COMMERCE CITY, CO

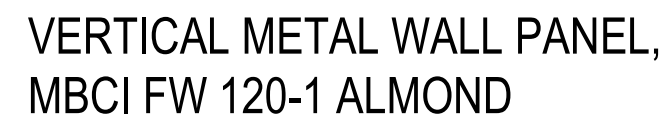
[illegible]

Project No:	XXX#####
Drawn By:	Author
Checked By:	Checker

## MATERIAL BOARD

1

Sheet 1 of 1



**1 PLANNING EAST ELEVATION**  
SCALE: 1/4" = 1'-0"

**EXHIBIT D**

**Preliminary Drainage Report**





# PRELIMINARY DRAINAGE REPORT

## **6601 COLORADO BOULEVARD INDUSTRIAL AT CLAIRE AND ALYSSA INDUSTRIAL SUBDIVISION**

Commerce City, Colorado

---

PREPARED FOR:  
**6601 COLORADO HOLDING, LLC**  
2551 N York St  
Denver, CO 80205  
Attn: Karl Umland

PREPARED BY:  
**Galloway & Company, Inc.**  
5500 Greenwood Plaza Blvd, Suite 200  
Greenwood Village, CO 80111  
Attn: Jenny Romano

PREPARED:  
**October 24, 2022**

REVISED:  
-

**ENGINEER'S STATEMENT**

*I affirm that this report and plan for the Final drainage design for 6601 Colorado Holding, LLC was prepared by me (or under my direct supervision) in accordance with the provisions of the Commerce City Storm Drainage Design and Technical Criteria Manual for the owners thereof. I understand that the City of Commerce City does not and will not assume liability for drainage facilities designed by others.*

---

Jennifer Romano, PE #44401  
For and on behalf of Galloway & Company, Inc.

---

Date

**DEVELOPER'S CERTIFICATION**

*"6601 Colorado Holding, LLC hereby certifies that the drainage facilities for the 6601 Colorado Boulevard Industrial facility shall be constructed according to the design presented in this report. I understand that the City of Commerce City does not and will not assume liability for the drainage facilities designed and/or certified by my engineer and that the City of Commerce City reviews drainage plans pursuant to the Municipal Code; but cannot, on behalf of 6601 Colorado Holding, LLC, guarantee that final drainage design review will absolve 6601 Colorado Holding, LLC and/or their successors and/or assigns of future liability for improper design."*

---

Authorized Signature  
6601 Colorado Holding, LLC – Karl Umland

---

Date

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- A. Reference Materials
- B. Hydrology Calculations
- C. Hydraulic Calculations
- D. Drainage Map

## **I. General Location and Description**

### **Location**

The 6601 Colorado Holding site, is located on a parcel of land situated in the SW ¼ of Section 1, Township 3 south, Range 68 West of the 6<sup>th</sup> Principal Meridian, Commerce City, County of Adams, State of Colorado. The site is currently developed as a light vehicle storage yard, unused fields, a small collection of storage buildings, and two single family residences. The site is bound by Colorado Boulevard to the east, industrial private lots to the north and south, and the O'Brian canal to the west. See Appendix A for a Vicinity Map of the site.

### **Description of Property**

The site is currently developed as a storage yard with a few acres of unused field area and is zoned AG agricultural. The project seeks to rezone the site as medium industrial (I-2). The area of disturbance is estimated to be approximately 11.00 acres. The west half of the site generally slopes to the northwest at 1-3% slopes while the east portion of the site slopes at less than 1% generally to the east.

According to the USDA NRCS Web Soil Survey for Adams County the site contains Terrace escarpments and Vona sandy loam, 0 to 1 percent, which are both classified as Hydrologic Soil Group A. Refer to Appendix A for soil survey information.

There are no known existing irrigation canals or irrigation ditches on the project site. O'Brian canal is located directly west of the site and will not be impacted by this development. There are no wetlands present on-site.

This report will present the proposed drainage design for this development, which includes regrading of the open yard of the site and a proposed warehouse building with associated paving on the east side of the site. On-site stormwater will be managed with a series of inlets connected to an infiltration pond. No existing connection to a public storm sewer exists or is proposed.

### **Proposed Project Description**

The project proposes to demolish all existing buildings on site as well as two existing water wells. The existing yard composing the majority of the site will be regraded to discourage ponding on site and route surface runoff to a proposed infiltration pond at the southwest corner of the site. A 30,000 SF light industrial building is proposed on the east side of the site. Paved parking and access drives surround the proposed building. Additional site improvements include installation of an approximately 263,260 SF gravel storage yard, utility services to the building, additional fencing and new access gates, site lights, and landscaping improvements. The development will be served by two access points along Colorado Boulevard.

### **Drainage Studies Relevant to the Site**

There are no known drainage studies relevant to the site or adjacent areas.

## **II. Drainage Basins and Sub-Basins**

### **Existing Basin Description**

The majority of the existing site, primarily the western section of the property, sheet flows west and outfalls to the existing O'Brian Canal. The remainder of the site is sloped at less than 1% generally sloping to the north. There are no existing detention or water quality facilities located on the project site and there is no existing storm infrastructure in close proximity to the site. The proposed development will

include stormwater infrastructure to collect and infiltrate water on site at a pond located in the southeast corner of the site. No offsite basins are accounted for in the proposed drainage design.

## **Proposed Sub-Basin Descriptions**

The proposed drainage plan for the site consists of nine drainage basins over the 11.55 acre site

As will be discussed later, the below proposed basin coverages are not reflected in the infiltration pond sizing. The pond has been sized to accommodate potential future use. Below is a breakdown of the site coverages as proposed:

Basin A-1 (0.69 acres) represents the proposed building roof area. Downspouts on the south side of the building route runoff to the concrete and asphalt paved area south of the building before runoff is collected and piped to the existing infiltration pond.

Basin A-2 and A-3 (0.87 and 1.07 acres respectfully) are located on the eastern side of the site and consist of mostly paved areas surrounding the proposed building. They consist of asphalt and concrete pavement, sidewalks, and landscaping. Drainage from the basins is collected at a pair of inlets north and south of the proposed building. These inlets are routed to the proposed infiltration pond.

Basin A-4 through A-7 (2.90, 0.17, 2.16, and 3.03 acres respectfully) are located on the west portion of the site. The majority of this area is proposed as gravel storage/parking areas. Landscaping surrounds the gravel yard. The individual basins are broken apart by drainage point. Runoff within basins A-4, A-5, and A-6 are routed by grass-lined swales and collected by inlets placed at low spots on the site. These inlets discharge to the proposed infiltration pond. Meanwhile, Basin A-7 sheet flows to the proposed infiltration pond.

Basin B-1 (0.13 acres) is located on the eastern most edge of the site. Due to proposed grading, this area is unable to be collected on site and is discharged to Colorado Boulevard.

Basin C-1 (0.55 acres) represents the untouched portions of landscaping along the west edge of the site. Due to pond placement and existing grading, this area is infeasible to be collected in the proposed pond on site. Runoff from this area routes as it currently does in the existing condition, towards the O'Brian Canal.

## **III. Design Criteria**

### **Regulations**

The proposed drainage design complies with the Mile High Flood District *Urban Storm Drainage Criteria Manual* and the Commerce City *Storm Drainage Design and Technical Criteria Manual*.

### **Hydrology**

The drainage calculations will be based on the *Storm Drainage Design and Technical Criteria Manual*. The design point rainfall values listed below will be utilized in the design calculations at a later stage in the project. These values were obtained from Chapter 4 of the *Storm Drainage Design and Technical Criteria Manual* (refer to Appendix A).

Duration	Average Recurrence Interval (years)				
	2	5	10	50	100
60-min	0.97	1.37	1.55	2.24	2.58

The time of concentration for each basin is assumed to be 5 minutes, which is based on the minimum allowable standards per the *Urban Storm Drainage Criteria Manual, Chapter 6*.

The rational method will be used to calculate peak flows as the tributary areas are less than 100 acres. The rational method has proven to be accurate for basins of this size and is based on the following formula:

$$Q = CIA$$

Where:

Q = Peak Discharge (cfs)

C = Runoff Coefficient

I = Runoff Intensity (inches/hour)

A = Drainage Area (acres)

## Hydraulics

Sheet flow, swales, and inlets shall convey runoff through the site to the designated infiltration pond. The WQCV water surface elevation, EURV water surface elevation, and 100-year water surface elevation were calculated using the Mile High Flood District Detention Basin Design Workbook (refer to Appendix C).

## Water Quality Enhancement

The proposed infiltration pond will provide water quality for approximately 94.11% of the site, which meets the state MS4 permit requirement of 80% minimum. The remaining 0.68 acres (Basins B-1 and C-1) of the site will flow offsite untreated since it is infeasible to capture and treat runoff from these areas, as allowed by the MS4 permit. The proposed infiltration pond will be seeded and grown to established vegetation that will assist in the removal of soluble pollutants such as phosphorous and nitrogen through biological uptake. Sediment will be removed during the percolation process.

## **IV. Stormwater Management Facility Design**

### Stormwater Conveyance Facilities

Stormwater runoff will be conveyed through the site via sheet flow or vegetated swales, inlets, and pipes to the proposed infiltration pond.

### Stormwater Storage Facilities

A single infiltration pond will be provided at the southwest corner of the site. Infiltration was chosen because there is no existing storm infrastructure available on or adjacent to the site to outfall detained runoff nor can it be released into the O'Brian Canal. Percolation testing will be performed to determine the infiltration capacity of the site. Nearby sites have utilized a similar approach for drainage conformance in Commerce City. As proposed, a majority of the site is proposed as a gravel yard suitable for storage or parking. MHFD provides an impervious value of 40% for gravel areas. To account for potential future use cases, the pond has been sized for the entirety of the site with gravel areas assumed to be 80% impervious. In the Appendix B composite % impervious calculations show that this approach leads to an

overall basin imperviousness of 64.1%. As proposed with the basin breakdown discussed in Section II of this report, the proposed composite imperviousness is 47.1%. Therefore, the pond is sufficiently sized for the proposed development with additional capacity for further impervious development on the site.

A MHFD-Detention spreadsheet was utilized to calculate the 100-year water surface elevation for the pond. The 1-hour point rainfall data built into this spreadsheet was utilized. The Rain Garden – Bioretention BMP was used since this provides the most accurate approximation for an infiltration pond. The infiltration pond was sized for two times the required 100-year detention volume per Commerce City requirements. Because additional detention volume was provided a factor of safety was not applied to the release rates of the pond. The required design volume (2\*100-year detention volume) is 2.65 acre-feet. Based on the MHFD-Detention spreadsheet the provided storage volume in the 100-year storm event is 2.92 acre-feet.

## **V. Conclusions**

### **Compliance with Standards**

The proposed storm drainage design has been performed in accordance with applicable sections of the MHFD *Urban Storm Drainage Criteria Manual*, the Commerce City *Storm Drainage Design and Technical Criteria Manual*, and sound engineering principles. The proposed improvements will modify existing drainage patterns to limit runoff currently running to neighboring properties or the existing canal by diverting flows to the proposed infiltration pond. The design shows that the runoff from the proposed and existing site improvements will be safely conveyed and treated with no adverse effects to downstream systems. Detailed calculations provided in this report show the design will be adequate for the proposed development.

## **VI. References**

1. Urban Storm Drainage Criteria Manual, Mile High Flood District, August 2018 (with current revisions).
2. Storm Drainage Design and Technical Criteria Manual, City of Commerce City, 1989.
3. Soil Map – Adams County, Colorado as available through the Natural Resources Conservation Service National Cooperative Soil Survey web site via Web Soil Survey 2.0.

## **APPENDIX A – Reference Material**

Vicinity Map

NRCS Soils Map





# VICINITY MAP

NTS

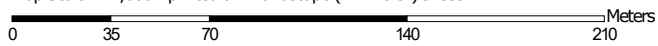


Soil Map—Adams County Area, Parts of Adams and Denver Counties, Colorado  
(6601 Colorado Blvd)



Soil Map may not be valid at this scale.

Map Scale: 1:2,680 if printed on A landscape (11" x 8.5") sheet.



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



Natural Resources  
Conservation Service

Web Soil Survey  
National Cooperative Soil Survey

8/31/2022  
Page 1 of 3

Soil Map—Adams County Area, Parts of Adams and Denver Counties, Colorado  
(6601 Colorado Blvd)

## 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 18, Aug 31, 2021

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

Date(s) aerial images were photographed: Jun 9, 2021—Jun 12, 2021

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

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Tc	Terrace escarpments	5.3	42.9%
VoA	Vona sandy loam, 0 to 1 percent slopes	7.1	57.1%
<b>Totals for Area of Interest</b>		<b>12.4</b>	<b>100.0%</b>

COMPOSITE % IMPERVIOUS CALCULATIONS

Subdivision: Lot 1 Two Dummies Subdivision  
Location: CO, Commerce City

Project Name: 6601 Colorado Blvd  
Project No.: 6CH01  
Calculated By: MSJ  
Checked By: JRR  
Date: 10/3/22

Basin ID	Total Area (ac)	Paved Roads			Lawns			Roofs			Gravel			Basins Total Weighted % Imp.
		% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	% Imp.	Area (ac)	Weighted % Imp.	
Site	11.55	100	1.74	15.1	0	0.24	0.0	90	0.69	5.40	80	6.29	43.60	64.1
A-1	0.69	100	0.00	0.00	0	0.00	0.00	90	0.69	90.20	40	0.00	0.00	90.20
A-2	0.87	100	0.63	72.69	0	0.24	0.00	90	0.00	0.00	40	0.00	0.00	72.69
A-3	1.07	100	1.03	95.87	0	0.05	0.00	90	0.00	0.00	40	0.00	0.00	95.87
A-4	2.90	100	0.00	0.00	0	0.24	0.00	90	0.69	21.40	40	2.66	36.70	58.10
A-5	0.17	100	0.00	0.00	0	0.17	0.00	90	0.00	0.00	40	0.00	0.00	0.00
A-6	2.16	100	0.00	0.00	0	0.52	0.00	90	0.00	0.00	40	1.64	30.40	30.40
A-7	3.03	100	0.00	0.00	0	1.04	0.00	90	0.00	0.00	40	1.99	26.30	26.30
B-1	0.13	100	0.03	22.73	0	0.10	0.00	90	0.00	0.00	40	0.00	0.00	22.73
C-1	0.55	100	0.00	0.00	0	0.55	0.00	90	0.00	0.00	40	0.00	0.00	0.00
Total	11.57	100	1.69	14.61	0	2.91	0.00	90	1.38	10.70	40	6.29	21.80	47.11

As Pond Sized

Total Site As Designed

STANDARD FORM SF-2  
TIME OF CONCENTRATION

Subdivision: Lot 1 Two Dummies Subdivision  
Location: CO, Commerce City

Project Name: 6601 Colorado Blvd  
Project No.: 6CH01  
Calculated By: MSJ  
Checked By: JRR  
Date: 10/3/22

SUB-BASIN						INITIAL/OVERLAND			TRAVEL TIME					Tc CHECK			FINAL
DATA						(Ti)			(Ti)					(URBANIZED BASINS)			
BASIN ID	D.A. (AC)	Hydrologic Soils Group	Impervious (%)	C <sub>100</sub>	C <sub>5</sub>	L (FT)	S (%)	T <sub>i</sub> (MIN)	L (FT)	S (%)	C <sub>v</sub>	VEL. (FPS)	T <sub>t</sub> (MIN)	COMP. T <sub>c</sub> (MIN)	TOTAL LENGTH (FT)	Urbanized T <sub>c</sub> (MIN)	T <sub>c</sub> (MIN)
Site	11.55	A	64.1	0.52	0.40												5.0
A-1	0.69	A	90.2	0.79	0.71												5.0
A-2	0.87	A	72.7	0.59	0.48												5.0
A-3	1.07	A	95.9	0.88	0.81												5.0
A-4	2.90	A	58.1	0.49	0.35												5.0
A-5	0.17	A	0.0	0.20	0.00												5.0
A-6	2.16	A	30.4	0.37	0.19												5.0
A-7	3.03	A	26.3	0.36	0.17												5.0
B-1	0.13	A	22.7	0.34	0.15												5.0
C-1	0.55	A	0.0	0.20	0.00												5.0
Total	11.57	A	47.1	0.43	0.28												5.0
																	5.0

NOTES:  
 $T_i = (0.395 * (1.1 - C_5) * (L)^{0.5}) / ((S)^{0.33})$ , S in ft/ft  
 $T_t = L / 60V$  (Velocity From Fig. 501)  
Velocity  $V = C_v * S^{0.5}$ , S in ft/ft  
 $T_c \text{ Check} = 10 + L / 180$   
For Urbanized basins a minimum  $T_c$  of 5.0 minutes is required.  
For non-urbanized basins a minimum  $T_c$  of 10.0 minutes is required

STANDARD FORM SF-3  
STORM DRAINAGE SYSTEM DESIGN  
(RATIONAL METHOD PROCEDURE)

Subdivision: Lot 1 Two Dummies Subdivision  
Location: CO, Commerce City  
Design Storm: 5-Year

Project Name: 6601 Colorado Blvd  
Project No.: 6CH01  
Calculated By: MSJ  
Checked By: JRR  
Date: 10/3/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Slope (%)	Street Flow (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	Tt (min)	
	1	A-1	0.69	0.71	5.0	0.49	4.79	2.3													Building Roof area
	1	A-2	0.87	0.48	5.0	0.42	4.79	2.0													Parking lot area north of building
	1	A-3	1.07	0.81	5.0	0.87	4.79	4.2													Parking lot area south of building
	1	A-4	2.90	0.35	5.0	1.01	4.79	4.8													Gravel lot, swale and inlet at north prop edge
	1	A-5	0.17	0.00	5.0	0.00	4.79	0.0													Landscape area, swale and inlet at north prop edge
	1	A-6	2.16	0.19	5.0	0.41	4.79	2.0													Gravel lot, swale and inlet along north and west edge
	1	A-7	3.03	0.17	5.0	0.52	4.79	2.5													Gravel lot, sheet flow to infiltration pond
									5.0	3.72	4.79	17.8									Total runoff from on-site to infiltration pond
	2	B-1	0.13	0.15	5.0	0.02	4.79	0.1													East frontage of site sheet flowing east to Colo. Blvd
									5.0	0.02	4.79	0.1									Total runoff from on-site to Colorado Blvd
	3	C-1	0.55	0.00	5.0	0.00	4.79	0.0													Existing area to remain. All Lscape. Sheet flow to canal
									5.0	0.00	4.79	0.0									Total runoff from on-site to O'Brian Canal



STANDARD FORM SF-3  
STORM DRAINAGE SYSTEM DESIGN  
(RATIONAL METHOD PROCEDURE)

Subdivision: Lot 1 Two Dummies Subdivision  
Location: CO, Commerce City  
Design Storm: 100-Year

Project Name: 6601 Colorado Blvd  
Project No.: 6CH01  
Calculated By: MSJ  
Checked By: JRR  
Date: 10/3/22

STREET	Design Point	DIRECT RUNOFF							TOTAL RUNOFF				STREET		PIPE			TRAVEL TIME			REMARKS
		Basin ID	Area (Ac)	Runoff Coeff.	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Tc (min)	C*A (Ac)	I (in/hr)	Q (cfs)	Slope (%)	Street Flow (cfs)	Design Flow (cfs)	Slope (%)	Pipe Size (inches)	Length (ft)	Velocity (fps)	Tt (min)	
	1	A-1	0.69	0.79	5.0	0.54	9.02	4.9													Building Roof area
	1	A-2	0.87	0.59	5.0	0.51	9.02	4.6													Parking lot area north of building
	1	A-3	1.07	0.88	5.0	0.95	9.02	8.6													Parking lot area south of building
	1	A-4	2.90	0.49	5.0	1.42	9.02	12.8													Gravel lot, swale and inlet at north prop edge
	1	A-5	0.17	0.20	5.0	0.03	9.02	0.3													Landscape area, swale and inlet at north prop edge
	1	A-6	2.16	0.37	5.0	0.80	9.02	7.2													Gravel lot, swale and inlet along north and west edge
	1	A-7	3.03	0.36	5.0	1.09	9.02	9.8													Gravel lot, sheet flow to infiltration pond
									5.0	5.34	4.79	25.6									Total runoff from on-site to infiltration pond
	2	B-1	0.13	0.34	5.0	0.04	9.02	0.4													East frontage of site sheet flowing east to Colo. Blvd
									5.0	0.04	4.79	0.2									Total runoff from on-site to Colorado Blvd
	3	C-1	0.55	0.20	5.0	0.11	9.02	1.0													Existing area to remain. All Lscape. Sheet flow to canal
									5.0	0.11	4.79	0.5									Total runoff from on-site to O'Brian Canal



## **APPENDIX B – Hydrology Calculations**

### Composite Imperviousness Calculations

*MHFD-Detention, Version 4.04 (February 2021)*

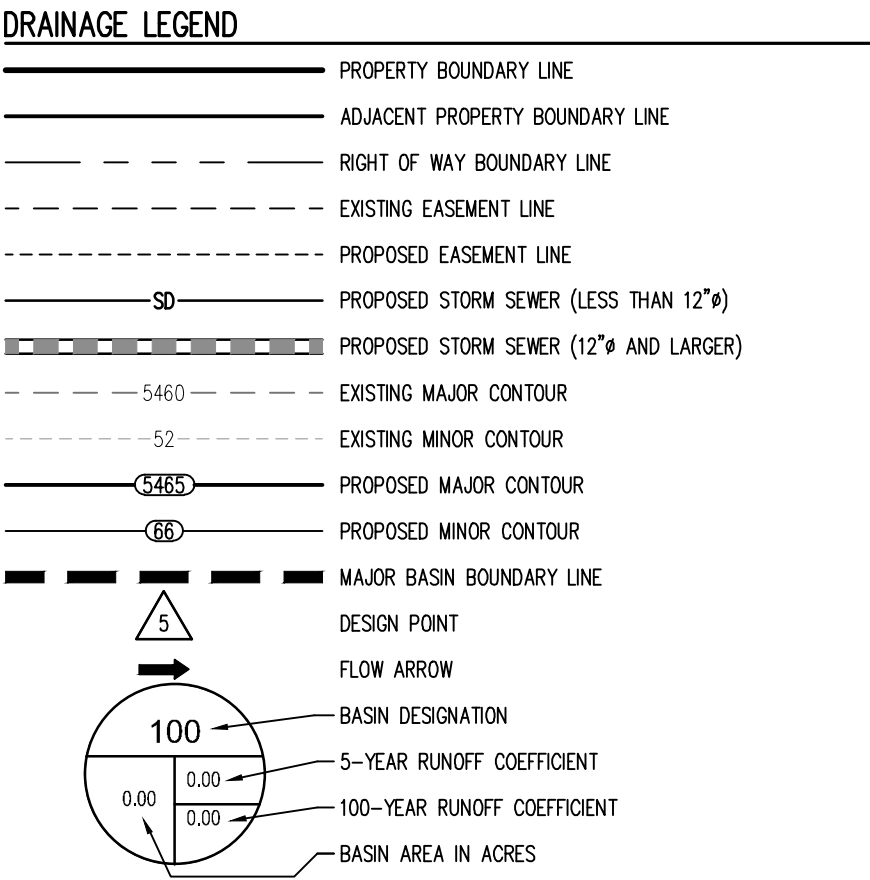
Basin ID: Site

## **APPENDIX C – Hydraulic Calculations**

Infiltration Pond Sizing Calculations

UD-Detention Spreadsheets

## **APPENDIX D – Drainage Map**



Project No:	6CH000001
Drawn By:	RDG
Checked By:	MSJ
Date:	10/14/2022

[illegible]

**EXHIBIT E**

**Traffic Impact Study**



# TRAFFIC IMPACT STUDY

**6601 COLORADO HOLDING**

Commerce City, CO

---

PREPARED FOR:  
**6601 Colorado Holding, LLC**

PREPARED BY:  
**Brian Horan, PE**  
**Daniela Gonzalez**

**Galloway & Company, Inc.**  
**5500 Greenwood Plaza Blvd, Suite 200**  
**Greenwood Village, CO 80111**

DATE:  
**October 14, 2022**



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## **Executive Summary**

### **Site Location and Study Area**

The property that comprises the application area for the proposed development is approximately 11.6 acres in size and is identified as Adams County Parcel Numbers 0182501400005 and 0182501400006. It is located at 6601 Colorado Boulevard in Commerce City, Colorado. It is zoned Agricultural District (AG) and is currently occupied by a light industrial and residential use.

The study area is generally bounded by Colorado Boulevard to the east, Burlington Ditch to the west, and property lines to the north and south. The study area for the project includes those intersections identified that could be affected by the proposed development:

- 68<sup>th</sup> Avenue/Colorado Boulevard
- 64<sup>th</sup> Avenue/Colorado Boulevard
- Proposed Site Accesses

### **Description of Proposed Development**

The Applicant, 6601 Colorado Holding, LLC seeks to develop the property with a general light industrial use. Site access is being proposed via two full movement accesses on Colorado Boulevard.

## **Conclusions and Recommendations**

### **Conclusions**

Based on the results of this traffic impact study, the following may be concluded:

- Under existing traffic conditions, the intersections within the study area currently operate at overall acceptable levels of service (LOS) "C" or better during the weekday AM and PM peak hours.
- Under background future 2024 and 2044 traffic conditions, without the development of the subject site, delays would increase slightly at study intersections due to regional traffic growth.
- The proposed site development would generate, upon completion and full occupancy, 24 new weekday AM and 17 new weekday PM peak hour vehicle trips as well as 163 new weekday daily trips.
- Under total future traffic conditions with development of the site, study intersections would continue to operate at acceptable LOS "C" consistent with background conditions.
- Under total future traffic conditions with development of the site, all forecasted queues would be contained within their effective storage.

### **Recommendations**

- The Applicant should provide access consistent with the site plan contained herein.

## I. Introduction

### Overview

This report presents the results of a Traffic Impact Study (TIS) conducted in support of a site plan to develop an industrial use in Commerce City, Colorado. Currently, the site is zoned Agricultural District (AG) and is occupied by a light industrial and residential use.

The Applicant, 6601 Colorado Holding, LLC seeks to rezone the property from Agricultural District (AG) to either Medium-Intensity Industrial District (I-2) or Heavy-Intensity Industrial District (I-3). Per the requirements of the City of Commerce City Engineering Construction Standards and Specifications, Section 5.02, a TIS is required for “A rezoning application or for the application for annexation into the City”.

### Site Location and Study Area

The property that comprises the application area for the proposed development is approximately 11.6 acres in size and is identified as Adams County Parcel Numbers 0182501400005 and 0182501400006. It is located at 6601 Colorado Boulevard in Commerce City, Colorado as shown on Figure 1-1. Site access is being proposed via two full movement accesses on Colorado Boulevard.

The Applicant, 6601 Colorado Holding, LLC seeks to develop the property with a general light industrial use. A reduction of the Applicant’s proposed conceptual site plan is provided on Figure 1-2. A full-size copy of the plan is provided in Appendix A.

The study area is generally bounded by Colorado Boulevard to the east, Burlington Ditch to the west, and property lines to the north and south.

Tasks undertaken in the course of this study included the following:

1. Reviewed the Applicant’s proposed development plans and other background data.
2. Conducted a virtual field reconnaissance of existing roadway and intersection geometries, traffic controls, and speed limits.
3. Conducted peak hour turning movement counts at the key intersections.
4. Analyzed existing levels of service at each of the key study intersections based on the methodologies set forth in the Highway Capacity Guidelines (HCM) 6<sup>th</sup> Edition as reported by Synchro version 11.
5. Forecasted background future traffic volumes based on baseline traffic counts and regional traffic growth for build-out (2024), and long-range (2044) conditions.
6. Calculated background levels of service at each of the key study intersections for the projected build-out years based on background future traffic forecasts, and the existing lane use and traffic controls.
7. Estimated the number of AM and PM peak hour trips that would be generated by the proposed use based on the Institute of Transportation Engineers (ITE) Trip Generation Manual 11<sup>th</sup> Edition rates/equations and methodologies.

8. Prepared AM and PM peak hour total future traffic forecasts based on background traffic forecasts plus site traffic assignments for the 2024 (buildout year) as well as 2044 (long range) conditions.
9. Calculated total future levels of service for each of the key study intersections based on projected total future traffic forecasts, existing/future traffic controls and intersection geometries.
10. Identified roadway improvements required to accommodate future traffic volumes as necessary.

Sources of data for this analysis included the ITE, HCM 6th, 6601 Colorado Holding, LLC, Commerce City, Colorado, and the files/library of Galloway.

## **Site Description and Access**

### **Site Conditions**

The terrain proximate to and surrounding the site is generally classified as "level".

### **Hazardous Conditions**

Based on the field reconnaissance in the vicinity of the subject site, no hazardous features or constraints were identified.

### **Proposed Site Access**

Access to the site is being proposed via two existing full movement accesses on Colorado Boulevard.

### **Existing Zoning**

The subject site is currently zoned Agricultural District (AG) and is currently occupied by a light industrial and residential use. Figure 1-3 depicts the existing zoning associated with the subject property, as well as neighboring properties as shown on the Commerce City zoning map.

### **Nearby Uses**

The properties surrounding the subject site are generally industrial uses to the north and south, and residential uses to the east.

### **Comprehensive Plan Land Use Recommendations for the Property**

According to the Commerce City Comprehensive Plan the future land use planned for the subject site is General Industrial. Primary uses include medium intensive and heavy-industrial uses. Secondary uses include flex space, warehousing, outdoor storage, open space, and other public uses and facilities. The proposed use is in conformance with the Comprehensive Plan.



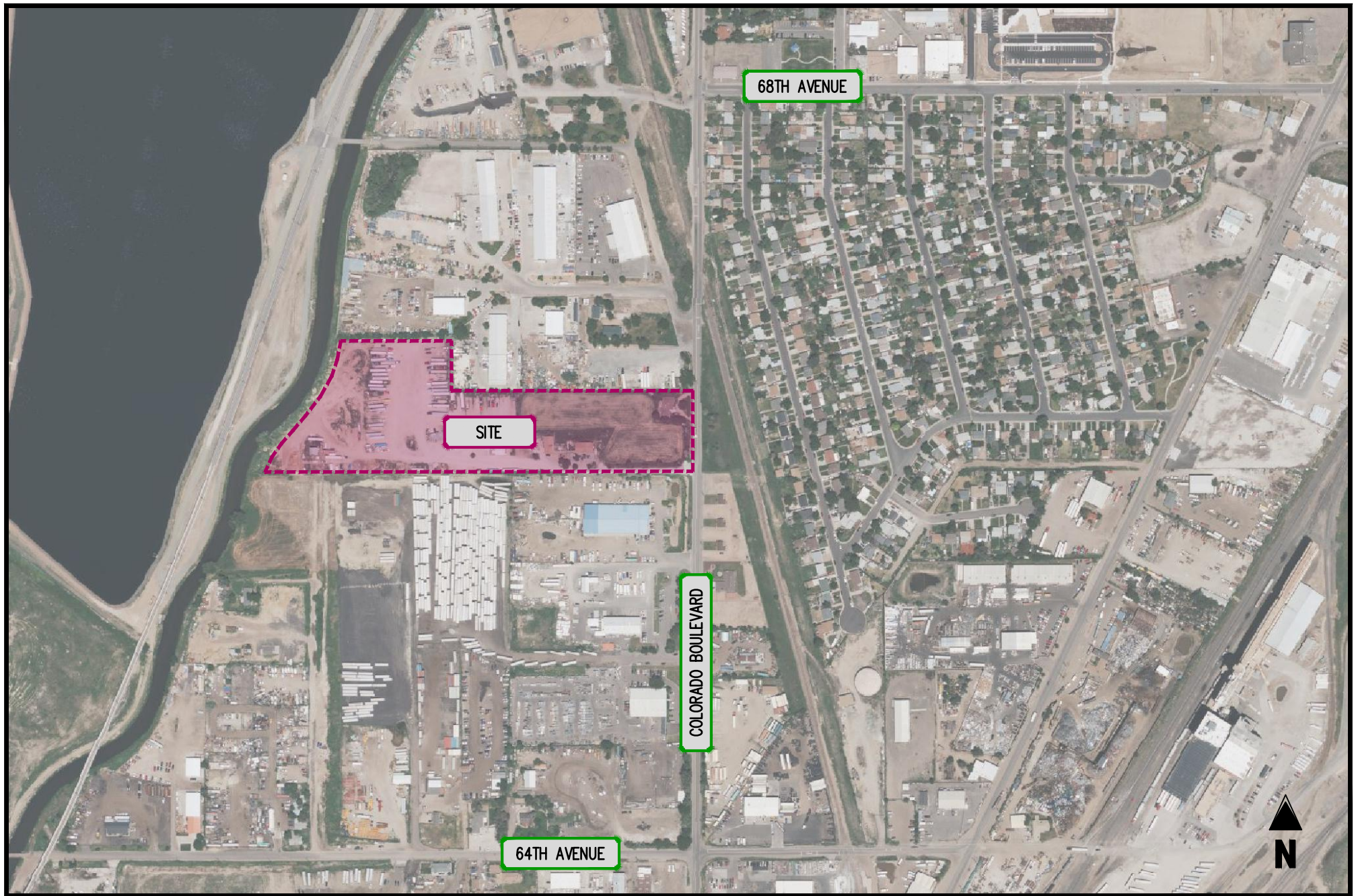


FIGURE 1-1  
SITE LOCATION





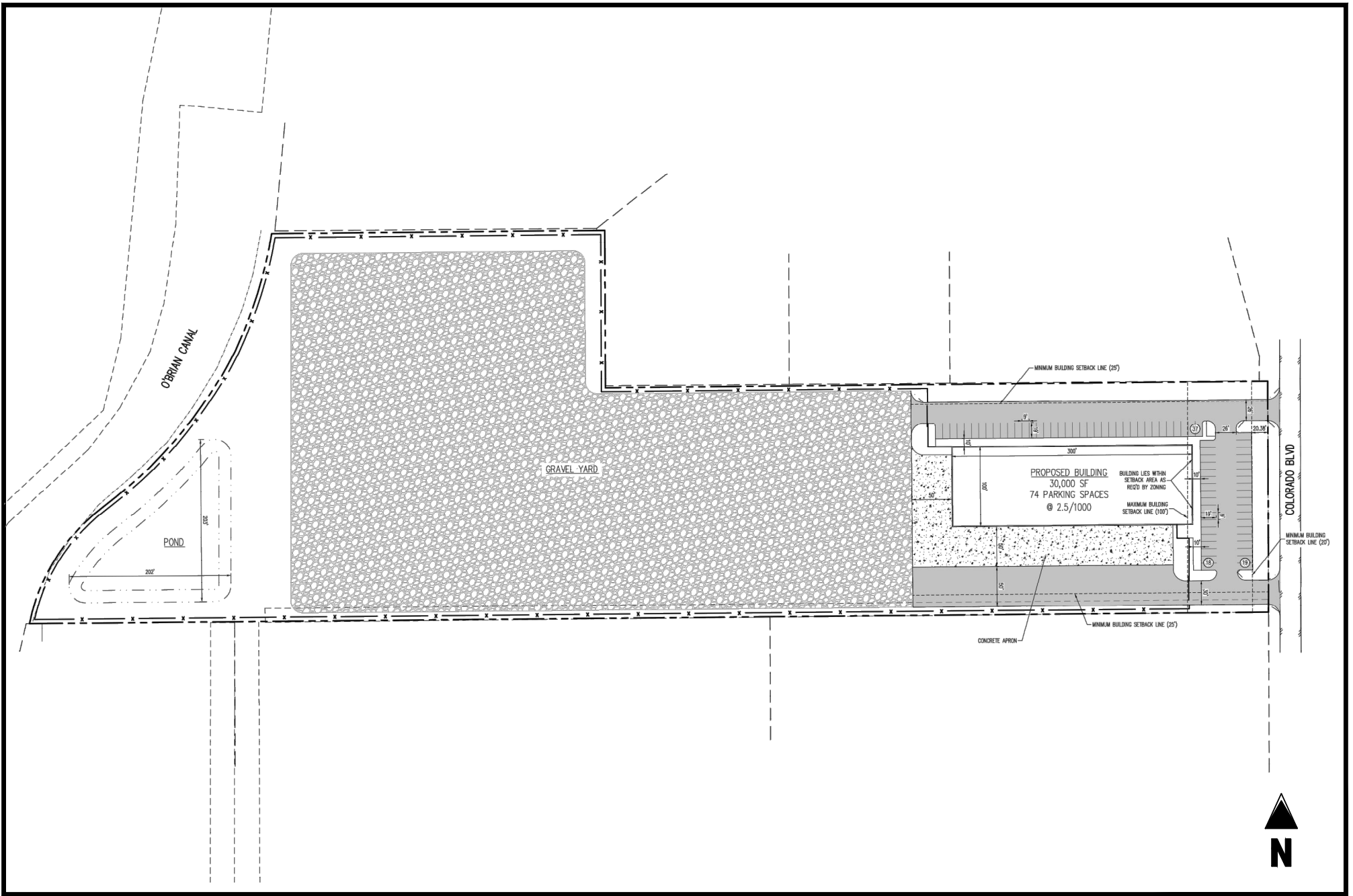


FIGURE 1-2  
SITE PLAN



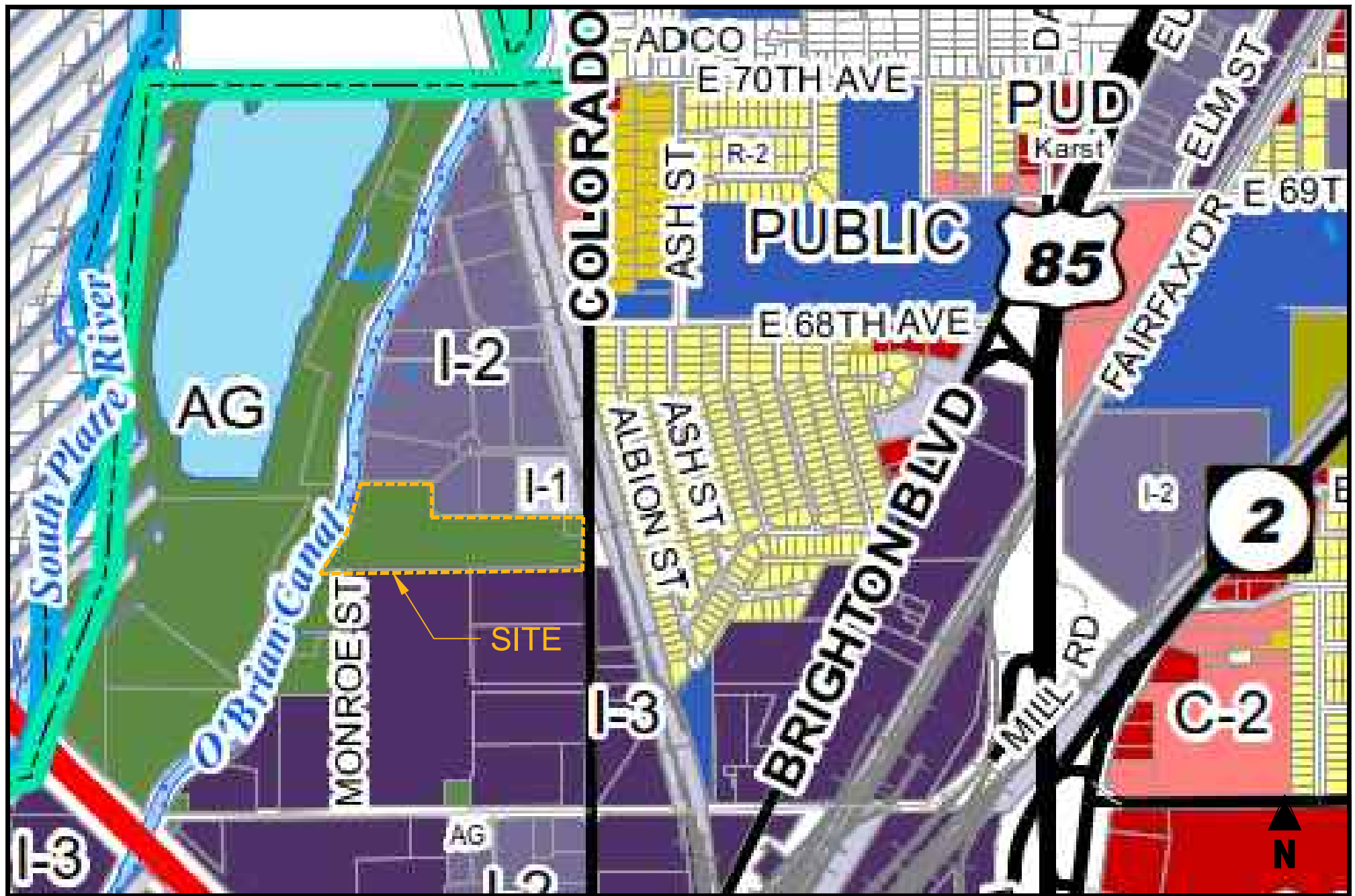


FIGURE 1-3  
EXISTING ZONING



## II. Background Information

### Study Area

The study area was determined by a review of intersections that would experience a significant portion of turning movement volumes generated by the site. As such, the traffic study focuses primarily on the following intersections:

#### **Study Intersections**

- 68<sup>th</sup> Avenue/Colorado Boulevard
- 64<sup>th</sup> Avenue/Colorado Boulevard
- Proposed Site Accesses

### Study Assumptions

For purposes of this analysis only, the proposed use is assumed to be built and occupied in one distinct phase. It was assumed that the use would be built and operational in study year 2024. As required by Commerce City, a long-term analysis of 2044 is also provided.

### Study Methodology

Synchro software version 11 was used to evaluate levels of service at each of the study intersections during the weekday AM and PM peak hours. Synchro is a macroscopic model used for optimizing traffic signal timing and performing capacity analyses. The software can model existing traffic signal timings or optimize splits, offsets, and cycle lengths for individual intersections, an arterial, or a complete network. Synchro allows the user to evaluate the effects of changing intersection geometrics, traffic demands, traffic control, and/or traffic signal settings as well as optimize traffic signal timings.

The levels of service reported for the study intersections analyzed herein were taken from the Highway Capacity Manual (HCM) 6<sup>th</sup> reports generated by Synchro 11. Level of service descriptions are included in Appendix B.

### Existing Roadway Network

Regional and local access to the subject site is provided via Colorado Boulevard. Figure 2-1 depicts existing lane use and traffic controls in the vicinity of the subject site. The following provides a description of the roadway within the study network.

#### **Colorado Boulevard**

Colorado Boulevard is constructed as a two-lane undivided section with a posted speed limit of 35 mph in the vicinity of the subject site. The city of Commerce City classifies the roadway as a Major Collector. The intersections with 68<sup>th</sup> Avenue and 64<sup>th</sup> Avenue operate under stop control.

### Assumed Improvements

No funded/programmed roadway improvements were identified at the study intersections.





### **III. Analysis of Existing Conditions**

#### **Traffic Volumes**

Weekday AM and PM peak hour traffic volumes counts were conducted on Thursday September 1, 2022, from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM at the study intersections by IDAX Data Solutions.

Based on a review of the intersection volumes, for purposes of this study, the peak hour of each intersection was selected in order to provide a conservative analysis.

The existing volumes are summarized on Figure 3-1. Copies of traffic counts are included in Appendix C. Existing peak hour factors (PHF) were also computed by approach from the traffic counts and applied to the analysis with a minimum of 0.85 and a maximum of 0.92.

#### **Operational Analysis**

Capacity/level of service analyses were conducted at the study intersections based on the existing lane use and traffic controls shown on Figure 2-1 and existing baseline vehicular traffic volumes shown on Figure 3-1. The capacity analysis results are presented in Appendix D and summarized in Table 3-1 and on Figure 3-2.

As shown in Table 3-1, the study intersections, currently operate at overall acceptable LOS “C” or better during the weekday peak hours.

#### **Existing Intersection Queues**

An analysis of intersection 95<sup>th</sup>-percentile queues was performed at key locations. The results of the queuing analysis, as reported by Synchro, are summarized in Table 3-2.

As shown in the table, the existing queues are contained within the effective storage within the study area.



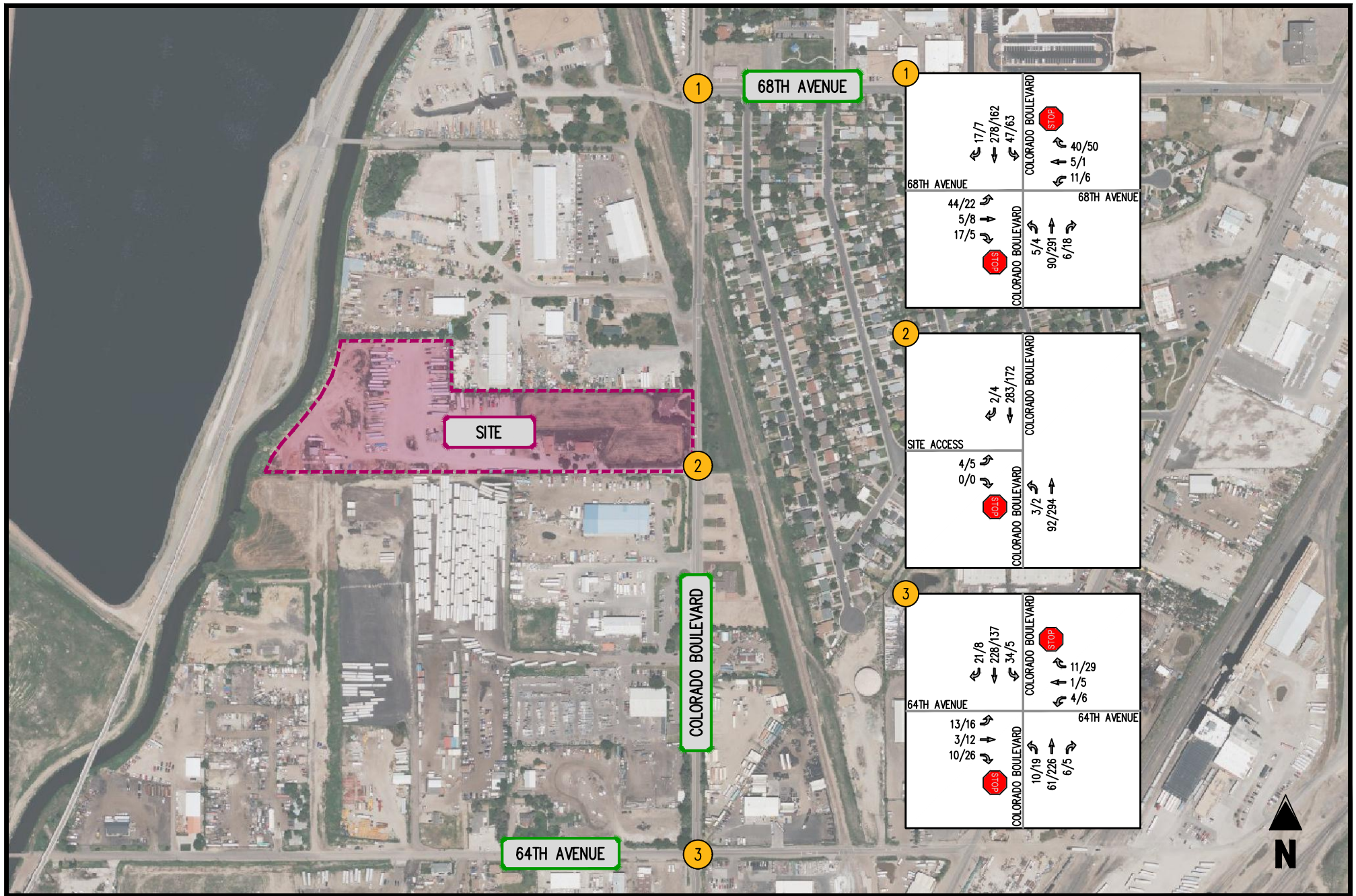


FIGURE 3-1  
EXISTING VOLUMES





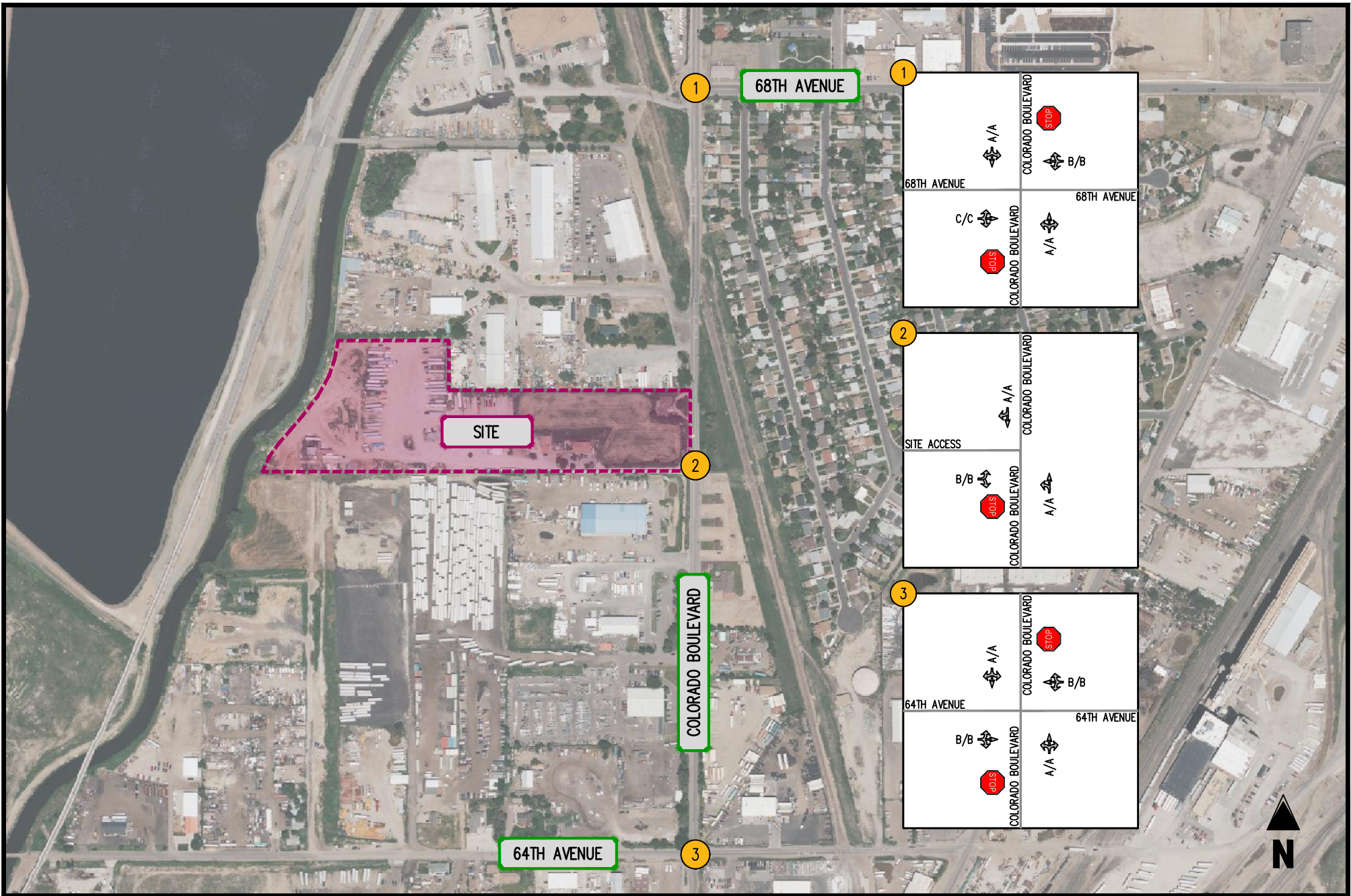


FIGURE 3-2  
EXISTING LOS



Table 3-1  
6601 COLORADO HOLDING, LLC  
Existing Intersection Level of Service Summary (1) (2)

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing 2022	
				AM Peak Hour	PM Peak Hour
1 68TH AVENUE/COLORADO BOULEVARD	STOP	68TH AVENUE 68TH AVENUE COLORADO BOULEVARD COLORADO BOULEVARD	EBLTR WBLTR NBLTR SBLTR	C [17.9] B [11.0] A [8.5] A [7.5]	C [18.1] B [11.6] A [8.7] A [8.2]
2 SITE ACCESS/COLORADO BOULEVARD	STOP	SITE ACCESS COLORADO BOULEVARD COLORADO BOULEVARD	EBLR NBLT SBTR	B [12.4] A [8.8] A [0.0]	B [12.4] A [8.2] A [0.0]
3 64TH AVENUE/COLORADO BOULEVARD	STOP	64TH AVENUE 64TH AVENUE COLORADO BOULEVARD COLORADO BOULEVARD	EBLTR WBLTR NBLTR SBLTR	B [13.1] B [10.4] A [8.2] A [7.7]	B [12.1] B [11.3] A [7.8] A [8.8]

Notes (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Table 3-2  
6601 COLORADO HOLDING, LLC  
Existing Intersection Queueing Summary (1)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Existing 2022	
					AM Peak Hour	PM Peak Hour
1 68TH AVENUE/COLORADO BOULEVARD	STOP	68TH AVENUE	EBLTR	-	20	10
		68TH AVENUE	WBLTR	-	7.5	7.5
		COLORADO BOULEVARD	NBLTR	-	0	0
		COLORADO BOULEVARD	SBLTR	-	2.5	5
2 SITE ACCESS/COLORADO BOULEVARD	STOP	SITE ACCESS	EBLR	-	0	0
		COLORADO BOULEVARD	NBLT	-	0	0
		COLORADO BOULEVARD	SBTR	-	0	0
3 64TH AVENUE/COLORADO BOULEVARD	STOP	64TH AVENUE	EBLTR	-	5	10
		64TH AVENUE	WBLTR	-	2.5	5
		COLORADO BOULEVARD	NBLTR	-	0	2.5
		COLORADO BOULEVARD	SBLTR	-	2.5	0

Note (1) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.

## **IV. Analysis of Future Conditions without Site Development**

### **Methodology**

The future traffic forecasts, without the proposed new use, were developed for 2024 and 2044 conditions based on a composite of existing baseline traffic volumes and regional traffic. A 1.0% growth factor per year was applied to the existing traffic volumes.

### **Regional Growth**

Increases in traffic associated with regional growth were estimated at 1.0 percent per year compounded for movements along the study intersections up to 2024 as well as to 2044. This growth accounts for increases in traffic resulting from influences outside of the immediate study area. The resulting increases in traffic within the study area are reflected on Figure 4-1 for 2024 build-out year conditions and Figure 4-2 for 2044 long range conditions.

### **Background Traffic Forecasts**

The existing traffic forecasts depicted on Figure 3-1 and the regional growth shown on Figure 4-1 (2024) and Figure 4-2 (2044) were added together to yield the background future traffic forecasts shown on Figure 4-3 for 2024 conditions, and Figure 4-4 for 2044 conditions.

### **Background Future Levels of Service**

Capacity analyses of 2024 and 2044 future traffic conditions without the proposed development are provided in Appendix E and summarized in Table 4-1. The forecasted levels of service are also depicted graphically on Figure 4-5 for 2024 conditions and Figure 4-6 for 2044 conditions.

As shown on Table 4-1, the signalized intersections within the study area would operate at overall acceptable LOS "C" or better during the AM and PM peak hours, consistent with existing conditions.

### **Background Future Queueing**

An analysis of intersection queues was performed at key locations under background future traffic conditions. The results of the queuing analysis are summarized in Table 4-2.

As shown in the table, queues within the study network will increase due to regional traffic growth and pipeline development. Forecasted queues would be contained within their effective storage.



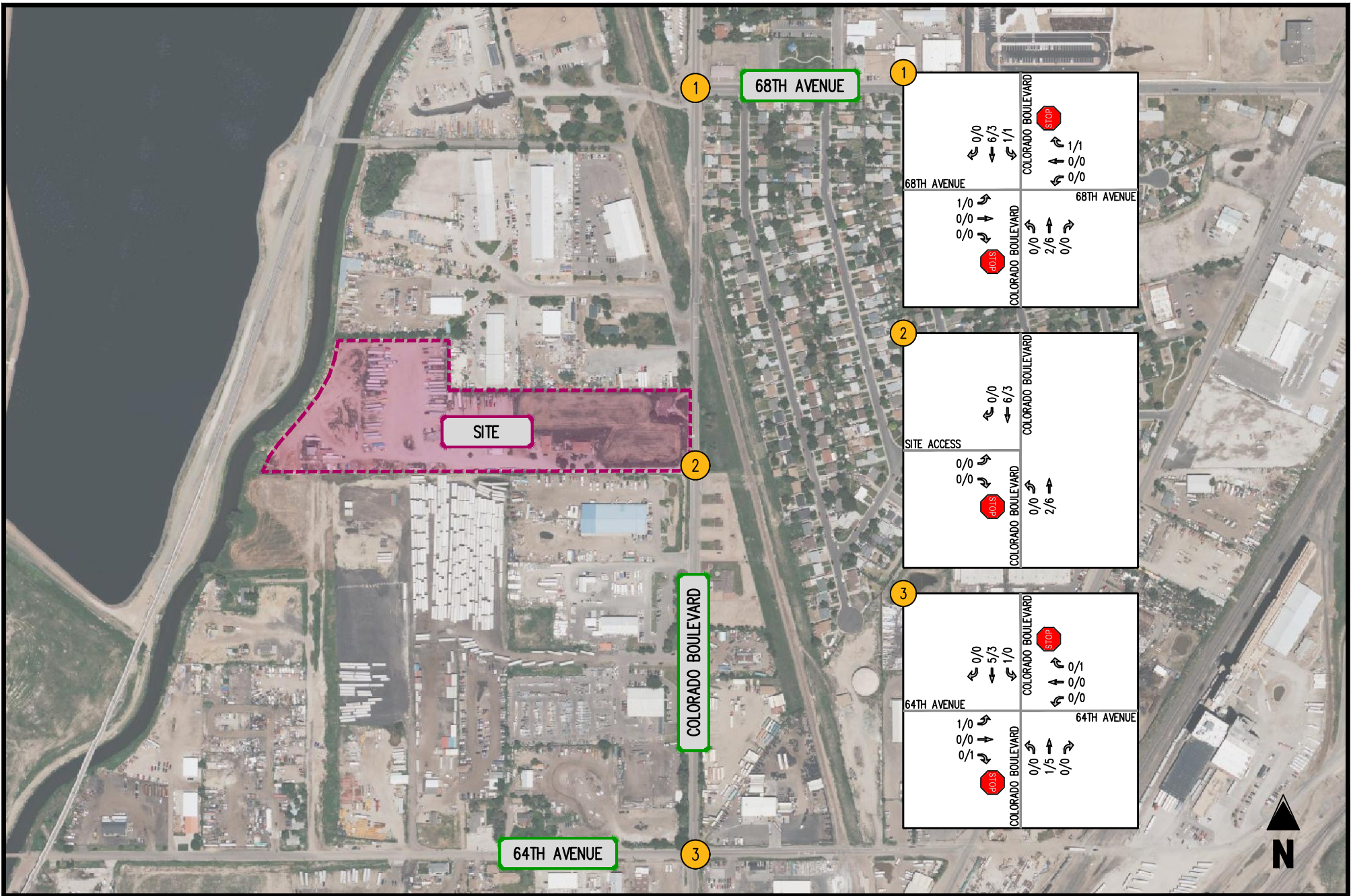


FIGURE 4-1  
BACKGROUND 2024 GROWTH

6601 COLORADO HOLDING, LLC  
COMMERCE CITY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

← MOVEMENT

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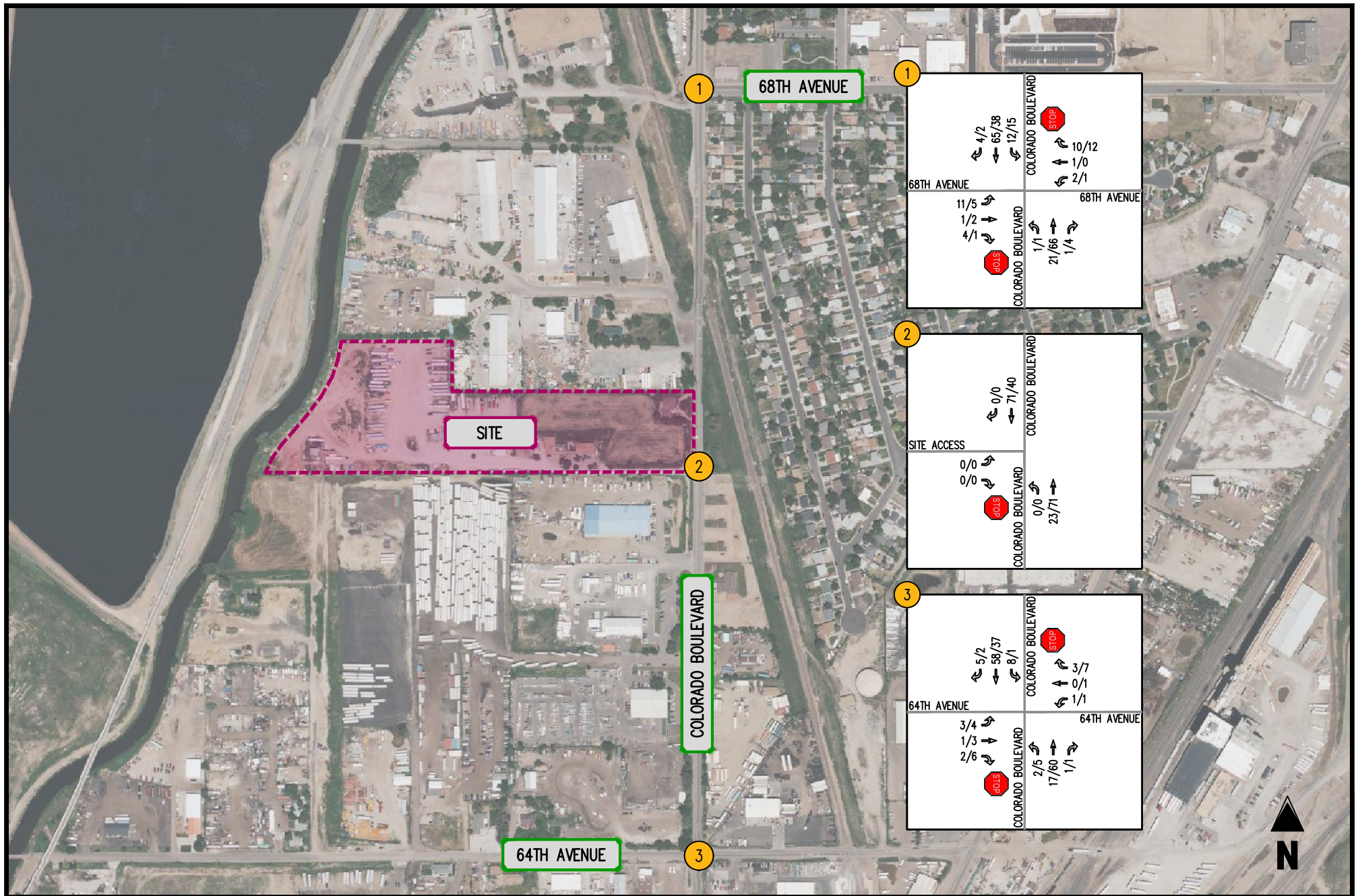


FIGURE 4-2  
BACKGROUND 2044 GROWTH

6601 COLORADO HOLDING, LLC  
COMMERCE CITY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

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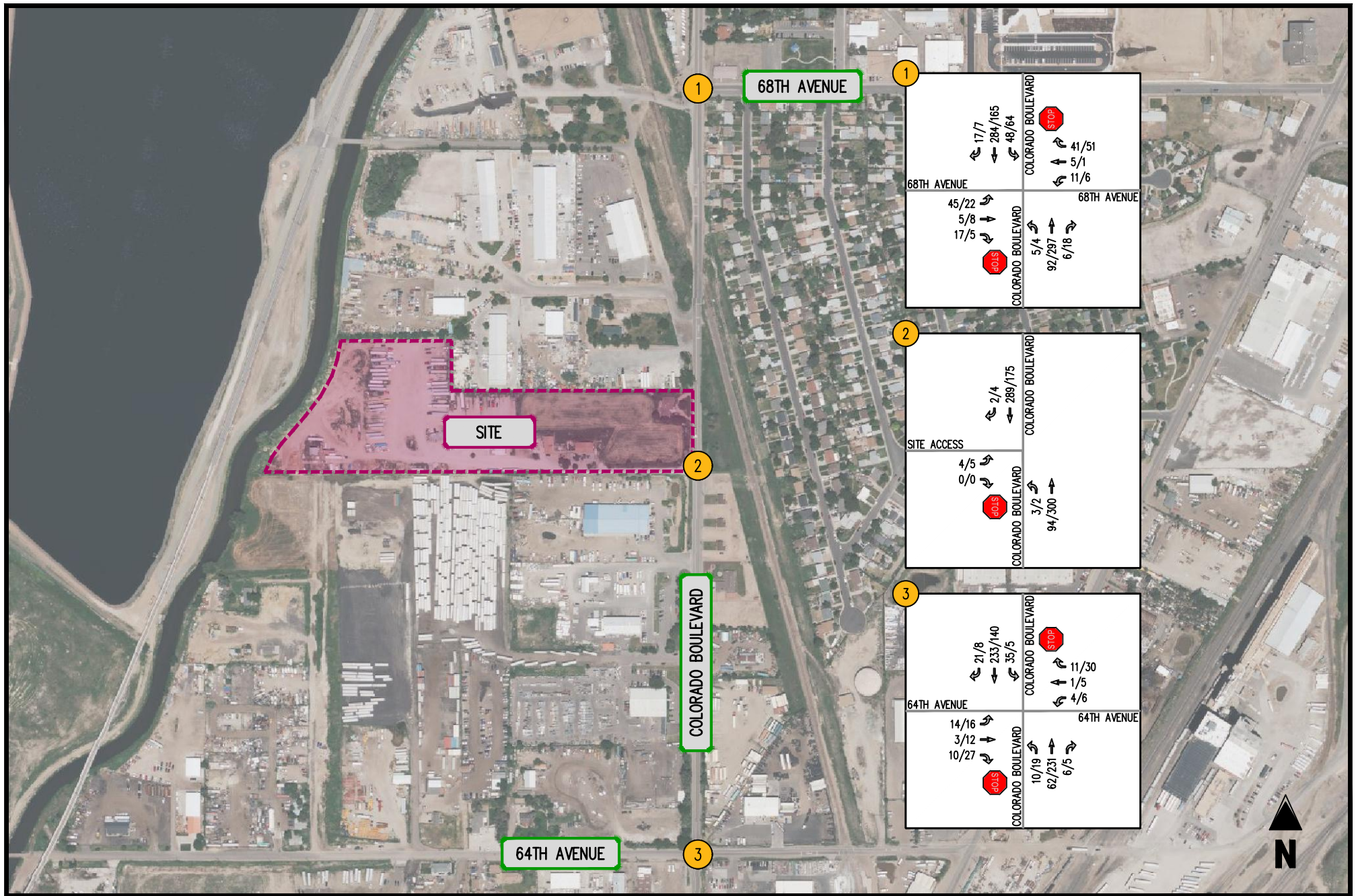


FIGURE 4-3  
BACKGROUND 2024 FORECASTS





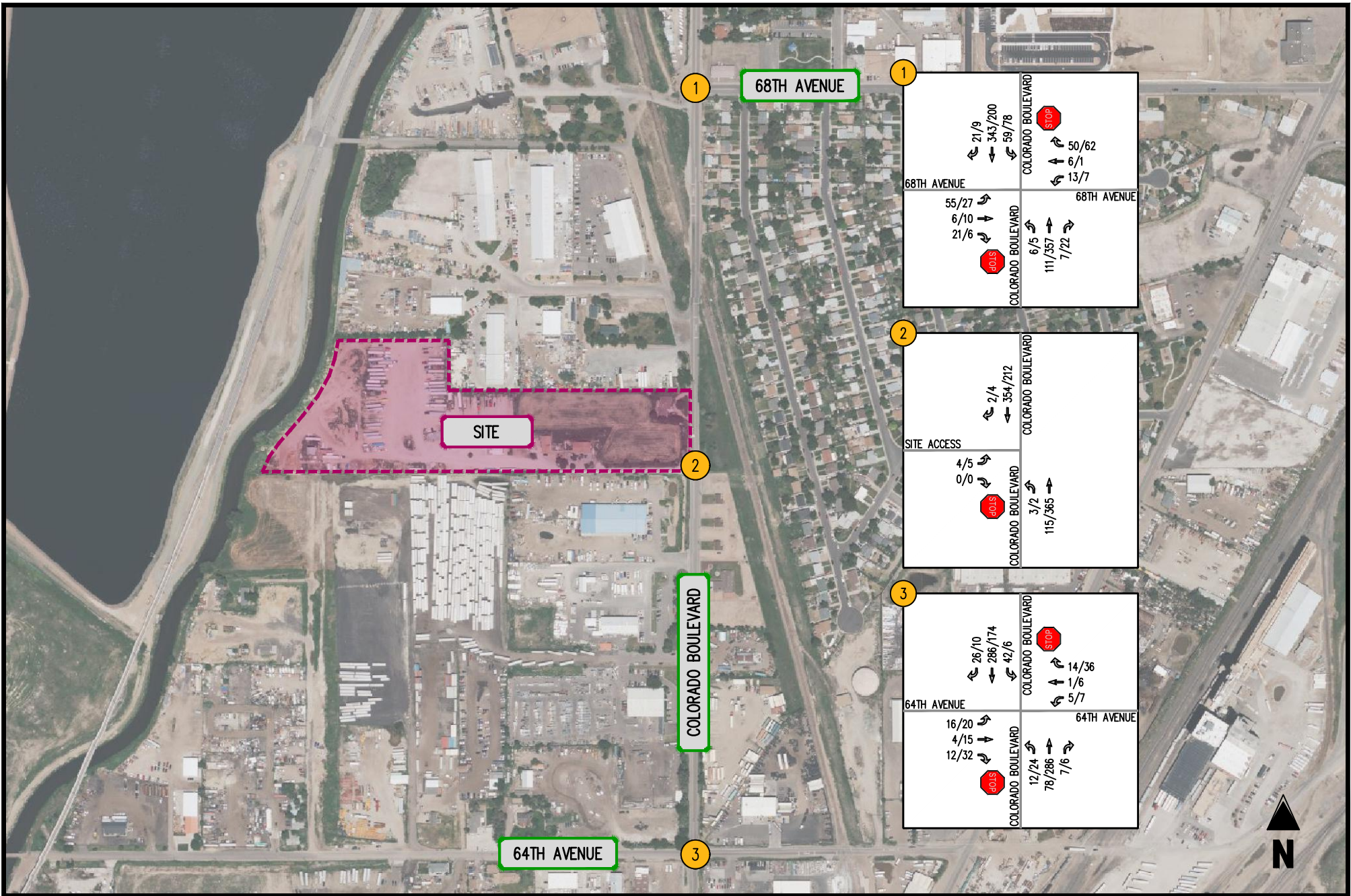


FIGURE 4-4  
BACKGROUND 2044 FORECASTS

6601 COLORADO HOLDING, LLC  
COMMERCE CITY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

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STOP SIGN





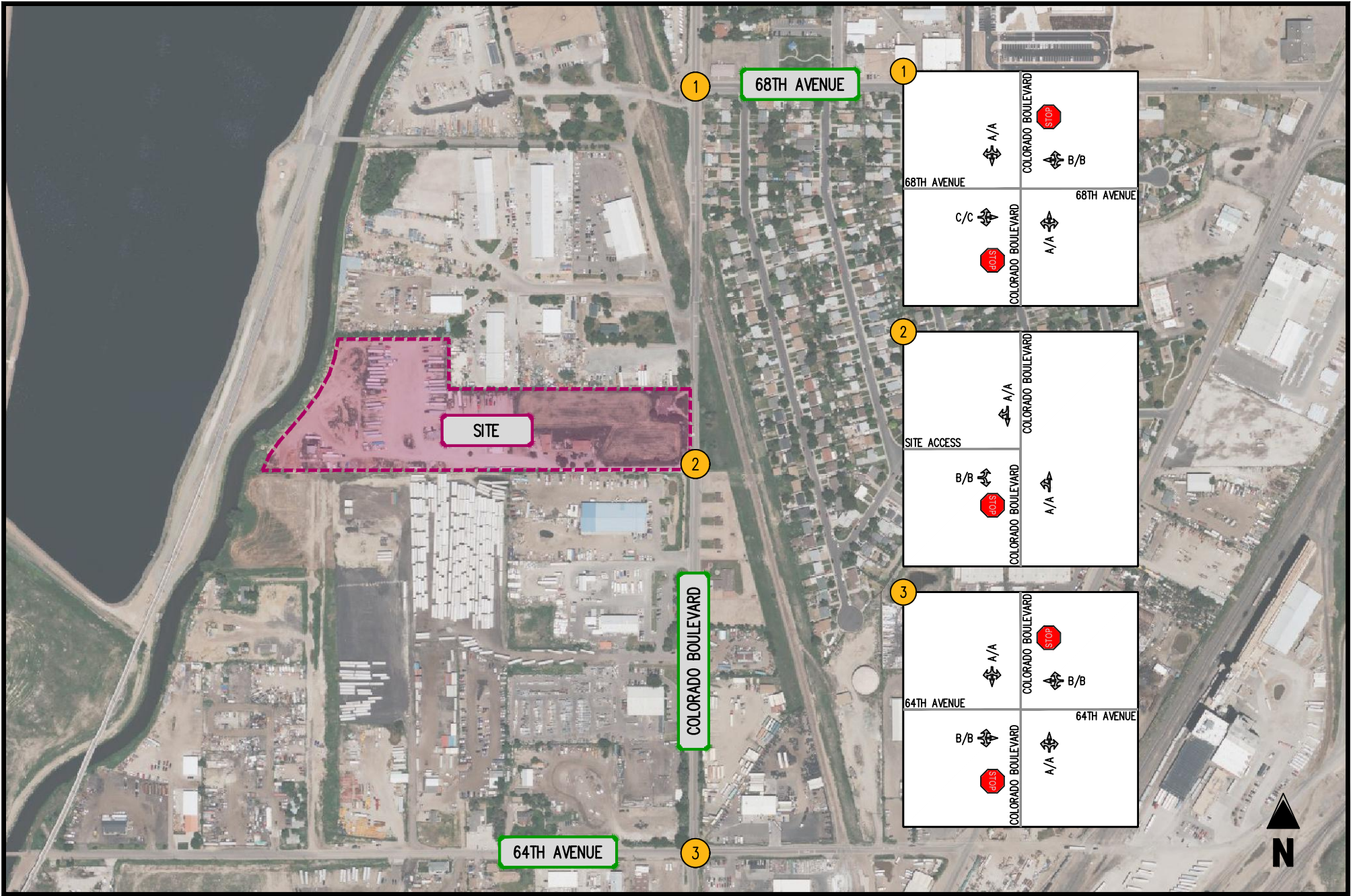


FIGURE 4-5  
BACKGROUND 2024 LOS

6601 COLORADO HOLDING, LLC  
COMMERCE CITY, CO

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← MOVEMENT

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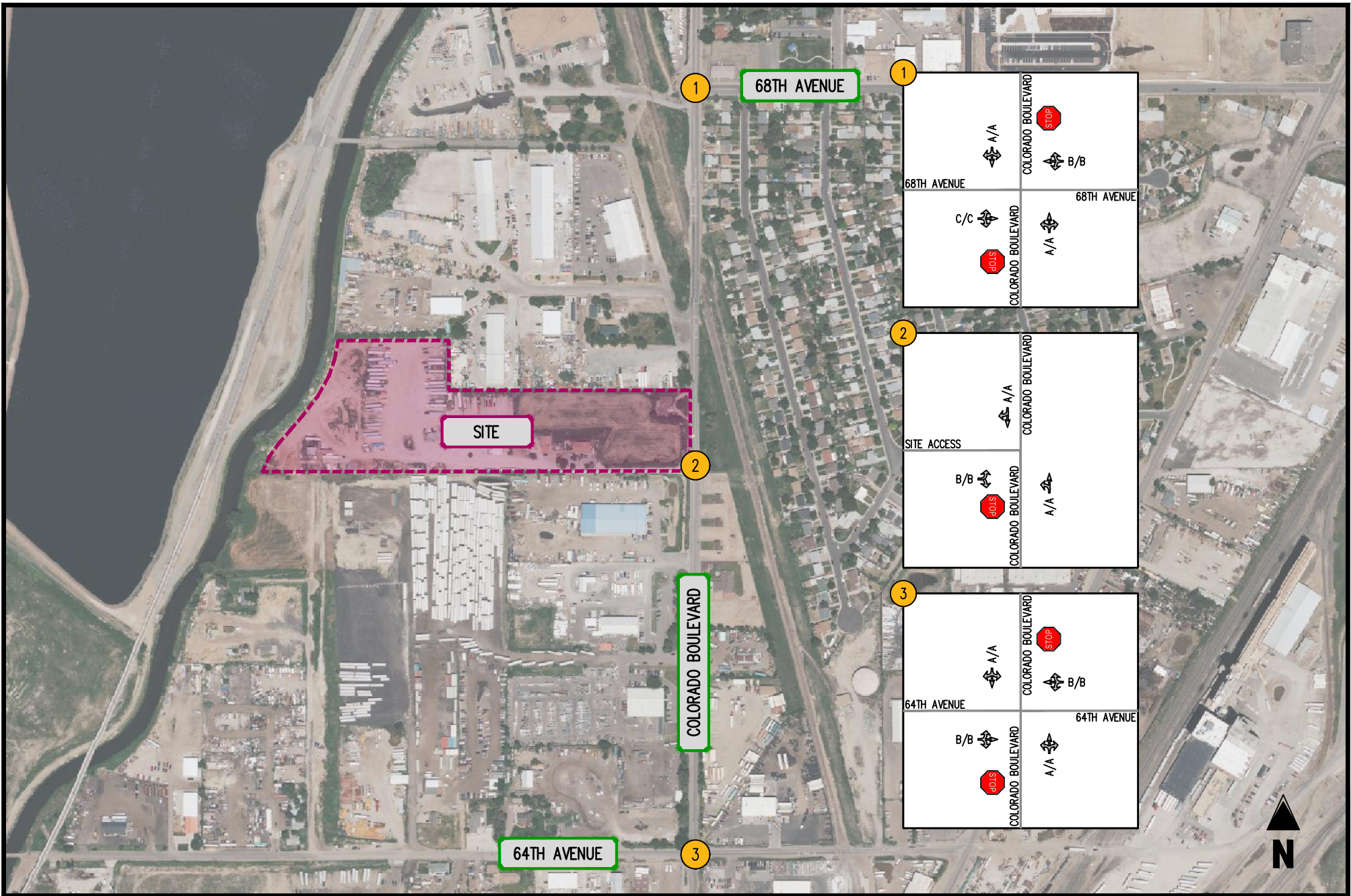


FIGURE 4-6  
BACKGROUND 2044 LOS



Table 4-1  
6601 COLORADO HOLDING, LLC  
Background Future Intersection Level of Service Summary (1) (2)

Intersection	Operating Condition	Street Name	Approach/ Movement	Existing 2022		Background 2024		Background 2044	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1 68TH AVENUE/COLORADO BOULEVARD	STOP	68TH AVENUE 68TH AVENUE COLORADO BOULEVARD COLORADO BOULEVARD	EBLTR WBLTR NBLTR SBLTR	C [17.9] B [11.0] A [8.5] A [7.5]	C [18.1] B [11.6] A [8.7] A [8.2]	C [17.0] B [10.8] A [8.5] A [7.5]	C [17.3] B [11.5] A [8.7] A [8.2]	C [21.8] B [11.6] A [8.7] A [7.6]	C [22.1] B [12.6] A [8.8] A [8.4]
2 SITE ACCESS/COLORADO BOULEVARD	STOP	SITE ACCESS COLORADO BOULEVARD COLORADO BOULEVARD	EBLR NBLT SBTR	B [12.4] A [8.8] A [0.0]	B [12.4] A [8.2] A [0.0]	B [12.2] A [8.8] A [0.0]	B [12.1] A [8.2] A [0.0]	B [13.2] A [9.1] A [0.0]	B [13.2] A [8.3] A [0.0]
3 64TH AVENUE/COLORADO BOULEVARD	STOP	64TH AVENUE 64TH AVENUE COLORADO BOULEVARD COLORADO BOULEVARD	EBLTR WBLTR NBLTR SBLTR	B [13.1] B [10.4] A [8.2] A [7.7]	B [12.1] B [11.3] A [7.8] A [8.8]	B [13.1] B [10.3] A [8.2] A [7.7]	B [11.7] B [11.1] A [7.8] A [8.8]	B [14.6] B [10.9] A [8.4] A [7.8]	B [13.2] B [12.1] A [7.9] A [9.0]

Notes (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Table 4-2  
6601 COLORADO HOLDING, LLC  
Background Future Intersection Queueing Summary (1)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Existing 2022		Background 2024		Background 2044	
					AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1 68TH AVENUE/COLORADO BOULEVARD	STOP	68TH AVENUE	EBLTR	-	20	10	17.5	10	30	17.5
		68TH AVENUE	WBLTR	-	7.5	7.5	7.5	7.5	10	12.5
		COLORADO BOULEVARD	NBLTR	-	0	0	0	0	0	0
		COLORADO BOULEVARD	SBLTR	-	2.5	5	2.5	5	2.5	5
2 SITE ACCESS/COLORADO BOULEVARD	STOP	SITE ACCESS	EBLR	-	0	0	0	0	0	0
		COLORADO BOULEVARD	NBLT	-	0	0	0	0	0	0
		COLORADO BOULEVARD	SBTR	-	0	0	0	0	0	0
3 64TH AVENUE/COLORADO BOULEVARD	STOP	64TH AVENUE	EBLTR	-	5	10	5	7.5	7.5	12.5
		64TH AVENUE	WBLTR	-	2.5	5	2.5	5	2.5	7.5
		COLORADO BOULEVARD	NBLTR	-	0	2.5	0	0	0	2.5
		COLORADO BOULEVARD	SBLTR	-	2.5	0	2.5	0	2.5	0

Note (1) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.



## V. Site Analysis

### Overview

The Applicant is proposing to develop the approximately 11.6 acre site with a general light industrial use. For purposes of this study, the site will be developed in one phase. For analysis purposes it was assumed that the development would be complete and operational in study year 2024. The following use and development programs were analyzed:

#### Build Out - 2024

30,000 SF General Light Industrial

### Proposed Site Access

As shown on the Applicant's conceptual plan (Figure 1-2), access to the development is being proposed via two existing full movement accesses on Colorado Boulevard

### Trip Generation

#### **Overview**

Trip generation estimates for the weekday AM and PM peak hours, as well as the weekday average daily traffic (ADT), were derived from the standard Institute of Transportation Engineers (ITE) Trip Generation Manual rates/equations, as published in the 11<sup>th</sup> edition. The trip generation analysis is presented in Table 5-1.

#### **Site Trips**

The vehicle trips that would be generated by the proposed development plan are summarized in Table 5-1. As shown in Table 5-1, the site would generate upon completion and full occupancy, 24 new weekday AM and 17 new weekday PM peak hour vehicle trips as well as 163 new weekday daily trips.

#### **Site Trip Distributions**

The distribution of the anticipated trips generated by the completion of the proposed development was based on an examination of existing traffic counts and local knowledge. Existing travel patterns indicate the following distribution is appropriate in the forecasting of future site traffic:

- To/from the north on Colorado Boulevard: 50%
- To/from the south on Colorado Boulevard: 50%

#### **Site Trip Assignments**

The assignment of the new vehicle trips generated upon the future build-out of the development project was based on the above distribution. The trips assignments are depicted on Figure 5-1.



Table 5-1

6601 Colorado Holding

Site Trip Generation

Land Use	Land Use Code	Amount	Units	AM Peak Hour			PM Peak Hour			Average Daily Trips
				In	Out	Total	In	Out	Total	
<i>Proposed</i> <sup>(1)</sup> General Light Industrial	110	30,000	SF	21	3	24	2	15	17	163

Note(s):

(1) Trip generation based on the Institute of Transportation Engineers' Trip Generation Manual, 11th Edition

## **VI. Analysis of Future Conditions with Site Development**

### **Total Future Traffic Forecasts**

The 2024 and 2044 total future traffic forecasts associated with the proposed development were developed by combining background future forecasts shown on Figure 4-4 (2024) and Figure 4-5 (2044), and the site trip assignments shown on Figure 5-1. The resulting total future traffic forecasts are provided on Figure 6-1 for 2024 and Figure 6-2 for 2044 conditions.

### **Total Future Levels of Service with Proposed Development**

Future levels of service with the proposed development plan were estimated at key study intersections based on the future traffic volumes shown on Figures 6-1 and Figure 6-2, the existing lane use on Figure 2-1, and the HCM 6<sup>th</sup> methodologies for unsignalized intersections. The results of these analyses are provided in Appendix F and presented in Table 6-1. Total future levels of service are also presented graphically on Figure 6-3 (2024) and Figure 6-4 (2044).

As shown in Table 6-1, levels of service under future site development conditions would remain consistent with future background conditions (i.e., without site development). Overall delays would experience minor increase due to site trips. The intersections within the study area would continue to operate at acceptable overall LOS “C” or better in the AM and PM peak hours in all future scenarios.

### **Total Future Queuing**

Total future queues were forecasted using Synchro software. The results of the queuing analysis are summarized in Table 6-2. As shown on Table 6-2, forecasted queues would be contained within their effective storage consistent with background conditions.







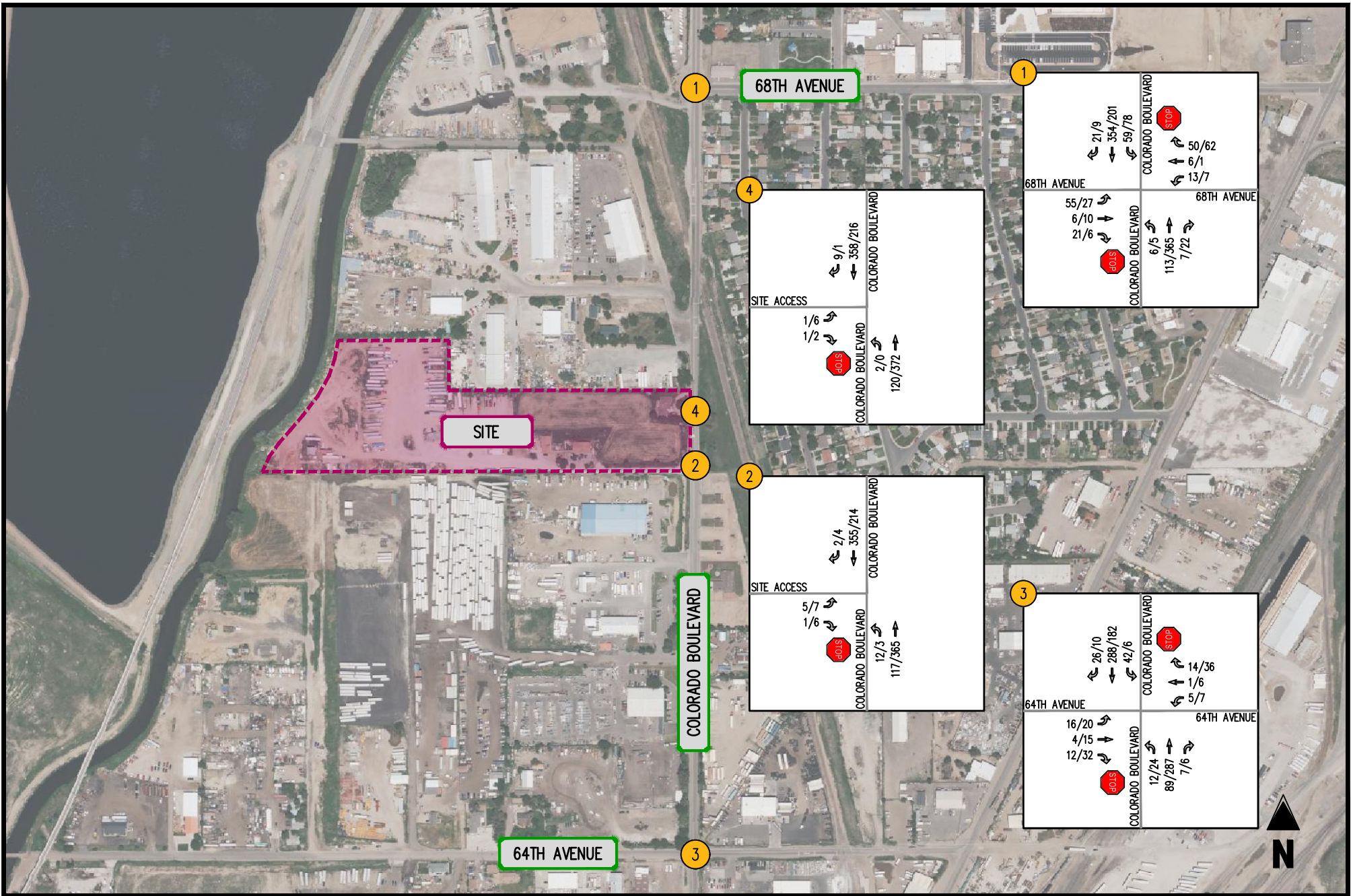


FIGURE 6-2  
TOTAL FUTURE 2044 FORECASTS

6601 COLORADO HOLDING, LLC  
COMMERCE CITY, CO

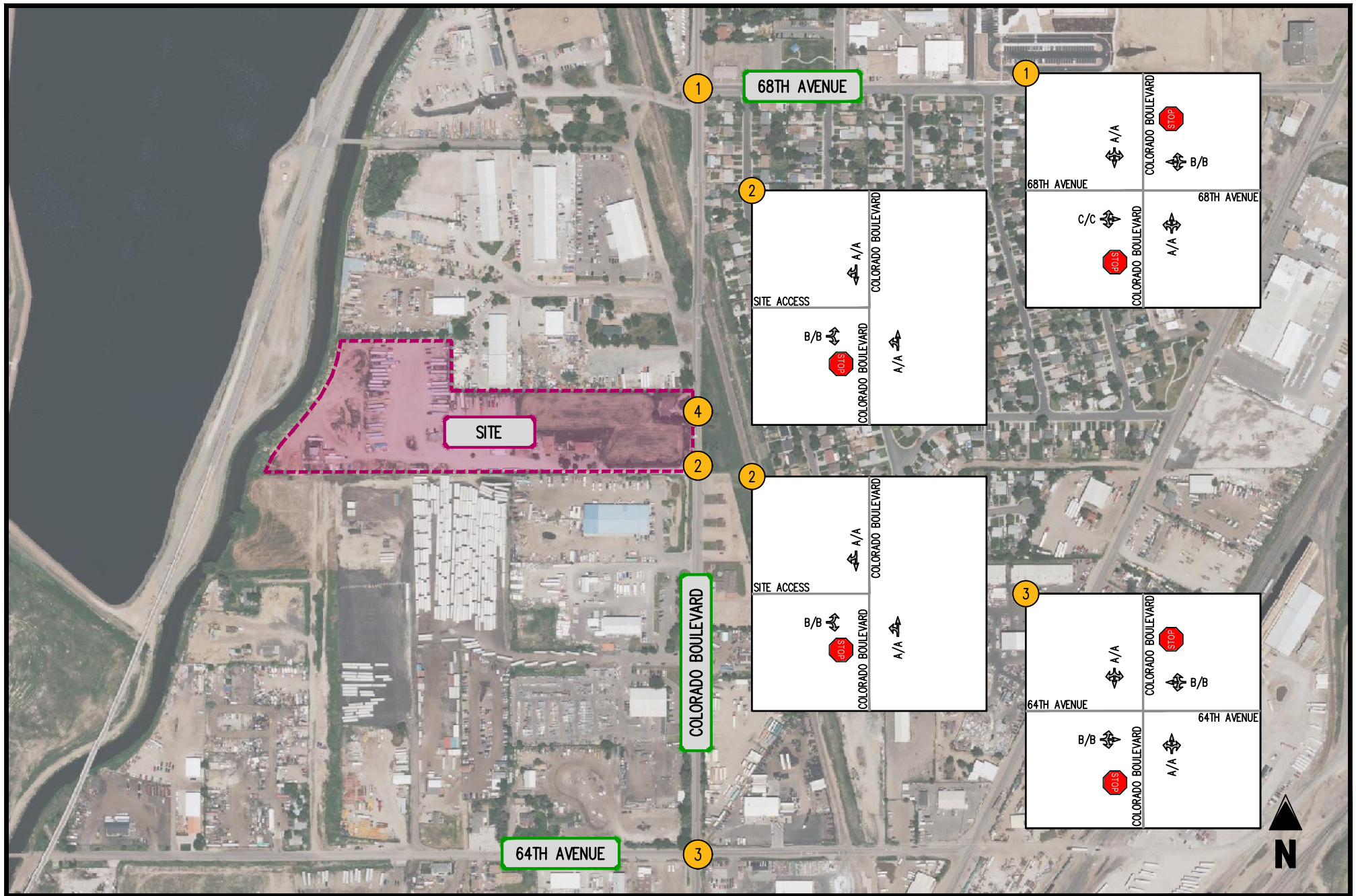
0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

← MOVEMENT

STOP SIGN









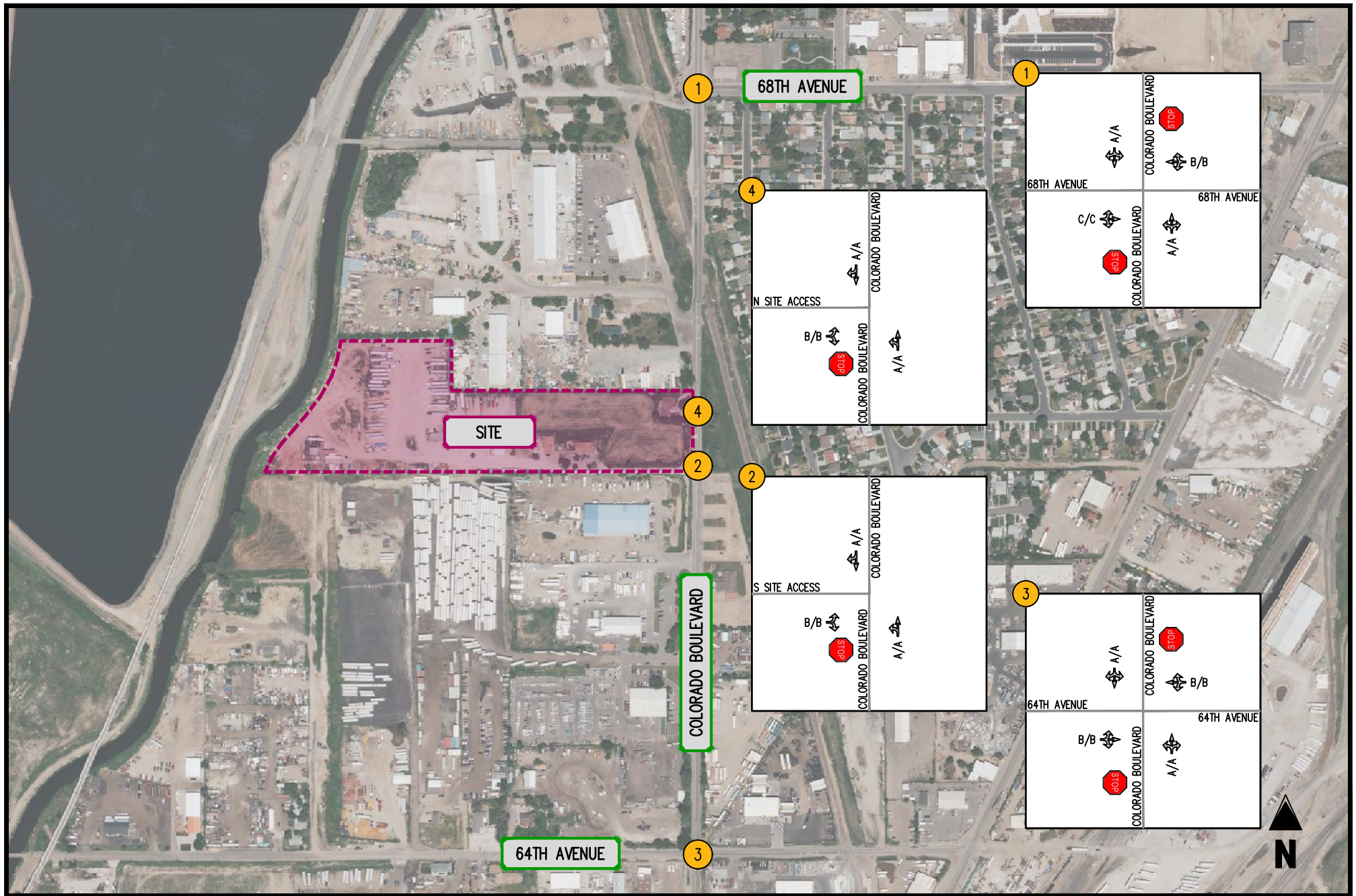


FIGURE 6-4  
TOTAL FUTURE 2044 LOS

6601 COLORADO HOLDING, LLC  
COMMERCE CITY, CO

0000/0000 (AM PEAK HOUR/PM PEAK HOUR)

← MOVEMENT

STOP STOP SIGN



Table 6-1  
6601 COLORADO HOLDING, LLC  
Total Future Intersection Level of Service Summary (1) (2)

Intersection	Operating Condition	Street Name	Approach/ Movement	Background 2024		Background 2044		Total Future 2024		Total Future 2044	
				AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1 68TH AVENUE/COLORADO BOULEVARD	STOP	68TH AVENUE 68TH AVENUE COLORADO BOULEVARD COLORADO BOULEVARD	EBLTR WBLTR NBLTR SBLTR	C [17.0] B [10.8] A [8.5] A [7.5]	C [17.3] B [11.5] A [8.7] A [8.2]	C [21.8] B [11.6] A [8.7] A [7.6]	C [22.1] B [12.6] A [8.8] A [8.4]	C [17.3] B [10.8] A [8.5] A [7.5]	C [17.5] B [11.5] A [8.7] A [8.2]	C [22.3] B [11.7] A [8.7] A [7.6]	C [22.3] B [12.7] A [8.8] A [8.5]
2 S SITE ACCESS/COLORADO BOULEVARD	STOP	S SITE ACCESS COLORADO BOULEVARD COLORADO BOULEVARD	EBLR NBLT SBTR	B [12.2] A [8.8] A [0.0]	B [12.1] A [8.2] A [0.0]	B [13.2] A [9.1] A [0.0]	B [13.2] A [8.3] A [0.0]	B [12.3] A [8.8] A [0.0]	B [10.9] A [8.2] A [0.0]	B [13.3] A [9.1] A [0.0]	B [11.7] A [8.3] A [0.0]
3 64TH AVENUE/COLORADO BOULEVARD	STOP	64TH AVENUE 64TH AVENUE COLORADO BOULEVARD COLORADO BOULEVARD	EBLTR WBLTR NBLTR SBLTR	B [13.1] B [10.3] A [8.2] A [7.7]	B [11.7] B [11.1] A [7.8] A [8.8]	B [14.6] B [10.9] A [8.4] A [7.8]	B [13.2] B [12.1] A [7.9] A [9.0]	B [13.2] B [10.4] A [8.2] A [7.8]	B [11.8] B [11.1] A [7.8] A [8.8]	B [14.8] B [11.0] A [8.4] A [7.8]	B [13.3] B [12.1] A [7.9] A [9.0]
4 N SITE ACCESS/COLORADO BOULEVARD	STOP	N SITE ACCESS COLORADO BOULEVARD COLORADO BOULEVARD	EBLR NBLT SBTR	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	B [10.6] A [7.9] A [0.0]	B [11.5] A [0.0] A [0.0]	B [13.3] A [9.1] A [0.0]	B [11.7] A [8.3] A [0.0]

Notes (1) Numbers in brackets [] represent delay at unsignalized intersections in seconds per vehicle.  
(2) Numbers in parenthesis () represent delay at signalized intersections in seconds per vehicle.



Table 6-2  
6601 COLORADO HOLDING, LLC  
Total Future Intersection Queueing Summary (1)

Intersection	Operating Condition	Street Name	Approach/ Movement	Available Storage	Background 2024		Background 2044		Total Future 2024		Total Future 2044	
					AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
1 68TH AVENUE/COLORADO BOULEVARD	STOP	68TH AVENUE	EBLTR	-	17.5	10	30	17.5	17.5	10	30	17.5
		68TH AVENUE	WBLTR	-	7.5	7.5	10	12.5	7.5	7.5	10	12.5
		COLORADO BOULEVARD	NBLTR	-	0	0	0	0	0	0	0	0
		COLORADO BOULEVARD	SBLTR	-	2.5	5	2.5	5	2.5	5	2.5	5
2 S SITE ACCESS/COLORADO BOULEVARD	STOP	S SITE ACCESS	EBLR	-	0	0	0	0	0	2.5	0	2.5
		COLORADO BOULEVARD	NBLT	-	0	0	0	0	0	0	0	0
		COLORADO BOULEVARD	SBTR	-	0	0	0	0	0	0	0	0
3 64TH AVENUE/COLORADO BOULEVARD	STOP	64TH AVENUE	EBLTR	-	5	7.5	7.5	12.5	5	7.5	7.5	12.5
		64TH AVENUE	WBLTR	-	2.5	5	2.5	7.5	2.5	5	2.5	7.5
		COLORADO BOULEVARD	NBLTR	-	0	0	0	2.5	0	0	0	2.5
		COLORADO BOULEVARD	SBLTR	-	2.5	0	2.5	0	2.5	0	2.5	0
4 N SITE ACCESS/COLORADO BOULEVARD	STOP	N SITE ACCESS	EBLR	-	N/A	N/A	N/A	N/A	0	0	0	0
		COLORADO BOULEVARD	NBLT	-	N/A	N/A	N/A	N/A	0	0	0	0
		COLORADO BOULEVARD	SBTR	-	N/A	N/A	N/A	N/A	0	0	0	0

Note (1) Queue length is based on the 95th percentile queue as reported by Synchro, Version 11.

## **VII. Conclusions and Recommendations**

### **Conclusions**

Based on the results of this traffic impact study, the following may be concluded:

- Under existing traffic conditions, the intersections within the study area currently operate at overall acceptable levels of service (LOS) “C” or better during the weekday AM and PM peak hours. Unsignalized side street movements within the study area are at or approaching capacity.
- Under background future 2024 and 2044 traffic conditions, without the development of the subject site, delays would increase slightly at study intersections due to regional traffic growth.
- The proposed site development would generate, upon completion and full occupancy, 24 new weekday AM and 17 new weekday PM peak hour vehicle trips as well as 163 new weekday daily trips.
- Under total future traffic conditions with development of the site, study intersections would continue to operate at acceptable LOS “C” consistent with background conditions.
- Under total future traffic conditions with development of the site, all forecasted queues would be contained within their effective storage.

### **Recommendations**

- The Applicant should provide access consistent with the site plan contained herein.



## **APPENDIX A – Full Sized Conceptual Plan**



**PRELIMINARY**  
NOT FOR BIDDING  
NOT FOR CONSTRUCTION

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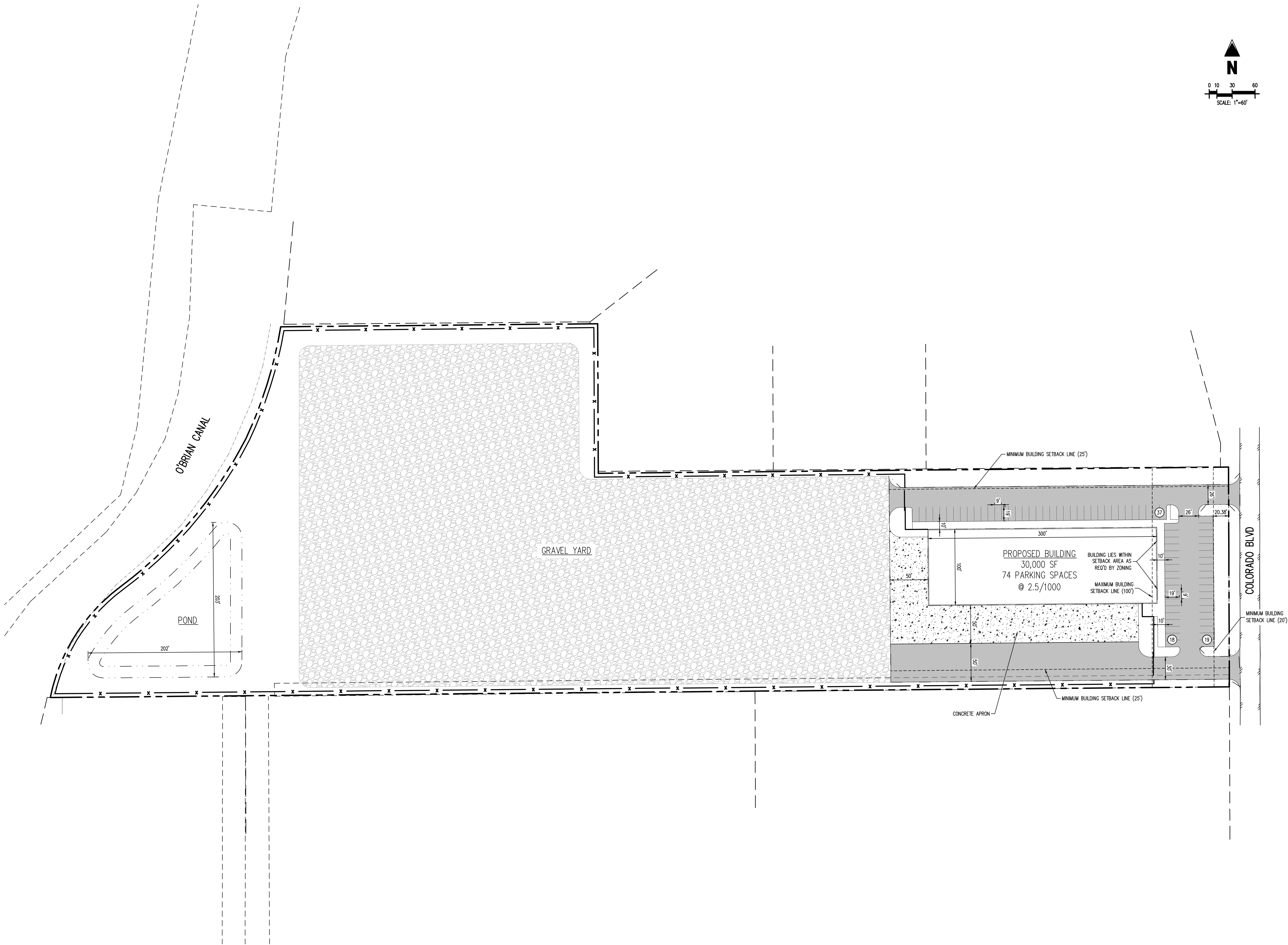
# COMMERCE CITY INDUSTRIAL

6601 Colorado Blvd  
Commerce City, CO

[illegible]

Project No:	6CH01
Drawn By:	MSJ
Checked By:	JRR
Date:	2022-09-27

## CONCEPTUAL SITE PLAN





## **APPENDIX B – LOS Descriptions**

## Level of Service for Signalized Intersections

Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average stopped delay per vehicle for a 15-min analysis period. The criteria are given in Exhibit 16-2. Delay may be measured in the field or estimated using procedures presented later in this chapter. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the  $v/c$  ratio for the lane group in question.

**LOS A** describes operations with very low delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

**LOS B** describes operations with delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of average delay.

Exhibit 16-2. Level-of-Service Criteria for Signalized Intersections

LEVEL OF SERVICE	STOPPED DELAY PER VEHICLE (SEC)
A	$\leq 10.0$
B	$> 10.0$ and $\leq 20.0$
C	$> 20.0$ and $\leq 35.0$
D	$> 35.0$ and $\leq 55.0$
E	$> 55.0$ and $\leq 80.0$
F	$> 80.0$

**LOS C** describes operations with delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

**LOS D** describes operations with delay greater than 35 and up to 55 sec per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high  $v/c$  ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

**LOS E** describes operations with delay greater than 55 and up to 80 sec per vehicle. This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high  $v/c$  ratios. Individual cycle failures are frequent occurrences.

**LOS F** describes operations with delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high  $v/c$  ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council



## Level of Service Criteria for Stop Sign Controlled Intersections

The level of service criteria are given in Table 17-2. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue until the vehicle departs from the stop line; this time includes the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. . . .

Table 17-2. Level of Service Criteria for TWSC Intersections

LEVEL OF SERVICE	AVERAGE CONTROL DELAY (sec/veh)
A	$\leq 10$
B	$> 10 \text{ and } \leq 15$
C	$> 15 \text{ and } \leq 25$
D	$> 25 \text{ and } \leq 35$
E	$> 35 \text{ and } \leq 50$
F	$> 50$

Average total delay less than 10 sec/veh is defined as Level of Service (LOS) A. Follow-up times of less than 5 sec have been measured when there is no conflicting traffic for a minor street movement, so control delays of less than 10 sec/veh are appropriate for low flow conditions. To remain consistent with the AWSC intersection analysis procedure described later in this chapter, a total delay of 50 sec/veh is assumed as the break point between LOS E and F.

The proposed level of service criteria for TWSC intersections are somewhat different from the criteria used in Chapter 16 for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, several driver behavior considerations combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, where drivers on the minor approaches to unsignalized intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized than signalized intersections. For these reasons, it is considered that the total delay threshold for any given level of service is less for an unsignalized intersection than for a signalized intersection. . . .

LOS F exists when there are insufficient gaps of suitable size to allow a side street demand to cross safely through a major street traffic stream. This level of service is generally evident from extremely long total delays experienced by side street traffic and by queueing on the minor approaches. The method, however, is based on a constant critical gap size - that is, the critical gap remains constant, no matter how long the side street motorist waits. LOS F may also appear in the form of side street vehicles' selecting smaller-than-usual gaps. In such cases, safety may be a problem and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior. The latter is more difficult to observe on the field than queueing, which is more obvious.

Source: Highway Capacity Manual, 2000. Transportation Research Board, National Research Council

## **APPENDIX C – Traffic Counts**



Two-Hour Count Summaries - Heavy Vehicles																		
Interval Start	Driveway				N/A				Colorado Blvd				Colorado Blvd				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
7:00 AM	0	1	0	0	0	0	0	0	0	2	7	0	0	0	16	0	26	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	18	0	0	0	7	0	25	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	8	0	0	0	10	0	18	0
7:45 AM	0	1	0	0	0	0	0	0	0	0	11	0	0	0	8	0	20	89
8:00 AM	0	0	0	0	0	0	0	0	0	0	6	0	0	0	8	0	14	77
8:15 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	10	0	19	71
8:30 AM	0	0	0	0	0	0	0	0	0	0	9	0	0	0	13	0	22	75
8:45 AM	0	0	0	0	0	0	0	0	0	0	7	0	0	0	9	0	16	71
Count Total	0	2	0	0	0	0	0	0	0	2	75	0	0	0	81	0	160	0
Peak Hour	0	2	0	0	0	0	0	0	0	2	44	0	0	0	41	0	89	0





Two-Hour Count Summaries - Bikes																		
Interval Start	Driveway			N/A			Colorado Blvd			Colorado Blvd						15-min Total	Rolling One Hour	
	Eastbound			Westbound			Northbound			Southbound								
	LT	TH	RT	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	0	0	0	0
7:15 AM	0	0	0	0	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	0	0	0	0
7:45 AM	0	0	0	0	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	0	0	0	0
8:15 AM	0	0	0	0	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	0	0	0	0
8:45 AM	0	0	0	0	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	0	0	0	0
Peak Hour	0	0	0	0	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.

## **APPENDIX D – Existing Synchro Outputs**

HCM 6th TWSC  
3: COLORADO BOULEVARD & 64TH AVENUE

09/09/2022





Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	12	26	6	5	29	19	226	5	5	137	8
Future Vol, veh/h	16	12	26	6	5	29	19	226	5	5	137	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	86	86	86	85	85	85
Heavy Vehicles, %	13	17	2	50	2	7	21	16	60	80	24	50
Mvmt Flow	19	14	31	7	6	34	22	263	6	6	161	9
Major/Minor	Minor2		Minor1			Major1			Major2			
Conflicting Flow All	508	491	166	510	492	266	170	0	0	269	0	0
Stage 1	178	178	-	310	310	-	-	-	-	-	-	-
Stage 2	330	313	-	200	182	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.67	6.22	7.6	6.52	6.27	4.31	-	-	4.9	-	-
Critical Hdwy Stg 1	6.23	5.67	-	6.6	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.67	-	6.6	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.153	3.318	3.95	4.018	3.363	2.389	-	-	2.92	-	-
Pot Cap-1 Maneuver	458	457	878	405	478	761	1300	-	-	952	-	-
Stage 1	799	724	-	609	659	-	-	-	-	-	-	-
Stage 2	661	631	-	703	749	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	425	445	878	374	465	761	1300	-	-	952	-	-
Mov Cap-2 Maneuver	425	445	-	374	465	-	-	-	-	-	-	-
Stage 1	783	719	-	597	646	-	-	-	-	-	-	-
Stage 2	613	618	-	661	744	-	-	-	-	-	-	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	12.1		11.3			0.6			0.3			
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1300	-	-	573	616	952	-	-				
HCM Lane V/C Ratio	0.017	-	-	0.111	0.076	0.006	-	-				
HCM Control Delay (s)	7.8	0	-	12.1	11.3	8.8	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.2	0	-	-				



## **APPENDIX E – Background (without site development) Synchro Outputs**

HCM 6th TWSC  
3: COLORADO BOULEVARD & 64TH AVENUE

09/09/2022

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	12	27	6	5	30	19	231	5	5	140	8
Future Vol, veh/h	16	12	27	6	5	30	19	231	5	5	140	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	13	17	2	50	2	7	21	16	60	80	24	50
Mvmt Flow	17	13	29	7	5	33	21	251	5	5	152	9
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	482	465	157	484	467	254	161	0	0	256	0	0
Stage 1	167	167	-	296	296	-	-	-	-	-	-	-
Stage 2	315	298	-	188	171	-	-	-	-	-	-	-
Critical Hdwy	7.23	6.67	6.22	7.6	6.52	6.27	4.31	-	-	4.9	-	-
Critical Hdwy Stg 1	6.23	5.67	-	6.6	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.23	5.67	-	6.6	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.617	4.153	3.318	3.95	4.018	3.363	2.389	-	-	2.92	-	-
Pot Cap-1 Maneuver	477	473	889	423	493	773	1310	-	-	964	-	-
Stage 1	810	733	-	620	668	-	-	-	-	-	-	-
Stage 2	673	641	-	715	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	445	461	889	393	481	773	1310	-	-	964	-	-
Mov Cap-2 Maneuver	445	461	-	393	481	-	-	-	-	-	-	-
Stage 1	795	729	-	608	655	-	-	-	-	-	-	-
Stage 2	627	629	-	675	752	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.7		11.1		0.6		0.3					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR					
Capacity (veh/h)	1310	-	-	596	636	964	-	-				
HCM Lane V/C Ratio	0.016	-	-	0.1	0.07	0.006	-	-				
HCM Control Delay (s)	7.8	0	-	11.7	11.1	8.8	0	-				
HCM Lane LOS	A	A	-	B	B	A	A	-				
HCM 95th %tile Q(veh)	0	-	-	0.3	0.2	0	-	-				




## **APPENDIX F – Future (with site development) Synchro Outputs**



# HCM 6th TWSC

## 2: COLORADO BOULEVARD & S SITE ACCESS

10/14/2022

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	7	6	3	300	177	4
Future Vol, veh/h	7	6	3	300	177	4
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	50	14	35	50
Mvmt Flow	8	7	3	326	192	4

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	526	194	196	0	-	0
Stage 1	194	-	-	-	-	-
Stage 2	332	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.6	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.65	-	-	-
Pot Cap-1 Maneuver	512	847	1136	-	-	-
Stage 1	839	-	-	-	-	-
Stage 2	727	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	510	847	1136	-	-	-
Mov Cap-2 Maneuver	510	-	-	-	-	-
Stage 1	836	-	-	-	-	-
Stage 2	727	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.9	0.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1136	-	625	-	-
HCM Lane V/C Ratio	0.003	-	0.023	-	-
HCM Control Delay (s)	8.2	0	10.9	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-