US Army Corps of Engineers®
SACRAMENTO DISTRICT

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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS
SACRAMENTO COUNTY, CALIFORNIA

VICINITY MAP
NOT TO SCALE

DESIGN FILE NO. 1-04-0642
SPEC NO. 2122

REGISTERED PROFESSIONAL ENGINEER
CHRISTOPHER L. STEPPER
C68617
Exp. SEP. 30, 2019
CIVIL
STATE OF CALIFORNIA

DATE SIGNED: 5/29/19
RESPONSIBLE FOR G, C-100S, C-200S, C-300S, C-500S, AND CG DRAWINGS

REGISTERED PROFESSIONAL ENGINEER
GRACE F. ROSE
C84813
Exp. 3-31-2020
CIVIL
STATE OF CALIFORNIA
5/29/19

RESPONSIBLE FOR S SHEETS

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MARK	DESCRIPTION	DATE

DESIGNED BY: C. STEPPER	ISSUE DATE: 05/09/2019
DRAWN BY: E. DIOCSON	SOLICITATION NO.:
CHECKED BY: S. SULLIVAN	CONTRACT NO.:
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U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

COVER SHEET

SHEET ID
G-001

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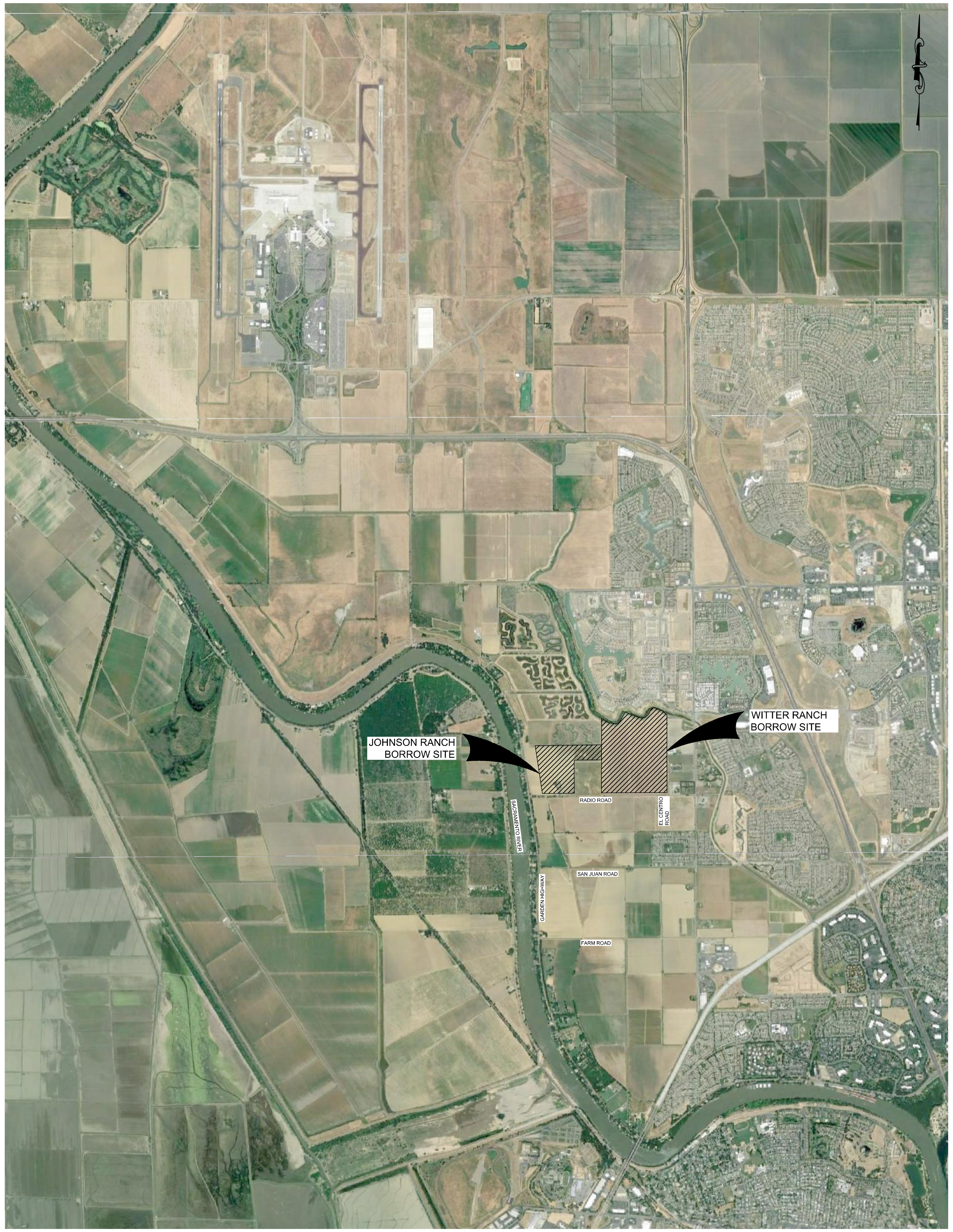
FINAL ISSUE FOR BID



PROJECT MAP

0 1760 3520 1 MILE

SCALE IN FEET
(APPROXIMATE - MAP IS SCHEMATIC)

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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PROJECT LOCATION MAP AND DRAWING LIST

SHEET ID
G-002

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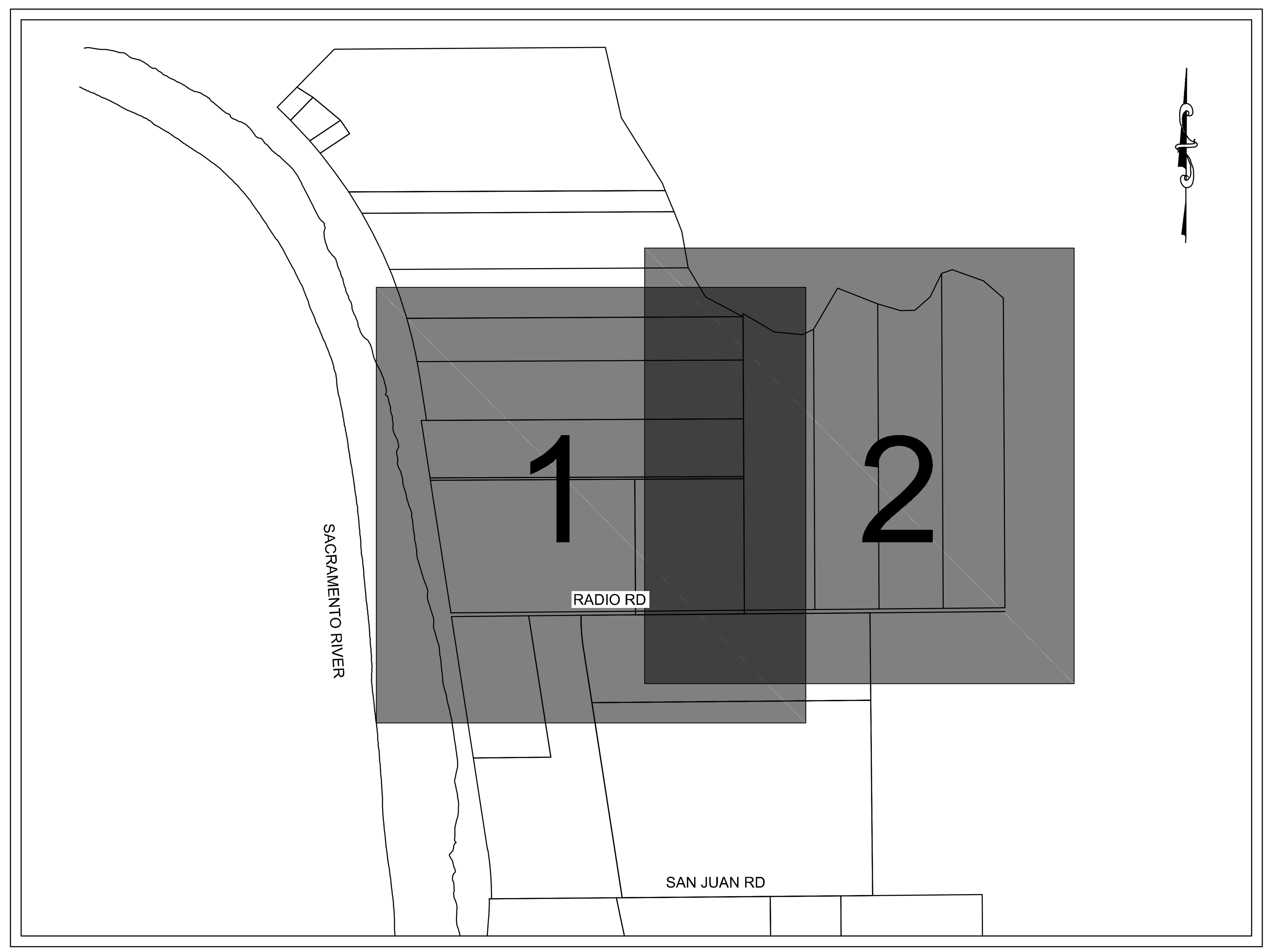
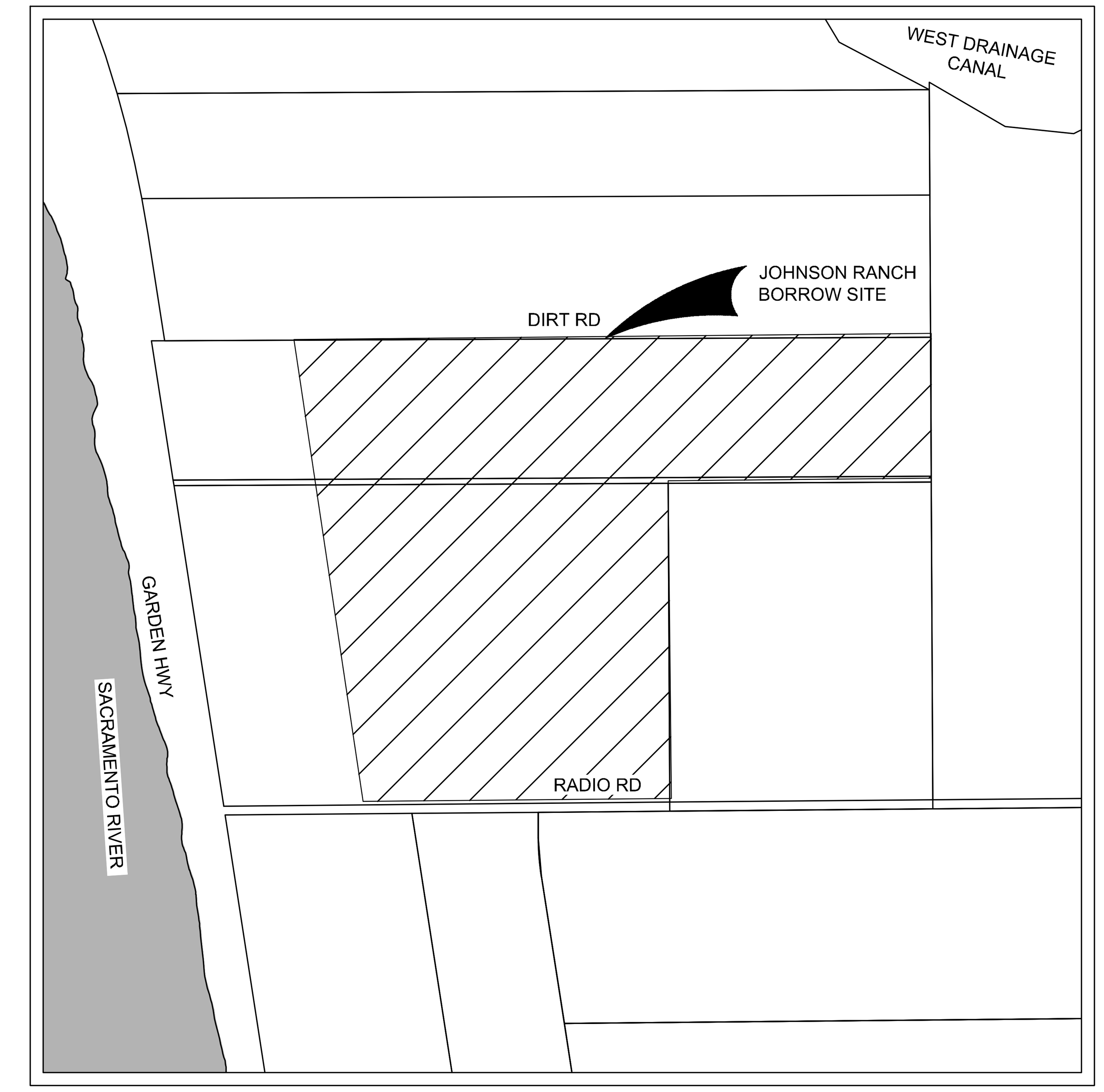
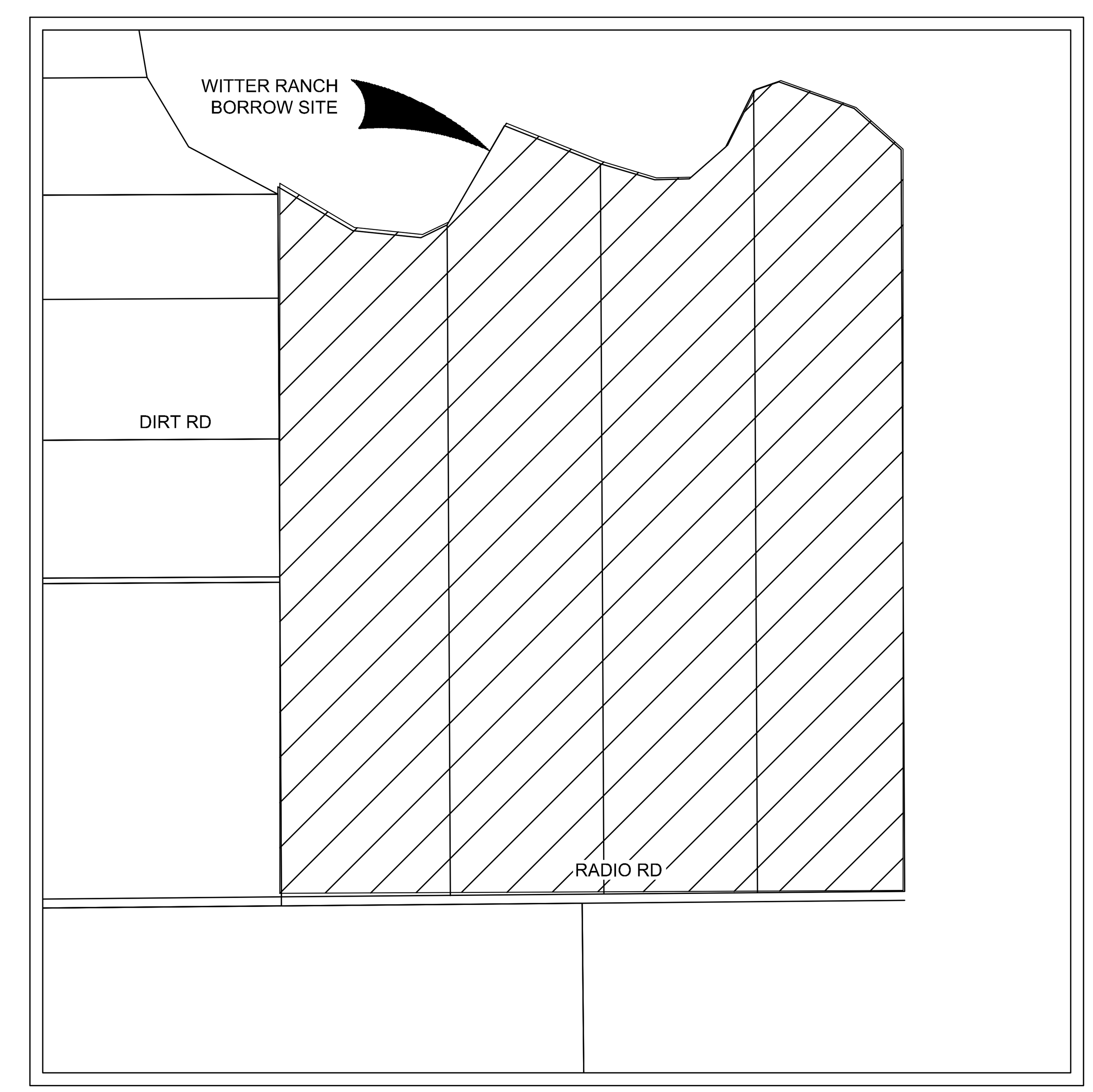


PROJECT MAP
SCALE: 1' = 1000'



PROJECT MAP 1
SCALE: 1' = 500'



PROJECT MAP 2
SCALE: 1' = 500'

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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PROJECT MAP

SHEET ID
G-003

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FINAL ISSUE FOR BID

GENERAL NOTES

1. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE THESE DRAWINGS, GENERAL NOTES, AND TECHNICAL PROVISIONS, AS WELL AS THE CONSTRUCTION SPECIFICATIONS FOR THIS PROJECT PRESENTED IN BOOK FORM.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING RECORD DRAWINGS FOR ALL WORK THROUGHOUT THE COURSE OF CONSTRUCTION. SUCH DRAWINGS SHALL RECORD THE LOCATION AND AS-BUILT CONDITION OF ALL PROJECT ELEMENTS. COPIES SHALL BE DELIVERED TO THE CONTRACTING OFFICER PRIOR TO THE ACCEPTANCE OF THE WORK AS INDICATED IN THE SPECIFICATIONS
3. THE CONTRACTOR SHALL EXAMINE THE DOCUMENTS AND SHALL NOTIFY THE CONTRACTING OFFICER OF ANY DISCREPANCIES WHICH MAY BE FOUND PRIOR TO THE START OF WORK.
4. DETAILS MARKED "TYPICAL" SHALL APPLY IN ALL CASES, UNLESS NOTED OTHERWISE.
5. FOR CONDITIONS DEVIATING FROM THE TYPICAL AND NOT SPECIFICALLY DETAILED IN THE PLANS, THE CONTRACTOR SHALL VERIFY CONSTRUCTION DETAILS WITH THE CONTRACTING OFFICER.
6. DETAILS AND DIMENSIONS OF EXISTING CONDITIONS AS SHOWN ON THESE DRAWINGS ARE FOR REFERENCE ONLY. THE CONTRACTOR SHALL FIELD VERIFY AND RESOLVE ANY CONFLICTS WITH THE CONTRACTING OFFICER.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES AND SUBCONTRACTORS UNDER THE CONTRACTOR'S JURISDICTION.
8. THE BASELINE SHOWN ON THE DRAWINGS IS THE CONSTRUCTION REFERENCE LINE FOR THE PROJECT FACILITIES SHOWN. THE CONTRACTOR SHALL ESTABLISH THE BASELINE AND ANY OFFSETS REQUIRED UTILIZING THE MONUMENTS PROVIDED.
9. THE CONTRACTOR IS RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MONUMENTS AND OTHER SURVEY MARKERS. MONUMENTS AND SURVEY MARKERS DESTROYED DURING CONSTRUCTION SHALL BE REPLACED BY A LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL PROVIDE CONTRACTING OFFICER WITH AT LEAST 48 HOURS ADVANCE NOTICE PRIOR TO REPLACEMENT.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLIANCE WITH ALL FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS APPLICABLE TO ALL WORK PERFORMED UNDER THE CONTRACT.
11. THE CONTRACTOR SHALL BE IN RECEIPT OF COUNTY-APPROVED PLANS PRIOR TO BEGINNING CONSTRUCTION WITHIN ANY COUNTY RIGHT-OF-WAY.
12. THE CONTRACTOR SHALL COMPLY WITH THE PROVISIONS OF THE CORPS OF ENGINEERS SAFETY & HEALTH MANUAL (EM 385-1-1).
13. INFORMATION CONTAINED WITHIN THESE DOCUMENTS SHALL NOT BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE REFERENCED CODES.
14. FOR ALL TRENCH EXCAVATIONS THAT ARE FIVE FEET OR MORE IN DEPTH, THE CONTRACTOR SHALL OBTAIN A PERMIT FROM THE DIVISION OF INDUSTRIAL SAFETY. PRIOR TO BEGINNING ANY EXCAVATION, A COPY OF THIS PERMIT SHALL BE MADE AVAILABLE AND BE LOCATED ON THE CONSTRUCTION SITE AT ALL TIMES.
15. THE CONTRACTOR SHALL PROVIDE EROSION, SEDIMENT, AND WATER POLLUTION CONTROL MEASURES IN ACCORDANCE WITH THE APPROVED STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
16. DUST CONTROL, EROSION CONTROL, AND SEDIMENT CONTROL MEASURES, INCLUDING STREET CLEANING AT WORK AREA ENTRANCES SHALL BE CONTINUOUSLY MAINTAINED.
17. THE CONTRACTOR SHALL MAINTAIN AND OPERATE CONSTRUCTION EQUIPMENT TO MINIMIZE EXHAUST EMISSIONS. DURING CONSTRUCTION, TRUCKS AND EQUIPMENT SHALL BE OPERATED ONLY WHEN NECESSARY AND ENGINES SHALL BE SHUT OFF WHEN TRUCKS ARE BEING LOADED, UNLOADED OR ARE OTHERWISE STATIONARY FOR A PERIOD OF MORE THAN 10 MINUTES. EQUIPMENT SHALL BE MAINTAINED IN GOOD CONDITION AND WELL TUNED TO MINIMIZE EXHAUST EMISSIONS.
18. THE CONTRACTOR SHALL CONDUCT OPERATIONS OUTSIDE OF AREAS TO BE PRESERVED OR PROTECTED ACCORDING TO THE PLANS.
19. THE CONTRACTOR SHALL PREPARE A TRAFFIC CONTROL PLAN DESCRIBING METHODS TO SAFELY CONTROL TRAFFIC ON PUBLIC ROADWAYS IN AND AROUND THE SITE.
20. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR FURNISHING AND MAINTAINING ALL WARNING SIGNS, DEVICES, AND FEATURES NECESSARY TO PROTECT THE HEALTH AND SAFETY OF THE GENERAL PUBLIC AND WORKERS AND TO PROVIDE FOR THE PROPER AND SAFE ROUTING OF VEHICULAR AND PEDESTRIAN TRAFFIC DURING THE PERFORMANCE OF THE WORK.
21. EXISTING FENCING AND GATES WITHIN THE RIGHT-OF-WAY SHALL BE REMOVED AS REQUIRED FOR CONSTRUCTION AND AS SPECIFIED ON THE DRAWINGS. SALVAGE OF FENCING ITEMS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS. WHERE EXISTING FENCING OR BARRIERS ARE REMOVED, TEMPORARY BARRIERS SHALL BE PROVIDED. FENCING AND GATE SIGNS SHALL BE REPLACED FOLLOWING CONSTRUCTION.
22. ALL FENCING OR GATES TO BE LOCATED ON A PROPERTY LINE SHALL BE LOCATED BY CONTRACTOR'S QUALIFIED LICENSED LAND SURVEYOR OR REGISTERED ENGINEER.
23. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO EXISTING FACILITIES AS DIRECTED BY THE CONTRACTING OFFICER.
24. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, SIZES AND LOCATIONS OF ALL EXISTING FACILITIES, UNDERGROUND UTILITIES, AND FEATURES TO REMAIN BEFORE STARTING WORK AND SHALL IMMEDIATELY NOTIFY THE CONTRACTING OFFICER OF ANY DISCREPANCIES.
25. UTILITY INFORMATION WAS COMPILED FROM DATA PROVIDED BY THE UTILITY OWNERS AND LOCATIONS ARE APPROXIMATE. THE ACTUAL LOCATIONS AND ELEVATIONS OF THE EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR.
26. DURING CONTRACT ACTIVITIES THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UNDERGROUND AND OVERHEAD UTILITIES FROM DAMAGE FROM CONSTRUCTION EQUIPMENT AND OPERATIONS.
27. THE CONTRACTOR IS HEREBY NOTIFIED THAT, PRIOR TO COMMENCING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES WHO ARE INVOLVED WITH THIS PROJECT. THE CONTRACTOR SHALL COORDINATE WORK WITH THESE COMPANIES WHEN WORKING NEAR UTILITY LINES AND UTILITY POLES.
28. THE CONTRACTOR IS TO REQUEST TO HAVE ALL UNDERGROUND UTILITIES THAT MAY POSSIBLY CONFLICT WITH THE ABOVE OR BELOW GROUND IMPROVEMENTS, LOCATED IN THE FIELD. THE CONTRACTOR AND ANY SUBCONTRACTOR ARE REQUIRED TO NOTIFY THE USA NORTH 811, 48 HOURS IN ADVANCE OF PERFORMING ANY EXCAVATION.
29. DRAWINGS SHOWN WITH AERIAL PHOTOS ARE PROVIDED FOR REFERENCE ONLY. ALL FACILITIES MAY NOT BE SHOWN ON PHOTOS. THE CONTRACTOR SHALL SATISFY THEMSELVES AS TO THE LOCATION OF EXISTING FACILITIES THAT MAY BE AFFECTED BY CONSTRUCTION.
30. EXISTING GRADES AND CONDITIONS SHALL BE CONFORMED TO WHENEVER POSSIBLE. ANY ADJACENT OR OFF SITE AREAS DISTURBED BY THE CONTRACTOR'S OPERATION MUST BE RESTORED BY THE CONTRACTOR TO THE PRE DISTURBANCE CONDITION TO THE SATISFACTION OF THE CONTRACTING OFFICER.
31. PIPE LENGTHS INDICATED ON DRAWINGS ARE THE DISTANCE BETWEEN THE CENTERLINE OF DISTRIBUTION BOXES, OR STANDPIPES, CONNECTIONS TO EXISTING PIPES, BENDS, AND ENDS OF PIPES AS APPLICABLE.
32. SURVEY (AERIAL PHOTO, TOPOGRAPHY AND FEATURES, BOUNDARY SURVEY, AND SURVEY CONTROL) IS BASED ON A FIELD SURVEY AND AERIAL SURVEY DATA FROM PHOTOGRAPHY DATED 2/28/17, PROVIDED BY TOWILL, INC.

    BOUNDARY SURVEY PROVIDED BY PSOMAS.

    THE HORIZONTAL DATUM OF THIS SURVEY IS THE NORTH AMERICAN DATUM OF 1983 (NAD83) (1991.35 EPOCH) BEING THE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) ZONE 2 (GRID SURFACE).

    THE VERTICAL DATUM OF THIS SURVEY IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).

HABITAT PROTECTION NOTES

1. SEE SPECIAL PROVISIONS AND GENERAL SPECIFICATIONS, FOR MEASURES TO BE APPLIED WHEN WORKING AROUND TREES TO BE AVOIDED.
2. SEE SPECIAL PROVISIONS AND GENERAL SPECIFICATIONS, FOR AVOIDING AND MINIMIZING IMPACTS TO THE GIANT GARTER SNAKE, FOR MEASURES TO BE APPLIED WHEN WORKING WITHIN THE 200 FOOT OF GIANT GARTER SNAKE (AQUATIC) HABITAT.
3. LIMITS OF TEMPORARY FENCING FOR HABITAT PROTECTION WILL BE FLAGGED IN THE FIELD BY CONTRACTING OFFICER.

BORROW SITE NOTES

1. DEWATERING OF SITE SHALL BE IN CONFORMANCE WITH FEDERAL, STATE AND LOCAL REQUIREMENTS.
2. TEMPORARY DEWATERING PIPELINES THAT CROSS ROADWAYS SHALL BE BURIED TO AVOID OBSTRUCTION OF ROADWAYS.
3. THE CONTRACTOR SHALL STRIP SURFACE LAYER TO A DEPTH INDICATED IN THE SPECIFICATIONS. SURFACE LAYER SHALL BE STOCKPILED AND REPLACED IN ACCORDANCE WITH SPECIFICATION 02 22 20.
4. ALL BORROW ELEVATIONS ARE SUB GRADE ELEVATIONS UNLESS LABELED AS FINISHED GRADE.
5. COMPLETE FULL EXCAVATION OF JOHNSON RANCH WOODLAND AND MARSH BORROW SITES TO GRADES SHOWN ON THE PLANS PRIOR BEGINNING SURFACE LAYER REMOVAL AND EXCAVATION OF WITTER RANCH BORROW SITE.
6.
7. CONDUCT EXCAVATION OF WITTER RANCH BORROW SITE IN A PROGRESSIVE MANNER SUCH THAT BORROW SITE IS UNIFORMLY GRADED AND POSITIVE DRAINAGE IS MAINTAINED.
8. CONTRACTOR SHALL SUBMIT A DETAILED BORROW SITE UTILIZATION PLAN TO THE CONTRACTING OFFICE FOR APPROVAL.
9. CONTRACTOR MAY OVEREXCAVATE SUITABLE MATERIAL AND GRADE NON-SPEC MATERIAL INTO THE OVEREXCAVATED AREAS SO LONG AS THE CONTRACTOR COMPLIES WITH FINISH GRADING PLAN AND COMPACTION REQUIREMENTS NOTED IN THE SPECIFICATION SECTION 310000.
10. CONTRACTOR SHALL SUBMIT HAUL ROAD PLANS AND DESIGN TO THE CONTRACTING OFFICE FOR APPROVAL.
11. UPON BORROW EXCAVATION COMPLETION, THE HAUL ROADS ARE TO BE REMOVED AND THE AFFECTED AREAS RESTORED BY CONTRACTOR.
12. THE CONTRACTOR SHALL INSTALL CULVERTS AS NECESSARY TO ENSURE CONTINUITY OF IRRIGATION AND DRAINAGE FACILITIES ADJACENT TO HAUL ROAD.
13. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING MINIMUM COVER DURING CONSTRUCTION FOR TEMPORARY VEHICLE LOADING ALONG HAUL ROUTES:

- FOR CMP AND HDPE PIPES, PLACE AT LEAST (4') FOUR FEET OF COVER OVER THE TOP OF PIPE.
- FOR REINFORCED CONCRETE PIPE, PLACE AT LEAST (3') THREE FEET OF COVER OVER THE TOP OF PIPE.

ESTIMATED EARTHWORK SUMMARY

LOCATION	AREA (ACRES)	TOTAL EXCAVATION (CUBIC YARDS)	TOP SOIL REPLACEMENT (CUBIC YARDS)	NET (CUBIC YARDS)
WHITTER RANCH	143	624,844	231,451	393,393
JOHNSON RANCH AG	24	175,874	19,234	156,640
JOHNSON RANCH MARSH	42	416,557	33,454	383,103
TOTAL	209	1,217,275	168,414	933,136

ABBREVIATIONS

∠	ANGLE
AB	AGGREGATE BASE, ANCHOR BOLT
AC	ALTERNATING CURRENT
ACC	ACCESSIBLE
ACI	AMERICAN CONCRETE INSTITUTE
ADH	ADHESIVE
ADJ	ADJACENT, ADJOINING, ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
AGGR	AGGREGATE
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
ALT	ALTERNATE
ALUM	ALUMINUM
AMB	AMBIENT
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APN	ASSESSOR'S PARCEL NUMBER
APPD	APPROVED
APPROX	APPROXIMATE
ASPH	ASPHALT
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AUTO	AUTOMATIC
AVG	AVERAGE
AWG	AMERICAN WIRE GAUGE
BC	BEGINNING OF CURVE
BDRY	BOUNDARY
BEV	BEVEL
BF	BOTTOM FACE, BLIND FLANGE
BFV	BUTTERFLY VALVE
BITUM	BITUMINOUS
BL	BASELINE, BUILDING LINE
BLDG	BUILDING
BLVD	BOULEVARD
BM	BENCHMARK
BO	BOTTOM OF
BOT	BOTTOM
BP	BEGIN POINT, BASE PLATE
BRCG	BRACING
BRG	BEARING
BRG PL	BEARING PLATE
BRKT	BRACKET
BS	BOTH SIDES
BTWN	BETWEEN
BVC	BEGINNING OF VERTICAL CURVE
BW	BUTTWELD, BOTH WAYS
C	CURVE
CAP	CAPACITY
CB	CATCH BASIN
CBC	CALIFORNIA BUILDING CODE
CCW	COUNTER CLOCKWISE
CDF	CONTROLLED DENSITY FILL
CEM	CEMENT
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CG	CUT GRADE
CHFR	CHAMFER
CHK	CHECK
CIP	CAST-IN-PLACE
CIRC	CIRCULAR
CJ	CONSTRUCTION JOINT, CONTROL JOINT
CKT	CIRCUIT
CKT BRKR	CIRCUIT BREAKER
CL, ℄	CENTER LINE
CLL	CONTRACT LIMIT LINE
CLR	CLEAR(ANCE)
CLRM	CONCRETE LOW STRENGTH MATERIAL
CND	CONDUIT
COL	COLUMN
COM	COMMON
CONT	CONTINUE, CONTINUOUS
CONTR	CONTRACTOR
COV	COVER
CP	CONTROL POINT
CT	CURRENT TRANSFORMER
C TO C	CENTER TO CENTER
CTR	CENTER
Cu	COPPER
CU FT	CUBIC FEET
CU YD	CUBIC YARDS
CVT	CULVERT
DAT	DATUM
db	BAR DIAMETER
DBL	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION
DET	DETAIL
DIA, Ø	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DIST	DISTANCE, DISTRIBUTION
DL	DEAD LOAD
DN	DOWN
DP	DEPTH
DR	DOOR
DR	DRAIN
DS	DOWNSTREAM
DTL	DETAIL
DWG	DRAWING
DWLS	DOWELS
DWY	DRIVEWAY
E	EAST
EA	EACH
EC	END OF CURVE
EF	EACH FACE
EG	EXISTING GRADE / GROUND
EJ	EXPANSION JOINT
EL, ELEV	ELEVATION - GRADE OR BUILDING
ELL	ELBOW
ELEC	ELECTRIC
EMD	ESTIMATED MAXIMUM DEMAND
EMER	EMERGENCY
ENCL	ENCLOSE(URE)
ENGR	ENGINEER
ENTR	ENTRANCE, ENTERING
EOP	EDGE OF PAVEMENT
EP	END POINT, ELECTRICAL PANELBOARD
EPY	EPOXY COATING
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE(D)
EX	EXISTING
EXC	EXCAVATION, EXCAVATE
EXP	EXPANSION
EXP BT	EXPANSION BOLT
EXT	EXTERIOR
F	FAHRENHEIT
FCJ	FLOOR CONSTRUCTION JOINT
FDTN	FOUNDATION
FG	FINISH GRADE
FH	FLAT HEAD
FIG	FIGURE
FIN	FINISHED, FINISH
FIN FLR	FINISH FLOOR
FL	FLOW LINE
FLR	FLOOR
FLEX	FLEXIBLE
FLR PL	FLOOR PLATE
FN	FENCE
FOC	FACE OF CURB, FACE OF CONCRETE
FOF	FACE OF FINISH
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FT	FEET
FT/FT	FOOT PER FOOT
FTG	FOOTING
GA	GUY ANCHOR, GAUGE, GAGE
GAL	GALLON(S)
GALV	GALVANIZED
GALV STL	GALVANIZED STEEL
GB	GRADE BREAK, GRAB BAR
GEN	GENERAL
GKT	GASKET(ED)
GND	GROUND
GPM	GALLONS PER MINUTE
GPOST	GATE POST
GR LN	GRADE LINE
GRTG	GRATING
GS	GROUND SHOT
GT	GROUT
HD	HEAVY DUTY
HDBD	HARDBOARD
HD JT	HEAD JOINT
HDPE	HIGH-DENSITY POLYETHYLENE
HK	HOOK(S)
HNDRL	HANDRAIL
HORIZ	HORIZONTAL
HT	HEIGHT
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HWL	HIGH WATER LEVEL
HYDR	HYDRAULIC
Hz	HERTZ
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
ILK	INTERLOCK
IN	INCH, INCHES
INCL	INCLUDED
INT	INTERIOR
INV	INVERT OF PIPE (FLOW LINE ELEVATION)
J-BOX	JUNCTION BOX
JCT	JUNCTION
JT	JOINT
KPL	KICKPLATE
kV	KILOVOLTS
kVA	KILOVOLT AMPERES
kW	KILOWATT
L	LENGTH
LB	POUND, LAG BOLT
LB/FT^2	POUND(S) PER SQUARE FOOT
LB/IN^2	POUND(S) PER SQUARE INCH
LD	LOAD
LDG	LOADING
LF	LINEAR FEET
LG	LENGTH
LIN	LINEAR
LL	LIVE LOAD
LLO	LONG LEG OPPOSITE
LLV	LONG LEG VERTICAL
LN	LANE
LOC	LOCATION
LONG	LONGITUDINAL
LR	LONG RADIUS
LTB	LEFT TOP OF BANK
LWL	LOW WATER LEVEL
MACH	MACHINE
MAINT	MAINTENANCE
MATL	MATERIAL(S)
MAX	MAXIMUM
MCC	MOTOR CONTROL CENTER
MECH RM	MECHANICAL ROOM
MEMB	MEMBRANE
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MTD	MOUNTED
MTL	METAL
N	NORTH
NAVD	NORTH AMERICAN VERTICAL DATUM
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NGS	NATIONAL GEOLOGICAL SURVEY
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NM	NONMETALLIC
NCMWC	NATOMAS CENTRAL MUTUAL WATER COMPANY
NO	NUMBER, NORMALLY OPEN
NOM	NOMINAL
N''REQD	NOT REQUIRED
NTS	NOT TO SCALE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OD	OUTSIDE DIAMETER
OHE	OVERHEAD ELECTRIC
OHW	OVERHEAD WIRE
PC	POINT OF CURVATURE, PIECE
PCC	POINT OF COMPOUND CURVATURE, PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PI	POINT OF INTERSECTION
PL	PLATE, PROPERTY LINE
PLAT	PLATFORM
PLF	POUNDS PER LINEAR FOOT
POB	POINT OF BEGINNING
POC	POINT OF CURVE
POE	POINT OF ENDING
PP	POWER POLE
PRES	PRESSURE
PROJ	PROJECT
PRV	PRESSURE-REGULATING VALVE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSO	PSOMAS
PT	POINT
PVI	POINT OF VERTICAL INTERSECTION
PVMT	PAVEMENT
Q	RATE OF FLOW
QTY	QUANTITY
R	RADIUS, RISER
R/W, ROW	RIGHT OF WAY
RBR	RUBBER
RC	REMOTE CONTROL
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
RD	ROAD, ROOF DRAIN
RD 1000	RECLAMATION DISTRICT 1000
REF	REFERENCE
REINF	REINFORCE(ING)
REQD	REQUIRED
RLG	RAILING
RND	ROUND
ROW	RIGHT OF WAY
RPM	REVOLUTIONS PER MINUTE
RSP	ROCK SLOPE PROTECTION
RTB	RIGHT TOP OF BANK
RTU	REMOTE TERMINAL UNIT
S	SOUTH, SLOPE
SAC	SACRAMENTO
SAFCA	SACRAMENTO AREA FLOOD CONTROL AGENCY
SCHED	SCHEDULE
SCRN	SCREEN
SD	STORM DRAIN
SEQ	SEQUENCE
SF	SQUARE FOOT
SHLDR	SHOULDER
SHT	SHEET
SIM	SIMILAR
SLNT	SEALANT
SLV	SLEEVE
SMUD	SACRAMENTO MUNICIPAL UTILITY DISTRICT
SOV	SHUT OFF VALVE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
ST	STREET
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SWBD	SWITCHBOARD
SYM	SYMBOL
SYMM	SYMMETRICAL
SYS	SYSTEM
TCE	TEMPORARY CONSTRUCTION EASEMENT
THK	THICK(NESS)
THW	TOP OF HEADWALL
TNBC	THE NATOMAS BASIN CONSERVANCY
TO	TOP OF
TOB	TOP OF BANK, TOP OF EMBANKMENT
TOC	TOP OF CONCRETE
TOFE	TOP OF FOUNDATION ELEVATION
TOL	TOLERANCE
TOPO	TOPOGRAPHY
TOS	TOP OF SLAB, TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UG	UNDERGROUND
UGE	UNDERGROUND ELECTRICAL
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTABLE POWER SUPPLY
UTIL	UTILITY
V	VELOCITY, VOLT
VAR	VARIABLE, VARNISH
VC	VERTICAL CURVE
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VIF	VERIFY IN FIELD
VOL	VOLUME
V.T.	VOLTAGE TRANSFORMER
W/	WITH
W/O	WITHOUT
WP	WATERPROOF(ING), WEATHERPROOF, WORKING POINT
WS	WATERSTOP
WSE, WSEL	WATER SURFACE ELEVATION
WSP	WELDED STEEL PIPE
WT	WEIGHT
WWF	WELDED WIRE FABRIC
WY	WAY
XFMR	TRANSFORMER
XSECT	CROSS SECTION
YD	YARD

US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

DESIGNED BY: C. STEPPER	ISSUE DATE: 05/09/2019
DRAWN BY: E. DIOCSON	SOLICITATION NO.:
CHECKED BY: S. SULLIVAN	CONTRACT NO.:
SUBMITTED BY: J. KASHIWADA	FILE NO: 1-04-0642
SIZE: ANSI D / SPEC NO: 2122	FILE NAME: 1-04-0642-G004.dwg

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

NOTES AND ABBREVIATIONS

SHEET ID

G-004

SYMBOLS

- BENCHMARK
- CONTROL POINT
- BOLLARD
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PEDESTAL BOX
- ELECTRIC TRANSFORMER BOX
- ELECTRIC SERVICE PANEL
- ELECTRIC HANDHOLE (PULLBOX)
- FIBER OPTIC MANHOLE
- GATE
- LIGHT BOLLARD
- LIGHT POLE (SINGLE)
- MARKER, CABLE
- MARKER, DUCT
- MONITORING WELL
- PIEZOMETER
- POWER POLE
- POWER POLE, DOUBLE
- POWER POLE WITH LIGHT
- SIGN (SINGLE POST)
- SIGN (DOUBLE POST)
- TRAFFIC FLOW DIRECTION
- UTILITY CROSSING / CONFLICT or CAUTION
- VALVE MANHOLE
- WATER VALVE
- WATER SURFACE
- 734.97' EXISTING SPOT ELEVATION
- 738.76 FINISHED / PROPOSED SPOT ELEVATION
- 3:1 2% FINISHED / PROPOSED SLOPE

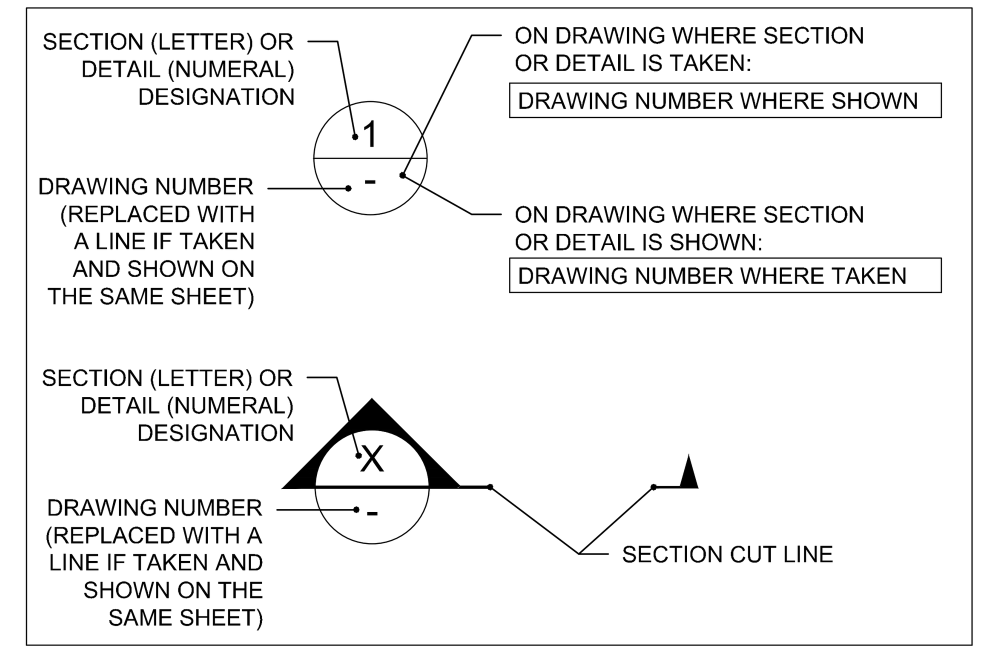
LINES

- CONSTRUCTION LIMITS
- CENTERLINE / BASELINE
- CON — CONDUIT, GENERIC
- G — GAS
- OHE — ELECTRIC, OVERHEAD
- E — ELECTRIC, UNDERGROUND
- EASEMENT
- xxx(.xx) — EXISTING CONTOUR LINES
- xxx(.xx) — PROPOSED CONTOUR LINES
- x — FENCE
- x x — FENCE (2)
- x x x — FENCE (3)
- FOC — FIBER OPTIC CABLE
- F — FUEL LINE
- GB — GRADE BREAK
- GRADING LIMITS
- GUARDRAIL
- o — HANDRAIL
- HAUL or TRAFFIC ROUTE
- PROPERTY LINE
- ROW — RIGHT-OF-WAY
- SS — SANITARY SEWER
- SHEETPILE
- SILT FENCE
- SD — STORM SEWER / CULVERT
- > — SWALE
- UD — UNDERDRAIN
- W — WATER
- WB — WETLAND BOUNDARY
- VEGETATION
- Q100 — 100YR (Q100) FLOOD LINE
- TREE REMOVAL

SECTIONS/DETAILS

(SEE X-XXX) SHEET REFERENCE

(SEE X/X-XXX) DETAIL REFERENCE



PATTERNS

- RIPRAP
- AGGREGATE SUBBASE
- ASPHALT
- ASPHALT OVERLAY
- CONCRETE
- GROUND, EXISTING
- GROUND, PROPOSED
- REMOVAL PATTERN
- DEEP BENCH
- SHALLOW BENCH
- WATER SURFACE

CONTACT:

AGENCY

JOHN BASSETT, DIRECTOR OF ENGINEERING
SACRAMENTO AREA FLOOD CONTROL AGENCY (SAFCA)
1007 7TH STREET
SACRAMENTO, CA
(916) 874-7606

ENGINEER - DESIGN

JEFF KASHIWADA, CIVIL ENGINEER
MEAD & HUNT
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA
(916) 993-4630

LIST OF CONTACTS

PUBLIC / UTILITY SERVICE	RESPONSIBLE ENTITY	REPRESENTATIVE	TELEPHONE
UNDERGROUND SERVICE ALERT	USA NORTH	- - -	800-642-2444
SPONSOR	SAFCA	JOHN BASSETT	916-874-7606
FEDERAL AGENCY	USACE	MARKUS BOEDTKER	916-557-6637
IRRIGATION SUPPLY	NMWC	BRETT GRAY	916-419-5936
DRAINAGE (O&M)	RD 1000	KEVIN KING	916-922-1449
DESIGN ENGINEER	MEAD & HUNT, INC.	CHRIS STEPPER	916-971-3961
GEOTECHNICAL ENGINEER	USACE	KHALED CHOWDHURY	916-557-5309
HABITAT MANAGER	NATOMAS BASIN CONSERVANCY	JOHN ROBERTS	916-649-3331
ELECTRICITY	SMUD	MICHELLE ZUNIGA	916-732-5726
TELEPHONE	AT&T	ASTRID WILLARD	916-453-6136
TRANSPORTATION	SACRAMENTO COUNTY	KYLE HINES	916-874-6760

NOTES:
1. ADMINISTRATION OF ALL WORK PERFORMED BY THE CONTRACTOR SHALL COMPLY WITH THE GENERAL SPECIFICATIONS.

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-G005.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

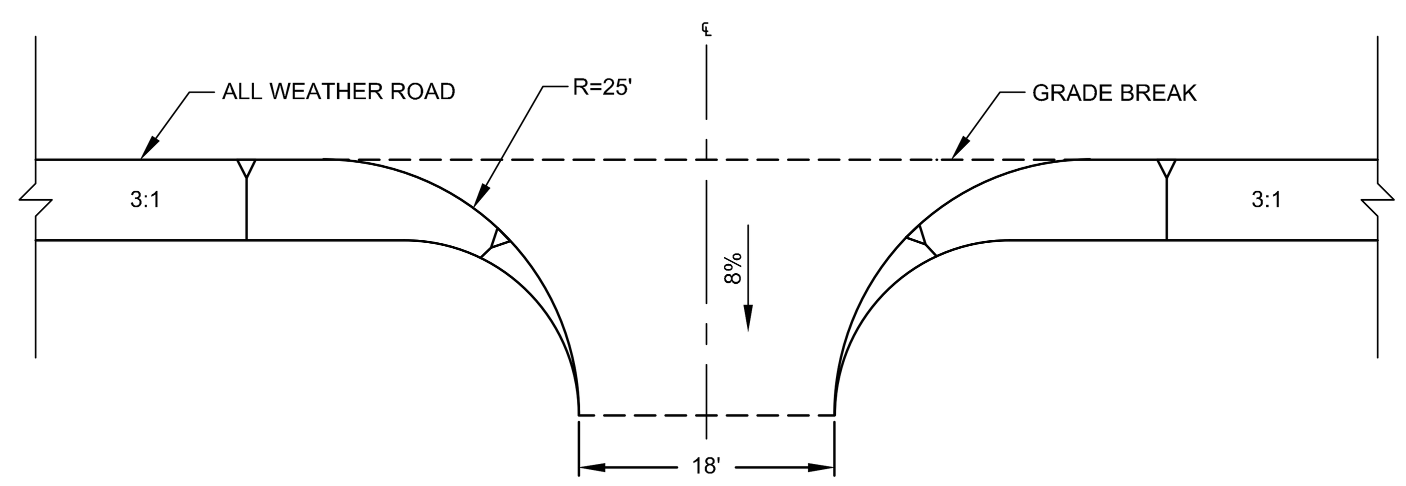
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

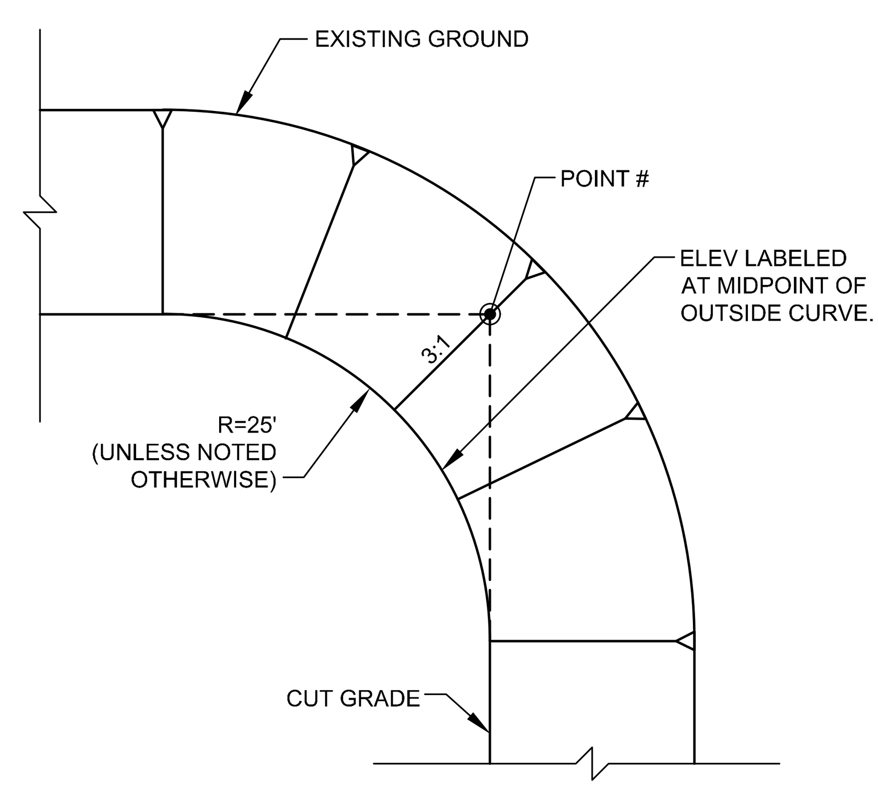
AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

LEGEND AND LIST OF CONTACTS

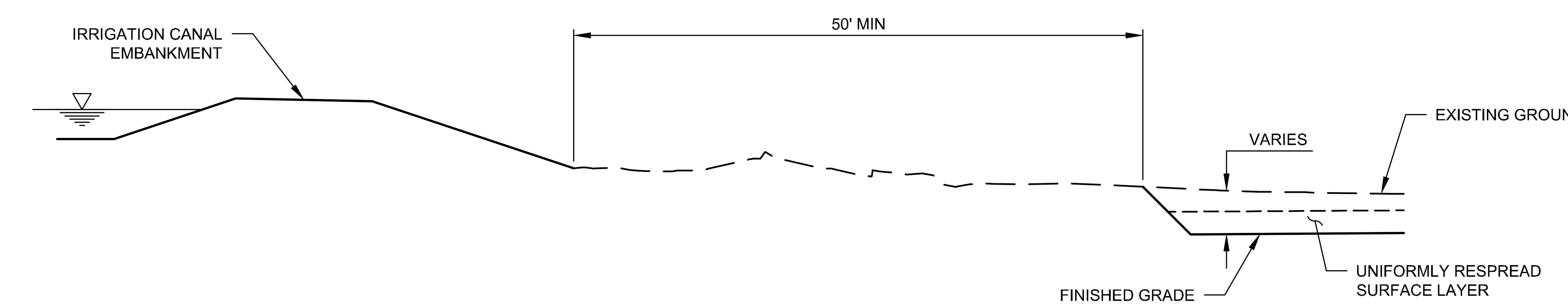
SHEET ID
G-005



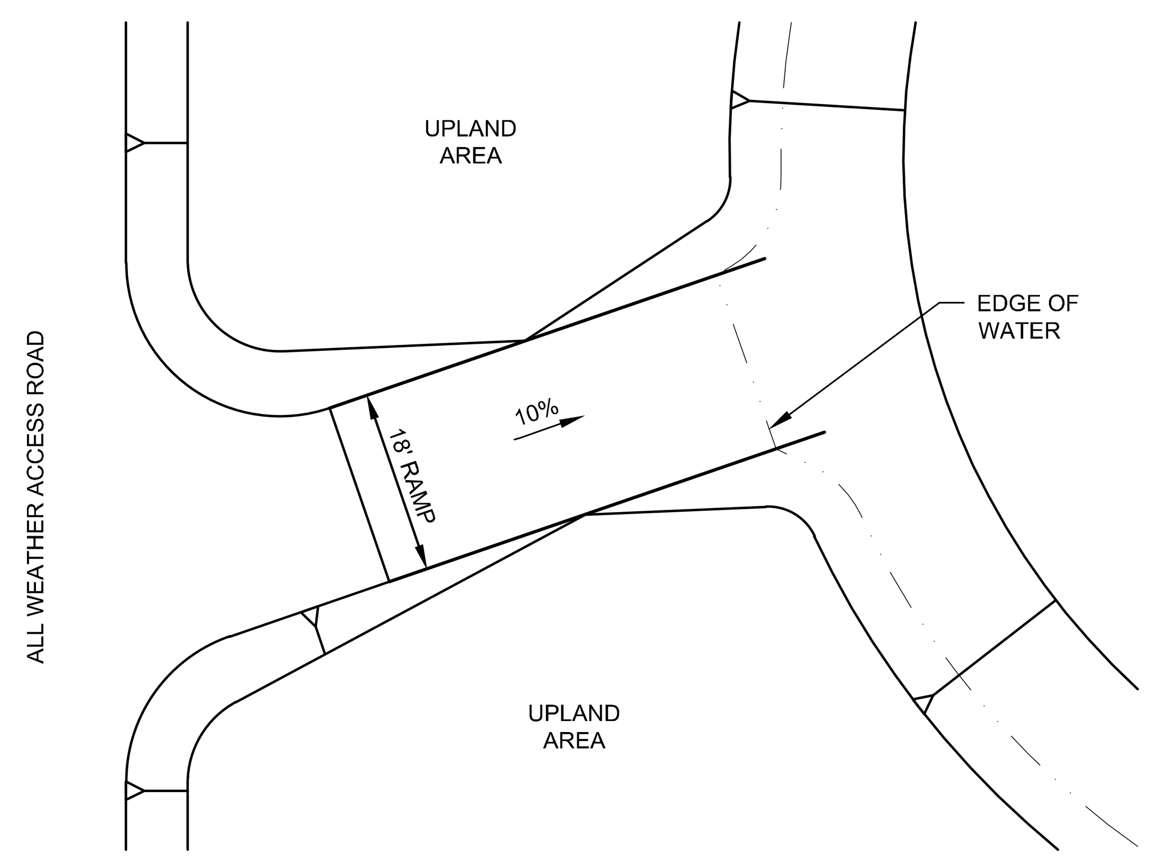
6 **TYPICAL FIELD ACCESS RAMP**
3/4"=1'-0"



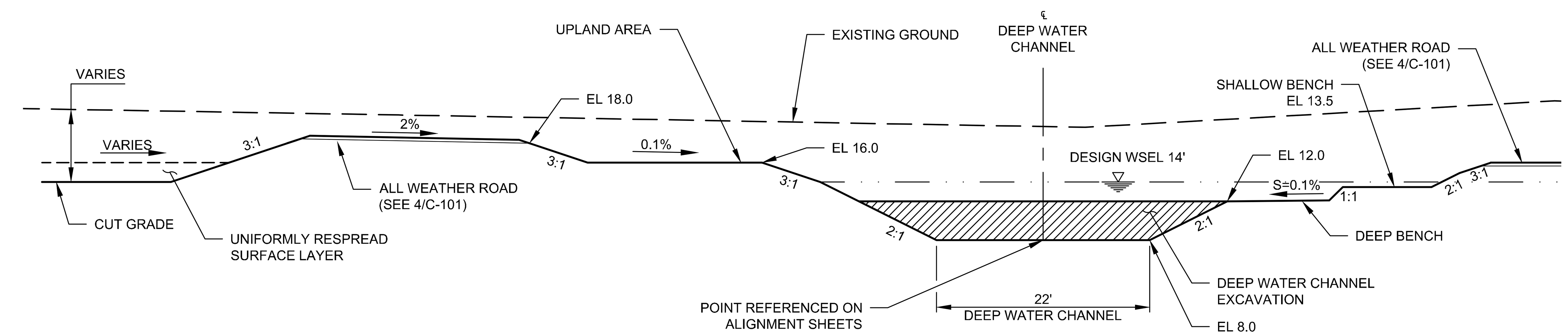
5 **CORNER GRADING**
3/4"=1'-0"



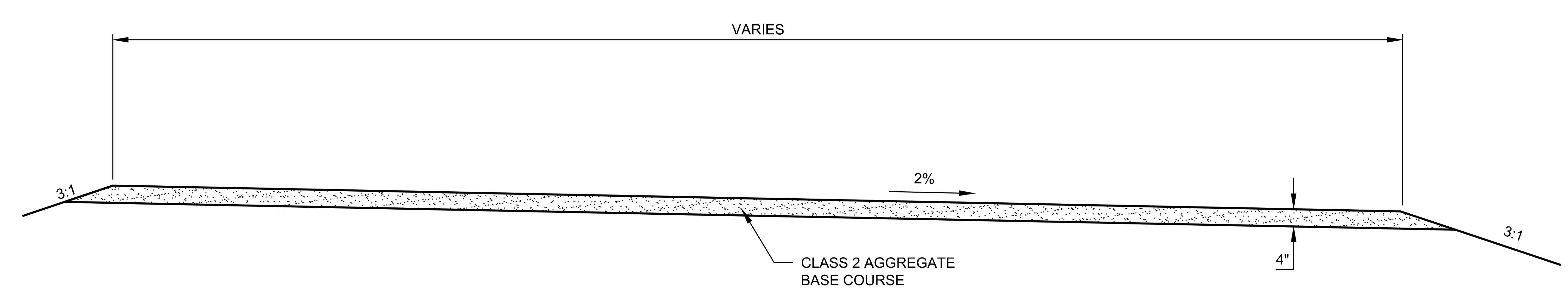
1 **TYPICAL GRASSLAND/AGRICULTURE AREA EXCAVATION CROSS SECTION**
1"=10'



7 **TYPICAL BOAT RAMP DETAIL**
3/4"=1'-0"



3 **TYPICAL JOHNSON RANCH MARSH CROSS SECTION**
1"=10'



4 **ALL WEATHER ROAD TYPICAL SECTION**
1"=2'

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MARK	DESCRIPTION	DATE

ISSUE DATE: 05/08/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO.: 1-04-0642
FILE NAME: 1-04-0642-C101.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

TYPICAL SECTIONS AND DETAILS

SHEET ID
C-101

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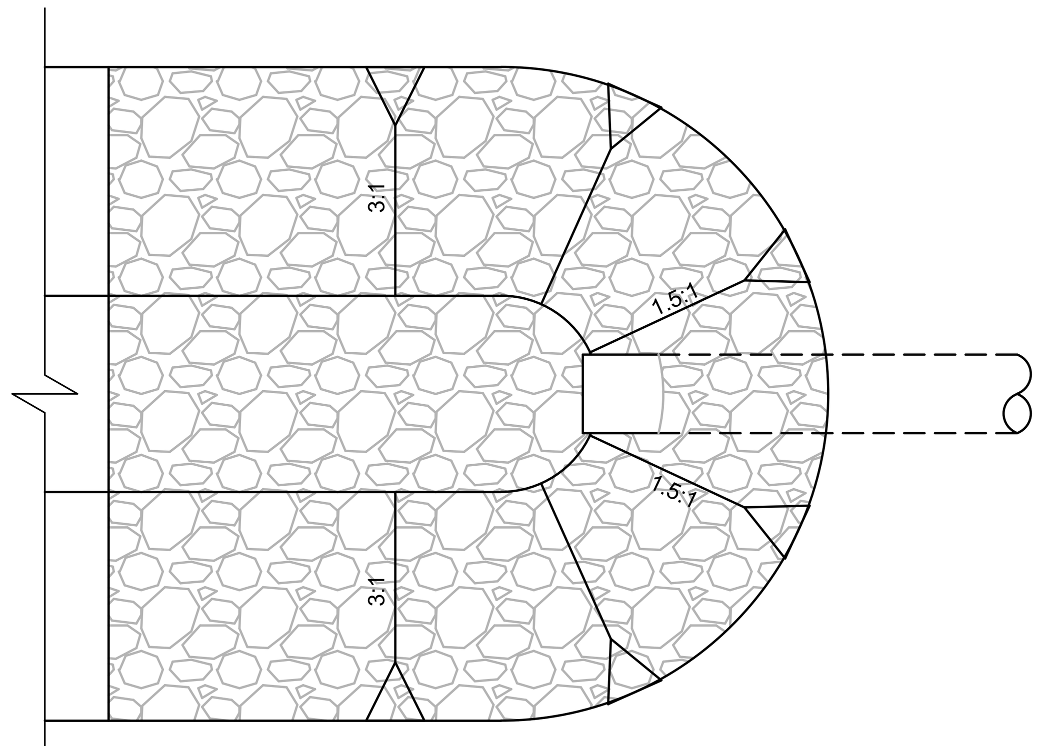
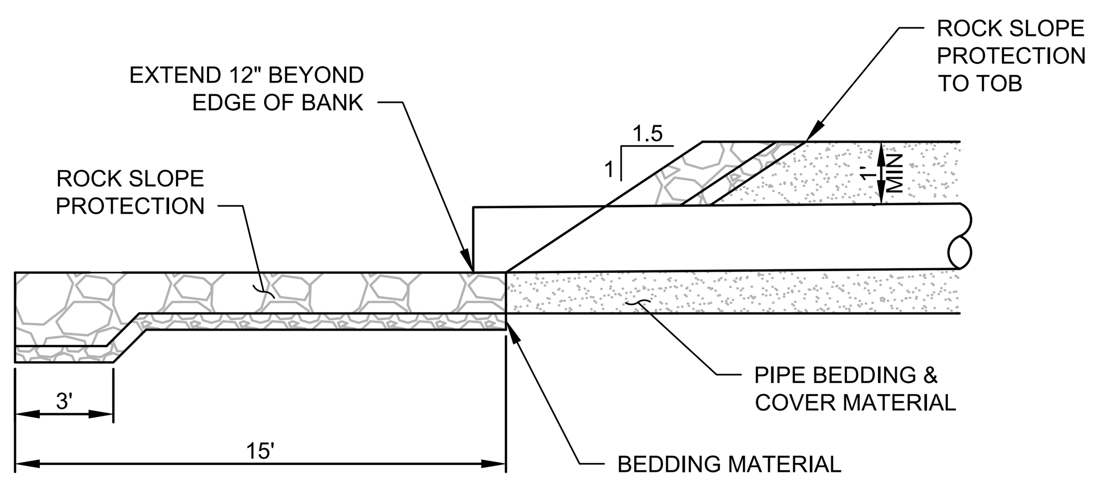
FINAL ISSUE FOR BID

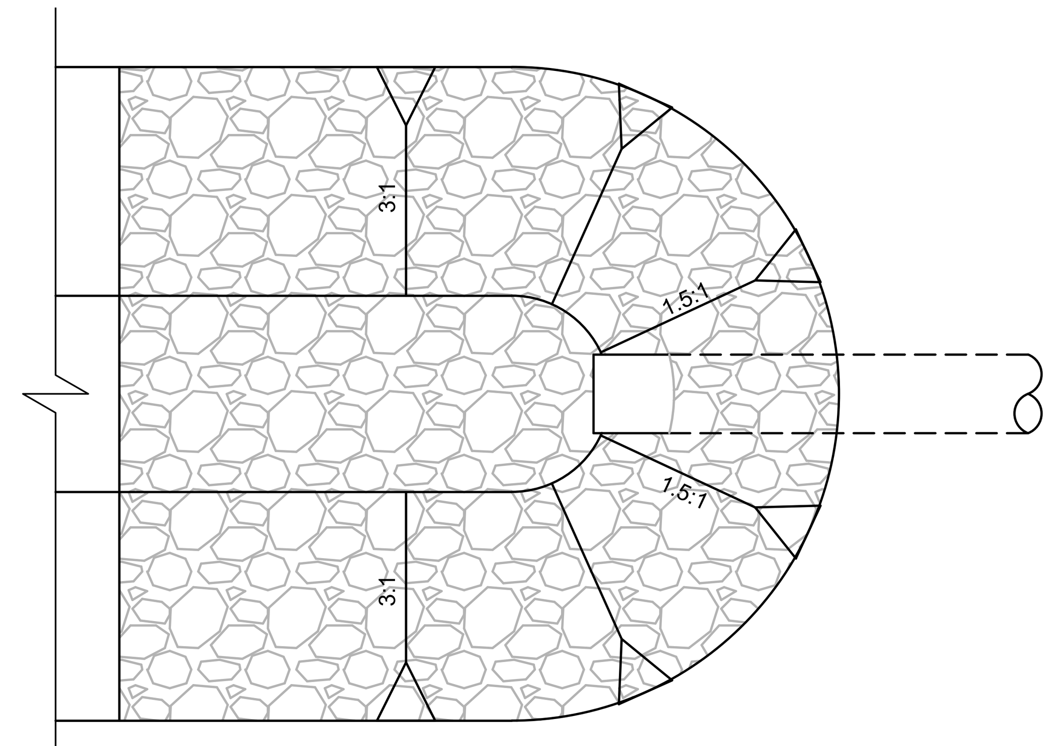


PLAN VIEW

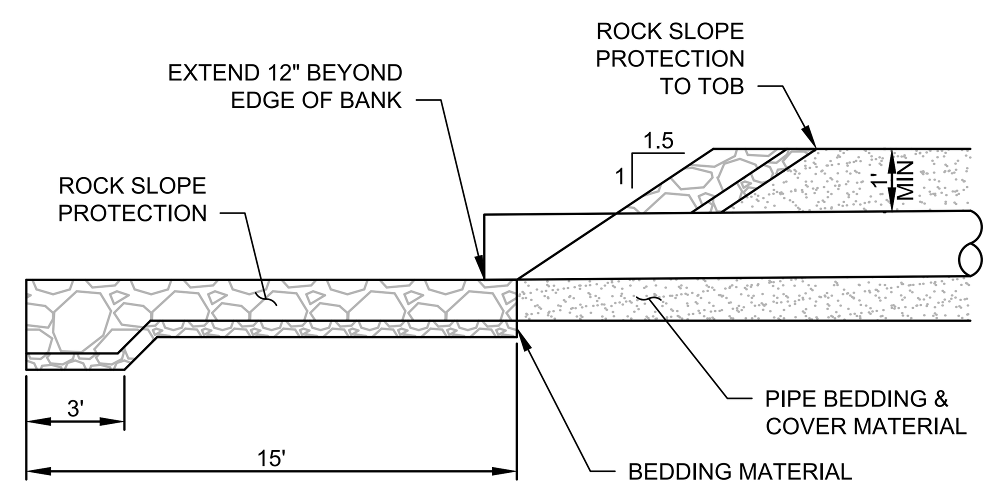


PROFILE VIEW

3 TYPICAL CULVERT INLET DETAIL
1"=5'

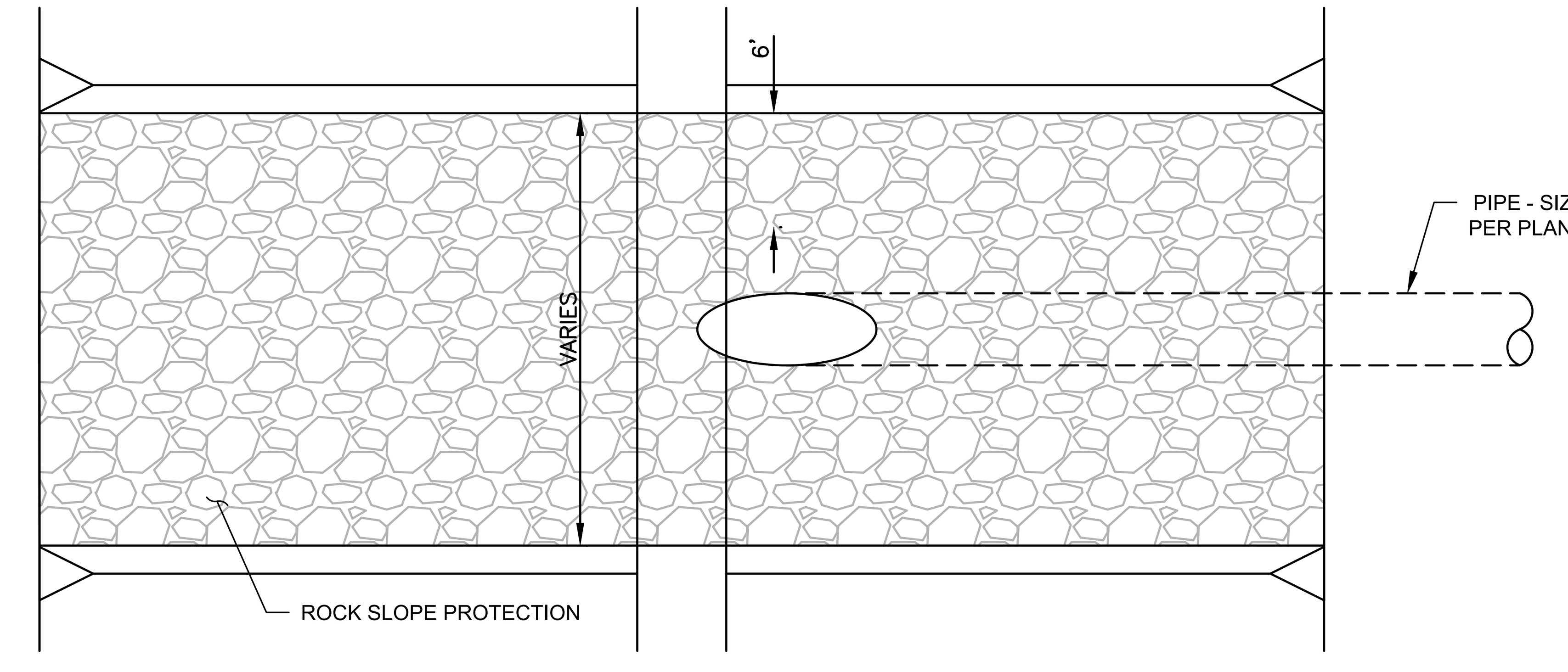


PLAN VIEW

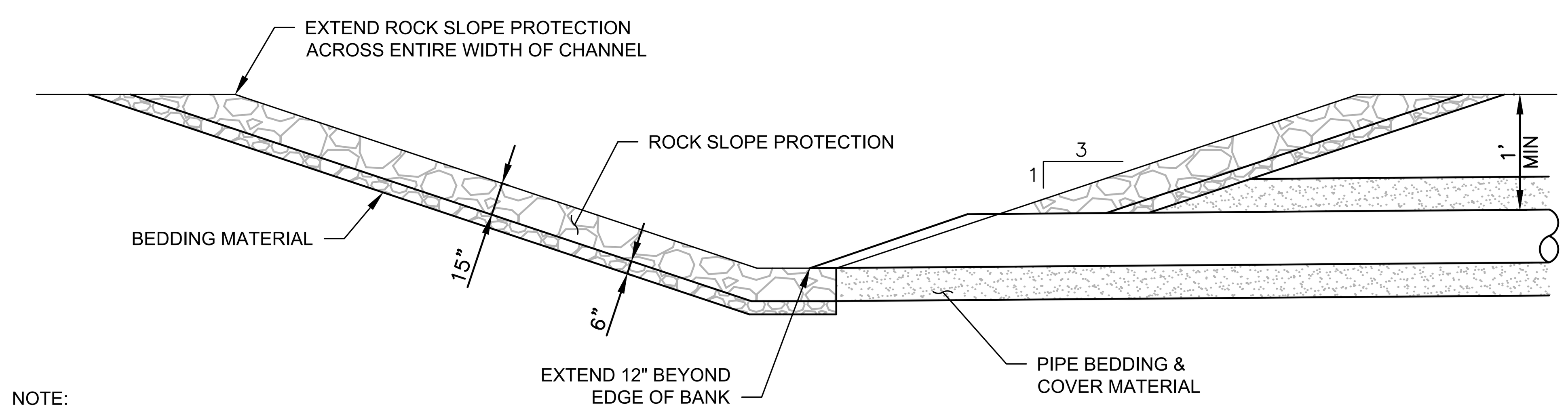


PROFILE VIEW

4 TYPICAL CULVERT OUTLET DETAIL
SCALE: 1"=5'



PLAN VIEW

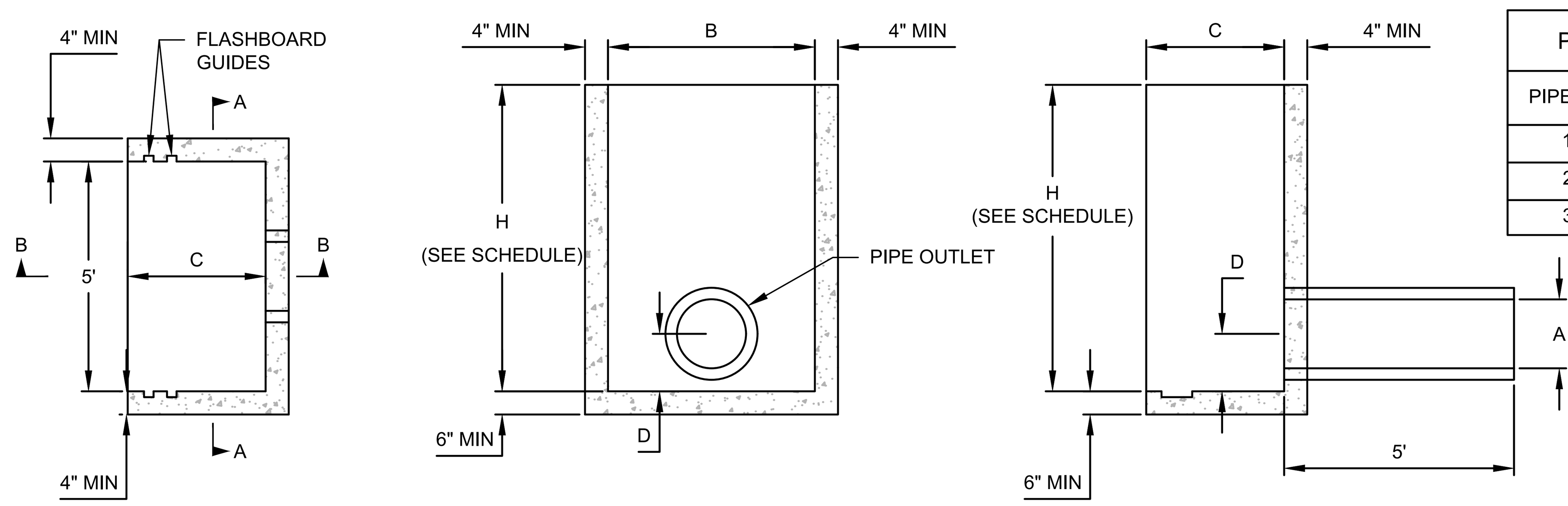


NOTE:

1. EXTEND ROCK SLOPE PROTECTION ACROSS ENTIRE WIDTH OF RECEIVING DITCH WHEN OUTLET IS PERPENDICULAR TO RECEIVING DITCH AND CHAMFER PIPE TO MATCH SLOPE

PROFILE VIEW

1 TYPICAL OUTLET DETAIL
1"=5'



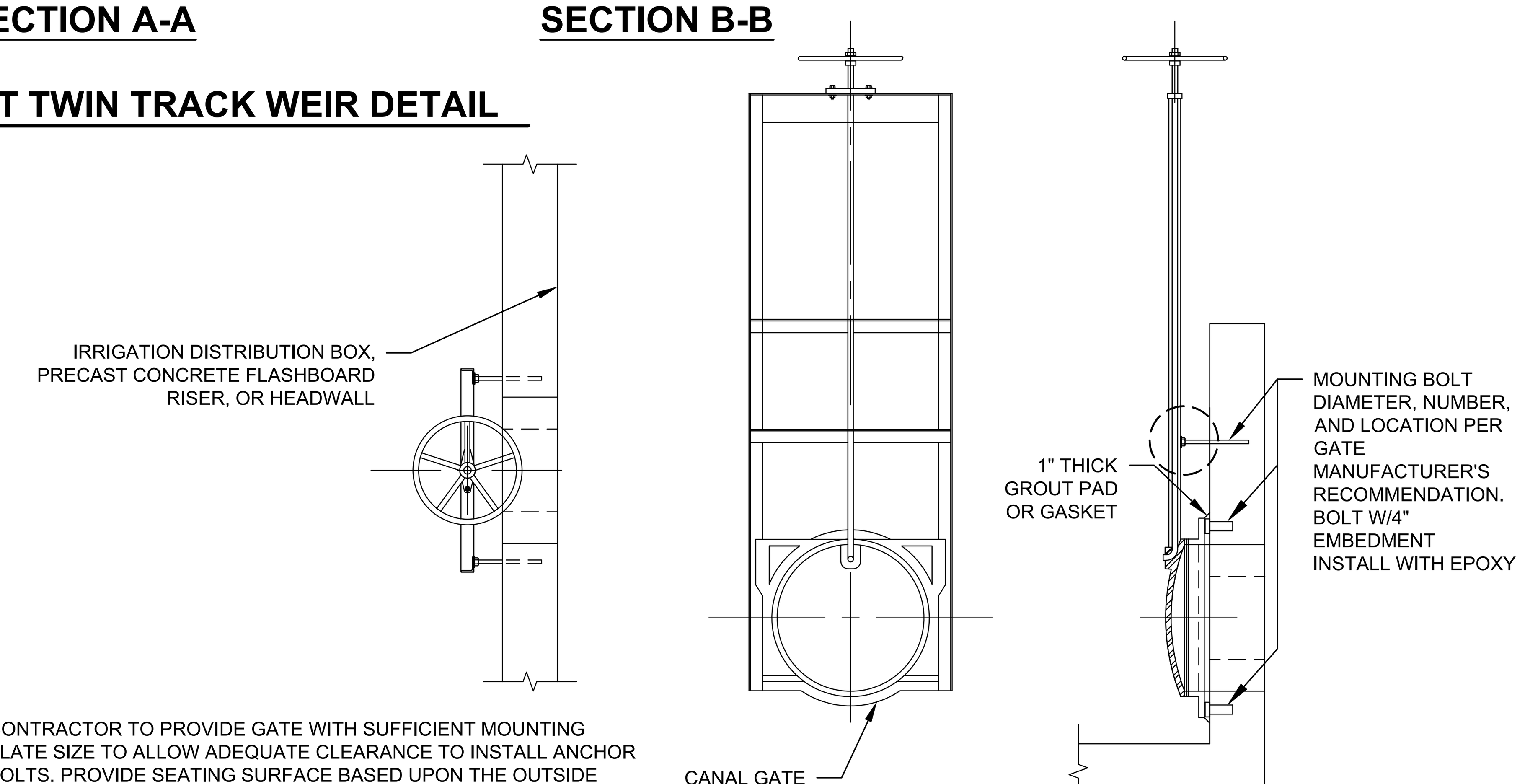
PLAN VIEW

SECTION A-A

SECTION B-B

PRECAST TWIN TRACK WEIR DIMENSIONS				
PIPE Ø (A)	B	C	D	NOMINAL SIZE
18"	3'	2'	10.75"	3' X H
24"	5'	3'	14.5"	5' X H
36"	5'	3'	21.5"	5' X H

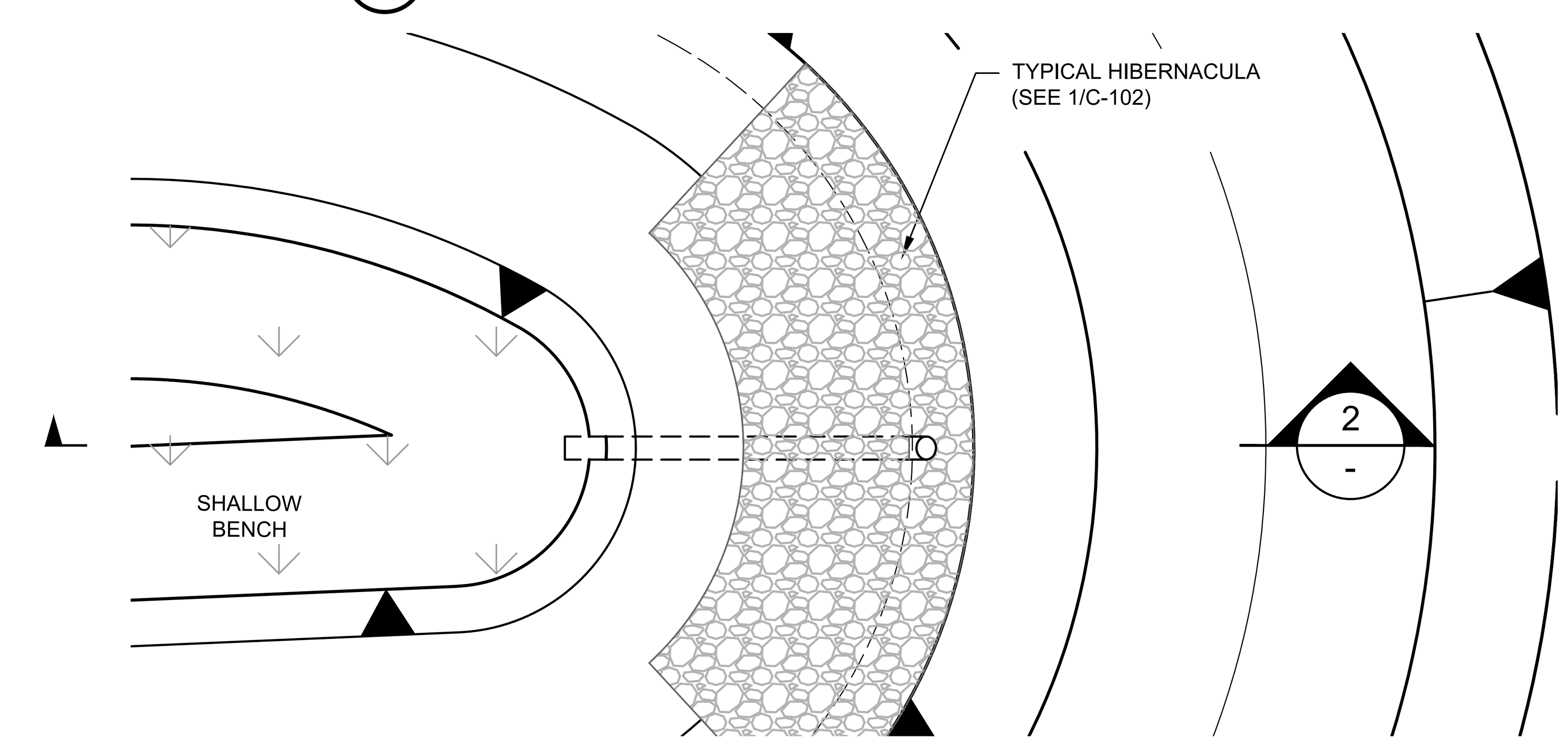
5 PRECAST TWIN TRACK WEIR DETAIL
4"=1'



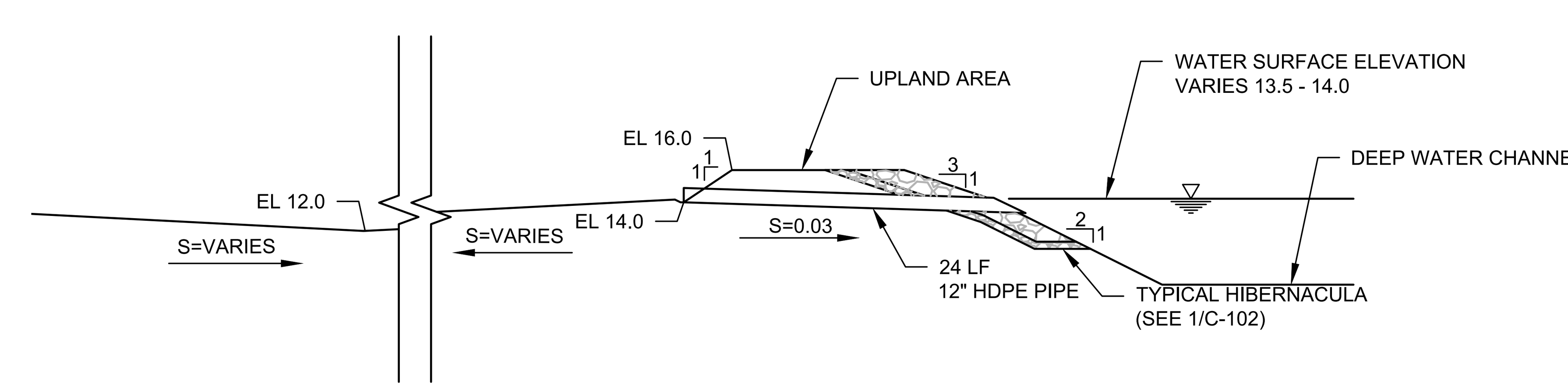
NOTE:

1. CONTRACTOR TO PROVIDE GATE WITH SUFFICIENT MOUNTING PLATE SIZE TO ALLOW ADEQUATE CLEARANCE TO INSTALL ANCHOR BOLTS. PROVIDE SEATING SURFACE BASED UPON THE OUTSIDE DIAMETER AT THE CAST IN PIPE STUB.

6 CANAL GATE DETAIL
1"=1'-0"



PLAN VIEW



PROFILE VIEW

2 UPLAND CULVERT CROSSING TO SHALLOW MARSH
1"=10'

US Army Corps of Engineers®

MARK | DESCRIPTION | DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-C103.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

TYPICAL DETAILS

SHEET ID

C-102

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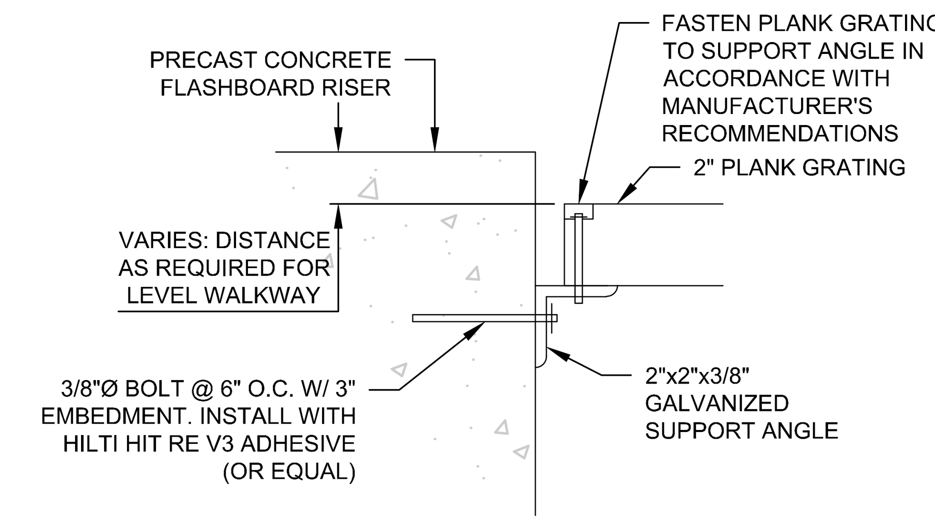
FINAL ISSUE FOR BID

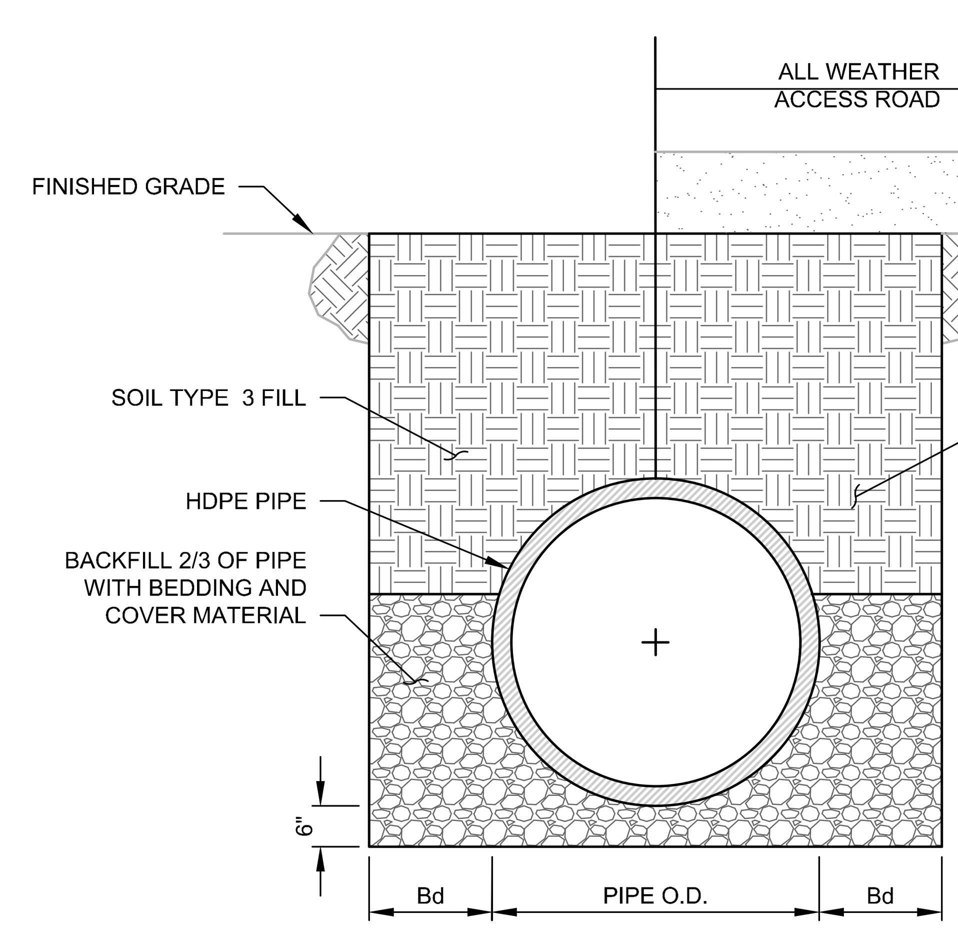
FLASHBOARD RISER TURNOUT OUTLET SCHEDULE							
DWG NO	INLET STATION	TURNOUT NAME	PIPE LENGTH (FT)	PIPE DIAMETER (IN)	PIPE MATERIAL	FLASHBOARD RISER HEIGHT (FT)	WALKWAY L (FT)
C-507	10+17.2	JOHNSON POD A	40'	24"	HDPE	6'	6.5'
C-507	16+15.1	JOHSNON POD B	40'	24"	HDPE	6'	6.5'
C-507	18+99.8	JOHNSON POD C	40'	24"	HDPE	6'	6.5'



2 WALKWAY SUPPORT DETAIL

3" = 1'-0"

0 3" 6" 9"

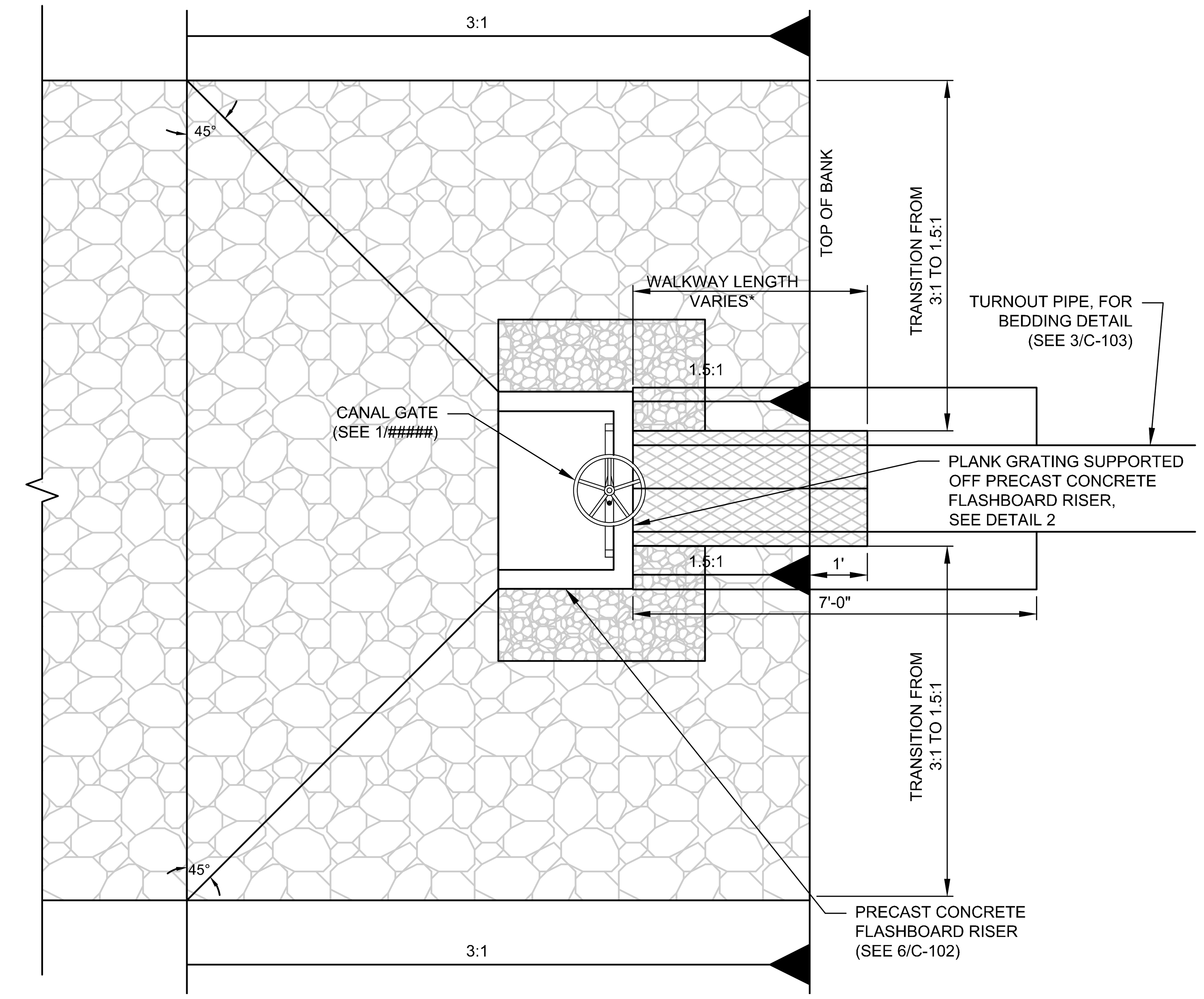


MINIMUM TRENCH WIDTHS	
NOMINAL PIPE OD, IN	MINIMUM TRENCH WIDTH, Bd, IN
<3	12 EA SIDE
3 - 16	PIPE OD + 12 EA SIDE
18 - 34	PIPE OD + 18 EA SIDE
36 - 63	PIPE OD + 24 EA SIDE
72 - 96	PIPE OD + 36 EA SIDE

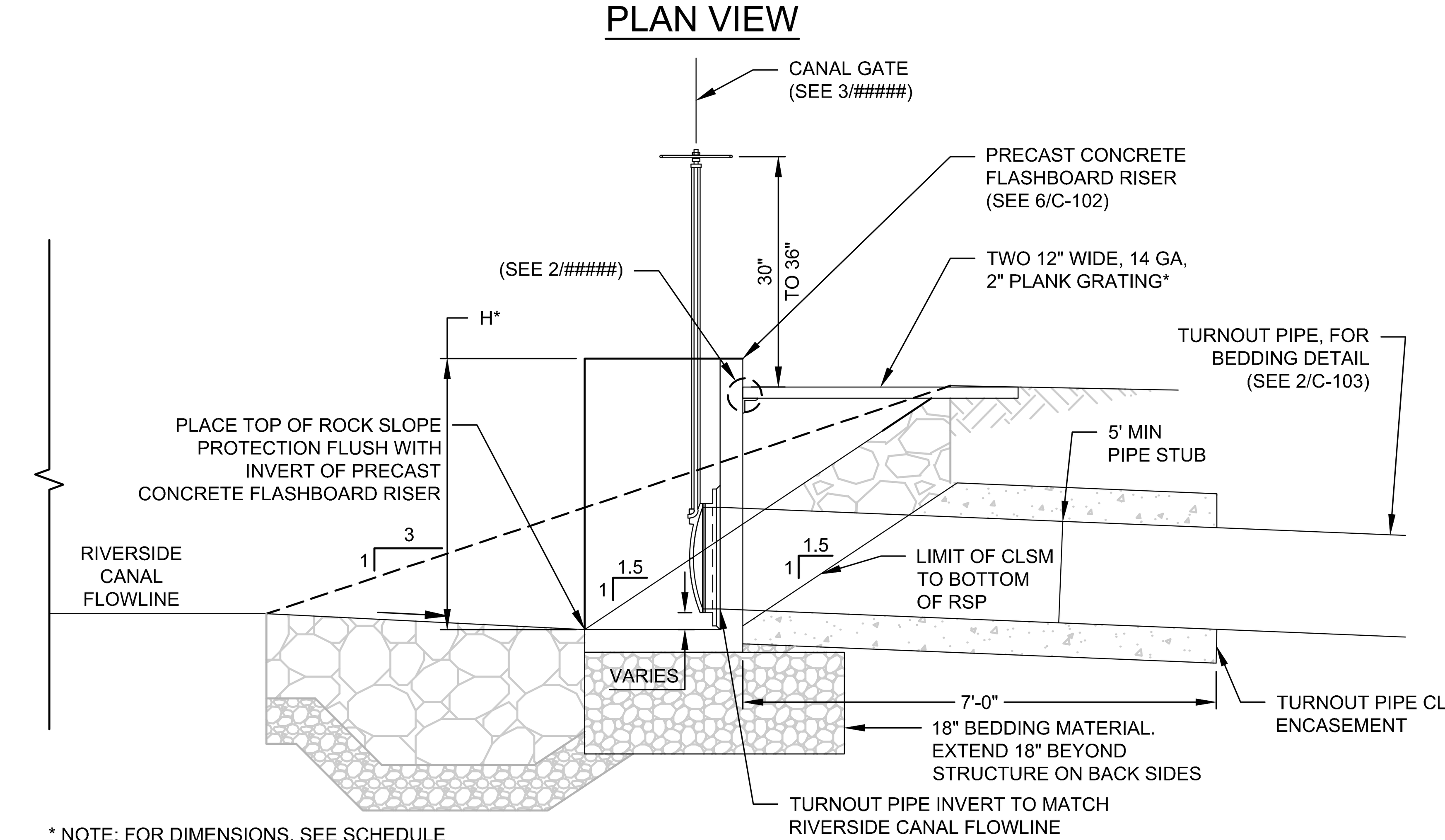
2 HDPE PIPE TRENCH DETAIL

1" = 2'

0 1 2 4



PLAN VIEW



* NOTE: FOR DIMENSIONS, SEE SCHEDULE ON SHEET C-103

ELEVATION

1 CANAL TURNOUT INLET DETAIL

1" = 2'

0 1 2 4

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-C104.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

TYPICAL CULVERT DETAIL

SHEET ID

C-103

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FINAL ISSUE FOR BID

1 **JOHNSON RANCH ALIGNMENTS**
1" =100'
0 50 100 200

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-C201.dwg

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

JOHNSON RANCH CONTROL ALIGNMENTS

SHEET ID
C-201

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FINAL ISSUE FOR BID

JOHNSON MARSH POD A ALIGNMENT CURVE DATA

CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C4	73.71'	117.44'	35° 57' 39"	38.12
C5	182.54'	45.00'	232° 24' 43"	91.43
C6	188.59'	47.00'	229° 54' 26"	101.01
C7	104.58'	117.00'	51° 12' 57"	56.08
C8	146.35'	50.00'	167° 42' 06"	464.10
C9	147.08'	44.00'	191° 31' 24"	436.07
C10	113.62'	111.00'	58° 38' 48"	62.35
C11	174.88'	67.00'	149° 32' 54"	246.16
C12	77.87'	61.00'	73° 08' 18"	45.25
C13	140.78'	52.00'	155° 06' 50"	235.66
C14	176.54'	49.00'	206° 25' 52"	208.66
C15	158.35'	52.00'	174° 28' 26"	1077.48
C16	152.42'	52.00'	167° 56' 47"	492.53
C17	163.27'	47.00'	199° 02' 23"	280.26
C18	152.50'	92.00'	94° 58' 28"	100.36
C19	110.83'	115.00'	55° 13' 07"	60.14
C20	183.17'	199.00'	52° 44' 20"	98.65
C21	274.13'	67.00'	234° 25' 30"	130.30
C22	146.50'	124.00'	67° 41' 33"	83.16
C23	300.19'	188.00'	91° 29' 14"	192.94
C24	150.45'	54.00'	159° 37' 48"	300.57
C25	36.24'	226.22'	9° 10' 39"	18.16
C26	79.96'	100.00'	45° 48' 59"	42.26
C27	16.42'	62.77'	14° 59' 07"	8.26
C28	111.05'	193.23'	32° 55' 44"	57.11
C29	214.03'	504.28'	24° 19' 02"	108.65
C30	108.99'	67.00'	93° 12' 03"	70.85

JOHNSON MARSH POD A ALIGNMENT LINE DATA

LINE NO.	LENGTH	BEARING
L14	127.90	N89° 54' 36.79"W
L15	10.00	N39° 29' 33.88"W
L16	60.00	N38° 37' 44.03"W
L17	54.51	S82° 13' 59.22"W
L18	35.78	N82° 46' 53.89"W
L19	82.36	N0° 33' 16.94"W

JOHNSON MARSH POD A ALIGNMENT POINT TABLE

POINT NO.	NORTHING	EASTING	DESCRIPTION
310	1994299.469	6688589.780	POB
311	1995002.440	6687904.362	POE

JOHNSON MARSH POD B ALIGNMENT CURVE DATA

CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C31	17.42'	40.00'	24° 56' 47"	8.85
C32	208.61'	105.02'	113° 48' 40"	161.14
C33	225.90'	145.00'	89° 15' 41"	143.14
C34	122.00'	101.00'	69° 12' 32"	69.69
C35	167.20'	61.01'	157° 01' 19"	300.17
C36	69.16'	69.96'	56° 38' 09"	37.70
C37	80.55'	33.91'	136° 05' 43"	84.14
C38	86.66'	62.25'	79° 45' 39"	52.01
C39	108.67'	89.00'	69° 57' 22"	62.27
C40	142.87'	211.00'	38° 47' 48"	74.30
C41	158.53'	182.00'	49° 54' 27"	84.69
C42	137.13'	53.00'	148° 14' 24"	186.30
C43	153.43'	96.00'	91° 34' 09"	98.67
C44	97.65'	51.13'	109° 25' 19"	72.25
C45	31.86'	41.39'	44° 06' 18"	16.77
C46	37.65'	41.39'	52° 07' 10"	20.24
C47	36.00'	41.39'	49° 49' 57"	19.23
C48	201.78'	75.98'	152° 09' 16"	306.50
C49	13.50'	109.26'	7° 04' 40"	6.76
C50	44.69'	47.90'	53° 26' 58"	24.12
C51	38.70'	107.40'	20° 38' 40"	19.56
C52	74.29'	107.40'	39° 37' 50"	38.70
C53	56.18'	66.00'	48° 46' 13"	29.92
C54	89.96'	36.00'	143° 10' 34"	108.14
C55	148.42'	107.00'	79° 28' 22"	88.95
C56	126.68'	45.26'	160° 22' 55"	261.77
C57	92.23'	43.00'	122° 53' 39"	79.02
C58	170.89'	45.00'	217° 34' 43"	132.27
C59	122.53'	36.00'	195° 00' 38"	273.25
C60	43.18'	63.20'	39° 08' 49"	22.47
C61	14.19'	16.84'	48° 17' 53"	7.55

JOHNSON MARSH POD B ALIGNMENT LINE DATA

LINE NO.	LENGTH	BEARING
L20	117.18	N0° 00' 00.00"E
L21	60.00	S89° 41' 56.25"W
L22	30.00	S78° 35' 17.15"W
L23	1.33	N70° 37' 24.90"E
L24	8.32	S57° 15' 25.25"E
L25	81.15	N76° 51' 53.92"E
L26	45.69	S82° 29' 25.66"E
L27	20.00	S27° 55' 37.44"E
L28	86.24	N0° 16' 44.41"W

JOHNSON MARSH POD B ALIGNMENT POINT TABLE

POINT NO.	NORTHING	EASTING	DESCRIPTION
312	1994554.014	6688653.860	POB
313	1995010.942	6689600.306	POE

JOHNSON MARSH POD C ALIGNMENT CURVE DATA

CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C62	81.91'	145.00'	32° 22' 00"	42.08
C63	185.88'	50.00'	212° 59' 52"	168.81
C64	72.45'	76.00'	54° 37' 15"	39.24
C65	123.74'	50.00'	141° 47' 43"	144.37
C66	173.61'	46.00'	216° 14' 27"	140.57
C67	112.32'	41.00'	156° 58' 08"	201.24
C68	148.37'	60.00'	141° 41' 04"	172.71
C69	117.98'	43.00'	157° 12' 04"	213.27
C70	234.33'	54.00'	248° 37' 36"	79.12
C71	146.58'	64.00'	131° 13' 36"	141.17
C72	96.82'	96.00'	57° 47' 08"	52.98
C73	186.89'	97.00'	110° 23' 27"	139.54
C74	209.79'	74.00'	162° 25' 48"	478.84
C75	265.47'	70.00'	217° 17' 35"	207.44
C76	176.47'	341.00'	29° 39' 04"	90.26
C77	135.92'	47.00'	165° 41' 35"	374.49
C78	227.10'	255.00'	51° 01' 40"	121.70
C79	117.15'	50.00'	134° 14' 34"	118.49
C80	77.84'	50.00'	89° 12' 06"	49.31

JOHNSON MARSH POD C ALIGNMENT LINE DATA

LINE NO.	LENGTH	BEARING
L29	104.36	S0° 50' 44.21"E
L30	29.54	N45° 41' 07.57"E
L31	100.00	S51° 47' 28.05"E
L32	20.00	S2° 30' 47.69"E
L33	69.02	S0° 50' 44.21"E
L34	124.80	N89° 57' 09.48"E

JOHNSON MARSH POD C ALIGNMENT POINT TABLE

POINT NO.	NORTHING	EASTING	DESCRIPTION
314	1994177.087	6688086.486	POB
315	1993377.617	6688632.987	POE

JOHNSON RANCH DITCH 1 ALIGNMENT LINE DATA

LINE NO.	LENGTH	BEARING
L1	135.14	N80° 27' 33.36"E
L2	535.84	N89° 26' 43.06"E
L3	1870.06	N89° 42' 46.02"E

JOHNSON RANCH DITCH 1 ALIGNMENT POINT TABLE

POINT NO.	NORTHING	EASTING	DESCRIPTION
316	1994974.264	6687117.773	POB
317	1995011.225	6689656.875	POE

JOHNSON RANCH DITCH 2 ALIGNMENT CURVE DATA

CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C1	104.72'	66.56'	90° 08' 22"	66.72
C2	128.34'	81.50'	90° 13' 41"	81.82

JOHNSON RANCH DITCH 2 ALIGNMENT POINT TABLE

POINT NO.	NORTHING	EASTING	DESCRIPTION
318	1995003.205	6687771.808	POB
319	1994553.785	6689730.352	POE

JOHNSON RANCH DITCH 2 ALIGNMENT LINE DATA

LINE NO.	LENGTH	BEARING
L4	64.02	S16° 31' 43.17"E
L5	774.69	S8° 45' 43.78"E
L6	69.93	N89° 10' 03.95"E
L7	542.52	S89° 56' 38.25"E
L8	232.33	N0° 11' 33.30"W
L9	989.08	S89° 57' 52.75"E
L10	70.51	S89° 59' 06.52"E

JOHNSON RANCH DITCH 3 ALIGNMENT CURVE DATA

CURVE NO.	LENGTH	RADIUS	DELTA	TANGENT
C3	71.34'	45.30'	90° 13' 41"	45.48

JOHNSON RANCH DITCH 3 ALIGNMENT POINT TABLE

POINT NO.	NORTHING	EASTING	DESCRIPTION
320	1993351.648	6688633.074	POB
321	1994513.683	6689730.386	POE

JOHNSON RANCH DITCH 3 ALIGNMENT LINE DATA

LINE NO.	LENGTH	BEARING
L11	1117.20	N0° 11' 33.30"W
L12	982.21	S89° 57' 52.75"E
L13	73.53	S89° 58' 56.58"E

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

DESIGNED BY: C. STEPPER	ISSUE DATE: 05/09/2019
DRAWN BY: E. DIOCSON	SOLICITATION NO.:
CHECKED BY: S. SULLIVAN	CONTRACT NO.:
SUBMITTED BY: J. KASHIWADA	FILE NO: 1-04-0642
SIZE: ANSI D / SPEC NO: 2122	FILE NAME: 1-04-0642-C201.dwg

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

JOHNSON RANCH CONTROL ALIGNMENT TABLES

SHEET ID
C-202

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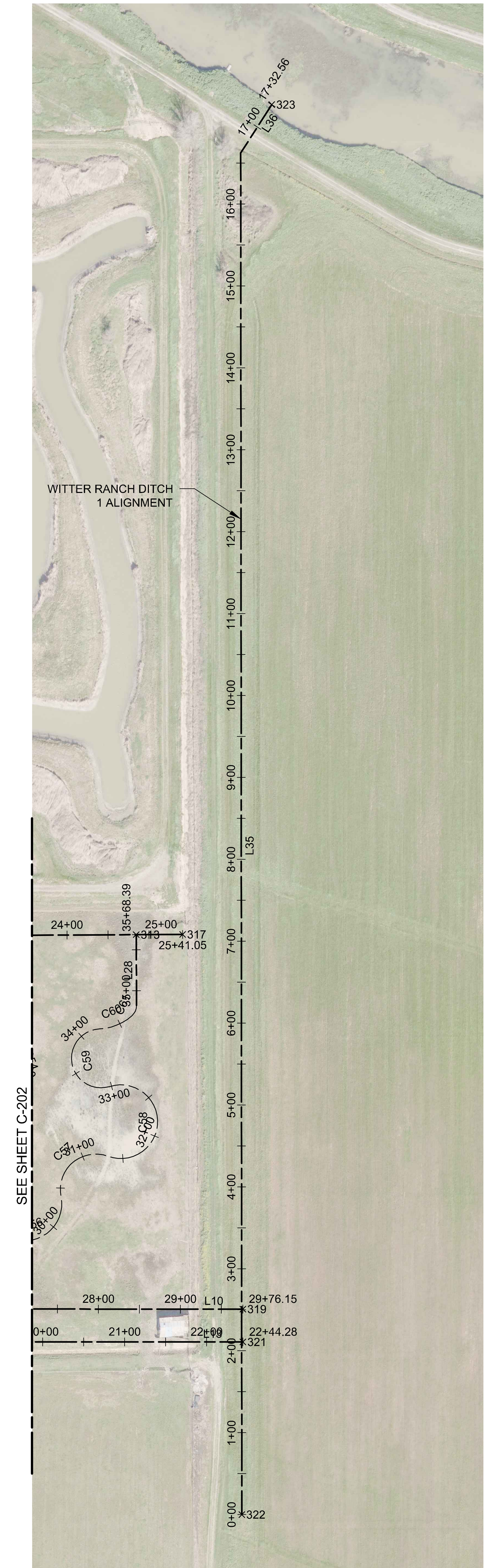

1 **WITTER RANCH ALIGNMENT**
1" =100'
0 50 100 200

WHITTER RANCH DITCH 1 ALIGNMENT LINE DATA		
LINE NO.	LENGTH	BEARING
L35	1662.34	N0° 02' 50.50"W
L36	70.22	N32° 42' 08.37"E

WHITTER RANCH DITCH 1 ALIGNMENT POINT TABLE			
POINT NO.	NORTHING	EASTING	DESCRIPTION
322	1994302.892	6689729.058	POB
323	1996024.324	6689765.622	POE

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SUBMITTED BY: J. KASHIWADA
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SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

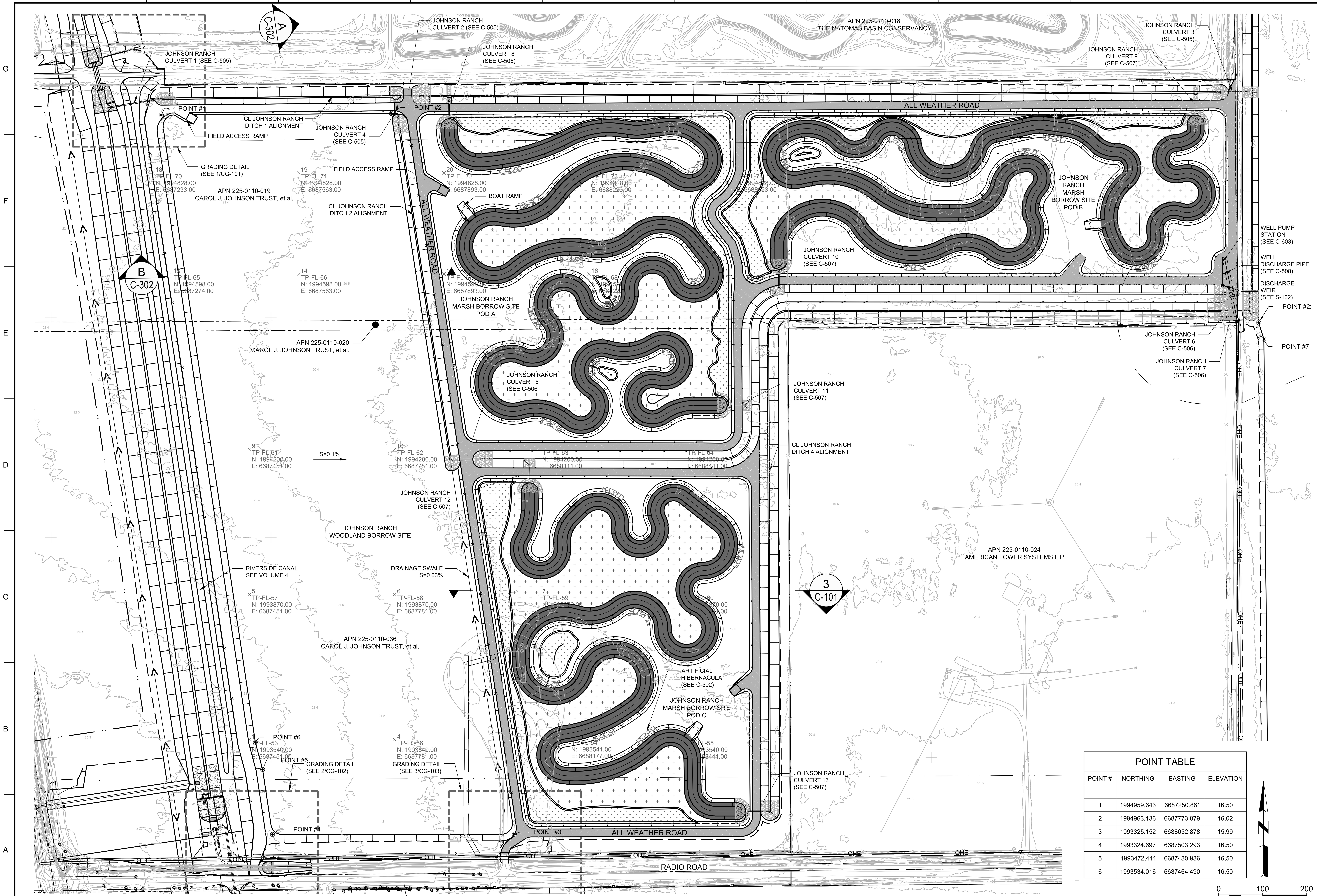
MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

WITTER RANCH CONTROL ALIGNMENTS

SHEET ID

C-203



POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
1	1994959.643	6687250.861	16.50
2	1994963.136	6687773.079	16.02
3	1993325.152	6688052.878	15.99
4	1993324.697	6687503.293	16.50
5	1993472.441	6687480.986	16.50
6	1993534.016	6687464.490	16.50

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DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-CG601.dwg

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180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

JOHNSON RANCH SITE PLAN

SHEET ID

C-301

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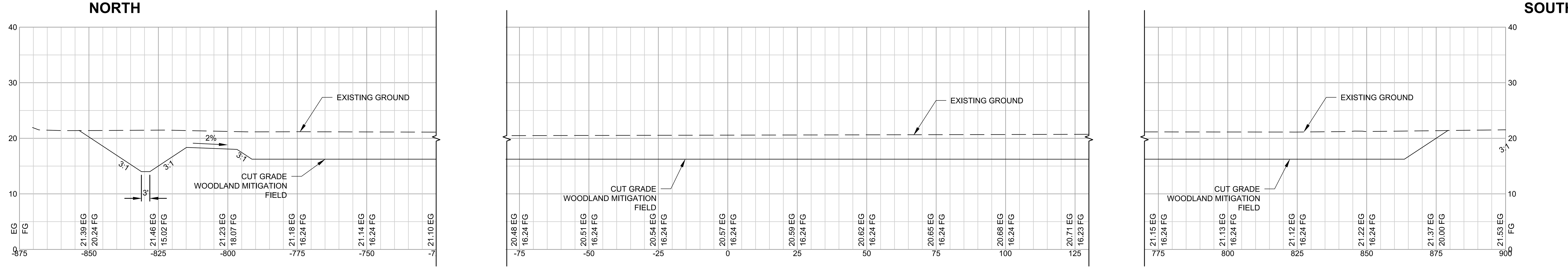
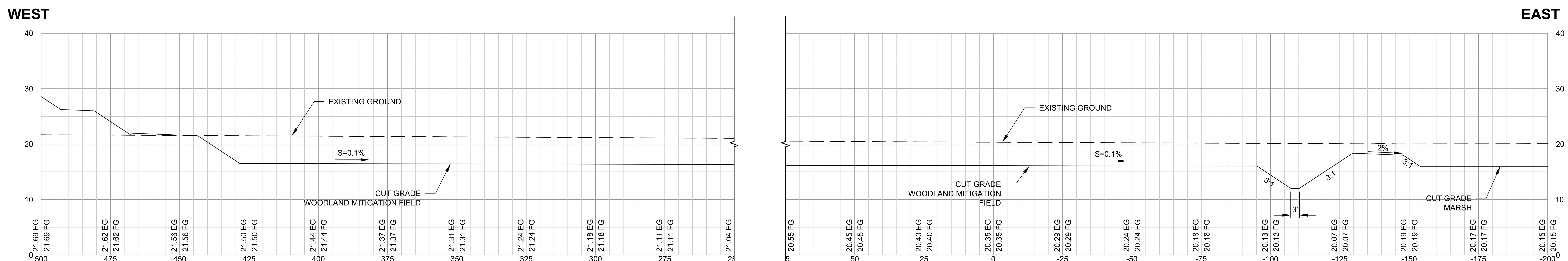


JOHNSON RANCH WOODLAND MITIGATION AREA
(A) NORTH-SOUTH SECTION

1" = 20' HORZ. SCALE
1" = 10' VERT. SCALE

0 10 20 40



JOHNSON RANCH WOODLAND MITIGATION AREA
(B) WEST-EAST SECTION

1" = 20' HORZ. SCALE
1" = 10' VERT. SCALE

0 10 20 40

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DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-CG604.dwg

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180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

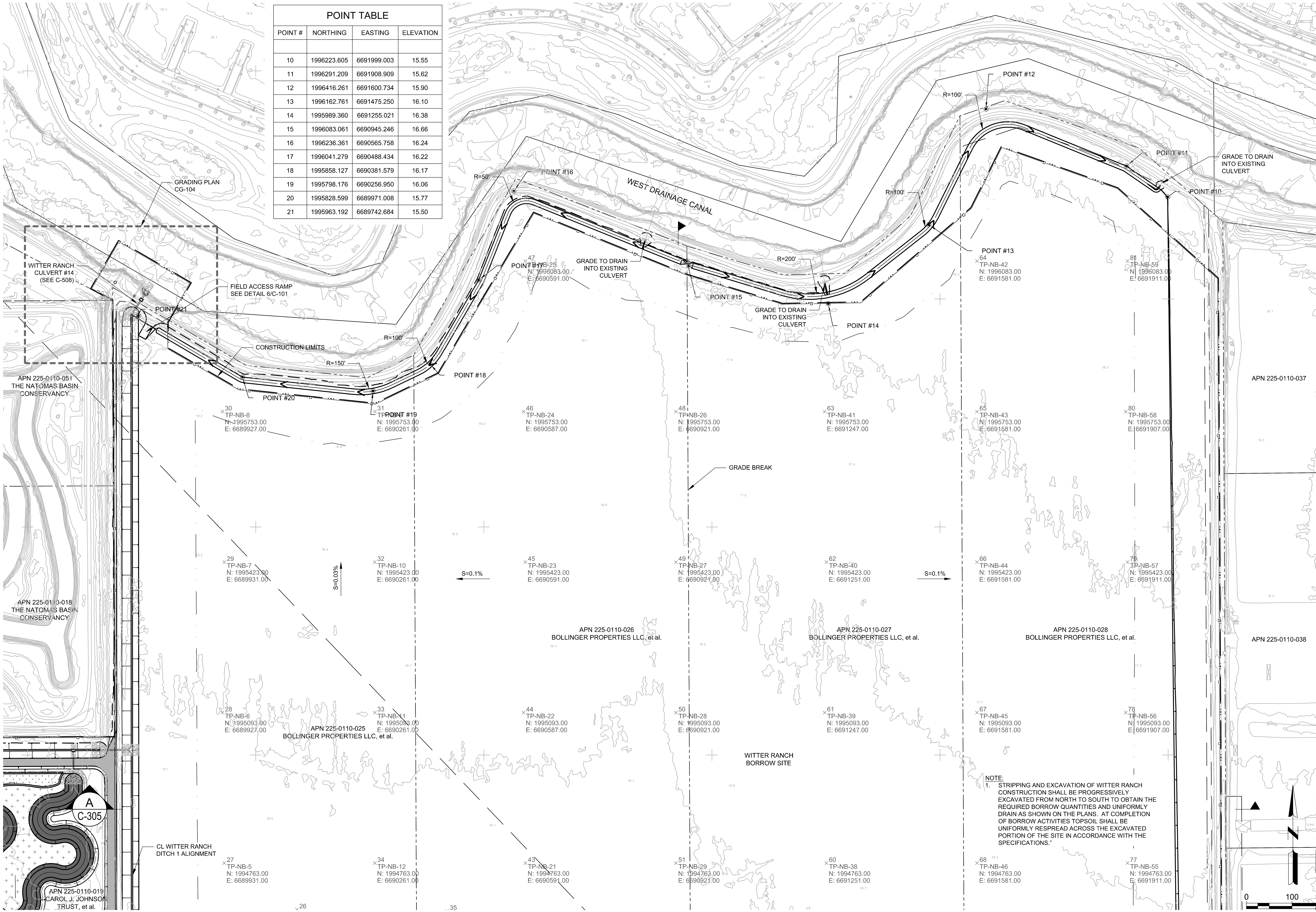
AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

JOHNSON RANCH SECTIONS

SHEET ID
C-302

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
10	1996223.605	6691999.003	15.55
11	1996291.209	6691908.909	15.62
12	1996416.261	6691600.734	15.90
13	1996162.761	6691475.250	16.10
14	1995989.360	6691255.021	16.38
15	1996083.061	6690945.246	16.66
16	1996236.361	6690565.758	16.24
17	1996041.279	6690488.434	16.22
18	1995858.127	6690381.579	16.17
19	1995798.176	6690256.950	16.06
20	1995828.599	6689971.008	15.77
21	1995963.192	6689742.684	15.50



NOTE:
1. STRIPPING AND EXCAVATION OF WITTER RANCH CONSTRUCTION SHALL BE PROGRESSIVELY EXCAVATED FROM NORTH TO SOUTH TO OBTAIN THE REQUIRED BORROW QUANTITIES AND UNIFORMLY DRAIN AS SHOWN ON THE PLANS. AT COMPLETION OF BORROW ACTIVITIES TOPSOIL SHALL BE UNIFORMLY RESPREAD ACROSS THE EXCAVATED PORTION OF THE SITE IN ACCORDANCE WITH THE SPECIFICATIONS."

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DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

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SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

WITTER RANCH SITE PLAN

SHEET ID
C-303

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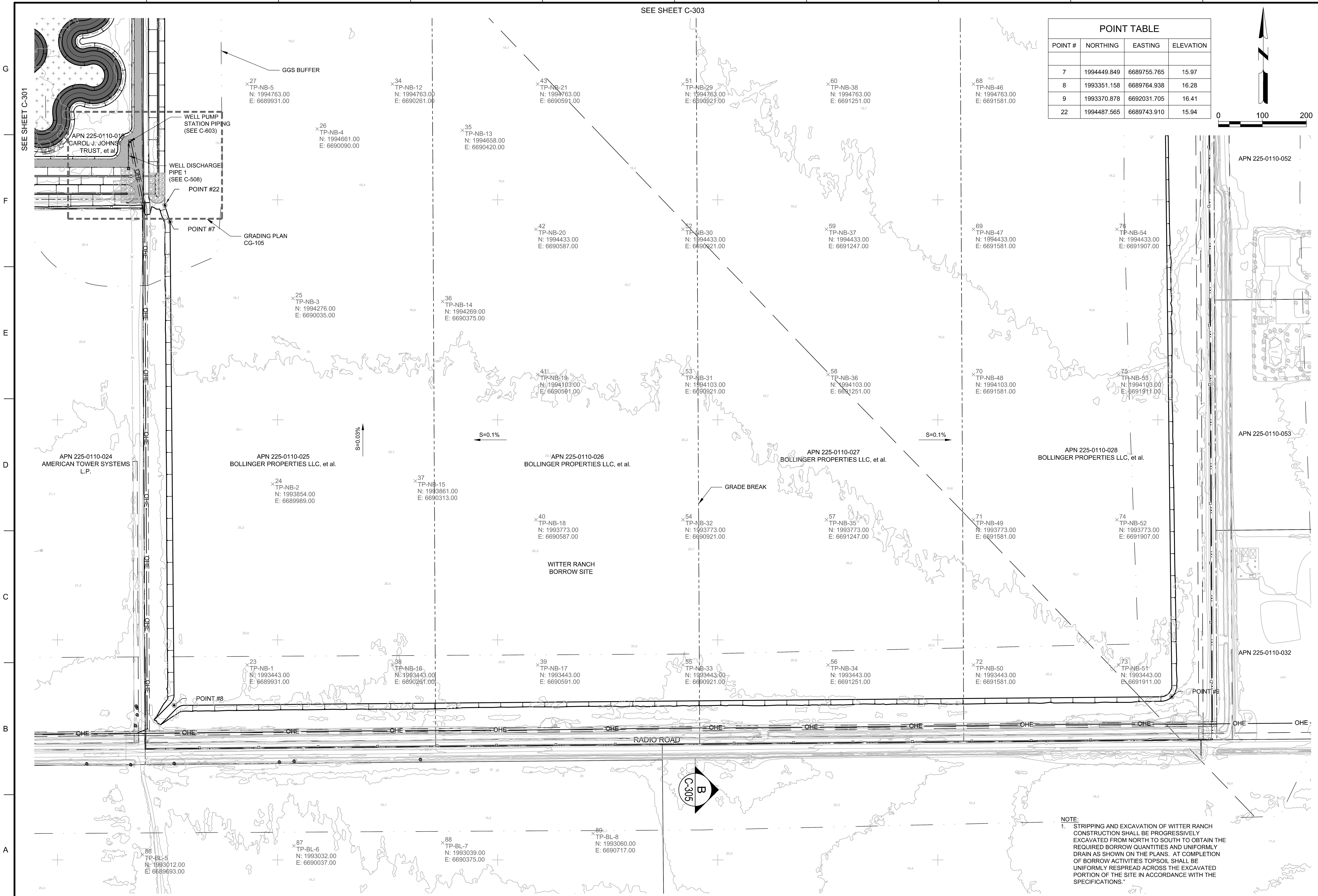

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
7	1994449.849	6689755.765	15.97
8	1993351.158	6689764.938	16.28
9	1993370.878	6692031.705	16.41
22	1994487.565	6689743.910	15.94

NOTE:
1. STRIPPING AND EXCAVATION OF WITTER RANCH CONSTRUCTION SHALL BE PROGRESSIVELY EXCAVATED FROM NORTH TO SOUTH TO OBTAIN THE REQUIRED BORROW QUANTITIES AND UNIFORMLY DRAIN AS SHOWN ON THE PLANS. AT COMPLETION OF BORROW ACTIVITIES TOPSOIL SHALL BE UNIFORMLY RESPREAD ACROSS THE EXCAVATED PORTION OF THE SITE IN ACCORDANCE WITH THE SPECIFICATIONS."

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MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
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MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

DESIGNED BY: C. STEPPER		ISSUE DATE: 05/09/2019
DRAWN BY: E. DIOCSON		SOLICITATION NO.:
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SUBMITTED BY: J. KASHIWADA		FILE NO: 1-04-0642
SIZE: ANSI D	SPEC NO: 2122	FILE NAME: 1-04-0642-CG603.dwg

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

WITTER RANCH SITE PLAN

SHEET ID
C-304

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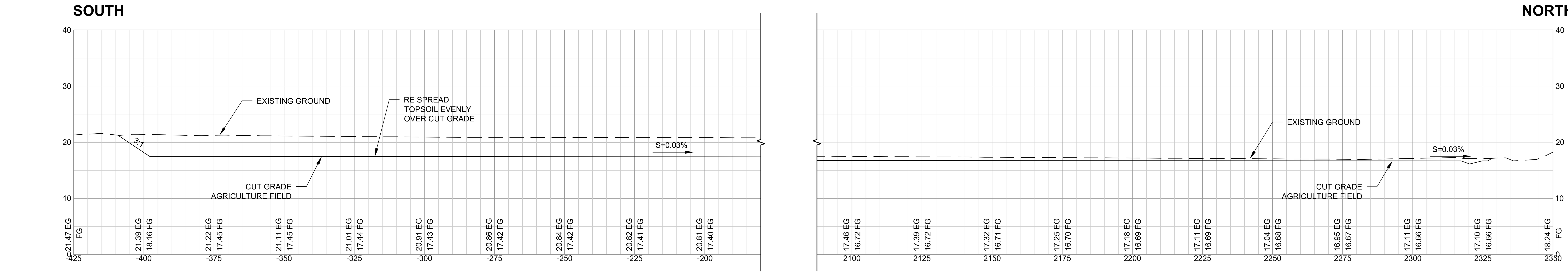
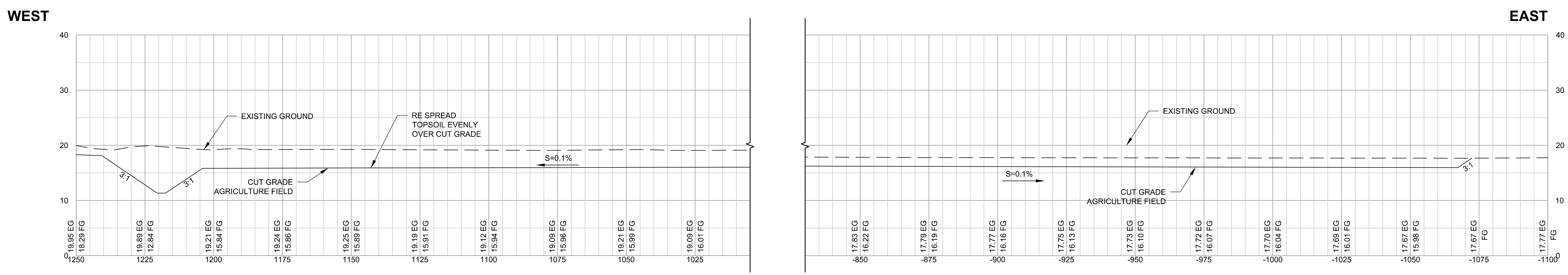


WITTER RANCH AGRICULTURE AREA
NORTH-SOUTH SECTION

B

1" = 20' HORZ. SCALE
1" = 10' VERT. SCALE

0 10 20 40



WITTER RANCH AGRICULTURE AREA
WEST-EAST SECTION

A

1" = 20' HORZ. SCALE
1" = 10' VERT. SCALE

0 10 20 40

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SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

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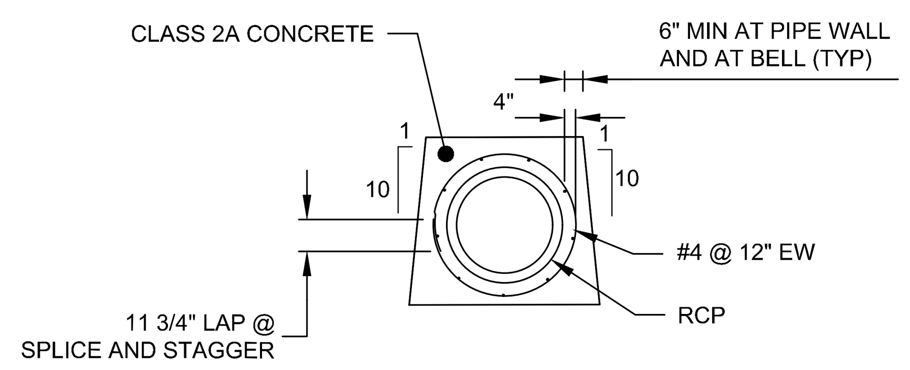
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

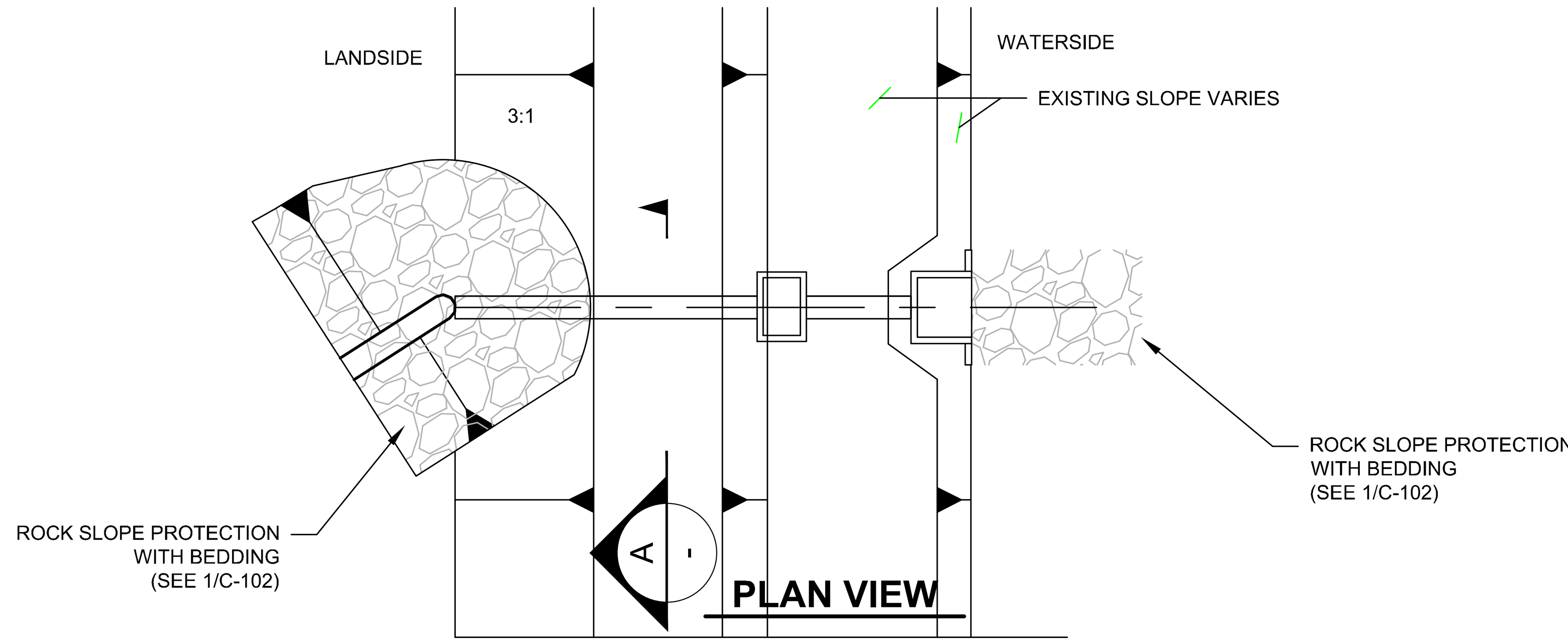
WITTER RANCH SECTIONS

SHEET ID
C-305

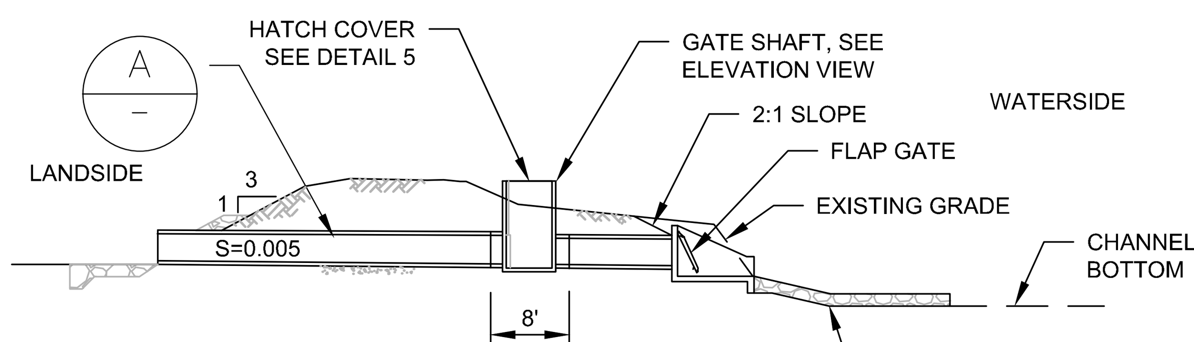


NOTES:
1. TWO PIPES ARE SIMILAR.
2. THE 1:10 BATTER OF THE ENCASED WALLS IS NOT NECESSARY WHERE THE TRENCH IS BACKFIELD WITH CONCRETE.

A SECTION
NOT TO SCALE

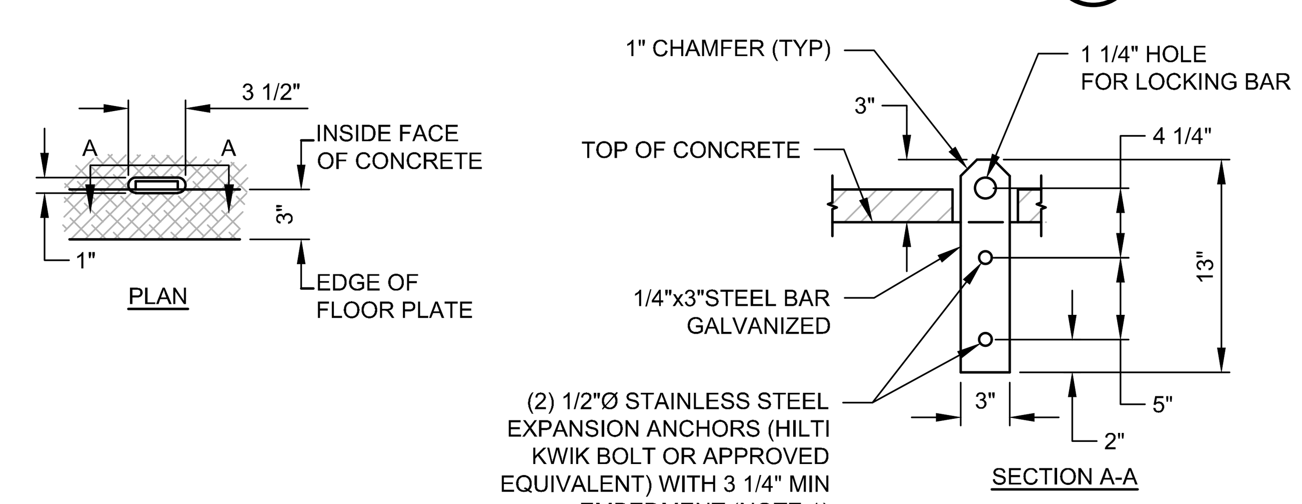


PLAN VIEW



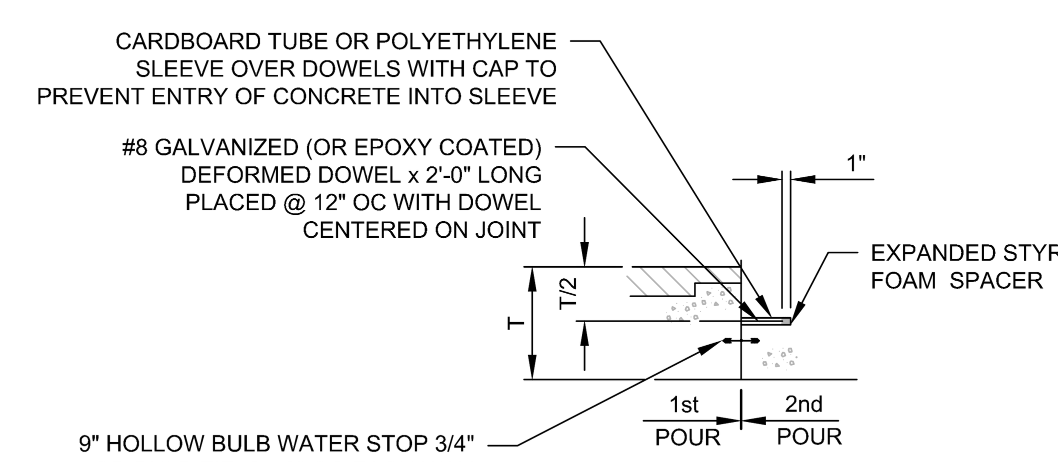
ELEVATION VIEW

1 TYPICAL CROSS CULVERT DETAIL
NOT TO SCALE

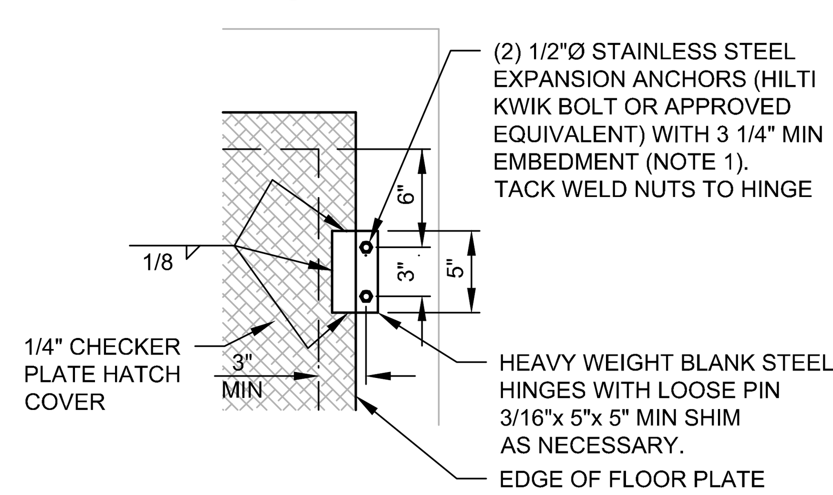


NOTE:
1. ISOLATE DISSIMILAR METALS WITH BITUMINOUS COATING.

7 DETAIL
1"=10'

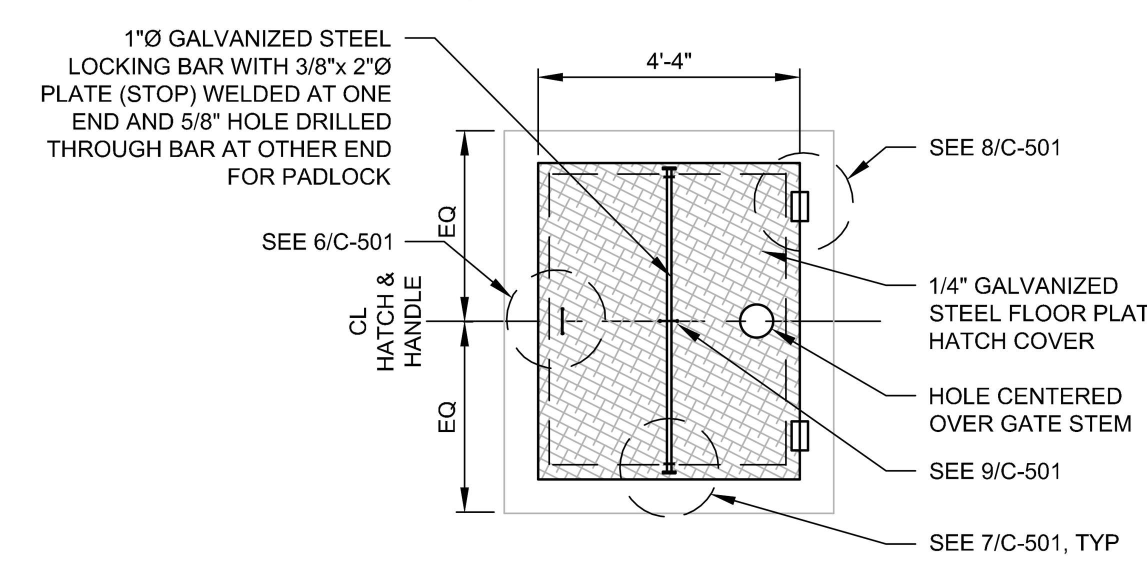


4 DETAIL
1"=10"

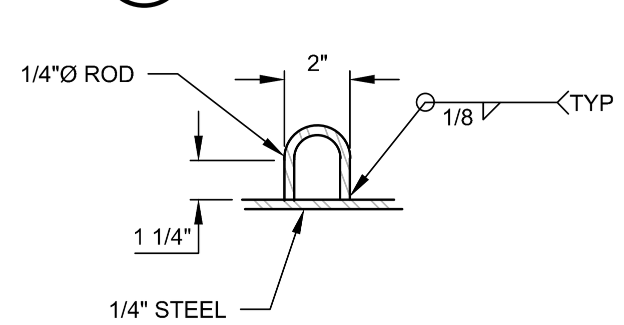


NOTE:
1. ISOLATE DISSIMILAR METALS WITH BITUMINOUS COATING.

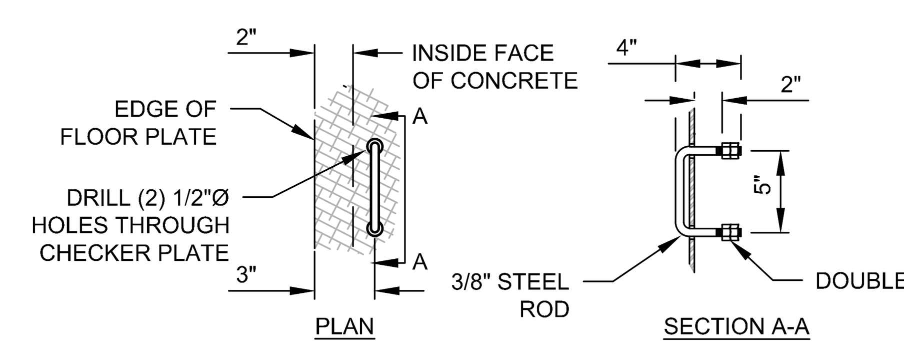
8 DETAIL
1"=10'



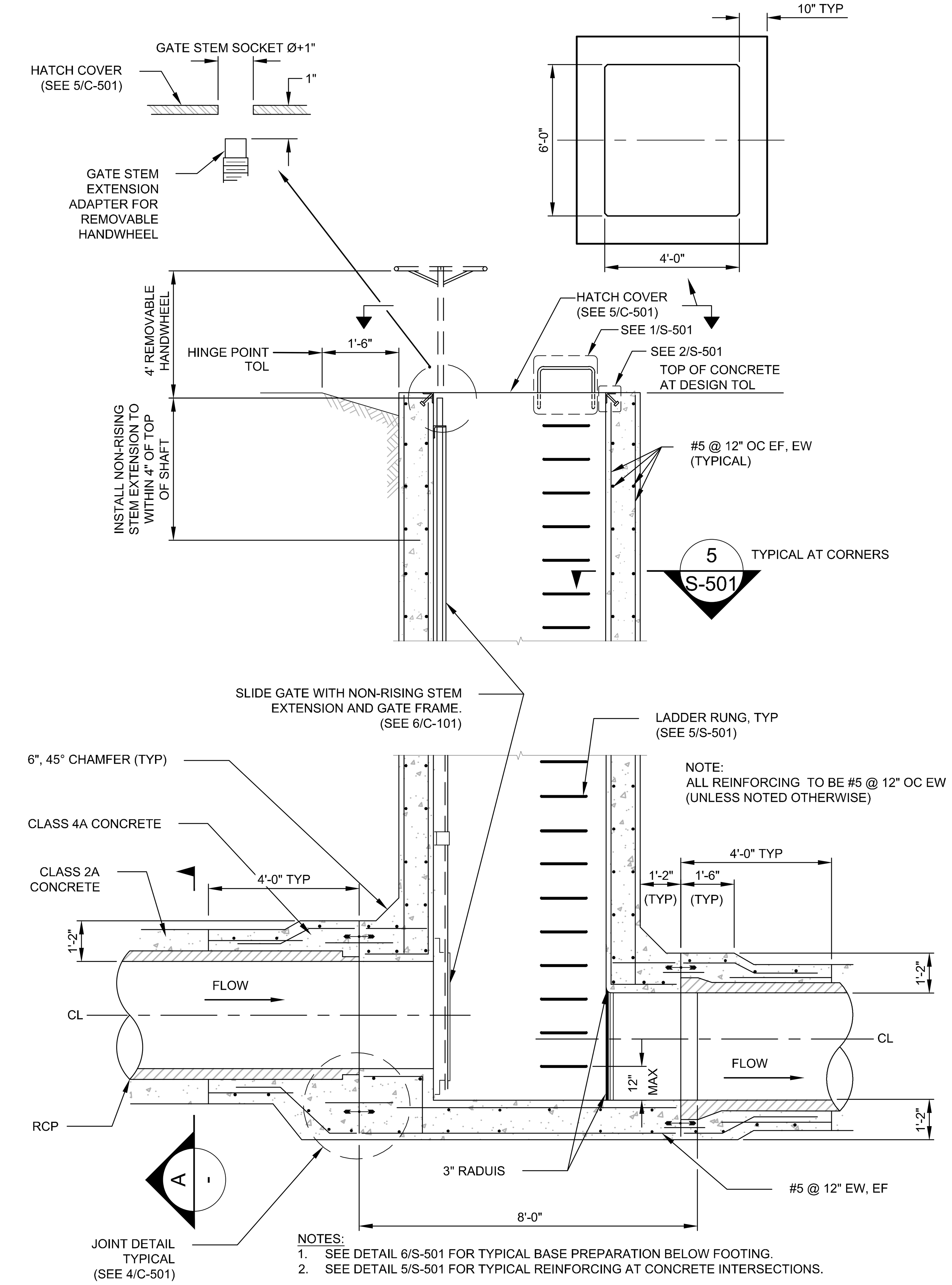
5 HATCH COVER DETAIL
1"=30'



9 DETAIL
1"=5'

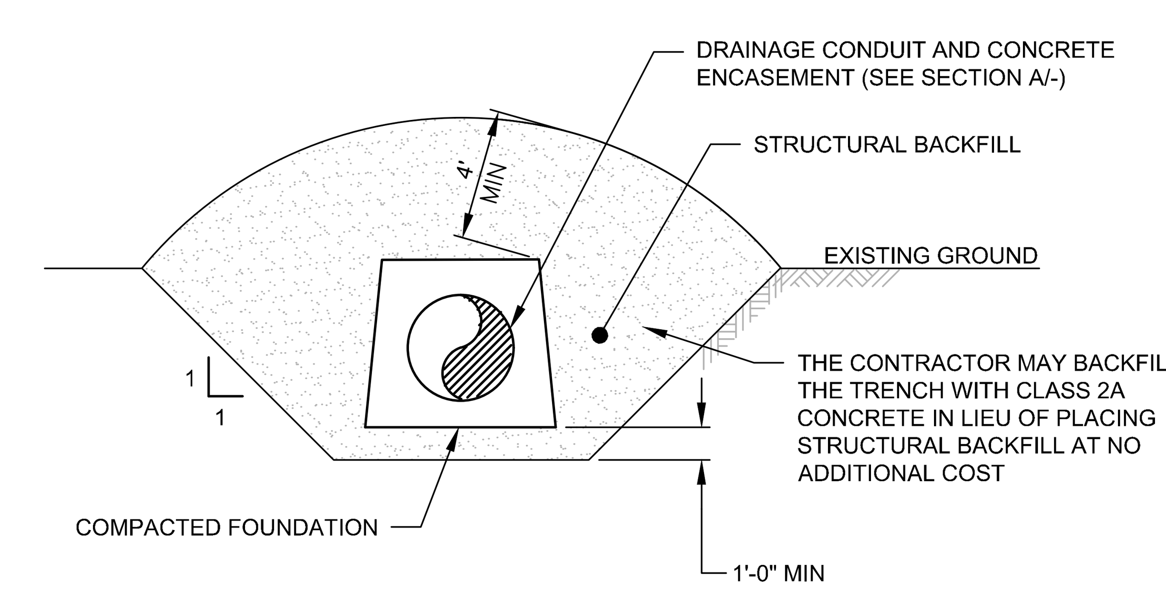


6 DETAIL
1"=10'



NOTES:
1. SEE DETAIL 6/S-501 FOR TYPICAL BASE PREPARATION BELOW FOOTING.
2. SEE DETAIL 5/S-501 FOR TYPICAL REINFORCING AT CONCRETE INTERSECTIONS.

2 GATE SHAFT ELEVATION VIEW
NOT TO SCALE



NOTE: TWO PIPES ARE SIMILAR

3 BACKFILL DETAIL OF RCP CULVERT THROUGH LEVEE
1"=60"

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
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FILE NAME: 1-04-0642-C102.dwg

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DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

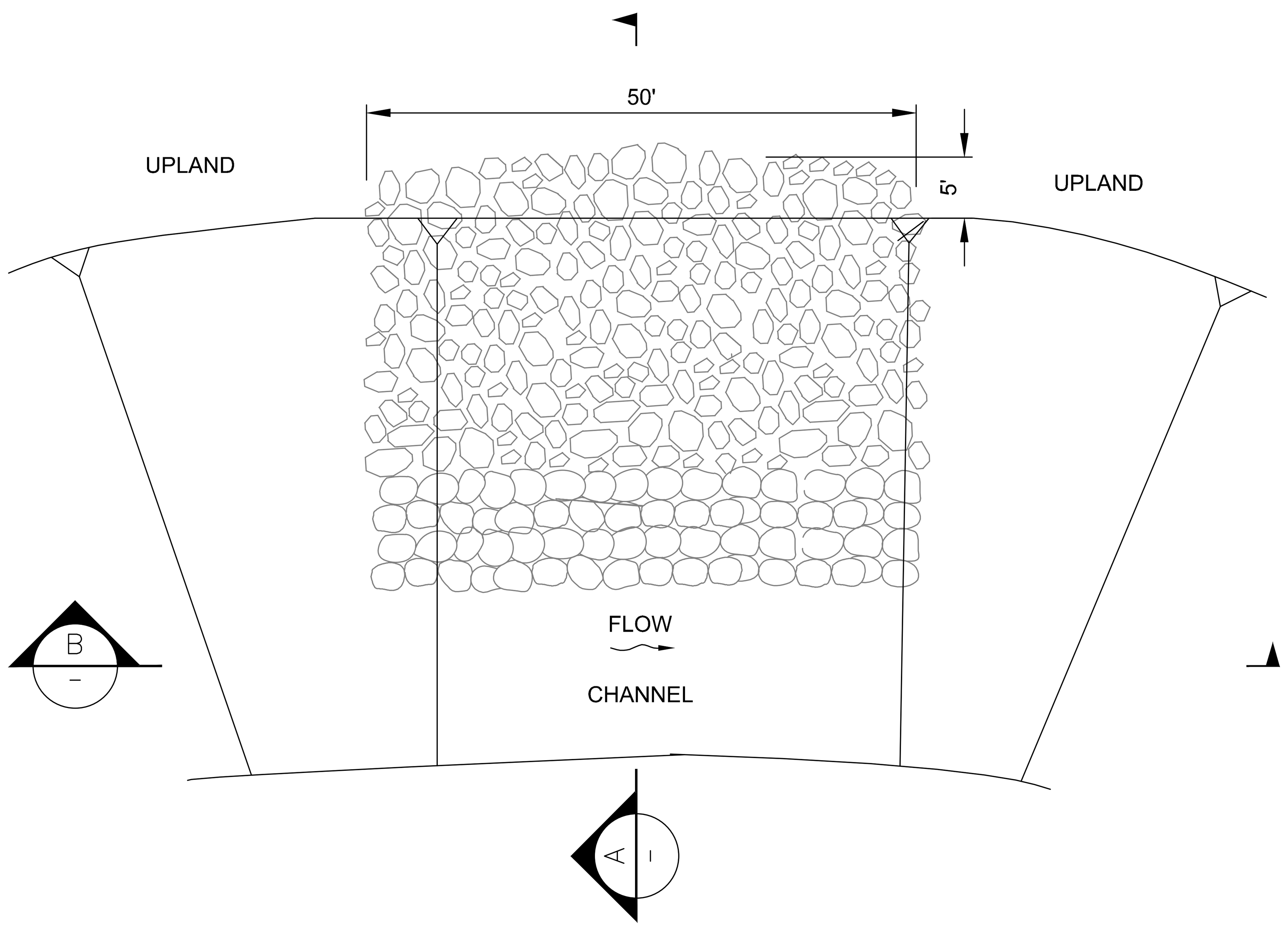
U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

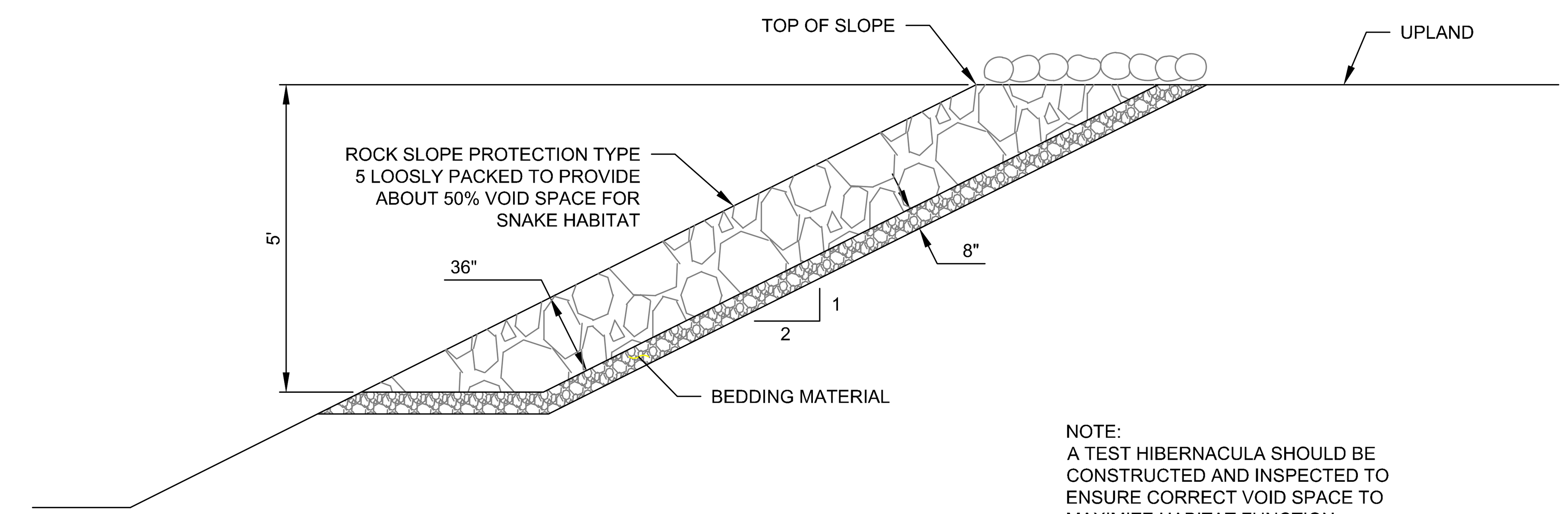
AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

LEVEE CROSS CULVERT DETAILS

SHEET ID
C-501

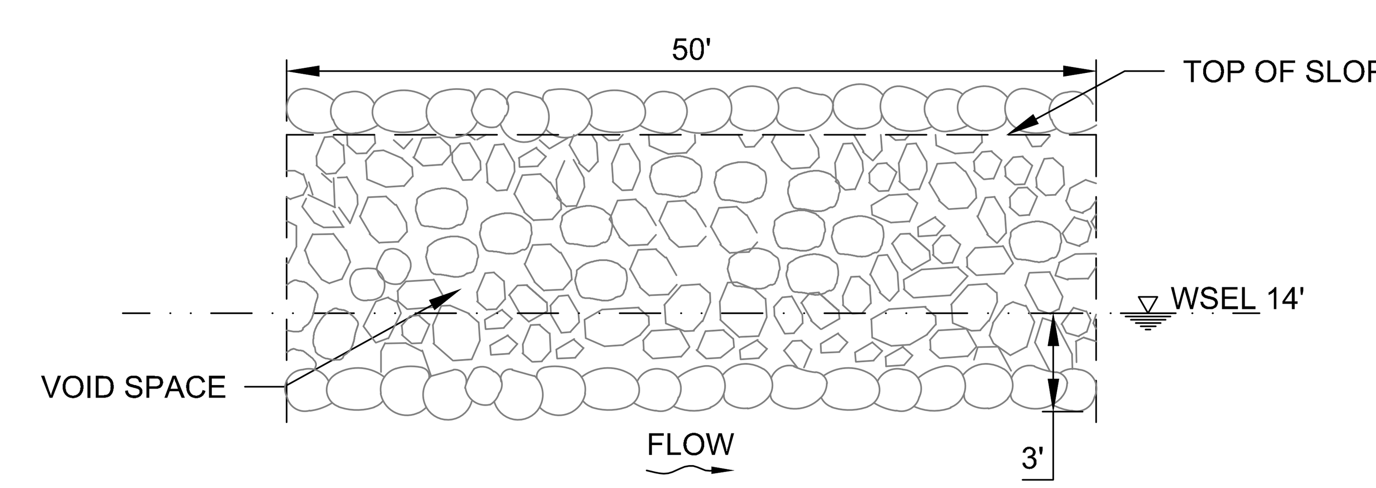


1 **ARTIFICIAL HIBERNACULA**
NOT TO SCALE



NOTE:
A TEST HIBERNACULA SHOULD BE CONSTRUCTED AND INSPECTED TO ENSURE CORRECT VOID SPACE TO MAXIMIZE HABITAT FUNCTION

A **SECTION**
NOT TO SCALE



B **ELEVATION**
NOT TO SCALE

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-C507.dwg

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

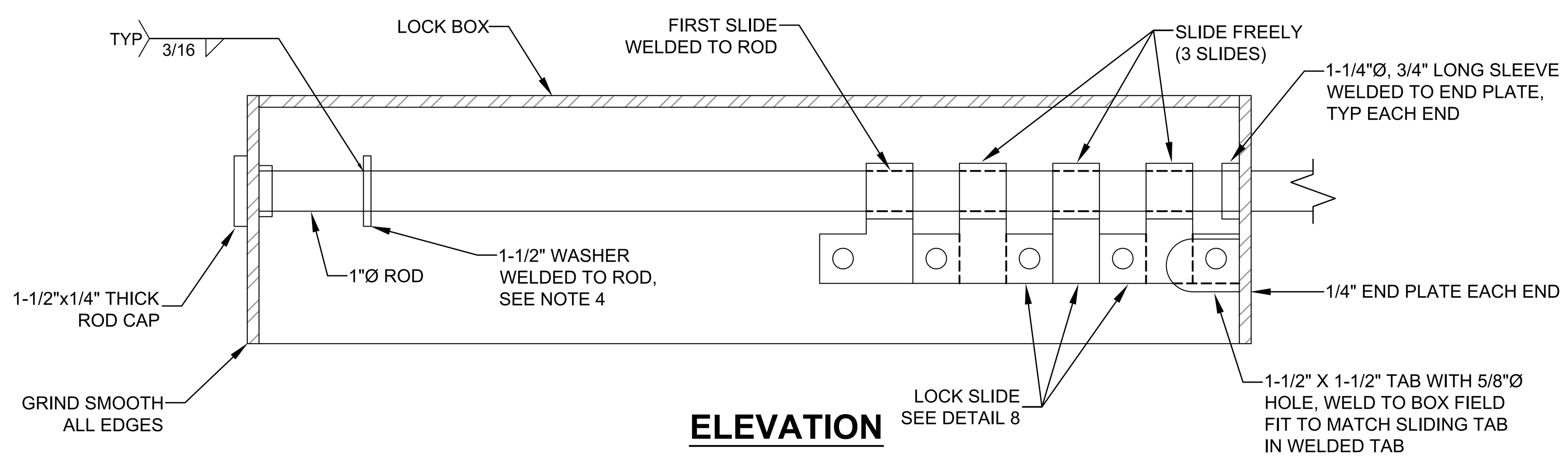
AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

HIBERNACULA

SHEET ID
C-502

X:\1941500\161390.01\TECH\CAD\30% Borrow Design\1-04-0642-C507.dwg

FINAL ISSUE FOR BID

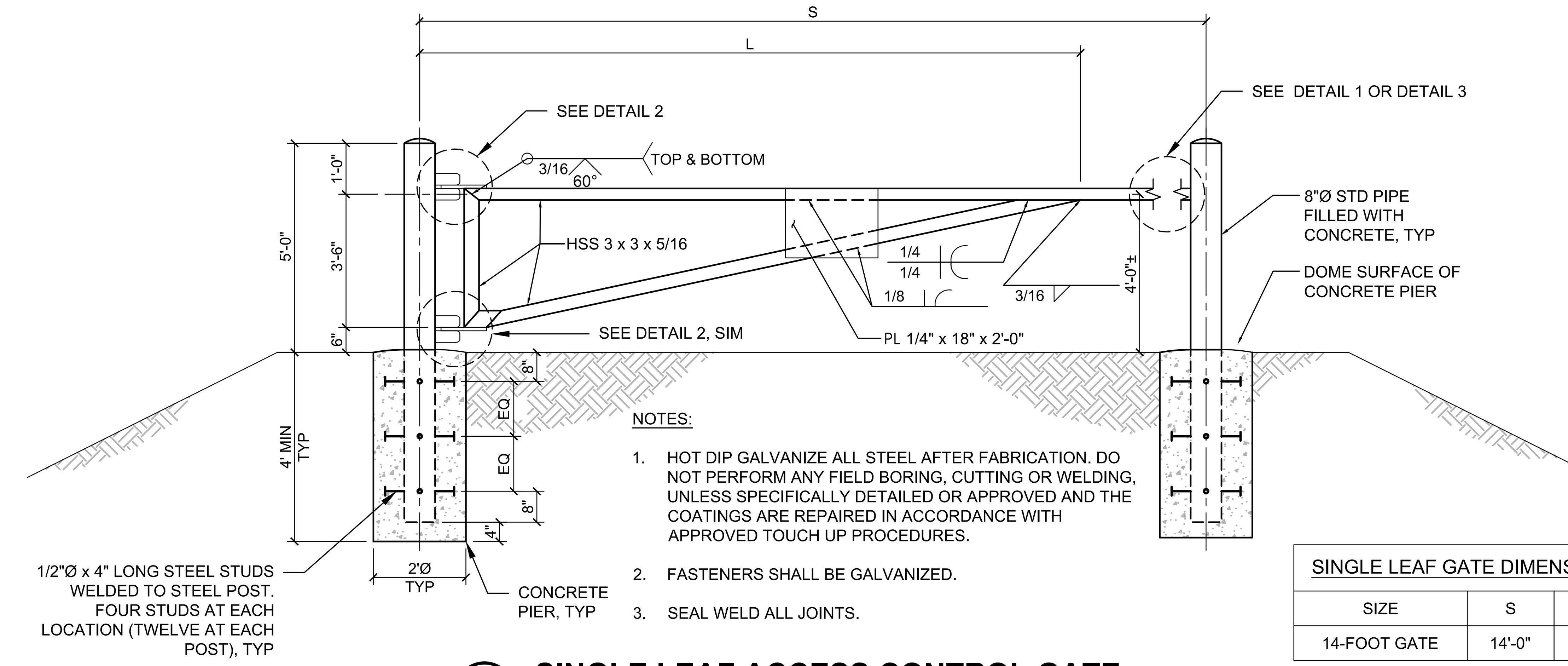


ELEVATION

GENERAL NOTES:

1. LOCK BOX SHALL BE 6" x 6" x 1/4" STEEL TUBING WITH BOTTOM CUT OUT AND ENDS CAPPED WITH 1/4" THICK PLATE.
2. OPENINGS IN PLATE CAPS REINFORCED WITH WELDING SLEEVE.
3. ROD SHALL SLIDE FREELY THROUGH SLIDING SLEEVES.
4. WELD WASHER TO ROD TO ALLOW ROD TO PASS THROUGH THE ROD PLATE 2" WHEN CLOSED AND ALLOW THE ROD TO BE PULLED BACK SUFFICIENTLY TO OPEN THE GATE BUT NOT AS FAR AS TO PULL ROD ALL THE WAY INTO LOCK BOX.
5. FIELD FIT LOCK MECHANISM LOCATION BASED ON FIRST LOCK TAB AND LOCK UNIT IN 'CLOSED' POSITION.

7 4-LOCK MULTI-LOCK ASSEMBLY DETAIL
NTS

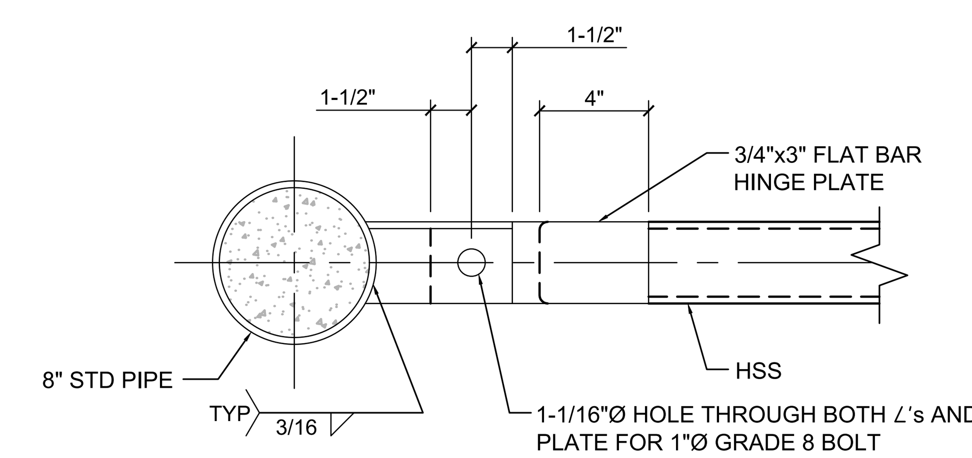


NOTES:

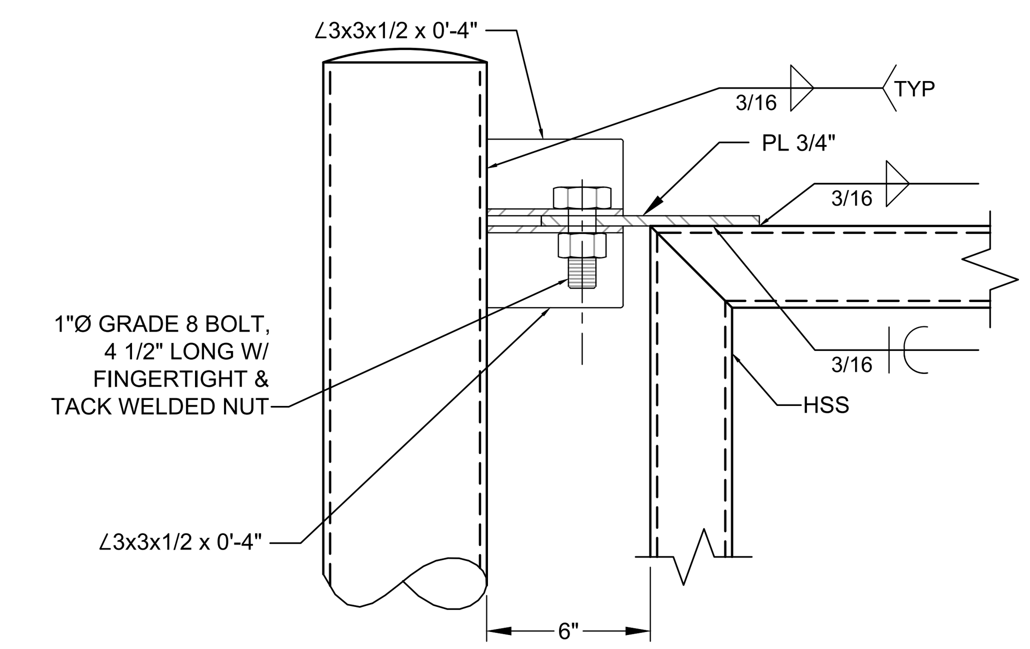
1. HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION. DO NOT PERFORM ANY FIELD BORING, CUTTING OR WELDING, UNLESS SPECIFICALLY DETAILED OR APPROVED AND THE COATINGS ARE REPAIRED IN ACCORDANCE WITH APPROVED TOUCH UP PROCEDURES.
2. FASTENERS SHALL BE GALVANIZED.
3. SEAL WELD ALL JOINTS.

SINGLE LEAF GATE DIMENSIONS		
SIZE	S	L
14-FOOT GATE	14'-0"	11'-4"

1 SINGLE LEAF ACCESS CONTROL GATE
NTS

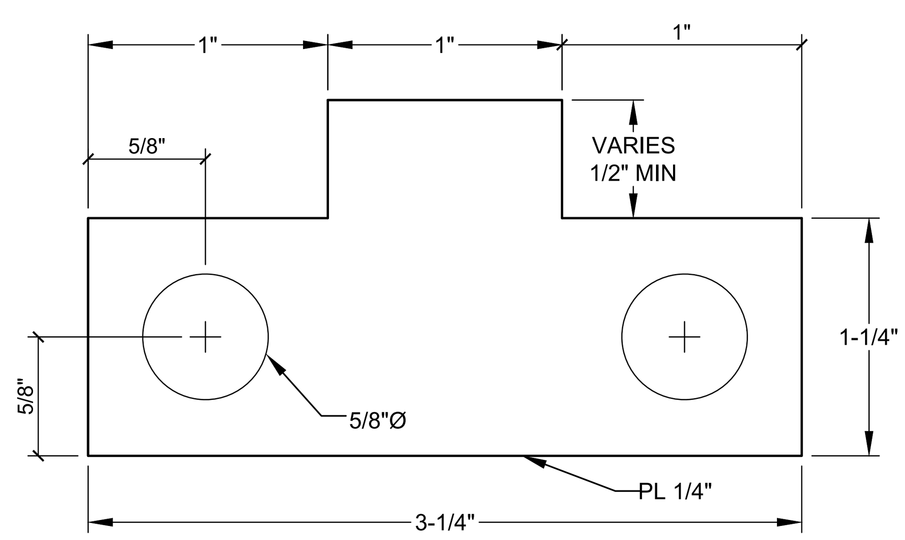


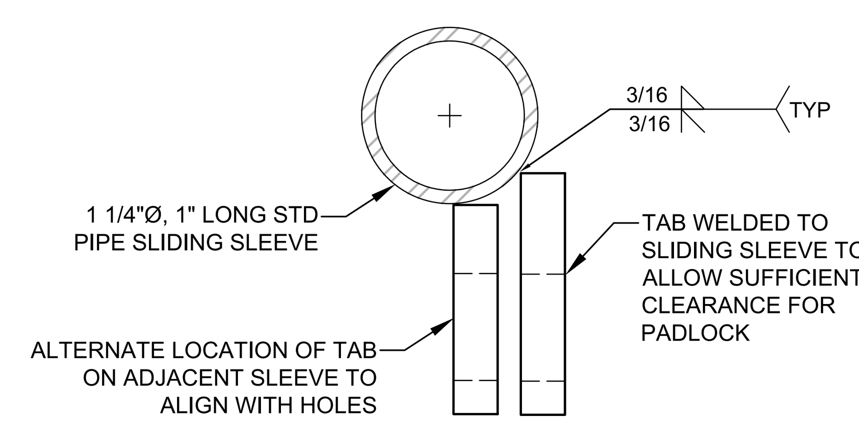
PLAN



ELEVATION

2 GATE HINGE ASSEMBLY DETAIL
NTS

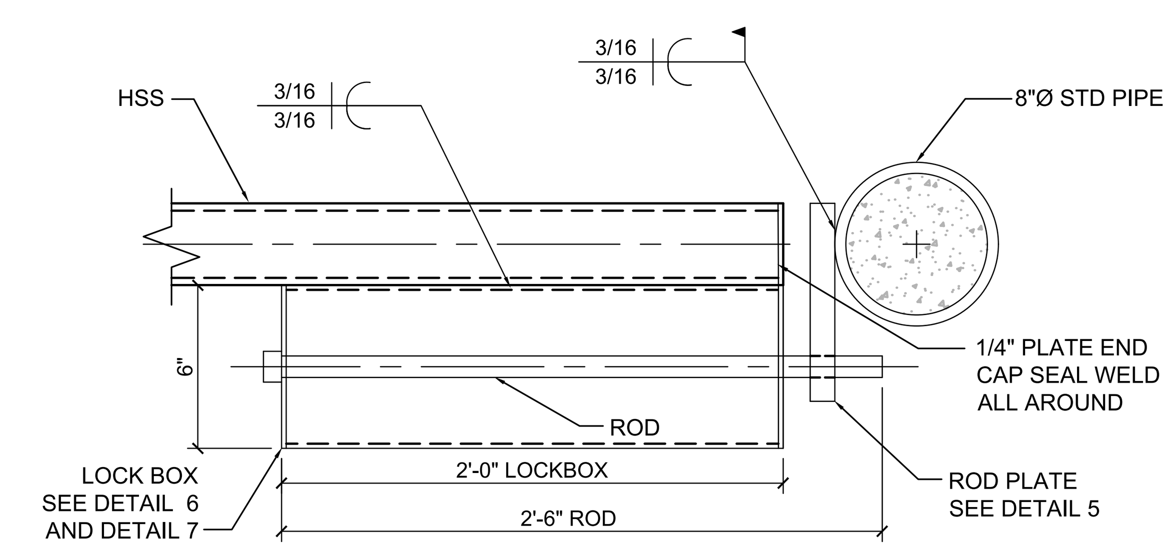




MATERIAL SPECIFICATIONS:

PIPE:	ASTM A53 GRADE B
HSS:	ASTM A500 GRADE B
PLATES/SHAPES:	ASTM A36
ROD:	ASTM A36
GALVANIZED:	ASTM A153
CONCRETE:	Fc = 4000 PSI
BOLTS:	SAE429

8 LOCK TAB AND SLIDING SLEEVE DETAIL
NTS



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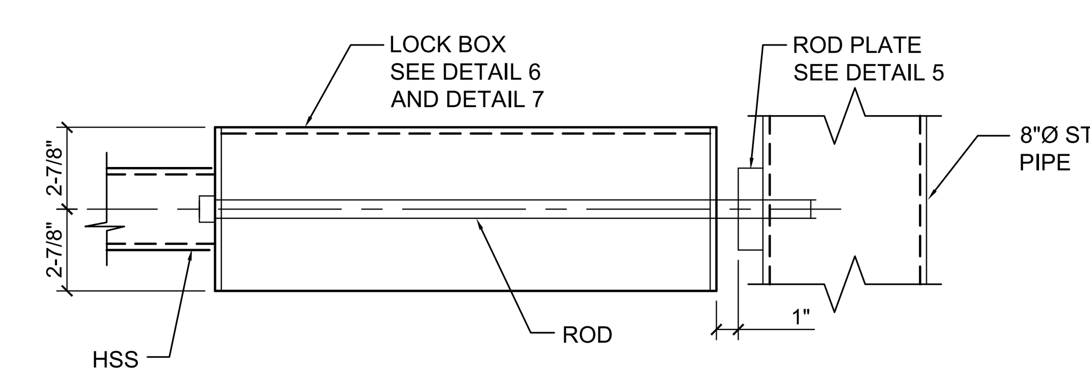
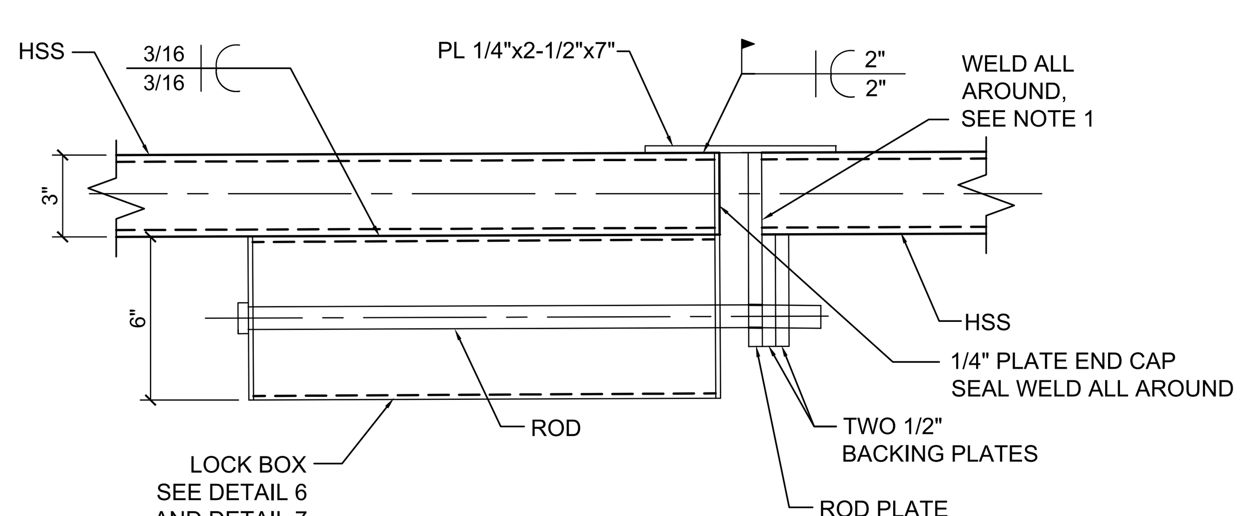


ELEVATION

NOTE:

1. INSTALL LOCK ASSEMBLIES IN ACCORDANCE WITH DETAIL 6 AND FIELD MOUNT ROD PLATE AFTER GATE IS INSTALLED.

3 MULTI-LOCK ASSEMBLY DETAIL FOR SINGLE LEAF GATE
NTS



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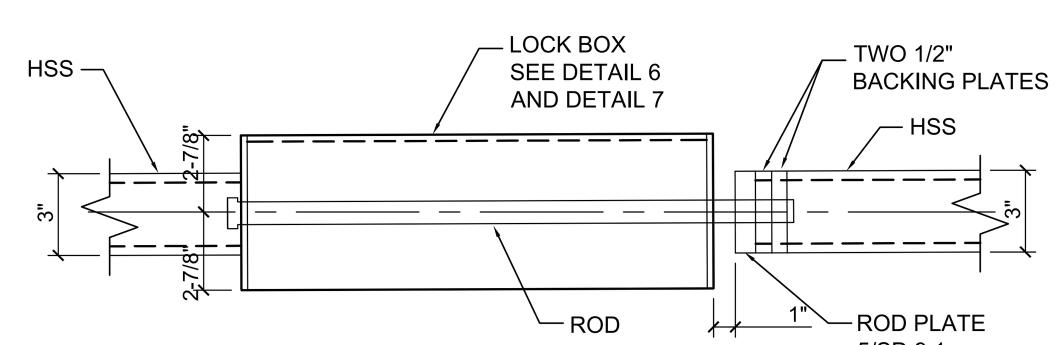
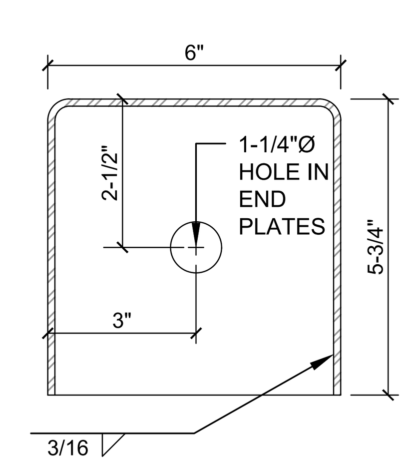


ELEVATION

NOTE:

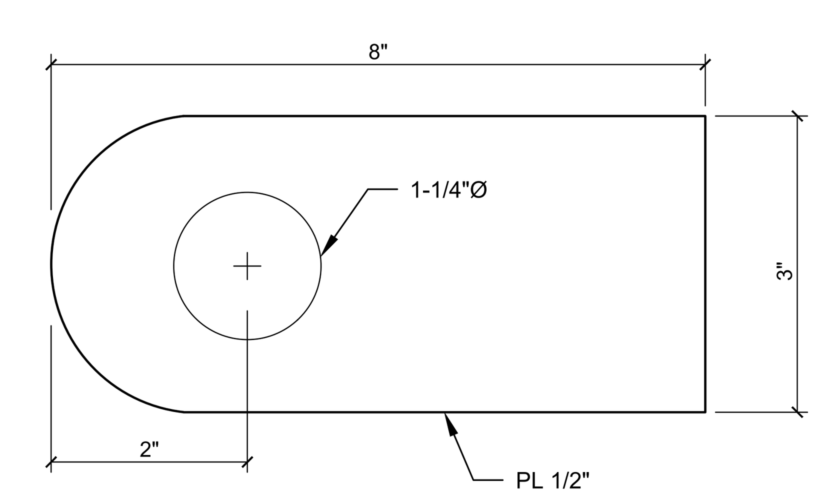
1. INSTALL LOCK ASSEMBLIES AND ROD PLATE AFTER GATE IS INSTALLED, FIELD MOUNT ROD PLATE AFTER GATE IS INSTALLED.
2. REPAIR GALVANIZING AFTER FIELD WELDING.

9 MULTI-LOCK ASSEMBLY DETAIL FOR DOUBLE LEAF GATE
NTS



SECTION

6 MULTI-LOCK LOCK BOX DETAIL
NTS



5 ROD PLATE DETAIL
NTS

4 NOT USED
NTS

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: | DRAWN BY: | CHECKED BY: | SUBMITTED BY: | SIZE: ANSI D | SPEC NO: 2122

ISSUE DATE: 05/09/2019 | SOLICITATION NO.: | CONTRACT NO.: | FILE NO: 1-04-0642 | FILE NAME: 1-04-0642-C508.dwg

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

FENCE DETAILS

SHEET ID
C-503

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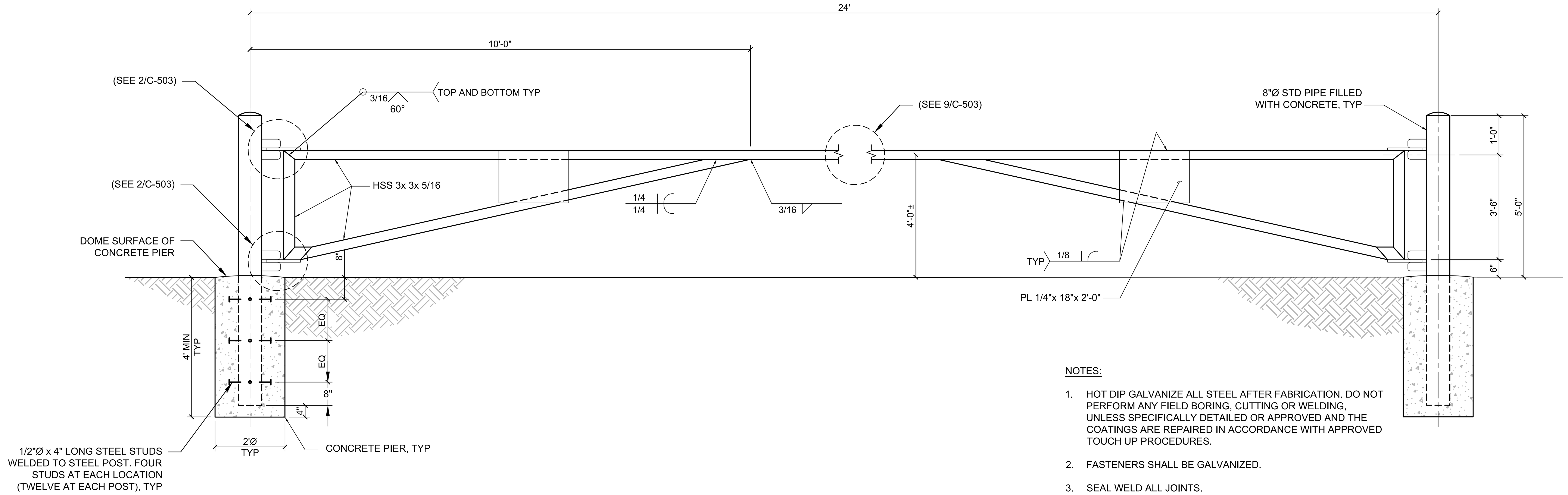
FINAL ISSUE FOR BID

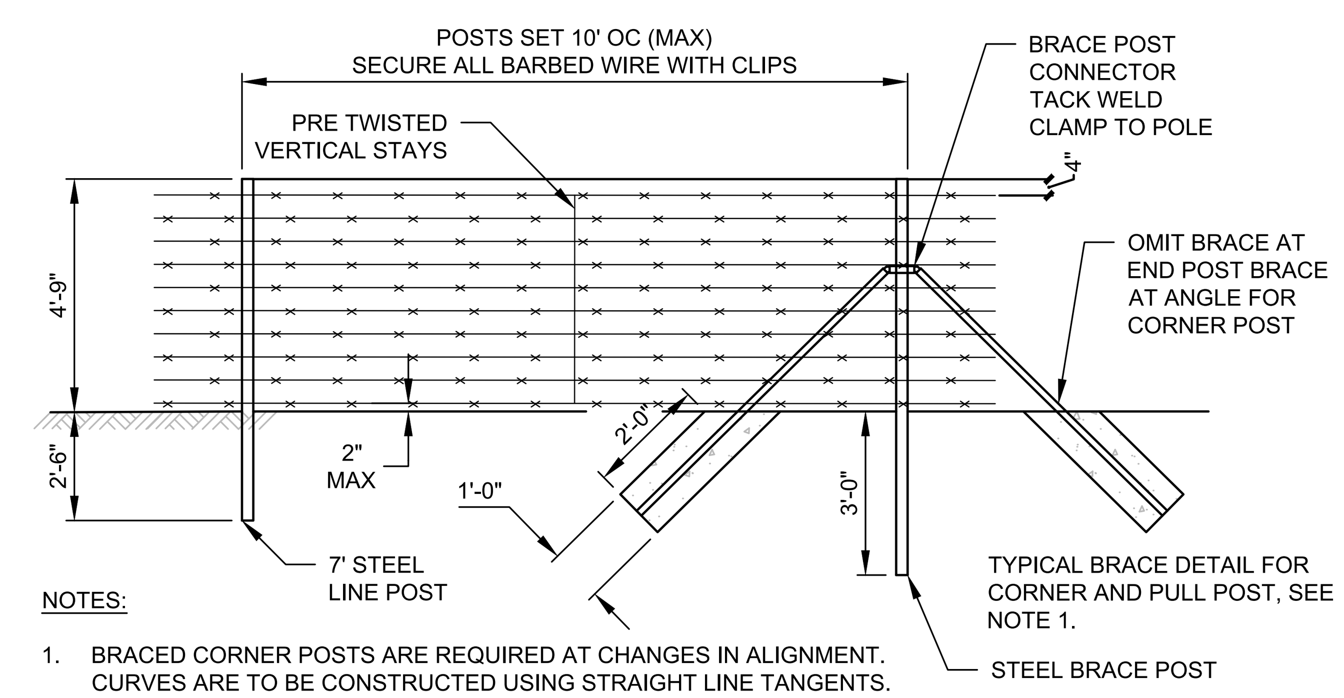


NOTES:

1. HOT DIP GALVANIZE ALL STEEL AFTER FABRICATION. DO NOT PERFORM ANY FIELD BORING, CUTTING OR WELDING, UNLESS SPECIFICALLY DETAILED OR APPROVED AND THE COATINGS ARE REPAIRED IN ACCORDANCE WITH APPROVED TOUCH UP PROCEDURES.
2. FASTENERS SHALL BE GALVANIZED.
3. SEAL WELD ALL JOINTS.

1 DOUBLE LEAF ACCESS CONTROL GATE

NTS



NOTES:

1. BRACED CORNER POSTS ARE REQUIRED AT CHANGES IN ALIGNMENT. CURVES ARE TO BE CONSTRUCTED USING STRAIGHT LINE TANGENTS. USE BRACE POSTS AT DEFLECTION ANGLES.
2. OFFSET HINGE SO GATE WILL SWING 180° TO OPEN FLAT AGAINST FENCE LINE.

2 BARBED WIRE FENCE

NOT TO SCALE

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

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FILE NO: 1-04-0642
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DESIGNED BY:
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CHECKED BY:
SUBMITTED BY:
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

FENCE DETAILS

SHEET ID
C-504

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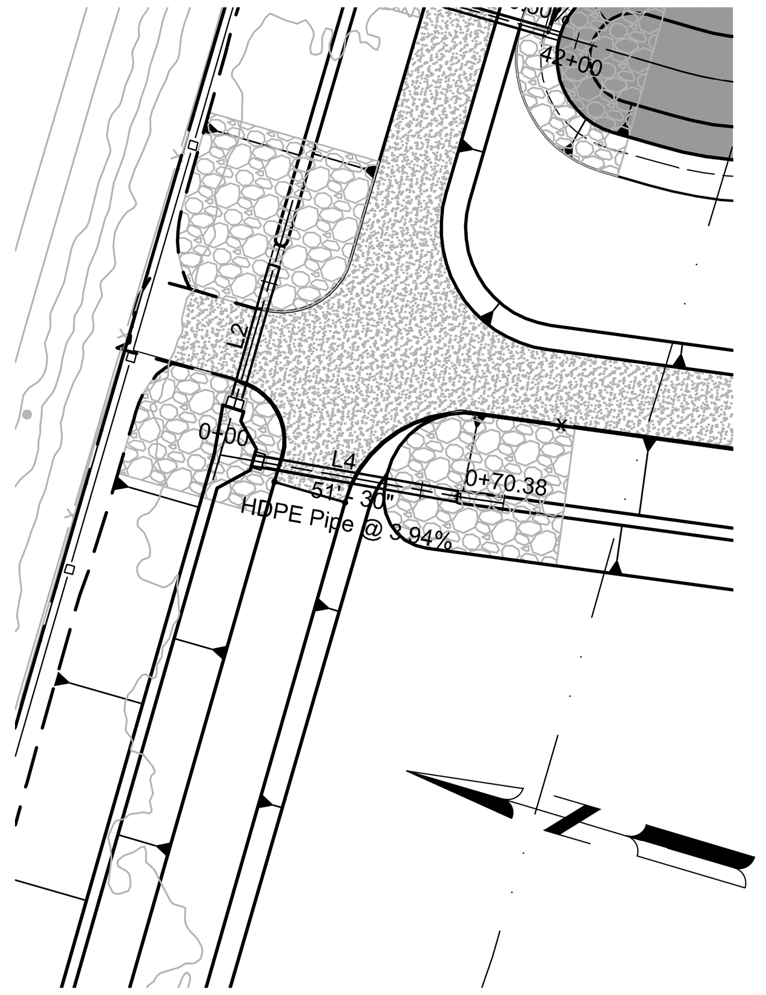
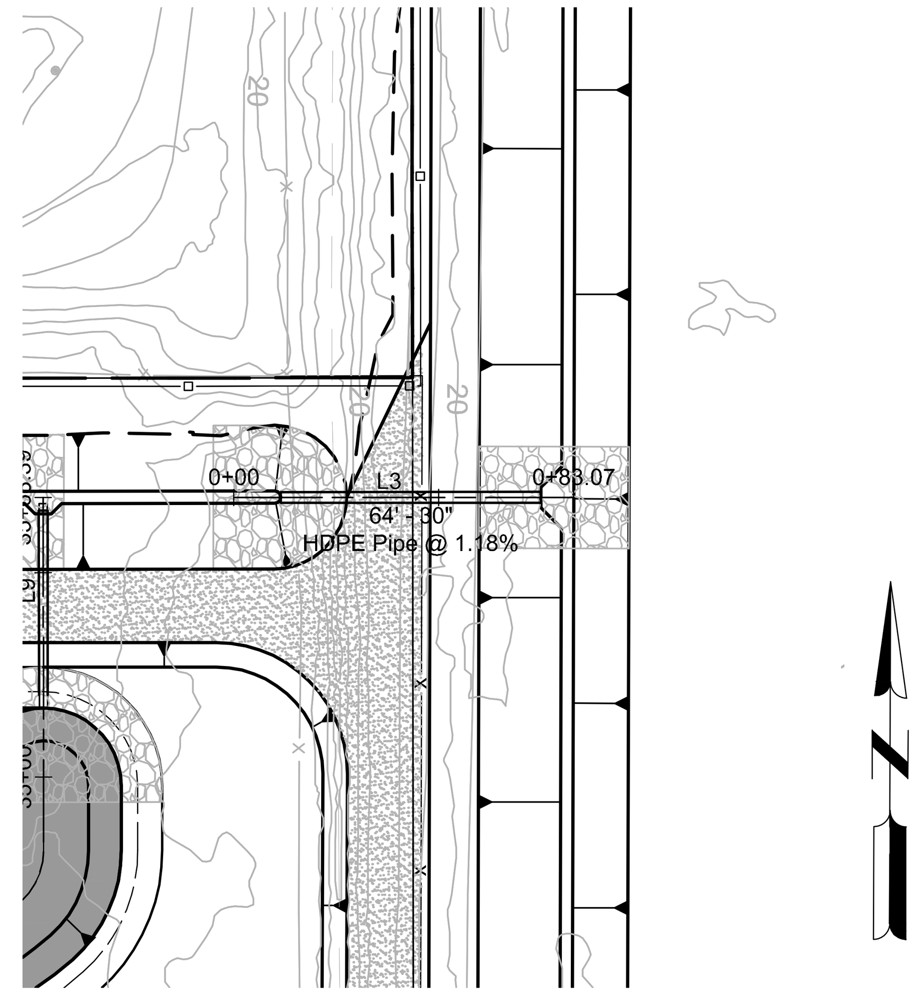
FINAL ISSUE FOR BID



4 JOHNSON RANCH BORROW SITE CULVERT 4 PLAN

1" = 40'

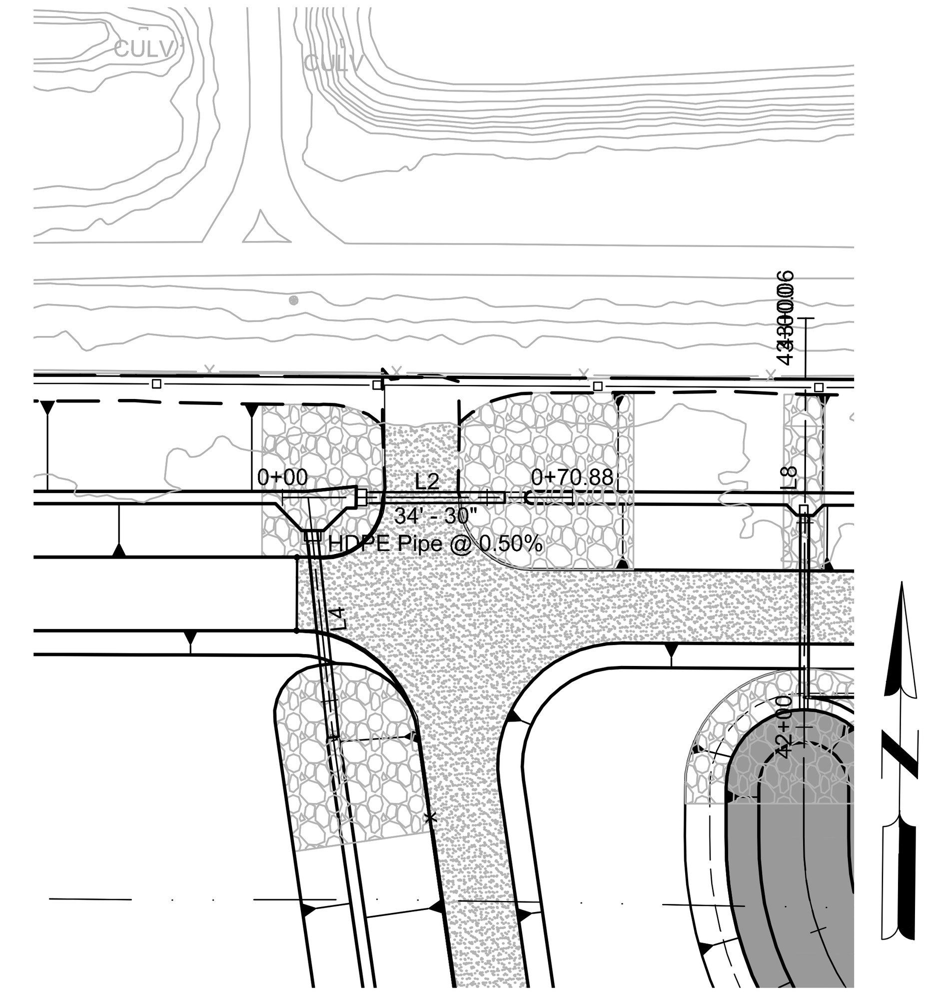
0 20 40 80



3 JOHNSON RANCH BORROW SITE CULVERT 3 PLAN

1" = 40'

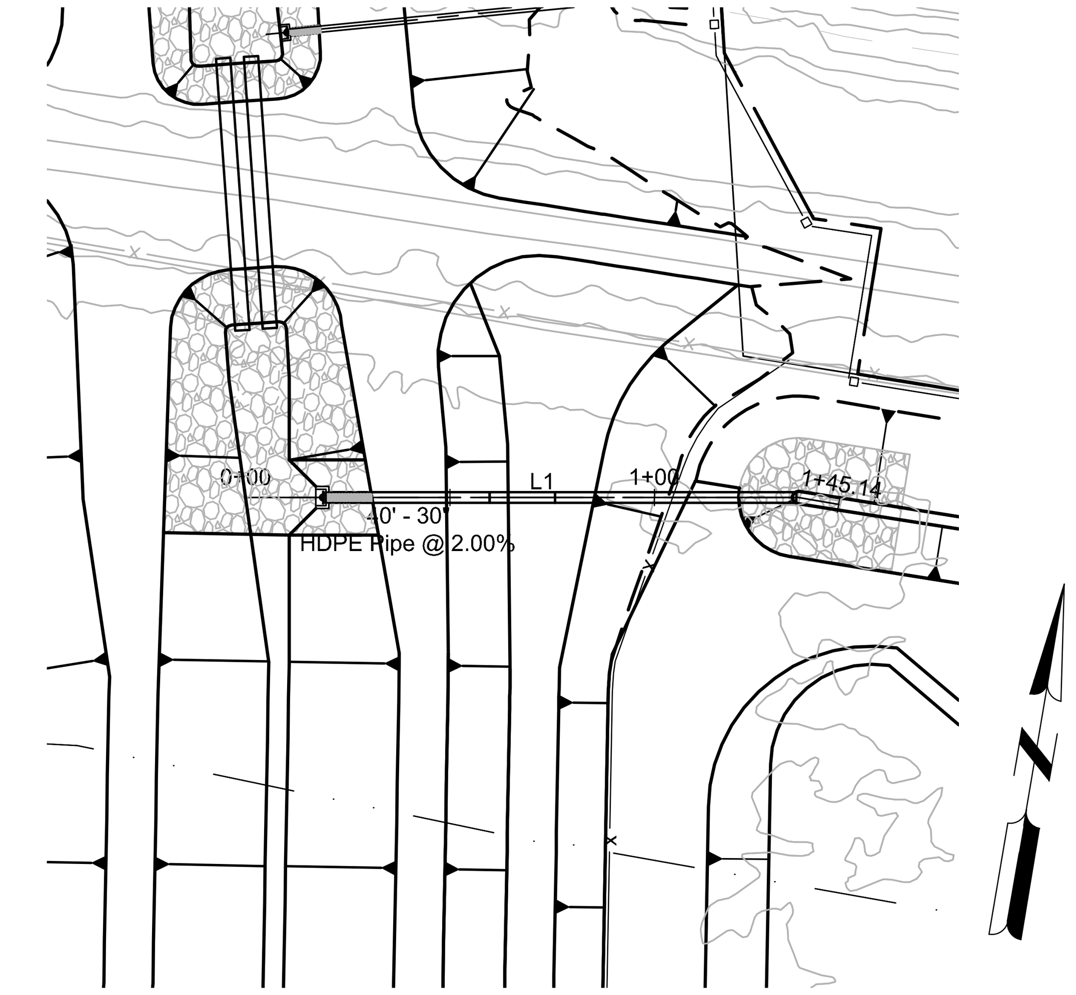
0 20 40 80



2 JOHNSON RANCH BORROW SITE CULVERT 2 PLAN

1" = 40'

0 20 40 80

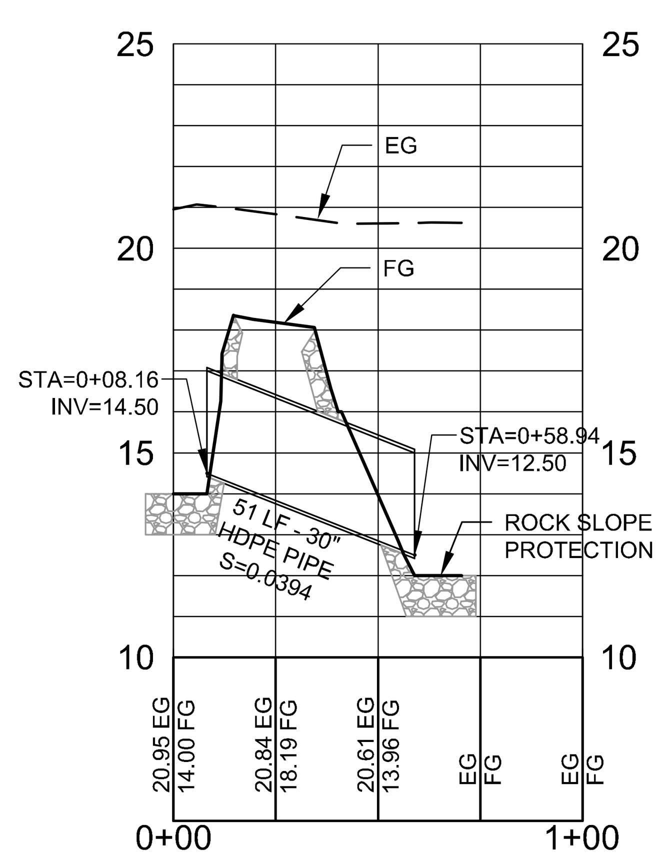


1 JOHNSON RANCH BORROW SITE MARSH CULVERT 1 PLAN

1" = 40'

0 20 40 80

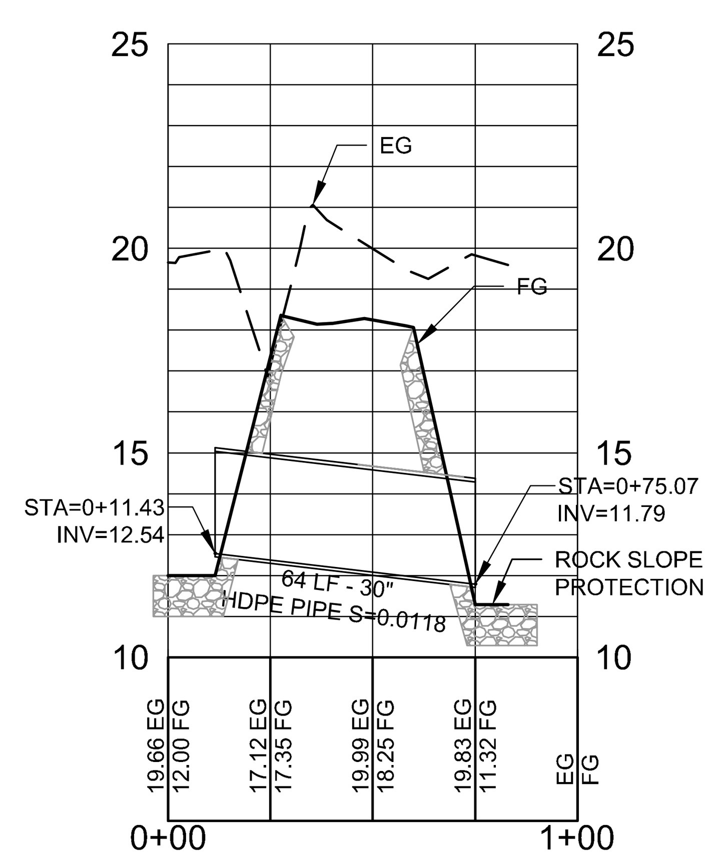
STORM DRAIN ALIGNMENT LINE DATA								
LINE #	LENGTH	BEARING	START POINT NORTHING	START POINT EASTING	END POINT NORTHING	END POINT EASTING	STATION START	STATION END
L1	135.14'	N80° 27' 33.36"E	1994974.26	6687117.77	1994996.66	6687251.05	0+00.00	1+35.14
L2	70.88'	N89° 25' 08.95"E	1995001.75	6687776.86	1995002.47	6687847.74	0+00.00	0+70.88
L3	83.07'	N89° 48' 14.08"E	1995011.12	6689646.90	1995011.41	6689729.97	0+00.00	0+83.07
L4	60.38'	S6° 34' 45.72"E	1995001.81	6687783.10	1994941.83	6687790.02	0+00.00	0+60.38



4 JOHNSON RANCH BORROW SITE CULVERT 4 PROFILE

1" = 40'

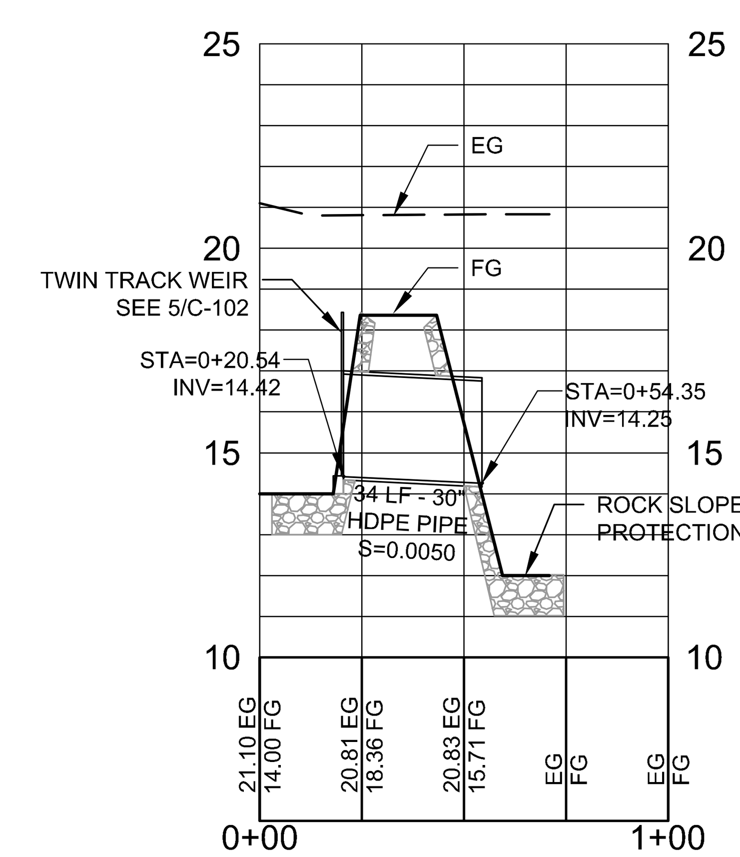
0 20 40 80



3 JOHNSON RANCH BORROW SITE CULVERT 3 PROFILE

1" = 40'

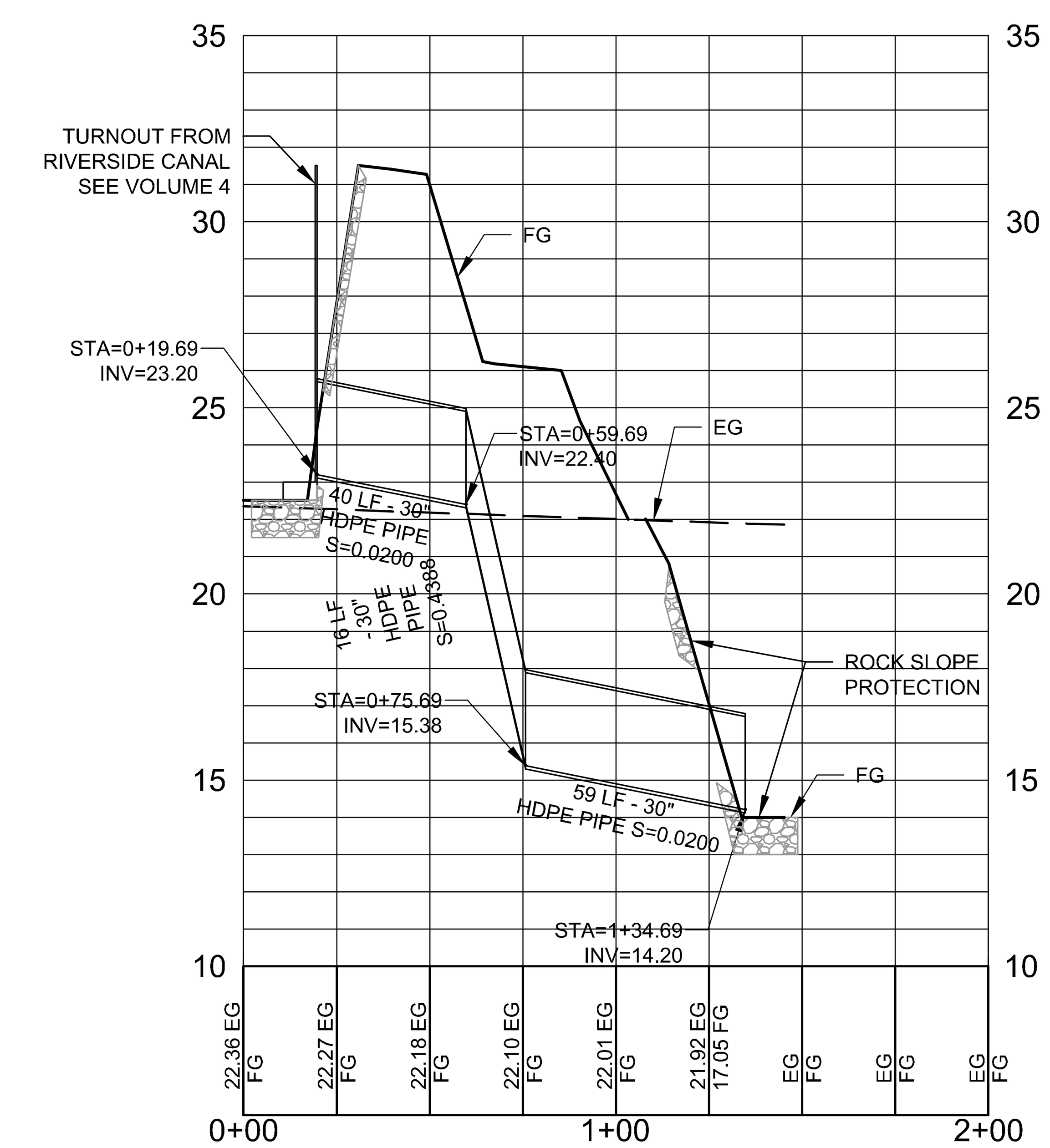
0 20 40 80



2 JOHNSON RANCH BORROW SITE CULVERT 2 PROFILE

1" = 40'

0 20 40 80



1 JOHNSON RANCH BORROW SITE CULVERT 1 PROFILE

1" = 40'

0 20 40 80

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-CG610.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PLAN AND PROFILE CULVERT 1 - 4

SHEET ID

C-505

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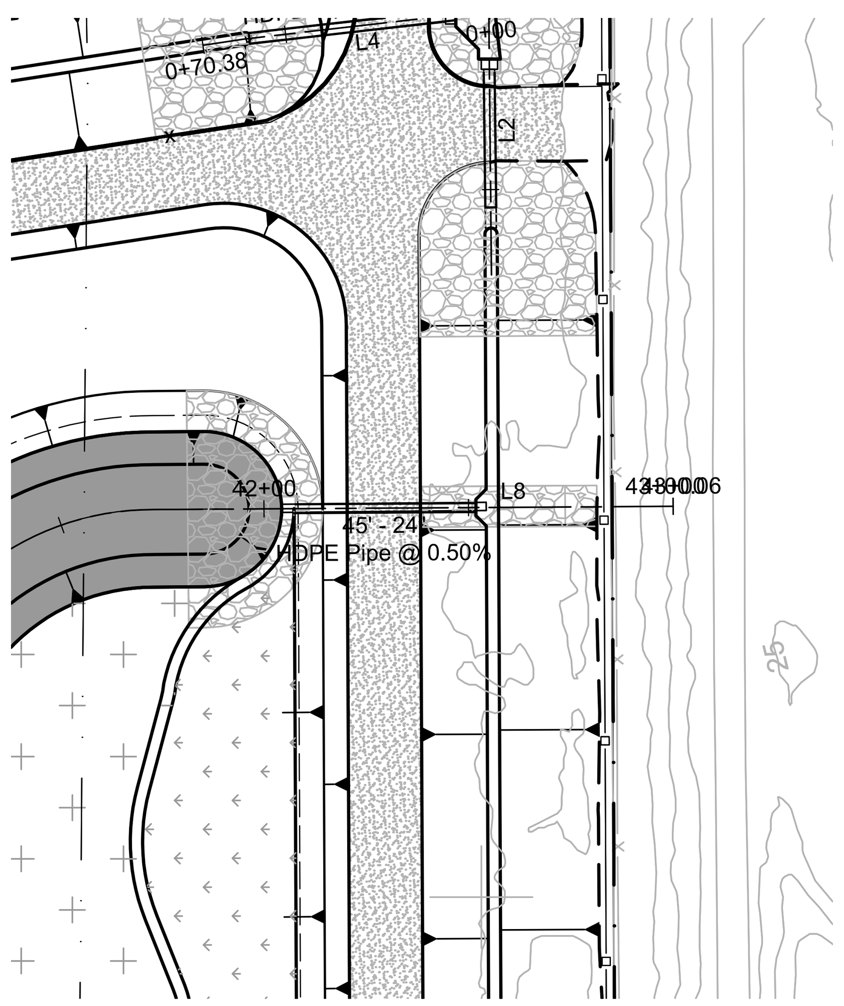
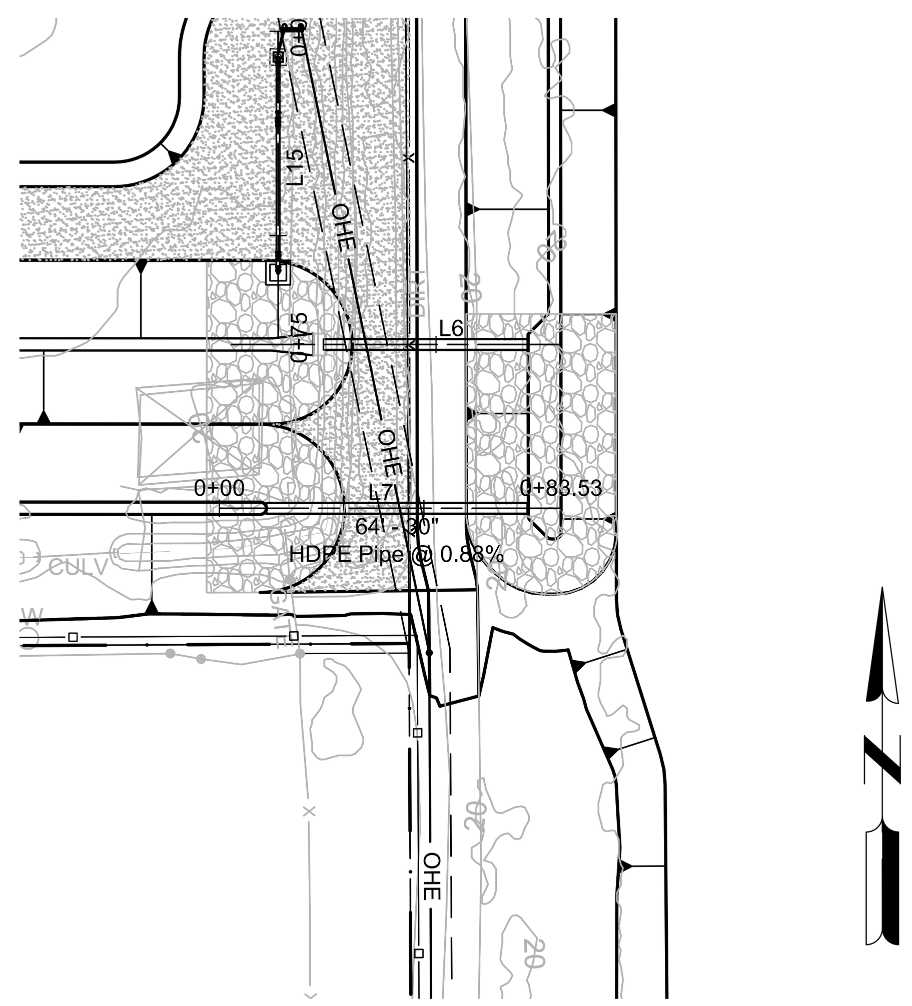


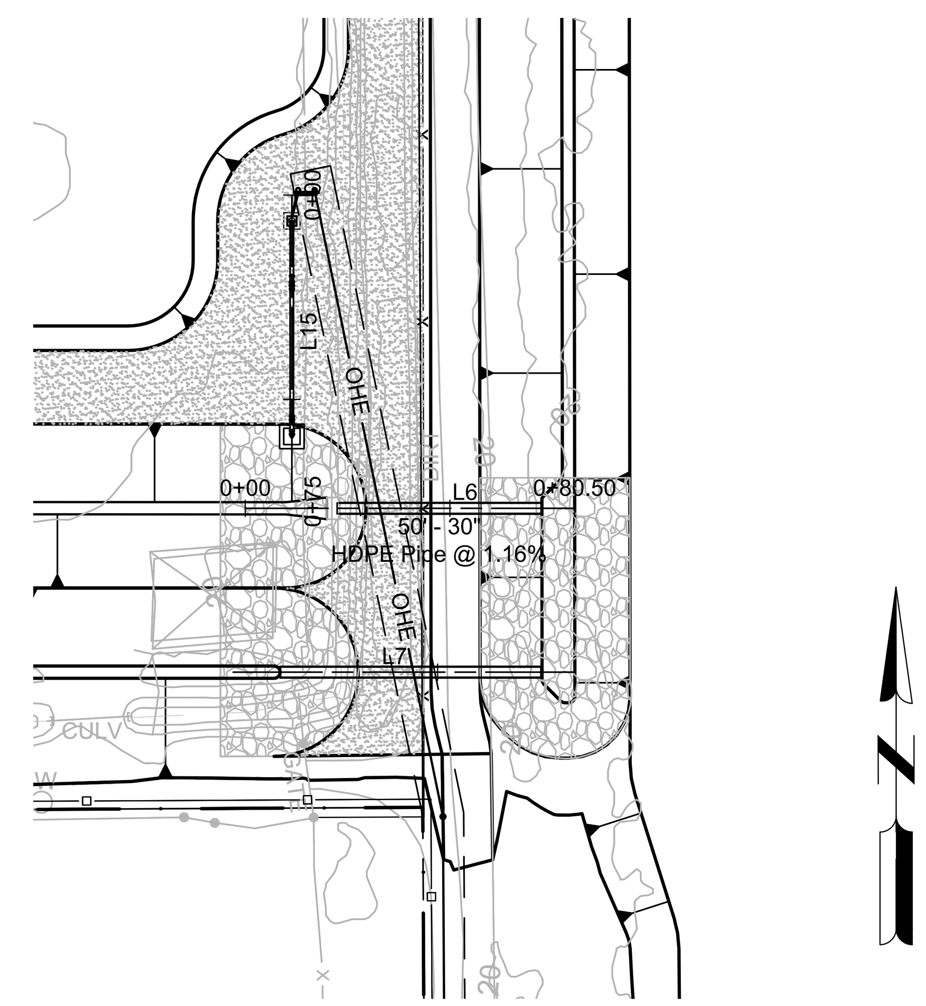
8 JOHNSON RANCH BORROW SITE CULVERT 8 PLAN
1" = 40'

0 20 40 80



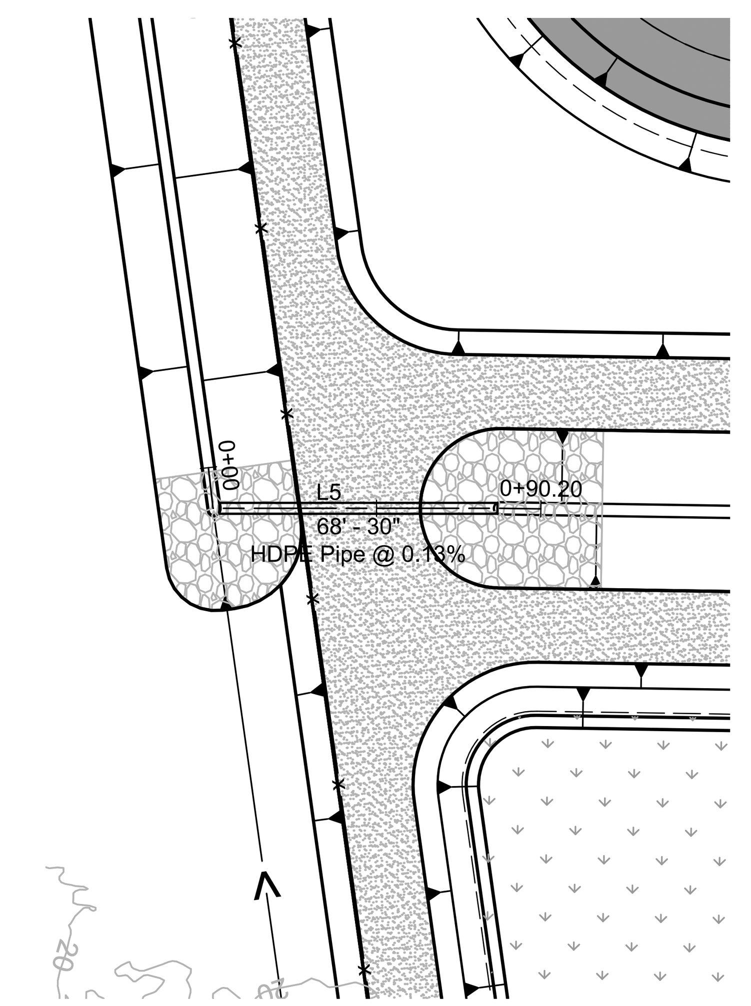
7 JOHNSON RANCH BORROW SITE CULVERT 7 PLAN
1" = 40'

0 20 40 80



6 JOHNSON RANCH BORROW SITE CULVERT 6 PLAN
1" = 40'

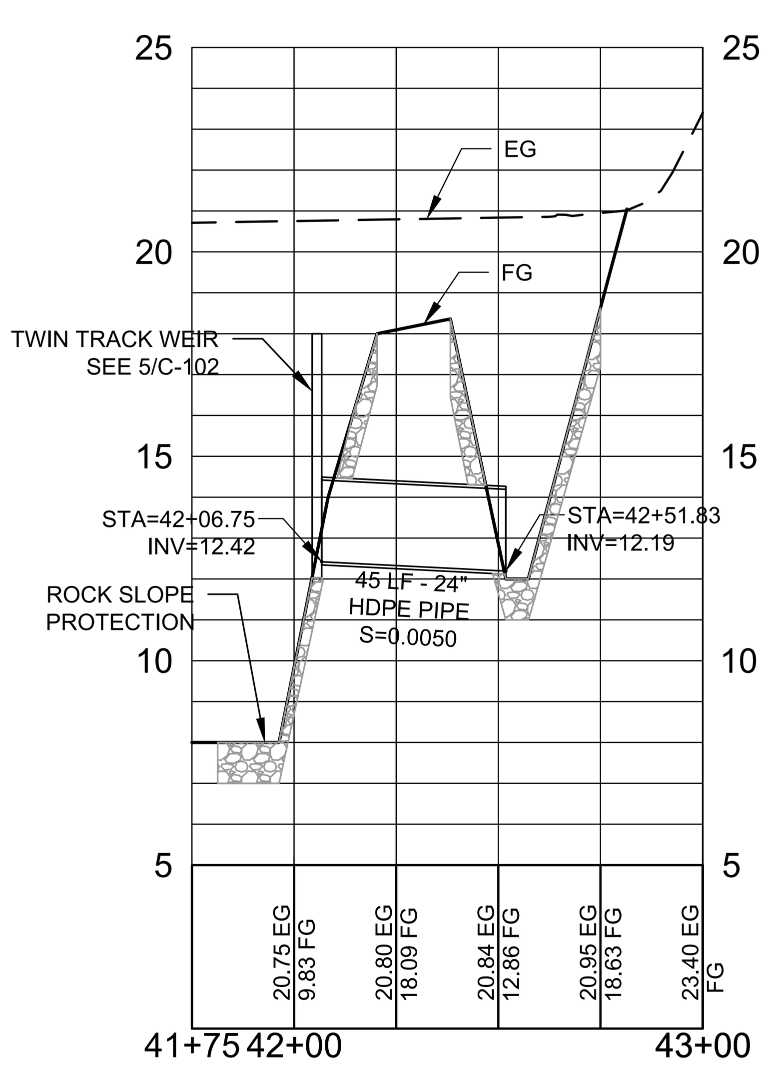
0 20 40 80



5 JOHNSON RANCH BORROW SITE CULVERT 5 PLAN
1" = 40'

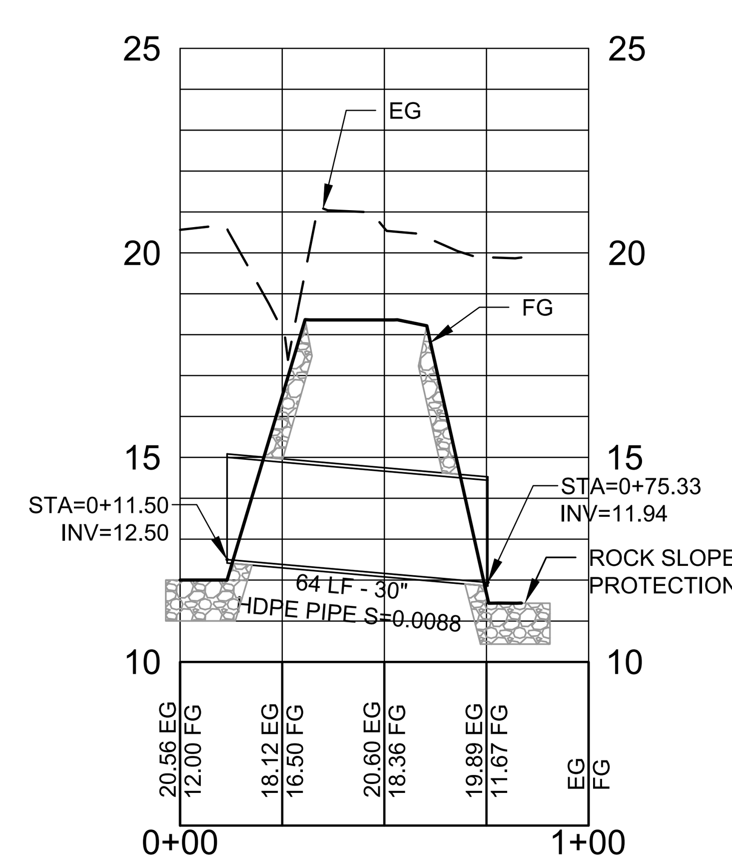
0 20 40 80

STORM DRAIN ALIGNMENT LINE DATA								
LINE #	LENGTH	BEARING	START POINT NORTHING	START POINT EASTING	END POINT NORTHING	END POINT EASTING	STATION START	STATION END
L5	70.20'	N89° 10' 03.95"E	1994176.17	6687907.76	1994177.19	6687977.95	0+10.00	0+80.20
L6	80.50'	S89° 58' 48.65"E	1994553.81	6689649.85	1994553.78	6689730.35	0+00.00	0+80.50
L7	83.53'	S89° 58' 56.58"E	1994513.71	6689646.85	1994513.68	6689730.38	0+00.00	0+83.53
L8	126.83'	N0° 21' 36.75"W	1994920.08	6687905.16	1995046.91	6687904.36	41+73.23	43+00.06



8 JOHNSON RANCH BORROW SITE CULVERT 8 PROFILE
1" = 40'

0 20 40 80



7 JOHNSON RANCH BORROW SITE CULVERT 7 PROFILE
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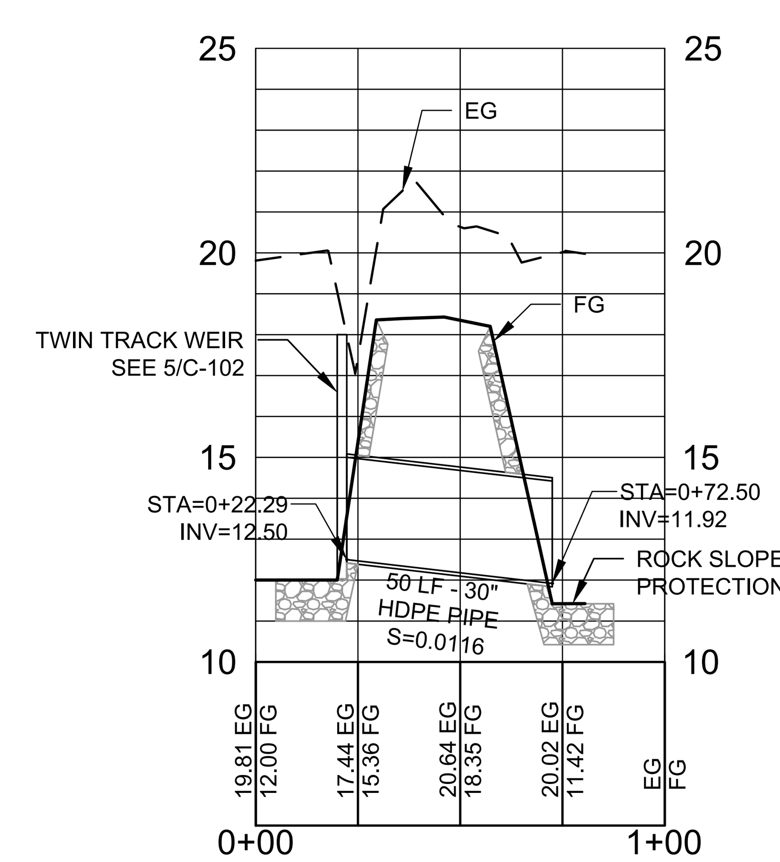

6 JOHNSON RANCH BORROW SITE CULVERT 6 PROFILE
1" = 40'

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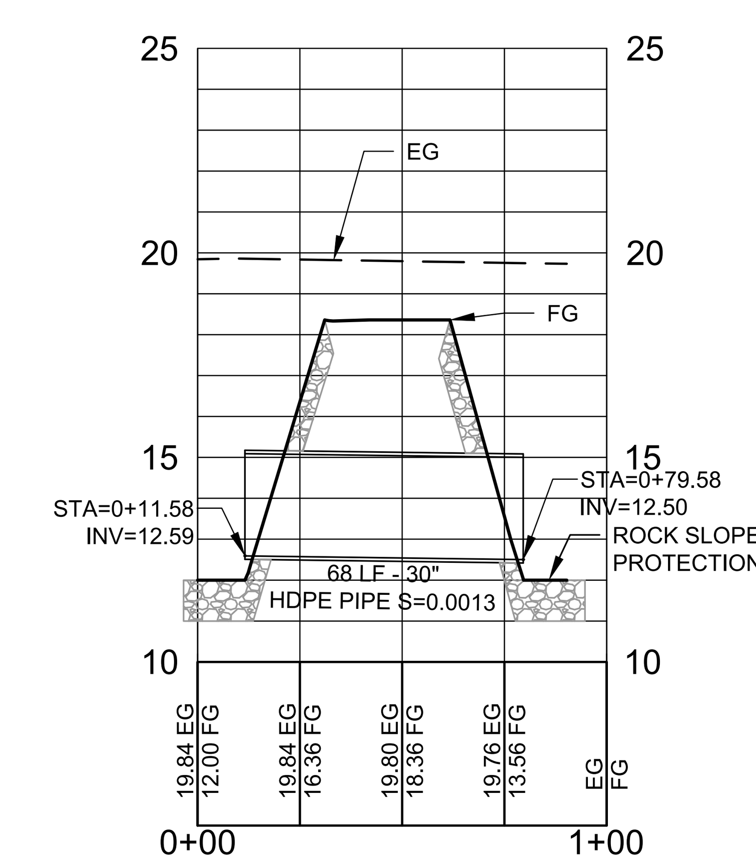

5 JOHNSON RANCH BORROW SITE CULVERT 5 PROFILE
1" = 40'

0 20 40 80

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
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U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PLAN AND PROFILE CULVERT 5 - 8

SHEET ID
C-506

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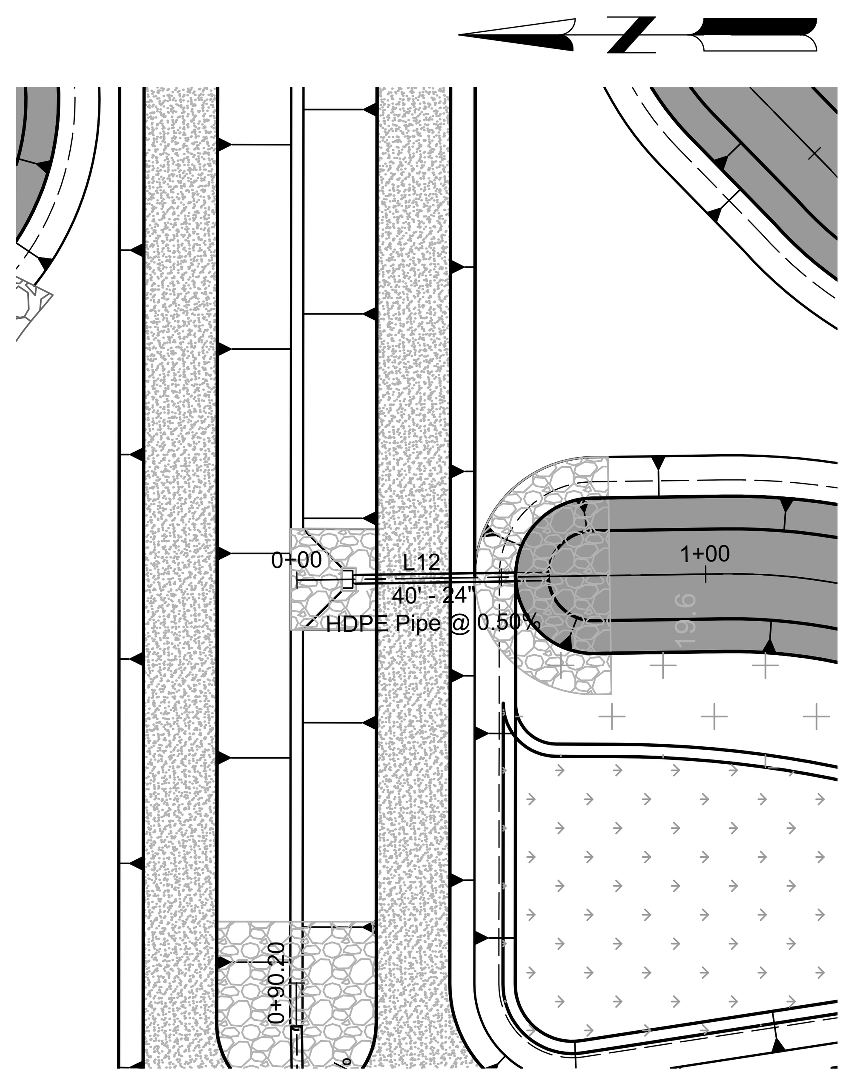
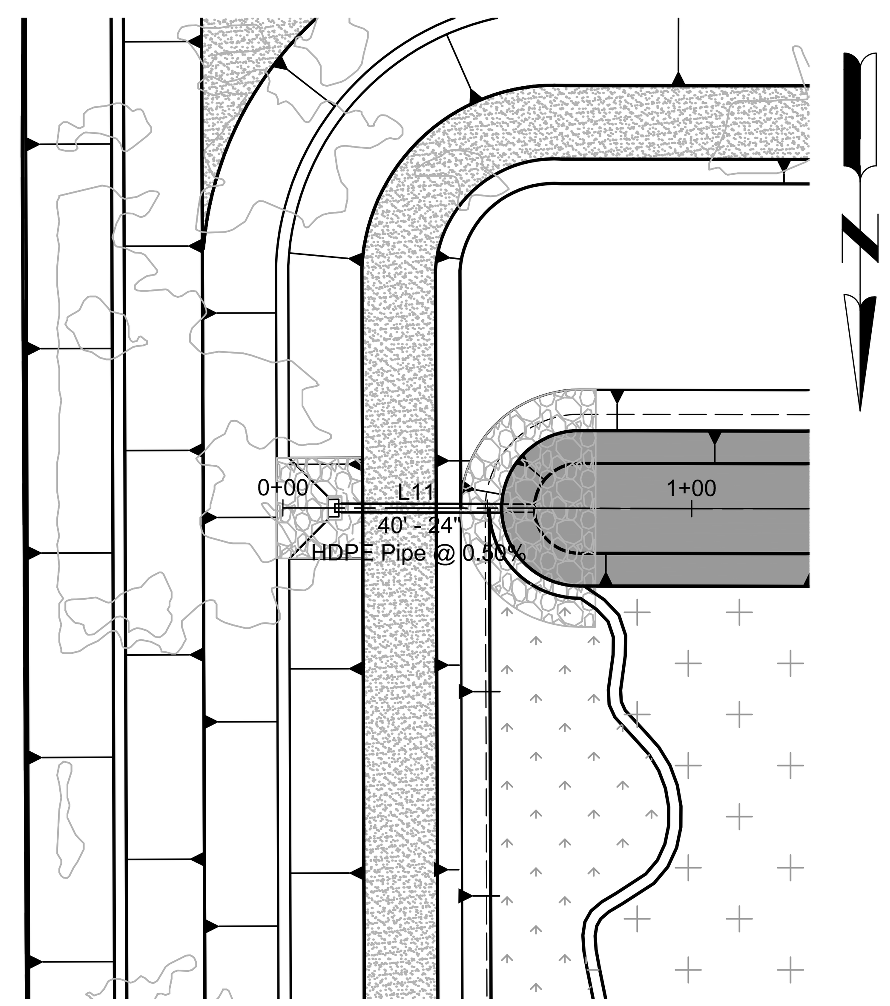
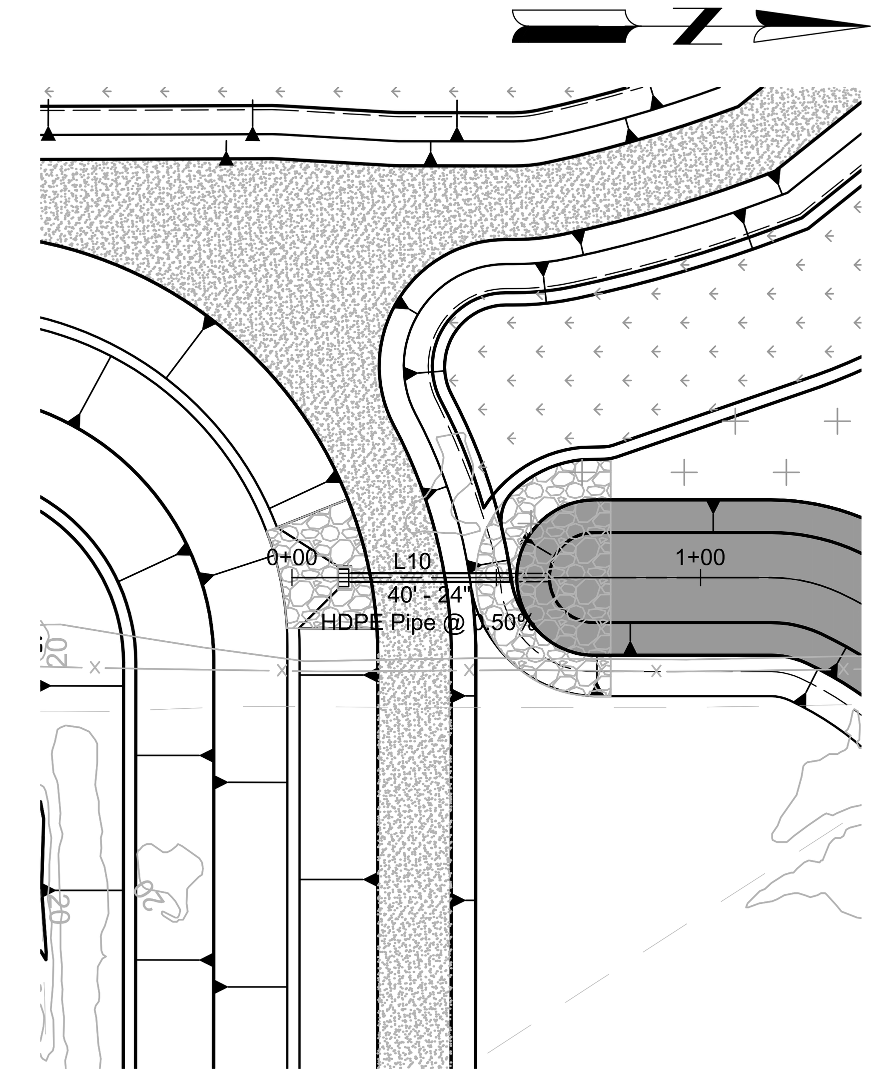


12 JOHNSON RANCH BORROW SITE CULVERT 12 PLAN
1" = 40'
0 20 40 80



11 JOHNSON RANCH BORROW SITE CULVERT 11 PLAN
1" = 40'
0 20 40 80



10 JOHNSON RANCH BORROW SITE CULVERT 10 PLAN
1" = 40'
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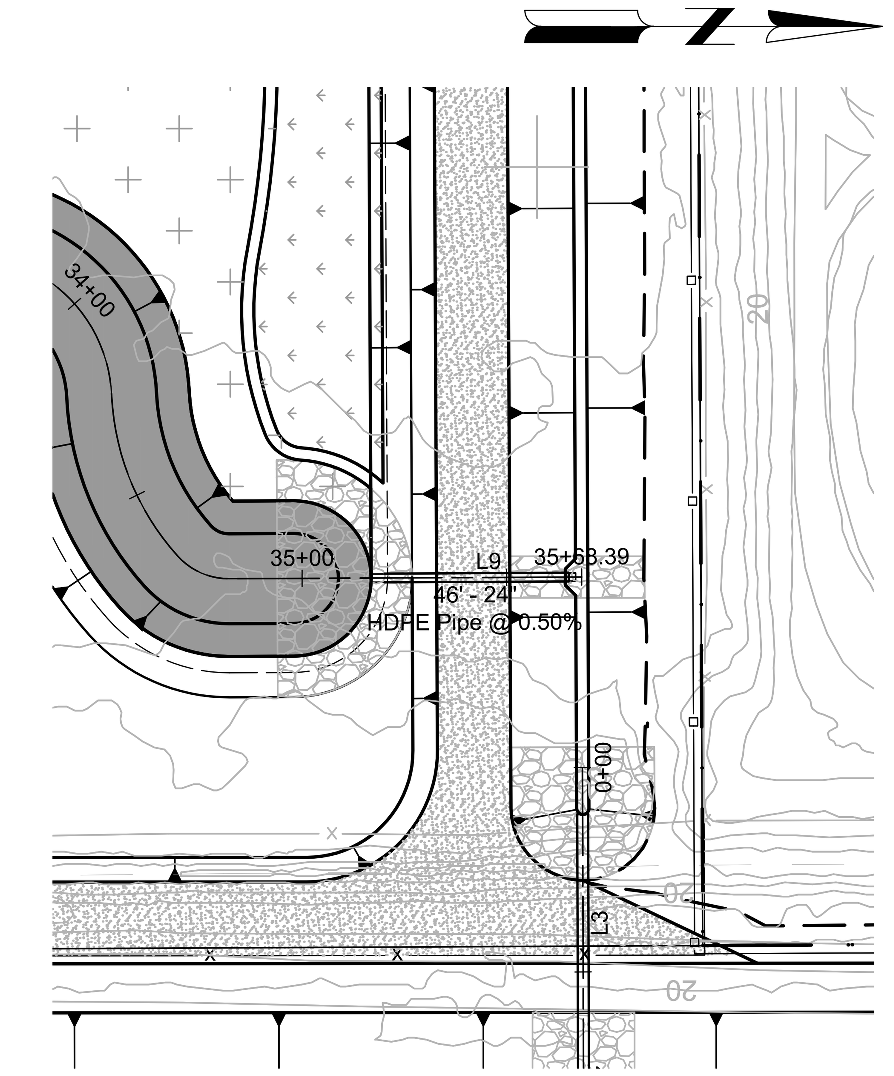

9 JOHNSON RANCH BORROW SITE CULVERT 9 PLAN
1" = 40'
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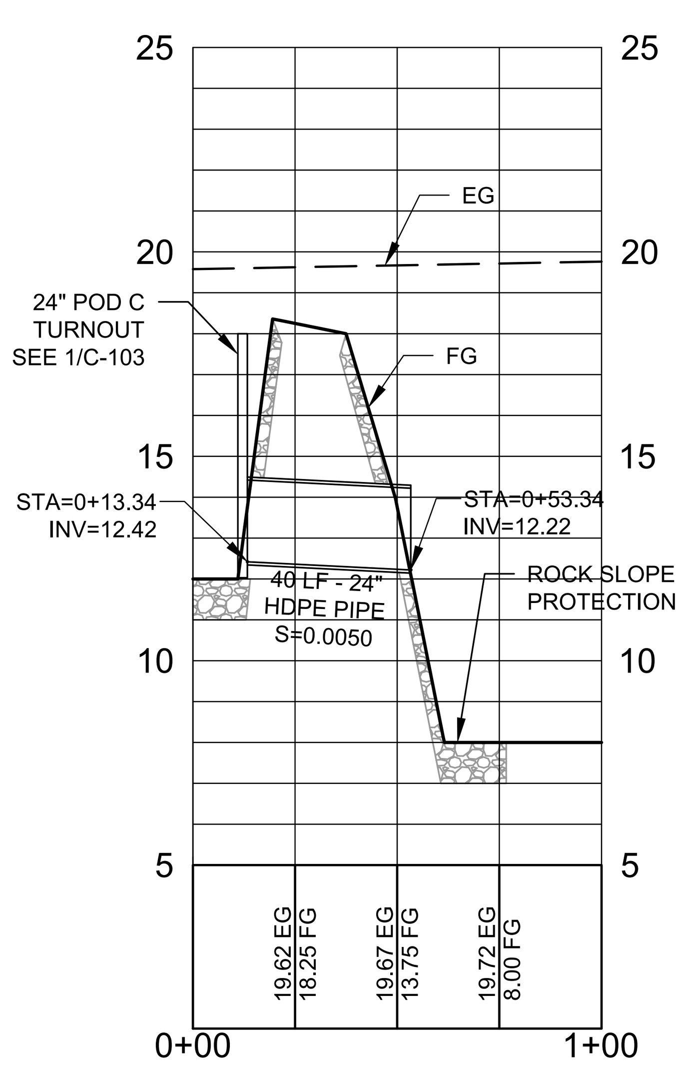

12 JOHNSON RANCH BORROW SITE CULVERT 12 PROFILE
1" = 40'
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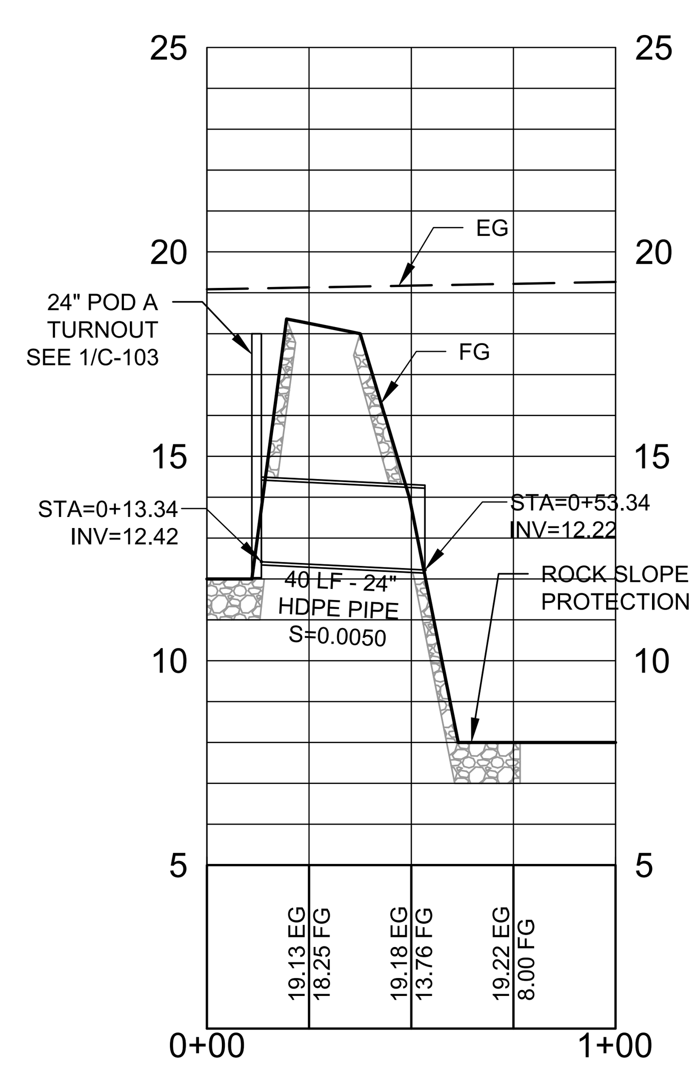

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1" = 40'
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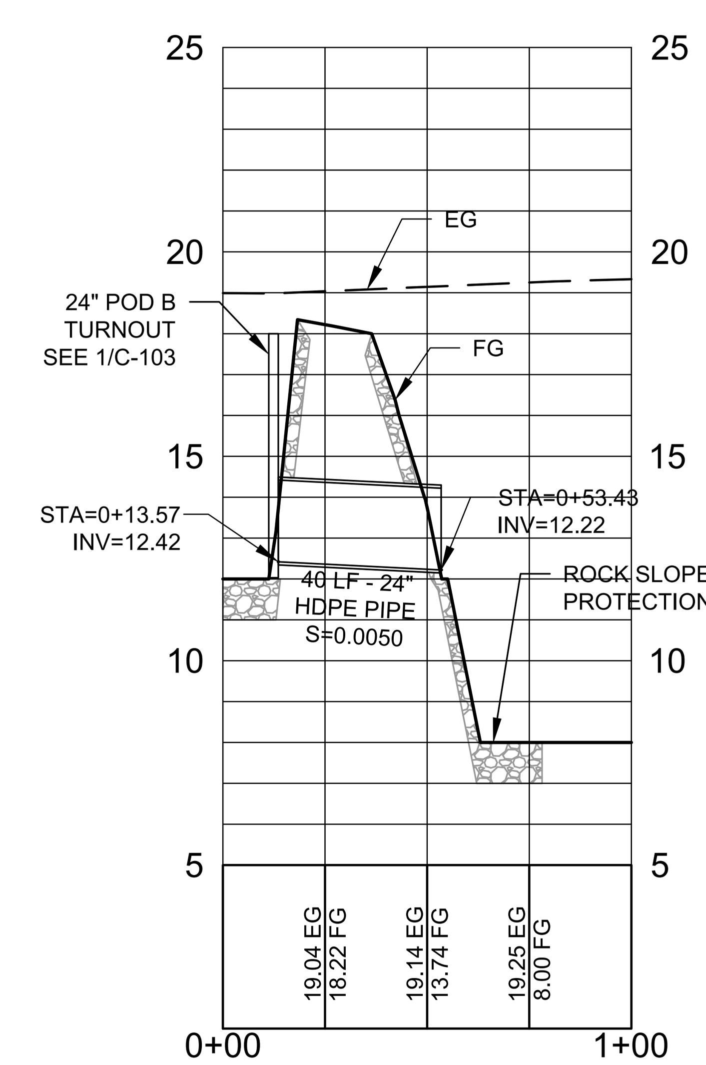

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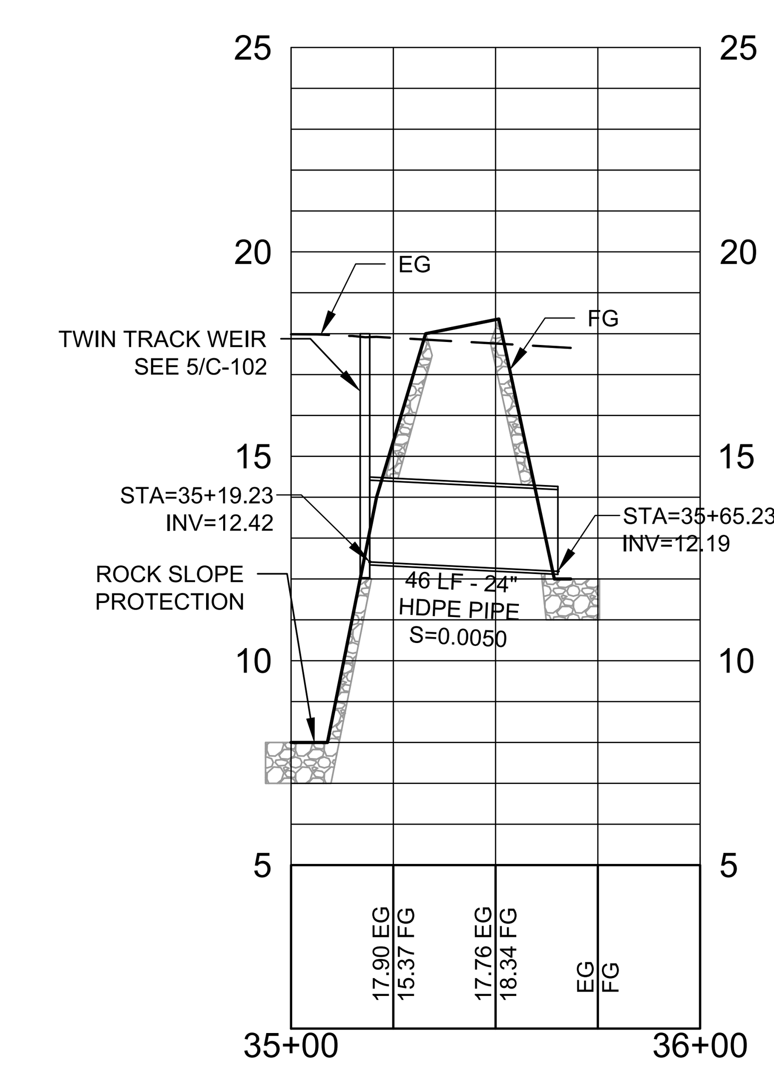

9 JOHNSON RANCH BORROW SITE CULVERT 9 PROFILE
1" = 40'
0 20 40 80

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

DESIGNED BY: C. STEPPER	ISSUE DATE: 05/09/2019
DRAWN BY: E. DIOCSON	SOLICITATION NO.:
CHECKED BY: S. SULLIVAN	CONTRACT NO.:
SUBMITTED BY: J. KASHIWADA	FILE NO: 1-04-0642
SIZE: ANSI D / SPEC NO: 2122	FILE NAME: 1-04-0642-CG610.dwg

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PLAN AND PROFILE CULVERT 9 - 12

SHEET ID
C-507

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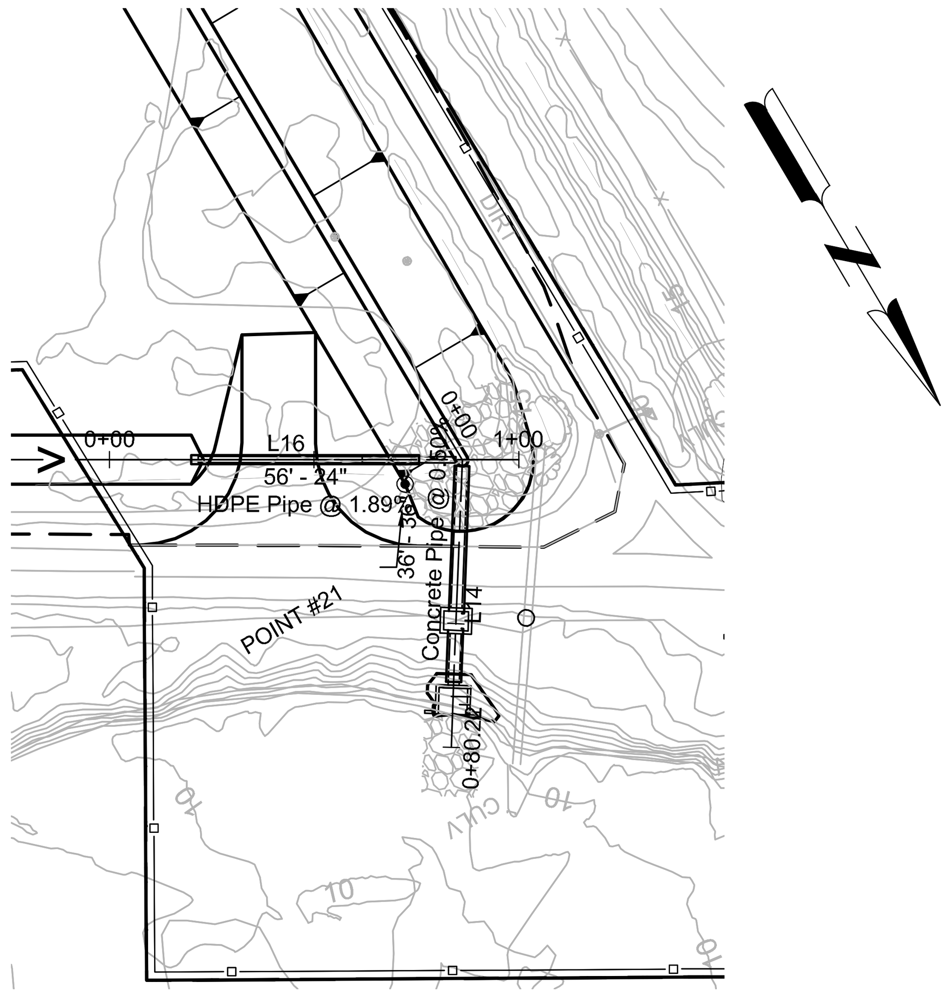
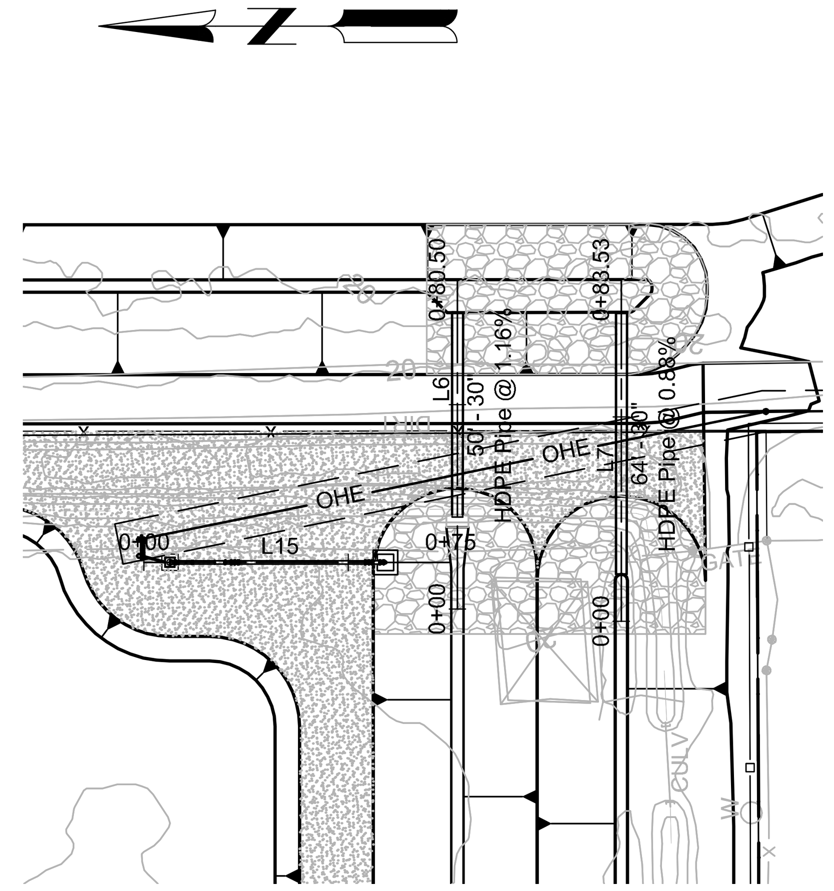
FINAL ISSUE FOR BID



(16) **CULVERT 16 PLAN**
1" = 40'
0 20 40 80



(15) **WITTER RANCH BORROW SITE WELL DISCHARGE 1 PLAN**
1" = 40'
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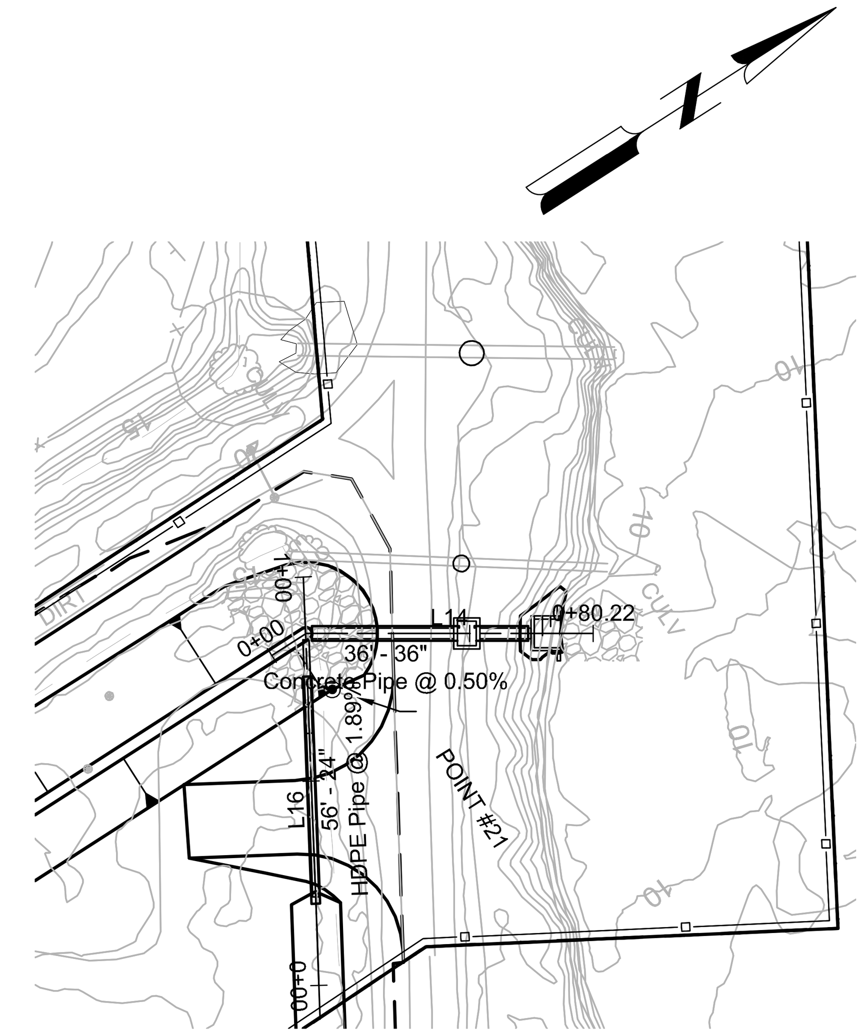
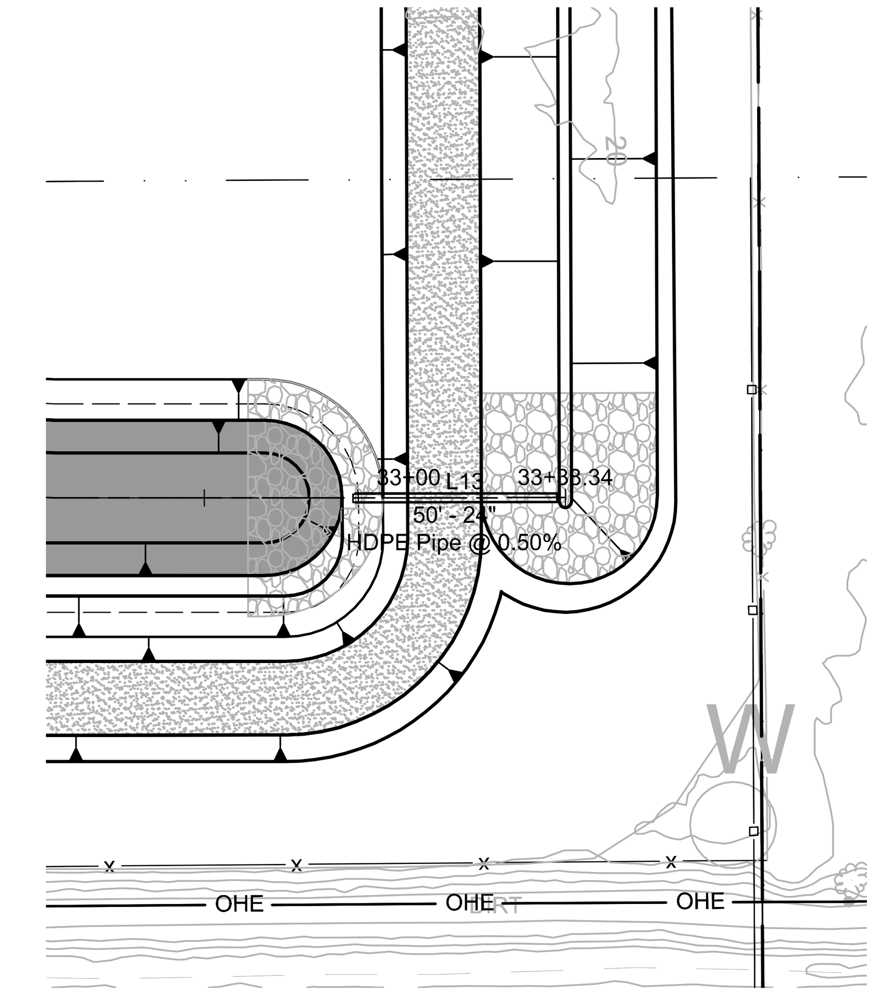
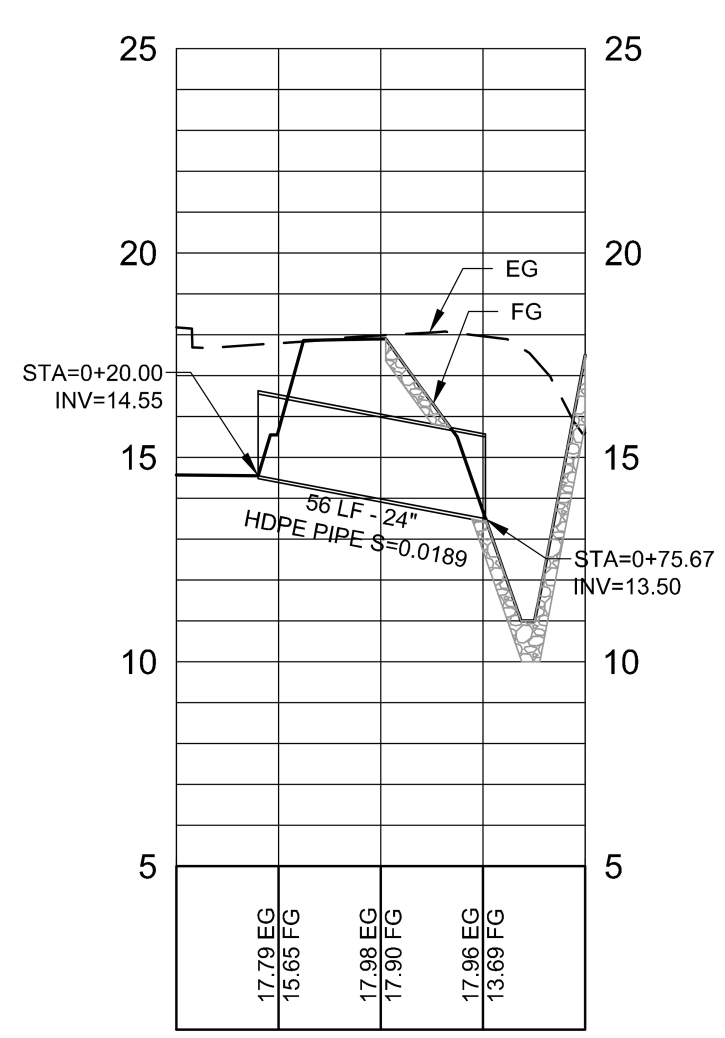


(14) **WITTER RANCH BORROW SITE CULVERT 14 PLAN**
1" = 40'
0 20 40 80

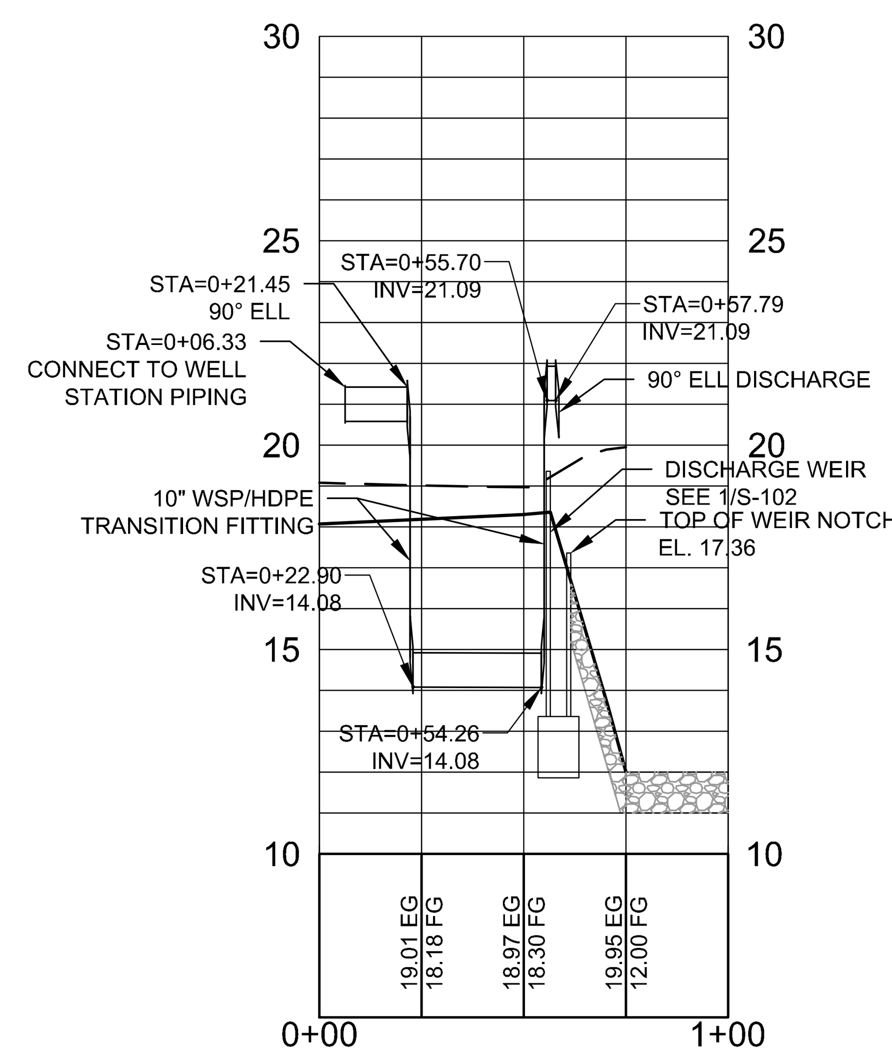


(13) **JOHNSON RANCH BORROW SITE CULVERT 13 PLAN**
1" = 40'
0 20 40 80

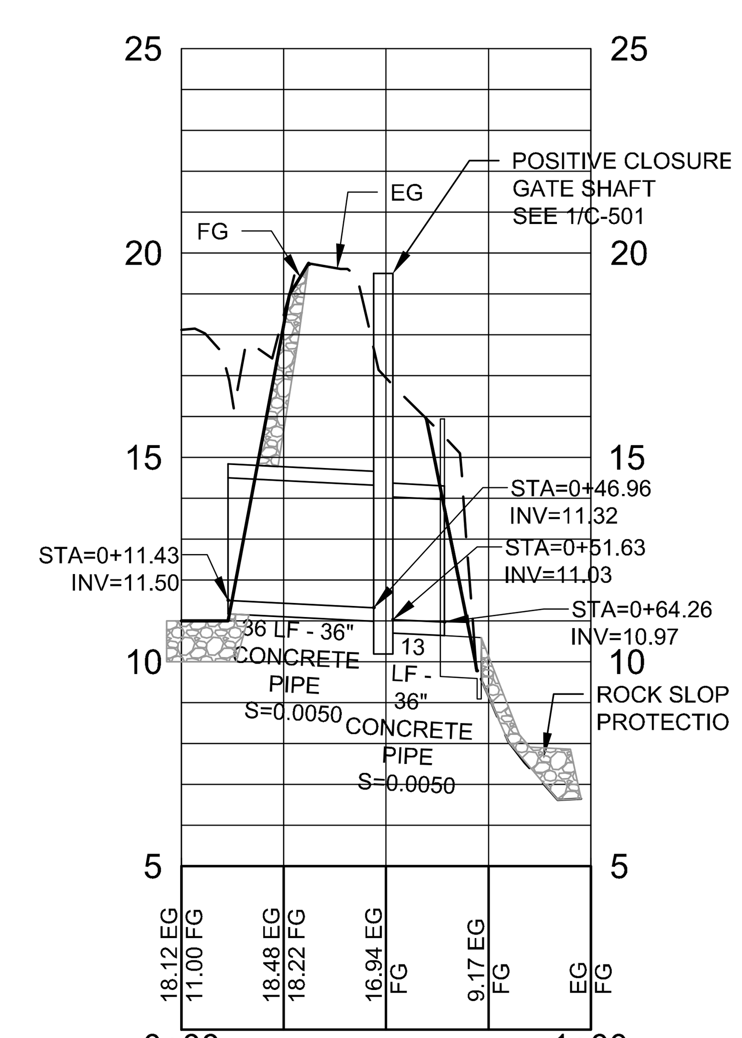
STORM DRAIN ALIGNMENT LINE DATA								
LINE #	LENGTH	BEARING	START POINT NORTHING	START POINT EASTING	END POINT NORTHING	END POINT EASTING	STATION START	STATION END
L13	124.80'	N89° 57' 09.48"E	1993377.51	6688508.19	1993377.62	6688632.99	32+13.54	33+38.34
L14	70.22'	N32° 42' 06.40"E	1995965.23	6689727.68	1996024.32	6689765.62	0+10.00	0+80.22
L15	75.00'	S0° 00' 12.63"W	1994630.47	6689661.24	1994555.47	6689661.24	0+00.00	0+75.00
L16	100.00'	N59° 28' 52.56"W	1995921.34	6689801.87	1995972.12	6689715.72	0+00.00	1+00.00



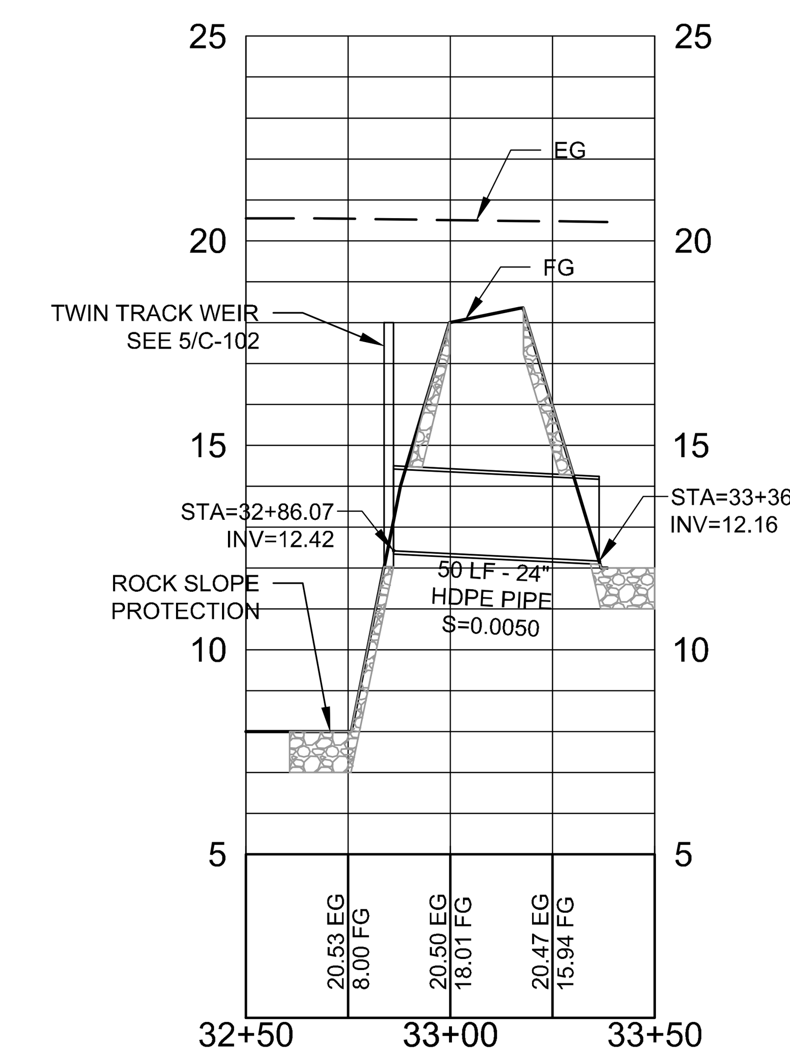
(16) **CULVERT 16 PROFILE**
1" = 40'
0 20 40 80



(15) **WITTER RANCH BORROW SITE WELL DISCHARGE 1 PROFILE**
1" = 40'
0 20 40 80



(14) **WITTER RANCH BORROW SITE CULVERT 14 PROFILE**
1" = 40'
0 20 40 80



(13) **JOHNSON RANCH BORROW SITE CULVERT 13 PROFILE**
1" = 40'
0 20 40 80

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MARK	DESCRIPTION	DATE

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-CG610.dwg

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PLAN AND PROFILE CULVERT 13 - 15

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C-508

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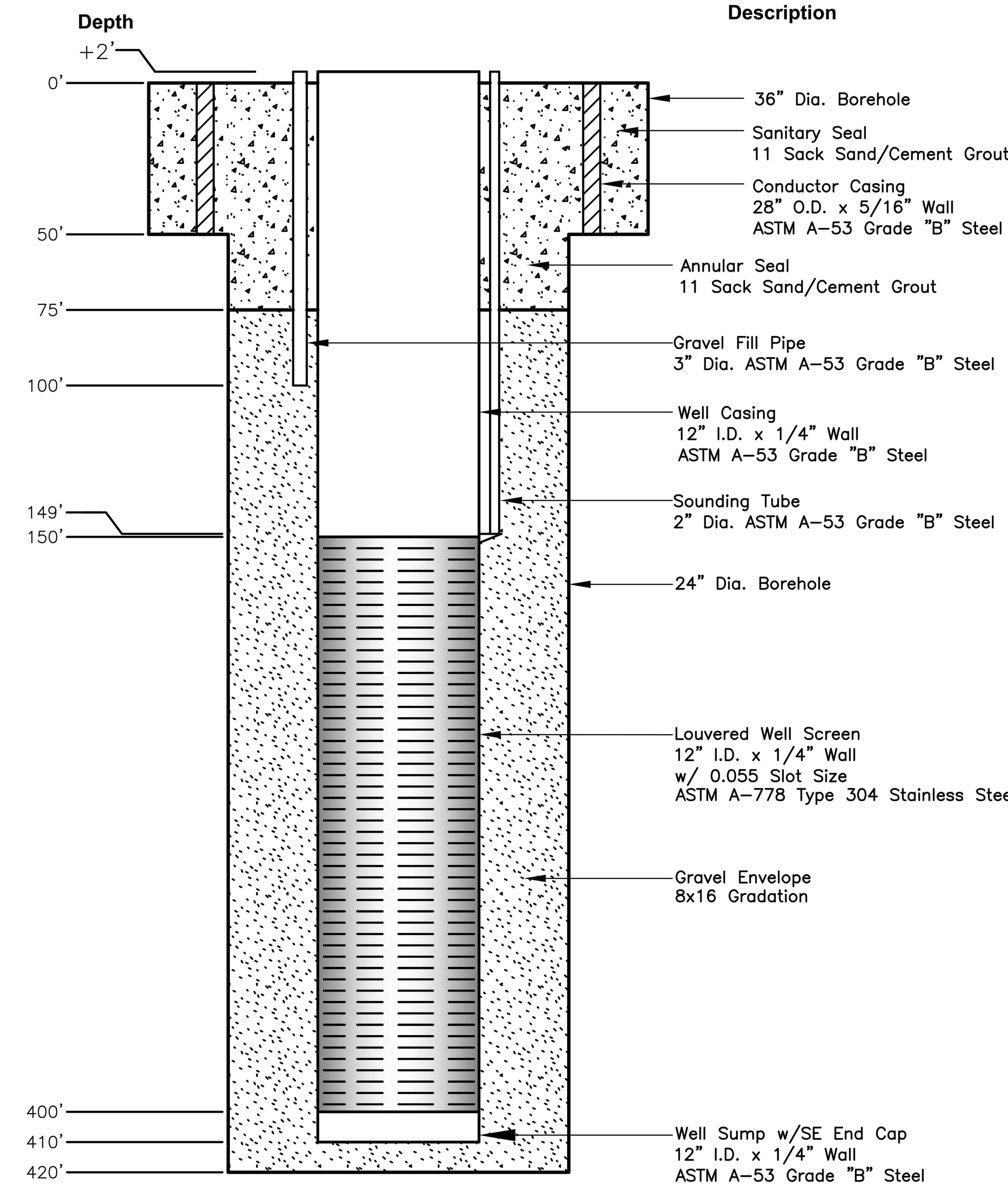
FINAL ISSUE FOR BID

PRELIMINARY
PRODUCTION WELL PROFILE



US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/24/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 18-2-104
FILE NAME: C-603

DESIGNED BY: S. LEWIS
DRAWN BY: G. GARRISON
CHECKED BY: C. JENKINS
SUBMITTED BY: S. LEWIS
SIZE: ANSI D
SPEC NO: 33 21 16

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SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

PRELIMINARY PRODUCTION
WELL PROFILE FOR
FISHERMAN LAKE WELL 4

REGISTERED PROFESSIONAL ENGINEER
JUSTIN M. SHOBE
No.C 77669
Exp. 6/30/2019
CIVIL
STATE OF CALIFORNIA

DATE: 5/24/19

Luhdorff & Scalmanini
Consulting Engineers
500 First Street
Woodland, California

SHEET ID
C-601

CAD FILE: G:\Projects\SAFCA\18-2-104\C-601.dwg DATE: 5/24/2019 4:09 PM

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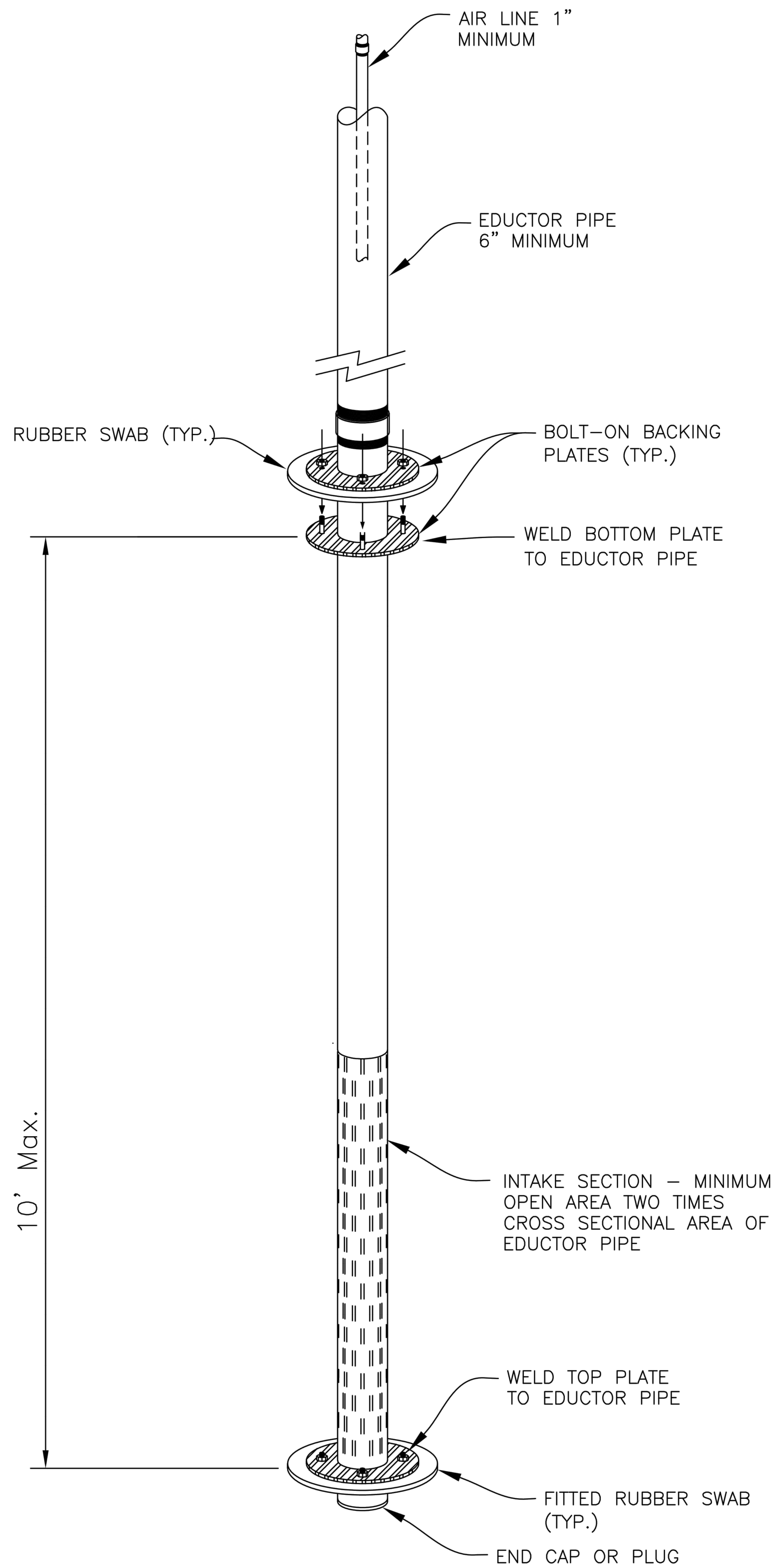
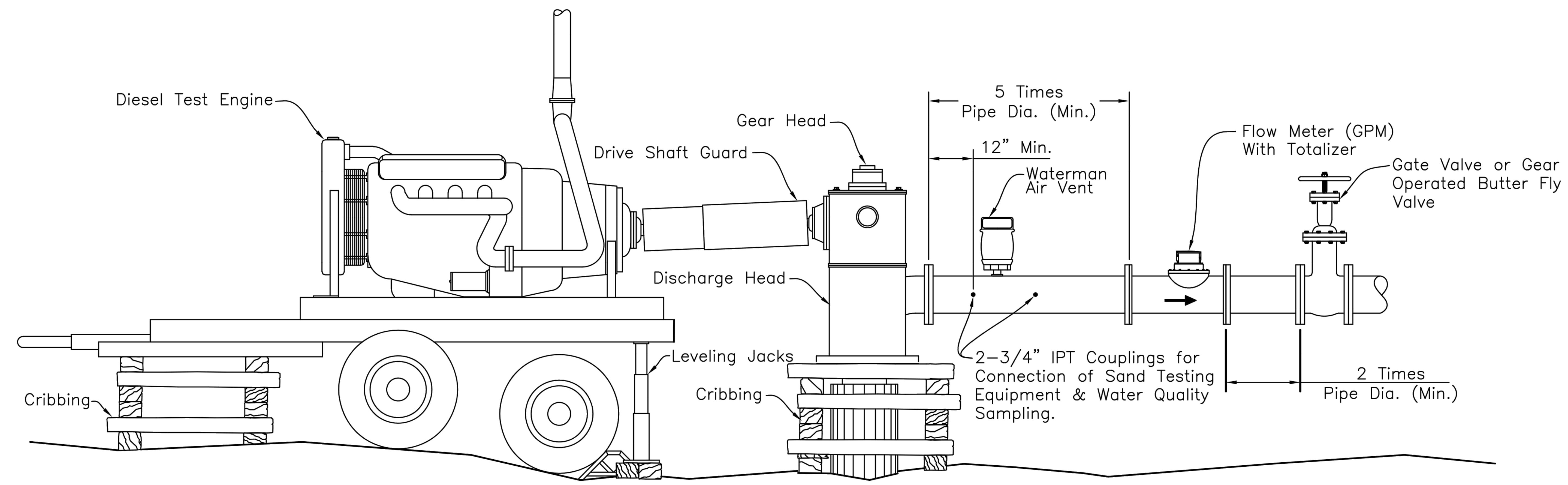


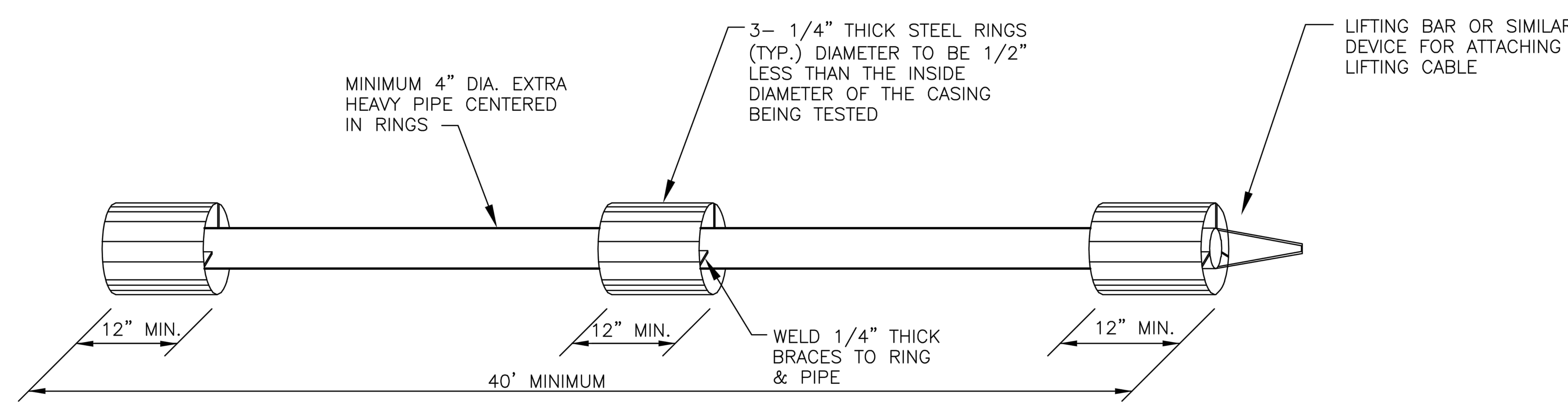
WELL DEVELOPMENT TOOL

N.T.S.



WELL TEST PUMP AND DISCHARGE ASSEMBLY

N.T.S.



ALIGNMENT TESTING TOOL

N.T.S.

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MARK	DESCRIPTION	DATE

ISSUE DATE: 05/24/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 18-2-104
FILE NAME: C-602

DESIGNED BY: S. LEWIS
DRAWN BY: G. GARRISON
CHECKED BY: C. JENKINS
SUBMITTED BY: S. LEWIS
SIZE: ANSI D
SPEC NO: 33 21 16

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

STANDARD CONSTRUCTION DETAILS

REGISTERED PROFESSIONAL ENGINEER
JUSTIN M. SHOBE
No.C 77669
Exp. 6\30\2019
CIVIL
STATE OF CALIFORNIA

DATE: 5/24/19

Luhdorff & Scalmanini
Consulting Engineers
500 First Street
Woodland, California

SHEET ID
C-602

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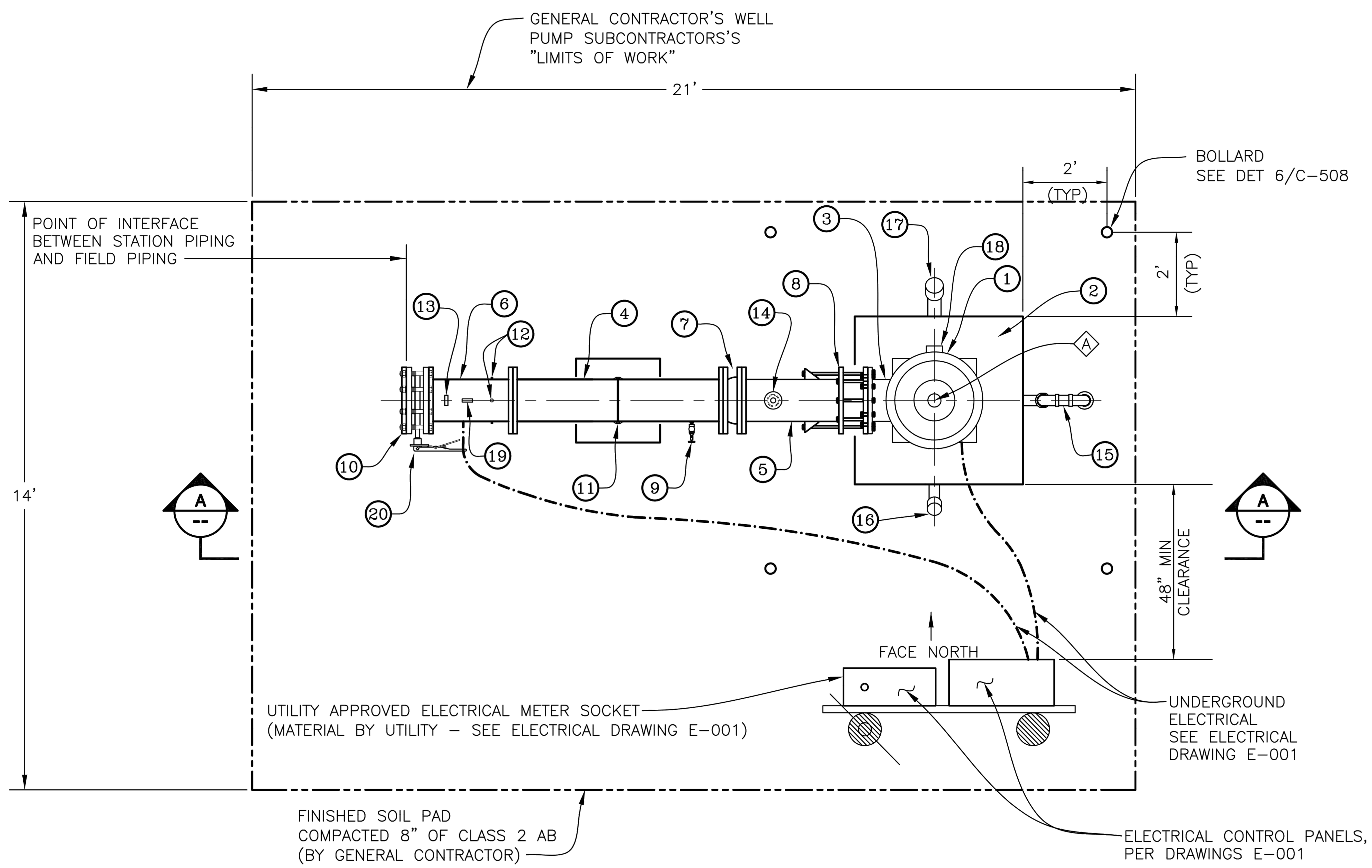
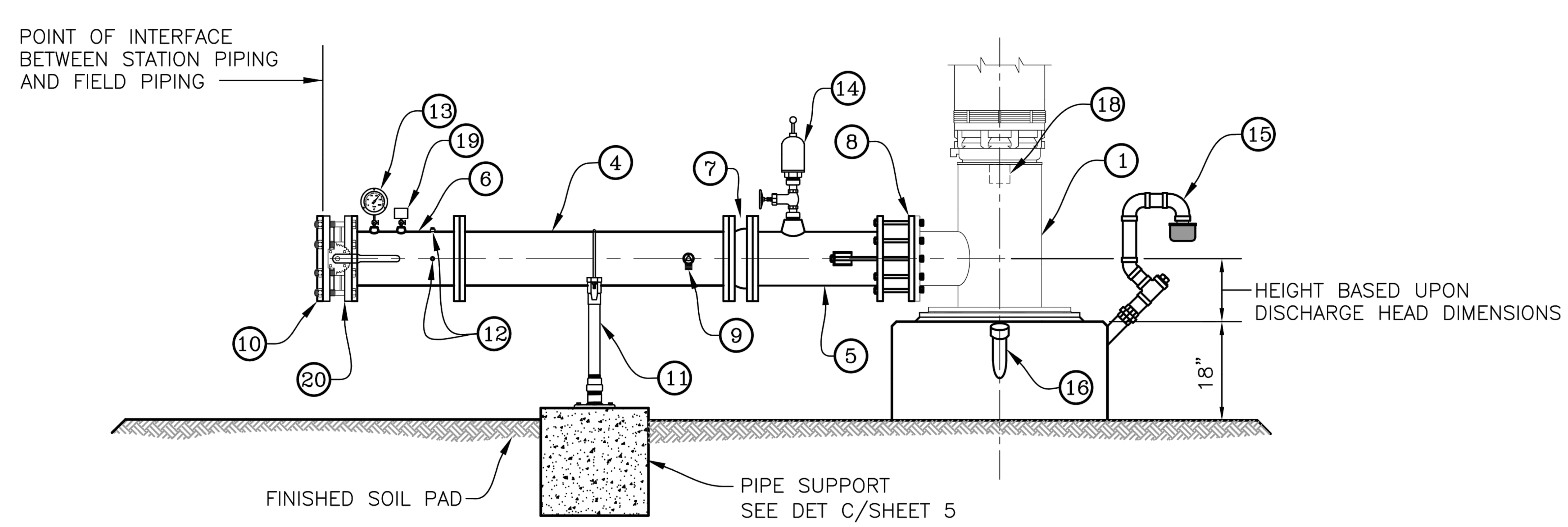


PUMP STATION PIPING

PLAN

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



PUMP STATION PIPING

SECTION A-A

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

SCHEDULE OF MATERIALS

ITEM	DESCRIPTION
1	VERTICAL TURBINE PUMP, OIL LUBRICATED, SEE WELL AND STATION PIPING SCHEDULE (BELOW) FOR SIZE
2	PUMP PEDESTAL, SEE DET A/C-604
3	FLANGED, FABRICATED STEEL DISCHARGE HEAD, SEE NOTES
4	5'-0" LG STL SPOOL, FL X FL, SEE NOTE 1 FOR SIZE
5	3'-0" LG STL SPOOL, FL X PE, SEE NOTE 1 FOR SIZE
6	2'-0" LG STL SPOOL, FL X FL, SEE NOTE 1 FOR SIZE
7	SPLIT DISC CHECK VALVE, FL X FL, SEE NOTE 1 FOR SIZE
8	FLANGED COUPLING ADAPTER W/ TIE RODS, SEE DET C/C-604, SEE NOTE 1 FOR SIZE
9	3/4" HOSE BIBB, SEE DET D/C-605
10	BLIND FLANGE, SEE NOTE 1 FOR SIZE
11	ADJUSTABLE PIPE SUPPORT W/PIPE YOKE, SEE DET C/C-605, SEE NOTE 1 FOR SIZE
12	TWO, 1/4" THREADED TAPS DIAMETRICALLY OPPOSED W/PLUGS, AND 1" THREADED TAP ON TOP W/PLUG
13	1" HALF COUPLING AND 0-30 PSI PRESSURE GAUGE, SEE DET A/C-605
14	3" HALF COUPLING WITH CONTINUOUS AIR VENT AND VACUUM RELIEF VALVE SEE DET B/C-605
15	3" CASING VENT ASSEMBLY, SEE DET B/C-604
16	3" GRAVEL FILL PIPE, SEE DET A/C-604
17	2" SOUNDING PIPE, SEE DET A/C-604
18	OIL LUBRICATION ASSEMBLY WITH SOLENOID VALVE AND DRIP FEED VALVE
19	HIGH PRESSURE SWITCH, 0-60 PSI, ADJUSTABLE SET POINT, SEE SPECIFICATIONS, SEE DET E/C-605
20	BUTTERFLY VALVE WITH LEVER HANDLE, SEE NOTE 1 FOR SIZE

WELL AND STATION PIPING SCHEDULE

STATION/WELL NAME	OWNER	EXISTING WELL			PROPOSED WELL			PROPOSED PUMP STATION *					
		WELL DEPTH (FT)	CASING DIA (IN)	WELL CAPACITY (GPM)	CASING DIA (IN)	WELL DEPTH (FT)	SCREEN INTERVALS (FT)	COLUMN PIPE DIAMETER (IN)	COLUMN PIPE LENGTH (FT)	STATION PIPING SIZE (IN)	WELL PUMP REQUIREMENTS		
											HEAD	FLOW	HP
FISH 4 WELL	SAFCA				12	410	250	8	130	10	65	1000	25

* NOTE: PUMP DESIGN FOR BIDDING PURPOSES ONLY. DESIGN FLOW, HEAD AND HORSEPOWER ARE SUBJECT TO CHANGE FOLLOWING WELL DRILLING AND TESTING.

NOTES:

1. FOR PIPE AND VALVE SIZE, SEE WELL AND STATION PIPING SCHEDULE, STATION PIPING SIZE.
2. CONTRACTOR SHALL SUBMIT TO THE CONTRACTING OFFICER FOR APPROVAL, THE FOLLOWING:
   A. COMPLETE PRODUCT DATA ON PIPE, FITTINGS, VALVES, APPURTENANCES, LININGS, AND COATINGS
   B. A LAYING PLAN SHOWING LOCATION OF EACH PIPE AND EACH SPECIAL LENGTH WITH EACH PIECE NUMBERED
3. STEEL FABRICATED PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A53 GRADE B, AND AWWA C200, DESIGN WORKING PRESSURE OF 100 PSI.
4. WELDED FITTINGS SHALL BE SEAMLESS STEEL CONFORMING TO ASTM A234
5. FLANGES SHALL BE FLAT FACE, CLASS B, CONFORMING TO AWWA C207 WITH CLASS 125 OD AND DRILLING PATTERN CONFORMING TO ASME B16.1
6. BOLTS SHALL BE CARBON STEEL, ASTM A307 GRADE B, WITH ASTM A563 GRADE A HEAVY HEX NUTS FOR CLASS B FLANGES, CONFORMING TO AWWA C207
7. GASKETS SHALL BE FULL FACED RED RUBBER, CONFORMING TO AWWA C207
8. SEE PAINTING SCHEDULE ON C-605

REGISTERED PROFESSIONAL ENGINEER JUSTIN M. SHORE No.C 77669 Exp. 6/30/2019 CIVIL STATE OF CALIFORNIA

DATE: 5/24/19

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Consulting Engineers
500 First Street
Woodland, California

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/24/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 18-2-104
FILE NAME: C-603

DESIGNED BY: J. SHORE
DRAWN BY: G. GARRISON
CHECKED BY: G. GARRISON
SUBMITTED BY: S. LEWIS
SIZE: ANSI D
SPEC NO: 43 21 39

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

WELL PUMP STATION PIPING

SHEET ID

C-603

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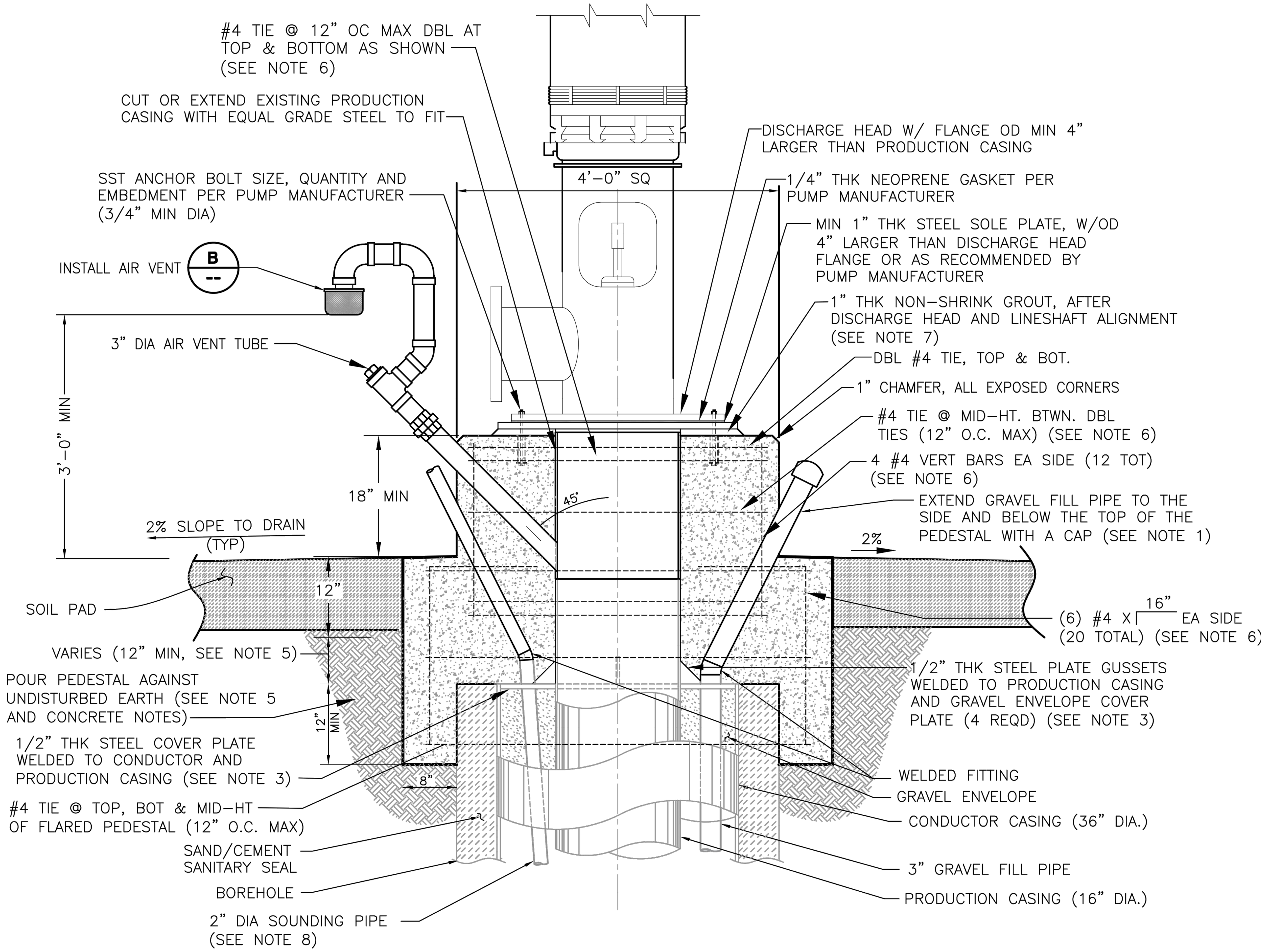


PUMP PEDESTAL DETAIL-MECHANICAL (A / -)

N.T.S.

GENERAL NOTES:

1.) SOUNDING PIPE, AIR VENT TUBE, AND GRAVEL FILL PIPE ARE SHOWN IN A ROTATED POSITION FOR CLARITY. SEE DRAWING C-603 FOR ORIENTATION. CONTRACTOR SHALL FIELD VERIFY THE LOCATIONS AND PROVIDE OFF-SETS AS NECESSARY TO AVOID CONFLICTS WITH WELL HEAD AND STATION PIPING.

2.) EXTERIOR SURFACE OF PUMP PEDESTAL SHALL BE SMOOTH GROUT FINISHED.

3.) IF THE STEEL COVER PLATE IS NOT PRESENT, THE STEEL GUSSETS ARE NOT REQUIRED.

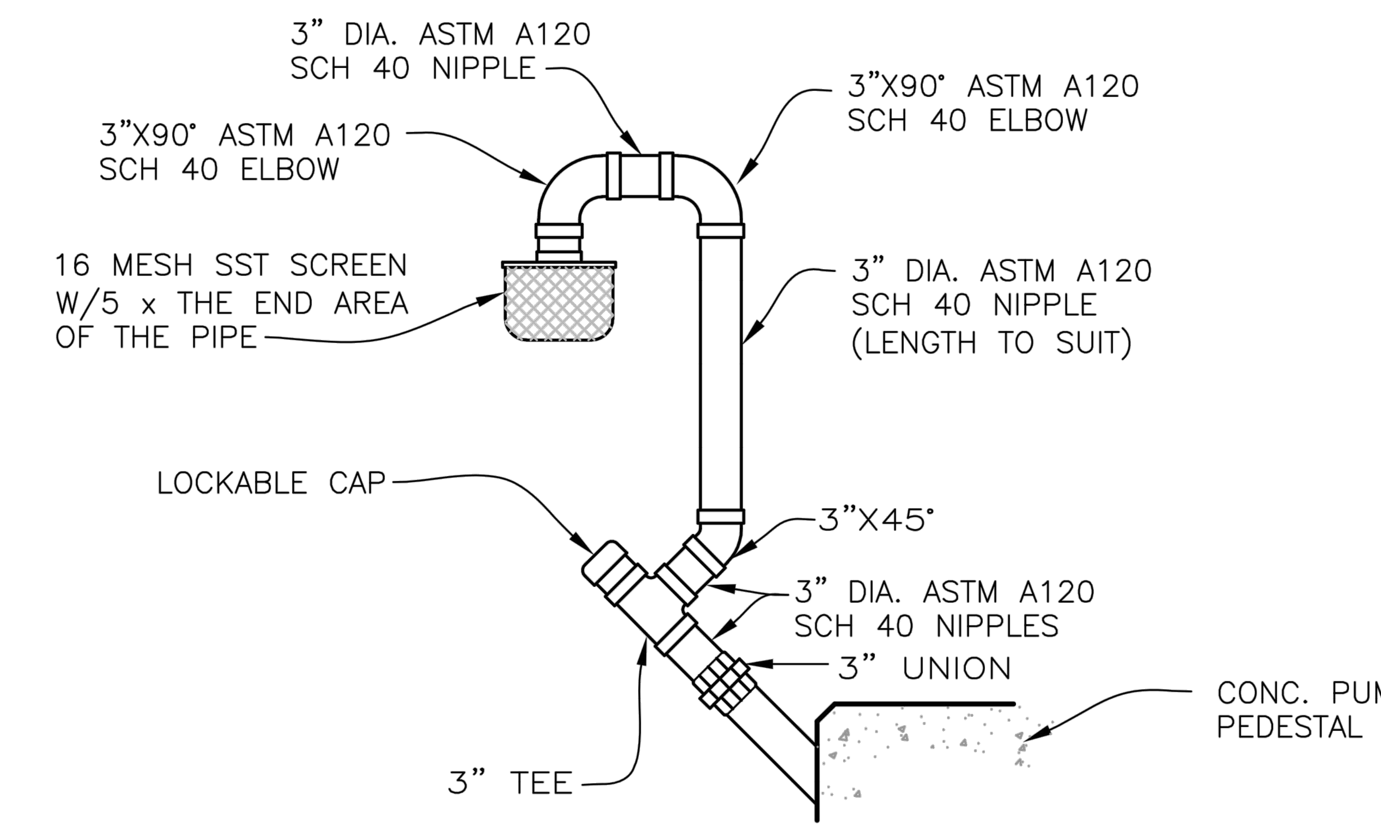
4.) CONTRACTOR TO INSURE ALL UNDERGROUND CONDUITS NEAR PEDESTAL ARE IN PLACE PRIOR TO POURING THE PEDESTAL. SEE ELECTRICAL DRAWINGS.

5.) THE CONTRACTOR SHALL LOCATE AND CLEAN THE SANITARY SEAL AND EXTEND THE PEDESTAL BASE AS SHOWN. CONTRACTOR SHALL ASSUME THAT THE SURFACE SEAL EXISTS 2 TO 5 FEET BELOW GROUND SURFACE. CONTRACTOR SHALL BOND PUMP PEDESTAL TO SANITARY SEAL WITH TWO PART EPOXY CONFORMING TO SECTION 95 OF THE CALTRANS STANDARD SPECIFICATIONS.

6.) MAINTAIN 3" CLEARANCE FROM OUTSIDE EDGE OF REBAR TO EDGE OF CONCRETE. TIES SHALL HAVE A 12" OVERLAP AND A 1 1/2" MIN VERTICAL CLEARANCE BETWEEN DOUBLE BARS.

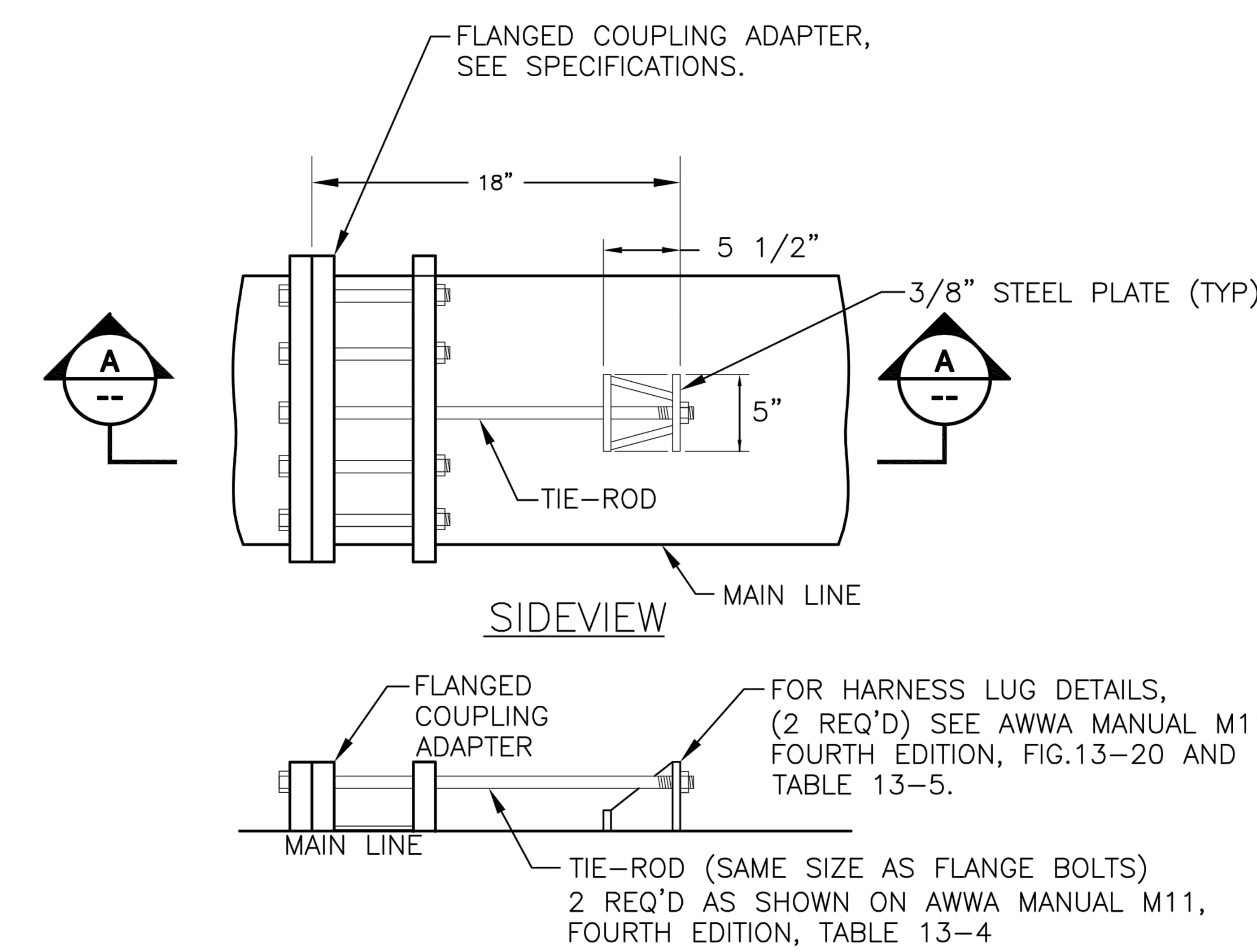
7.) FOR VERTICAL TURBINE LINE SHAFT PUMP INSTALLATION, REFER TO SPECIFICATIONS FOR SHIM PLACEMENT AND ALIGNMENT OF PUMP HEAD AND LINE SHAFT PRIOR TO GROUTING. THE WELL MAY HAVE AN INCLINATION. ALIGN DISCHARGE HEAD AND PLACE SHIMS OR LEVELING WEDGES BETWEEN SOLE PLATE AND PEDESTAL, AS REQUIRED.

8.) INSTALL SOUNDING PIPE AT A MINIMUM ANGLE TO ALLOW PASSAGE OF A 3/4" OD, 12 INCH LONG PROBE INTO WELL CASING.



PRODUCTION CASING AIR VENT DETAIL (B / --)

N.T.S.



TIE-ROD ASSEMBLY DETAIL (C / -)

N.T.S.

CONCRETE NOTES:

1.) CONTRACTOR TO SUBMIT CONCRETE MIX DESIGN TO ENGINEER. MIX DESIGN SUBMITTAL SHALL CONTAIN PAST HISTORY OF 10 BREAKS MIN, TESTED PER ASTM C31 OR C39 AS VERIFICATION OF DESIGN STRENGTH.
2.) PROVIDE CONCRETE MIX DESIGN CERTIFICATE UPON DELIVERY
3.) THE MINIMUM 28 DAY COMPRESSIVE STRENGTH FOR PUMP PEDESTAL CONCRETE SHALL BE 3,000 PSI
4.) THE MAXIMUM AGGREGATE SIZE SHALL BE 1 1/2".
5.) SLUMP RANGE SHALL BE 4 ±1 INCH AND TESTED TO MEET THE REQUIREMENTS OF ASTM STANDARD C143.
6.) MAXIMUMN WATER TO CEMENT RATIO BY WEIGHT SHALL BE 0.50
7.) REINFORCING STEEL SHALL BE INTERMEDIATE GRADE BILLET STEEL BARS CONFORMING TO ASTM DESIGNATION A615 GRADE 60.
8.) PUMP PEDESTAL TO BE COMPLETED IN A SINGLE CONCRETE POUR.

REGISTERED PROFESSIONAL ENGINEER JUSTIN M. SHOBE No.C 77669 Exp. 6/30/2019 CIVIL STATE OF CALIFORNIA

DATE: 5/24/19

Luhdorff & Scalmanini Consulting Engineers
500 First Street
Woodland, California

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

DESIGNED BY: J. SHOBE
DRAWN BY: G.GARRISON
CHECKED BY: G. GARRISON
SUBMITTED BY: S. LEWIS
SIZE: ANSI D
ISSUE DATE: 05/24/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 18-2-104
FILE NAME: C-604
SPEC NO: 43 21 39

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS
MECHANICAL DETAILS I

SHEET ID
C-604

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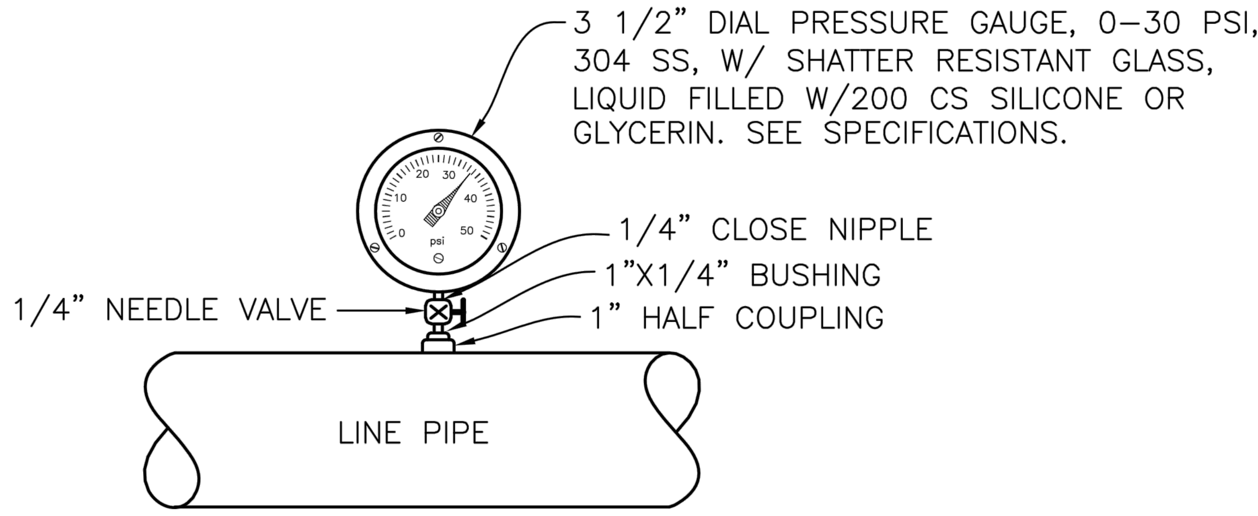
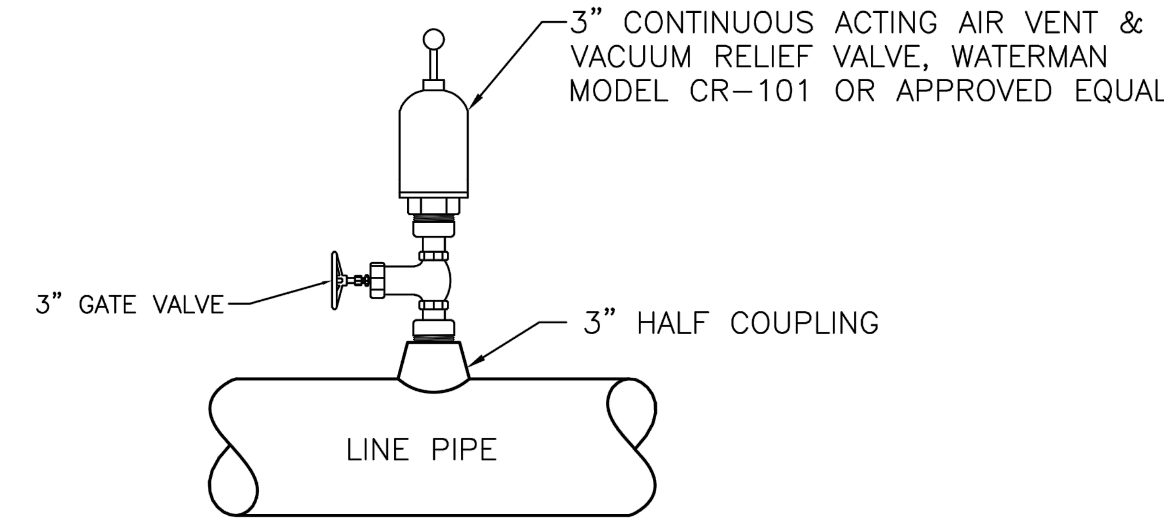
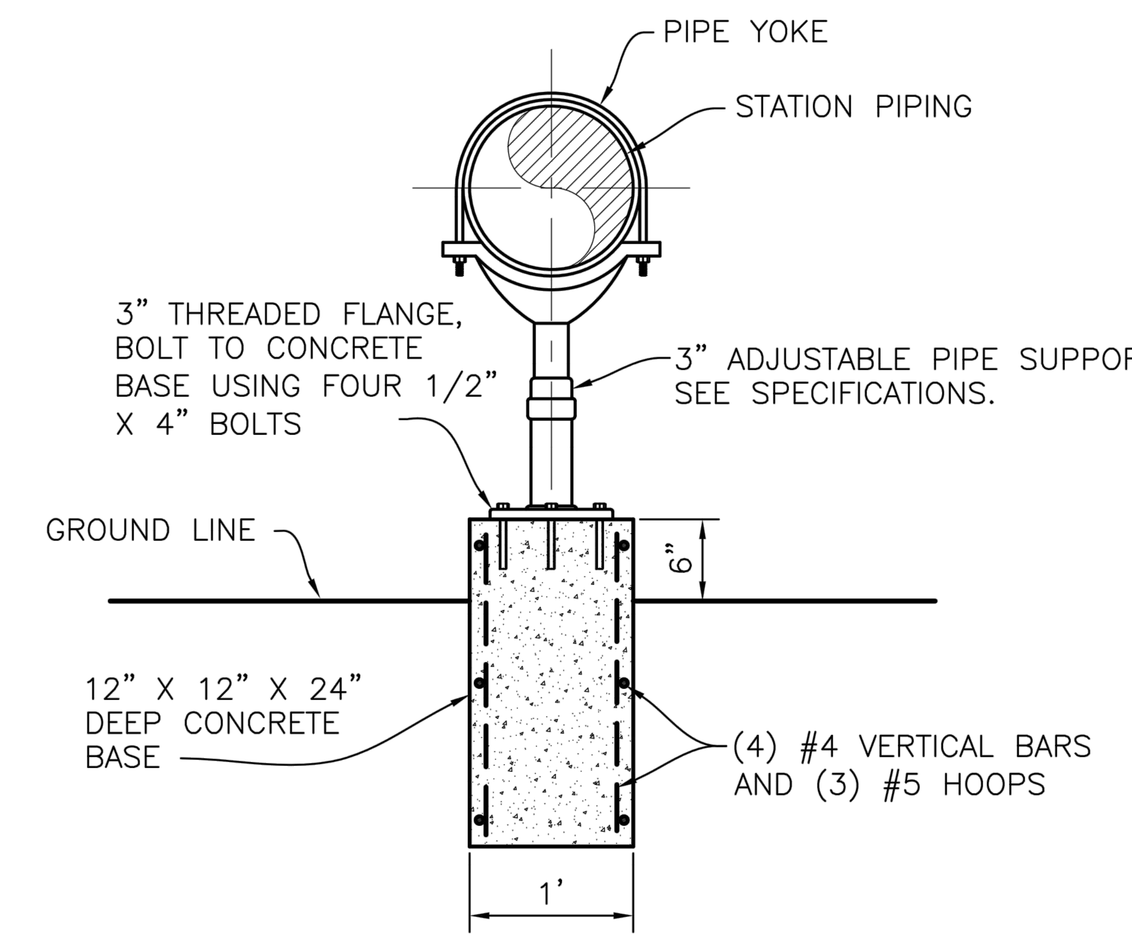


ALL FITTINGS TO BE 316L STAINLESS STEEL

PRESSURE GAUGE DETAIL A/--
N.T.S.

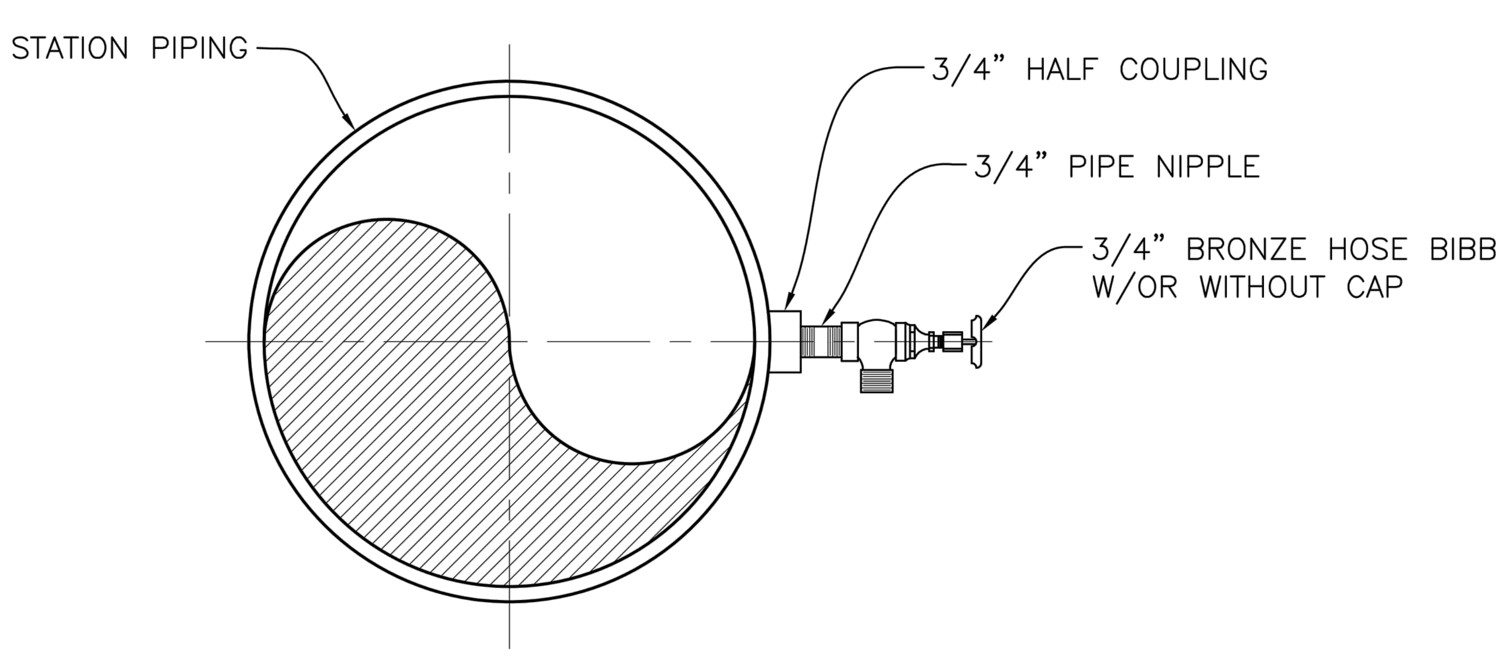


AIR RELEASE AND VACUUM VALVE DETAIL B/--
N.T.S.



ADJUSTABLE PIPE SUPPORT ASSEMBLY C/--
N.T.S.

ALL FITTINGS SHALL BE STAINLESS STEEL



HOSE BIBB DETAIL D/--
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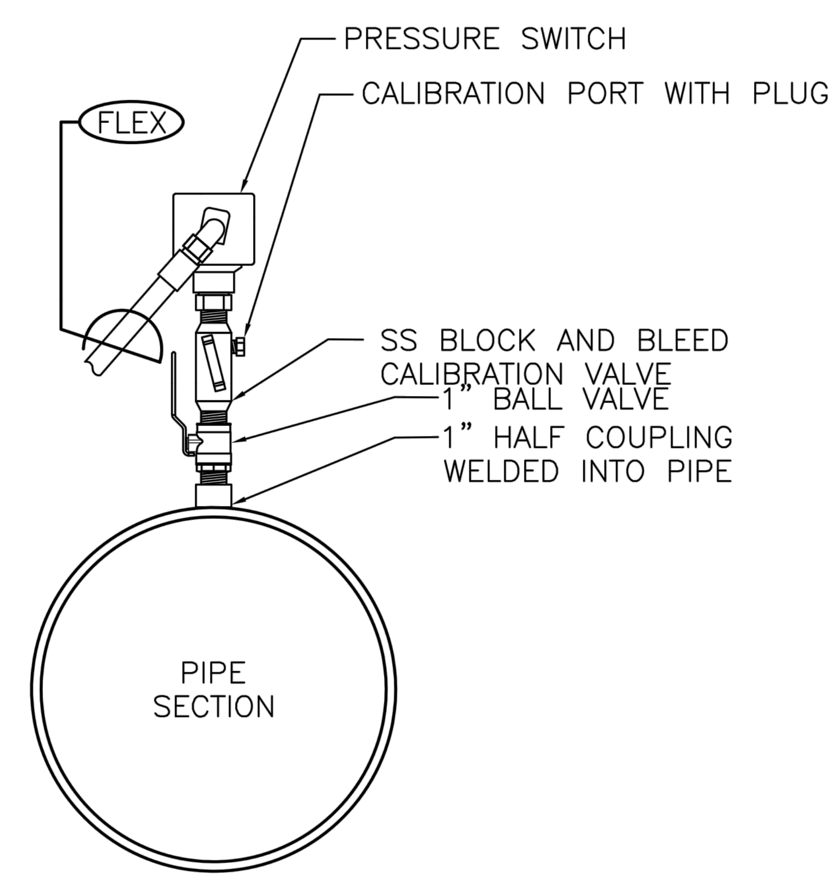

PRESSURE SWITCH DETAIL E/--
N.T.S.

PAINTING SCHEDULE

	SURFACE PREPARATION	FIRST COAT	SECOND COAT	THIRD COAT
SYSTEM 1 – EXTERIOR STEEL PIPE, VALVES AND FITTINGS	COMMERCIAL BLAST (SP6)	ZINC-RICH URETHANE, 2.5 TO 3.5 MILS; 1. TNEME-ZINC SERIES 90-97 OR 2. DEVOE CATHA-COAT 302H	POLYAMIDE EPOXY, 4 TO 6 MILS; 1. TNEMEC EPOXOLINE HS SERIES 166 OR SERIES V69F, OR 2. DEVOE BAR-RUST 235 (IN WINTER) OR BAR-RUST 231 (IN SUMMER)	ALIPHATIC ACRYLIC POLYURETHANE, 2 TO 3 MILS; 1. TNEMEC ENDURA-SHIELD II SERIES 1075 OR 2. DEVOE DEVTHANE 379H

NOTE:

UNLESS OTHERWISE SPECIFIED ALL EXPOSED FERROUS METAL NOT FACTORY FINISHED SHALL BE PAINTED.

REGISTERED PROFESSIONAL ENGINEER JUSTIN M. SHOBE No.C 77669 Exp. 6/30/2019 CIVIL STATE OF CALIFORNIA
DATE: 5/24/19

Luhdorff & Scalmanini
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500 First Street
Woodland, California

US Army Corps of Engineers

MARK	DESCRIPTION	DATE

ISSUE DATE: 05/24/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 18-2-104
FILE NAME: C-605

DESIGNED BY: J. SHOBE
DRAWN BY: G. GARRISON
CHECKED BY: G. GARRISON
SUBMITTED BY: S. LEWIS
SIZE: ANSI D
SPEC NO: 43 21 39

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

MECHANICAL DETAILS II

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C-605

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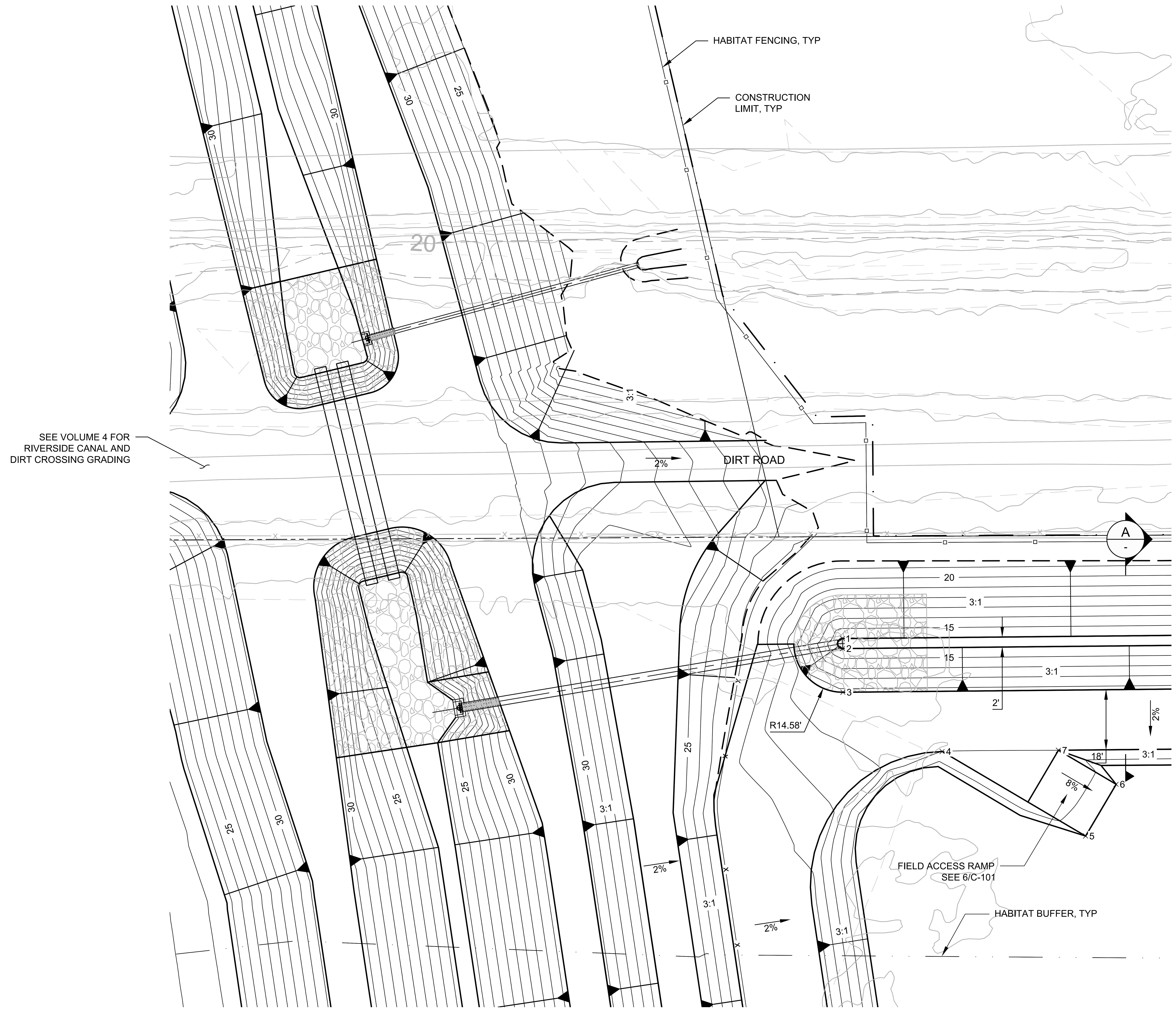

1 GRADING DETAIL
1" = 20'
0 10 20 40

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
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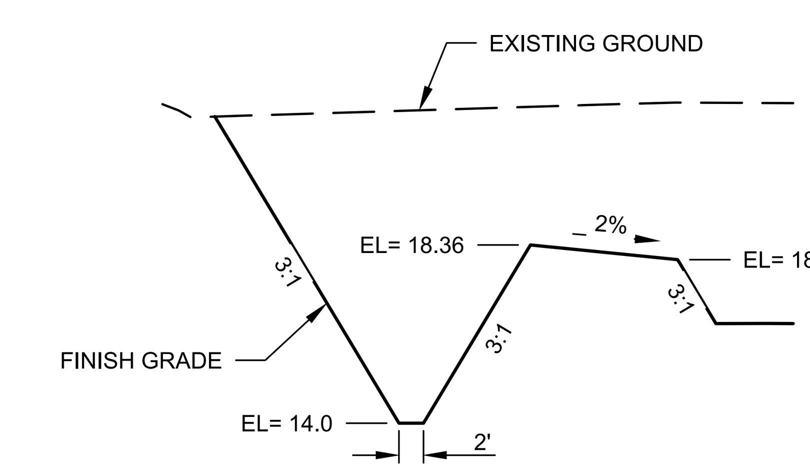
2	1994995.163	6687251.058	14.00
3	1994982.084	6687251.187	18.36
4	1994964.337	6687280.895	18.00
5	1994939.013	6687323.860	16.43
6	1994954.520	6687333.000	16.44
7	1994964.708	6687315.715	18.00



A SECTION
1" = 20'
0 10 20 40

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MARK	DESCRIPTION	DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642C-CG101.dwg
DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

JOHNSON RANCH GRADING PLAN

SHEET ID
CG-101

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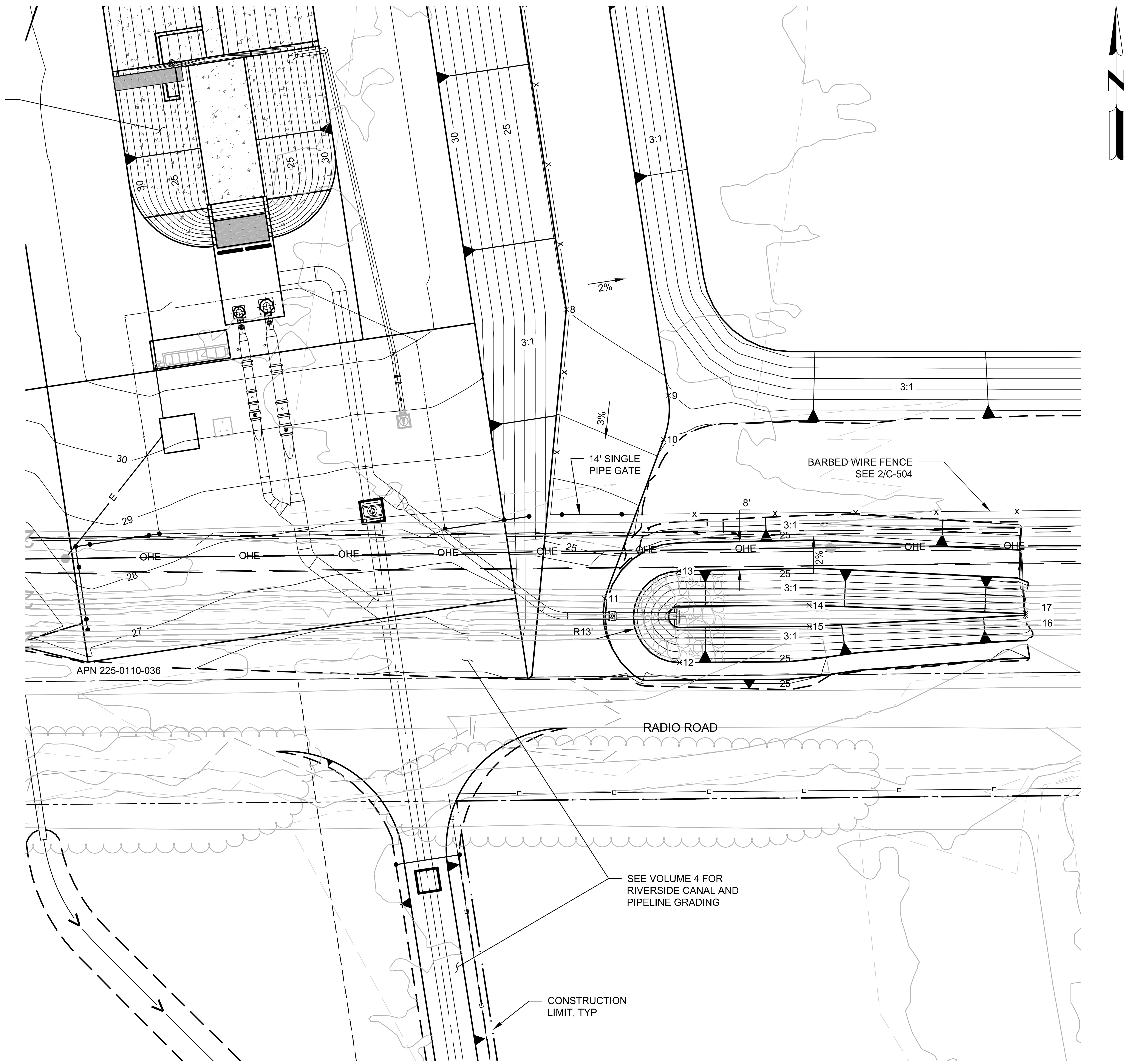

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
8	1993336.740	6687461.055	22.00
9	1993312.237	6687490.045	22.11
10	1993299.759	6687488.748	22.71
11	1993254.504	6687472.041	25.37
12	1993236.342	6687493.259	25.50
13	1993262.341	6687493.053	25.50
14	1993252.636	6687530.140	20.50
15	1993246.635	6687530.129	20.50
16	1993249.775	6687591.563	20.50
17	1993250.203	6687591.572	20.50

2 GRADING DETAIL

1" = 20'

0 10 20 40

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MARK	DESCRIPTION	DATE

ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642C-CG101.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
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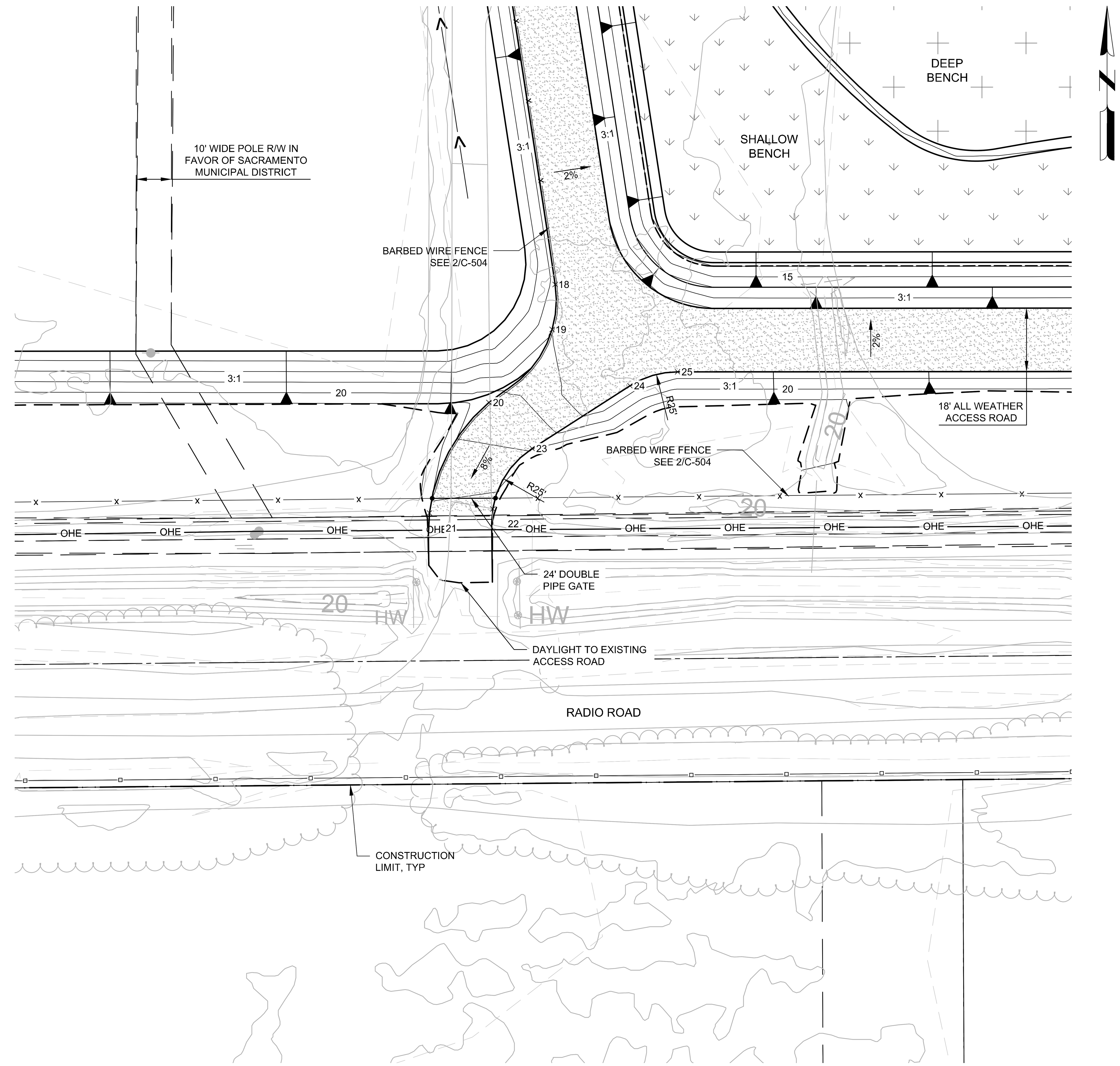

3 GRADING DETAIL
1" = 20'

0 10 20 40

POINT TABLE			
POINT #	NORTHING	EASTING	ELEVATION
18	1993343.982	6688057.050	18.36
19	1993331.203	6688056.180	18.92
20	1993310.460	6688038.249	20.29
21	1993279.143	6688021.379	22.22
22	1993280.271	6688039.338	22.33
23	1993297.409	6688050.529	20.93
24	1993315.223	6688078.286	18.36
25	1993319.184	6688091.769	18.36

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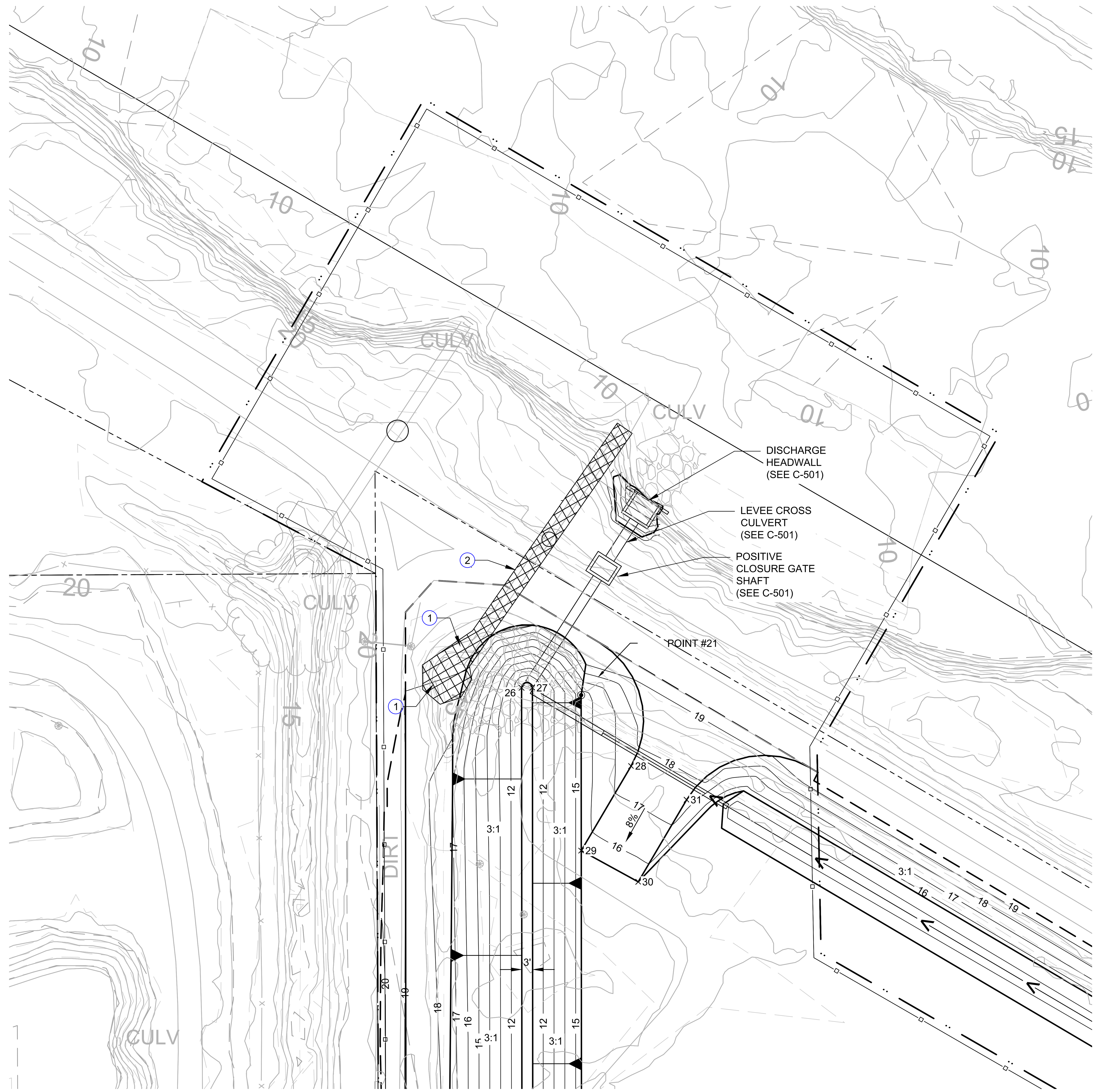

4 GRADING DETAIL

1" = 20'

0 10 20 40

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
26	1995965.234	6689726.184	11.00
27	1995965.234	6689729.184	11.00
28	1995943.553	6689756.523	17.69
29	1995920.123	6689742.719	15.51
30	1995911.475	6689758.506	15.53
31	1995934.209	6689771.899	17.64

NOTE:

1. CLEAR AND GRADE IN ACCORDANCE WITH SPECIFICATIONS SECTION 311100.

DEMOLITION NOTES:

1. REMOVE AND WASTE EXISTING BARB WIRE FENCING WITHIN CONSTRUCTION LIMITS.
2. REMOVE AND WASTE EXISTING CULVERT AND MANHOLE STRUCTURE

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WITTER RANCH GRADING PLAN

SHEET ID

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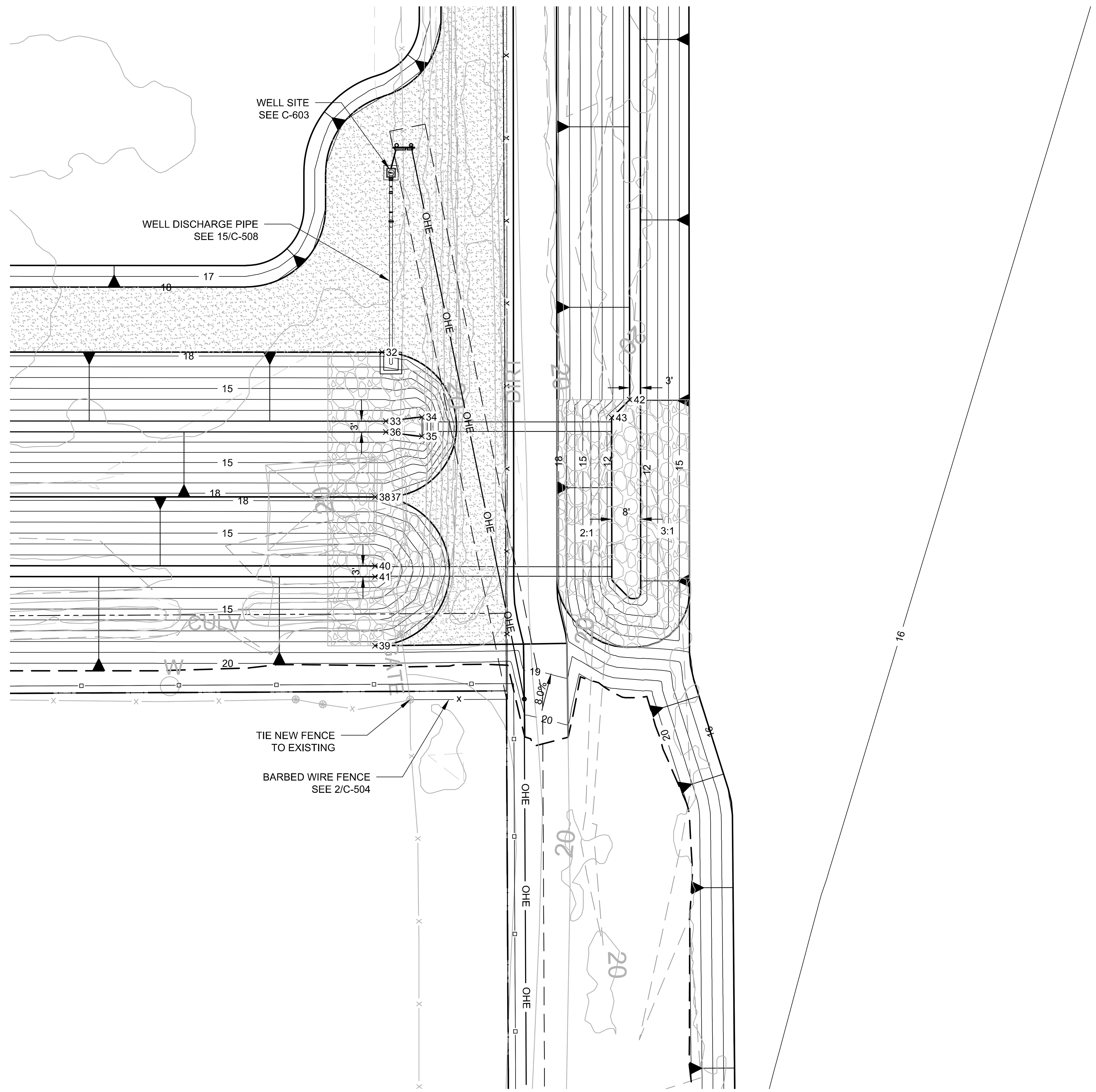

5 **GRADING DETAIL**

1" = 20'

0 10 20 40

POINT TABLE

POINT #	NORTHING	EASTING	ELEVATION
32	1994574.404	6689658.779	18.36
33	1994555.303	6689659.843	12.00
34	1994556.477	6689669.812	12.00
35	1994551.131	6689669.808	12.00
36	1994552.303	6689659.841	12.00
37	1994534.303	6689659.830	18.36
38	1994534.305	6689656.867	18.37
39	1994493.105	6689656.841	18.37
40	1994515.205	6689656.855	12.00
41	1994512.205	6689656.853	12.00
42	1994561.280	6689727.345	11.42
43	1994556.286	6689722.351	11.42

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FINAL ISSUE FOR BID

GENERAL STRUCTURAL NOTES:

G-1. SEE SHEET G-004 FOR ADDITIONAL GENERAL NOTES.

G-2 ALL PIPE TERMINATING AT A CONCRETE WALL SHALL BE FITTED WITH A FLEXIBLE RESILIENT COUPLING AT THE TERMINUS (UNO).

G-3 SEE CIVIL OR ANY RELEVANT DRAWINGS FOR SIZE AND LOCATION OF ALL OPENINGS REQUIRED FOR DUCTS, PIPES AND ALL PIPES SLEEVES, ELECTRICAL CONDUITS AND OTHER ITEMS TO BE EMBEDDED IN CONCRETE OR OTHERWISE INCORPORATED IN STRUCTURAL WORK.

G-4 NO PIPES OR DUCTS SHALL BE EMBEDDED INTO STRUCTURAL CONCRETE UNLESS SO SHOWN ON THE PLANS OR APPROVAL BY THE CONTRACTING OFFICER.

SHORING AND EXCAVATION NOTES:

SE-1 CONTRACTOR SHALL CONSULT THE GEOTECHNICAL REPORT AND THE GEOTECHNICAL ENGINEER IF ADDITIONAL GUIDANCE IS REQUIRED PER THE CONTRACT DOCUMENTS FOR RECOMMENDATIONS ON ALL CONSTRUCTION SITE CONDITIONS REQUIRING EXCAVATIONS, SHORING, DEWATERING AND BRACING.

SE-2 ALL ERECTION AND EXCAVATION PROCEDURES SHALL CONFORM TO CAL-OSHA STANDARDS. ANY DEVIATIONS MUST BE APPROVED BY CAL-OSHA PRIOR TO ERECTION. SHORING AND BRACING SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT SAFETY AND STRUCTURAL INTEGRITY IS NOT COMPROMISED DURING THE ENTIRE PROCESS. SAFETY ISSUES SHALL BE IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES. REQUIREMENTS OF THE ARMY CORPS OF ENGINEERS SAFETY AND HEALTH MANUAL, EM 385-1-1 SHALL BE ADHERED TO.

SE-3 THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES.

STRUCTURAL DESIGN CRITERIA:

1. DESIGN REFERENCES (USED FOR GUIDANCE):

   2016 CALIFORNIA BUILDING CODE (CBC) - DESIGN DATA
   USACE ENGINEERING MANUAL EM 1110-2-2100 - LOAD CONDITIONS
   ACI 350-06 - CONCRETE DESIGN

2. WIND DESIGN DATA (CBC 1603.1.4)

BASIC WIND SPEED (3-SECOND GUST):	V3S=110 MPH
RISK CATEGORY:	II
WIND IMPORTANCE FACTOR:	IW=1.0
WIND EXPOSURE:	C

3. EARTHQUAKE DESIGN DATA (CBC 1603.1.5)

RISK CATEGORY:	I
IMPORTANCE FACTOR:	Ie = 1.00
SITE CLASS:	E
MCE EARTHQUAKE SPECTRAL ACCELERATIONS	
AT SHORT PERIODS:	SMS = 0.909 G
AT A PERIOD OF 1 SECOND:	SM1 = 0.844 G
DESIGN EARTHQUAKE SPECTRAL ACCELERATIONS	
AT SHORT PERIODS:	SDS = 0.606 G
AT A PERIOD OF 1 SECOND:	SD1 = 0.563 G
SEISMIC DESIGN CATEGORY:	SDC = D

   RESPONSE MODIFICATION COEFFICIENT: N/A FOR EARTH RETAINED STRUCT.

   ANALYSIS METHOD: EQUIVALENT LATERAL FORCE

4. LOADS:

   a. PEDESTRIAN: 60 PSF MIN ON ALL ELEVATED SLABS & GRATES

   b. VEHICLE: HS-20 (CAL-TRANS BRIDGE DESIGN SPECIFICATIONS) APPLIES OVER LIFT STATION SLAB

4. EARTH LOADS & CAPACITY:
   (PER KLEINFELDER GEOTECHNICAL REPORT, RIVERSIDE CANAL, DATED 9/24/10)

COMPACTED SOIL GRAVITY LOAD		SOIL BEARING CAPACITY SHALLOW FND:	
SATURATED	= 120 PCF	GENERAL	= 1000 PSF
		PIPE CROSSING	= 1800 PSF
LEVEL SOIL LATERAL LOADS:		PASSIVE PRESSURE:	
ACTIVE DRAINED	= 45 PCF	DRAINED	= 320 PCF
ACTIVE SUBMERGED	= 85 PCF	SUBMERGED	= 150 PCF
AT REST DRAINED	= 65 PCF		
AT REST SUBMERGED	= 95 PCF		

   FRICTION RESISTANCE:
   f=0.30 CANAL EMBANKMENT OR CHANNEL LINING FILL
   f=0.40 ENGINEERED FILL

EARTHWORK NOTES:

EW-1. SEE THE DESIGN DOCUMENTATION REPORT FOR THE GEOTECHNICAL REPORT. COMPLY WITH SECTION 31 00 00 OF PROJECT SPECIFICATIONS.

EW-2. UNLESS DIRECTED OTHERWISE BY THE CONTRACTING OFFICER, THE CONTRACTOR SHALL RETAIN AN INDEPENDENT, QUALIFIED GEOTECHNICAL ENGINEERING FIRM/TESTING FIRM TO IDENTIFY AREAS OF POOR SOILS, TO MONITOR PROPER SUBGRADE PREPARATIONS AND TO OVERSEE AND TEST THE PLACEMENT OF COMPACTED FILL MATERIAL.

EW-3. ALL SUBTERRANEAN STRUCTURES, UTILITIES, PIPING, ETC. IN THE AREA OF EXCAVATIONS TO BE LOCATED AND MARKED BY CONTRACTOR PRIOR TO EARTH REMOVAL WORK. CONTRACTOR TO MAINTAIN MARKERS UNTIL EXCAVATION ACTIVITIES HAVE CEASED. IF UNDERGROUND UTILITY CONFLICTS ARE DISCOVERED BEFORE OR ENCOUNTERED DURING EXCAVATION, NOTIFY THE CONTRACTING OFFICER IMMEDIATELY.

EW-4 BEFORE PLACING FOOTINGS, FOUNDATIONS OR SLAB-ON-GRADE, THE SUB-GRADE SHALL BE PREPARED AND INSPECTED AS REQUIRED BY THE SPECIFICATIONS.

EW-5. FOOTING SUBGRADES SHALL BE CLEAN AND FREE OF DEBRIS, STANDING WATER, AND LOOSE SOIL. NO FILL SHALL BE PLACED OVER FROZEN, MUDDY, OR OTHER DELETERIOUS MATERIAL. NO FILL SHALL BE PLACED OVER A PREVIOUS LIFT THAT HAS NOT BEEN ADEQUATELY COMPACTED PER SPECIFICATIONS.

EW-6. BACKFILL AGAINST FOUNDATION WALLS SHALL BE PLACED EVENLY ON ALL SIDES IN ORDER TO ACHIEVE GENERALLY BALANCED LOADINGS.

EW-7. RETAINING WALLS AND BELOW GRADE WALLS SHALL BE SHORED DURING EXTERIOR SOIL COMPACTION.

EW-8. UNLESS OTHERWISE DIRECTED BY THE GEOTECHNICAL ENGINEER OVER EXCAVATE TO A DEPTH 1'-6" BELOW THE BOTTOM OF FOOTINGS, SLABS-ON-GRADE AND OTHER STRUCTURES. OVER EXCAVATION SHALL EXTEND 3'-0" HORIZONTALLY FROM EDGE OF FOOTING, SLABS-ON-GRADE AND OTHER STRUCTURES, EACH WAY. BEFORE PLACING FOOTINGS, FOUNDATIONS, SLABS-ON-GRADE OR OTHER STRUCTURES, THE SUB-GRADE SHALL BE PREPARED AND INSPECTED AS REQUIRED BY THE PROJECT SPECIFICATIONS. SEE DETAIL 6/S-101.

EW-9. STRUCTURE BACKFILL SHALL MEET THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.

SHOP DRAWINGS:

SD-1. SHOP DRAWINGS REQUIRED BY THE GENERAL NOTES AND/OR SPECIFICATIONS SHALL BE SUBMITTED TO THE CONTRACTING OFFICER FOR REVIEW PRIOR TO FABRICATION. CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS.

SD-2. THE GENERAL CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS AND PRODUCT DATA FOR CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTAL. GENERAL CONTRACTOR SHALL CLOUD OR FLAG ALL ITEMS NOT IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND SHALL VERIFY ALL DIMENSIONS.

SD-3. ANY CHANGES OR DEVIATIONS FROM THE ORIGINAL CONTRACT DRAWINGS SHALL BE CLOUDED BY THE MANUFACTURER OR FABRICATOR. ANY CHANGES OR DEVIATIONS WHICH ARE CLOUDED OR FLAGGED BY SUBMITTING PARTIES SHALL NOT BE CONSIDERED APPROVED AFTER THE CONTRACTING OFFICER'S REVIEW, UNLESS SPECIFICALLY NOTED ACCORDINGLY BY THE CONTRACTING OFFICER.

SD-4. SHOP DRAWING REVIEW IS INTENDED ONLY FOR GENERAL CONFORMANCE TO THE DESIGN INTENT AND CONSTRUCTION DOCUMENTS.

STRUCTURAL OBSERVATION

SO-1. STRUCTURAL OBSERVATION IS REQUIRED FOR ALL STRUCTURES SHOWN IN DRAWINGS. PROVIDE ACCESS AND SCHEDULE ALLOWANCES FOR STRUCTURAL OBSERVATION. COORDINATE ACCESS AND SCHEDULE WITH CONTRACTING OFFICER.

SO-2. COORDINATE WITH CONTRACTING OFFICER THE NECESSARY HOLD POINTS FOR STRUCTURAL OBSERVATION AT A PRECONSTRUCTION MEETING. MINIMUM HOLD POINT ARE LISTED BELOW:
- FOUNDATION PRE-PLACEMENT
- CONCRETE WALL AND SLAB PRE-PLACEMENT
- FINAL STRUCTURE

CONCRETE & REINFORCING STEEL NOTES:

MATERIAL PROPERTIES (UNO)

COMPRESSIVE STRENGTH - F'c = 4000 PSI CLASS 4A

CONCRETE REINFORCEMENT - Fy = 60 KSI (ASTM A615 GR 60)

CR-1. COMPLY WITH SECTION 03 30 00 OF PROJECT SPECIFICATIONS.

CR-2. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON SHOP DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.

CR-3. HORIZONTAL BARS SHALL BE DETAILED TO SHOW THE DISTANCE FROM AT LEAST ONE END OF THE BAR TO THE NEAREST FACE OF WALL.

CR-4. REINFORCING SHALL BE DETAILED IN ACCORDANCE WITH THE LATEST VERSION OF ACI 315.

CR-5. ALL REINFORCEMENT BARS SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST CRSI MANUAL OF STANDARD PRACTICE AND SHALL BE CLEAN AND FREE OF GREASE AND SCALING RUST.

CR-6. PROVIDE WATER STOPS IN HORIZONTAL AND VERTICAL CONSTRUCTION JOINTS UNLESS OMISSION IS SPECIFICALLY APPROVED BY THE CONTRACTING OFFICER AT EACH LOCATION.

CR-7. HOOK HORIZONTAL WALL AND BEAM REINFORCING BARS AT DISCONTINUOUS ENDS, TYPICAL UNO EXTEND REINFORCEMENT TO FAR FACE OF PIERS/PEDESTALS AND/OR COLUMNS UNO

CR-8. PROVIDE HOT/COLD WEATHER PROCEDURES AND PROTECTION IN ACCORDANCE WITH ACI RECOMMENDATIONS AND PROJECT SPECIFICATIONS.

CR-9. CONCRETE REINFORCEMENT PROTECTION/CLEAR COVER, UNO (IN ACCORDANCE WITH ACI 350):

BOTTOM & SIDES CAST AGAINST EARTH	3"
FORMED SIDES AND TOP	2"

CR-10. PROVIDE ADDITIONAL #5 TRIM BARS AT 4'-0" LONG 3" AWAY FROM CORNER AT 45° TO ALL REENTRANT CORNERS AND OPENINGS IN CONCRETE SLABS AND WALLS FOR EACH LAYER OF REINF. UNO.

CR-11. ALL CONCRETE DESIGN AND CONSTRUCTION SHALL CONFORM WITH THE 2016 CALIFORNIA BUILDING CODE REQUIREMENTS AND THOSE OF THE FOLLOWING STANDARDS (LATEST EDITION):

"ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONC."
"ACI 315, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
"ACI 350, CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES."
"ACI 307, RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"

CR-12. ALUMINUM CONDUIT IS NOT PERMITTED TO BE EMBEDDED IN CONCRETE.

CR-13. UNO, PROVIDE FOOTING DOWELS TO MATCH VERTICAL WALL REINFORCING.

CR-14. UNO, CONTRACTOR SHALL SUBMIT PLANS OF JOINT LOCATIONS TO THE CONTRACTING OFFICER FOR APPROVAL PRIOR TO CASTING FOR STRUCTURES LONGER THAN 40 FT.

CR-15. PROVIDE A ¾" CHAMFER ON ALL EXPOSED EDGES.

CR-16. ALL ADHESIVE ANCHORS AND ADHESIVE DOWELS INTO CONCRETE TO BE ADHESIVE ANCHORED WITH HILTI RE-500-V3 ADHESIVE OR SIMPSON SET 3G ADHESIVE UNLESS INDICATED OTHERWISE.

STRUCTURAL STEEL NOTES:

MATERIAL PROPERTIES (UN0)

W-SHAPES	Fy = 50 KSI (A992 OR A572 Gr 50)
C-SHAPES & ANGLES	Fy = 36 KSI (A36)
PLATES & BARS	Fy = 36 KSI (A36)
SQUARE TUBES	Fy = 46 KSI (A500 Gr B)
PIPES	Fy = 35 KSI (A53 TYPE S, Gr B)
ROUND TUBES	Fy = 35 KSI (A53 TYPE S, Gr B)
ANCHOR RODS	Fy = 36 KSI (F1554)

S-1. UNO, ALL BOLTED CONNECTIONS SHALL UTILIZE 3/4 INCH DIAMETER A325-X BOLTS TIGHTENED TO THE SNUG-TIGHT CONDITION. THE SNUG-TIGHT CONDITION IS DEFINED BY THE RCSC'S "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS".

S-2. NON-SHRINK GROUT SHALL BE PER SPECIFICATION 03 30 00.

S-3. ALL WELDING OF NEW STEEL IS TO BE WITH E70XX ELECTRODES, UNO WELDING SHALL BE IN ACCORDANCE WITH THE LATEST AWS D1.1 SPECIFICATIONS BY CERTIFIED WELDERS.

S-4. ALL STEEL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION. FASTENERS SHALL BE HOT-DIPPED GALVANIZED. FIELD BORING, CUTTING OR WELDING ARE NOT ALLOWED UNLESS SPECIFICALLY DETAILED AND APPROVED TOUCH UP IS PROVIDED.

STRUCTURAL TESTING AND INSPECTION:

TI-1. AN INDEPENDENT TESTING AND INSPECTION FIRM SHALL BE RETAINED TO PROVIDE SPECIFIED FIELD AND LAB TESTING OF CONSTRUCTION MATERIALS AND TO PROVIDE SPECIFIED CONSTRUCTION INSPECTIONS. THE CONSTRUCTION INSPECTION SHALL BE DONE BY INSPECTORS WHOSE QUALIFICATIONS ARE SATISFACTORY TO THE CONTRACTING OFFICER.

TI-2. THE CONTRACTOR SHALL PROVIDE THE CONTRACTING OFFICER AND THE INDEPENDENT TESTING AND INSPECTION FIRM ACCESS TO ALL PLACES WHERE THE WORK IS BEING PERFORMED. A MINIMUM OF 24 HOURS NOTIFICATION SHALL BE GIVEN TO THE TESTING AND INSPECTION FIRM PRIOR TO THE COMMENCEMENT OF WORK REQUIRING TESTING OR INSPECTION.

TI-3. THE INDEPENDENT TESTING AND INSPECTION FIRM SHALL INSPECT FOR CONFORMANCE TO SPECIFIED REQUIREMENTS FOR PROTECTING NEW CONCRETE FROM THE ADVERSE EFFECTS OF WEATHER, HEATING EQUIPMENT AND OTHER POTENTIALLY HARMFUL CONDITIONS.

TI-4. THE INDEPENDENT TESTING AND INSPECTION FIRM IS NOT AUTHORIZED TO DIRECT OR APPROVE ANY CHANGES FROM THE CONTRACT DOCUMENTS. IF THE CONTRACTOR WISHES TO QUESTION THE TESTING AND INSPECTION FIRM'S INTERPRETATION OF THE CONTRACT DOCUMENTS, HE MAY DO SO DIRECTLY WITH THE CONTRACTING OFFICER.

TI-5. THE INDEPENDENT TESTING AND INSPECTION FIRM IS NOT AUTHORIZED TO STOP OR DELAY THE WORK. IF THE CONTRACTOR ELECTS TO CONTINUE WITH A CERTAIN PORTION OF WORK AFTER BEING NOTIFIED BY THE TESTING FIRM THAT SUCH WORK IS NOT IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS, THE CONTRACTOR DOES SO AT THEIR OWN RISK AND MAY BE REQUIRED TO CORRECT THE WORK AT A LATER DATE.

TI-6. THE INDEPENDENT TESTING AND INSPECTION FIRM FIRM IS NOT INSPECTING FOR CAL-OSHA COMPLIANCE OR REQUIRED TO INSPECT TEMPORARY CONSTRUCTION, SUCH AS TEMPORARY BRACING. TEMPORARY CONSTRUCTION IS THE CONTRACTOR'S SOLE RESPONSIBILITY.

TI-7. THE THESE NOTES AND THE PROJECT SPECIFICATIONS TYPICALLY INDICATE THE FREQUENCY OF CONSTRUCTION TESTING AND INSPECTIONS. WHERE THE FREQUENCY IS NOT INDICATED, THE INDEPENDENT TESTING AND INSPECTION FIRM SHALL SUBMIT A PROPOSAL OF INSPECTION INTERVALS TO THE CONTRACTING OFFICER.

TI-8. THE INDEPENDENT TESTING AND INSPECTION FIRM SHALL ISSUE ON GOING REPORTS OF INSPECTIONS AND TESTS TO THE CONTRACTOR AND CONTRACTING OFFICER. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN IF UNCORRECTED, TO THE CONTRACTING OFFICER.THE INDEPENDENT TESTING AND INSPECTION FIRM SHALL PREPARE AND SUBMIT A FINAL REPORT TO THE CONTRACTING OFFICER DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS.

TI-9. SPECIAL INSPECTION AND TESTING DOES NOT REPLACE CODE-REQUIRED INSPECTIONS OR STRUCTURAL OBSERVATIONS.

TI-10. IT IS THE CONTRACTOR'S RESPONSIBILITY TO INSPECT ALL STRUCTURAL WORK FOR CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY INSPECTION PROVIDED BY OTHERS DOES NOT RELIEVE THE CONTRACTOR OF THIS RESPONSIBILITY. ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS THAT ARE FOUND AT A LATER DATE AND ARE DECLARED TO BE SIGNIFICANT BY THE CONTRACTING OFFICER SHALL BE CORRECTED BY THE CONTRACTOR WITHOUT COST OR ANY DELAY TO THE PROJECT SCHEDULE.

TI-11. STRUCTURAL SPECIAL INSPECTION AND TESTING BY THE INDEPENDENT TESTING AND INSPECTION FIRM SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND INCLUDE THE SCOPE LISTED IN TABLE 1 ON S-002.

ABBREVIATIONS

ABT	ABOUT
CL	CENTER LINE
CLR	CLEAR
DEG	DEGREE
DIA	DIAMETER
EA	EACH
EF	EACH FACE
EL	ELEVATION
EMB	EMBED
EW	EACH WAY
GALV	GALVANIZED
HDG	HOT-DIPPED GALVANIZED
HORIZ	HORIZONTAL
MAX	MAXIMUM
MIN	MINIMUM
OC	ON CENTER
RCP	REINFORCED CONCRETE PIPE
REINF	REINFORCEMENT
STD	STANDARD
SYM	SYMMETRICAL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE

US Army Corps of Engineers®

MARK	DESCRIPTION	DATE

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NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

STRUCTURAL NOTES

SHEET ID

S-001

TABLE 1: SPECIAL INSPECTION AND TESTING

SOILS	SPECIAL CONTIN-UOUS	SPECIAL PERI-ODIC	TESTING (SEE SPECS)	COMMENTS	CODE / STANDARD REF. (CBC 2016 UNO)
VERIFICATION THAT OVER-EXCAVATION EXTENDS TO PROPER DEPTH, HAS REACHED PROPER MATERIAL, AND HAS EXTENDED TO PROPER HORIZONTAL EXTENTS		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (2)
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVATION OF SUBGRADE AT BOTTOM OF OVER-EXCAVATION, AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (5)
CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (3)
DURING PLACEMENT AND COMPACTION OF COMPACTED FILL, VERIFICATION OF USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES	X		X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (4)
VERIFICATION OF MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY		X	X	BY PROJECT GEOTECHNICAL ENGINEER	TABLE 1705.6 (1)
CONCRETE REINFORCEMENT	SPECIAL CONTIN-UOUS	SPECIAL PERI-ODIC	TESTING (SEE SPECS)	COMMENTS	CODE / STANDARD REF. (CBC 2016 UNO)
INSPECTION OF REINFORCING STEEL AND PLACEMENT		X			TABLE 1705.3 (1) / ACI 318: 20, 25.2, 25.3, 26.6.1-26.6.3
CONCRETE	SPECIAL CONTIN-UOUS	SPECIAL PERI-ODIC	TESTING (SEE SPECS)	COMMENTS	CODE / STANDARD REF. (CBC 2016 UNO)
PRE-PLACEMENT INSPECTION OF CAST-IN-PLACE ANCHORS AND EMBEDS		X		COORDINATE WITH STEEL INSPECTION REQUIREMENTS	TABLE 1705.3 (3) / ACI 318: 17.8.2
PRE-PLACEMENT INSPECTION OF FORMWORK FOR SHAPE, LOCATION, DIMENSIONS		X			TABLE 1705.3 (12) / ACI 318: 26.11.1.2(b)
PLACEMENT – VERIFICATION OF REQUIRED DESIGN MIX		X		VERIFY PRIOR TO DEPOSITING. NOTE ADDITIVES (ADMIXTURES, WATER, ETC) ADDED PRIOR TO PLACEMENT	TABLE 1705.3 (5) / ACI 318: CH. 19, 26.4.3, 26.4.4
PLACEMENT -TESTING FOR SLUMP, AIR CONTENT, TEMPERATURE AT TIME WHEN STRENGTH SAMPLES ARE MADE	X		X		TABLE 1705.3 (6) / ASTM C 172, ASTM C 31 / ACI 318: 26.4, 26.12
INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION / CONSOLIDATION	X				TABLE 1705.3 (7) / ACI 318: 26.5
COMPRESSIVE STRENGTH TESTING			X		ACI 318: 26.12
INSPECTION OF FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES		X			TABLE 1705.3 (8) / ACI 318: 26.5.3-26.5.5
VERIFICATION OF PROTECTION FROM THE ADVERSE EFFECTS OF WEATHER, HEATING EQUIPMENT, WELDING AND OTHER POTENTIALLY HARMFUL CONDITIONS.		X			ACI 318, ACI 305, ACI 306
VERIFICATION OF IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES OR FORMS FROM BEAMS AND STRUCTURAL SLABS.		X		NOT REQUIRED AT FOOTINGS, SLABS ON GRADE OR OTHER GROUND SUPPORTED CONCRETE	TABLE 1705.3 (11) / ACI 318 26.11.2
INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.		X			TABLE 1705.3 (10) / ACI 318 26.8
CONCRETE POST-INSTALLED ANCHORS	SPECIAL CONTIN-UOUS	SPECIAL PERI-ODIC	TESTING (SEE SPECS)	COMMENTS	CODE / STANDARD REF. (CBC 2016 UNO)
INSPECTION OF POST-INSTALLED MECHANICAL ANCHORS; VERIFICATION OF APPROVED RESEARCH REPORT ACI 355.2 PREQUALIFIED		X		INSPECT IN ACCORDANCE WITH APPROVED RESEARCH REPORT	TABLE 1705.3 (4) / ACI 318 17.8.2
INSPECTION OF POST-INSTALLED ADHESIVE ANCHORS (INCLUDING ANCHORS W/ SUSTAINED TENSION AND UPWARDLY INCLINED ANCHORS); VERIFICATION OF INSTALLER CERTIFICATION; VERIFICATION OF APPROVED RESEARCH REPORT ACI 355.4 PREQUALIFIED	X			INSPECT IN ACCORDANCE WITH APPROVED RESEARCH REPORT (CONTINUOUS - DO NOT LOWER INSPECTION FREQUENCY)	TABLE 1705.3 (4) / ACI 318 17.8.2

TABLE NOTES:

A. REFER TO SPECIFICATIONS FOR TESTING REQUIREMENTS AND ADDITIONAL QUALITY ASSURANCE REQUIREMENTS.

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ISSUE DATE: 05/09/2019
SOLICITATION NO.:
CONTRACT NO.:
FILE NO: 1-04-0642
FILE NAME: 1-04-0642-S002.dwg

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

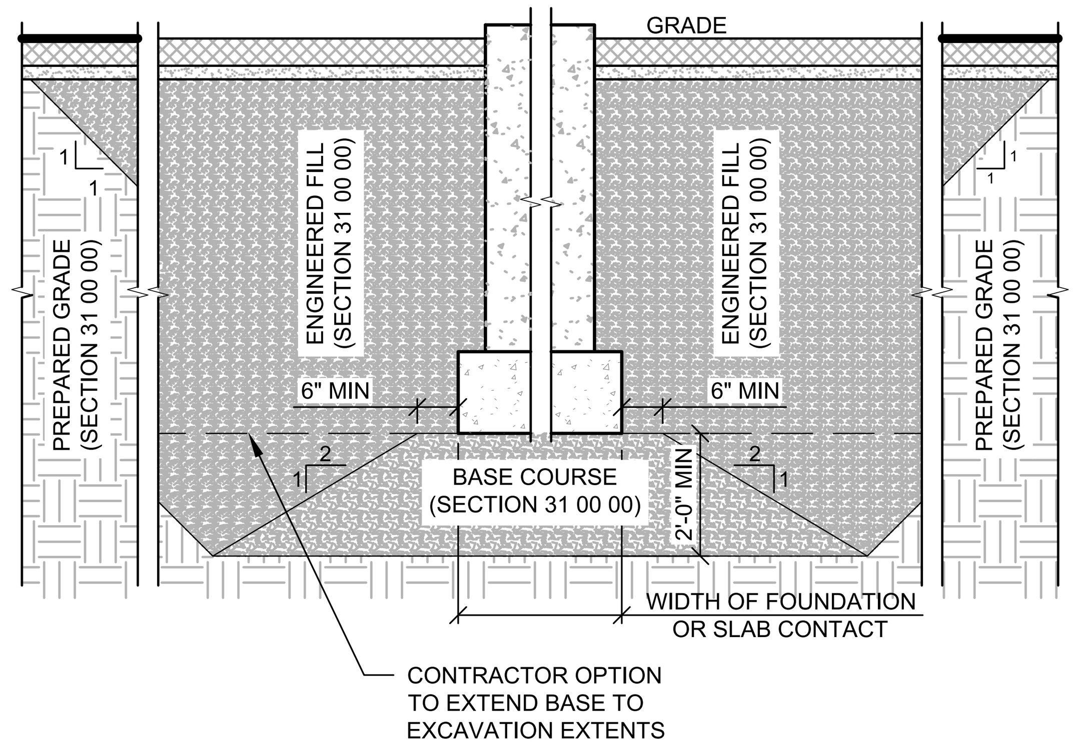
MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
SACRAMENTO, CA 95834

AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

SPECIAL INSPECTION NOTES

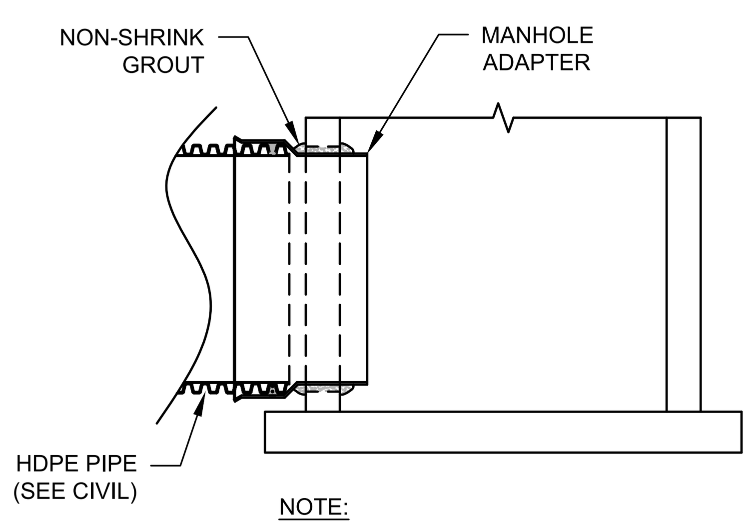
SHEET ID

S-002



6 TYPICAL OVER-EXCAVATION REQUIREMENTS

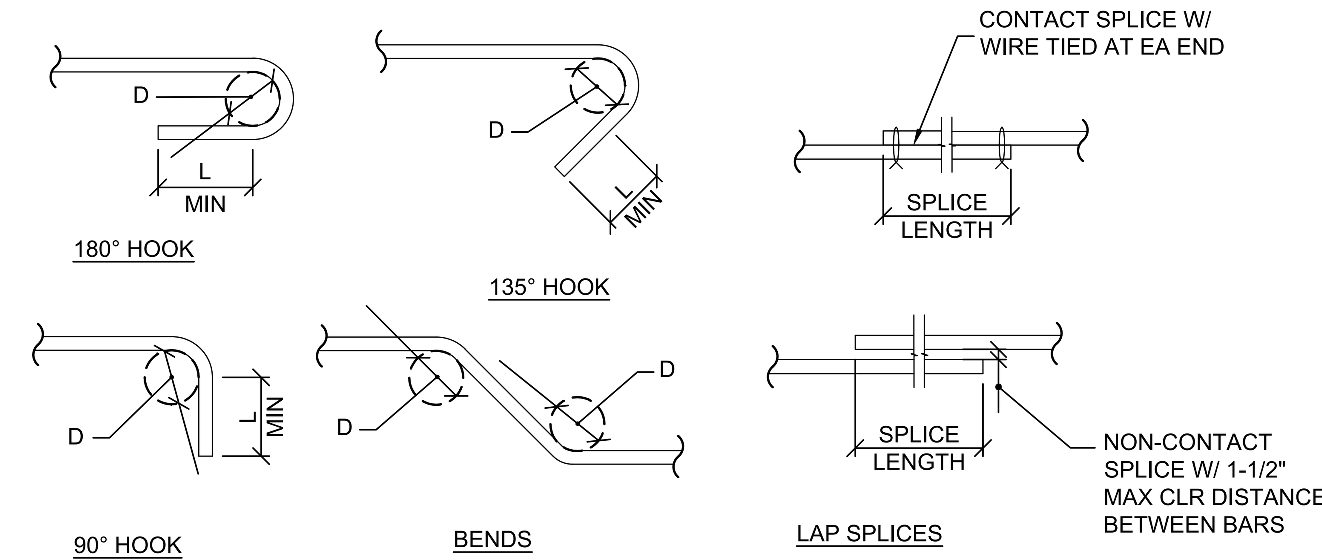
NTS



NOTE:
1. FOR 18" PIPE USE 24" DIA OPENING.

7 HDPE PIPE PENETRATION DETAIL

1"=2'



REINFORCING BAR BEND, LAP SPLICE LENGTH AND STANDARD HOOK SCHEDULE

SIZE	MIN PIN DIA	REINF SPLICE LENGTH	MIN 90 HOOK "L"	MIN 180 HOOK "L"
#3	2 1/4"	18"	4 1/2"	2 1/2"
#4	3"	21"	6"	2 1/2"
#5	3 3/4"	25"	7 1/2"	2 1/2"
#6	4 1/2"	27"	9"	3"
#7	5 1/4"	42"	10 1/2"	3 1/2"
#8	6"	53"	12"	4"
#9	9 1/2"	65"	13 1/2"	4 1/2"
#10	10 3/4"	81"	15 1/4"	5 1/4"
#11	12"	93"	17"	5 3/4"

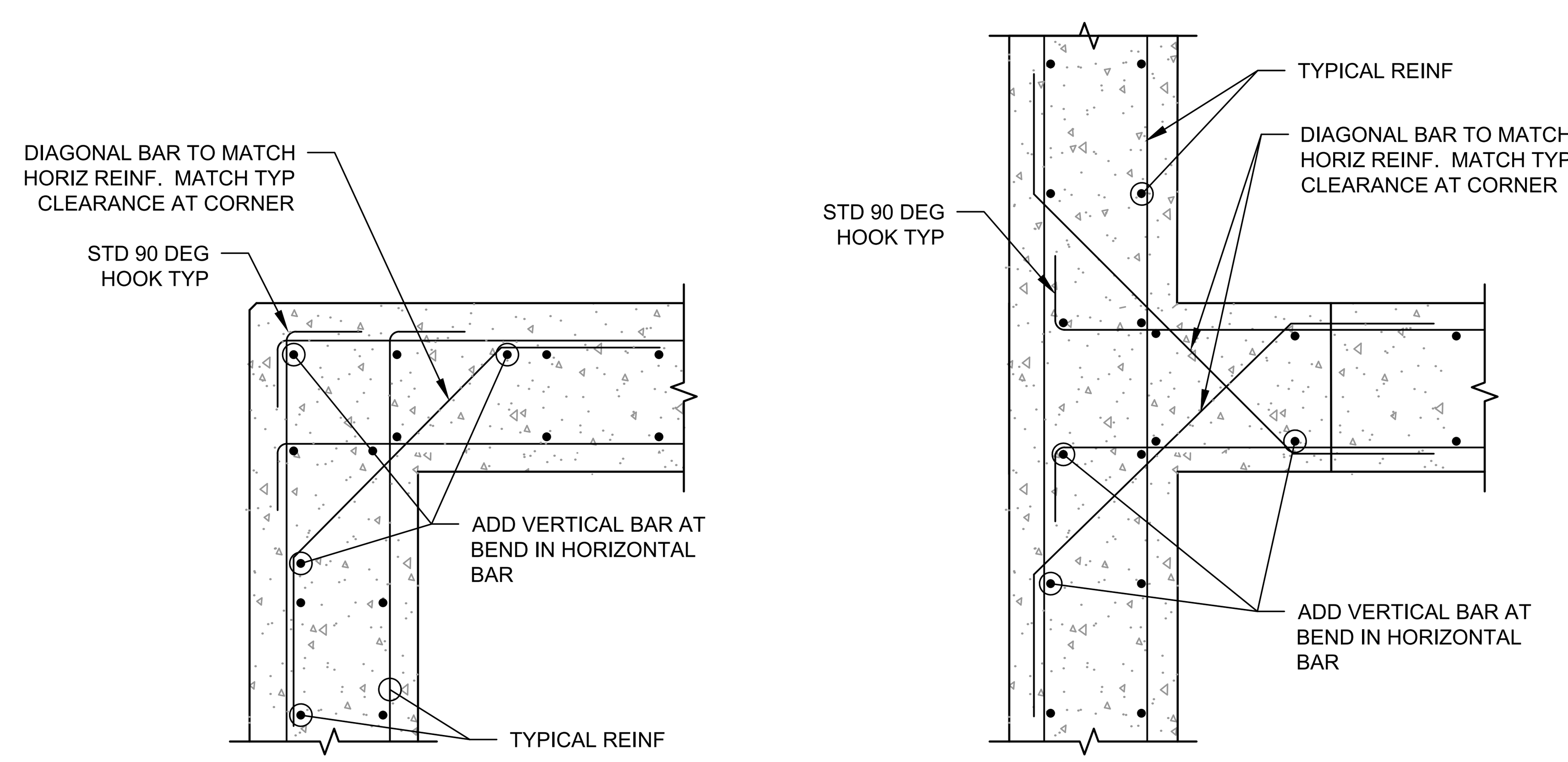
TIE, STIRRUP, HOOP AND CROSSTIE SCHEDULE

SIZE	MIN PIN DIA	MIN 90° HOOK "L"	MIN 135° HOOK "L"	LAP SPLICE LENGTH
#3	1 1/2"	3"	3"	USE TYP REINF SCHEDULE
#4	2"	3"	3"	
#5	2 1/2"	3 3/4"	3 3/4"	

NOTES:
1. THIS DETAIL SHALL BE USED WHERE REBAR SPLICE LENGTHS AND DEVELOPMENTS ARE NOT SPECIFICALLY DETAILED/DIMENSIONED IN THE DRAWINGS.
2. SCHEDULE IS BASED ON ACI 318. LAP SPLICE LENGTHS GIVEN ARE APPLICABLE FOR NORMAL WEIGHT CONCRETE WITH A MINIMUM STRENGTH (f'c) OF 4000 PSI. FOR LIGHTWEIGHT AGGREGATE CONCRETE, MULTIPLY TABLE VALUES BY 1.3.
3. WHERE BARS OF DIFFERENT SIZE ARE LAP SPLICED, SPLICE LENGTH SHALL BE THE SPLICE LENGTH OF LARGER BAR.

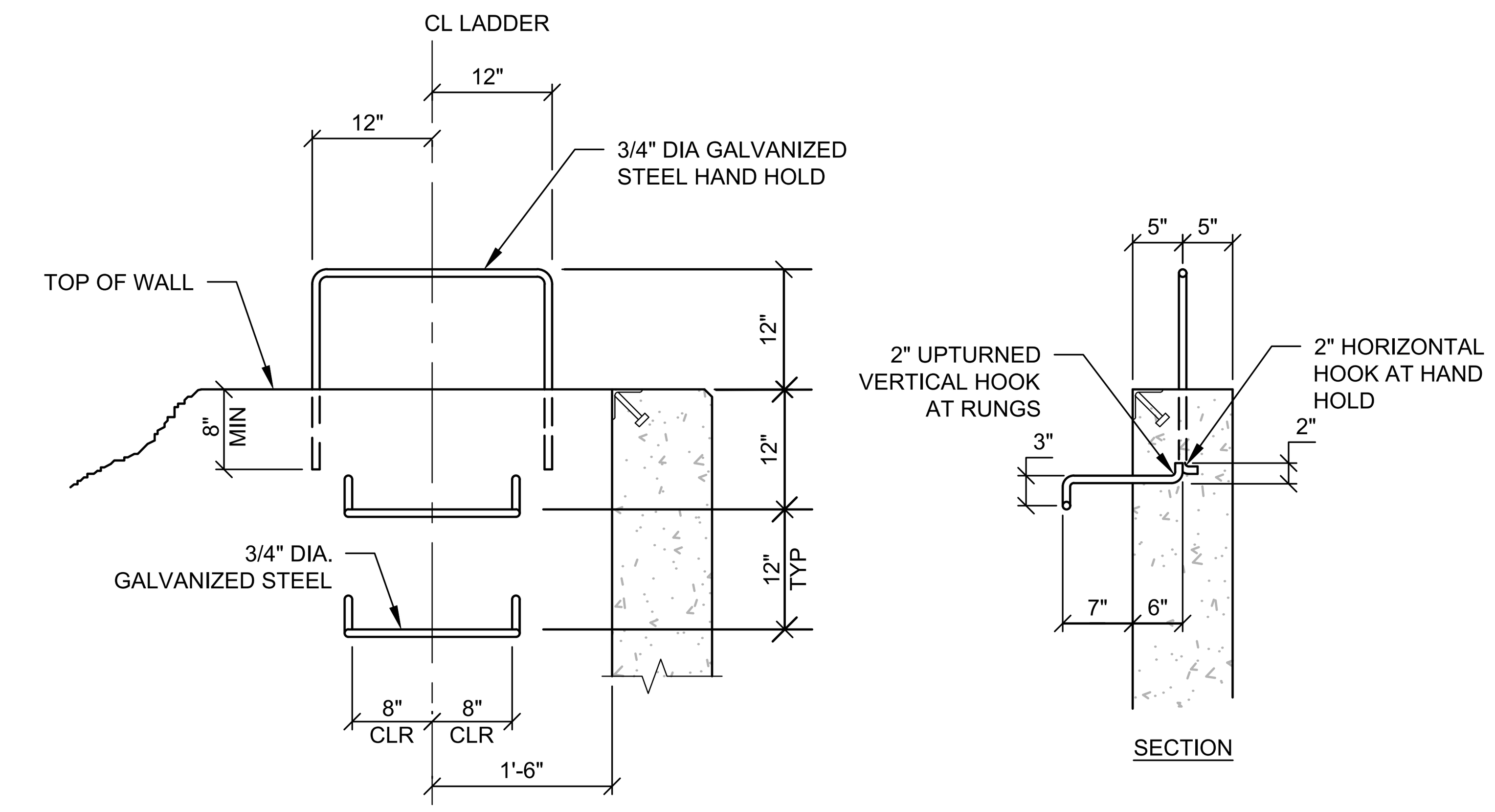
4 TYPICAL BAR BENDS, HOOKS AND SPLICES

NTS



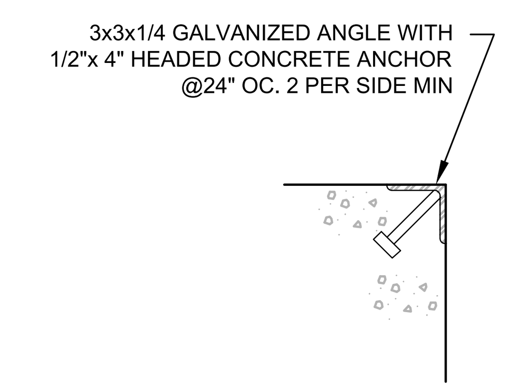
5 TYPICAL CONCRETE INTERSECTION

NTS



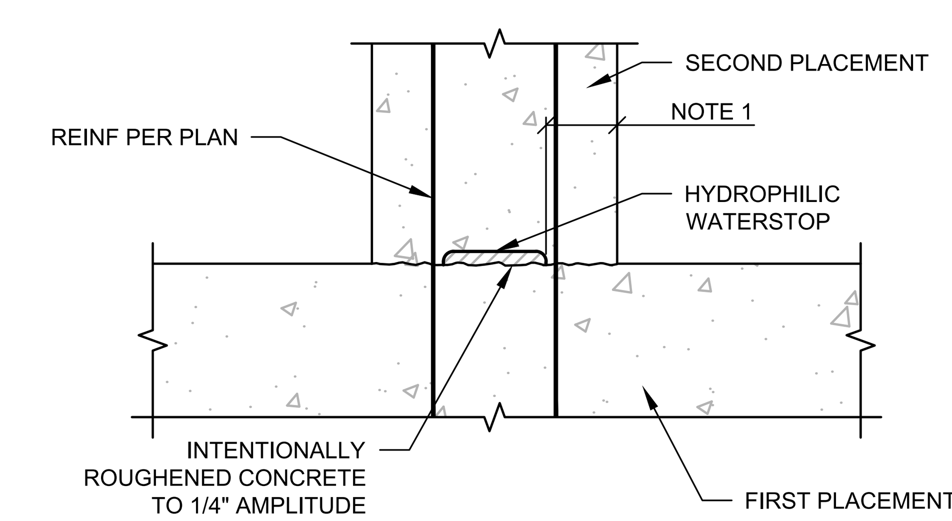
1 ACCESS LADDER DETAIL

NTS



2 ANGLE AT TOP OF GATE SHAFT

NTS



NOTE:
1. PROVIDE CLEARANCE IN ACCORDANCE W/ MANUFACTURER'S INSTRUCTIONS, 3" MIN UNO.

3 TYPICAL CONSTRUCTION JOINT

1 1/2" = 1'-0"

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DATE
DESCRIPTION

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DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122

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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

TYPICAL STRUCTURAL DETAILS

SHEET ID
S-101

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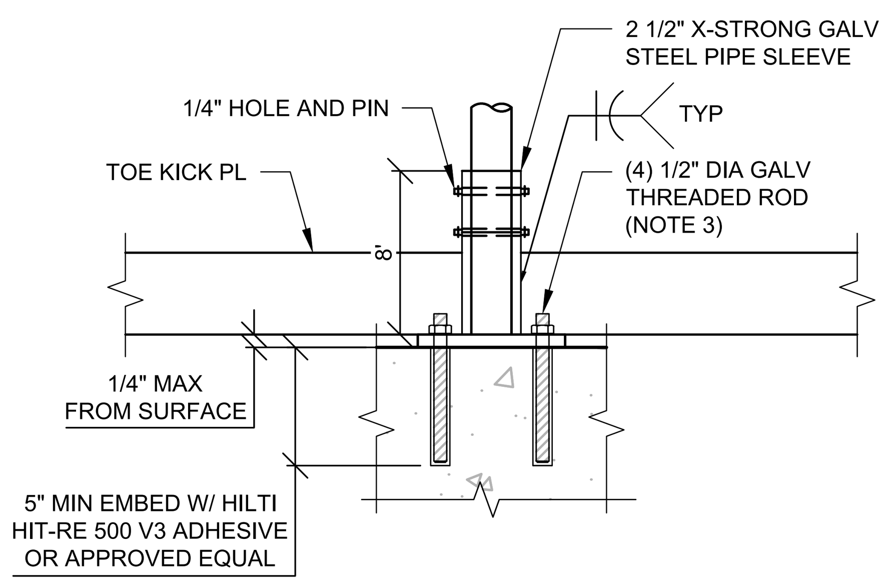
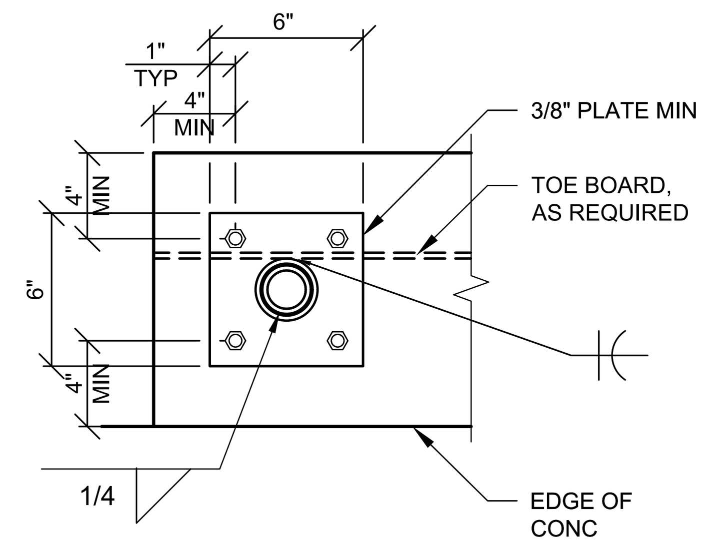
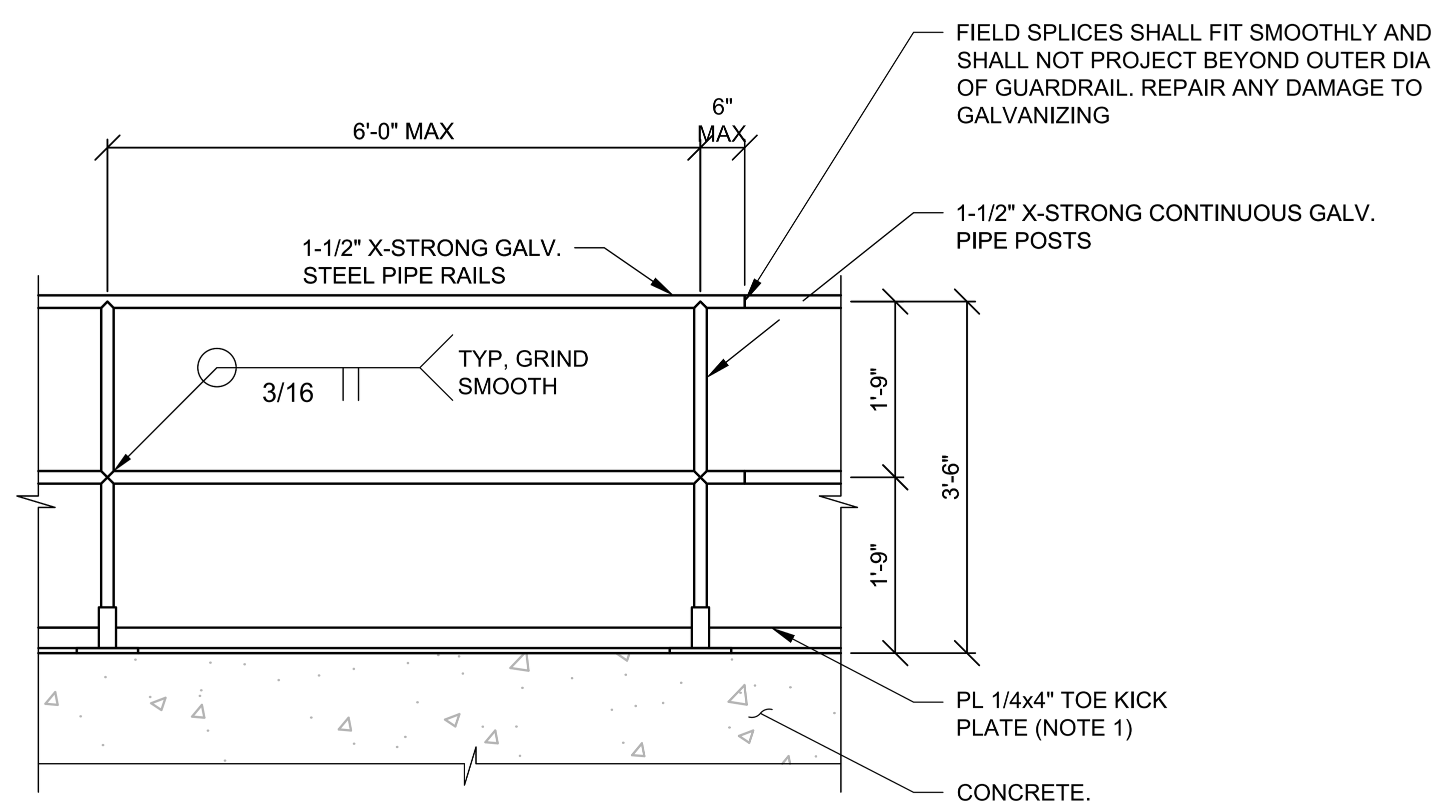




CONCRETE TOP MOUNT



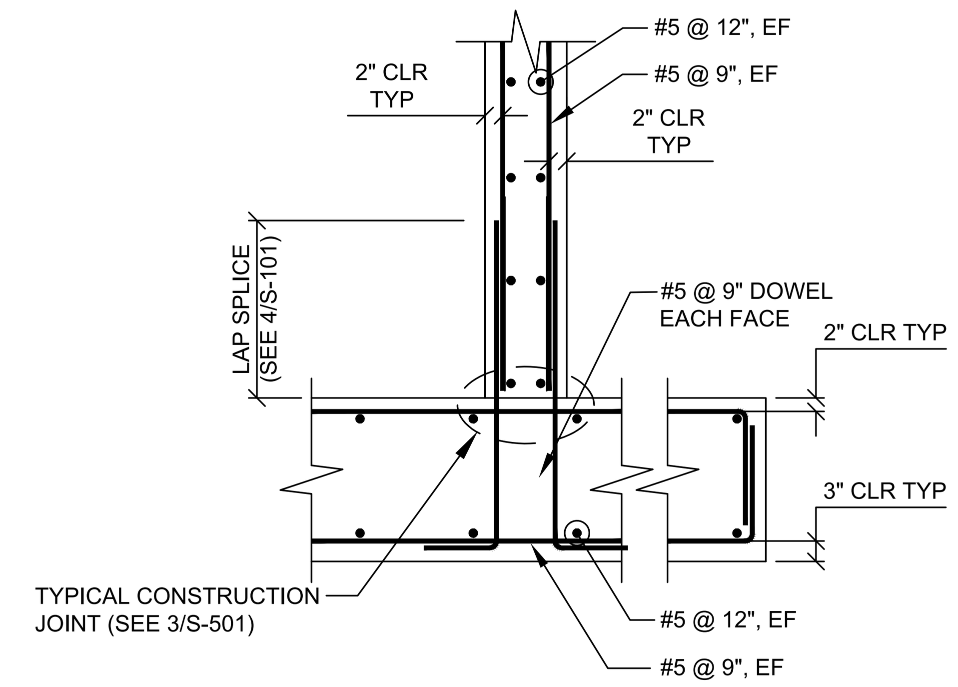
ELEVATION

NOTES:

1. INSTALL TOE KICK PLATE WHERE REQUIRED TO PROTECT PERSONNEL BELOW FROM FALLING OBJECTS. 1/4" MAX GAP BETWEEN CONCRETE AND TOE BOARD. NOTCH AROUND BASE PLATES AS REQUIRED. DO NOT DAMAGE PERMANENT FINISH. TOE KICK PLATE CAN BE OMITTED WHERE PROTECTION OF PERSONNEL BELOW FROM FALLING OBJECTS IS NOT REQUIRED PER CAL-OSHA.
2. FIELD MEASURE RAILING PRIOR TO FABRICATION. GALVANIZE AFTER FABRICATION. GRIND ALL SURFACES SMOOTH DURING FABRICATION.
3. (4) 1/2" DIA HILTI KWIK BOLT TZ-SS W/ 3 1/4" EMBED OR APPROVED EQUAL MAY BE USED AS AN ALTERNATIVE TO THREADED RODS ADHESIVE ANCHORS. ISOLATE DISSIMILAR METALS W/ BITUMINOUS COATING.
4. HOT-DIP GALVANIZE ALL STEEL AFTER FABRICATION.

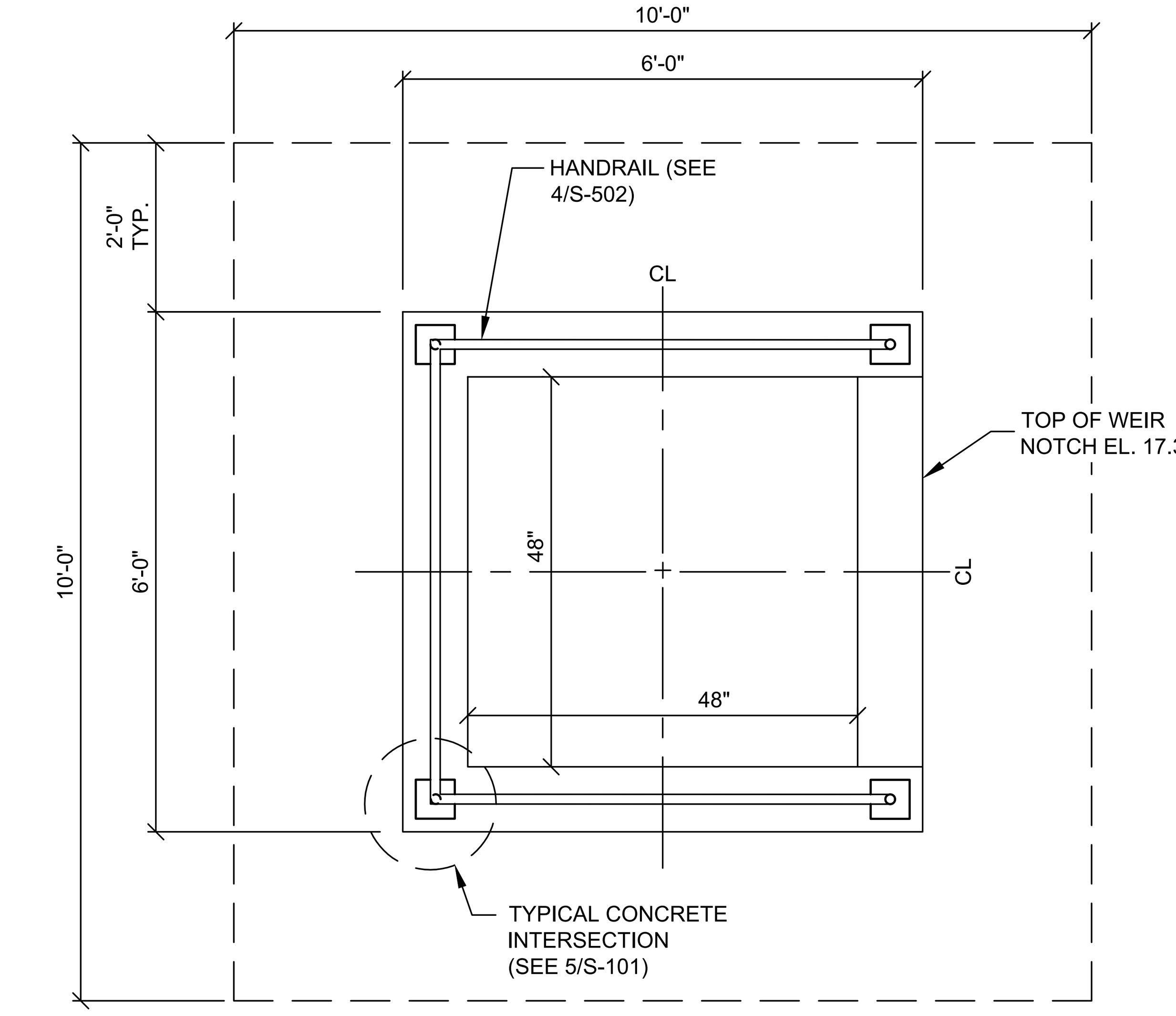
4 TYPICAL HANDRAIL DETAIL

NTS



2 TYPICAL DISCHARGE WEIR REINFORCEMENT

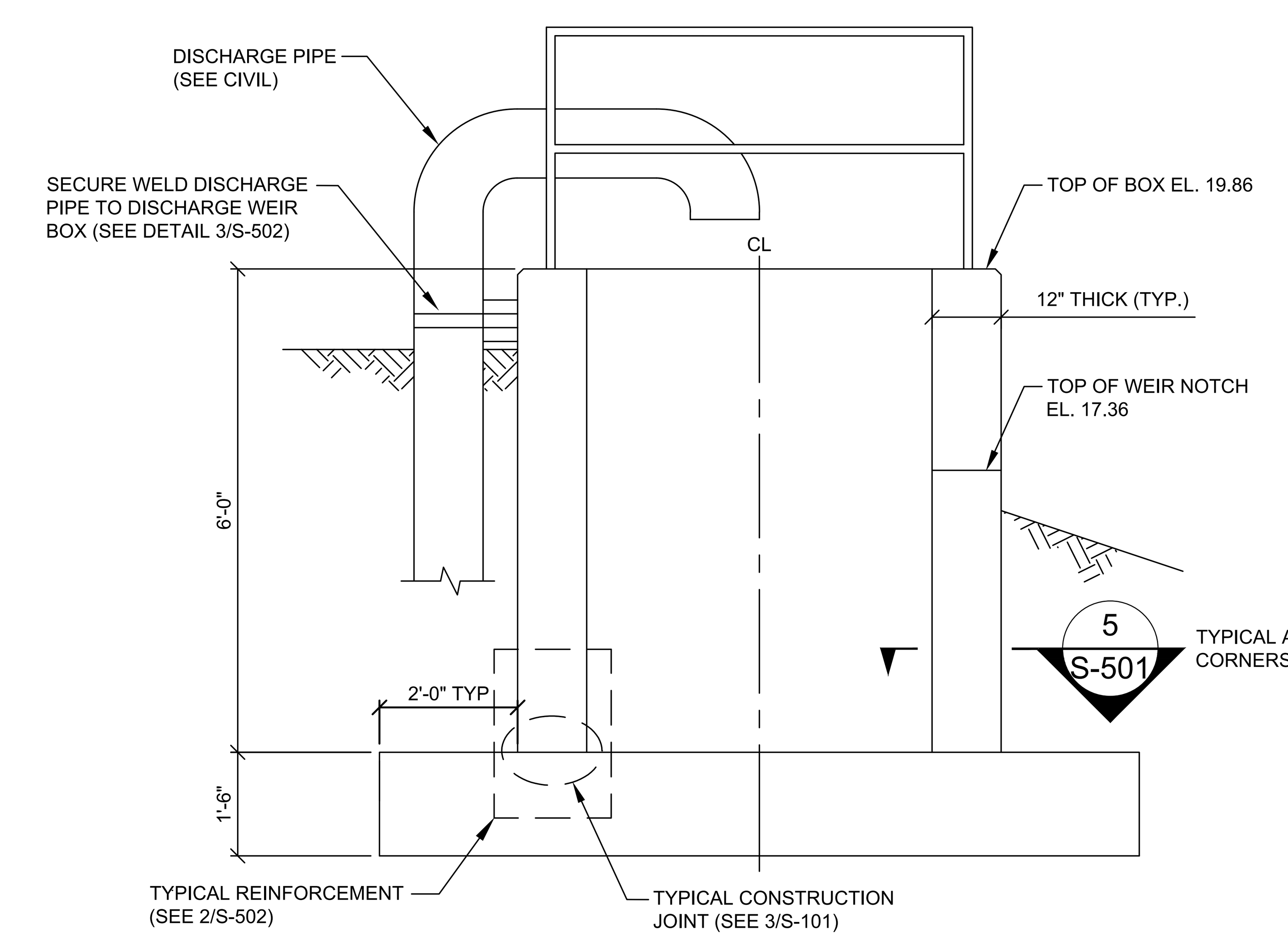
1/2" = 1'-0"



PLAN

NOTES:

1. LOCATE BASE PLATE FOR HANDRAIL AT CENTERLINE OF WALL THICKNESS.



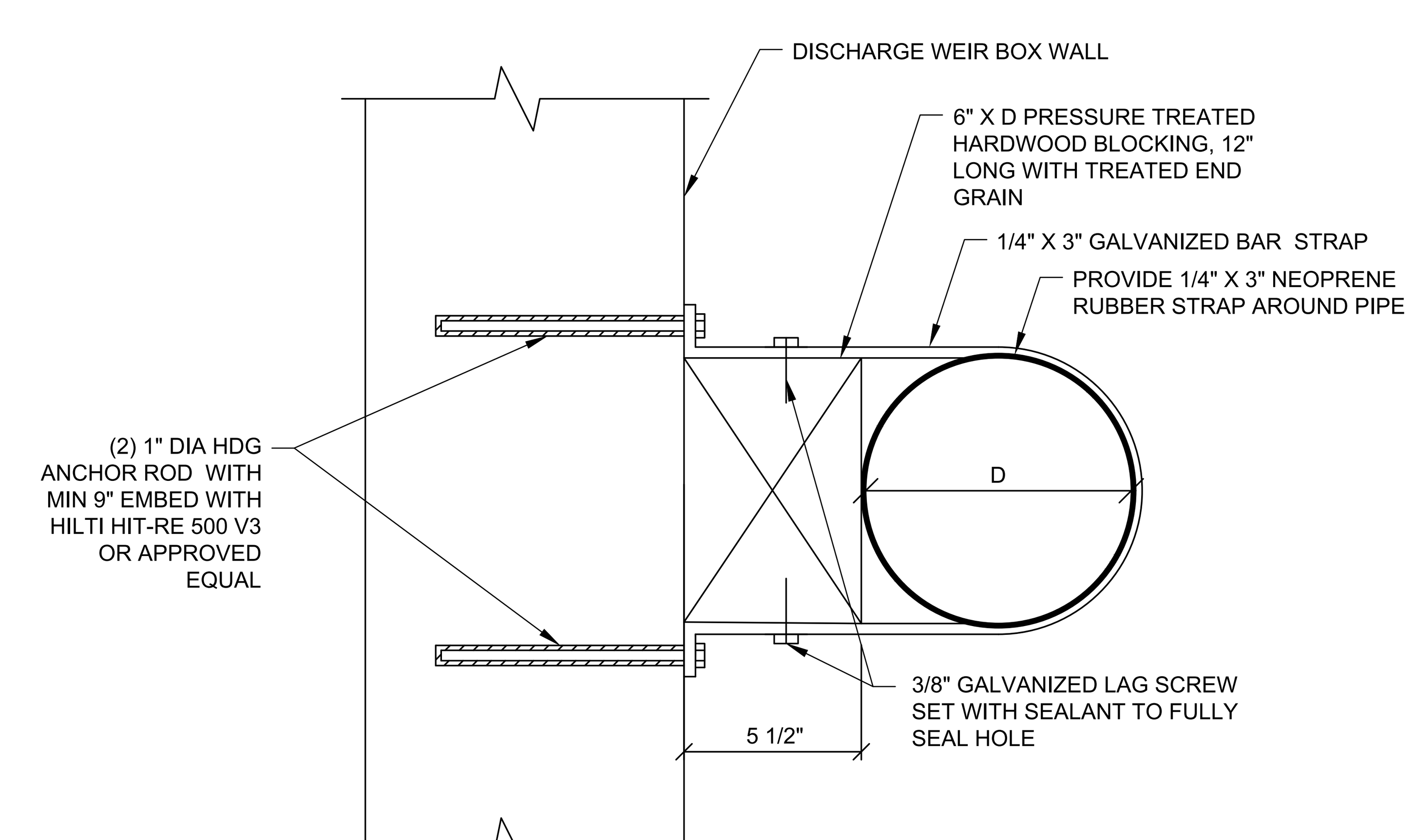
ELEVATION

NOTES:

1. SEE 6/S-101 FOR TYPICAL BASE PREPARATION BELOW FOOTING.

1 DISCHARGE WEIR PLAN AND ELEVATION

NTS



3 STANDPIPE STRAP DETAIL

1" = 1'-0"

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DESIGNED BY: C. STEPPER	ISSUE DATE: 05/09/2019
DRAWN BY: E. DIOCSON	SOLICITATION NO.:
CHECKED BY: S. SULLIVAN	CONTRACT NO.:
SUBMITTED BY: J. KASHIWADA	FILE NO: 1-04-0642
SIZE: ANSI D / SPEC NO: 2122	FILE NAME: S-102 DISCHARGE WEIR STRUCTURAL DETAILS

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

DISCHARGE WEIR STRUCTURAL DETAILS

SHEET ID

S-102

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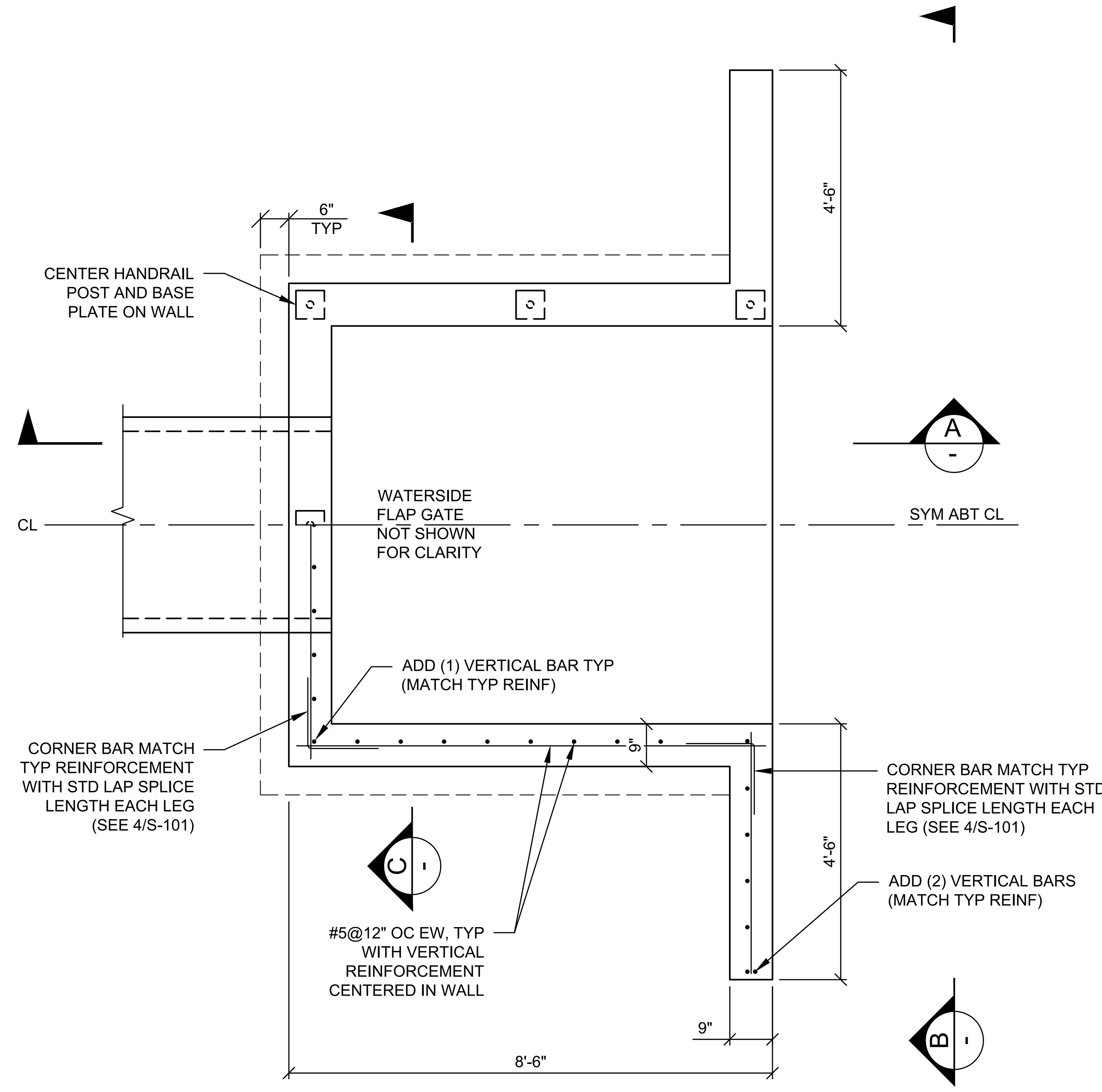
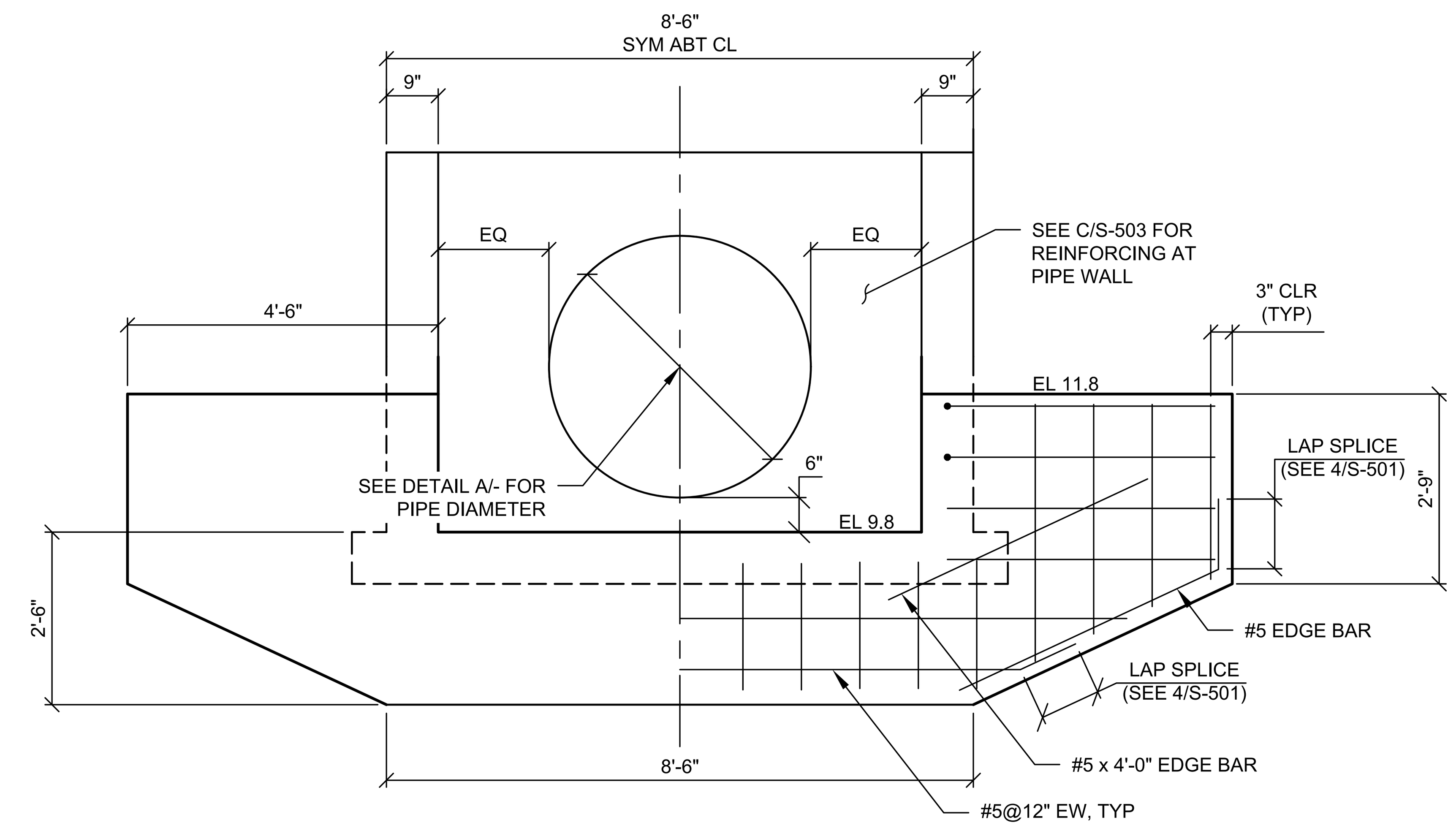
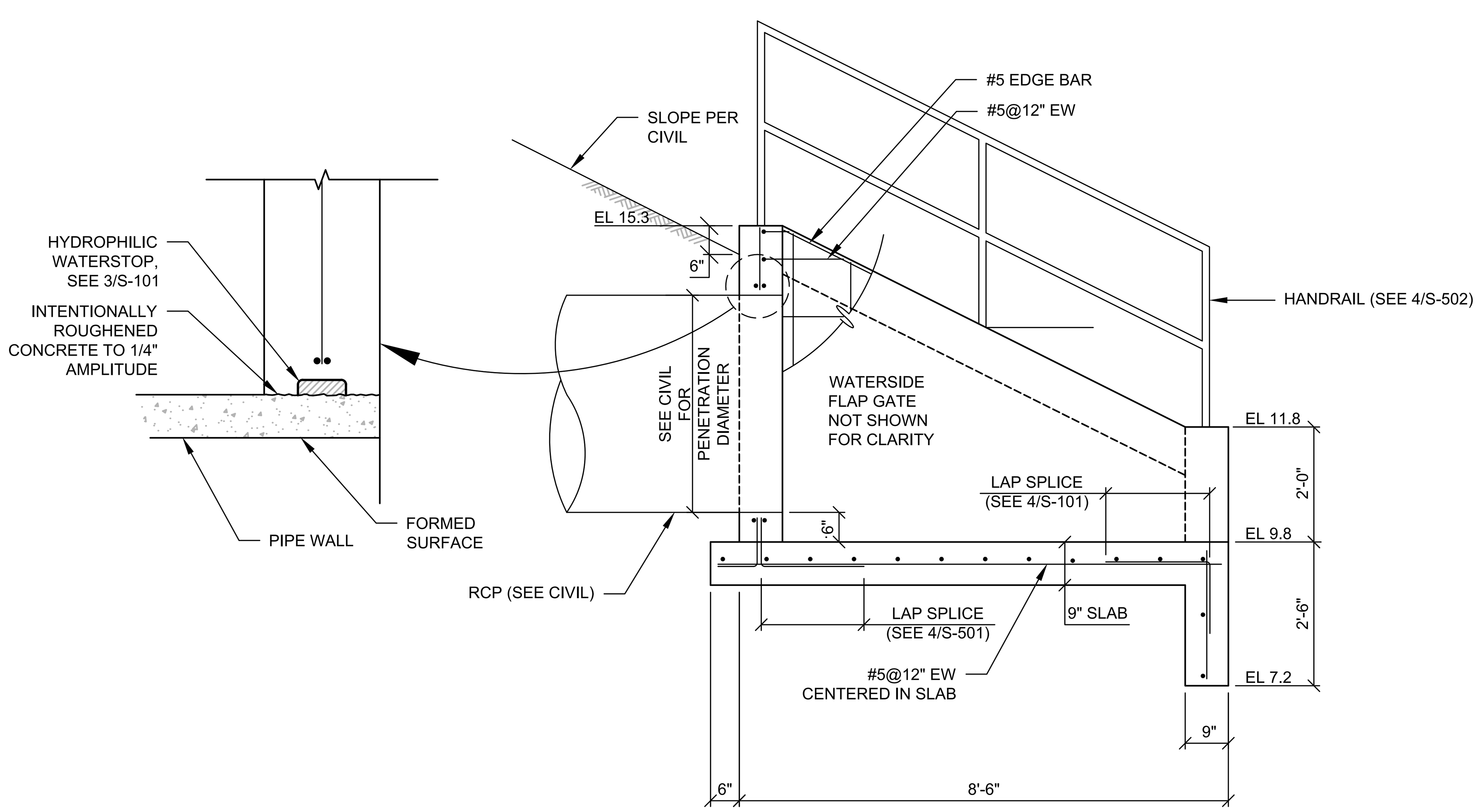


1 **OUTFALL PLAN**
1"=2'-0"

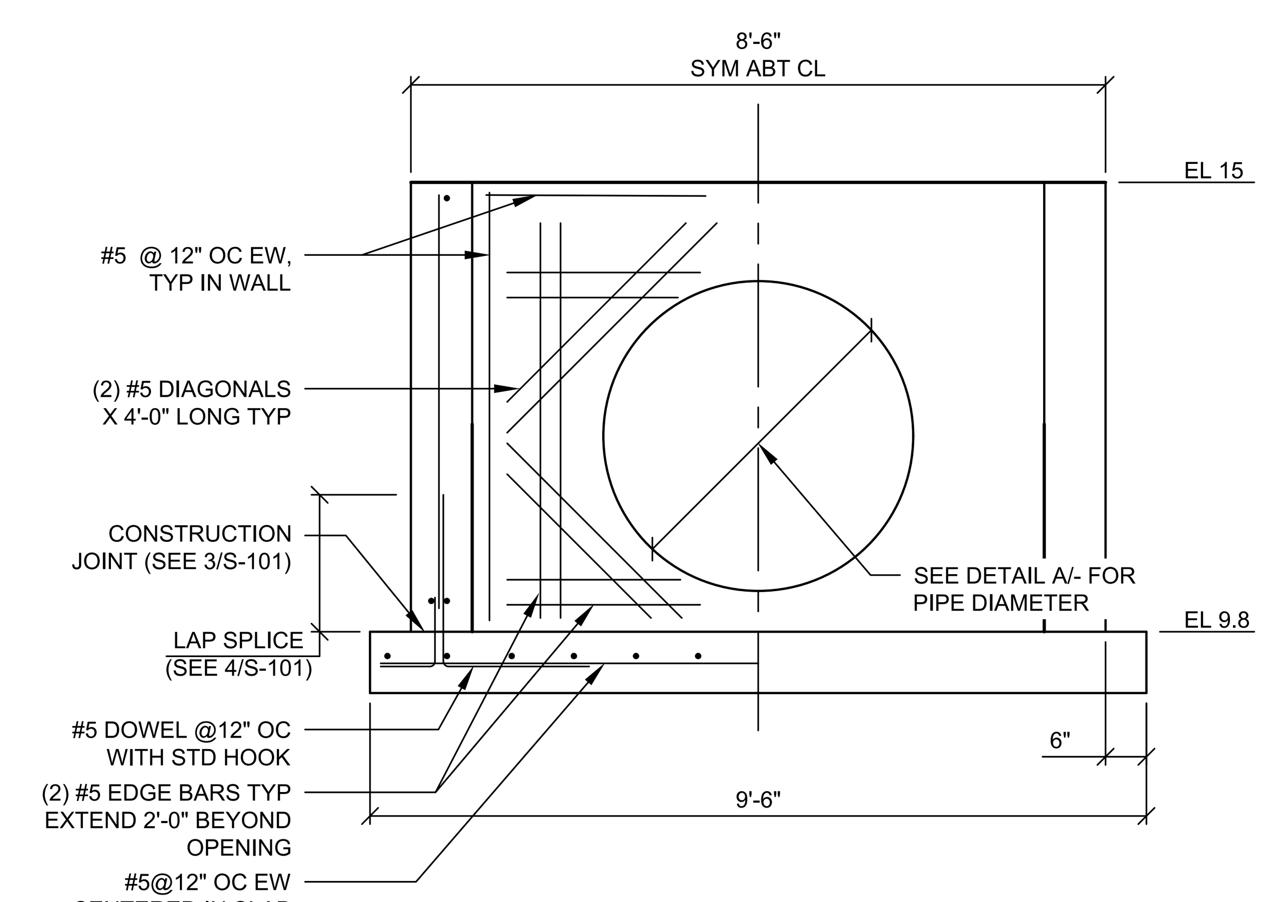


B **ELEVATION**
1"=2'-0"



NOTE:
SEE 6/S-101 FOR TYPICAL BASE PREPARATION BELOW FOOTINGS.

A **SECTION**
1"=2'-0"



C **ELEVATION**
1"=2'-0"

US Army Corps of Engineers®

DATE

DESIGNED BY: C. STEPPER
DRAWN BY: E. DIOCSON
CHECKED BY: S. SULLIVAN
SUBMITTED BY: J. KASHIWADA
SIZE: ANSI D
SPEC NO: 2122
ISSUE DATE: 05/06/2019
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FILE NO: 1-04-0642
FILE NAME: S-103 OUTFALL HEADWALL STRUCTURAL DETAILS

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
180 PROMENADE CIRCLE, SUITE 240
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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

OUTFALL HEADWALL STRUCTURAL DETAILS

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1 2 3 4 5 6 7 8 9 10

COMPONENTS

SYMBOL	DESCRIPTION
RES	RESISTOR
	POTENTIOMETER
	CAPACITOR, FIXED
	CAPACITOR, ADJUSTABLE
	DIODE
	DIODE, ZENER
	VARISTOR TRANSIENT VOLTAGE SUPPRESSOR
	VOLTAGE SURGE SUPPRESSOR, AC
MOV	METAL OXIDE VARISTOR

DEVICES – MISCELLANEOUS

SYMBOL	DESCRIPTION
	AUDIBLE ALARM
	BATTERY
HTR	HEATER
?	3 PHASE MOTOR ? = MOTOR HP
M	3 PHASE MOTOR
M	SINGLE PHASE MOTOR
	TRANSFORMER SIZE AND VOLTAGE AS SHOWN
M	UTILITY POWER METER

SWITCHES – OPERATOR

SYMBOL	DESCRIPTION
SW	TOGGLE OR DISCONNECT SWITCH
PB	PUSHBUTTON – NORMALLY OPEN, MOMENTARY ACTION
PB	PUSHBUTTON – NORMALLY CLOSED, MOMENTARY ACTION
PB	PUSHBUTTON, MECHANICALLY INTERLOCKED, DOUBLE CIRCUIT – NORMALLY CLOSED AND NORMALLY OPEN, MAINTAINED ACTION
H O A	SELECTOR SWITCH, 3 POSITION – CONTACT STATUS SHOWN EXISTS AT POSITION OF H–HAND, O–OFF, OR A–AUTO
2–1 1–2	SELECTOR SWITCH, 2 POSITION – CONTACT STATUS SHOWN EXISTS AT POSITION AS SHOWN

SWITCHES – PROCESS

SYMBOL	DESCRIPTION
FS	FLOW SWITCH – CLOSES UPON INCREASING FLOW
FS	FLOW SWITCH – OPENS UPON INCREASING FLOW
LS	LEVEL SWITCH – CLOSES UPON INCREASING LEVEL
LS	LEVEL SWITCH – OPENS UPON INCREASING LEVEL
PS	PRESSURE SWITCH – CLOSES UPON INCREASING PRESSURE (DECREASING VACUUM)
PS	PRESSURE SWITCH – OPENS UPON INCREASING PRESSURE (DECREASING VACUUM)
TS	TEMPERATURE SWITCH – CLOSES UPON INCREASING TEMPERATURE
TS	TEMPERATURE SWITCH – OPENS UPON INCREASING TEMPERATURE
ZS	LIMIT SWITCH – CLOSES AT SET LIMIT
ZS	LIMIT SWITCH – OPENS AT SET LIMIT
ZS	PROXIMITY SWITCH – CLOSES UPON DECREASING DISTANCE
ZS	PROXIMITY SWITCH – OPENS UPON DECREASING DISTANCE
WS	TORQUE SWITCH – CLOSES UPON INCREASING TORQUE
WS	TORQUE SWITCH – OPENS UPON INCREASING TORQUE

DEVICES – FRONT PANEL

SYMBOL	DESCRIPTION
X	INDICATING LIGHT, LETTER "X" INDICATES COLOR: R=RED G=GREEN, A=AMBER, W=WHITE Y=YELLOW, B=BLUE
PTT X	INDICATING LIGHT, PUSH TO TEST
AM	AMP METER
VM	VOLT METER
ETM	ELAPSED TIME METER
XS	MULTI–POSITION SWITCH WHERE LETTER "X" IS FUNCTION: A=AMP, V=VOLT

DEVICES – RELAY

SYMBOL	DESCRIPTION
M1	CONTACTOR OR STARTER M1
CR 1	CONTROL RELAY CR1
TR 2	TIME DELAY RELAY TR2 – ADJUSTABLE TIME DELAY RANGE & SETTING AS SHOWN
TDOE TDOD	TIME DELAY ON ENERGIZATION TIME DELAY ON DE–ENERGIZATION
107, 121	REFERENCED RELAY WITH N.O. CONTACT ON LINE 107 N.C. CONTACT ON LINE 121
CR1 (105)	NORMALLY OPEN, RELAY CONTACT – ACTUATED BY RELAY CR1 COIL LOCATED ON LINE 105
CR1	NORMALLY CLOSED, RELAY CONTACT – ACTUATED BY RELAY CR1
TR2	NORMALLY OPEN, TIME DELAY RELAY CONTACT – CONTACT CLOSES AFTER TR2 IS ENERGIZED
TR2	NORMALLY CLOSED, TIME DELAY RELAY CONTACT – CONTACT OPENS AFTER TR2 IS ENERGIZED
TR2	NORMALLY OPEN, TIME DELAY RELAY CONTACT – CONTACT OPENS AFTER TR2 IS DE–ENERGIZED
TR2	NORMALLY CLOSED, TIME DELAY RELAY CONTACT – CONTACT CLOSES AFTER TR2 IS DE–ENERGIZED
TR2	CONTACT OPENS AND CLOSES IN A TIMED REPEAT CYCLE
SV	SOLENOID COIL

DEVICES – PROTECTIVE

SYMBOL	DESCRIPTION
500A/3P LSI	CIRCUIT BREAKER, WITH AMPS OR POLES AS SHOWN OR NOTED PROVIDE TRIP UNIT AS SHOWN MCP– MOTOR CIRCUIT PROTECTOR TM– THERMAL MAGNETIC LSIG– LONG, SHORT, INST, GFI MCS– MOLDED CASE SWITCH, NO TRIP
OL	THERMAL OVERLOAD CONTACT
	THERMAL OVERLOAD ELEMENT
	FUSE WITH BLOWN FUSE INDICATING LIGHT
	FUSE
K	KIRK–KEY INTERLOCK
500A/3P DISC	DISCONNECT SWITCH, WITH POLES AS SHOWN OR NOTED PROVIDE AMP RATING OR HP RATING AS SHOWN

WIRING – CONNECTIONS

SYMBOL	DESCRIPTION
	PANEL OR EQUIPMENT WIRING
	FIELD WIRING
	CONDUCTORS – NOT CONNECTED
	CONDUCTORS – CONNECTED
	GROUND
	PLUG AND RECEPTACLE
	INCOMING LINE
123 123 123	TERMINAL BLOCKS WITH TERMINAL NUMBER AS SHOWN
	TERMINAL BLOCKS WITH TERMINAL NUMBER DETERMINED BY SUBMITTAL
SHIELD CONDUCTOR	SHIELDED CABLE

PLAN – SYMBOLS

SYMBOL	DESCRIPTION
	CONDUIT, EXPOSED
	CONDUIT, IN SLAB OR BELOW GRADE
	CONDUIT, CONCEALED IN WALL OR CEILING
	CONDUIT STUBBED OUT & CAPPED
	CONDUIT BENDS TOWARD OBSERVER
	CONDUIT BENDS AWAY FROM OBSERVER
	CONDUIT ENDS
J	FLEXIBLE CONDUIT CONNECTION FROM J–BOX TO EQUIPMENT
	CONDUIT CHANGE IN ELEVATION
G	BARE COPPER GROUND WIRE
G	GROUND CONNECTION BOLTED TYPE
G	GROUND CONNECTION EXOTHERMIC WELD TYPE
	DISCONNECT SWITCH
	FIELD MOUNTED DEVICE
	SPECIAL RECEPTACLE
	TELEPHONE/DATA RECEPTACLE 2 PORT TA568A, 2 CAT 6 CABLES
#	CONDUIT NUMBER
T	THERMOSTAT
E	EYS SEAL
J	JUNCTION BOX
	PULL BOX OF SIZE SHOWN (CHRISTY BOX SIZE MINIMUM)
# A a	LIGHTING FIXTURE # – CIRCUIT BREAKER NUMBER A – FIXTURE SCHEDULE REF. a – CONTROL SWITCH REFERENCE
# #	DUPLEX AND QUADPLEX RECEPTACLE # – CIRCUIT BREAKER NUMBER
# $ 2 a	TOGGLE SWITCH # – CIRCUIT BREAKER NUMBER SUBSCRIPT – CIRCUIT CONTROLLED SUPERSCRIPT – BLANK = 1 POLE 2 = 2 POLE 3 = 3 WAY OTHER – M = MOTION DETECTOR T = TIMER SWITCH

MISCELLANEOUS ABBREVIATIONS

&	AND	MTR	MOTOR
@	AT	MUX	MULTIPLEXER
A	AMBER, AMPERES	MV	MERCURY VAPOR, MEDIUM VOLTAGE
AC	ALTERNATING CURRENT	N	NEUTRAL
ACK	ACKNOWLEDGE	NC	NORMALLY CLOSED
AFF	ABOVE FINISHED FLOOR	NHC	NORMALLY HELD CLOSED
AH	AMP HOUR	NHO	NORMALLY HELD OPEN
AI	ANALOG INPUT	NIC	NOT IN CONTRACT
AIC	AMP INTERRUPTING CAPACITY SYMMETRICAL	NL	NIGHT LIGHT
AM	AMP METER	NO	NORMALLY OPEN
AO	ANALOG OUTPUT	NTS	NOT TO SCALE
AWG	AMERICAN WIRE GUAGE	(N)	NEW
ATS	AUTOMATIC TRANSFER SWITCH	OC	ON CENTER
BATT	BATTERY	OI	OPERATOR INTERFACE
(B)	PROVIDED BY OWNER – INSTALLED BY CONTRACTOR	OL	OVERLOAD
BFC	BELOW FINISHED CEILING	ORP	OXIDATION REDUCTION POTENTIAL
BOD	BIOCHEMICAL OXYGEN DEMAND	P	POLE
BPF	BAND PASS FILTER	PB	PUSHBUTTON
BYP	BYPASS	PBX	PULL BOX
C	CONDUIT	PF	POWER FACTOR
CAP	CAPACITOR	PFR	POWER FAIL RELAY
CB	CIRCUIT BREAKER	PH	HYDROGEN ION CONCENTRATION
CKT	CIRCUIT	PLC	PROGRAMMABLE LOGIC CONTROLLER
COAX	COAXIAL CABLE	PM	POWER MONITOR
COMM	COMMUNICATION	PNL	PANEL
CR	CONTROL RELAY	POT	POTENTIOMETER
CT	CURRENT TRANSFORMER	PRESS	PRESSURE
CS	CONSTANT SPEED	PR	PAIR, TWISTED AND SHIELDED
CU	COPPER	PRI	PRIMARY
DC	DIRECT CURRENT	PROVIDE	FURNISH, INSTALL, AND CONNECT
DET	DETAIL	PS	PRESSURE SWITCH
DI	DIGITAL INPUT	PT	POTENTIAL TRANSFORMER
DISC	DISCONNECT	PTT	PUSH TO TEST
DO	DIGITAL OUTPUT	PVC	POLYVINYLCHLORIDE
DPDT	DOUBLE POLE DOUBLE THROW	PWR	POWER
DWG	DRAWING	REF	REFERENCE
E–DTL	ELECTRICAL DRAWING DETAIL	RFI	RADIO FREQUENCY INTERFERENCE
ELEV	ELEVATION	RMS	ROOT MEAN SQUARE
ENET	ETHERNET	RTD	RESISTANCE TEMPERATURE DETECTOR
ETM	ELAPSED TIME METER	RST	RESET
ESW	ETHERNET SWITCH	RVAT	REDUCE VOLTAGE AUTO TRANSFORMER
(E)	EXISTING	RTU	REMOTE TERMINAL UNIT
FCS	FIELD CONTROL STATION	(R)	REWIRE, RELOCATE, REVISE, REUSE
FLA	FULL LOAD AMPS	SCH	SCHEDULE
FLEX	FLEXIBLE LIQUID TIGHT CONDUIT	SEC	SECONDARY, SECOND
FRP	FIBERGLASS REINFORCED PLASTIC	SECS	SECONDS
FS	FULL SPEED	SEL	SELECTOR
FVNR	FULL VOLTAGE NON–REVERSING	SFA	SERVICE FACTOR AMPS
FVR	FULL VOLTAGE REVERSING	SPEC	SPECIFICATION
FWD	FORWARD	SS	STAINLESS STEEL
(F)	FUTURE	SSRC	STAINLESS STEEL RIGID CONDUIT
GALV	GALVANIZED	SSS	SOLID STATE STARTER
GFI	GROUND FAULT INTERRUPTER	STT	START
GND	GROUND	STP	STOP
GRS	GALVANIZED RIGID STEEL CONDUIT	SV	SOLENOID VALVE
GRS–PVC	PVC COATED GRS CONDUIT	SW	SWITCH
HI	HIGH	SWBD	SWITCHBOARD
HIM	HUMAN INTERFACE MODULE	SYMM	SYMMETRICAL
HOA	HAND OFF AUTO	TB	TERMINAL BLOCK
HP	HORSE POWER	TC	TIME CLOCK
HPS	HIGH PRESSURE SODIUM	TDOD	TIME DELAY ON DE–ENERGIZATION
HS	HAND SWITCH	TDOE	TIME DELAY ON ENERGIZATION
HTR	HEATER	TELCO	TELEPHONE COMPANY
HZ	HERTZ	TM	THERMAL MAGNETIC
HZD	HAZARD	TEMP	TEMPERATURE
I	INTERLOCK	TR	TIME DELAY RELAY
I–DTL	INSTRUMENTATION DRAWING DETAIL	TRIAD	TWISTED AND SHIELDED 3 CONDUCTOR
I/O	INPUT/OUTPUT	TS	TEMPERATURE SWITCH
INST	INSTANTANEOUS	TSPR	TWISTED AND SHIELDED PAIR
ISR	INTRINSICALLY SAFE RELAY	TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
IS	INTRINSICALLY SAFE	TYP	TYPICAL
J	JUNCTION BOX	UG	UNDERGROUND
K	KILO, PREFIX	ULH	ULTRA LOW HARMONIC
LA	LIGHTNING ARRESTOR	UON	UNLESS OTHERWISE NOTED
LC	LIGHTING CONTACTOR	UPS	UNINTERRUPTIBLE POWER SUPPLY
LEL	LOWER EXPLOSION LIMIT	V	VOLTAGE
LO	LOW	VA	VOLT AMPS
LOS	LOCK OUT STOP	VAR	VOLT AMPS REACTIVE
LR	LATCHING RELAY	VFD	VARIABLE FREQUENCY DRIVE
LS	LIMIT SWITCH	VLV	VALVE
M	MOTOR CONTACTOR	VM	VOLTMETER
MAG	MAGNETIC FLOWMETER	VMR	VOLTAGE MONITOR RELAY
MAX	MAXIMUM	VR	VOLTAGE RELAY
MCM	THOUSAND CIRCULAR MILS	W	WATTS
MCP	MOTOR CIRCUIT PROTECTOR	WP	WEATHER PROOF, NEMA 3R
MCS	MOLDED CASE SWITCH	WTP	WATER TREATMENT PLANT
MH	MANHOLE	WWTP	WASTE WATER TREATMENT PLANT
MIN	MINIMUM, MINUTE	XFMR	TRANSFORMER
MODEM	MODEM	Z	IMPEDANCE
MOV	MOTOR OPERATED VALVE	ZS	LIMIT SWITCH

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U.S. ARMY CORPS OF ENGINEERS
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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

ELECTRICAL
SYMBOLS AND ABBREVIATIONS

SHEET ID
E-001

FINAL ISSUE FOR BID

ELECTRICAL

SCOPE OF WORK

A. THE MAJOR COMPONENTS TO BE FURNISHED, INSTALLED, TESTED AND PLACED INTO OPERATION ARE:
1. UTILITY METERING WITH MAIN DISCONNECT.
2. PUMP CONTROL PANEL:
   a. MOTOR CONTROLS WITH COMBINATION SOLID STATE STARTER.
   b. MISCELLANEOUS EQUIPMENT AS SHOWN ON CONTRACT DRAWINGS.
   c. MOUNTING SUPPORTS AS DETAILED.
3. CONDUIT – SUPPORT SYSTEMS, WIRE, AND GROUNDING SYSTEM, FOR EQUIPMENT INTERCONNECTION, AND OPERATION.
4. TRENCHING, BACKFILLING, COMPACTION AND RESURFACING FOR ALL NEW UNDERGROUND CONDUIT ROUTES, CONCRETE PADS, AND PULL BOXES.
5. COORDINATION AND EQUIPMENT FOR CONNECTION OF POWER UTILITY SERVICES PER UTILITY DRAWINGS AND STANDARDS.
6. SYSTEM TESTING AND DOCUMENTATION.

B. THE CONTRACTOR SHALL INSTALL, READY FOR USE, THE ELECTRICAL SYSTEM AS SPECIFIED HEREIN AND SHOWN ON THE CONTRACT DRAWINGS. FURNISH ALL REQUIRED LABOR, MATERIALS, PROJECT EQUIPMENT, TOOLS, CONSTRUCTION EQUIPMENT, SAFETY EQUIPMENT, TRANSPORTATION, TEST EQUIPMENT, INCIDENTALS AND SERVICES TO PROVIDE A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM AS SHOWN ON THE DRAWINGS, INCLUDED IN THESE SPECIFICATIONS, OR NECESSARY FOR FULLY OPERATING FACILITY.

C. FURNISH AND INSTALL ELECTRICAL AND CONTROL PORTION OF ELECTRO-MECHANICAL EQUIPMENT, INTERCONNECTING WIRE, AND MAKE CONNECTIONS TO PLACE EQUIPMENT IN OPERATION.

D. ALL ELECTRICAL MATERIALS AND WORK SHALL CONFORM TO PUBLISHED STANDARDS OF THE NATIONAL ELECTRIC CODE (NEC), INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE), AND UNDERWRITERS LABORATORIES INC (UL).

CONTRACTOR QUALIFICATIONS

A. MANAGEMENT AND INSTALLATION OF THE ENTIRE ELECTRICAL AND CONTROL SYSTEM REQUIRED FOR THIS PROJECT SHALL BE BY AN ELECTRICAL CONTRACTOR MEETING QUALIFICATIONS AS DEFINED HEREIN.
B. ELECTRICAL CONTRACTOR MUST BE COMPETENT IN PERFORMANCE, SUPERVISION AND COORDINATION OF WORK PERFORMED BY EQUIPMENT SUPPLIERS AND SUBCONTRACTORS.

C. THE ELECTRICAL CONTRACTOR (EC) SHALL MEET THE FOLLOWING MINIMUM QUALIFICATIONS:
1. HAS A CURRENT C10 ELECTRICAL CONTRACTOR'S LICENSE ISSUED BY THE STATE OF CALIFORNIA DEPARTMENT OF CONSUMER AFFAIRS.
2. EC SHALL HAVE SUFFICIENT QUALIFIED PERSONNEL TO STAFF THE PROJECT. STATE LAW REQUIRES THAT ALL PERSONNEL INSTALLING ELECTRICAL COMPONENTS ARE CERTIFIED BY THE STATE OF CALIFORNIA AS "ELECTRICIAN" OR "ELECTRICIAN TRAINEE." APPRENTICES MAY INSTALL ELECTRICAL COMPONENTS ONLY UNDER DIRECT SUPERVISION OF A CERTIFIED ELECTRICIAN.
3. EC SHALL BE FAMILIAR WITH AND UNDERSTAND CODES AND REQUIREMENTS FROM NFPA70, NFPA110, AND ALL OTHER LOCAL CODES AS REQUIRED FOR WORK SCOPE AS DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS.
4. EC SHALL KNOW AND UNDERSTAND COMMON TERMS AND ABBREVIATIONS USED IN THE INDUSTRY. NOT ALL TERMS AND ABBREVIATIONS WILL BE DEFINED IN THE DRAWINGS.
5. EC SHALL CARRY ALL INSURANCES AS REQUIRED BY LAW.

CONTRACT DOCUMENTS

A. THE CONTRACT DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE DESCRIPTIVE OF THE TYPE OF ELECTRICAL SYSTEM TO BE PROVIDED WITH SUFFICIENT DETAIL TO CONSTRUCT. MINOR OMISSION OF DETAIL SHALL NOT RELIEVE A QUALIFIED CONTRACTOR FROM THE OBLIGATION TO PROVIDE A COMPLETE OPERATIONAL SYSTEM IF IT CAN BE DETERMINED THAT THE PARTICULAR DETAIL IS USUAL AND CUSTOMARY FOR SIMILAR SYSTEMS.
B. CONTRACT DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND EQUIPMENT, EXCEPT WHEN SPECIFICALLY DIMENSIONED OR DETAILED. EXACT LOCATIONS OF ELECTRICAL PRODUCTS SHALL BE VERIFIED IN THE FIELD. FIELD MEASUREMENTS TAKE PRECEDENCE OVER DIMENSIONED DRAWINGS. DRAWING INTENT IS TO SHOW SIZE, CAPACITY, APPROXIMATE LOCATON, DIRECTION AND GENERAL RELATIONSHIP OF EQUIPMENT IN AREA SHOWN BUT NOT EXACT DETAIL OR ARRANGEMENT.

UTILITY COORDINATION AND FEES

A. ALL UTILITY FEES AND CHARGES WILL BE PAID BY OWNER.

B. COORDINATE ALL WORK WITH THE UTILITY FOR THE WORK SHOWN ON CONTRACT DRAWINGS.
1. UNLESS ALREADY COMPLETED, APPLY FOR ELECTRIC SERVICE WITHIN 10 WORKING DAYS FROM NOTICE TO PROCEED.
2. COORDINATE AND MEET WITH THE UTILITY'S REPRESENTATIVE AT THE PROJECT SITE(S) WITHIN THIRTY (30) DAYS AFTER AWARD OF CONTRACT.
3. DISCUSS SPECIFIC INSTALLATION AND COMPLY WITH UTILITY REQUIREMENTS. CONTACT ENGINEER IN THE EVENT THAT UTILITY REQUIREMENTS FAR EXCEED ALLOWANCES IN THE PLANS AND SPECIFICATIONS. PROVIDE AN ITEMIZED LIST OF DEVIATIONS AND POTENTIAL COSTS OR CREDITS.
4. COORDINATE AND OBTAIN REQUIRED INSPECTIONS PRIOR TO BACKFILL. MAKE CORRECTIONS TO INSTALLATION AS REQUIRED.
5. COORDINATE CONNECTION AND DATE OF SERVICE WITH UTILITY. UTILITY BACK-CHARGES DUE TO MIS-COORDINATION OR INSTALLATION PROBLEMS WILL BE CONTRACTOR RESPONSIBILITY TO PAY AND CORRECT.

C. FURNISH AND INSTALL ELECTRIC SERVICE IN ACCORDANCE WITH THE SERVING UTILITY'S REQUIREMENTS.
1. THE CONTRACT PLANS SHOW THE PRELIMINARY DESIGN FOR THE UTILITY INSTALLATION. SLIGHT CHANGES REQUIRED BY THE UTILITY DO NOT CONSTITUTE EXTRA WORK UNLESS COST IMPACTS IN MATERIAL AND LABOR EXCEED $1000 PER WELL. IN THAT EVENT, THE AGREED EXCESS AMOUNT WILL BE ALLOWED AS A CONTRACT CHANGE.
2. THE CONTRACTOR SHALL PROVIDE AND INSTALL SERVICE ENTRANCE EQUIPMENT, ALL MATERIAL, CONDUITS, WIRING, PULL ROPES, POLE RISERS, TRANSFORMER PADS, BOLLARDS, ETC. AS SHOWN ON UTILITY DESIGN DRAWINGS AND STANDARDS FOR NEW POWER SERVICE. UTILITY STANDARDS ARE AVAILABLE UPON REQUEST FROM THE UTILITY OR FOR DOWNLOAD FROM THE UTILITY'S WEBSITE.
3. THE UTILITY WILL PROVIDE AND INSTALL PRIMARY WIRE, TRANSFORMER, METER, AND CONNECTIONS.

D. FOLLOWING AWARD OF CONTRACT, SCHEDULE ALL SERVICE INSTALLATIONS AND CONNECTIONS WITH UTILITIES. CONSTRUCTION OR START-UP DELAYS AS A CONSEQUENCE TO LACK OF DOCUMENTED EFFORT BY THE CONTRACTOR WHICH DELAY THE PROJECT COMPLETION DUE TO LACK OF UTILITY SERVICES WILL NOT BE CONSIDERED VALID AND CONTRACT LIQUIDATED DAMAGES MAY BE ASSESSED.

INSPECTIONS

A. GENERAL
1. CONTRACT WORK OR MATERIALS SHALL BE SUBJECT TO INSPECTION AT ANY TIME BY THE ENGINEER. IF EQUIPMENT, MATERIAL, OR INSTALLATION METHOD DOES NOT CONFORM TO THE CONTRACT DOCUMENTS, OR DOES NOT HAVE A FAVORABLY REVIEWED SUBMITTAL STATUS AND HAS BEEN DETERMINED TO BE UNSATISFACTORY BY THE ENGINEER, THEN THE CONTRACTOR SHALL REMOVE SAID MATERIAL FROM THE PREMISES; AND IF SAID MATERIAL HAS BEEN INSTALLED, THE ENTIRE EXPENSE OF REMOVING AND REPLACING SAME, INCLUDING ANY CUTTING AND PATCHING THAT MAY BE NECESSARY, SHALL BE BORNE BY THE CONTRACTOR.
2. WORK SHALL NOT BE CLOSED IN OR COVERED OVER BEFORE INSPECTION AND APPROVAL BY THE ENGINEER. ALL COSTS ASSOCIATED WITH UNCOVERING AND MAKING REPAIRS WHERE NON-INSPECTED WORK HAS BEEN PERFORMED SHALL BE BORNE BY THE CONTRACTOR.
3. THE CONTRACTOR SHALL COOPERATE WITH THE ENGINEER AND PROVIDE ASSISTANCE AT ALL TIMES FOR THE INSPECTION OF THE ELECTRICAL SYSTEM UNDER THIS CONTRACT. THE CONTRACTOR SHALL REMOVE COVERS, PROVIDE ACCESS, OPERATE EQUIPMENT, AND PERFORM OTHER REASONABLE WORK WHICH, IN THE OPINION OF THE ENGINEER, WILL BE NECESSARY TO DETERMINE THE QUALITY OF THE WORK.

B. MILESTONES REQUIRING INSPECTION AND SIGNOFF.
1. UNDERGROUND CONDUIT COMPLETE. DO NOT COVER ANY PORTION OF CONDUIT PRIOR TO INSPECTION. CONDUITS MUST BE LABELED WITH TEMPORARY TAGS.
2. WIRE TERMINATION COMPLETE. DO NOT ENERGIZE EQUIPMENT. ALL WIRE TAGS MUST BE INSTALLED AND WIRES TERMINATED. PRE-ENERGIZATION TESTING TO COMMENCE AFTER INSPECTION.
3. START-UP AND TESTING. SCHEDULE TESTS WITH ENGINEER 2 WEEKS PRIOR TO TEST DATE.
4. PUNCH LIST – FINAL INSPECTION. SCHEDULE FINAL WALKTHROUGH WITH ENGINEER ONE WEEK PRIOR TO INTENDED PROJECT COMPLETION DATE. ALL ITEMS ON PUNCHLIST MUST BE COMPLETE PRIOR TO SCHEDULING WALK-THROUGH.

SUBMITTAL REQUIREMENTS

A. GENERAL
1. PER SPECIFICATION SECTION 01330.

NAMEPLATES & TAGS

A. EQUIPMENT EXTERIOR NAMEPLATES – NAMEPLATE MATERIAL SHALL BE RIGID LAMINATED BLACK PLASTIC WITH BEVELED EDGES AND WHITE LETTERING; EXCEPT FOR CAUTION, WARNING, AND DANGER NAMEPLATES THE COLOR SHALL BE RED WITH WHITE LETTERING. THE SIZE OF THE NAMEPLATE SHALL BE AS SHOWN ON THE DRAWINGS. NO LETTERS ARE ALLOWED SMALLER THAN 3/16". ALL NAMEPLATES LOCATED OUTDOORS SHALL BE UV RESISTANT. SECURELY FASTEN NAMEPLATES IN PLACE USING TWO STAINLESS STEEL SCREWS IF THE NAMEPLATE IS NOT AN INTEGRAL PART OF THE DEVICE. EPOXY CEMENT OR GLUED ON NAMEPLATES WILL NOT BE ACCEPTABLE. ENGRAVE THE NAMEPLATES WITH THE INSCRIPTIONS AS APPROVED BY THE ENGINEER IN THE SUBMITTAL.
1. FOR EACH MAJOR PIECE OF ELECTRICAL EQUIPMENT PROVIDE A MANUFACTURER'S NAMEPLATE SHOWING THE CONTRACT SPECIFIED NAME AND NUMBER DESIGNATION, AND PERTINENT RATINGS SUCH AS VOLTAGE, # OF PHASES, RATINGS, ETC.
2. FOR EACH DEVICE WITH A SPECIFIC IDENTITY (PUSHBUTTON, INDICATOR, INSTRUMENT, ETC.) MOUNTED ON THE EXTERIOR OR DEADFRONT OF A PIECE OF EQUIPMENT PROVIDE A NAMEPLATE WITH THE INSCRIPTION AS SHOWN IN THE CONTRACT DOCUMENTS.

COMPONENTS

A. SWITCHES AND PUSHBUTTONS
1. SWITCHES (HS) AND PUSHBUTTONS (HC) FOR GENERAL PURPOSE APPLICATIONS SHALL BE WATER AND OIL TIGHT AS DEFINED BY NEMA 4X, CORROSION RESISTANT AS DEFINED BY NEMA ICS 6-110.58, U.L. LISTED, STANDARD 30 MM DIAMETER, WITH PLASTIC HOLDING NUT.
2. SWITCHES AND PUSHBUTTONS SHALL HAVE CONTACTS RATED NEMA A600 OR 10 AMPERES CONTINUOUS AND 600 VAC. PROVIDE NO AND NC CONTACTS AS REQUIRED.
3. ENGRAVED BLACK LEGEND PLATES SHALL BE PROVIDED TO DEFINE EACH SWITCH AND PUSHBUTTON FUNCTION.
4. SELECTOR SWITCHES FOR HAND-OFF-AUTO (HOA) APPLICATIONS SHALL HAVE THE HAND POSITION TO THE LEFT, OFF IN CENTER, AND AUTO IN THE RIGHT POSITION.

B. INDICATING LIGHTS
1. INDICATING LIGHTS FOR GENERAL PURPOSE APPLICATIONS SHALL BE NEMA 4X, CORROSION RESISTANT AS DEFINED BY NEMA ICS 6-110.58, U.L. LISTED, 30 MM DIAMETER, WITH PLASTIC LENS, PLASTIC HOLDING NUT, AND MINIATURE BAYONET LAMP BASE.
2. LAMP SHALL BE FULL VOLTAGE 120 VAC WITH 28 CHIP (MIN) HIGH INTENSITY LED.
3. INDICATING LIGHTS SHALL HAVE CONTACTS RATED NEMA A600 OR 10 AMPERES CONTINUOUS AND 600 VAC. PROVIDE NO AND NC CONTACTS AS REQUIRED.
4. ENGRAVED BLACK LEGEND PLATES SHALL BE PROVIDED TO DEFINE EACH LIGHTS FUNCTION.
5. INDICATING LIGHTS DESIGNATED "PTT" ON WIRING DIAGRAM OR SHOWN WITH PUSH-TO-TEST WIRING SHALL BE PROVIDED WITH A PUSH-TO-TEST SWITCH AND WIRING.

C. RELAYS AND TIMERS
1. GENERAL: RELAYS AND TIMERS SHALL BE PROVIDED WITH N.O. OR N.C. CONTACTS AS SHOWN ON THE CONTRACT DRAWINGS. ALL SPARE CONTACTS SHOWN SHALL BE PROVIDED. CONTACTS SHALL BE RATED 10 AMPS MINIMUM AT 120 VAC, 60 HZ UNLESS OTHERWISE SHOWN ON THE CONTRACT DRAWINGS. COIL VOLTAGE SHALL BE 120 VAC UNLESS OTHERWISE DESCRIBED OR SHOWN ON THE CONTRACT DRAWINGS. RELAYS AND TIMERS SHALL BE DESIGNED FOR CONTINUOUS DUTY. ALL RELAYS SHALL BE U.L. LISTED. ALL RELAYS AND SOCKETS SHALL BE THE PRODUCT OF A SINGLE MANUFACTURER.
2. SOCKETS FOR PLUG-IN RELAYS AND TIMERS SHALL BE STANDARD INDUSTRIAL TYPE DIN RAIL MOUNT WITH BARRIER TYPE PRESSURE PLATE SCREW TERMINALS. SOCKETS SHALL BE RATED 300 VAC, 10 AMPS MINIMUM.
3. CONTROL RELAYS (CR) SHALL BE PLUG-IN TYPE WITH NEON INDICATING LIGHTS AND CLEAR SEE-THROUGH SEALED HOUSING TO EXCLUDE DUST. PROVIDE IDEC TYPE RR, OR APPROVED EQUAL. TWO FORM-C CONTACTS (MINIMUM) SHALL BE PROVIDED ON EACH RELAY.
4. TIME DELAY RELAYS ON ENERGIZATION (TR-TDOE) SHALL BE SOLID STATE PLUG-IN RELAYS WITH ADJUSTABLE TIMER RANGES FROM 1 SECOND TO 10 HOURS SELECTABLE UNLESS OTHER RANGES ARE SHOWN. PROVIDE LED TIMER ENERGIZED INDICATOR LAMP.

D. CIRCUIT BREAKERS
1. CIRCUIT BREAKERS SHALL BE OF THE INDICATING TYPE, PROVIDING ON, OFF AND TRIPPED POSITIONS OF THE OPERATING HANDLE. CIRCUIT BREAKERS SHALL BE QUICK-MAKE, QUICK-BREAK, WITH A THERMAL-MAGNETIC (TM) ACTION, EXCEPT WHEN PROTECTING MOTOR FEEDERS WHERE MOTOR CIRCUIT PROTECTOR (MCP) BREAKERS WITH ADJUSTABLE MAGNETIC TRIP SHALL BE USED. WHERE INDICATED, PROVIDE BREAKERS WITH GROUND FAULT (GRI), LONG (L), SHORT (S) AND INSTANTANEOUS (I) ADJUSTABLE TRIP FUNCTIONS.
2. CIRCUIT BREAKERS SHALL BE THE BOLT-ON TYPE. THE USE OF TANDEM OR DUAL CIRCUIT BREAKERS IN A NORMAL SINGLE-POLE SPACE TO PROVIDE THE NUMBER OF POLES OR SPACES SPECIFIED ARE NOT ACCEPTABLE. ALL MULTIPLE-POLE CIRCUIT BREAKERS SHALL BE DESIGNED SO THAT AN OVERLOAD ON ONE POLE AUTOMATICALLY CAUSES ALL POLES TO OPEN.
3. EACH 480 VOLT CIRCUIT BREAKER SHALL HAVE A MINIMUM INTERRUPTING CAPACITY OF 42,000 AMPERES OR AS OTHERWISE SHOWN IN THE DRAWINGS. EACH 120 OR 208 OR 240 VOLT BREAKER SHALL BE RATED FOR A MINIMUM 10,000 AMPERES INTERRUPTING CAPACITY. BREAKERS SHALL BE SIZED AS SHOWN ON DRAWINGS AND AS NECESSARY FOR THE SUPPLIED EQUIPMENT.
4. CIRCUIT BREAKERS AND MOTOR CIRCUIT PROTECTORS SHALL BE MANUFACTURED BY CUTLER-HAMMER, SQUARE D, G.E., ITE, OR APPROVED EQUAL.

E. RECEPTACLES
1. GFI, GROUND FAULT CIRCUIT INTERRUPTING, RECEPTACLES (DENOTED BY GFI NEXT TO RECEPTACLE SYMBOL ON PLAN) SHALL BE USED IN ALL BOXES SHOWN AS WEATHERPROOF. GFI RECEPTACLES SHALL BE DUPLEX, 20A, 120V, WITH "TEST" AND "RESET" BUTTONS WITH SHALLOW DESIGN FOR MOUNTING AND STANDARD SCREW TERMINALS FOR DIRECT WIRING. "DAISY CHAIN" CONNECTING MULTIPLE RECEPTACLES FROM ONE GFI UNIT IS NOT ACCEPTABLE. GFI RECEPTACLES SHALL BE LEVITON 8898, OR APPROVED EQUAL.

F. DISCONNECT SWITCH
1. DISCONNECT SWITCH SHALL BE HEAVY DUTY, HORSEPOWER RATED, THREE POLE, SINGLE THROW, FUSIBLE/NON-FUSIBLE WITH QUICK MAKE/BREAK OPERATING MECHANISM. THE ENCLOSURE SHALL BE 316 STAINLESS STEEL AND RATED NEMA 4X. THE ENCLOSED SWITCH SHALL BE RATED FOR 480 VOLT, AND 10HP (MINIMUM) UNLESS OTHERWISE SHOWN ON THE DRAWINGS. PROVIDE FUSES, AUXILIARY CONTACTS, OR INDICATORS AS REQUIRED BY THE MOTOR CONTROL OR ONE-LINE DIAGRAM. THE OPERATOR SHALL ACTUATE THE SWITCH SIDE MOUNTED HANDLE AND HAVE PROVISIONS FOR UP TO 3 PADLOCKS. DISCONNECT SWITCH SHALL BE CUTLER HAMMER DH SERIES, SQUARE D OR APPROVED EQUAL.

EXECUTION OF CONSTRUCTION METHODS

A. EQUIPMENT SHALL BE ASSEMBLED AND WIRED BY THE MANUFACTURER PRIOR TO SHIPMENT FIELD MODIFICATIONS OR CHANGES ARE NOT ALLOWED WITHOUT A WRITTEN "CHANGE ORDER" TO THE CONTRACT. FIELD CHANGES, HOWEVER LARGE OR SMALL, SHALL BE EXECUTED USING THE COMPONENTS, MATERIALS, WIRING, LABELING, AND ASSEMBLY METHODS IDENTICAL TO THAT OF THE ORIGINAL SUPPLIED EQUIPMENT.
B. ELECTRICAL PLUGS, RECEPTACLES, CORDS, AND CONNECTORS REQUIRED TO POWER OR INTERFACE THE EQUIPMENT AND PANELS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
C. FACTORY AS-BUILT DRAWINGS FOR EACH CUSTOM MANUFACTURED CONTROL PANEL OR MCC SHALL BE SHIPPED WITH THE EQUIPMENT AND PLACED INSIDE IN WATERPROOF ENVELOPES.

INSTALLATION

A. GENERAL
1. INSTALL ALL PRODUCTS PER MANUFACTURER'S RECOMMENDATIONS AND THE DRAWINGS.
PROVIDE ALL NECESSARY HARDWARE, CONDUIT, WIRING, FITTINGS, AND DEVICES TO CONNECT THE ELECTRICAL EQUIPMENT PROVIDED UNDER OTHER SECTIONS.
B. PANELS AND ENCLOSURES:
1. INSTALL PANELS AND ENCLOSURES AT THE LOCATION SHOWN ON THE PLANS OR APPROVED BY THE ENGINEER.
2. INSTALL LEVEL AND PLUMB.
3. SEAL ALL ENCLOSURE OPENINGS TO PREVENT ENTRANCE OF INSECTS AND RODENTS.

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ELECTRICAL
ELECTRICAL SPECIFICATIONS 1

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FINAL ISSUE FOR BID

CONDUIT, RACEWAYS AND WIREWAYS

A. GENERAL – CONDUIT, RACEWAYS, AND WIREWAYS, WIRING METHODS, MATERIALS, INSTALLATION SHALL MEET ALL REQUIREMENTS OF THE NEC, BE UL LABELED FOR THE APPLICATION, AND MEET THE MINIMUM FOLLOWING SPECIFICATIONS.
1. ALL WIRING SHALL BE INSTALLED IN CONDUITS, RACEWAYS, OR WIREWAYS WHEN INTERCONNECTING EQUIPMENT AND DEVICES.
2. THE CONTRACTOR SHALL USE SPECIAL CONDUIT, RACEWAYS, WIREWAYS, CONSTRUCTION METHODS, AND MATERIALS AS SHOWN ON THE CONTRACT DRAWINGS; WHICH SHALL TAKE PRECEDENCE OVER ANY GENERAL METHODS AND MATERIALS SPECIFIED IN THIS SECTION.
3. THE CONTRACTOR SHALL USE CONDUIT MATERIAL TYPES (SPEC PER CONDUIT SCHEDULE) AS DEFINED BELOW OR AS OTHERWISE SHOWN IN THE CONTRACT DRAWINGS OR AS SPECIFICALLY CALLED OUT IN THE CONDUIT SCHEDULE.
a. NON-EXPOSED UNDERGROUND PORTIONS OF CONDUIT RUN SHALL BE PVC-40 FOR ALL SIGNALS AND VOLTAGES UNLESS OTHERWISE SHOWN IN THE CONDUIT SCHEDULE.
b. EXPOSED CONDUIT MATERIAL (NOT UNDERGROUND AND BEYOND TRANSITION) SHALL BE PER THE FOLLOWING TABLE UNLESS SPECIFICALLY NOTED OTHERWISE IN THE PLAN DRAWINGS. THE CONDUIT SCHEDULE DENOTES THE CONDUIT TYPE FOR NON-EXPOSED (UNDER-GROUND, IN-CONCRETE, ETC.) AND DOES NOT APPLY OR COORDINATE WITH THIS TABLE. EXPOSED CONDULETS, ELBOWS, FITTINGS, DEVICE BOXES, AND HARDWARE SHALL BE OF THE SAME MATERIAL AND FINISH AS THE ADJACENT CONDUIT.

LOCATION	MATERIALS
– INDOORS NEMA 1 OR 12	GALVANIZED RIGID STEEL (GRS)
– OUTDOORS NEMA 3R	GALVANIZED RIGID STEEL (GRS)
– OUTDOORS NEMA 4	PVC COATED GALVANIZED RIGID STEEL (GRS-PVC)
– INDOORS/OUTDOORS CORROSIVE (CHEMICAL OR GAS) AREAS NEMA 4X	PVC COATED GALVANIZED RIGID STEEL (GRS-PVC)
– INDOORS/OUTDOORS HAZARDOUS AREAS CLASS 1 DIV 1 OR 2	PVC COATED GALVANIZED RIGID STEEL (GRS-PVC)

3. CONDUIT TAGS
a. ALL CONDUITS LISTED IN THE "CONDUIT AND WIRE ROUTING SCHEDULE" SHALL HAVE CONDUIT TAGS AT BOTH ENDS OF EACH CONDUIT RUN WITH TAG NUMBER FROM SCHEDULE IDENTIFIED. THIS SHALL INCLUDE ENDS WITHIN UNDERGROUND PULL BOXES.
b. ALL CONDUITS SHALL HAVE TEMPORARY TAGS DURING CONSTRUCTION. TEMPORARY TAGS MAY BE MADE FROM DUCT TAPE WITH HAND WRITTEN INK MARKING OR SUITABLE EQUIVALENT. TEMPORARY TAGS SHALL BE REMOVED BY CONTRACTOR AT TIME OF INSTALLATION OF PERMANENT TAGS.
c. LETTER HEIGHT SHALL BE 1/4" MINIMUM. ENGRAVE THE TAGS WITH THE CONDUIT NUMBER OR ACRONYM. LABELING SHALL BE NEATLY INSTALLED FOR VISIBILITY AND SHALL BE CLEARLY LEGIBLE. SECURELY FASTEN TAGS IN PLACE USING 20GA STAINLESS STEEL TIE WIRE THROUGH A PILOT HOLE ON THE TAG.
4. SUPPORTS
a. CROSS SECTION OF A SINGLE CHANNEL SHALL BE 1-5/8" x 1-5/8" AND CROSS-SECTION OF A DOUBLE CHANNEL SHALL BE 1-5/8" x 3-1/4". THE CHANNEL WALL THICKNESS SHALL BE 12 GAUGE AS APPLICABLE.
b. ONE-HOLE CLAMPS SHALL BE INTENDED FOR PIPE MOUNTING ON SUPPORT CHANNELS AND EQUIPPED WITH CLAMP-BACKS. THE CLAMPS SHALL BE EFCOR, THOMAS AND BETTS, APPLETON OR EQUAL.
c. SPACERS, PROVIDED TO SUPPORT UNDERGROUND CONDUITS IN CONCRETE ENCASEMENTS, SHALL BE PLASTIC. THE SPACERS SHALL BE CARLON, JOHNSON MANVILLE, UNDERGROUND PRODUCTS OR EQUAL.
d. ANCHORS SHALL BE EXPANSION TYPE FOR SECURING EQUIPMENT TO CONCRETE FOUNDATIONS, FLOORS AND WALLS. ANCHORS SHALL HAVE LENGTH IDENTIFICATION MARK ON THE EXPOSED END OF THE BOLT. PROVIDE HILTI KWIK BOLT 3, OR EQUAL.

B. GALVANIZED RIGID STELL CONDUIT – (GRS)
1. MANUFACTURED FROM HIGH-STRENGTH STEEL AND HOT DIPPED ZINC GALVANIZED INSIDE AND OUT. CONDUIT AND FITTINGS SHALL MEET UL 514B, UL 6, AND CONFORM TO NEMA RN 2. CONDUIT SHALL BE CAPABLE OF BEING USED AS AN EQUIPMENT GROUNDING CONDUCTOR PER NEC 250.
2. PROVIDE GALVANIZED RIGID STEEL FACTORY SWEEPS AND ELBOWS FOR 90 DEGREE TRANSITIONS.
3. CAST FITTINGS AND DEVICE BOXES SHALL BE MALLEABLE IRON OR ALUMINUM. APPLETON TYPE FS/FD OR APPROVED EQUAL.
4. IN HAZARDOUS LOCATIONS, FITTINGS SHALL MEET AND BE LISTED UL 886.
5. ALL FITTINGS, HUBS, COUPLINGS, PULLING ELBOWS AND CONNECTORS SHALL BE THREADED-TYPE. SET-SCREW TYPE AND COMPRESSION-TYPE ARE NOT ACCEPTABLE. ALL THREAD CONDUIT IS NOT ALLOWED OVER 1/2" EXPOSED LENGTH. COVER PLATES SHALL BE CAST IRON WITH SEALING GASKET IN NEMA 3R LOCATIONS.
6. PIPE THREADS SHALL BE TREATED WITH T & B "KOPR-SHIELD".
7. CONDUITS ENTERING ENCLOSURES SHALL BE FITTED WITH INSULATED GROUNDING BUSHING; O-Z "HBLG", APPLETON "GIB", OR APPROVED EQUAL. ALL GROUNDING BUSHINGS SHALL BE TIED TO THE GROUNDING SYSTEM WITH PROPERLY SIZED BONDING CONDUCTORS PER THE NEC CODE.

C. GALVANIZED RIGID STEEL CONDUIT – PVC COATED (GRS-PVC)
1. GALVANIZED RIGID STEEL CONDUIT WITH A 40-MIL THICK POLYVINYLCHLORIDE EXTERIOR COATING AND A 2-MIL URETHANE INTERIOR COATING MEETING NEMA RN-1, UL-6 AND ETL PVC-001. THE BOND OF THE PVC TO THE ZINC COATED PIPE MUST BE STRONGER THAN THE TENSILE STRENGTH OF THE PVC.
2. PROVIDE PVC COATED GALVANIZED RIGID STEEL FACTORY SWEEPS AND ELBOWS FOR 90 DEGREE TRANSITIONS.
3. CAST FITTINGS AND DEVICE BOXES SHALL BE MALLEABLE IRON OR ALUMINUM WITH A 40 MILS THICK PVC COATING. ROBROY TYPE FS/FD OR APPROVED EQUAL.
4. IN HAZARDOUS LOCATIONS, FITTINGS SHALL MEET AND BE LISTED UL 886.
5. PROVIDE PVC COATED THREADED-TYPE FITTINGS, HUBS, PULLING ELBOWS, COUPLINGS, AND CONNECTORS; SET-SCREW TYPE AND COMPRESSION-TYPE ARE NOT ACCEPTABLE. FORM 8 CONDUIT FITTINGS, 1/2" THROUGH 4", MUST HAVE A TONGUE-IN-GROOVE GASKET TO EFFECTIVELY SEAL OUT THE CORROSIVE ELEMENTS. COVERS SHALL BE SUPPLIED WITH PLASTIC ENCAPSULATED STAINLESS STEEL COVER SCREWS.
6. A PVC SLEEVE EXTENDING ONE PIPE DIAMETER OR TWO INCHES, WHICHEVER IS LESS, SHALL BE FORMED AT EVERY FEMALE FITTING OPENING EXCEPT UNIONS. THE INSIDE SLEEVE DIAMETER SHALL BE MATCHED TO THE OUTSIDE DIAMETER OF THE CONDUIT. PIPE THREADS SHALL BE TREATED WITH CONDUIT INTERIOR URETHANE TOUCH UP COMPOUND.
7. ALL JUNCTION AND METAL PULL BOXES SHALL BE GALVANIZED WITH EXTERIOR SURFACES PVC COATED TO 40 MILS THICKNESS.
8. UNISTRUT, STRUT CLAMPS, PIPE STRAPS, AND CLAMP BACK SPACERS, SHALL HAVE 40 MIL THICK PVC COATING. ALL MOUNTING ANCHORS SHALL BE STAINLESS STEEL.
9. CONDUITS ENTERING ENCLOSURES SHALL BE FITTED WITH INSULATED GROUNDING BUSHING; OZ/GEDNEY "HBLG" OR APPROVED EQUAL. ALL GROUNDING BUSHINGS SHALL BE TIED TO THE GROUNDING SYSTEM WITH PROPERLY SIZED BONDING CONDUCTORS PER THE NEC CODE.
10. GRS-PVC CONDUIT TO BE ROBROY PLASTI-BOND, OR APPROVED EQUAL.

D. EMT CONDUIT, ELECTRICAL METALLIC TUBING
1. THINWALL ELECTROPLATED GALVANIZED STEEL SUITABLE FOR INDOOR AND OUTDOOR USE WITH 90 C WIRES, AND CONFORM TO UL 797.
2. WHERE EXPOSED AND BELOW 8 FEET FROM FLOOR FITTINGS AND DEVICE BOXES SHALL BE MALLEABLE CAST IRON OR ALUMINUM. APPLETON TYPE FS/FD OR APPROVED EQUAL. WHERE CONCEALED IN WALLS OR CEILINGS OR ABOVE 8 FEET FROM FLOOR, DEVICE BOXES MAY BE STAMPED STEEL.
3. ALL FITTINGS, HUBS, COUPLINGS, PULLING ELBOWS AND CONNECTORS SHALL BE COMPRESSION-TYPE, SET SCREW TYPE ARE NOT ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT (UP TO 2") – (FLEX)
1. LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT SHALL BE CONSTRUCTED OF FLEXIBLE PVC AND HAVE A SMOOTH INNER SURFACE WITH INTEGRAL CRUSH RESISTANT REINFORCEMENT WITHIN THE CONDUIT AND BE DESIGNATED AS A TYPE LFNC-B (FOR FNMC-B).
2. LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT SHALL BE SUNLIGHT, OIL, AND FLAME RESISTANT AND APPROVED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS IN INDOOR AND OUTDOOR APPLICATIONS.
3. LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT SHALL BE LISTED TO UL STANDARD UL1660.
4. LIQUID TIGHT FLEXIBLE NON-METALLIC CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH ARTICLE 351, PART B OF THE NATIONAL ELECTRICAL CODE (NEC) AND OTHER APPLICABLE SECTIONS OF THE NEC AND/OR LOCAL ELECTRICAL CODES.
5. LIQUID TIGHT FITTINGS SHALL BE LISTED FOR THE USE WITH LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT AND SHALL BE MARKED LFNC-B (FNMC-B).
6. FLEXIBLE NON-METALLIC CONDUIT SHALL BE CARLON CARFLEX OR EQUAL.

UNDERGROUND BOXES

A. UNDERGROUND PULL BOXES SHALL BE PREFABRICATED CONCRETE WITH "CHRISTY BOX" SIZE AND TYPE OR EQUIVALENT OR DIMENSIONED ON THE DRAWINGS. PROVIDE LARGER BOXES AS DETERMINED IN FIELD TO ALLOW FOR ADEQUATE PULL AREA AT CONTRACTOR DISCRETION. EXTENSION SECTIONS SHALL BE PROVIDED AS NECESSARY TO REACH THE DEPTH OF UNDERGROUND CONDUITS WITH MAXIMUM DEPTH OF 48". ALL BOXES SHALL HAVE GALVANIZED STEEL HOLD DOWN BOLTS AND HARDWARE. BOXES LOCATED IN PAVED AREAS OR OTHER AREAS WHICH VEHICLES MAY TRAVEL SHALL BE H/20 LOADING RATED AND HAVE TRAFFIC COVERS. STEEL COVERS OR LIDS SHALL BE GALVANIZED AND GROUNDED WITH BONDING JUMPER TO THE LOCAL GROUNDING CIRCUIT PER NEC. PULL BOX COVERS SHALL BE LABELED ELECTRICAL, SIGNAL, UTILITY, AND TELEPHONE, WHICHEVER APPLIES. PULL BOXES SHALL BE CHRISTY CONCRETE PRODUCTS, BROOKS OR APPROVED EQUAL.

GROUNDING SYSTEM

A. THE UTILITY SERVICE GROUND SHALL BE TIED TO A BUILDING GROUND GRID CONSISTING OF A "UFER" AND/OR GROUND ROD TYPE GROUNDING SYSTEM.
B. THE GROUND ROD SHALL CONSIST OF NOT LESS THAN 10 CONTINUOUS FEET OF 3/4 INCH COPPER COATED ELECTROPLATED HIGH GRADE CARBON STEEL. THE GROUND ROD SHALL BE A NEHRING TYPE NCC, WEATER 348 OR APPROVED EQUAL. THE GROUND ROD SHALL EXTEND UP FOR VISIBLE CONNECTION OF A UL APPROVED "GROUND CLAMP" TO THE GROUND CONDUCTORS.
C. PROVIDE GROUND WELL ENCLOSURES FOR ALL OUTDOOR GROUND RODS. FURNISH CHRISTY TYPE F8 OR EQUAL UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
D. GROUND ROD CLAMPS SHALL BE BOLT-ON TYPE AS MANUFACTURED BY O-Z GEDNEY TYPE GRC, OR APPROVED EQUAL.
E. GROUNDING CONDUCTORS SHALL BE SIZED AS SHOWN ON THE DRAWINGS OR IN ACCORDANCE WITH NEC TABLE 250, WHICHEVER IS LARGER.
F. THE SYSTEM NEUTRAL (GROUNDED CONDUCTOR) SHALL BE CONNECTED TO THE SYSTEM'S GROUNDING CONDUCTOR AT ONLY A SINGLE POINT IN THE SYSTEM. THIS CONNECTION SHALL BE MADE BY A REMOVABLE BONDING JUMPER SIZED IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE NATIONAL ELECTRICAL CODE IF THE SIZE IS NOT SHOWN ON THE DRAWINGS. THE GROUNDING OF THE SYSTEM NEUTRAL SHALL BE IN THE ENCLOSURE THAT HOUSES THE SERVICE ENTRANCE MAIN OVERCURRENT PROTECTION.
G. THE SECONDARY ON ALL TRANSFORMERS SHALL BE GROUNDED.
H. ALL RACEWAY SYSTEMS, SUPPORTS, ENCLOSURES, PANELS, MOTOR FRAMES, AND EQUIPMENT HOUSINGS SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED.
I. ALL RECEPTACLES SHALL HAVE THEIR GROUNDING CONTACT CONNECTED TO A GROUNDING CONDUCTOR.

INSTALLATION – EXECUTION

A. RIGID CONDUITS AND DUCTS:
1. EXPOSED CONDUITS SHALL BE NEATLY ARRANGED WITH RUNS PERPENDICULAR OR LEVEL AND PARALLEL TO WALLS. BENDS SHALL BE CONCENTRIC.
2. A MAXIMUM OF THREE EQUIVALENT 90 DEGREE ELBOWS ARE ALLOWED IN ANY CONTINUOUS RUN. INSTALL PULL BOXES WHERE REQUIRED TO LIMIT BENDS IN CONDUIT RUNS TO NOT MORE THAN 270 DEGREES OR WHERE PULLING TENSION WOULD EXCEED THE MAXIMUM ALLOWABLE FOR THE CABLE.
3. ROUTE ALL ABOVE GRADE CONDUITS PARALLEL OR PERPENDICULAR TO STRUCTURE LINES AND/OR PIPING. CONDUITS INSTALLED ABOVE GRADE SHALL BE BRACED IN PLACE WITH STANCHIONS. EXPANSION JOINTS SHALL BE INSTALLED EVERY 100 FEET. BENDS SHALL BE CONCENTRIC.

B. FLEXIBLE CONDUIT AND CORDS
1. FLEXIBLE CONDUIT LENGTHS SHALL NOT BE GREATER THAN 36 INCHES FOR SIZES UP TO 2 1/2" AND 48 INCHES FOR 3" AND LARGER CONDUIT.
2. FLEXIBLE CONDUIT SHALL INCLUDE A GROUND CONDUCTOR FOR EQUIPMENT BONDING IN CIRCUITS OVER 30 VDC OR AS SHOWN IN THE CONDUIT SCHEDULE.
3. FLEXIBLE CONDUIT SHALL ONLY BE INSTALLED IN EXPOSED OR ACCESSIBLE LOCATIONS.

C. DEVICE MOUNTING HEIGHTS:
1. MOUNTING HEIGHTS OF FIXTURES AND DEVICES SHALL BE AS FOLLOWS UNLESS OTHERWISE INDICATED OR WHEN HEIGHT HAS TO BE ADJUSTED TO BE OVER OR UNDER COUNTER TOPS.

WALL SWITCHES	=>	48 INCHES
CONVENIENCE OUTLETS	=>	18 INCHES
TELEPHONE OUTLETS	=>	18 INCHES
BRACKET FIXTURES	=>	7 FEET 6 INCHES

LOW VOLTAGE WIRE AND CABLE

A. WIRE
1. WIRE SHALL BE PROPERLY FUSED OR CIRCUIT BREAKER PROTECTED AT OR BELOW THE MAXIMUM AMPERAGE RATING ALLOWED BY THE NEC.
2. CONTROL AND POWER WIRING
a. CONDUCTORS SHALL BE COPPER WITH 98% MINIMUM CONDUCTIVITY.
b. CLASS C STRANDING. SOLID CONDUCTORS MAY BE USED FOR LIGHTING AND RECEPTACLE CIRCUITS.
c. INSULATION OF ALL CONDUCTORS AND CABLES SHALL BE RATED 600 VOLT (MIN).
d. FIELD WIRE IN CONDUIT:
1). INSULATION TYPE THHN / THWN, RATED 90°C IN DRY LOCATIONS AND 75°C IN WET LOCATIONS, OIL RESISTANT, UL83.
2). SIZE ALL CONDUCTORS PER NFPA 70 MINIMUM.
3). MINIMUM #12 AWG FOR WIRES USED IN POWER TRANSMISSION CIRCUITS OR AS DEFINED ON THE DRAWINGS.
4). MINIMUM #14 AWG FOR WIRES USED IN SIGNAL TRANSMISSION CIRCUITS OR AS DEFINED ON THE DRAWINGS.
3. INSTRUMENT WIRING:
a. FIELD: INSTRUMENT CABLES SHALL HAVE 600V TRAY CABLE RATED INSULATION AND 100% INDIVIDUAL SHIELDED TWISTED PAIR #16 CONDUCTORS WITH DRAIN WIRE. SINGLE TWISTED SHIELDED PAIR (TSPR.) CABLES SHALL BE BELDEN 9342, OR APPROVED EQUAL. THREE WIRE TWISTED SHIELDED CABLES (TS3W) SHALL BE BELDEN 1119A OR APPROVED EQUAL.
b. MULTI-PAIR INSTRUMENT CABLE AS REQUIRED PER CONDUIT SCHEDULE SHALL HAVE 300V RATED INSULATION AND 100% INDIVIDUAL SHIELDED TWISTED PAIR #18 CONDUCTORS WITH DRAIN WIRE. MULTIPLE TWISTED SHIELDED PAIR (T.S.PR.) CABLES SHALL BE BELDEN 9773 THRU 9777, OR APPROVED EQUAL.
4. DATA CABLE
a. DATA NETWORK CABLE (INDOOR) SHALL CONSIST OF 4 PAIR UNSHIELDED TWISTED PAIR #23 AWG SOLID CONDUCTORS. THE CABLE SHALL BE RATED BY IEEE FOR SERVICE INTENDED – PLENUM AND DRY. PROVIDE THE FOLLOWING OR EQUAL.
1). CATEGORY 5E CABLE TO 1.2 GBS – BELDEN DATA TWIST 350
b. DATA NETWORK CABLE (OUTDOOR) SHALL CONSIST OF 4 PAIR SHIELDED TWISTED PAIR #23 AWG SOLID CONDUCTORS. THE CABLE SHALL BE RATED BY IEEE FOR SERVICE INTENDED – PLENUM, CONDUIT, WET OR DRY. PROVIDE THE FOLLOWING OR EQUAL.
1). CATEGORY 5E SHIELDED UNDERGROUND IN CONDUIT – BELDEN 7919A

FABRICATION AND INSTALLATION

A. WIRE TERMINATIONS
1. SINGLE WIRE AND CABLE CONDUCTORS SHALL BE TERMINATED ACCORDING TO THE REQUIREMENTS OF THE TERMINAL DEVICE AS FOLLOWS:
a. CRIMP-ON TERMINALS: SHALL BE UL LISTED, SELF-INSULATING SLEEVE TYPE, WITH RING OR RECTANGULAR TYPE TONGUE, SUITABLE FOR THE SIZE AND MATERIAL OF THE WIRE TO BE TERMINATED, AND FOR USE WITH EITHER SOLID OR STRANDED CONDUCTORS.
b. TERMINAL BLOCKS: REMOVE THE LAST +/– 0.25 INCHES INSULATION FROM THE CONDUCTOR AND INSERT IT UNDER THE PRESSURE PLATE TO FULL LENGTH OF THE BARE PORTION OF THE CONDUCTOR. TIGHTEN THE SCREW TO CLOSE THE PRESSURE PLATE ONTO THE CONDUCTOR. NO MORE THAN TWO CONDUCTORS SHALL BE INSTALLED IN A SINGLE TERMINAL. ALL STRANDS OF THE CONDUCTOR SHALL BE CAPTURED UNDER THE PRESSURE PLATE.

B. WIRE SPLICING
1. NO WIRES SHALL BE SPLICED WITHOUT PRIOR APPROVAL BY THE ENGINEER.

C. WIRE INSTALLATION
1. EXERCISE CARE IN PULLING WIRES AND CABLES INTO CONDUIT OR WIREWAYS SO AS TO AVOID KINKING, STRESSING THE CABLES, OR DAMAGING THE INSULATION. USE A UL LISTED PULLING COMPOUND FOR LUBRICATION WITHIN CONDUITS AS NECESSARY. THE RACEWAY CONSTRUCTION SHALL BE COMPLETE AND PROTECTED FROM WEATHER BEFORE CABLE IS PULLED IN. SWAB CONDUITS BEFORE INSTALLING CABLES AND EXERCISE CARE IN PULLING, TO AVOID DAMAGE TO THE INSULATION OR CONDUCTORS.
2. ALL WIRE AND CABLES (WITH THE EXCEPTION OF COAXIAL ANTENNA CABLE) SHALL BE INSTALLED WITHIN UL LISTED RACEWAYS OR ENCLOSURES. INSTALL ALL WIRES AND CABLES IN ONE CONTINUOUS LENGTH UNLESS SPLICES ARE PER CONTRACT DRAWINGS, REQUIRED TO CONNECT EQUIPMENT OR SUBMITTED AND FAVORABLY REVIEWED.
3. BUNDLE INCOMING WIRE AND CABLES IN PANELS. ZIP-TIE AT INTERVALS OF 2" AND NEATLY SPREAD INTO TREES AND CONNECT TO THEIR RESPECTIVE TERMINALS. ALLOW SUFFICIENT SLACK IN CABLES FOR ALTERATIONS IN TERMINAL CONNECTIONS. DO NOT BUNDLE, TAPE OR TIE WIRES WITHIN CONDUITS.

ELECTRICAL FIELD TESTING

A. THE OWNER REPRESENTATIVE OR ENGINEER WILL BE ACTIVELY ENGAGED IN OPERATIONAL TESTING AND COMMISSIONING. THESE EFFORTS SHALL BE COMBINED EFFORTS OF THE OWNER/ENGINEER AND CONTRACTOR. THE CONTRACTOR SHALL FACILITATE TEST AS OUTLINED HEREIN SUCH THAT HARDWARE AND SOFTWARE ARE TESTED COMPLETELY AND ALL APPLICABLE TEST DOCUMENTATION IS COMPLETED.
B. THE FOLLOWING TEST SHALL BE PERFORMED, PROVIDE COMPLETED TEST FORMS.
1. PRE-ENERGIZATION INSPECTIONS AND TESTS:
a. VISUAL AND MECHANICAL INSPECTION TESTS
b. WIRE INSULATION AND CONTINUITY TESTS
c. OPERATIONAL TESTING

REGISTERED PROFESSIONAL ENGINEER
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US Army Corps of Engineers ®

MARK	DESCRIPTION	DATE

DESIGNED BY: M. YARBROUGH	ISSUE DATE: 05/24/2019
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CHECKED BY: T. FRISCH	CONTRACT NO.:
SUBMITTED BY: S. LEWIS	FILE NO: 18-2-104
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U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT

MEAD & HUNT, INC.
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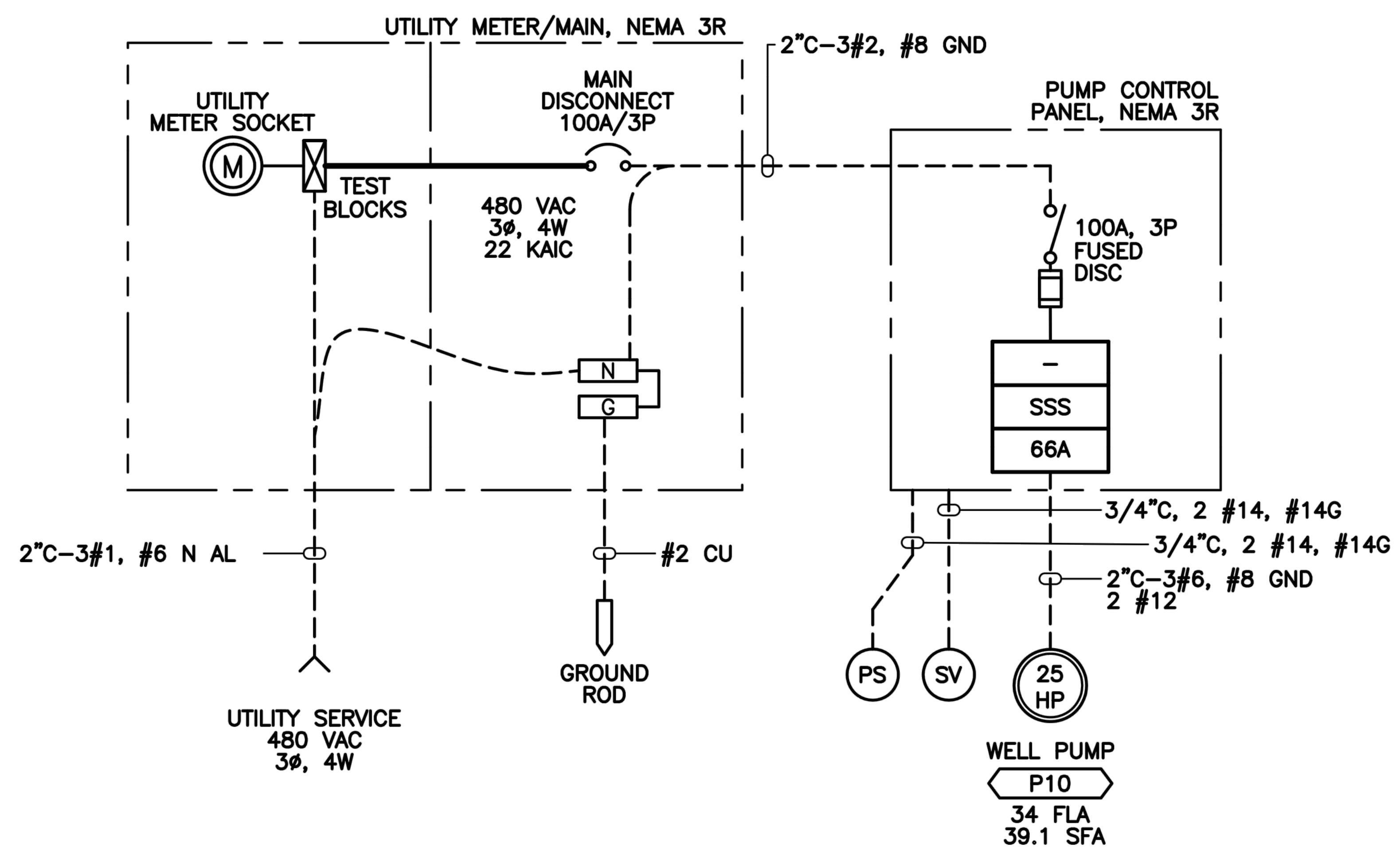
AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

ELECTRICAL
ELECTRICAL SPECIFICATIONS 2

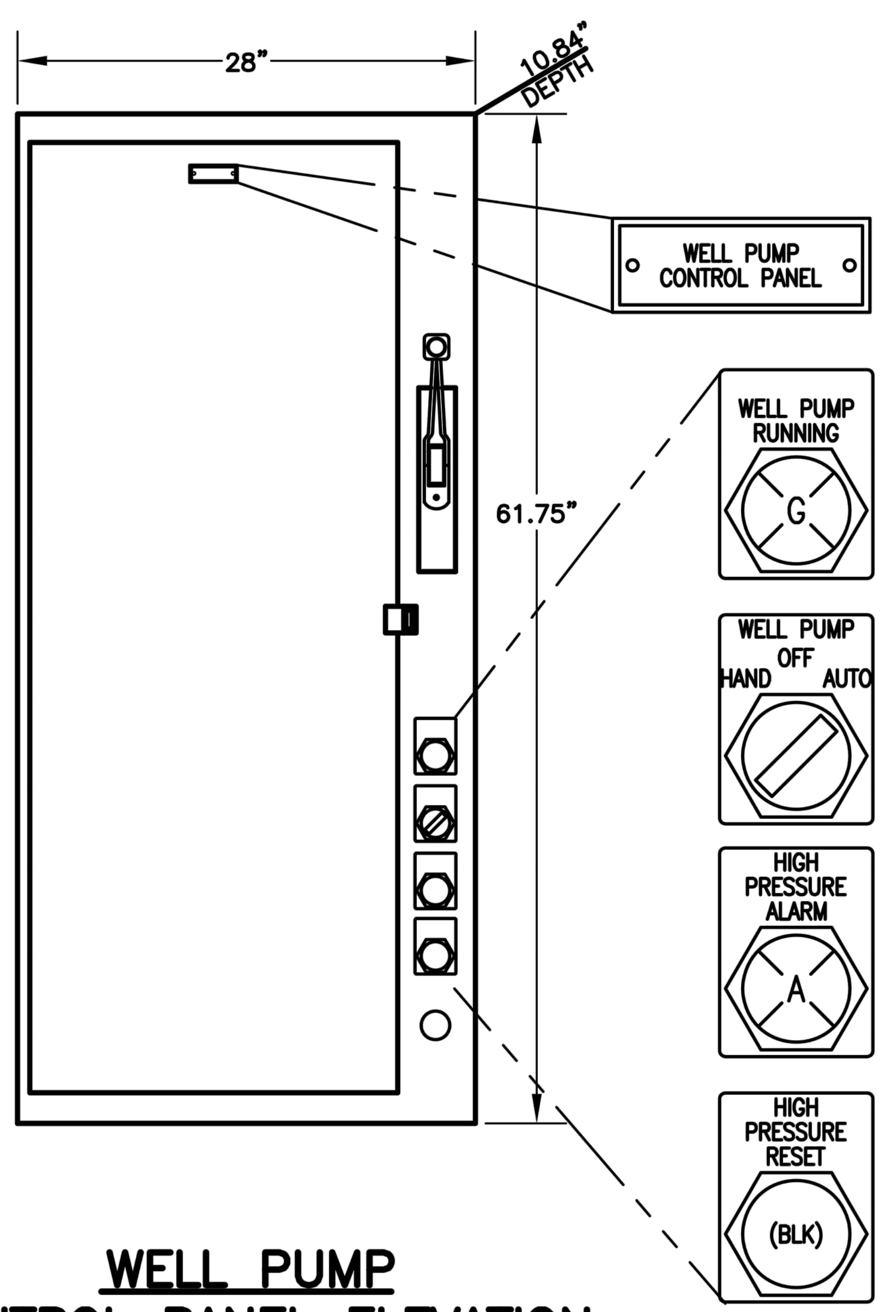
SHEET ID
E-003

FINAL ISSUE FOR BID

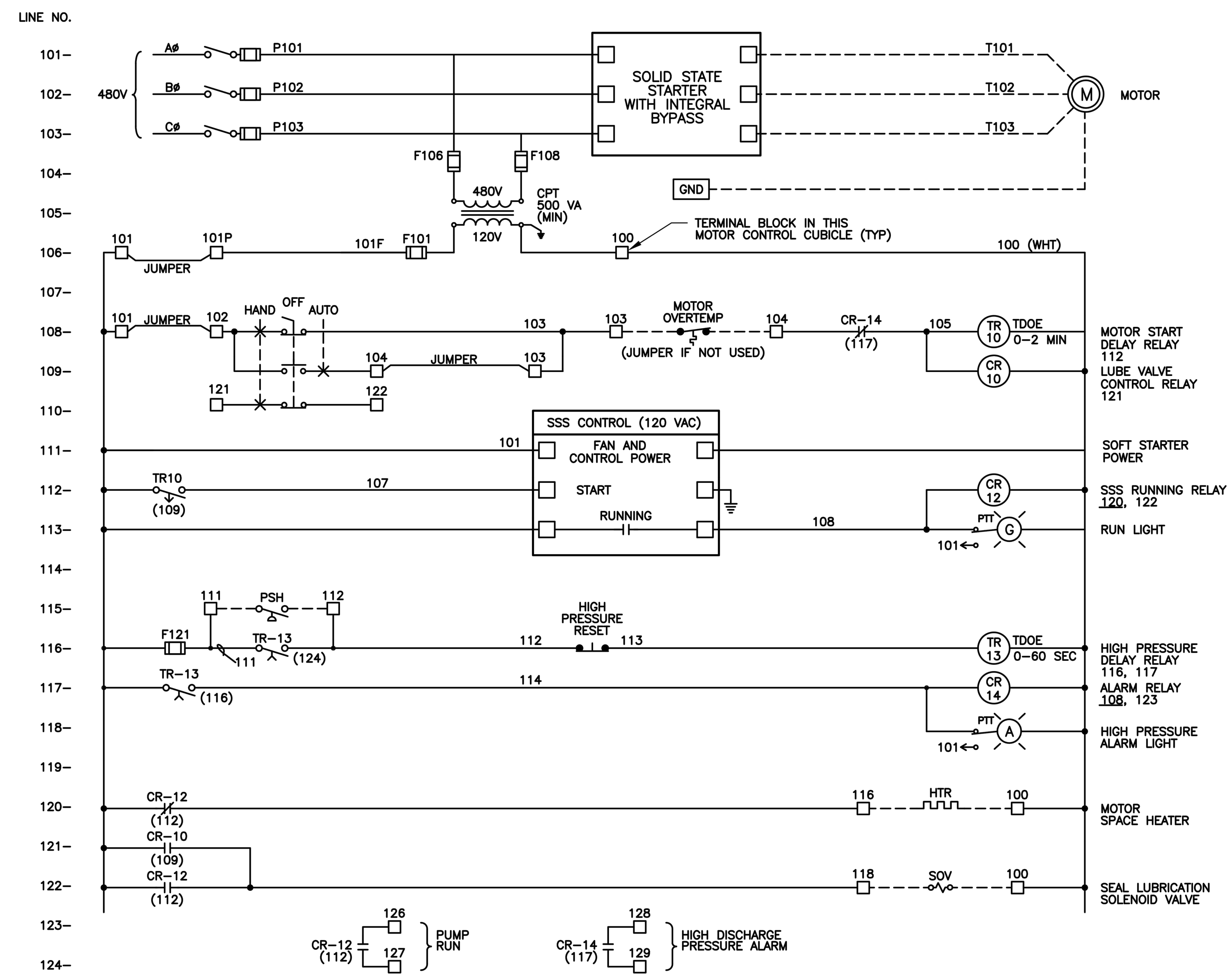
LOAD CALCULATIONS – 25 HORSEPOWER			
LOAD DESCRIPTION	LOAD	QTY	TOTAL
25 HP BOOSTER PUMP	34.00 A	1	28267.1 VA
TOTAL LOAD =	34.00 A		28267.1 VA
LOAD CORRECTION FACTORS			
LARGEST MOTOR LOAD x 25%: 25 HP => 0.25 x 28267.1VA =	8.50 A		7066.8 VA
80% BREAKER DERATING = TOTAL x 0.25 = FOR CONTINUOUS LOADS NEC 210-20	10.63 A		8833.5 VA
UTILITY SERVICE SIZE (MIN) =	53.13 A		44167.3 VA
480V, 3 PHASE, 4 WIRE			
UTILITY SERVICE SIZE PROPOSED =	100 AMP		



ONE LINE DIAGRAM



WELL PUMP CONTROL PANEL ELEVATION



WELL PUMP ELEMENTARY DIAGRAM

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AMERICAN RIVER COMMON FEATURES
NATOMAS BASIN REACH B VOLUME 6
BORROW SITE EXCAVATION PLANS

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PUMP PANEL ELEVATION AND WIRING DIAGRAMS

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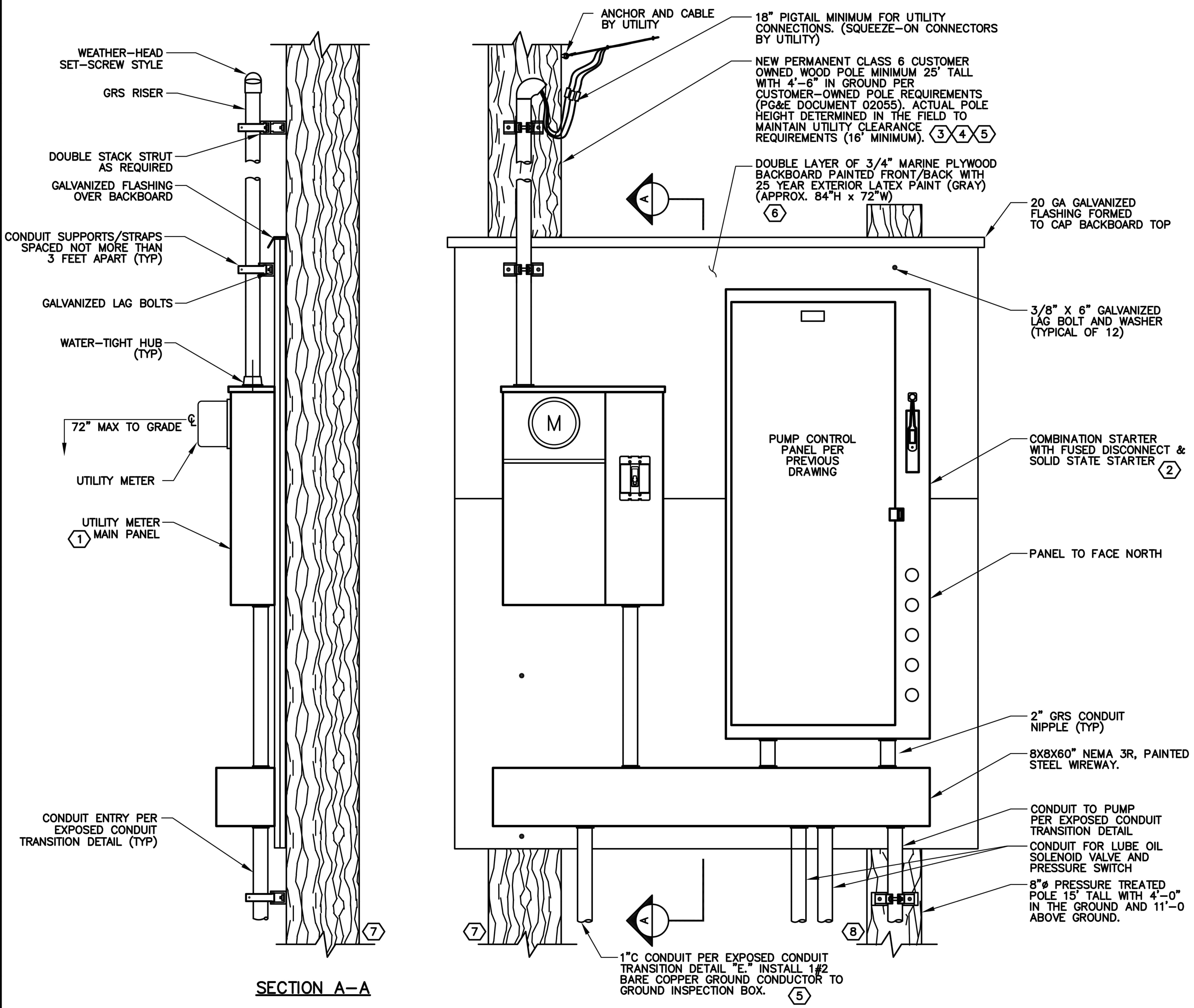
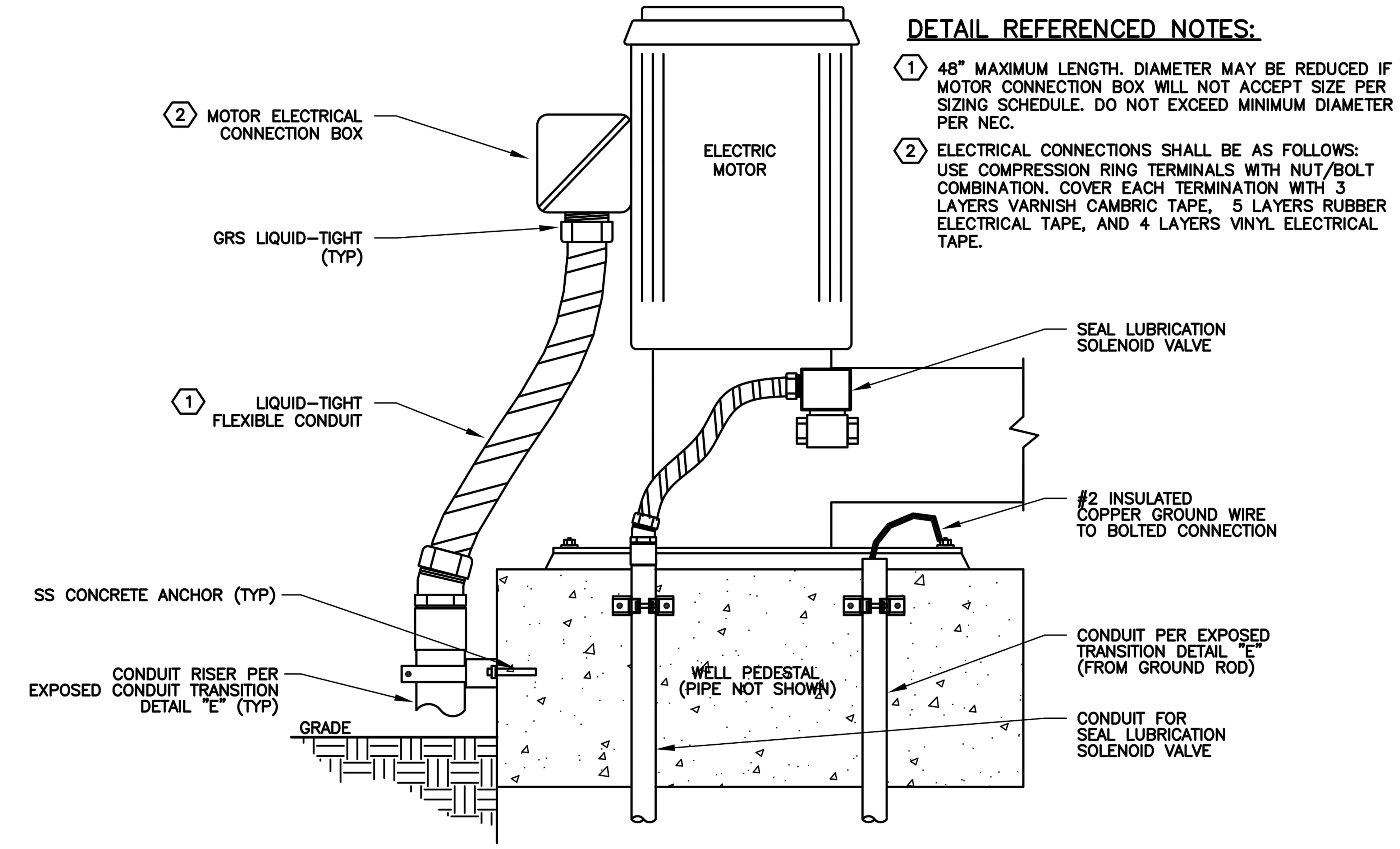
FINAL ISSUE FOR BID



A – PUMP CONTROL PANEL DETAIL
NOT TO SCALE

DRAWING REFERENCED NOTES:

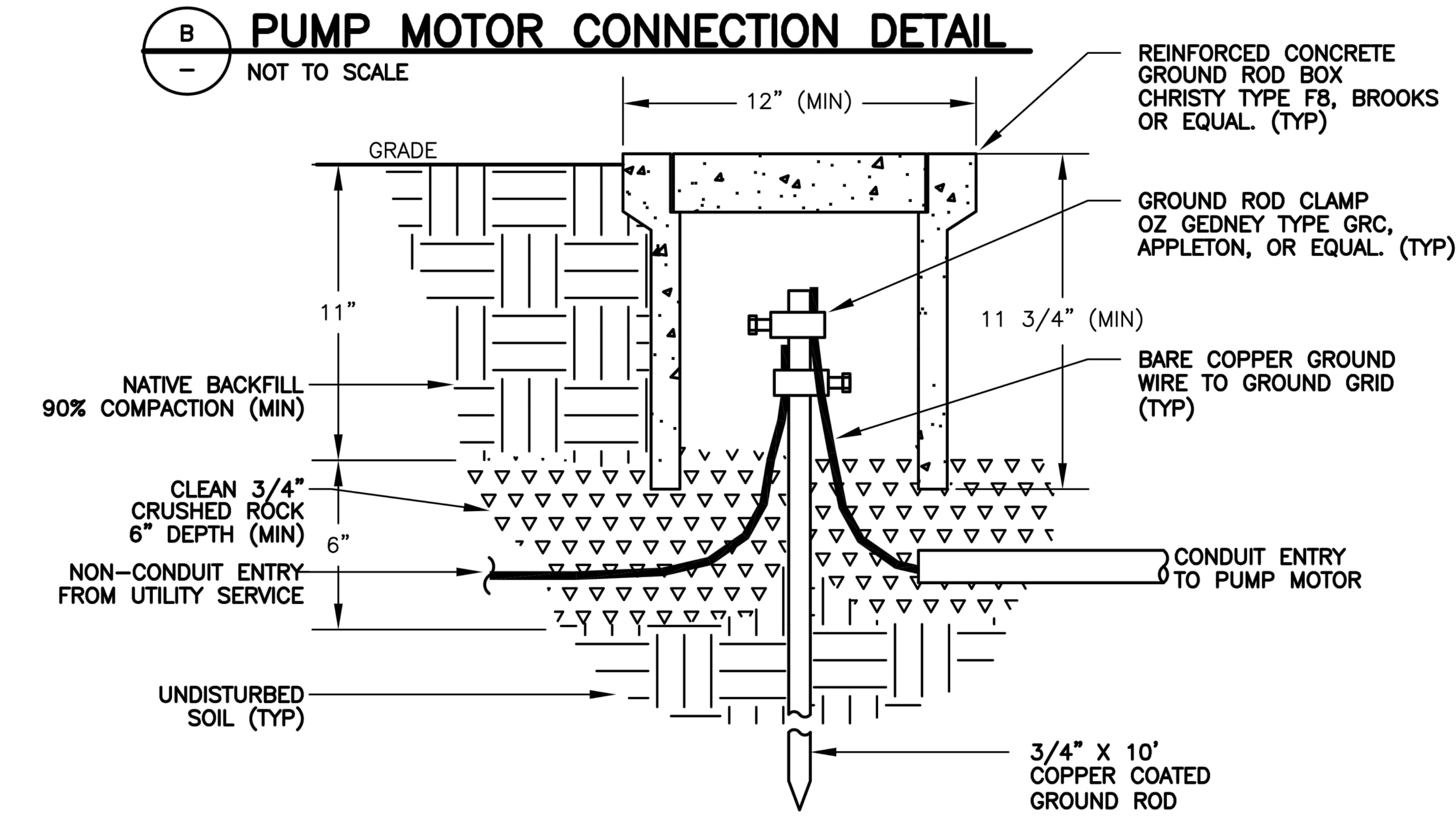
1. SINGLE METER POSITION, NEMA TYPE 3R RATED, ANSI 61 GRAY ELECTROCOAT FINISH, 600 VAC RATED TEST BLOCK BYPASS UTILITY METERING ENCLOSURE WITH MAIN DISCONNECT. PROVIDE COOPER B-LINE MTBHMS15 SERIES, CIRCLE AW, OR APPROVED EQUAL.
2. ENCLOSED TYPE NEMA 3R RATED COMBINATION SOFT STARTER MOTOR CONTROLLER WITH FUSED DISCONNECT AND EXTERNAL SIDE DISCONNECT PADLOCKABLE HANDLE. PROVIDE CUTLER HAMMER IT S801 SERIES, ALLEN BRADLEY SMC-3 OR APPROVED EQUAL.
3. NOTIFY UTILITY AND SCHEDULE INSPECTION PRIOR TO SETTING CUSTOMER-OWNED POLE
4. PROVIDE COPY OF THE "CERTIFICATE OF TREATMENT" TO UTILITY.
5. GROUNDING WIRE SHALL BE PROTECTED AGAINST MECHANICAL DAMAGE BY RIGID STEEL CONDUIT. THE GROUND ROD SHALL BE LOCATED NO LESS THAN 12 INCHES FROM THE POLE SURFACE.
6. CUSTOMER'S EQUIPMENT SHALL NOT BE INSTALLED IN THE CLIMBING SPACE OR OVER THE POLE BRAND.
7. SERVICE POLE TO BE SET BY UTILITY.
8. SERVICE POLE TO BE SET BY CONTRACTOR.



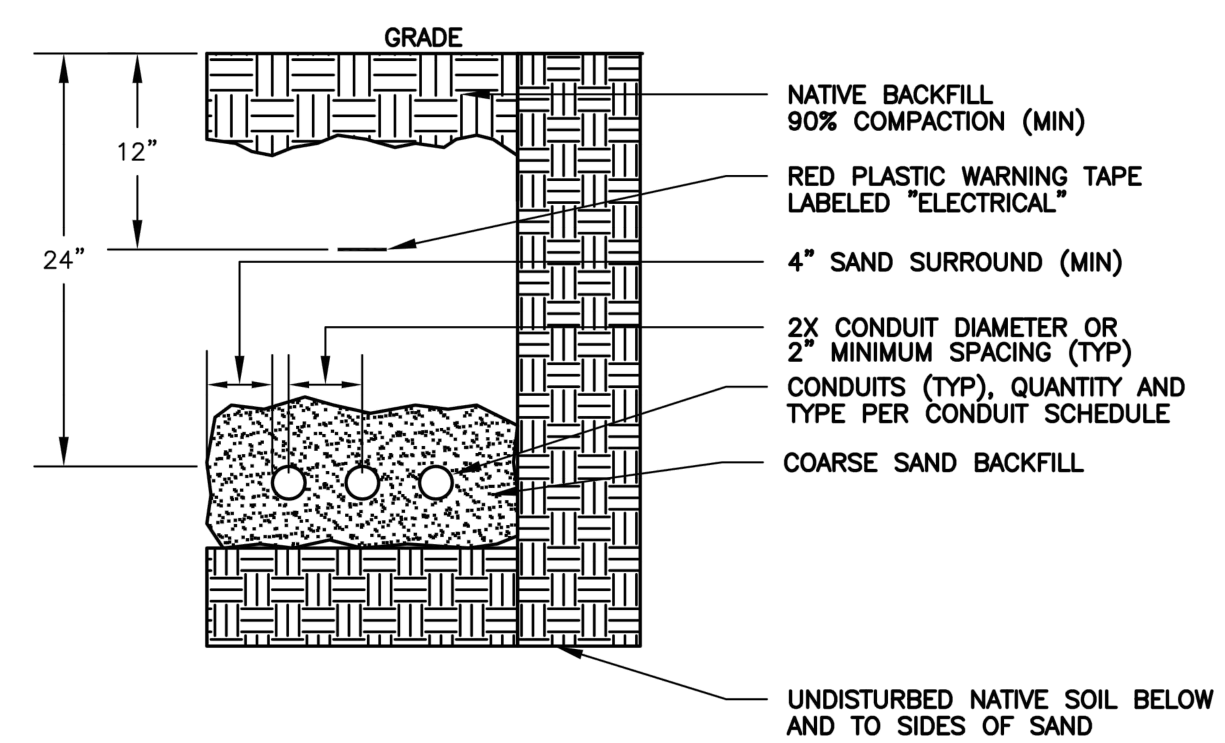
DETAIL REFERENCED NOTES:

1. 48" MAXIMUM LENGTH. DIAMETER MAY BE REDUCED IF MOTOR CONNECTION BOX WILL NOT ACCEPT SIZE PER SIZING SCHEDULE. DO NOT EXCEED MINIMUM DIAMETER PER NEC.
2. ELECTRICAL CONNECTIONS SHALL BE AS FOLLOWS: USE COMPRESSION RING TERMINALS WITH NUT/BOLT COMBINATION. COVER EACH TERMINATION WITH 3 LAYERS VARNISH CAMBRIC TAPE, 5 LAYERS RUBBER ELECTRICAL TAPE, AND 4 LAYERS VINYL ELECTRICAL TAPE.

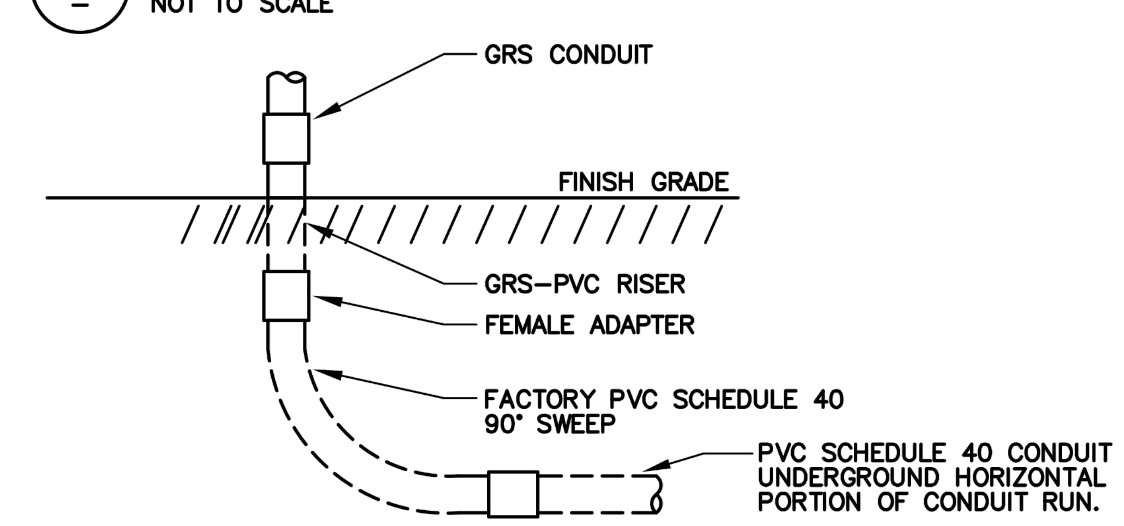
B – PUMP MOTOR CONNECTION DETAIL
NOT TO SCALE



C – GROUND INSPECTION BOX DETAIL
NOT TO SCALE



D – UNDERGROUND CONDUIT DETAIL
NOT TO SCALE



E – EXPOSED CONDUIT TRANSITION DETAIL
NOT TO SCALE

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AMERICAN RIVER COMMON FEATURES
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ELECTRICAL DETAILS

SHEET ID
E-005

FINAL ISSUE FOR BID