

DRAWINGS FOR FERRY LANDSIDE IMPROVEMENT PROJECT IN THE CITY OF SAUSALITO

CITY PROJECT NO. 03.01.001
FERRY TERMINAL AT DOWNTOWN PARKING LOT 1
ANCHOR STREET AND TRACY WAY
JUNE 2024

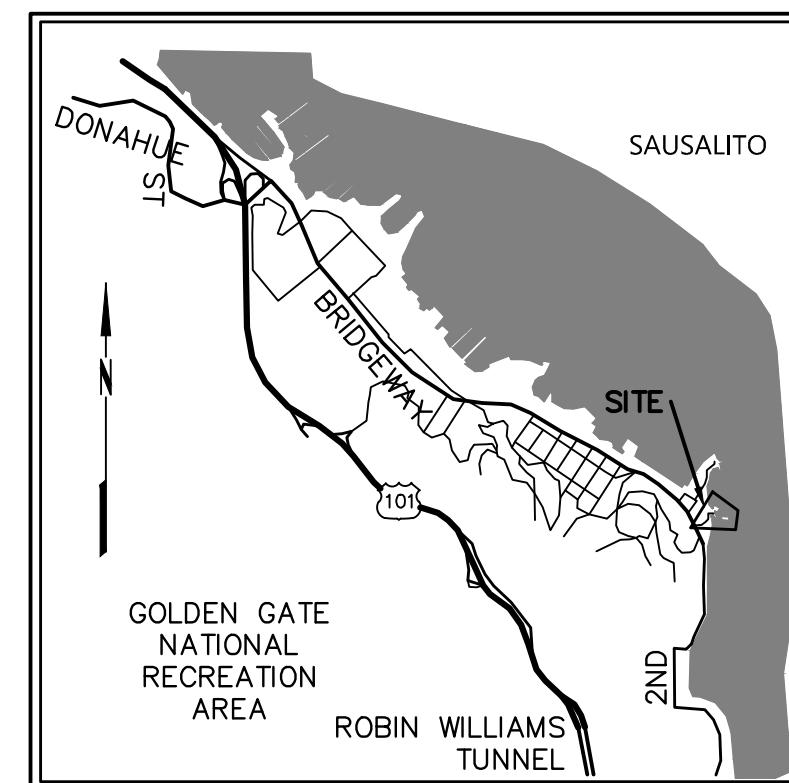


CIVIL ENGINEER: BKF ENGINEERS
200 4TH ST, STE. 300
SANTA ROSA, CA. 95401
PH: (707) 583-8500

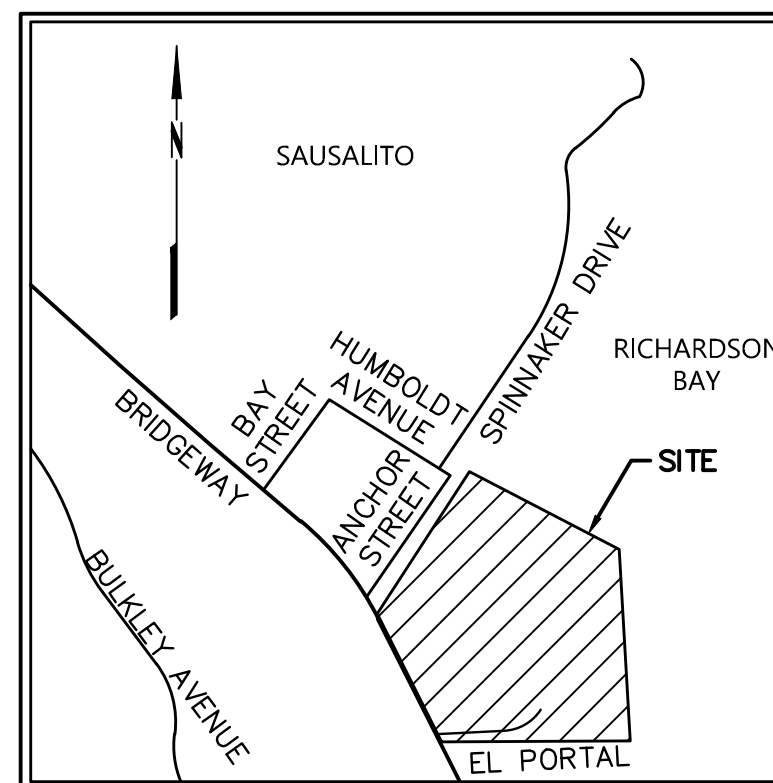
ELECTRICAL ENGINEER: CAPITAL ENGINEERING CONSULTANTS, INC
11020 SUN CENTER DRIVE
RANCHO CORDOVA, CA 95670
PH: (916) 851-3500

LANDSCAPE ARCHITECT: RHAA LANDSCAPE ARCHITECTURE + PLANNING
225 MILLER AVENUE
MILL VALLEY, CA 94941
PH: (415) 383-7900

LAND SURVEYOR: BKF ENGINEERS
200 4TH ST, STE. 300
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LOCATION MAP
NOT TO SCALE



VICINITY MAP
NOT TO SCALE

INDEX OF DRAWINGS

- C1.0 PROJECT INFORMATION
- C2.0 CIVIL GENERAL NOTES, LEGEND, AND ABBREVIATIONS
- C3.0 OVERALL SITE PLAN
- C4.0 BID ALTERNATES PLAN
- C5.0 SITE LAYOUT AND HORIZONTAL CONTROL PLAN
- C6.0 TYPICAL SECTIONS
- C7.0 EXISTING CONDITIONS PLAN
- C8.0 DEMOLITION AND EROSION CONTROL PLAN
- C9.0 GRADING AND UTILITY PLAN
- C9.1 CURB RAMP ENLARGEMENTS
- C9.2 CURB RAMP ENLARGEMENTS
- C10.0 STRIPING AND SIGNAGE PLAN
- C11.0 STORMWATER CONTROL PLAN
- C12.0 CONSTRUCTION STAGING AND PHASING PLAN
- C13.0 CIVIL CONSTRUCTION DETAILS
- L0.0 GENERAL NOTES
- L1.0 TREE PROTECTION & REMOVAL PLAN
- L2.0 CONSTRUCTION PLAN
- L3.0 LANDSCAPE LAYOUT PLAN
- L4.0 IRRIGATION NOTES & LEGEND
- L4.1 IRRIGATION PLAN
- L5.0 PLANTING SCHEDULE & LEGEND
- L5.1 PLANTING PLAN
- L6.0 SITE SECTIONS
- L7.0 LANDSCAPE CONSTRUCTION DETAILS
- L8.0 IRRIGATION DETAILS
- L8.1 IRRIGATION DETAILS
- L8.2 IRRIGATION DETAILS
- L9.0 PLANTING DETAILS
- E0.1 ELECTRICAL NOTES AND LEGEND
- E1.0 ELECTRICAL PLAN
- C14.0 BID ALTERNATE 1
- C14.1 BID ALTERNATE 2
- E1.1 ELECTRICAL BID ALTERNATE 3 PLAN
- E2.0 ELECTRICAL DETAILS
- E3.0 TITLE 24 LTO FORMS
- E3.1 TITLE 24 LTO FORMS

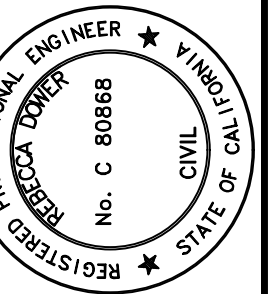
STATEMENT OF APPROVAL

APPROVAL OF THESE PLANS DOES NOT RELEASE THE CONTRACTOR OF THE RESPONSIBILITY FOR CORRECTIONS OF MISTAKES, ERRORS OR OMISSIONS CONTAINED THEREIN. IF DURING THE COURSE OF CONSTRUCTION OF THE IMPROVEMENTS, PUBLIC INTEREST REQUIRES A MODIFICATION FOR A DEPARTURE FROM SPECIFICATIONS AND DETAILS OF THE CITY OF SAUSALITO OR THESE PLANS, THE PUBLIC WORKS DIRECTOR SHALL HAVE THE AUTHORITY TO REQUIRE SUCH MODIFICATION OR DEPARTURE AND TO SPECIFY SUCH MODIFICATION OR DEPARTURE TO SPECIFY THE MANNER IN WHICH THE SAME IS TO BE MADE.

APPROVED FOR THE CITY OF SAUSALITO

BY: _____
KEVIN MCGOWAN
DIRECTOR OF PUBLIC WORKS

DATE



REBECCA DOWER
6/17/2024
C 80868

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FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA

PROJECT INFORMATION

Revisions

No.	Date	By	Reason

Drawing Number:

C1.0

1 OF 37

GENERAL

THE DESIGN PROFESSIONAL WHO PREPARED THESE DRAWINGS IS NOT RESPONSIBLE FOR THE MISUSE OF OR UNAUTHORIZED CHANGES MADE TO THESE DRAWINGS. THE CONTRACTOR SHALL OBTAIN WRITTEN PERMISSION FROM THE DESIGN PROFESSIONAL WHO PREPARED THESE DRAWINGS PRIOR TO MAKING CHANGES.

THE CONTRACTOR SHALL:

FURNISH AND INSTALL MATERIALS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS OF THE CITIES AND COUNTY OF MARIN DATED JUNE 1992, THE UNIFORM CONSTRUCTION STANDARDS OF THE CITIES AND COUNTY OF MARIN DATED MAY 2008, AND THE STATE STANDARD PLANS (CURRENT EDITION) AND STATE STANDARD SPECIFICATIONS (CURRENT EDITION).

OBTAIN RELEVANT PERMITS AND APPROVALS REQUIRED BY GOVERNING AGENCIES PRIOR TO COMMENCING WORK.

ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION FOR THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT APPLIES CONTINUOUSLY, AND IS NOT LIMITED TO NORMAL WORKING HOURS.

HOLD HARMLESS, INDEMNIFY AND DEFEND THE OWNER, THE DESIGN PROFESSIONAL, THEIR CONSULTANTS AND THE CITY OF SAUSALITO, FROM LIABILITY, REAL OR ALLEGED IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE WILLFUL MISCONDUCT OR SOLE NEGLIGENCE OF THE DESIGN PROFESSIONAL.

SUBMIT A TRAFFIC CONTROL PLAN TO THE DEPARTMENT OF PUBLIC WORKS AND OBTAIN APPROVAL PRIOR TO COMMENCING WORK IN THE PUBLIC RIGHT-OF-WAY.

PROVIDE A PROPERLY SIGNED ALTERNATE ACCESSIBLE ROUTE OF TRAVEL IF CONSTRUCTION ACTIVITIES IMPACT PEDESTRIAN ACCESS. THIS REQUIREMENT APPLIES CONTINUOUSLY, AND IS NOT LIMITED TO NORMAL WORKING HOURS.

CONTACT UNDERGROUND SERVICE ALERT (811) AT LEAST 48-HOURS BEFORE EXCAVATING.

PROPERLY MUFFLE EQUIPMENT AND LIMIT CONSTRUCTION HOURS TO 8:00 AM TO 5:00 PM MONDAY THROUGH FRIDAY, AND 9:00 AM TO 4:00 PM ON SATURDAY, EXCLUDING HOLIDAYS. THIS RESTRICTION INCLUDES THE STARTUP OF MOTOR VEHICLES AND OTHER HEAVY EQUIPMENT.

REPAIR DAMAGE TO FACILITIES OCCURRING AS A RESULT OF CONSTRUCTION ACTIVITIES TO RETURN THEM TO THEIR CONDITION PRIOR TO CONSTRUCTION. IF THE CONTRACTOR DOES NOT ACT PRUDENTLY, THE CITY OF SAUSALITO MAY, AT ITS DISCRETION PERFORM THE CORRECTION AND CHARGE THE CONTRACTOR FOR COSTS INCURRED.

PROVIDE RECORD DRAWINGS TO THE OWNER'S REPRESENTATIVE WHICH INCLUDE IMPROVEMENTS WHICH DEVIATE FROM AND IMPROVEMENTS NOT SHOWN ON THE ORIGINAL DESIGN DRAWINGS.

GRADING

PERFORM GRADING TO WITHIN 0.10-FEET OF THE LINES AND ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS.

REMOVE MATERIAL WHICH WILL NOT BE USED ON SITE AS IT IS EXCAVATED AND DISPOSE OF IN ACCORDANCE WITH THE GOVERNING AGENCY'S REQUIREMENTS.

MAINTAIN A CLEAN CONSTRUCTION SITE TO PREVENT THE INTRODUCTION OF FOREIGN MATERIALS INTO THE STORM WATER CONVEYANCE SYSTEM. ACTIVITY DURING CONSTRUCTION WHICH RESULTS IN THE DISCHARGE OF POLLUTANTS TO THE STORM WATER CONVEYANCE SYSTEM IS IN VIOLATION OF THE MARIN COUNTY CODE OF ORDINANCES AND THE SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD'S REGULATIONS.

PROVIDE DUST CONTROL THROUGHOUT THE DURATION OF THE CONSTRUCTION PROJECT TO MINIMIZE AIRBORNE POLLUTANTS.

STOP WORK IF CONTAMINATED MATERIAL IS ENCOUNTERED. PREPARE A WORK PLAN AND ACQUIRE APPROVAL IN WRITING FROM THE CITY OF SAUSALITO FIRE DEPARTMENT AND THE SAN FRANCISCO BAY REGIONAL WATER QUALITY CONTROL BOARD PRIOR TO RESUMING WORK.

STOP WORK AND NOTIFY THE OWNER'S REPRESENTATIVE AND THE CITY OF SAUSALITO LIAISON IF REMAINS OF PREHISTORIC OR HISTORIC HUMAN ACTIVITIES ARE ENCOUNTERED. CONTACT THE MARIN COUNTY CORONER IF HUMAN REMAINS ARE ENCOUNTERED. THE OWNER WILL RETAIN THE SERVICES OF A QUALIFIED ARCHAEOLOGIST APPROVED BY THE CITY OF SAUSALITO TO EVALUATE THE SITUATION AND MAKE RECOMMENDATIONS FOR TREATMENT OF THE RESOURCE. THE CONTRACTOR SHALL PROCEED WITH WORK AT THE OWNER'S DIRECTION IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE ARCHAEOLOGIST.

UTILITIES

EXPOSE EXISTING UTILITIES PRIOR TO TRENCHING TO VERIFY THE ALIGNMENTS AND ELEVATIONS OF THE UTILITIES, AND TO VERIFY DESIGN ASSUMPTIONS. EXISTING UTILITIES MAY REQUIRE RELOCATION AND/OR PROPOSED IMPROVEMENTS MAY REQUIRE GRADE OR ALIGNMENT REVISION DUE TO FIELD CONDITIONS. IF THE EXPOSED UTILITY IS DETERMINED TO BE IN A LOCATION WHICH IS NOT REFLECTED BY THE CONSTRUCTION DOCUMENTS, NOTIFY THE ENGINEER IN WRITING SO THAT APPROPRIATE ADJUSTMENTS CAN BE MADE.

REPORT UTILITY CONFLICTS TO THE OWNER'S REPRESENTATIVE IN WRITING AS THEY ARE ENCOUNTERED SO THAT THE OWNER AND OWNER'S REPRESENTATIVE CAN MAKE A DECISION AS TO HOW THE CONTRACTOR SHOULD PROCEED WITH THE WORK.

UNLESS OTHERWISE NOTED, PROVIDE CLASS III REINFORCED CONCRETE PIPE (RCP), OR HIGH DENSITY POLYETHYLENE PIPE (HDPE) WHERE ANNOTATED AS STORM DRAIN (SD) ON THE CONSTRUCTION DRAWINGS.

PROVIDE TRENCHING IN ACCORDANCE WITH THE UNIFORM CONSTRUCTION STANDARDS OF THE CITIES AND COUNTY OF MARIN DRAWING NUMBERS 330, 340 AND 350.

EXISTING UNDERGROUND FACILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE AND HAVE BEEN LOCATED BASED ON TOPOGRAPHIC FEATURES AND AVAILABLE INFORMATION. THE PROFESSIONAL WHO PREPARED THESE DRAWINGS, THE OWNER, AND THE CITY OF SAUSALITO ASSUME NO RESPONSIBILITY FOR THE ACCURACY OF THESE FACILITIES OR FOR THE INADVERTENT OMISSION OF RELATED INFORMATION.

THE CONTRACTOR IS CAUTIONED NOT TO ORDER PRECAST ITEMS OR INSTALL IMPROVEMENTS UNTIL CONFLICTS ARE RESOLVED. IMPROVEMENTS INSTALLED OR ORDERED PRIOR TO CONFLICT RESOLUTION SHALL BE DONE SOLELY AT THE CONTRACTOR'S RISK AND AT NO EXPENSE TO THE OWNER, THE DESIGN PROFESSIONAL, OR THE CITY OF SAUSALITO.

UTILITY CONFLICTS MAY OCCUR IN THOSE INSTANCES WHERE TWO GRAVITY UTILITIES CROSS AND LACK THE REQUIRED SEPARATION, OR IN THOSE INSTANCES WHERE AN EXISTING UTILITY HAS NOT BEEN IDENTIFIED IN THE CONSTRUCTION DOCUMENTS.

CROSSING UTILITIES WHICH HAVE BEEN IDENTIFIED IN THE CONSTRUCTION DOCUMENTS MAY NOT BE CONSTRUED AS UTILITY CONFLICTS. THE CONTRACTOR SHALL INSTALL GRAVITY UTILITIES TO THE LINES AND ELEVATIONS IDENTIFIED IN THE CONSTRUCTION DOCUMENTS AND INSTALL OTHER UTILITIES ABOVE OR BELOW GRAVITY UTILITIES WHILE COMPLYING WITH THE MINIMUM COVER REQUIREMENTS FOR EACH UTILITY INSTALLED.

UTILITY LENGTHS SHOWN REFLECT ROUNDED LENGTHS MEASURED HORIZONTALLY BETWEEN THE CENTERS OF STRUCTURES. THE CONTRACTOR SHALL VERIFY SLOPED UTILITY LENGTHS IN THE FIELD PRIOR TO ORDERING MATERIAL.

STRIPING AND SIGNING

STRIPING, PAVEMENT MARKINGS AND SIGNING SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE CALTRANS STANDARD PLANS AND STANDARD SPECIFICATIONS, THE CURRENT EDITION OF THE CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

MAPPING

PRESERVE AND PERPETUATE EXISTING SURVEY MONUMENTATION WHICH WILL BE DISTURBED OR REMOVED TO FACILITATE THE PROPOSED IMPROVEMENTS. CITY HAS RETAINED THE SERVICES OF A LICENSED LAND SURVEYOR TO LOCATE SAID MONUMENTATION PRIOR TO DISTURBANCE. TO RE-ESTABLISH MONUMENTATION WHICH HAS BEEN DISTURBED AS A RESULT OF PROJECT CONSTRUCTION AND TO FILE THE APPROPRIATE DOCUMENTATION, PURSUANT TO BUSINESS AND PROFESSIONS CODE SECTION 8771, WITH THE MARIN COUNTY RECORDER ONCE CONSTRUCTION IS COMPLETE.

CITY OF SAUSALITO MONUMENTS ARE TO BE REPLACED IN ACCORDANCE WITH 2018 MARIN COUNTY UNIFORM CONSTRUCTION STANDARD DWG. NO. 300.

NATIONAL GEODETIC SURVEY (NGS) BENCHMARK PID HT1071 IS TO BE REPLACED IN ACCORDANCE WITH "BENCH MARK RESET PROCEDURES" PUBLISHED BY NGS IN 2011.

TOPOGRAPHIC INFORMATION SHOWN HEREON WAS OBTAINED FROM THE MAP PREPARED FOR THE SAUSALITO TERMINAL OF THE GOLDEN GATE FERRY IMPROVEMENT PROJECT PREPARED IN 2010 AND THE MUNI LOT 2 IMPROVEMENTS PROJECT PREPARED IN 2019 AND SUPPLEMENTED BY A FIELD SURVEY CONDUCTED BY BKF ENGINEERS IN SEPTEMBER 2020.

TREE TRUNK DIAMETERS ARE REFLECTED GRAPHICALLY AND WERE MEASURED AT CHEST HEIGHT (±48-INCHES). DRIPLINE DIAMETERS AND TREE SPECIES ARE APPROXIMATE ONLY AND SHOULD BE VERIFIED BY A CERTIFIED ARBORIST.

BENCHMARK: THE ELEVATIONS SHOWN HEREON ARE BASED ON A FOUND NGS BENCHMARK, NGS PID HT1074, NOAA PID 941 4806 TIDAL 30, STAMPED '30 1936', BEING A TIDAL STATION DISK FOR TIDE STATION, ID 9414806, SAUSALITO, SAN FRANCISCO BAY, AND HAVING A PUBLISHED ELEVATION OF 15.85 FEET (DATUM = MLLW, TIDAL EPOCH 1983-2001).

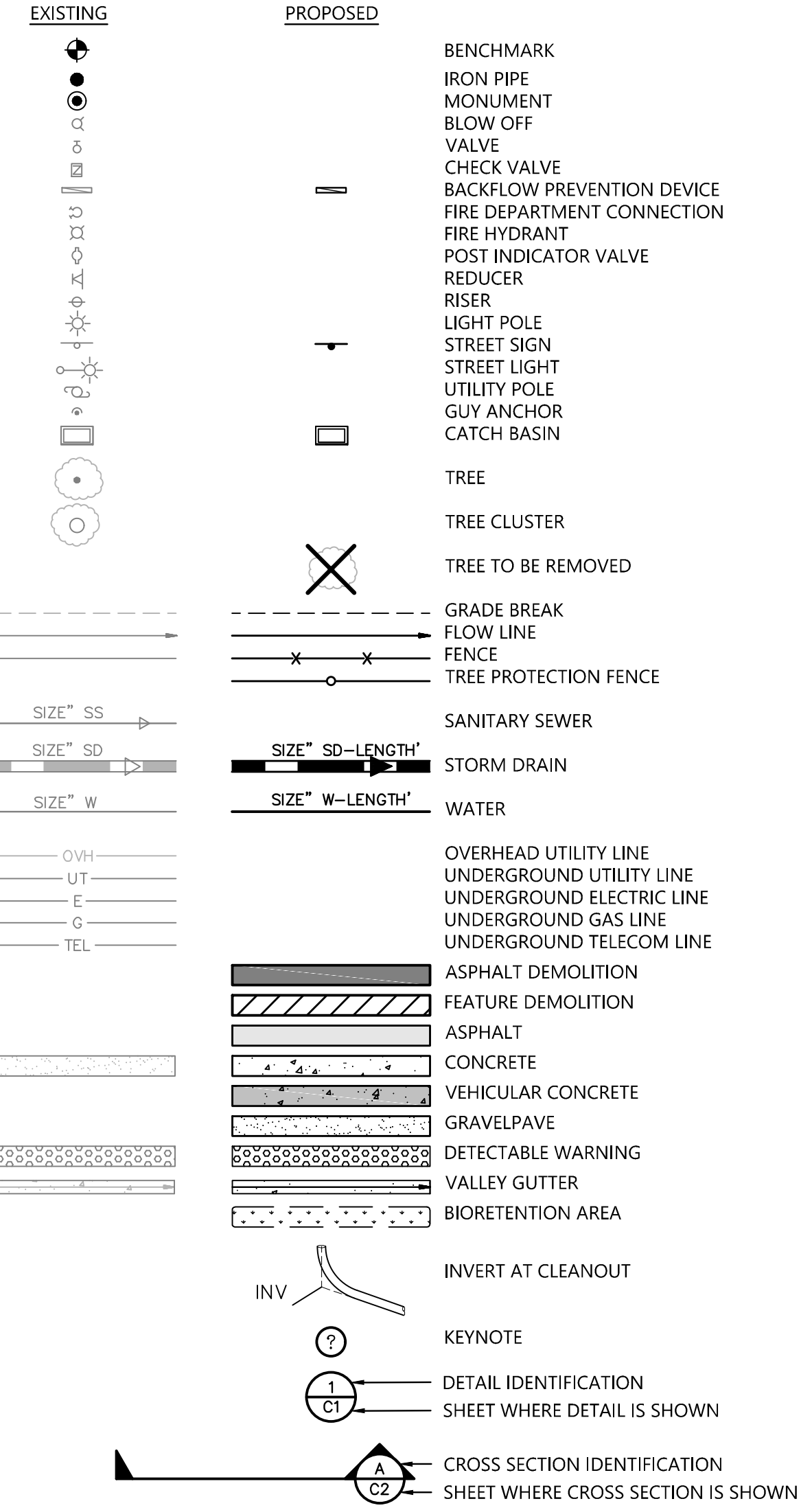
BASIS OF BEARINGS: THE BEARING OF N 56°08'46.5" W AS SHOWN ON THE RECORD OF SURVEY MAP FILED IN BOOK 3 OF SURVEYS AT PAGE 3, MARIN COUNTY RECORDS, BETWEEN FOUND MONUMENTS ON HUMBOLDT AVENUE AT JOHNSON STREET AND BAY STREET.

ABBREVIATIONS

± MORE OR LESS
AB AGGREGATE BASE
AC ASPHALT CONCRETE
AD AREA DRAIN
APN ASSESSOR'S PARCEL NUMBER
BD BRASS DISK
BFP BACKFLOW PREVENTER
BLDG BUILDING
BLRD BOLLARD
BM BENCHMARK
C COMPACT
CB CATCH BASIN
CL2 CLASS II
CO CLEAN OUT
COMM COMMUNICATIONS
CONC CONCRETE
DIA DIAMETER
DYL DOUBLE YELLOW LINE
E ELECTRIC
EP EDGE OF PAVEMENT
EX EXISTING
FF FINISHED FLOOR
FG FINISHED GRADE
FT FOOT
GB GRADE BREAK
GI GRATE INLET
HB HOSE BIB
IN INCH
INV BOTTOM INSIDE OF PIPE

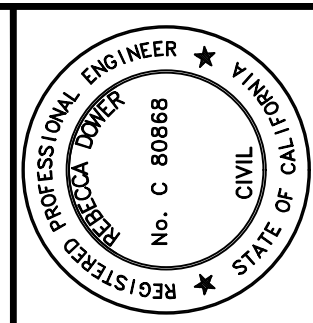
IR IRRIGATION
LF LINEAR FOOT
MAX MAXIMUM
MH MANHOLE
MIN MINIMUM
NO NUMBER
NTS NOT TO SCALE
PG&E PACIFIC GAS & ELECTRIC
R RADIUS
RWL RAIN WATER LEADER
S= SLOPE
SL STREET LIGHT
SD STORM DRAIN
SDCO STORM DRAIN CLEAN OUT
SDMH STORM DRAIN MANHOLE
SS SANITARY SEWER
SSCO SANITARY SEWER CLEAN OUT
SSMH SANITARY SEWER MANHOLE
TB TOP OF BOX
TC TOP FACE OF CURB
TEL TELECOMMUNICATION LINE
TG TOP OF GRATE
TYP TYPICAL
UB UTILITY BOX
VLT VAULT
W WATER
WL WHITE LINE
WM WATER METER

SYMBOLS & LEGEND



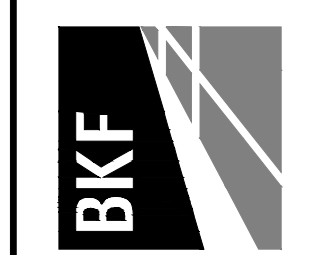
MATERIALS TABLE with columns: SURFACE TYPE, LOCATION, THICKNESS, CL2 BASE ROCK, NOTE. Includes rows for PEDESTRIAN CONCRETE, VEHICULAR CONCRETE, and PARKING AND DRIVEWAYS.

- 1. REFER TO THE LANDSCAPE DRAWINGS AND SPECIFICATIONS FOR JOINT DETAILS AND CONCRETE FINISH.
2. PROVIDE NUMBER 4 BARS AT 12-INCH ON CENTER AND EXPANSION JOINTS IN ACCORDANCE WITH THE CALTRANS STANDARD SPECIFICATIONS. CONCRETE TO HAVE A BROOMED FINISH.
3. 2-POUND DAVIS BLACK #8084 (OR EQUIVALENT) PER CUBIC YARD OF CONCRETE SHALL BE ADDED TO THE MIX.



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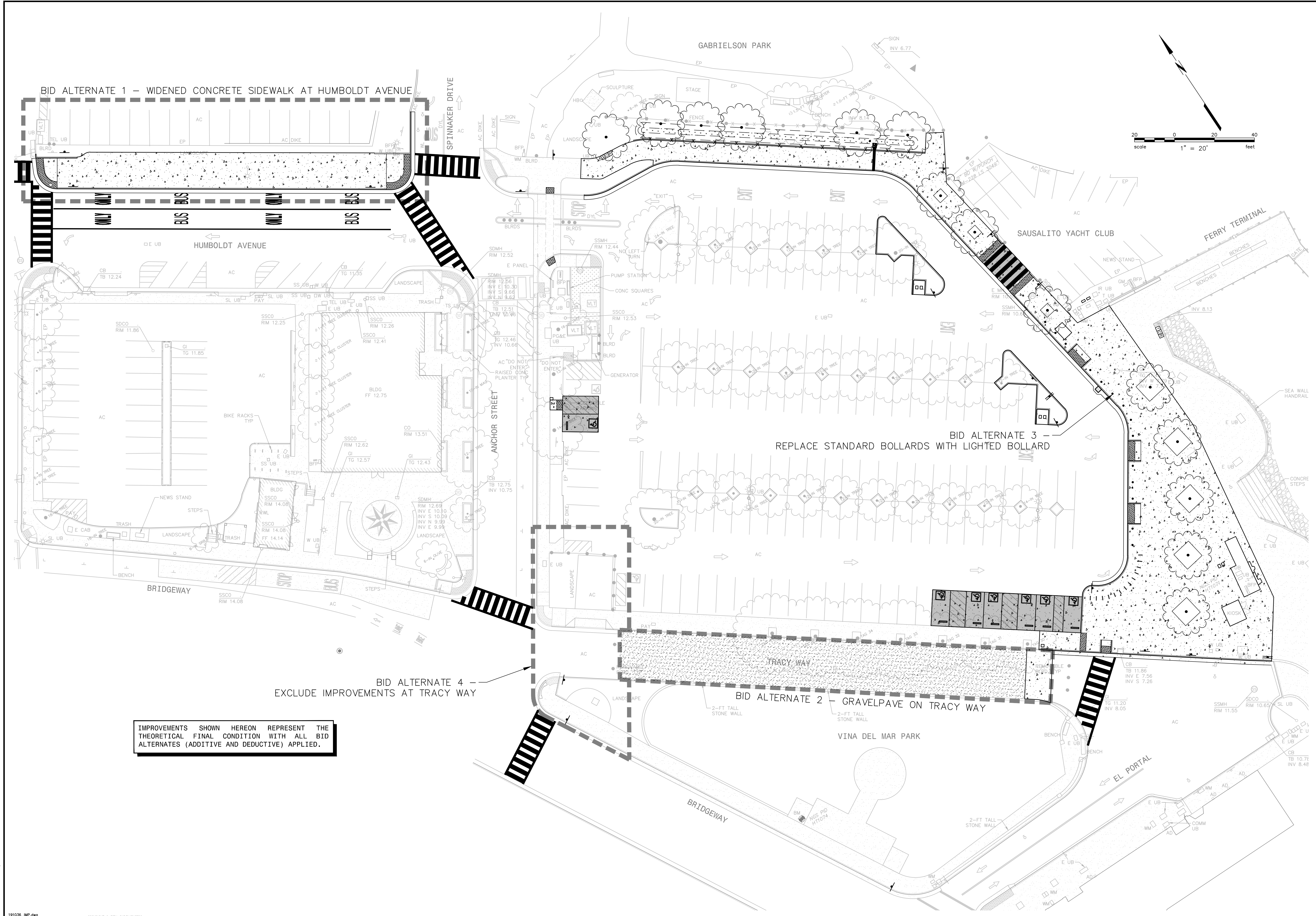


FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
CIVIL GENERAL NOTES, LEGEND, AND ABBREVIATIONS

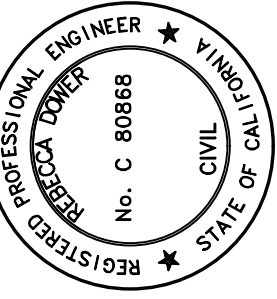
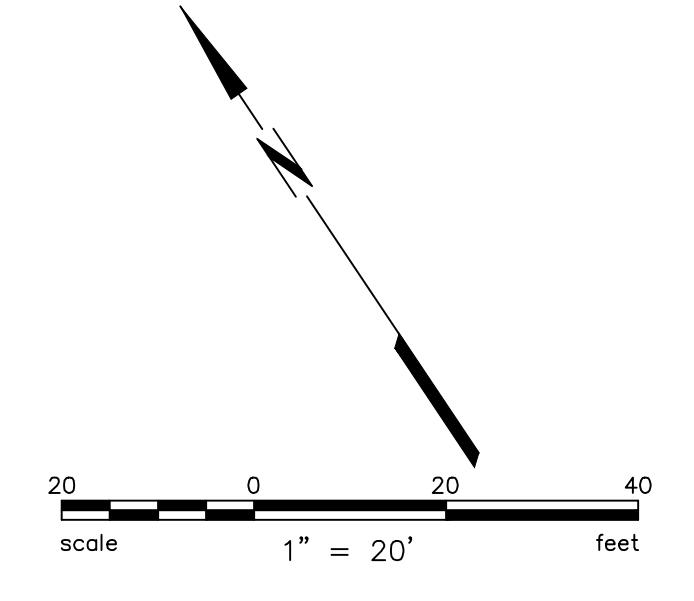
Revisions table with columns: No., Date, Description. Includes entries for AS SHOWN, Design: BD, Drawn: SR, Approved: BD, Job No: 20191036.

Drawing Number: C2.0
2 OF 37

Plot: Jun 14, 2024 at 11:31am



IMPROVEMENTS SHOWN HEREON REPRESENT THE THEORETICAL FINAL CONDITION WITH ALL BID ALTERNATES (ADDITIVE AND DEDUCTIVE) APPLIED.



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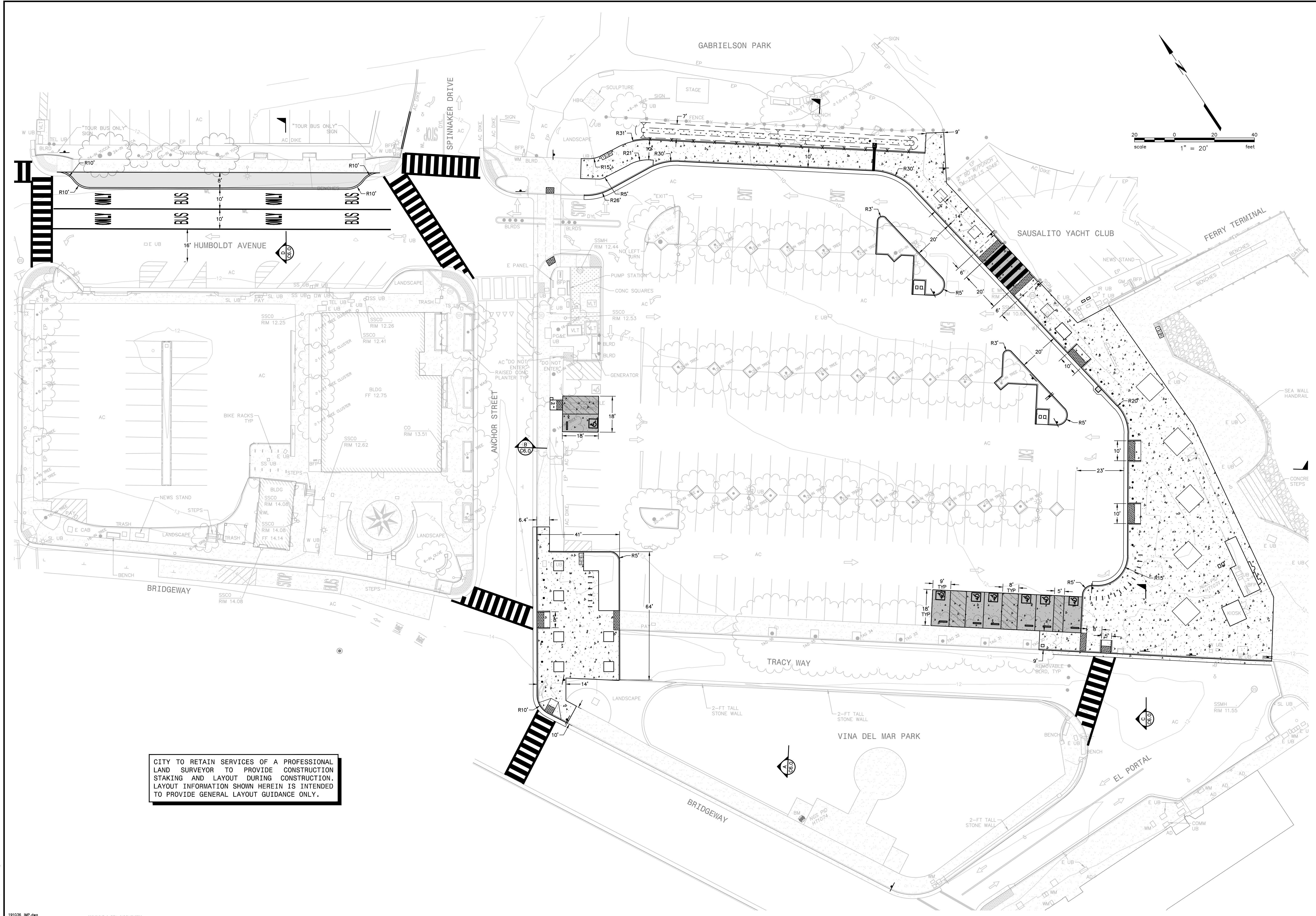
FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA

BID ALTERNATES PLAN

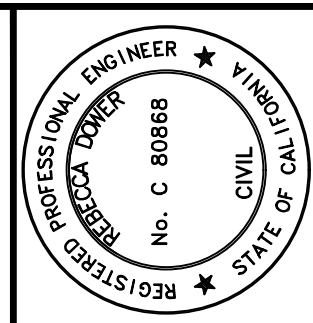
No.	Revisions

Date: JUNE 2024
Scale: AS SHOWN
Design: BD
Drawn: SR
Approved: BD
Job No: 20191036

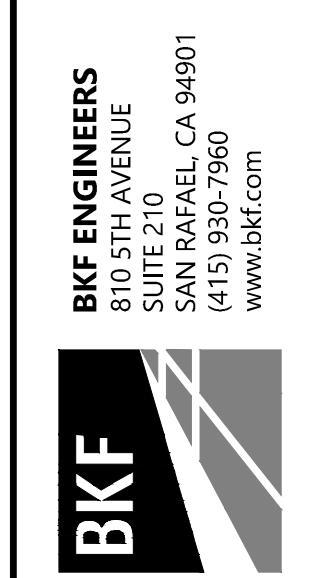
Drawing Number:
C4.0
4 OF 37



CITY TO RETAIN SERVICES OF A PROFESSIONAL LAND SURVEYOR TO PROVIDE CONSTRUCTION STAKING AND LAYOUT DURING CONSTRUCTION. LAYOUT INFORMATION SHOWN HEREIN IS INTENDED TO PROVIDE GENERAL LAYOUT GUIDANCE ONLY.



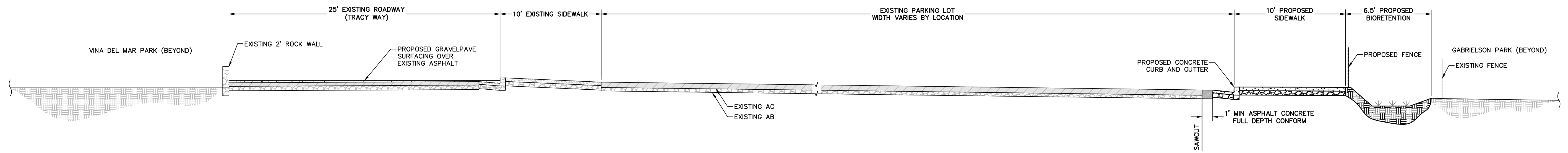
REBECCA DOWER
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6/17/2024



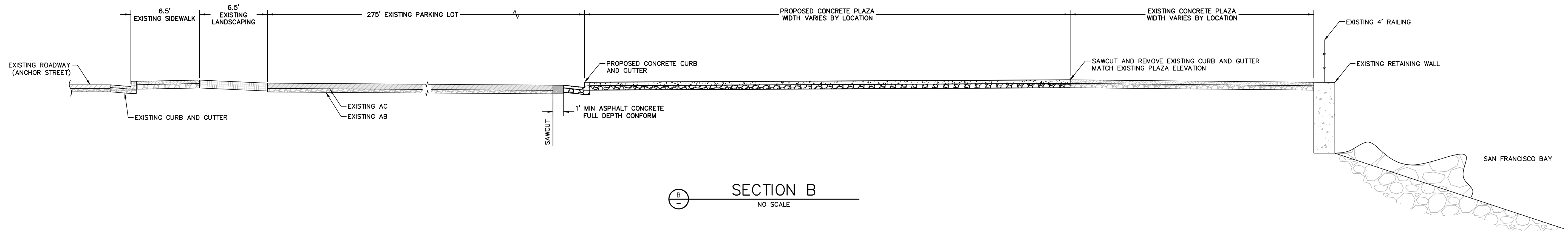
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SAUSALITO, CALIFORNIA
SITE LAYOUT AND HORIZONTAL CONTROL PLAN

Revisions	
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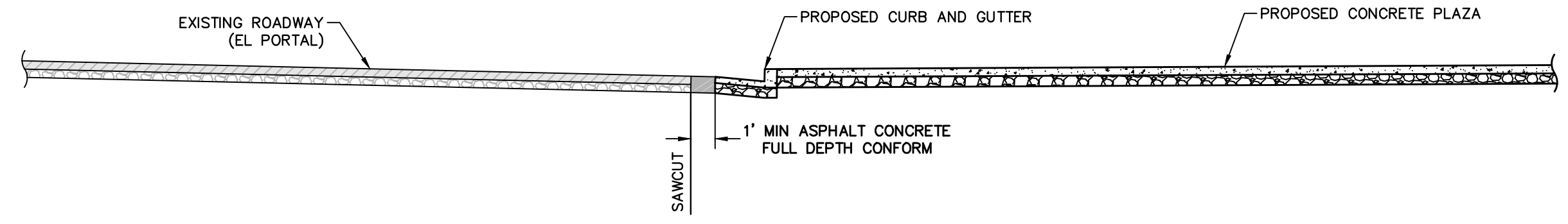
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Design: BD	Drawn: SR
Approved: BD	Job No: 20191036
Drawing Number: C5.0	
5 OF 37	



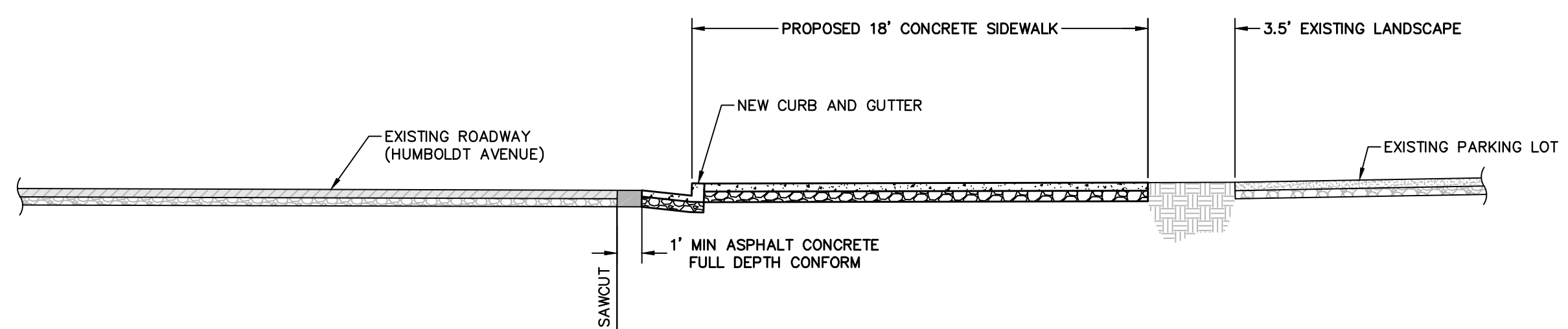
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SECTION B
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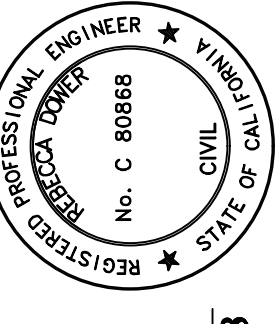


SECTION C
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SECTION D
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REFER TO SHEET C5.0 FOR SECTION CUT LOCATIONS.



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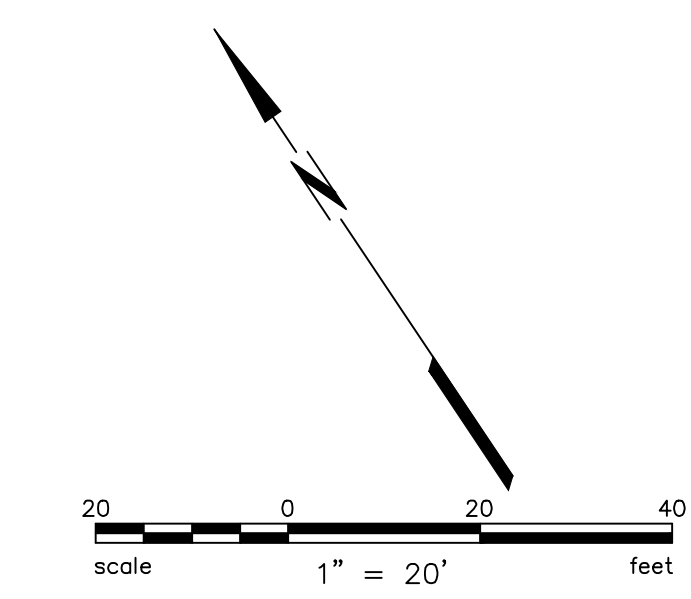
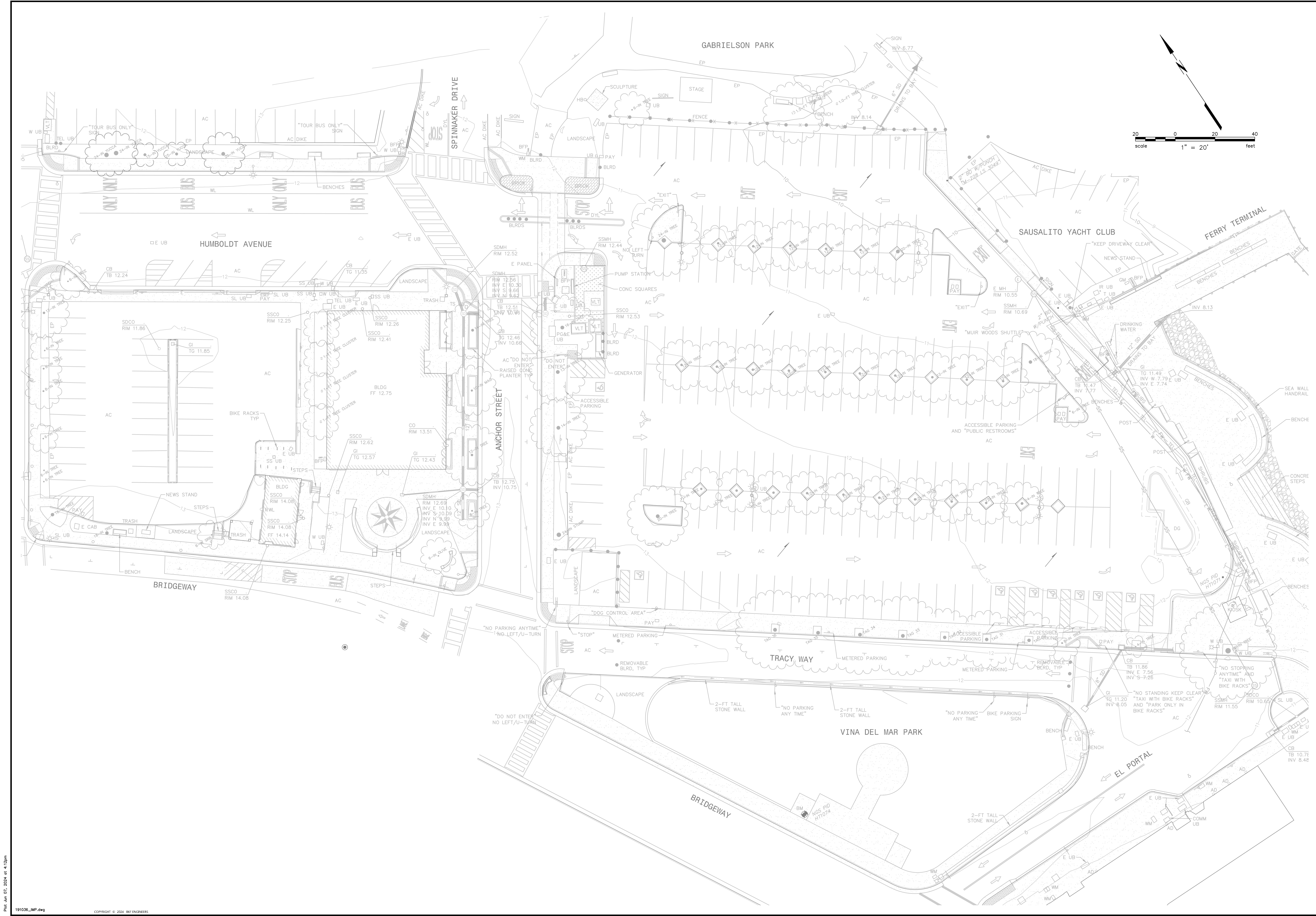


FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA

Revisions	No.	Date	By	Check

Date: JUNE 2024
Scale: AS SHOWN
Design: BD
Drawn: SR
Approved: BD
Job No: 20191036

Drawing Number:
C6.0
6 OF 37



REGISTERED PROFESSIONAL ENGINEER
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 No. C 80868
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 STATE OF CALIFORNIA

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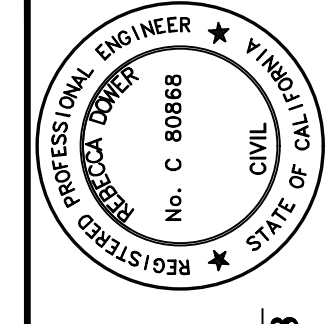
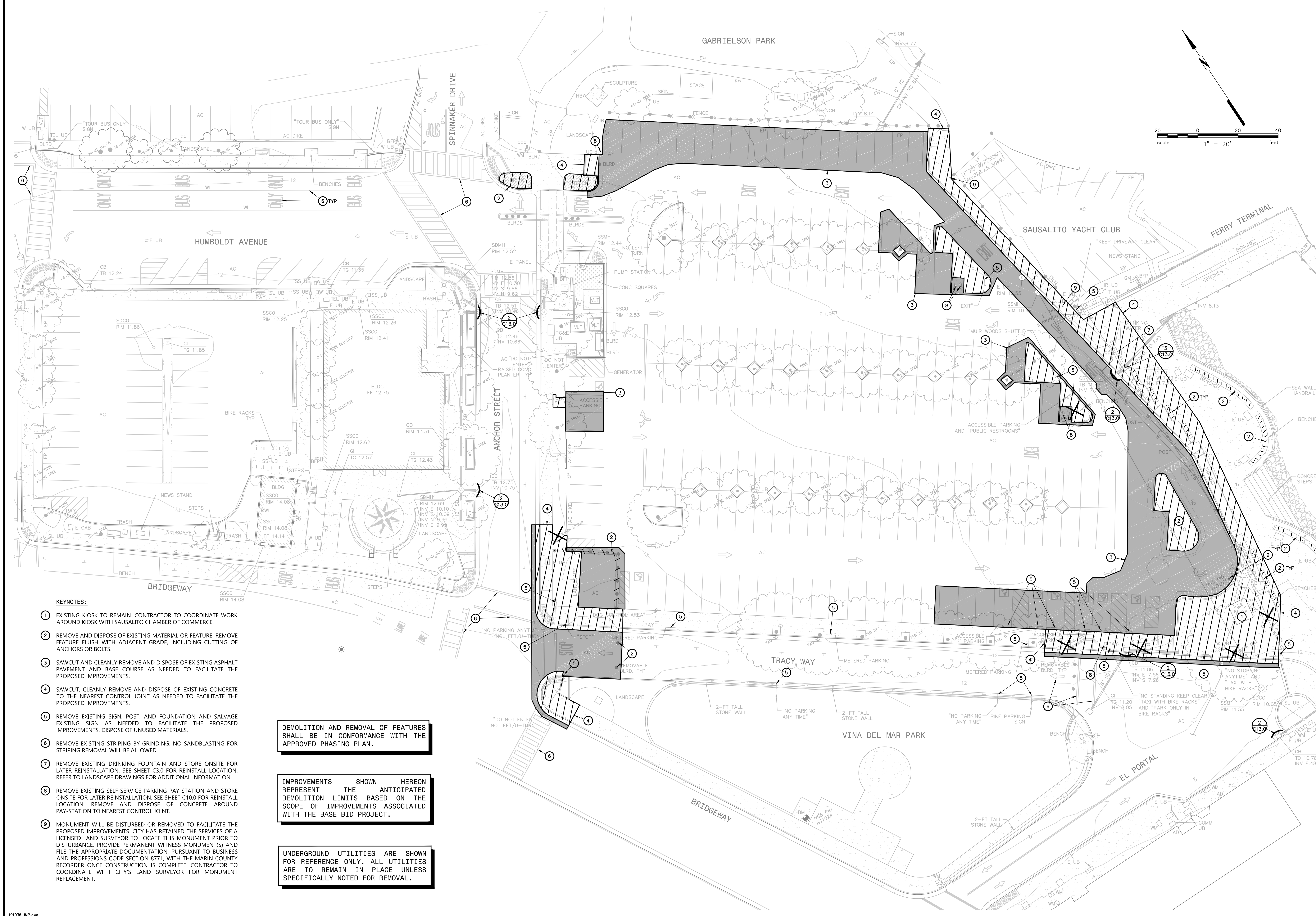
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FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA

EXISTING CONDITIONS PLAN

Revisions	
No.	Description

Date: JUNE 2024	Scale: AS SHOWN
Design: BD	Drawn: SR
Approved: BD	Job No: 20191036
Drawing Number:	
C7.0	
7 OF 37	



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FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA
DEMOLITION AND EROSION CONTROL PLAN

- KEYNOTES:**
- 1 EXISTING KIOSK TO REMAIN. CONTRACTOR TO COORDINATE WORK AROUND KIOSK WITH SAUSALITO CHAMBER OF COMMERCE.
 - 2 REMOVE AND DISPOSE OF EXISTING MATERIAL OR FEATURE. REMOVE FEATURE FLUSH WITH ADJACENT GRADE, INCLUDING CUTTING OF ANCHORS OR BOLTS.
 - 3 SAWCUT AND CLEANLY REMOVE AND DISPOSE OF EXISTING ASPHALT PAVEMENT AND BASE COURSE AS NEEDED TO FACILITATE THE PROPOSED IMPROVEMENTS.
 - 4 SAWCUT, CLEANLY REMOVE AND DISPOSE OF EXISTING CONCRETE TO THE NEAREST CONTROL JOINT AS NEEDED TO FACILITATE THE PROPOSED IMPROVEMENTS.
 - 5 REMOVE EXISTING SIGN, POST, AND FOUNDATION AND SALVAGE EXISTING SIGN AS NEEDED TO FACILITATE THE PROPOSED IMPROVEMENTS. DISPOSE OF UNUSED MATERIALS.
 - 6 REMOVE EXISTING STRIPING BY GRINDING. NO SANDBLASTING FOR STRIPING REMOVAL WILL BE ALLOWED.
 - 7 REMOVE EXISTING DRINKING FOUNTAIN AND STORE ONSITE FOR LATER REINSTALLATION. SEE SHEET C3.0 FOR REINSTALL LOCATION. REFER TO LANDSCAPE DRAWINGS FOR ADDITIONAL INFORMATION.
 - 8 REMOVE EXISTING SELF-SERVICE PARKING PAY-STATION AND STORE ONSITE FOR LATER REINSTALLATION. SEE SHEET C10.0 FOR REINSTALL LOCATION. REMOVE AND DISPOSE OF CONCRETE AROUND PAY-STATION TO NEAREST CONTROL JOINT.
 - 9 MONUMENT WILL BE DISTURBED OR REMOVED TO FACILITATE THE PROPOSED IMPROVEMENTS. CITY HAS RETAINED THE SERVICES OF A LICENSED LAND SURVEYOR TO LOCATE THIS MONUMENT PRIOR TO DISTURBANCE. PROVIDE PERMANENT WITNESS MONUMENT(S) AND FILE THE APPROPRIATE DOCUMENTATION, PURSUANT TO BUSINESS AND PROFESSIONS CODE SECTION 8771, WITH THE MARIN COUNTY RECORDER ONCE CONSTRUCTION IS COMPLETE. CONTRACTOR TO COORDINATE WITH CITY'S LAND SURVEYOR FOR MONUMENT REPLACEMENT.

DEMOLITION AND REMOVAL OF FEATURES SHALL BE IN CONFORMANCE WITH THE APPROVED PHASING PLAN.

IMPROVEMENTS SHOWN HEREON REPRESENT THE ANTICIPATED DEMOLITION LIMITS BASED ON THE SCOPE OF IMPROVEMENTS ASSOCIATED WITH THE BASE BID PROJECT.

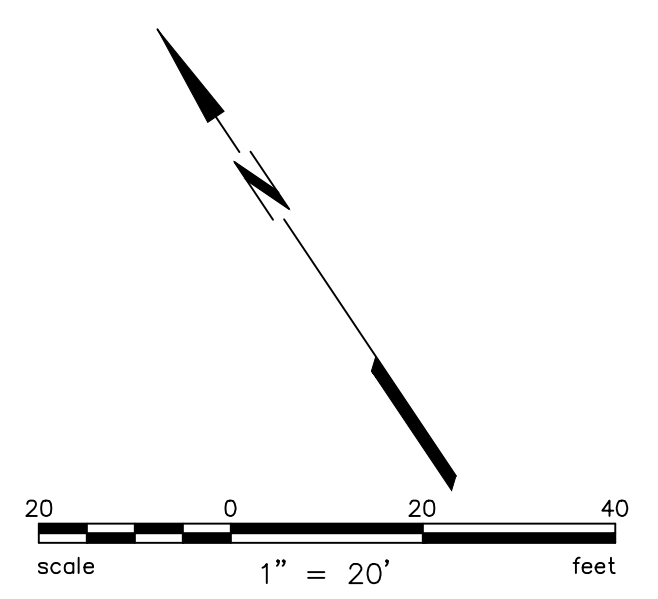
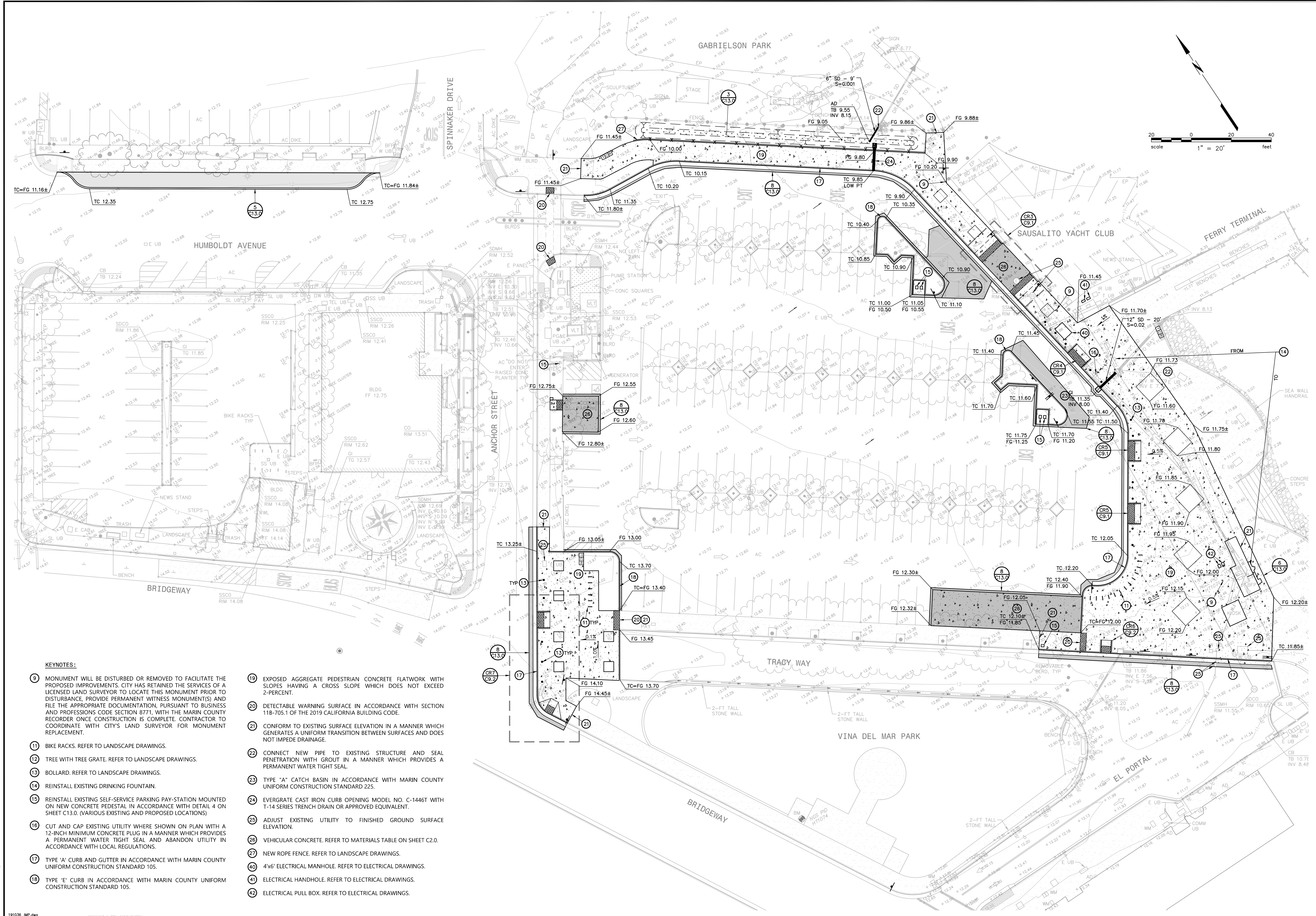
UNDERGROUND UTILITIES ARE SHOWN FOR REFERENCE ONLY. ALL UTILITIES ARE TO REMAIN IN PLACE UNLESS SPECIFICALLY NOTED FOR REMOVAL.

No.	Revisions

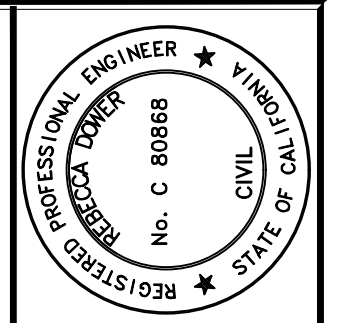
Date: JUNE 2024
 Scale: AS SHOWN
 Design: BD
 Drawn: SR
 Approved: BD
 Job No: 20191036

Drawing Number:
C8.0
 8 OF 37

Plot: Jun 07, 2024 at 4:12pm



- KEYNOTES:**
- 9 MONUMENT WILL BE DISTURBED OR REMOVED TO FACILITATE THE PROPOSED IMPROVEMENTS. CITY HAS RETAINED THE SERVICES OF A LICENSED LAND SURVEYOR TO LOCATE THIS MONUMENT PRIOR TO DISTURBANCE. PROVIDE PERMANENT WITNESS MONUMENT(S) AND FILE THE APPROPRIATE DOCUMENTATION, PURSUANT TO BUSINESS AND PROFESSIONS CODE SECTION 8771, WITH THE MARIN COUNTY RECORDER ONCE CONSTRUCTION IS COMPLETE. CONTRACTOR TO COORDINATE WITH CITY'S LAND SURVEYOR FOR MONUMENT REPLACEMENT.
 - 11 BIKE RACKS. REFER TO LANDSCAPE DRAWINGS.
 - 12 TREE WITH TREE GRATE. REFER TO LANDSCAPE DRAWINGS.
 - 13 BOLLARD. REFER TO LANDSCAPE DRAWINGS.
 - 14 REINSTALL EXISTING DRINKING FOUNTAIN.
 - 15 REINSTALL EXISTING SELF-SERVICE PARKING PAY-STATION MOUNTED ON NEW CONCRETE PEDESTAL IN ACCORDANCE WITH DETAIL 4 ON SHEET C13.0. (VARIOUS EXISTING AND PROPOSED LOCATIONS)
 - 16 CUT AND CAP EXISTING UTILITY WHERE SHOWN ON PLAN WITH A 12-INCH MINIMUM CONCRETE PLUG IN A MANNER WHICH PROVIDES A PERMANENT WATER TIGHT SEAL AND ABANDON UTILITY IN ACCORDANCE WITH LOCAL REGULATIONS.
 - 17 TYPE 'A' CURB AND GUTTER IN ACCORDANCE WITH MARIN COUNTY UNIFORM CONSTRUCTION STANDARD 105.
 - 18 TYPE 'E' CURB IN ACCORDANCE WITH MARIN COUNTY UNIFORM CONSTRUCTION STANDARD 105.
 - 19 EXPOSED AGGREGATE PEDESTRIAN CONCRETE FLATWORK WITH SLOPES HAVING A CROSS SLOPE WHICH DOES NOT EXCEED 2-PERCENT.
 - 20 DETECTABLE WARNING SURFACE IN ACCORDANCE WITH SECTION 11B-705.1 OF THE 2019 CALIFORNIA BUILDING CODE.
 - 21 CONFORM TO EXISTING SURFACE ELEVATION IN A MANNER WHICH GENERATES A UNIFORM TRANSITION BETWEEN SURFACES AND DOES NOT IMPEDE DRAINAGE.
 - 22 CONNECT NEW PIPE TO EXISTING STRUCTURE AND SEAL PENETRATION WITH GROUT IN A MANNER WHICH PROVIDES A PERMANENT WATER TIGHT SEAL.
 - 23 TYPE "A" CATCH BASIN IN ACCORDANCE WITH MARIN COUNTY UNIFORM CONSTRUCTION STANDARD 225.
 - 24 EVERGRATE CAST IRON CURB OPENING MODEL NO. C-1446T WITH T-14 SERIES TRENCH DRAIN OR APPROVED EQUIVALENT.
 - 25 ADJUST EXISTING UTILITY TO FINISHED GROUND SURFACE ELEVATION.
 - 26 VEHICULAR CONCRETE. REFER TO MATERIALS TABLE ON SHEET C2.0.
 - 27 NEW ROPE FENCE. REFER TO LANDSCAPE DRAWINGS.
 - 40 4"x6" ELECTRICAL MANHOLE. REFER TO ELECTRICAL DRAWINGS.
 - 41 ELECTRICAL HANDHOLE. REFER TO ELECTRICAL DRAWINGS.
 - 42 ELECTRICAL PULL BOX. REFER TO ELECTRICAL DRAWINGS.



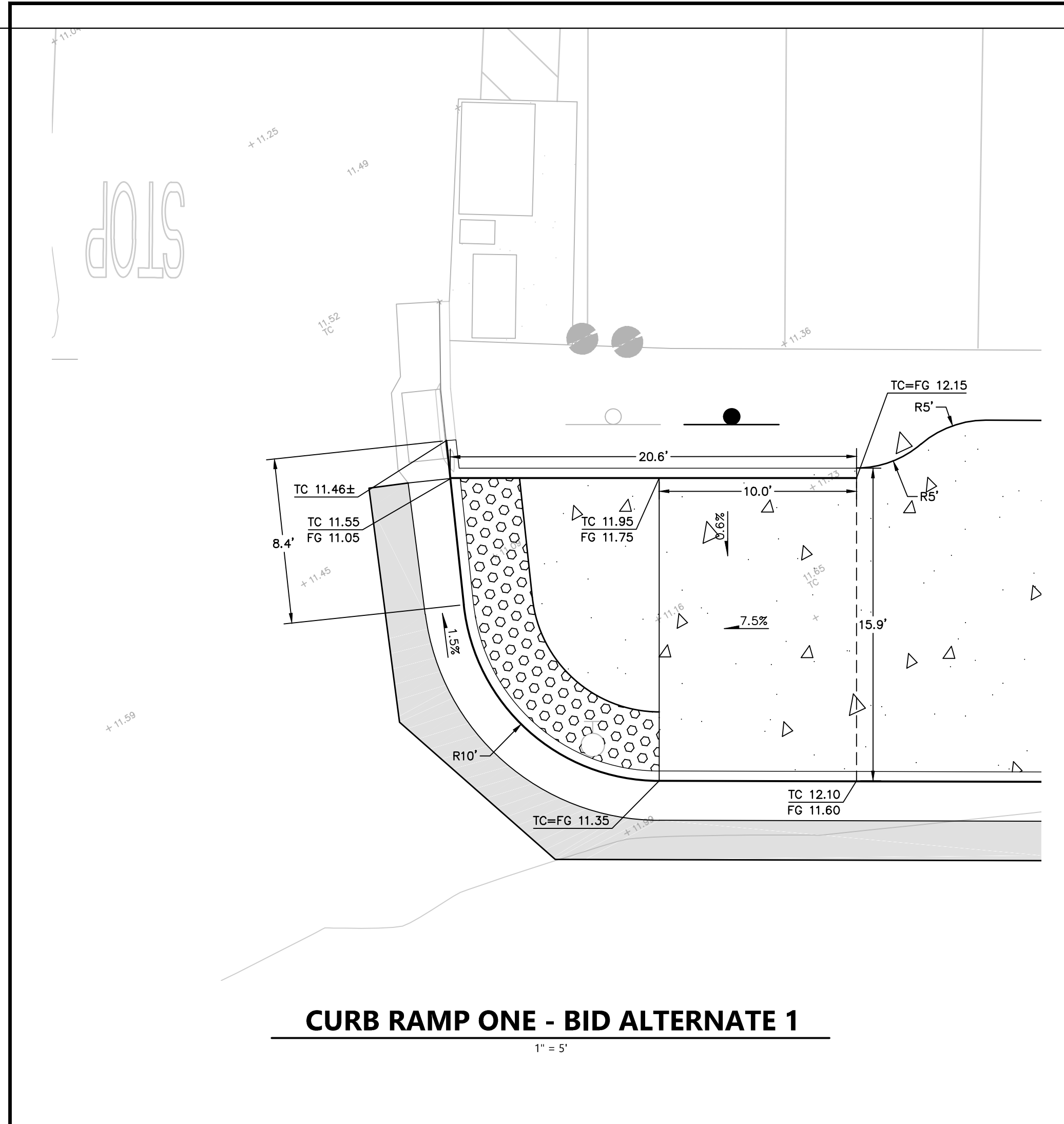
REBECCA DOWER
 C 80868
 6/17/2024
BKF ENGINEERS
 810 5TH AVENUE
 SUITE 210
 SAN RAFAEL, CA 94901
 (415) 930-7960
 www.bkf.com

FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA
GRADING AND UTILITY PLAN

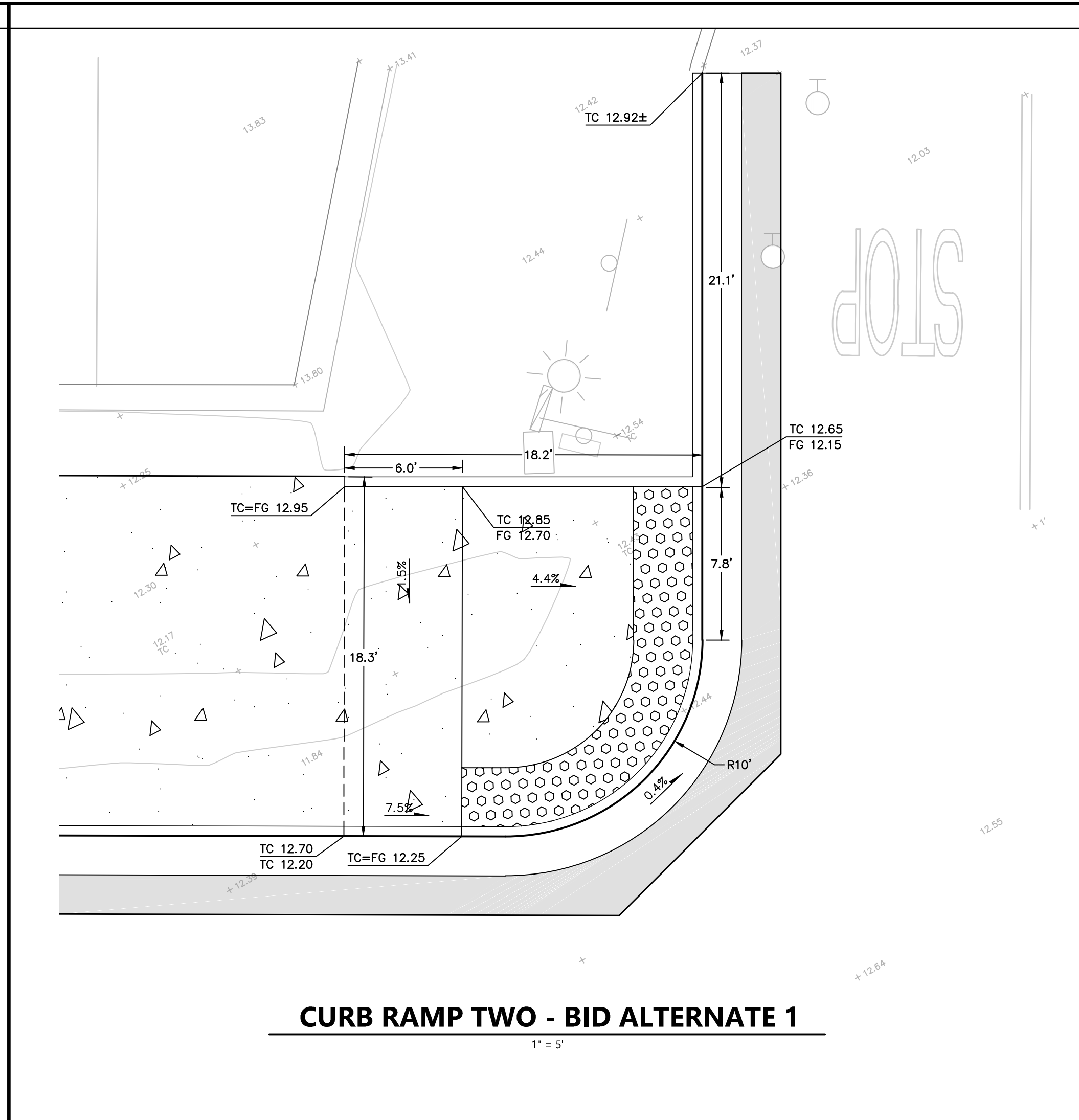
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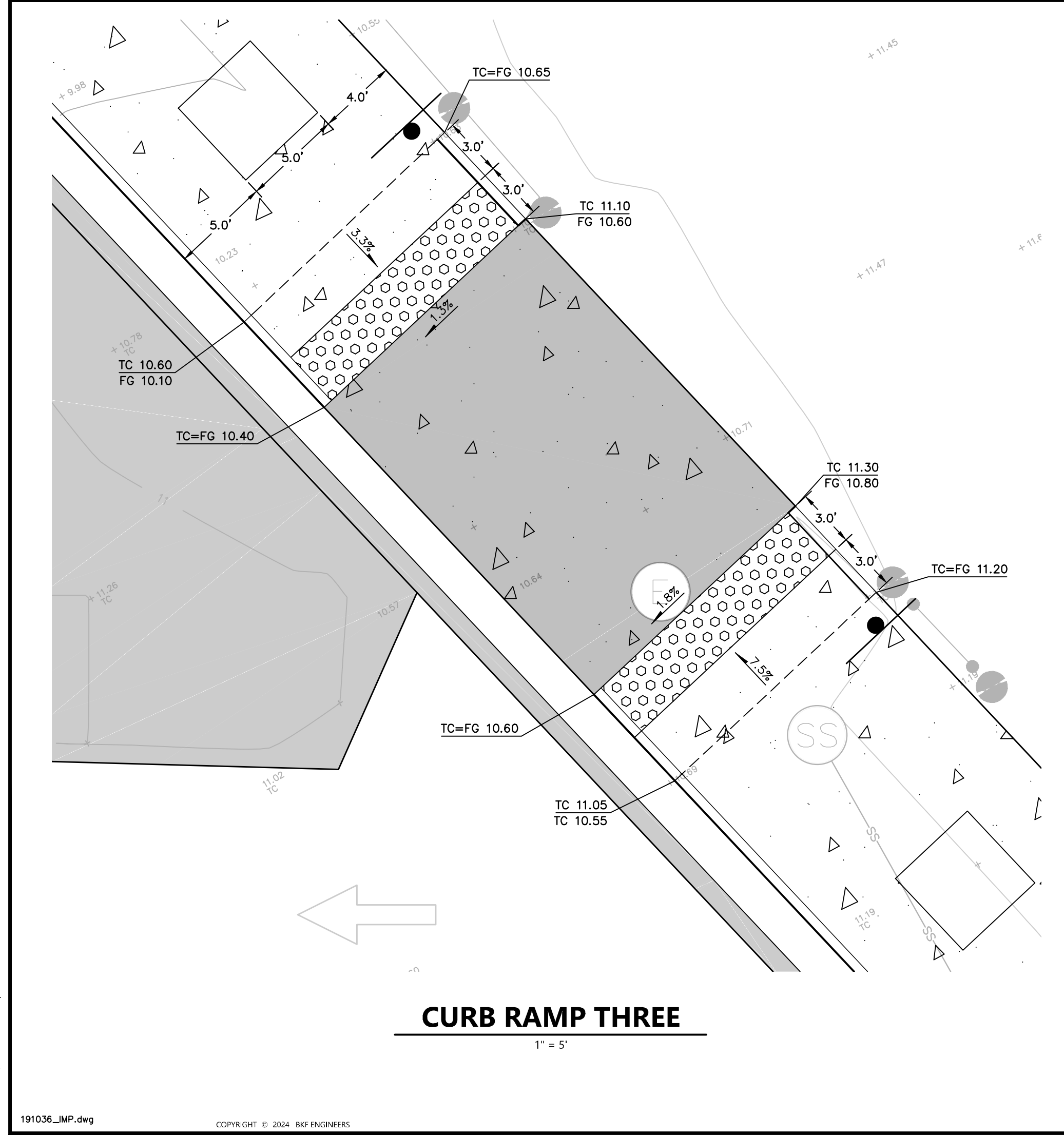
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 9 OF 37



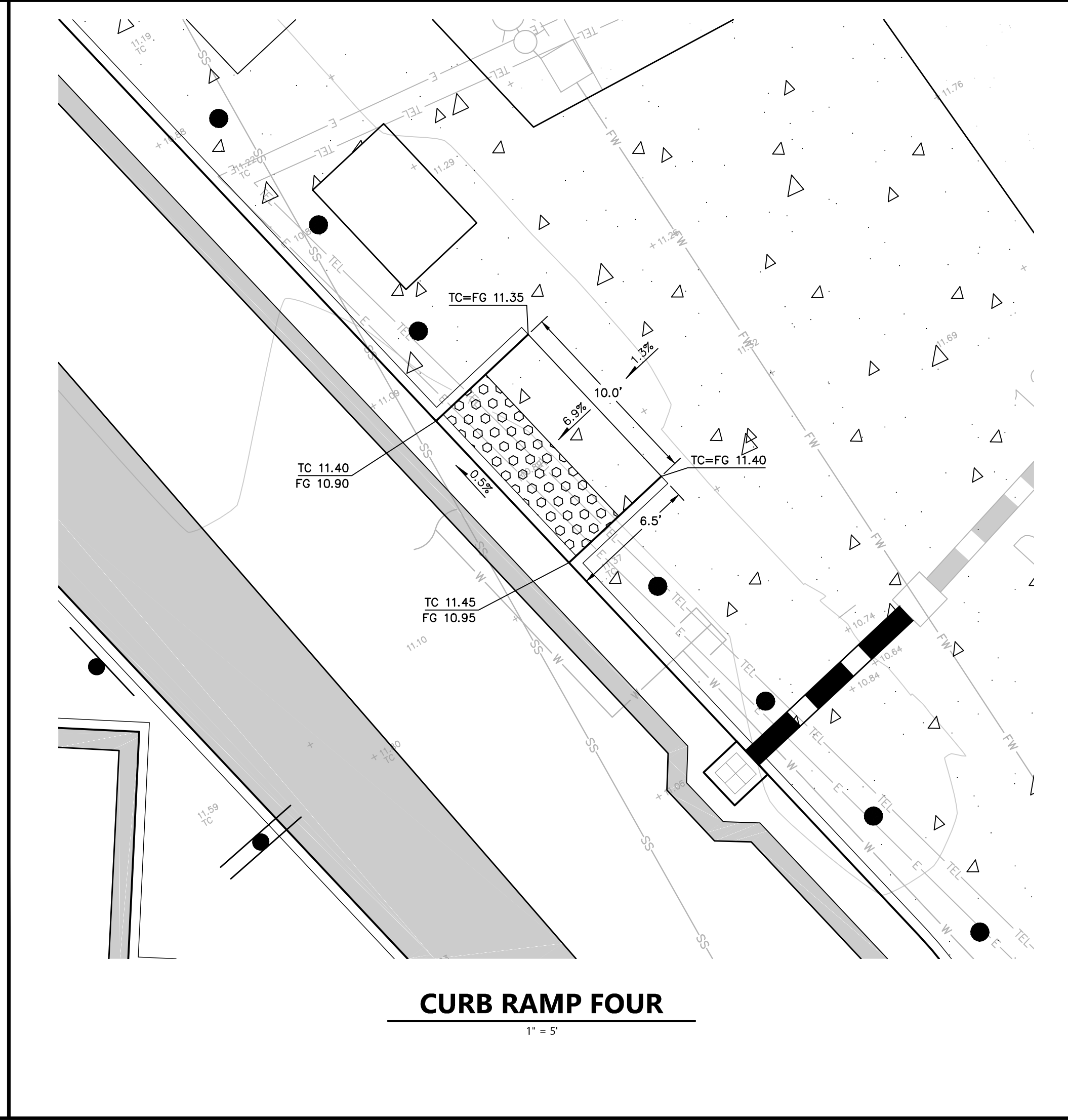
CURB RAMP ONE - BID ALTERNATE 1
1" = 5'



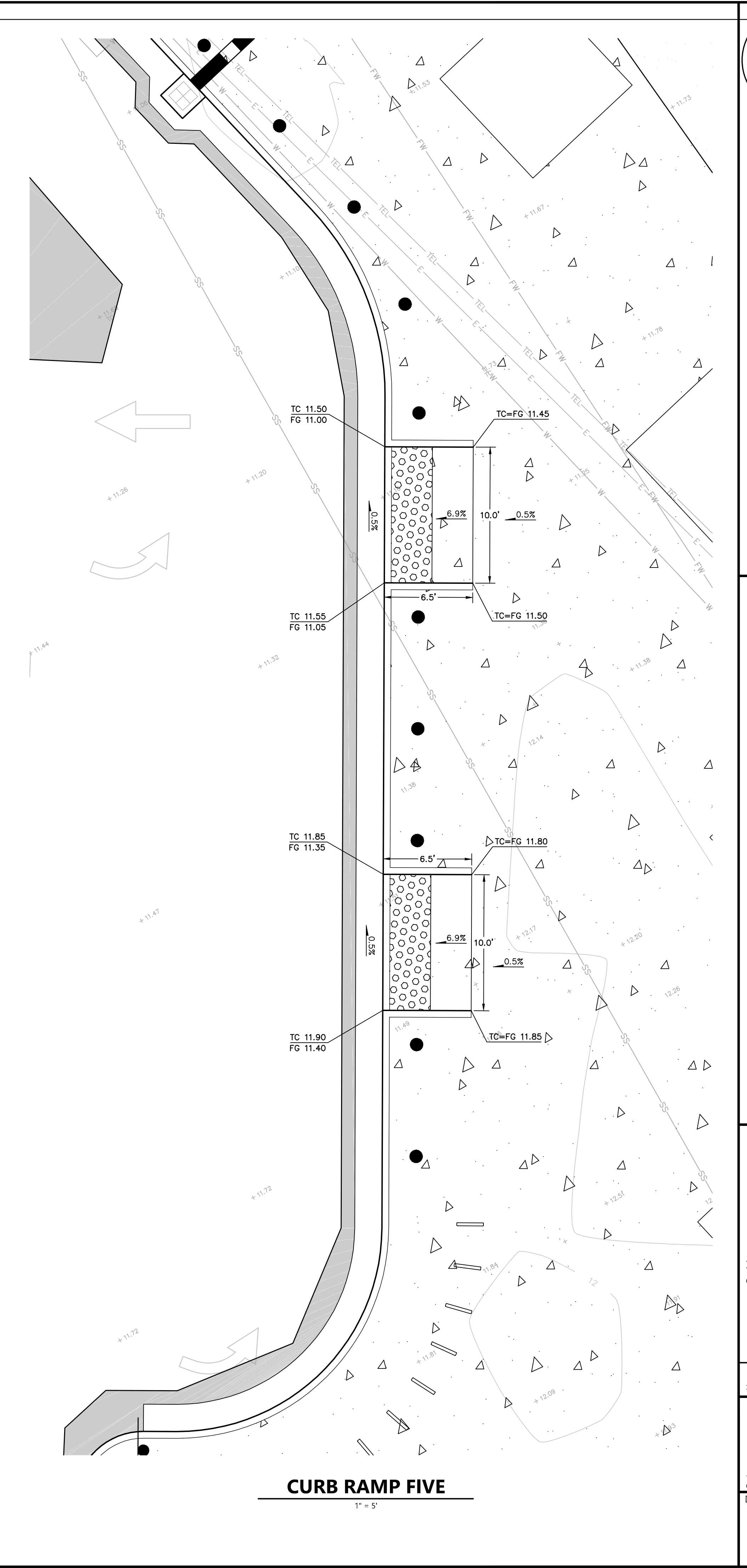
CURB RAMP TWO - BID ALTERNATE 1
1" = 5'



CURB RAMP THREE
1" = 5'



CURB RAMP FOUR
1" = 5'



CURB RAMP FIVE
1" = 5'


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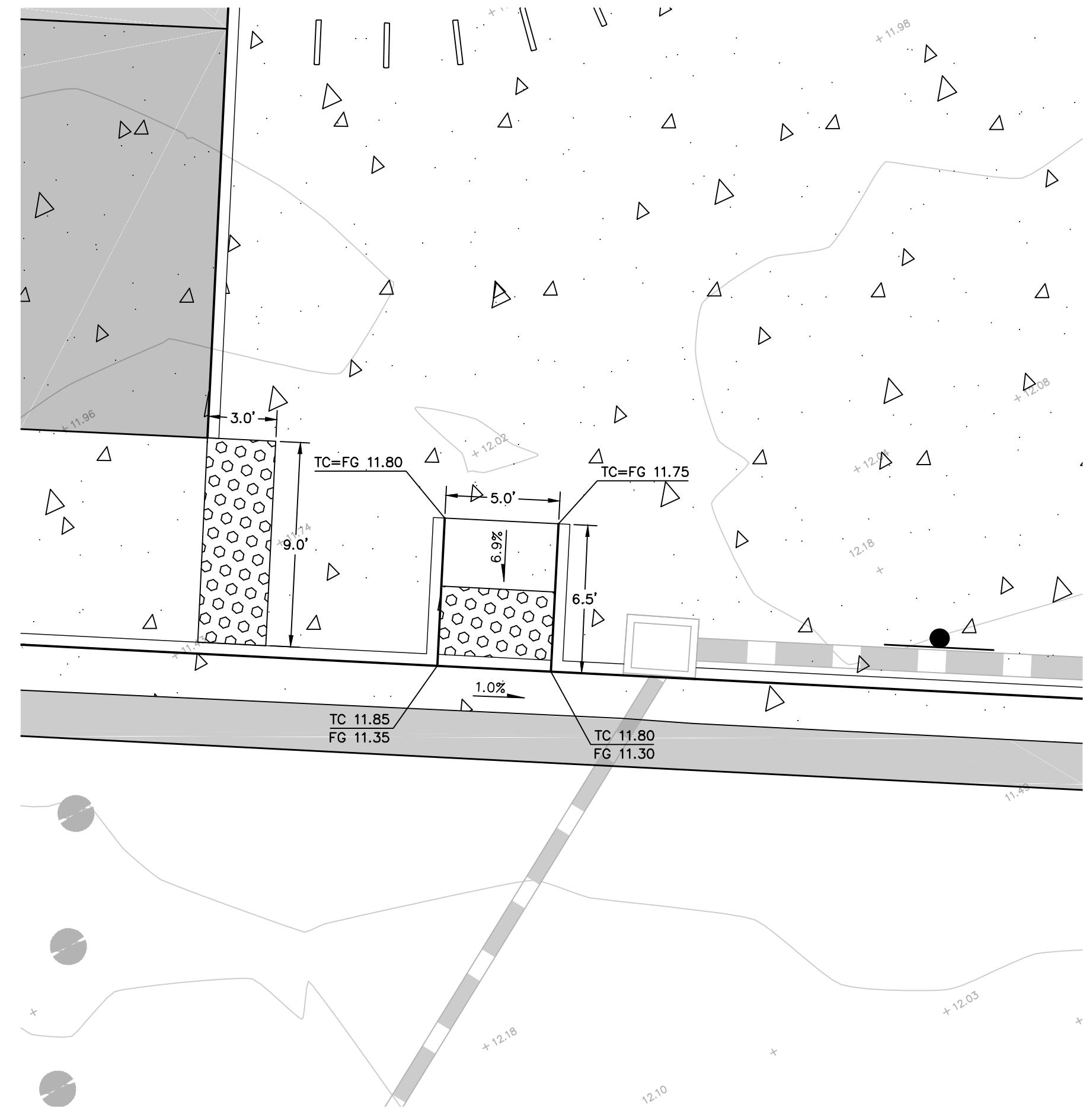
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 APN 065-073-03
 SAUSALITO, CALIFORNIA

CURB RAMP GRADING ENLARGEMENTS

No.	Revisions

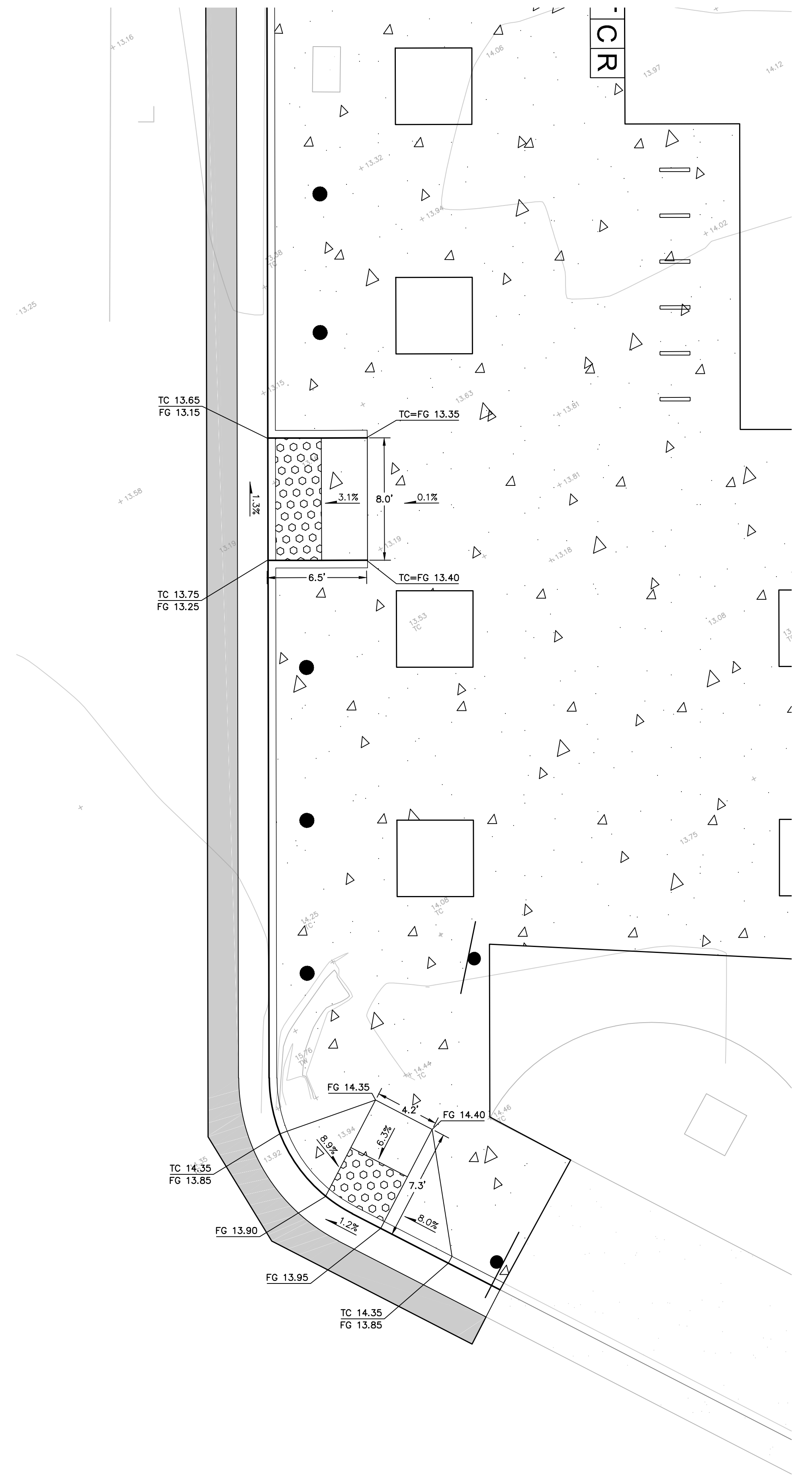
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 Drawn: SR
 Approved: BD
 Job No: 20191036

Drawing Number:
C9.1
 10 OF 37



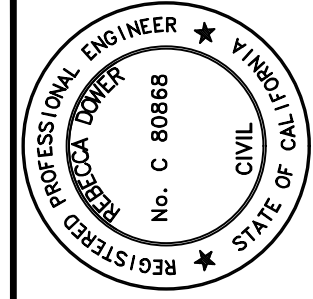
CURB RAMP SIX

1" = 5'



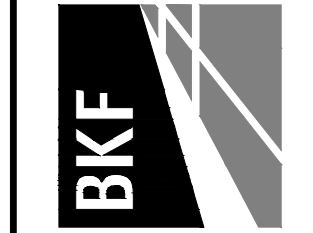
CURB RAMP SEVEN

1" = 5'



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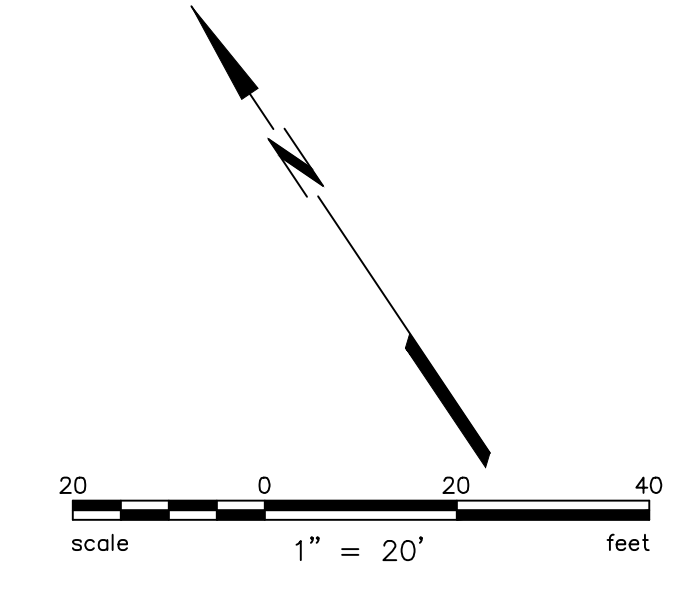
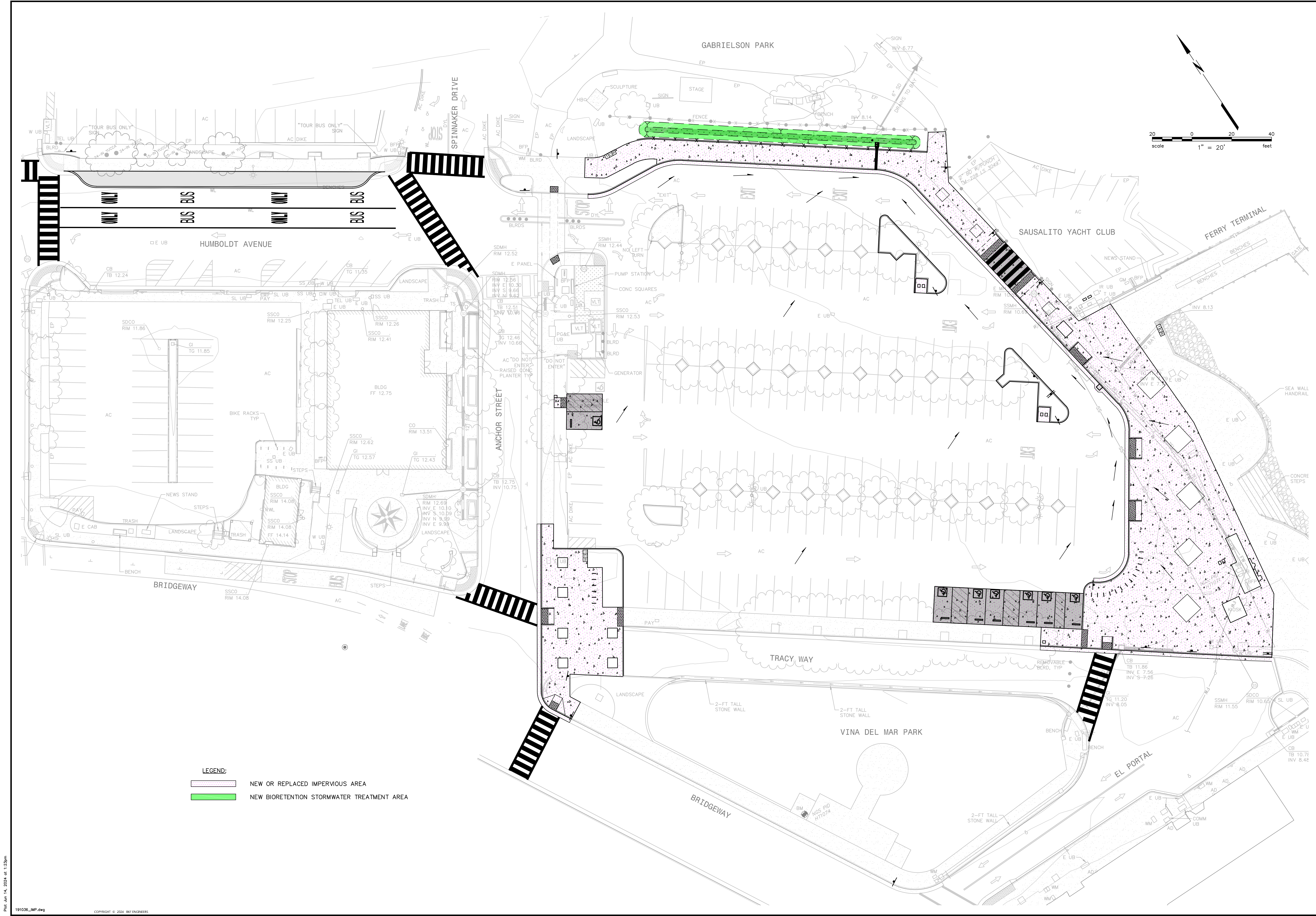




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 SAUSALITO, CALIFORNIA

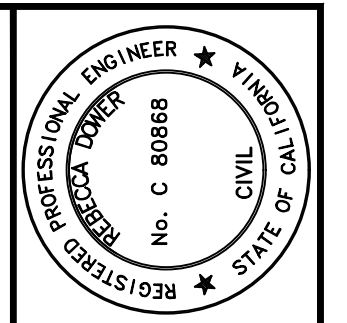
CURB RAMP GRADING ENLARGEMENTS

Revisions	
No.	Description

Date: JUNE 2024
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LEGEND:
 NEW OR REPLACED IMPERVIOUS AREA
 NEW BIORETENTION STORMWATER TREATMENT AREA



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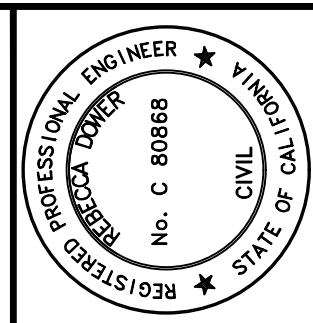
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 APN 065-073-03
 SAUSALITO, CALIFORNIA

STORMWATER CONTROL PLAN

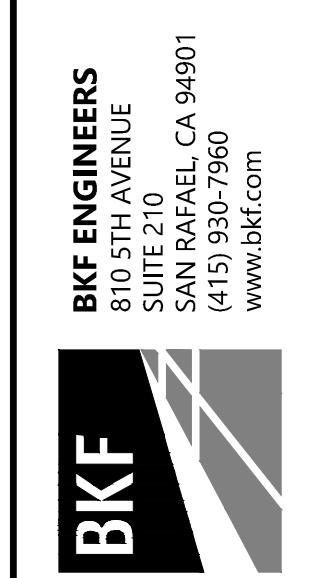
No.	Revisions

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Drawing Number:
C11.0
 13 OF 37



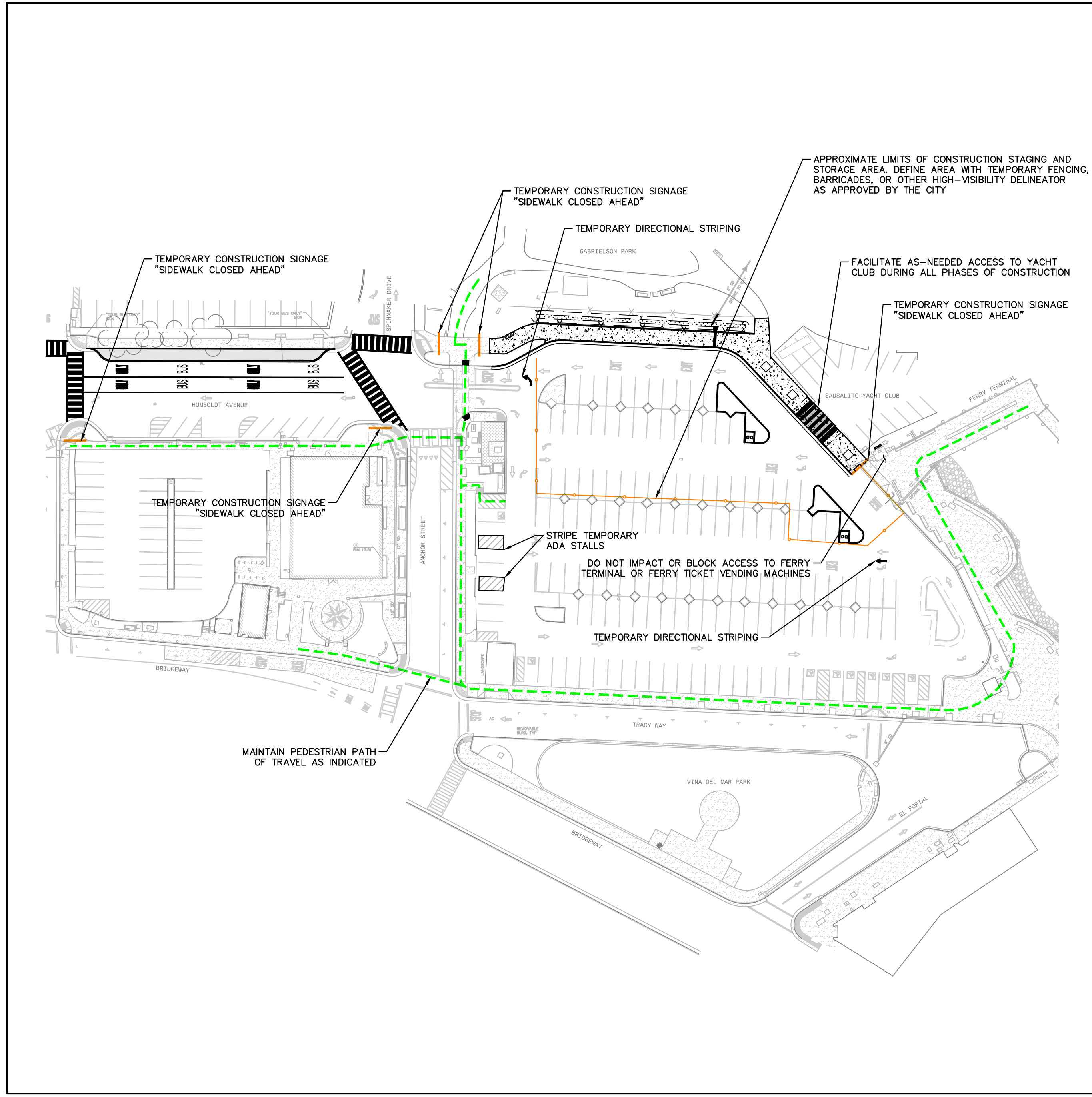
REBECCA DOWER
C 80868
6/17/2024



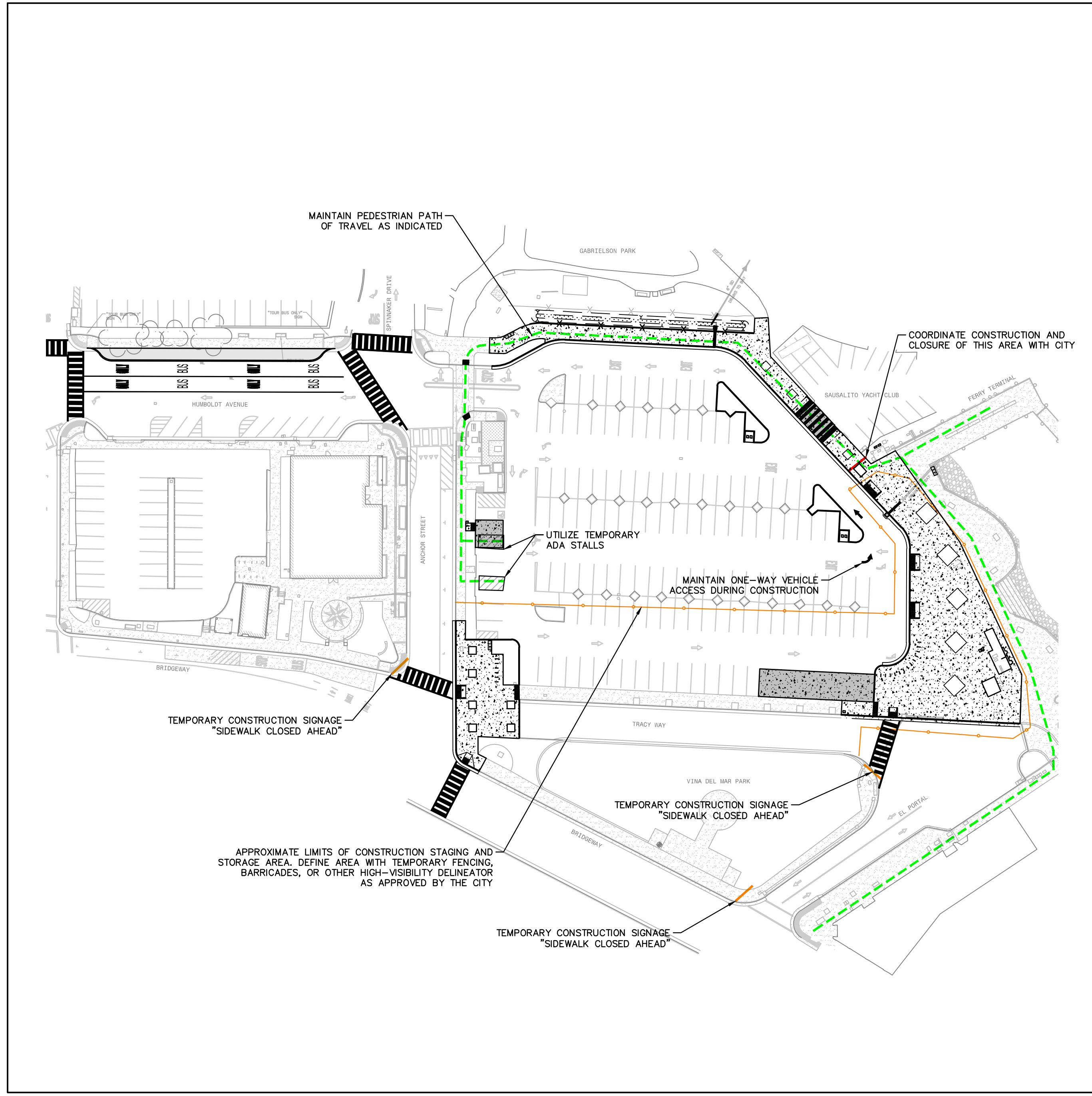
FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
CONSTRUCTION STAGING AND PHASING PLAN

Revisions	No.	Date

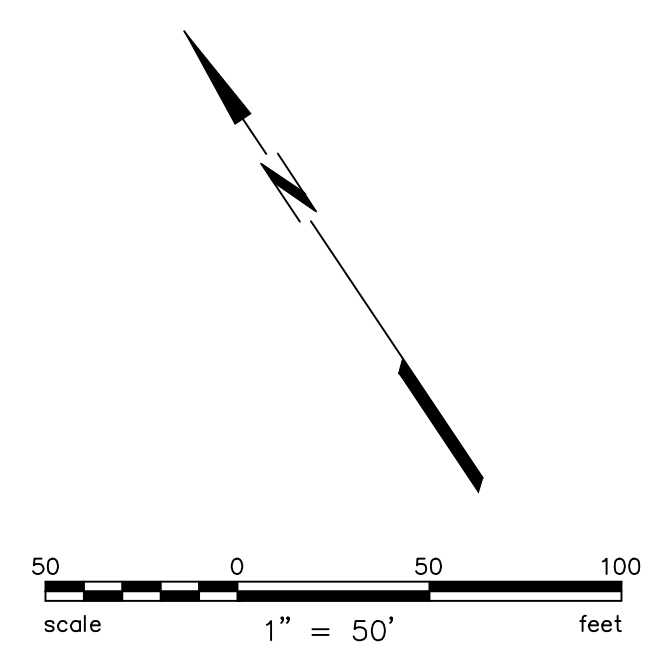
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Design: BD
Drawn: SR
Approved: BD
Job No: 20191036
Drawing Number:
C12.0
14 OF 37



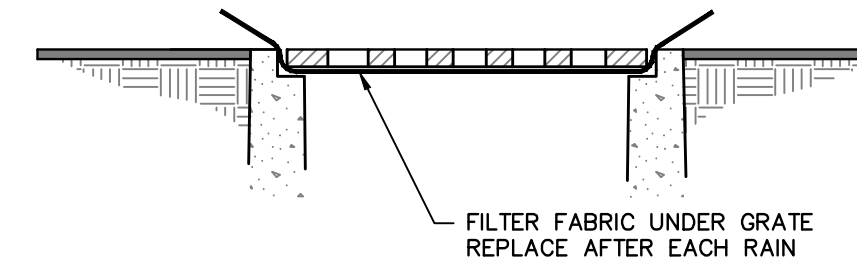
PHASE ONE CONSTRUCTION
APPROXIMATE PHASE ONE
CONSTRUCTION DURATION = 8 WEEKS



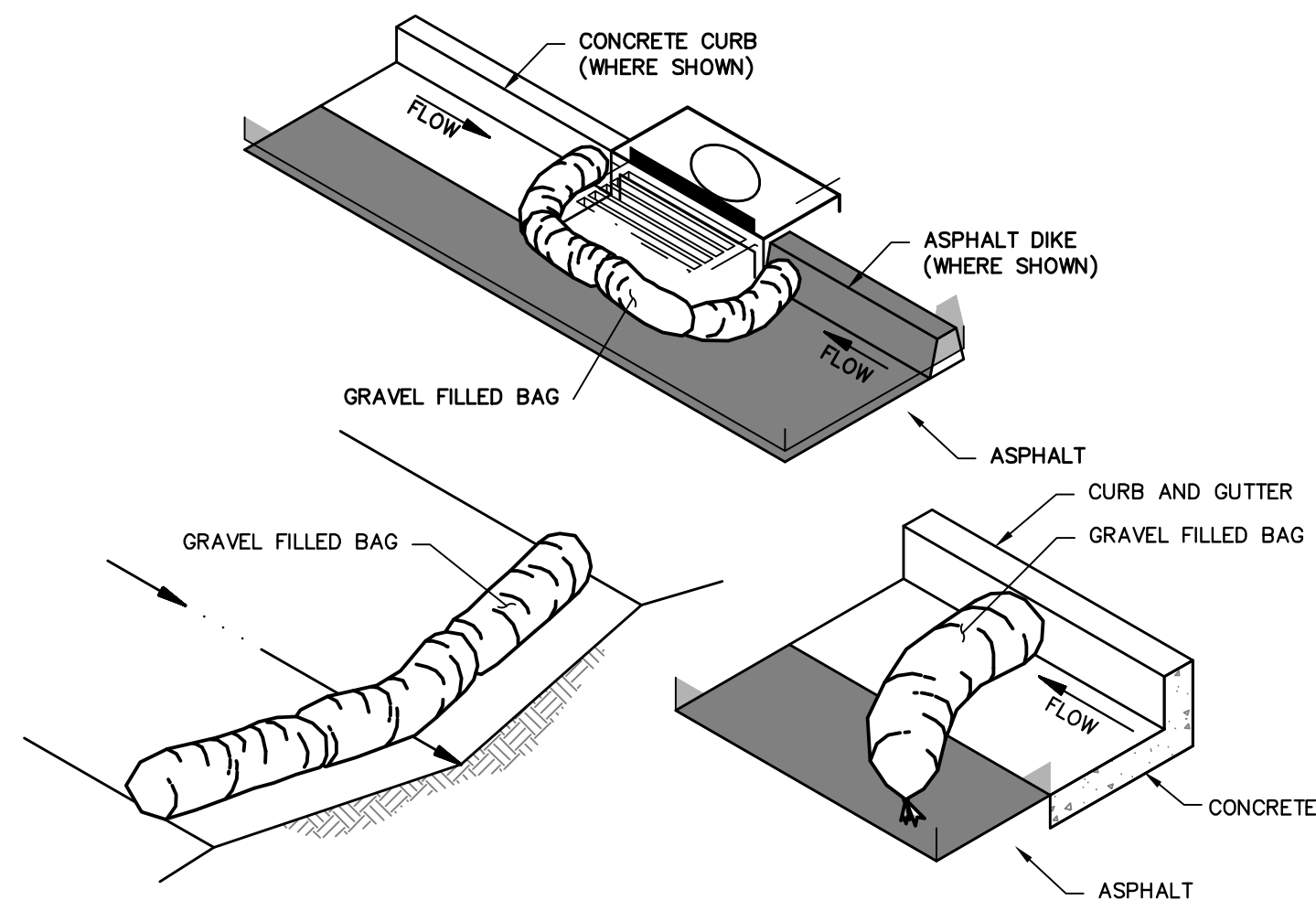
PHASE TWO CONSTRUCTION
APPROXIMATE PHASE TWO
CONSTRUCTION DURATION = 16 WEEKS



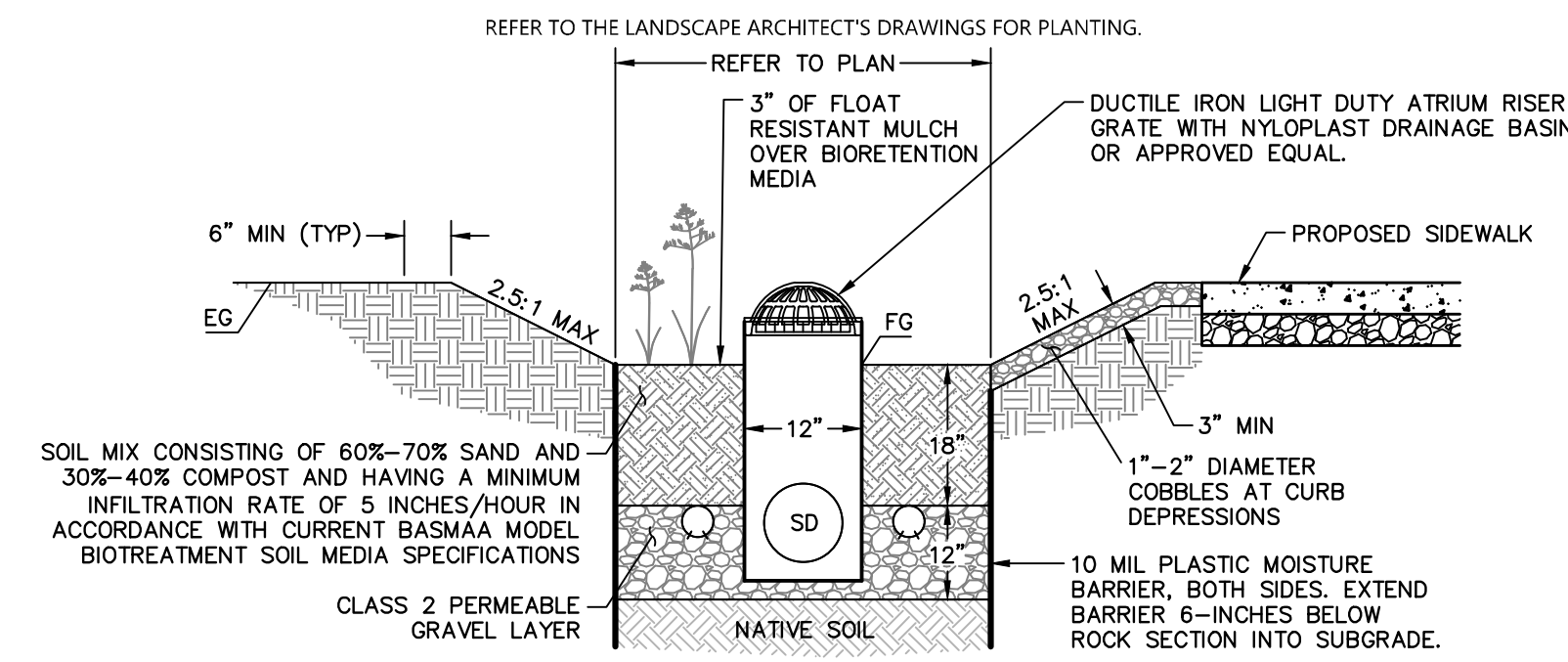
THIS STAGING AND PHASING PLAN IS PROVIDED FOR GENERAL REFERENCE AND GUIDANCE ONLY. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING CONTINUED PUBLIC SPACE ACCESS TO PORTIONS OF PARKING LOT 1 AND THE FERRY TERMINAL DURING ALL STAGES OF CONSTRUCTION, UNLESS DIRECTED OTHERWISE BY THE CITY. THIS PLAN DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY TO PROVIDE THE REQUIRED STAGING, TRAFFIC CONTROL, AND TEMPORARY SIGNAGE PLANS AS REQUIRED BY THE PROJECT SPECIFICATIONS.



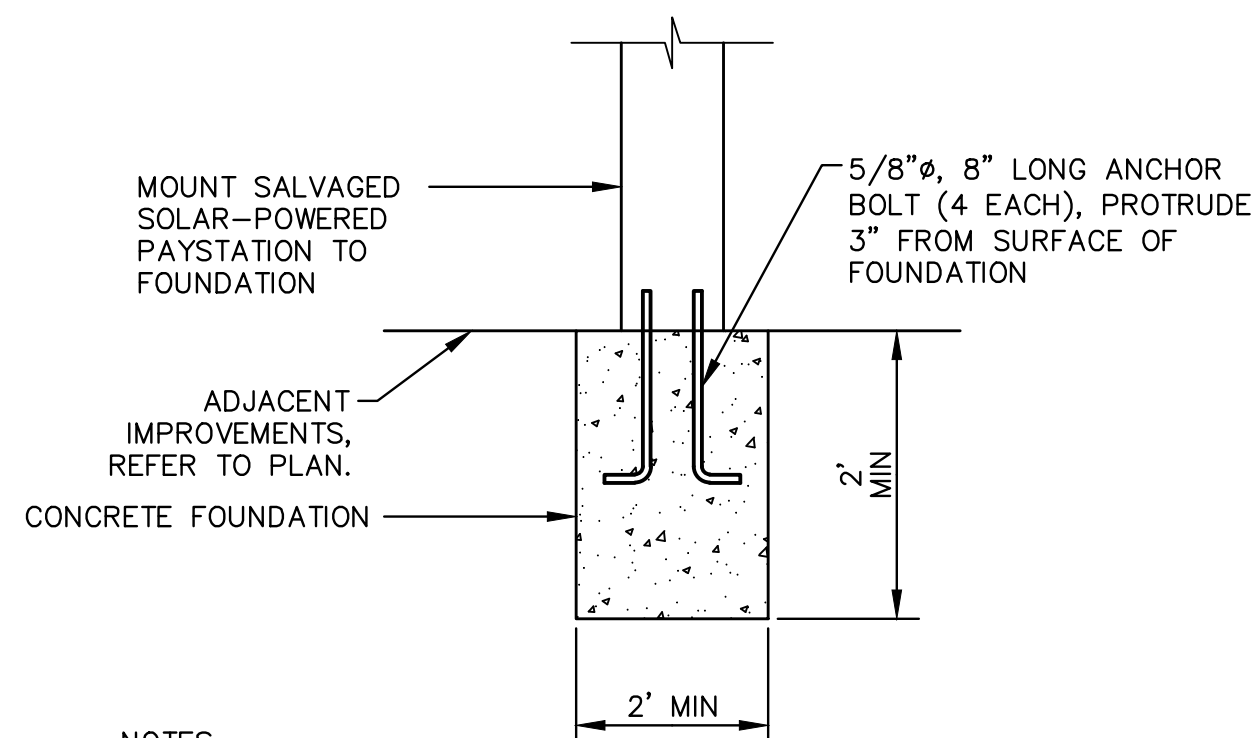
1
-
-
FILTER FABRIC DETAIL
NTS



2
-
-
GRAVEL BAG
NTS



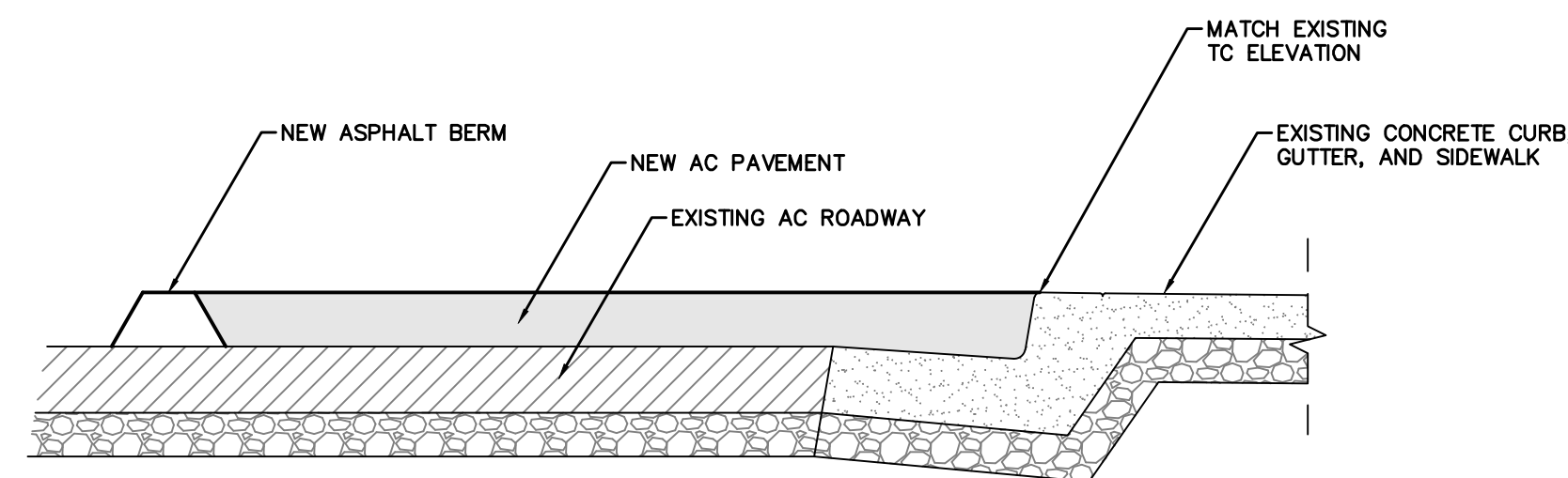
3
-
-
BIORETENTION AREA
NTS



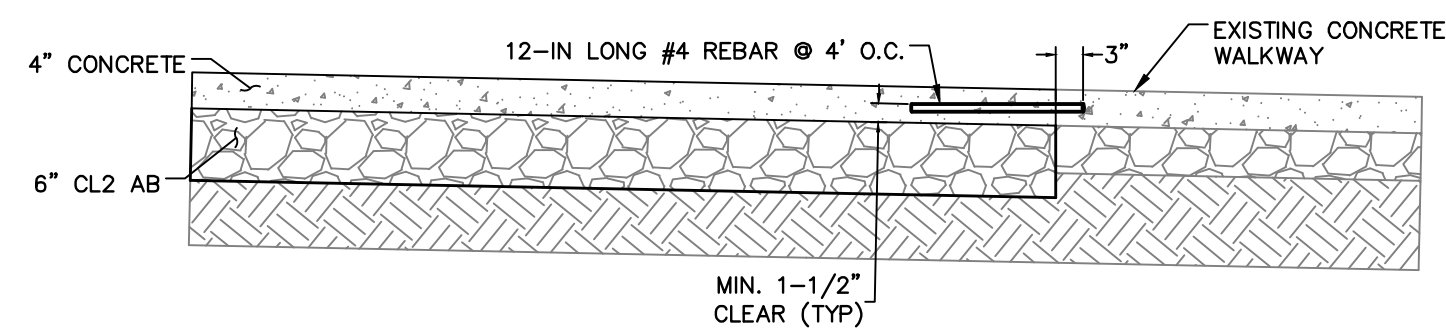
NOTES:

1. CONCRETE PEDESTAL AND ANCHOR BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS FOR LUKE SELF-SERVICE PAY STATION MOUNTING.
2. FIELD VERIFY MATERIAL, TYPE, AND SIZE OF EXISTING ANCHOR BOLTS, REPLACE BOLTS IN-KIND.

4
-
-
**SELF-SERVICE PARKING
PAYSTATION CONCRETE PEDESTAL**
NTS



5
-
-
ASPHALT BERM AND PAVEMENT
NO SCALE

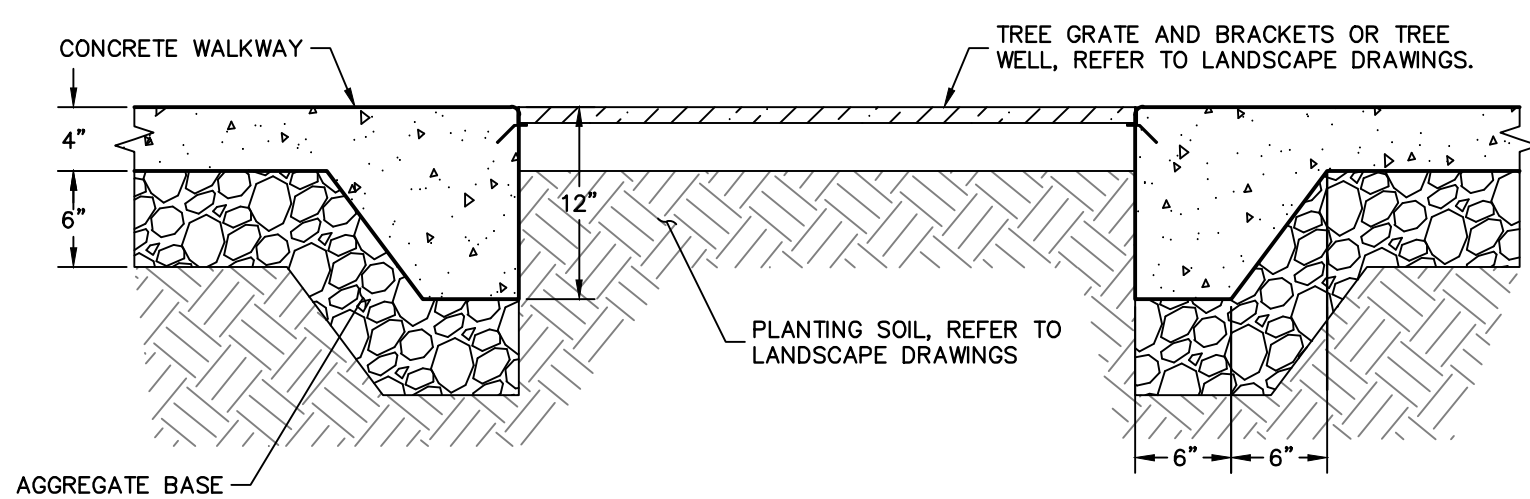


6
-
-
CONCRETE DOWELING
NTS

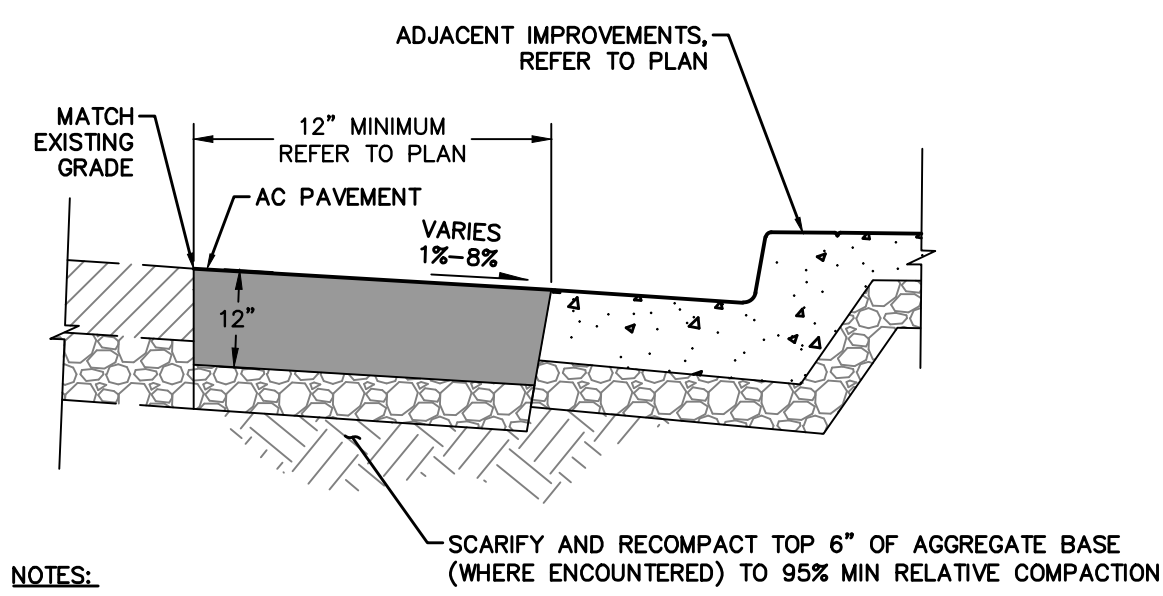
NOTES:

INSTALL SIGN NO LESS THAN 17" WIDE BY 22" HIGH POSTED EITHER 1) IN A CONSPICUOUS PLACE AT EACH ENTRANCE TO AN OFF-STREET PARKING FACILITY OR 2) IMMEDIATELY ADJACENT TO ONSITE ACCESSIBLE PARKING AND VISIBLE FROM EACH PARKING SPACE WHICH READS "UNAUTHORIZED VEHICLES PARKED IN DESIGNATED ACCESSIBLE SPACES. NOT DISPLAYING DISTINGUISHING PLACARDS OR SPECIAL LICENSE PLATES ISSUED FOR PERSONS WITH DISABILITIES WILL BE TOWED AWAY AT THE OWNERS EXPENSE. TOWED VEHICLES MAY BE RECLAIMED AT _____ OR BY TELEPHONING _____". (BLANK SPACES SHALL BE FILLED IN WITH APPROPRIATE INFORMATION AS A PERMANENT PART OF THE SIGN.)

70 SQ. IN. DARK BLUE REFLECTIVE PORCELAIN, ENAMEL STEEL SIGN WITH WHITE INTERNATIONAL SYMBOL OF ACCESSIBILITY MOUNTED 80" OFF F.G. ON 1.5" x 6" STEEL POST. PROVIDE AN ADDITIONAL SIGN OR ADDITIONAL LANGUAGE BELOW THE SYMBOL OF ACCESSIBILITY WHICH READS "MINIMUM FINE \$250 - VAN SPACE SHALL HAVE AN ADDITIONAL "VAN ACCESSIBLE" SIGN MOUNTED BELOW THE SYMBOL OF ACCESSIBILITY PER CBC SEC 11B-502.6.



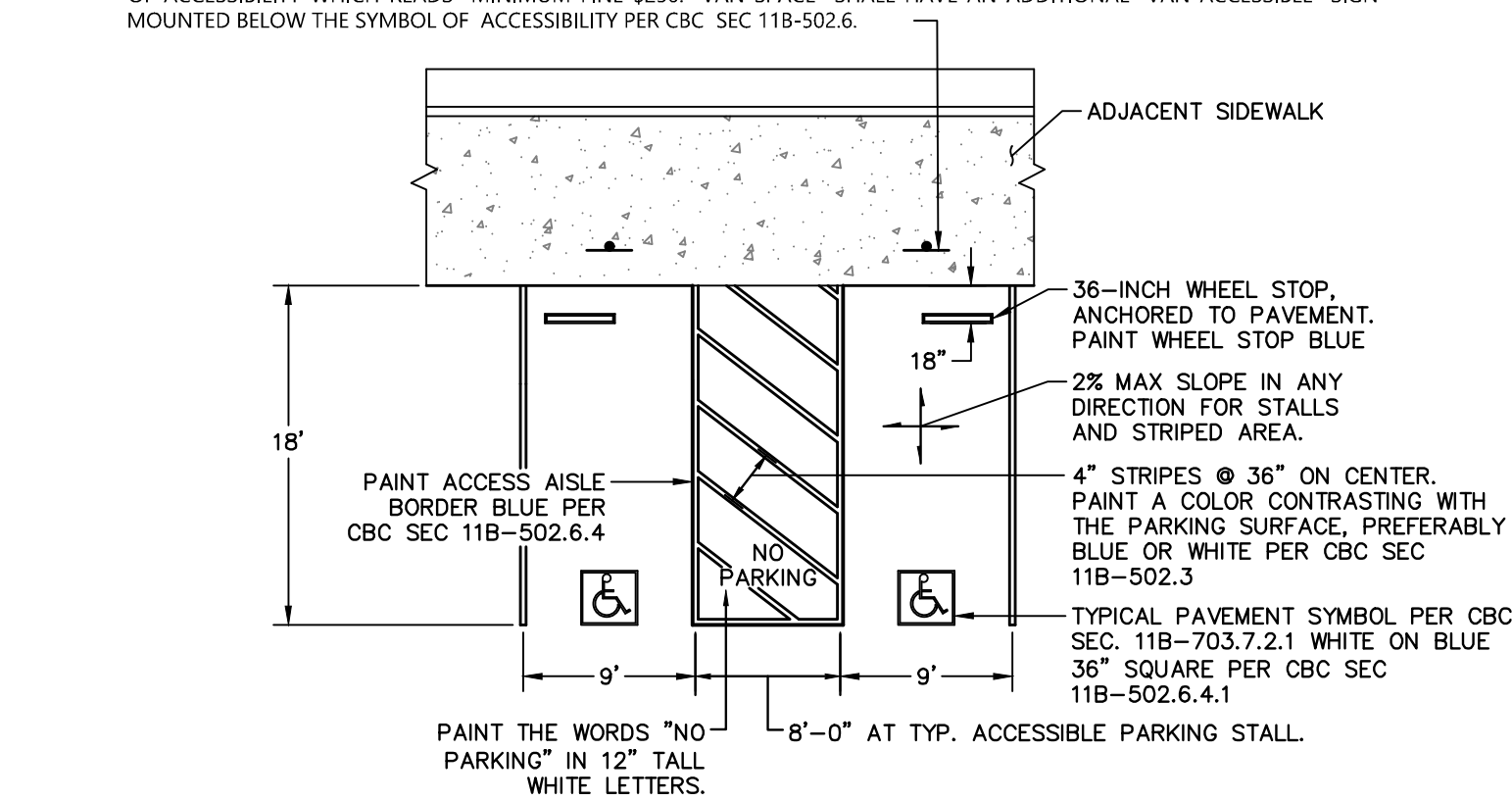
7
-
-
**THICKENED CONCRETE EDGE
AT TREE WELLS AND GRATES**
NTS



NOTES:

1. EXISTING PAVEMENT SECTION THICKNESSES VARY.

8
-
-
**ASPHALT CONCRETE
FULL DEPTH CONFORM**
NTS



9
-
-
ACCESSIBLE PARKING STALL STRIPING
NTS

REGISTERED PROFESSIONAL ENGINEER
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CIVIL
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FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
CIVIL DETAILS

No.	Revisions

Date: JUNE 2024
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Design: BD
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Job No: 20191036

Drawing Number:
C13.0
15 OF 37

ACCESSIBILITY NOTES

- ALL SITE WORK SHALL COMPLY WITH CURRENT CALIFORNIA BUILDING CODE (CALIFORNIA CODE OF REGULATIONS TITLE 24), CURRENT STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA), AND THE CURRENT FAIR HOUSING ACT DESIGN MANUAL.
- ALL PAVING AREAS SHALL BE ACCESSIBLE PER TITLE 24. ALL PAVING SURFACES ARE TO BE STABLE, FIRM, AND SLIP RESISTANT WITH CROSS SLOPES NOT TO EXCEED 2% IN ANY DIRECTION, UNLESS OTHERWISE NOTED. ACCESSIBLE PATHS OF TRAVEL ARE BARRIER-FREE ACCESS ROUTES AT LEAST 48" CLEAR IN WIDTH AND WITHOUT ANY ABRUPT VERTICAL LEVEL CHANGES EXCEEDING 1/2" IF BEVELED AT 1:2 MAX SLOPE, OR VERTICAL LEVEL CHANGES NOT EXCEEDING 1/4" MAX. ALL ACCESSIBLE PATHWAYS SHALL BE SLOPED LESS THAN 5% IN THE DIRECTION OF TRAVEL, UNLESS OTHERWISE NOTED.
- ALL ACCESSIBLE PATHS OF TRAVEL SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS BELOW 80" ABOVE FINISH GRADE. OBJECTS WITH LEADING EDGES LOCATED BETWEEN 27" AND 80" ABOVE FINISH GRADE SHALL NOT PROTRUDE MORE THAN 4" HORIZONTALLY INTO THE PATH OF TRAVEL. EXCEPTIONS INCLUDE GUARDRAILS, DOOR CLOSERS, AND DOOR STOPS. GUARDRAILS OR OTHER BARRIERS SHALL BE PROVIDED WHERE OBJECT PROTRUSION IS BEYOND THE LIMITS ALLOWED.
- ALL PATHS SHALL HAVE GUARDRAILS WHEN VERTICAL CHANGE IS GREATER THAN 30" AND WITHIN 3'-0" OF PATH OF TRAVEL.

GENERAL NOTES

- THESE DRAWINGS AND SPECIFICATIONS DESCRIBE THE QUALITY AND CHARACTER OF THE MATERIALS, SHAPE, CONFIGURATION AND DESIGN INTENT OF THE COMPLETED, INSTALLED WORK. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING COMPLETE AND OPERATIONAL SYSTEMS AND INSTALLATIONS OF THE DESCRIBED DESIGN INTENT, INCLUDING ALL MISCELLANEOUS ITEMS OF WORK, MATERIALS, EQUIPMENT, ETC., NECESSARY TO COMPLETE THE INSTALLATION WHETHER OR NOT MENTIONED IN THE SPECIFICATIONS OR SHOWN ON THE DRAWINGS. ALL MATERIALS SHALL BE FURNISHED AND PROPERLY INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED.
- THE INSTALLED WORK SHALL CONFORM TO THE REQUIREMENTS OF THE GOVERNING BUILDING AUTHORITY, ALL SPECIAL REQUIREMENTS AND CONDITIONS OF THE BUILDING PERMIT, AND ALL APPLICABLE CODES, LAWS, STANDARDS, ETC.
- THE CONTRACTOR SHALL EXAMINE THE DRAWINGS AND SPECIFICATIONS AND CLEARLY UNDERSTAND THE EXISTING CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED PRIOR TO BIDDING. THE CONTRACTOR SHALL BE FAMILIAR WITH THE PROJECT SITE, FIELD INVESTIGATE, VERIFY AND BE RESPONSIBLE FOR ALL CONDITIONS, ELEVATIONS AND DIMENSIONS OF THE PROJECT, AS SHOWN ON OR REFERENCED ON THE DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE ABOUT ANY CONDITION REQUIRING MODIFICATION OR CLARIFICATION PRIOR TO BIDDING. ENTERING INTO AN AGREEMENT WITH THE OWNER INDICATES THAT THE CONTRACTOR HAS VISITED THE SITE, FAMILIAR WITH THE EXISTING CONDITIONS AND FULLY UNDERSTANDS THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. NO ALLOWANCES OF ANY KIND WILL BE MADE FOR ANY EXTRA COST DUE TO THE CONTRACTOR'S FAILURE TO INFORM THE OWNER OF DISCREPANCIES IN TIME TO ISSUE CORRECTIVE ADDENDA PRIOR TO BIDDING.
- ALL GENERAL NOTES, DIMENSIONS, AND DETAILS SHALL BE CONSIDERED TYPICAL AND APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED. SPECIFIC NOTES, DETAILS AND SPECIFICATIONS SHALL TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
- THE CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF ALL WORK BETWEEN TRADES, SUBCONTRACTORS, MANUFACTURERS, FABRICATORS, AND ALL OTHER CONTRACTED FOR THE COMPLETION OF THE WORK, INCLUDING THOSE UNDER SEPARATE CONTRACTS FOR CONCURRENT PROJECTS.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL TESTING, INSPECTIONS AND REPORTING AS OUTLINED IN THE CONTRACT DOCUMENT AND AS REQUIRED BY THE PERMITTING AUTHORITIES TO COMPLETE THE WORK.
- ALL UNDERGROUND UTILITIES SHOWN ON THESE PLANS REFLECT THE AVAILABLE RECORDS. CONTRACTOR SHALL USE CAUTION IN ALL EXCAVATION OPERATIONS. THE CONTRACTOR IS RESPONSIBLE TO INVESTIGATE AND VERIFY ALL EXISTING AND PROPOSED CONDITIONS AS SHOWN OR REFERENCED IN THE DOCUMENTS, INCLUDING LOCATION AND DEPTH OF ALL UTILITIES. THE CONTRACTOR SHALL IMMEDIATE NOTIFY THE OWNER'S REPRESENTATIVE OF ANY CONFLICTS AND/OR DISCREPANCIES BETWEEN EXISTING AND PROPOSED CONDITIONS WHICH WILL AFFECT THE WORK, BEFORE PROCEEDING WITH THE WORK.
- CONTRACTOR SHALL NOTIFY UNDERGROUND SERVICE ALERT (USA 800-642-2444) TWO WORKING DAYS MINIMUM PRIOR TO ANY EXCAVATION.
- THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE DIVISION OF INDUSTRIAL SAFETY PERTAINING TO "CONFINED SPACE". ANY MANHOLE, CULVERT, DROP INLET OR TRENCH, WHICH COULD CONTAIN AIR THAT IS NOT READILY VENTILATED, MAY BE CONSIDERED A "CONFINED SPACE".
- PROVIDE ADEQUATE PROTECTION FOR ALL PROPOSED AND EXISTING UTILITIES DURING THE CONSTRUCTION OF THIS PROJECT.
- ALL EXISTING UTILITY STRUCTURES (SHOWN OR NOT SHOWN ON THE DRAWINGS) WITHIN THE AREA OF WORK SHALL BE ADJUSTED OR RECONSTRUCTED TO THE FINISH GRADES SHOWN AND SPECIFIED.
- UTILITY CONNECTIONS AND DISCONNECTIONS NECESSARY TO COMPLETE THE WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO MINIMIZE UTILITY SERVICE INTERRUPTIONS. CONTRACTOR SHALL COORDINATE ALL "DOWN TIME" WITH THE OWNER'S REPRESENTATIVE AND THE APPROPRIATE UTILITY AND/OR AGENCY.
- REFER TO CIVIL DRAWINGS FOR INFORMATION AND LOCATION OF ALL EXISTING AND PROPOSED UTILITIES.
- THE CONTRACTOR SHALL PROTECT EXISTING FACILITIES, TREES, LANDSCAPE AND OTHER ITEMS TO REMAIN FROM DAMAGE. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR SHALL PROVIDE BARRICADES, SIGNS, LIGHTS, ETC. FOR THE PROTECTION OF PUBLIC, PERSONNEL, PROPERTY, AND MATERIAL AND TO PREVENT UNCONTROLLED ACCESS TO THE SITE AT ALL TIMES. THE CONTRACTOR SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, AND NOT LIMITED TO NORMAL WORKING HOURS.

- THE CONTRACTOR SHALL PROVIDE ACCESSIBLE EGRESS AND INGRESS TO ON-SITE FACILITIES THAT ARE TO REMAIN OPERATIONAL DURING CONSTRUCTION.
- ANY PERMANENT MONUMENTS OR POINTS DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES SHALL BE REPLACED BY A LICENSED ENGINEER OR LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL EMPLOY ALL MEANS NECESSARY TO CONTROL AIRBORNE PARTICULATE (DUST) AT AND NEAR THE CONSTRUCTION SITE OF WORK AND ALONG APPROACH ROUTES TO THE CONSTRUCTION SITE AND IN COMPLIANCE WITH LOCAL AIR QUALITY STANDARDS.
- BEFORE ACCEPTANCE BY THE OWNER'S REPRESENTATIVE, THE COMPLETED CONSTRUCTION SHALL BE CLEARED, ANY APPLICABLE LABELS REMOVED, AND ALL OTHER TOUCHUP WORK COMPLETED. ALL FINISH MATERIALS SHALL BE PROTECTED AT ALL TIMES AGAINST SUBSEQUENT DAMAGE UNTIL FINAL ACCEPTANCE BY THE OWNER'S REPRESENTATIVE.
- THE CONTRACTOR SHALL CONTACT THE OWNER'S REPRESENTATIVE FOR DESIGNATION OF THE EQUIPMENT AND MATERIAL STORAGE AND STAGING AREAS AT THE JOB SITE.
- WASTEWATER GENERATED DURING CONSTRUCTION SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM. IF NECESSARY, THE CONTRACTOR SHALL PROVIDE AN AREA FOR ON-SITE WASHING ACTIVITIES DURING CONSTRUCTION. MATERIALS THAT COULD CONTAMINATE STORMWATER RUNOFF SHALL BE STORED IN AREAS WHICH ARE DESIGNED TO PREVENT EXPOSURE TO RAINFALL AND PREVENT RUNOFF. GRADING AND DRAINAGE FEATURES SHALL BE CONSTRUCTED SO THAT WATER FLOW DOES NOT DRAIN TO OTHER PROPERTIES. FLUSHING OF STREETS AND PARKING LOTS TO REMOVE DIRT AND CONSTRUCTION DEBRIS IS PROHIBITED UNLESS PROPER SEDIMENT CONTROLS ARE USED.
- REFER TO CIVIL DRAWINGS FOR THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP). IF NO PLAN IS PROVIDED, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE A SWPPP TO THE APPROPRIATE AGENCY FOR APPROVAL.
- THE CONTRACTOR IS RESPONSIBLE FOR CONFORMING TO ALL IMPROVEMENTS TO THE ADJACENT EXISTING CONDITIONS WITH SMOOTH TRANSITIONS TO AVOID ANY ABRUPT OR APPARENT CHANGES IN GRADES, CROSS SLOPE, HAZARDOUS CONDITIONS, ETC.
- THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE OF ANY REVISIONS OR ADDITIONAL WORK REQUIRED AS A RESULT OF FIELD CONDITIONS OR LOCAL GOVERNING AUTHORITIES. ALL REVISIONS SHALL BE IN WRITTEN CHANGE ORDER FORM AND APPROVED AND AUTHORIZED BY THE OWNER'S REPRESENTATIVE BEFORE PROCEEDING WITH THE WORK. WORK PERFORMED WITHOUT WRITTEN AUTHORIZATION SHALL BE THE FULL RESPONSIBILITY OF THE CONTRACTOR AND AT NO ADDITIONAL COST TO THE OWNER.

QUALITY CONTROL NOTES

- CONTRACTOR IS TO PROVIDE A SUMMARY OF ALL SUBMITTALS AND MOCKUPS NECESSARY FOR LANDSCAPE WORK AND ASSOCIATED SCOPE ITEMS FOR APPROVAL BY LANDSCAPE ARCHITECT. CONTRACTOR IS TO PROVIDE COMPREHENSIVE SUBMITTALS AS OUTLINED IN THE APPROVED SUMMARY OF SUBMITTALS IN TIMELY MANNER AND IN ACCORDANCE WITH THE CONTRACT FOR REVIEW AND APPROVAL.
- THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING SHOP DRAWINGS THAT ARE COORDINATED WITH ALL DISCIPLINES AND WITH EXISTING AND PROPOSED CONDITIONS AND WILL REFLECT ALL INFORMATION NECESSARY FOR COORDINATION AND CONFORMANCE REQUIREMENTS.
- ALL APPROVED SUBMITTALS, TEST RESULTS, PRODUCTS, SYSTEMS, SHOP DRAWINGS, MATERIALS, AND MOCKUPS WILL BE CONSIDERED PART OF THE PROJECT SPECIFICATIONS.



FERRY LANDSIDE IMPROVEMENT PROJECT

APN 065-073-03
SAUSALITO, CALIFORNIA

L0.0 GENERAL NOTES

No.	Revisions
Date: JUNE 2024	
Scale: AS SHOWN	
Design: INITIALS	
Drawn: INITIALS	
Approved: INITIALS	
Job No: 20191036	

Drawing Number:

L0.0

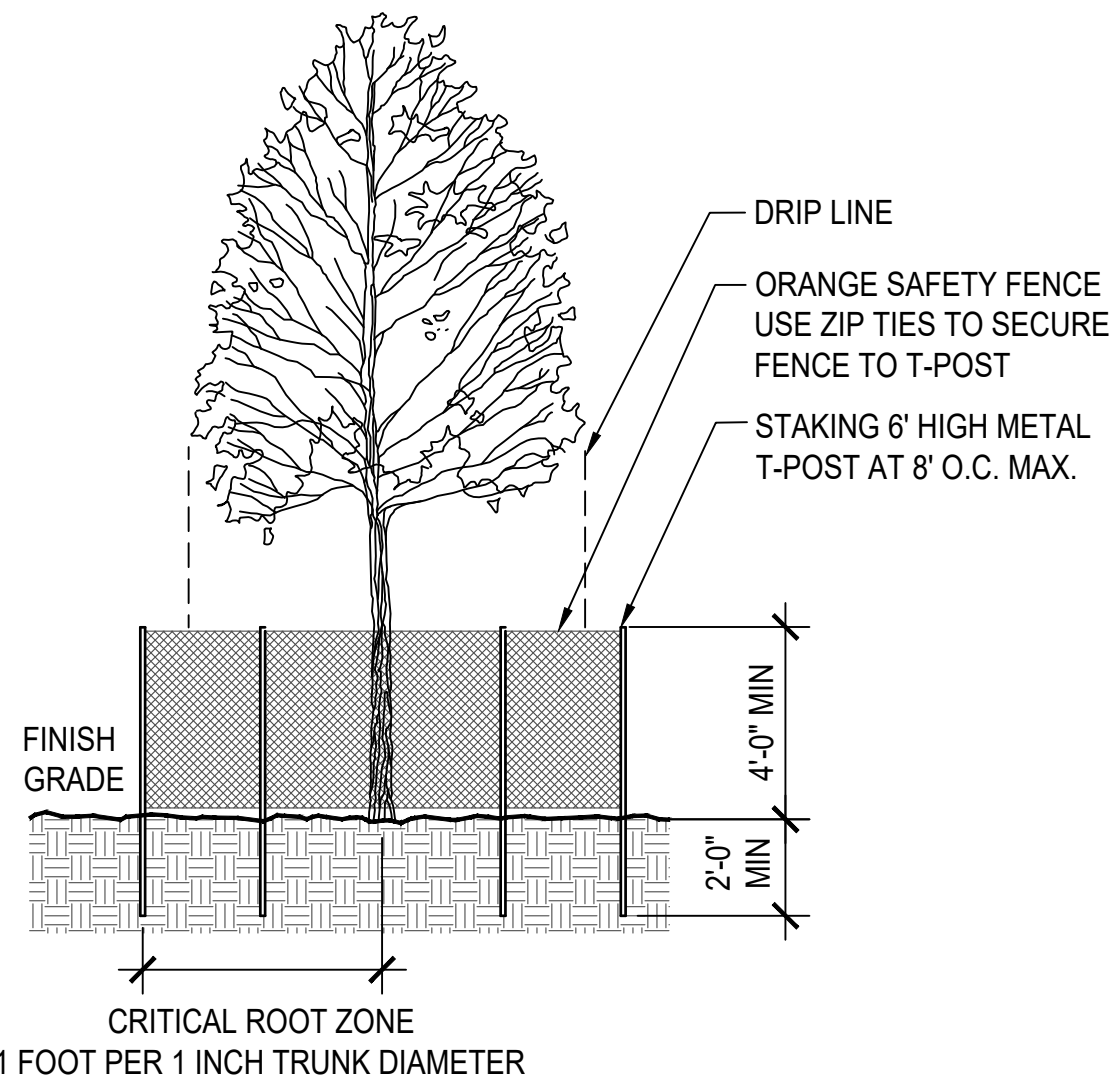
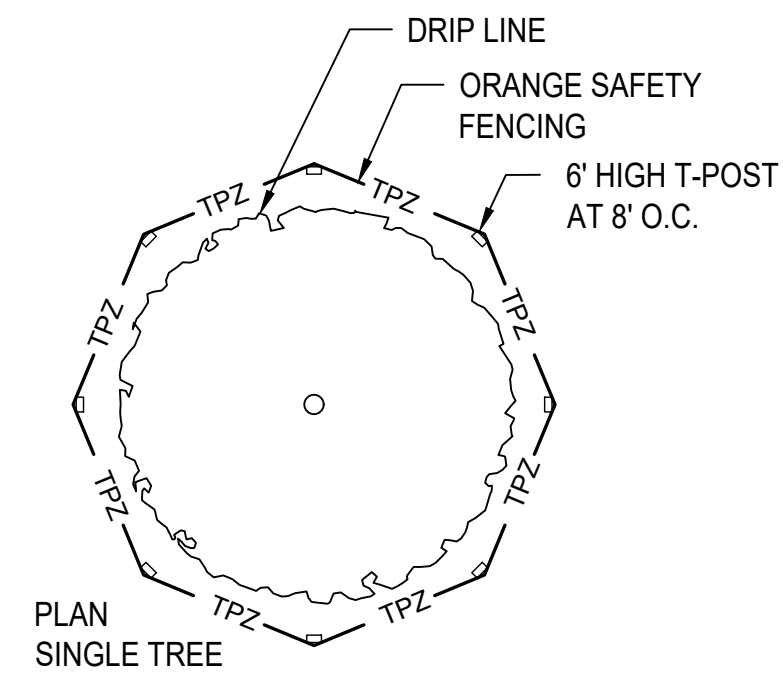
16 OF 37

TREE PROTECTION & REMOVAL LEGEND

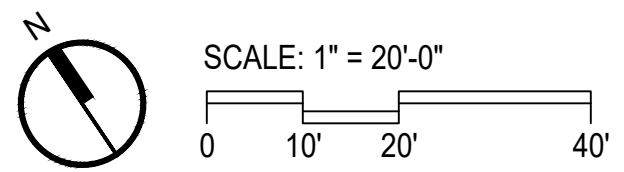
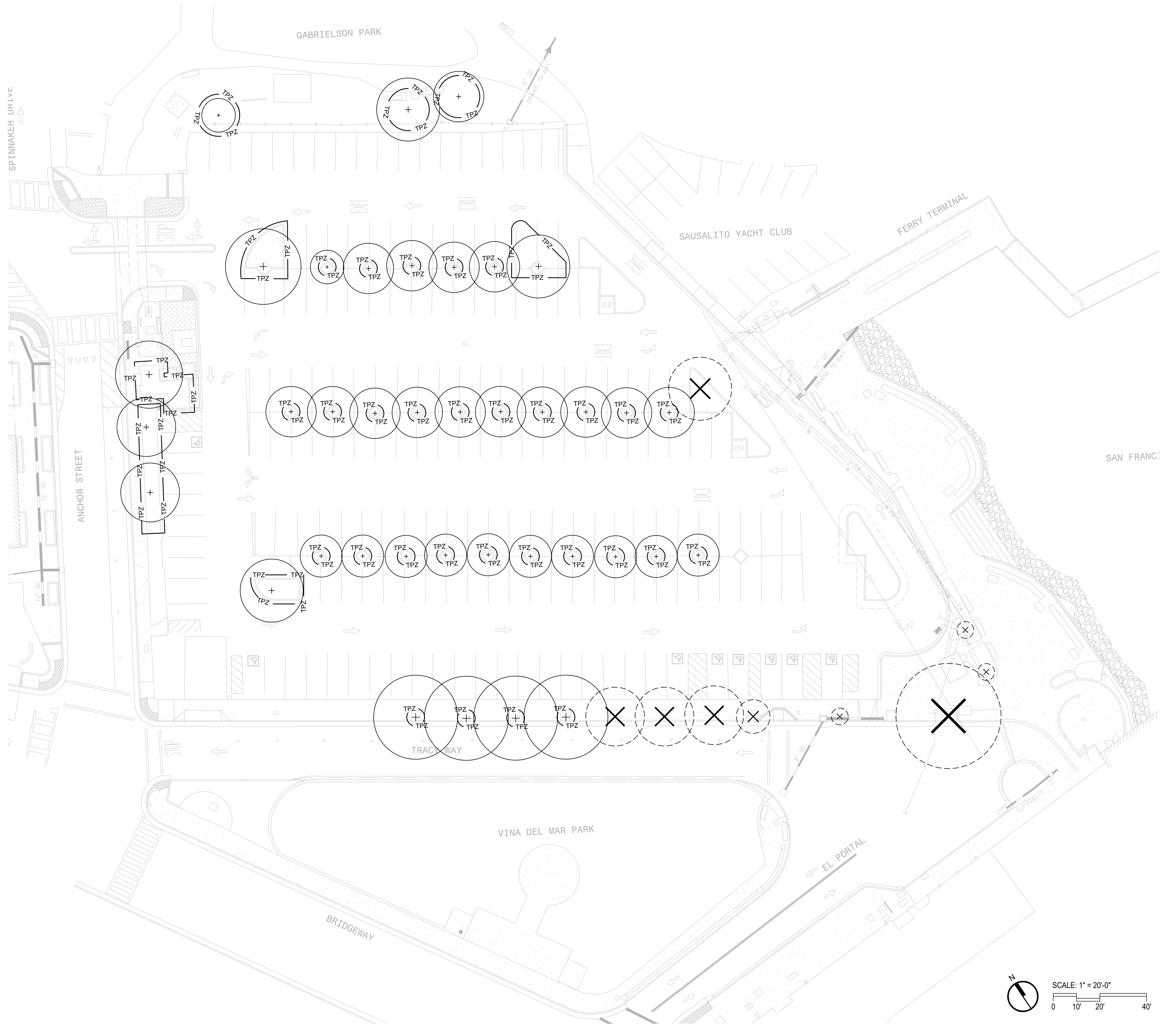
- TPZ — TREE PROTECTION ZONE, SEE SPECS
- (X) (E) TREE TO BE REMOVED
- (+) (E) TREE TO REMAIN

TREE PROTECTION & REMOVAL NOTES

1. REFER TO SPECIFICATIONS FOR EXISTING TREE PROTECTION REQUIREMENTS.
2. PROTECT ALL TREES FROM CONSTRUCTION IMPACTS AS SPECIFIED AND SUBJECT TO REVIEW AND APPROVAL OF OWNER'S REPRESENTATIVE.



1 TREE PRESERVATION FENCING
SCALE: 1/4" = 1'-0"



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FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
TREE PROTECTION & REMOVAL PLAN

No.	Revisions
Date: JUNE 2024	
Scale: AS SHOWN	
Design: INITIALS	
Drawn: INITIALS	
Approved: INITIALS	
Job No. 20191036	

Drawing Number:
L1.0
17 OF 37

Plot: Jun 07, 2024 at 2:27pm
L1.0 Tree Protection & Removal Plan.dwg COPYRIGHT © 2024, RBF ENGINEERS

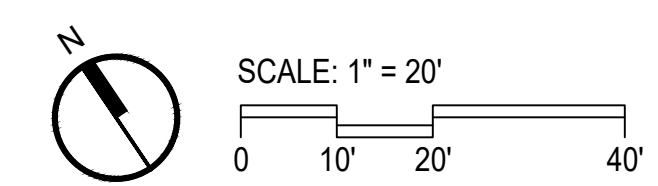
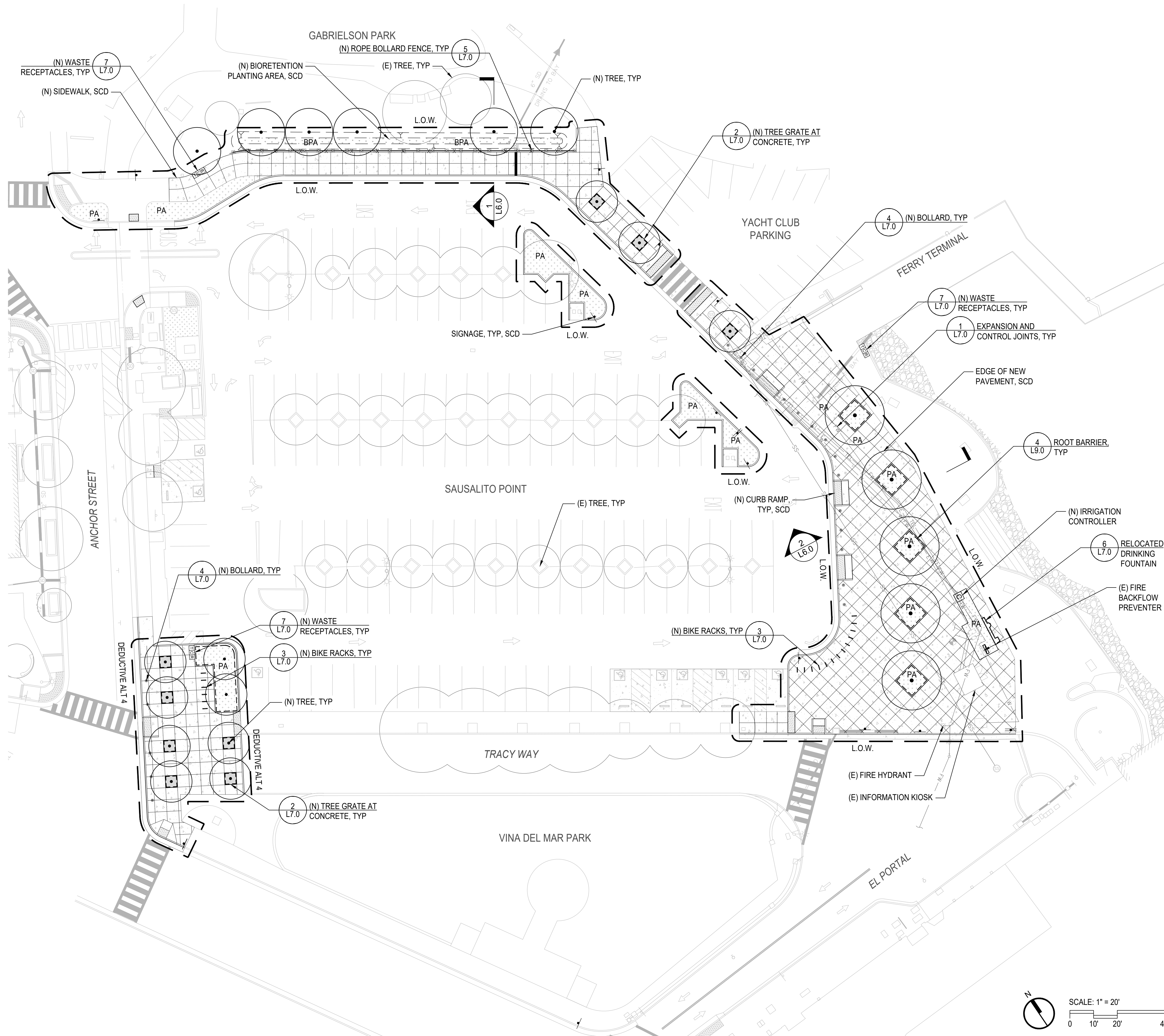
CONSTRUCTION PLAN LEGEND

- EA EACH
- (E) EXISTING
- LOW LIMIT OF WORK
- (N) NEW
- SCD SEE CIVIL DRAWINGS
- TYP TYPICAL
- SCORE JOINT, SEE SPECS
- EJ EXPANSION JOINT, SEE SPECS
- (E) CONCRETE PAVING
- (N) CONCRETE PAVING, SCD
- PA PLANTING AREA
- BPA BIORETENTION PLANTING AREA
- (N) CONTROLLER
- (N) LIGHT - BOLLARD
- (N) TREE

FURNISHINGS SCHEDULE - BASE BID					
QTY	SYMBOL	NOTES	LENGTH	WIDTH	HEIGHT
19	—	BIKE RACK		1'-11 5/8"	2'-7 1/2"
19	○	BOLLARD		0'-7 1/2"	2'-9 1/2"
9	▨	TREE GRATE	5'-0"	5'-0"	
3 EA	TCR	TRASH, COMPOST, & RECYCLING RECEPTACLES			

FURNISHINGS SCHEDULE - DEDUCTIVE ALT 4					
QTY	SYMBOL	NOTES	LENGTH	WIDTH	HEIGHT
13	—	BIKE RACK		1'-11 5/8"	2'-7 1/2"
14	○	BOLLARD		0'-7 1/2"	2'-9 1/2"
3	▨	TREE GRATE	5'-0"	5'-0"	
2 EA	TCR	TRASH, COMPOST, & RECYCLING RECEPTACLES			

NOTES:
REFER TO DETAILS & SPECS FOR DIMENSIONAL & PRODUCT INFORMATION. DIMENSIONS PROVIDED FOR REFERENCE ONLY.



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FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
CONSTRUCTION PLAN

No.	Revisions

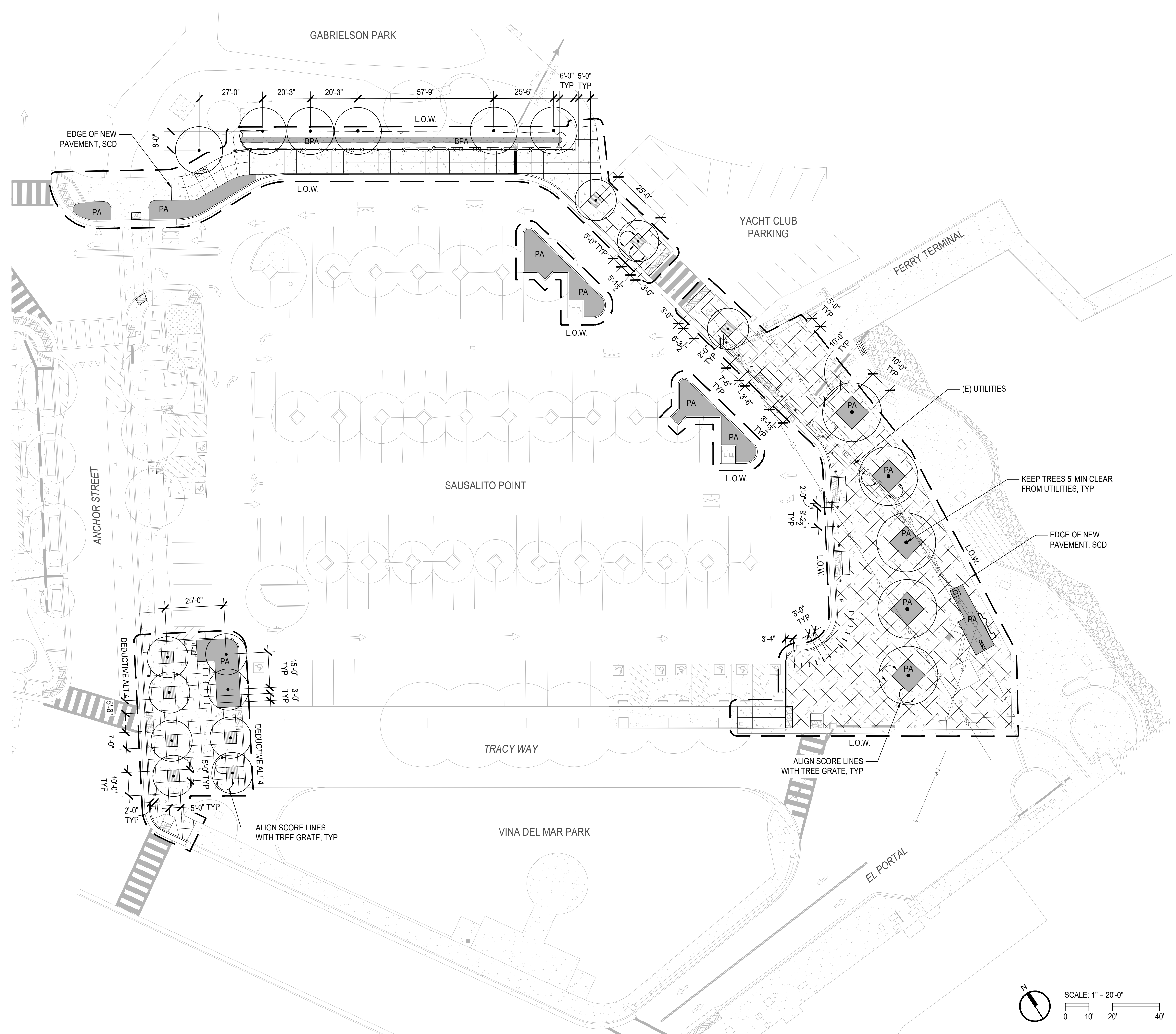
Date: JUNE 2024
Scale: AS SHOWN
Design: INITIALS
Drawn: INITIALS
Approved: INITIALS
Job No: 20191036
Drawing Number:
L2.0
18 OF 37

LAYOUT LEGEND

- ⊕ CENTER LINE
- ALIGN
- SCORE JOINT, SEE SPECS
- EJ EXPANSION JOINT, SEE SPECS
- EQ EQUAL
- (E) EXISTING
- MAX MAXIMUM
- MIN MINIMUM
- OC ON CENTER
- TYP TYPICAL
- LIGHT - BOLLARD
- PA PLANTING AREA
- BPA BIORETENTION PLANTING AREA

LAYOUT NOTES

1. THE CONTRACTOR IS RESPONSIBLE TO LAYOUT ALL IMPROVEMENTS AS SHOWN AND SPECIFIED.
2. THE CONTRACTOR SHALL FIELD VERIFY THAT ALL STAKING SET FOR IMPROVEMENTS ARE CONSISTENT WITH THE DESIGN INTENT OF THESE PLANS AND IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE AND LANDSCAPE ARCHITECT OF ANY DISCREPANCY.
3. ALL CURVES TO BE CONTINUOUS WITH SMOOTH TRANSITIONS AS SHOWN IN THE DRAWINGS, UNLESS OTHERWISE NOTED.
4. HORIZONTAL DIMENSIONS ARE SHOWN AT THE PRIMARY GEOMETRIC CONTROL POINTS FOR THE IMPROVEMENTS TO AID THE CONTRACTOR WITH THE ESTABLISHMENT OF THE HORIZONTAL LOCATION OF THE IMPROVEMENTS AND ARE BASED ON THE SURVEY PROVIDED BY THE CIVIL ENGINEER.
5. THE CONTRACTOR SHALL REFER TO THE ENGINEERING PLANS FOR THE LAYOUT, DIMENSIONS, ANGLES AND ELEVATIONS OF ALL BUILDINGS, STRUCTURES, UTILITIES, CURBS AND GUTTERS.



No.	Revisions

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Approved: INITIALS
Job No. 20191036

Drawing Number:

L3.0

WATER EFFICIENT LANDSCAPE (MWEL) WORKSHEET - NON-RESIDENTIAL DEDUCTIVE ALTERNATIVE 4

Project Information
 Date: 6/7/2024
 Project Applicant: RHAA Landscape Architecture and Planning
 Project Address: Sausalito Ferry Landing, Sausalito, CA
 Total Landscape Area: 3,051 sq ft
 Project Type: New
 Water Supply Type: Potable
 Project Contact Project Applicant: Barbara Lundburg (Principal RHAA), PH: (415) 383 7905
 Project Contact Project Owner: Barbara Lundburg CA LA #1591

"I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package"
 Barbara Lundburg CA LA #1591

Name of City: Sausalito
Reference Evapotranspiration (Eto) = 34.3 inches/year

Hydrozone (a)	Plant Description	Plant Factor (PF) (g)	Irr Method (b)	Irrigation Efficiency IE (c)	ETAF (PF/IE) (f)	Landscape Area (sq ft)	ETAF x Area	Estimated Total Water Use (ETWU) (e)	
REGULAR LANDSCAPE AREAS									
Shrub	1	Low	0.3	Drip	0.81	0.37	419	155	3,300
Bioretention	2	Low	0.3	Spray	0.75	0.40	1,047	419	8,906
Tree	3	Mod	0.6	Drip	0.81	0.74	60	44	945
Shrub	4	Low	0.3	Drip	0.81	0.37	1,445	535	11,377
Tree	5	Low	0.3	Drip	0.81	0.37	80	30	630
TOTALS						3,051	1,183		
						(A)	(B)		

SPECIAL LANDSCAPE AREAS (SLA)									
Recreation Areas						1	0	0	0
Edible Plants						1	0	0	0
Recycled Water						1	0	0	0
TOTALS						0	0	0	0
						(C)	(D)		

ETWU Total	25,159
Maximum Allowed Water Allowance (MAWA) (e)	29,192

(a) **Hydrozone #/Planting Description**
 Eg 1) front lawn
 2) low water use plantings
 3) medium water use planting

(b) **Irrigation Method**
 overhead spray
 or drip

(c) **Irrigation Efficiency**
 0.75 for spray head
 0.81 for drip

(d) **ETWU (Annual Gallons Required) = Eto x 0.62 x ETAF x Area**
 where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

(e) **MAWA (Annual Gallons Allowed) = (Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]**
 where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet.

(f) **ETAF Evapotranspiration Adjustment Factor**
 Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

ETAF Calculations

Regular Landscape Areas	
Total ETAF x Area	1,183 (B)
Total Area	3,051 (A)
Average ETAF	0.39 (B/A)

(g) **Plant Factor**

Very Low Water Use	0.1
Low Water Use	0.1 - 0.3
Moderate Water Use	0.4 - 0.6
High Water Use	0.7 - 1.0

All Landscape Areas	
Total ETAF x Area	1,183 (B + D)
Total Area	3,051 (A + C)
Sitewide ETAF	0.39 (B + D) / (A + C)

IRRIGATION NOTES

- REFER TO PLANS, DETAILS AND SPECIFICATIONS FOR IRRIGATION SYSTEM COMPONENTS, INSTALLATION, MAINTENANCE, SCHEDULING, AND REPORTING REQUIREMENTS.
- THE CONTRACTOR SHALL COMPLY WITH LOCAL WATER DISTRICT PROCEDURES & REQUIREMENTS, ALL CITY OF SAUSALITO REQUIREMENTS, AND THE STATE WATER EFFICIENT LANDSCAPE ORDINANCE. ORDINANCE CRITERIA HAS BEEN APPLIED ACCORDINGLY FOR THE EFFICIENT USE OF WATER IN THE IRRIGATION DESIGN PLAN.
- THESE IRRIGATION DRAWINGS ARE DIAGRAMMATIC AND INDICATIVE OF THE WORK TO BE INSTALLED. ALL PIPING, VALVES, AND OTHER IRRIGATION COMPONENTS ARE TO BE INSTALLED WITHIN PLANTING AREAS TO THE GREATEST EXTENT POSSIBLE. DUE TO THE SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL OFFSETS, FITTINGS, SLEEVES, CONDUIT, AND OTHER ITEMS WHICH MAY BE REQUIRED.
- THE CONTRACTOR IS TO INVESTIGATE THE EXISTING AND PROPOSED FINISHED CONDITION OF THE WORK. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE OF ANY CONFLICTS AND/OR DISCREPANCIES BETWEEN EXISTING AND PROPOSED CONDITIONS WHICH WILL AFFECT THE WORK, BEFORE PROCEEDING WITH THE WORK. IN THE EVENT THESE NOTIFICATIONS ARE NOT PERFORMED, THE CONTRACTOR ASSUMES FULL RESPONSIBILITY FOR REQUIRED REVISIONS.
- THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES, INCLUDING THE INSTALLATION OF ALL PIPE, CONDUIT AND SLEEVES THROUGH OR UNDER WALLS, ROADWAYS, PAVING AND STRUCTURES.
- PRIOR TO TRENCHING AND DIGGING, CONTACT USA (800-227-2600) TO LOCATE ALL UNDERGROUND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MINOR CHANGES IN THE IRRIGATION LAYOUT DUE TO OBSTRUCTIONS NOT SHOWN ON THE IRRIGATION DRAWINGS SUCH AS UNDERGROUND UTILITIES, VAULTS, ETC. THE CONTRACTOR SHALL AVOID CONFLICTS WITH UNDERGROUND UTILITIES, NEW PLANTING, SITE OR ARCHITECTURAL ELEMENTS, AND EXISTING TREES; ANY DAMAGE TO THESE CAUSED BY THE INSTALLATION OF THE IRRIGATION SYSTEM SHALL BE REPAIRED AND/OR REPLACED AT NO EXPENSE TO THE OWNER.
- THE CONTRACTOR SHALL VERIFY FLOW RATE AND PRESSURE AT THE POINT OF CONNECTION PRIOR TO THE INSTALLATION OF THE IRRIGATION SYSTEM AND NOTIFY THE OWNER'S REPRESENTATIVE OF TEST RESULTS BEFORE CONSTRUCTION BEGINS. NOTIFY LANDSCAPE ARCHITECT IF PRESSURE IS GREATER OR LESS THAN THE STATIC PRESSURE STATED ON THE PLANS TO DETERMINE IF PRESSURE REGULATION OR A BOOSTER PUMP IS REQUIRED.
- INSTALL ALL IRRIGATION EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
- WHERE PIPE SIZES HAVE BEEN OMITTED OR THERE IS A CONFLICT, REFER TO THE LATERAL PIPE SIZING CHART FOR SIZES. AS CHANGES IN LAYOUT OCCUR DURING STAKING AND CONSTRUCTION, PIPE SIZES MAY NEED TO BE ADJUSTED ACCORDINGLY. ALL LATERAL END RUNS SHALL BE 1" SIZE UNLESS OTHERWISE NOTED.
- THE REMOTE CONTROL VALVES SPECIFIED ON THE DRAWINGS ARE PRESSURE REDUCING TYPES. SET THE DISCHARGE PRESSURE AS RECOMMENDED BY MANUFACTURER.
- LOCATE BUBBLERS AND EMITTERS ON UPHILL SIDE OF PLANT OR TREE.

WATER EFFICIENT LANDSCAPE (MWEL) WORKSHEET - NON-RESIDENTIAL BASE BID

Project Information
 Date: 6/7/2024
 Project Applicant: RHAA Landscape Architecture and Planning
 Project Address: Sausalito Ferry Landing, Sausalito, CA
 Total Landscape Area: 3,051 sq ft
 Project Type: New
 Water Supply Type: Potable
 Project Contact Project Applicant: Barbara Lundburg (Principal RHAA), PH: (415) 383 7905
 Project Contact Project Owner: Barbara Lundburg CA LA #1591

"I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package"
 Barbara Lundburg CA LA #1591

Name of City: Sausalito
Reference Evapotranspiration (Eto) = 34.3 inches/year

Hydrozone (a)	Plant Description	Plant Factor (PF) (g)	Irr Method (b)	Irrigation Efficiency IE (c)	ETAF (PF/IE) (f)	Landscape Area (sq ft)	ETAF x Area	Estimated Total Water Use (ETWU) (e)	
REGULAR LANDSCAPE AREAS									
Shrub	1	Low	0.3	Drip	0.81	0.37	419	155	3,300
Bioretention	2	Low	0.3	Spray	0.75	0.40	1,047	419	8,906
Tree	3	Mod	0.6	Drip	0.81	0.74	60	44	945
Shrub	4	Low	0.3	Drip	0.81	0.37	1,445	535	11,377
Tree	5	Low	0.3	Drip	0.81	0.37	80	30	630
Tree	6	Low	0.3	Drip	0.81	0.37	80	30	630
Shrub	7	Low	0.3	Drip	0.81	0.37	355	131	2,796
TOTALS						3,051	1,344		
						(A)	(B)		

SPECIAL LANDSCAPE AREAS (SLA)									
Recreation Areas						1	0	0	0
Edible Plants						1	0	0	0
Recycled Water						1	0	0	0
TOTALS						0	0	0	0
						(C)	(D)		

ETWU Total	28,585
Maximum Allowed Water Allowance (MAWA) (e)	29,192

(a) **Hydrozone #/Planting Description**
 Eg 1) front lawn
 2) low water use plantings
 3) medium water use planting

(b) **Irrigation Method**
 overhead spray
 or drip

(c) **Irrigation Efficiency**
 0.75 for spray head
 0.81 for drip

(d) **ETWU (Annual Gallons Required) = Eto x 0.62 x ETAF x Area**
 where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year.

(e) **MAWA (Annual Gallons Allowed) = (Eto) (0.62) [(ETAF x LA) + ((1-ETAF) x SLA)]**
 where 0.62 is a conversion factor that converts acre-inches per acre per year to gallons per square foot per year, LA is the total landscape area in square feet, SLA is the total special landscape area in square feet.

(f) **ETAF Evapotranspiration Adjustment Factor**
 Average ETAF for Regular Landscape Areas must be 0.55 or below for residential areas, and 0.45 or below for non-residential areas.

ETAF Calculations

Regular Landscape Areas	
Total ETAF x Area	1,344 (B)
Total Area	3,051 (A)
Average ETAF	0.44 (B/A)

(g) **Plant Factor**

Very Low Water Use	0.1
Low Water Use	0.1 - 0.3
Moderate Water Use	0.4 - 0.6
High Water Use	0.7 - 1.0

All Landscape Areas	
Total ETAF x Area	1,344 (B + D)
Total Area	3,051 (A + C)
Sitewide ETAF	0.44 (B + D) / (A + C)

- CONTRACTOR SHALL MAKE FINAL CONNECTION BETWEEN ELECTRICAL SUPPLY AND THE CONTROLLER, AND BETWEEN THE MAIN LINE AND WATER SOURCE AT THE POINT OF CONNECTION(S).
- THE INTENT OF THIS IRRIGATION SYSTEM IS TO PROVIDE THE MINIMUM AMOUNT OF WATER REQUIRED TO SUSTAIN GOOD PLANT HEALTH. IT IS THE RESPONSIBILITY OF THE LANDSCAPE MAINTENANCE CONTRACTOR TO PROGRAM THE IRRIGATION CONTROLLER(S) TO PROVIDE THE MINIMUM AMOUNT OF WATER NEEDED TO SUSTAIN GOOD PLANT HEALTH. THIS INCLUDES MAKING ADJUSTMENTS TO THE PROGRAM FOR SEASONAL WEATHER CHANGES, PLANT MATERIAL, WATER REQUIREMENTS, MOUNDS AND SLOPES, SUN, SHADE AND WIND EXPOSURE.
- THE CONTRACTOR SHALL COORDINATE VALVE NUMBERING, CONTROLLER OPERATIONS AND PROGRAMMING WITH OWNER'S REPRESENTATIVE.
- STATION OPERATION TIMES SHALL NOT DELIVER WATER EXCEED THE SOIL INFILTRATION RATE(S) AS DETERMINED BY THE SOILS REPORT(S).
- THE CONTRACTOR SHALL PROVIDE THE OWNER'S REPRESENTATIVE WITH CLEAR AS-BUILT PLANS OF THE INSTALLED OF IRRIGATION SYSTEM.
- INSTALL 2-WIRE CABLE WITHIN SCH.40 1.25" CONDUIT WITH LONG SWEEPS IN AND OUT OF EACH VALVE BOX. SEAL ALL CONDUIT OPENINGS WITH WATERPROOF FOAM.
- EVERY CHANGE IN DIRECTION. ONLY SPLICE TWO WIRE CABLE AT THREE WAY WIRE CONNECTIONS.
- IRRIGATION CONTROL WIRES: SOLID COPPER WITH U.L. APPROVAL FOR DIRECT BURIAL IN GROUND. SIZE #14AWG WIRE WITH A JACKETED 2-CONDUCTOR. PREFERRED WIRE MAKE AND MODEL IS THE PAIGE IRRIGATION WIRE, SPEC P7072D. ALL SPLICING SHALL BE MADE WITH 3-M DBR/Y-6 WATERPROOF SPLICE KIT.
- DECODER GROUNDING SHALL BE PROVIDED EVERY (500 FEET OR EVERY 8 DECODERS, WHICHEVER IS SMALLER, AT THE CONTROLLER AND AT THE LAST DECODER OR AT THE END OF THE 2 WIRE PATH. GROUND WITH A 5/8" X 8' COPPER CLAD GROUNDING ROD. #6 COPPER WIRE TO SURGE DEVICE/DECODER. INCLUDE A SURGE ARRESTOR AT EACH GROUNDING LOCATION. A SPLIT BOLT CONNECTION TO BE USED TO CONNECT THE SURGE DEVICE TO THE GROUND WIRE WITH A DBR/Y-6 WATERPROOF CONNECTOR.
- SPLICING OF JACKETED 2-WIRE IS PERMITTED IN VALVE BOXES ONLY. LEAVE A 24" LONG COIL OF WIRE AT EACH SPLICE AND A 24" LONG EXPANSION LOOP IN ALL PULL BOXES.

IRRIGATION REFERENCES

- CALIFORNIA WATER EFFICIENT LANDSCAPE ORDINANCE (AB 1881), OR ADOPTED LOCAL ORDINANCE
- LOCAL WATER DISTRICT REQUIREMENTS
- LATEST EDITION OF THE UNIFORM PLUMBING CODE AND THE NATIONAL ELECTRIC CODE

IRRIGATION LEGEND

- (M) (E) IRRIGATION METER. SEE CIVIL
- (E) BACKFLOW PREVENTOR. SEE CIVIL
- (MV) MASTER VALVE
GRISWOLD SERIES 2000, NORMALLY OPEN, 2" LINE
- (FS) FLOW SENSOR
RAINBIRD FS SERIES
- (C) CONTROLLER
RAINBIRD ESP-LXD WEATHER-BASED 2-WIRE DECODER CONTROLLER W/ LSXMMSS STAINLESS STEEL CABINET & LSXMMSSPED STAINLESS STEEL PEDESTAL. PROVIDE FIRST GROUND 25' AWAY FROM CONTROLLER, THEN 600' THEREAFTER, AND AT SPURS OVER 50'. PROVIDE GROUND 8' OFF 2-WIRE PATH. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- (S) SOIL SENSORS
RAINBIRD * SOIL SENSORS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- (W) WEATHER SENSOR
RAINBIRD*
- MAINLINE PIPE
SCH 40 PVC, 3" AND SMALLER, SEE SIZING CHART
- LATERAL LINE PIPE
SCH 40 PVC, 1" AND LARGER, SEE SIZING CHART
- (6) SLEEVE
SCH 40 PVC, SIZE AS SHOWN
- REMOTE CONTROL VALVE - MEDIUM AND HIGH FLOW
RAINBIRD PESB-PRS-D-R
PRESSURE REGULATING TYPE
- EMITTER REMOTE CONTROL VALVE - LOW FLOW DRIP ZONES
RAINBIRD XERIGATION CONTROL ZONE KITS
XCZ-PRB-100-COM-R
PRESSURE REGULATING TYPE
- ISOLATION VALVE
NIBCO T113-IRR, LINE SIZE
- QUICK COUPLING VALVE
RAINBIRD 33-DNP
- SUBSURFACE DRIP IRRIGATION
RAINBIRD XFS-CV-06-18 DRIFLINE
1/2" POLYETHYLENE DRIP EMITTER LINE W/ PRESSURE REGULATING EMITTERS & COPPER RWT PROTECTION & QF DRIFLINE FLEX HEADERS. 18" O.C. EMITTER SPACING. RB XFS OPERATION INDICATOR AT END OF EACH DRIP ZONE.
- CONTROLLER / STATION NUMBER
GALLON PER MINUTE OF ZONE
VALVE SIZE
- TREE BUBBLERS - 2 PER TREE
RAINBIRD: RWS-M-B-C-1402, 0.5 GPM,
CHECK VALVE
- SPRAY IRRIGATION
RAINBIRD RD 1806PRS W/ VAN SERIES VARIABLE ARC NOZZLES

SYSTEM INFORMATION
 POTABLE WATER

70 PSI	AVAILABLE PSI AT POC
90 GPM	AVAILABLE GPM AT POC
30 PSI	OPERATING PSI FOR SYSTEM
60 GPM	OPERATING GPM FOR SYSTEM

PVC SCH 40 PIPE SIZE	
PIPE SIZE	GPM
1"	0-11
1-1/2"	12-24
2"	24-35
2-1/2"	35-60
3"	60-90

TYPICAL REMOTE CONTROL VALVE SIZE	
VALVE SIZE	GPM
1"	0-25
1-1/2"	26-50
2"	50-100

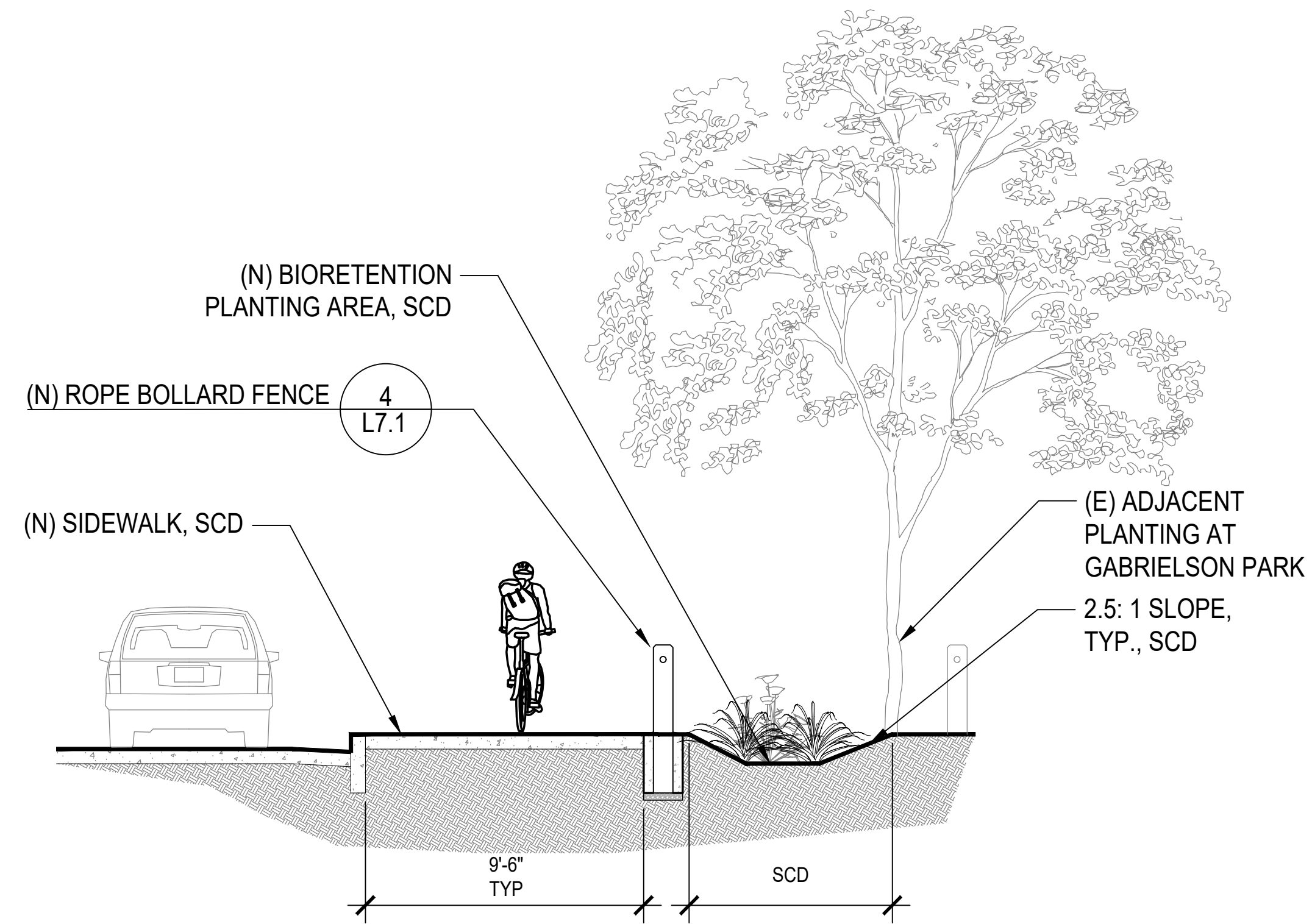
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 APR 065-073-03
 SAUSALITO, CALIFORNIA

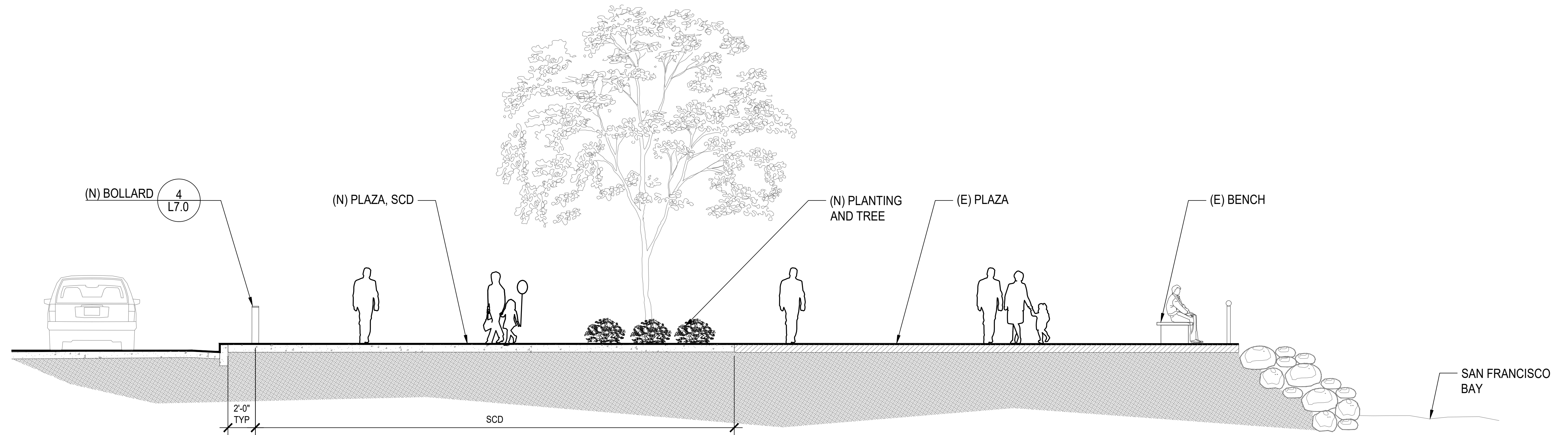
IRRIGATION NOTES & LEGEND

No.	Date	By	Checked

Drawing Number:
L4.0
 20 OF 37



1 SECTION AT BIORETENTION PLANTING AREA
SCALE: 1/4" = 1'-0"



2 SECTION THROUGH NEW PLAZA
SCALE: 1/4" = 1'-0"

225 MILLER AVENUE
MILL VALLEY, CA 94541
415.383.7900
www.rhaa.com



FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA

SITE SECTIONS

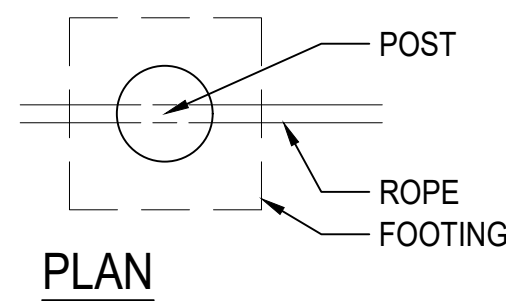
No.	Revisions

Date: JUNE 2024
Scale: AS SHOWN
Design: INITIALS
Drawn: INITIALS
Approved: INITIALS
Job No: 20191036

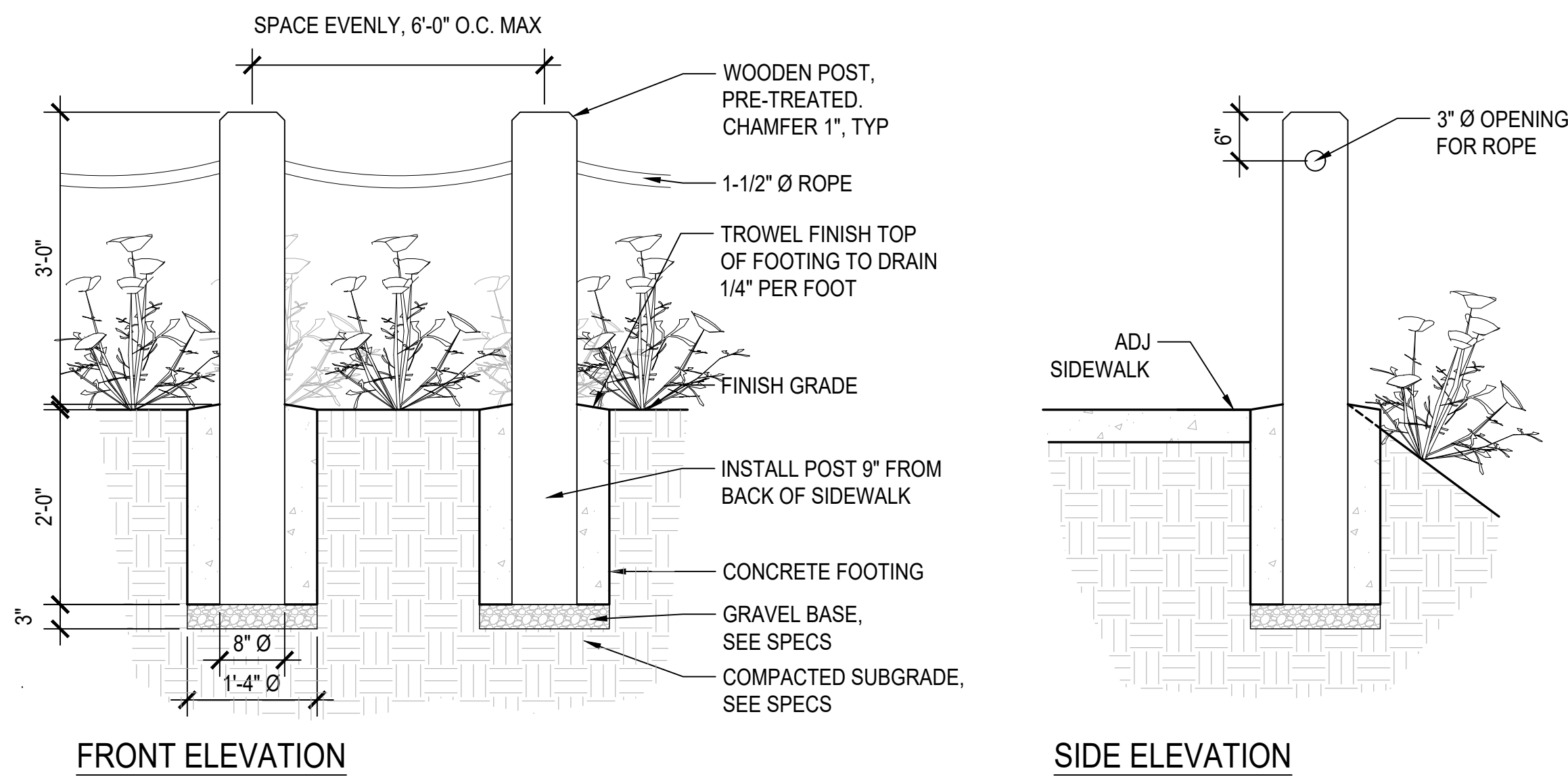
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L6.0

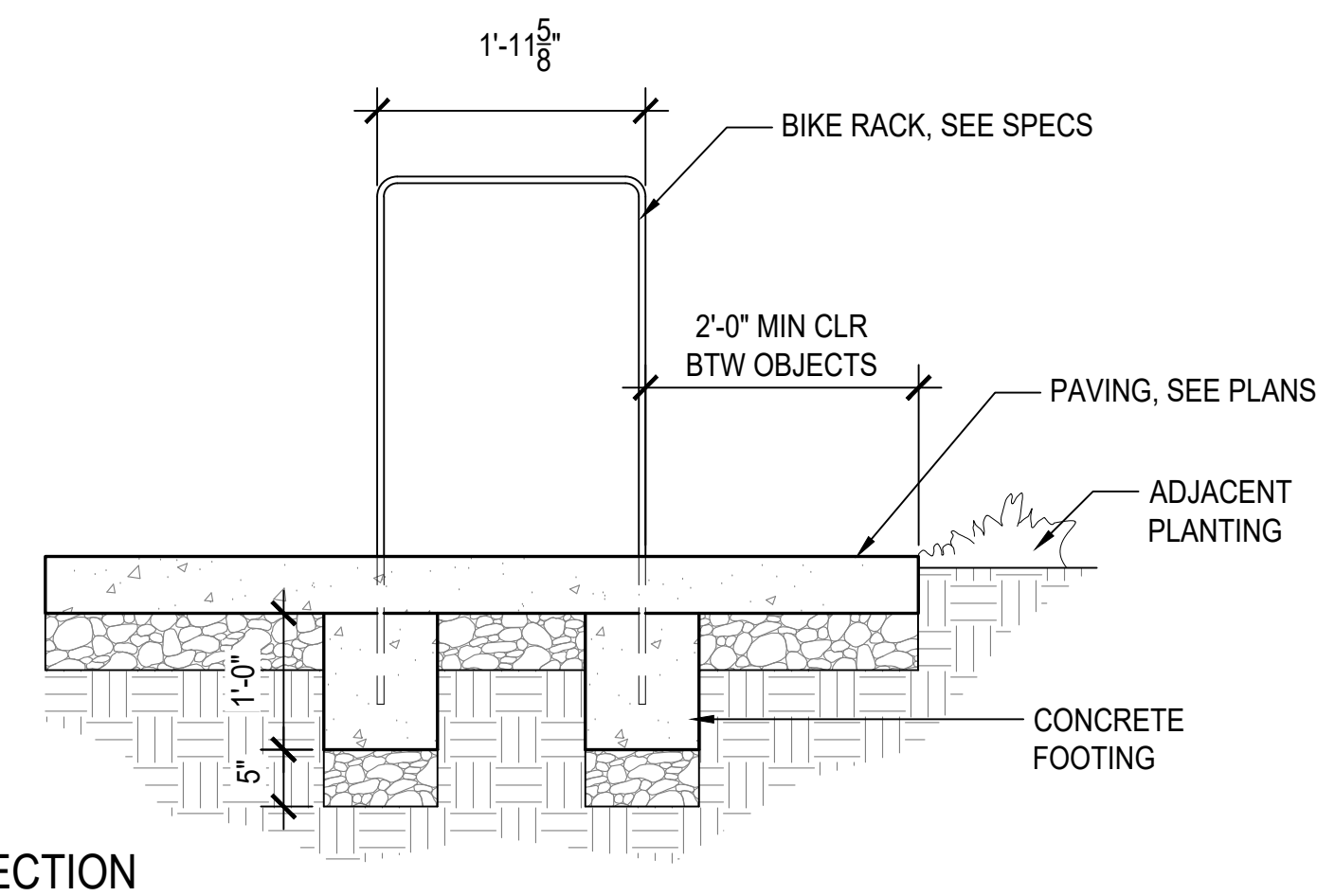
24 OF 37



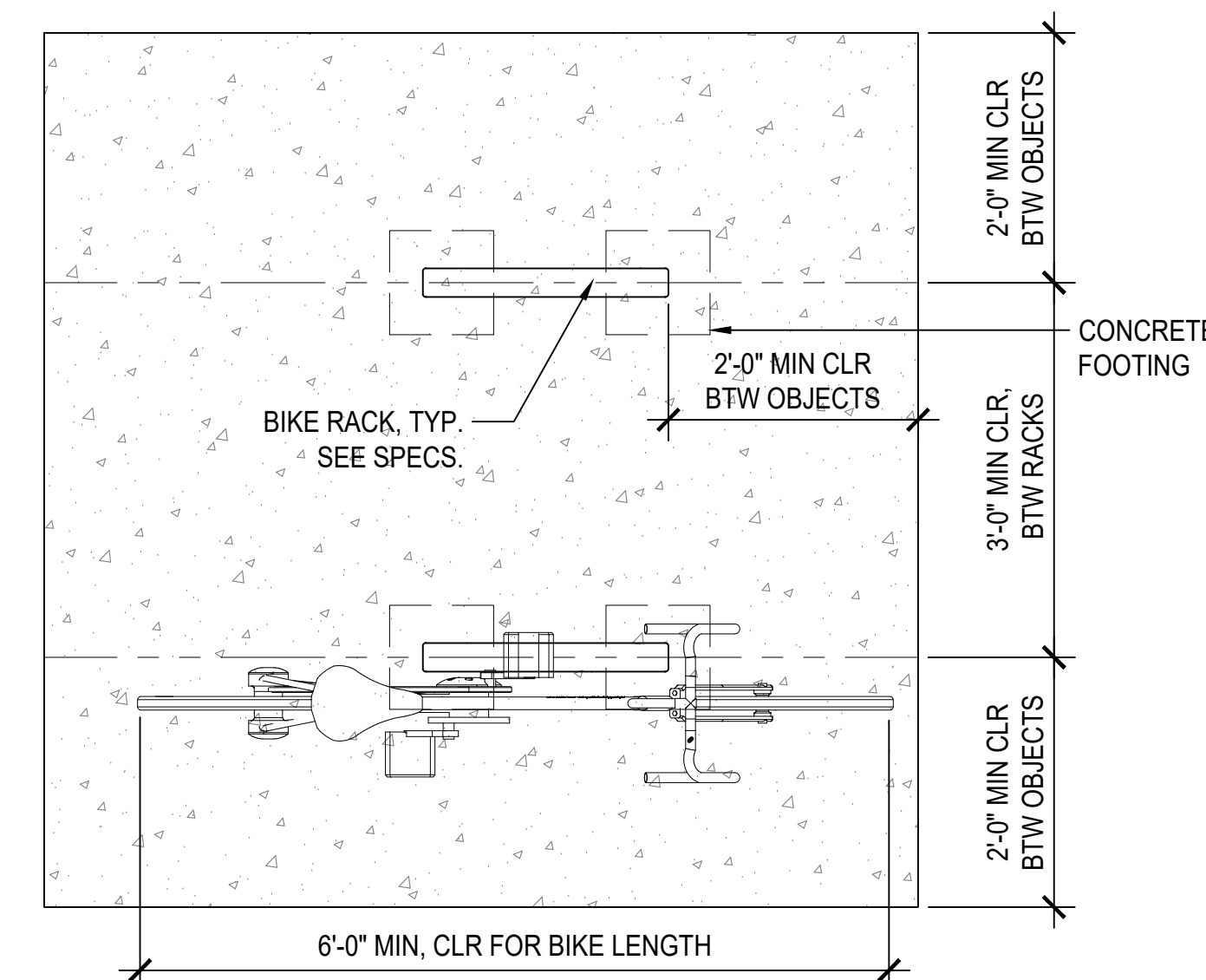
- NOTES:
1. MATCH EXISTING ROPE BOLLARD FENCE AT YACHT CLUB PARKING LOT BOUNDARY. SUBMIT SAMPLE FOR APPROVAL.



- NOTES:
1. MFR: VESTRE
 2. MODEL: 696C VROOM BICYCLE RACK LARGE
 3. MATERIAL & FINISH: POWDER-COATED ALUMINUM
 4. COLOR: 7026 GRANITE GREY
 5. MOUNTING: CASTING IN GROUND
 6. CONTRACTOR TO INSTALL PER MFR'S INSTRUCTIONS.



SECTION

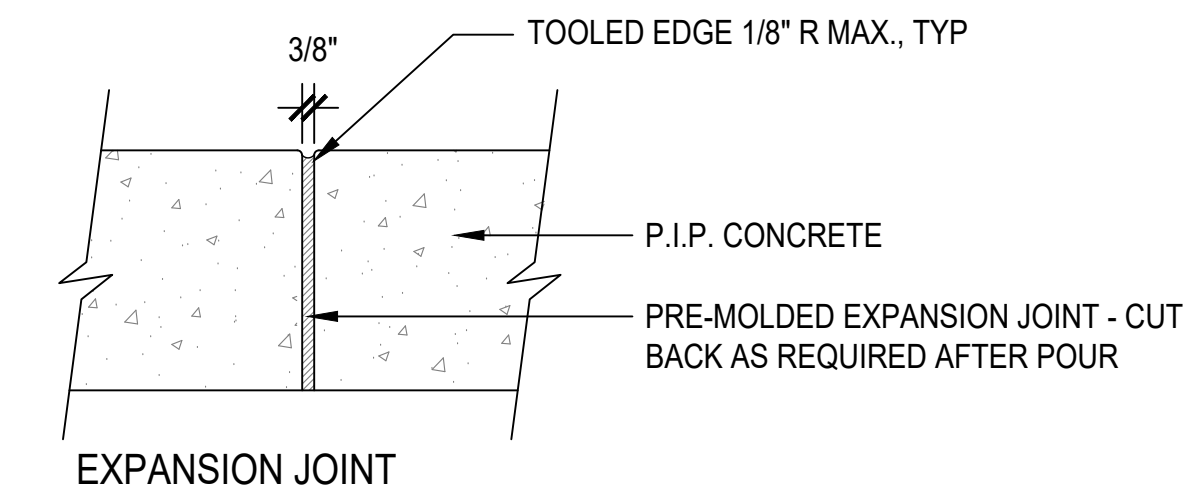


PLAN

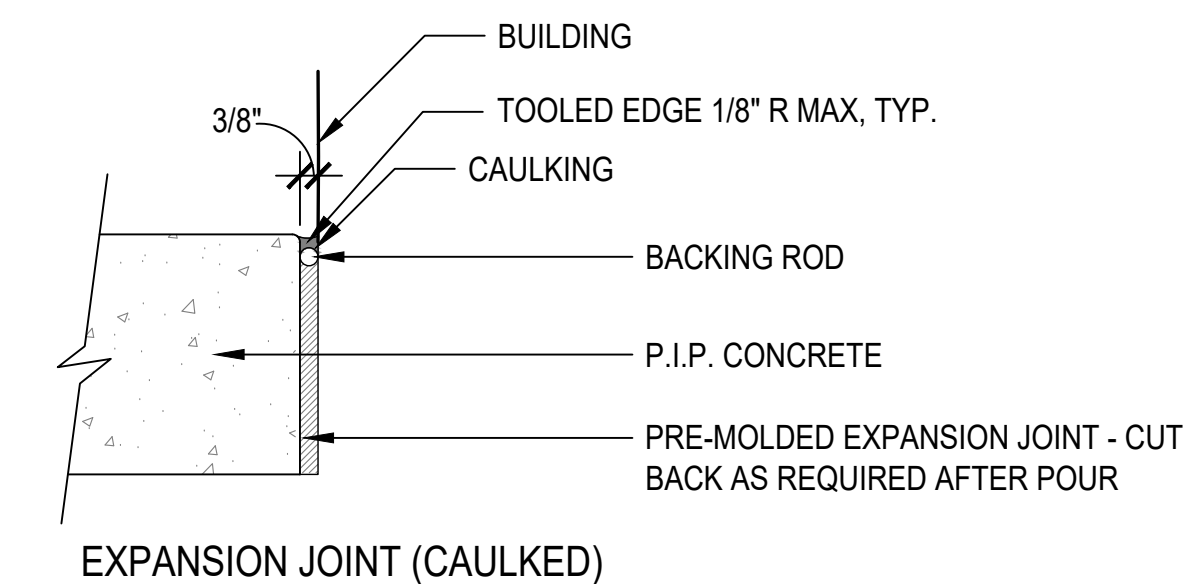
3 BIKE RACK

SCALE: 3/4" = 1'-0"

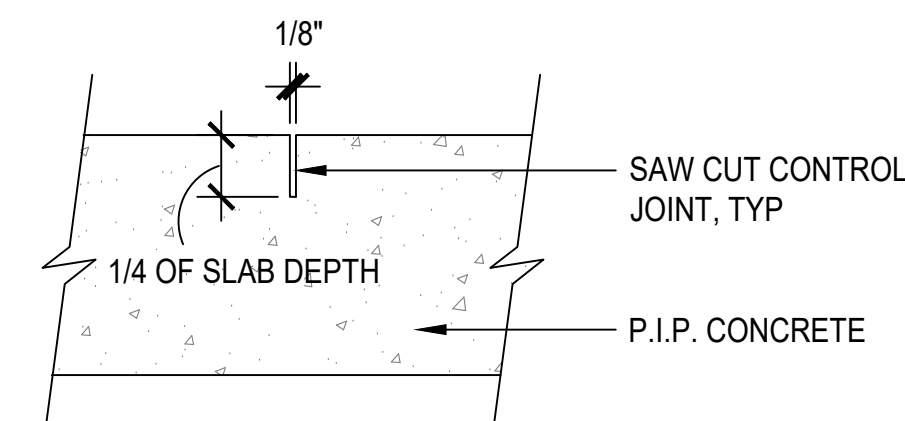
- NOTES:
1. PROVIDE EJS AT ALL WALLS, COLUMNS AND SIMILAR VERTICAL STRUCTURES.
 2. EXPANSION JOINTS AS SHOWN ON PLAN.
 3. DOWEL IS TYPICAL AT ALL EJS EXCEPT AGAINST CURBS, WALLS, COLUMNS OR SIMILAR VERTICAL STRUCTURES, UNLESS OTHERWISE NOTED ON THE DRAWING.



EXPANSION JOINT



EXPANSION JOINT (CAULKED)

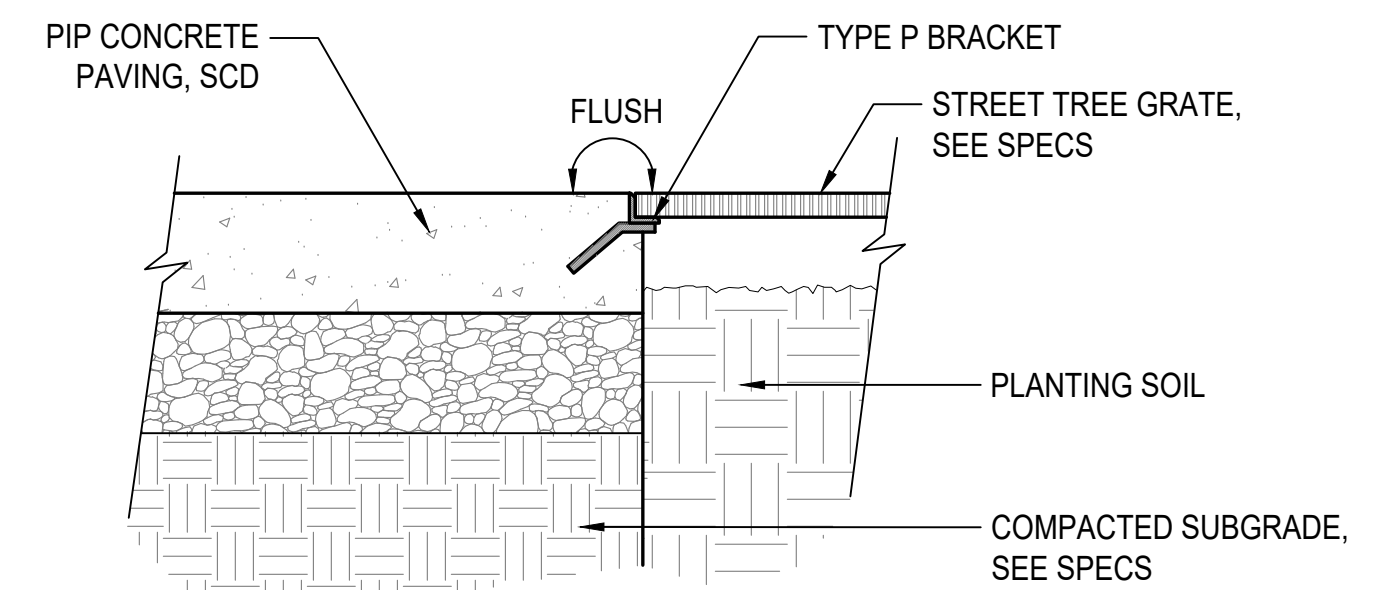


SAW-CUT SCORE / CONTROL JOINT

1 EXPANSION AND CONTROL JOINTS

SCALE: 3" = 1'-0"

- NOTES:
1. MFR: IRONSMITH
 2. MODEL: ADA-M6058, W/ TWO (2) HOLES FOR TREE STAKES
 3. MATERIAL: 100% RECYCLED GRAY IRON
 4. SIZE: 60" x 60"
 5. COLOR: RAL 7026 GRANITE GREY
 6. CONTRACTOR TO SUBMIT SHOP DRAWINGS & INSTALL & ANCHOR PER MFR'S INSTRUCTIONS.



2 TREE GRATE AT CONCRETE

SCALE: 1-1/2" = 1'-0"

5 ROPE BOLLARD FENCE

SCALE: 3/4" = 1'-0"

- NOTES:
1. CONTRACTOR TO RELOCATE EXISTING DRINKING FOUNTAIN.



6 RELOCATED DRINKING FOUNTAIN

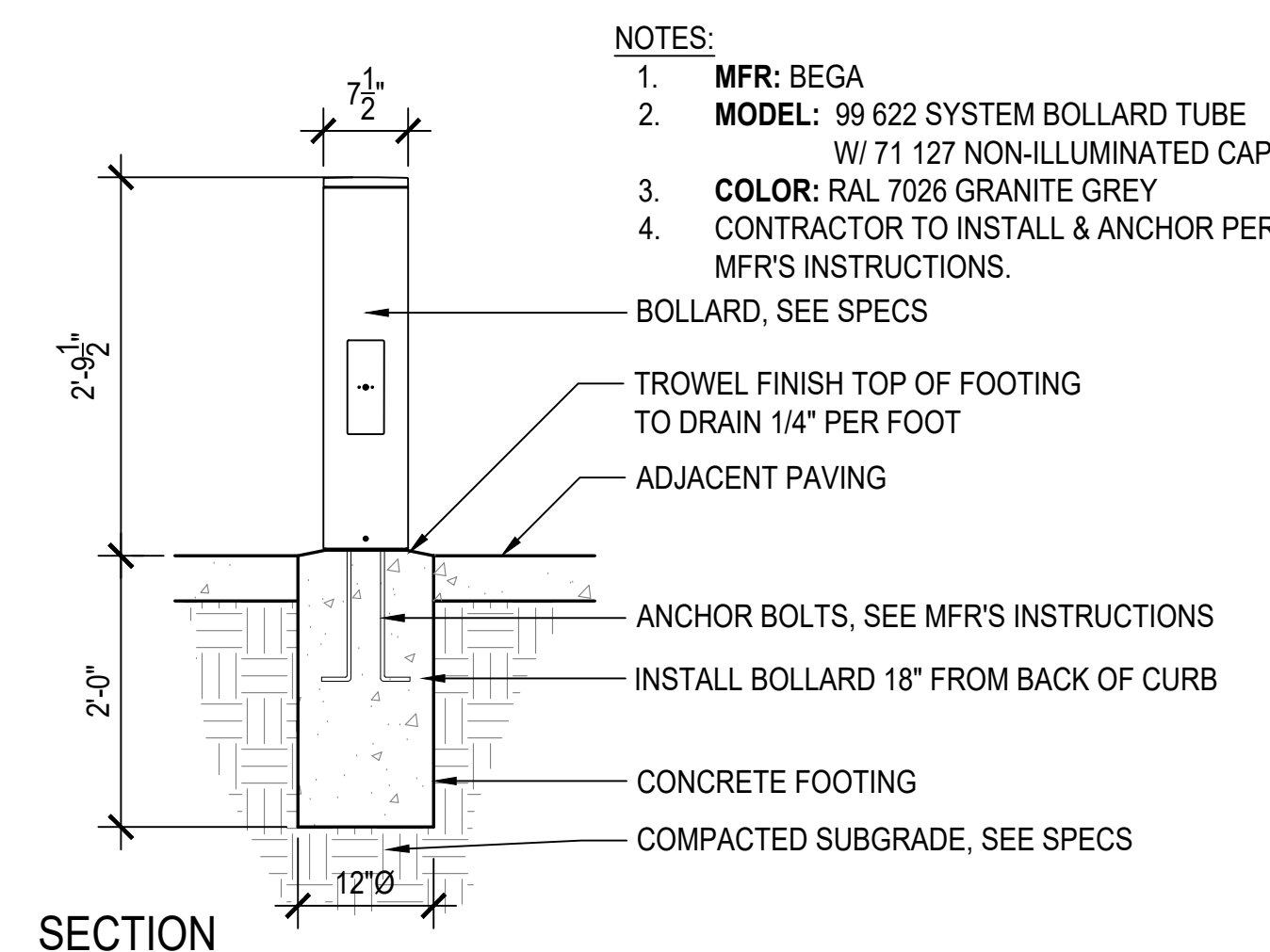
SCALE: NTS



- NOTES:
1. MFR: SECURR
 2. MODEL: CG32 - PS
 3. COLOR: MATCH EXISTING
 4. ADDITIONAL: ZINC-RICH PRIMER FOR CORROSION RESISTANCE
 5. CONTRACTOR TO MATCH WASTE RECEPTACLES SHOWN IN IMAGE.
 6. CONTRACTOR TO INSTALL & ANCHOR PER MFR'S INSTRUCTIONS.

7 WASTE RECEPTACLES

SCALE: NTS

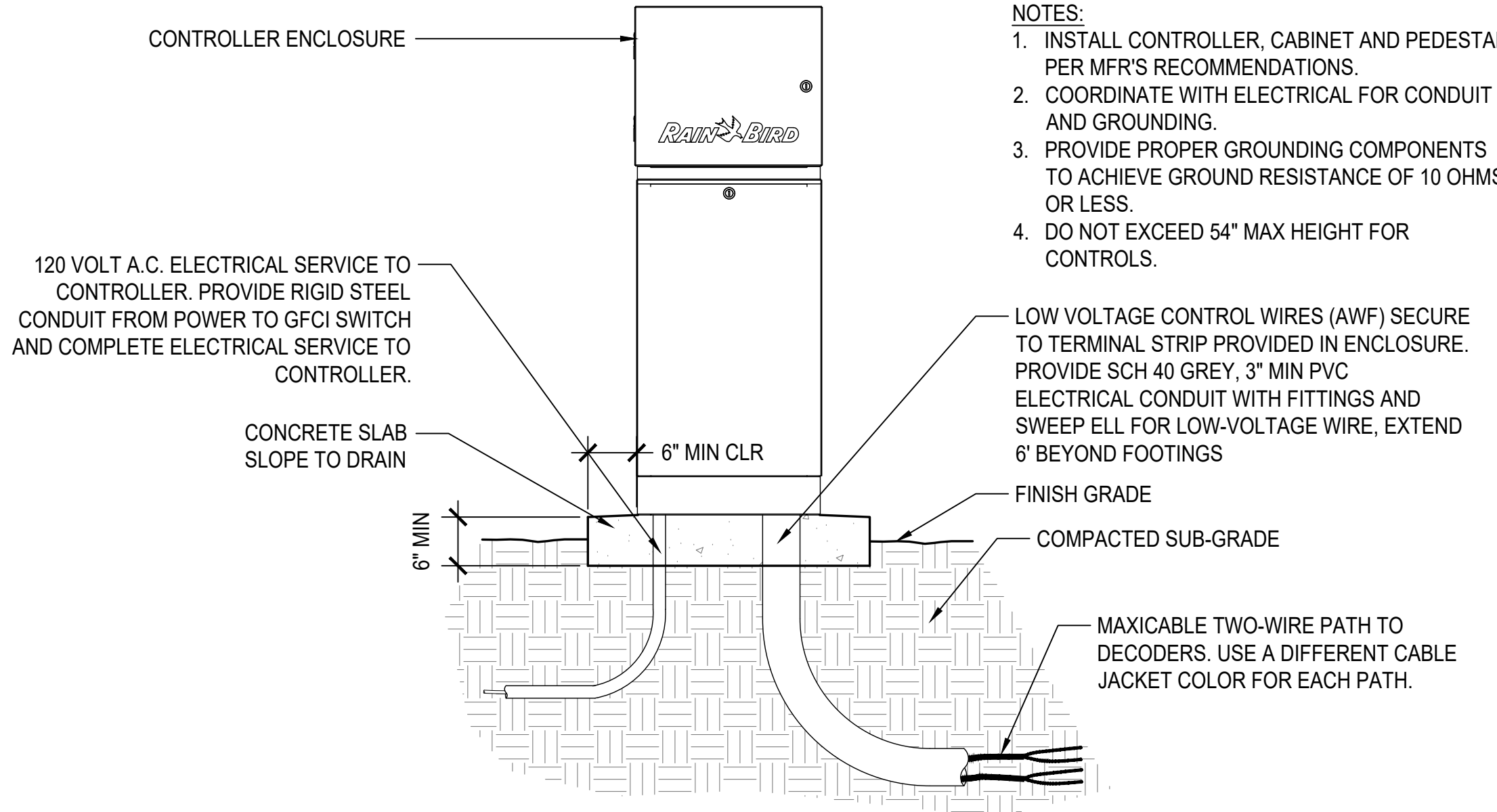


SECTION

4 BOLLARD

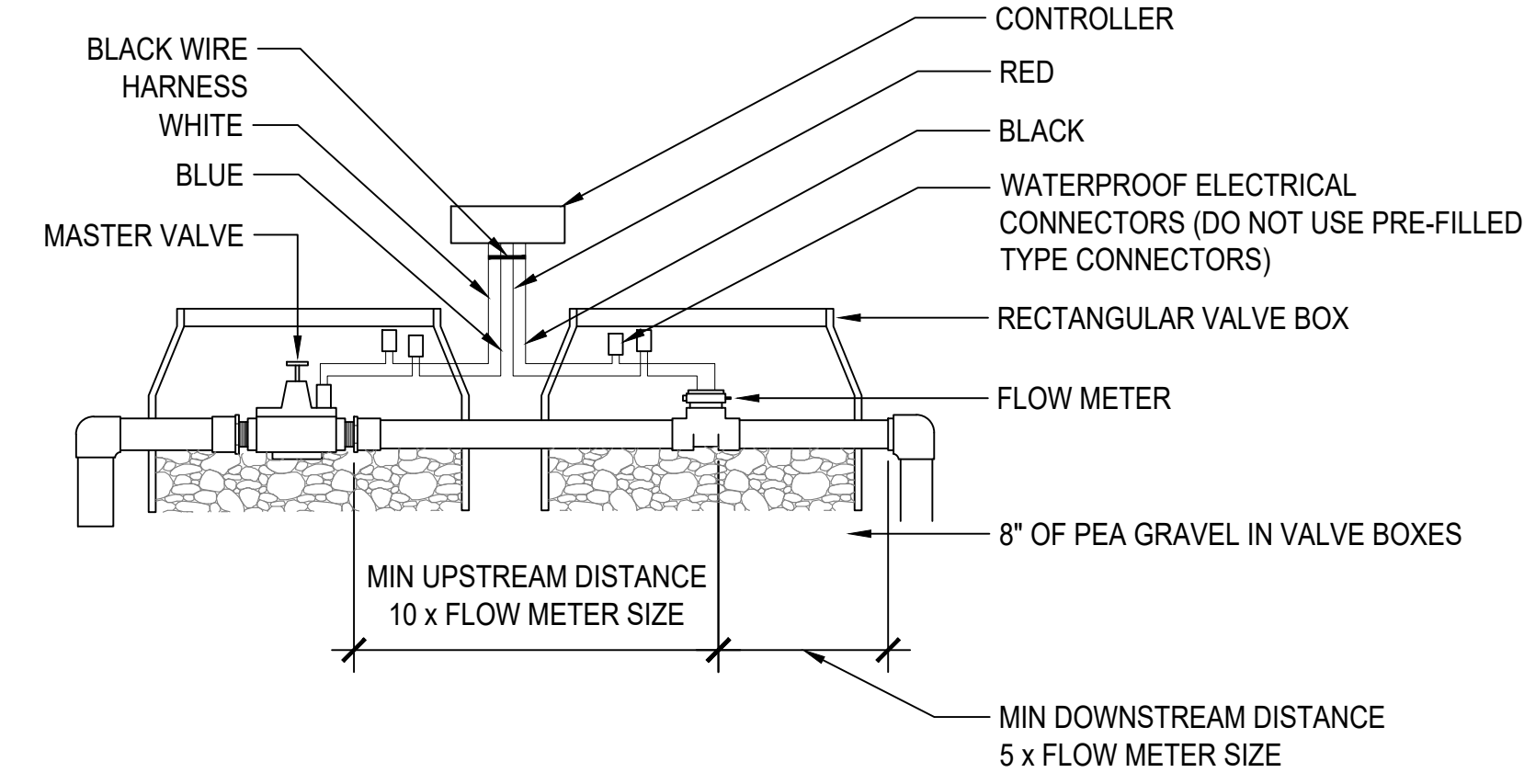
SCALE: 3/4" = 1'-0"

Date	Scale	Design	Drawn	Approved	Job No.
JUNE 2024	AS SHOWN	INITIALS	INITIALS	INITIALS	20191036

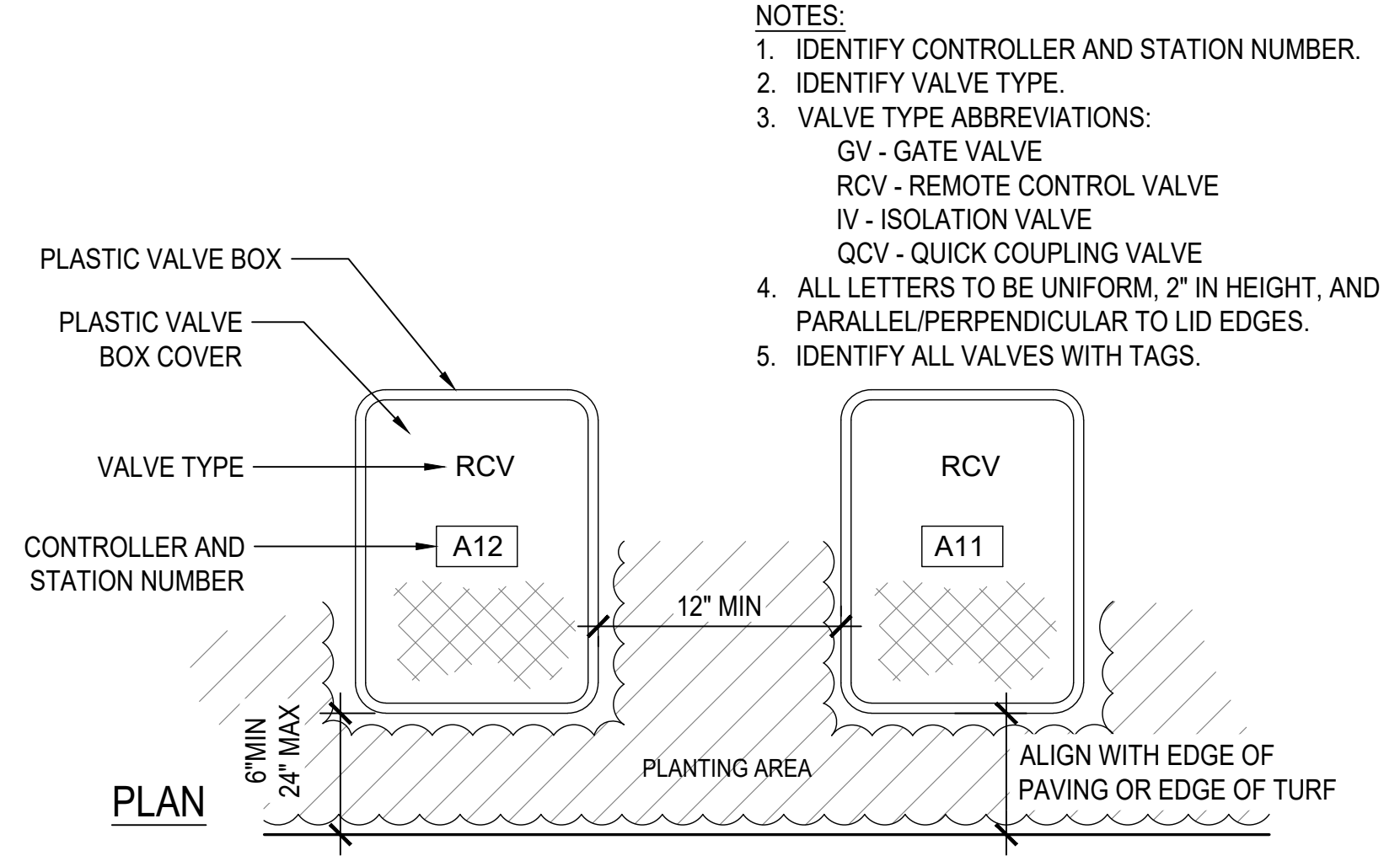


NOTES:
 1. INSTALL CONTROLLER, CABINET AND PEDESTAL PER MFR'S RECOMMENDATIONS.
 2. COORDINATE WITH ELECTRICAL FOR CONDUIT AND GROUNDING.
 3. PROVIDE PROPER GROUNDING COMPONENTS TO ACHIEVE GROUND RESISTANCE OF 10 OHMS OR LESS.
 4. DO NOT EXCEED 54\"/>

2 CONTROLLER PEDESTAL MOUNT
 SCALE: NTS

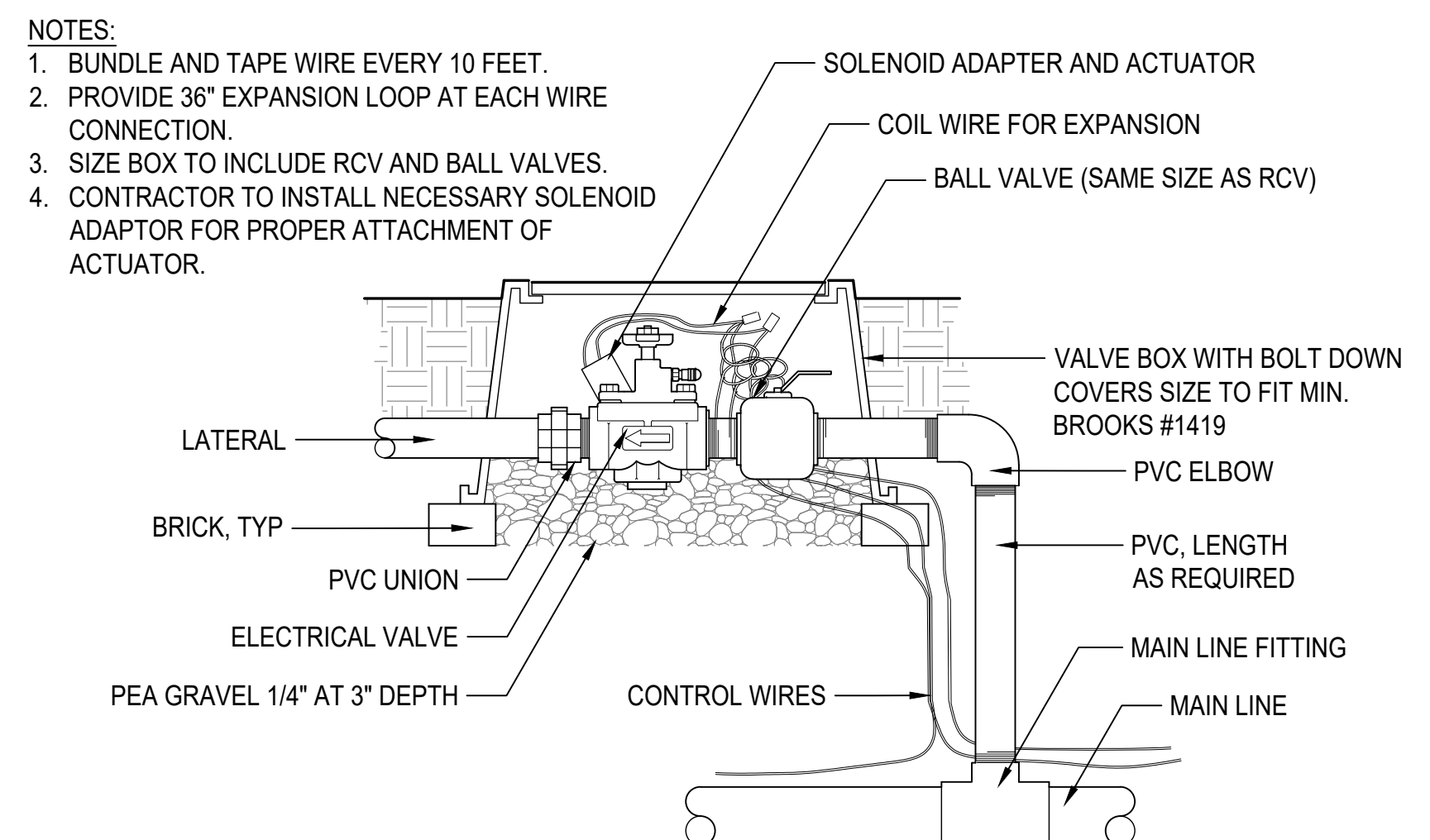


1 MASTER VALVE AND FLOW METER
 SCALE: 3/4\"/>



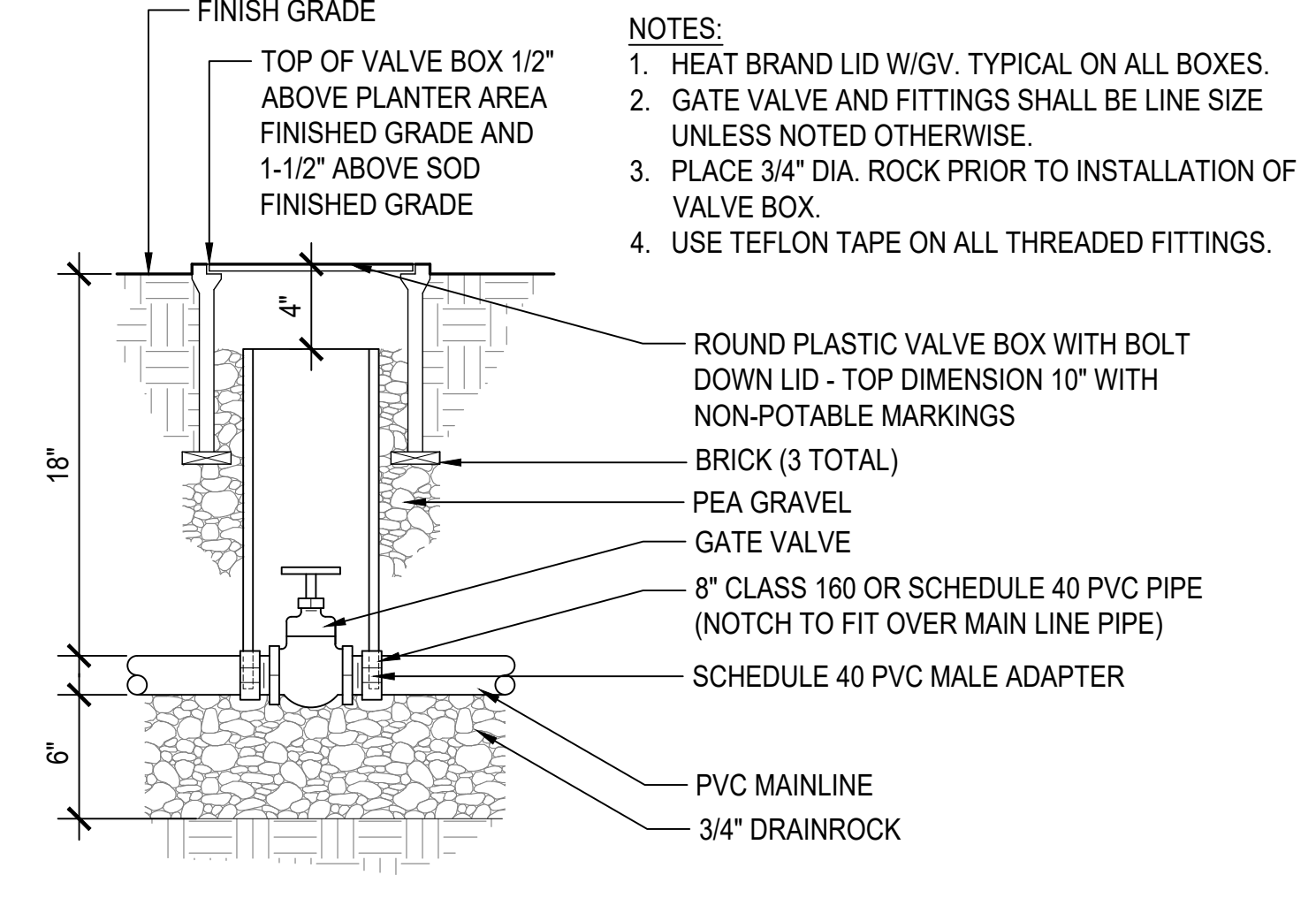
NOTES:
 1. IDENTIFY CONTROLLER AND STATION NUMBER.
 2. IDENTIFY VALVE TYPE.
 3. VALVE TYPE ABBREVIATIONS:
 GV - GATE VALVE
 RCV - REMOTE CONTROL VALVE
 IV - ISOLATION VALVE
 QCV - QUICK COUPLING VALVE
 4. ALL LETTERS TO BE UNIFORM, 2\"/>

7 VALVE BOXES
 SCALE: 1-1/2\"/>



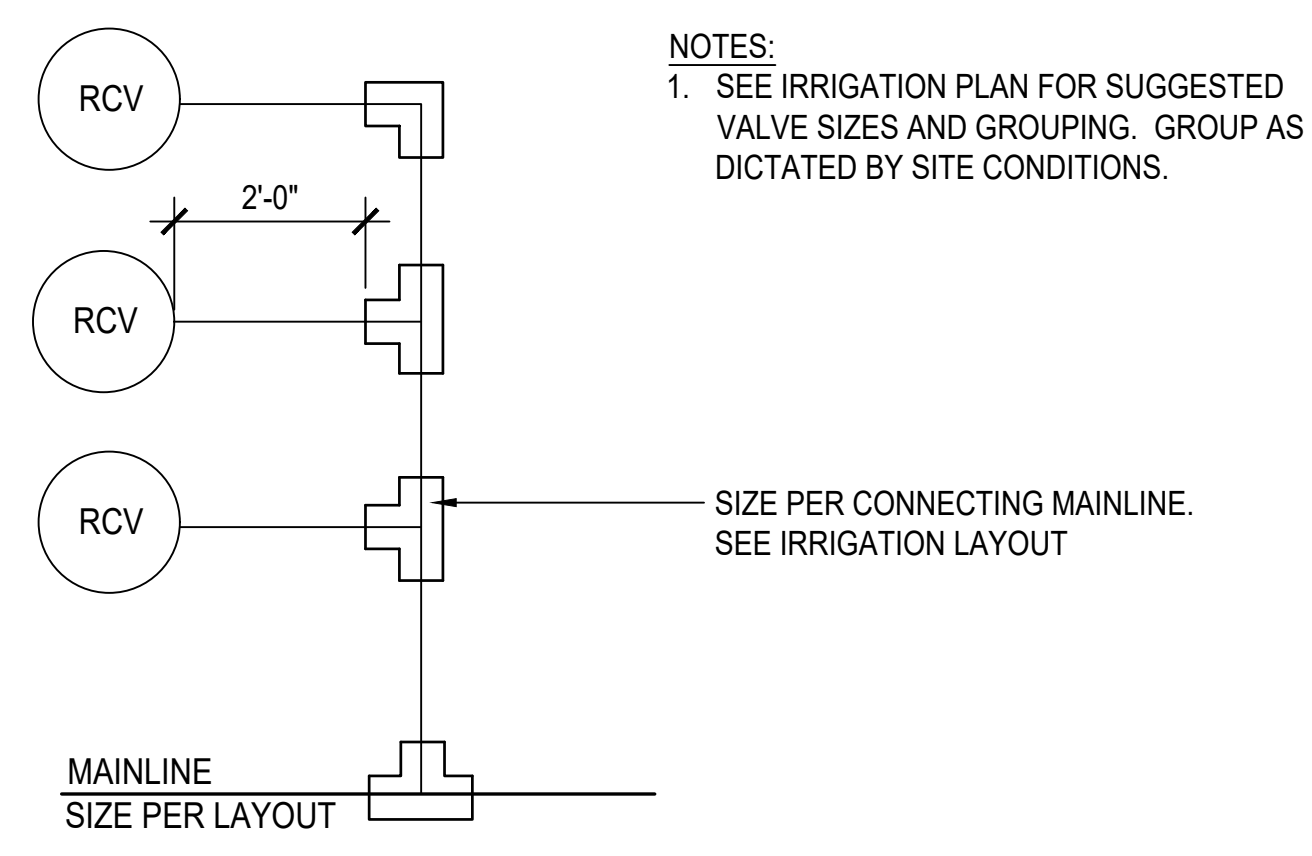
NOTES:
 1. BUNDLE AND TAPE WIRE EVERY 10 FEET.
 2. PROVIDE 36\"/>

5 REMOTE CONTROL VALVE
 SCALE: 3\"/>



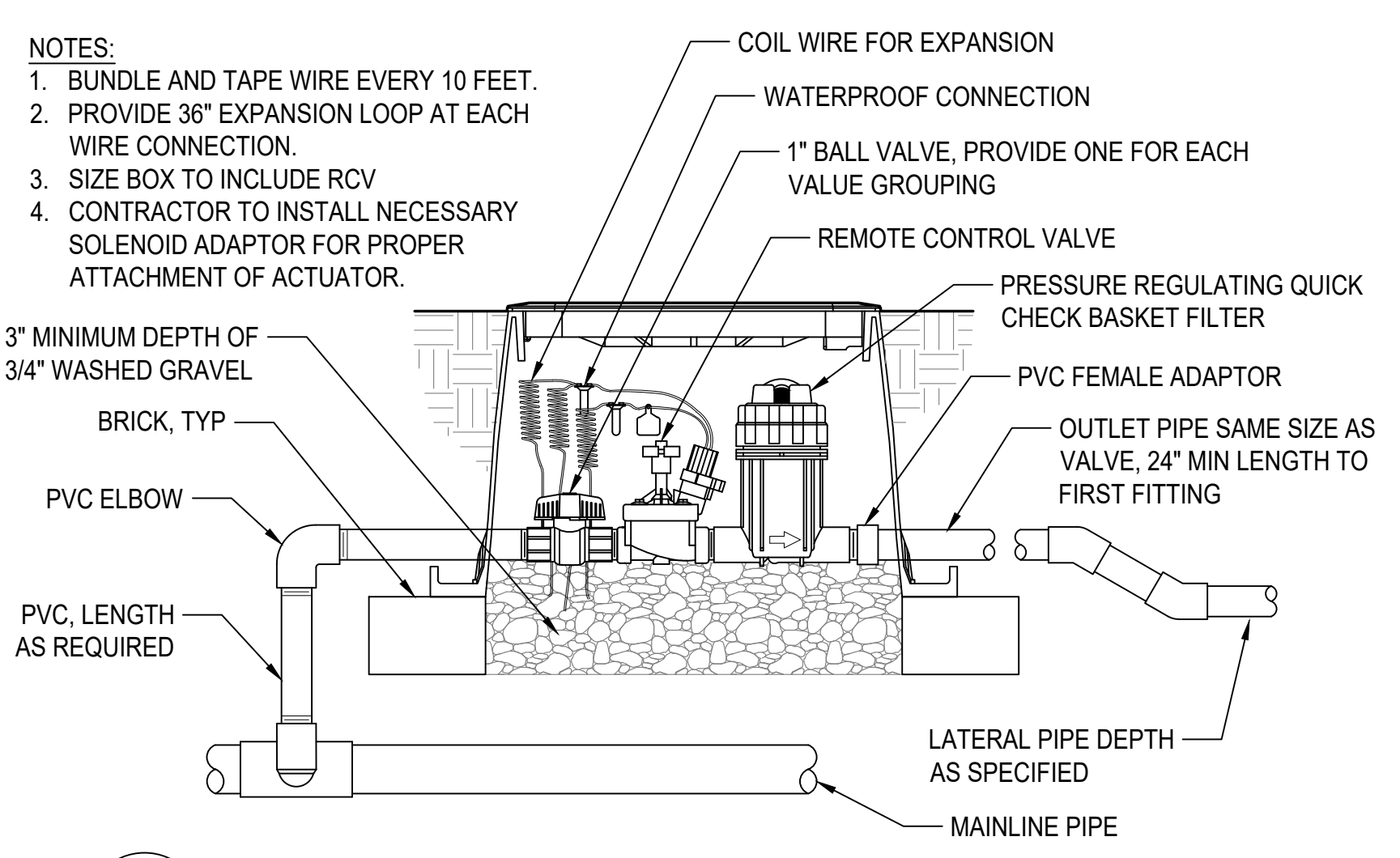
NOTES:
 1. HEAT BRAND LID W/GV. TYPICAL ON ALL BOXES.
 2. GATE VALVE AND FITTINGS SHALL BE LINE SIZE UNLESS NOTED OTHERWISE.
 3. PLACE 3/4\"/>

3 ISOLATION GATE VALVE
 SCALE: 3\"/>



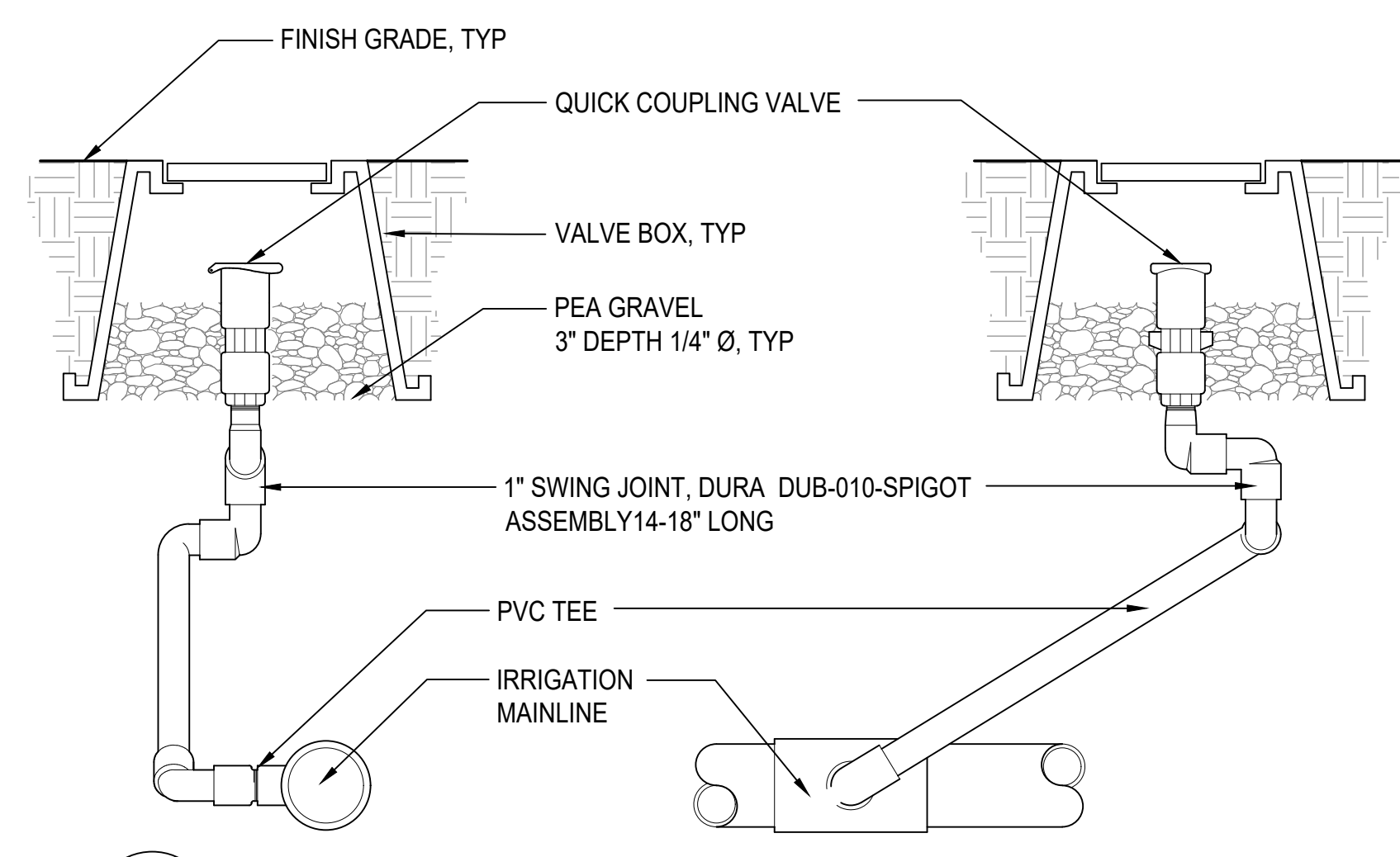
NOTES:
 1. SEE IRRIGATION PLAN FOR SUGGESTED VALVE SIZES AND GROUPING. GROUP AS DICTATED BY SITE CONDITIONS.

8 VALVE GROUPINGS
 SCALE: 1/2\"/>



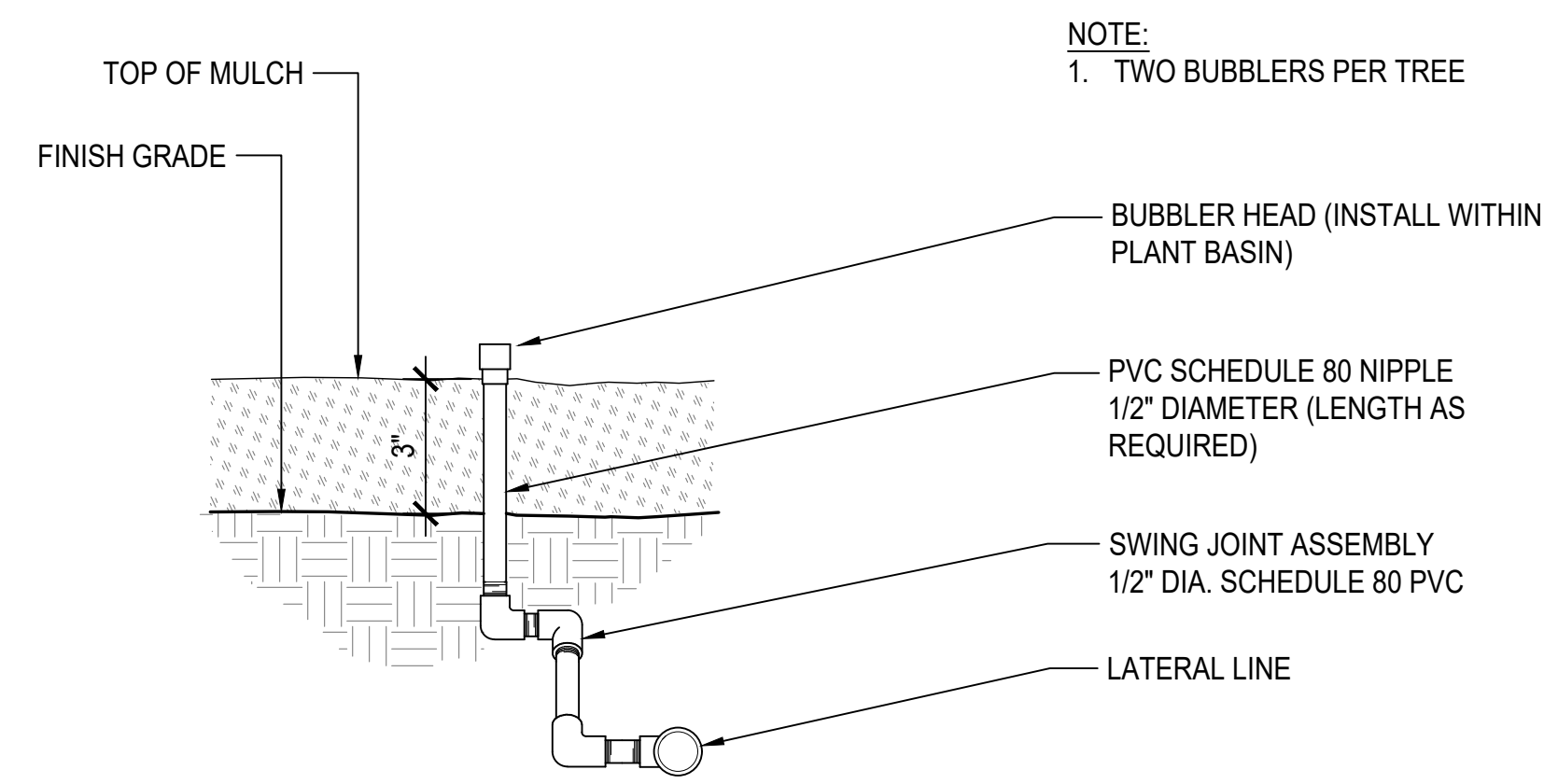
NOTES:
 1. BUNDLE AND TAPE WIRE EVERY 10 FEET.
 2. PROVIDE 36\"/>

6 REMOTE CONTROL VALVE - DRIP
 SCALE: 3\"/>

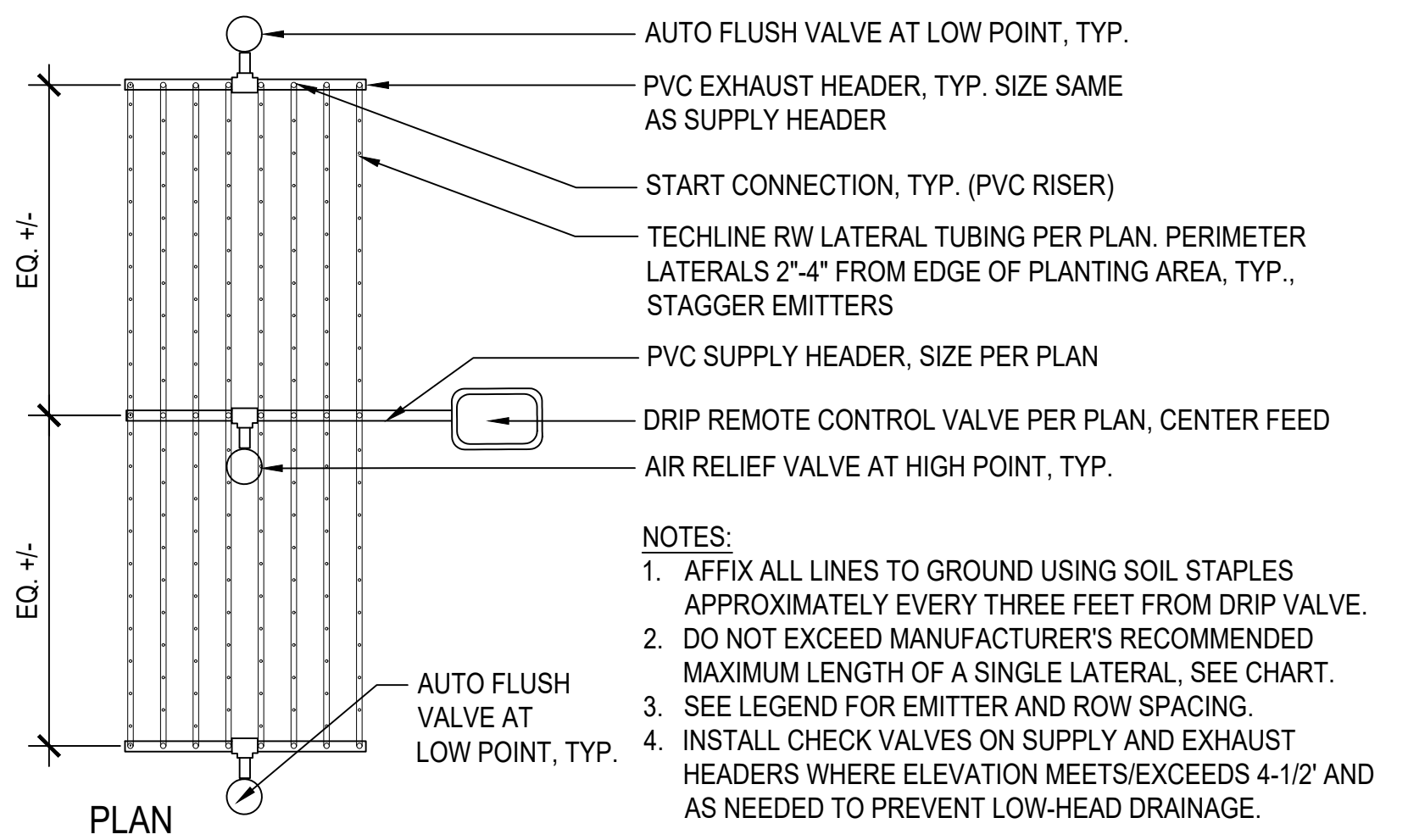


4 QUICK COUPLING VALVE
 SCALE: 3\"/>

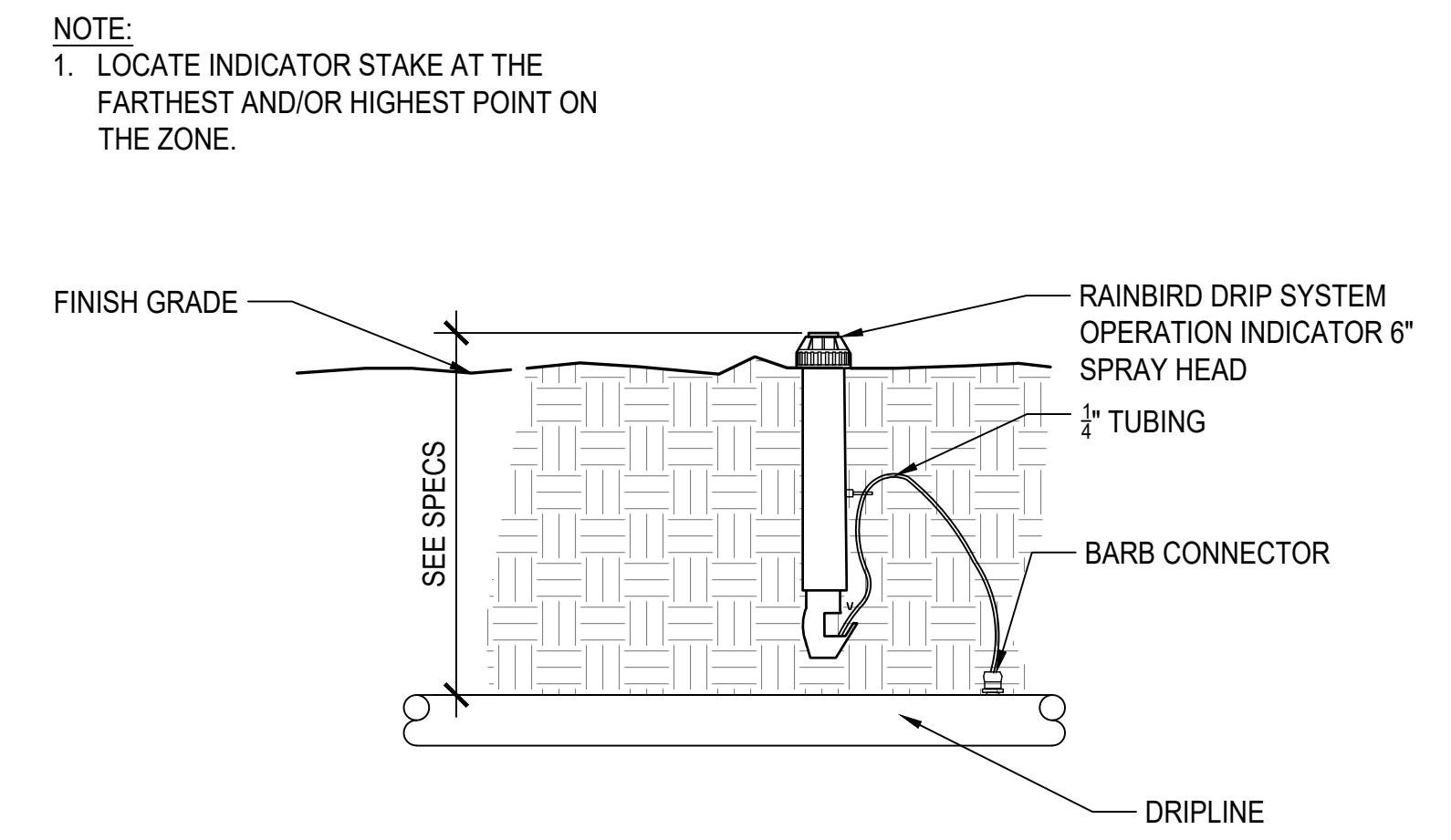
No.	Revisions
Date: JUNE 2024	Scale: AS SHOWN
	Design: INITIALS
	Drawn: INITIALS
	Approved: INITIALS
	Job No. 20191036
Drawing Number:	



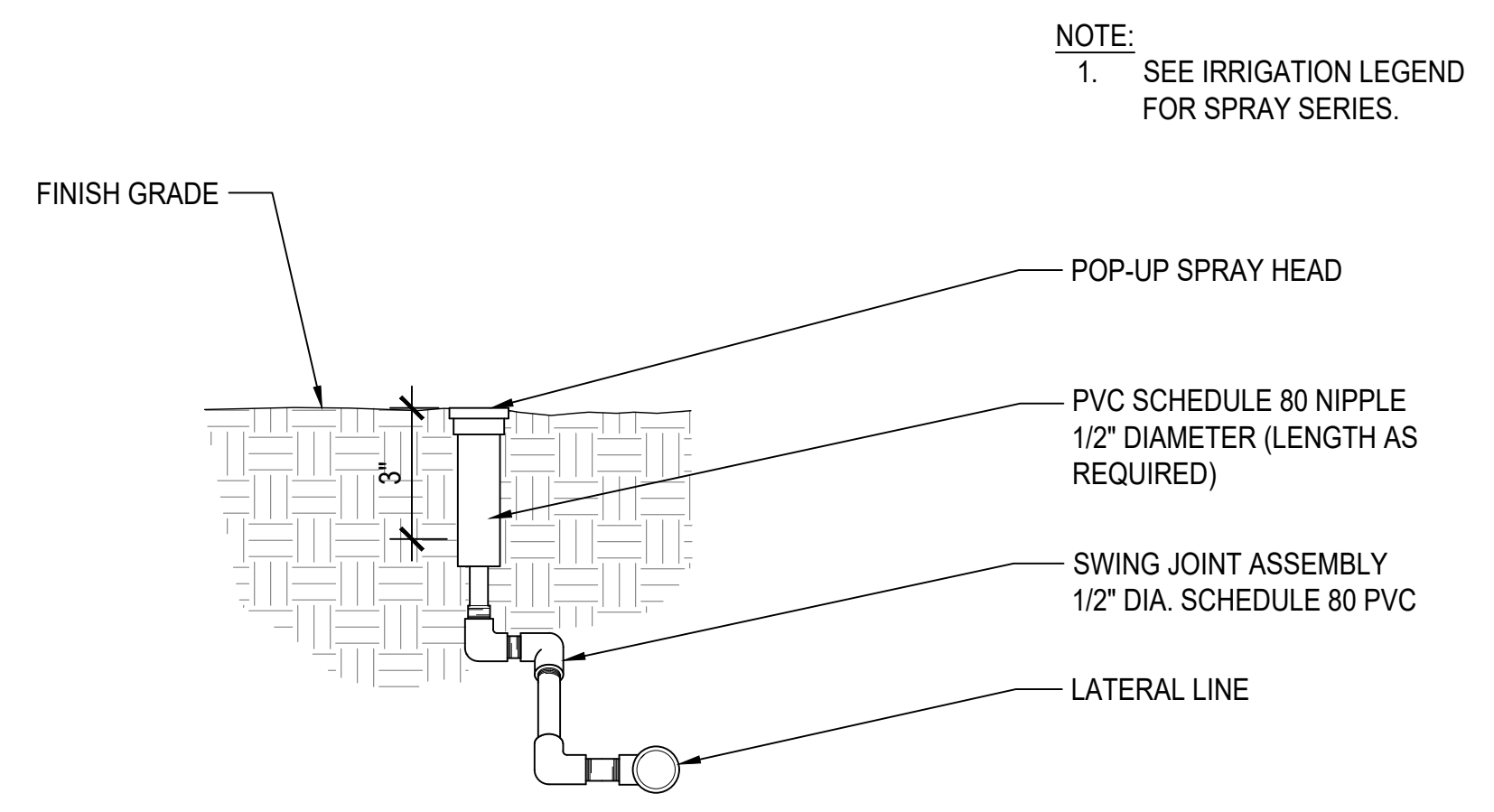
7 TREE BUBBLER
SCALE: 3" = 1'-0"



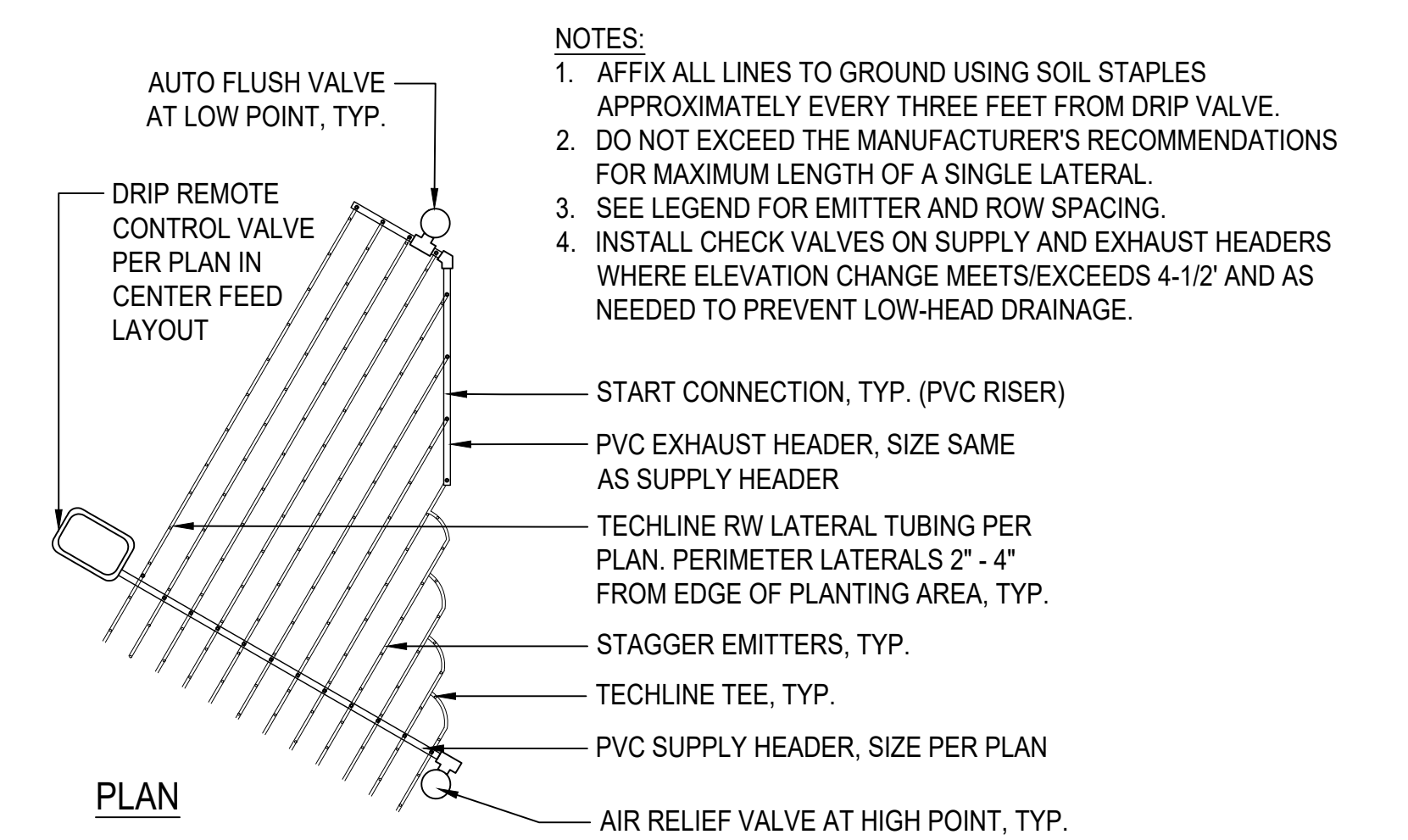
4 LINEAR DRIP TUBING LAYOUT
NTS



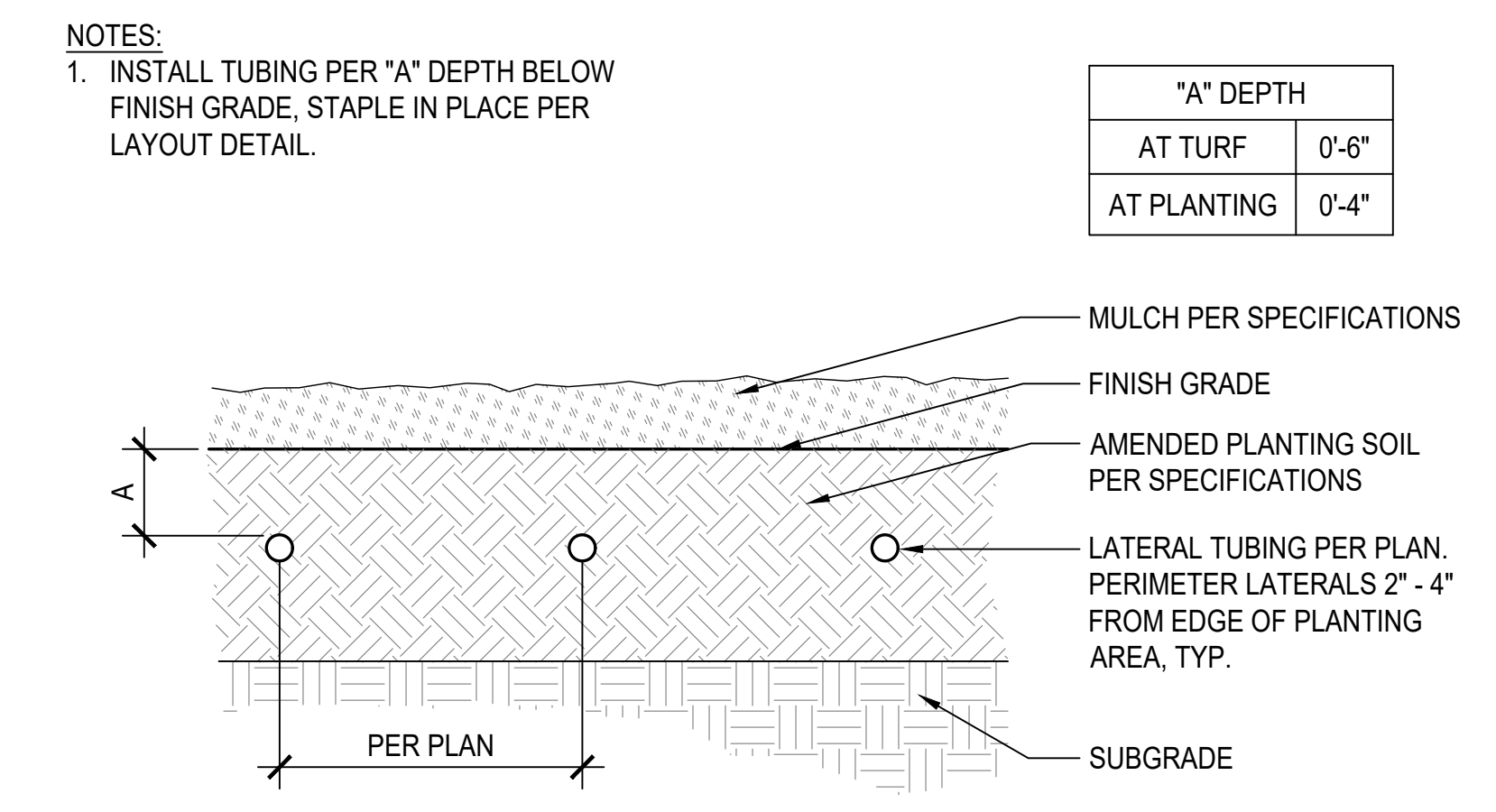
1 DRIP OPERATION INDICATOR
NTS



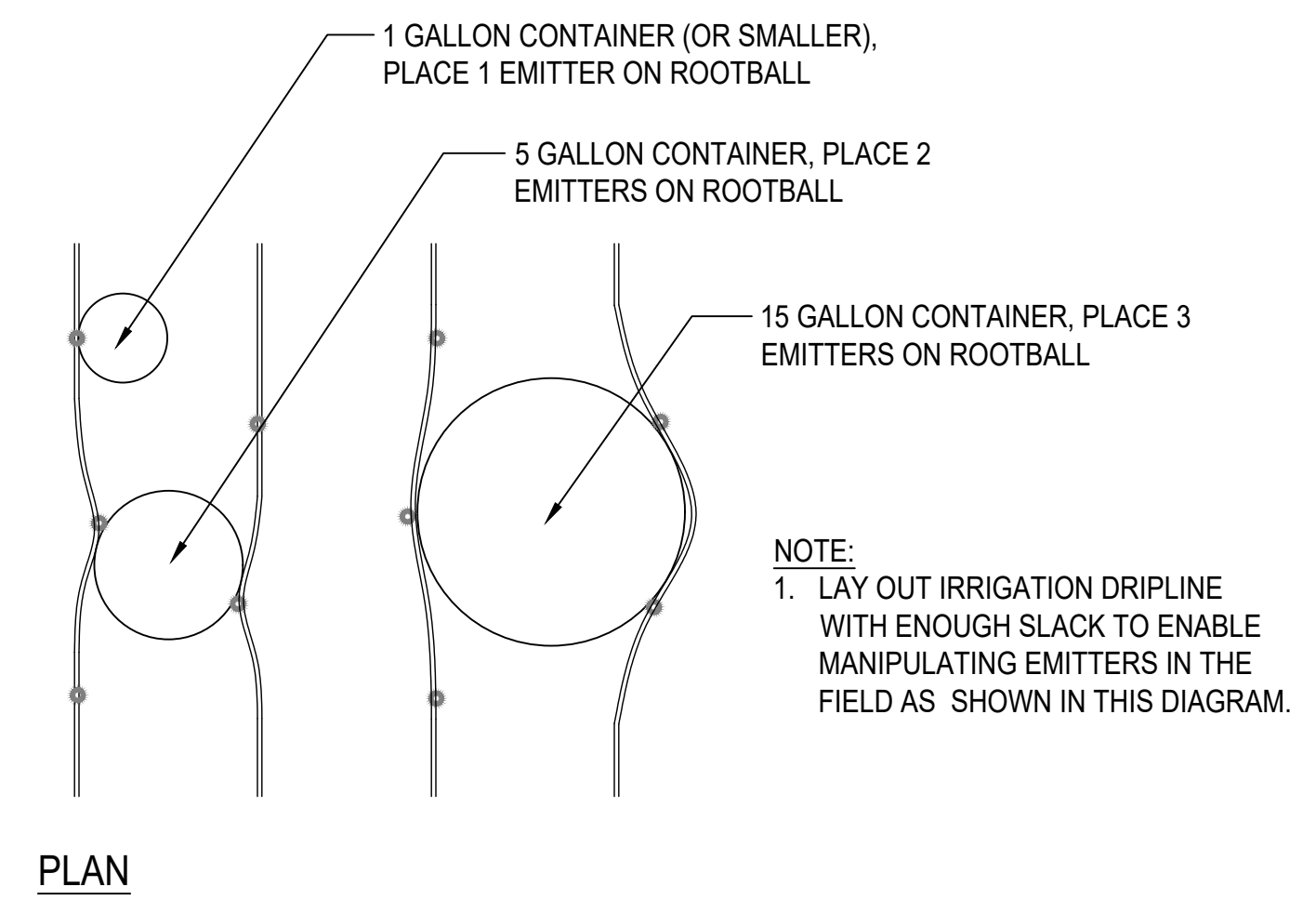
8 SPRAY POP UP
SCALE: 3" = 1'-0"



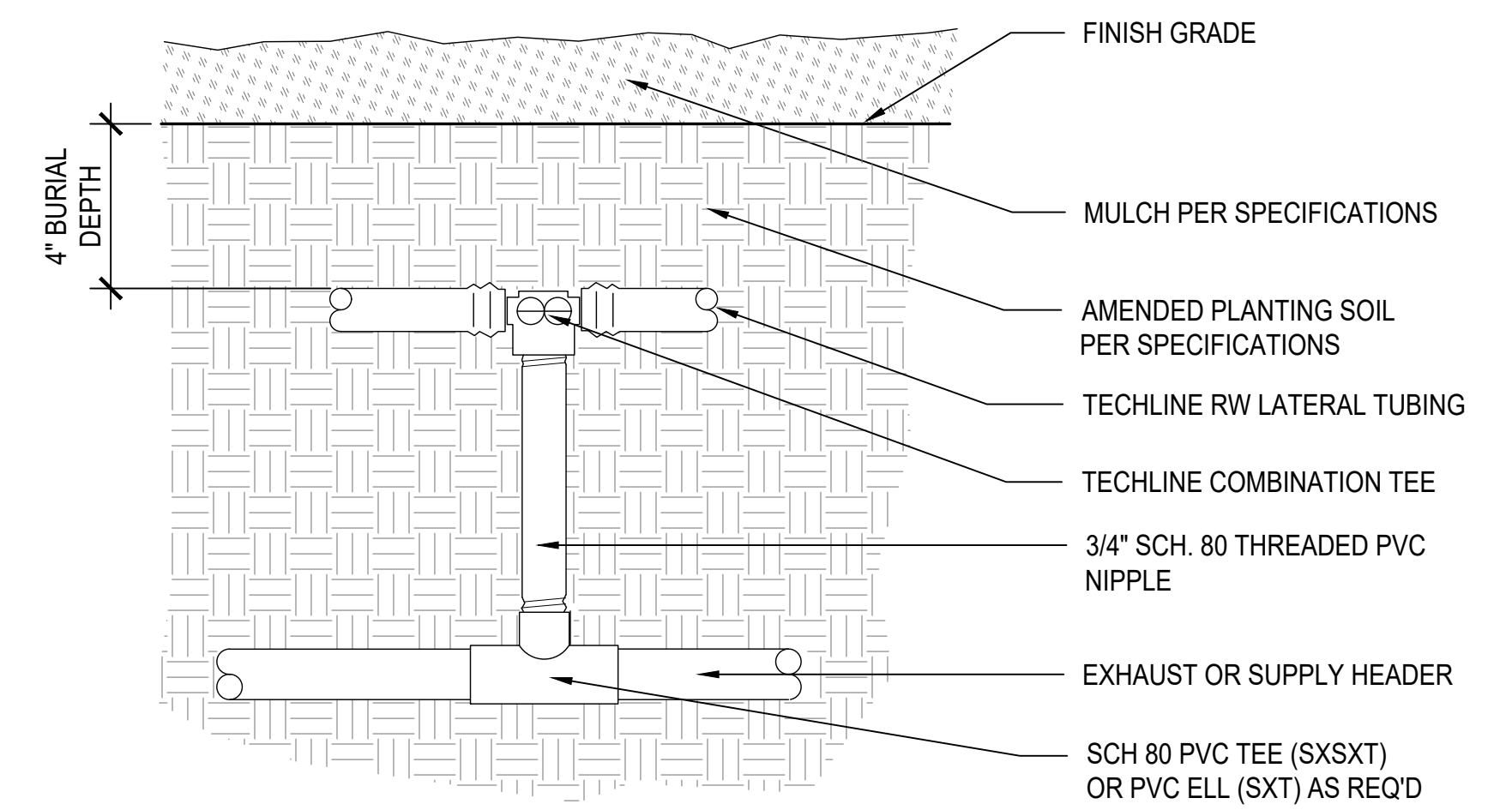
5 IRREGULAR DRIP TUBING LAYOUT
NTS



2 DRIP TUBING SUBGRADE INSTALLATION
SCALE: 1-1/2" = 1'-0"

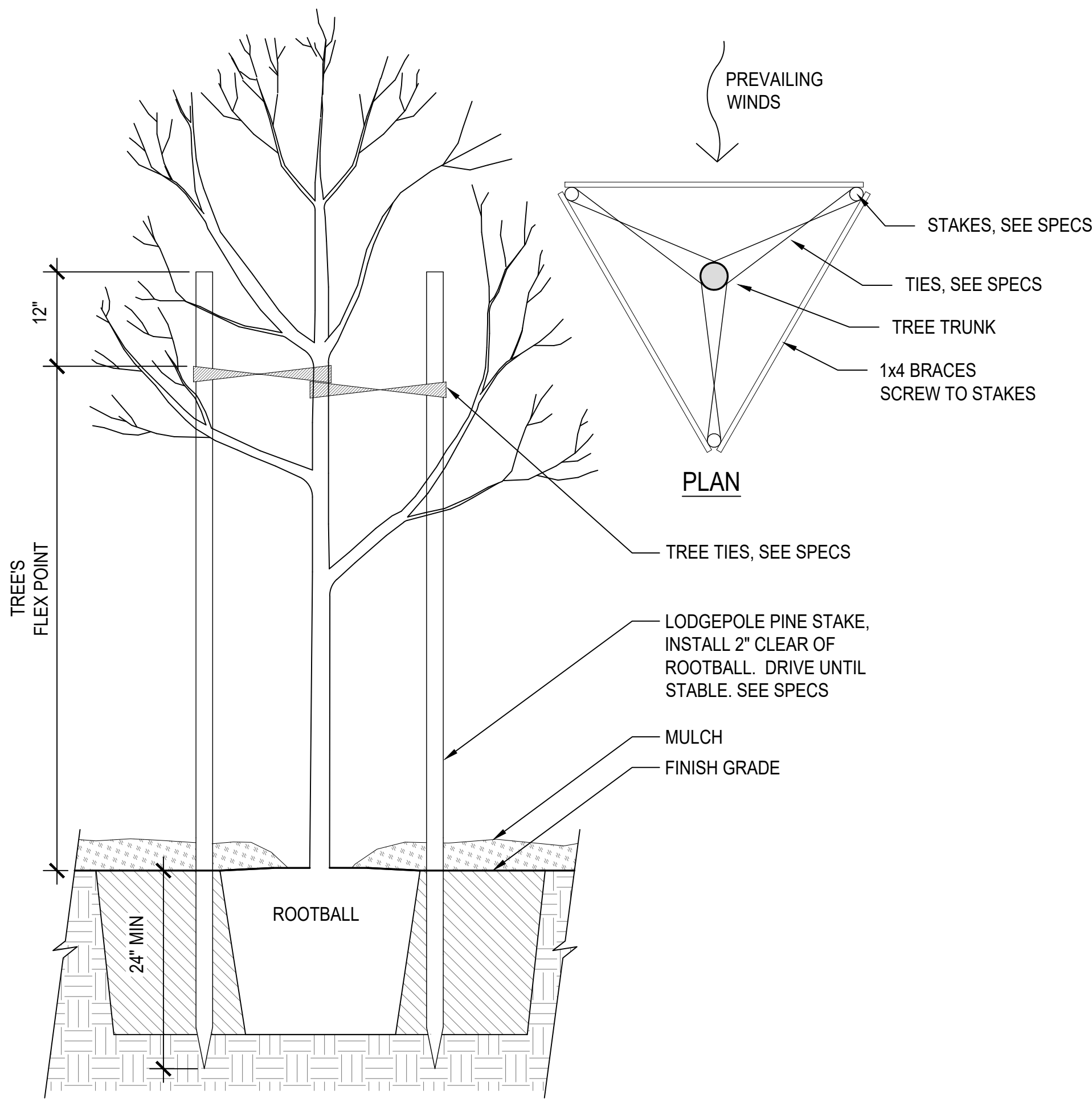


6 DRIP TUBING EMITTER PLACEMENT
SCALE: 1" = 1'-0"



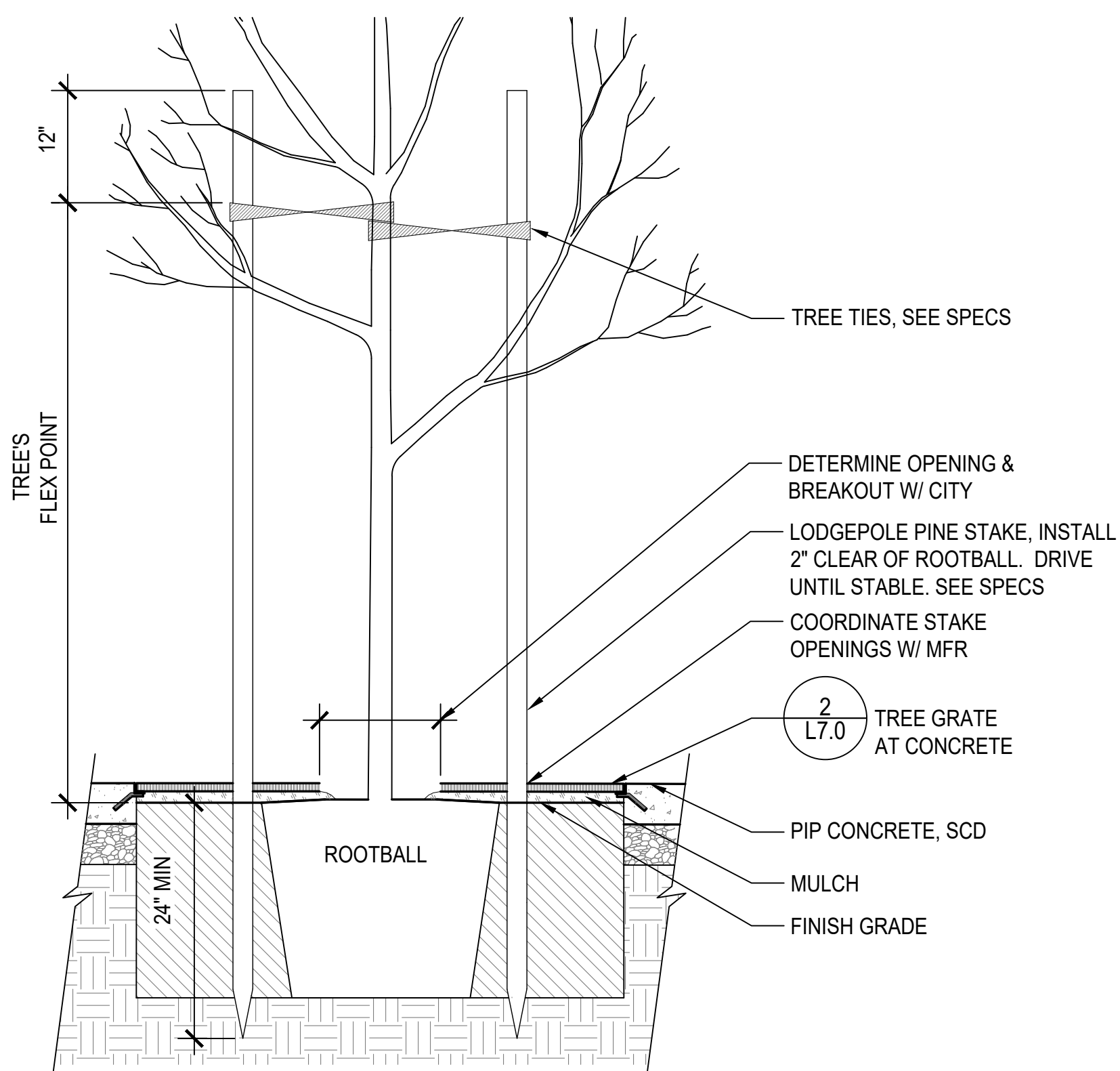
3 DRIP TUBING START CONNECTION
SCALE: 3" = 1'-0"

Revisions	
No.	Description



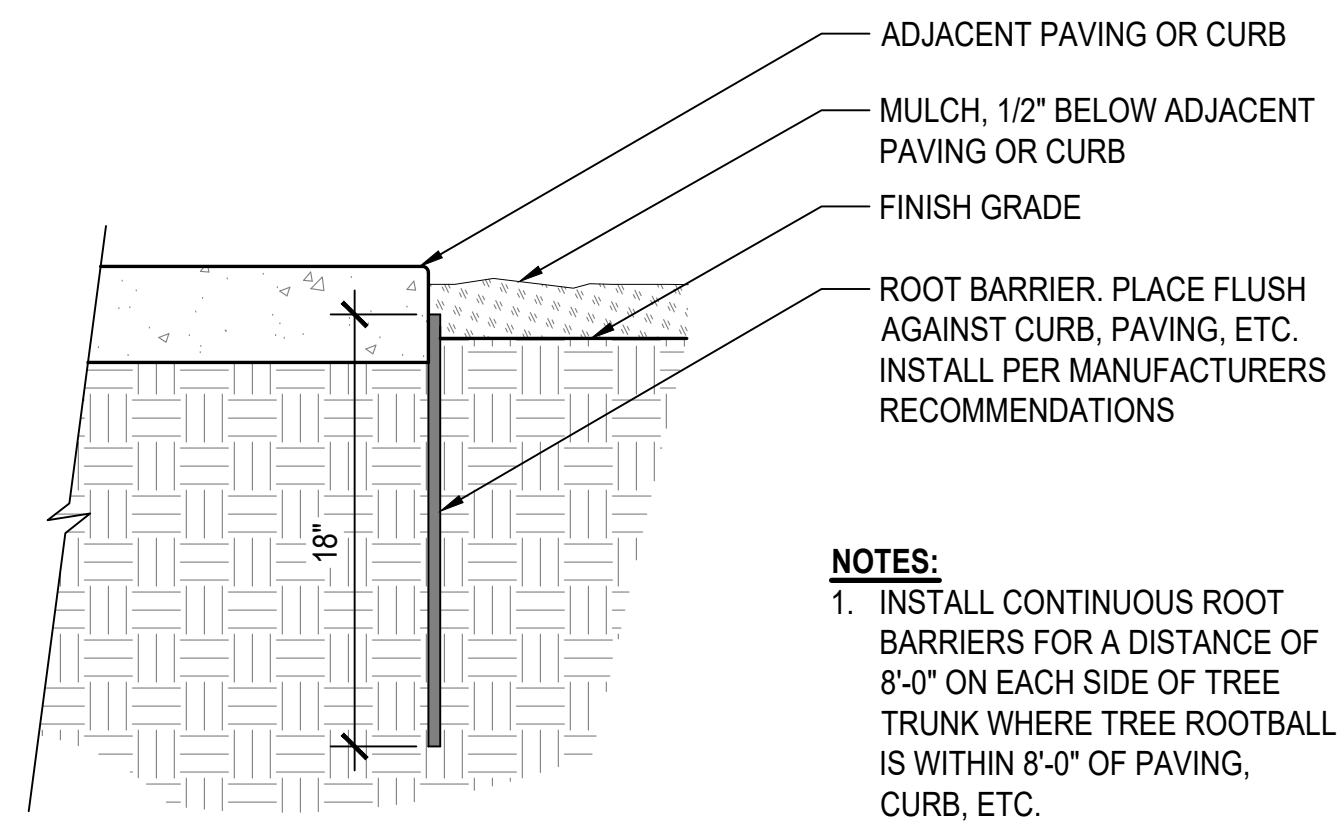
6 TREE STAKING

SCALE: 3/4" = 1'-0"



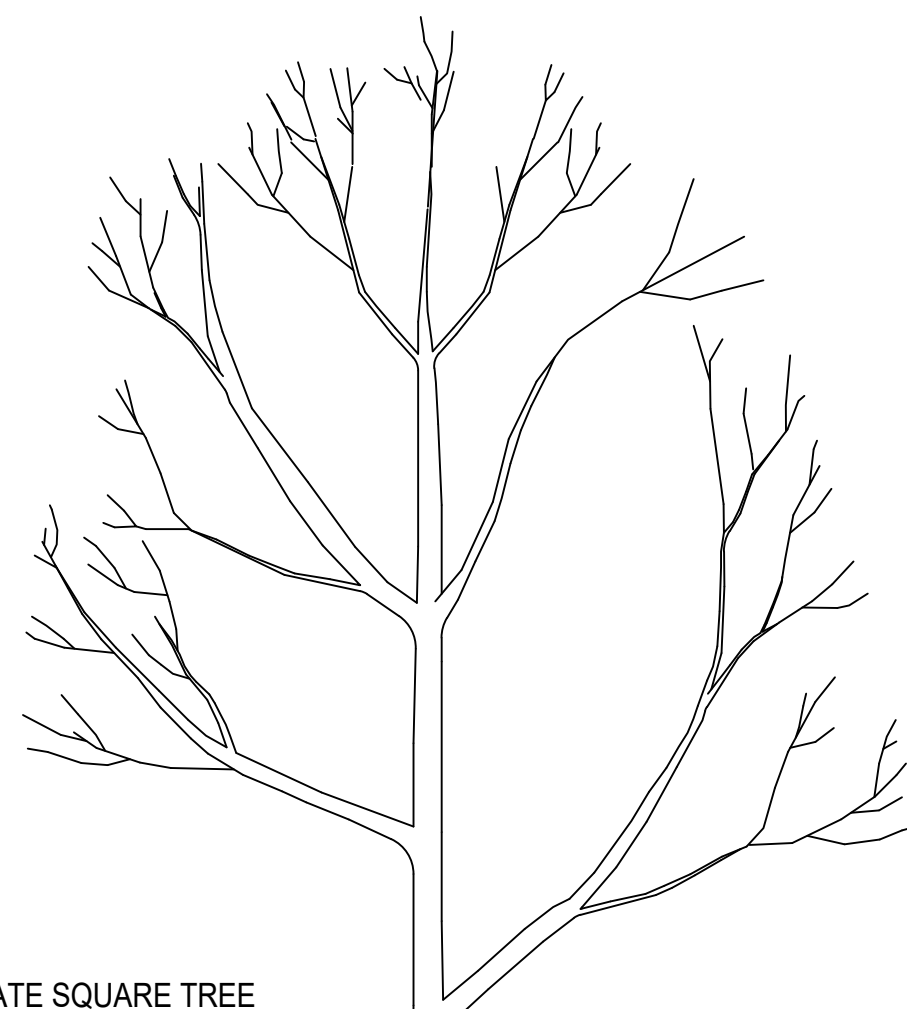
7 TREE STAKING IN TREE GRATE

SCALE: 3/4" = 1'-0"



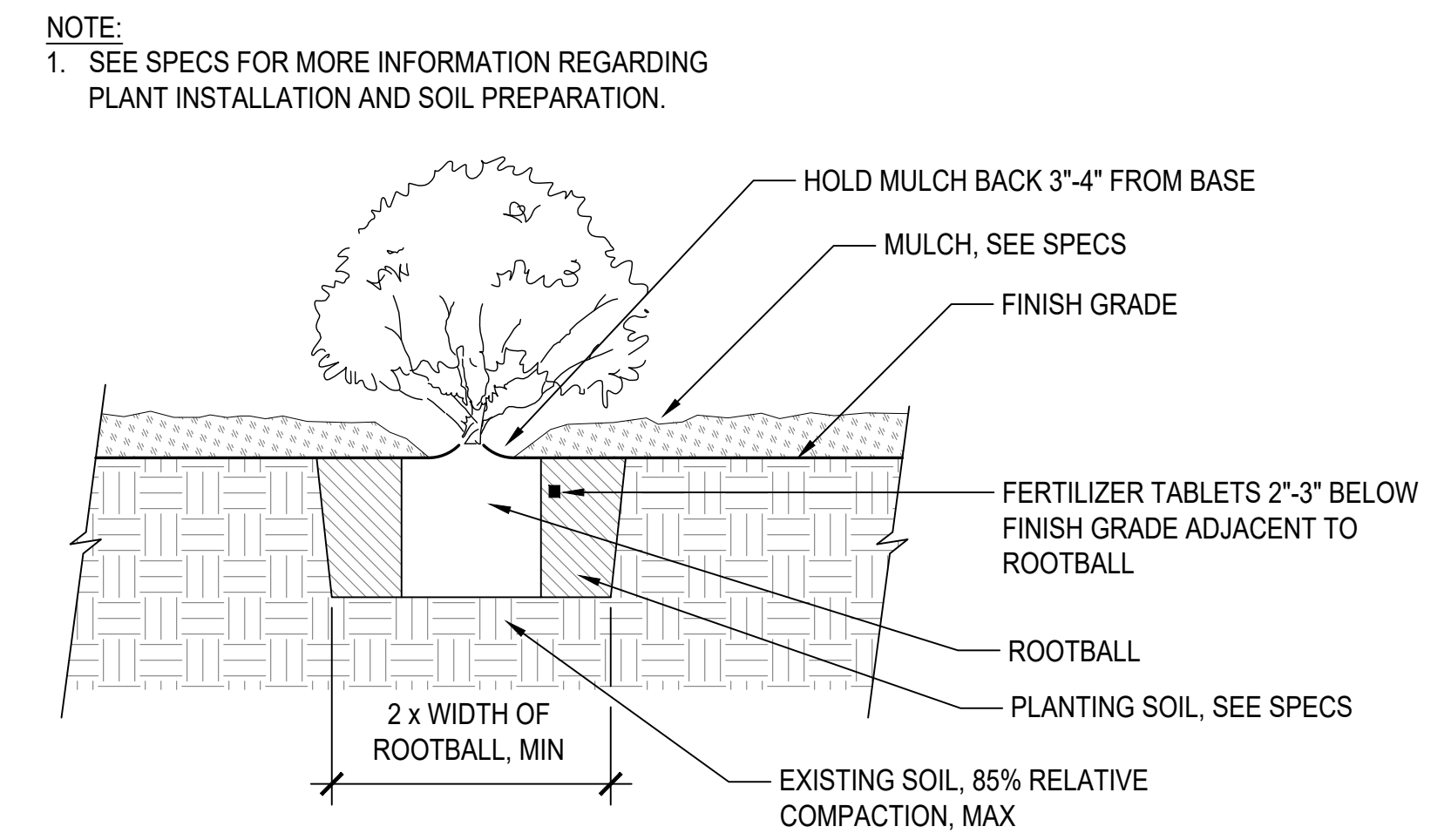
4 ROOT BARRIER

SCALE: 1-1/2" = 1'-0"



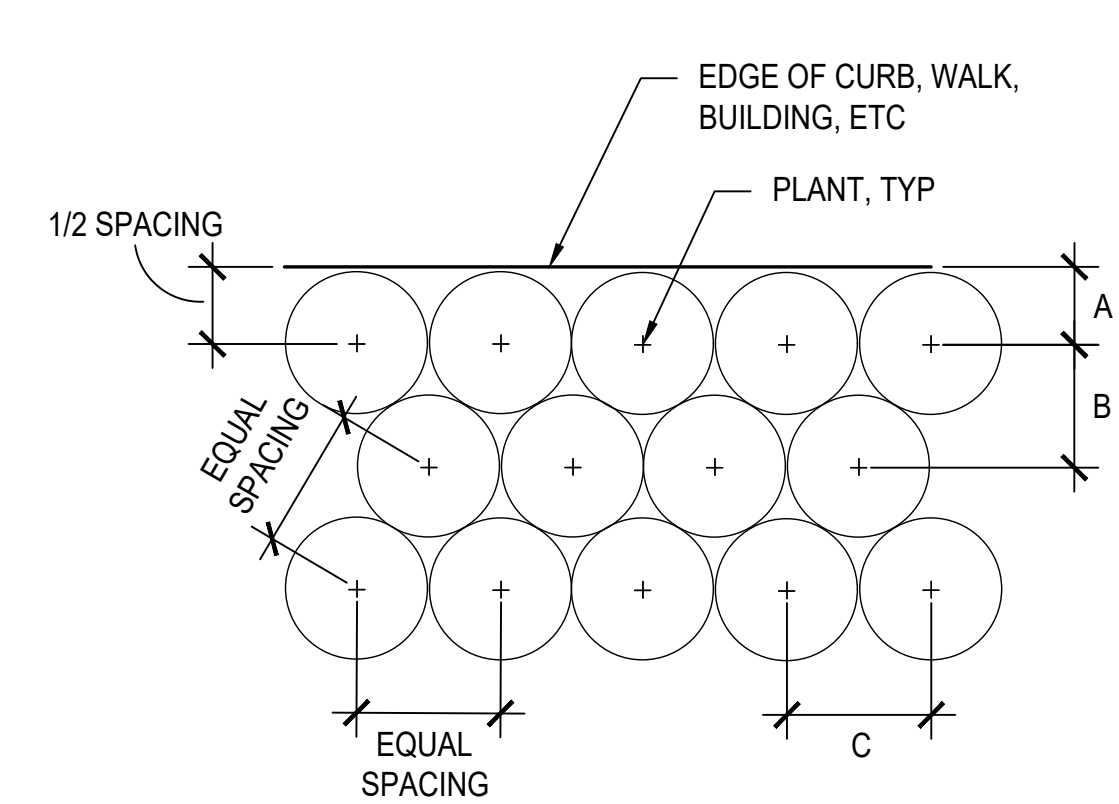
5 TREE PLANTING

NTS



1 SHRUB PLANTING

SCALE: 1" = 1'-0"

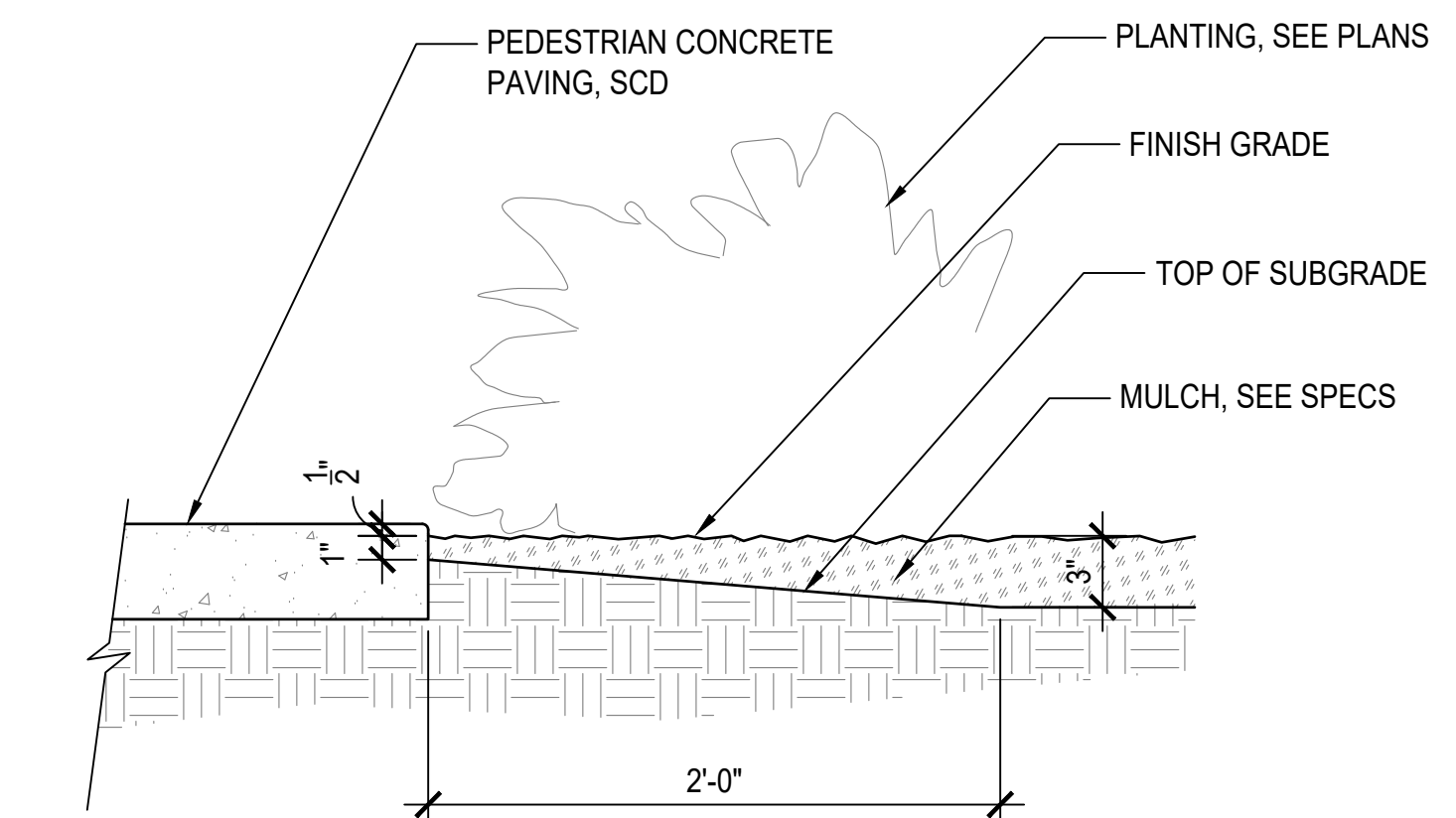


NOTES:
1. SEE PLANTING PLAN FOR SPACING BY PLANT SPECIES.
2. INSTALL TRIANGULATED PLANT LAYOUT, UNLESS OTHERWISE SHOWN ON PLANS.

PLANT SPACING	A	B	C
12"	6"	10"	12"
1'-6"	9"	1'-4"	1'-6"
2'-0"	12"	1'-9"	2'-0"
2'-6"	1'-3"	2'-2"	2'-6"
3'-0"	1'-6"	2'-7"	3'-0"
3'-6"	1'-9"	3'-0"	3'-6"
4'-0"	2'-0"	3'-6"	4'-0"
4'-6"	2'-3"	3'-11"	4'-6"
5'-0"	2'-6"	4'-4"	5'-0"

2 PLANTING LAYOUT

NTS



3 MULCH AT CONCRETE PAVING

SCALE: 1-1/2" = 1'-0"

ELECTRICAL SYMBOL LIST

NOTE: THIS IS A STANDARD SYMBOL LIST AND NOT ALL ITEMS MAY BE USED.

Abbreviations

AFC	ABOVE FINISHED CEILING
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BC	BARE COPPER
C	CONDUIT, CLOSE, CONTROL
CB	CIRCUIT BREAKER
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CT	CURRENT TRANSFORMER
CU	COPPER
DN	DOWN
EF	EXHAUST FAN
F	FUSE
FBO	FURNISHED BY OTHERS
G, GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GRC	GALVANIZED RIGID STEEL CONDUIT
KVA	KILOVOLT AMPERES
KW	KILOWATT
MDB	MAIN DISTRIBUTION BOARD
MDP	MAIN DISTRIBUTION PANEL
MSB	MAIN SWITCHBOARD
MT, MTD	MOUNT, MOUNTED
N	NEUTRAL
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
OFCI	OWNER FURNISHED, CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED, OWNER INSTALLED
OS	OCCUPANCY SENSOR
PNL	PANEL
S	SWITCH
XFMR	TRANSFORMER

Connections / Equipment

	HEAVY DUTY FUSED DISCONNECT SWITCH
	JUNCTION BOX
	JUNCTION BOX WITH FLEX CONNECTION TO EQUIPMENT
	WALL-MOUNTED JUNCTION BOX
	NON-FUSED DISCONNECT SWITCH
	TRANSFORMER

General

	NEW WORK
	EQUIPMENT IDENTIFICATION
	KEYED NOTE
	Lighting
	CEILING FAN
	EXIT SIGN CEILING MOUNTED, ARROW(S) INDICATES DIRECTION IF SHOWN
	EXIT SIGN WALL MOUNTED, ARROW(S) INDICATES DIRECTION IF SHOWN
	AREA LUMINAIRE ARM MOUNTED WITH POLE AND CONCRETE BASE

Miscellaneous

	BRANCH CIRCUIT WIRING. ARROW INDICATES HOME RUN TO PANEL WITH CIRCUITS AS NOTED. WIRE SIZE IS #12 AWG MINIMUM UNLESS NOTED OTHERWISE. SHORT TICK MARKS INDICATE PHASE CONDUCTORS. LONG TICK MARKS INDICATE NEUTRAL CONDUCTORS. A SINGLE CURVED TICK MARK INDICATES INSULATED GREEN GROUND CONDUCTOR. SECOND CURVED TICK MARK INDICATES "ISOLATED GROUND" (GREEN INSULATION WITH YELLOW STRIPE) CONDUCTOR.
	BRANCH PANEL
	CIRCUIT BREAKER
	CURRENT TRANSFORMER
	DIGITAL TYPE METER WITH VOLTMETER, AMMETER, KW METER, KVA METER, KVAR METER, AND %THD METER
	EQUIPMENT CONNECTION ITEM. REFER TO SCHEDULE
	FLUSH MOUNT EQUIPMENT ENCLOSURE AS NOTED
	FLUSH WALL MOUNTED BRANCH PANEL
	GROUND ROD
	GROUNDING POINT
	MAIN DISTRIBUTION PANEL / SUB DISTRIBUTION PANEL
	METER WITH CONNECTION
	SURFACE MOUNT EQUIPMENT ENCLOSURE AS NOTED
	UTILITY TRANSFORMER PAD/VAULT
	WALL MOUNTING BRACKET
	WATER PIPE GROUND CONNECTION

Raceways

	CONDUIT CONCEALED IN WALL OR CEILING SPACE
	CONDUIT ROUTED BELOW FLOOR / GRADE
	CONDUIT ELLED DOWN
	CONDUIT ELLED UP
	CONDUIT/WIRING CONTINUATION
	CONDUIT/WIRING STUBBED OUT WITH END CAP OR INSULATED PLASTIC BUSHING
	FLEXIBLE CONDUIT

Switches and Receptacles

	DUPLEX RECEPTACLE (MULTIPLE LETTERS INDICATE MULTIPLE OPTIONS) A = ABOVE COUNTER B = CLOCK HANGER C = FLUSH CEILING MOUNTED E = EMERGENCY F = ARC FAULT PROTECTED BY BREAKER IN PANEL G = GROUND FAULT CIRCUIT INTERRUPTER H = HOSPITAL GRADE K = CHILD RESISTANT COVER L = ISOLATED GROUND P = PENDANT MOUNTED WITH CORD GRIPS. VERIFY PENDANT LENGTH S = SPLIT WIRED T = TAMPER RESISTANT SHUTTERED RECEPTACLE W = WEATHERPROOF CONTINUOUS USE COVER, GFCI PROTECTED, WITH WEATHER-RESISTANT RECEPTACLE ? = DESIGNER DEFINED
	DOUBLE DUPLEX RECEPTACLE. SEE LETTER CODE LIST AT DUPLEX RECEPTACLE FOR OPTIONS
	SINGLE RECEPTACLE. SEE LETTER CODE LIST AT DUPLEX RECEPTACLE FOR OPTIONS
	DUPLEX RECEPTACLE, FLUSH FLOOR
	EQUIPMENT ELECTRICAL CONNECTION
	SPECIAL PURPOSE RECEPTACLE. LETTER CODE DENOTES RECEPTACLE CONFIGURATION LX-XXR = NEMA CONFIGURATION TWIST-LOCK RECEPTACLE X-XXR = NEMA CONFIGURATION STRAIGHT BLADE RECEPTACLE P = PENDANT MOUNT WITH CORD GRIPS. VERIFY PENDANT LENGTH X = COORDINATE RECEPTACLE CONFIGURATION WITH EQUIPMENT BEING SUPPLIED
	OCCUPANCY SENSOR (SELF CONTAINED) P = PASSIVE INFRARED D = DUAL TECHNOLOGY U = ULTRASONIC, 360 DEG RANGE H = ULTRASONIC, HALLWAY PATTERN
	SINGLE POLE SWITCH 2 = DOUBLE POLE SWITCH 3 = THREE-WAY SWITCH 4 = FOUR-WAY SWITCH o THRU z (LOWERCASE) = LUMINAIRE CONTROL DESIGNATION D = DIMMER F = FAN SPEED CONTROL K = KEY OPERATED SWITCH L = LIGHTED HANDLE M = MANUAL MOTOR STARTER WITH THERMAL OVERLOAD P = SWITCH WITH PILOT LIGHT S = SENTRY SWITCH T = INTERVAL TIMER W = WEATHERPROOF SWITCH V = LOW VOLTAGE SWITCH ? = DESIGNER DEFINED SWITCH

DEVICE OUTLETS SHALL BE NO MORE THAN +48" AFF TO TOP OF BOX NOR LESS THAN +15" AFF TO BOTTOM OF BOX PER CBC 11B-308.1.2

GENERAL NOTES

- ALL SWITCHBOARDS AND PANELBOARDS SUPPLIED BY A FEEDER SHALL BE MARKED TO INDICATE THE DEVICE OR EQUIPMENT WHERE THE POWER SUPPLY ORIGINATES.
- NEW ELECTRICAL WIRING TO BE IN COMPLIANCE WITH 2019 NATIONAL ELECTRICAL CODE (NEC) AS AMENDED BY THE 2020 CALIFORNIA ELECTRICAL CODE (CEC).
- PROVIDE MELAMINE PLASTIC ENGRAVED LABELS FOR PANELS, MAIN SWITCHBOARD DISCONNECTS, AND ALL MAJOR ELECTRICAL EQUIPMENT.
- SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT. THE MARKINGS SHALL INCLUDE THE DATE THE FAULT-CURRENT CALCULATION WAS PERFORMED.
- ALL EQUIPMENT AND APPURTENANCES TO BE UL (NRTL) LISTED AND LABELED PER CEC.
- CONTRACTOR TO VERIFY THAT ALL TERMINALS ARE RATED AT 75°C OR HIGHER. PER NEC; IF A BREAKER (OR TERMINATION POINT) IS RATED AT 100 AMPS OR LESS AND IS NOT LABELED AS SUITABLE FOR TERMINATIONS AT 75°C, BY DEFAULT IT IS RATED 60°C. ALL SPECIFIED CONDUCTOR SIZES ARE BASED ON EXPECTED TERMINAL TEMPERATURE RATINGS. DO NOT CHANGE CONDUCTOR SIZE WITHOUT VERIFY THE TEMPERATURE RATING OF THE TERMINAL TO BE USED.
- PROVIDE #12 CONDUCTORS FOR ALL WIRING FOR CIRCUITS WHERE NOT SHOWN ON DRAWINGS. NUMBER AS REQUIRED IN CONDUIT SIZED PER NEC. PROVIDE CONDUIT OR METAL SHEATHED CABLE FOR ALL CONDUCTORS, UNLESS OTHERWISE ALLOWED.
- INSTALL AND CONNECT A CODE SIZE INSULATED GROUND CONDUCTOR IN ALL BRANCH CIRCUITS AND FEEDER CONDUITS. THESE EQUIPMENT GROUND WIRES MAY NOT BE SHOWN ON THE PLANS. INCREASE CONDUIT SIZE WHERE REQUIRED.
- LOCATION AND DEPTH OF ALL UNDERGROUND CONDUITS SHALL BE COORDINATED WITH THE WASTE LINES, RAIN WATER LEADER LINES, SPRINKLER LINES, WATER LINES AND BUILDING FOOTINGS PRIOR TO ROUGH-IN.
- VERIFY CONTROL REQUIREMENTS FOR ROOF EQUIPMENT, EXHAUST FANS, AIR CONDITIONING UNITS, AND FANS PRIOR TO ROUGH-IN.
- UNLESS DIS-ALLOWED BY THE AUTHORITY HAVING JURISDICTION; NON-METALLIC SHEATHED CABLE; USES PERMITTED AS FOLLOWS PER CEC 334.10: STRUCTURES OF TYPES III, IV, AND V CONSTRUCTION. CABLES SHALL BE CONCEALED WITHIN WALLS, FLOORS, OR CEILINGS THAT PROVIDE A THERMAL BARRIER OF MATERIAL THAT HAS AT LEAST A 15-MINUTE FINISH RATING AS IDENTIFIED IN LISTINGS OF FIRE-RATED ASSEMBLIES OR AS PER CEC 334.10. USES NOT PERMITTED AS FOLLOWS PER CEC 334.12: EXPOSED WITHIN A DROPPED OR SUSPENDED CEILING CAVITY, IN THEATERS AND SIMILAR LOCATIONS, EMBEDDED IN CONCRETE OR AGGREGATE, AND HAZARDOUS LOCATIONS OR AS PER CEC 334.12.
- AN INTERSYSTEM BONDING TERMINATION FOR CONNECTION OF BONDING CONDUCTORS REQUIRED FOR COMMUNICATION SYSTEMS SHALL BE PROVIDED EXTERNAL TO ENCLOSURES AT THE SERVICE EQUIPMENT OR METERING EQUIPMENT ENCLOSURE. THE INTERSYSTEM BONDING TERMINATION SHALL CONSIST OF A SET OF TERMINALS WITH THE CAPACITY FOR CONNECTION OF NOT LESS THAN THREE COMMUNICATION SYSTEMS BONDING CONDUCTORS.
- ACCEPTANCE TESTING REQUIRED PER 2022 CALIFORNIA ENERGY CODE. A CERTIFIED LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN IS REQUIRED TO PERFORM THE TESTS SET FORTH IN THE FOLLOWING ACCEPTANCE TEST FORMS (CONTACT SMART LIGHT SYSTEMS (530) 412-0971 FOR SHOP DRAWINGS AND FURTHER INFORMATION):
 - NRCA-LTI-02-A - LIGHTING CONTROLS
 - NRCA-LTI-03-A - AUTOMATIC DAYLIGHTING
 - NRCA-LTI-02-A - OUTDOOR MOTION SENSOR AND LIGHTING SHUT-OFF CONTROLS.

SHEET INDEX

E0.1	ELECTRICAL NOTES AND LEGEND
E1.0	ELECTRICAL PLAN
E1.1	ELECTRICAL BID ALTERNATE 3 PLAN
E2.0	ELECTRICAL DETAILS
E3.0	TITLE 24 LTO FORMS
E3.1	TITLE 24 LTO FORMS



Date Signed: 6/14/24



RANCHO CORDOVA, CALIFORNIA

NH - RK
PM - DESIGN TEAM

230817
PROJECT NO.

FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA
 ELECTRICAL NOTES AND LEGEND

Revisions	
No.	
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Approved:	
Job No:	

Drawing Number:

E0.1

30 OF 37

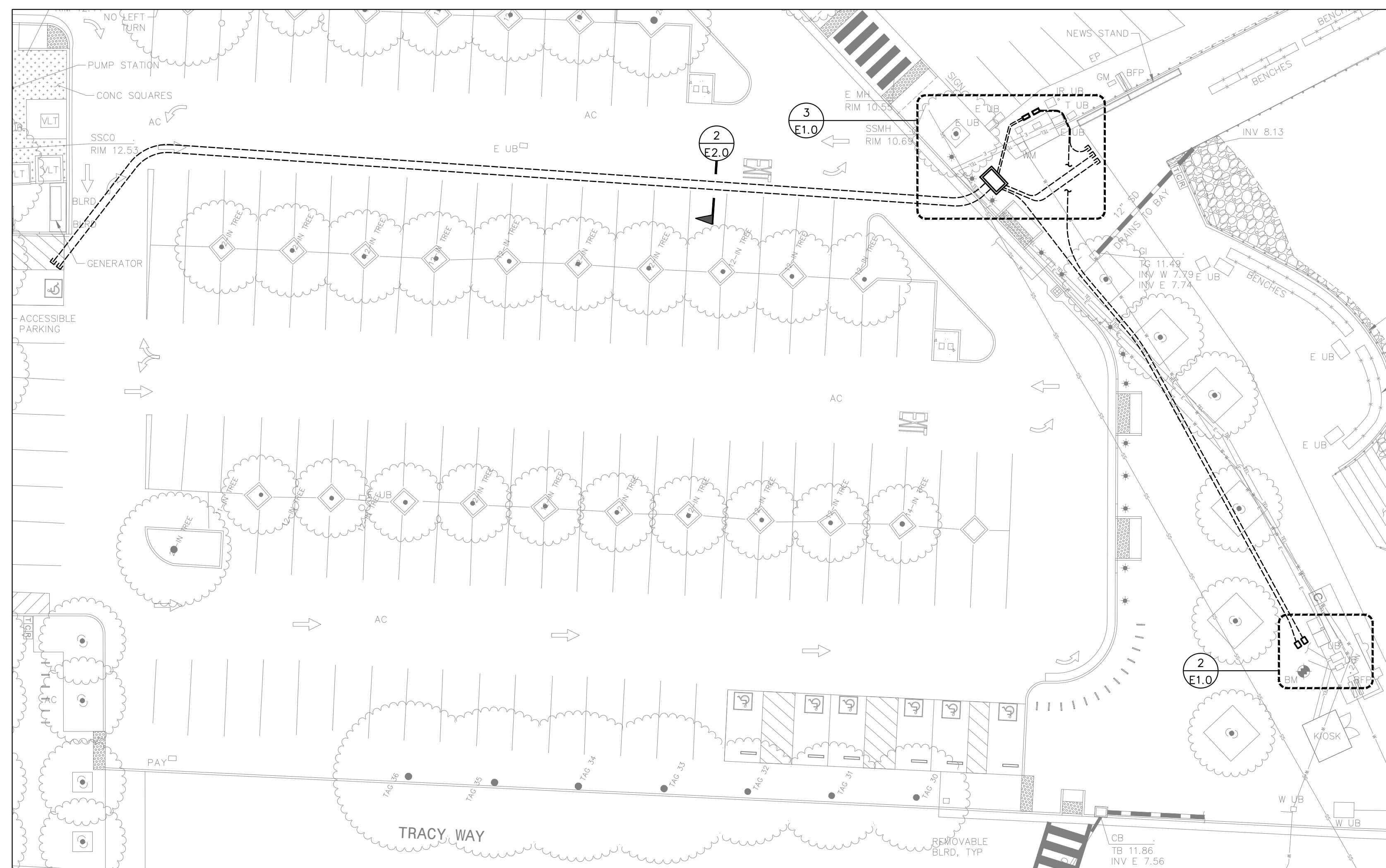
CONDUIT & WIRE ROUTING SCHEDULE					
ID	CONDUITS	WIRES	EQUIP. GND.	FROM	TO
A1	5" PVC			4'X6' MANHOLE	ADA PARKING
A2	2" PVC			4'X6' MANHOLE	CONC. PIER
A3	4" PVC			4'X6' MANHOLE	FLOAT
A4	1-1/2" PVC			4'X6' MANHOLE	FUTURE TICKET MACHINE
A5	2" PVC			12"X22.25" HANDHOLE	TVM
A6	2" PVC			12"X22.25" HANDHOLE	ENTRY GATE
A7	4" PVC			12"X22.25" HANDHOLE	4'X6' MANHOLE



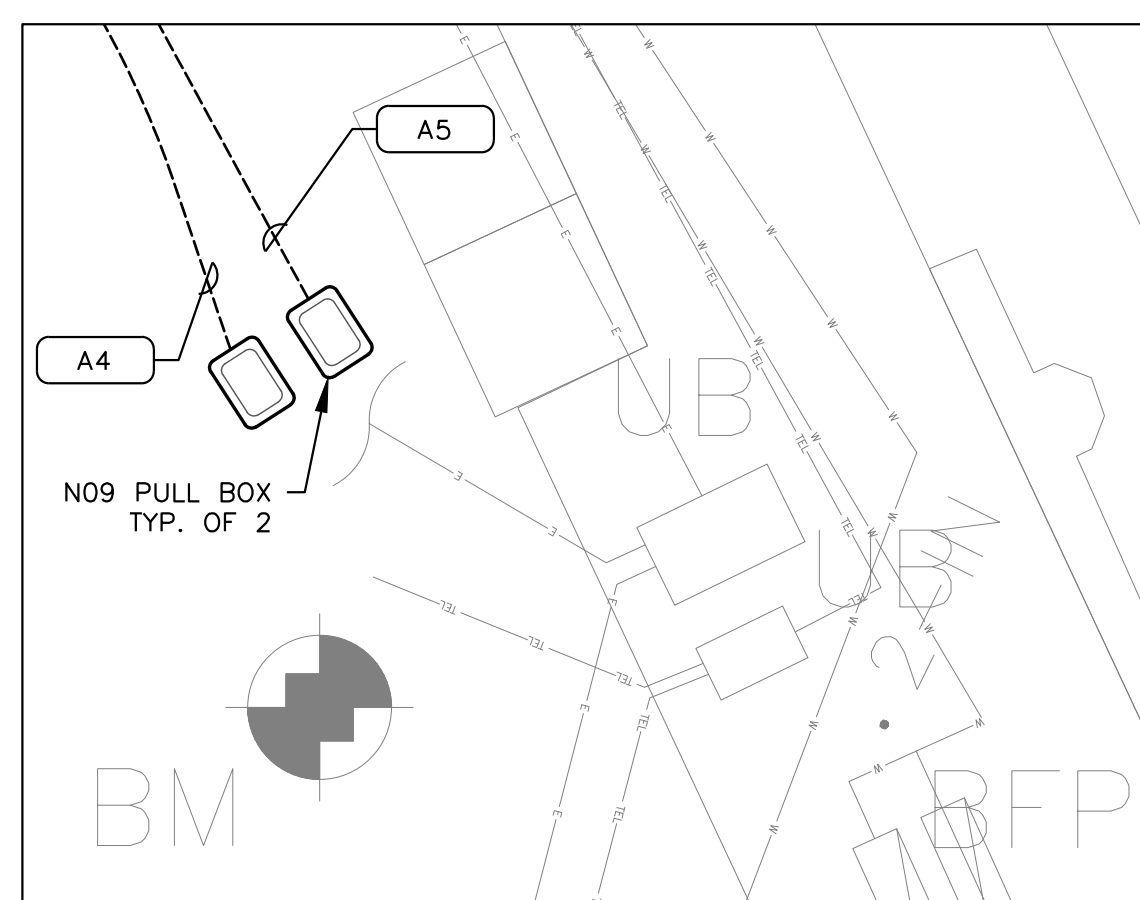
Date Signed: 6/14/24



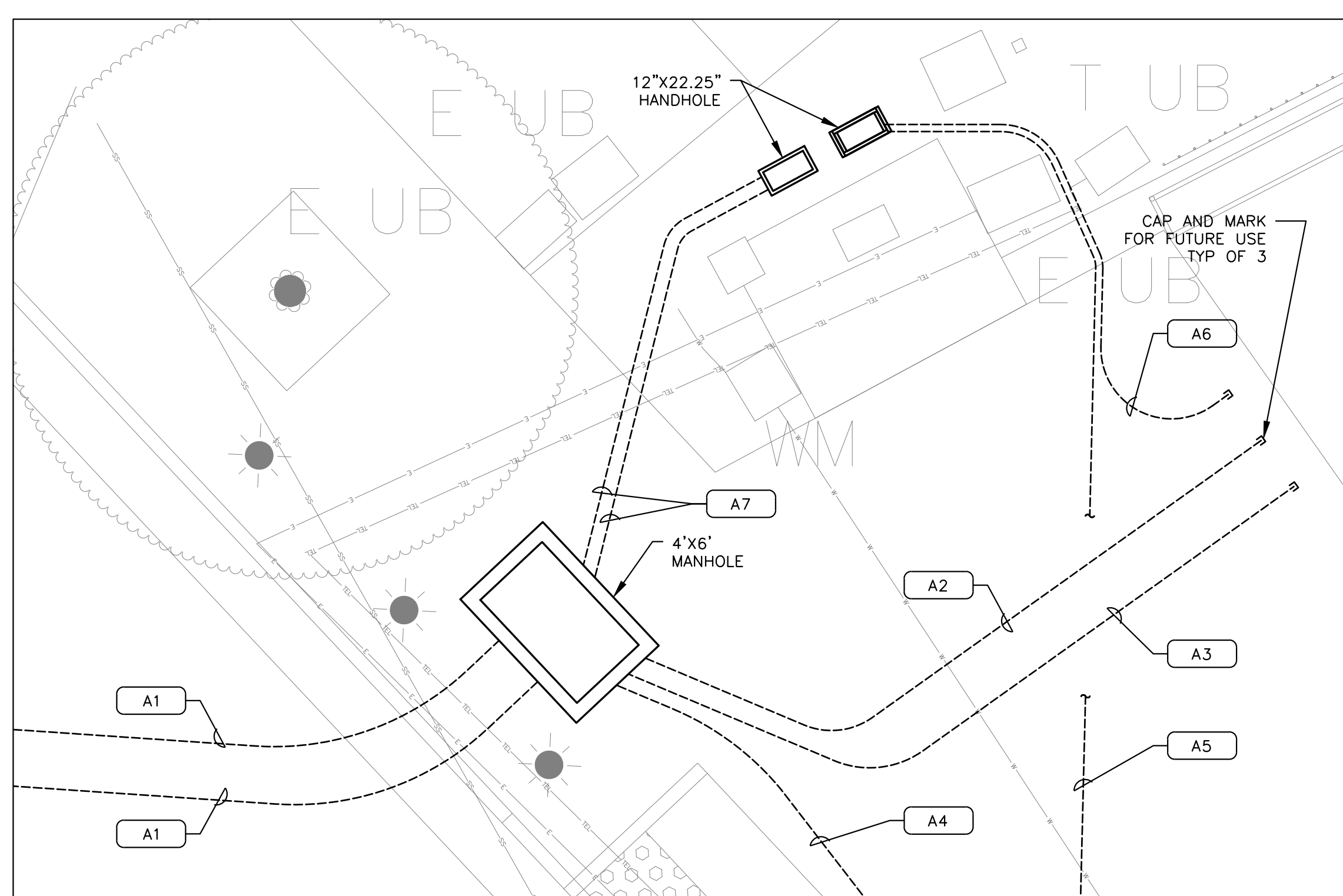
RANCHO CORDOVA, CALIFORNIA
 NH - RK
 PM - DESIGN TEAM
 230817
 PROJECT NO.



1 ELECTRICAL PLAN
 SCALE: 1"=20'-0"
 0 20' 40'



2 ENLARGED ELECTRICAL PLAN
 SCALE: 1/4"=1'-0"
 0 2' 4' 8'

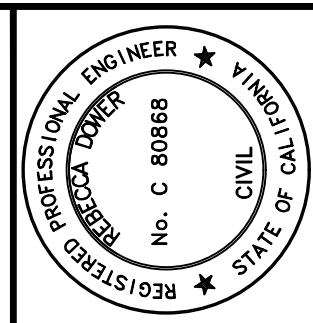


3 ENLARGED ELECTRICAL PLAN
 SCALE: 1/4"=1'-0"
 0 2' 4' 8'

FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA
ELECTRICAL PLAN

Revisions	
No.	Description

Date: Scale: Design: Drawn: Approved: Job No:
E1.0
 31 OF 37

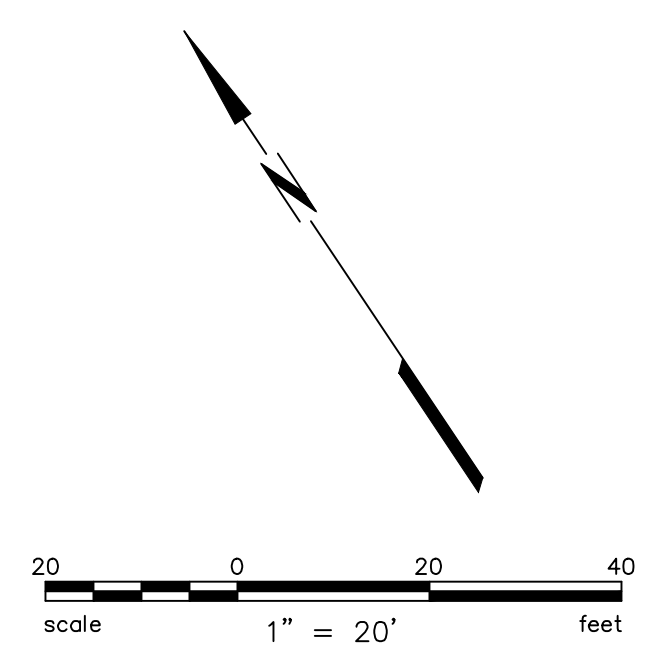
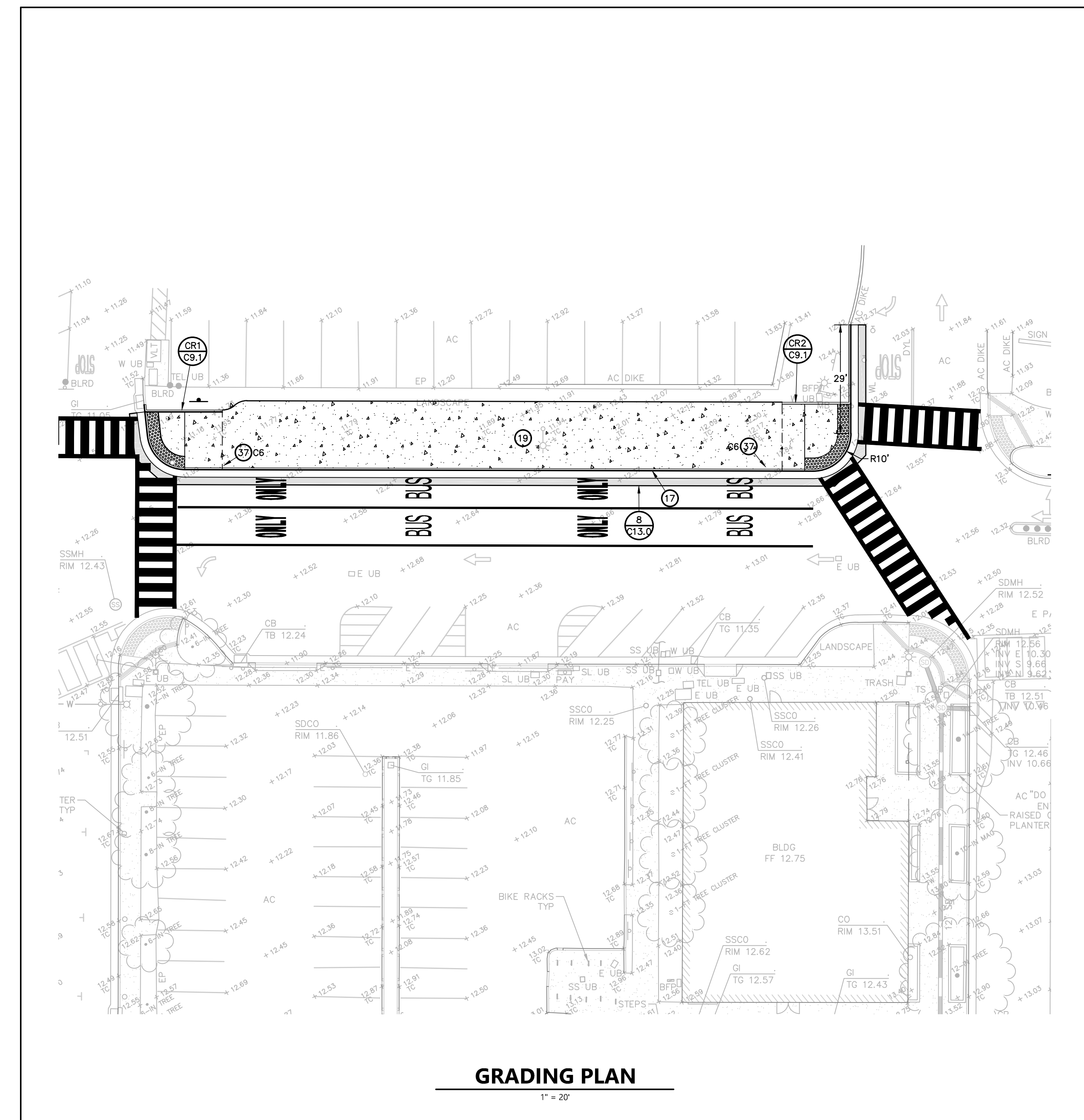
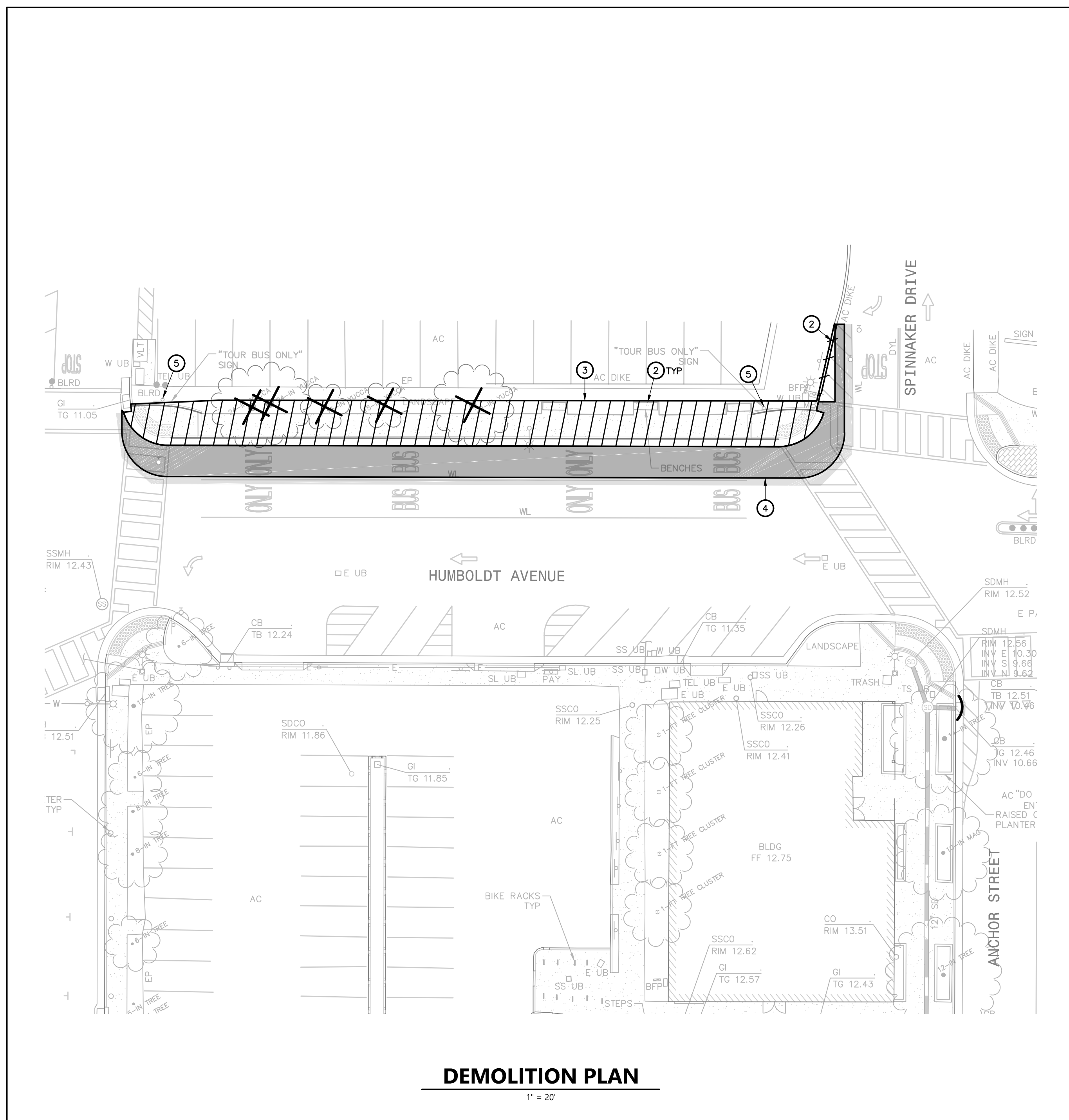


REBECCA DOWER
C 80868
6/17/2024

BKF
BIKE ENGINEERS
810 5TH AVENUE
SUITE 210
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(415) 930-7960
www.bkf.com

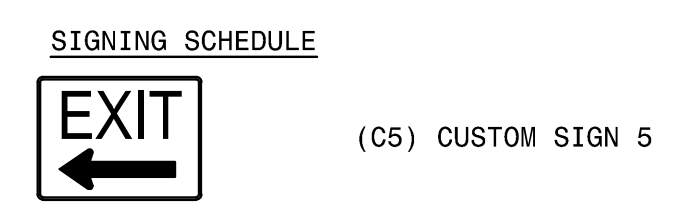
FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
**ADDITIVE ALTERNATIVE 1 - SIDEWALK
ACROSS HUMBOLDT AVENUE**

Date: JUNE 2024	No.
Scale: AS SHOWN	
Design: BD	
Drawn: SR	
Approved: BD	
Job No: 20191036	
Drawing Number:	
C14.0	
32 OF 37	

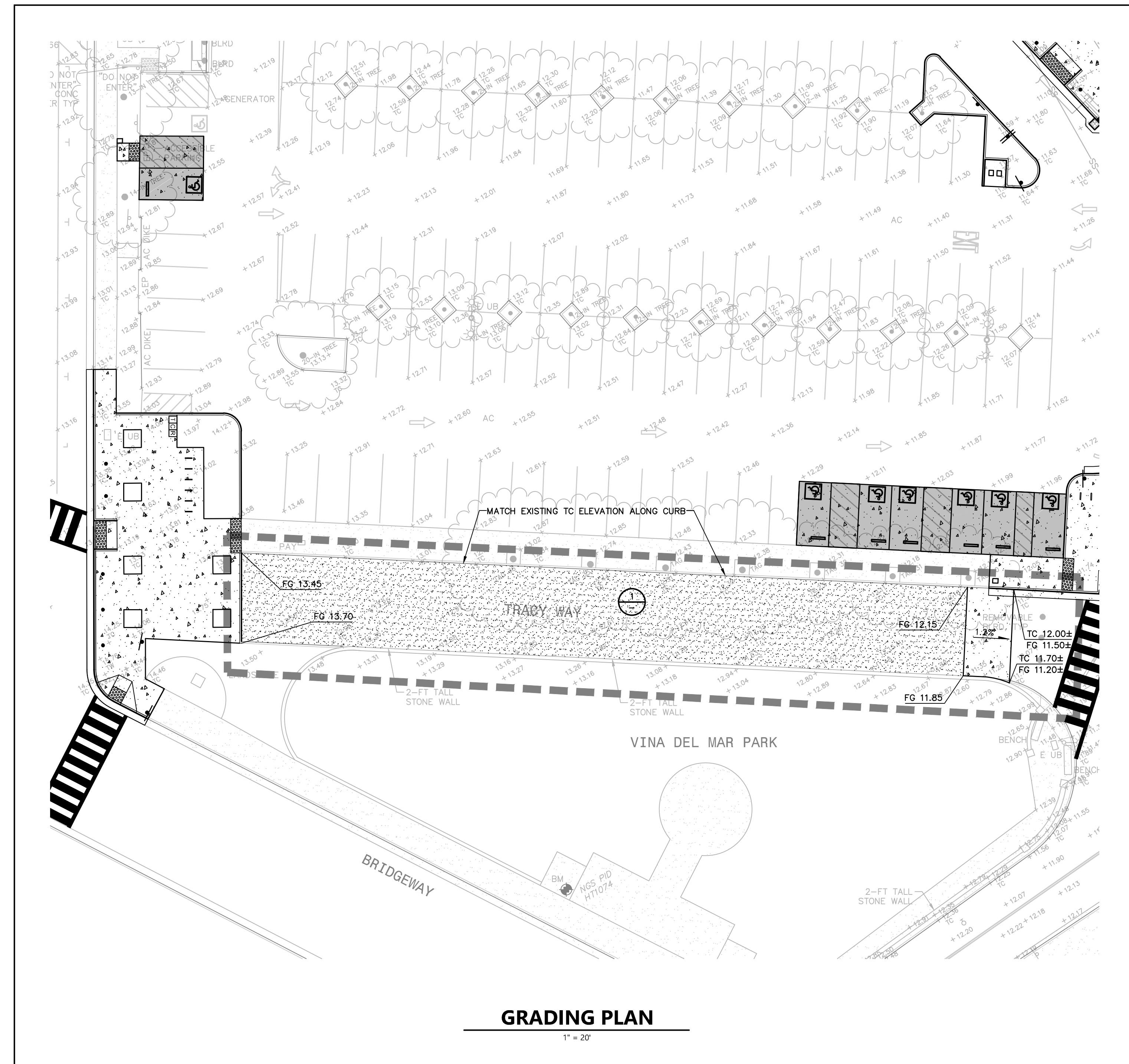
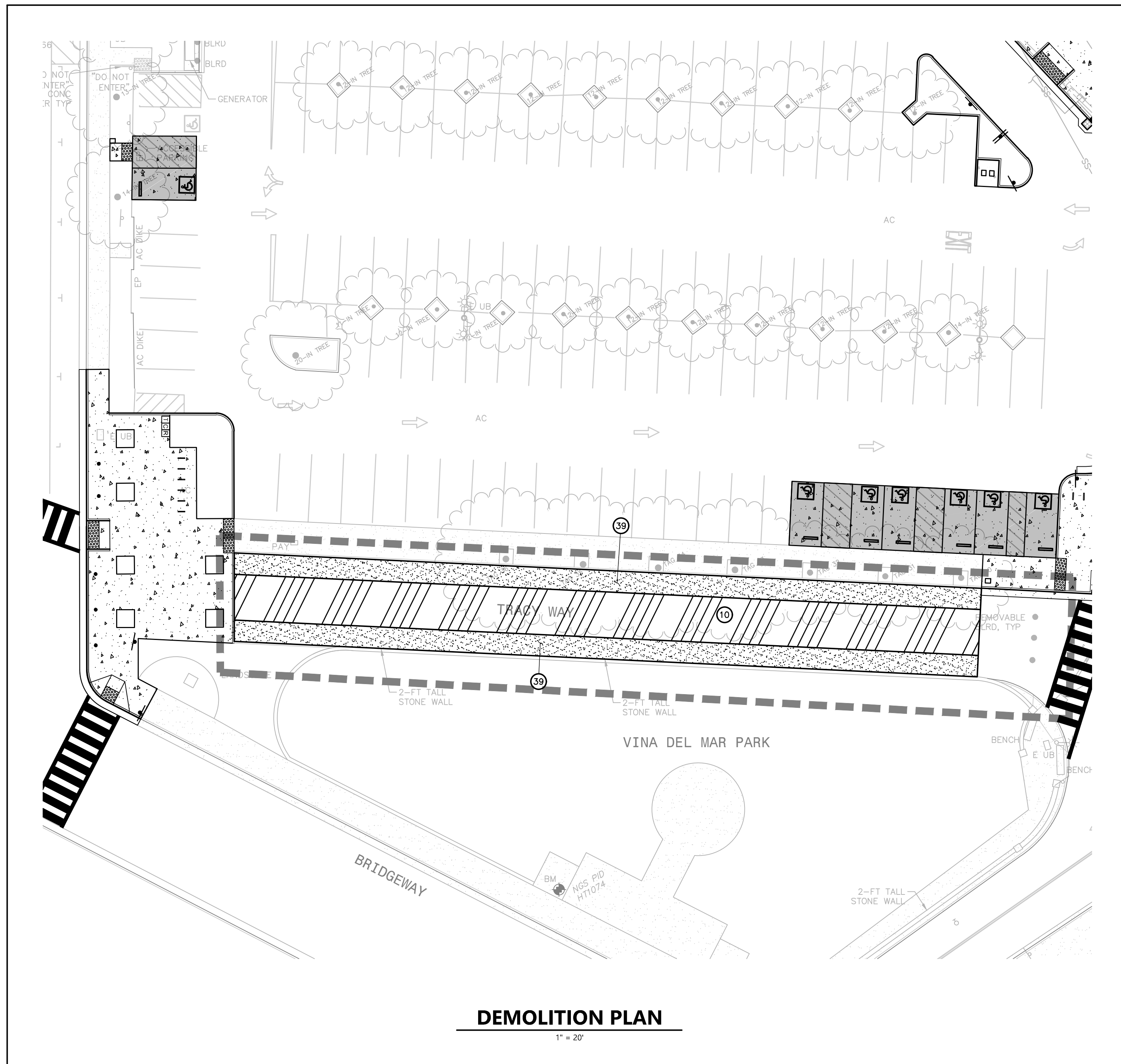


- KEYNOTES:**
- ② REMOVE AND DISPOSE OF EXISTING MATERIAL OR FEATURE. REMOVE FEATURE FLUSH WITH ADJACENT GRADE, INCLUDING CUTTING OF ANCHORS OR BOLTS.
 - ③ SAWCUT AND CLEANLY REMOVE AND DISPOSE OF EXISTING ASPHALT PAVEMENT AND BASE COURSE AS NEEDED TO FACILITATE THE PROPOSED IMPROVEMENTS.
 - ④ SAWCUT, CLEANLY REMOVE AND DISPOSE OF EXISTING CONCRETE TO THE NEAREST CONTROL JOINT AS NEEDED TO FACILITATE THE PROPOSED IMPROVEMENTS.
 - ⑤ REMOVE EXISTING SIGN, POST, AND FOUNDATION AND SALVAGE EXISTING SIGN AS NEEDED TO FACILITATE THE PROPOSED IMPROVEMENTS. DISPOSE OF UNUSED MATERIALS.

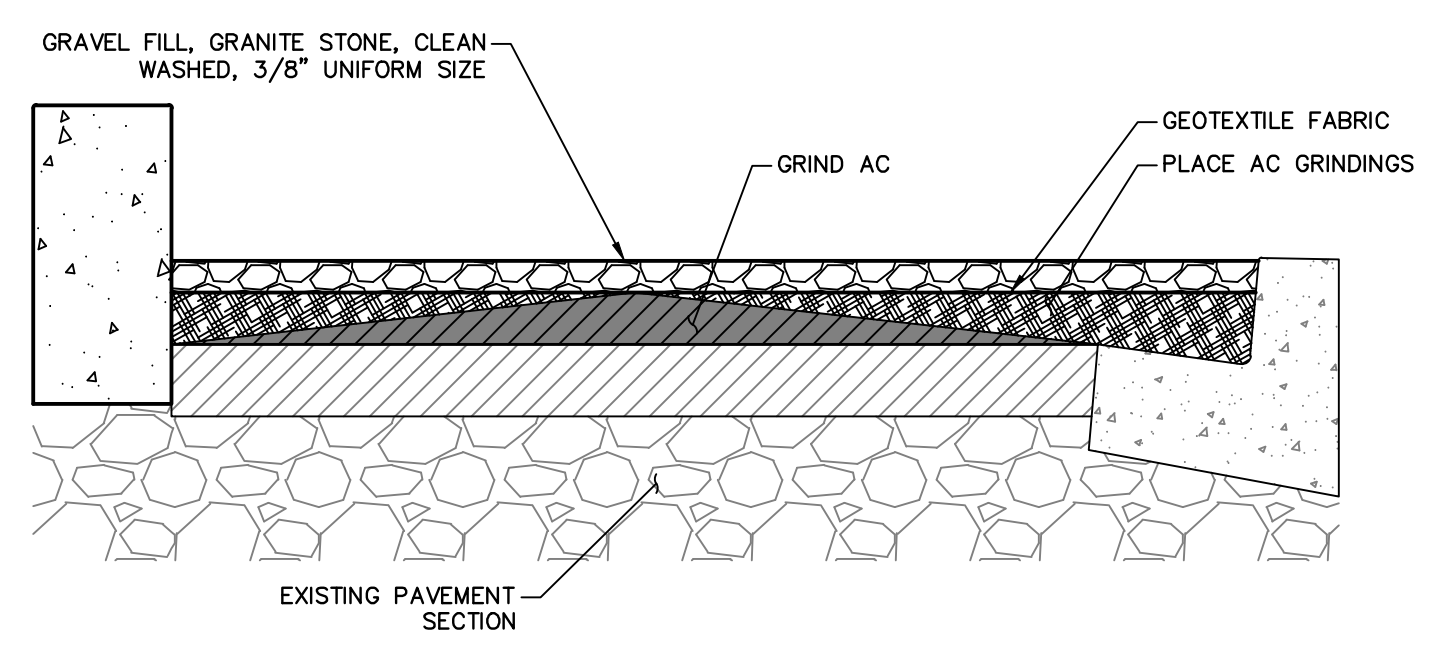
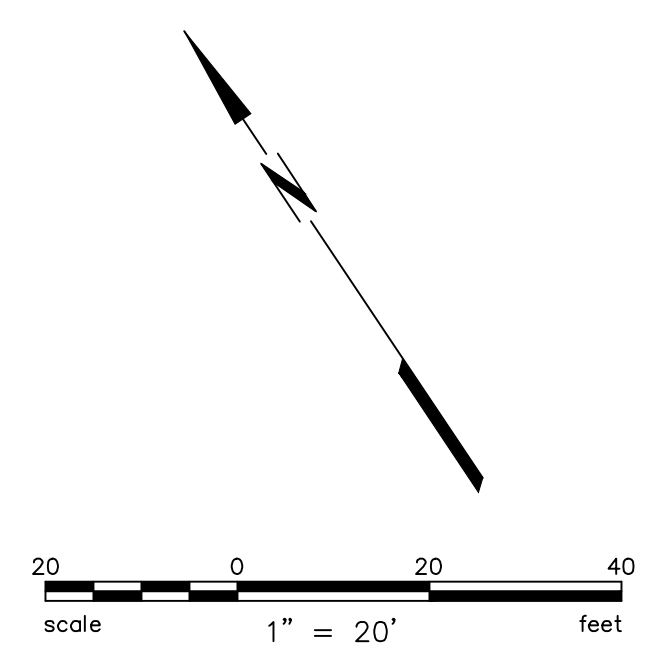
- KEYNOTES:**
- ⑰ TYPE 'A' CURB AND GUTTER IN ACCORDANCE WITH MARIN COUNTY UNIFORM CONSTRUCTION STANDARD 105.
 - ⑱ EXPOSED AGGREGATE PEDESTRIAN CONCRETE FLATWORK WITH SLOPES HAVING A CROSS SLOPE WHICH DOES NOT EXCEED 2-PERCENT.
 - ⑳ ADJUST EXISTING UTILITY TO FINISHED GROUND SURFACE ELEVATION.
 - ㉟ EXISTING SIGN PANEL AND NEW POST IN FOUNDATION IN ACCORDANCE WITH MARIN COUNTY UNIFORM CONSTRUCTION STANDARD 310.



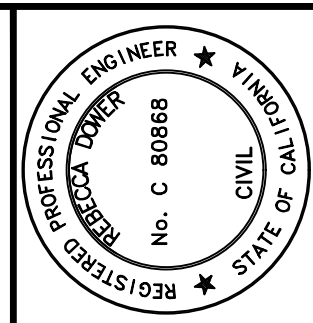
Plot: Jun 07, 2024 at 4:36pm



- KEYNOTES:**
- ⑩ GRIND EXISTING ASPHALT CONCRETE AS REQUIRED TO PROVIDE AN EVEN SURFACE FOR GRAVELPAVE SURFACING HAVING A MINIMUM THICKNESS OF 1-INCH IN A MANNER WHICH GENERATES A UNIFORM TRANSITION BETWEEN SURFACES AND DOES NOT IMPEDE DRAINAGE.
 - ③⁹ PLACE AND COMPACT PAVEMENT GRINDINGS ON TOP OF EXISTING ASPHALT TO CREATE A LEVEL SUBGRADE SURFACE FOR GRAVELPAVE PLACEMENT.



① GRAVELPAVE OVER ASPHALT
NO SCALE



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FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA

**ADDITIVE ALTERNATIVE 2 - GRAVELPAVE
ACROSS TRACY WAY**

Revisions	
No.	Description

Date: JUNE 2024	No.
Scale: AS SHOWN	
Design: BD	
Drawn: SR	
Approved: BD	
Job No: 20191036	

Drawing Number:
C14.1
33 OF 37

LIGHTING FIXTURE SCHEDULE

DESCRIPTION	MANUFACTURER	LAMPS	WATTS	VOLTAGE	COLOR	MOUNTING	WEIGHT	LUMENS
LED BOLLARD 360° LIGHT DISTRIBUTION SYMMETRIC ILLUMINATION	BEGA CAT. NO. 99 570 K4 BLK	LED	14.4	120	BLACK	REFER TO DETAIL 4/E2.0	19.4 LBS	746

GENERAL NOTES:

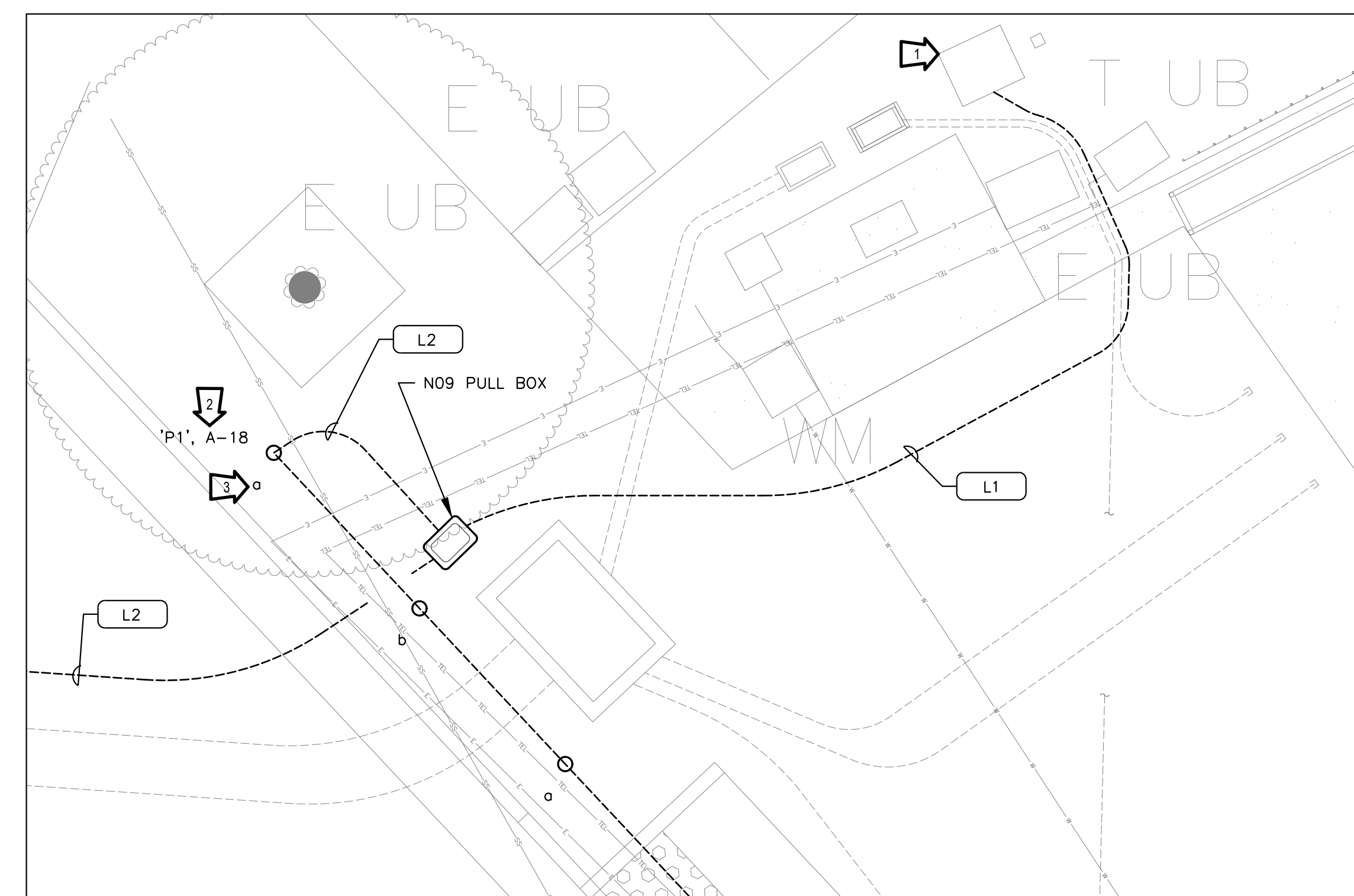
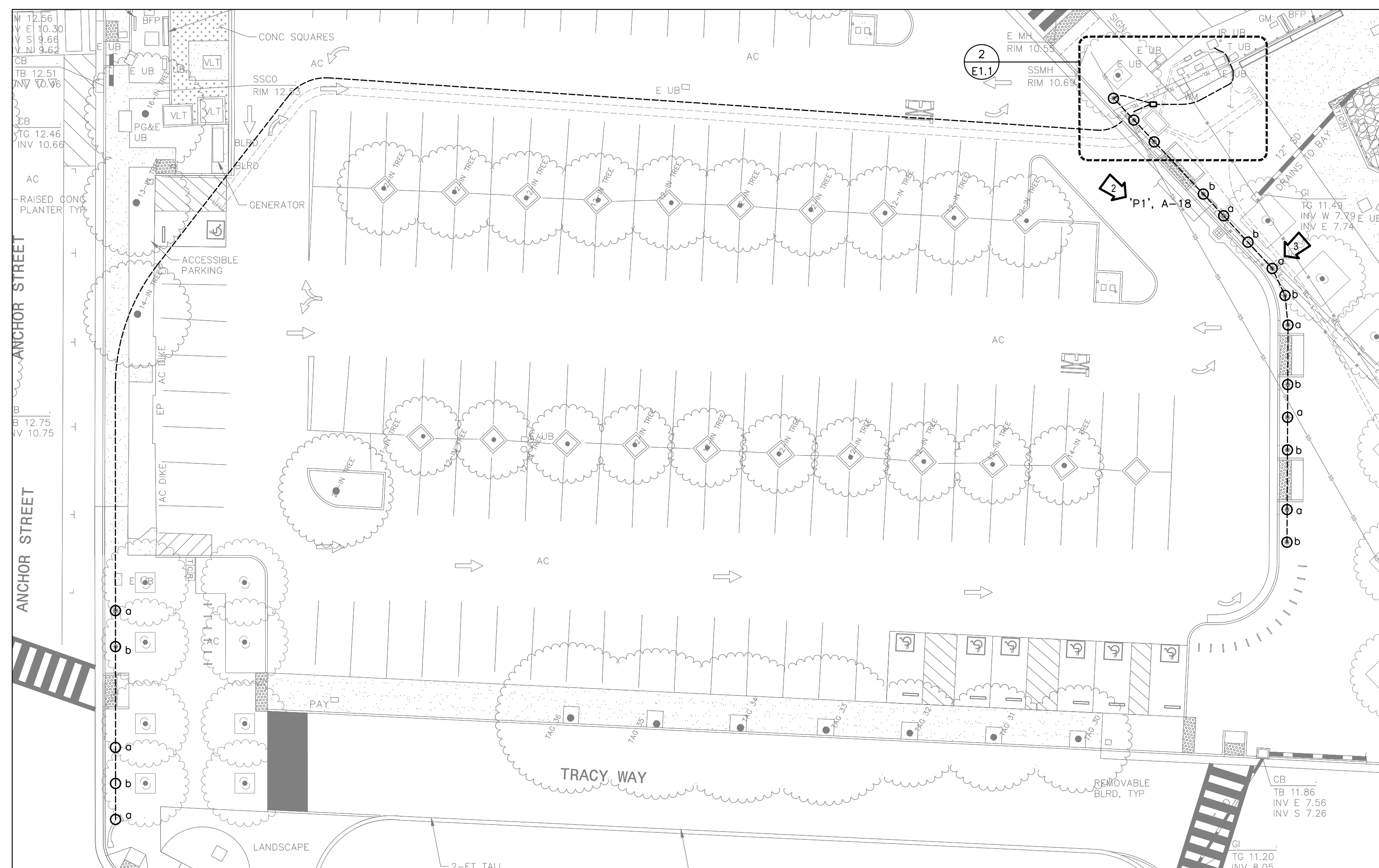
- A. THIS LIGHTING SCHEDULE IS NOT COMPLETE WITHOUT A COPY OF THE PROJECT MANUAL CONTAINING ELECTRICAL SPECIFICATIONS.
- B. SPECIFIED MANUFACTURERS ARE APPROVED TO SUBMIT BID. INCLUSION DOES NOT RELIEVE MANUFACTURER FROM SUPPLYING PRODUCT AS DESCRIBED.
- C. PROVIDE SUBMITTALS THAT INCLUDE LIGHTING FIXTURE, LED, AND DRIVER INFORMATION FOR EACH FIXTURE, WITH APPLICABLE OPTIONS CLEARLY CHECKED OR HIGHLIGHTED. SUBMITTALS NOT INCLUDING THIS INFORMATION WILL BE RETURNED AS REJECTED BY THE ENGINEER OF RECORD.
- D. PROVIDE COMMISSIONING OF THE LIGHTING AND LIGHTING CONTROLS IN ACCORDANCE WITH CALIFORNIA TITLE 24 COMMISSIONING REQUIREMENTS.

CONDUIT & WIRE ROUTING SCHEDULE

ID	CONDUITS	WIRES	EQUIP. GND.	FROM	TO
L1	1" PVC	2 #10 PWR	#10	PANEL A	N09 PULL BOX
L2	3/4" PVC	2 #10 PWR	#10	N09 PULL BOX	LIGHT BOLLARDS

KEY NOTES

- 1. PROVIDE 1P/20 CB FOR NEW LIGHTING CIRCUIT IN SPACE 18. MATCH ALL (E) PANEL CHARACTERISTICS INCLUDING AIC RATING. PROVIDE MULTI-RELAY TIME CLOCK EQUAL TO TORK DTS200B. MOUNT TIMECLOCK INSIDE EXISTING PANEL "A".
- 2. LIGHTING FIXTURE "P1" TYPICAL FOR ALL 19 LIGHT BOLLARDS TO BE INSTALLED. LIGHTING FIXTURES WILL BE WIRED TO SPACE 18 ON PANEL "A".
- 3. "a" AND "b" REFERS TO THE ASSIGNED CHANNEL FOR THE LIGHTING CONTROL RELAY FOR EACH FIXTURE.



1 ELECTRICAL ALTERNATE PLAN
SCALE: 1"=20'-0"
0 20' 40'

2 ENLARGED ELECTRICAL ALTERNATE PLAN
SCALE: 1/4"=1'-0"
0 2' 4' 8'



Date Signed: 6/14/24



RANCHO CORDOVA, CALIFORNIA

NH - RK

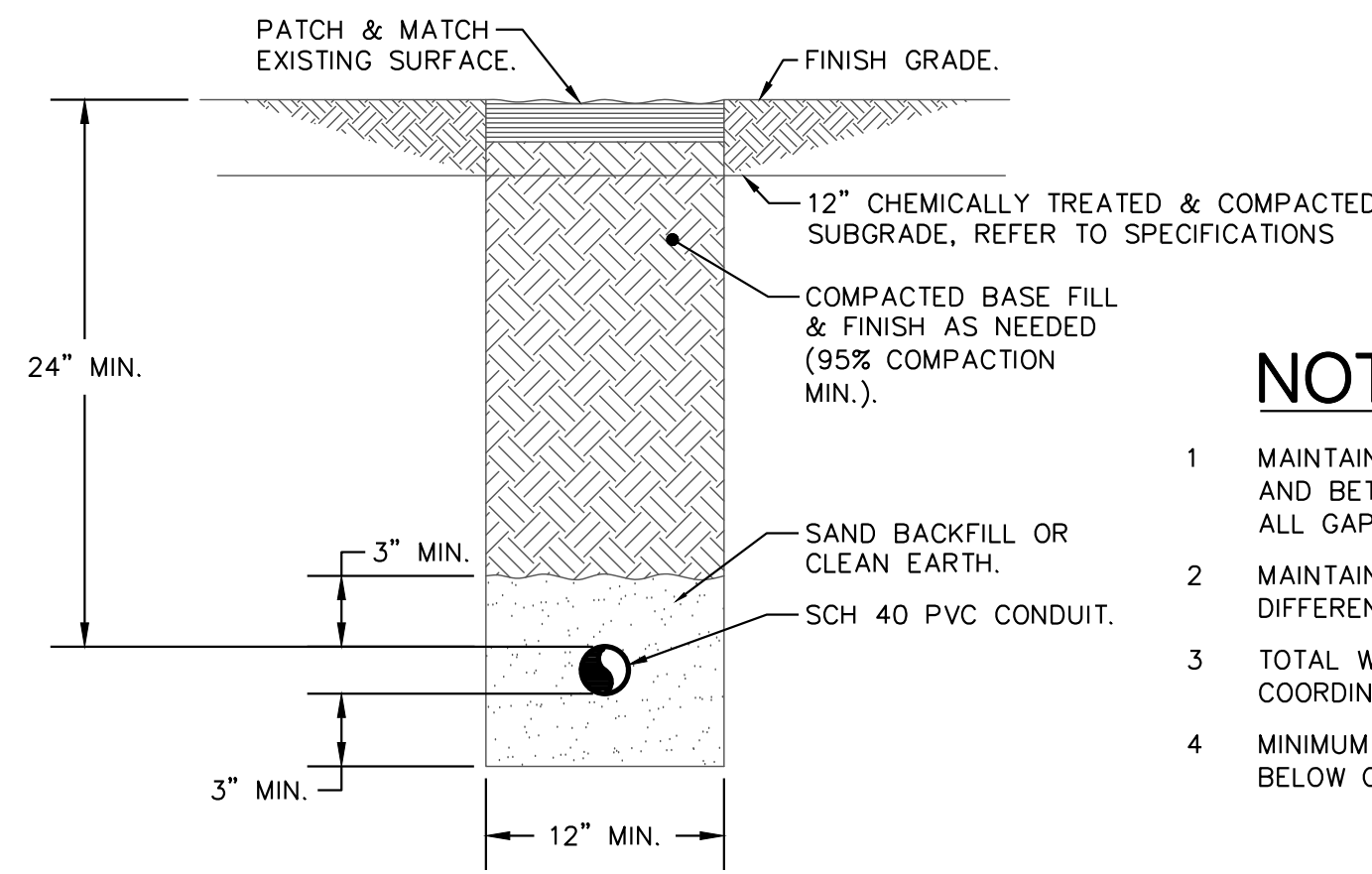
PM - DESIGN TEAM

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PROJECT NO.

FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA
ELECTRICAL BID ALTERNATE 3 PLAN

Revisions	No.	Date:	Scale:	Design:	Drawn:	Approved:	Job No:

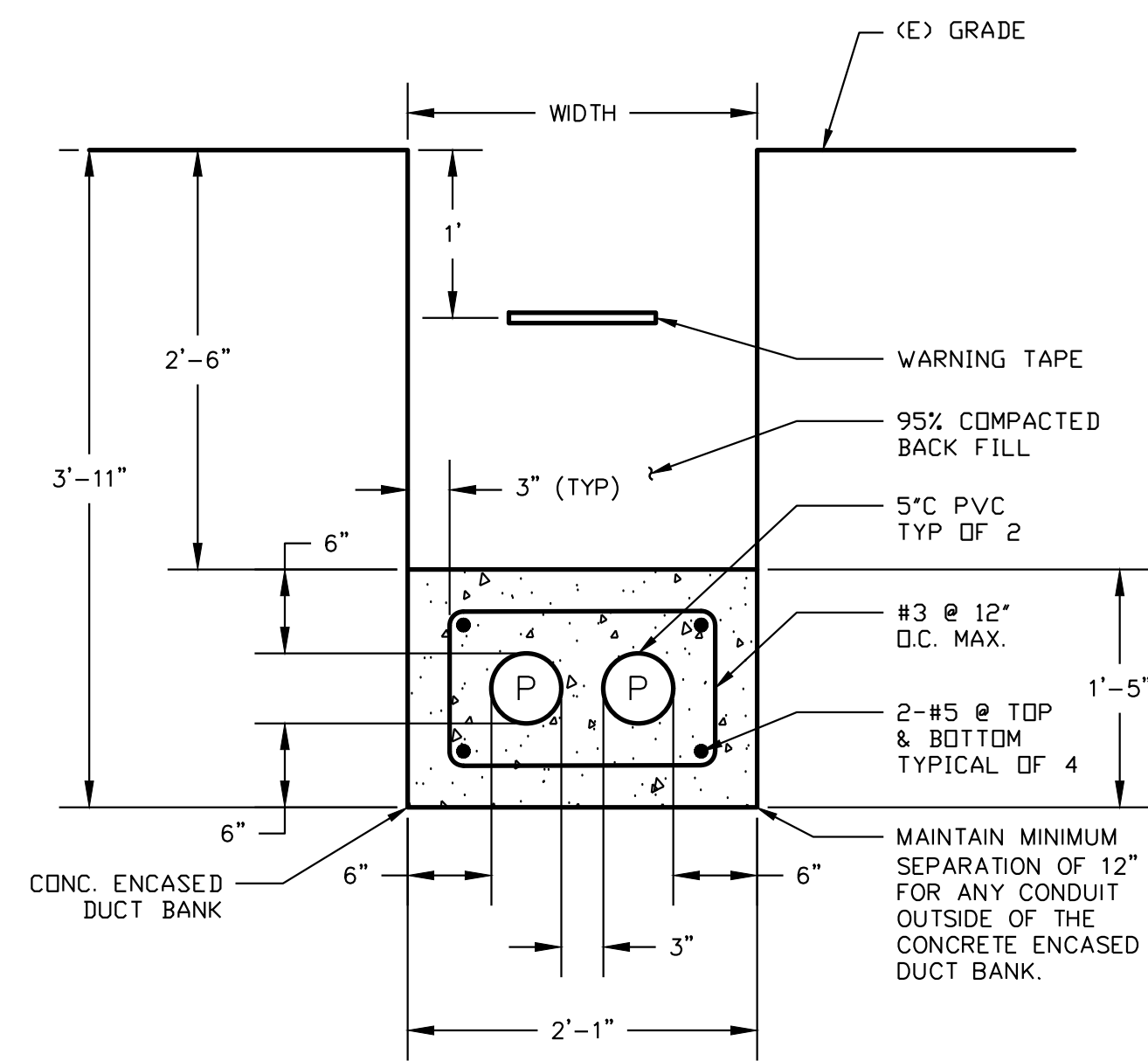
E1.1
34 OF 37



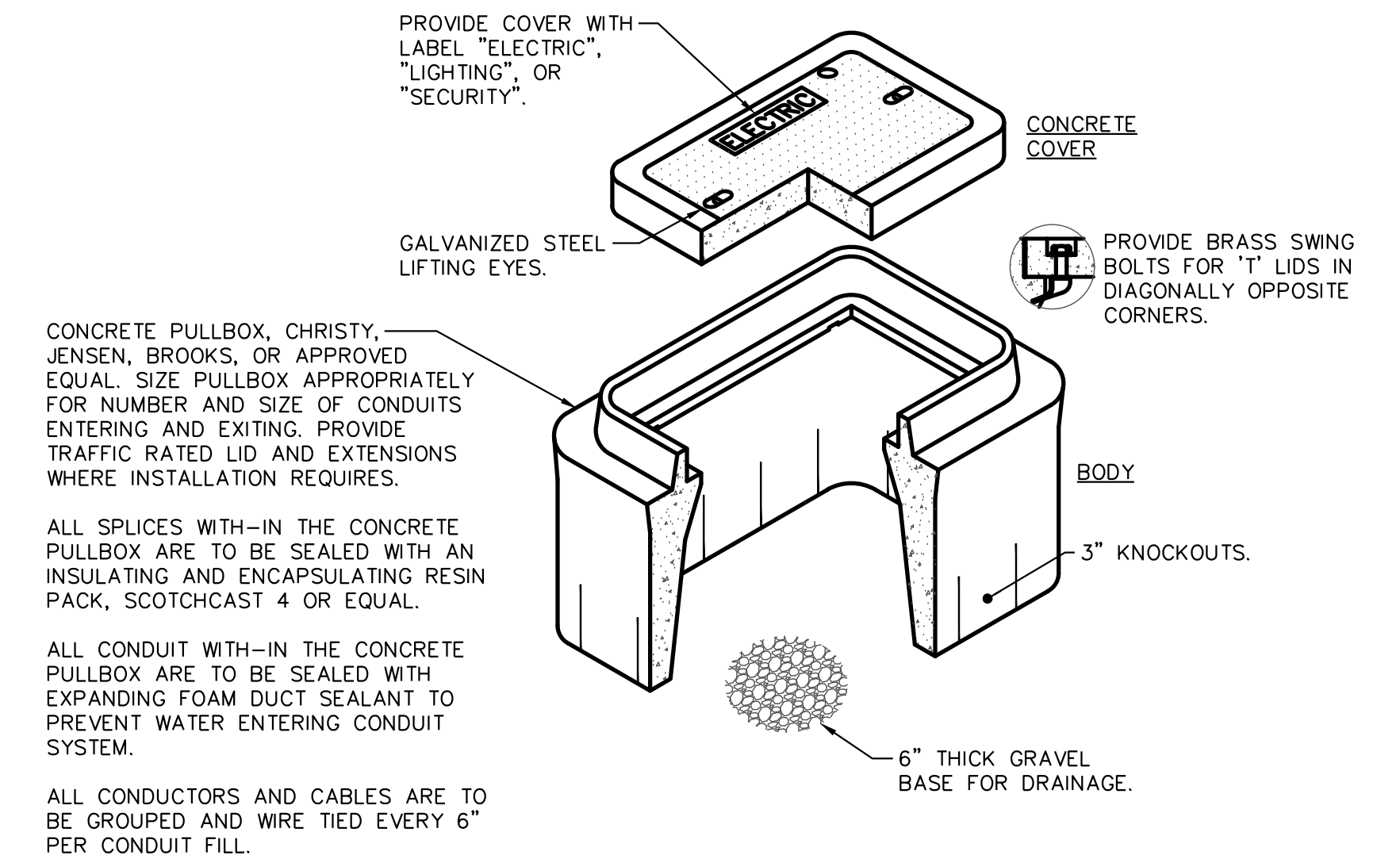
NOTES

- 1 MAINTAIN A MINIMUM OF 2" SEPARATION BETWEEN ALL CONDUITS AND BETWEEN CONDUITS AND SIDE WALL TO ALLOW SAND TO FILL ALL GAPS.
- 2 MAINTAIN A MINIMUM OF 2" SEPARATION BETWEEN CONDUITS ON DIFFERENT ROWS OR LEVELS.
- 3 TOTAL WIDTH AND DEPTH OF TRENCH SHALL BE VERIFIED AND COORDINATED ON JOB SITE.
- 4 MINIMUM DEPTH FOR POWER AND SIGNAL CONDUITS SHALL BE 24" BELOW GRADE.

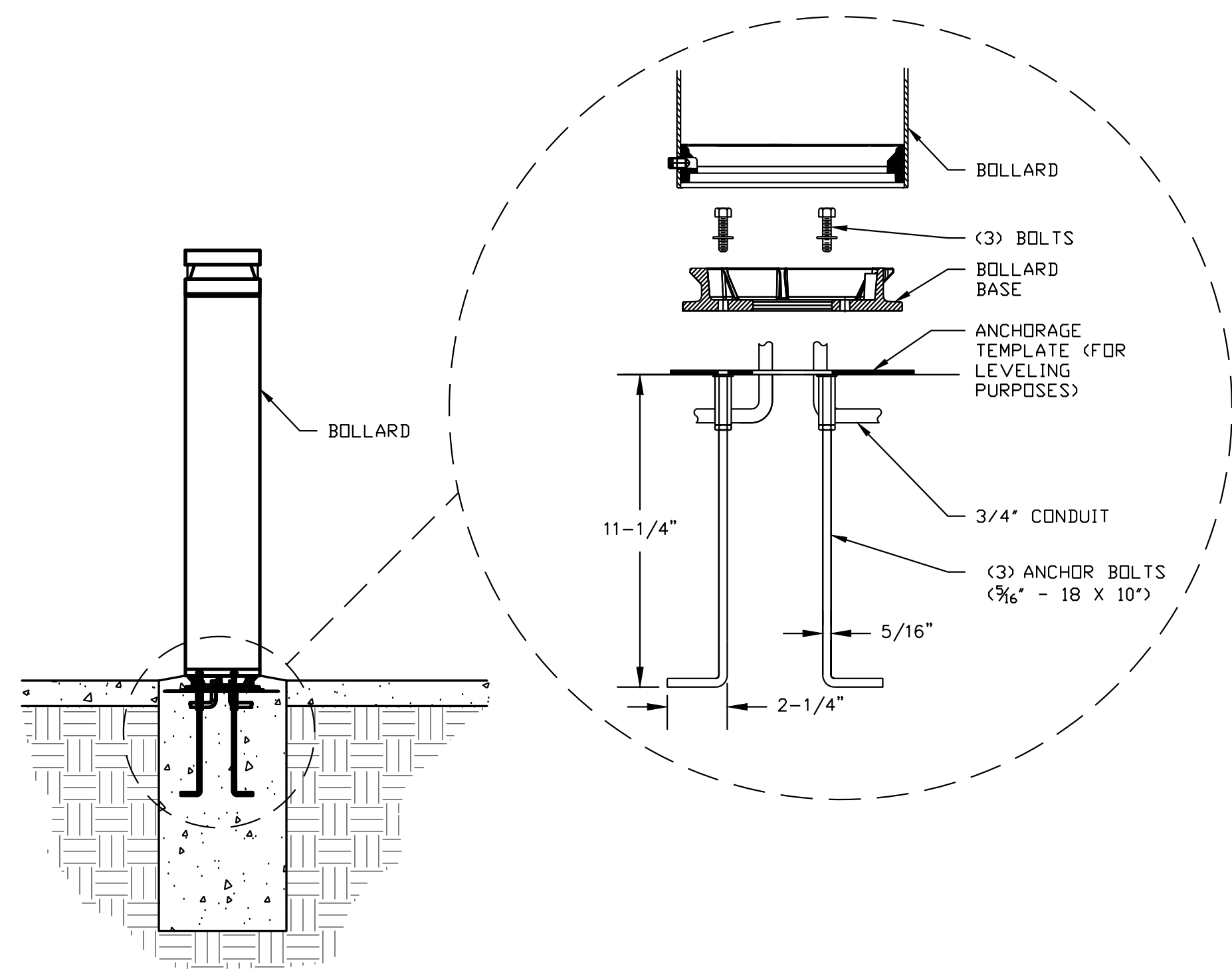
1 TYPICAL TRENCH DETAIL
NO SCALE



2 CONC. DUCT BANK TRENCH DETAIL
NO SCALE



3 TYPICAL CONCRETE PULLBOX DETAIL
NO SCALE



4 LIGHT BOLLARD MOUNT DETAIL
NO SCALE



Date Signed: 6/14/24



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230817
PROJECT NO.

FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA

ELECTRICAL DETAILS

Revisions	
No.	Description

Date:
Scale:
Design:
Drawn:
Approved:
Job No:

Drawing Number: **E2.0**

35 OF 37

STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 2 of 7)
Date Prepared: 6/7/2024

C. COMPLIANCE RESULTS
Results in this table are automatically calculated from data input and calculations in Tables F through N. Note: If any cell on this table says "COMPLIES with Exceptional Conditions" refer to Table D. Exceptional Conditions for guidance or see applicable Table referenced below.

Calculations of Total Allowed Lighting Power (Watts) 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv						Compliance Results			
01	02	03	04	05	06	07	08	09	
General Hardscape Allowance 140.7(d)1 / 170.2(e)6 (See Table I)	+ Per Application 140.7(d)2 / 170.2(e)6 (See Table J)	+ Sales Frontage 140.7(d)2 (See Table K)	+ Ornamental 140.7(d)2 / 170.2(e)6 (See Table L)	+ Per Specific Area 140.7(d)2 / 170.2(e)6 (See Table M)	OR Existing Power Allowance 141.0(b)2L / 180.2(b)4Bv (See Table N)	= Total Allowed (Watts)	≥ Total Actual (Watts)	07 must be >= 08	
330	+	---	+	---	+	---	330	≥ 274	COMPLIES
Shielding Compliance (See Table G for Details)								N/A	
Controls Compliance (See Table H for Details)								COMPLIES	

D. EXCEPTIONAL CONDITIONS
This table is auto-filled with uneditable comments because of selections made or data entered in tables throughout the form.

E. ADDITIONAL REMARKS
This table includes remarks made by the permit applicant to the Authority Having Jurisdiction.
Motion Sensor is integrated to the Lighting Fixture

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STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 4 of 7)
Date Prepared: 6/7/2024

H. OUTDOOR LIGHTING CONTROLS
This table demonstrates compliance with controls requirements for all new or altered luminaires installed as part of the permit application. For alteration projects, luminaires which are existing to remain (ie untouched) and luminaires which are removed and reinstalled (wiring only) do not need to be included in this table even if they are within the spaces covered by the permit application.
Outdoor lighting for nonresidential buildings, parking garages and common service areas in multifamily buildings must be documented separately from outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit

Mandatory Controls for Nonresidential Occupancies, Parking Garages & Common Areas in Multifamily Buildings				
01	02	03	04	05
Area Description	Shut-Off 130.2(c)1 / 160.5(c)	Auto-Schedule 130.2(c)2 / 160.5(c)	Motion Sensor 130.2(c)3 / 160.5(c)	Field Inspector
Pedestrian Hardscape	Astronomical Timer	Provided	NA: Each Luminaire ≤ 40 Watts	Pass Fail

¹ FOOTNOTE: Text has been abbreviated, please refer to Table 160.5-A to confirm compliance with the specific light source technologies listed.
² Authority having jurisdiction may ask for cutsheets or other documentation to confirm compliance of light source.
³ Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings are exempted from ii and iii.

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STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 1 of 7)
Date Prepared: 6/7/2024

A. GENERAL INFORMATION

01 Project Location (city)	Sausalito	04 Total Illuminated Hardscape Area (ft ²)	4140
02 Climate Zone	3		
03 Outdoor Lighting Zone per Title 24 Part 10.1114 or as designated by Authority Having Jurisdiction (AHJ):			
<input type="checkbox"/> LZ-0: Very Low - Undeveloped Parkland	<input checked="" type="checkbox"/> LZ-2: Moderate - Urban Clusters	<input type="checkbox"/> LZ-4: High - Must be reviewed by CA Energy Commission for Approval	
<input type="checkbox"/> LZ-1: Low - Rural Areas	<input type="checkbox"/> LZ-3: Moderately High - Urban Areas		
05 Occupancy Types within Project			
• All Other Occupancies			

B. PROJECT SCOPE
This table includes outdoor lighting systems that are within the scope of the permit application and are demonstrating compliance using the prescriptive path outlined in 140.7 / 170.2(e)6 or 141.0(b)2L / 180.2(b)4Bv for alterations.

My Project Consists of:

01	02
<input checked="" type="checkbox"/> New Lighting System	Must Comply with Allowances from 140.7 / 170.2(e)6
<input type="checkbox"/> Altered Lighting System	Is your alteration increasing the connected lighting load (Watts)? <input type="radio"/> Yes <input checked="" type="radio"/> No
03	04
% of Existing Luminaires Being Altered ¹	Sum Total of Luminaires Being Added or Altered
<input type="checkbox"/> < 10% <input type="checkbox"/> >= 10% and < 50% <input type="checkbox"/> >= 50%	Calculation Method

Please proceed to Table F. Outdoor Lighting Fixture Schedule to define the project's luminaires.
¹ FOOTNOTES: % of Existing Luminaires Being Altered = (Sum Total of Luminaires Being Added or Altered / Existing Luminaires within the Scope of the Permit Application) x 100.

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STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 3 of 7)
Date Prepared: 6/7/2024

F. OUTDOOR LIGHTING FIXTURE SCHEDULE
For new or altered lighting systems demonstrating compliance with 140.7 / 170.2(e)6 all new luminaires being installed and any existing luminaires remaining or being moved within the spaces covered by the permit application are included in the Table below. For altered lighting systems using the Existing Power method per 141.0(b)2L only new luminaires being installed and replacement luminaires being installed as part of the project scope are included (ie, existing luminaires remaining or existing luminaires being moved are not included). Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H, and are not included here. All other multifamily outdoor lighting is included here.

Designed Wattage:									
01	02	03	04	05	06	07	08	09	10
Name or Item Tag	Complete Luminaire Description	Watts per luminaire ^{1, 2}	How is Wattage determined	Total Number Luminaires ²	Luminaire Status ³	Excluded per 140.7(a) / 170.2(e)6A	Design Watts	Cutoff Req. > 6,200 initial lumen output 130.2(b) / 160.5(c)1 ⁴	Field Inspector
P1	P1 <input type="checkbox"/> Linear	14.4	Mfr. Spec	19	New	<input type="checkbox"/>	273.6	NA: < 6200 lumens	Pass Fail
Total Design Watts:							274		

¹ NOTES: Selections with a * require a note in the space below explaining how compliance is achieved.
EX: Luminaire is lighting a statue; EXCEPTION 2 to 130.2(b)
² FOOTNOTES: Authority Having Jurisdiction may ask for Luminaire cut sheets to confirm wattage used for compliance per 130.0(c) / 160.5(b)
³ For linear luminaires, wattage should be indicated as W/lf instead of Watts/luminaire. Total linear feet should be indicated in column 05 instead of number of luminaires.
⁴ Select "New" for new luminaires in a new outdoor lighting project, or for added luminaires in an alteration. Select "Altered" for replacement luminaires in an alteration. Select "Existing to Remain" for existing luminaires within the project scope that are not being altered and are remaining. Select "Existing Reinstalled" for existing luminaires which are being removed and reinstalled as part of the project scope.
⁵ Compliance with mandatory shielding requirements is required for luminaires with initial lumen output >= 6,200 unless exempted by 130.2(b) / 160.5(c)

G. SHIELDING REQUIREMENTS (BUG)
This section does not apply to this project.

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Date Signed: 6/14/2024



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230817
PROJECT NO.

FERRY LANDSIDE IMPROVEMENT PROJECT
 APN 065-073-03
 SAUSALITO, CALIFORNIA
 TITLE 24 LTO FORMS

No.	Date:	By:	Check:	Design:	Drawn:	Approved:	Job No:

Drawing Number:
E3.0
36 OF 37

STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 6 of 7)
Date Prepared: 6/7/2024

M. LIGHTING ALLOWANCE: PER SPECIFIC AREA
This section does not apply to this project.

N. EXISTING CONDITIONS POWER ALLOWANCE (alterations only)
This section does not apply to this project.

O. DECLARATION OF REQUIRED CERTIFICATES OF INSTALLATION
Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and can be found online.

Form/Title
NRCI-LTO-E - Must be submitted for all buildings

P. DECLARATION OF REQUIRED CERTIFICATES OF ACCEPTANCE
Selections have been made based on information provided in this document. If any selection has been changed by permit applicant, an explanation should be included in Table E. Additional Remarks. These documents must be provided to the building inspector during construction and must be completed through an Acceptance Test Technician Certification Provider (ATTCP). For more information visit: <http://www.energy.ca.gov/title24/attcp/providers.html>

Form/Title	Systems/Spaces To Be Field Verified
NRCA-LTO-02-A - Must be submitted for all outdoor lighting controls except for alterations where controls are added to <= 20 luminaires.	Pedestrian Hardscape;

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STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 5 of 7)
Date Prepared: 6/7/2024

I. LIGHTING POWER ALLOWANCE (per 140.7 / 170.2(e))
This table includes areas using allowance calculations per 140.7 / 170.2(e). General Hardscape Allowance is per Table 140.7-A/Table 170.2-R while "Use it or lose it" Allowances are per Table 140.7-B /Table 170.2-S. Indicate which allowances are being used to expand sections for user input. Luminaires that qualify for one of the "Use it or lose it" allowances shall not qualify for another "Use it or lose it" allowance. Outdoor lighting attached to multifamily buildings and controlled from the inside of a dwelling unit are included in Table H, and are not included here. All other multifamily outdoor lighting is included here.

Area Description	Area Wattage Allowance (AWA)				Linear Wattage Allowance (LWA)			Total General AWA + LWA (Watts)
	Illuminated Area (ft ²)	Allowed Density (W/ft ²)	Area Allowance (Watts)	Perimeter Length (lf)	Allowed Density (W/lf)	Linear Allowance (Watts)		
East Walkway	2756	0.019	52.4	342	0.2	51.3	104	
West Walkway	1384	0.019	26.3	0	0.2	0	26	
Initial Wattage Allowance for Entire Site (Watts):							200	
Instances of Initial Wattage Allowance (LZ 0 only):								
Total General Hardscape Allowance (Watts):							330	

J. LIGHTING ALLOWANCE: PER APPLICATION
This section does not apply to this project.

K. LIGHTING ALLOWANCE: SALES FRONTAGE
This section does not apply to this project.

L. LIGHTING ALLOWANCE: ORNAMENTAL
This section does not apply to this project.

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STATE OF CALIFORNIA
Outdoor Lighting CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF COMPLIANCE NRCC-LTO-E
Project Name: Sausalito Ferry Landside Report Page: (Page 7 of 7)
Project Address: Sausalito Ferry Landside Date Prepared: 6/7/2024

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT
I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name: Jefferson Gulde	Documentation Author Signature:
Company: Capital Engineering Consultants Inc.	Signature Date: 2024-06-07
Address: 11020 Sun Center Drive, Suite 100	CEA/ HERS Certification Identification (if applicable):
City/State/Zip: Rancho Cordova CA 95670	Phone: 916-851-3567

RESPONSIBLE PERSON'S DECLARATION STATEMENT
I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Compliance is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
- The energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
- The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
- I will ensure that a completed signed copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name: Nathan Hearn	Responsible Designer Signature:
Company: Capital Engineering Consultants Inc.	Date Signed: 2024-06-07
Address: 11020 Sun Center Drive Suite 100	License: E23927
City/State/Zip: Rancho Cordova CA 95670	Phone: 916-851-3568

Generated Date/Time: Documentation Software: EnergyPro
CA Building Energy Efficiency Standards - 2022 Nonresidential Compliance Report Version: 2022.0.000 Compliance ID: EnergyPro-30211-0624-1243 Schema Version: rev 20220101 Report Generated: 2024-06-07 14:05:23



Date Signed: 6/14/2024

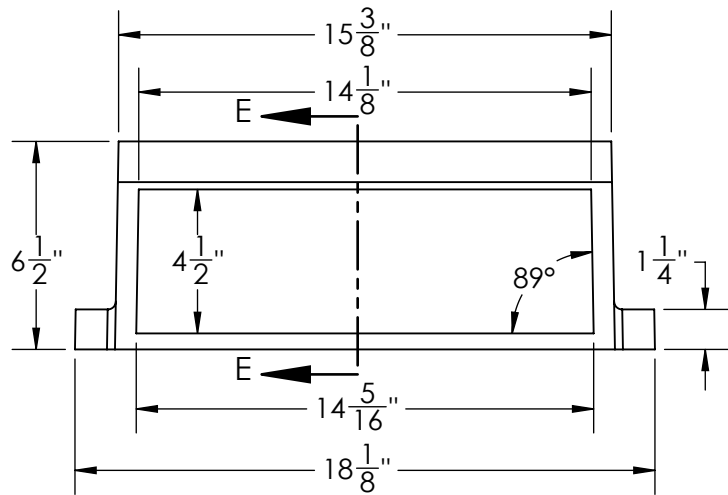


RANCHO CORDOVA, CALIFORNIA
NH - RK
PM - DESIGN TEAM
230817
PROJECT NO.

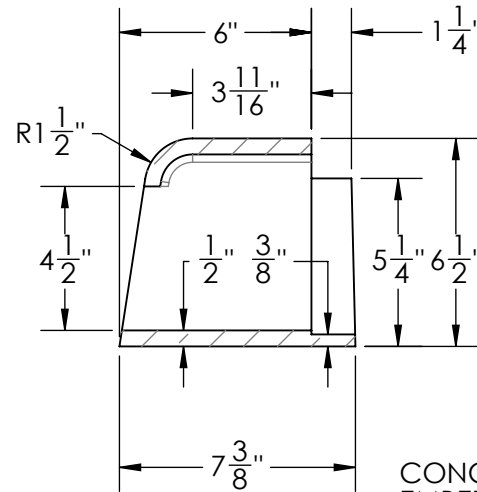
FERRY LANDSIDE IMPROVEMENT PROJECT
APN 065-073-03
SAUSALITO, CALIFORNIA
TITLE 24 LTO FORMS

No.	Date:	By:	Design:	Drawn:	Approved:	Job No:

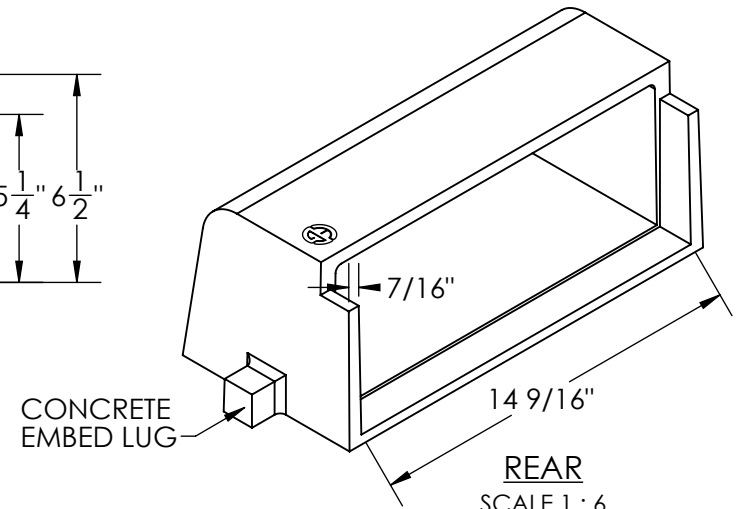
Revisions
Drawing Number:
E3.1
37 OF 37



FRONT
SCALE 1 : 6



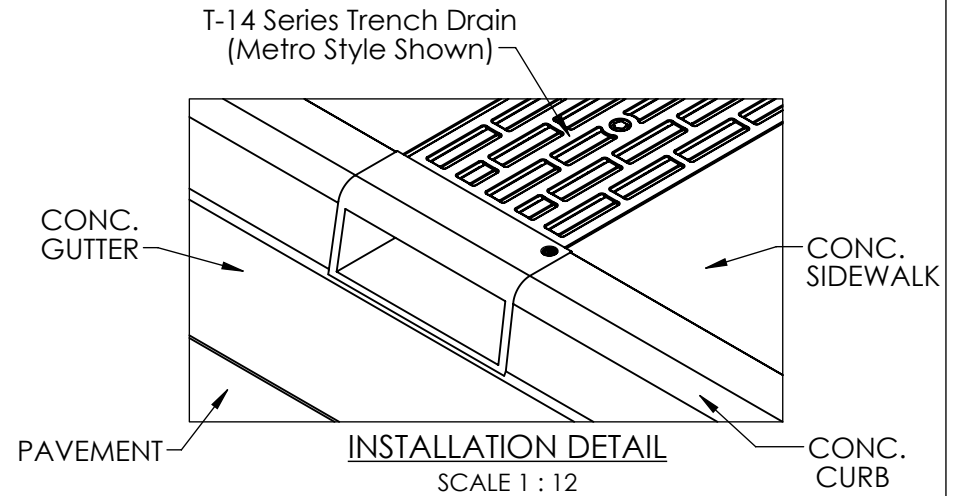
SECTION E-E
SCALE 1 : 6



REAR
SCALE 1 : 6



PERSPECTIVE OF C-1446T
N.T.S.



INSTALLATION DETAIL
SCALE 1 : 12

Product No. : C-1446T

Material: ASTM-A48 Class 30B Gray Iron

Weight: 38.33 lbs. ea.

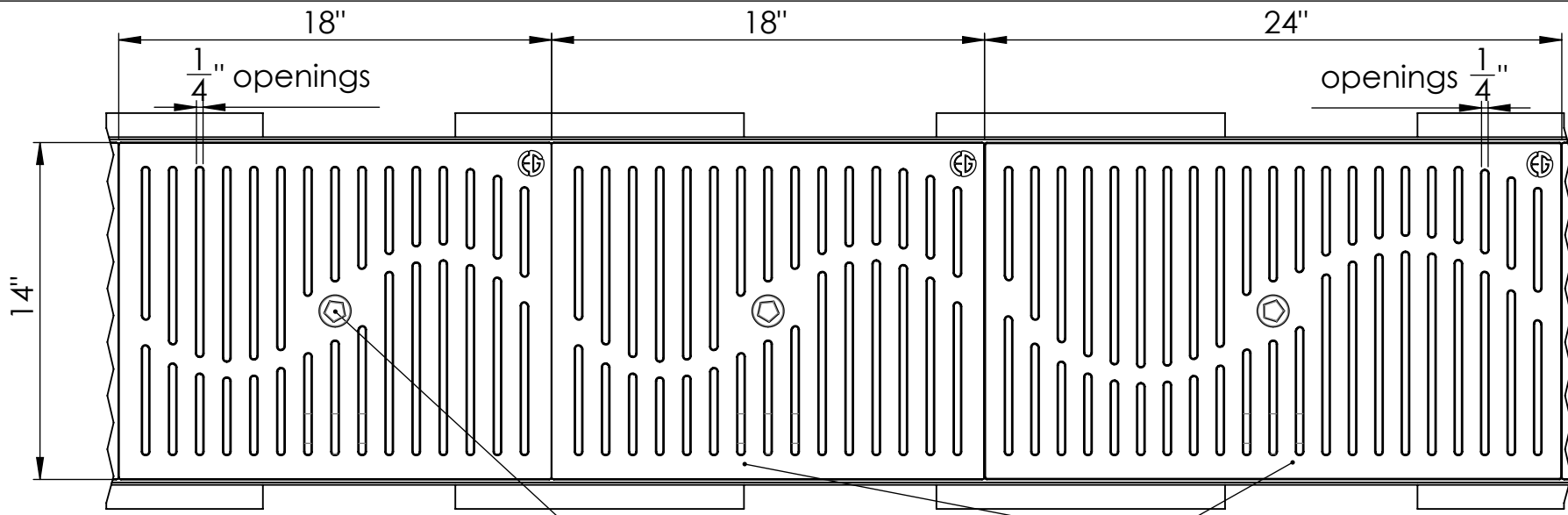
Made in USA 



EVERGRATE

Durable. Dependable. Design.

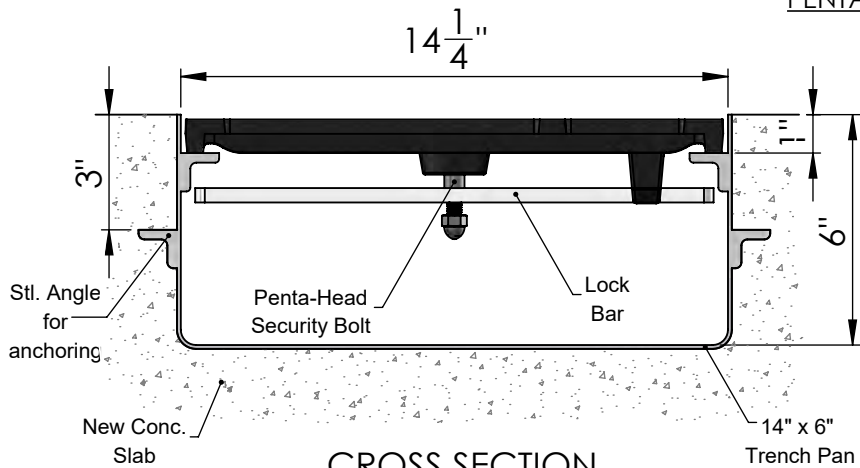
A DIVISION OF J.R. HOE



Stainless Steel Pentagon Security Bolt
Secures Stainless Steel Locking
Bar to Frame

14" WIDE CAST IRON GRATES-
CONTINUUM STYLE W/
PENTA-LOCK CHANNEL FRAME
SCALE 1 : 7

Grates furnished in 24" and 18"
Standard Lengths



CROSS SECTION
SCALE 1:5



PERSPECTIVE OF ASSEMBLY
N.T.S.

Product No. : T-14C Continuum

Grate Material: ASTM-A48 Class 30B Cast Iron

Grate + Frame Weight: 30.6 lbs./LF.

Frame Material: Plain Steel

14" x 18" Open Area: 44" sq. in.

Load Rating: Non-Traffic (Pedestrian)

14" x 24" Open Area: 62" sq. in.

Made in USA



EVERGRATE

Durable. Dependable. Design.

A DIVISION OF J.R. HOE

**6058
ADA
Tree Grate**

60" x 60" Tree grate in two sections for pedestrian loads only

1/2" Maximum slot opening for A.D.A. compliance and pedestrian safety

Cast from 100% recycled gray iron or Aluminum or Brass alloy C854 Yellow brass

Tree opening: 16", 26"
Grates can be ordered with or later expanded to these openings. Please specify when ordering.

Finish: Unfinished or Black Dip, or Enamel paint, or Polyurethane paint, or Powder coat. Zinc undercoat available.

Specify finish and color

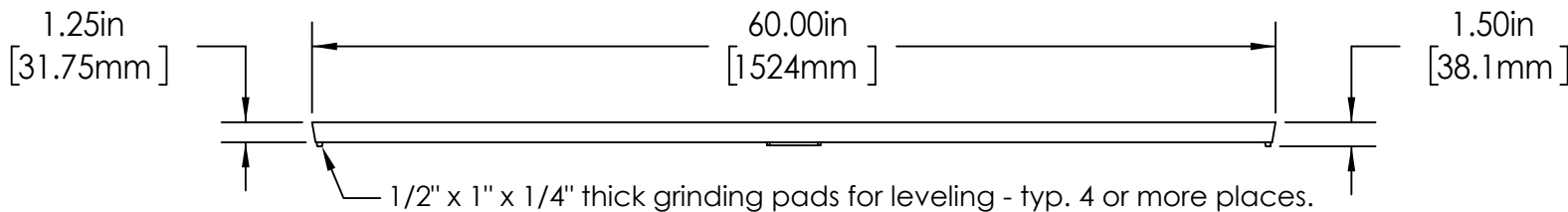
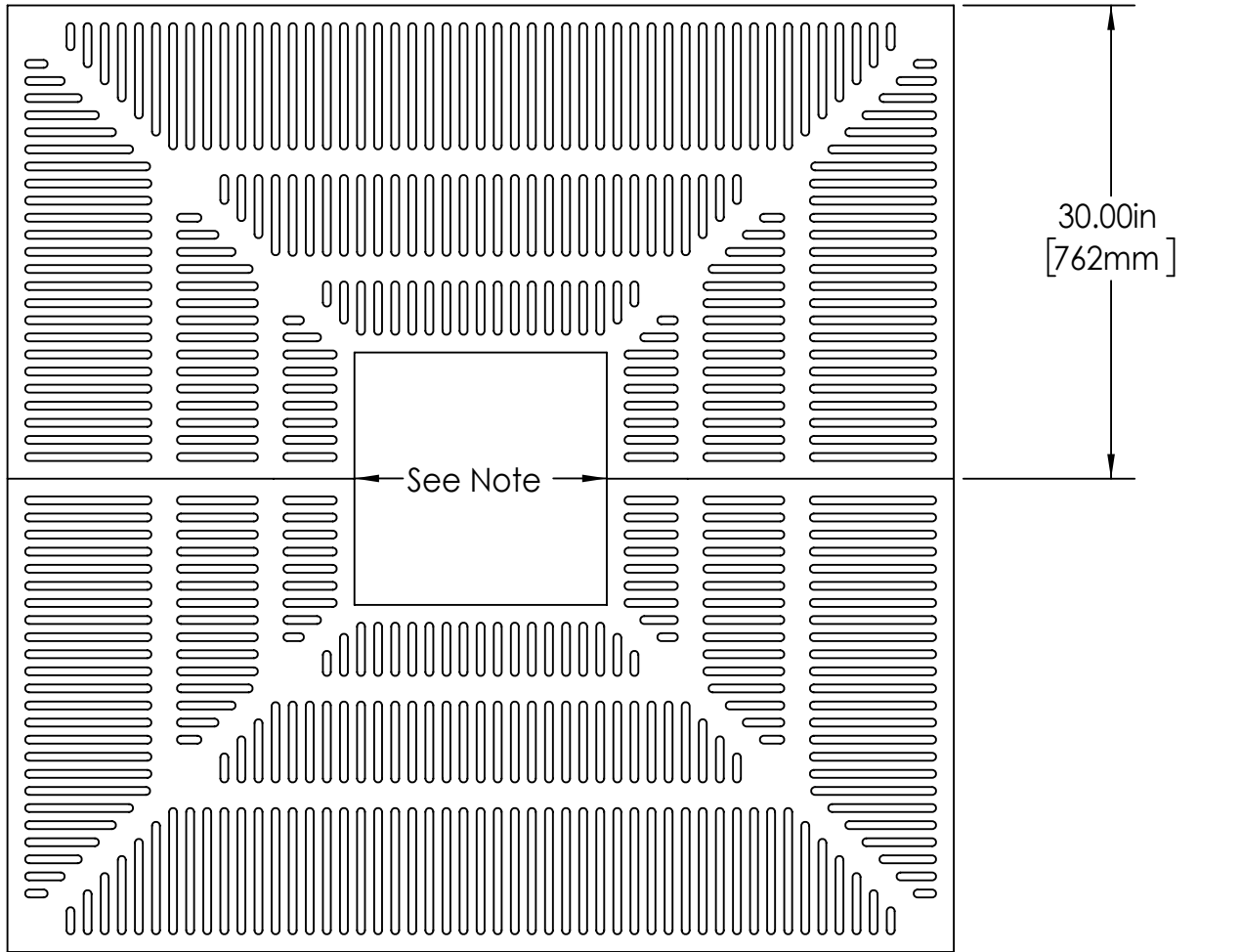
Use frame model: 6000F

Weight:
iron = 460 lb / 209 Kg
Aluminum: 155 lb / 70 Kg

DO NOT SCALE DRAWING

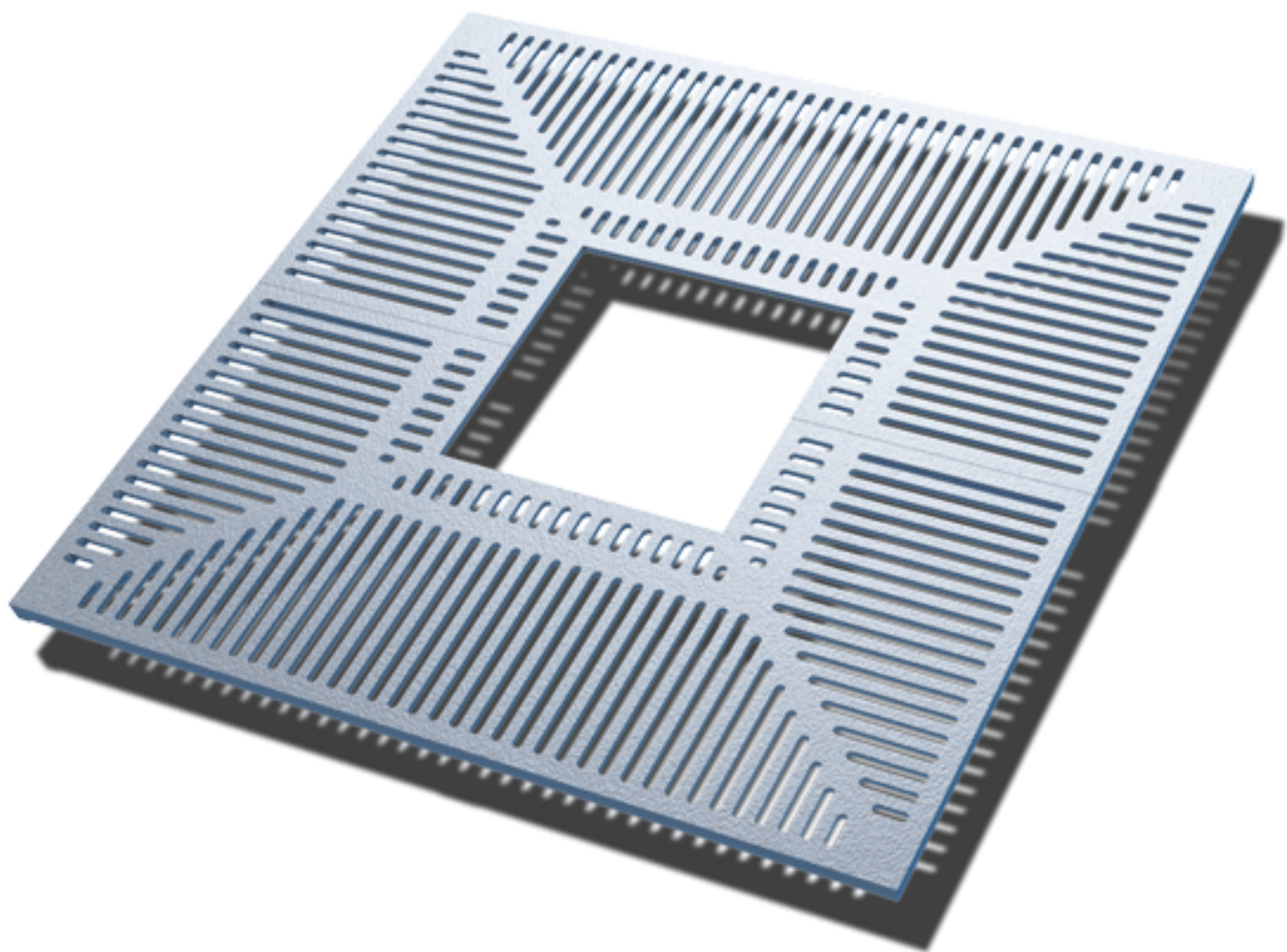
IRONSMITH

41-701 Corporate Way #3
Palm Desert, CA 92260
(800) 338-4766
(760) 776-5080 Fax



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POST CONSTRUCTION WAYFINDING PLAN



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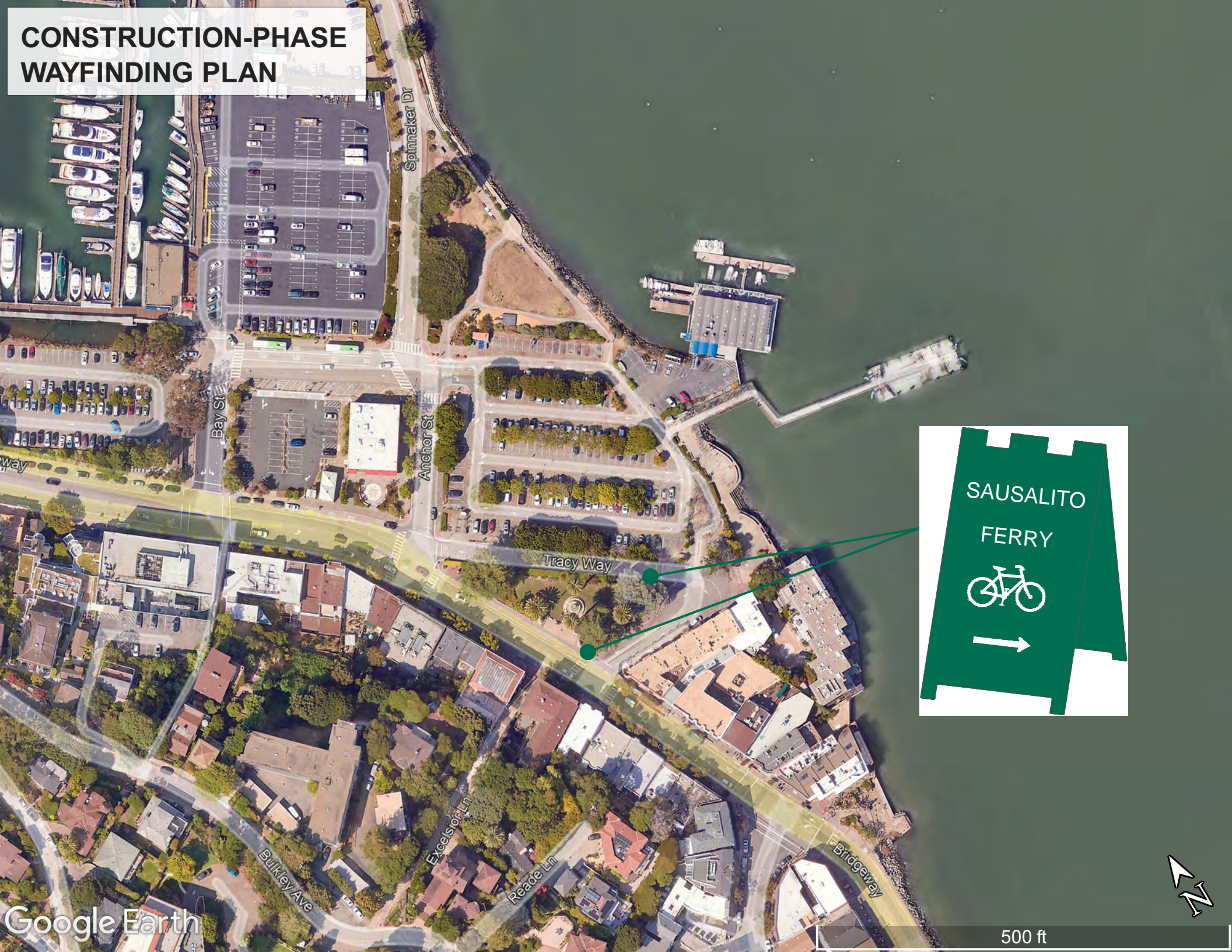


SAUSALITO FERRY  ↑

SAUSALITO FERRY  →



CONSTRUCTION-PHASE WAYFINDING PLAN

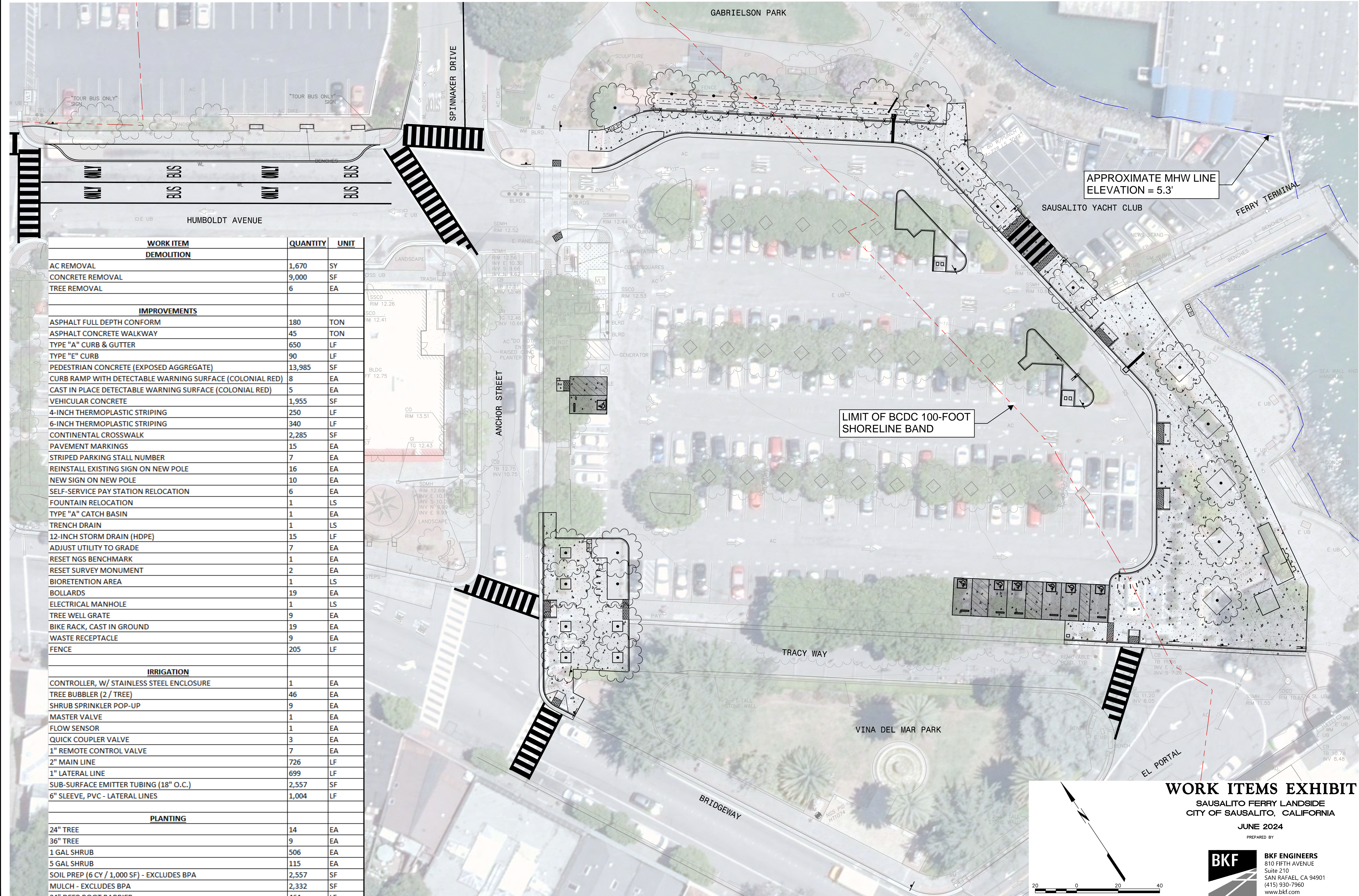


SAUSALITO
FERRY



→





WORK ITEM	QUANTITY	UNIT
DEMOLITION		
AC REMOVAL	1,670	SY
CONCRETE REMOVAL	9,000	SF
TREE REMOVAL	6	EA
IMPROVEMENTS		
ASPHALT FULL DEPTH CONFORM	180	TON
ASPHALT CONCRETE WALKWAY	45	TON
TYPE "A" CURB & GUTTER	650	LF
TYPE "E" CURB	90	LF
PEDESTRIAN CONCRETE (EXPOSED AGGREGATE)	13,985	SF
CURB RAMP WITH DETECTABLE WARNING SURFACE (COLONIAL RED)	8	EA
CAST IN PLACE DETECTABLE WARNING SURFACE (COLONIAL RED)	5	EA
VEHICULAR CONCRETE	1,955	SF
4-INCH THERMOPLASTIC STRIPING	250	LF
6-INCH THERMOPLASTIC STRIPING	340	LF
CONTINENTAL CROSSWALK	2,285	SF
PAVEMENT MARKINGS	15	EA
STRIPED PARKING STALL NUMBER	7	EA
REINSTALL EXISTING SIGN ON NEW POLE	16	EA
NEW SIGN ON NEW POLE	10	EA
SELF-SERVICE PAY STATION RELOCATION	6	EA
FOUNTAIN RELOCATION	1	LS
TYPE "A" CATCH BASIN	1	EA
TRENCH DRAIN	1	LS
12-INCH STORM DRAIN (HDPE)	15	LF
ADJUST UTILITY TO GRADE	7	EA
RESET NGS BENCHMARK	1	EA
RESET SURVEY MONUMENT	2	EA
BIORETENTION AREA	1	LS
BOLLARDS	19	EA
ELECTRICAL MANHOLE	1	LS
TREE WELL GRATE	9	EA
BIKE RACK, CAST IN GROUND	19	EA
WASTE RECEPTACLE	9	EA
FENCE	205	LF
IRRIGATION		
CONTROLLER, W/ STAINLESS STEEL ENCLOSURE	1	EA
TREE BUBBLER (2 / TREE)	46	EA
SHRUB SPRINKLER POP-UP	9	EA
MASTER VALVE	1	EA
FLOW SENSOR	1	EA
QUICK COUPLER VALVE	3	EA
1" REMOTE CONTROL VALVE	7	EA
2" MAIN LINE	726	LF
1" LATERAL LINE	699	LF
SUB-SURFACE EMITTER TUBING (18" O.C.)	2,557	SF
6" SLEEVE, PVC - LATERAL LINES	1,004	LF
PLANTING		
24" TREE	14	EA
36" TREE	9	EA
1 GAL SHRUB	506	EA
5 GAL SHRUB	115	EA
SOIL PREP (6 CY / 1,000 SF) - EXCLUDES BPA	2,557	SF
MULCH - EXCLUDES BPA	2,332	SF
24" DEEP ROOT BARRIER	464	LF

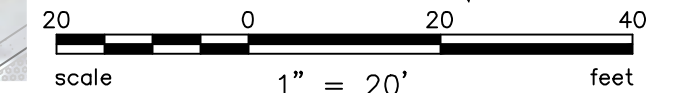
WORK ITEMS EXHIBIT

SAUSALITO FERRY LANDSIDE
CITY OF SAUSALITO, CALIFORNIA

JUNE 2024

PREPARED BY

BKF BKF ENGINEERS
810 FIFTH AVENUE
Suite 210
SAN RAFAEL, CA 94901
(415) 930-7960
www.bkf.com



Plot Jun 07, 2024 at 12:16pm
191036:DWG.dwg BKF ENGINEERS

Bench Mark Reset Procedures

Guidelines to preserve elevation data for a *soon-to-be disturbed* or *soon-to-be destroyed* bench mark

Documented by

Curtis L. Smith
National Geodetic Survey
Silver Spring MD 20910
September 2010



NATIONAL GEODETIC SURVEY

United States Department Of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service



Contents

- Relocating Vertical Control Bench Marks **2**
- Setting a New Bench Mark **2**
- Single Mark Level Tie (3rd Order). **3**
- Observing Sequence for Optical Leveling Equipment **4**
- Observing Sequence for Digital Leveling Equipment **6**
- When Reference Points Are Required **8**
- Destroyed Bench Marks **9**
- Data Review and Final Adjusted Elevations **9**
- Data Submission **9**
- Bibliography **9**
- Attachment A. Guidelines and Procedures to Replace a Destroyed Bench Mark
 Along an Existing Level Line and Maintain Original Order of Accuracy **10**
- Attachment B. New or Replacement Survey Monuments **12**
 - Concrete Monument **12**
 - Survey Disk Set in Bedrock or Structure **14**
 - Survey Disk in Structure **16**
 - NGS 3-D Deep Driven Rod Mark **16**
- Attachment C. Written Station Descriptions and Digital Photographs **18**

Relocating Vertical Control Bench Marks

The purpose of these guidelines is to provide the necessary information to preserve elevation data for a soon-to-be disturbed or soon-to-be destroyed bench mark¹. It is imperative that elevation information be transferred or referenced from the original bench mark prior to its being disturbed or destroyed. Note that such destruction or disturbance remains illegal (18 USC Sec. 1858). However, that law has long been recognized as more of a deterrent than an enforceable statute. NGS understands that bench mark resets will occur, despite the law, and therefore recognizes the need for a document to define standards for such resets. The support and cooperation of local surveyors and engineers is not only important, but essential to preservation of bench marks.

Each vertical control bench mark represents a large investment of resources. Since it is intended for a bench mark to provide a continuous record of elevation changes, as well as vertical control for many local surveyors, its preservation is vital. Although bench marks are constructed in locations where they are less likely to be disturbed, many are disturbed or destroyed by: highway rebuilding and retrofitting; railroad maintenance; urban development; addition of buried utilities; and building construction and demolition.

If an existing U.S. Coast and Geodetic Survey (USC&GS), National Geodetic Survey (NGS), U.S. Geological Survey (USGS), or other agency bench mark whose geodetic information resides in the database on the NGS Internet site (available at geodesy.noaa.gov) is about to be disturbed or destroyed, a representative of NGS should be contacted for further information and direction to reset the monument. Points of contact for many states are listed under the State Advisors link on the NGS Internet site (also see page 11 of this document; contact NGS directly if your state is not listed). Typical reset bench marks are published as 3rd Order elevations, due to the single bench mark reference

to determine elevation. Refer to Attachment A for minimum requirements to maintain the order and class of the original bench mark.

Note: Verify the survey mark in question has a published vertical order listing accurate to 1st or 2nd Order through the NGS Web site before resetting the mark. Resets of existing 3rd Order vertical control or resets of marks that have already been reset and are published as 3rd Order vertical control are not acceptable. If the mark has additional other control (e.g., horizontal, gravity, etc.), effort should be made to transfer the other data if possible. Contact a representative of NGS, as described above, for further help and direction in perpetuating this additional control.

There are two general situations that occur when a bench mark is to be destroyed: (1) there is time available to reset a new monument in the vicinity before the threatened mark is destroyed, and (2) the threatened mark will be destroyed before the new mark can be set. The latter case generally occurs when the location of the new (replacement) mark is not yet suitable or available for its physical establishment. This is often the case when the new mark will not be set until a new bridge or culvert head wall is constructed. Guidelines for both cases are presented in this document.

¹ The term “bench mark” refers to a specific type of survey monument that is used to define the orthometric height of a location.



Setting a New Bench Mark

Use a new NGS bench mark disk, if available, or your agency bench mark disk, and provide appropriate stamping. The new disk will be stamped with the same designation as the soon-to-be or already destroyed bench mark. It will be stamped with the word RESET and the year of the reset; for example, a bench mark designated M 123 reset in the year 2006, would be stamped M 123 RESET 2006 (see Figure 1).

Select a suitable site for the new bench mark, if possible, within one setup from the bench mark to be replaced. Establish the bench mark, as described in Attachment B of this document. Bench marks are generally set in a poured-in-place, concrete monument, in an existing stable concrete foundation (bridge abutment), in a drill hole in bedrock, or as a deep rod mark driven to refusal. NGS can provide guidance and information on other types of settings as well.

Level observations between the points must satisfy 3rd Order or better accuracy standards. Sight lengths must be limited to 70 meters, for the 3rd Order standard. Where possible, the replacement mark should therefore be set within about 140 meters of the old mark. The replacement mark must be set no farther than four setups apart, i.e., no more than 560 meters. Resets greater than four setups from the original mark will not be accepted unless they are observed following a minimum of 2nd Order, Class II procedures. Contact an NGS representative to discuss specific site conditions and possible options. Refer to the “FGCS Specifications and Procedures to Incorporate Electronic



Figure 1. Sample disk stamping.

Digital/Bar-Code Leveling Systems” for 3rd and higher order accuracy leveling requirements.

Note: *It is not necessary to establish the new mark at the same elevation or exact same location as the old mark.*

A witness post should be set within 2 meters of the relocated mark, if possible. (Occasionally the setting of a witness post can be skipped, especially if it will pose a hazard or draw unwanted attention, such as in urban areas.) Remove any witness posts for the destroyed bench mark. A complete description of the new mark must be provided with the information identified in the “Report on Location and Description of Reset Bench Mark” form (downloadable from the NGS Internet site). A sketch of the location is beneficial for comparison with the written description. Clear digital photographs of the disk should be provided which confirm agency information, disk size and type, and designation stamping. Legible pencil rubbings of the disk are acceptable in the event a clear digital photograph is not possible. Written station description and digital photograph guidelines are available in Attachment C. A recovery note for the old mark should be entered via the NGS On-line Mark Recovery Entry Form providing text describing the proposed destruction of the old mark or by following the posted directions to report the mark as destroyed.

Single Mark Level Tie (3rd Order)

An assumed elevation for the old mark can be used in the leveling since the principal concern is with the difference of elevation between the old mark and the new one. It should be noted; the elevation for the newly relocated bench mark will only be published to the nearest 0.01 meter, or 0.1 feet, because the absolute elevation of the bench mark to be destroyed cannot be verified without incorporating other bench marks into the survey, as a check. Many projects do not provide the resources required for multiple mark checks, but it is still imperative that the mark be reset to the best precision allowable.

Geodetic quality level instruments and rods should be used to transfer reset elevations to new bench marks. Refer to Annex F of the “Input Formats and Specifications of the National Geodetic Survey Data Base” for a listing of

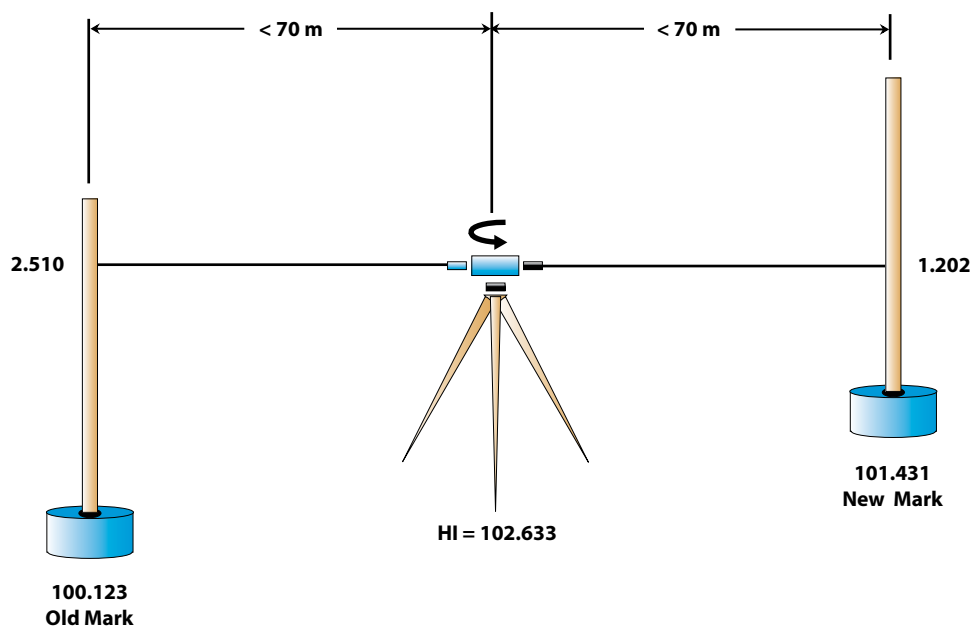
equipment and their related codes. The instrument and rod combined resolution's least count should be 1.0 millimeters, or 0.005 feet, or better. Refer to the "FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems" for 3rd and higher order accuracy leveling procedures and equipment requirements.

Record rod readings, at a minimum, to millimeters, or thousandths of feet. The model and type of instrument and rods used (e.g., fiberglass, aluminum, single piece, etc.), as well as rod scale units (e.g., meters, feet, or bar code) should be entered on the "Observations for Relocation of Bench Mark" form (downloadable from the NGS internet site), where indicated.

Observing Sequence for Optical Leveling Equipment

1. Remove equipment from travel cases, attach level instrument to tripod, and let equipment acclimate to local conditions, usually about 10 to 15 minutes. Perform instrument collimation check (peg test) per manufacturer's instructions and record in field notes.
2. Firmly setup and plumb the instrument halfway between the old and new bench marks (see Figure 2). Limit sight lengths to no more than 70 meters (230 feet), from the instrument to either bench mark, or from the instrument to one bench mark and a turning pin, or when between two turning pins, in the case of multiple setup requirements, e.g., distance between bench marks is greater than 140 meters (459 feet), see Figure 3. Backsight distance to foresight distance imbalance must be less than 5 meters (16.4 feet). Accumulated backsight to foresight distance imbalance must be less than 10 meters (32.8 feet), in the case of multiple setups. Level instrument using tribrach foot screws following equipment leveling procedures.

Figure 2. Direct old mark to new mark level tie. Backsight-foresight distance imbalance must be less than 5 meters.



3. Plumb level rod on highest point of old mark, e.g., on the domed top of disk M 123. Record the designation and published elevation of the starting bench mark, noting vertical datum and units of measure (such information is available from the NGS Integrated Database, most frequently in a format called “datasheets.” See the NGS Internet site for more information). Record the equipment information, such as model and serial numbers, observer and rodmen names, and starting time with appropriate date and time zone on the recording form.

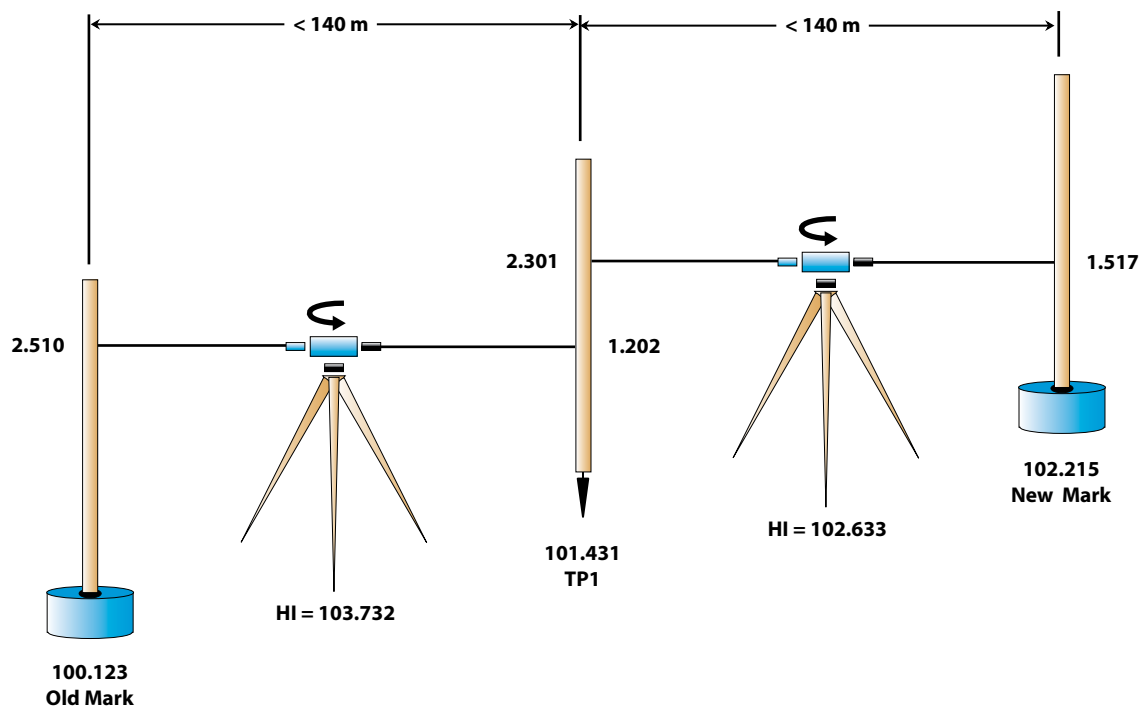
4. Backsight Reading: Observe intercept of middle reticule of the rod scale to get the backsight reading. Record rod reading to the best precision possible, as indicated above. Observe the stadia reading to determine distance from the point to the instrument and record distance on recording form. If the distance from the instrument to the back rod is greater than the allowable, reset the instrument within the allowable distance and reobserve and record the backsight reading and distance.

5. Compute height of instrument (HI), - the sum of the backsight and the published or starting elevation.

6. Plumb level rod on highest point of new bench mark. Record the designation of the new mark, e.g., M 123 RESET, or TP1 (for turning point 1, in the case of multiple setups).

7. Foresight Reading: Observe intercept of middle reticule of the rod scale to get the foresight reading. Observe the stadia reading to determine the distance from the instrument to the point and record on the form. Again, this distance must be within the allowable sight length distance, or a multiple setup leveling between the old and new points must be observed, as illustrated in Figure 3. Make sure backsight and foresight distance imbalance does not exceed the tolerances indicated in step 2 above. If the distance imbalance is greater than the allowable, move the instrument to a position that will be within this tolerance and reobserve both the backsight and foresight rod and stadia readings.

Figure 3. Old mark to new mark level tie for distances for 140 meters. Accumulated backsight - foresight setup imbalance must be less than 10 meters.



8. Compute the elevation of the new point, either the new bench mark or the turning point; this is the difference of the HI (computed in Step 5) minus the foresight.

If additional setups are needed, evenly split the difference between the last fore turning point – now new backsight - and the new bench mark, with the instrument, or advance no farther than 70 meters (230 feet) from the new back turning point (old fore turning point); then reset the instrument. Advance back rod same distance ahead of instrument, within 5 meters (16.4 feet), to new fore turning point, or to the new bench mark. Repeat steps 2 through 8, until you have reached the new bench mark. Ensure the accumulated backsight to foresight distance imbalance is less than 10 meters (32.8 feet). This is accomplished by selecting the instrument's location in relationship to the rods' so the accumulated distance imbalance is minimized through compensating longer or shorter foresight lengths.

Always plan the observations between the old and new points so that the same rod is set on the starting and ending bench mark. In the case of using two rods, for leveling in a multiple setup leveling scenario, always start and end with the same rod on the bench mark, i.e., produces an even number of setups. This ensures systematic error, with regards to the level rods, cancels during the leveling observations.

9. When the last setup has been observed, record the ending time, and weather conditions, e.g., temperature observed at instrument height with units, wind effects, and sun conditions during the level observations, on the recording form.

10. All observations between the old and new points must be confirmed by performing double-run leveling, forwards and backwards, which will provide elevation differences opposite in numerical sign. Leveling from the old point to the new point provides the forward leveling and leveling from the new point to the old point provides the backward leveling. For return observations, reset and re-level the instrument, even when only one turn is required. Level backward from new point to the old, in the same manner as steps 2 through 8.

Note: The observed elevation difference for the forward and backward leveling, between the old and new points, for 3rd Order leveling, may differ by no more than 2.0 millimeters for a one-setup section, 3.79 millimeters for multiple setup sections less than 0.10 kilometers in length, or 12 millimeters $\times \sqrt{D}$, where D is the shortest one-way length of section in kilometers, for sections greater than 0.10 kilometers.

Agreement of Observed Elevation Differences, Observed Backward and Forward During:

Condition	1st Order, Class II	2nd Order, Class I	2nd Order, Class II	3rd Order
One-setup section	+/- 0.50 mm	+/- 1.00 mm	+/- 1.50 mm	+/- 2.00 mm
2-runnings of section < 0.10 km in length	+/- 1.26 mm	+/- 1.90 mm	+/- 2.53 mm	+/- 3.79 mm
2-runnings of section of one-way length D : $T\sqrt{D}$ mm, $T =$	+/- 4.00	+/- 6.00	+/- 8.00	+/- 12.00

Table 1. Tolerances for Geodetic Leveling

11. To compute the elevation difference from the old mark to the new, average the two elevation differences between the old mark and the new mark maintaining the sign, positive or negative, of the leveling from the old to the new mark, i.e., forward leveling. The field elevation for the new bench mark will be the average computed difference (the mean of both the forward and backward leveling) plus the published elevation of the old bench mark.

Note: The old mark should not be disturbed until observations involved in the leveling have been checked by the observer or recorder to ensure required procedures and closures have been met.

Observing Sequence for Digital Leveling Equipment

These observing procedures are intended for use with digital levels only.

- 1.** Remove equipment from travel cases, attach level instrument to tripod, and let equipment acclimate to local conditions, usually about 10 to 15 minutes. Perform an instrument collimation check (two-peg test) to determine instrument collimation error. The determined value should meet specifications and set to be applied to all future field observations, as outlined in the digital level user's manual.
- 2.** Firmly set up and plumb the instrument about halfway between old and new bench marks. Limit sight lengths to no more than 70 meters (230 feet), from the instrument to either bench mark, or from the instrument to one bench mark and a turning pin, or when between two turning pins, in the case of multiple setup requirements, e.g., distance between bench marks is greater than 140 meters (459 feet). Backsight distance to foresight distance imbalance must be less than 5 meters (16.4 feet). Accumulated backsight to foresight distance imbalance must be less than 10 meters (32.8 feet) in the case of multiple setups.

Level instrument using tribrach foot screws to center bull's-eye bubble. Turn on instrument and select backsight/foresight level program. Set and confirm instrument parameters, e.g., averaging three measurements; display maximum decimal places; record readings; and other observing config-

uration information, such as rod type, and metric units. The starting elevation for the old point should be set to 0.0000 (zero), as the difference in elevation between the new and old points is being determined in the field.

3. Plumb level rod on highest point of old mark, e.g., on the domed top of disk M 123. Record the designation and published elevation of the starting bench mark, noting vertical datum and units of measure (such information is available from the NGS Integrated Database, most frequently in a format called "datasheets". See the NGS Internet site for more information). Record equipment information, such as model and serial numbers, determined instrument collimation, observer and rodmen names, and starting time with appropriate date and time zone on the recording form.

4. Backsight Reading: Sight through instrument and align vertical crosshair in middle of bar-code for rod on the old mark. Use focusing knob to bring the bar-code image into sharp focus. Depress measure button and record rod reading. Note distance from rod to instrument. It should be less than 70 meters (230 feet). If the distance from the instrument to the back rod is greater than the allowable, reset the instrument within the allowable distance and reobserve and record the backsight reading and distance.

5. Plumb rod on highest point of new bench mark. Record designation of new mark, e.g., M 123 RESET, or TP1 (for turning point 1, in the case of multiple setups).

6. Foresight Reading: Point and focus the level instrument on the rod over the new mark. Depress measure button and record rod reading. Note distance from rod to instrument; it should be less than 70 meters (230 feet). Again, this distance must be within the allowable sight length distance, or a multiple setup leveling between the old and new points must be observed, as illustrated in Figure 3. Note imbalance between backsight and foresight distances; the difference should be less than 5 meters (16.4 feet). If the distance imbalance is greater than the allowable, move the instrument to a position that will be within this tolerance and reobserve both the backsight and foresight rod and stadia readings.

7. The difference in elevation between the old bench mark and the new bench mark, or turning point, in the case of multiple setups, is computed as the sum of the backsight reading minus the foresight reading.

If additional setups are needed, evenly split the difference between the last fore turning point— now new backsight—and the new bench mark, with the instrument, or advance no farther than 70 meters (230 feet) from the fore turning point; then reset the instrument. Advance back rod same distance ahead of instrument, within 5 meters (16.4 feet), to new fore turning point, or to the new bench mark. Ensure accumulated backsight to foresight distance imbalance is less than 10 meters (32.8 feet). Repeat steps 2 through 7, until you have reached the new bench mark. When the last setup has been observed, record the ending time, and weather conditions, e.g., temperature observed at instrument height with units, wind effects, and sun conditions during the level observations, on the recording form.

Always plan the observations between the old and new points so that the same rod is set on the starting and ending bench mark. In the case of using two rods, for leveling in a multiple setup leveling scenario, always start and end with the same rod on the bench mark, i.e., an even number of setups. This ensures any systematic error, with regards to the level rods, is canceled during the leveling observations.

8. All observations between the old and new points must be confirmed by performing double-run leveling, i.e., leveling from the old point to the new point as forward leveling and from the new point to the old point as backward leveling. For return observations, reset and re-level the instrument, even when only one turn is required. Level backward from new point to the old; in the same manner as in steps 2 through 7. The starting elevation at the new point for the backward leveling should be set to 0.0000 (zero), as the difference in elevation between the new and old points is being determined in the field.

Note: The observed elevation difference for the forward and backward leveling, between the old and new points, for 3rd Order leveling, may differ by no more than 2.0 millimeters for a one-setup section, 3.79 millimeters for multiple setup

sections less than 0.10 kilometers in length, or 12 millimeters $\times \sqrt{D}$, where D is the shortest one-way length of section in kilometers, for sections greater than 0.10 kilometers.

9. To compute the elevation difference from the old mark to the new, average the two elevation differences between the old mark and the new mark maintaining the sign, positive or negative, of the forward leveling from the old to the new mark. The field elevation for the new bench mark will be the average computed difference (the mean of both the forward and backward leveling) plus the published elevation of the old bench mark.

Note: The old mark should not be disturbed until observations involved in the leveling have been checked by the observer or recorder to ensure required procedures and closures have been met.

When Reference Points Are Required

If an old mark has to be removed before a new mark can be established, a series of three reference points should be set in the vicinity. Set stable points, which are unlikely to move or be damaged from the time they are set, to the time they are used to establish the elevation of the new mark. Examples of “stable” reference points are a chiseled cross in concrete or an outcrop, an anchor bolt set into concrete, a nail driven in a tree root, a stable re-bar driven in a location that will survive construction, as well as others.

Leveling should be performed so there is a separate setup between each reference point and the bench mark(s), following similar procedures (as listed in steps 2 to 9 above). A suggested sequence is as follows: observe forward and backward leveling between the old bench mark to be reset and reference point 1; observe forward and backward leveling between the old bench mark to be reset and reference point 2; and observe forward and backward leveling between the old bench mark to be reset and reference point 3, as illustrated in Figure 4. The loop should be closed by observing forward and backward leveling between reference points 1 and 2, and between reference points 2 and 3, to provide an additional check on the reference points.



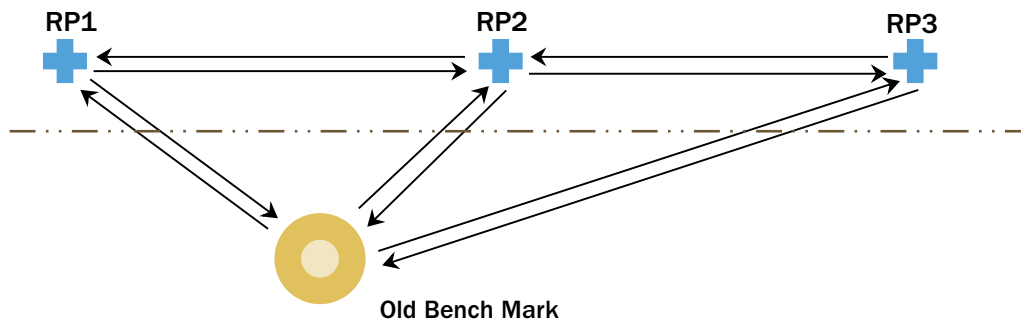


Figure 4. Old bench mark ties to three reference points.

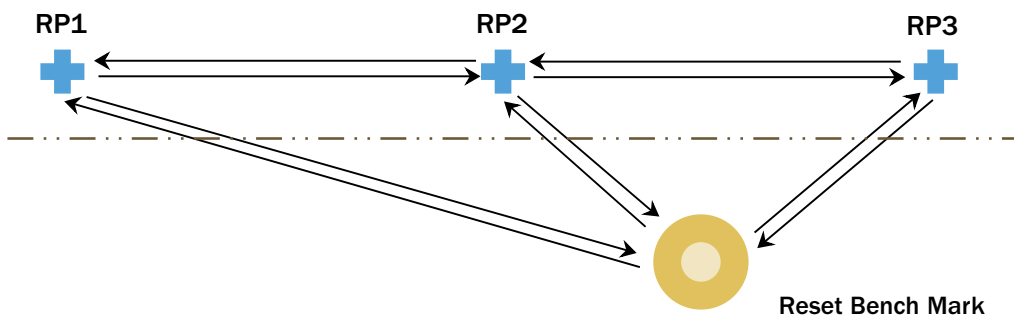


Figure 5. Three reference points tie to new reset bench mark.

A similar set of observations is obtained between each of the reference points and the new bench mark, after it has been established, as illustrated in Figure 5.

Elevation differences between reference points that differ from the original elevation differences, beyond allowable section closure tolerances, must be investigated and noted. If the old bench mark is still in existence, a direct level tie between the old and new marks can be achieved by following the previous observing sequences for optical or digital leveling equipment. If the old mark has been disturbed or destroyed, loop closure analysis should indicate which of the reference points is in question. Re-run the leveling to ensure

correct high points were held and procedures were followed. Note and describe any stability issues relevant to the reference point of concern. Submit all data with a discussion of conditions which may have caused the difference in elevation for review and final determination on the acceptability of the data by NGS. It may be necessary to perform a level tie to an adjacent existing bench mark, following a minimum of 2nd Order, Class II procedures, to establish an elevation for this new bench mark in these conditions.

Destroyed Bench Marks

After the new mark has been established and leveled, and it is conclusive the old monument will be destroyed, the old disk should be removed and returned to NGS, at the address listed below for Data Submission. If the old disk cannot be returned, please describe the reason. A copy of field notes, a description of the original mark, a description of the reset mark, completed reset forms, and any remarks that seem pertinent to this action, should also be submitted.

Destroyed bench mark disks should be returned to NGS, along with the reset information requested below. NGS does not identify bench marks as destroyed in its records without definitive proof of the mark's destruction. Refer to the Mark Recovery Entry Form on the NGS Internet site for further details about submitting information about destroyed geodetic control points.

Note: If the old bench mark is in poor condition, such that the elevation may be questionable, it should be considered destroyed. No effort should be made to transfer a potentially erroneous elevation to a new replacement bench mark from a questionable bench mark in poor condition. Poor condition can be described as a leaning, loose in the ground, or deteriorated monument. Attachment A describes the procedures for establishing a new vertical control point, not a reset, in the area of a bench mark found in poor condition by performing level ties to other adjacent bench marks.

Data Review and Final Adjusted Elevations

NGS will review submitted data for conformation to guidelines, quality, and completeness. NGS will then adjust observed elevation differences and provide the final adjusted elevation and description for the new reset mark published in NGS elevation records, and made available through its database. Information about NGS, its products and services, as well as station data sheet information can be found on the NGS Internet site.

Data Submission

Before NGS will publish new reset elevations, the following must be supplied:

1. Completed station description for new mark and updated recovery note for old mark in D-file format (.dsc) using the most current version of the NGS program WinDesc. Required description information is based on the field form, "Report on Location and Description of Reset Bench Mark."
2. Completed reset leveling observations (.hgz88) and accompanying report (.rpt) files using the most current version of the NGS program Translev for observations between reset mark and existing mark(s), or reference points used to reset the mark. Required observation information is based on the field form "Observations for Relocation of Bench Mark."
 - 2a. Include a digital copy of the leveling observations if a digital level was used for the observations.
3. Original field notes (clearly legible), digital photographs of the new mark and digital (scanned) version of a site sketch, if one was made. The destroyed old disk, or digital photographs clearly showing the old disk is destroyed, if available. If the old mark has not been destroyed at time of submission it should be so stated in the recovery note for that mark in the description file.

The previously mentioned field forms and software programs are available on the NGS Internet site

Submit paper copies of documents and reports in one report cover along with digital files copied to CD-ROM, as well as the removed disk, if possible, to the National Geodetic Survey:

Bench Mark Resets

NOAA, National Geodetic Survey, N/NGS43
Bldg. SSMC3, Room 8545
1315 East-West Highway
Silver Spring, MD 20910
Phone: 301-713-3242

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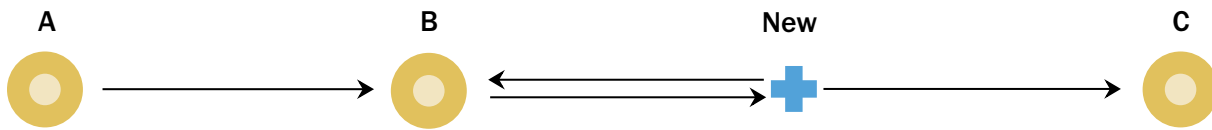
Attachment A. Guidelines and Procedures to Replace a Destroyed Bench Mark along an Existing Level Line, and Maintain Original Order of Accuracy

The guidelines and procedures given below were written to provide guidance on establishing, to the same order/class, one or two bench marks along a previously leveled line of bench marks, from the remaining bench marks along that line. If a large number of bench marks in a row, along a line, are destroyed, it is required that a minimum of two or three

existing bench marks, depending on the intended order and class, on each side of the destroyed bench marks be tied. Alternatively, the entire line may be re-leveled.

Following these guidelines and procedures will result in the height of the new bench mark published, to millimeters, and the accuracy will be published to the same order/class as the original line. The results will NOT be published as a 3rd Order “reset” bench mark.

Network Geometry for Replacing One or Two 1st Order Bench Marks



1st Order (preferred method): (A, B, and C are existing 1st Order bench marks)

- A to B = single-run, must check* published difference
- B to NEW = double-run, forward and backward leveling must check*
- NEW to C = single-run
- B to C = not directly leveled, but must check* published difference

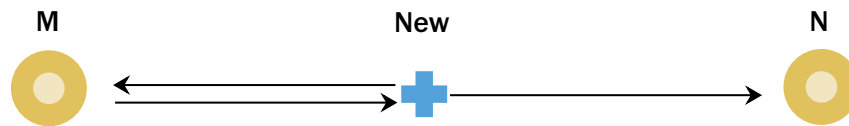


1st Order (optional method): (D, E, and F are existing 1st Order bench marks)

- D to E = single-run, must check* published difference
- E to F = single-run, must check* published difference
- F to NEW = double-run, forward and backward leveling must check*

**Note: “Check” refers to “Maximum section misclosure (millimeters)” of $4 \times \sqrt{D}$, as defined for 1st Order, Class II levels; where D is shortest length of section (one-way) in kilometers, in the publication “FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems.”*

Network Geometry for Replacing One or Two 2nd Order Bench Marks

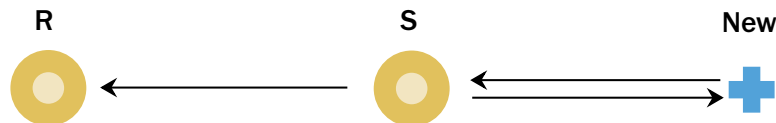


2nd Order (preferred method): (M and N are existing 2nd Order bench marks)

M to NEW = double-run, forward and backward leveling must check*

NEW to N = single-run

M to N = not directly leveled, but must check* published difference



2nd Order (optional method): R and S are existing 2nd Order bench marks)

R to S = single-run, must check* published difference

S to NEW = double-run, forward and backward leveling must check*

**Note: "Check" refers to "Maximum section misclosure (millimeters)" of $6\sqrt{D}$, as defined for 2nd Order, Class I levels and $8\sqrt{D}$, as defined for 2nd Order, Class II levels; where D is shortest length of section (one-way) in km, in the publication FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems.*

ADDITIONAL REQUIREMENTS WHEN SUBMITTING DATA TO NGS

1. The observations and a description for the new bench mark and recovery notes for the existing bench marks must be submitted in Blue Book format as described in FGDC Input Format and Specifications of the National Geodetic Survey Data Base, Volume II Vertical Control Data . Software programs available from the NGS Internet site, Translev (observations) and WinDesc (descriptions and recovery notes), can be used to create the data in Blue Book format.

2. The monumentation should be the same quality and type as the monumentation used on the original level line; however, the new bench mark should provide the same vertical stability or better as the previous one as described in Geodetic Bench Marks, NOAA Manual NOS NGS 1.

3. The leveling equipment and procedures used must meet the FGCS Specifications and Procedures to Incorporate Electronic Digital/Bar-Code Leveling Systems for the order/class of leveling being performed.

Attachment B. New or Replacement Survey Monuments

Typical bench mark or geodetic control disks are made of aluminum, brass, or bronze. They are about 9 centimeters (3.5 inches) in diameter, and have a domed surface to support the foot of a leveling rod, and a center point for plumbing survey equipment. Information is imprinted on its surface to identify the monument, and aid the user in obtaining data about it. This pre-cast logo is recessed, so that it does not interfere with the leveling rod, or other survey equipment. A deformed shank or stem, about 7.0 centimeters (2.5 inches) long, is cast with, or otherwise attached to the bottom surface of the disk, to help prevent the disk from being rotated or dislodged.

SITE SELECTION

Even though the reset bench mark must remain within the general proximity of the original monument, considerations for selecting an appropriate site for the replacement monument must be addressed. Select a secure location that might provide natural protection, such as one well away from a highway surface, near the edge of the right-of-way. Provide for monument stability, both vertically and horizontally, by selecting a location that reduces the influence from ground and soil movement. Avoid settings in low, potentially wet areas, slopes, and all earth-fill situations. Crests of hills are generally good locations for bench marks, as they reduce influence of frost heave; and the consistency of soil tends to be firmer. Ensure usefulness by selecting a location that is readily accessible, and safe for users. Select a site with good,



Figure B - 1. Brass disk, front and side view.

unobstructed horizons so the bench mark can be used with satellite-based positioning systems if possible. Always obtain the site owner's permission prior to any work on the site.

Caution: Always confirm status of buried utilities prior to digging monument holes, by contacting local utility companies or a buried utility location service.

CONCRETE MONUMENT

1. Monument Design. A concrete monument should be poured-in-place in a hole, dug in the ground; cylindrical or squared in appearance; and slightly "bell-shaped," or wider at the bottom. The monument must extend well below the frost line; typically 1.3 meters (4 feet) deep and 0.3 meters (1 foot) in diameter. Local ground conditions, such as hard soil types with subsurface rock, may prohibit desired monument depth; whereas, softer, sandy soil types may require slightly deeper monuments to assure stability. Avoid setting concrete monuments in areas affected by sliding or other potential movement, such as in slopes and all earth-fill situations.

2. Station Designation. Stamp the station designation and setting year on the top surface of the disk prior to setting.

3. Digging the Hole. The hole is generally dug with an auger or post-hole digger (bell-shaped, or wider at the bottom), then backfilled with concrete mix. The bottom of the hole is enlarged about 0.1 meters (0.4 feet) in radius, tapering upward for 0.4 meters (1.4 feet), in order to make the bottom of the monument bell-shaped (to help keep the monument stable). Care should be taken to avoid creating any shoulders or mushrooming effect near the top of the monument, which might afford opportunity for frost heave or surface soil action to move the monument. A cylindrical form, such as rolled black tar paper (felt paper) or a cardboard form, placed at the top of the hole and extending about 0.4 meters (1.4 feet) deep will create a round shape and help support the upper portion of the concrete monument until the cement cures. A smooth surface near the top of the monument is less susceptible to damage by frost or other forces, than unfinished tops.

4. Concrete Ingredients. The quality of the ingredients and their proportions help determine how dense and impervious the cured concrete will be. The ingredients include aggregate

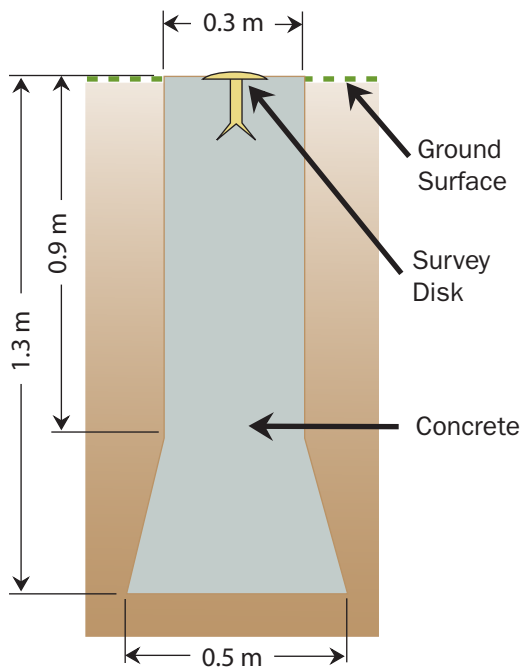


Figure B - 2. Schematic of concrete monument.

gate, cement, and water. Aggregate should be clean (free from silt and clay, harmful chemicals, and organic matter) and well graded, i.e., contain proportionate amounts of many particle sizes. In specifying mix proportions, the aggregate is usually divided into two parts: sand (particle size less than 4 millimeters) and gravel (particle size greater than 4 millimeters). Both parts should be well graded. Aggregates that are porous, split easily, or are otherwise weak or permeable, result in poor concrete. Examples of poor aggregate include shale, claystone, sandstone, and micaceous rocks.

Varying sized bags of pre-mix concrete are readily available, and work well for setting concrete monuments. When using pre-mix concrete, ensure that the aggregate is well graded. Additional Portland cement and/or sand, typically a half shovelful per 60-pound bag, can be added to improve consistency and quality of the finished monument. A typical concrete monument setting requires 8 to 10, 60-pound bags of concrete mix, depending on the size of the hole.

The water used in concrete mix should be relatively free of impurities; such as acids, alkalis, salts, oil, organic matter, and silt. Impurities can decrease the strength and durability of cured concrete. As a rule, do not use water that you would not drink.

5. Mixing and Placing. Suitable proportions (by bulk volume) of cement, to sand, to gravel are 1:2:3. If the gravel is made up of fragmented or angular particles, use a little less gravel and, proportionately, more sand. Add only enough water to make the mix workable. About half the water added to the mix is used in the chemical reaction (hydration) that causes the paste to harden into binder. If too little water is used, however, the mix will not compact properly and spaces will be left in the mass. A good indication of the right amount of water is that the mix neither runs nor falls off the shovel, but sluggishly slides off and flattens upon hitting the ground.

Fresh concrete must be well mixed before placed, otherwise the minute particles of cement will not be sufficiently wet, and the aggregate will not be completely coated with paste. Before placement, the hole should be damp, so the moisture will not be drawn from the fresh concrete into the surrounding soil. In no case should it be so wet as to be muddy. Segregation of the various sizes of aggregate should not be much of a problem when pouring concrete survey monuments. However, be aware that segregation can occur, and is undesirable when it does. Continuously tamp the mix into a compact mass, while filling the hole, so it becomes less pervious and, consequently, more durable. Some bleeding (water gain at the surface) is to be expected when finishing the mark. Excessive bleeding indicates too much water in the mix or poor gradation of aggregate.

Note: *Pour the entire concrete monument in a single setting to ensure a solid stable monument. Allowing a pour surface to partially dry, or cure, between consecutive pours creates a weakness in the concrete.*

6. Finishing Monument and Setting the Disk. After pouring concrete and tamping to settle and remove voids, the top of the monument is smoothed off and slightly beveled with a trowel. The top of the finished monument should be flush with the ground, or slightly recessed for protection from

mowers, etc. Wet and clean the disk by rubbing all surfaces with cement, to remove unwanted dirt and oils; rinse well. Fill underside of disk with cement, using a trowel. Hold disk loosely upside-down by end of the shank then gently tap domed surface of disk from below, with the handle of the trowel, several times, to allow cement to settle and trapped air to escape. This process is very important, because it will minimize the existence of highly undesirable voids under the disk once in place. Carefully turn the disk over so as not to dislodge the under-disk cement and press the disk stem into the top center of the monument until the rim of the disk touches the concrete. The disk is typically oriented to read with the observer facing north. This is useful for GPS and gravity observations, which orient to north. Lightly press and tap the disk into the top of the concrete monument until the concrete slightly overlaps the edges of the disk which helps protect the disk. Once the disk is in place, finish the top of the monument by smoothing with the trowel.

7. Clean Up. Excess concrete is cleaned from the surface of the disk after installing. Excess dirt and trash are removed, and the site is returned to its “as-found” condition. The bench mark is the only evidence left to represent the quality of work performed, and therefore the cleanliness of the site should reflect similar quality.

Caution: Lime and/or cement in concrete can cause burns on skin and destroy clothing. Water used to rinse tools, concrete/cement mixing containers, etc., can kill vegetation if dumped on the ground.

8. Curing Concrete. Concrete should be covered for several days after it is placed. This prevents rain from making the mix too wet, and ruining the finished surface. It also prevents the surface from drying too rapidly, leaving too little water for complete hydration, as well as concealing the disk from people who might tamper with it at this vulnerable stage. A piece of wood, cardboard, heavy paper, or similar item should suffice for covering the mark, and should be removed after cement has cured.

9. Cold Weather Precautions. Frozen fresh concrete has a damaging effect, because expansion of water as it freezes separates solid particles in the mix. This reduces the strength of the bond and makes the concrete more porous and less durable. Three protective measures should be

taken in cold weather; either singly or in combination. First, use warm ingredients; the first 24 hours after a mix has been placed, it develops little heat of its own to prevent freezing. After 24 hours some heat is developed, as a product of the chemical reactions occurring in the mix. The use of warm ingredients is especially beneficial during the first 24 hours. To keep the aggregate and cement warm, store them indoors and keep them in a heated vehicle until they are mixed.

Second, use Type III (high-early-strength) cement or special additives, such as calcium chloride, which speeds curing. The calcium chloride should be dissolved in the mixing water, instead of mixing it with other ingredients. If a large number of concrete marks are being installed, by mass production, using a “ready-mix” contractor, fast-curing additives should not be added until the concrete is delivered on site.

Third, insulate the finished mark for a week after the concrete is poured. One method is to cover the mark with boards, resting on supports. Cover with paper or plastic, then add a layer of straw, Styrofoam, or similar insulating material, about 0.15 meters (0.5 feet) thick, and finally a layer of soil 0.15- to 0.3 meters (0.5- to 1.0 feet) thick. Pile snow loosely on top, if available.

SURVEY DISK SET IN BEDROCK OR STRUCTURE

Sound bedrock is the most desirable setting for vertical control points. Besides the ease and cost effectiveness with which a disk can be installed, bedrock provides the most stable setting in terms of both crustal motion and disturbances inflicted by people. Always use bedrock when a suitable outcrop exists. As a rule of thumb, bedrock is considered potentially good, if the distance between natural joints and fissures is greater than 1 meter (3.0 feet).

1. Station Designation. Stamp the station designation and setting year on the top surface of the disk, prior to setting.

2. Site Selection. Pick a fairly level and accessible spot on the outcrop, that appears intact with the bulk of the rock. A simple test can be performed to help determine the condition and integrity of the rock by placing one’s hand near the area the disk will be set, then striking the outcrop with a moderately heavy hammer, and feeling for vibration. Sound



outcrop will force the hammer to rebound with each impact and vibration through the rock should be minimal. Avoid rock that sounds hollow from this test.

3. Drilling the Hole. Drill a 2.5 centimeters (1 inch) diameter hole, about 8 centimeters (3 inches) deep into the bedrock. Chisel a flat, level recessed area around the top of the hole, to a diameter slightly larger than the disk. Test the hole with the disk to see if it is deep enough, and the disk sits flush in the chiseled area.

When installation is completed, the top surface of the disk should sit level and slightly below the surface of surrounding rock, to help protect the disk. Chisel a drain channel through the low edge of the chiseled recess, to allow water to drain away from finished mark.

Caution: Protective eye-wear should be worn when drilling into bedrock or masonry.

4. Mixing Cement. Remove all rock powder and debris from the hole and recessed area. Flush and fill the hole with clean water; then pour dry cement into it. Mix ingredients right in the hole with a thin stick or other implement such as a screw-driver. Add water and cement to make enough mortar/cement to fill hole, with a little extra available to

place on the underside of the disk. When the mortar is completely mixed, it should be thick, but still workable, like heavy mashed potatoes.

5. Preparing the Disk. Wet and clean the disk by rubbing all surfaces with cement, to remove unwanted dirt and oils; rinse well. Fill underside of disk with mortar, using a trowel. Hold disk loosely upside-down by end of the shank then gently tap domed surface of disk from below, with the handle of the trowel, several times, to allow mortar to settle and trapped air to escape. This process is very important, because it will minimize the existence of highly undesirable voids under the disk once in place.

6. Setting the Disk. Place the shank of the disk into the cement-filled hole and press the mark firmly into place. The disk is typically oriented to read with the observer facing north. This is useful for GPS and gravity observations, which orient to north. Slightly twist the disk back-and-forth and gently tap it with the end of the trowel handle, to help settle the disk, completely and evenly, into the recess in the bedrock. The disk is considered set when the slight back-and-forth movement stops and the disk settles firmly in place. Work excess mortar around the outer edge of the disk, making sure that it is smooth, and slightly overlaps the top, edges of the disk. An exposed disk edge could provide

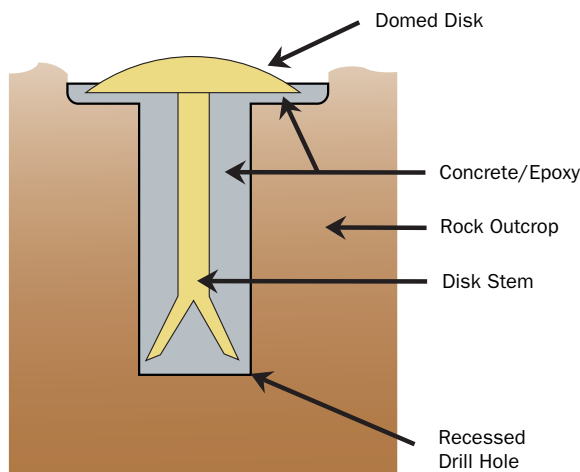


Figure B - 3. Side view of disk in outcrop.

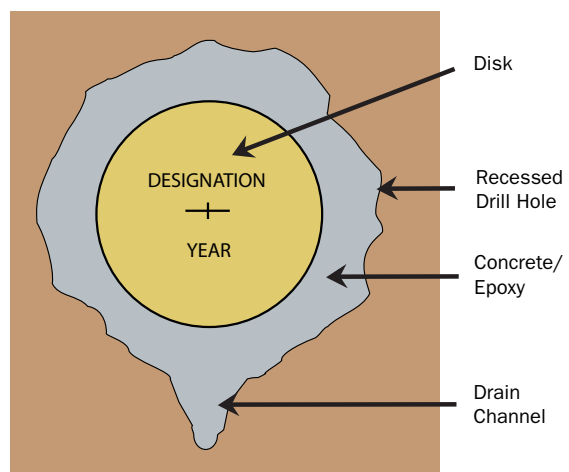


Figure B - 4. Top view of disk in outcrop.

a weak spot that can be used by someone, or the elements, to dislodge the mark.

7. Cleaning and Finishing. Sprinkle a little dry cement on the exposed surface of the disk, and then rub it with a clean rag or short bristled brush, using circular strokes. This cleans the disk and removes excess mortar from its surface and recessed letters. Rubbing the wet mortar around the edge of the disk in the same manner is done intentionally to finish its surface and help prevent cracking. Brush away loose cement and make sure the finished product has a neat appearance.

8. Curing Cement. Cover the newly set disk while the cement is still wet, to prevent heavy rains or other debris from ruining its surface; and to conceal the disk from people who might tamper with it at this vulnerable stage. A piece of wood, cardboard, heavy paper, or similar item should suffice for covering the mark, and should be removed after cement has cured.

9. Clean Up. The area is cleaned; excess dirt and trash removed; and returned to its “as-found” condition. The bench mark is the only evidence left to represent the quality of work performed, and therefore the cleanliness of the site should reflect similar quality.

Caution: *Lime and/or cement in concrete can cause burns on skin and destroy clothing. Water used to rinse tools, concrete/cement mixing containers, etc., can kill vegetation, if dumped on the ground.*

SURVEY DISK IN STRUCTURE

The procedure for setting a disk in a concrete or masonry structure is identical to that for setting one in bedrock.

Caution: *Use protective eye-wear when drilling into masonry or concrete.*

Stability and safety issues are also concerns when setting a disk in small structures such as bridges. Select locations with continuous, deep foundations such as head walls, and avoid locations such as curbs, sidewalks, bridge decks, and railings.

When drilling into brick or other soft material, an electric drill or hammer and star drill should be used, rather than heavy power equipment, to prevent potential damage to the exterior. Recess the chiseled depression for the disk so the top of the disk, when set, is flush with surrounding structure. This will eliminate the need for a chiseled drain, as described for the disk in outcrop.

The hole should be flushed with water, and wet before mortar is put into it to remove dusty surfaces and aid bonding. After placing the shank of the disk into the mortar filled hole, work it to the bottom edge of the hole, as described in Step 6, so that it will not settle askew while the mortar is curing.

Highway grade epoxy may be used in place of cement, if it meets ultraviolet standards and will hold up to “all” weather conditions. Setting procedures with epoxy are similar to those described previously, except the drilled hole, though needing to be extremely clean, cannot be wet.

NGS 3-D DEEP DRIVEN ROD MARK

The recommended survey marker that produces stability for most conditions is the three-dimensional (3-D) drivable survey monument. The principal component of this monument is a 17 millimeter (9/16 inch) diameter, stainless steel rod driven into the ground, using a gasoline powered reciprocating hammer, until refusal or a reduced driving rate has been achieved. The rounded top center of the rod is the survey datum point. The upper 1.0 meter (3 feet) of the rod is encased in a 2.5 centimeter (1 inch) grease filled PVC or plastic extruded fin sleeve that is held horizontally stable by the surrounding, back-filled, washed sand. Effects of up and down ground movement during freeze/thaw or wet/dry conditions are buffered from the anchored rod by the grease filled sleeve promoting vertical stability. A 12.7 or 15.2 centimeter (5 or 6 inch) PVC pipe with attached standard aluminum hinged logo cap protects and identifies the top of the monument.

Time required setting an average 3-D rod mark using the following procedures and referencing Figure B-4 is 2 to 3 hours. Photo documentation of setting a 3-D rod mark can be found on the NGS Internet site.

A. EQUIPMENT REQUIRED TO SET MONUMENTS:

ROD DRIVERS AND ACCESSORIES

Qty	Description	Notes
1	Pneumatic Rod Driver	Use these, or something similar: a) Whacker Model BHB 25 (with tool kit) b) Pionjar Model 120 (with tool kit) c) Cobra Combi (with tool kit)
1	Rod Driving Insert	Holds machine on rod and acts as impact point while driving rods
1	Shovel Bit (optional)	For machine to help start and dig holes
1 Pint	Required Oil Type and Calibrated Container	For determining gas/oil mix
2	Gasoline Containers with Gasoline	For fueling the rod driving machine and generator

DIGGING THE HOLE

Qty	Description	Notes
1	Post Hole Digger	Capable of digging a hole 4-feet deep
1	Gas Powered Post Hole Digger with Augers (optional)	For increased productivity
1	Digging Bar	For dislodging rocks and hard packed soil

DRIVING THE ROD

Qty	Description	Notes
1	2 lb. Hammer	To start rods and stamp designations
2	Wrenches/Grips	For attaching rods together. Use either of these: a) 8" to 10" Quality Pipe Wrenches b) Quality Vise Grips

FINISHING THE ROD

Qty	Description	Notes
1	Hack Saw + Extra Blades	For cutting stainless steel rod
1	4" or 5" Grinder	Use electric or battery powered. For cutting and finishing off top of rod.
1	Gas Powered Electric Generator	For powering grinder and drill
2	Sanding Disks (medium grade), Metal Cutting Disks	For use with the grinder
1	Steel File	For fine finishing off the rod
1	Centering Sleeve	To aid in center punching mark on rod top
1	Center Punch	To punch mark on rod top
Var	Sandpaper or Sanding Pad	For fine finishing rod top

Bench Mark Reset Procedures

FINISHING THE MONUMENT

Qty	Description	Notes
1	¼" Stamping Set	For lettering and numbering station designation/date
1	Hand Saw	For cutting 5 or 6-inch PVC pipe
1	Bucket or Wheelbarrow	For mixing cement and moving unwanted dirt
2	5 Gallon Water Containers and Water	For mixing cement and cleaning equipment
1	Hoe or Sharp Shooter Shovel	For mixing cement
1	Heavy Rubber Mallet	To aid lowering logo cap and PVC pipe into cement
1	Cement Finishing Trowel	For smoothing concrete top
1	Stiff Vegetable Type Brush	For cleaning logo cap and hinges

ASSORTED ACCESSORIES

Qty	Description	Notes
1	Tool Box with standard tools	For incidental repairs. Should include, at the least: Slotted and Phillips Head Screw-Drivers, Pliers, Needle Nose Pliers, Wire Cutters, Assorted Wrenches, Sockets, Allen Wrenches, Wire Brush
1	Round Nose Shovel	For helping dig hole
1	Tile Spade	For digging hole and mixing cement. Also known as a "Sharp Shooter Shovel"
1 Roll	Black Tar Paper (Felt Paper)	For making cylindrical form for top of monument
1	30 Meter Tape Measure	For various measurements
1 Pair	Leather or Cotton Work Gloves	For hand protection especially while working with cement
1 Pair	Protective Eyewear	For eye protection especially during operation of machinery
1 Pair	Hearing Protection Devices,	For hearing protection especially during operation of machinery Ear Plugs or Ear Muffs
Var	Rags / Paper Towels	For general cleanup

B. MATERIALS REQUIRED TO CONSTRUCT EACH MARK:

Qty	Description	Notes
23	9/16" Internally-threaded Stainless Steel Rods each 4-feet long	See section C, step 8. This allows a maximum depth of 92 feet.
1	4 to 5 inch piece of Stainless Steel Rod	To serve as impact point protection while driving rods
25	3/8" Threaded Stainless Steel Studs	One per rod section, plus spares
1	Steel, Fluted Spiral Rod Entry Point	Standard Order
1	Aluminum Hinged Logo Cap	Standard Order
1	Schedule 40 PVC Pipe, 5" or 6" diameter, 20 inches long	Fits hinged logo cap
1	Sleeve Apparatus Kit (see notes)	Use either: a) One (1) schedule 40 PVC pipe, 1" diameter and at least 3 feet long with two (2) plastic end cap alignment bushings, center drilled to 9/16" b) One (1) plastic extruded fin sleeve, 1" diameter and at least 3 feet long with two (2) plastic end cap alignment bushings, center drilled to 9/16" (extruded fin sleeve)
1 Pint	PVC Cement or Epoxy	Ensure cement or epoxy adheres plastic pipe or sleeve
1 Pint	PVC Cleaning Solvent	Only if using PVC Cement
1	Grease Gun	Fills 1" grease filled sleeve
1 Tube	Food Grade, Non-Toxic Grease	Often comes in 17 ounce tubes. Use tubes which fit the grease gun.
1 cubic foot	Bagged Concrete Mix	Depends on size of hole
2 lbs	Portland Cement	If necessary, is used to enhance integrity of ready mix concrete
½ cubic feet	Washed Sand	Fills bottom of hole, inside PVC pipe, around grease filled sleeve

machine with an equivalent weight (55 or more pounds) and driving force (24 joule or 17.7 Foot-Pounds).

6. Adding Rods. Remove the short piece of rod (impact point) leaving the threaded stud in the section of rod in the ground. Attach another 1.2 meters (4 feet) long section of rod and, using a new threaded stud, thread on the impact point. This “cycling” of a new stud from impact point into top of the rods in the ground insures the integrity of the studs at all connections. Tighten securely using pipe wrenches as described above in step 4. Always tighten rods maintaining a clockwise pressure to avoid loosening the rods already in the ground. Drive the new length of rod into the ground with the reciprocating driver.

7. Achieving Required Rod Depth. Repeat step 6 until the rod refuses to drive further, known as anchored, or until a driving rate of 60 seconds per foot is achieved, i.e., it takes 60 seconds to drive 0.3 meter (1.0 foot) of rod into the ground. In the event the driven rods will not sufficiently slow down to meet desired driving rate, terminate upon reaching 27.4 meters (90 feet) or 22.5 rods. This leaves about 0.6 meter (2 feet) of rod out of the hole. If possible, leave the driven rods alone overnight to let them set up or adhere to the soil. Return the following day and drive remaining 0.6 meter (2 feet) of rod and determine whether driving rate has reduced. If rod feels secure in ground, i.e., will not rotate, use this depth even though the minimum driving rate of 60 seconds per foot has not been met. If the rod is still unsecured, turns freely in clockwise direction, a decision must be made considering further expense for the monument. Sometimes, all that is necessary to achieve a well anchored rod is driving it a few more feet. Unfortunately, in other instances, an additional hundred feet or more may be required to anchor the rods. Only rods driven to refusal or to which met the slow driving rate will be accepted for resets. Indicate in the written station description the depth of the rod and whether it was driven to refusal or met the slow driving rate. Also include a description of any unusual mark setting circumstances.

8. Finishing the Datum Point. When refusal or prescribed driving rate is reached, cut off the rod with a hacksaw or comparable tool, always removing at least the tapped and threaded portion, and leaving the top of rod about 8 centi-

meters (3 inches) below ground surface. Shape the top of the rod to a smooth, hemispherical surface using a portable grinding machine with a grinding attachment or sanding wheels, files and sand paper to produce a nicely finished, rounded surface. This is the datum surface and ragged edges or grinding marks are not acceptable on top of the finished rod.

9. Applying the Center Punch. The datum point must then be created by center punching a dimple on top of the rod to provide a plumbing (centering) point. Place the centering sleeve over the top of the rounded rod to facilitate locating the exact center of the rod. Punch a substantial dimple, 1.5 millimeters (1/16 inch) deep, into the top of the rod using a punch and hammer or spring loaded center punch. Several blows may be needed to create a sufficient dimple. Remember, this is the actual survey point, so don't hesitate to spend a few extra minutes to produce a professional, finished product.

10. Installing Grease Filled Sleeve. Insert the grease filled sleeve, produced in step 3, over the rod with the unfilled portion at the top. The upper end of sleeve will fill as rod displaces grease from the bottom. The datum point on top of rod should protrude through top of the sleeve about 8 centimeters (3 inches) with sleeve extending to the bottom of the hole.

11. Back-Filling with Clean Sand. Back-fill and pack the bottom 0.6 meter (24 inches) or more of the hole with washed sand around the outside of grease filled sleeve. This fills the bottom of the hole and helps stabilize the sleeve.

12. Placing Logo Cap and PVC Pipe. Place the 12.7 or 15.2 centimeter (5 or 6 inch) diameter PVC pipe and logo cap over and around the grease filled sleeve and rod in the center of the hole. The bottom of the PVC pipe should extend into the top of the sand in the bottom of the hole. Leave the top of the logo cap and PVC pipe slightly higher than the top of the ground surface until the concrete is in place. Back-fill the center of the PVC pipe with washed sand around and to within 2.5 centimeters (1 inch) from the top of the grease filled sleeve. The rod should be centered in the PVC pipe.

13. Adding the Concrete Collar. Mix concrete in a bucket or wheel barrel to pasty, well moistened consistency like mashed potatoes. Add Portland cement, if necessary, in sufficient quantity (1 to 2 pounds) to enhance the concrete mix or to help dry an over moistened mixture to produce an adequate consistency. A good indication of adequate consistency is that the mix neither runs nor falls off the shovel but sluggishly slides off and flattens upon hitting the ground. Pour concrete into the hole around logo cap and PVC pipe filling to about the ground surface. A round form made from black tar paper (felt paper) can be inserted during this filling process to create a round top for the monument. Open the logo cap and grasp the PVC pipe then shake to settle concrete around the pipe and to fill voids. Add more concrete to fill to within 1 centimeter ($\frac{1}{2}$ inch) of the ground surface.

14. Finishing the Top of the Concrete. Trowel the top of concrete to a smooth, fairly finished surface. Tap alternate edges of the logo cap, using a rubber mallet or hammer and wooden block, lowering it and attached PVC pipe into surface of concrete. Finish the top of the concrete by troweling a smooth, finished surface, round in appearance with the logo cap fairly centered.

15. Finishing the Mark. Add sand to the inside of the PVC pipe to bring its level to within 2.5 centimeters (1 inch) of the top of the grease filled sleeve. Clean any overlapping concrete from the surface of the logo cap using a stiff bristled brush. The finished height of logo cap and access cover should be slightly lower than the surface of the ground. The logo cap should be approximately in the center of the top of the concrete. Datum point should be about 8 centimeters (3 inches) below the cover of the logo cap and centered in the 12.7 or 15.2 centimeter (5 or 6 inch) diameter PVC pipe. The top of the grease filled sleeve should be about 8 centimeters (3 inches) below the datum point and the washed sand 2.5 centimeters (1 inch) below top of the sleeve. Clean any cement that may have gotten onto the exposed rod or datum point.

16. Clean Up. Clean all equipment and remove all debris such as extra cement, excess dirt, and trash leaving the area in the condition it was found. Remove excess grease and insure that the datum point is clean.

Attachment C. Written Station Descriptions and Digital Photographs

Written station descriptions should be concise, accurate, informative documents that enhance recovery of survey monuments. Standardized forms for writing descriptions ensure that pertinent station information is recorded completely and consistently while at the survey monument site. This reduces errors and omissions that occur when writing station descriptions from memory. See downloadable (from NGS) “Report on Relocation and Description of Reset Bench Mark” form.

Clear digital photographs of the disk should be provided which confirm agency information, disk size and type, and designation stamping as well as the condition of the mark and local surroundings. Legible pencil rubbings of the disk are acceptable in the event a clear digital photograph is not possible.

In general, written descriptions are comprised of four elements: a standardized descriptive heading, three paragraphs of text including a description of physical monument, a “to reach” narrative and permanent station reference objects with measurements therefrom.

1. Description Headings. Station description headings identify the survey monument. This heading facilitates cataloging and referencing descriptive information by the establishing agency and for others wishing to use the monument. This information includes the station designation, station identification stamping, type of monument and/or datum point, approximate latitude, longitude, elevation, and county of location, agency and date of establishment, and other pertinent data.

2. Description of Physical Monument. Text for a station description should begin with general comments consisting of a brief, approximate discussion of station site location, monument type, and setting style. This helps pinpoint the station’s location on a map and assists surveyors unfamiliar with the area. General comments include airline distances and directions from nearest towns or prominent landmarks, and a general statement about immediate area, such as “on top of the east end of a long highway cut.” A detailed description accurately describes the monument and prepares the surveyor for the type of monument expected at the site. Examples include: “The station is a 9 centimeter diameter brass NGS bench mark disk set in top of a 0.3 meters round concrete

monument 1.3 meters deep and projecting 5.0 centimeters above the ground,” or “The station is the top center of a stainless steel rod recessed 80 millimeters below ground driven to refusal at a depth of 7.5 meters encased in a 0.12 meters PVC pipe with standard logo cap surrounded by concrete and flush with the ground.”. Also include digital photographs of both a close-up of the mark itself, and a wider field shot of the locality surrounding the mark.

Property ownership information should be included as the last sentence for all general comment paragraphs. Ownership information, such as owner’s name and address, or a comment such as “on state highway right-of-way”, facilitates station access.

3. “To Reach” Narrative. Reaching the station by vehicle or other means is described in detail in the “to reach” narrative. Begin narrative at an easily located starting reference point, such as a prominent highway junction, post office, or courthouse (sometimes post offices and courthouses are harder to find than the mark, so judgment must be used). Direct the reader from the starting point with routes and described mileages, including cross-references such as road intersections, to the station site. Describe each turn, route followed, and distance traveled. Vehicle mileage, accurate to the tenth of a mile, is obtained from a vehicle’s odometer and directions are determined from good maps or compass headings.

Important information regarding a station’s location will not be omitted if consistent writing style is maintained for all descriptions. After initial starting point of the “to reach” is described, each new sentence should be written in the following format: go, continue, or turn; in what direction; on what road; for what distance; to what point, e.g., “Continue northwest on State Highway 22 for 2.3 km (1.4 mi) to the station on the left.”

4. Permanent Station Reference Objects with Measurements.

The third and final paragraph of the station description identifies exact measurements from described reference objects.

List at least three permanent reference objects with distances and directions from the station in each description. Objects measured from varying directions to station sites are essential for locating a buried monument or to help verify that it has been disturbed or destroyed. More than three measurements and references may be included as this may benefit in the

event that one or more are lost through time. Exact measurements to the hundredth of a meter (centimeter), or tenth of a foot, and accurate compass derived directions save time when searching or digging for hidden or buried monuments.

Reference items such as numbered power poles, top center of culvert pipe ends, concrete head walls and wing walls, permanent fence corners and road center lines are long lasting and easily identified.

Record all distances and measurements with proper unit annotations. If both English and metric units are desired, record one within parentheses following the other measurements, again noting associated unit annotations.

Metal or fiberglass witness posts have been set near many bench marks. If one of these witness posts is near the mark to be relocated, it should be moved or replaced, if possible, to a location near the new mark. A statement of the distance and direction from witness post to new mark should be included in description.

Finally, as an additional measure to aid in relocating the bench mark, a simple position computed from a non-geodetic (“handheld”) Global Navigation Satellite System (GNSS) unit may be entered. Even with meters of potential inaccuracy, such a position will assist significantly in relocating lost marks in areas where reference points may be destroyed.

5. Digital Photographs. Digital photographs are useful for station (mark) reconnaissance, mark recovery, mark stability assessment, quality control, and as an aid during data processing and data verification. Generally three photographs per station will be stored in the NGS database, which will make them accessible to future users. The three photographs are described as numbers: (1) extreme close-up, clearly legible, (2) eye-level (5 to 6 feet distant), and (3) horizontal view (approximately 10 to 30 feet distant). All three photographs require a digital caption and the correct file name. The picture filename should be the station designation, dash, photo number, dash, date, dot, jpg, e.g., M 123 RESET-1-15JUN2006.jpg. Refer to the requirements for the submission of digital photographs on the NGS Internet site for complete details.





