185 South State Street, Suite 800
Salt Lake City, Utah 84111
801.936.5557 | maverik.com

February 4, 2020

Wes Irvin, Principal Planner
City of Oroville
1735 Montgomery Street
Oroville, CA 95965

RE: Use Permit and Tentative Map Application

Maverik, Inc., respectfully submits this narrative for a proposed convenience store with fuel dispensers at the west corner of Oroville Dam Boulevard and Feather River Boulevard

Existing Conditions

- Combination of vacant property and structures
- Current zoning for the property is zoned C-2 (Airport Overlay D)

SITE DEVELOPMENT PLAN AND VACATION CONSIDERATION

Project Description

The proposed convenience store is approximately 6,000 square feet with ten (10) fuel dispensers and canopy in front of the store and four (4) high-flow dispensers to the west of the store. A CAT scale to weigh commercial trucks will also be on site. The development will provide fueling, packaged beer and wine sales, as well as fresh food items. Public restrooms will be open to the public. The store will operate 24 hours, 7 days a week.

Operations

Maverik, Inc. owns and operates over 350 stores in 10 states and plans to continue a favorable growth pattern in the future. Maverik employs over 5100 people who are eligible for health benefits (Health, Dental and Vision), long and short-term disability, tuition reimbursement, 401 (k) matching contribution opportunities, gym reimbursement, scholarships, paid time off and other benefits. This store will employ approximately 15

to 18 employees. Store employees receive training in over 40 different aspects of the job including safety, point of sale, service, identification for alcohol sales, management and customer service.

The store's interior is nicely finished with tile floors and adventure themed walls that emphasize Maverik's "Adventure's First Stop" brand. The store is designed to facilitate an on-site bakery as well as Build-To-Order sandwich bar, burritos, tacos, pizza and other fresh food offerings.

Store Exteriors

The building elevations, building materials and floor plan depict the architectural style and theming known as the Maverik brand. The exterior of the building will consist of metal roof elements, fiber cement, cultured stone, glass storefront, steel truss beams, etc. HVAC equipment will be situated on the store roof and screened from view by a parapet wall and is consistent with code requirements for screening roof mounted mechanical equipment and blending in with the surrounding community. The fuel canopy includes design elements and materials equal to the store.

Site Design

The site proposes the following accesses:

- Right in/right out access is proposed on Oroville Dam Boulevard
- Full access is proposed on Feather River Boulevard

Adequate on-site parking with ADA parking is proposed to the south and east areas of the site.

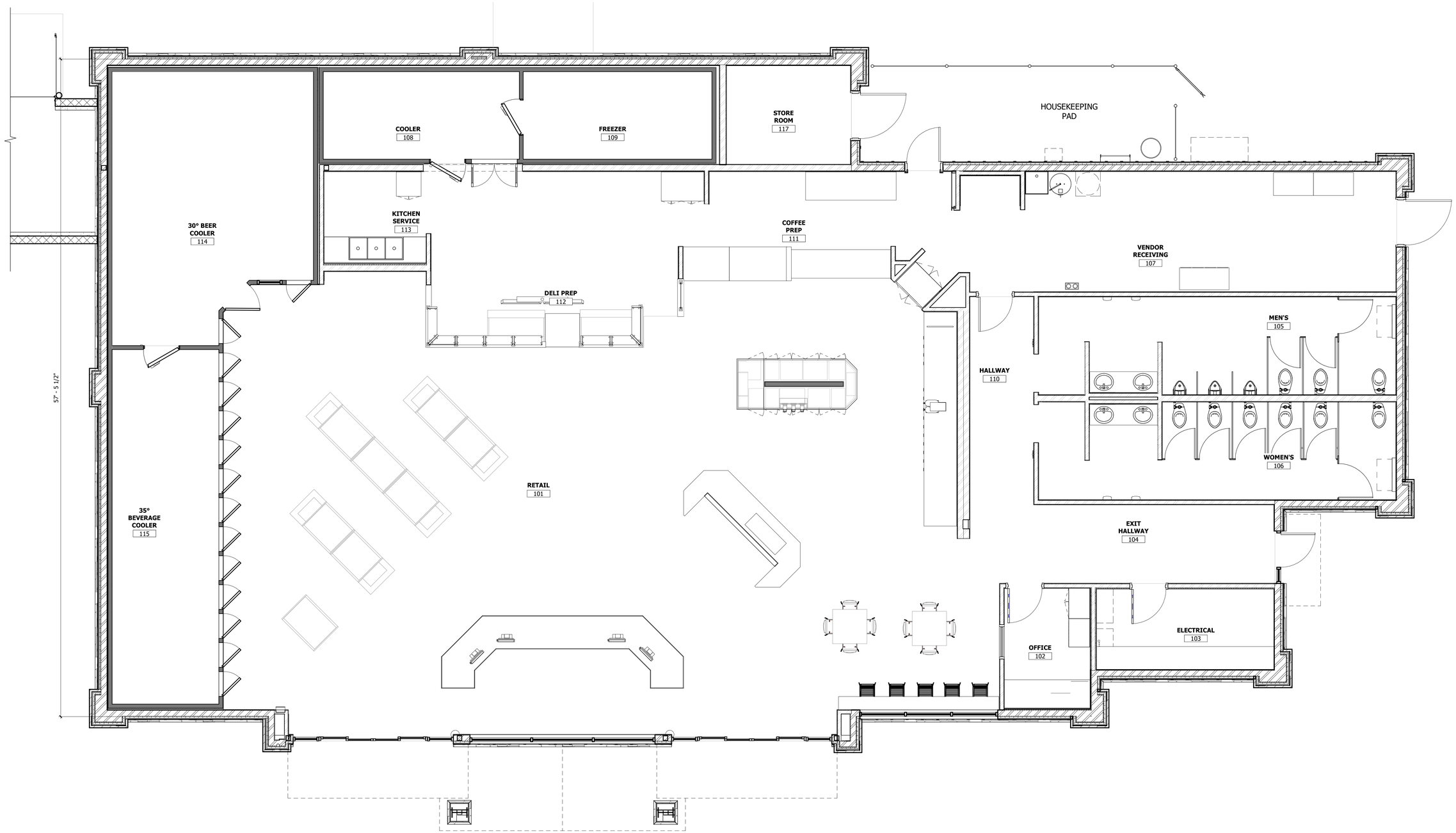
Outdoor seating is incorporated into the landscaping and is adjacent to the store's side entrance.

The proposed Maverik convenience store and fueling development is an appropriate use for its location. The Maverik development will not be detrimental to other similar uses in the area due to its location and development standards.

Please contact me at (702) 370-6962 or Mike Micheels with Cartwright Nor Cal at 916-978-4001 if you have any questions regarding this application.

Regards,
Maverik, Inc.

Rick Magness
Planning Project Manager



1 FLOOR PLAN
SCALE: 1/4" = 1'-0"

PROPOSED MAVERIK C-STORE

Prototype Version: 50_R_XR_0319
Building Square Footage: 5,951 SF

A-1 | FLOOR PLAN

MAVERIK

185 S. State Street
Salt Lake City, Utah 84111

1 BUILDING PERSPECTIVE
SCALE:

PROPOSED MAVERIK C-STORE

Prototype Version: 50_R_XR_0319
Building Square Footage: 5,951 SF

A-2 | PERSPECTIVE

MAVERIK
185 S. State Street
Salt Lake City, Utah 84111

KEYED NOTES

04.05	CULTURED STONE VENEER, SKYLINE, COUNTRY LEDGESTONE
04.06	CULTURED STONE VENEER CAP, SKYLINE, COUNTRY LEDGESTONE
05.01	PRE-FINISHED GUTTER, BRITE RED
05.15	STEEL AWNING, COLOR P-9, SEE DETAILS 4 & 5 ON SHEET A5.13 AND SCHEDULE ON SHEET A6.03, AND STRUCTURAL DETAILS ON SHEET S6.01
06.08	FIBER CEMENT BOARD & BATTEN SIDING, COBBLESTONE
06.10	FIBER CEMENT BOARD & BATTEN SIDING, AGED PEWTER
06.15	STACKED FIBER CEMENT TRIM BOARDS, COBBLESTONE
08.02	ALUMINUM STOREFRONT SYSTEM, DARK BRONZE
08.04	HOLLOW METAL DOOR AND FRAME, PAINTED AGED PEWTER
32.01	CHAIN LINK FENCE WITH PRIVACY SLATS. COLOR TO MATCH BUILDING FIELD COLOR

2 LEFT ELEVATION
SCALE: 1/4" = 1'-0"

1 FRONT ELEVATION
SCALE: 1/4" = 1'-0"

PROPOSED MAVERIK C-STORE

Prototype Version: 50_R_XR_0319
Building Square Footage: 5,951 SF

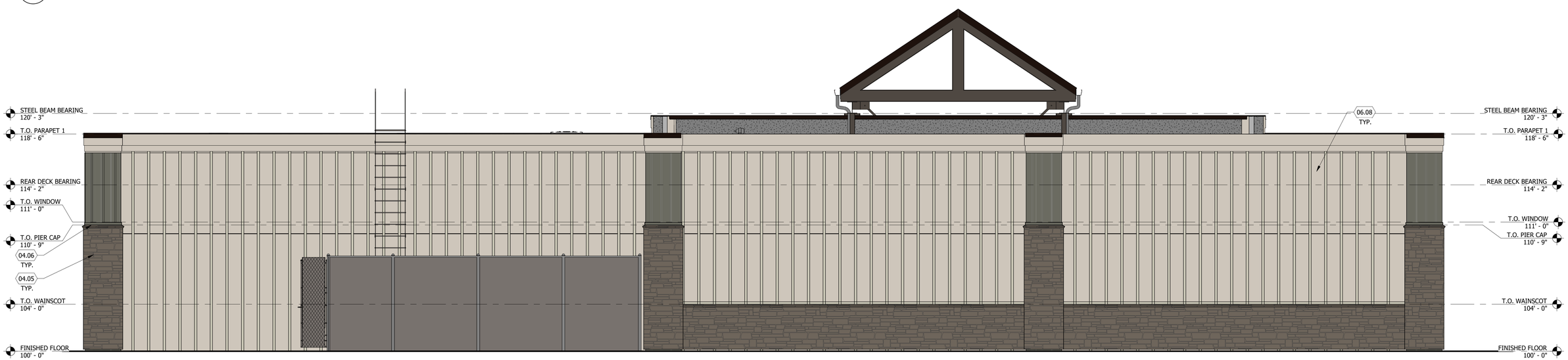
A-3 | EXTERIOR ELEVATIONS

185 S. State Street
Salt Lake City, Utah 84111

KEYED NOTES

04.05	CULTURED STONE VENEER, SKYLINE, COUNTRY LEDGESTONE
04.06	CULTURED STONE VENEER CAP, SKYLINE, COUNTRY LEDGESTONE
05.01	PRE-FINISHED GUTTER, BRITE RED
05.03	PAINTED STEEL, BLACK FOX
05.15	STEEL AWNING, COLOR P-9, SEE DETAILS 4 & 5 ON SHEET A5.13 AND SCHEDULE ON SHEET A6.03, AND STRUCTURAL DETAILS ON SHEET S6.01
06.08	FIBER CEMENT BOARD & BATTEN SIDING, COBBLESTONE

2 RIGHT ELEVATION
SCALE: 1/4" = 1'-0"



1 REAR ELEVATION
SCALE: 1/4" = 1'-0"

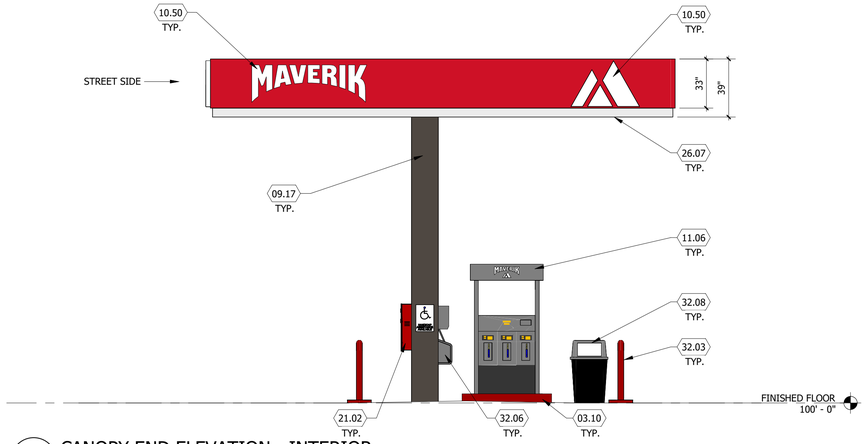
PROPOSED MAVERIK C-STORE

Prototype Version: 50_R_XR_0319
Building Square Footage: 5,951 SF

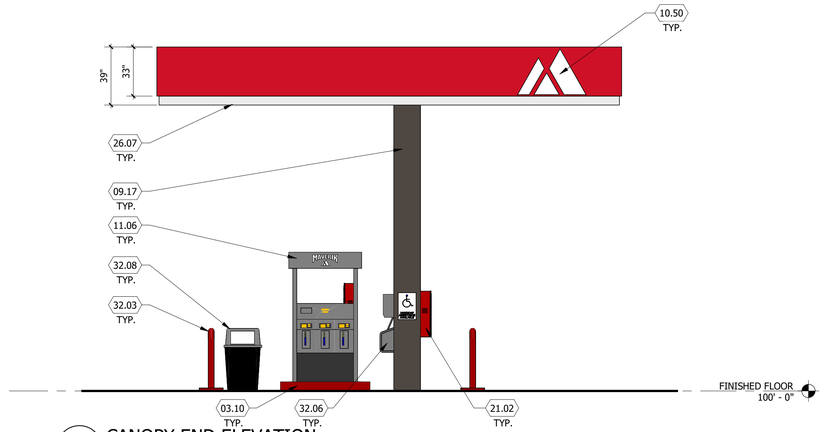
A-4 | EXTERIOR ELEVATIONS

MAVERIK

185 S. State Street
Salt Lake City, Utah 84111



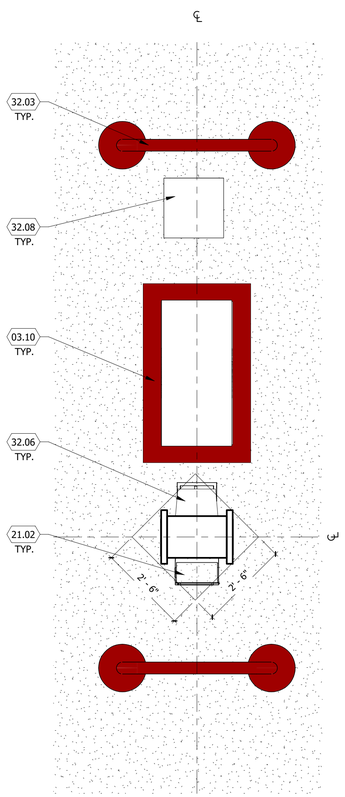
5 CANOPY END ELEVATION - INTERIOR
SCALE: 1/4" = 1'-0"



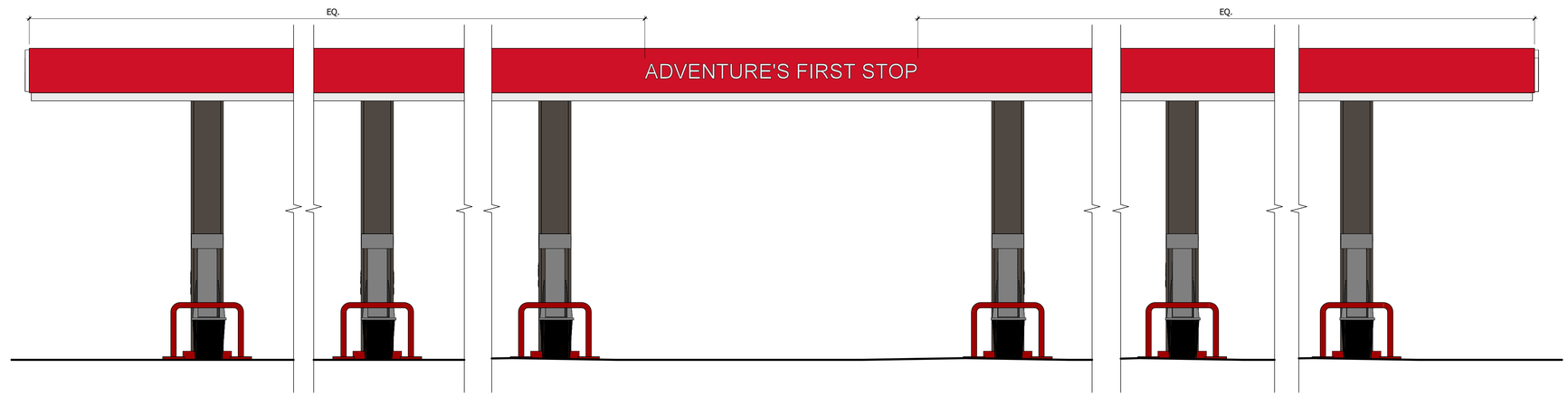
4 CANOPY END ELEVATION
SCALE: 1/4" = 1'-0"

KEYED NOTES

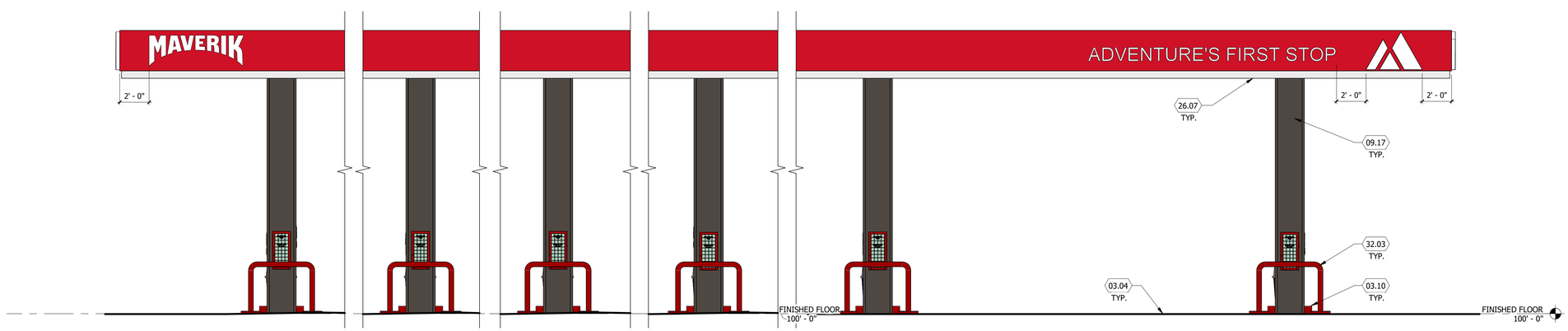
03.04	REINFORCED CONCRETE PAD
03.10	6" MIN. RAISED CONCRETE ISLAND W/ TOOLED EDGES AND CORNERS. VERIFY SIZE W/ DISPENSER SUPPLIER +/-5'-0" X 3'-0" (NO METAL FORM). ACCESSIBLE ISLAND TO BE 6"; SEE CIVIL DRAWINGS FOR LOCATION
09.17	PANEL COLUMN CLADDING, COLOR TO MATCH P-9
10.50	SIGNAGE TO BE COORDINATED BY FUEL CANOPY CONTRACTOR WITH OWNER
11.06	DISPENSING STATION (BY OTHERS)
21.02	SURFACE MOUNTED FIRE EXTINGUISHER AND CABINET, PROVIDE 1 EXTINGUISHER FOR EVERY 2 COLUMNS
26.07	ALL LIGHT FIXTURES (NOT SHOWN) TO BE FLUSH MOUNTED WITHIN THE DECK PANEL SOFFIT (SOFFIT COLOR P-7). SEE ELECTRICAL DRAWINGS
32.03	4" DIAMETER "U" BOLLARD, SET AND FILLED W/ CONCRETE, SEE CIVIL DRAWINGS PAINTED P-4
32.06	S.S.I. (WINDOW WASH/PAPER TOWEL) PROVIDED BY OWNER INSTALLED BY CONTRACTOR, MOUNTED TO COLUMN PER ADA REQUIREMENTS (4'-0" MAX A.F.F. TO PAPER TOWEL FOLD)
32.08	TRASH CONTAINER, PROVIDED BY OWNER



2 CANOPY COLUMN PLAN
SCALE: 1/2" = 1'-0"



3 FUEL DISPENSING CANOPY BUILDING ELEVATION
SCALE: 1/4" = 1'-0"



1 FUEL DISPENSING CANOPY STREET ELEVATION
SCALE: 1/4" = 1'-0"

PROPOSED MAVERIK C-STORE

Prototype Version: 50_R_XR_0319
Building Square Footage: 5,951 SF

A-5 | CANOPY ELEVATIONS

185 S. State Street
Salt Lake City, Utah 84111

BB-1 Fiberboard - Cobblestone

BB-2 Fiberboard - Aged Pewter

BB-3 Fiberboard - Cobblestone

Cultured Stone - Skyline, Country Ledgestone

C-1 MBCI Medium Bronze

C-2 MBCI Brite Red

Anodized - Dark Bronze

Paint - Black Fox

PROPOSED MAVERIK C-STORE

Prototype Version: 50_R_XR_0319
Building Square Footage: 5,951 SF

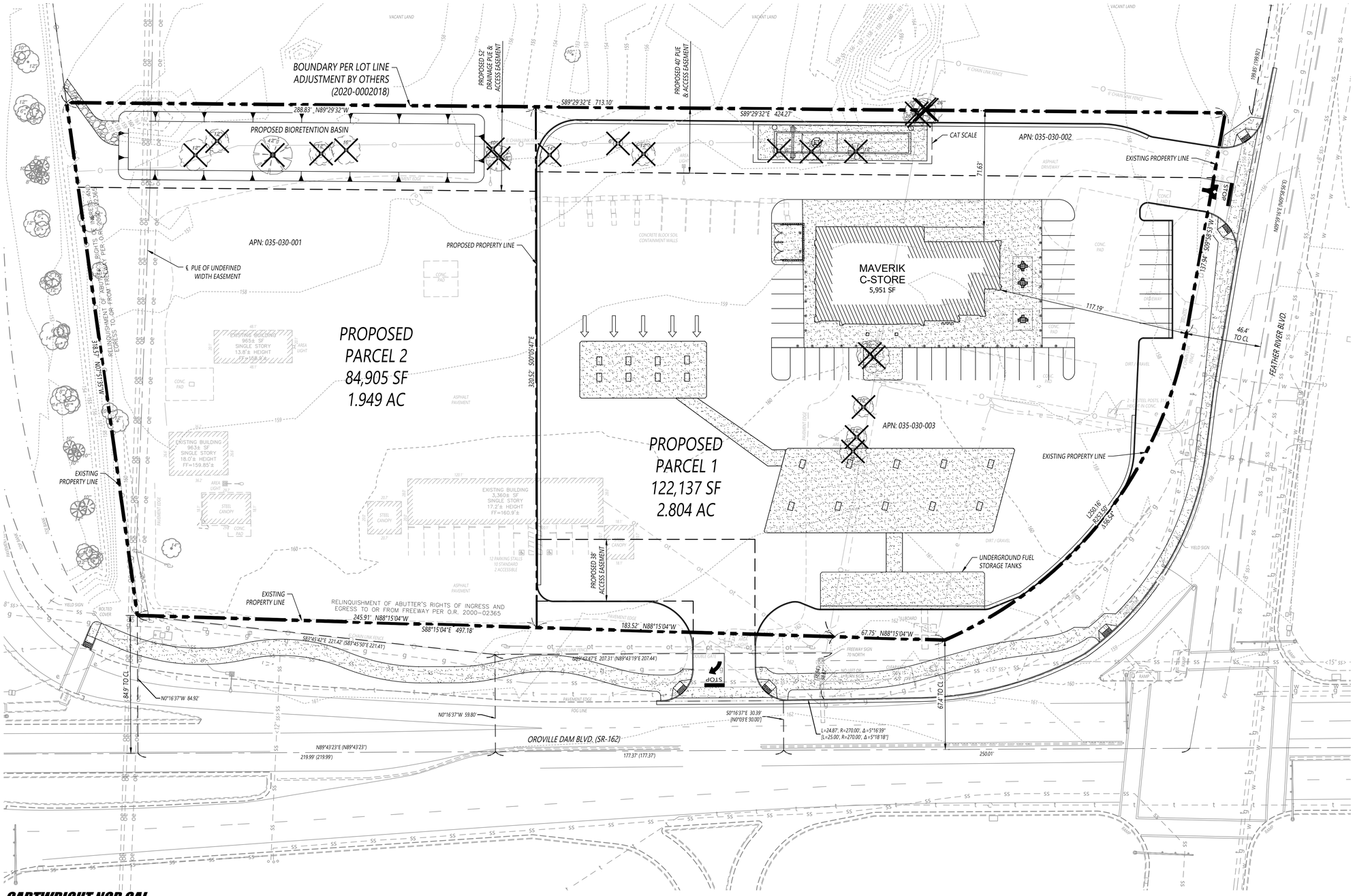
A-6 | EXTERIOR MATERIALS BOARD

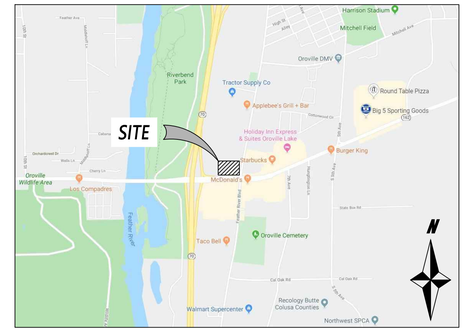
185 S. State Street
Salt Lake City, Utah 84111

TENTATIVE PARCEL MAP FOR

MAVERICK GAS STATION - OROVILLE

LOT LINE ADJUSTMENT 2020-0002018 INVOLVING APNS :035-030-001, 002, 003, 028
OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
CITY OF OROVILLE, CALIFORNIA





VICINITY MAP
NOT TO SCALE

ASSESSORS PARCEL NUMBER
RECENTLY RECORDED LOT LINE ADJUSTMENT (2020-0002018) INVOLVING ASSESSOR'S PARCEL NUMBER (APNS): 035-030-001, 002, 003, 028

PROPERTY OWNERS / DEVELOPER
MAVERIK, INC.
185 S. STATE STREET, SUITE 800
SALT LAKE CITY, UT 84111
PHONE: 801-936-5557
CONTACT: RICK MAGNESS
RICK.MAGNESS@MAVERIK.COM

APPLICANT
CARTWRIGHT ENGINEERS
4180 DOUGLAS BLVD. SUITE 200
GRANITE BAY, CA 95746
PHONE: 916-978-4001
CONTACT: ROBERT J HEDRICK, PE; MIKE MICHEELS, PROJECT MANAGER
ROBH@CARTWRIGHT-AEC.COM; MIKEM@CARTWRIGHT-AEC.COM

SITE SURVEYOR
UNICO ENGINEERING, INC.
110 BLUE RAVINE RD.
FOLSOM, CA, 95630
PHONE: 916-900-6623
CONTACT: ROB MARKS
EMAIL: RMARKS@UNICOENGINEERING.COM

FLOOD ZONE:
ZONE X - AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOOD

EXISTING & PROPOSED ZONING & USE:
C-2: INTENSIVE COMMERICAL

C-2 SETBACK INFORMATION
FRONT = 0', BACK = 0', SIDE = 0', STREET = 12'

EXISTING PROPERTY	
EXISTING PARCEL	207,043 SF / 4.753± AC

PROPOSED PROPERTY	
PROPOSED PARCEL 1	84,905 SF / 1.949± AC
PROPOSED PARCEL 2	122,137 SF / 2.804± AC
TOTAL	207,042 SF / 4.753± AC

REGISTERED PROFESSIONAL ENGINEER ROBERT J HEDRICK No. 69517 Exp. 06/30/20 CIVIL STATE OF CALIFORNIA

N

0' 15' 30' 60'
SCALE: 1"=30'

REVISIONS		
DELTA	DATE	DESCRIPTION
1	-	-
2		
3		
4		
5		

CITY OF OROVILLE
COUNTY OF BUTTE
DATE: 02/03/2020
DRAWN BY: HK

CARTWRIGHT NOR CAL
CIVIL ENGINEERING & PROJECT MANAGEMENT
4180 DOUGLAS BLVD, SUITE 200
GRANITE BAY, CALIFORNIA 95746
T (916) 978-4001
WWW.CARTWRIGHTENGINEERS.COM

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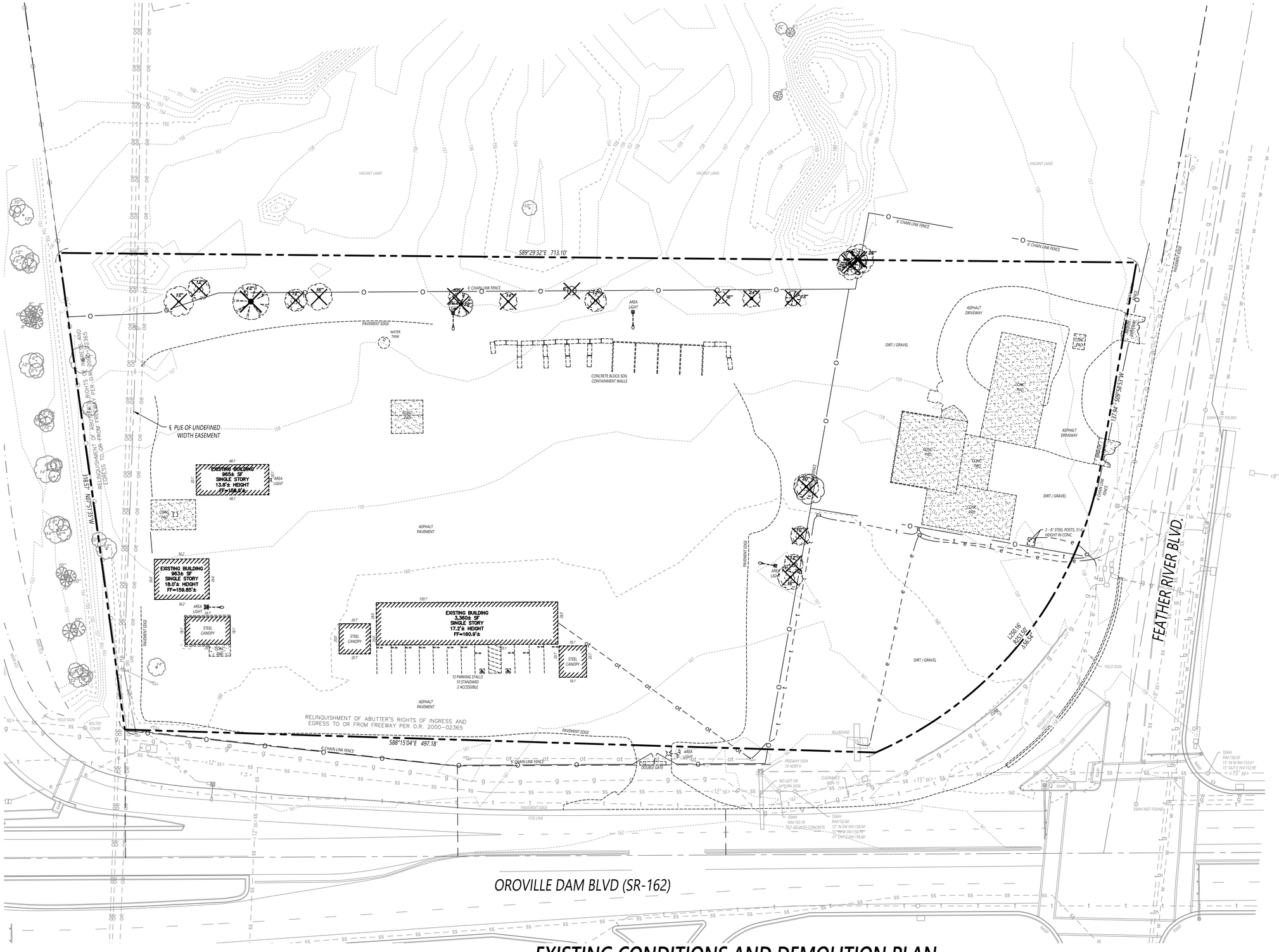

LEGEND

	PROPERTY LINE
	CENTER LINE
	PROPERTY TIE LINE
— — t — — t —	TELEPHONE UNDERGROUND LINE
— — e — — e —	ELECTRICAL UNDERGROUND LINE
— — g — — g —	GAS LINE
— — jt — — jt —	JOINT TRENCH
— — oe — — oe —	OVERHEAD ELECTRICAL
— — ot — — ot —	OVERHEAD TELEPHONE
— — <12" SS> — — ss —	SANITARY SEWER LINE
— — <12" SD> — — sd —	STORM DRAIN LINE
— — <12" W> — — w —	WATER LINE
	FLOWLINE
34	MINOR CONTOUR (1' INTERVAL)
35	MAJOR CONTOUR (5' INTERVAL)
	FENCE LINE
	UTILITY BOX
	SANITARY SEWER MANHOLE
	SIGN
	UTILITY POLE
	EXISTING TREE
	EXISTING TREE TO BE REMOVED

NOTE: STRUCTURES, UTILITIES, TREES, ETC., SHOWN DARK/BOLD IN PLAN VIEW INDICATES THAT ITEM IS PLANNED FOR REMOVAL

TOPOGRAPHIC SURVEY NOTE:

1. BASIS OF BEARINGS: THE SOUTH LINE OF PARCEL 6, BOOK 146 OF MAPS AT PAGE 44, BUTTE COUNTY RECORDS, AND IS TAKEN AS BEARING:

   NORTH 89° 41' 59" EAST

2. TOPOGRAPHIC SURVEY PREPARED BY: UNICO ENGINEERING, INC. FIELD WORK PERFORMED IN NOVEMBER, 2019.

EXISTING CONDITIONS AND DEMOLITION PLAN
MAVERIK - OROVILLE DAM ROAD

OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

CARTWRIGHT NOR CAL
CIVIL ENGINEERING & PROJECT MANAGEMENT
4180 DOUGLAS BLVD, SUITE 200
GRANITE BAY, CALIFORNIA 95746
T (916) 978-4001
WWW.CARTWRIGHTENGINEERS.COM

DATE: 2/3/2020
SCALE: 1"=30'
DRAWN BY: SD/RP

C1.0

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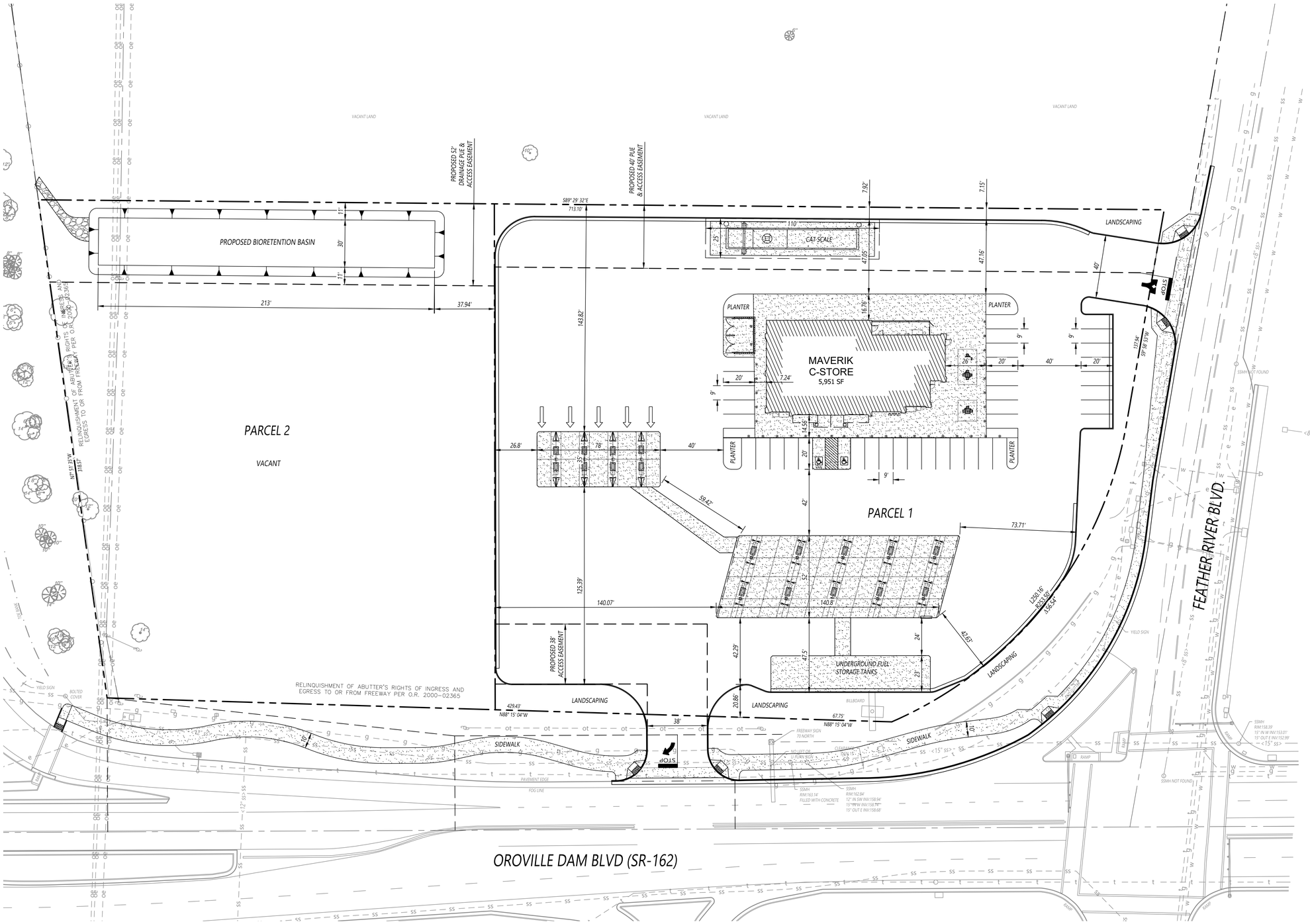

PRELIMINARY SITE PLAN
MAVERIK - OROVILLE DAM ROAD

OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

0' 15' 30' 60'
SCALE: 1"=30'

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C2.0

DATE: 2/3/2020
SCALE: 1"=30'
DRAWN BY: SD/RP

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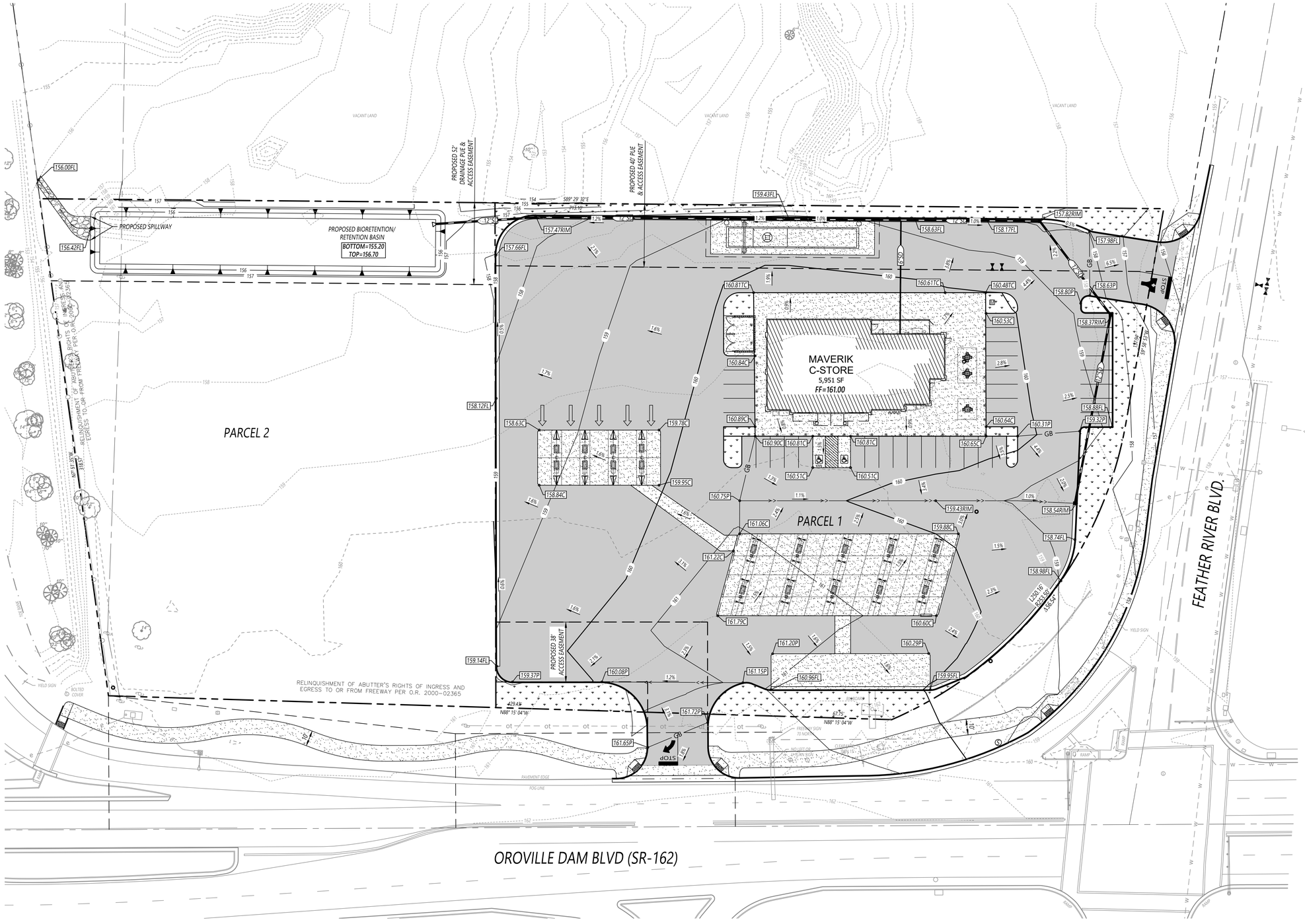

GRADING LEGEND:

- EXISTING 1-FT CONTOUR
- EXISTING 5-FT CONTOUR
- PROPOSED 1-FT CONTOUR
- PROPOSED 5-FT CONTOUR
- EXISTING PROPERTY LINE
- EXISTING EASEMENT
- PROPOSED EASEMENT
- PROPOSED STORM DRAIN LINE
- PROPOSED DRAIN INLET
- PROPOSED STORM DRAIN MANHOLE
- PROPOSED STORM DRAIN CLEANOUT
- PROPOSED PAVEMENT CREASE
- PROPOSED SWALE FLOWLINE
- ???C CONCRETE ELEVATION
- ???FL FLOWLINE ELEVATION
- ???P PAVEMENT ELEVATION
- ???RIM RIM ELEVATION
- ???S GROUND ELEVATION
- ???TC TOP OF CURB ELEVATION
- FF=??? BUILDING FINISHED FLOOR ELEVATION
- X.X% PROPOSED GROUND SLOPE
- (X.X%) EXISTING GROUND SLOPE
- GB GRADE BREAK
- WORK LIMIT LINE
- PROPOSED COBBLE SWALE

ENGINEER'S PRELIMINARY OPINION OF EARTHWORK:

	CUT (CY)	FILL (CY)	NET (CY)
RAW GRADING	±1,860	±3,000	±1,140 (FILL)
ASSUMED BUILDING/PAVEMENT SUBGRADE EXCAVATION	±2,720		±2,720 (CUT)
ADJUSTED TOTAL	±4,580	±3,000	±1,580 (CUT/EXPORT)

NOTE: ENGINEERS ESTIMATE OF EARTHWORK ARE RAW VOLUMES AND IS BASED ON EXISTING GROUND SURFACE OF THE SITE AT THE TIME OF THE SURVEY. IT INCLUDES ESTIMATED EXCAVATION FOR NEW PAVEMENT AND BUILDING PAD. THE ESTIMATE DOES NOT INCLUDE REMEDIAL EARTHWORK (IF REQUIRED), TRENCH SPOILS, OR SHRINK OR SWELL FACTORS. IT SHALL BE THE RESPONSIBILITY OF THE EARTHWORK CONTRACTOR TO VERIFY ALL EARTHWORK QUANTITIES PRIOR TO BID.

PAVING LEGEND:

- PROPOSED LANDSCAPE
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE

N

0' 15' 30' 60'

SCALE: 1"=30'

PRELIMINARY GRADING AND DRAINAGE PLAN
MAVERIK - OROVILLE DAM ROAD

OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

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C3.0

DATE: 2/3/2020
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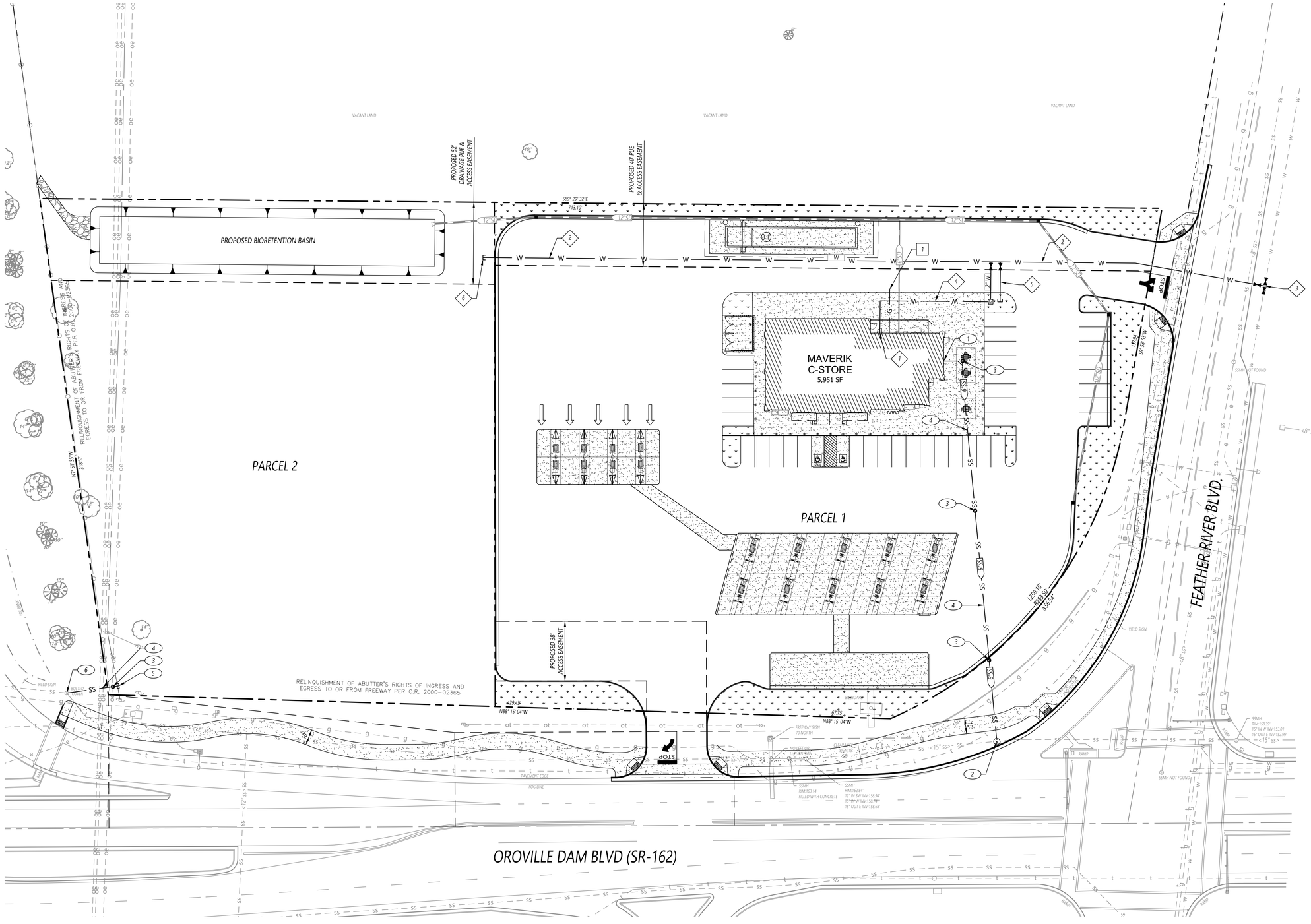

LEGEND:

- PROPOSED STORM DRAIN LINE
- EXISTING SANITARY SEWER LINE
- PROPOSED SANITARY SEWER LINE
- EXISTING WATER LINE
- PROPOSED WATER LINE
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED CLEANOUT
- PROPOSED GATE VALVE
- PROPOSED DCDA/RP
- PROPOSED WATER METER

WATER KEY NOTES:

1. APPROXIMATE LOCATION OF PROPOSED COMMON WATER SERVICE BUILDING POINT OF CONNECTION.
2. PROPOSED PUBLIC WATER SERVICE LINE.
3. CONNECT TO EXISTING WATER MAIN.
4. PROPOSED COMMON WATER SERVICE WITH METER & BACKFLOW. SIZE TO BE DETERMINED BY PLUMBING ENGINEER.
5. PROPOSED IRRIGATION SERVICE WITH BACKFLOW. SIZE TO BE DETERMINED BY IRRIGATION DESIGNER.
6. PROPOSED WATER STUB FOR FUTURE ADJACENT DEVELOPMENT.

SEWER KEY NOTES:

1. APPROXIMATE LOCATION OF PROPOSED SEWER POINT OF CONNECTION TO BUILDING.
2. CONNECT TO EXISTING 15" SANITARY SEWER MAIN WITH NEW SANITARY SEWER MANHOLE.
3. PROPOSED SANITARY SEWER CLEANOUT.
4. PROPOSED 6" PRIVATE SANITARY SEWER LINE.
5. PROPOSED SEWER STUB FOR FUTURE DEVELOPMENT.
6. PROPOSED SEWER CONNECTION AT EXISTING MANHOLE/PUMP STATION.

DRY UTILITY KEY NOTES:

1. PROPOSED GAS LINE.

N

0' 15' 30' 60'
SCALE: 1"=30'

PRELIMINARY UTILITY PLAN
MAVERIK - OROVILLE DAM ROAD

OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

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DATE: 2/3/2020
SCALE: 1"=30'
DRAWN BY: SD/RP

C4.0

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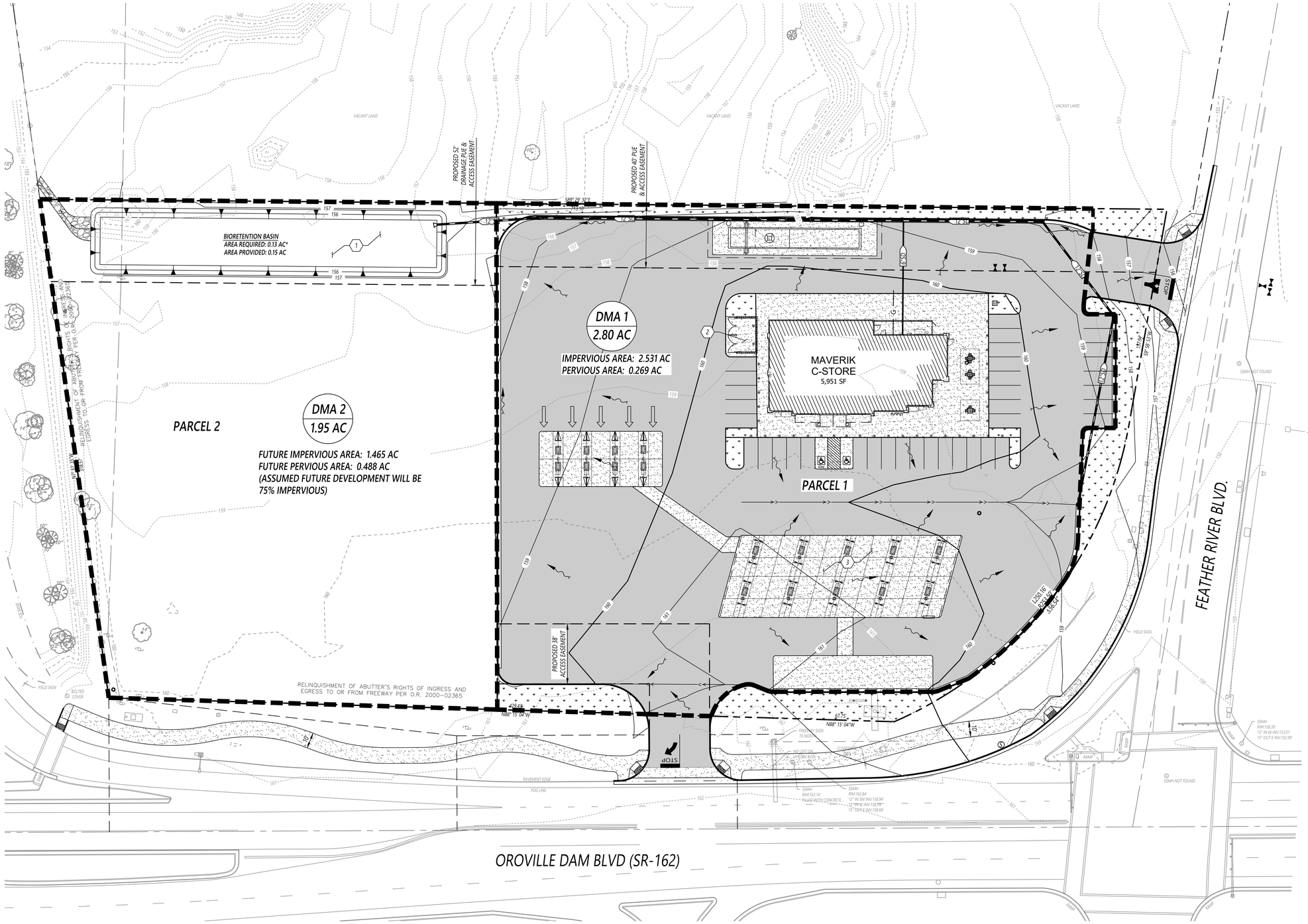

DMA LEGEND:

- DMA / AC — DRAINAGE MANAGEMENT AREA (DMA) DESIGNATION AREA
- DRAINAGE MANAGEMENT AREA (DMA) LIMIT
- DRAINAGE FLOW DIRECTION
- X"SD — PROPOSED STORM DRAIN LINE
- PROPOSED LANDSCAPE
- PROPOSED ASPHALT PAVEMENT
- PROPOSED CONCRETE PAVEMENT

STORM WATER QUALITY CONTROL PLAN KEY NOTES:

1. PROPOSED TREATMENT CONTROL MEASURE - BIORETENTION BASIN WITH MINIMUM 6" PONDING DEPTH, 18" SOIL MEDIA, AND 12" GRAVEL.
2. PROPOSED SOURCE CONTROL MEASURE - REFUSE CONTAINER STORAGE AREA. SEE CASQA BMP FACTSHEET NO. SD-32.
3. PROPOSED SOURCE CONTROL MEASURE - CANOPY COVER OVER FUEL DISPENSING AREA AND SITE IS GRADED TO PREVENT RUN-ON. SEE CASQA BMP FACTSHEET NO. SD-30.

IMPERVIOUS SURFACE INFORMATION:

PROPOSED ON-SITE IMPERVIOUS SURFACING:

DMA 1:
PAVED AREA:

AC/PCC PAVEMENT	±2.227 AC

COVERED AREA:

BUILDING ROOF/FUEL CANOPY	±0.304 AC

DMA 2:
IMPERVIOUS AREA:

ASSUMED 75% OF TOTAL AREA	±1.465 AC

TOTAL PROPOSED IMPERVIOUS: ±3.996 AC

*PRELIMINARY BIORETENTION BASIN SIZING PER CALIFORNIA PHASE II LID SIZING TOOL

PRE- AND POST-DEVELOPED FLOW RATE CALCULATIONS:

PRE-DEVELOPED PEAK FLOW RATE:
DRAINAGE SHED AREA: 3.57 AC
C-VALUE: 0.68
TIME OF CONCENTRATION: 20 MINUTES
10-YEAR INTENSITY: 1.73 IN/HR
100-YEAR INTENSITY: 2.44 IN/HR
10-YEAR PEAK FLOW RATE, Q_{10}: 4.22 CFS
100-YEAR PEAK FLOW RATE, Q_{100}: 5.96 CFS

POST-DEVELOPED PEAK FLOW RATE:
DRAINAGE SHED AREA: 4.75 AC
C-VALUE: 0.80
TIME OF CONCENTRATION: 10 MINUTES
10-YEAR INTENSITY: 2.22 IN/HR
100-YEAR INTENSITY: 3.12 IN/HR
10-YEAR PEAK FLOW RATE, Q_{10}: 8.44 CFS**
100-YEAR PEAK FLOW RATE, Q_{100}: 11.86 CFS**

**POST-DEVELOPED PEAK FLOW RATES WILL BE MITIGATED TO NOT EXCEED PRE-DEVELOPED RUNOFF BY PROVIDING DETENTION IN THE BIORETENTION BASIN PER BUTTE COUNTY IMPROVEMENT STANDARDS.

N

0' 15' 30' 60'
SCALE: 1"=30'

PRELIMINARY STORM WATER QUALITY CONTROL PLAN
MAVERIK - OROVILLE DAM ROAD

OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

CARTWRIGHT NOR CAL
CIVIL ENGINEERING & PROJECT MANAGEMENT
4180 DOUGLAS BLVD, SUITE 200
GRANITE BAY, CALIFORNIA 95746
T (916) 978-4001
WWW.CARTWRIGHTENGINEERS.COM

Login Name: susand
Plot Date: February 03, 2020 – 1:54 pm
File Name: U:\219044-Maverik – Oroville Dam Blvd\CAD_DD\Production Drawings\219044-DD-SWQCP.dwg

C5.0

DATE: 2/3/2020
SCALE: 1"=30'
DRAWN BY: SD/RP

TRAFFIC IMPACT ANALYSIS

FOR

MAVERIK STORE PROJECT

Oroville, CA

Prepared For:

SIERRA VIEW COMPANY, INC.
4202 Douglas Blvd., Suite 100
Granite Bay, CA 95746

Prepared By:

KD Anderson & Associates, Inc.
3853 Taylor Road, Suite G
Loomis, California 95650
(916) 660-1555

January 20, 2020

6740-01

Maverik Oroville.rpt

MAVERIK STORE PROJECT
TRAFFIC IMPACT ANALYSIS

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MAVERIK STORE PROJECT
TRAFFIC IMPACT ANALYSIS

EXECUTIVE SUMMARY

- **Project Description.** This study evaluates the traffic impacts associated with a 5,340 sf convenience store with adjoining gasoline sales proposed on the north side of Oro Dam Blvd (SR 162) at the Feather River Blvd intersection in Oroville. The site is currently occupied by a landscaping business and has full access to Oro Dam Blvd just west of Feather River Blvd. The project proposes to maintain the Oro Dam Blvd access but to preclude outbound left turn at that location. The project also proposes a full access driveway on Feather River Blvd north of Oro Dam Blvd.

- **Trip Generation.** The project is estimated to create 444 a.m. peak hour and 370 p.m. peak hour trips. An appreciable share of that traffic will be pass-by trips already on Oro Dam Blvd, and after reduction for pass-by trips, the project is expected to generate 170 primary trips in the a.m. peak hour and 162 primary trips in the p.m. peak hour.

- **Existing Setting.** All intersections in the area of the project currently operate within City of Oroville and Caltrans minimum Level of Service thresholds (i.e., LOS D or better). The Level of Services on the segments of Oro Dam Blvd between the SR 70 Northbound Ramps and Feather River Blvd and on Feather River Blvd north of Oro Dam Blvd are LOS D and LOSC, respectively, which also satisfies the minimum. The 95th percentile queue in the westbound through lane at the Oro Dam Blvd / SR 70 SB Ramps exceed the available storage slightly. No recommendations have been made for improvements needed to satisfy minimum standards.

- **Existing plus Project Conditions.** All study area intersections and roadway segments will continue to operate within the minimum Level of Service threshold with the addition of project traffic. The project will increase the length of peak period queues slightly but will not result in additional locations where the available storage is exceeded. With regards to site access, the 95th percentile queue eastbound left turn approaching Feather River Blvd will not exceed the storage available between the intersection and the project driveway and will provide space for deceleration from 15-20 mph into the lane. Thus inbound left turn access at the driveway appear feasible in the near term. However, reconstructing the median on Oro Dam Blvd west of the driveway to lengthen the left turn lane at the driveway is recommended to provide deceleration space.

  The project will contribute to the need for facilities to accommodate alternative transportation modes in Oroville. This impact can be addressed, however, by standard frontage improvements on Oro Dam Blvd and on Feather River Blvd., which includes sidewalk.

- **Cumulative (2040) Conditions.** Butte County Association of Governments (BCAG) is in the process of preparing a new travel demand model (TDM) to respond to changes in the aftermath of the Camp Fire, and BCAG has suggested that the current TDM continue to be used until their new model is available. Future background volumes derived from the TDM indicate that study area intersections and segments will continue to operate within accepted Level of Service thresholds, at LOS D or better. Queue lengths may exceed available storage at four locations, including locations at the southbound SR 70 ramps intersection.

  A corridor study for SR 162 was prepared in 2016 by Traffic Works, LLC for BCAG and the City of Oroville. At the Oro Dam Blvd / Feather River Blvd intersection those improvements included adding a second westbound left turn lane and a separate eastbound right turn lane. Similarly the intersection is addressed by the City' updated CIP and traffic impact fee.

- **Cumulative (2040) plus Project Conditions.** All study intersections will continue to operate within the minimum LOS D standard. Because the queue approaching the eastbound left turn lane at Feather River Blvd extends through the project driveway intersection, it will be necessary to eliminate left turns into the site under long term conditions. The project will add traffic to the same locations where 95th percentile queues exceed available storage

  While implementing the improvements identified in the SR 162 Corridor Plan is not required to address identified impacts, that work could widen SR 162 by 6 to 12 feet along the project frontage, and right of way could need to be acquired.

- **Site Circulation Layout.** The project layout includes a main aisle that circles the convenience market and automobile fueling positions. This aisle is connected to the adjoining public road system by driveways that extend roughly 80 feet into the site. These driveway throats can accommodate three waiting automobiles or a truck and automobile without interfering with the flow of traffic into the site.

- **Site Design Recommendations.** Because the exit queue on the Oro Dam Blvd driveway is longer than the throat depth under cumulative plus project conditions it could interfere with inbound traffic. A 120 foot-long median should be constructed on the driveway to separate inbound and outbound traffic. Because the Oro Dam Blvd driveway is between the gore point of the westbound ramp onto NB SR 70 and the free right turn lane at Feather River Blvd a deceleration taper (roughly 110 feet long and 12 feet wide at the driveway curb return) should be constructed. The site plan will need to include a designated pedestrian path of travel from adjoining sidewalks to the convenience market.

TRAFFIC IMPACT ANALYSIS FOR
MAVERIK STORE PROJECT
Oroville, CA

STUDY PURPOSE AND OBJECTIVES

This study evaluates the traffic impact for the Maverik Store Project proposed on Oro Dam Blvd (SR 162) at its intersection with Feather River Blvd in Oroville, CA. Figure 1 presents the project location within the vicinity map. The site is located on the northwest corner of the intersection and is currently occupied by a small landscaping supply business that generates little traffic.

Traffic study parameters are consistent with City of Oroville and California Department of Transportation (Caltrans) guidelines.

This study addresses the following scenarios:

1. Existing Traffic Conditions
2. Existing plus Project
3. Cumulative Traffic Conditions (Year 2040)
4. Cumulative Traffic Conditions plus Project (2040)

The objective of this study is to identify those roads and street intersections that may be impacted by development of this project and, if needed to suggest strategies for mitigating the impacts of this project.

PROJECT DESCRIPTION

The Maverik Store is a 5,340 sf convenience market with adjoining gasoline and diesel sales. A total of 16 automobile and 5 truck fueling positions will be available. The Maverik Store project is located on the north side of Oro Dam Blvd (SR 162) immediately west of Feather River Blvd. Access to the site is prosed at two locations. The site has an existing full access driveway on Oro Dam Blvd located roughly 300 feet from Feather River Blvd (centerline to centerline). That access will be retained but will be restricted to left turn in and right turn in-and-out only. The project will have a second access on Feather River Blvd roughly 380 feet from Oro Dam Blvd (centerline to centerline). The site plan indicates that 41 on-site parking spaces will be provided. Figure 2 presents the project site plan.

VICINITY MAP

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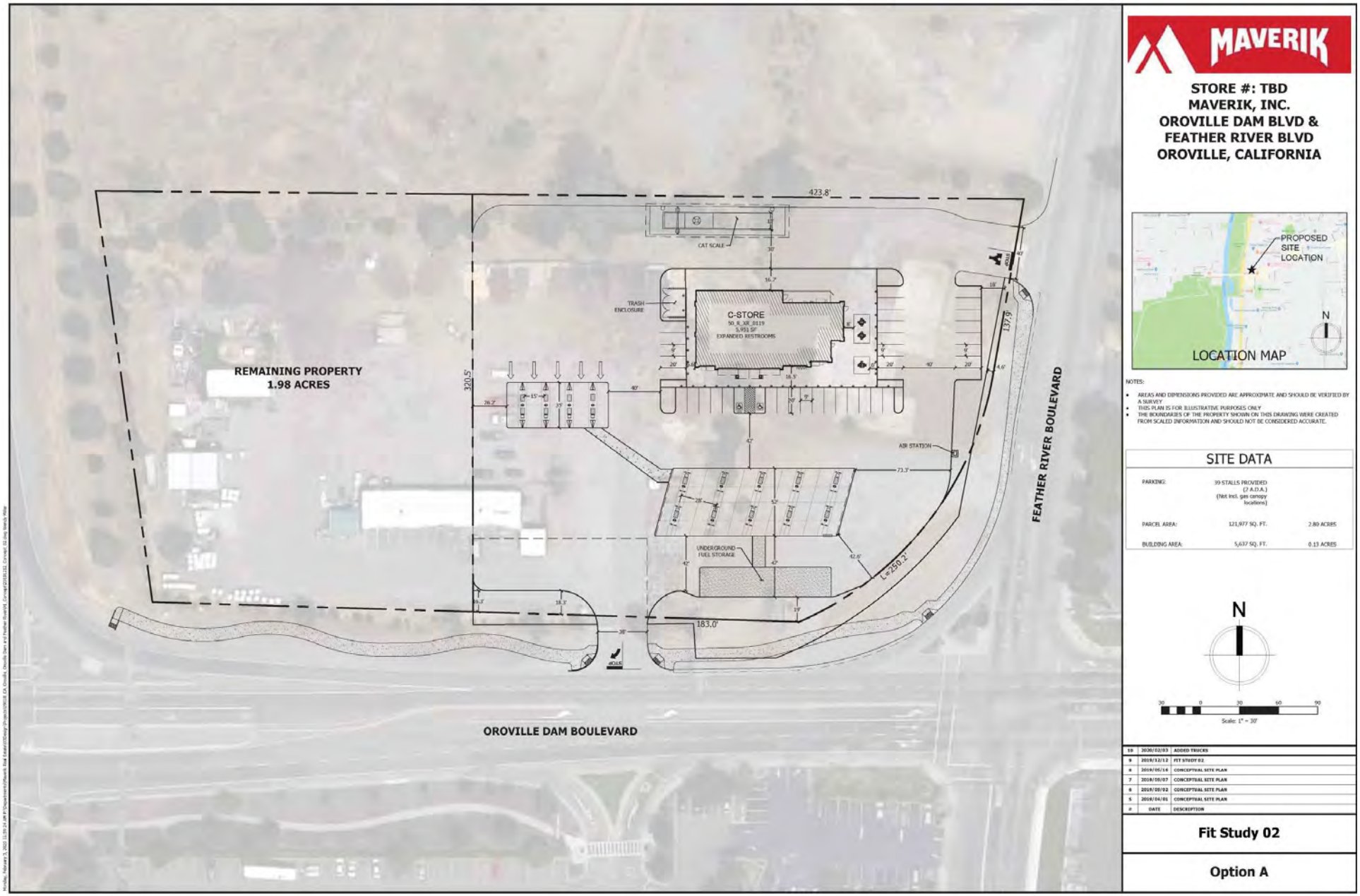
4590-01 RA 1/20/2020

figure 1



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CONCEPTUAL SITE PLAN

4590-01 RA 2/3/2020

figure 2

EXISTING SETTING

Study Area

This study addresses traffic conditions on Oro Dam Blvd (SR 162) and other roads used to access the site. The limits of the study area were based on the requirements for previous traffic studies conducted in the vicinity. The text that follows describes the facilities included in this analysis.

Study Area Facilities

Roadway. Oro Dam Blvd (SR 162) is classified as a Principal Arterial by Caltrans and as a four-lane arterial by the City of Oroville. Oro Dam Blvd is generally a five-lane roadway between SR 70 and Washington Avenue/Olive Highway with two travel lanes in each direction and a two-way left turn lane. From SR 70 to east of Feather River Blvd the roadway is a four-lane divided highway with left turn lanes. Caltrans reports that in 2017 SR 162 carried an Annual Average Daily Traffic (AADT) volume of 31,500 vehicles per day in the area between SR 70 and Feather River Blvd, with the volume dropping to 30,000 AADT east of Feather River Blvd.

Intersections. The quality of traffic flow is often governed by the operation of major intersections. For this study, five intersections along the routes serving this site were identified for evaluation. The study locations include:

The ***SR 70 Southbound Ramps / Oro Dam Blvd intersection*** is a major access intersection for motorists traveling to Oroville from Chico and Sacramento. This signalized intersection serves the southbound legs of a tight diamond interchange. The southbound off-ramp consists of a left turn lane, a shared through-left turn lane and a right turn lane. The eastbound approach along Oro Dam Blvd crosses over the Feather River as a two-lane bridge and then widens to three lanes about 200 feet from the intersection. The approach includes two through lanes and a right turn lane. The westbound approach includes a left turn lane and a through lane, both extending back to the northbound SR 70 ramp intersection. Sidewalk is present along both sides of Oro Dam Blvd and with crosswalks only in the east-west direction.

The ***SR 70 Northbound Ramps / Oro Dam Blvd intersection*** provides access to northbound motorists traveling between Sacramento and Chico. This signalized intersection serves the northbound legs of a tight diamond interchange. The northbound off-ramp consists of a shared through-left and a right turn lane. The eastbound approach along Oro Dam Blvd consists of a left turn lane and two through lanes. The westbound approach includes a through lane continues as the westbound left turn lane at the southbound ramp intersection, a through lane and a free right turn lane that "drops" the second eastbound travel lane from Feather River Blvd. Sidewalk is present along both sides of Oro Dam Blvd. Crosswalks are present along the north, south and west sides of the intersection.

The **Oro Dam Blvd / Site access intersection** provides access to the existing use, and access to an existing retail center is available on the south side of the intersection. The south side access is limited to right turns in-and-out only by a "pork chop" island in the driveway. Oro Dam Blvd

has two travel lanes in each direction in this area, but the westbound right turn "drop" lane onto NB SR 70 begins just beyond the intersection. A left-turn lane into the site has been created from a portion of the eastbound aisle provided at the Feather River Blvd intersection. Today the lane into the site is 85 feet long, and the left turn lane approaching Feather River Blvd is 225 feet long. Sidewalk exists on the south side of Oro Dam Blvd in this area but not on the northside. There are no crosswalks.

The **Oro Dam Blvd / Feather River Blvd intersection** is a major access intersection for east-west traffic through Oroville. This is a signalized intersection with the eastbound approach consisting of a left turn lane, a through lane and a shared through-right lane. Eastbound u-turns are prohibited. The westbound approach includes a left turn lane, two through lanes and a right turn lane. Westbound u-turns are prohibited. The northbound approach includes left, through and right turn lanes while the southbound approach includes a left turn lane and a shared through-right lane that extends into a wide-radius right turn lane. This "free right turn" is outside the control of the traffic signal, however, a through traffic queue can block entry to the lane. Sidewalk is present in the northeast, southwest and southeast quadrants; however, crosswalks are present on all approaches.

The **Feather River Blvd / Project access intersection** will be constructed with the project. Measured centerline to centerline the driveway is about 375 feet from Oro Dam Blvd and about 100 feet from an existing driveway serving the commercial area east of Feather River Blvd. In this area Feather River Blvd is a two-lane facility with a continuous center Two-Way Left-Turn (TWLT) lane. That lane extends south from the driveway's location into the southbound left turn lane at Feather River Blvd, and roughly 280 feet of storage will be available between the driveway and intersection.

The **Feather River Blvd / Mitchell Avenue intersection** is a "tee" located north of the project site. The intersection s controlled by a stop sign on the westbound Mitchel Avenue approach. Each leg of the intersection has as single approach lane. Sidewalk is present on all corners, but there are no crosswalks are striped.

Level of Service Analysis

Methodology. *Level of Service Analysis* has been employed to provide a basis for describing existing traffic conditions and for evaluating the significance of project traffic impacts. Level of Service measures the *quality* of traffic flow and is represented by letter designations from "A" to "F", with a grade of "A" referring to the best conditions, and "F" representing the worst conditions. Table 1 presents typical Level of Service characteristics.

Local agencies and Caltrans adopt minimum Level of Service standards for their facilities. The City of Oroville identifies LOS 'E' as the limits of acceptable Level of Service along Oro Dam Blvd between SR 70 and Foothill Blvd. The Caltrans Transportation Concept Report for SR 162[1] identifies LOS D as the "concept" LOS. The City of Oroville indicates that LOS D is the minimum standard elsewhere.

[1] *Transportation Concept Report State Route 162*, Caltrans District 3, February, 2017

The analysis techniques presented in the *6th Edition* of the *Highway Capacity Manual (HCM)* were used to provide a basis for describing existing traffic conditions and evaluating the significance of project traffic impacts.

Intersections. Various software programs have been developed to assist in calculating intersection Level of Service, and the level of sophistication of each program responds to factors that affect the overall flow of traffic. For studies in the vicinity of SR 70 Caltrans has requested that Synchro-SimTraffic simulation software be used for intersection analysis in order to account for the effects of closely spaced traffic signals along Oro Dam Blvd. The software is a stochastic model, i.e. randomness is present when running the simulations. The results will vary within each scenario and between scenarios. This may occasionally result in some intersections having somewhat lower delays and shorter queues in the Plus Project scenario than in the No Project scenario. The simulation results contained herein reflect the average of the 20 one-hour simulation runs.

TABLE 1
LEVEL OF SERVICE DEFINITIONS

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Delay ≤ 10.0 sec	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. Delay > 10.0 sec and ≤ 20.0 sec	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. Delay > 20.0 sec and ≤ 35.0 sec	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestion of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed. Delay > 35.0 sec and ≤ 55.0 sec	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). Delay > 55.0 sec and ≤ 80.0 sec	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. Delay > 80.0 sec	Intersection blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.

Sources: Highway Capacity Manual 6th Edition, 2016 Transportation Research Board.

Roadway Segment Level of Service. The criteria for evaluating roadway LOS is outlined in the City of Oroville's *2012 TCIP & Traffic Impact Fee Program* and 2015 *Oroville Sustainability Updates Draft Supplemental EIR*. Roadway capacity is determined by facility type, as shown in Table 2 and is based on peak hour volume.

TABLE 2
PEAK HOUR LOS CAPACITY THRESHOLD
ARTERIAL ROADWAYS

Functional Class	Lanes	Maximum Volume (vehicles per hour in both directions)				
		LOS A	LOS B	LOS C	LOS D	LOS E
Major Arterial	2	-	-	970	1,760	≤1,870
	4[1]	-	-	1,750	2,740	≤2,890
	4[2]		-	1,920	3,540	≤3,740
	6	-	-	2,710	5,320	≤5,600

[1] undivided roadway [2] divided roadway

Caltrans Design Standards for Left Turn Lane Channelization

Highway Design Manual. Caltrans summarizes their statewide design standards in the *Highway Design Manual (HDM).* This reference document is available on line at http://www.dot.ca.gov/design/manuals/hdm.html, and guidance regarding left turn lanes is in Chapter 4. These standards involve two considerations: Storage for waiting vehicles and additional space for deceleration outside of the through lanes for the vehicles that are using the left turn lane. The total combined length of the left turn lane and the bay taper preceding that lane is to be the sum of storage and deceleration requirements. The HDM does note the possibility that in urban areas where cross streets are closely spaced it may not be possible to achieve full deceleration length.

Storage. Estimating the length of storage needed in left tun lanes at intersection controlled by traffic signals is accomplished as a by-product of Level of Service calculation or computer simulation. While simulation can also identify queueing at unsignalized intersections, the HDM suggests that un-signalized left turn lanes provide storage equivalent to a two-minute accumulation of peak hour vehicles at 25 feet per vehicle. A minimum storage of two vehicles is suggested, and if trucks comprise 10% of the background truck space for one truck and one passenger vehicles is recommended.

Deceleration. The HDM notes the deceleration distance required for various turn lane entry speeds, and these are noted in Table 3. Today the speed limit is posted at 35 mph on Oro Dam Blvd. If that limit is strictly applied than a left turn lane requires 275 feet beyond what is needed just for storage.

TABLE 3 HIGHWAY DESIGN MANUAL DECELERATION STANDARDS	
Design Speed	**Deceleration Lane Length (feet)**
15	Xx[1]
25	1852
30	235
35	275[1]
40	315
45	375[1]
50	435
55	485[1]
60	530
Source: HDM Table 405.2B [2] interpolated from Caltrans data	

The HDM allows for a reduction in deceleration requirements based on engineering judgment, and entry speed can be reduced by up to 20 mph. in this case, that reduction would imply entry at 15 mph. While a recommendation for 15 mph deceleration distance is not included in the HDM, the deceleration distance could be as short as 50 feet assuming decision time and deceleration at standard rates for passenger cars.

Existing Traffic Operations

Intersection Levels of Service. Figure 3 presents the existing lane configurations and current peak hour traffic volumes at intersections in the study area. Traffic volume counts at the two SR 70 ramp intersections and the Oro Dam Blvd / Feather River Blvd intersection were counted in October 2018, prior to the Camp Fire in Paradise, CA. New counts were conducted at the NB Ramps intersection in August 2019. In November 2019 new counts were made at the Oro Dam Blvd / Feather River Blvd, at Feather River Blvd / Mitchell Drive and at the SR 162 project driveway intersections. The post-fire volumes indicate a decrease in intersection traffic. The volumes at the Southbound ramps were proportionally reduced based on the 2019 volume information.

The signalized intersections utilized the existing timing plans provided by Caltrans District 3. Table 3 summarizes current levels of service at the six study area intersections and driveways during the a.m. and p.m. peak hours. All intersections currently operate at LOS C or better which is within the City's LOS E and Caltrans' LOS D threshold.

TABLE 3 EXISTING PEAK HOUR LEVELS OF SERVICE AT INTERSECTIONS						
		AM Peak Hour Intersection		PM Peak Hour Intersection		Meets Peak Hour Traffic Signal Warrant?
Location	**Control**	**LOS**	**Average Delay**	**LOS**	**Average Delay**	
1. Oro Dam Blvd / SR 70 SB Ramps	Signal	B	13	B	14	-
2. Oro Dam Blvd / SR 70 NB Ramps	Signal	B	10	B	10	-
3. Oro Dam Blvd / Access Southbound approach	SB Stop	-	-	D	27	No
4. Oro Dam Blvd / Feather River Blvd	Signal	B	15	C	21	-
6. Feather River Blvd / Mitchell Drive Westbound Approach	WB Stop	A	8	B	10	No

Roadway Levels of Service. Table 4 summarizes Levels of Service based on the existing hourly traffic volumes along Oro Dam Blvd. Applicable Level of Service thresholds and roadway classifications are presented. Oro Dam Blvd currently operates at LOS D which is within the City's minimum roadway threshold and satisfies Caltrans' minimum LOS D threshold. Feather River Blvd operates at LOS C north of Oro Dam Blvd.

TABLE 4 EXISTING ROADWAY SEGMENT LEVELS OF SERVICE						
			Standard		Existing Conditions	
Roadway	**Location**	**Facility Classification**	**LOS**	**Hourly Volume Threshold**	**Hourly Volume**	**LOS**
Feather River Blvd	North of Oro Dam Blvd	2-lane Arterial[1]	D	1,760	735	C
Oro Dam Blvd	West of Feather River Blvd	4-Lane Arterial[2]	E	≤3,740	2,220	D
Source: City of Oroville Transportation Improvement Program [1] undivided roadway [2] divided roadway						

Legend

- XX — AM Peak Hour Volume
- (XX) — PM Peak Hour Volume
- R1-1 — Stop Sign
- Signalized Intersection

NORTH

N.T.S.

6 — Feather River Blvd/ Mitchell Ave

R1-1

(99) 86 → (230) 158

81 (86) ↑ 72 (89)

65 (81) ← 182 (224)

5 — Feather River Blvd/ Project Access

(439) 235 →

← 251 (296)

1 — SB SR 70 Ramps/ Oro Dam Rd

(374) 398 ← (80) 147

(0) 0 →

← 379 (605)

112 (181) →

(546) 544 →

(69) 51 →

2 — NB SR 70 Ramps/ Oro Dam Rd

← 388 (516)

← 428 (720)

(56) 98 ←

(864) 844 →

63 (66) ← 1 (1) ↑ 163 (120) →

3 — Project Access/ Oro Dam Rd

R1-1

(3) 0 ← (1) 0 →

0 (3) ↑ 777 (1172) ←

(1) 1 →

(942) 997 →

(62) 23 →

3 (26) ← R1-1

4 — Feather River Blvd/ Oro Dam Rd

(115) 93 ← (150) 49 ↓ (174) 93 ←

105 (90) ↑ 553 (778) ↓ 134 (199) ←

(78) 89 ←

(739) 797 →

(162) 96 →

65 (174) ← 57 (128) ↑ 106 (233) →

EXISTING TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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6740-01 RA 1/20/2020

figure 3

Turn Lane Queues. Table 5 presents information regarding current peak period queuing in turn lanes at each of the intersections. Due to the intersection spacing, through movements between intersections was also reviewed to determine if queues extend through adjacent intersections. The available storage is presented along with current peak hour traffic volumes and the 95th percentile queue length. On approaches with multiple turn lanes the longest queue is identified.

Most intersections have turn lane storage capacity that can accommodate peak period queues. The 95th percentile queue exceeds available storage in one location, along the westbound through lane at the SR 70 southbound ramps intersection.

TABLE 5
EXISTING PEAK HOUR QUEUES

Location	Length	AM Peak Hour		PM Peak Hour	
		VPH	Queue (feet)	VPH	Queue (feet)
1. Oro Dam Blvd / SR 70 SB Ramps					
SB left turn (2 lanes)	†	398	120	374	120
WB left turn	240	112	115	181	145
WB through	240	379	175	605	245
2. Oro Dam Blvd / SR 70 NB Ramps					
NB right turn	225	163	80	120	70
EB left turn	270	98	135	56	100
EB through	270	844	185	864	155
WB through	700	428	195	720	300
3. Oro Dam Blvd / Access					
EB left turn	85	1	<25	1	<25
4. Oro Dam Blvd / Feather River Blvd					
NB left turn	280	106	95	233	190
SB left turn	180‡	93	90	115	115
SB right+thru	Unlimited	142	55	324	140
EB left turn	225	89	115	78	140
EB through	700	893	280	901	335
WB left turn	385	134	110	199	175

Highlighted values indicate queue length in excess of available storage
† - includes 1-600 ft lane and 1-200ft lane
‡ - continues as Two-way Left-Turn lane

Left Turn Lane Design. The configuration of the existing eastbound left turn lane approaching the Feather River Blvd intersection has been evaluated based on identified standards. As noted above, the 95th percentile queue in the p.m. peak hour is 140 feet. A design for deceleration from the 35 mph speed limit would add 275 feet to the beginning of the bay taper, or 415 feet. Alternatively, a 15 mph entry would add 50 feet for a total of 190 feet. The existing left turn lane is 450 feet long, including the area when project site access occurs. Thus, it is possible to achieve the 35 mph standard assuming motorists travel through site driveway opening. Alternatively, deceleration from 15 to 20 mph is achieved using only the area between driveway and intersection.

Non-Automobile Transportation

Transit System. Public transportation in Butte County is known as the 'B-Line' and is operated by Butte Regional Transit. The transit system serves communities throughout the Butte County area. In the vicinity of the project the B-Line operates three routes, the 20, 24 and 25.

Route 20 – This route operates bi-directionally between Oroville and Chico. The route operates Monday through Friday southbound with the first bus leaving the Chico Transit Center at 5:50 a.m. and the last bus leaving at 6:10 p.m. Buses operate at approximately one-hour headways. The first bus along the northbound route departs the Oroville Transit Center at 5:50 a.m. with the last one departing at 7:10 p.m., at about one-hour intervals. Both directions operate on Saturday and Sunday with only five runs in each direction. The southbound runs begin at 7:50 a.m. and the last run begins at 4:10 p.m., at approximately two-hour headways. The northbound route departs the Oroville Transit Center at 8:43 a.m. with the last bus departing at 5:30 p.m., at about 2-hour headways. The trip takes about 50 minutes.

Route 24 – This route operates between the Oroville Transit Center and the town of Thermolito, west of SR 70. The route operates in a clockwise direction, proceeding west from the transit center along Mitchell Avenue, south on Feather River Blvd and west on Oro Dam Blvd into Thermolito. In Thermolito it heads north and then proceeds east along Grand Avenue into Oroville. The route operates Monday through Friday with the first bus departing the transit center at 6:34 a.m. The last bus departs at 6:54 p.m. and operates at about one-hour headways. The loop takes about 36 minutes to complete.

Route 25 – This route operates between the Oroville Transit Center and the Feather River Cinemas located on Feather River Blvd south of the project site. The route operates Monday through Friday with the first bus departing the transit center at 6:12 a.m. The last bus departs at 6:32 p.m. and operates at about one-hour headways. The loop takes about 18 minutes to complete.

In addition to fixed route bus lines the B-Line also operates two paratransit services. One service is for individuals who cannot utilize the fixed route system. The second service is dial-a-ride service provided for riders aged 70 or older.

Bicycle and Pedestrian System. Existing bicycle facilities through Oroville are generally limited to on-street accessibility and bicycle routes. However, the 2010 Oroville Bike Plan outlines new first and second tier priority bicycle facilities. First tier bikeways include a network along Oro Dam Blvd between SR 70 and Orange Avenue. In the project vicinity a second tier project includes adding a network along Feather River Blvd between Montgomery Street and Cal Oak Road.

The City has a connected pedestrian network with many streets having sidewalks on both sides. In the project vicinity, a sidewalk or pathway exists along the south side of Oro Dam Blvd providing direct access into the project site. Sidewalk does not exist on the north side of the street between SR 70 and Feather River Blvd. East of Feather River Blvd and on Feather River Blvd south of Oro Dam Blvd sidewalk is present along both sides of the street. Sidewalk is discontinuous along Feather River Blvd north of Oro Dam Blvd and is present only at locations where frontage improvements have been completed as part of development along the street.

EXISTING PLUS PROJECT IMPACTS

The development of this project will attract additional traffic to the project site. The amount of additional traffic on a particular section of the street network is dependent upon two factors:

- ***Trip Generation,*** the number of new trips generated by the project, and
- ***Trip Distribution and Assignment***, the specific routes that the new traffic takes.

Assumptions

Trip Generation. Trip generation is determined by identifying the type and size of land use being developed. Recognized sources of trip generation data may then be used to calculate the total number of trip ends. The trip generation of the project was computed using trip generation rates published in *Trip Generation* (Institute of Transportation Engineers, 10th Edition, 2017) based on the projected uses.

The proposed project will be a 5,340 sf convenience store with 25 fueling positions. Land Use 960 ***Super Convenience Market / Gas Station*** was selected to develop trip generation for the project site based on the size of the store, as noted in Table 6. The project is projected to create 444 a.m. peak hour trips and 370 p.m. peak hour trips, as noted in Table 7.

Pass-by Trips. A share of the trips associated with retail uses are typically drawn from the stream of traffic already near the site by customers who stop on their way as part of another trip. The ITE Trip Generation handbook contains the results of pass-by trip studies prepared for various uses. In this case no published rates are available for Code 960 Super Convenience Stores, and the rates identified for Code 945 Gasoline Station with Convenience Store were employed. After reduction for pass-by trips, the project is expected to generate 170 primary trips in the a.m. peak hour and 162 primary trips in the p.m. peak hour.

TABLE 6
TRIP GENERATION RATES

Source	Description	Quantity	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
960	Super Convenience Market / Gas Station	Ksf	50%	50%	83.14	50%	50%	69.28

TABLE 7
PASS-BY TRIP GENERATION ESTIMATES

Source	Description	Quantity	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
960	Gross Trips	5.34 ksf	222	222	444	185	185	370
	Pass-by Trips	63%-56%	137	137	274	104	104	208
	New Trips		85	85	170	81	81	162

TABLE 8 PRIMARY TRIP DISTRIBUTION SUMMARY		
Direction	**Route**	**Percent of Total Primary Trips**
North	State Route 70 north of Oro Dam Blvd	25%
	Feather River Blvd north of project	12.5%
South	State Route 70 south of Oro Dam Blvd	25%
	Feather River Blvd south of Oro Dam Blvd	7.5%
East	Oro Dam Blvd east of Feather River Blvd	22.5%
West	Oro Dam Blvd west of State Route 70	7.5%
Total		100.00%

PASS BY TRIP DISTRIBUTION SUMMARY				
Direction	**AM**		**PM**	
	Inbound	**Outbound**	**Inbound**	**Outbound**
Eastbound on Oro Dam Blvd	44%	43%	33%	34%
Westbound on Oro Dam Blvd	35%	34%	35%	39%
Northbound on Feather River Blvd	10%	11%	18%	10%
Southbound on Feather River Blvd	11%	12%	15%	17%

Trip Distribution. The distribution of project traffic was determined based on review of existing traffic counts and the travel patterns in the area relative to the land use, as well as the location of competing convenience type stores. As noted in Table 8, an appreciable share of the project primary trips is expected to be drawn from SR 70.

The distribution of project pass-by trips is assumed to be in proportion to the volume of traffic at the Oro Dam Blvd / Feather River Blvd intersection. As noted in Table 8, roughly 70% to 80% of the pass-by trips will come from traffic already on Oro Dam Blvd, and the balance are on Feather River Blvd.

Trip Assignment. The assignment of project trips reflects the availability of alternative access points, the relative time to use each access and the view of the access to approaching customers. For this assessment it has been conservatively assumed that all trips arriving from SR 70 will use Oro Dam Blvd driveway. Traffic arriving from the east will be split between the Oro Dam Blvd and Feather River Blvd driveways in a 67% / 33% ratio. The resulting trip assignment is shown Figure 4.

Existing Plus Project Conditions

The impacts of developing the project have been identified by superimposing project traffic onto Existing background conditions. Resulting intersection Levels of Service were then calculated and used as the basis for evaluating potential project impacts.

Traffic Volumes. Figure 5 illustrates the sum of existing and project traffic at the study locations.

Intersection Levels of Service. Table 9 provides a comparison of the a.m. and p.m. peak hour Levels of Service at each study intersection with and without the Maverik Store project. As shown, while the project may increase the length of average delays slightly. all intersections will continue to operate at LOS C or better, which is within both City and Caltrans minimum LOS thresholds.

Roadway Levels of Service. Table 9 summarizes the roadway segment Levels of Service based on the peak hour traffic volumes along Oro Dam Blvd west of the project and on Feather River Blvd north of the project. The Level of Service along Oro Dam Blvd is expected to remain at LOS D conditions with the project completed, and Feather River Blvd will remain at LOS C.

Legend

XX	AM Peak Hour Volume
(XX)	PM Peak Hour Volume
R1-1	Stop Sign
	Signalized Intersection

NORTH

N.T.S.

6

R1-1

0 (0)
2 (2)

(0) 0
(8) 9

2 (2)
9 (8)

Feather River Blvd/ Mitchell Ave

5

(0) -15
(10) 26

(21) 26
(26) 101

-14 (-11)
27 (25)

Feather River Blvd/ Project Access

1

6 (6)
21 (21)

(21) 21
(0) 0
(0) 0

(6) 6
(0) 0

SB SR 70 Ramps/ Oro Dam Rd

2

21 (21)
28 (28)

(0) 0
(28) 28

21 (21)
0 (0)
0 (0)

NB SR 70 Ramps/ Oro Dam Rd

3

65 (59)
-42 (-41)

(88) 96

R1-1

(76) 104
(-29) -55
(0) 0

R1-1

0 (0)

Project Access/ Oro Dam Rd

4

10 (8)
17 (19)
-8 (-7)

(49) 72
(19) 19
(-7) -6

(2) 0
(-25) -49
(-6) -6

-3 (-6)
3 (4)
6 (8)

Feather River Blvd/ Oro Dam Rd

PROJECT ONLY TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

6740-01 RA 1/20/2020

figure 4

Legend

XX	AM Peak Hour Volume
(XX)	PM Peak Hour Volume
R1-1	Stop Sign
	Signalized Intersection

NORTH

N.T.S.

6

R1-1

81 (86)
74 (91)

(99) 86
(238) 167

67 (83)
191 (232)

Feather River Blvd/ Mitchell Ave

5

(423) 220
(26) 26

(20) 26
(77) 101

237 (285)
27 (25)

Feather River Blvd/ Project Access

1

(394) 419
(0) 0
(80) 147

385 (611)
133 (201)

(552) 550
(69) 51

SB SR 70 Ramps/ Oro Dam Rd

2

409 (536)
456 (746)

(56) 98
(890) 872

184 (140)
1 (1)
63 (66)

NB SR 70 Ramps/ Oro Dam Rd

3

(88) 96
R1-1

65 (62)
735 (1131)

(77) 105
(913) 942
(62) 23

R1-1
3 (26)

Project Access/ Oro Dam Rd

4

(164) 165
(169) 68
(167) 87

115 (98)
570 (795)
126 (192)

(80) 89
(714) 748
(156) 90

62 (168)
60 (132)
112 (241)

Feather River Blvd/ Oro Dam Rd

EXISTING PLUS PROJECT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

6740-01 RA 1/20/2020

figure 5

TABLE 8
PEAK HOUR INTERSECTION LEVELS OF SERVICE
EXISTING PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		Existing		Existing +Project		Existing		Existing +Project		
		LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	
1. Oro Dam Blvd / SR 70 SB Ramps	Signal	B	13	B	14	B	14	B	15	-
2. Oro Dam Blvd / SR 70 NB Ramps	Signal	B	10	B	10	A	10	B	10	-
3. Oro Dam Blvd / Access										
Eastbound left turn	SB Stop	-	-	A	8	-	-	B	10	No
Southbound approach		-	-	A	6	D	27	B	11	
4. Oro Dam Blvd / Feather River Blvd	Signal	B	15	B	17	C	21	C	23	-
5. Feather River Blvd / Project Eastbound approach	EB Stop	-	-	A	5			A	7	No
6. Feather River Blvd / Mitchell Drive Westbound approach	WB Stop	A	8	A	9	B	10	B	10	No

TABLE 9
EXISTING PLUS PROJECT ROADWAY SEGMENT LEVELS OF SERVICE

Roadway	Location	Facility Classification	Minimum Standard		Existing				
			LOS	Volume (vph)	Volume (vph)	LOS	Volume (vph)		LOS
							Project Only	Total	
Feather River Blvd	North of Project	2-lane Arterial[1]	D	1,760	735	C	19	754	C
Oro Dam Blvd	West of Project	4-lane Arterial[2]	E	≤3,740	2,261	D	94	2,355	D

Source: City of Oroville Transportation Improvement Program [1] undivided roadway [2] divided roadway

TABLE 10
EXISTING PLUS PROJECT PEAK HOUR QUEUES

Location	Length	AM Peak Hour Volume (vph) Existing	AM Peak Hour Volume (vph) Project	AM Peak Hour Volume (vph) Total	AM Peak Hour Queue (feet)	PM Peak Hour Volume (vph) Existing	PM Peak Hour Volume (vph) Project	PM Peak Hour Volume (vph) Total	PM Peak Hour Queue (feet)
1. Oro Dam Blvd / SR 70 SB Ramps									
SB left turn	600[1]	398	21	419	130	374	20	110	130
WB left turn	240	112	21	133	125	181	20	160	165
WB through	240	379	6	385	190	605	6	250	250
2. Oro Dam Blvd / SR 70 NB Ramps									
NB right turn	225	163	21	184	85	120	20	75	75
EB left turn	270	98	0	98	120	56	0	110	105
EB through	270	844	28	872	180	864	26	155	155
WB through	700	428	28	456	200	720	26		305
3. Oro Dam Blvd / Access									
EB left turn	85	1	103	104	75	1	76	77	80
4. Oro Dam Blvd / Feather River Blvd									
NB left turn	280	106	6	112	100	233	8	241	195
SB left turn	180[2]	93	72	165	120	115	49	164	150
SB right+thru	180	142	13	155	80	324	12	336	165
EB left turn	225	89	0	89	120	78	2	80	140
EB through	700	893	-55	838	270	901	-31	870	330
WB left turn	385	134	-8	126	105	199	-7	192	175
5. Feather River Blvd / Project Driveway									
NB left turn	‡	-	27	27	30	-	0	25	35

Highlighted values indicate queue length in excess of available storage
[1] - includes 1-600 ft lane and 1-200ft lane. [2] – continues as two way left turn lane [3] xxx feet of storage between driveway and SR 162

Turn Lane Queues. Table 10 presents information regarding peak period queuing in turn lanes at each of the study intersections under Existing plus Project conditions. Through movements between intersections was also reviewed to determine if queues extend through adjacent intersections.

With one exception all intersections have turn lane storage capacity that can accommodate peak period queues. The westbound through movement at the Oro Dam Blvd / SR 70 Southbound Ramps intersection having a queue that extends the length of the available turn lane.

Left Turn Lane Design. From the standpoint of project access on Oro Dam Blvd the key issue is the length of queue in the eastbound left turn lane at the project driveway and the length of the concurrent queue in the adjoining eastbound left turn lane at Feather River Blvd. As indicated, the queue at Feather River Blvd is 140 feet, which is similar to the existing condition. The driveway turn lane does not occupy the area that would be required to store these vehicles waiting at the Feather River Blvd intersection, and deceleration into that area from 15 to 20 mph is still possible.

Similarly, the 95th percentile queue in the left turn lane at the project driveway approaches but does not exceed the available storage length. However, no space would be available for deceleration outside of the through travel lanes. While permitting inbound left turns at the project access would be feasible in the near term, reconstructing the median area west of the project to lengthen the lane and provide space for deceleration outside the thru travel lanes is recommended.

A similar review was conducted regarding the Feather River Blvd driveway. The combination of northbound left turn lane queue (35 feet) at the driveway and southbound left turn lane queue at Feather River Blvd (150 feet) is 190 feet which can be accommodate by the 280 feet of available storage. The full access at this location is feasible.

Alternative Transportation Modes

Pedestrian Facilities. The project is likely to generate pedestrians who would walk to the site from neighboring commercial areas or residential areas. Today there are no sidewalks along the project frontage, but sidewalks exist elsewhere as noted earlier. The absence of sidewalks along the project frontage would result in potential conflicts between pedestrians and automobiles. As has been the case elsewhere in Oroville, the project will be required to install sidewalks on Oro Dam Blvd and on Feather River Blvd as part of standard City frontage improvement requirements.

Bicycle Facilities. Similarly, there are no dedicated bicycle facilities along the project's frontage. Paved shoulder exists on the south side of Oro Dam Blvd, and while edge line exists this area is not designated as a Class II lane. The project will address its incremental impact to the need for bicycle facilities be making standard frontage improvements.

CUMULATIVE IMPACTS

Background Traffic Volume Forecasts

Traditionally, future traffic volumes are derived from tools maintained by local agencies. Those tools may be as simple as historic traffic growth rates or as complicated as regional planning models. In this case the Butte County Association of Governments (BCAG) is that agency. BCAG is in the process of preparing a new travel demand model (TDM) to respond to the Camp Fire that occurred in Paradise during November 2018. The fire, which destroyed most of the town of Paradise, has changed housing, population and jobs values that are input to the model. BCAG is currently in the process of determining how to adjust the future year model based on if, when and to what scale the town will be rebuilt. BCAG has suggested that the current TDM continue to be used until their new model is available. Cumulative volumes, therefore, were based on the current BCAG 2040 TDM. Peak hour volumes along Oro Dam Blvd and adjacent streets were provided from the model.

Year 2040 Forecasts / Conditions

Improvements. In 2040 are generally projected to remain with their current lane configurations. While there are no identified and funded improvements, it is possible if in fact likely that the current signal timing may change. Under cumulative conditions changes to the timing patterns were assumed.

The *City of Oroville's Traffic Impact Fee Program Update (2012)*[1] identified improvements to study area intersections that are addressed by the fee program. The Oro Dam Blvd / Feather River Blvd intersection is included in the program, and while not assumed in this analysis, these improvements are noted:

- Add Eastbound Right Turn Pocket
- Add Second Northbound Left Turn pocket
- Restripe southbound approach to create separate Left Turn+Thru lane and Right turn lanes.

While not assumed in this analysis, a corridor level planning study for SR 162 was prepared in 2016 by Traffic Works, LLC under contract to BCAG and the City of Oroville[2]. The study noted that capacity improvements should eventually be completed along the corridor. In the vicinity of the project the preferred alternative included the following improvements:

- Oro Dam Blvd / Feather River Blvd intersection:
  - add a second westbound left turn lane
  - add an eastbound right turn lane

[2] *Butte County Association of Government SR 162 Corridor Plan,* Traffic Works, LLC, June, 2016

2040 Traffic Volume Forecasts. Year 2040 traffic forecasts were based on the most recent BCAG traffic model. An incremental method was employed to develop intersection turning movements while accounting for any inherent model deficiencies. The base year model and Year 2040 model approach volumes were compared at each intersection. Applicable growth factors were calculated, and the results were applied to current observed volumes. Future Intersection turning movements were then developed using the techniques described in NCHRP Report 255 (Furness Factoring).

The basis for evaluating "Plus Project" conditions was determined. The TDM's land use files were reviewed to determine whether the model already assumed development ton the subject site. In general the model places the subject site in a large Traffic Analysis Zone (TAZ) located between Oro Dam Blvd and Montgomery Street and between SR 70 and Feather River Blvd. that are is projected to see limited retail growth, and the growth that was identified appears to be more closely related to completion of the approved retail area that is partially built out along the west side of Feather River Blvd towards the north end of the TAZ. Based on this information it has been assumed that the trips associated with the project are in addition to the background traffic volumes projections created with the model.

Cumulative Traffic Conditions – No Project

Intersection Levels of Service. Figure 6 displays the projected 2040 peak hour traffic volumes for the local intersections without the project. Table 11 displays the resulting a.m. and p.m. peak hour Levels of Service at each study intersection under the Cumulative "No Project" condition based on "optimized" signal timing. The three signalized intersections along Oro Dam Blvd are projected to operate at LOS D or better. The unsignalized Feather River Blvd / Mitchell Drive intersection will operate at LOS C. All intersections operate within the minimum LOS thresholds of both the City of Oroville and Caltrans.

Roadway Levels of Service. Table 12 summarizes future Levels of Service on roadway segments based on the projected traffic volumes derived from the BCAG TDM. The roadway volumes are projected to increase along Oro Dam Blvd and Feather River Blvd, but the roadway level of service will remain at LOS D on Oro Dam Blvd and LOS C on Feather River Blvd.

Peak Hour Queues. Table 13 presents information regarding peak period queuing in lanes at each of the signalized intersections under Cumulative conditions without the project. While most intersections will continue to have turn lane storage that can accommodate peak period queues. The 95th percentile queues at four locations will exceed the available storage length and are highlighted.

Left Turn Lane Design. The 95th percentile queue in the eastbound left turn lane approaching Feather River Blvd is 225 feet. This queue fills the area between the driveway and intersection, and any deceleration outside of through travel lanes occurs by driving through the site access opening. Because the volume of traffic turning into the exiting uses on the site is so small, Caltrans may not elect to close the opening, as would normally be the case.

Legend

XX AM Peak Hour Volume
(XX) PM Peak Hour Volume
R1-1 Stop Sign
Signalized Intersection

NORTH
N.T.S.

6
(130) 110
(295) 200
R1-1
100 (110)
90 (115)
80 (105)
225 (290)
Feather River Blvd/ Mitchell Ave

5
(555) 330
360 (380)
Feather River Blvd/ Project Access

1
(655) 695
(0) 0
(125) 230
455 (725)
250 (415)
(645) 665
(140) 110
SB SR 70 Ramps/ Oro Dam Rd

2
610 (775)
545 (925)
(145) 235
(1155) 1125
285 (230)
5 (5)
160 (215)
NB SR 70 Ramps/ Oro Dam Rd

3
(5) 5
R1-1
5 (5)
1145 (1705)
(0) 0
(1265) 1405
(90) 35
R1-1
25 (60)
Project Access/ Oro Dam Rd

4
(110) 95
(135) 90
(200) 145
105 (130)
830 (1170)
115 (195)
(165) 180
(935) 1055
(225) 195
115 (205)
75 (85)
175 (340)
Feather River Blvd/ Oro Dam Rd

CUMULATIVE WITHOUT PROJECT TRAFFIC VOLUMES AND LANE CONFIGURATIONS

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6740-01 RA 1/20/2020

figure 6

TABLE 11
PEAK HOUR INTERSECTION LEVELS OF SERVICE
CUMULATIVE PLUS PROJECT CONDITIONS

Location	Control	AM Peak Hour				PM Peak Hour				Traffic Signal Warranted?
		Cumulative		Cumulative +Project		Cumulative		Cumulative +Project		
		LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	LOS	Average Delay	
1. Oro Dam Blvd / SR 70 SB Ramps	Signal	B	20	B	20	C	21	C	22	-
2. Oro Dam Blvd / SR 70 NB Ramps	Signal	B	14	B	14	B	14	B	14	-
3. Oro Dam Blvd / Access Eastbound left turn Southbound approach	SB Stop	 -	 -	 B B	 15 12			 E D	 36 29	No
4. Oro Dam Blvd / Feather River Blvd	Signal	C	24	C	25	C	35	D	38	-
5. Feather River Blvd / Project Eastbound approach	EB Stop	-	-	A	7			B	16	No
6. Feather River Blvd / Mitchell Drive Westbound approach	WB Stop	B	12	B	12	C	20	C	18	No

TABLE 12
CUMULATIVE PLUS PROJECT ROADWAY SEGMENT LEVELS OF SERVICE

Roadway	Location	Facility Classification	Minimum Standard		Cumulative		Cumulative + Project		
							Volume (vph)		
			LOS	Volume (vph)	Volume (vph)	LOS	Project Only	Total	LOS
Feather River Blvd	North of Project	2-lane Arterial[1]	D	1,760	825	C	19	844	C
Oro Dam Blvd	West of Feather River Blvd	4-Lane Arterial[2]	E	≤3,740	3,065	D	94	3,159	D

Source: City of Oroville Transportation Improvement Program [1] undivided roadway [2] divided roadway

TABLE 13
CUMULATIVE PLUS PROJECT PEAK HOUR QUEUES

Location	Length (feet)	AM Peak Hour					PM Peak Hour				
		Cumulative		Cumulative Plus Project			Cumulative				
		Volume (vph)	Queue (feet)	Volume (vph) Project	Volume (vph) Total	Queue (feet)	Volume (vph)	Queue (feet)	Volume (vph) Project	Volume (vph) Total	Queue (feet)
1. Oro Dam Blvd / SR 70 SB Ramps											
SB left turn (2 lanes)	600[1]	695	210	21	716	210	655	210	20	675	195
WB left turn	240	250	215	21	271	240	415	320	20	435	320
WB through	240	455	215	6	461	220	725	285	6	731	285
2. Oro Dam Blvd / SR 70 NB Ramps											
NB right turn	225	285	155	21	306	170	230	140	20	250	140
EB left turn	270	235	255	0	235	260	145	200	0	145	175
EB through	270	1,125	285	28	1,153	295	1,155	220	26	1,181	200
WB through	700	545	210	28	573	215	925	350	26	951	330
3. Oro Dam Blvd / Access											
EB left turn	85	0	-	104	104	105	0	-	76	76	135
4. Oro Dam Blvd / Feather River Blvd											
NB left turn	280	175	160	6	81	175	340	285	8	348	300
SB left turn	180[2]	95	100	72	167	145	110	140	49	159	175
SB right+thru	unlimited	235	100	13	248	130	335	195	12	347	225
EB left turn	225	180	220	0	180	220	165	225	2	167	235
EB through	700	1,250	590	-55	1,195	510	1,160	620	-31	1,129	595
WB left turn	385	115	120	-8	107	115	195	325	-7	188	375
5. Feather River Blvd / Project Driveway											
NB left turn	285[3]	0		27	27	30	0	-	25	25	35

Highlighted values indicate queue length in excess of available storage
[1] - includes 1-600 ft lane and 1-200ft lane. [2] – continues as two way left turn lane [3] 285 feet of storage between project driveway and SR 162

Cumulative Plus Maverik Store Project Conditions

Traffic Volumes. The impacts of developing the project have been identified by superimposing project traffic onto the background Cumulative traffic condition. Figure 7 identifies the resulting traffic volumes.

Intersection Levels of Service. Table 11 compares "Plus Project" conditions with the "No Project" Cumulative conditions. As noted, all three signalized intersections along Oro Dam Blvd will continue to operate at LOS D or better. The Feather River Blvd / Project Driveway intersection will operate at LOS B in the peak periods while the Oro Dam Blvd / Project Driveway intersection will operate at LOS D (outbound traffic) and LOS E (eastbound left turn) in the p.m. peak hour. All of these conditions remain with the minimum LOS standards of the City and Caltrans.

Roadway Levels of Service. Table 12 summarizes future Levels of Service based on the projected traffic volumes. Oro Dam Blvd will continue to operate at LOS D, while Feather river Blvd will continue to operate at LOS C.

Queuing. Table 13 presents information regarding peak period queuing in lanes at each of the intersections under Cumulative plus Project conditions. Most intersections have turn lane storage capacity that can accommodate peak period queues. The four highlighted locations are projected to have queues that exceed the available storage. These same locations were identified in the Cumulative No Project conditions. In each of these locations the additional queue is less than a car length when compared to the No Project conditions.

Left Turn Lane Design. From the standpoint of project access to Oro Dam Blvd the key issue remains the length of queue in the eastbound left turn lane at the project driveway and the concurrent queue in the adjoining eastbound left turn lane at Feather River Blvd. As indicated, the queue at Feather River Blvd intersection exceeds the storage distance between the project driveway and the intersection. Thus, the driveway turn lane occupies an area that would be required to store vehicles waiting at the intersection. The 95th percentile queue in the left turn lane at the project driveway also exceeds the available storage length.

Under cumulative plus project conditions it is possible that during peak periods some traffic waiting to turn left at Feather River Blvd will occupied the opening at the project driveway. Under that condition access into the site will be blocked. While it is possible to restripe the existing Feather River Blvd turn lane to create a separate turn lane that visually differentiates it from the driveway left turn lane, this action would reduce the available storage and likely result in waiting vehicles spilling over into the adjoining through lane. Because either blocking the driveway access or causing spillover into the adjoining lanes creates a hazard, it is likely that Caltrans will require that the left turn lane at the driveway be closed.

Eliminating left turns into the site will add turning traffic at the Oro Dam Blvd / Feather River Blvd intersection, and it is likely that some of this diverted traffic will want to make a u-turn and return to the Oro Dam Blvd driveway. Today u-turns are prohibited on both the westbound and eastbound Oro Dam Blvd approaches. The basis for the prohibition is unclear from review of the

intersection layout, as the distance between left turn lane and the curb on the north side of the road is about 40 feet. This width would normally accommodate u-turns.

A similar review of cumulative conditions was conducted for the project's Feather River Blvd driveway. The combination of northbound left turn lane queue (35 feet) at the driveway and southbound left turn lane queue at Feather River Blvd (175 feet) is 210 feet which can be accommodate by the 280 feet of available storage. Thus, full access at this location is feasible. The northbound queue would be slightly longer (65 feet) if left turns into the site are eliminated on Oro Dam Blvd and eastbound u-turns continue to be prohibited, however, access remains feasible. Access would remain feasible if the southbound approach at Oro Dam Blvd was reconfigured as suggested in the City Transportation Impact Fee program.

Effects of SR 162 Corridor Plan Implementation. The SR 162 Corridor Plan suggests improvements to the Oro Dam Blvd / Feather River Blvd intersection. While not required to mitigate an identified project impact, the extent to which implementing the corridor plan affects this site has been considered.

The corridor plan identifies two intersection improvements to the intersection:

- add a second westbound left turn lane
- add an eastbound right turn lane

Creating the second westbound left turn lane and eastbound right turn lane would require widening Oro Dam Blvd. The roadway is roughly 80 feet wide east of the intersection (curb to curb). That section accommodates a paved shoulder (8 feet) and two eastbound travel lanes (24 feet) a narrow, raised median (2 feet), westbound left turn lane (12 feet), two westbound lens (22 feet) and a right turn lane (12 feet). Assuming that the highway was widened on both sides of the centerline to accommodate another 12 foot left turn lane but only the south side of the highway was widened to construct the westbound right turn, then the westbound lanes of the intersection could move 6 feet to the north. Alternatively, if all 24 feet of widening for the two lanes is centered about the centerline of the highway, then the westbound lanes would move 12 feet.

The extent to which the SR 162 Corridor Plan should be accommodated by the project site is unknown. At the simplest level, the City and Caltrans could require that an irrevocable offer of dedication be made for the right of way needed to accommodate the plan.

Legend

- XX — AM Peak Hour Volume
- (XX) — PM Peak Hour Volume
- R1-1 — Stop Sign
- Signalized Intersection

NORTH

N.T.S.

6 — Feather River Blvd/ Mitchell Ave

(130) 110
(303) 209
R1-1
100 (110)
92 (117)
82 (107)
234 (298)

5 — Feather River Blvd/ Project Access

(539) 315
(26) 26
(20) 26
(77) 101
346 (369)
27 (25)

1 — SB SR 70 Ramps/ Oro Dam Rd

(675) 716
(0) 0
(125) 230
461 (731)
271 (435)
(651) 671
(140) 110

2 — NB SR 70 Ramps/ Oro Dam Rd

631 (795)
573 (951)
(145) 235
(1181) 1153
5 (5)
160 (215)
306 (250)

3 — Project Access/ Oro Dam Rd

(93) 101
R1-1
70 (64)
1103 (1664)
(76) 104
(1236) 1350
(90) 35
25 (60)
R1-1

4 — Feather River Blvd/ Oro Dam Rd

(159) 167
(154) 109
(193) 139
115 (138)
847 (1187)
107 (188)
(167) 180
(910) 1006
(219) 189
181 (348)
78 (89)
112 (199)

CUMULATIVE PLUS PROJECT
TRAFFIC VOLUMES AND LANE CONFIGURATIONS

KD Anderson & Associates, Inc.
Transportation Engineers

6740-01 RA 1/20/2020

figure 7

SITE ACCESS AND CIRCULATION REVIEW

The project site plan has been reviewed with regards to typical issues such as driveway throat depth and internal circulation to address these questions:

- Does the layout of the site provide adequate driveway throat depth to ensure that site traffic does not spillover onto adjoining public streets?
- Are auxiliary turn lanes needed at the project's driveway?
- Are onsite improvements needed for alternative transportation modes?
- Is emergency vehicle access adequate?

Site Circulation Layout. The project layout includes a main aisle that circles the convenience market and automobile fueling positions. This aisle is connected to the adjoining public road system by driveways that extend roughly 80 feet into the site. These driveway throats can accommodate three waiting automobiles or a truck and automobile without interfering with the flow of traffic into the site.

Driveway Throat Depth Assessment. The available throat depth was compared to projected 95th percentile queues under cumulative plus project conditions. The queue forecast at the Oroville Dam Blvd driveway is estimated at 120 feet, while the queue in the Feather River Blvd driveway is estimated to be 90 feet. While the throat depth at the Feather River Blvd driveway is adequate, under long term conditions the queue waiting at Oro Dam Blvd could interfere with inbound traffic. To address this issue it will be necessary to construct a 120 foot median in the Oro Dam Blvd driveway to separate inbound and outbound traffic.

Auxiliary Lanes. Because the background traffic volume on Feather River Blvd is relatively low, auxiliary right turn lanes are not required at that driveway. However, the location of the Oro Dam Blvd driveway is between the ramp onto NB SR 70 and the free right turn lane at Feather River Blvd and requires assessment. The distance between the gore of the SR 70 ramp and the end of the Feather River Blvd right turn lane is about 275 feet. Because this distance is short a deceleration taper should be constructed at the proposed driveway. That taper would be roughly 110 feet long and 12 feet wide at the driveway curb return. This will help more entering vehicles out of the through travel lanes.

Pedestrian Access. The plan will need to include a designated pedestrian path of travel from adjoining sidewalks to the convenience market.

Emergency Access. Emergency vehicles can enter the site from either driveway. Both driveways are more than 40 feet wide to accommodate trucks. These driveway widths would accommodate emergency vehicles as well should be design based on the applicable fire apparatus.

FINDINGS / RECOMMENDATIONS / MITIGATIONS

The preceding analysis has identified project impacts that may occur without mitigation. The text that follows identifies a strategy for mitigating the impacts of the proposed project. Recommendations are identified for facilities that require mitigation but are not a result of the proposed project. If the project causes a significant impact, mitigations are identified for the facility.

Existing Conditions

Traffic Operations. All intersections and roadway segments in the study area currently operate within the minimum Level of Service standards adopted by the City of Oroville and Caltrans. The assessment of queuing indicates that the 95th percentile queue can be accommodated by available storage at most locations but the queue in the westbound through lane at the Oro Dam Blvd / SR 70 SB Ramps intersection exceeds into the NB Ramps intersection.

Existing plus Project Conditions

Traffic Operations. All intersections and roadway segments will continue to operate with Levels of Service that satisfy iminium standards. No specific improvements are needed to address Level of service impacts. The project will incrementally increase the length of queues at some locations but does not result in new locations where the projected queues exceeds available storage.

Site Access. The following mitigation should apply.

Oro Dam Blvd Access. The project proposes to allow eastbound left turn into the site at the existing Oro Dam Blvd driveway but to preclude outbound left turns. Because the length of the queue in the eastbound left turn lane approaching Feather River Blvd can be accommodated between the driveway and intersection, inbound left turn access is feasible in the near term. If left turn inbound access is allowed by Caltrans, reconstructing the median area to lengthen the driveway's existing turn lane is recommended. However, under cumulative conditions that queue extends beyond the driveway and left turn access is not feasible in the long term.

Driveway Auxiliary Lanes. The Oro Dam Blvd driveway is close to the southbound free right turn lane at Feather River Blvd. Widening the roadway to provide a deceleration taper is recommended.

Driveway Throat Depth. The Oro Dam Blvd driveway will need a 120 foot median top separate inbound and outbound traffic and provide adequate storage for waiting vehicles outside of the path of inbound traffic.

Frontage Improvements. The project should provide standard City of Oroville and Caltrans frontage improvements that include shoulder and sidewalk to address it incremental impact to pedestrians and bicyclists. A designated on-site path of travel for pedestrians is needed between the convenience store and the adjoining street.

Cumulative Conditions

All signalized intersections will continue to operate within accepted level of service thresholds, at LOS D or better. Levels of Service continue to operate at LOS B. This is within the minimum requirements of both the City of Oroville and Caltrans. The roadway segment for Oro Dam Blvd between the SR 70 Northbound Ramps and Feather River Blvd will operate at an acceptable LOS, at LOS D and Feather River Blvd will operate at LOS C.

The 95th percentile queues at four locations will exceed the available storage length and are highlighted.

The corridor study for SR 162 noted that capacity improvements should be completed along the corridor. In the vicinity of the project the preferred alternative improvements along Oro Dam Blvd included the following:

- Oro Dam Blvd / Feather River Blvd intersection:

    - add second westbound left turn lane;
    - add eastbound right turn lane;
    - increase left turn lane length on northbound and southbound Feather River Blvd approaches.

Improvements to the Oro Dam Blvd / Feather River Blvd intersection are also included in the City's Transportation Impact Fee program.

Cumulative plus Project Conditions

Under Plus Project conditions, all signalized intersections will continue to operate within accepted level of service thresholds. The signalized intersections will operate at LOS D. The levels of service at the project driveway along Feather River Blvd will continue to operate at LOS B while the driveway along Oro Dam Blvd will decline to LOS E in the p.m. peak hour. This is within the minimum criteria of both the City of Oroville and Caltrans. The same 4 locations that have queues that exceed available storage will continue to do so.

The project shall contribute to cumulative mitigation by paying adopted fees.

REFERENCES

1. *Butte County Association of Government SR 162 Corridor Plan,* Traffic Works, LLC, June, 2016
2. *Transportation Concept Report State Route 162*, Caltrans District 3, February, 2017
3. *Highway Capacity Manual*, Transportation Research Board, 6th Edition, 2016
4. *California Manual on Uniform Traffic Control Devices*, 2014
5. *Oroville Sustainability Updates* and corresponding *Final Supplemental EIR* (adopted March 2015)
6. *City of Oroville, Oroville Bike Plan 2010, August 2010*
7. *City of Oroville 2012 Transportation Capital Improvement Program (TCIP) and Impact Fee Update Report, Omni-Means, 2012.*

APPENDICES

Prepared by National Data & Surveying Services

Feather River Blvd & Oro Dam Blvd E

Peak Hour Turning Movement Count

ID: 19-07440-001
City: Oroville

Day: Tuesday
Date: 11/19/2019

PEAK HOURS	
AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS	
AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Feather River Blvd — SOUTHBOUND

AM	93	49	93	0	251
NOON	0	0	0	0	0
PM	174	150	115	0	296

Oro Dam Blvd E — EASTBOUND

AM	NOON	PM
752	0	1185
0	0	0
89	0	78
797	0	739
96	0	162

Oro Dam Blvd E — WESTBOUND

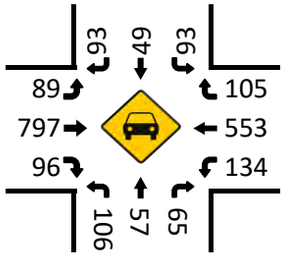
PM	NOON	AM
90	0	105
778	0	553
199	0	134
0	0	0
1028	0	955

Feather River Blvd — NORTHBOUND

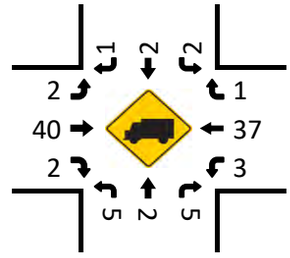
PM	511	0	233	128	174
NOON	0	0	0	0	0
AM	279	0	106	57	65

CONTROL			
Signalized			
TEV	2237 AM	0 NOON	3020 PM
PHF	0.89		0.91

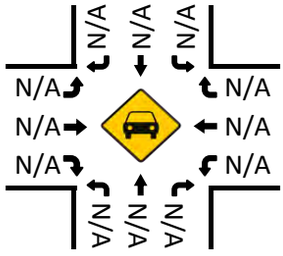
Total Vehicles (AM)



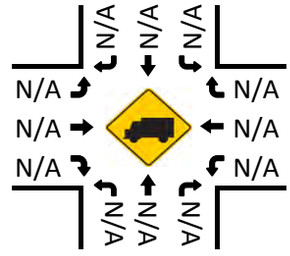
HT (AM)



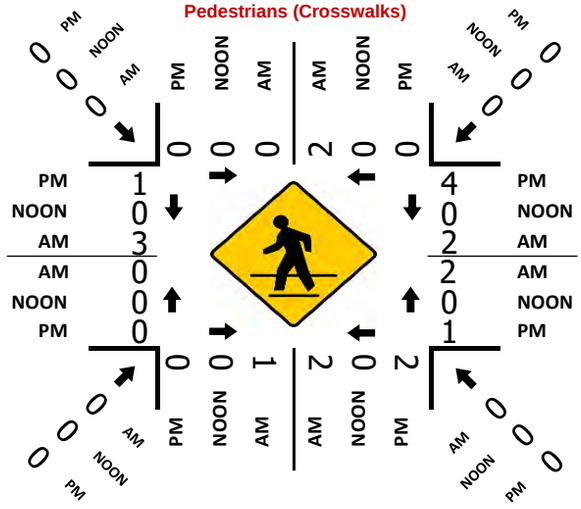
Total Vehicles (Noon)



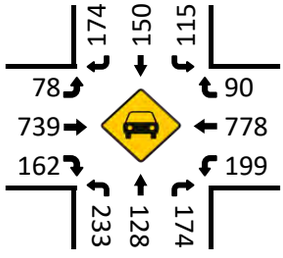
HT (NOON)



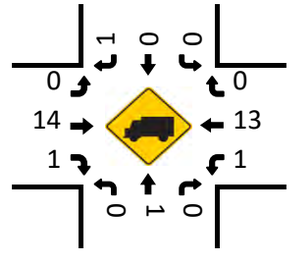
Pedestrians (Crosswalks)



Total Vehicles (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Oro Dam Blvd E
City: Oroville
Control: Signalized

Project ID: 19-07440-001
Date: 11/19/2019

Total

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	22	10	8	0	21	12	16	0	15	117	19	0	18	102	17	0	377
7:15 AM	24	15	19	0	14	15	27	0	12	165	25	0	24	163	9	0	512
7:30 AM	26	13	14	0	20	16	23	0	23	246	21	0	26	146	17	0	591
7:45 AM	33	18	21	0	30	14	31	0	26	239	26	0	27	137	27	0	629
8:00 AM	28	14	15	0	20	6	19	0	27	164	26	0	29	121	28	0	497
8:15 AM	19	12	15	0	23	13	20	0	13	148	23	0	52	149	33	0	520
8:30 AM	28	21	14	0	16	20	20	0	20	146	45	0	37	127	28	0	522
8:45 AM	36	16	30	0	23	19	25	0	28	129	23	0	35	112	19	0	495
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	216	119	136	0	167	115	181	0	164	1354	208	0	248	1057	178	0	4143
APPROACH %'s :	45.86%	25.27%	28.87%	0.00%	36.07%	24.84%	39.09%	0.00%	9.50%	78.45%	12.05%	0.00%	16.72%	71.27%	12.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	106	57	65	0	93	49	93	0	89	797	96	0	134	553	105	0	2237
PEAK HR FACTOR :	0.803	0.792	0.774	0.000	0.775	0.766	0.750	0.000	0.824	0.810	0.923	0.000	0.644	0.928	0.795	0.000	0.889
	0.792				0.783				0.844				0.846				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	60	31	35	0	28	37	43	0	22	191	31	0	44	237	26	0	785
4:15 PM	54	23	44	0	21	31	34	0	25	162	31	0	49	193	23	0	690
4:30 PM	48	23	34	0	21	37	30	0	21	179	39	0	46	197	20	1	696
4:45 PM	51	24	41	0	31	33	39	0	22	173	43	0	40	193	20	0	710
5:00 PM	55	39	51	0	28	42	55	0	15	183	46	0	55	231	29	0	829
5:15 PM	62	37	35	0	24	37	42	0	27	191	30	0	69	179	21	0	754
5:30 PM	65	28	47	0	32	38	38	0	14	192	43	0	35	175	20	0	727
5:45 PM	45	15	41	0	27	39	14	1	23	164	42	0	59	150	30	0	650
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	440	220	328	0	212	294	295	1	169	1435	305	0	397	1555	189	1	5841
APPROACH %'s :	44.53%	22.27%	33.20%	0.00%	26.43%	36.66%	36.78%	0.12%	8.85%	75.17%	15.98%	0.00%	18.53%	72.60%	8.82%	0.05%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	233	128	174	0	115	150	174	0	78	739	162	0	199	778	90	0	3020
PEAK HR FACTOR :	0.896	0.821	0.853	0.000	0.898	0.893	0.791	0.000	0.722	0.962	0.880	0.000	0.721	0.842	0.776	0.000	0.911
	0.922				0.878				0.983				0.847				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Oro Dam Blvd E
City: Oroville
Control: Signalized

Project ID: 19-07440-001
Date: 11/19/2019

Cars

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	19	10	8	0	18	11	15	0	14	104	18	0	17	94	15	0	343
7:15 AM	23	12	18	0	13	15	25	0	12	154	25	0	22	153	9	0	481
7:30 AM	24	12	12	0	20	15	22	0	23	234	21	0	25	138	17	0	563
7:45 AM	31	18	20	0	29	14	31	0	25	229	26	0	27	129	27	0	606
8:00 AM	27	14	13	0	20	6	19	0	27	157	24	0	29	112	28	0	476
8:15 AM	19	11	15	0	22	12	20	0	12	137	23	0	50	137	32	0	490
8:30 AM	28	21	13	0	16	20	20	0	20	138	45	0	31	113	27	0	492
8:45 AM	29	16	30	0	23	19	23	0	28	114	22	0	32	107	18	0	461
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	200	114	129	0	161	112	175	0	161	1267	204	0	233	983	173	0	3912
APPROACH %'s :	45.15%	25.73%	29.12%	0.00%	35.94%	25.00%	39.06%	0.00%	9.87%	77.63%	12.50%	0.00%	16.77%	70.77%	12.46%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	101	55	60	0	91	47	92	0	87	757	94	0	131	516	104	0	2135
PEAK HR FACTOR :	0.81	0.764	0.750	0.000	0.784	0.783	0.742	0.000	0.806	0.809	0.904	0.000	0.655	0.935	0.813	0.000	0.881
	0.783				0.777				0.838				0.857				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	60	31	35	0	28	37	41	0	22	183	31	0	44	234	26	0	772
4:15 PM	53	23	43	0	21	31	33	0	25	159	29	0	49	189	23	0	678
4:30 PM	48	22	34	0	21	37	30	0	21	170	39	0	45	196	20	1	684
4:45 PM	51	24	41	0	31	33	39	0	22	169	43	0	40	190	20	0	703
5:00 PM	55	39	51	0	28	42	55	0	15	178	46	0	55	227	29	0	820
5:15 PM	62	37	35	0	24	37	41	0	27	188	30	0	69	176	21	0	747
5:30 PM	65	27	47	0	32	38	38	0	14	190	42	0	34	172	20	0	719
5:45 PM	45	15	41	0	27	39	14	1	23	160	42	0	59	149	30	0	645
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	439	218	327	0	212	294	291	1	169	1397	302	0	395	1533	189	1	5768
APPROACH %'s :	44.61%	22.15%	33.23%	0.00%	26.57%	36.84%	36.47%	0.13%	9.05%	74.79%	16.17%	0.00%	18.65%	72.38%	8.92%	0.05%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	233	127	174	0	115	150	173	0	78	725	161	0	198	765	90	0	2989
PEAK HR FACTOR :	0.90	0.814	0.853	0.000	0.898	0.893	0.786	0.000	0.722	0.954	0.875	0.000	0.717	0.843	0.776	0.000	0.911
	0.921				0.876				0.980				0.846				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Oro Dam Blvd E
City: Oroville
Control: Signalized

Project ID: 19-07440-001
Date: 11/19/2019

HT

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	3	0	0	0	3	1	1	0	1	13	1	0	1	8	2	0	34
7:15 AM	1	3	1	0	1	0	2	0	0	11	0	0	2	10	0	0	31
7:30 AM	2	1	2	0	0	1	1	0	0	12	0	0	1	8	0	0	28
7:45 AM	2	0	1	0	1	0	0	0	1	10	0	0	0	8	0	0	23
8:00 AM	1	0	2	0	0	0	0	0	0	7	2	0	0	9	0	0	21
8:15 AM	0	1	0	0	1	1	0	0	1	11	0	0	2	12	1	0	30
8:30 AM	0	0	1	0	0	0	0	0	0	8	0	0	6	14	1	0	30
8:45 AM	7	0	0	0	0	0	2	0	0	15	1	0	3	5	1	0	34
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	16	5	7	0	6	3	6	0	3	87	4	0	15	74	5	0	231
APPROACH %'s :	57.14%	17.86%	25.00%	0.00%	40.00%	20.00%	40.00%	0.00%	3.19%	92.55%	4.26%	0.00%	15.96%	78.72%	5.32%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	5	2	5	0	2	2	1	0	2	40	2	0	3	37	1	0	102
PEAK HR FACTOR :	0.625	0.500	0.625	0.000	0.500	0.500	0.250	0.000	0.500	0.833	0.250	0.000	0.375	0.771	0.250	0.000	0.850
	0.600				0.625				0.917				0.683				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	2	0	0	8	0	0	0	3	0	0	13
4:15 PM	1	0	1	0	0	0	1	0	0	3	2	0	0	4	0	0	12
4:30 PM	0	1	0	0	0	0	0	0	0	9	0	0	1	1	0	0	12
4:45 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	3	0	0	7
5:00 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	4	0	0	9
5:15 PM	0	0	0	0	0	0	1	0	0	3	0	0	0	3	0	0	7
5:30 PM	0	1	0	0	0	0	0	0	0	2	1	0	1	3	0	0	8
5:45 PM	0	0	0	0	0	0	0	0	0	4	0	0	0	1	0	0	5
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1	2	1	0	0	0	4	0	0	38	3	0	2	22	0	0	73
APPROACH %'s :	25.00%	50.00%	25.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	92.68%	7.32%	0.00%	8.33%	91.67%	0.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	1	0	0	0	0	1	0	0	14	1	0	1	13	0	0	31
PEAK HR FACTOR :	0.00	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.700	0.250	0.000	0.250	0.813	0.000	0.000	0.861
	0.250				0.250				0.750				0.875				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Oro Dam Blvd E
City: Oroville
Control: Signalized

Project ID: 19-07440-001
Date: 11/19/2019

Bikes

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	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	1	0	0	0	0	0	0	0	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	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	1	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	1	0	0	1	2	0	0	1	0	0	0	6
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	33.33%	66.67%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	4
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.250	0.250	0.000	0.000	0.250	0.000	0.000	0.000	1.000
					0.250				0.500				0.250				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	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	0	0	0
5:30 PM	0	0	0	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	0	0	0
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	4
APPROACH %'s :	0.00%	50.00%	50.00%	0.00%	0.00%	0.00%	100.00%	0.00%					0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
					0.250												

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Oro Dam Blvd E
City: Oroville

Project ID: 19-07440-001
Date: 11/19/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Feather River Blvd		Feather River Blvd		Oro Dam Blvd E		Oro Dam Blvd E		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	2	0	1	1	1	1	6
7:15 AM	0	0	1	0	1	0	0	1	3
7:30 AM	0	1	0	2	0	1	0	1	5
7:45 AM	0	1	1	0	2	0	0	0	4
8:00 AM	0	0	0	0	0	1	0	0	1
8:15 AM	0	0	0	0	0	0	0	2	2
8:30 AM	1	0	0	0	0	0	1	0	2
8:45 AM	0	0	0	0	1	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	2	4	2	5	3	2	5	24
APPROACH %'s :	33.33%	66.67%	66.67%	33.33%	62.50%	37.50%	28.57%	71.43%	
PEAK HR :	**07:30 AM - 08:30 AM**								TOTAL
PEAK HR VOL :	0	2	1	2	2	2	0	3	12
PEAK HR FACTOR :		0.500	0.250	0.250	0.250	0.500		0.375	0.600
	0.500		0.375		0.500		0.375		

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	3	0	0	3
4:15 PM	0	0	0	0	0	1	0	0	1
4:30 PM	2	0	0	0	0	0	2	0	4
4:45 PM	0	0	0	2	0	3	0	0	5
5:00 PM	0	0	0	0	1	1	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	1	1
5:45 PM	1	0	0	0	0	0	2	0	3
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	3	0	0	2	1	8	4	1	19
APPROACH %'s :	100.00%	0.00%	0.00%	100.00%	11.11%	88.89%	80.00%	20.00%	
PEAK HR :	**04:45 PM - 05:45 PM**								TOTAL
PEAK HR VOL :	0	0	0	2	1	4	0	1	8
PEAK HR FACTOR :				0.250	0.250	0.333		0.250	0.400
			0.250		0.417		0.250		

Prepared by National Data & Surveying Services

Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy & Oro Dam Blvd E

Peak Hour Turning Movement Count

ID: 19-07440-002
City: Oroville

Day: Tuesday
Date: 11/19/2019

PEAK HOURS	
	07:15 AM - 08:15 AM
	NONE
	04:30 PM - 05:30 PM

COUNT PERIODS	
	07:00 AM - 09:00 AM
	NONE
	04:00 PM - 06:00 PM

SOUTHBOUND (Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy)

AM	0	0	0	0	0	AM
NOON	0	0	0	0	0	NOON
PM	1	0	3	0	3	PM

EASTBOUND (Oro Dam Blvd E)

AM	NOON	PM
778	0	1174
1	0	1
0	0	0
997	0	942
23	0	62

WESTBOUND (Oro Dam Blvd E)

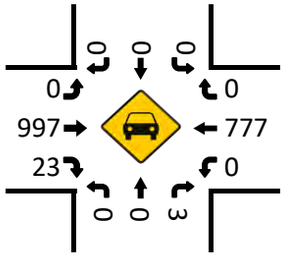
PM	NOON	AM
3	0	0
1172	0	777
0	0	0
0	0	0
971	0	1000

NORTHBOUND (r less Dwy/Advanced Soil and Garde)

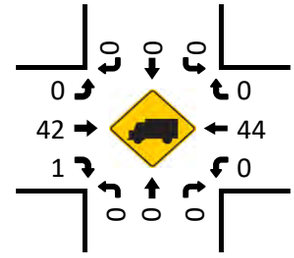
PM	62	0	0	0	26	PM
NOON	0	0	0	0	0	NOON
AM	23	0	0	0	3	AM

CONTROL			
1 WAY-STOP (NB)			
TEV	1801	0	2210
	AM	NOON	PM
PHF	0.90		0.95

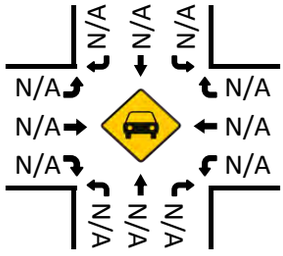
Total Vehicles (AM)



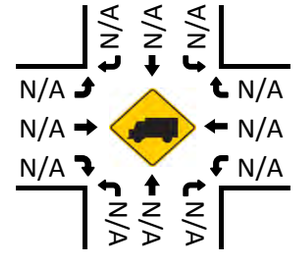
HT (AM)



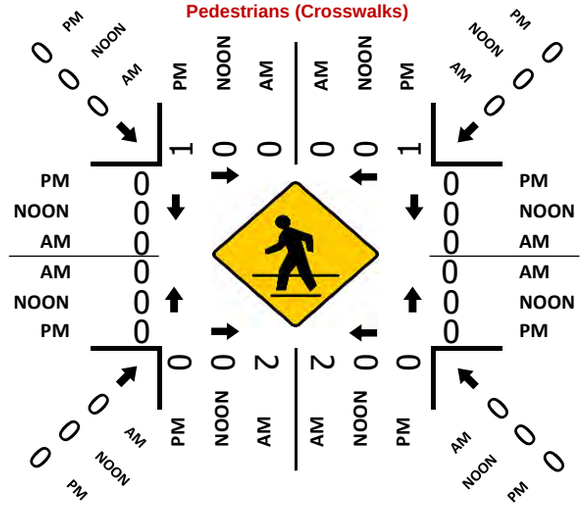
Total Vehicles (Noon)



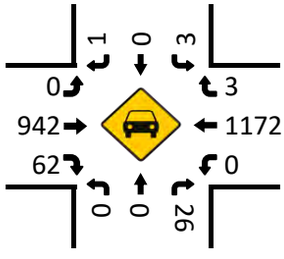
HT (NOON)



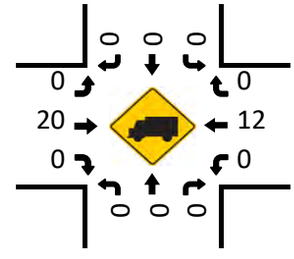
Pedestrians (Crosswalks)



Total Vehicles (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy & Oro Dam Blvd E
City: Oroville
Control: 1 WAY-STOP (NB)

Project ID: 19-07440-002
Date: 11/19/2019

Total

NS/EW Streets:	Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	3	0	0	0	0	0	0	148	6	1	0	143	0	0	301
7:15 AM	0	0	0	0	0	0	0	0	0	211	2	1	0	201	0	0	415
7:30 AM	0	0	0	0	0	0	0	0	0	281	3	0	0	204	0	0	488
7:45 AM	0	0	1	0	0	0	0	0	0	291	11	0	0	200	0	0	503
8:00 AM	0	0	2	0	0	0	0	0	0	214	7	0	0	172	0	0	395
8:15 AM	0	0	2	0	0	0	0	0	0	194	3	0	0	184	0	0	383
8:30 AM	0	0	2	0	0	0	0	0	1	200	9	0	0	177	0	0	389
8:45 AM	0	0	4	0	0	0	0	0	0	179	5	0	0	165	1	0	354
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	14	0	0	0	0	0	1	1718	46	2	0	1446	1	0	3228
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.06%	97.23%	2.60%	0.11%	0.00%	99.93%	0.07%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	3	0	0	0	0	0	0	997	23	1	0	777	0	0	1801
PEAK HR FACTOR :	0.000	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.857	0.523	0.250	0.000	0.952	0.000	0.000	0.895
	0.375								0.845				0.952				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	8	0	1	0	0	0	1	240	12	0	0	322	0	0	584
4:15 PM	0	0	9	0	1	0	1	0	0	206	17	0	0	297	2	0	533
4:30 PM	0	0	5	0	0	0	0	0	0	242	10	0	0	277	1	0	535
4:45 PM	0	0	7	0	1	0	0	0	0	221	13	0	0	275	0	0	517
5:00 PM	0	0	6	0	0	0	1	0	0	229	20	0	0	326	2	0	584
5:15 PM	0	0	8	0	2	0	0	0	0	250	19	1	0	294	0	0	574
5:30 PM	0	0	11	0	0	0	0	0	0	229	32	0	0	262	0	0	534
5:45 PM	0	0	14	0	0	0	1	0	1	226	24	0	0	227	0	0	493
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	68	0	5	0	3	0	2	1843	147	1	0	2280	5	0	4354
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	62.50%	0.00%	37.50%	0.00%	0.10%	92.47%	7.38%	0.05%	0.00%	99.78%	0.22%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	26	0	3	0	1	0	0	942	62	1	0	1172	3	0	2210
PEAK HR FACTOR :	0.000	0.000	0.813	0.000	0.375	0.000	0.250	0.000	0.000	0.942	0.775	0.250	0.000	0.899	0.375	0.000	0.946
	0.813				0.500				0.931				0.896				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy & Oro Dam Blvd E
City: Oroville
Control: 1 WAY-STOP (NB)

Project ID: 19-07440-002
Date: 11/19/2019

Cars

NS/EW Streets:	Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	3	0	0	0	0	0	0	132	6	1	0	131	0	0	273
7:15 AM	0	0	0	0	0	0	0	0	0	201	2	1	0	188	0	0	392
7:30 AM	0	0	0	0	0	0	0	0	0	270	2	0	0	194	0	0	466
7:45 AM	0	0	1	0	0	0	0	0	0	279	11	0	0	190	0	0	481
8:00 AM	0	0	2	0	0	0	0	0	0	205	7	0	0	161	0	0	375
8:15 AM	0	0	2	0	0	0	0	0	0	181	3	0	0	171	0	0	357
8:30 AM	0	0	1	0	0	0	0	0	1	194	9	0	0	163	0	0	368
8:45 AM	0	0	4	0	0	0	0	0	0	163	5	0	0	153	0	0	325
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	13	0	0	0	0	0	1	1625	45	2	0	1351	0	0	3037
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.06%	97.13%	2.69%	0.12%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	**07:15 AM - 08:15 AM**																TOTAL
PEAK HR VOL :	0	0	3	0	0	0	0	0	0	955	22	1	0	733	0	0	1714
PEAK HR FACTOR :	0.00	0.000	0.375	0.000	0.000	0.000	0.000	0.000	0.000	0.856	0.500	0.250	0.000	0.945	0.000	0.000	0.891
			0.375							0.843				0.945			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	8	0	1	0	0	0	1	233	12	0	0	318	0	0	573
4:15 PM	0	0	9	0	1	0	0	0	0	201	17	0	0	291	1	0	520
4:30 PM	0	0	5	0	0	0	0	0	0	233	10	0	0	277	1	0	526
4:45 PM	0	0	7	0	1	0	0	0	0	218	13	0	0	273	0	0	512
5:00 PM	0	0	6	0	0	0	1	0	0	223	20	0	0	321	2	0	573
5:15 PM	0	0	8	0	2	0	0	0	0	248	19	1	0	289	0	0	567
5:30 PM	0	0	11	0	0	0	0	0	0	226	32	0	0	259	0	0	528
5:45 PM	0	0	14	0	0	0	1	0	1	221	24	0	0	226	0	0	487
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	68	0	5	0	2	0	2	1803	147	1	0	2254	4	0	4286
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	71.43%	0.00%	28.57%	0.00%	0.10%	92.32%	7.53%	0.05%	0.00%	99.82%	0.18%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	0	26	0	3	0	1	0	0	922	62	1	0	1160	3	0	2178
PEAK HR FACTOR :	0.00	0.000	0.813	0.000	0.375	0.000	0.250	0.000	0.000	0.929	0.775	0.250	0.000	0.903	0.375	0.000	0.950
			0.813				0.500			0.919				0.900			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy & Oro Dam Blvd E
City: Oroville
Control: 1 WAY-STOP (NB)

Project ID: 19-07440-002
Date: 11/19/2019

HT

NS/EW Streets:	Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0	16	0	0	0	12	0	0	28
7:15 AM	0	0	0	0	0	0	0	0	0	10	0	0	0	13	0	0	23
7:30 AM	0	0	0	0	0	0	0	0	0	11	1	0	0	10	0	0	22
7:45 AM	0	0	0	0	0	0	0	0	0	12	0	0	0	10	0	0	22
8:00 AM	0	0	0	0	0	0	0	0	0	9	0	0	0	11	0	0	20
8:15 AM	0	0	0	0	0	0	0	0	0	13	0	0	0	13	0	0	26
8:30 AM	0	0	1	0	0	0	0	0	0	6	0	0	0	14	0	0	21
8:45 AM	0	0	0	0	0	0	0	0	0	16	0	0	0	12	1	0	29
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	1	0	0	0	0	0	0	93	1	0	0	95	1	0	191
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%					0.00%	98.94%	1.06%	0.00%	0.00%	98.96%	1.04%	0.00%	
PEAK HR :	**07:15 AM - 08:15 AM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	42	1	0	0	44	0	0	87
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.250	0.000	0.000	0.846	0.000	0.000	0.946
										0.896				0.846			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	7	0	0	0	4	0	0	11
4:15 PM	0	0	0	0	0	0	1	0	0	5	0	0	0	6	1	0	13
4:30 PM	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	9
4:45 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	5
5:00 PM	0	0	0	0	0	0	0	0	0	6	0	0	0	5	0	0	11
5:15 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	0	7
5:30 PM	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0	0	6
5:45 PM	0	0	0	0	0	0	0	0	0	5	0	0	0	1	0	0	6
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	1	0	0	40	0	0	0	26	1	0	68
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	96.30%	3.70%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	20	0	0	0	12	0	0	32
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.556	0.000	0.000	0.000	0.600	0.000	0.000	0.727
										0.556				0.600			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy & Oro Dam Blvd E
City: Oroville
Control: 1 WAY-STOP (NB)

Project ID: 19-07440-002
Date: 11/19/2019

Bikes

NS/EW Streets:	Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy				Oro Dam Blvd E				Oro Dam Blvd E				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	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
7:30 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
7:45 AM	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	1	0	0	0	0	0	0	1
8:15 AM	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
8:45 AM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	3
APPROACH %'s :									0.00%	100.00%	0.00%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.500
										0.500							

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	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	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	0	0	0	3	1	0	0	2	0	0	6
APPROACH %'s :									0.00%	75.00%	25.00%	0.00%	0.00%	100.00%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1	1	0	0	1	0	0	3
PEAK HR FACTOR :	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.250	0.000	0.000	0.750
										0.500				0.250			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Ross dress for less Dwy/Advanced Soil and Garden Supply Dwy & Or **Project ID:** 19-07440-002
City: Oroville **Date:** 11/19/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Ross dress for less Dwy/Advanced Soil and		Ross dress for less Dwy/Advanced Soil and		Oro Dam Blvd E		Oro Dam Blvd E		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	2	0	0	0	0	2
7:45 AM	0	0	1	0	0	0	0	0	1
8:00 AM	0	0	1	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	3	2	0	0	0	0	5
APPROACH %'s :			60.00%	40.00%					
PEAK HR :	**07:15 AM - 08:15 AM**								TOTAL
PEAK HR VOL :	0	0	2	2	0	0	0	0	4
PEAK HR FACTOR :			0.500	0.250					0.500
			0.500						

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0
5:00 PM	1	1	0	0	0	0	0	0	2
5:15 PM	0	0	0	0	0	0	0	0	0
5:30 PM	0	1	0	0	0	0	0	0	1
5:45 PM	0	0	1	0	0	0	0	0	1
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	1	3	1	0	0	0	0	0	5
APPROACH %'s :	25.00%	75.00%	100.00%	0.00%					
PEAK HR :	**04:30 PM - 05:30 PM**								TOTAL
PEAK HR VOL :	1	1	0	0	0	0	0	0	2
PEAK HR FACTOR :	0.250	0.250							0.250
		0.250							

Prepared by National Data & Surveying Services

Feather River Blvd & Mitchell Ave

Peak Hour Turning Movement Count

ID: 19-07440-003
City: Oroville

Day: Tuesday
Date: 11/19/2019

PEAK HOURS

AM	07:45 AM - 08:45 AM
NOON	NONE
PM	04:30 PM - 05:30 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

SOUTHBOUND (Feather River Blvd)

AM	0	158	86	0	263
NOON	0	0	0	0	0
PM	0	230	99	0	310

EASTBOUND (Mitchell Ave)

AM	NOON	PM
0	0	0
0	0	0
0	0	0
0	0	0
0	0	0

WESTBOUND (Mitchell Ave)

PM	NOON	AM
86	0	81
0	0	0
89	0	72
0	0	0
180	0	151

NORTHBOUND (Feather River Blvd)

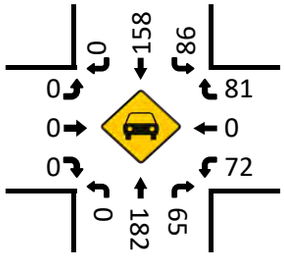
PM	319	0	0	224	81
NOON	0	0	0	0	0
AM	230	0	0	182	65

CONTROL

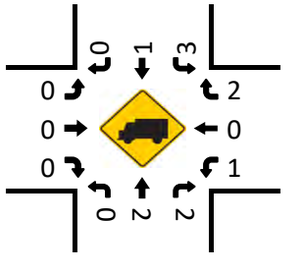
1 WAY-STOP (WB)

	AM	NOON	PM
TEV	644	0	809
PHF	0.83		0.88

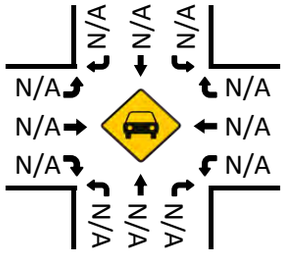
Total Vehicles (AM)



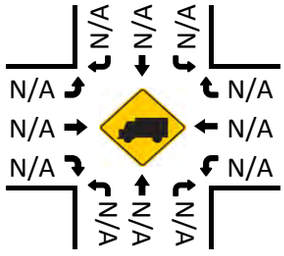
HT (AM)



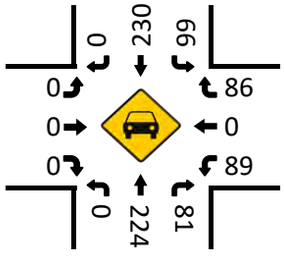
Total Vehicles (Noon)



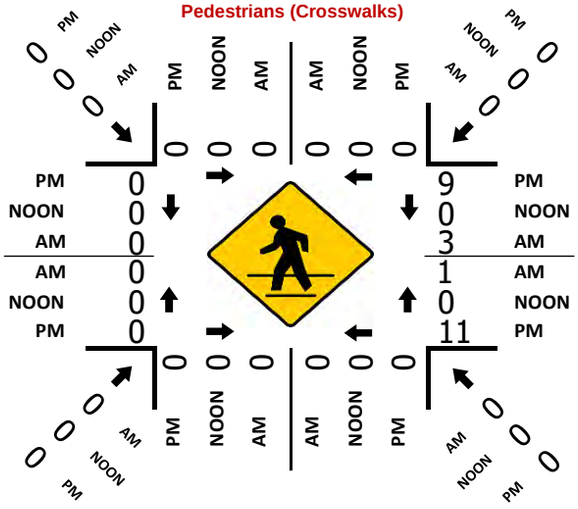
HT (NOON)



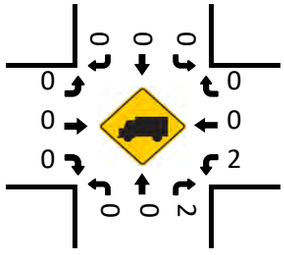
Total Vehicles (PM)



Pedestrians (Crosswalks)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Mitchell Ave
City: Oroville
Control: 1 WAY-STOP (WB)

Project ID: 19-07440-003
Date: 11/19/2019

Total

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Mitchell Ave				Mitchell Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	44	6	0	14	25	0	0	0	0	0	0	11	0	9	0	109
7:15 AM	0	30	10	0	16	29	0	0	0	0	0	0	9	0	12	0	106
7:30 AM	0	35	16	0	21	38	0	0	0	0	0	0	10	0	15	0	135
7:45 AM	0	52	19	0	25	54	0	0	0	0	0	0	26	0	17	0	193
8:00 AM	0	47	8	0	19	31	0	0	0	0	0	0	16	0	17	0	138
8:15 AM	0	41	10	0	24	39	0	0	0	0	0	0	14	0	27	0	155
8:30 AM	0	42	28	0	18	34	0	0	0	0	0	0	16	0	20	0	158
8:45 AM	0	49	13	0	24	36	0	0	0	0	0	0	16	0	13	0	151
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	340	110	0	161	286	0	0	0	0	0	0	118	0	130	0	1145
APPROACH %'s :	0.00%	75.56%	24.44%	0.00%	36.02%	63.98%	0.00%	0.00%					47.58%	0.00%	52.42%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	182	65	0	86	158	0	0	0	0	0	0	72	0	81	0	644
PEAK HR FACTOR :	0.000	0.875	0.580	0.000	0.860	0.731	0.000	0.000	0.000	0.000	0.000	0.000	0.692	0.000	0.750	0.000	0.834
		0.870				0.772								0.890			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	61	22	0	30	70	0	0	0	0	0	0	21	0	26	1	231
4:15 PM	0	51	21	0	13	57	0	0	0	0	0	0	19	0	14	0	175
4:30 PM	0	56	19	0	33	51	0	0	0	0	0	0	19	0	26	0	204
4:45 PM	0	47	15	0	24	45	0	0	0	0	0	0	25	0	15	0	171
5:00 PM	0	69	19	0	22	72	0	0	0	0	0	0	21	0	28	0	231
5:15 PM	0	52	28	0	20	62	0	0	0	0	0	0	24	0	17	0	203
5:30 PM	0	40	14	0	15	53	0	0	0	0	0	0	16	0	25	0	163
5:45 PM	0	41	22	0	13	37	0	0	0	0	0	0	18	0	16	0	147
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	417	160	0	170	447	0	0	0	0	0	0	163	0	167	1	1525
APPROACH %'s :	0.00%	72.27%	27.73%	0.00%	27.55%	72.45%	0.00%	0.00%					49.24%	0.00%	50.45%	0.30%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	224	81	0	99	230	0	0	0	0	0	0	89	0	86	0	809
PEAK HR FACTOR :	0.000	0.812	0.723	0.000	0.750	0.799	0.000	0.000	0.000	0.000	0.000	0.000	0.890	0.000	0.768	0.000	0.876
		0.866				0.875								0.893			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Mitchell Ave
City: Oroville
Control: 1 WAY-STOP (WB)

Project ID: 19-07440-003
Date: 11/19/2019

Cars

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Mitchell Ave				Mitchell Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	41	6	0	12	21	0	0	0	0	0	0	10	0	9	0	99
7:15 AM	0	29	9	0	15	28	0	0	0	0	0	0	8	0	12	0	101
7:30 AM	0	35	16	0	19	37	0	0	0	0	0	0	10	0	15	0	132
7:45 AM	0	52	18	0	25	54	0	0	0	0	0	0	25	0	17	0	191
8:00 AM	0	47	8	0	17	30	0	0	0	0	0	0	16	0	16	0	134
8:15 AM	0	40	9	0	24	39	0	0	0	0	0	0	14	0	26	0	152
8:30 AM	0	41	28	0	17	34	0	0	0	0	0	0	16	0	20	0	156
8:45 AM	0	48	13	0	24	35	0	0	0	0	0	0	15	0	11	0	146
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	333	107	0	153	278	0	0	0	0	0	0	114	0	126	0	1111
APPROACH %'s :	0.00%	75.68%	24.32%	0.00%	35.50%	64.50%	0.00%	0.00%					47.50%	0.00%	52.50%	0.00%	
PEAK HR :	**07:45 AM - 08:45 AM**																TOTAL
PEAK HR VOL :	0	180	63	0	83	157	0	0	0	0	0	0	71	0	79	0	633
PEAK HR FACTOR :	0.00	0.865	0.563	0.000	0.830	0.727	0.000	0.000	0.000	0.000	0.000	0.000	0.710	0.000	0.760	0.000	0.829
		0.868				0.759								0.893			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	61	22	0	29	70	0	0	0	0	0	0	20	0	25	1	228
4:15 PM	0	51	21	0	13	57	0	0	0	0	0	0	18	0	14	0	174
4:30 PM	0	56	18	0	33	51	0	0	0	0	0	0	18	0	26	0	202
4:45 PM	0	47	14	0	24	45	0	0	0	0	0	0	25	0	15	0	170
5:00 PM	0	69	19	0	22	72	0	0	0	0	0	0	20	0	28	0	230
5:15 PM	0	52	28	0	20	62	0	0	0	0	0	0	24	0	17	0	203
5:30 PM	0	40	14	0	15	53	0	0	0	0	0	0	16	0	25	0	163
5:45 PM	0	41	21	0	12	37	0	0	0	0	0	0	18	0	16	0	145
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	417	157	0	168	447	0	0	0	0	0	0	159	0	166	1	1515
APPROACH %'s :	0.00%	72.65%	27.35%	0.00%	27.32%	72.68%	0.00%	0.00%					48.77%	0.00%	50.92%	0.31%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	224	79	0	99	230	0	0	0	0	0	0	87	0	86	0	805
PEAK HR FACTOR :	0.00	0.812	0.705	0.000	0.750	0.799	0.000	0.000	0.000	0.000	0.000	0.000	0.870	0.000	0.768	0.000	0.875
		0.861				0.875								0.901			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Mitchell Ave
City: Oroville
Control: 1 WAY-STOP (WB)

Project ID: 19-07440-003
Date: 11/19/2019

HT

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Mitchell Ave				Mitchell Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	3	0	0	2	4	0	0	0	0	0	0	1	0	0	0	10
7:15 AM	0	1	1	0	1	1	0	0	0	0	0	0	1	0	0	0	5
7:30 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
8:00 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	1	0	4
8:15 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	3
8:30 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
8:45 AM	0	1	0	0	0	1	0	0	0	0	0	0	1	0	2	0	5
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	7	3	0	8	8	0	0	0	0	0	0	4	0	4	0	34
APPROACH %'s :	0.00%	70.00%	30.00%	0.00%	50.00%	50.00%	0.00%	0.00%					50.00%	0.00%	50.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	2	2	0	3	1	0	0	0	0	0	0	1	0	2	0	11
PEAK HR FACTOR :	0.000	0.500	0.500	0.000	0.375	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.500	0.000	0.688
		0.500				0.333								0.750			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
4:30 PM	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2
4:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
5:15 PM	0	0	0	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	0	0	0
5:45 PM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	2
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	3	0	2	0	0	0	0	0	0	0	4	0	1	0	10
APPROACH %'s :	0.00%	0.00%	100.00%	0.00%	100.00%	0.00%	0.00%	0.00%					80.00%	0.00%	20.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	0	2	0	0	0	0	0	0	0	0	0	2	0	0	0	4
PEAK HR FACTOR :	0.00	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500
		0.500												0.500			

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Mitchell Ave
City: Oroville
Control: 1 WAY-STOP (WB)

Project ID: 19-07440-003
Date: 11/19/2019

Bikes

NS/EW Streets:	Feather River Blvd				Feather River Blvd				Mitchell Ave				Mitchell Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
7:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2	0	3
8:30 AM	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
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	3	0	0	2	3	0	0	0	0	0	0	0	0	3	0	11
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	40.00%	60.00%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	0	1	0	0	2	1	0	0	0	0	0	0	0	0	2	0	6
PEAK HR FACTOR :	0.000	0.250	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.500
	0.250				0.750								0.250				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
4:15 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	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	1	0	0	0	1
5:45 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	2	2	0	0	2	0	0	0	0	0	0	2	0	0	0	8
APPROACH %'s :	0.00%	50.00%	50.00%	0.00%	0.00%	100.00%	0.00%	0.00%					100.00%	0.00%	0.00%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
PEAK HR FACTOR :	0.00	0.250	0.250	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
	0.500				0.250												

National Data & Surveying Services

Intersection Turning Movement Count

Location: Feather River Blvd & Mitchell Ave
City: Oroville

Project ID: 19-07440-003
Date: 11/19/2019

Pedestrians (Crosswalks)

NS/EW Streets:	Feather River Blvd		Feather River Blvd		Mitchell Ave		Mitchell Ave		
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
7:00 AM	0	0	0	0	2	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	1	1	0	0	2
7:45 AM	0	0	0	0	1	0	0	0	1
8:00 AM	0	0	0	0	0	3	0	0	3
8:15 AM	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	3	0	0	0	3
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	7	4	0	0	11
APPROACH %'s :					63.64%	36.36%			
PEAK HR :	**07:45 AM - 08:45 AM**								TOTAL
PEAK HR VOL :	0	0	0	0	1	3	0	0	4
PEAK HR FACTOR :					0.250	0.250			0.333
					0.333				

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
4:00 PM	0	0	0	0	0	1	0	0	1
4:15 PM	0	0	0	0	1	1	0	0	2
4:30 PM	0	0	0	0	2	1	0	0	3
4:45 PM	0	0	0	0	4	0	0	0	4
5:00 PM	0	0	0	0	3	4	0	0	7
5:15 PM	0	0	0	0	2	4	0	0	6
5:30 PM	0	0	0	0	1	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	0	0	13	11	0	0	24
APPROACH %'s :					54.17%	45.83%			
PEAK HR :	**04:30 PM - 05:30 PM**								TOTAL
PEAK HR VOL :	0	0	0	0	11	9	0	0	20
PEAK HR FACTOR :					0.688	0.563			0.714
					0.714				

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.1	0.0	0.0	0.4
Total Del/Veh (s)	16.4	11.8	10.7	13.1

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.9	0.3
Total Del/Veh (s)	9.8	11.0	8.7	10.1

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0
Total Del/Veh (s)	1.9	2.4	7.3	2.1

4: Feather River Blvd & Oroville Dam Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	18.2	12.6	15.2	13.1	15.4

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.2	0.1
Total Del/Veh (s)	8.4	1.6	2.2	3.4

Total Zone Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	435.5

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	151	144	42	145	228	124	134	94
Average Queue (ft)	71	76	13	59	85	61	74	40
95th Queue (ft)	122	123	32	116	175	104	120	75
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					0			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	189	210	201	126	229	68	79	101
Average Queue (ft)	59	87	78	42	113	4	30	45
95th Queue (ft)	133	184	173	93	196	39	65	78
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)		0	0					
Queuing Penalty (veh)		0	0					
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)					0			
Queuing Penalty (veh)					1			

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	NB
Directions Served	L	T	TR	R
Maximum Queue (ft)	4	46	53	22
Average Queue (ft)	0	2	4	2
95th Queue (ft)	4	24	31	13
Link Distance (ft)		389	389	314
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	85			
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	145	253	263	125	175	173	64	112	84	75	106	67
Average Queue (ft)	59	144	163	61	81	75	23	54	34	33	46	23
95th Queue (ft)	114	232	248	107	144	136	49	94	70	63	87	52
Link Distance (ft)	254	254	254		533	533			342			180
Upstream Blk Time (%)		0	1									
Queuing Penalty (veh)		1	2									
Storage Bay Dist (ft)				385			200	240		240	275	
Storage Blk Time (%)						0						0
Queuing Penalty (veh)						0						0

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	102	7	86
Average Queue (ft)	52	0	23
95th Queue (ft)	85	4	65
Link Distance (ft)	4151	1754	1095
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 4

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	604	57	124	421	221	221	163
v/c Ratio	0.66	0.11	0.34	0.41	0.58	0.58	0.34
Control Delay	20.3	0.4	9.4	4.9	24.9	24.9	5.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.3	0.4	9.4	5.0	24.9	24.9	5.8
Queue Length 50th (ft)	72	0	5	1	54	54	0
Queue Length 95th (ft)	156	0	85	193	145	145	38
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	2247	1061	581	1664	736	736	787
Starvation Cap Reductn	0	0	0	234	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.05	0.21	0.29	0.30	0.30	0.21

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	109	938	476	431	71	181
v/c Ratio	0.28	0.36	0.35	0.27	0.25	0.41
Control Delay	4.8	2.7	12.4	0.4	24.4	5.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	4.8	2.7	12.4	0.4	24.4	5.8
Queue Length 50th (ft)	0	0	50	0	17	0
Queue Length 95th (ft)	18	54	94	0	61	33
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	581	3188	2249	1583	777	819
Starvation Cap Reductn	0	709	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.38	0.21	0.27	0.09	0.22

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	997	23	0	777	0	0	0	3	0	0	0
Future Vol, veh/h	1	997	23	0	777	0	0	0	3	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	85	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1084	25	0	845	0	0	0	3	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	845	0	-	-	-	0	-	-	542	-	-	423
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	787	-	0	0	-	-	0	0	485	0	0	579
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	787	-	-	-	-	-	-	-	485	-	-	579
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.5	0
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	485	787	-	-	-	-
HCM Lane V/C Ratio	0.007	0.001	-	-	-	-
HCM Control Delay (s)	12.5	9.6	-	-	-	0
HCM Lane LOS	B	A	-	-	-	A
HCM 95th %tile Q(veh)	0	0	-	-	-	-

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	970	146	601	114	115	62	71	101	53	101
v/c Ratio	0.38	0.72	0.48	0.33	0.13	0.44	0.22	0.21	0.41	0.20	0.06
Control Delay	38.1	23.8	37.4	16.2	3.9	38.6	36.0	4.4	38.7	37.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.1	23.8	37.4	16.2	3.9	38.6	36.0	4.4	38.7	37.1	0.1
Queue Length 50th (ft)	40	193	59	98	0	47	24	0	41	21	0
Queue Length 95th (ft)	106	331	143	174	31	120	76	17	109	68	0
Internal Link Dist (ft)		236		523			338			183	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	603	2366	754	2588	1188	603	966	874	603	953	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.41	0.19	0.23	0.10	0.19	0.06	0.08	0.17	0.06	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	797	96	134	553	105	106	57	65	93	49	93
Future Volume (veh/h)	89	797	96	134	553	105	106	57	65	93	49	93
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	866	104	146	601	114	115	62	71	101	53	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	174	1005	121	201	1171	522	160	267	226	189	298	
Arrive On Green	0.10	0.31	0.31	0.11	0.33	0.33	0.09	0.14	0.14	0.11	0.16	0.00
Sat Flow, veh/h	1781	3195	384	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	97	482	488	146	601	114	115	62	71	101	53	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1801	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.9	14.2	14.2	4.4	7.6	2.9	3.5	1.6	2.2	3.0	1.4	0.0
Cycle Q Clear(g_c), s	2.9	14.2	14.2	4.4	7.6	2.9	3.5	1.6	2.2	3.0	1.4	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	174	559	567	201	1171	522	160	267	226	189	298	
V/C Ratio(X)	0.56	0.86	0.86	0.73	0.51	0.22	0.72	0.23	0.31	0.53	0.18	
Avail Cap(c_a), veh/h	641	1439	1459	801	2877	1283	641	1023	867	641	1010	
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	0.00
Uniform Delay (d), s/veh	23.9	17.9	17.9	23.8	15.0	13.5	24.6	21.1	21.4	23.5	20.2	0.0
Incr Delay (d2), s/veh	1.0	1.6	1.5	1.9	0.1	0.1	2.3	0.2	0.3	0.9	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.2	5.2	1.8	2.6	0.9	1.5	0.7	0.8	1.2	0.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.0	19.5	19.5	25.7	15.2	13.5	26.9	21.3	21.7	24.4	20.3	0.0
LnGrp LOS	C	B	B	C	B	B	C	C	C	C	C	
Approach Vol, veh/h		1067			861			248			154	A
Approach Delay, s/veh		20.0			16.7			24.0			23.0	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	22.5	9.0	13.8	9.4	23.3	9.9	12.9
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	6.4	16.2	5.5	3.4	4.9	9.6	5.0	4.2
Green Ext Time (p_c), s	0.1	1.3	0.0	0.1	0.0	1.0	0.0	0.1

Intersection Summary	
HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	72	81	182	65	86	158
Future Vol, veh/h	72	81	182	65	86	158
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	78	88	198	71	93	172

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	592	234	0	0	269	0
Stage 1	234	-	-	-	-	-
Stage 2	358	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	469	805	-	-	1295	-
Stage 1	805	-	-	-	-	-
Stage 2	707	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	432	805	-	-	1295	-
Mov Cap-2 Maneuver	520	-	-	-	-	-
Stage 1	805	-	-	-	-	-
Stage 2	651	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.6	0	2.8
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	640	1295	-
HCM Lane V/C Ratio	-	-	0.26	0.072	-
HCM Control Delay (s)	-	-	12.6	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1	0.2	-

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	593	75	197	658	203	204	87
v/c Ratio	0.65	0.14	0.44	0.60	0.59	0.59	0.19
Control Delay	21.1	0.6	11.7	8.6	27.9	28.0	1.1
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	21.1	0.6	11.7	8.8	27.9	28.0	1.1
Queue Length 50th (ft)	81	0	9	15	56	57	0
Queue Length 95th (ft)	153	1	119	325	142	142	3
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	2106	1004	544	1626	689	689	749
Starvation Cap Reductn	0	0	0	356	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.07	0.36	0.52	0.29	0.30	0.12

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	57	882	735	527	68	122
v/c Ratio	0.17	0.33	0.48	0.33	0.26	0.29
Control Delay	4.1	2.8	12.4	0.6	26.5	1.7
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	4.1	3.0	12.5	0.6	26.5	1.7
Queue Length 50th (ft)	0	0	84	0	18	0
Queue Length 95th (ft)	12	81	147	0	63	1
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	544	3078	2152	1583	728	781
Starvation Cap Reductn	0	937	0	0	0	0
Spillback Cap Reductn	0	0	156	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.41	0.37	0.33	0.09	0.16

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	942	62	0	1172	3	0	0	26	3	0	1
Future Vol, veh/h	1	942	62	0	1172	3	0	0	26	3	0	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	85	-	-	-	-	-	-	-	0	-	-	-
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	1024	67	0	1274	3	0	0	28	3	0	1

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1277	0	-	-	-	0	-	-	512	1790	2302	639
Stage 1	-	-	-	-	-	-	-	-	-	1276	1276	-
Stage 2	-	-	-	-	-	-	-	-	-	514	1026	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	540	-	0	0	-	-	0	0	507	51	38	419
Stage 1	-	-	0	0	-	-	0	0	-	176	236	-
Stage 2	-	-	0	0	-	-	0	0	-	511	310	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	540	-	-	-	-	-	-	-	507	48	38	419
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	48	38	-
Stage 1	-	-	-	-	-	-	-	-	-	176	236	-
Stage 2	-	-	-	-	-	-	-	-	-	482	309	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	12.5	67.4
HCM LOS			B	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	507	540	-	-	-	62
HCM Lane V/C Ratio	0.056	0.002	-	-	-	0.07
HCM Control Delay (s)	12.5	11.7	-	-	-	67.4
HCM Lane LOS	B	B	-	-	-	F
HCM 95th %tile Q(veh)	0.2	0	-	-	-	0.2

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	80	929	205	802	93	240	132	183	119	155	179
v/c Ratio	0.47	0.86	0.71	0.55	0.13	0.70	0.32	0.37	0.60	0.63	0.11
Control Delay	56.4	39.8	54.8	24.2	6.5	51.6	38.8	8.6	57.9	54.7	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.4	39.8	54.8	24.2	6.5	51.6	38.8	8.6	57.9	54.7	0.1
Queue Length 50th (ft)	47	270	118	198	4	133	66	0	69	90	0
Queue Length 95th (ft)	116	428	239	306	37	#340	161	63	158	192	0
Internal Link Dist (ft)		236		523			338			184	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	390	1721	488	1987	924	390	625	652	390	617	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.54	0.42	0.40	0.10	0.62	0.21	0.28	0.31	0.25	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	739	162	199	778	90	233	128	174	115	150	174
Future Volume (veh/h)	78	739	162	199	778	90	233	128	174	115	150	174
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	80	762	167	205	802	93	240	132	183	119	155	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	146	870	191	250	1272	567	286	350	297	171	230	
Arrive On Green	0.08	0.30	0.30	0.14	0.36	0.36	0.16	0.19	0.19	0.10	0.12	0.00
Sat Flow, veh/h	1781	2898	635	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	80	467	462	205	802	93	240	132	183	119	155	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1756	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.8	16.3	16.3	7.3	12.2	2.6	8.5	4.0	6.9	4.2	5.2	0.0
Cycle Q Clear(g_c), s	2.8	16.3	16.3	7.3	12.2	2.6	8.5	4.0	6.9	4.2	5.2	0.0
Prop In Lane	1.00		0.36	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	146	533	527	250	1272	567	286	350	297	171	230	
V/C Ratio(X)	0.55	0.88	0.88	0.82	0.63	0.16	0.84	0.38	0.62	0.70	0.67	
Avail Cap(c_a), veh/h	547	1228	1213	684	2456	1095	547	873	740	547	862	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	28.7	21.6	21.6	27.2	17.3	14.3	26.5	23.1	24.3	28.5	27.3	0.0
Incr Delay (d2), s/veh	1.2	1.9	1.9	2.6	0.2	0.0	2.5	0.2	0.8	1.9	1.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.3	6.3	3.1	4.4	0.9	3.6	1.7	2.5	1.8	2.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	23.5	23.5	29.8	17.5	14.3	29.1	23.4	25.1	30.4	28.6	0.0
LnGrp LOS	C	C	C	C	B	B	C	C	C	C	C	
Approach Vol, veh/h		1009			1100			555			274	A
Approach Delay, s/veh		24.0			19.5			26.4			29.4	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.1	24.5	14.5	13.0	9.4	28.3	10.3	17.2
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	9.3	18.3	10.5	7.2	4.8	14.2	6.2	8.9
Green Ext Time (p_c), s	0.1	1.3	0.1	0.3	0.0	1.4	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	89	86	224	81	99	230
Future Vol, veh/h	89	86	224	81	99	230
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	97	93	243	88	108	250

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	753	287	0	0	331	0
Stage 1	287	-	-	-	-	-
Stage 2	466	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	377	752	-	-	1228	-
Stage 1	762	-	-	-	-	-
Stage 2	632	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	339	752	-	-	1228	-
Mov Cap-2 Maneuver	445	-	-	-	-	-
Stage 1	762	-	-	-	-	-
Stage 2	568	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.8	0	2.5
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	557	1228	-
HCM Lane V/C Ratio	-	-	0.342	0.088	-
HCM Control Delay (s)	-	-	14.8	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0.3	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.0	0.1	0.0	0.3
Total Del/Veh (s)	17.1	11.8	13.2	13.9

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.7	0.2
Total Del/Veh (s)	7.5	11.8	10.0	9.9

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.4	3.6	9.3	26.6	3.1

4: FEATHER RIVER BLVD & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	26.6	18.6	20.6	18.5	21.4

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.3	0.2
Total Del/Veh (s)	9.5	2.3	2.6	4.0

Total Zone Performance

Denied Del/Veh (s)	0.9
Total Del/Veh (s)	490.4

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	142	148	45	178	276	122	135	77
Average Queue (ft)	71	83	16	77	125	62	72	31
95th Queue (ft)	121	131	37	145	242	103	119	62
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					1			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)								
Queuing Penalty (veh)								

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	143	194	186	263	366	61	80	82
Average Queue (ft)	39	59	53	66	169	2	33	37
95th Queue (ft)	98	155	144	172	301	35	67	65
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)			0		0			
Queuing Penalty (veh)			0		2			
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)				0	4			
Queuing Penalty (veh)				0	16			

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	LTR
Maximum Queue (ft)	10	87	104	57	37	57	33
Average Queue (ft)	0	7	10	3	1	20	5
95th Queue (ft)	6	47	55	38	31	48	23
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)				0	0		
Queuing Penalty (veh)				0	0		
Storage Bay Dist (ft)	85						
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	186	270	284	203	263	247	116	211	138	111	148	184
Average Queue (ft)	67	179	198	103	144	123	24	116	66	55	63	74
95th Queue (ft)	137	267	281	174	229	208	74	189	116	93	115	140
Link Distance (ft)	254	254	254		534	534			342			182
Upstream Blk Time (%)	0	1	2								0	0
Queuing Penalty (veh)	0	4	8								0	2
Storage Bay Dist (ft)				385			200	240		240	275	
Storage Blk Time (%)						1	0	0			0	7
Queuing Penalty (veh)						1	0	0			0	22

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	SB
Directions Served	R
Maximum Queue (ft)	129
Average Queue (ft)	11
95th Queue (ft)	74
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	121	16	99
Average Queue (ft)	55	1	31
95th Queue (ft)	95	7	78
Link Distance (ft)	1663	1763	1169
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 56

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	8.1	1.7	2.3	3.0	2.7	6.4	5.8	2.8

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	85	13	49	17	38	28	90
Average Queue (ft)	36	0	2	1	2	2	38
95th Queue (ft)	72	11	24	11	18	16	66
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	611	57	148	428	233	233	163
v/c Ratio	0.66	0.11	0.40	0.41	0.60	0.60	0.33
Control Delay	20.8	0.4	10.7	5.0	25.4	25.4	5.7
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	20.8	0.4	10.7	5.0	25.4	25.4	5.7
Queue Length 50th (ft)	74	0	6	1	58	58	0
Queue Length 95th (ft)	162	0	103	205	153	153	38
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	2204	1044	570	1641	722	722	775
Starvation Cap Reductn	0	0	0	242	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.28	0.05	0.26	0.31	0.32	0.32	0.21

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	109	969	507	454	71	204
v/c Ratio	0.28	0.42	0.45	0.29	0.26	0.47
Control Delay	4.6	3.1	14.0	0.5	25.3	7.8
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	4.6	3.2	14.0	0.5	25.3	7.8
Queue Length 50th (ft)	0	0	55	0	17	0
Queue Length 95th (ft)	18	59	101	0	63	45
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	570	3202	2221	1583	762	807
Starvation Cap Reductn	0	713	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.39	0.23	0.29	0.09	0.25

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	105	942	23	0	735	65	0	0	3	0	0	96
Future Vol, veh/h	105	942	23	0	735	65	0	0	3	0	0	96
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	114	1024	25	0	799	71	0	0	3	0	0	104

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	870	0	-	-	-	0	-	-	512	-	-	435
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	770	-	0	0	-	-	0	0	507	0	0	569
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	770	-	-	-	-	-	-	-	507	-	-	569
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.1	0	12.1	12.7
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	507	770	-	-	-	569
HCM Lane V/C Ratio	0.006	0.148	-	-	-	0.183
HCM Control Delay (s)	12.1	10.5	-	-	-	12.7
HCM Lane LOS	B	B	-	-	-	B
HCM 95th %tile Q(veh)	0	0.5	-	-	-	0.7

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	97	911	137	620	125	122	65	67	179	74	95
v/c Ratio	0.43	0.78	0.52	0.43	0.17	0.50	0.28	0.23	0.55	0.26	0.06
Control Delay	40.8	28.0	40.4	19.4	4.6	41.4	39.2	4.2	37.8	35.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	28.0	40.4	19.4	4.6	41.4	39.2	4.2	37.8	35.4	0.1
Queue Length 50th (ft)	41	188	57	110	0	51	27	0	74	30	0
Queue Length 95th (ft)	111	335	142	202	36	130	82	13	173	86	0
Internal Link Dist (ft)		236		523			338			183	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	528	2322	661	2539	1171	528	846	779	528	834	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.39	0.21	0.24	0.11	0.23	0.08	0.09	0.34	0.09	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	89	748	90	126	570	115	112	60	62	165	68	87
Future Volume (veh/h)	89	748	90	126	570	115	112	60	62	165	68	87
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	97	813	98	137	620	125	122	65	67	179	74	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	173	949	114	195	1101	491	161	264	224	237	343	
Arrive On Green	0.10	0.30	0.30	0.11	0.31	0.31	0.09	0.14	0.14	0.13	0.18	0.00
Sat Flow, veh/h	1781	3193	385	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	97	452	459	137	620	125	122	65	67	179	74	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1801	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.9	13.5	13.5	4.2	8.2	3.3	3.8	1.7	2.1	5.5	1.9	0.0
Cycle Q Clear(g_c), s	2.9	13.5	13.5	4.2	8.2	3.3	3.8	1.7	2.1	5.5	1.9	0.0
Prop In Lane	1.00		0.21	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	173	528	535	195	1101	491	161	264	224	237	343	
V/C Ratio(X)	0.56	0.86	0.86	0.70	0.56	0.25	0.76	0.25	0.30	0.76	0.22	
Avail Cap(c_a), veh/h	632	1418	1437	790	2836	1265	632	1008	854	632	995	
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	0.00
Uniform Delay (d), s/veh	24.3	18.7	18.7	24.2	16.3	14.6	25.0	21.6	21.7	23.6	19.6	0.0
Incr Delay (d2), s/veh	1.1	1.6	1.6	1.7	0.2	0.1	2.7	0.2	0.3	1.8	0.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.0	5.1	1.7	2.9	1.1	1.6	0.7	0.8	2.2	0.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.4	20.3	20.3	25.9	16.4	14.7	27.7	21.7	22.0	25.4	19.7	0.0
LnGrp LOS	C	C	C	C	B	B	C	C	C	C	B	
Approach Vol, veh/h		1008			882			254			253	A
Approach Delay, s/veh		20.8			17.7			24.7			23.7	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.2	21.8	9.1	15.3	9.5	22.5	11.5	13.0
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	6.2	15.5	5.8	3.9	4.9	10.2	7.5	4.1
Green Ext Time (p_c), s	0.0	1.2	0.0	0.1	0.0	1.0	0.1	0.1

Intersection Summary	
HCM 6th Ctrl Delay	20.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	101	27	237	220	26
Future Vol, veh/h	26	101	27	237	220	26
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	28	110	29	258	239	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	569	253	267	0	-	0
Stage 1	253	-	-	-	-	-
Stage 2	316	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	484	786	1297	-	-	-
Stage 1	789	-	-	-	-	-
Stage 2	739	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	471	786	1297	-	-	-
Mov Cap-2 Maneuver	471	-	-	-	-	-
Stage 1	768	-	-	-	-	-
Stage 2	739	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.8	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1297	-	691	-	-
HCM Lane V/C Ratio	0.023	-	0.2	-	-
HCM Control Delay (s)	7.8	0	11.5	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.7	-	-

Intersection	
Int Delay, s/veh	4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	74	81	191	67	86	167
Future Vol, veh/h	74	81	191	67	86	167
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	80	88	208	73	93	182

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	613	245	0	0	281	0
Stage 1	245	-	-	-	-	-
Stage 2	368	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	456	794	-	-	1282	-
Stage 1	796	-	-	-	-	-
Stage 2	700	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	419	794	-	-	1282	-
Mov Cap-2 Maneuver	511	-	-	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	643	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	2.7
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	628	1282	-
HCM Lane V/C Ratio	-	-	0.268	0.073	-
HCM Control Delay (s)	-	-	12.8	8	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.1	0.2	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.2	0.0	0.0	0.4
Total Del/Veh (s)	17.3	12.0	11.5	13.8

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	3.0	0.4
Total Del/Veh (s)	9.3	11.0	8.8	9.9

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	2.3	2.9	6.4	5.8	2.8

4: Feather River Blvd & Oroville Dam Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	19.4	14.6	17.1	15.1	16.8

5: FEATHER RIVER BLVD & GAS STATION ACCESS Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.0	0.0
Total Del/Veh (s)	5.0	1.2	0.6	1.7

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.2	0.1
Total Del/Veh (s)	9.0	1.5	2.1	3.4

Total Zone Performance

Denied Del/Veh (s)	1.0
Total Del/Veh (s)	575.9

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	154	151	40	158	244	130	143	85
Average Queue (ft)	80	76	14	64	91	65	79	40
95th Queue (ft)	134	125	32	123	188	109	127	71
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)					0			
Queuing Penalty (veh)					0			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)	0							
Queuing Penalty (veh)	0							

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	166	207	202	134	232	89	78	102
Average Queue (ft)	55	82	71	46	110	3	31	49
95th Queue (ft)	119	180	165	98	199	40	65	85
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)	0	0	0		0			
Queuing Penalty (veh)	0	0	0		0			
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)					1			
Queuing Penalty (veh)					1			

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	85	13	49	17	38	28	90
Average Queue (ft)	36	0	2	1	2	2	38
95th Queue (ft)	72	11	24	11	18	16	66
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)							
Queuing Penalty (veh)							

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	153	245	258	124	176	183	87	117	88	69	146	135
Average Queue (ft)	62	140	161	60	89	91	26	57	38	31	69	33
95th Queue (ft)	121	223	243	105	154	154	60	99	76	58	120	80
Link Distance (ft)	254	254	254		533	533			342			181
Upstream Blk Time (%)		0	0								0	0
Queuing Penalty (veh)		1	2								0	0
Storage Bay Dist (ft)				385			200	240		240	200	
Storage Blk Time (%)						0	0				0	1
Queuing Penalty (veh)						0	0				0	2

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	29
Average Queue (ft)	1
95th Queue (ft)	24
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 5: FEATHER RIVER BLVD & GAS STATION ACCESS

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	76	37	1	5
Average Queue (ft)	40	6	0	0
95th Queue (ft)	65	28	2	5
Link Distance (ft)	356		181	150
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)		75		
Storage Blk Time (%)		0		
Queuing Penalty (veh)		0		

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	112	17	80
Average Queue (ft)	53	1	23
95th Queue (ft)	88	7	61
Link Distance (ft)	4151	1754	1095
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 6

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	14.9	2.2	2.8	3.9	3.2	8.9	10.8	3.9

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	93	82	105	64	50	58	102
Average Queue (ft)	36	5	9	3	3	19	42
95th Queue (ft)	76	39	52	38	24	47	78
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)				0			0
Queuing Penalty (veh)				0			0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	593	82	218	664	214	214	87
v/c Ratio	0.65	0.16	0.49	0.60	0.61	0.61	0.19
Control Delay	21.3	1.0	12.8	9.0	28.8	28.8	1.0
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	21.3	1.0	12.8	9.2	28.8	28.8	1.0
Queue Length 50th (ft)	85	0	10	5	63	63	0
Queue Length 95th (ft)	155	4	134	342	152	152	3
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	2069	989	535	1638	678	678	738
Starvation Cap Reductn	0	0	0	356	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	0.08	0.41	0.52	0.32	0.32	0.12

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	57	908	761	547	68	143
v/c Ratio	0.17	0.34	0.49	0.35	0.26	0.34
Control Delay	4.3	2.8	12.5	0.6	27.3	3.3
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0
Total Delay	4.3	2.9	12.5	0.6	27.3	3.3
Queue Length 50th (ft)	0	0	88	0	19	0
Queue Length 95th (ft)	13	83	155	0	64	12
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	535	3047	2128	1583	715	772
Starvation Cap Reductn	0	965	0	0	0	0
Spillback Cap Reductn	0	0	161	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.11	0.44	0.39	0.35	0.10	0.19

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	79	913	62	0	1131	63	0	0	26	0	0	90
Future Vol, veh/h	79	913	62	0	1131	63	0	0	26	0	0	90
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	86	992	67	0	1229	68	0	0	28	0	0	98

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1297	0	-	-	-	0	-	-	496	-	-	649
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	530	-	0	0	-	-	0	0	519	0	0	412
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	530	-	-	-	-	-	-	-	519	-	-	412
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	12.3	16.4
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	519	530	-	-	-	412
HCM Lane V/C Ratio	0.054	0.162	-	-	-	0.237
HCM Control Delay (s)	12.3	13.1	-	-	-	16.4
HCM Lane LOS	B	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	0.6	-	-	-	0.9

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	82	897	198	820	102	248	136	177	170	174	172
v/c Ratio	0.49	0.85	0.71	0.59	0.15	0.69	0.35	0.37	0.70	0.66	0.11
Control Delay	56.7	40.5	55.4	25.9	6.9	50.5	40.3	9.0	58.3	54.8	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	40.5	55.4	25.9	6.9	50.5	40.3	9.0	58.3	54.8	0.1
Queue Length 50th (ft)	48	260	114	208	6	137	69	0	98	100	0
Queue Length 95th (ft)	118	416	233	324	41	#357	167	64	211	210	0
Internal Link Dist (ft)		236		523			338			184	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	386	1704	483	1958	915	386	619	644	386	610	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.53	0.41	0.42	0.11	0.64	0.22	0.27	0.44	0.29	0.11

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	714	156	192	795	99	241	132	168	165	169	167
Future Volume (veh/h)	80	714	156	192	795	99	241	132	168	165	169	167
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	736	161	198	820	102	248	136	177	170	174	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	149	845	185	243	1222	545	295	312	264	222	235	
Arrive On Green	0.08	0.29	0.29	0.14	0.34	0.34	0.17	0.17	0.17	0.12	0.13	0.00
Sat Flow, veh/h	1781	2899	634	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	82	451	446	198	820	102	248	136	177	170	174	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1756	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	2.8	15.4	15.4	6.9	12.6	2.9	8.6	4.2	6.7	5.9	5.7	0.0
Cycle Q Clear(g_c), s	2.8	15.4	15.4	6.9	12.6	2.9	8.6	4.2	6.7	5.9	5.7	0.0
Prop In Lane	1.00		0.36	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	149	518	512	243	1222	545	295	312	264	222	235	
V/C Ratio(X)	0.55	0.87	0.87	0.82	0.67	0.19	0.84	0.44	0.67	0.77	0.74	
Avail Cap(c_a), veh/h	556	1248	1234	695	2496	1113	556	888	752	556	876	
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	0.00
Uniform Delay (d), s/veh	28.2	21.5	21.5	26.9	17.9	14.7	25.9	24.0	25.0	27.1	27.0	0.0
Incr Delay (d2), s/veh	1.2	1.8	1.8	2.6	0.2	0.1	2.5	0.4	1.1	2.1	1.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	6.0	5.9	2.9	4.6	1.0	3.6	1.8	2.5	2.5	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.3	23.4	23.4	29.4	18.2	14.8	28.4	24.3	26.1	29.2	28.7	0.0
LnGrp LOS	C	C	C	C	B	B	C	C	C	C	C	
Approach Vol, veh/h		979			1120			561			344	A
Approach Delay, s/veh		23.9			19.9			26.7			29.0	
Approach LOS		C			B			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	23.7	14.6	13.1	9.4	27.0	12.0	15.7
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	8.9	17.4	10.6	7.7	4.8	14.6	7.9	8.7
Green Ext Time (p_c), s	0.1	1.2	0.1	0.3	0.0	1.4	0.1	0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	79	26	285	423	27
Future Vol, veh/h	21	79	26	285	423	27
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	23	86	28	310	460	29

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	841	475	489	0	-	0
Stage 1	475	-	-	-	-	-
Stage 2	366	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	335	590	1074	-	-	-
Stage 1	626	-	-	-	-	-
Stage 2	702	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	325	590	1074	-	-	-
Mov Cap-2 Maneuver	325	-	-	-	-	-
Stage 1	607	-	-	-	-	-
Stage 2	702	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.1	0.7	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1074	-	504	-	-
HCM Lane V/C Ratio	0.026	-	0.216	-	-
HCM Control Delay (s)	8.4	0	14.1	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.8	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	91	86	232	83	99	238
Future Vol, veh/h	91	86	232	83	99	238
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	99	93	252	90	108	259

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	772	297	0	0	342	0
Stage 1	297	-	-	-	-	-
Stage 2	475	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	368	742	-	-	1217	-
Stage 1	754	-	-	-	-	-
Stage 2	626	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	330	742	-	-	1217	-
Mov Cap-2 Maneuver	438	-	-	-	-	-
Stage 1	754	-	-	-	-	-
Stage 2	561	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.1	0	2.4
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	547	1217	-
HCM Lane V/C Ratio	-	-	0.352	0.088	-
HCM Control Delay (s)	-	-	15.1	8.2	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.6	0.3	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.0	0.0	0.0	0.4
Total Del/Veh (s)	17.8	12.1	13.6	14.4

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.1	2.7	0.3
Total Del/Veh (s)	7.5	11.8	10.1	10.0

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	3.2	3.8	8.9	10.8	3.9

4: FEATHER RIVER BLVD & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.0
Total Del/Veh (s)	27.1	19.8	22.1	20.7	22.5

5: PROJECT ACCESS & FEATHER RIVER BLVD Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.1	0.0	0.1	0.1
Total Del/Veh (s)	6.7	1.6	1.0	1.8

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.3	0.2
Total Del/Veh (s)	9.8	2.2	2.7	4.1

Total Zone Performance

Denied Del/Veh (s)	0.8
Total Del/Veh (s)	539.7

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	151	152	56	203	281	130	148	75
Average Queue (ft)	77	85	18	85	128	66	77	30
95th Queue (ft)	128	133	41	161	247	111	129	59
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)				0	0			
Queuing Penalty (veh)				0	1			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)							0	
Queuing Penalty (veh)							0	

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	157	192	178	240	374	97	83	96
Average Queue (ft)	41	59	52	68	169	4	36	43
95th Queue (ft)	104	156	144	170	303	52	72	75
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)	0				0	0		
Queuing Penalty (veh)	0				1	0		
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)				0	5			
Queuing Penalty (veh)				0	17			

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	93	82	105	64	50	58	102
Average Queue (ft)	36	5	9	3	3	19	42
95th Queue (ft)	76	39	52	38	24	47	78
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)				0			0
Queuing Penalty (veh)				0			0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)		0					
Queuing Penalty (veh)		0					

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	166	272	280	204	267	283	197	226	174	107	165	194
Average Queue (ft)	68	176	197	102	153	139	31	122	73	52	86	89
95th Queue (ft)	137	261	277	173	245	235	105	194	135	88	148	162
Link Distance (ft)	254	254	254		534	534			342			182
Upstream Blk Time (%)	0	1	2						0		0	1
Queuing Penalty (veh)	0	3	7						0		0	3
Storage Bay Dist (ft)				385			200	240		240	200	
Storage Blk Time (%)						2	0	0			0	10
Queuing Penalty (veh)						2	0	1			0	34

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	SB
Directions Served	R
Maximum Queue (ft)	145
Average Queue (ft)	17
95th Queue (ft)	94
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 5: PROJECT ACCESS & FEATHER RIVER BLVD

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	82	41	55
Average Queue (ft)	38	9	3
95th Queue (ft)	66	33	27
Link Distance (ft)	188		148
Upstream Blk Time (%)			0
Queuing Penalty (veh)			0
Storage Bay Dist (ft)		75	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	128	15	100
Average Queue (ft)	58	1	32
95th Queue (ft)	99	8	79
Link Distance (ft)	1663	1763	1169
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 71

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	739	122	278	506	386	386	256
v/c Ratio	0.75	0.22	0.76	0.50	0.80	0.80	0.40
Control Delay	26.5	3.1	26.1	5.3	37.6	37.6	5.4
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Total Delay	26.5	3.1	26.1	5.5	37.6	37.6	5.4
Queue Length 50th (ft)	146	0	104	111	148	148	0
Queue Length 95th (ft)	202	22	#242	196	#335	#335	51
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	1686	834	435	1352	552	552	691
Starvation Cap Reductn	0	0	0	228	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.15	0.64	0.45	0.70	0.70	0.37

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	261	1250	606	678	184	317
v/c Ratio	0.67	0.52	0.45	0.43	0.60	0.69
Control Delay	18.6	3.6	16.3	0.8	34.3	17.4
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0
Total Delay	18.6	3.9	16.3	0.8	34.3	17.4
Queue Length 50th (ft)	79	66	88	0	72	34
Queue Length 95th (ft)	#225	147	153	0	131	109
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	435	2726	1686	1583	584	670
Starvation Cap Reductn	0	754	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.63	0.36	0.43	0.32	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1405	35	0	1145	5	0	0	25	0	0	5
Future Vol, veh/h	0	1405	35	0	1145	5	0	0	25	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1527	38	0	1245	5	0	0	27	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1250	0	-	-	-	0	-	-	764	-	-	625
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	553	-	0	0	-	-	0	0	346	0	0	428
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	553	-	-	-	-	-	-	-	346	-	-	428
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.3	13.5
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	346	553	-	-	-	428
HCM Lane V/C Ratio	0.079	-	-	-	-	0.013
HCM Control Delay (s)	16.3	0	-	-	-	13.5
HCM Lane LOS	C	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	-	0

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	1359	125	902	114	190	82	125	103	98	158
v/c Ratio	0.74	0.85	0.64	0.60	0.16	0.74	0.29	0.36	0.61	0.53	0.10
Control Delay	58.4	31.1	58.6	25.9	8.0	58.7	41.3	10.4	59.2	55.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.4	31.1	58.6	25.9	8.0	58.7	41.3	10.4	59.2	55.1	0.1
Queue Length 50th (ft)	116	371	75	222	9	113	46	0	62	59	0
Queue Length 95th (ft)	212	#664	147	364	51	206	98	52	126	122	0
Internal Link Dist (ft)		236		523			338			183	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	362	1603	453	1813	854	362	580	579	362	572	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.85	0.28	0.50	0.13	0.52	0.14	0.22	0.28	0.17	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	1055	195	115	830	105	175	75	115	95	90	145
Future Volume (veh/h)	180	1055	195	115	830	105	175	75	115	95	90	145
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	196	1147	212	125	902	114	190	82	125	103	98	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	237	1256	231	159	1334	595	231	293	248	150	208	
Arrive On Green	0.13	0.42	0.42	0.09	0.38	0.38	0.13	0.16	0.16	0.08	0.11	0.00
Sat Flow, veh/h	1781	2997	551	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	196	678	681	125	902	114	190	82	125	103	98	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1771	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	7.7	25.7	26.1	4.9	15.3	3.5	7.5	2.8	5.2	4.0	3.5	0.0
Cycle Q Clear(g_c), s	7.7	25.7	26.1	4.9	15.3	3.5	7.5	2.8	5.2	4.0	3.5	0.0
Prop In Lane	1.00		0.31	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	237	745	742	159	1334	595	231	293	248	150	208	
V/C Ratio(X)	0.83	0.91	0.92	0.78	0.68	0.19	0.82	0.28	0.50	0.68	0.47	
Avail Cap(c_a), veh/h	496	1113	1110	620	2226	993	496	792	671	496	781	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	30.3	19.6	19.7	32.0	18.8	15.1	30.5	26.7	27.7	32.0	29.9	0.0
Incr Delay (d2), s/veh	2.8	6.0	6.7	3.2	0.2	0.1	2.8	0.2	0.6	2.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	10.5	10.8	2.2	5.7	1.2	3.3	1.2	1.9	1.8	1.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	25.6	26.4	35.2	19.0	15.2	33.3	26.9	28.3	34.0	30.5	0.0
LnGrp LOS	C	C	C	D	B	B	C	C	C	C	C	
Approach Vol, veh/h		1555			1141			397			201	A
Approach Delay, s/veh		26.9			20.4			30.4			32.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.4	35.1	13.3	13.0	13.6	32.0	10.1	16.2
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	6.9	28.1	9.5	5.5	9.7	17.3	6.0	7.2
Green Ext Time (p_c), s	0.0	2.0	0.1	0.2	0.1	1.6	0.0	0.2

Intersection Summary	
HCM 6th Ctrl Delay	25.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	90	100	225	80	110	200
Future Vol, veh/h	90	100	225	80	110	200
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	98	109	245	87	120	217

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	746	289	0	0	332	0
Stage 1	289	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	381	750	-	-	1227	-
Stage 1	760	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	339	750	-	-	1227	-
Mov Cap-2 Maneuver	444	-	-	-	-	-
Stage 1	760	-	-	-	-	-
Stage 2	567	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15	0	2.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	565	1227	-
HCM Lane V/C Ratio	-	-	0.366	0.097	-
HCM Control Delay (s)	-	-	15	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.7	0.3	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.6	0.0	0.0	0.5
Total Del/Veh (s)	25.1	16.8	16.7	19.5

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.6	0.4
Total Del/Veh (s)	14.0	13.0	15.4	13.8

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.1	0.0
Total Del/Veh (s)	5.5	3.5	38.8	8.1	5.0

4: Feather River Blvd & Oroville Dam Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.1	0.0	0.1
Total Del/Veh (s)	26.8	21.0	22.5	18.3	23.5

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.3	0.2
Total Del/Veh (s)	12.1	2.2	2.7	4.8

Total Zone Performance

Denied Del/Veh (s)	1.3
Total Del/Veh (s)	1773.1

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	237	286	80	263	253	231	244	198
Average Queue (ft)	140	113	26	119	116	125	138	67
95th Queue (ft)	217	209	57	216	214	197	209	142
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)				0	0			
Queuing Penalty (veh)				1	0			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)	1	0					1	0
Queuing Penalty (veh)	5	0					2	0

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	296	294	291	215	254	310	162	190
Average Queue (ft)	142	139	116	89	110	89	73	89
95th Queue (ft)	255	284	258	170	207	262	131	156
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)	1	1	0		0	0		
Queuing Penalty (veh)	3	3	2		0	0		
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)				0	1			0
Queuing Penalty (veh)				0	2			0

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	TR	T	TR	R	R
Maximum Queue (ft)	270	292	11	14	77	28
Average Queue (ft)	55	68	0	1	24	5
95th Queue (ft)	199	212	11	12	61	23
Link Distance (ft)	389	389	254	254	314	155
Upstream Blk Time (%)	0	0				
Queuing Penalty (veh)	1	0				
Storage Bay Dist (ft)						
Storage Blk Time (%)	1					
Queuing Penalty (veh)	0					

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	252	286	296	149	276	287	215	189	119	90	117	130
Average Queue (ft)	132	229	243	66	150	154	35	94	48	45	55	51
95th Queue (ft)	221	305	311	120	240	252	118	160	93	77	100	101
Link Distance (ft)	254	254	254		533	533			342			180
Upstream Blk Time (%)	0	7	11									0
Queuing Penalty (veh)	1	33	54									0
Storage Bay Dist (ft)				385			200	240		240	275	
Storage Blk Time (%)						3	0	0				3
Queuing Penalty (veh)						3	0	0				7

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	56
Average Queue (ft)	3
95th Queue (ft)	34
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	146	20	99
Average Queue (ft)	65	1	31
95th Queue (ft)	111	10	77
Link Distance (ft)	4151	1754	1095
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 120

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	701	152	451	788	356	356	136
v/c Ratio	0.68	0.27	1.08	0.72	0.83	0.83	0.26
Control Delay	24.1	4.5	84.3	8.9	43.0	43.0	3.9
Queue Delay	0.0	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	24.1	4.5	84.3	9.3	43.0	43.0	3.9
Queue Length 50th (ft)	135	0	~194	207	136	136	0
Queue Length 95th (ft)	188	34	#355	341	#318	#318	27
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	1609	804	416	1402	527	527	611
Starvation Cap Reductn	0	0	0	217	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.44	0.19	1.08	0.66	0.68	0.68	0.22

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.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	148	1179	944	791	224	235
v/c Ratio	0.41	0.49	0.68	0.50	0.69	0.50
Control Delay	11.8	4.7	20.2	1.1	37.5	8.6
Queue Delay	0.0	0.4	0.1	0.0	0.0	0.0
Total Delay	11.8	5.1	20.3	1.1	37.5	8.6
Queue Length 50th (ft)	38	116	164	0	87	4
Queue Length 95th (ft)	122	164	263	0	162	57
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	416	2624	1638	1583	556	650
Starvation Cap Reductn	0	789	0	0	0	0
Spillback Cap Reductn	0	0	84	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.64	0.61	0.50	0.40	0.36

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	1265	90	0	1705	5	0	0	60	0	0	5
Future Vol, veh/h	0	1265	90	0	1705	5	0	0	60	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1375	98	0	1853	5	0	0	65	0	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1858	0	-	-	-	0	-	-	688	-	-	929
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	322	-	0	0	-	-	0	0	389	0	0	269
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	322	-	-	-	-	-	-	-	389	-	-	269
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	16.1	18.7
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	389	322	-	-	-	269
HCM Lane V/C Ratio	0.168	-	-	-	-	0.02
HCM Control Delay (s)	16.1	0	-	-	-	18.7
HCM Lane LOS	C	A	-	-	-	C
HCM 95th %tile Q(veh)	0.6	0	-	-	-	0.1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	170	1196	201	1206	134	351	88	216	113	139	206
v/c Ratio	0.77	0.85	0.79	0.80	0.19	1.10	0.24	0.45	0.67	0.69	0.13
Control Delay	70.9	37.8	68.3	34.2	10.8	124.4	42.4	8.9	69.4	66.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	37.8	68.3	34.2	10.8	124.4	42.4	8.9	69.4	66.5	0.2
Queue Length 50th (ft)	118	392	140	387	23	~284	53	0	79	97	0
Queue Length 95th (ft)	207	#635	231	565	71	#541	113	68	148	174	0
Internal Link Dist (ft)		236		523			338			184	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	318	1406	398	1593	756	318	510	590	318	503	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.53	0.85	0.51	0.76	0.18	1.10	0.17	0.37	0.36	0.28	0.13

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	165	935	225	195	1170	130	340	85	205	110	135	200
Future Volume (veh/h)	165	935	225	195	1170	130	340	85	205	110	135	200
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	170	964	232	201	1206	134	351	88	216	113	139	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	1039	250	235	1363	608	381	423	359	149	180	
Arrive On Green	0.11	0.37	0.37	0.13	0.38	0.38	0.21	0.23	0.23	0.08	0.10	0.00
Sat Flow, veh/h	1781	2842	682	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	170	602	594	201	1206	134	351	88	216	113	139	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1748	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.7	30.4	30.6	10.3	29.6	5.3	18.1	3.6	11.4	5.8	6.8	0.0
Cycle Q Clear(g_c), s	8.7	30.4	30.6	10.3	29.6	5.3	18.1	3.6	11.4	5.8	6.8	0.0
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	203	650	639	235	1363	608	381	423	359	149	180	
V/C Ratio(X)	0.84	0.93	0.93	0.86	0.88	0.22	0.92	0.21	0.60	0.76	0.77	
Avail Cap(c_a), veh/h	381	855	840	476	1709	762	381	608	515	381	600	
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	0.00
Uniform Delay (d), s/veh	40.6	28.5	28.5	39.8	26.9	19.4	36.0	29.4	32.4	41.9	41.3	0.0
Incr Delay (d2), s/veh	3.5	11.8	12.3	3.5	4.3	0.1	27.0	0.1	0.6	2.9	2.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	14.3	14.2	4.6	12.6	1.9	10.5	1.6	4.4	2.6	3.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	40.2	40.9	43.2	31.2	19.5	63.0	29.5	33.0	44.9	43.9	0.0
LnGrp LOS	D	D	D	D	C	B	E	C	C	D	D	
Approach Vol, veh/h		1366			1541			655			252	A
Approach Delay, s/veh		41.0			31.8			48.6			44.3	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.3	39.2	24.0	14.0	14.7	40.9	11.8	26.2
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	12.3	32.6	20.1	8.8	10.7	31.6	7.8	13.4
Green Ext Time (p_c), s	0.1	1.6	0.0	0.2	0.0	2.2	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	38.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	5.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	115	110	290	105	130	295
Future Vol, veh/h	115	110	290	105	130	295
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	125	120	315	114	141	321

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	975	372	0	0	429	0
Stage 1	372	-	-	-	-	-
Stage 2	603	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	279	674	-	-	1130	-
Stage 1	697	-	-	-	-	-
Stage 2	546	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	237	674	-	-	1130	-
Mov Cap-2 Maneuver	355	-	-	-	-	-
Stage 1	697	-	-	-	-	-
Stage 2	463	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.2	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	462	1130	-
HCM Lane V/C Ratio	-	-	0.529	0.125	-
HCM Control Delay (s)	-	-	21.2	8.6	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	3	0.4	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.4	0.7	0.0	0.7
Total Del/Veh (s)	24.7	19.2	20.1	21.1

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.2	0.3
Total Del/Veh (s)	10.5	15.3	18.3	13.9

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	3.2	0.1	0.1
Total Del/Veh (s)	10.4	5.4	95.7	20.4	9.4

4: FEATHER RIVER BLVD & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.1	4.2	15.0	0.0	3.9
Total Del/Veh (s)	35.1	38.2	38.2	21.6	34.8

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.4	0.2
Total Del/Veh (s)	19.5	2.5	4.2	6.8

Total Zone Performance

Denied Del/Veh (s)	7.3
Total Del/Veh (s)	771.8

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	209	214	121	294	292	223	235	160
Average Queue (ft)	122	118	37	194	165	123	138	53
95th Queue (ft)	188	182	83	317	284	194	208	122
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)				2	1			
Queuing Penalty (veh)				14	3			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)	0	0					1	0
Queuing Penalty (veh)	0	0					1	0

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	232	258	255	278	389	348	213	167
Average Queue (ft)	98	90	82	158	189	101	98	74
95th Queue (ft)	198	220	206	289	346	302	171	139
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)	0	0	0		1	0		
Queuing Penalty (veh)	1	1	2		5	1		
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)				3	5		0	1
Queuing Penalty (veh)				16	24		0	1

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	WB	WB	NB	SB
Directions Served	T	TR	T	TR	R	R
Maximum Queue (ft)	332	333	139	135	178	35
Average Queue (ft)	103	120	10	8	66	5
95th Queue (ft)	307	319	73	71	174	24
Link Distance (ft)	389	389	254	254	314	155
Upstream Blk Time (%)	1	1	0	0	2	
Queuing Penalty (veh)	7	8	0	2	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)	5					
Queuing Penalty (veh)	0					

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	244	287	298	396	510	520	225	264	340	222	174	206
Average Queue (ft)	142	244	257	155	318	314	115	208	115	72	73	103
95th Queue (ft)	226	305	308	332	485	495	276	286	314	148	137	196
Link Distance (ft)	254	254	254		534	534			342			182
Upstream Blk Time (%)	0	14	20		1	1			4		0	3
Queuing Penalty (veh)	1	65	91		4	4			17		0	19
Storage Bay Dist (ft)				385			200	240		240	275	
Storage Blk Time (%)				0	6	25	0	14	0	0	0	16
Queuing Penalty (veh)				0	11	33	1	40	0	0	1	50

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	SB
Directions Served	R
Maximum Queue (ft)	142
Average Queue (ft)	40
95th Queue (ft)	141
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	3
Queuing Penalty (veh)	7

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	227	24	154
Average Queue (ft)	87	2	52
95th Queue (ft)	167	14	116
Link Distance (ft)	1663	1763	1169
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 431

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	15.1	5.1	5.5	4.1	3.8	35.4	11.5	5.6

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	136	256	262	28	79	67	117
Average Queue (ft)	47	47	60	1	6	23	45
95th Queue (ft)	105	183	198	19	39	54	83
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)		0	0				0
Queuing Penalty (veh)		1	1				0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)		1					
Queuing Penalty (veh)		1					

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	746	122	301	512	398	398	256
v/c Ratio	0.77	0.22	0.80	0.50	0.82	0.82	0.40
Control Delay	27.5	3.1	28.5	5.2	39.1	39.1	5.3
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Total Delay	27.5	3.1	28.5	5.4	39.1	39.1	5.3
Queue Length 50th (ft)	148	0	115	114	154	154	0
Queue Length 95th (ft)	204	22	#270	201	#350	#350	52
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	1626	811	420	1387	532	532	676
Starvation Cap Reductn	0	0	0	233	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.15	0.72	0.44	0.75	0.75	0.38

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	261	1281	637	701	184	340
v/c Ratio	0.69	0.53	0.46	0.44	0.60	0.74
Control Delay	19.7	3.8	16.7	0.9	34.1	20.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	19.7	4.2	16.7	0.9	34.1	20.2
Queue Length 50th (ft)	77	66	94	0	72	44
Queue Length 95th (ft)	#226	153	167	0	127	123
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	420	2637	1626	1583	563	654
Starvation Cap Reductn	0	751	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.68	0.39	0.44	0.33	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	104	1350	35	0	1103	70	0	0	25	0	0	101
Future Vol, veh/h	104	1350	35	0	1103	70	0	0	25	0	0	101
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	113	1467	38	0	1199	76	0	0	27	0	0	110

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1275	0	-	-	-	0	-	-	734	-	-	638
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	540	-	0	0	-	-	0	0	363	0	0	419
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	540	-	-	-	-	-	-	-	363	-	-	419
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	0	15.7	16.6
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	363	540	-	-	-	419
HCM Lane V/C Ratio	0.075	0.209	-	-	-	0.262
HCM Control Delay (s)	15.7	13.4	-	-	-	16.6
HCM Lane LOS	C	B	-	-	-	C
HCM 95th %tile Q(veh)	0.2	0.8	-	-	-	1

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	196	1298	116	921	125	197	85	122	182	118	151
v/c Ratio	0.75	0.82	0.62	0.63	0.18	0.75	0.38	0.41	0.74	0.60	0.10
Control Delay	59.2	30.3	59.0	27.5	8.4	59.2	47.4	12.5	60.1	57.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	30.3	59.0	27.5	8.4	59.2	47.4	12.5	60.1	57.1	0.1
Queue Length 50th (ft)	118	355	71	238	11	119	50	0	110	72	0
Queue Length 95th (ft)	215	#627	140	383	55	216	107	54	200	141	0
Internal Link Dist (ft)		236		523			338			183	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	358	1585	448	1794	849	358	574	572	358	566	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.82	0.26	0.51	0.15	0.55	0.15	0.21	0.51	0.21	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	1006	189	107	847	115	181	78	112	167	109	139
Future Volume (veh/h)	180	1006	189	107	847	115	181	78	112	167	109	139
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	196	1093	205	116	921	125	197	85	122	182	118	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	238	1203	225	160	1275	569	239	225	191	229	215	
Arrive On Green	0.13	0.40	0.40	0.09	0.36	0.36	0.13	0.12	0.12	0.13	0.11	0.00
Sat Flow, veh/h	1781	2988	558	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	196	648	650	116	921	125	197	85	122	182	118	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1770	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	7.5	23.9	24.1	4.4	15.6	3.8	7.5	2.9	5.1	6.9	4.2	0.0
Cycle Q Clear(g_c), s	7.5	23.9	24.1	4.4	15.6	3.8	7.5	2.9	5.1	6.9	4.2	0.0
Prop In Lane	1.00		0.32	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	238	715	713	160	1275	569	239	225	191	229	215	
V/C Ratio(X)	0.82	0.91	0.91	0.72	0.72	0.22	0.82	0.38	0.64	0.79	0.55	
Avail Cap(c_a), veh/h	511	1148	1143	639	2296	1024	511	816	692	511	806	
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	0.00
Uniform Delay (d), s/veh	29.4	19.6	19.6	30.9	19.3	15.5	29.3	28.2	29.2	29.4	29.1	0.0
Incr Delay (d2), s/veh	2.7	4.4	4.8	2.3	0.3	0.1	2.7	0.4	1.3	2.4	0.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	9.5	9.6	1.9	5.8	1.3	3.3	1.3	1.9	3.0	1.8	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.1	24.0	24.4	33.2	19.6	15.6	32.1	28.6	30.5	31.8	29.9	0.0
LnGrp LOS	C	C	C	C	B	B	C	C	C	C	C	
Approach Vol, veh/h		1494			1162			404			300	A
Approach Delay, s/veh		25.2			20.5			30.9			31.1	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.3	33.0	13.4	13.0	13.3	30.0	13.0	13.4
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	6.4	26.1	9.5	6.2	9.5	17.6	8.9	7.1
Green Ext Time (p_c), s	0.0	1.9	0.1	0.2	0.1	1.6	0.1	0.2

Intersection Summary	
HCM 6th Ctrl Delay	24.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	26	101	27	346	315	26
Future Vol, veh/h	26	101	27	346	315	26
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	28	110	29	376	342	28

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	790	356	370	0	-	0
Stage 1	356	-	-	-	-	-
Stage 2	434	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	359	688	1189	-	-	-
Stage 1	709	-	-	-	-	-
Stage 2	653	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	348	688	1189	-	-	-
Mov Cap-2 Maneuver	348	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	653	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13.3	0.6	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1189	-	573	-	-
HCM Lane V/C Ratio	0.025	-	0.241	-	-
HCM Control Delay (s)	8.1	0	13.3	-	-
HCM Lane LOS	A	A	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.9	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	92	100	234	82	110	209
Future Vol, veh/h	92	100	234	82	110	209
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	100	109	254	89	120	227

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	766	299	0	0	343	0
Stage 1	299	-	-	-	-	-
Stage 2	467	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	371	741	-	-	1216	-
Stage 1	752	-	-	-	-	-
Stage 2	631	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	329	741	-	-	1216	-
Mov Cap-2 Maneuver	437	-	-	-	-	-
Stage 1	752	-	-	-	-	-
Stage 2	560	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.3	0	2.9
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	556	1216	-
HCM Lane V/C Ratio	-	-	0.375	0.098	-
HCM Control Delay (s)	-	-	15.3	8.3	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	1.7	0.3	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.7	0.0	0.0	0.5
Total Del/Veh (s)	27.0	17.0	17.2	20.3

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.6	0.4
Total Del/Veh (s)	14.3	13.1	16.3	14.1

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.2	0.0
Total Del/Veh (s)	5.8	4.1	35.4	11.5	5.6

4: Feather River Blvd & Oroville Dam Rd Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.2	0.1	0.0	0.1
Total Del/Veh (s)	27.4	22.8	24.3	21.1	24.7

5: FEATHER RIVER BLVD & GAS STATION ACCESS Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.1	0.1
Total Del/Veh (s)	6.5	1.3	0.9	1.9

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.0	0.3	0.2
Total Del/Veh (s)	11.9	2.1	2.7	4.7

Total Zone Performance

Denied Del/Veh (s)	1.2
Total Del/Veh (s)	1878.4

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	239	329	64	277	254	220	242	204
Average Queue (ft)	147	117	24	127	114	125	140	68
95th Queue (ft)	227	262	51	237	217	194	208	144
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)				0	0			
Queuing Penalty (veh)				2	1			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)	2	0					1	0
Queuing Penalty (veh)	7	1					2	0

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	292	302	292	228	268	298	184	201
Average Queue (ft)	144	150	123	98	115	84	75	97
95th Queue (ft)	261	293	267	183	215	250	145	169
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)	1	1	1		0	0		
Queuing Penalty (veh)	4	6	2		0	0		
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)				0	1		0	0
Queuing Penalty (veh)				1	2		0	0

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	136	256	262	28	79	67	117
Average Queue (ft)	47	47	60	1	6	23	45
95th Queue (ft)	105	183	198	19	39	54	83
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)		0	0				0
Queuing Penalty (veh)		1	1				0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)		1					
Queuing Penalty (veh)		1					

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	245	284	291	136	294	313	225	201	120	96	164	168
Average Queue (ft)	135	226	242	63	160	170	54	102	51	46	88	63
95th Queue (ft)	218	303	305	114	255	276	170	172	99	79	146	130
Link Distance (ft)	254	254	254		533	533			342			181
Upstream Blk Time (%)	0	6	10								0	0
Queuing Penalty (veh)	1	29	46								0	1
Storage Bay Dist (ft)				385			200	240		240	200	
Storage Blk Time (%)						4	0	0			0	4
Queuing Penalty (veh)						5	0	0			0	14

Intersection: 4: Feather River Blvd & Oroville Dam Rd

Movement	SB
Directions Served	R
Maximum Queue (ft)	100
Average Queue (ft)	6
95th Queue (ft)	52
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	0
Queuing Penalty (veh)	0

Intersection: 5: FEATHER RIVER BLVD & GAS STATION ACCESS

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	93	40	27
Average Queue (ft)	42	7	2
95th Queue (ft)	72	29	19
Link Distance (ft)	356		150
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)		75	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	137	21	102
Average Queue (ft)	65	1	31
95th Queue (ft)	110	11	78
Link Distance (ft)	4151	1754	1095
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 129

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by movement

Movement	EBL	EBT	EBR	WBT	WBR	NBR	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.0	0.1	0.1	0.4	0.0
Total Del/Veh (s)	36.1	8.4	8.3	6.0	4.7	51.9	29.1	9.2

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	186	301	310	145	127	140	146
Average Queue (ft)	58	87	105	11	13	50	59
95th Queue (ft)	132	271	286	73	73	115	117
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)		0	0	0	0	0	1
Queuing Penalty (veh)		2	3	0	0	0	0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)		3					
Queuing Penalty (veh)		3					

Lane Group	EBT	EBR	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	708	152	474	795	367	368	136
v/c Ratio	0.68	0.27	1.16	0.73	0.84	0.84	0.25
Control Delay	24.3	4.5	110.8	9.3	43.8	44.1	3.9
Queue Delay	0.0	0.0	0.0	0.5	0.0	0.0	0.0
Total Delay	24.3	4.5	110.8	9.8	43.8	44.1	3.9
Queue Length 50th (ft)	138	0	~219	216	144	144	0
Queue Length 95th (ft)	191	34	#379	344	#332	#333	27
Internal Link Dist (ft)	2419			252		535	
Turn Bay Length (ft)		225					200
Base Capacity (vph)	1585	794	410	1381	519	519	604
Starvation Cap Reductn	0	0	0	223	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.19	1.16	0.69	0.71	0.71	0.23

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.

HCM 6th Edition methodology does not support clustered intersections.

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	148	1207	972	812	224	256
v/c Ratio	0.41	0.50	0.69	0.51	0.69	0.54
Control Delay	11.7	4.7	20.4	1.2	38.1	10.5
Queue Delay	0.0	0.4	0.1	0.0	0.0	0.0
Total Delay	11.7	5.1	20.5	1.2	38.1	10.5
Queue Length 50th (ft)	38	120	170	0	89	11
Queue Length 95th (ft)	122	166	274	0	162	70
Internal Link Dist (ft)		252	373		733	
Turn Bay Length (ft)						220
Base Capacity (vph)	410	2593	1618	1583	548	643
Starvation Cap Reductn	0	784	0	0	0	0
Spillback Cap Reductn	0	0	83	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.36	0.67	0.63	0.51	0.41	0.40

Intersection Summary

HCM 6th Edition methodology does not support clustered intersections.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	78	1236	90	0	1664	65	0	0	60	0	0	95
Future Vol, veh/h	78	1236	90	0	1664	65	0	0	60	0	0	95
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	Free	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	-	-	-	-	-	0	-	-	0
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, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	85	1343	98	0	1809	71	0	0	65	0	0	103

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1880	0	-	-	-	0	-	-	672	-	-	940
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	4.14	-	-	-	-	-	-	-	6.94	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	2.22	-	-	-	-	-	-	-	3.32	-	-	3.32
Pot Cap-1 Maneuver	315	-	0	0	-	-	0	0	398	0	0	265
Stage 1	-	-	0	0	-	-	0	0	-	0	0	-
Stage 2	-	-	0	0	-	-	0	0	-	0	0	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	315	-	-	-	-	-	-	-	398	-	-	265
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1.2	0	15.8	27
HCM LOS			C	D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	398	315	-	-	-	265
HCM Lane V/C Ratio	0.164	0.269	-	-	-	0.39
HCM Control Delay (s)	15.8	20.6	-	-	-	27
HCM Lane LOS	C	C	-	-	-	D
HCM 95th %tile Q(veh)	0.6	1.1	-	-	-	1.8

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	172	1164	194	1224	143	359	92	209	165	159	199
v/c Ratio	0.78	0.84	0.78	0.83	0.20	1.13	0.28	0.46	0.76	0.73	0.13
Control Delay	71.8	37.5	68.7	36.5	11.5	133.7	45.2	9.7	71.0	67.5	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	37.5	68.7	36.5	11.5	133.7	45.2	9.7	71.0	67.5	0.2
Queue Length 50th (ft)	121	383	136	406	26	~301	58	0	116	112	0
Queue Length 95th (ft)	211	#620	228	#605	78	#568	120	69	203	196	0
Internal Link Dist (ft)		236		523			338			184	
Turn Bay Length (ft)			385		200	240		240	275		85
Base Capacity (vph)	317	1402	397	1589	756	317	508	583	317	501	1583
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.83	0.49	0.77	0.19	1.13	0.18	0.36	0.52	0.32	0.13

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.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	910	219	188	1187	139	348	89	199	160	154	193
Future Volume (veh/h)	167	910	219	188	1187	139	348	89	199	160	154	193
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	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	172	938	226	194	1224	143	359	92	209	165	159	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	1025	246	228	1327	592	379	388	329	200	200	
Arrive On Green	0.12	0.36	0.36	0.13	0.37	0.37	0.21	0.21	0.21	0.11	0.11	0.00
Sat Flow, veh/h	1781	2841	683	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	172	586	578	194	1224	143	359	92	209	165	159	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1747	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	8.9	29.6	29.7	10.0	30.9	5.8	18.7	3.9	11.3	8.5	7.8	0.0
Cycle Q Clear(g_c), s	8.9	29.6	29.7	10.0	30.9	5.8	18.7	3.9	11.3	8.5	7.8	0.0
Prop In Lane	1.00		0.39	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	205	641	630	228	1327	592	379	388	329	200	200	
V/C Ratio(X)	0.84	0.91	0.92	0.85	0.92	0.24	0.95	0.24	0.64	0.82	0.79	
Avail Cap(c_a), veh/h	379	851	837	474	1702	759	379	605	513	379	597	
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	0.00
Uniform Delay (d), s/veh	40.7	28.7	28.7	40.1	28.1	20.3	36.5	31.0	34.0	40.8	40.9	0.0
Incr Delay (d2), s/veh	3.5	10.2	10.6	3.5	6.6	0.1	32.4	0.1	0.8	3.2	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	13.7	13.6	4.5	13.6	2.1	11.4	1.7	4.4	3.9	3.7	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.2	38.8	39.3	43.6	34.7	20.4	68.9	31.1	34.7	44.0	43.6	0.0
LnGrp LOS	D	D	D	D	C	C	E	C	C	D	D	
Approach Vol, veh/h		1336			1561			660			324	A
Approach Delay, s/veh		39.7			34.5			52.8			43.8	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	38.9	24.0	15.1	14.8	40.1	14.6	24.5
Change Period (Y+Rc), s	* 4	* 5	* 4	* 5	* 4	* 5	* 4	* 5
Max Green Setting (Gmax), s	* 25	* 45	* 20	* 30	* 20	* 45	* 20	* 30
Max Q Clear Time (g_c+I1), s	12.0	31.7	20.7	9.8	10.9	32.9	10.5	13.3
Green Ext Time (p_c), s	0.1	1.6	0.0	0.3	0.0	2.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	40.2
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	21	79	26	369	539	27
Future Vol, veh/h	21	79	26	369	539	27
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	23	86	28	401	586	29

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1058	601	615	0	-	0
Stage 1	601	-	-	-	-	-
Stage 2	457	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	249	500	965	-	-	-
Stage 1	547	-	-	-	-	-
Stage 2	638	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	240	500	965	-	-	-
Mov Cap-2 Maneuver	240	-	-	-	-	-
Stage 1	527	-	-	-	-	-
Stage 2	638	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	17	0.6	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	965	-	407	-	-
HCM Lane V/C Ratio	0.029	-	0.267	-	-
HCM Control Delay (s)	8.8	0	17	-	-
HCM Lane LOS	A	A	C	-	-
HCM 95th %tile Q(veh)	0.1	-	1.1	-	-

Intersection	
Int Delay, s/veh	5.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	117	110	299	107	130	304
Future Vol, veh/h	117	110	299	107	130	304
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	127	120	325	116	141	330

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	995	383	0	0	441	0
Stage 1	383	-	-	-	-	-
Stage 2	612	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	271	664	-	-	1119	-
Stage 1	689	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	229	664	-	-	1119	-
Mov Cap-2 Maneuver	349	-	-	-	-	-
Stage 1	689	-	-	-	-	-
Stage 2	458	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	22	0	2.6
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	453	1119	-
HCM Lane V/C Ratio	-	-	0.545	0.126	-
HCM Control Delay (s)	-	-	22	8.7	0
HCM Lane LOS	-	-	C	A	A
HCM 95th %tile Q(veh)	-	-	3.2	0.4	-

1: OROVILLE DAM RD & SR 70 SB RAMP Performance by approach

Approach	EB	WB	SB	All
Denied Del/Veh (s)	1.4	0.6	0.0	0.7
Total Del/Veh (s)	25.2	20.2	20.1	21.6

2: SR 70 NB RAMP & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	All
Denied Del/Veh (s)	0.0	0.0	2.3	0.3
Total Del/Veh (s)	9.2	15.1	18.0	13.3

3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	0.0	0.1	0.4	0.0
Total Del/Veh (s)	9.9	5.9	51.9	29.1	9.2

4: FEATHER RIVER BLVD & OROVILLE DAM RD Performance by approach

Approach	EB	WB	NB	SB	All
Denied Del/Veh (s)	0.0	6.9	13.7	0.0	4.7
Total Del/Veh (s)	35.1	42.6	43.1	25.4	37.6

5: PROJECT ACCESS & FEATHER RIVER BLVD Performance by approach

Approach	EB	NB	SB	All
Denied Del/Veh (s)	0.3	0.0	0.8	0.4
Total Del/Veh (s)	15.6	1.3	2.8	3.5

6: FEATHER RIVER BLVD & MITCHELL AVE Performance by approach

Approach	WB	NB	SB	All
Denied Del/Veh (s)	0.2	0.1	0.3	0.2
Total Del/Veh (s)	17.9	2.3	3.7	6.2

Total Zone Performance

Denied Del/Veh (s)	7.4
Total Del/Veh (s)	798.4

Intersection: 1: OROVILLE DAM RD & SR 70 SB RAMP

Movement	EB	EB	EB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	L	LT	R
Maximum Queue (ft)	212	206	113	295	294	224	239	167
Average Queue (ft)	126	117	36	203	164	129	144	52
95th Queue (ft)	190	180	78	320	277	196	209	117
Link Distance (ft)		2454		282	282	549	549	
Upstream Blk Time (%)				3	1			
Queuing Penalty (veh)				18	4			
Storage Bay Dist (ft)	225		225					200
Storage Blk Time (%)	0	0	0				1	0
Queuing Penalty (veh)	1	0	0				1	0

Intersection: 2: SR 70 NB RAMP & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	NB	NB
Directions Served	L	T	T	T	T	R	LT	R
Maximum Queue (ft)	228	243	243	279	384	380	174	167
Average Queue (ft)	89	85	71	160	180	116	95	80
95th Queue (ft)	176	199	178	283	331	327	150	139
Link Distance (ft)	282	282	282		389	389	766	
Upstream Blk Time (%)	0	0	0		1	0		
Queuing Penalty (veh)	0	1	1		6	2		
Storage Bay Dist (ft)				220				220
Storage Blk Time (%)				4	4		0	
Queuing Penalty (veh)				19	19		0	

Intersection: 3: D/W RETAIL/PROJECT ACCESS & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	NB	SB
Directions Served	L	T	TR	T	TR	R	R
Maximum Queue (ft)	186	301	310	145	127	140	146
Average Queue (ft)	58	87	105	11	13	50	59
95th Queue (ft)	132	271	286	73	73	115	117
Link Distance (ft)		389	389	254	254	314	155
Upstream Blk Time (%)		0	0	0	0	0	1
Queuing Penalty (veh)		2	3	0	0	0	0
Storage Bay Dist (ft)	200						
Storage Blk Time (%)		3					
Queuing Penalty (veh)		3					

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	L	T	R	L	T
Maximum Queue (ft)	255	290	296	410	547	539	225	264	352	209	180	214
Average Queue (ft)	148	244	257	175	350	352	134	218	151	70	101	128
95th Queue (ft)	234	304	306	375	529	536	294	298	373	147	173	223
Link Distance (ft)	254	254	254		534	534			342			182
Upstream Blk Time (%)	1	12	18		1	1			5		0	6
Queuing Penalty (veh)	3	55	81		7	7			23		0	39
Storage Bay Dist (ft)				385			200	240		240	200	
Storage Blk Time (%)				0	9	32	0	20	0		0	23
Queuing Penalty (veh)				0	16	45	1	58	2		1	83

Intersection: 4: FEATHER RIVER BLVD & OROVILLE DAM RD

Movement	SB
Directions Served	R
Maximum Queue (ft)	145
Average Queue (ft)	54
95th Queue (ft)	164
Link Distance (ft)	
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	85
Storage Blk Time (%)	3
Queuing Penalty (veh)	11

Intersection: 5: PROJECT ACCESS & FEATHER RIVER BLVD

Movement	EB	NB	SB
Directions Served	LR	L	TR
Maximum Queue (ft)	116	43	161
Average Queue (ft)	48	10	31
95th Queue (ft)	93	36	117
Link Distance (ft)	188		148
Upstream Blk Time (%)	0		1
Queuing Penalty (veh)	0		3
Storage Bay Dist (ft)		75	
Storage Blk Time (%)		0	
Queuing Penalty (veh)		0	

Intersection: 6: FEATHER RIVER BLVD & MITCHELL AVE

Movement	WB	NB	SB
Directions Served	LR	TR	LT
Maximum Queue (ft)	193	25	144
Average Queue (ft)	83	2	50
95th Queue (ft)	157	14	110
Link Distance (ft)	1663	1763	1169
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 514

Geotechnical Engineering Report

Maverik Fueling Station Oroville
Oroville, California
May 30, 2019
Terracon Project No. NB195035

Prepared for:
Maverik, Inc.
Salt Lake City, UT

Prepared by:
Terracon Consultants, Inc.
Sacramento, California

May 30, 2019

Maverik, Inc.
185 South State Street, Ste 800
Salt Lake City, UT 84111

Attn: Ms. Ashley Olsen
P: (801) 677-2930
E: Ashley.olsen@maverik.com

Re: Geotechnical Engineering Report
Maverik Fueling Station Oroville
NWC Feather River Blvd. and Oroville Dam Blvd.
Oroville, California
Terracon Project No. NB195035

Dear Ms. Olsen:

We have completed the Geotechnical Engineering services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. PNB195035 dated April 17, 2019. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for the proposed project.

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

Sincerely,
Terracon Consultants, Inc.

Nicholas M. Novotny
Professional Geologist 9626
Senior Staff Geologist

Patrick C. Dell, Senior Associate
Geotechnical Engineer 2186
Department Manager

REPORT TOPICS

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Note: This report was originally delivered in a web-based format. **Orange Bold** text in the report indicates a referenced section heading. The PDF version also includes hyperlinks which direct the reader to that section and clicking on the ***GeoReport*** logo will bring you back to this page. For more interactive features, please view your project online at client.terracon.com.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES
SITE LOCATION AND EXPLORATION PLANS
EXPLORATION RESULTS
SUPPORTING INFORMATION

Note: Refer to each individual Attachment for a listing of contents.

REPORT SUMMARY

Topic [1]	Overview Statement [2]
Project Description	The project will consist of a new Maverik Fueling Station. Improvements include a 5,637 sq. ft. C-Store, underground storage tanks (UST's), fueling islands, and associated asphalt pavements, concrete flatwork, and landscaping areas. Only the eastern portion of the site will be developed as part of this project.
Geotechnical Characterization	■ Subsurface materials encountered at the site generally consisted of loose to dense dredge tailing deposits that extended to depths of between 14 and 17 feet below the existing ground surface (bgs). The dredge tailing deposits consisted of gravel with silt, sand, and cobbles up to 14 inches in dimension. ■ Native soils encountered beneath the dredge tailings generally consisted of loose to very dense silty sands that extended to the maximum depth of exploration of 51½ feet. ■ Groundwater encountered at a depth of 18 feet during our investigation.
Earthwork	■ Dredge tailing deposits are very susceptible to caving and raveling when excavated. Excavations through dredge tailings for foundations, utilities and UST's will require shoring or other stabilization measures to keep the excavations open. ■ Existing dredge tailing materials may be suitable for use as engineered fill provided they are processed to conform with the requirements for engineered fill outlined in **Earthwork**.
Shallow Foundations	■ The proposed C-store and fueling canopy improvements may be supported on shallow spread footing foundations bearing directly on recompacted dredge tailing deposits.
Deep Foundations	■ The proposed fueling canopies may be supported on drilled shaft foundations bearing into dredge tailing deposits. ■ Drilled shafts will need to be cased to prevent caving of the sidewalls.
Pavements	With subgrade prepared as noted in **Earthwork**. Anticipated traffic indices (TI's) are as follows: ■ TI of 4.5 – Auto Parking ■ TI of 5.5 – Auto Drives ■ TI of 6.5 – Heavy Truck Drives ■ The aggregate base section used to construct pavement sections should be underlain with a filter fabric such as Mirafi 140-N, or equivalent, to reduce the potential for fine materials in the aggregate base from migrating into the void space of the near surface gravels and cobbles.
General Comments	This section contains important information about the limitations of this geotechnical engineering report.

1. If the reader is reviewing this report as a pdf, the topics above can be used to access the appropriate section of the report by simply clicking on the topic itself.
2. This summary is for convenience only. It should be used in conjunction with the entire report for design purposes.

Geotechnical Engineering Report

Maverik Fueling Station Oroville
NWC Feather River Blvd. and Oroville Dam Blvd.
Oroville, California

Terracon Project No. NB195035
May 30, 2019

INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed Maverik Fueling Station to be located at northwest corner of Feather River Boulevard and Oroville Dam Boulevard in Oroville, California. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Excavation considerations
- Seismic site classification per 2016 CBC
- Foundation design and construction
- Floor slab design and construction
- Lateral earth pressures
- Pavement design and construction

The geotechnical engineering Scope of Services for this project included the advancement of seven (7) test borings to depths ranging from approximately 6½ to 51½ feet below existing site grades (bgs). In addition, percolation testing was also performed.

Maps showing the site and boring locations are shown in the **Site Location** and **Exploration Plan** sections, respectively. The results of the laboratory testing performed on soil samples obtained from the site during the field exploration are included on the boring logs and/or as separate graphs in the **Exploration Results** section.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.

Item	Description
Parcel Information	The project is located at the northwest corner of Feather River Boulevard and Oroville Dam Boulevard in Oroville, California. See **Site Location**

Item	Description
Existing Improvements	The southeast portion of the site is undeveloped; an existing commercial facility with a main structure and several outbuildings are present in the western portion of the site. In the northeast portion of the site, some concrete building pads are present where a building was demolished.
Current Ground Cover	The western portion of the site is covered by asphalt pavements and the existing commercial structure. Bare soils, grass, and weeds with remnant concrete building pads are present in the northeastern portion of the site.
Existing Topography	Relatively level with minor topographic relief. Site topography slopes gently down to the north at an approximate grade of 1%.
Geology	■ The near surface materials consist of dredge tailing deposits (t), as described in the geologic map of the area[1]. Dredge tailings generally consist of material that has been excavated and processed through a gold dredge. This process washes away the fine soil material leaving behind relatively clean gravels and cobbles. Dredge tailing deposits date back to the late 19th and early 20th centuries when this region of the Feather River was mined for gold.

1 Saucedo, G.J., and Wagner, D.L., 1992, Geologic map of the Chico quadrangle: California Division of Mines and Geology, Regional Geologic Map 7A, scale 1:250,000

PROJECT DESCRIPTION

Our initial understanding of the project was provided in our proposal and was discussed during project planning. A period of collaboration has transpired since the project was initiated, and our final understanding of the project conditions is as follows:

Item	Description
Information Provided	Email and site plan provided by Ashley Olsen on Monday 4/15/2019.
Project Description	The project will consist of a new Maverik Fueling Station. Improvements include a 5,637 sq. ft. C-Store, underground storage tanks (UST's), fueling islands, and associated asphalt pavements, concrete flatwork, and landscaping areas. Only the eastern portion of the site will be developed as part of this project.
Finished Floor Elevation	Anticipated to be ±2 feet of existing ground surface.
Maximum Loads	■ Columns: 40 kips (max) ■ Walls: 2 kips per linear foot (klf) ■ Slabs: 100 pounds per square foot (psf)
Grading/Slopes	Grading is expected to be relatively minor, with cuts and fills on the order of 1 to 2 feet anticipated.
Below-Grade Structures	UST's are anticipated to be placed approximately 10 to 12 feet below grade.

Item	Description
Pavements	Both rigid (concrete) and flexible (asphalt) pavement sections are considered. Anticipated traffic is as follows: ■ TI = 4.5 (Parking Lot) ■ TI = 5.5 (Drive Lanes) ■ TI = 6.5 (Heavy Truck Drives) The pavement design period is 20 years.

GEOTECHNICAL CHARACTERIZATION

We have developed a general characterization of the subsurface conditions based upon our review of the subsurface exploration, laboratory data, geologic setting and our understanding of the project. This characterization, termed GeoModel, forms the basis of our geotechnical calculations and evaluation of site preparation and foundation options. Conditions encountered at each exploration point are indicated on the individual logs. The individual logs can be found in the **Exploration Results** section and the GeoModel can be found in the **Figures** section of this report.

As part of our analyses, we identified the following model layers within the subsurface profile. For a more detailed view of the model layer depths at each boring location, refer to the GeoModel.

Model Layer	Layer Name	General Description
1	**Dredge Tailing Deposits**	Poorly Graded Gravel with Silt and Sand, gravel and cobbles up to 14 inches in dimension, fine to coarse grained, rounded to subrounded, loose to dense.
2	**Silty Sand**[1]	fine to coarse grained, subangular, nonplastic, loose to very dense

1. Stratum 2 not encountered in Borings B-6 and B-7 which only extended to depths of 6½ feet bgs.

Dredge tailings consisting of Poorly Graded Gravel with Silt and Sand were encountered across the entire site to depths of between 14 to 17 feet bgs. Based on our experience with this region and our review of the geologic map of the area, we have concluded that these fill materials are derived from historic dredging and mining operations of this region.

GROUNDWATER

The boreholes were observed while drilling and after completion for the presence and level of groundwater. Groundwater was encountered in test boring B-1 at a depth of 17.5 feet bgs while drilling and at 19 feet bgs at the completion of drilling.

The project site is located approximately 1,700 feet east of the Feather River. Groundwater level fluctuations are expected to occur at this site due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than anticipated. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

SEISMIC CONSIDERATIONS

The seismic design requirements for buildings and other structures are based on Seismic Design Category. Site Classification is required to determine the Seismic Design Category for a structure. The Site Classification is based on the upper 100 feet of the site profile defined by a weighted average value of either shear wave velocity, standard penetration resistance, or undrained shear strength in accordance with Section 20.4 of ASCE 7 and the 2016 California Building Code (CBC). Based on the soil properties encountered at the site and as described on the exploration logs and results, it is our professional opinion that the **Seismic Site Classification is D**. Subsurface explorations at this site were extended to a maximum depth of 51½ feet. The site properties below the boring depth to 100 feet were estimated based on our experience and knowledge of geologic conditions of the general area. Additional deeper borings or geophysical testing may be performed to confirm the conditions below the current boring depth.

LIQUEFACTION

Liquefaction is a mode of ground failure that results from the generation of high pore water pressures during earthquake ground shaking, causing loss of shear strength. Liquefaction is typically a hazard where loose sandy soils or non-plastic fine-grained soils exist below groundwater. The California Geologic Survey (CGS) has designated certain areas within California as potential liquefaction hazard zones. These are areas considered at a risk of liquefaction-related ground failure during a seismic event, based upon mapped surficial deposits and the presence of a relatively shallow water table. The project site is not located within a liquefaction hazard zone mapped by the CGS.

However, due to the shallow depth to groundwater and the soil conditions encountered in our exploratory borings, a detailed liquefaction analysis was conducted utilizing LiquefyPro Software. We assumed a groundwater depth of 17 feet bgs in our analysis based on our findings in the field and historic groundwater elevations. The analysis uses correlations based on SPT blow counts recorded at uniform intervals throughout the boring. The analysis of potential liquefaction was calculated based on the soil conditions encountered in boring B-1. Based on the analysis, the liquefaction potential is judged to be low. Total and differential settlement due to liquefaction is expected to be negligible across the site based on the soil conditions encountered at boring B-1.

PERCOLATION TESTING

One (1) percolation boring was advanced at the site to a depth of approximately 5 feet bgs on the eastern edge of the site (Boring B-7). The percolation test hole was excavated using a 6-inch diameter solid flight auger. After excavation, the percolation test hole was presoaked with clean water. During the test, the rate of water infiltration through the clean dredge tailing gravels was very high, and an accurate rate of infiltration could not be properly determined. Based on our observations at the site, we have provided an estimate of infiltration and percolation rates respectively in the table below.

Sample Location	Field Infiltration Rate (in/hr)	Percolation Rate (min/in)
Boring B-7	Greater than 60	Less than 1

CORROSIVITY

The table below lists the results of laboratory soluble sulfate, soluble chloride, electrical resistivity, and pH testing. The values may be used to estimate potential corrosive characteristics of the on-site soils with respect to contact with the various underground materials which will be used for project construction.

Corrosivity Test Results Summary						
Boring	Sample Depth (feet)	Soil Description	Soluble Sulfate (PPM)	Soluble Chloride (PPM)	Electrical Resistivity (Ω-cm)	pH
B-5	1 to 2.5	GP-GM	156	25	2,088	7.3

The sulfate test results indicate that the soil from boring B-5 classifies as Class S1 according to Table 19.3.1.1 of ACI 318-14. Sulfate Class S1 specifies type II cement with a maximum water-cement ratio of 0.50. For further information, see ACI 318-14, Section 19.3.

The chloride test results indicate that the soils have a relatively low chloride content present. According to Table 19.3.1.1 of ACI 318-14, the soil should not be considered an external source of chloride (i.e. sea water, etc.) to concrete foundations. Consequently, chloride classes of C0 and C1 should be used where applicable. C0 is defined as, “Concrete dry or protected from moisture” and C1 is defined as, “Concrete exposed to moisture but not to an external source of chlorides”. For the amount of chlorides allowed in concrete mix designs, Table 19.3.2.1 of ACI 318-14 shall be adhered to as appropriate.

GEOTECHNICAL OVERVIEW

Dredge tailing deposits consisting of relatively clean gravel with some silt and sand and cobbles up to 14 inches in dimension were encountered across the site to depths of between 14 and 17 feet bgs. Dredge tailing deposits are very susceptible to caving and raveling during excavation. Excavations through dredge tailings for foundations, utilities and UST's will require shoring or other stabilization measures to keep the excavations open. Existing dredge tailing materials may be suitable for use as engineered fill provided they are processed to conform with the requirements for engineered fill outlined in **Earthwork**.

The proposed C-store and fueling canopy improvements may be supported on shallow spread footing foundations bearing on recompacted dredge tailing deposits. Additional recommendations and design values are provided in the **Shallow Foundations** section.

In lieu of spread footings, the fueling canopies may be supported by a drilled shaft foundation system. Installation of deep foundations in this soil type (dredge tailings) will be difficult. If deep foundations are selected, it is our opinion that cast in place drilled pier foundations will work best. Drilled piers will need to be cased to prevent caving if this foundation option is selected. Deep foundation options for the fueling canopies are discussed further in the **Deep Foundations** section.

Floor slabs should be supported on a minimum of 12 inches of compacted engineered fill.

Recommendations for both rigid (concrete) and flexible (asphalt) pavement systems are provided for this site. The **Pavements** section addresses the design of pavement systems. Aggregate base sections of the pavements should be underlain with a filter fabric such as Mirafi 140-N, or equivalent, to reduce the potential for fine materials in the aggregate base from migrating into the void space of the underlying clean gravels and cobbles

The **General Comments** section provides an understanding of the report limitations.

EARTHWORK

The following recommendations include site preparation, excavation, subgrade preparation and placement of engineered fills on the project. The recommendations presented for design and construction of earth supported elements including foundations, slabs, and pavements are contingent upon following the recommendations outlined in this section.

Earthwork on the project should be observed and evaluated by Terracon. The evaluation of earthwork should include observation and testing of engineered fill, subgrade preparation, foundation bearing soils, and other geotechnical conditions exposed during the construction of the project.

Site Preparation

Strip and remove existing vegetation, debris, foundations, concrete slabs, pavements and other deleterious materials from proposed building and pavement areas. Exposed surfaces should be free of mounds and depressions which could prevent uniform compaction. The site should be initially graded to create a relatively level surface to receive fill and provide for a relatively uniform thickness of fill beneath proposed building structures.

Demolition or removal of existing structures should include complete removal of all foundation systems, floor slabs, and remaining underground utilities within the proposed construction area. This should include removal of any loose backfill found adjacent to existing foundations. All materials derived from the demolition of existing structures and pavements should be removed from the site and not be allowed for use as on-site fill, unless processed in accordance with the fill requirements included in this report.

After stripping and demolition, the resulting subgrade should be proof rolled with an adequately loaded vehicle such as a fully-loaded tandem-axle dump truck. The proof-rolling should extend at least 5 feet beyond the lateral extent of the proposed structure and pavement areas and be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proof-roll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed or modified by stabilizing with aggregate base and geogrids. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

Existing Dredge Tailings

As noted in **Geotechnical Overview**, dredge tailing deposits consisting of relatively clean gravel with silt and sand and cobbles up to 14 inches in dimension were encountered across the site to depths of between 14 and 17 feet bgs. Support of footings, floor slabs, and pavements on or above the existing dredge tailing deposits is discussed in this report. However, even with the recommended construction procedures, there is an inherent risk for the owner that compressible fill, or unsuitable material within or buried by the dredge tailing fill will not be discovered. This risk of unforeseen conditions cannot be eliminated without completely removing the dredge tailings down to native soils and backfilling with compacted engineered fill.

Pavements over the dredge tailings should be constructed as follows. Once the planned subgrade elevation has been reached, the entire pavement area should be proof-rolled. As indicated above, aggregate base sections should be underlain with a filter fabric such as Mirafi 140-N, or equivalent, to reduce the potential for fine materials within the aggregate base from migrating into the void spaces of the gravels and cobbles.

Fill Material Types

All fill materials should be inorganic soils free of vegetation, debris, and fragments larger than three inches in size. Existing dredge tailing materials may be suitable for use as engineered fill provided they are processed to conform with the requirements for engineered fill outlined in this section. Pea gravel or other similar non-cementitious, poorly-graded materials should not be used as fill or backfill without the prior approval of the geotechnical engineer.

Imported earth materials for use as engineered fill should be pre-approved by our representative prior to construction. Imported non-expansive soils may be used as fill material for the following:

- general site grading
- foundation areas
- slab-on-grade floor
- pavement subgrade
- foundation backfill
- trench backfill
- exterior slabs-on-grade

Soils for use as compacted engineered fill material within the proposed building pad area should conform to non-expansive materials as indicated in the following recommendations:

Gradation	Percent Finer by Weight (ASTM C 136)
3”	100
No. 4 Sieve	50 – 100
No. 200 Sieve	10-40
Liquid Limit	30 (max)
Plasticity Index	10 (max)
Maximum Expansive Index*	20 (max)

*ASTM D 4829

Engineered fill should be placed and compacted in horizontal lifts, using equipment and procedures that will produce recommended moisture contents and densities throughout the lift. Fill lifts should not exceed ten inches in loose thickness.

Fill Compaction Requirements

Recommended compaction and moisture content criteria for engineered fill materials are as follows:

Material Type and Location	Per the Modified Proctor Test (ASTM D 1557)		
	Minimum Compaction Requirement (%)	Range of Moisture Contents for Compaction Above Optimum	
		Minimum	Maximum
Low volume change (non-expansive) fill:			
Beneath foundations:	90	0%	+4%
Beneath slabs:	90	0%	+4%
Exposed Surfaces to receive fill:	90	0%	+4%
Miscellaneous backfill:	90	0%	+4%
Aggregate Base (Beneath pavements):	95	0%	+4%
Utility Trenches*:	90	0%	+4%

*The upper 12 inches beneath pavement should be compacted to 95% of the maximum dry density as determined in the ASTM D1557 test method.

On-site materials that may be used for fill will include clean, rounded river gravel and cobbles. Conventional compaction testing using a nuclear gauge is not possible in this material type. Compaction in these materials is typically controlled by using performance specifications in lieu of compaction requirements. In order to achieve compaction in these materials, we recommend placing fills in lifts not exceeding 10 inches in loose thickness, and making 8 to 10 passes with a large, smooth or pad drum, vibratory compactor or other suitable compactor. Prior to the beginning of grading operations, the contractor should submit his proposed methods of compaction for review and approval by the Geotechnical Engineer.

Grading and Drainage

All grades must provide effective drainage away from the building during and after construction and should be maintained throughout the life of the structure. Water retained next to the building can result in soil movements greater than those discussed in this report. Greater movements can result in unacceptable differential floor slab and/or foundation movements, cracked slabs and walls, and roof leaks.

Exposed ground should be sloped and maintained at a minimum 5% away from the building for at least 10 feet beyond the perimeter of the building. Locally, flatter grades may be necessary to transition ADA access requirements for flatwork. After building construction and landscaping have been completed, final grades should be verified to document effective drainage has been achieved. Grades around the structure should also be periodically inspected and adjusted, as necessary, as part of the structure's maintenance program. Where paving or flatwork abuts the structure, a maintenance program should be established to effectively seal and maintain joints and prevent surface water infiltration.

Earthwork Construction Considerations

Shallow excavations for the proposed structure may require the use of specialized heavy duty construction equipment that can excavate gravel and cobble up to 14 inches in dimension. Excavations are expected to continually cave and may need to be shored to reach desired grades. Upon completion of filling and grading, care should be taken to maintain the subgrade water content prior to construction of floor slabs. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades or in excavations. Water collecting over or adjacent to construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted prior to floor slab construction.

Trenching for utilities and deep excavations for the UST will need to use shoring or shielding techniques to reach expected grades. The groundwater table could affect excavation efforts and a temporary dewatering system consisting of sumps with pumps could be necessary to achieve the recommended depth of excavation.

Additional effort may be necessary to extract cobble-sized materials, particularly in deep narrow excavations such as utility trenches. Consideration should be given to obtaining a unit price for difficult excavation in the contract documents for the project.

As a minimum, excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

Construction Observation and Testing

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of existing structures, underground utilities, vegetation and topsoil, proofrolling, and mitigation of areas delineated by the proofroll to require mitigation.

Each lift of compacted fill should be tested, evaluated, and reworked, as necessary, until approved by the Geotechnical Engineer prior to placement of additional lifts. If imported fill other than the dredge tailing fill is used as engineered fill, each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet of compacted fill in the

building areas and 5,000 square feet in pavement areas. One density and water content test should be performed for every 12-inch thick lift for every 50 linear feet of compacted utility trench backfill.

In areas of foundation excavations, the bearing subgrade should be evaluated under the direction of the Geotechnical Engineer. If unanticipated conditions are encountered, the Geotechnical Engineer should prescribe mitigation options.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

SHALLOW FOUNDATIONS

The proposed C-store and fueling canopies may be supported on shallow spread footings bearing directly on the existing dredge tailing deposits. Excavating footing trenches in clean gravels and cobbles will be difficult and require forms. The contractor should plan accordingly. The bottoms of all foundation excavations should be compacted with a vibratory compactor prior to placement of reinforcing steel.

If the site has been prepared in accordance with the requirements noted in **Earthwork**, the following design parameters are applicable for shallow foundations.

Design Parameters – Compressive Loads

Item	Description
Maximum Net Allowable Bearing pressure [1, 2]	2,500 psf
Required Bearing Stratum [3]	Recompacted existing dredge tailing deposits
Minimum Foundation Dimensions	Columns: 24 inches Continuous: 12 inches
Ultimate Passive Resistance [4] **(equivalent fluid pressures)**	350 pcf
Ultimate Coefficient of Sliding Friction [5]	0.40
Minimum Embedment below Finished Grade [6]	12 inches
Estimated Total Settlement from Structural Loads [2]	Less than about 3/4 inch

Item	Description
Estimated Differential Settlement [2, 7]	About 2/3 of total settlement

1. The maximum net allowable bearing pressure is the pressure in excess of the minimum surrounding overburden pressure at the footing base elevation. An appropriate factor of safety has been applied. These bearing pressures can be increased by 1/3 for transient loads unless those loads have been factored to account for transient conditions. Values assume that exterior grades are relatively flat around the structure.
2. Values provided are for maximum loads noted in **Project Description**.
3. Unsuitable or soft soils should be over-excavated and replaced per the recommendations presented in the **Earthwork** section.
4. Use of passive earth pressures require the sides of the excavation for the spread footing foundation to be nearly vertical and the concrete placed neat against these vertical faces or that the footing forms be removed and compacted structural fill be placed against the vertical footing face. If passive resistance is used to resist lateral loads, the base friction should be reduced by 25 percent.
5. Can be used to compute sliding resistance where foundations are placed on suitable soil/materials. Should be neglected for foundations subject to net uplift conditions.
6. Embedment necessary to minimize the effects of seasonal water content variations. Finished grade is defined as the lowest adjacent grade within five feet of the foundation for perimeter (exterior) footings.
7. Differential settlements are as measured over a span of 50 feet.

Foundation Construction Considerations

As noted in **Earthwork**, the footing excavations should be evaluated under the direction of the Geotechnical Engineer. The base of all foundation excavations should be free of water and loose soil, prior to placing concrete. Concrete should be placed soon after excavating to reduce bearing soil disturbance. Care should be taken to prevent wetting or drying of the bearing materials during construction. Excessively wet or dry material or any loose/disturbed material in the bottom of the footing excavations should be removed/reconditioned before foundation concrete is placed.

To ensure foundations have adequate support, special care should be taken when footings are located adjacent to trenches. The bottom of such footings should be at least 1 foot below an imaginary plane with an inclination of 1.5 horizontal to 1.0 vertical extending upward from the nearest edge of the adjacent trench.

DEEP FOUNDATIONS

The proposed fueling canopies may be supported on shallow spread footings or on drilled shaft foundations. Recommendations for drilled shaft foundations are presented in the following paragraphs.

Drilled Shaft Design Parameters

Soil design parameters are provided below in the **Drilled Shaft Design Summary** table for the design of drilled shaft foundations. The values presented for allowable side friction and end bearing include a factor of safety.

Drilled Shaft Design Summary [1]				
Approximate Elevation (feet)	Stratigraphy [2]		Allowable Skin Friction (psf) [3]	Allowable End Bearing Pressure (psf) [4]
	No.	Material		
2 to 8	1	Poorly Graded Gravel with Silt and Sand (Dredge Tailings)	25	5,500
8 to 17	1	Poorly Graded Gravel with Silt and Sand (Dredge Tailings)	125	11,000
17 to 30	2	Silty Sand	250	--

1. Design capacities are dependent upon the method of installation, and quality control parameters. The values provided are estimates and should be verified when installation protocol have been finalized.
2. See **Subsurface Profile** in **Geotechnical Characterization** for more details on stratigraphy.
3. Applicable for compressive loading only. Reduce to 2/3 of values shown for uplift loading. Effective weight of shaft can be added to uplift load capacity.
4. Shafts should extend at least one diameter into the bearing stratum for end bearing to be considered.

Tensile reinforcement should extend to the bottom of shafts subjected to uplift loading. Buoyant unit weights of the soil and concrete should be used in the calculations below the highest anticipated groundwater elevation.

Drilled shaft should have a minimum (center-to-center) spacing of three diameters. Closer spacing may require a reduction in axial load capacity. Axial capacity reduction can be determined by comparing the allowable axial capacity determined from the sum of individual piles in a group versus the capacity calculated using the perimeter and base of the pile group acting as a unit. The lesser of the two capacities should be used in design.

A minimum shaft diameter of 12 inches should be used. Drilled shafts should have a minimum length of 6 feet and should extend into the bearing strata at least one shaft/pile diameter for the allowable end bearing pressures listed in the above table.

Post-construction settlements of drilled shafts designed and constructed as described in this report are estimated to range from about ½ to ¾ inch. Differential settlement between individual shafts is expected to be ½ to ⅔ of the total settlement.

Drilled Shaft Lateral Loading

The following table lists input values for use in LPILE analyses. LPILE estimates values of k_h and ε_{50} based on strength; however, non-default values of k_h should be used where provided. Since deflection or a service limit criterion will most likely control lateral capacity design, no safety/resistance factor is included with the parameters.

Stratigraphy [1]		L-Pile Soil Model	S_u (psf) [2]	f [2]	g (pcf) [2,3]	Strain Factor ε_{50} [2]	k_h (pci) [2]
No.	Material						
1	Poorly Graded Gravel	Sand (Reese)	---	35°	110	---	90
2	Silty Sand	Sand (Reese)	---	34°	115	---	60

1. See **Subsurface Profile** in **Geotechnical Characterization** for more details on Stratigraphy.
2. Definition of Terms:
   - S_u: Undrained shear strength
   - f : Internal friction angle,
   - g: Moist unit weight
   - ε_{50}: Non-default ε_{50} strain
   - k_h: Horizontal modulus of subgrade reaction
3. Buoyant unit weight values should be used below water table.

The load capacities provided herein are based on the stresses induced in the supporting soil strata. The structural capacity of the shafts/piles should be checked to assure they can safely accommodate the combined stresses induced by axial and lateral forces. Lateral deflections of shafts/piles should be evaluated using an appropriate analysis method, and will depend upon the pile's diameter, length, configuration, stiffness and "fixed head" or "free head" condition. We can provide additional analyses and estimates of lateral deflections for specific loading conditions upon request. The load-carrying capacity of shafts/piles may be increased by increasing the diameter and/or length.

Drilled Shaft Construction Considerations

Gravel and cobble subgrade materials were encountered within the area of the proposed improvements. To prevent collapse of the sidewalls and/or to control groundwater seepage, the use of temporary steel casing may be required for construction of the drilled shaft foundations. The drilled shaft contractor and foundation design engineer should be informed of these risks.

A full-depth temporary steel casing will be required to stabilize the sides of the shaft excavations in the overburden. Difficult drilling conditions should be expected within the gravel and cobble layers encountered in our investigation within the upper 17 feet. Gravel and Cobble were noted in our exploration as reaching up to 14 inches in dimension and the potential for hard drilling conditions should be anticipated by the installation contractor. Water or loose soil should be removed from the bottom of the drilled shafts prior to placement of the concrete.

Care should be taken to not disturb the sides and bottom of the excavation during construction. The bottom of the shaft excavation should be free of loose material before concrete placement. Concrete should be placed as soon as possible after the foundation excavation is completed, to reduce potential disturbance of the bearing surface.

Concrete for "dry" drilled shaft construction should have a slump of about 5 to 7 inches. Concrete should be directed into the shaft utilizing a centering chute. Concrete for "wet" shaft construction would require higher slump concrete.

While withdrawing casing, care should be exercised to maintain concrete inside the casing at a sufficient level to resist earth and hydrostatic pressures acting on the casing exterior. Arching of the concrete, loss of seal and other problems can occur during casing removal and result in contamination of the drilled shaft. These conditions should be considered during the design and construction phases. Placement of loose soil backfill should not be permitted around the casing prior to removal.

The drilled shaft installation process should be performed under the direction of the Geotechnical Engineer. The Geotechnical Engineer should document the shaft installation process including soil/rock and groundwater conditions encountered, consistency with expected conditions, and details of the installed shaft.

FLOOR SLABS

Design parameters for floor slabs assume the requirements for **Earthwork** have been followed. Specific attention should be given to positive drainage away from the structure.

Floor Slab Design Parameters

Item	Description
Floor Slab Support [1]	Minimum 12 inches of compacted engineered fill.
Capillary Break	Minimum 4 inches of free-draining (less than 6% passing the U.S. No. 200 sieve) crushed aggregate if imported sandy import fill is used.[2] No capillary break is needed if the underlying engineered fill consists of relatively clean gravels.
Estimated Modulus of Subgrade Reaction [3]	200 pounds per square inch per inch (psi/in) for point loads

1. Floor slabs should be structurally independent of building footings or walls to reduce the possibility of floor slab cracking caused by differential movements between the slab and foundation.
2. Free-draining granular material should have less than 5% fines (material passing the No. 200 sieve). Other design considerations such as cold temperatures and condensation development could warrant more extensive design provisions.
3. Modulus of subgrade reaction is an estimated value based upon our experience with the subgrade condition, the requirements noted in **Earthwork**, and the floor slab support as noted in this table. It is provided for point loads. For large area loads the modulus of subgrade reaction would be lower.

The use of a vapor retarder should be considered beneath concrete slabs on grade covered with wood, tile, carpet, or other moisture sensitive or impervious coverings, or when the slab will support equipment sensitive to moisture. When conditions warrant the use of a vapor retarder, the slab designer should refer to ACI 302 and/or ACI 360 for procedures and cautions regarding the use and placement of a vapor retarder.

Saw-cut control joints should be placed in the slab to help control the location and extent of cracking. For additional recommendations refer to the ACI Design Manual. Joints or cracks should be sealed with a water-proof, non-extruding compressible compound specifically recommended for heavy duty concrete pavement and wet environments.

Where floor slabs are tied to perimeter walls or turn-down slabs to meet structural or other construction objectives, our experience indicates differential movement between the walls and slabs will likely be observed in adjacent slab expansion joints or floor slab cracks beyond the length of the structural dowels. The Structural Engineer should account for potential differential settlement through use of sufficient control joints, appropriate reinforcing or other means.

Floor Slab Construction Considerations

Finished subgrade, within and for at least 10 feet beyond the floor slab, should be protected from traffic, rutting, or other disturbance and maintained in a relatively moist condition until floor slabs are constructed. If the subgrade should become damaged or desiccated prior to construction of floor slabs, the affected material should be removed and structural fill should be added to replace the

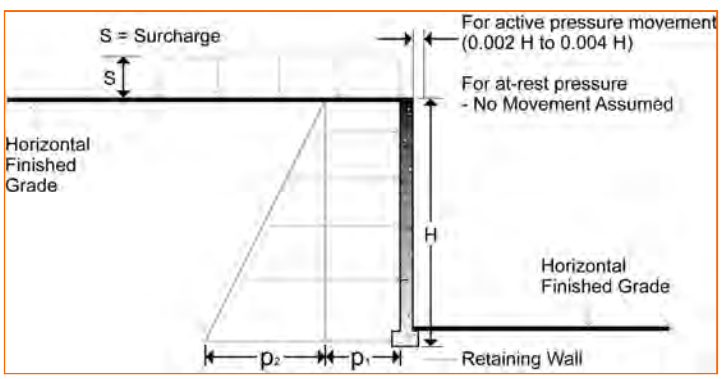
resulting excavation. Final conditioning of the finished subgrade should be performed immediately prior to placement of the floor slab support course.

The Geotechnical Engineer should approve the condition of the floor slab subgrades immediately prior to placement of the floor slab support course, reinforcing steel, and concrete. Attention should be paid to high traffic areas that were rutted and disturbed earlier, and to areas where backfilled trenches are located.

LATERAL EARTH PRESSURES

Design Parameters

Structures with unbalanced backfill levels on opposite sides should be designed for earth pressures at least equal to values indicated in the following table. Earth pressures will be influenced by structural design of the walls, conditions of wall restraint, methods of construction and/or compaction and the strength of the materials being restrained. Two wall restraint conditions are shown in the diagram below. Active earth pressure is commonly used for design of free-standing cantilever retaining walls and assumes wall movement. The “at-rest” condition assumes no wall movement and is commonly used for basement walls, loading dock walls, or other walls restrained at the top. The recommended design lateral earth pressures do not include a factor of safety and do not provide for possible hydrostatic pressure on the walls (unless stated).



Lateral Earth Pressure Design Parameters			
Earth Pressure Condition [1]	**Coefficient for Backfill Type**[2]	**Surcharge Pressure** [3, 4, 5] **p_1 (psf)**	**Effective Fluid Pressures (psf)** [2, 4, 5]
Active (Ka)	0.33	(0.33)S	(40)H
At-Rest (Ko)	0.50	(0.50)S	(60)H
Passive (Kp)	3.00	---	(350)H

Lateral Earth Pressure Design Parameters			
Earth Pressure Condition [1]	**Coefficient for Backfill Type** [2]	**Surcharge Pressure** [3, 4, 5] **p_1 (psf)**	**Effective Fluid Pressures (psf)** [2, 4, 5]

1. For active earth pressure, wall must rotate about base, with top lateral movements 0.002 H to 0.004 H, where H is wall height. For passive earth pressure, wall must move horizontally to mobilize resistance.
2. Uniform, horizontal backfill, compacted to at least 90% of the ASTM D 1557 maximum dry density, rendering a maximum unit weight of 120 pcf.
3. Uniform surcharge, where S is surcharge pressure.
4. Loading from heavy compaction equipment is not included.
5. No safety factor is included in these values.

Backfill placed against structures should consist of granular soils. For the granular values to be valid, the granular backfill must extend out and up from the base of the wall at an angle of at least 45 and 60 degrees from vertical for the active and passive cases, respectively.

PAVEMENTS

General Pavement Comments

Pavement designs are provided for the traffic conditions and pavement life conditions as noted in **Project Description** and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section must be applied to the site which has been prepared as recommended in the **Earthwork** section.

Design of Asphaltic Concrete (AC) pavements are based on the procedures in the Caltrans Highway Design Manual, 2018 edition. Design of Portland Cement Concrete (PCC) pavements are based upon American Concrete Institute (ACI) 330R-01; Guide for Design and Construction of Concrete Parking Lots.

One sample of the near surface soils was obtained and classified at our laboratory by an engineer. A Resistance Value (R-value) could not be determined in the lab due to the large size of gravel and cobble in the near surface material. Based on our experience with these subgrade materials, a design R-value of 50 was used for the AC and PCC pavement designs. We have provided pavement sections for traffic indices (TI) of 4.5 and 5.5 and 6.5.

Pavement Section Thicknesses

The following table provides options for AC and PCC Sections:

Typical Pavement Section (inches)					
Traffic Area	**Alternative**	**Asphalt Concrete (AC) Surface Course**	**Portland Cement Concrete (PCC)**	**Aggregate Base (AB) Course**	**Total Thickness**
Auto Parking Assumed Traffic Index (TI) = 4.5	PCC	--	4.5	--	4.5
	AC	3.0	--	4.0	7.0
Auto Drive Areas Assumed Traffic Index (TI) = 5.5	PCC	--	5.0	--	5.0
	AC	3.5	--	4.0	7.5
Light Truck Drive Areas Assumed Traffic Index (TI) = 6.5	PCC	--	5.0	--	5.0
	AC	4.0	--	4.0	8.0

The estimated pavement sections provided in this report are minimums for the assumed design criteria, and as such, periodic maintenance should be expected. Areas for parking of heavy vehicles, concentrated turn areas, and start/stop maneuvers could require thicker pavement sections. Edge restraints (i.e. concrete curbs or aggregate shoulders) should be planned along curves and areas of maneuvering vehicles. A maintenance program including surface sealing, joint cleaning and sealing, and timely repair of cracks and deteriorated areas will increase the pavement's service life. As an option, thicker sections could be constructed to decrease future maintenance.

Concrete for rigid pavements should have a minimum 28-day compressive strength of 4,000 psi, a modulus of rupture of 500 psi, and be placed with a maximum slump of 4 inches. Proper joint spacing will also be required to prevent excessive slab curling and shrinkage cracking. Joints should be sealed to prevent entry of foreign material and dowelled where necessary for load transfer.

Where practical, we recommend early-entry cutting of crack-control joints in PCC pavements. Cutting of the concrete in its "green" state typically reduces the potential for micro-cracking of the pavements prior to the crack control joints being formed, compared to cutting the joints after the concrete has fully set. Micro-cracking of pavements may lead to crack formation in locations other than the sawed joints, and/or reduction of fatigue life of the pavement.

Pavement design methods are intended to provide structural sections with adequate thickness over a subgrade such that wheel loads are reduced to a level the subgrade can support.

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

Dishing in parking lots surfaced with AC is usually observed in frequently-used parking stalls (such as near the front of buildings) and occurs under the wheel footprint in these stalls. The use of higher-grade asphaltic cement, or surfacing these areas with PCC, should be considered. The dishing is exacerbated by factors such as irrigated islands or planter areas, sheet surface drainage to the front of structures, and placing the ACC directly on a compacted clay subgrade.

Rigid PCC pavements will perform better than AC in areas where short-radii turning and braking are expected (i.e. entrance/exit aprons) due to better resistance to rutting and shoving. In addition, PCC pavement will perform better in areas subject to large or sustained loads. An adequate number of longitudinal and transverse control joints should be placed in the rigid pavement in accordance with ACI and/or AASHTO requirements. Expansion (isolation) joints must be full depth and should only be used to isolate fixed objects abutting or within the paved area.

PCC pavement details for joint spacing, joint reinforcement, and joint sealing should be prepared in accordance with American Concrete Institute (ACI 330R-01 and ACI 325R.9-91). PCC pavements should be provided with mechanically reinforced joints (doweled or keyed) in accordance with ACI 330R-01.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section. Appropriate sub-drainage or connection to a suitable daylight outlet should be provided to remove water from the granular subbase.

The pavement surfacing and adjacent sidewalks should be sloped to provide rapid drainage of surface water. Water should not be allowed to pond on or adjacent to slabs, since it could saturate the subgrade and contribute to premature pavement or slab deterioration.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g. crack and joint sealing and patching) and global maintenance (e.g. surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

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

1. Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.
2. Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
3. Install below pavement drainage systems surrounding areas anticipated for frequent wetting.
4. Install joint sealant and seal cracks immediately.
5. Seal all landscaped areas in or adjacent to pavements to reduce moisture migration to subgrade soils.
6. Place compacted, low permeability backfill against the exterior side of curb and gutter.
7. Place curb, gutter and/or sidewalk directly on subgrade soils rather than on unbound granular base course materials.

GENERAL COMMENTS

Our analysis and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted in this report, to provide observation and testing services during pertinent construction phases. If variations appear, we

can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

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

Our services and any correspondence or collaboration through this system are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third-party beneficiaries intended. Any third-party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.

Site characteristics as provided are for design purposes and not to estimate excavation cost. Any use of our report in that regard is done at the sole risk of the excavating cost estimator as there may be variations on the site that are not apparent in the data that could significantly impact excavation cost. Any parties charged with estimating excavation costs should seek their own site characterization for specific purposes to obtain the specific level of detail necessary for costing. Site safety, and cost estimating including, excavation support, and dewatering requirements/design are the responsibility of others. If changes in the nature, design, or location of the project are planned, our conclusions and recommendations shall not be considered valid unless we review the changes and either verify or modify our conclusions in writing.

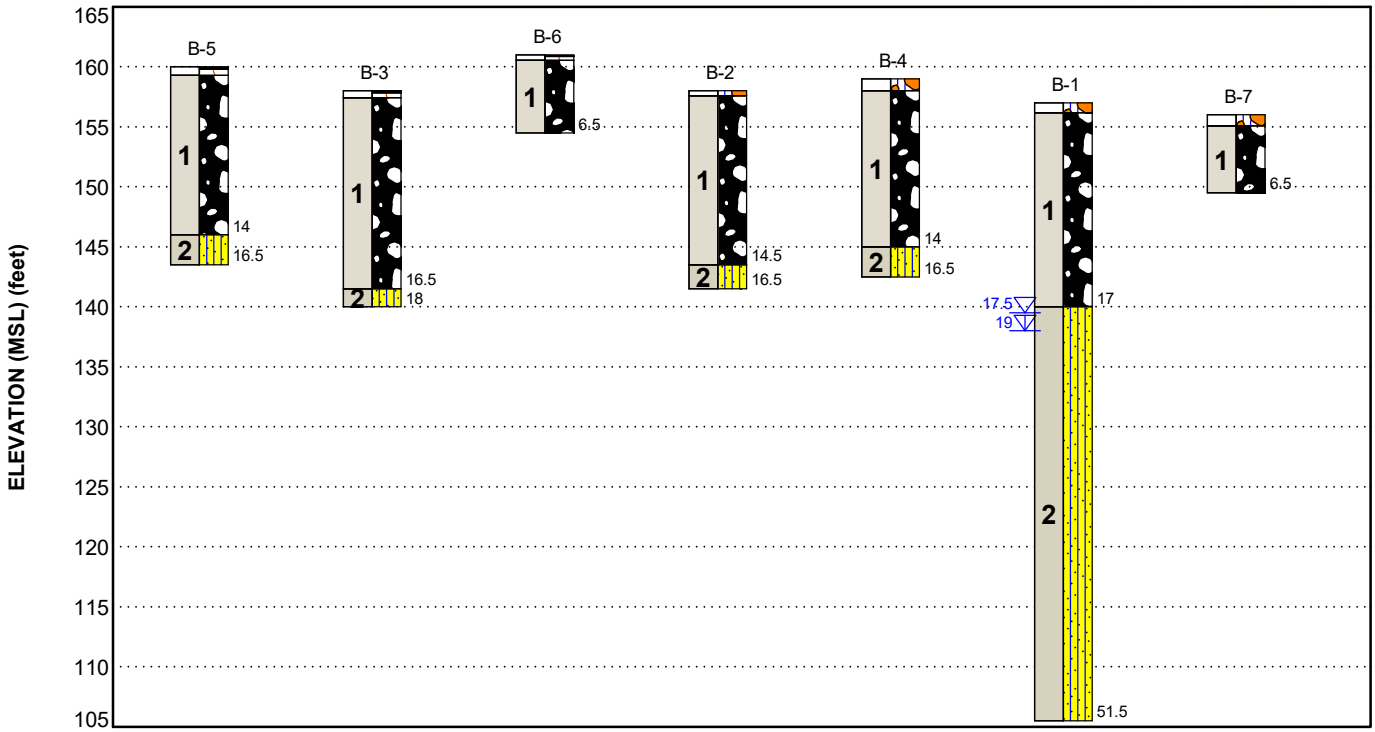
FIGURES

Contents:

GeoModel

GEOMODEL

Maverik Fueling Station Oroville ■ Oroville, CA
5/28/2019 ■ Terracon Project No. NB195035



This is not a cross section. This is intended to display the Geotechnical Model only. See individual logs for more detailed conditions.

Model Layer	Layer Name	General Description
1	Dredge Tailing Deposits	Poorly Graded Gravel with Silt and Sand, gravel and cobbles up to 14" in dimension, fine to coarse grained, rounded to subrounded, loose to dense
2	Silty Sand	fine to coarse grained, subangular, nonplastic, loose to very dense

LEGEND

- Silty Gravel
- Asphalt
- Boulders and Cobbles
- Aggregate Base Course
- Silty Sand

- First Water Observation
- Second Water Observation
- Third Water Observation

Groundwater levels are temporal. The levels shown are representative of the date and time of our exploration. Significant changes are possible over time. Water levels shown are as measured during and/or after drilling. In some cases, boring advancement methods mask the presence/absence of groundwater. See individual logs for details.

NOTES:
Layering shown on this figure has been developed by the geotechnical engineer for purposes of modeling the subsurface conditions as required for the subsequent geotechnical engineering for this project. Numbers adjacent to soil column indicate depth below ground surface.

ATTACHMENTS

EXPLORATION AND TESTING PROCEDURES

Field Exploration

Number of Borings	Boring Depth (feet)	Planned Location
1	51½	C-Store
2	16½ and 18	C-Store and Auto Fueling Island
1	16½	New UST
2	6½	Pavement Parking and Drives

Boring Layout and Elevations: Unless otherwise noted, Terracon personnel provided the boring layout. Coordinates were obtained with a handheld GPS unit (estimated horizontal accuracy of about ±10 feet) and approximate elevations were obtained by interpolation from Google Earth. If elevations and a more precise boring layout are desired, we recommend borings be surveyed.

Subsurface Exploration Procedures: We advanced the borings with a truck-mounted rotary drill rig using continuous hollow stem flight augers. We obtained samples at depths of 1 foot and 5 feet and at intervals of 5 feet thereafter. In the split-barrel sampling procedure, a standard 2-inch outer diameter split-barrel sampling spoon was driven into the ground by a 140-pound automatic hammer falling a distance of 30 inches. The number of blows required to advance the sampling spoon the last 12 inches of a normal 18-inch penetration is recorded as the Standard Penetration Test (SPT) resistance value. The SPT resistance values, also referred to as N-values, are indicated on the boring logs at the test depths. A 2.5-inch O.D. split-barrel Modified California sampling spoon with 2.0-inch I.D. tube lined sampler was also used for sampling. Tube-lined, split-barrel sampling procedures are similar to standard split spoon sampling procedure; however, blow counts are not equivalent to the SPT blow counts. We observed and recorded groundwater levels during drilling and sampling. For safety purposes, all borings were backfilled with auger cuttings after their completion with the exception of boring B-1 which was backfilled with a grout slurry. Pavements were patched with cold-mix asphalt.

The sampling depths, penetration distances, and other sampling information was recorded on the field boring logs. The samples were placed in appropriate containers and taken to our soil laboratory for testing and classification by a geologist. Our exploration team prepared field boring logs as part of the drilling operations. These field logs included visual classifications of the materials encountered during drilling and our interpretation of the subsurface conditions between samples. Final boring logs were prepared from the field logs. The final boring logs represent the Geotechnical Engineer's interpretation of the field logs and include modifications based on observations and tests of the samples in our laboratory.

Laboratory Testing

The project geologist reviewed the field data and assigned laboratory tests to understand the engineering properties of the various soil strata, as necessary, for this project. Procedural standards noted below are for reference to methodology in general. In some cases, variations to methods were applied because of local practice or professional judgment. Standards noted below include reference to other, related standards. Such references are not necessarily applicable to describe the specific test performed.

- ASTM D2216 Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
- ASTM D4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D422 Standard Test Method for Particle-Size Analysis of Soils
- ASTM D1140 Standard Test Method for Determining the Amount of Material Finer than No. 200 Sieve by Soil Washing

The laboratory testing program included examination of soil samples by a geologist. Based on the material's texture and plasticity, we described and classified the soil samples in accordance with the Unified Soil Classification System.

SITE LOCATION AND EXPLORATION PLANS

Contents:

Site Location Plan
Exploration Plan

Note: All attachments are one page unless noted above.

SITE LOCATION

Maverik Fueling Station Oroville ■ Oroville, California
May 30, 2019 ■ Terracon Project No. NB195035

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

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Maverik Fueling Station Oroville ■ Oroville, California

May 30, 2019 ■ Terracon Project No. NB195035

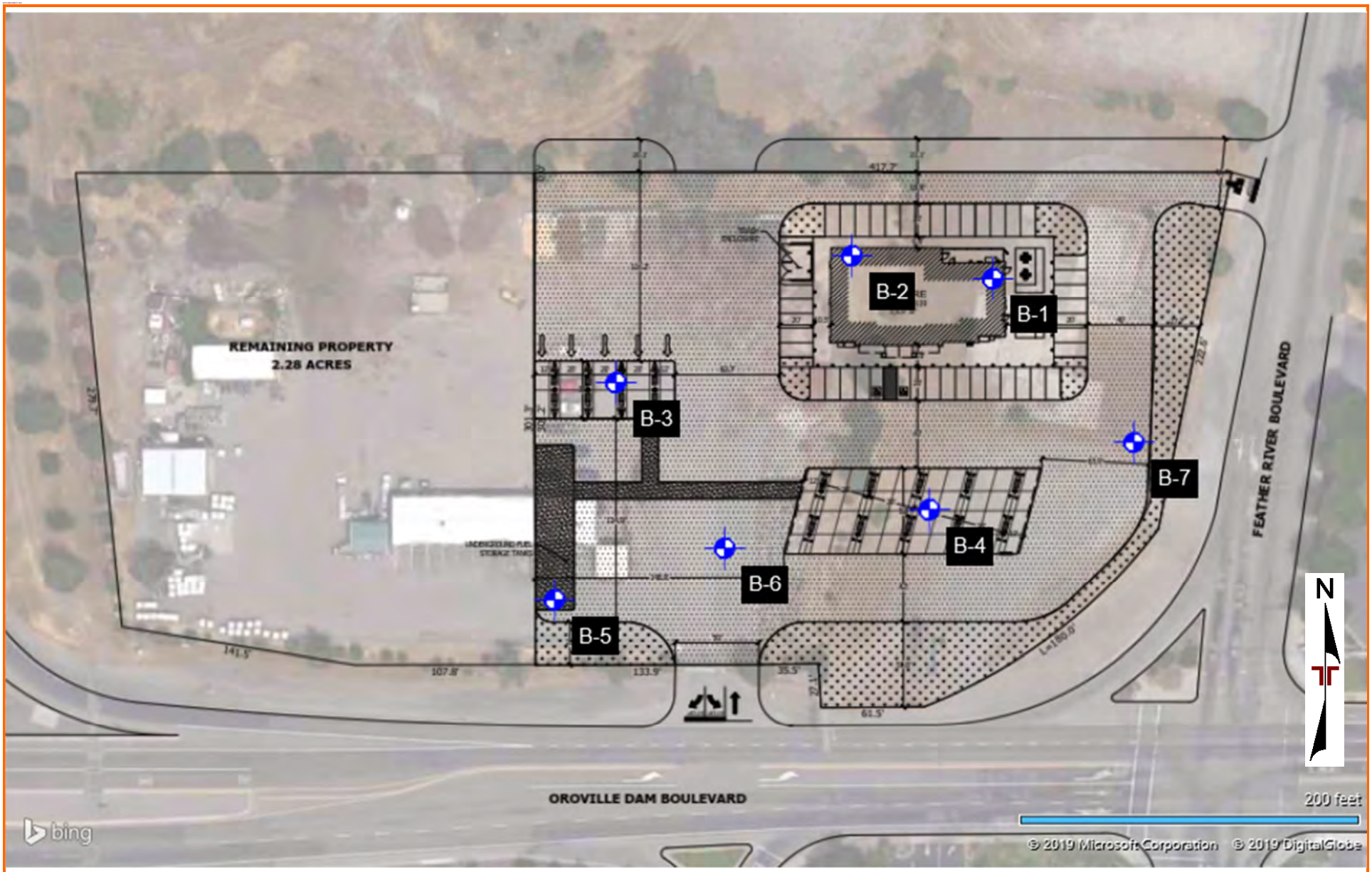


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION RESULTS

Contents:

Boring Logs (B-1 through B-7)
Grain Size Distribution
Corrosivity Test Results

Note: All attachments are one page unless noted above.

BORING LOG NO. B-1

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4989° Longitude: -121.5724°

MODEL LAYER	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
	0.8	**FILL - SILTY GRAVEL (GM)**, rounded to subrounded, nonplastic, light brown, dry, medium dense, 10" thickness							
1		**FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, loose to dense, gravel and cobbles up to 9" in dimension, dredge tailings				6-23-13 N=36	2		12
			5			5-10-13 N=23	3		8
			10			17-3-4 N=7	4		10
			15			12-15-17 N=32			
	17.0	**SILTY SAND (SM)**, trace gravel, fine to coarse grained, subangular, nonplastic, brown, loose							
2			20			2-4-5 N=9	35		42
		brown to gray, medium dense, weak cementation	25			3-13-14 N=27	22	109	16

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

While drilling

At completion of drilling

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-03-2019
Boring Completed: 05-03-2019
Drill Rig: CME 75
Driller: R.A.
Project No.: NB195035

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-1

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4989° Longitude: -121.5724°

MODEL LAYER	GRAPHIC LOG	DEPTH	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
2		**SILTY SAND (SM)**, trace gravel, fine to coarse grained, subangular, nonplastic, brown, loose *(continued)*							
		fine grained, brown	30		X	10-15-14 N=29	39	85	31
		fine to medium grained, light brown	35		X	7-9-14 N=23	31	93	20
		orangish brown, very dense, moderate cementation	40		X	16-28-30 N=58	29	80	27
		dense	45		X	15-23-20 N=43	39		23
		moderate to strong cementation, black mottled	50		X	19-21-11 N=32	42		36
		51.5							
		Boring Terminated at 51.5 Feet							

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with cement-bentonite grout upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

While drilling

At completion of drilling

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-03-2019 | Boring Completed: 05-03-2019

Drill Rig: CME 75 | Driller: R.A.

Project No.: NB195035

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-2

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4989° Longitude: -121.5727°

MODEL LAYER	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
	0.4	**FILL - SILTY GRAVEL (GM)**, rounded to subrounded, nonplastic, light brown, dry, medium dense, ~5" thickness							
1		**FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, medium dense to loose, gravel and cobbles up to 14" in dimension, dredge tailings				12-33-8			
			5			4-5-4 N=9	5		
			10			3-4-7 N=11			
	14.5								
2		**SILTY SAND (SM)**, fine grained, nonplastic, light brown, loose	15			5-4-4 N=8	9		12
	16.5	***Boring Terminated at 16.5 Feet***							

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-06-2019	Boring Completed: 05-06-2019
Drill Rig: CME 75	Driller: R.A.
Project No.: NB195035	

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-3

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4987° Longitude: -121.5732°

MODEL LAYER	DEPTH	DESCRIPTION	DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	PERCENT FINES
	0.2	**ASPHALT**, ~2" thickness				4	3
1	0.6	**FILL - AGGREGATE BASE COURSE (GP)**, fine to coarse grained, subangular, nonplastic, brown, ~5" thickness					
		FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, medium dense to loose, gravel and cobbles up to 8" in dimension, dredge tailings			13-21-17		
			5		3-4-2	2	
			10		3-3-3		
			15		11-5-2		
2	16.5	**SILTY SAND (SM)**, fine grained, nonplastic, light brown, loose			2-3-5 N=8	18	
	18.0	***Boring Terminated at 18 Feet***					

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-06-2019
Boring Completed: 05-06-2019
Drill Rig: CME 75
Driller: R.A.
Project No.: NB195035

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-4

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4984° Longitude: -121.5725°

MODEL LAYER	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
	1.0	**FILL - SILTY GRAVEL (GM)**, rounded to subrounded, nonplastic, light brown, dry, medium dense, ~12" thickness							
1		**FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, medium dense to loose, gravel and cobbles up to 11" in dimension, dredge tailings				7-22-20	1		
			5			13-15-25	3		
			10			3-4-5 N=9			
	14.0					25-12-7 N=19	13		
2		**SILTY SAND (SM)**, fine grained, nonplastic, light brown to brown, loose	15			4-5-6	10		15
	16.5	***Boring Terminated at 16.5 Feet***							

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-06-2019 | Boring Completed: 05-06-2019

Drill Rig: CME 75 | Driller: R.A.

Project No.: NB195035

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-5

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4983° Longitude: -121.5733°

MODEL LAYER	DEPTH	LOCATION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
	0.2	**ASPHALT**, ~2.5" thickness							
1	0.7	**FILL - AGGREGATE BASE COURSE (GP)**, fine to coarse grained, subangular, nonplastic, brown, ~6" thickness							
		FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM), with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, medium dense to loose, gravel and cobbles up to 10" in dimension, dredge tailings				18-26-18	3		
			5			5-4-3	3		
			10			48-14-6	1		
2	14.0	**SILTY SAND (SM)**, fine grained, very loose	15			2-3-2			
	16.5	***Boring Terminated at 16.5 Feet***							

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-06-2019
Boring Completed: 05-06-2019
Drill Rig: CME 75
Driller: R.A.
Project No.: NB195035

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-6

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4984° Longitude: -121.573°

MODEL LAYER	GRAPHIC LOG	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
		0.1	**ASPHALT**, ~1.5" thickness							
		0.5	**FILL - AGGREGATE BASE COURSE (GP)**, fine to coarse grained, subangular, nonplastic, brown, ~4" thickness							
1			**FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, medium dense to loose, gravel and cobbles up to 10" in dimension, dredge tailings				11-10-12	4		
				5			3-3-3			
		6.5	***Boring Terminated at 6.5 Feet***							

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with Auger Cuttings
Surface capped with asphalt

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-06-2019
Boring Completed: 05-06-2019
Drill Rig: CME 75
Driller: R.A.
Project No.: NB195035

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

BORING LOG NO. B-7

PROJECT: Maverik Fueling Station Oroville

CLIENT: Maverik, Inc
Salt Lake City, UT

SITE: 350 East Oroville Dam Blvd
Oroville, CA

LOCATION See Exploration Plan

Latitude: 39.4986° Longitude: -121.5721°

MODEL LAYER	GRAPHIC LOG	DEPTH	DESCRIPTION	DEPTH (Ft.)	WATER LEVEL OBSERVATIONS	SAMPLE TYPE	FIELD TEST RESULTS	WATER CONTENT (%)	DRY UNIT WEIGHT (pcf)	PERCENT FINES
		0.9	**FILL - SILTY GRAVEL (GM)**, rounded to subrounded, nonplastic, light brown, dry, ~11" thickness							
1			**FILL - POORLY GRADED GRAVEL WITH SILT AND SAND (GP-GM)**, with cobbles, fine to coarse grained, rounded to subrounded, light brown to light gray, medium dense to loose, gravel and cobbles up to 8" in dimension, dredge tailings				14-17-17	1		
				5			5-6-4	1		
		6.5	***Boring Terminated at 6.5 Feet***							

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

Hammer Type: Automatic

Advancement Method:
6" Hollow Stem Auger

Abandonment Method:
Boring backfilled with soil cuttings upon completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Notes:

WATER LEVEL OBSERVATIONS

Not encountered

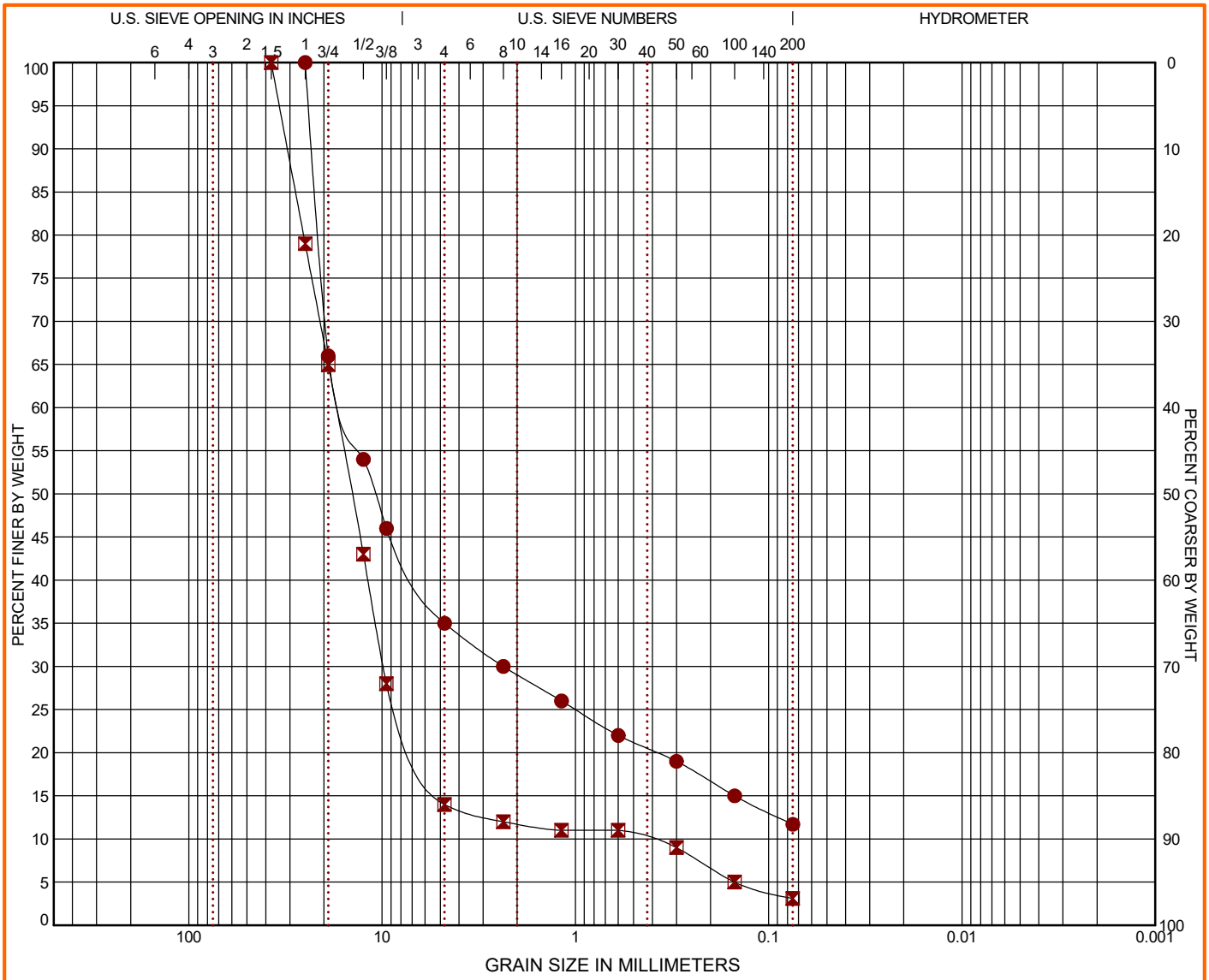
Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

Boring Started: 05-03-2019	Boring Completed: 05-03-2019
Drill Rig: CME 75	Driller: R.A.
Project No.: NB195035	

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GEO SMART LOG-NO WELL NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ MODELLAYER.GPJ 5/30/19

GRAIN SIZE DISTRIBUTION

ASTM D422 / ASTM C136



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	BORING ID	DEPTH	% COBBLES	% GRAVEL	% SAND	% SILT	% FINES	% CLAY	USCS
●	B-1	1 - 2.5	0.0	65.0	23.3		11.7		GP-GM
⊠	B-3	0.2 - 0.7	0.0	86.0	10.9		3.1		GP

GRAIN SIZE

	●	⊠
D_{60}	15.411	17.275
D_{30}	2.36	9.854
D_{10}		0.424

COEFFICIENTS

	●	⊠
C_C	6.89	13.25
C_U	293.66	40.72

●		⊠			
Sieve	% Finer	Sieve	% Finer	Sieve	% Finer
1"	100.0	1 1/2"	100.0		
3/4"	66.0	1"	79.0		
1/2"	54.0	3/4"	65.0		
3/8"	46.0	1/2"	43.0		
#4	35.0	3/8"	28.0		
#8	30.0	#4	14.0		
#16	26.0	#8	12.0		
#30	22.0	#16	11.0		
#50	19.0	#30	11.0		
#100	15.0	#50	9.0		
#200	11.7	#100	5.0		
		#200	3.1		

SOIL DESCRIPTION

●	POORLY GRADED GRAVEL with SILT AND SAND
⊠	POORLY GRADED GRAVEL (GP)

REMARKS

●	
⊠	

PROJECT: Maverik Fueling Station Oroville

SITE: 350 East Oroville Dam Blvd
Oroville, CA

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA

PROJECT NUMBER: NB195035

CLIENT: Maverik, Inc
Salt Lake City, UT

LABORATORY TESTS ARE NOT VALID IF SEPARATED FROM ORIGINAL REPORT. GRAIN SIZE: USCS 1 NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ TERRACON_DATATEMPLATE.GDT 5/23/19

SUMMARY OF LABORATORY RESULTS

Borehole No.	Depth (ft.)	USCS Soil Class.	In-Situ Properties		Classification				Corrosivity					Remarks
			Dry Density (pcf)	Water Content (%)	Passing #200 Sieve (%)	Atterberg Limits			pH	Resistivity (ohm-cm)	Water Soluble			
						LL	PL	PI			Salts (ppm)	Sulfates (ppm)	Chlorides (ppm)	
B-5	1	GP-GM			3				7.3	2088	25	156	25	

REMARKS

1. Dry Density and/or moisture determined from one or more rings of a multi-ring sample.
2. Visual Classification.
3. Submerged to approximate saturation.

PROJECT: Maverik Fueling Station Oroville

SITE: 350 East Oroville Dam Blvd
Oroville, CA

Terracon
50 Golden Land Ct, Ste 100
Sacramento, CA
PH. 916-928-4690 FAX. 916-928-4697

PROJECT NUMBER: NB195035

CLIENT: Maverik, Inc
Salt Lake City, UT

EXHIBIT: B-1

THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT. CORROSIVITY TABLE NB195035 MAVERIK FUELING STATION - OROVILLE.GPJ TERRACON_DATATEMPLATE.GDT 5/30

SUPPORTING INFORMATION

Contents:

General Notes
Unified Soil Classification System

Note: All attachments are one page unless noted above.

GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

Maverik Fueling Station Oroville ■ Oroville, CA

May 24, 2019 ■ Terracon Project No. NB195035

SAMPLING	WATER LEVEL	FIELD TESTS
Modified California Ring Sampler Grab Sample Standard Penetration Test	**Water Initially Encountered** **Water Level After a Specified Period of Time** **Water Level After a Specified Period of Time** Water levels indicated on the soil boring logs are the levels measured in the borehole at the times indicated. Groundwater level variations will occur over time. In low permeability soils, accurate determination of groundwater levels is not possible with short term water level observations.	**N** Standard Penetration Test Resistance (Blows/Ft.) **(HP)** Hand Penetrometer **(T)** Torvane **(DCP)** Dynamic Cone Penetrometer **UC** Unconfined Compressive Strength **(PID)** Photo-Ionization Detector **(OVA)** Organic Vapor Analyzer

DESCRIPTIVE SOIL CLASSIFICATION

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

LOCATION AND ELEVATION NOTES

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

STRENGTH TERMS

RELATIVE DENSITY OF COARSE-GRAINED SOILS (More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance		CONSISTENCY OF FINE-GRAINED SOILS (50% or more passing the No. 200 sieve.) Consistency determined by laboratory shear strength testing, field visual-manual procedures or standard penetration resistance		
Descriptive Term (Density)	**Standard Penetration or N-Value Blows/Ft.**	**Descriptive Term (Consistency)**	**Unconfined Compressive Strength Qu, (tsf)**	**Standard Penetration or N-Value Blows/Ft.**
Very Loose	0 - 3	Very Soft	less than 0.25	0 - 1
Loose	4 - 9	Soft	0.25 to 0.50	2 - 4
Medium Dense	10 - 29	Medium Stiff	0.50 to 1.00	4 - 8
Dense	30 - 50	Stiff	1.00 to 2.00	8 - 15
Very Dense	> 50	Very Stiff	2.00 to 4.00	15 - 30
		Hard	> 4.00	> 30

RELATIVE PROPORTIONS OF SAND AND GRAVEL		RELATIVE PROPORTIONS OF FINES	
Descriptive Term(s) of other constituents	Percent of Dry Weight	**Descriptive Term(s) of other constituents**	**Percent of Dry Weight**
Trace	<15	Trace	<5
With	15-29	With	5-12
Modifier	>30	Modifier	>12

GRAIN SIZE TERMINOLOGY		PLASTICITY DESCRIPTION	
Major Component of Sample	**Particle Size**	**Term**	**Plasticity Index**
Boulders	Over 12 in. (300 mm)	Non-plastic	0
Cobbles	12 in. to 3 in. (300mm to 75mm)	Low	1 - 10
Gravel	3 in. to #4 sieve (75mm to 4.75 mm)	Medium	11 - 30
Sand	#4 to #200 sieve (4.75mm to 0.075mm	High	> 30
Silt or Clay	Passing #200 sieve (0.075mm)		

UNIFIED SOIL CLASSIFICATION SYSTEM

Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests [A]					Soil Classification	
					Group Symbol	Group Name [B]
Coarse-Grained Soils: More than 50% retained on No. 200 sieve	**Gravels:** More than 50% of coarse fraction retained on No. 4 sieve	**Clean Gravels:** Less than 5% fines [C]	Cu ³ 4 and 1 £ Cc £ 3 [E]		GW	Well-graded gravel [F]
			Cu < 4 and/or [Cc<1 or Cc>3.0] [E]		GP	Poorly graded gravel [F]
		Gravels with Fines: More than 12% fines [C]	Fines classify as ML or MH		GM	Silty gravel [F, G, H]
			Fines classify as CL or CH		GC	Clayey gravel [F, G, H]
	Sands: 50% or more of coarse fraction passes No. 4 sieve	**Clean Sands:** Less than 5% fines [D]	Cu ³ 6 and 1 £ Cc £ 3 [E]		SW	Well-graded sand [I]
			Cu < 6 and/or [Cc<1 or Cc>3.0] [E]		SP	Poorly graded sand [I]
		Sands with Fines: More than 12% fines [D]	Fines classify as ML or MH		SM	Silty sand [G, H, I]
			Fines classify as CL or CH		SC	Clayey sand [G, H, I]
Fine-Grained Soils: 50% or more passes the No. 200 sieve	**Silts and Clays:** Liquid limit less than 50	**Inorganic:**	PI > 7 and plots on or above "A"		CL	Lean clay [K, L, M]
			PI < 4 or plots below "A" line [J]		ML	Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OL	Organic clay [K, L, M, N]
						Organic silt [K, L, M, O]
	Silts and Clays: Liquid limit 50 or more	**Inorganic:**	PI plots on or above "A" line		CH	Fat clay [K, L, M]
			PI plots below "A" line		MH	Elastic Silt [K, L, M]
		Organic:	Liquid limit - oven dried / Liquid limit - not dried	< 0.75	OH	Organic clay [K, L, M, P]
						Organic silt [K, L, M, Q]
Highly organic soils:	Primarily organic matter, dark in color, and organic odor				PT	Peat

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

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

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

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

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

[F] If soil contains ³ 15% sand, add "with sand" to group name.

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

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

[I] If soil contains ³ 15% gravel, add "with gravel" to group name.

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

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

[L] If soil contains ³ 30% plus No. 200 predominantly sand, add "sandy" to group name.

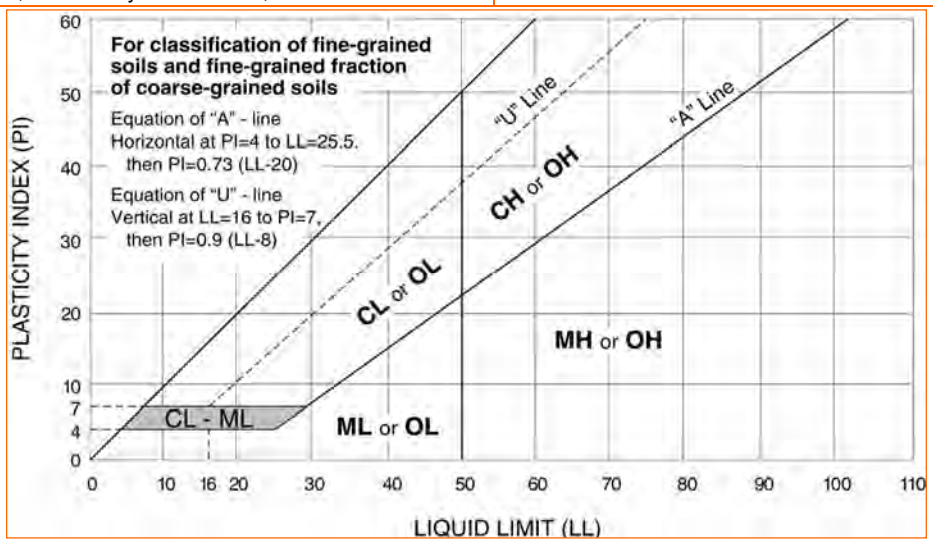
[M] If soil contains ³ 30% plus No. 200, predominantly gravel, add "gravelly" to group name.

[N] PI ³ 4 and plots on or above "A" line.

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

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

[Q] PI plots below "A" line.



2020-0002018

Recorded
Official Records
County of
Butte
CANDACE J. GRUBBS
County Clerk-Recorder

10:17AM 17-Jan-2020

REC FEE	0.00
COPIES	18.50

WS
Page 1 of 11

WHEN RECORDED RETURN TO:
CITY OF OROVILLE
PUBLIC WORKS DEPARTMENT
1735 MONTGOMERY STREET
OROVILLE, CA 95965

Pursuant to Sections 6103 and 27383 of the Government Code, the City of Oroville is exempt from payment of recording fee.

Space Above This Line for Recorder's Use Only

CERTIFICATE OF COMPLIANCE

This Certificate of Compliance is hereby issued by the City of Oroville to certify that the Lot Line Adjustment that created the parcels of property described below is in compliance with the applicable provisions of the Subdivision Map Act and of Chapter 23 of the Oroville City Code.

Parcel A: Remaining 4.753 Acres, Owned by GGD Oakdale, LLC.

Parcel B: Remaining 4.091 Acres, Owned by GGD Oakdale, LLC.

Parcel C: Remaining 0.644 Acres, Owned by GGD Oakdale, LLC.

Parcel D: Remaining 3.679 Acres, Owned by GGD Oakdale, LLC.

ROW Dedication: Remaining 12,032 Sq. Ft., Deeded to the City of Oroville

Description: All that certain real property situated in the City of Oroville, Butte County, California, described as follows:

See **EXHIBITS "B"** and **"C"** attached hereto and made a part hereof.

11 / WS

This certificate relates only to issues of compliance or noncompliance with the Subdivision Map Act and local ordinances enacted pursuant thereto. The parcel(s) described herein may be sold, leased, or financed without further compliance with the Subdivision Map Act or any local ordinances enacted pursuant thereto. Development of the parcel(s) may require issuance of a permit or permits, or other grant or grants of approval.

*Approval of the Lot Line Adjustment does not guarantee that the resulting lot or parcel is developable and the individual lots or parcels which have been merged are not separately available for sale, lease, or financing purposes.

Michael Massaro, P.E.
Contract City Engineer
Public Works Department

2/15/2020
Date

CALIFORNIA ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF Placer

On January 15, 2020, before me, Jennifer L. Goodwin, Notary Public, personally appeared, Michael Massaro, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Jennifer L. Goodwin

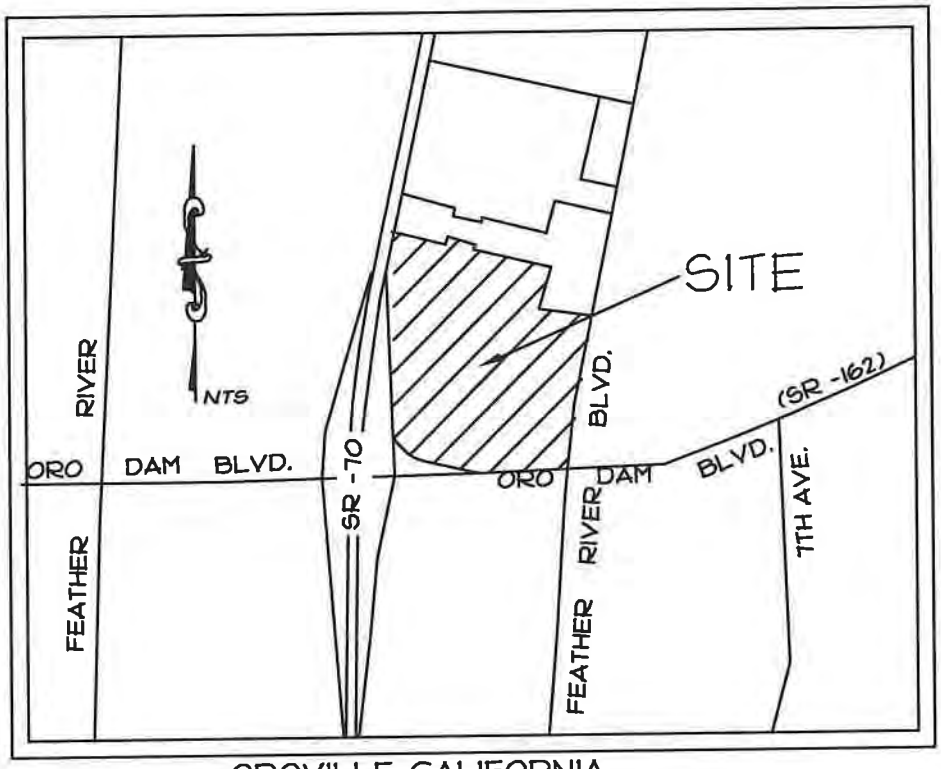
JENNIFER L. GOODWIN
Notary Public - California
Placer County
Commission # 2158999
My Comm. Expires Jul 30, 2020

OPTIONAL USE

Title or Type of Document: Certificate of Compliance

Document Date: no date *Number of Pages:* 1

EXHIBIT "B"



OROVILLE, CALIFORNIA
VICINITY MAP

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

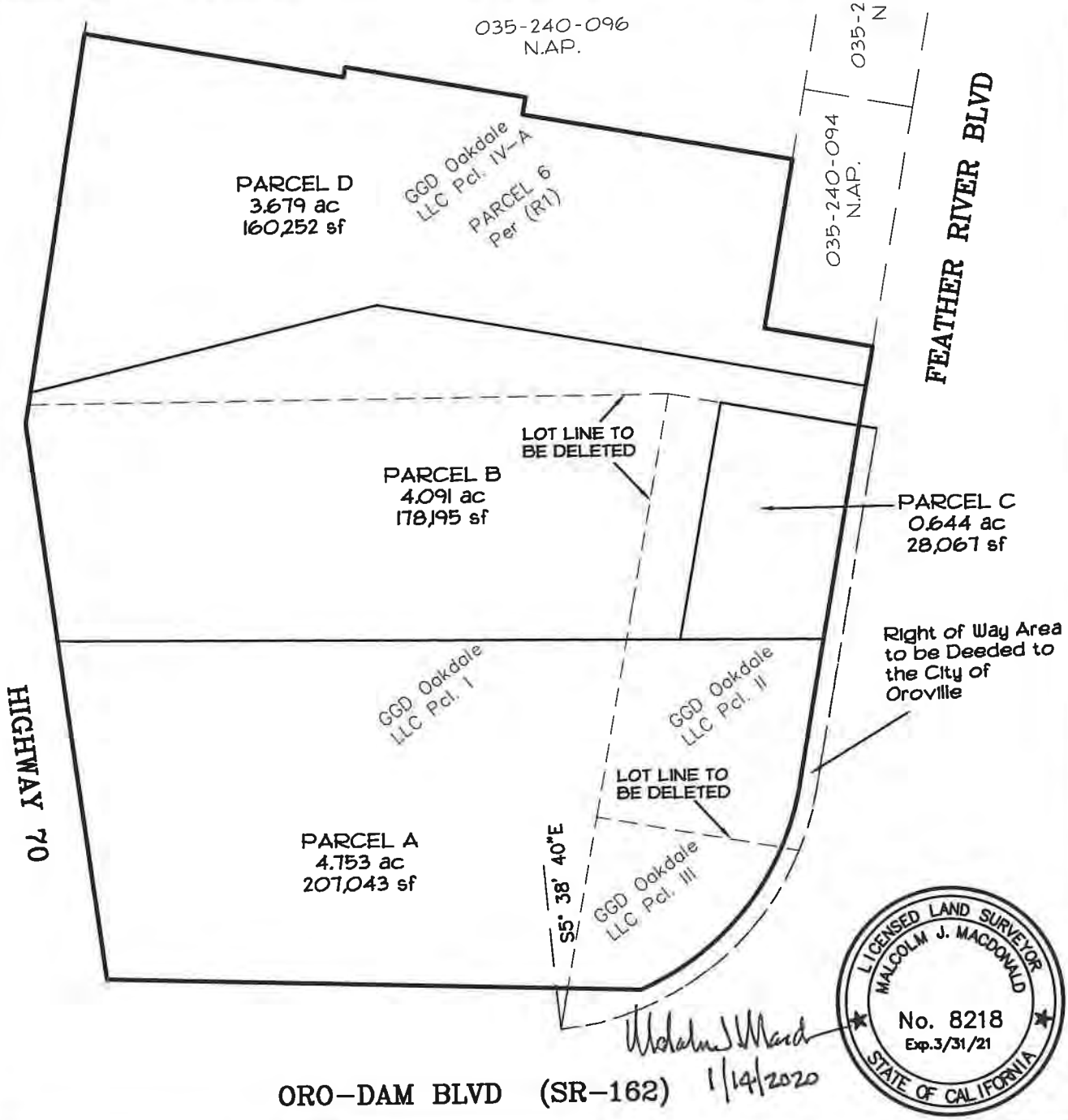
1/14/2020

DRAWN BY: JCM DATE: 1/3/20 SCALE: N.T.S. APPROVED BY: MJM	PROJECT: PAGE 1 OF 6 LOT LINE ADJUSTMENT PLAT FOR: SANJIV CHOPRA	Robertson Erickson Civil Engineers and Surveyors 888 Manzanita Court, Suite 101 Chico, CA 95926 530-894-3500 894-8955 fax

EXHIBIT "B"

CITY ENGINEER'S STATEMENT:
THIS PLAT DEPICTS A LOT LINE ADJUSTMENT AS APPROVED BY THE CITY OF OROVILLE DIRECTOR OF PUBLIC WORKS ON JULY 30, 2019, AS IT APPEARED ON THE TENTATIVE MAP, AND ANY APPROVED ALTERATIONS THEREOF, AND IS IN CONFORMANCE WITH THE REQUIREMENTS OF LOCAL ORDINANCE AND NO NEW PARCELS ARE BEING CREATED.

PLAT NOTE:
THIS PLAT DOES NOT CONSTITUTE A LEGAL DESCRIPTION OF THE LOTS OR PARCELS DEPICTED AND DOES NOT SHOW ALL EASEMENTS OF RECORD ON OR AFFECTING SAID LOTS AND PARCELS.



DRAWN BY: jcm DATE: 1/3/20 SCALE: 1" = 140' APPROVED BY: mjm	PROJECT: PAGE 2 OF 6 LOT LINE ADJUSTMENT PLAT FOR: SANJIV CHOPRA	Robertson Erickson Civil Engineers and Surveyors 888 Manzanita Court, Suite 101 Chico, CA 95926 530-894-3500 894-8955 fax

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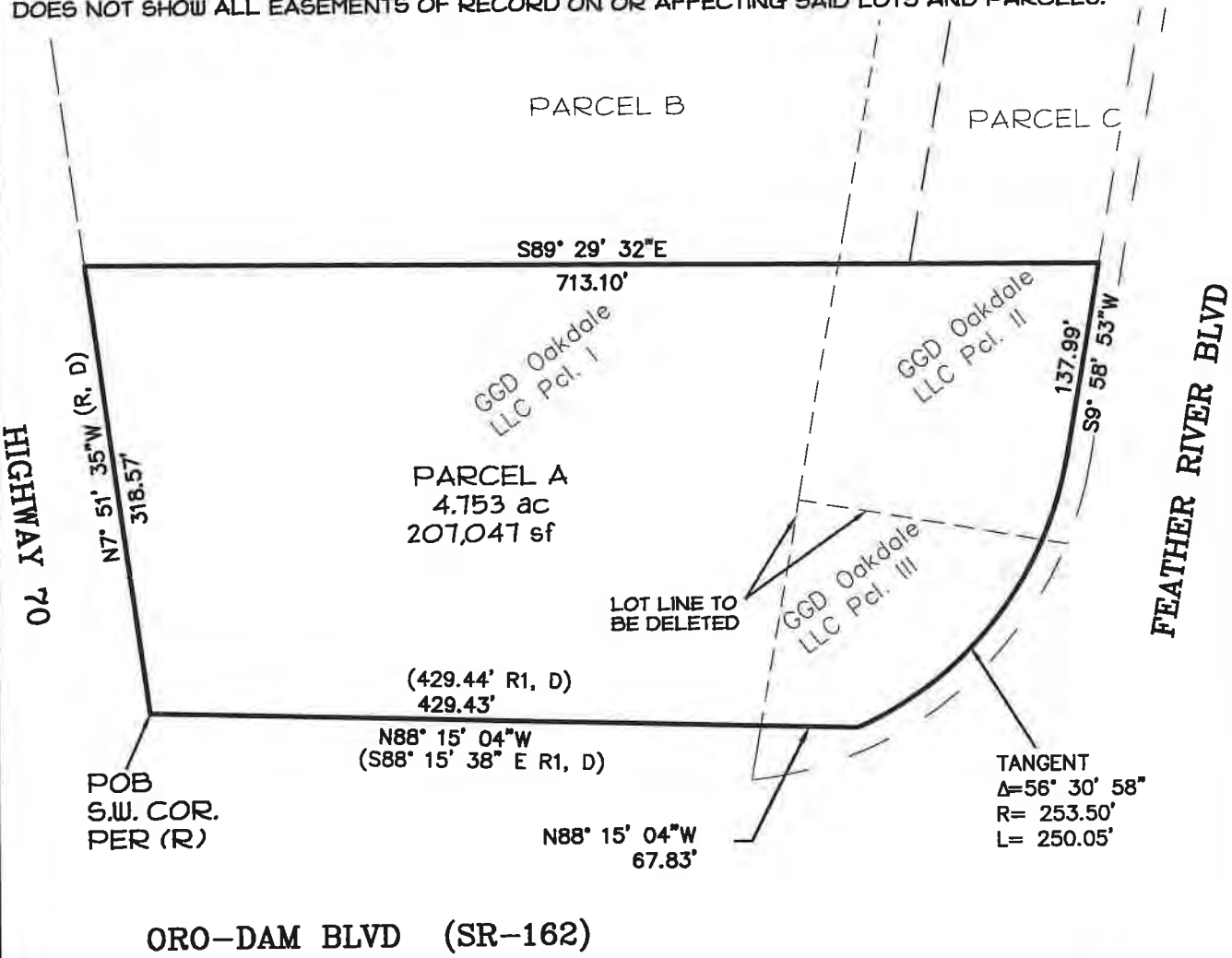

LEGEND

POB	POINT OF BEGINNING
(D)	DEED DATA PER RSN 2018-034640
(R1)	RECORD DATA PER 157-M-37

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

1/14/2020

DRAWN BY: JCM DATE: 1/3/20 SCALE: 1"= 120' APPROVED BY: MJM	PROJECT: PAGE 3 OF 6 LOT LINE ADJUSTMENT PLAT FOR: SANJIV CHOPRA	Robertson Erickson Civil Engineers and Surveyors 888 Manzanita Court, Suite 101 Chico, CA 95926 530-894-3500 894-8955 fax

EXHIBIT "B"

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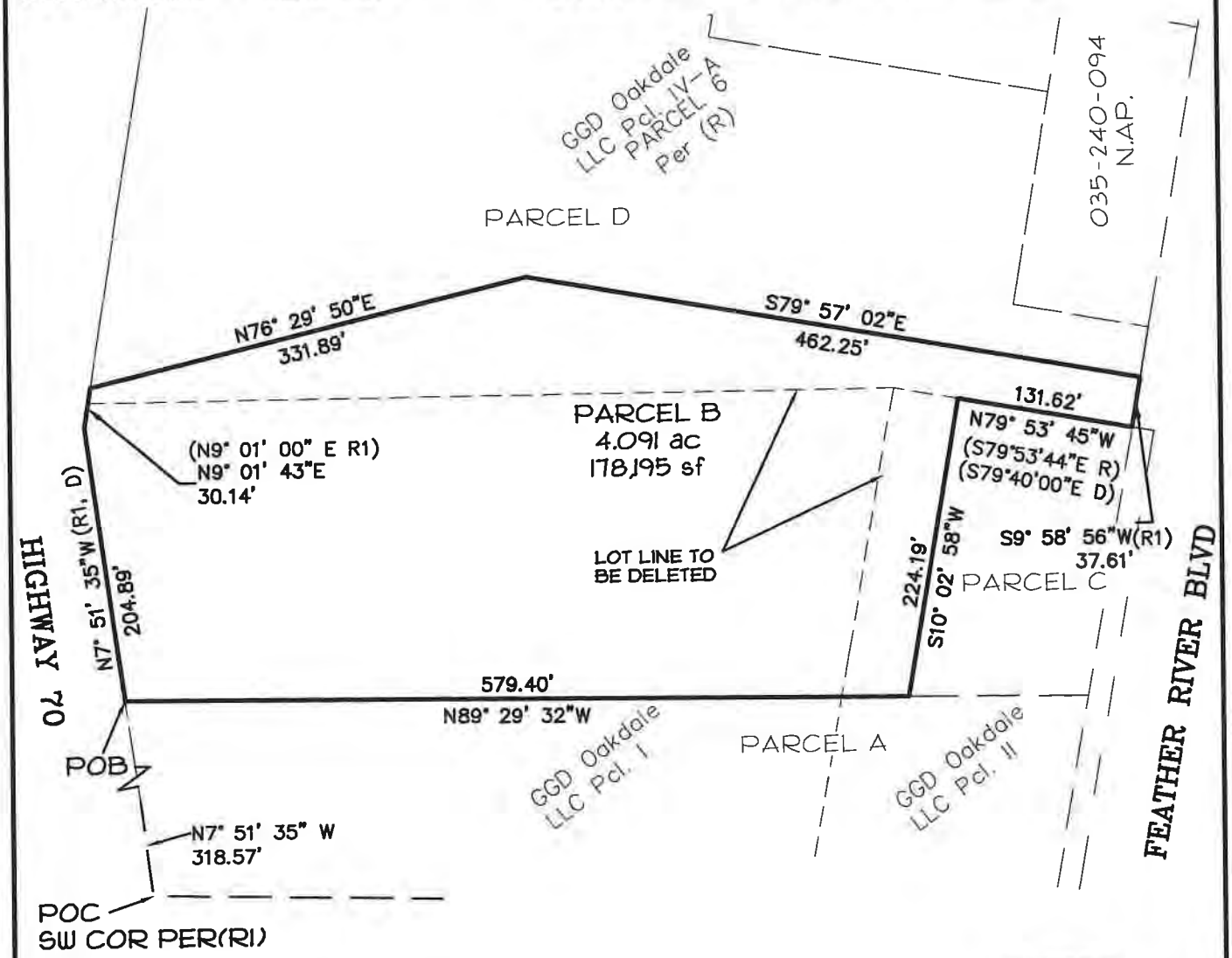

LEGEND

POB	POINT OF BEGINNING
POC	POINT OF COMMENCEMENT
(D)	DEED DATA PER RSN 2018-034640
(R1)	RECORD DATA PER 157-M-37

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

1/14/2020

DRAWN BY: jcm	PROJECT:	PAGE 4 OF 6
DATE: 1/3/20	LOT LINE ADJUSTMENT PLAT FOR: SANJIV CHOPRA	Robertson Erickson
SCALE: 1"= 120'		Civil Engineers and Surveyors
APPROVED BY: mjm		888 Manzanita Court, Suite 101
		Chico, CA 95926
		530-894-3500 894-8955 fax

EXHIBIT "B"

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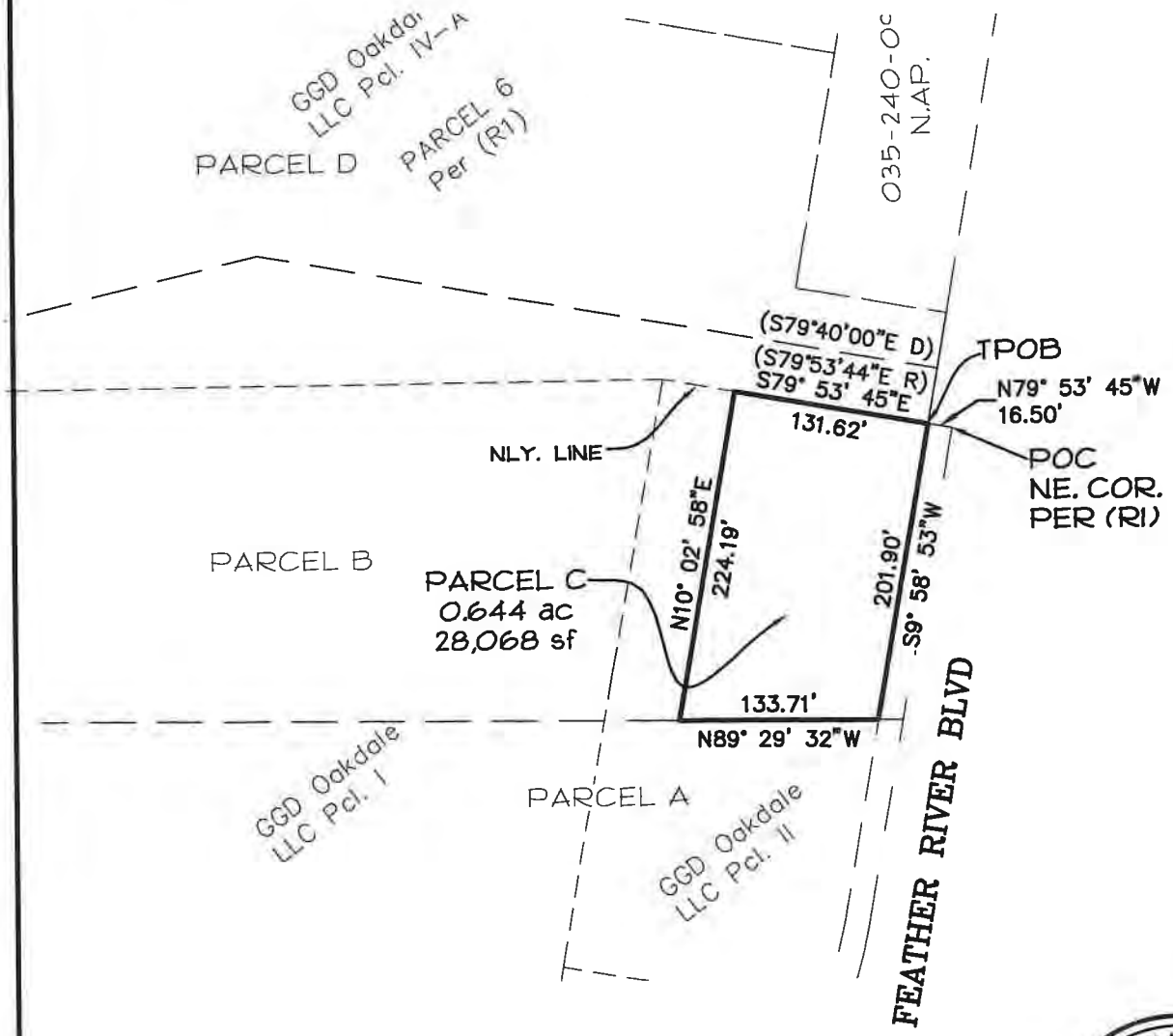

LEGEND

TPOB	TRUE POINT OF BEGINNING
POC	POINT OF COMMENCEMENT
(D)	DEED DATA PER RSN 2018-034640
(RI)	RECORD DATA PER 157-M-37

Malcolm Macdonald
1/14/2020

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

DRAWN BY: JCM	PROJECT:	PAGE 5 OF 6
DATE: 1/3/20	LOT LINE ADJUSTMENT PLAT FOR: SANJIV CHOPRA	Robertson Erickson
SCALE: 1" = 120'		Civil Engineers and Surveyors
APPROVED BY: mjm		888 Manzanita Court, Suite 101
		Chico, CA 95926
		530-894-3500 894-8955 fax

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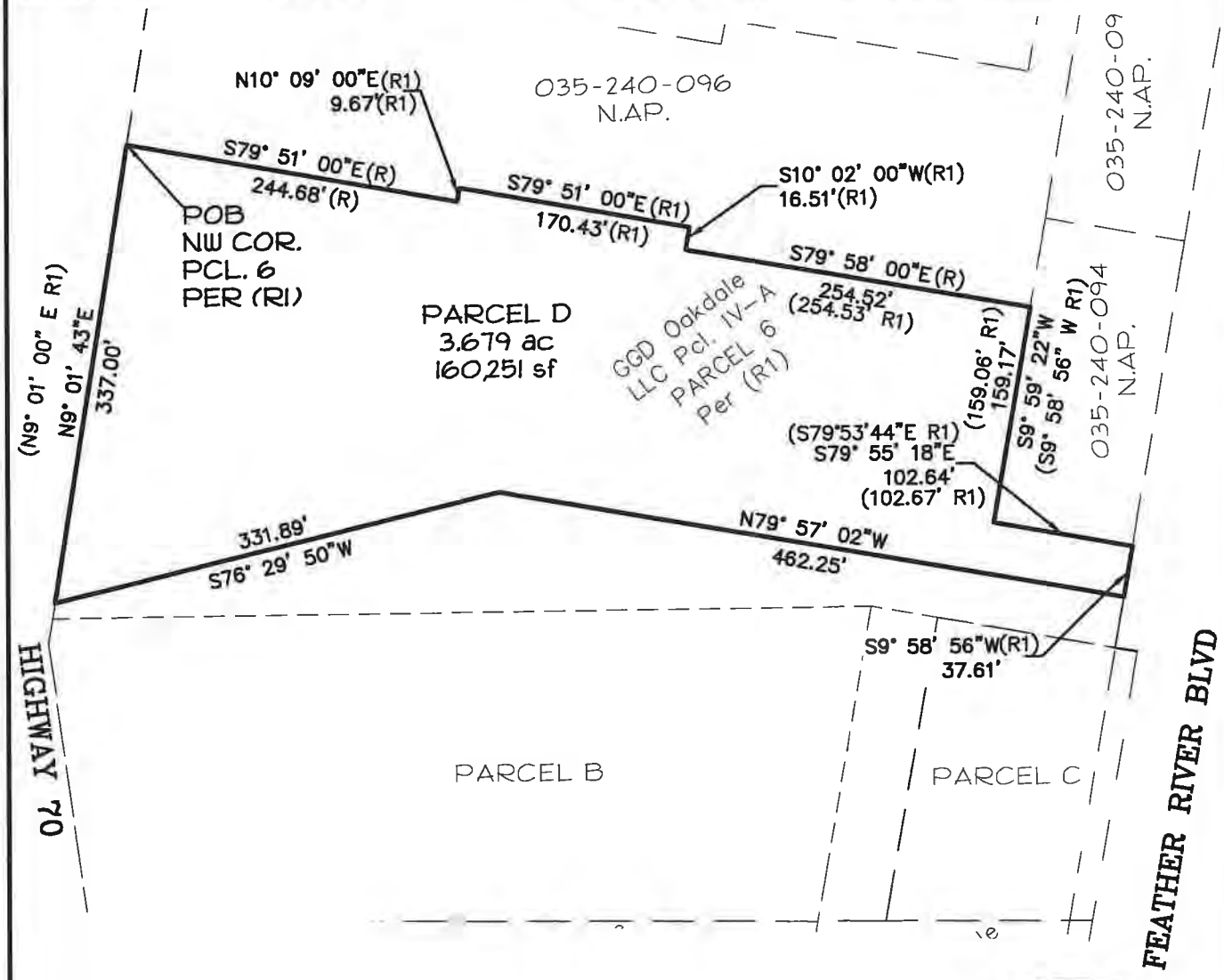


LEGEND

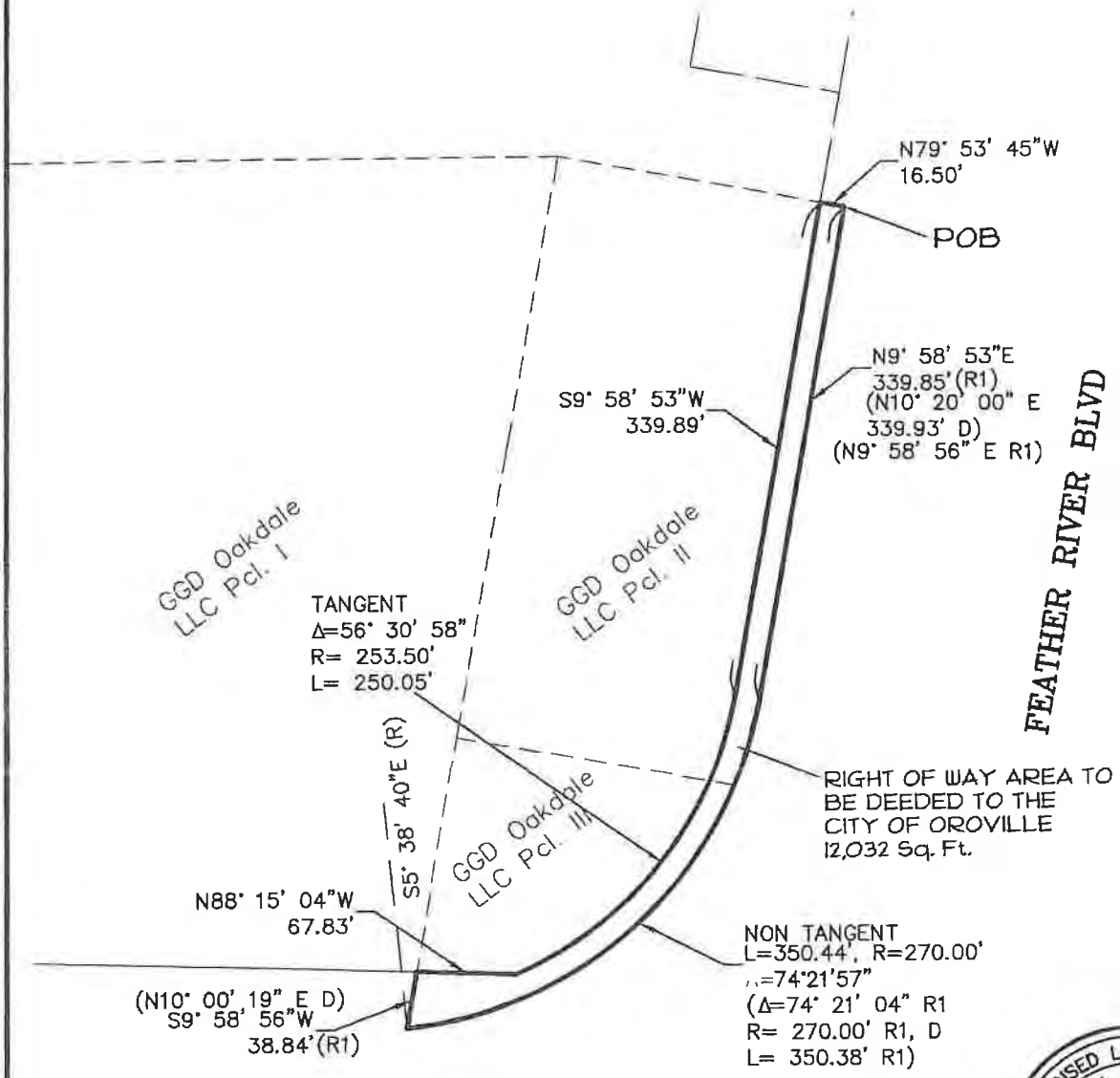
POB	POINT OF BEGINNING
(D)	DEED DATA PER RSN 2018-034640
(R1)	RECORD DATA PER 157-M-37

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

1/14/2020

DRAWN BY: jcm	PROJECT:	PAGE 6 OF 6
DATE: 1/3/20	LOT LINE ADJUSTMENT PLAT FOR: SANJIV CHOPRA	Robertson Erickson Civil Engineers and Surveyors 888 Manzanita Court, Suite 101 Chico, CA 95926 530-894-3500 894-8955 fax
SCALE: 1" = 120'		
APPROVED BY: mjm		

EXHIBIT "B"



ORO-DAM BLVD (SR-162)

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

1/14/2020

LEGEND

POB	POINT OF BEGINNING
(D)	DEED DATA PER RSN 2018-034640
(R1)	RECORD DATA PER 157-M-37
(R)	RADIAL

DRAWN BY: jcm	PROJECT: PAGE 1 OF 1	Robertson Erickson
DATE: 1/3/20	RIGHT OF WAY ACQUISITION PLAT	Civil Engineers and Surveyors
SCALE: 1" = 120'	GGD OAKDALE LLC/CITY OF OROVILLE	888 Manzanita Court, Suite 101
APPROVED BY: mjm		Chico, CA 95926
		530-894-3500 894-8955 fax

EXHIBIT "C"
GRANT DEED TO CITY OF OROVILLE

All that certain real property situate in the City of Oroville, County of Butte, State of California, described as follows:

Being a portion of the lands of R. & H. Leasing as shown on that certain record of survey recorded in the Office of the Recorder of the County of Butte, State of California, on June 19, 2003, in Book 157 of Maps, at Page(s) 37-40 and a portion of the land as described in the deed to GGD Oakdale, LLC, Parcels II, and III, recorded October 8, 2018 under Recorder's Serial No. 2018-0034640 in the Office of the Recorder of the County of Butte, State of California, more particularly described as follows:

Beginning at the northeast corner of said R. & H. Leasing as shown on said record of survey, and being the northeast corner of Parcel II as described in said deed to GCD Oakdale LLC, and being an angle point on the northwesterly right of way of Feather River Boulevard as shown on said record of survey. Thence North 79° 53' 45" West 16.50 feet on and along said northwesterly right of way of Feather River Boulevard to an angle point in said northwesterly right of way line;

Thence South 09° 58' 53" West 339.89 feet, to the beginning of a tangent 253.50 foot radius curve concave to the northwest;

Thence on and along said 253.50 foot radius curve, through a central angle of 56° 30' 58", an arc length of 250.05 feet;

Thence North 88° 15' 04" West 67.83 feet to the southeast corner of the lands of the Neitling Trust as shown on said record of survey and the southeast corner of Parcel I as described in said deed to GCD Oakdale LLC, and an angle point in the northerly right of way of Oro Dam Boulevard as shown on said record of survey;

Thence South 09° 58' 56" West 38.84 feet, on and along said Feather River Boulevard right of way line and the westerly line of GGD Oakdale property Parcel III, to the beginning of a non-tangent 270.00 foot radius curve concave northwesterly, with a radial bearing of South 5° 38' 40" East;

Thence along the arc said non-tangent 270.00 foot radius curve, through a central angle of 74° 21' 57" an arc length of 350.44 feet to a point on said northwesterly right of way of said Feather River Boulevard and said easterly line of said GGD Oakdale property Parcel II and Parcel III, also being the and said Feather River Boulevard as shown on said record of survey;

Thence North 09° 58' 53" East 339.85 feet, more or less, on and along said northwesterly line of said Feather River Boulevard to the **Point of Beginning**.

Containing 12,032 Square Feet, more or less.

LICENSED LAND SURVEYOR
MALCOLM J. MACDONALD
No. 8218
Exp.3/31/21
STATE OF CALIFORNIA

1/14/2020

Signage Plan Narrative for Maverik Oroville, CA

Maverik is looking to build a new site in Oroville, CA on the Northwest corner of Oroville Dam Blvd and Feather River Blvd. Included in the sign package would be a freeway oriented multi-tenant sign.

To be successful Maverik will need to be able to advertise to freeway traffic traveling north and south on I-70. We have hired a sign consultant to help us determine sign height and size in order for the sign to be clearly visible and allow traffic to be able to safely read the sign and allow them ample time exit I-70 (approximately 7 seconds at normal freeway speeds) and visit our store. Maverik doesn't want to build a sign any larger than it needs to be as costs for these signs increase exponentially with each foot in height.

YESCO sign company has performed many "sign flagging surveys". In past stores, these surveys have been critical to help determine the correct sign height for each site. Many times there are power lines, buildings, trees, billboards, others signs and many other natural obstructions that would block the sign and render it useless.

Here in Oroville, we met on site with YESCO and first we had them lift their truck to 80 ' overall height with a 10 'x 10 'banner and took photos traveling north and south on I-70 so that we could put together a mockup of what the sign would look like in the field. We also took photos of what the sign would look like for traffic heading east and west on Oroville Dam Blvd.

As you can see from the mock up that YESCO put together, there are clearly some visibility issues with tree height traveling both north and south on I-70. There is also a visibility impediment for traffic traveling east on Oroville Dam Blvd as the freeway bridge blocks the sign.

Due to these visibility impediments, we increased the sign flagging height to 100'. As you can see in the renderings, the sign is visible to both north and south bound traffic on I-70 and would allow traffic to the proper time (7 seconds) to safely make the necessary lane change to exit the freeway. At this height, traffic heading east on Oroville Dam road would also be able to clearly see the sign.

It is of the opinion of our sign consultant that the sign height be at 100 'overall height and that the necessary square footage to be clearly visible and safe would be 572 sq feet for the North/South facing sign on I-70 and 221 sq feet for the east/west facing sign on Oroville Dam Blvd.

Sign Package for Maverik for Maverik #29081 Oroville, CA

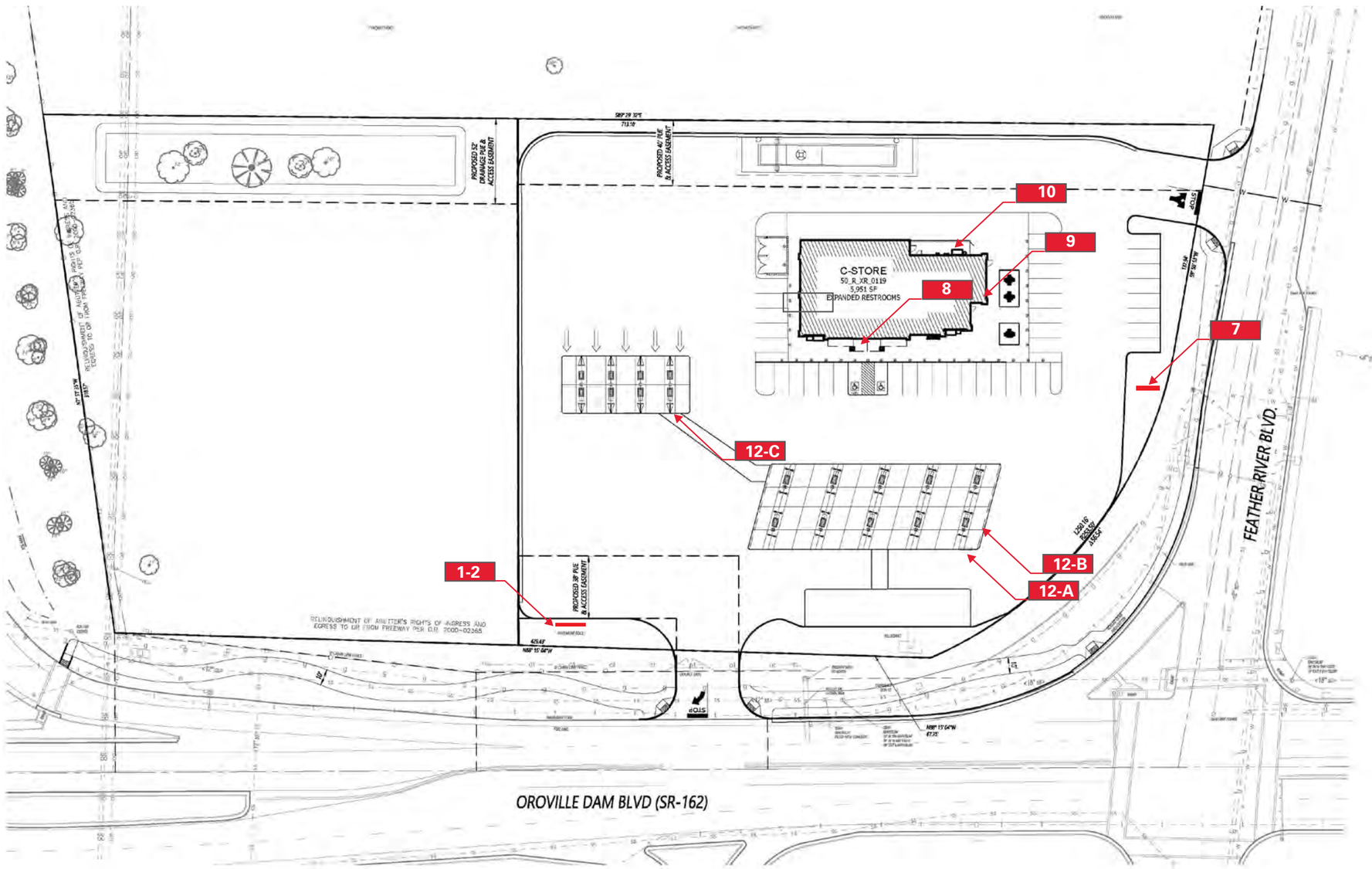
Presented By

YESCO

Salt Lake Region

Version:
DSGN #29081 R2 1-24-2020

SITE PLAN

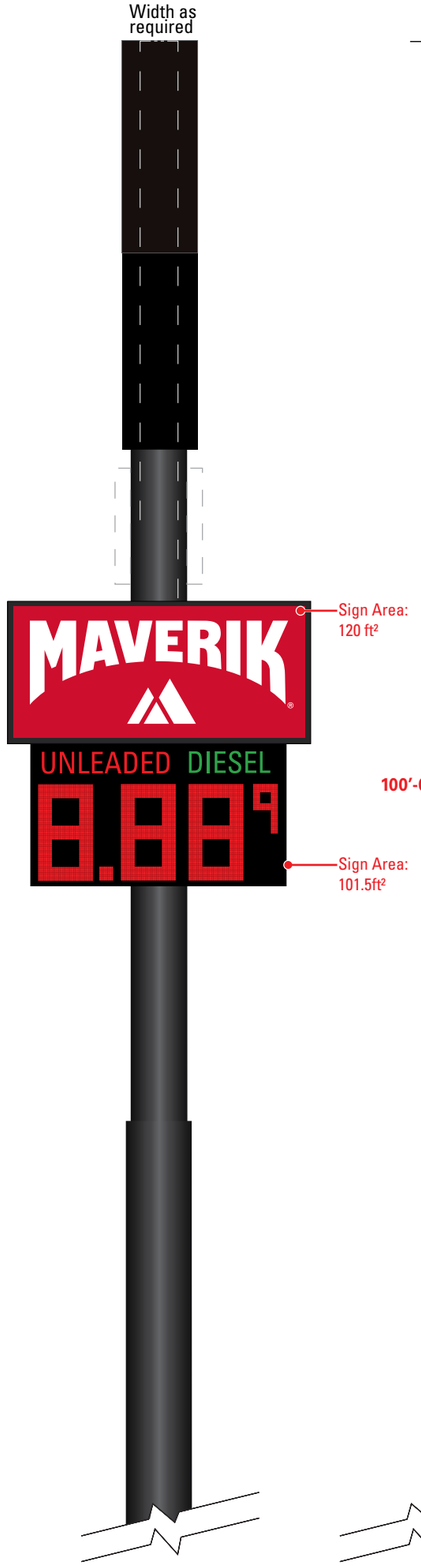


PRELIMINARY SITE PLAN
MAVERIK - OROVILLE DAM ROAD

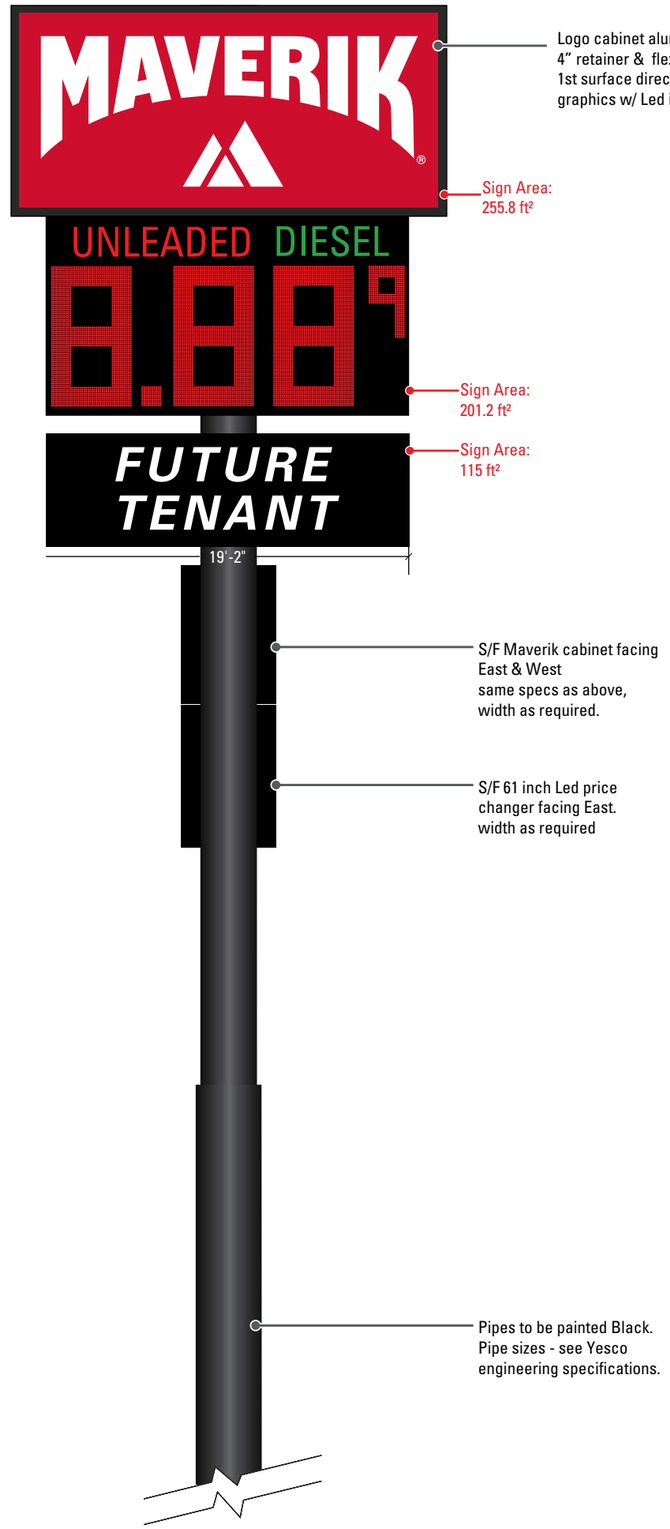
OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

CARTWRIGHT NOR CAL
CIVIL ENGINEERING & PROJECT MANAGEMENT
4180 DOUGLAS BLVD, SUITE 200
GRANITE BAY, CALIFORNIA 95746
T (916) 978-4001
WWW.CARTWRIGHTENGINEERS.COM

DATE: 1/23/2020
SCALE: 1"=30'
DRAWN BY: HK



1.1 SIDE VIEW



1 D/F ILLUMINATED SIGN DISPLAY

100 ft

SCOPE OF WORK:

MANUFACTURE & INSTALL *ONE [1]* D/F ILLUMINATED POLE SIGN DISPLAY:

All Led cabinet/sizes to be verified.

PERMITTING

NORTH & SOUTH		EAST & WEST	
Mav cab:	255.8 sf	Mav cab:	120. sf
Led cab:	201.2	Led cab:	101.2
CAR cab:	115.	Total:	221.2 sf
Total:	572. sf		

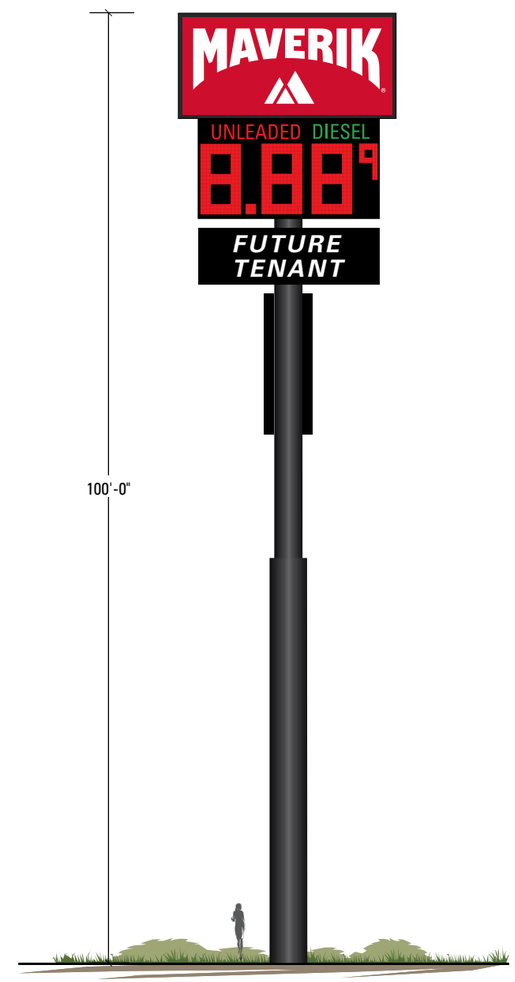
COMBINED TOTAL: 793.2 SF

FINAL ELECTRICAL CONNECTION BY:	CLIENT TO PROVIDE POWER TO SIGN LOCATION YESCO TO PROVIDE FINAL CONNECTION

COLOR KEY - MAVERIK STANDARDS - NEW LOGO

1	PAINT	PREPAINTED BRONZE & PIPE SW# 7020 BLK FOX
	VINYL	3M 3630-69 DURANODIC
2	ACRYLIC	3RK32 OR 2283
	PAINT	PMS # 427C

NOTE: UNLESS OTHERWISE NOTED, THE COLORS DEPICTED ON THIS RENDERING MAY NOT MATCH ACTUAL COLORS ON FINISHED DISPLAY. PLEASE REFER TO COLOR-CALLOUTS AND THEIR APPROPRIATE VENDOR SPECIFIED SAMPLES FOR APPROVED COLOR SPECIFICATIONS



YESCO
DESIGN
1605 South Gramercy Rd.
Salt Lake City, UT 84104
801.487.8481
www.yesco.com

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2	1-24-2020 no chg this pg-CTL
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Approval

A/E Sign / Date

Client Sign / Date

Landlord Sign / Date

Maverik

NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren
Designer: Cheryl Lewis

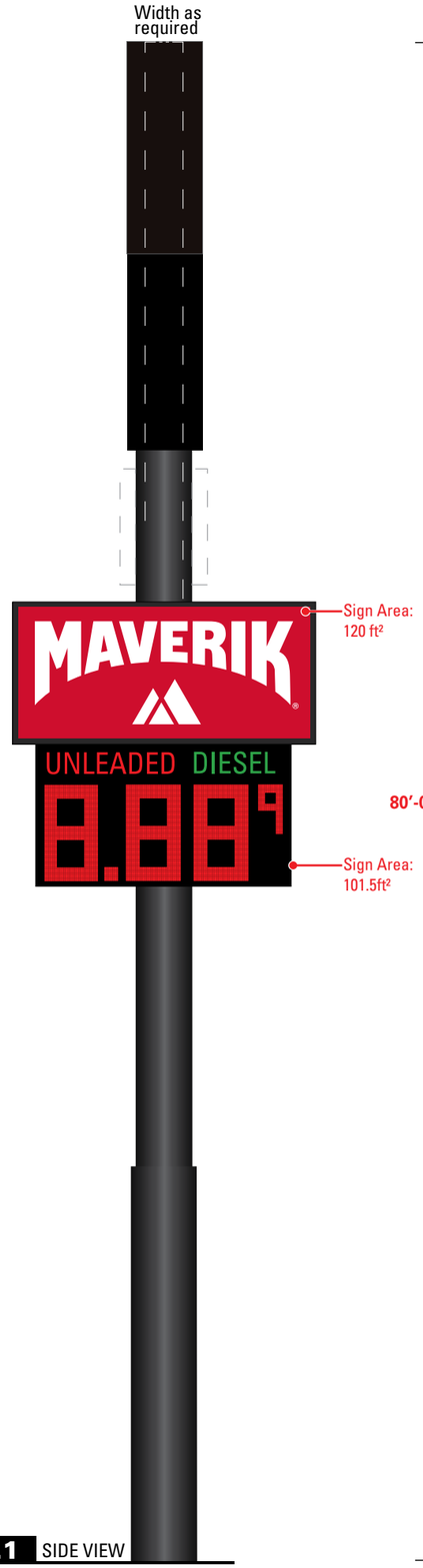
Orig: 12-19-2019

OPY# 29081 **R2**

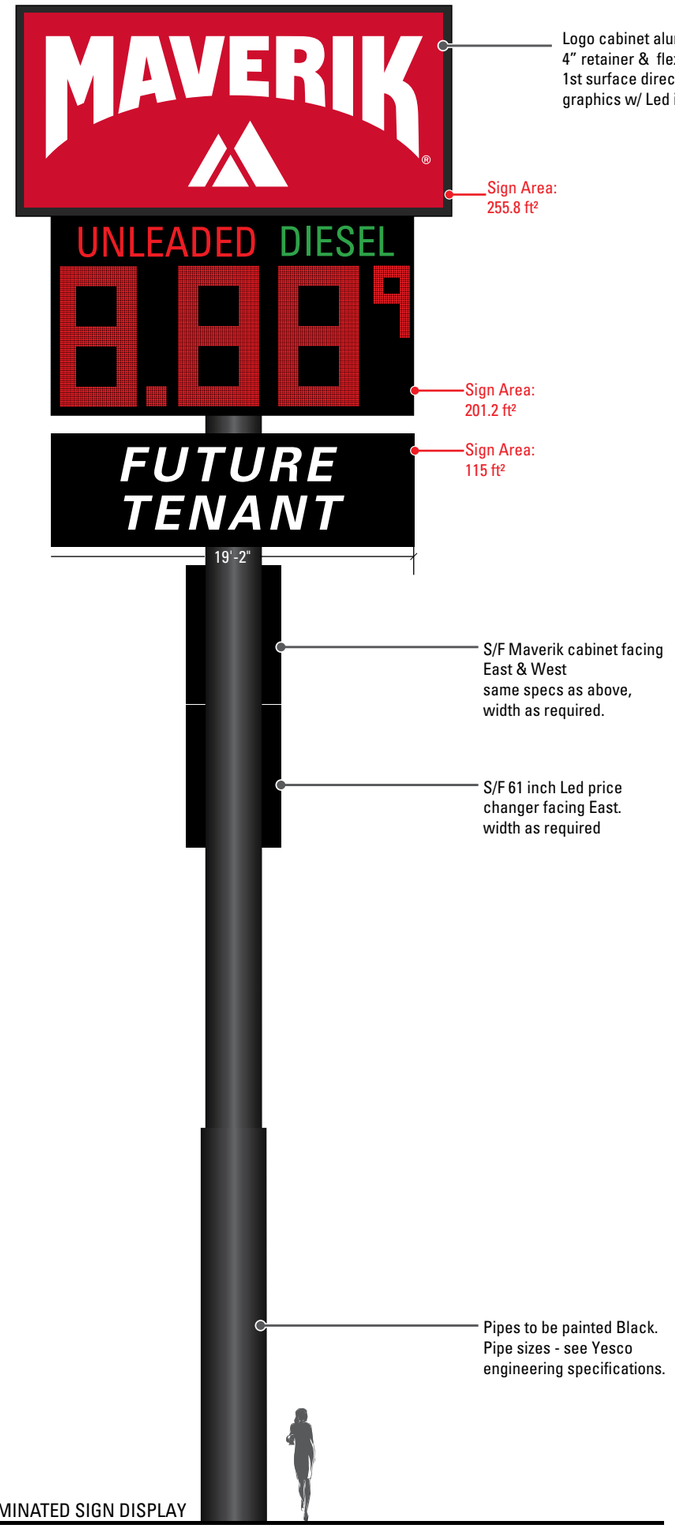
JO #00000

scale: as noted

ART 1.0



2.1 SIDE VIEW



2 D/F ILLUMINATED SIGN DISPLAY

80 ft

SCOPE OF WORK:

MANUFACTURE & INSTALL *ONE [1]* D/F ILLUMINATED POLE SIGN DISPLAY:

All Led cabinet/sizes to be verified.

PERMITTING

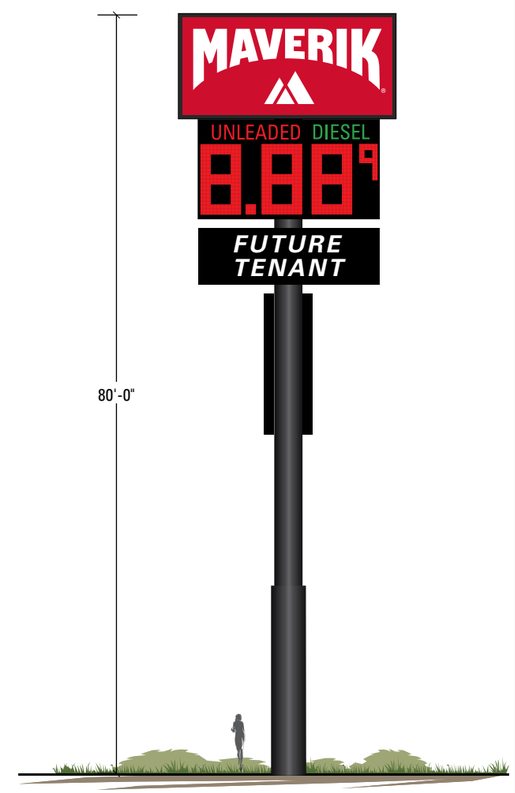
NORTH & SOUTH		EAST & WEST	
Mav cab:	255.8 sf	Mav cab:	120. sf
Led cab:	201.2	Led cab:	101.2
CAR cab:	115.	Total:	221.2 sf
Total:	572. sf		

FINAL ELECTRICAL CONNECTION BY:	CLIENT TO PROVIDE POWER TO SIGN LOCATION YESCO TO PROVIDE FINAL CONNECTION

COLOR KEY - MAVERIK STANDARDS - NEW LOGO

1	PAINT	PREPAINTED BRONZE & PIPE SW# 7020 BLK FOX
	VINYL	3M 3630-69 DURANODIC
2	ACRYLIC	3RK32 OR 2283
	PAINT	PMS # 427C

NOTE: UNLESS OTHERWISE NOTED, THE COLORS DEPICTED ON THIS RENDERING MAY NOT MATCH ACTUAL COLORS ON FINISHED DISPLAY. PLEASE REFER TO COLOR-CALLOUTS AND THEIR APPROPRIATE VENDOR SPECIFIED SAMPLES FOR APPROVED COLOR SPECIFICATIONS



YESCO
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Maverik

NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren
Designer: Cheryl Lewis

Orig: 12-19-2019

OPY# 29081 **R2**

JO #00000

scale: as noted

ART 2.0

ART SUPERIMPOSED ON PHOTO - SHOWN AT APPROXIMATE RELATIVE SCALE

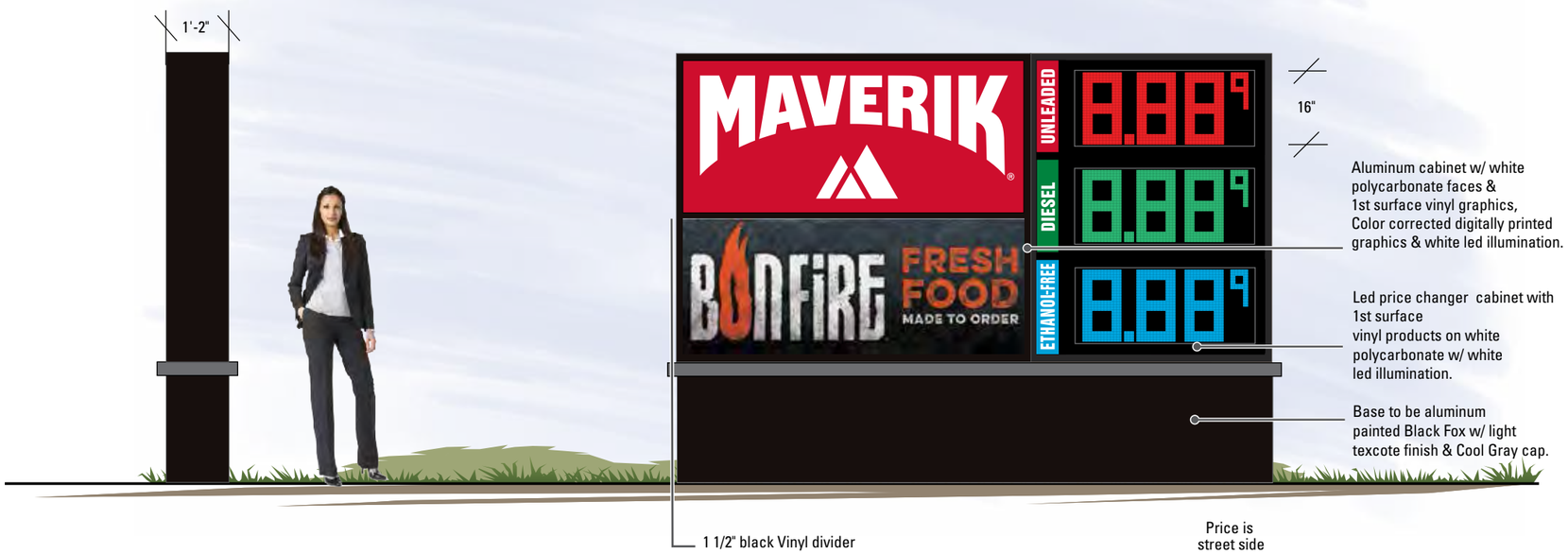
ART SUPERIMPOSED ON PHOTO - SHOWN AT APPROXIMATE RELATIVE SCALE

ART SUPERIMPOSED ON PHOTO - SHOWN AT APPROXIMATE RELATIVE SCALE

ART SUPERIMPOSED ON PHOTO - SHOWN AT APPROXIMATE RELATIVE SCALE

M-8-64-16in

Cabinet sizes & widths have been verified from Sunshine. All remainder of sign to match.



7.1 SIDE VIEW

7 D/F ILLUMINATED MONUMENT SIGN

SCALE: 3/8" = 1'-0"

Reverse View

This design does not constitute production ready artwork and is to be used exclusively for proofing and review purposes only.

SCOPE OF WORK:

MANUFACTURE & INSTALL *ONE [1]* D/F ILLUMINATED SIGN DISPLAY:

Cabinets to be painted Black Fox (use sign comp when pipe size allows).

PERMITTING	SIGN AREA: 64 ft²
FINAL ELECTRICAL CONNECTION BY:	CLIENT TO PROVIDE POWER TO SIGN LOCATION YESCO TO PROVIDE FINAL CONNECTION

COLOR KEY

1	PAINT	PMS #348C/SW#LV5-5074896-389504-A
	VINYL	3M 3630-26 GREEN
2	PAINT	DUPONT# K 9441
	VINYL	3M 3630-147 LT EUROPEAN BLUE
3	PAINT	PMS #186
	VINYL	3M 3630-33 RED
4	PAINT	PMS STANDARD BLACK
	VINYL	3M 3630-22
5	PAINT	PMS 427C
	VINYL	AVERY UC 900-811-T
6	PAINT	PMS COOL GRAY 7C
	VINYL	
7	PAINT	SHERWIN WILLIAMS# 7020 "BLACK FOX"
	VINYL	

NOTE: UNLESS OTHERWISE NOTED, THE COLORS DEPICTED ON THIS RENDERING MAY NOT MATCH ACTUAL COLORS ON FINISHED DISPLAY. PLEASE REFER TO COLOR-CALLOUTS AND THEIR APPROPRIATE VENDOR SPECIFIED SAMPLES FOR APPROVED COLOR SPECIFICATIONS

YESCO
DESIGN
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Landlord Sign / Date

Maverik

NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren
Designer: Cheryl Lewis

Orig: 12-19-2019

OPY# 29081 R2

JO #00000

scale: as noted

ART 7.0

5" deep aluminum channel letter w/ 3RK31 or 2283 Red Arcylic faces. 1" bronze trim cap & pre-painted returns *[see color key]*. White L.E.D illumination. Mounted to steel panel. Self contained power supplies.

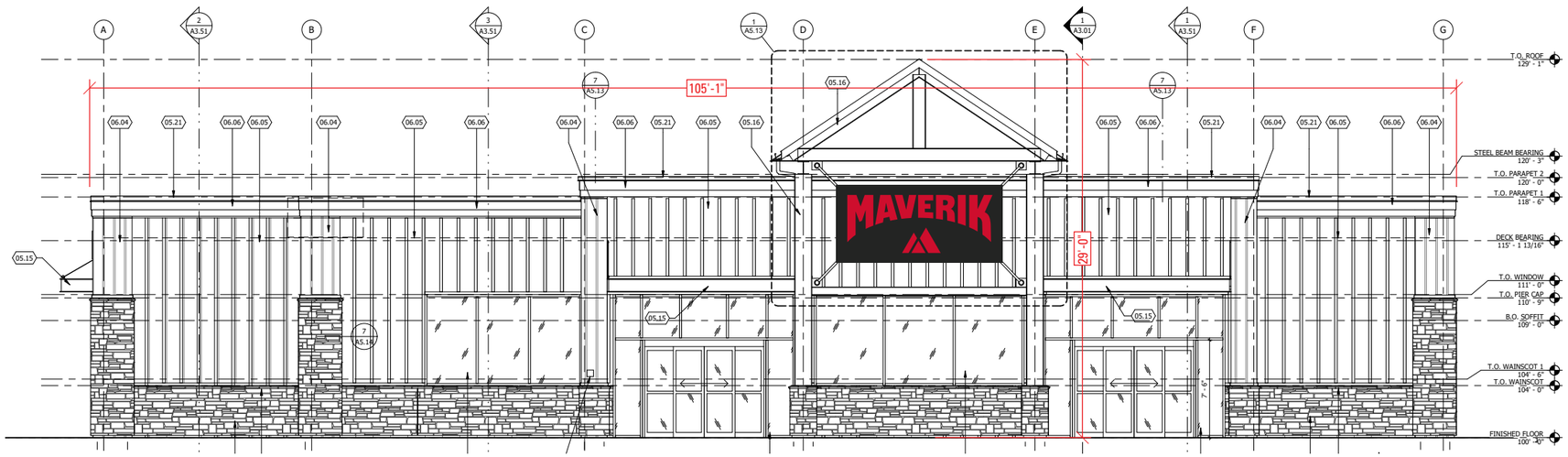
Customer provided steel plate.

8.1 SIDE VIEW

8 PAN CHANNEL LETTERS ON STEEL PANEL CABINET

SCALE: 3/8" = 1'-0"

THIS ELEVATION IS REPRESENTATIONAL ONLY-REPLACE WITH SPECIFIC PLANS



8.2 DETAIL ELEVATION

SCALE: 3/32" = 1'-0"

This design does not constitute production ready artwork and is to be used exclusively for proofing and review purposes only.

SCOPE OF WORK:

MANUFACTURE & INSTALL *ONE [1]* SET OF ILLUMINATED CHANNEL LETTER ON CUSTOMER PROVIDED STEEL PANEL. MOUNTED TO RACEWAY.

PERMITTING	SIGN AREA: 77ft²
FINAL ELECTRICAL CONNECTION BY:	YESCO

COLOR KEY - MAVERIK STANDARDS - NEW LOGO

1	PAINT	SHERWIN WILLIAMS# 7020 "BLACK FOX"
	PREPAINT	DURANODIC BRONZE
	VINYL	3M 3630-69 DURANODIC
2	PMS	PANTONE® 186c
	VINYL	3M 3630-33 "RED"
3	PAINT	MATCH PMS 348c/SW#LV5-5074896-389504-A
	VINYL	3M 3630-26 "GREEN"
4	PAINT	DUPONT #K 9441
	VINYL	3M 3630-26 "LT EUROPEAN BLUE"
5	PAINT	SHERWIN WILLIAMS TO MATCH "PMS 427c"
	VINYL	AVERY UC 900-811-T "PANTONE 427c"
6	PMS	PANTONE® 2945c
	VINYL	3M 3630-167 "BRIGHT BLUE"

NOTE: UNLESS OTHERWISE NOTED, THE COLORS DEPICTED ON THIS RENDERING MAY NOT MATCH ACTUAL COLORS ON FINISHED DISPLAY. PLEASE REFER TO COLOR-CALLOUTS AND THEIR APPROPRIATE VENDOR SPECIFIED SAMPLES FOR APPROVED COLOR SPECIFICATIONS

NOTE:

FIELD SURVEY REQUIRED PRIOR TO FABRICATION. ENGINEERING TO DETERMINE ATTACHMENT POINTS.

YESCO

DESIGN

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Landlord Sign / Date

Maverik

NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren

Designer: Cheryl Lewis

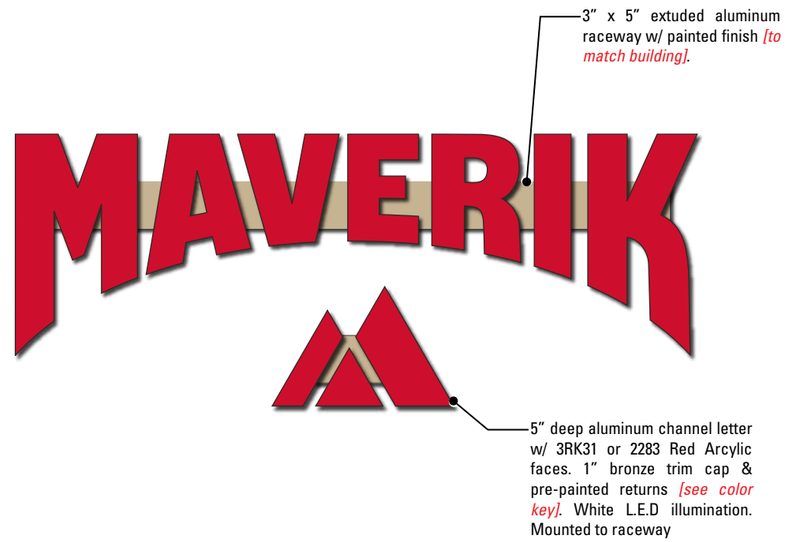
Orig: 12-19-2019

OPY# 29081 **R2**

JO #00000

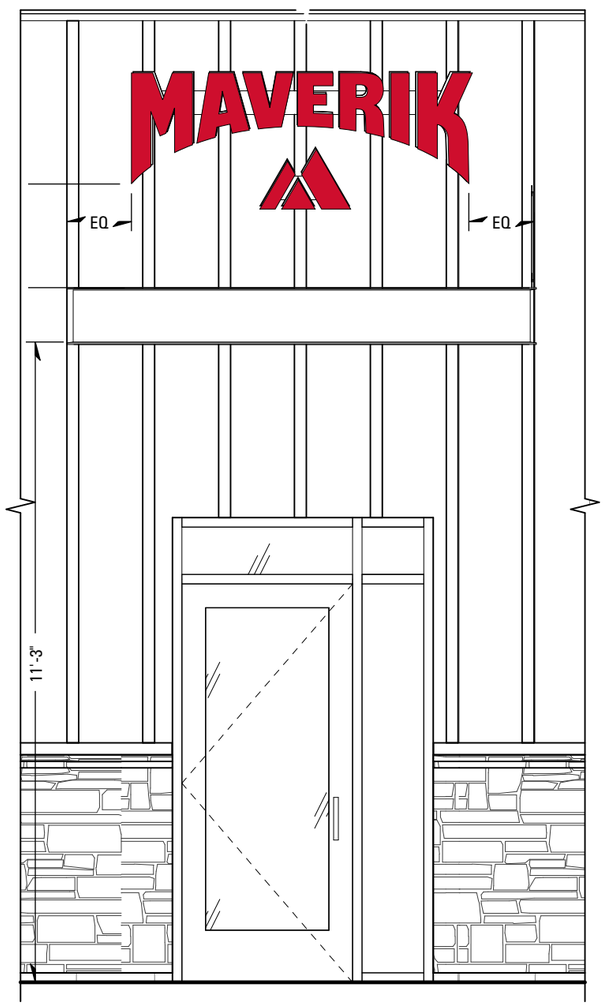
scale: as noted

ART 8.0



9 PAN CHANNEL LETTERS — 24" LETTER SET

SCALE: 3/4" = 1'-0"

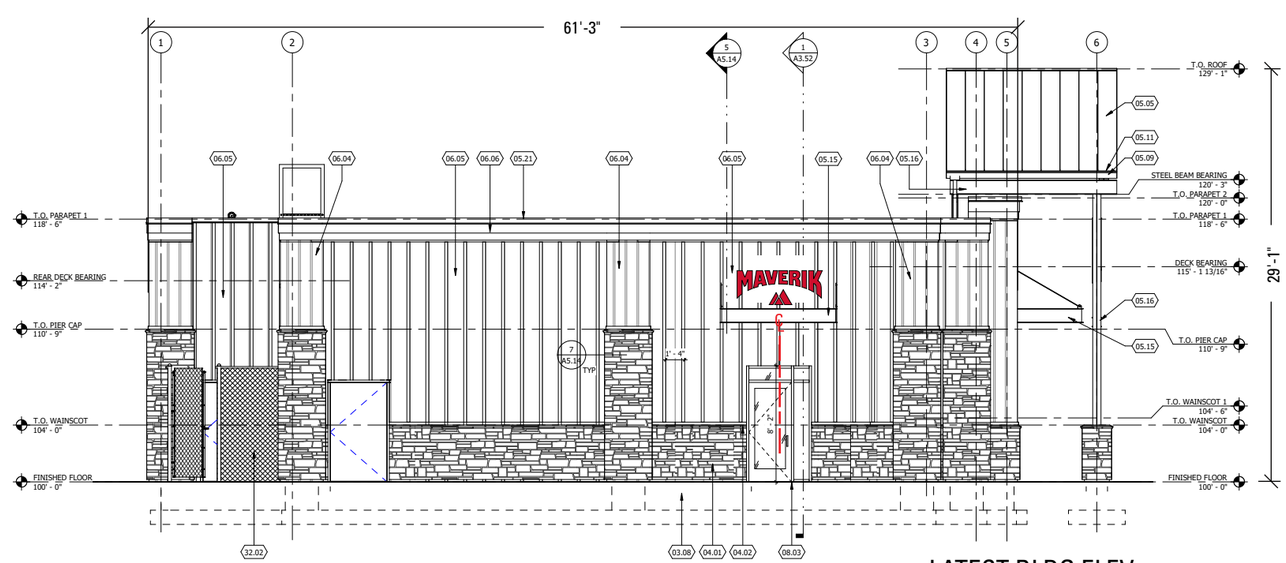


9.1 SIDE VIEW

9.2 DETAIL ELEVATION

SCALE: 3/8" = 1'-0"

THIS ELEVATION IS REPRESENTATIONAL ONLY



LATEST BLDG ELEV.

9.3 DETAIL ELEVATION

SCALE: 3/32" = 1'-0"

SCOPE OF WORK:

MANUFACTURE & INSTALL *ONE [1]* SET L.E.D. ILLUMINATED PAN CHANNEL LETTERS. MOUNT TO BUILDING ON RACEWAY.

PERMITTING	SIGN AREA: 14.35ft²	ELECTRICAL:	2 Amps 120 V

FINAL ELECTRICAL CONNECTION BY:	YESCO

COLOR KEY - MAVERIK STANDARDS - NEW LOGO

1	PAINT	SHERWIN WILLIAMS# 7020 "BLACK FOX"
	PREPAINT	DURANODIC BRONZE
	VINYL	3M 3630-69 DURANODIC
2	PMS	PANTONE® 186c
	VINYL	3M 3630-33 "RED"
3	PAINT	MATCH PMS 348c/SW#LV5-5074896-389504-A
	VINYL	3M 3630-26 "GREEN"
4	PAINT	DUPONT #K 9441
	VINYL	3M 3630-26 "LT EUROPEAN BLUE"
5	PAINT	SHERWIN WILLIAMS TO MATCH "PMS 427c"
	VINYL	AVERY UC 900-811-T "PANTONE 427c"
6	PMS	PANTONE® 2945c
	VINYL	3M 3630-167 "BRIGHT BLUE"

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NOTE:

FIELD SURVEY REQUIRED PRIOR TO FABRICATION.

YESCO

DESIGN

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Maverik
NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren

Designer: Cheryl Lewis

Orig: 12-19-2019

OPY# 29081 R2

JO #00000

scale: as noted

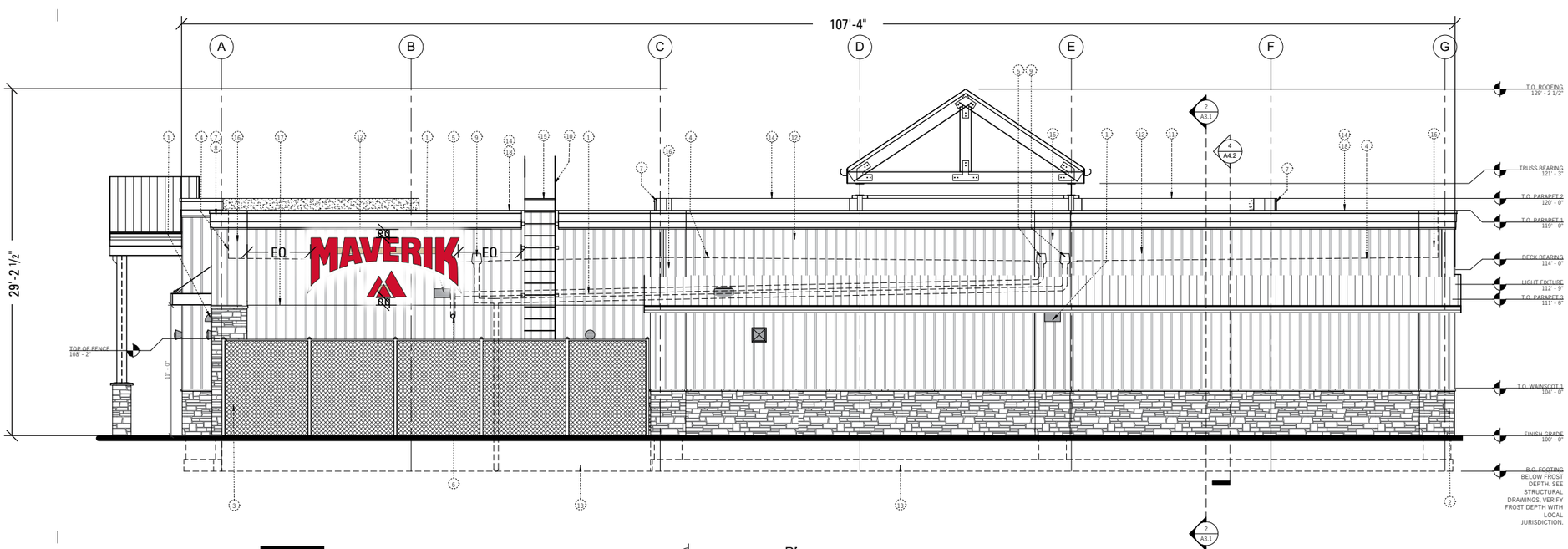
ART 9.0

10.1 SIDE VIEW

10 PAN CHANNEL LETTERS — 51" LETTER SET

SCALE: 3/8" = 1'-0"

THIS ELEVATION IS REPRESENTATIONAL ONLY



10.3 DETAIL ELEVATION

SCALE: 3/32" = 1'-0"

SCOPE OF WORK:

MANUFACTURE & INSTALL *ONE [1]* SET L.E.D. ILLUMINATED PAN CHANNEL LETTERS. MOUNT TO BUILDING ON RACEWAY.

PERMITTING	SIGN AREA: 53.2ft²	ELECTRICAL:	2 Amps 120 V

FINAL ELECTRICAL CONNECTION BY:	YESCO

COLOR KEY - MAVERIK STANDARDS - NEW LOGO

1	PAINT	SHERWIN WILLIAMS# 7020 "BLACK FOX"
	PREPAINT	DURANODIC BRONZE
	VINYL	3M 3630-69 DURANODIC
2	PMS	PANTONE® 186c
	VINYL	3M 3630-33 "RED"
3	PAINT	MATCH PMS 348c/SW#LV5-5074896-389504-A
	VINYL	3M 3630-26 "GREEN"
4	PAINT	DUPONT #K 9441
	VINYL	3M 3630-26 "LT EUROPEAN BLUE"
5	PAINT	SHERWIN WILLIAMS TO MATCH "PMS 427c"
	VINYL	AVERY UC 900-811-T "PANTONE 427c"
6	PMS	PANTONE® 2945c
	VINYL	3M 3630-167 "BRIGHT BLUE"

NOTE: UNLESS OTHERWISE NOTED, THE COLORS DEPICTED ON THIS RENDERING MAY NOT MATCH ACTUAL COLORS ON FINISHED DISPLAY. PLEASE REFER TO COLOR-CALLOUTS AND THEIR APPROPRIATE VENDOR SPECIFIED SAMPLES FOR APPROVED COLOR SPECIFICATIONS

NOTE:

FIELD SURVEY REQUIRED PRIOR TO FABRICATION.

YESCO

DESIGN

1605 South Gramercy Rd.
Salt Lake City, UT 84104
801.487.8481

www.yesco.com

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This sign is installed in accordance with the requirements of Article 600 of the National Electrical Code and / or other applicable local codes. This includes proper grounding and bonding of the sign.

Revisions

No.	Date / Description
orig.	
1	
2	1-24-2020 added this pg-CTL
3	
4	
5	
6	

Approval

A/E Sign / Date

Client Sign / Date

Landlord Sign / Date

Maverik

NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren

Designer: Cheryl Lewis

Orig: 12-19-2019

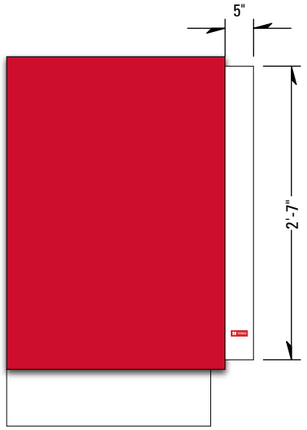
OPY# 29081 **R2**

JO #00000

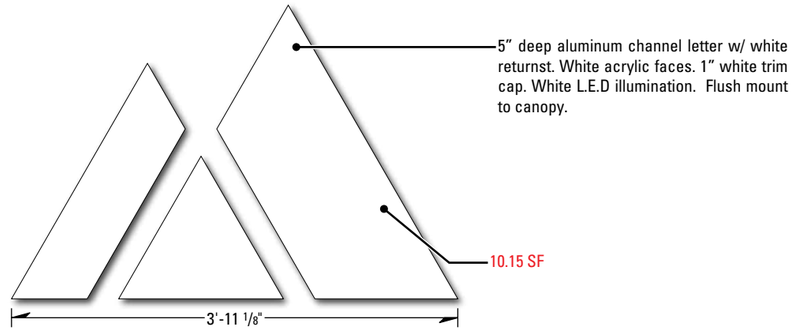
scale: as noted

ART 10.0

This design does not constitute production ready artwork and is to be used exclusively for proofing and review purposes only.

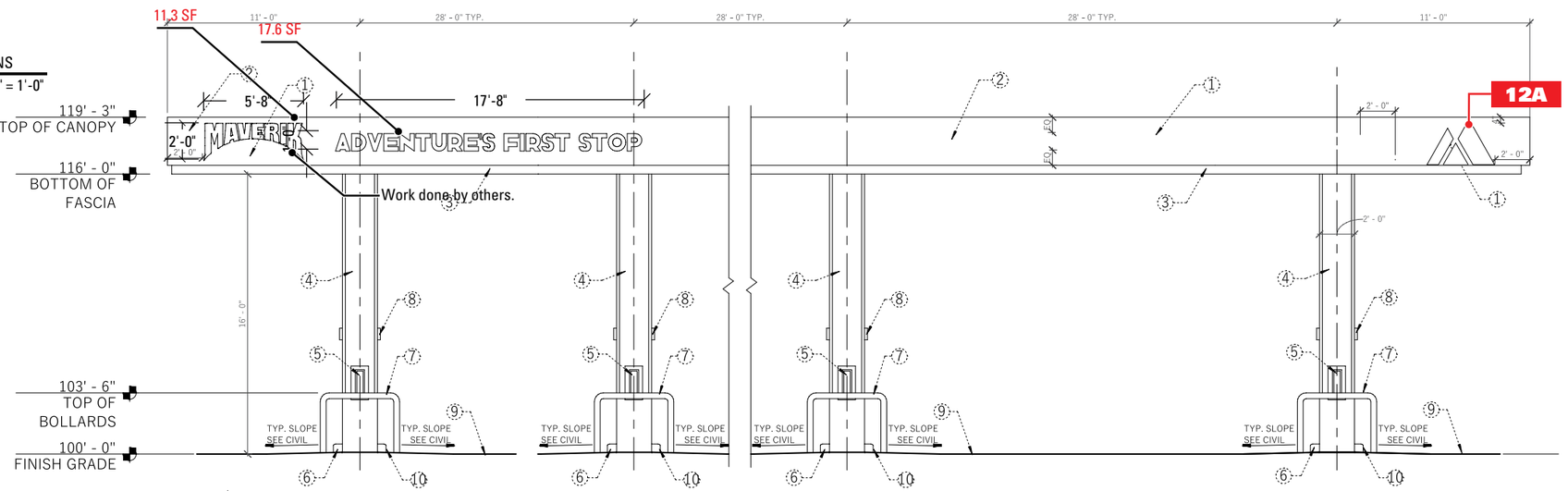


12.1 SIDE VIEW



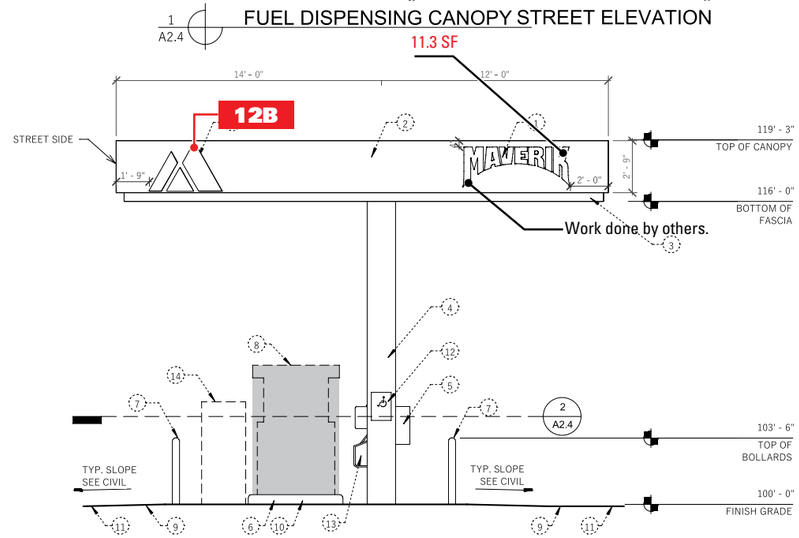
12 A-C ILLUMINATED SUMMIT LOGO
SCALE: 3/4" = 1'-0"

12.2 ELEVATIONS
SCALE: 1/8" = 1'-0"

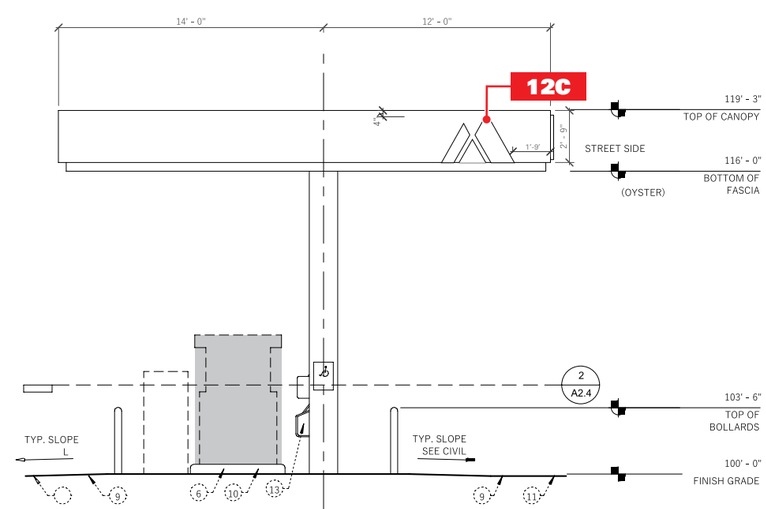


1 A2.4 FUEL DISPENSING CANOPY STREET ELEVATION

THIS ELEVATION IS REPRESENTATIONAL ONLY



4 A2.4 END CANOPY STREET ELEVATION



3 A2.4 END CANOPY LOT ELEVATION

SCOPE OF WORK:

MANUFACTURE & INSTALL *THREE [3]* SETS L.E.D. ILLUMINATED SUMMIT LOGO.
Maverik 11.3 sf x 2=22.6
Summit 10.15 sf x 3=30.45
Adventure... 17.6 sf
Total: 70.65 sf

PERMITTING	SIGN AREA: 10.15ft²	ELECTRICAL:	2 Amps 120 V

FINAL ELECTRICAL CONNECTION BY:	YESCO

NOTE:
FIELD SURVEY REQUIRED PRIOR TO FABRICATION.

YESCO
DESIGN
1605 South Gramercy Rd.
Salt Lake City, UT 84104
801.487.8481
www.yesco.com

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A/E Sign / Date

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Maverik
NW corner Oroville Dam Road
& Feather River Blvd
Oroville, CA

Acct. Exec: Matt Wren
Designer: Cheryl Lewis

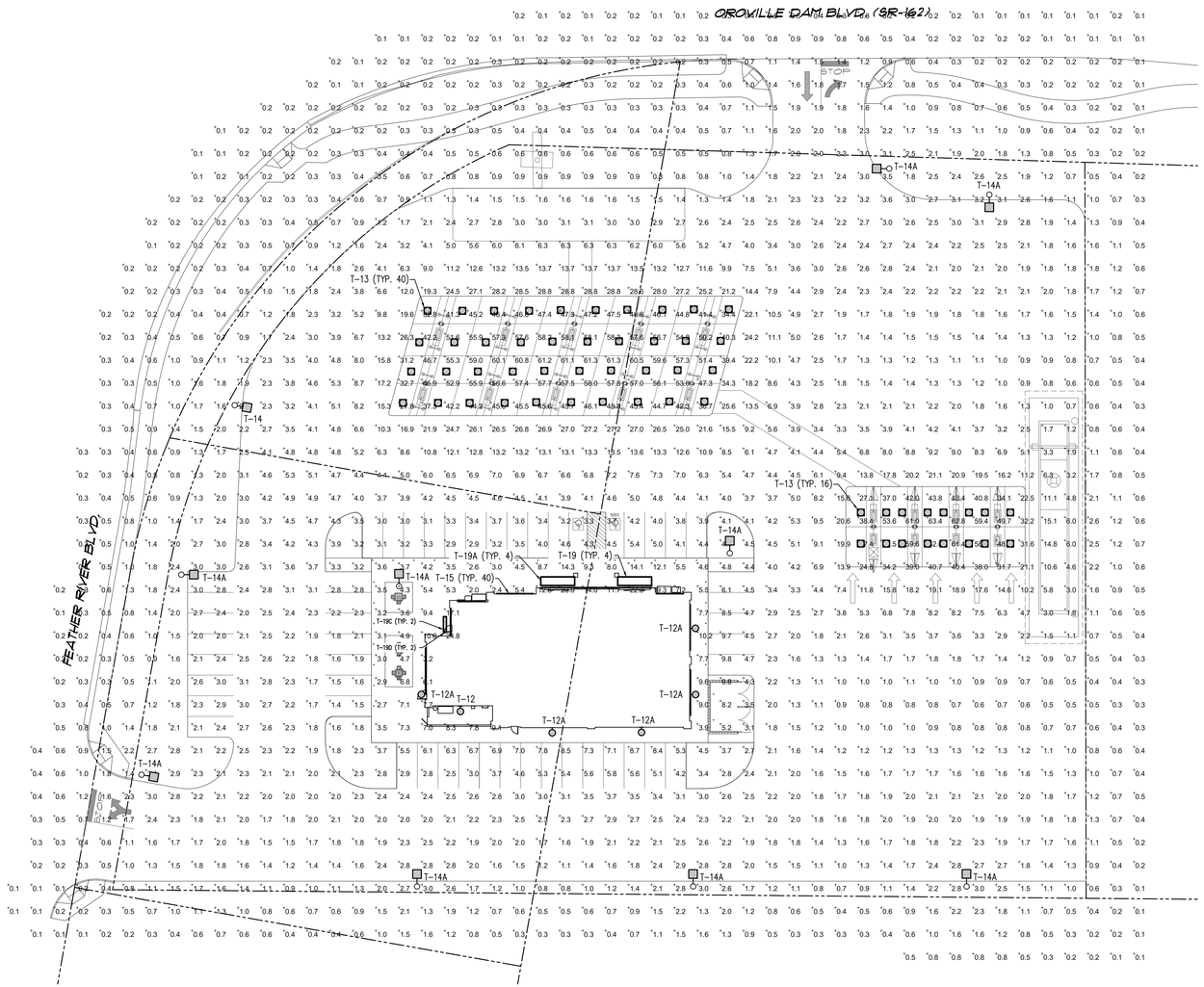
Orig: 12-19-2019

OPY# 29081 R2

JO #00000

scale: as noted

ART 12.0



1 E-1.2 **SITE PHOTOMETRIC PLAN**

SCALE: 1"=30'-0"

MASTER LUMINAIRE SCHEDULE

TYPE	MANUFACTURER	CATALOG NUMBER	VOLTS	MOUNTING	LAMPS	BALLAST	WATTS	IMAGE
DESCRIPT.	LOW PROFILE, FULL CUTOFF WALL PACK , LED, DARK BRONZE, 4K, 7700 LUMENS							
T-12	LITHONIA	DSXW1 LED 20C 1000 40K T3M MVOLT DDBXD	120	WALL	INCLUDED		82	
	LSI	XWM 3 LED 08 40 UE BRZ		HEIGHT SPECIFIED				
	DECO	D444-80-40K-UNV-T3-SCBA		BY ARCHITECT				
T-12A	SAME AS T-12 EXCEPT WITH TYPE IV DISTRIBUTION (FORWARD THROW)						82	
DESCRIPT.	CANOPY MOUNTED, CUTOFF LUMINAIRE, 103W LED, FLAT LENS, FOR SINGLE DECK CANOPIES (15,209 LUMENS)							
T-13	LSI	SCV LED 15L SC UNV DIM 40 WHT	UNV	CANOPY	INCLUDED		103	
DESCRIPT.	POLE MOUNTED, CUTOFF LUMINAIRE SINGLE HEAD, LED, 18,930 LUMENS, 25"FT SQUARE POLE (4", 11 GA.), 4K							
T-14	LITHONIA	DSX1 LED 60C 700 40K T3M MVOLT SPA DDBXD/SSS	208	25'-0" POLE	INCLUDED		103	
		25 4C DM19 DDB						
	LSI	SLM LED 18L SIL 3 UNV 40 70 CRI BRZ						
	CREE	ARE-EDG-3M-DA-10-E-UL-SCBA-525MA-40K/RPSQ-25-4-11-S-CREEFINISH						
T-14A	SAME AS T-14 EXCEPT WITH TYPE IV DISTRIBUTION (FORWARD THROW)						103	
DESCRIPT.	4FT LED STRIP LUMINAIRE, COLD WEATHER (0°F), 3000 LUMENS, DAMP LISTED, LENS (1.78" WIDTH), 4K							
T-15	LITHONIA	TZL1N L96 6000LM FST MVOLT 40K 80CRI WH	UNV	EXTERIOR COVE	INCLUDED		40	
	LSI	MLS4 LED 20L CSM UNV DIM U						
	CREE	LS8-80L-40K-10V						
DESCRIPT.	DIRECT VIEW, RUBBER COATED, OUTDOOR LED TAPE LIGHT							
T-19	KELVIX	DV41K WR 24V CH602 2 WH CP EC 200HD-C2-2-24V	MT	SURFACE	INCLUDED		80	
T-19A	SAME AS T-19 EXCEPT 4'-0"						30	
T-19C	SAME AS T-19 EXCEPT 7'-0"							
T-19D	SAME AS T-19 EXCEPT 1'-6"							

*LUMINAIRES ARE PROVIDED BY OWNER, INSTALLED BY E.C. (REFERENCE SCHEDULE ON E-4.0)

CALCULATION SUMMARY

AREA NAME	GRID / TYPE	SPAC	GROUP	AVE	MAX	MIN	MAX/MIN	AVE/MIN
PARKING	0'-0" / H-H	10.00	<+>	5.5	63.4	0.00	N/A	N/A

Nielson Engineering, Inc.
Consulting Engineers
156 North Twelfth Avenue
Pocatello, Idaho 83201
PHONE (208) 232-2577
FAX (208) 234-0918

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FFKR ARCHITECTS
bogue building
730 pacific avenue
salt lake city
Utah 84104
o 801-521-6186
f 801-539-1916
ffkr.com

MAVERIK

MAVERIK INC.
OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA
PHOTOMETRIC PLAN

SEAL

REGISTERED PROFESSIONAL ENGINEER
MICHAEL S. INGRAM
No. E 20152
ELECTRICAL
STATE OF CALIFORNIA

DATE	STATUS

DATE	REVISION

PROJECT NUMBER	19336
FILE	
DRAWN BY	MJE
CHECKED BY	MSI
SCALE	As indicated

PHOTOMETRIC PLAN

E-1.2

SIERRA NEVADA ARBORISTS

January 27, 2020

Mr. John Vaccaro
Sierra View Construction
4202 Douglas Boulevard., Suite 100
Granite Bay, California 95746

RE: ***Site Visit, Tree Inspection & Arborist Report North West corner of Oroville Dam Blvd. & Feather river Blvd., Oroville, California***

Dear Mr. Vaccaro:

Attached please find the tree inventory and arborist report for the parcel located at the north west corner of Feather River Boulevard and Oroville Dam Boulevard in Oroville, California. The tree inventory includes all trees that meet the criteria of the City of Oroville tree preservation ordinance (muni code chapter 17.12). The scope of the inventory captured trees that are outside the protection of the ordinance in an effort to identify all trees on site measuring 6" dbh and larger to prevent misidentification of any trees.

The inventory includes 20 trees with species as follows – Black Locust 5 trees/ 90 inches; Gray Pine 3 trees/ 76 inches; Western Juniper 2 trees/59 inches; Valley Oak 1 tree/ 6 inches; Blue Oak 1 tree/ 11 inches and Interior Live Oak 8 trees/ 142 inches. Most of the trees are multi stemmed trees with relatively small trunk diameters. Many of the trees have either structural or health problems resulting in low retention ratings. Trees numbered 2 and 11 are the best candidates for retention with number 12 being a possibility.

The inventory data and a location exhibit are attached for your use. Please do not hesitate to contact me should you have any questions.

Very truly yours,

Edwin E. Stirtz
International Society of Arboriculture
Certified Arborist WE-0510A
ISA Tree Risk Assessment Qualified
Member, American Society of Consulting Arborists

Tree No	Protected By Code	Common Name	Diam	Measured At	Measured Canopy Radius	Arborist Rating	Recommend	Notes
1	No	Black locust	20	36	15	1 Extreme Structure or Health Problems	Remove	Decay and co-dominant. One half has been removed.
2	No	Interior live oak	11	54	10	4 Good - No Apparent Problems	Preserve	Young native tree in good condition. Remove dead branches only.
3	No	Black locust	14	54	12	1 Extreme Structure or Health Problems	Remove	Codominant, included bark
4	No	Black locust	23	36	54	2 Major Structure or Health Problems	Remove	Codominant with included bark. Exposed wood with decay.
701	Yes	Grey pine	26	54	25	3 Fair - Minor Problems	Remove	Fairly good structure. Lower limbs are long horizontal and heavy. Undesirable species.
702	Yes	Grey pine	26	54	25	1 Extreme Structure or Health Problems	Remove	Codominant, long heavy limbs, undesireable Species
5	No	Western juniper	11	54	15	1 Extreme Structure or Health Problems	Remove	1/2 of top broke out leaving exposed wood with decay.
6	No	Black locust	23	54	25	1 Extreme Structure or Health Problems	Remove	Extensive decay and split in the middle.
7	Yes	Interior live oak	25	54	10	2 Major Structure or Health Problems	Remove	8,8, and 7" stems from the ground with included bark. Dead branches and poor structure.
8	No	Interior live oak	10	54	12	1 Extreme Structure or Health Problems	Remove	Top of tree is dead. Injuries on the main trunks and branches, probably from squirrel.
703	Yes	Grey pine	24	54	25	3 Fair - Minor Problems	Remove	Fair structure. Slight lean to the south. Undesirable species.
9	No	Interior live oak	18	12	20	2 Major Structure or Health Problems	Remove	C0-dominant stem with included bark.
10	No	Black locust	10	54	54	0 Dead	Remove	Dead
704	Yes	Western juniper	48	54	25	1 Extreme Structure or Health Problems	Impacted	Root collar buried. Injury at base with extensive decay in main trunk. Lower branches broken.
11	No	Blue oak	11	54	20	3 Fair - Minor Problems	Preserve	Outside fence. Fair structure, crowded by multi-stem live oak to the west.
705	Yes	Interior live oak	28	54	54	1 Extreme Structure or Health Problems	Remove	8,7,4,7" multi-stem. From ground. Canopy is in poor condition with squirrel two and broken and dead branches. Poor vigor.
12	No	Interior live oak	19	54	20	3 Fair - Minor Problems	Impacted	Soil around base of tree has been graded and disturbed. Slight lean as a result. Fair vigor good structure except large low limbs.
13	No	Interior live oak	13	54	15	3 Fair - Minor Problems	Remove	Limb structure is crowded at main attachments that all arise at 5 feet. Fair to poor Vigor
14	No	Valley oak	6	6	5	1 Extreme Structure or Health Problems	Remove	Young tree with codominant stems at 12 inches.
15	No	Interior live oak	18	54	10	1 Extreme Structure or Health Problems	Remove	Two stems 10 and 5 inches. Included bark at all main attachments. Fair vigor.

SIERRA VIEW CONSTRUCTION

OROVILLE DAM BOULEVARD 7 FEATHER RIVER BOULEVARD, OROVILLE, CA.

Tree Inventory Exhibit

Prepared by Sierra Nevada Arborists

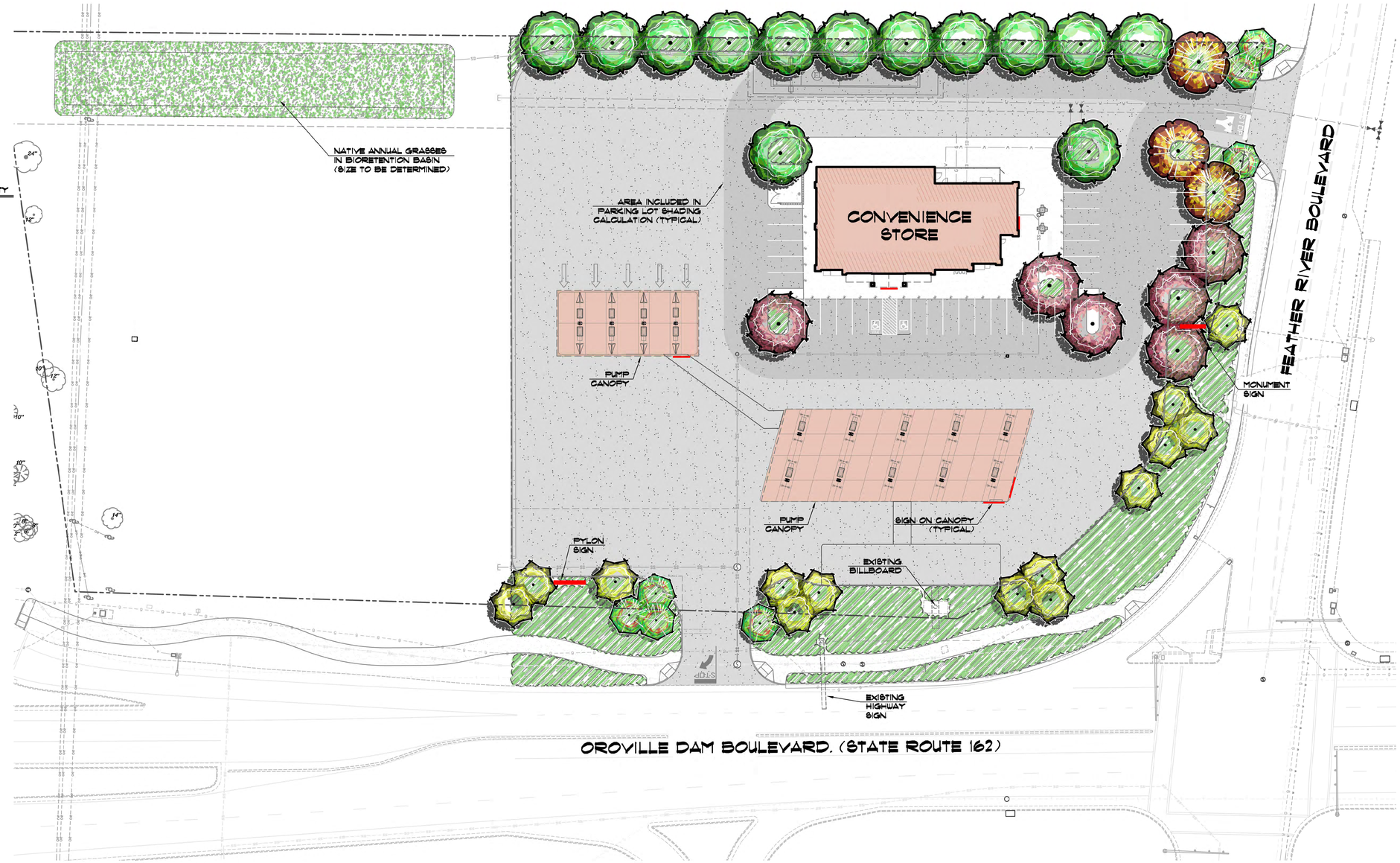
January 27, 2020

PARKING LOT SHADE CALCULATIONS:

TREE TYPE	AREA/ FULL		QUANTITY FULL	3/4	1/2	1/4	SUBTOTAL		TOTAL	
35 ' DIA. TREES										
PISTACHIA CHINENSIS	962	S.F.	1	0	2	0	1924	S.F.		
QUERCUS SUBER	962	S.F.	0	0	9	0	4329	S.F.		
ZELKOVA SERRATA	962	S.F.	2	1	2	0	3608	S.F.		
							35 ' TOTAL:		9861	S.F.
							PARKING AREA:		27479	S.F.
							SHADE REQUIRED:	50%	13739	S.F.
							SHADE PROVIDED:	36%	9861	S.F.

PLANT LIST & LEGEND

SYMBOL	BOTANIC NAME/COMMON NAME	SIZE	QUANTITY
	LAGERSTROEMIA X. 'DYNAMITE/CRAPE MYRTLE	15 GALLON	7
	PARKINSONIA X. 'DESERT MUSEUM/PALO VERDE	15 GALLON	14
	PISTACIA CHINENSIS/CHINESE PISTACHE	15 GALLON	3
	QUERCUS SUBER/CORK OAK	15 GALLON	13
	ZELKOVA SERRATA 'VILLAGE GREEN/SAWLEAF ZELKOVA	15 GALLON	6
	SHRUB & GROUNDCOVER AREA:		
	ACACIA REDOLENS "DESERT CARPET"/PROSTRATE ACACIA	1 GALLON	
	ARCTOSTAPHYLOS D. "HOWARD McMINN"/MANZANITA	5 GALLON	
	BULBINE FRUTESCENS (YELLOW)/CAPE BALSAM	1 GALLON	
	CHONDROPETALUM TECTORUM/DWF. CAPE RUSH	5 GALLON	
	CISTUS PURPUREUS/PURPLE ROCKROSE	5 GALLON	
	CALLISTEMON V. 'LITTLE JOHN'/DWF. BOTTLE BRUSH	5 GALLON	
	COTONEASTER D. "LOWFAST"/PROSTRATE COTONEASTER	1 GALLON	
	CAREX DIVULSA/EURASIAN GRAY SEDGE	1 GALLON	
	DIANELLA REVOLUTA 'BABY BLISS'/BLACK FLAX LILY	1 GALLON	
	HESPERALOE X. 'BRAKE LIGHTS'/HYBRID RED YUCCA	2 GALLON	
	JUNIPERUS C. "SAN JOSE"/SAN JOSE JUNIPER	1 GALLON	
	LOMANDRA LONGIFOLIA 'BREEZE'/DWF. MAT RUSH	1 GALLON	
	LANTANA MONTEVIDENSIS/LANTANA	5 GALLON	
	MUHLENBERGIA CAPILLARIS/PURPLE MUHLY GRASS	1 GALLON	
	NERIUM O. "DWARF RED"/PETITE RED OLEANDER	5 GALLON	
	NANDINA DOMESTICA 'GULF STREAM'/DWF. HEAVENLY BAMBOO	5 GALLON	
	NEPETA X. FAASSENII/CATMINT	1 GALLON	
	PENISETUM M. 'RED BUNNY TAILS'/DWF. FOUNTAIN GRASS	1 GALLON	
	SALVIA X. 'BEE'S BLISS'/CREEPING SAGE	1 GALLON	
	SALVIA MICROPHYLLA 'HOT LIPS'/AUTUMN SAGE	5 GALLON	
	TULBAGHIA VIOLACEA/SOCIETY GARLIC	1 GALLON	
	VERBENA PERUVIANA "HOMESTEAD PURPLE"/HYBRID VERBENA	1 GALLON	



Garth Ruffner Landscape Architect (916) 797-2576
4120 Douglas Blvd., Suite 306, #301, Roseville, CA 95746-5935
GarthRuffner.com California R.L.A. #2808

CARTWRIGHT NOR CAL
CIVIL ENGINEERING & PROJECT MANAGEMENT
4180 DOUGLAS BLVD, SUITE 200
GRANITE BAY, CALIFORNIA 95746
T (916) 978-4001
WWW.CARTWRIGHTENGINEERS.COM

Login Name: gruff
Plot Date: February 03, 2020 - 11:33 am
File Name: J:\2019\39076 Crt, Maverik, Oroville\39076 LA Prelim.dwg

PRELIMINARY LANDSCAPE PLAN
MAVERIK - OROVILLE DAM ROAD

OROVILLE DAM BLVD. & FEATHER RIVER BLVD.
OROVILLE, CA

N

0' 15' 30' 60'
SCALE: 1"=30'

DATE: 2/3/2020
SCALE: 1"=30'
DRAWN BY: GR

City of Oroville

Planning Division - Community Development Department

1735 Montgomery Street
Oroville, CA 95965-4897
(530) 538-2420 FAX (530) 538-2426
www.cityoforoville.org

Donald Rust
DIRECTOR

TRAKIT#:_____-_____

TENTATIVE MAP APPLICATION

(Please print clearly and fill in/provide all that apply)

REQUIRED FOR A COMPLETE APPLICATION	TYPE OF MAP
{ } Completed and signed Application Forms { } Application Fee(s) Paid * Additional fees from the Fire Department and Public Works Division may apply for their review.	Please select all that apply: {X} Tentative Parcel Map: $3,500.34 (Deposit) + $210.02 (6% Tech Fee) = $3,710.36 { } Tentative Subdivision Map: $4,041.06 (Deposit) + $242.46 (6% Tech Fee) = $4,283.52 { } Vesting Tentative Map: (Same as Tentative Subdivision Map)

MAP REQUIREMENTS

The tentative map shall be prepared in a manner acceptable to the city and shall be prepared by a registered civil engineer or licensed land surveyor. The tentative map shall be clearly and legibly drawn and shall contain not less than the following unless requested and specifically waived by the department director:

Four (4) 24" x 36' copies, folded to 8 ½" x 11", and one (4) 8 ½" x 11" copies of the tentative map and grading plan prepared by a Registered civil engineer, drawn to scale and containing the following:

a. Name and address of property owner of record, subdivider and engineer.
b. Project name, date prepared, north arrow, scale, and list of utility purveyors.
c. Vicinity map.
d. Existing zoning and land use.
e. Existing topography, note contour interval of site to 100%, with 2 or 5 foot intervals for slopes greater than 10%.
f. Type, location, and drip line of existing trees over 8 inches in diameter at breast height (DBH).
g. Location of existing structures, including wells and septic system, with notation "to remain" or "to be abandoned / removed."
h. Location, width, and direction of flow of each water course and any area subject to water inundation.
i. Location, width and name of existing streets, right-of-way or pavement.
j. Widths, location and identity of all existing and proposed easements.
k. Proposed street location, grade, centerline and radius of curves, pavement, right-of-way width and street names. Show typical sections of all streets.
l. Location and size of existing and proposed sanitary sewer mains, storm drains and fire hydrants.
m. Lot layout and dimensions including parcel size.
n. Proposed lot grading, building pad elevation, top and toe of cut and fill slopes, and approximate location of street grades. Include a separate grading plan for subdivisions.
o. Proposed trails, parks, school sites, and common areas for public or private use.
p. Phasing sequence, if any.
q. The subdivider, or subdivider's designated agent, shall file a tentative parcel map application with the Zoning Administrator. The submitted material shall conform to the requirements of the Zoning Administrator as to form and content. Rules governing form and content shall conform to the requirements of Section 66445 of the Government Code and shall require enough information to ensure adequate consideration.
r. The subdivider shall specify any deviation from city standards and the justification for such deviation.
s. The name or names of any geologist or soils engineer whose services were required in the preparation of the design of the tentative map.

Upon the written request of the subdivider, the department may waive any of the above tentative map requirements if the department determines that the type of subdivision does not justify compliance with these requirements, or if the department determines that other circumstances justify a waiver. The department may require other drawings, data, or information as deemed necessary by the department to accomplish the purposes of the Subdivision Map Act.

Vesting Tentative Maps are processed in the same manner as regular tentative maps with the exception that all discretionary approvals required prior to issuance of the construction permits must be obtained prior to action of the tentative map. Vesting maps must comply with City requirements and Subdivision Map Act requirements. A Vesting Map protects the right to develop and obtain building permit(s) even if land use regulations change between the time when map approvals are obtained and building permit(s) are issued.

REQUIRED DATA / REPORTS

The tentative map shall be accompanied by the following data and reports:

N/A{ } 1. **Street Names.** A list of proposed street names for any unnamed street or alley for review by the city engineer.

{✓} 2. **Soils Report.** A preliminary soils report prepared in accordance with the provisions of chapter 70 (Excavation and Grading) of the Uniform Building Code shall be submitted. If the preliminary soils report indicates the presence of critically expansive soils or other soil problems which, if not corrected, would lead to structural defects, the soils report accompanying the final map shall contain an investigation of each lot within the subdivision.

{ } 3. **Title Report.** Current Title Report, less than 6 months old.

{✓} 4. **Environmental Review.** Information shall be submitted as required by the department to allow a determination on environmental review to be made in accordance with CEQA. The subdivider shall deposit and pay all fees as may be required for the preparation and processing of environmental review documents.

{✓} 5. **Preliminary Engineering Calculations.** Information shall be submitted as required by the standard engineering specifications to demonstrate the adequacy of the design of the proposed improvements. Such information shall include design parameters and engineering calculations.

N/A{ } 6. **Phasing.** If the subdivider plans to file multiple final maps on the tentative map, he shall submit a written notice to this effect to the community development director.

{✓} 7. **Arborist Report**. If oak trees exist on the property, 3 copies of an Arborist Report.

{ } 8. **Other Reports.** Any other data or reports deemed necessary by the department.

An application will not be considered as complete until all of the information has been submitted to the Planning Department. Information required will vary by type of map (parcel / subdivision). Incomplete applications will not be processed.

REQUIRED DATA / REPORTS

By initialing below, I acknowledge and agree to the following:

RM 1. The applicant shall defend, indemnify, and hold harmless the City, and each of its officers, employees and agents, from and against any and all claims, actions and proceedings, within the time period set forth in Government Code section 66499.37, to attack, set aside, void or annul any of the decisions or determinations which the City makes in connection with the approval of the tentative parcel map or with the adoption of any environmental document relating thereto under the California Environmental Quality Act (CEQA). The applicant shall reimburse the City and each of its officers, employees and agents for any costs, including but not limited to court costs, awards to plaintiff/ petitioner for costs and attorneys' fees and any other litigation expenses that the City may be required to pay to plaintiff/petitioner because of such approval or adoption. The City shall reasonably cooperate in the defense of any such litigation, which duty to cooperate shall include the following:

RM a. The City shall notify the applicant promptly of any claim, action or proceeding of which it becomes aware.

RM b. The City shall have the right to retain legal counsel of its choice, at the sole cost and expense of the City, to defend the City in litigation, but such defense shall not relieve the applicant of any obligation imposed by this indemnity.

RM c. The applicant shall have the right to approve any settlement.

APPLICANT'S SIGNATURE

I hereby certify that the information provided in this application is, to my knowledge, true and correct.

Applicant's Signature: _____ Date: JANUARY 8, 2020

OFFICE USE ONLY

APPROVED BY: _____ DATE: _____

{ } Credit Card #: _____ { } Debit Card #: _____ { } Money Order { } Cash { } Check # _____