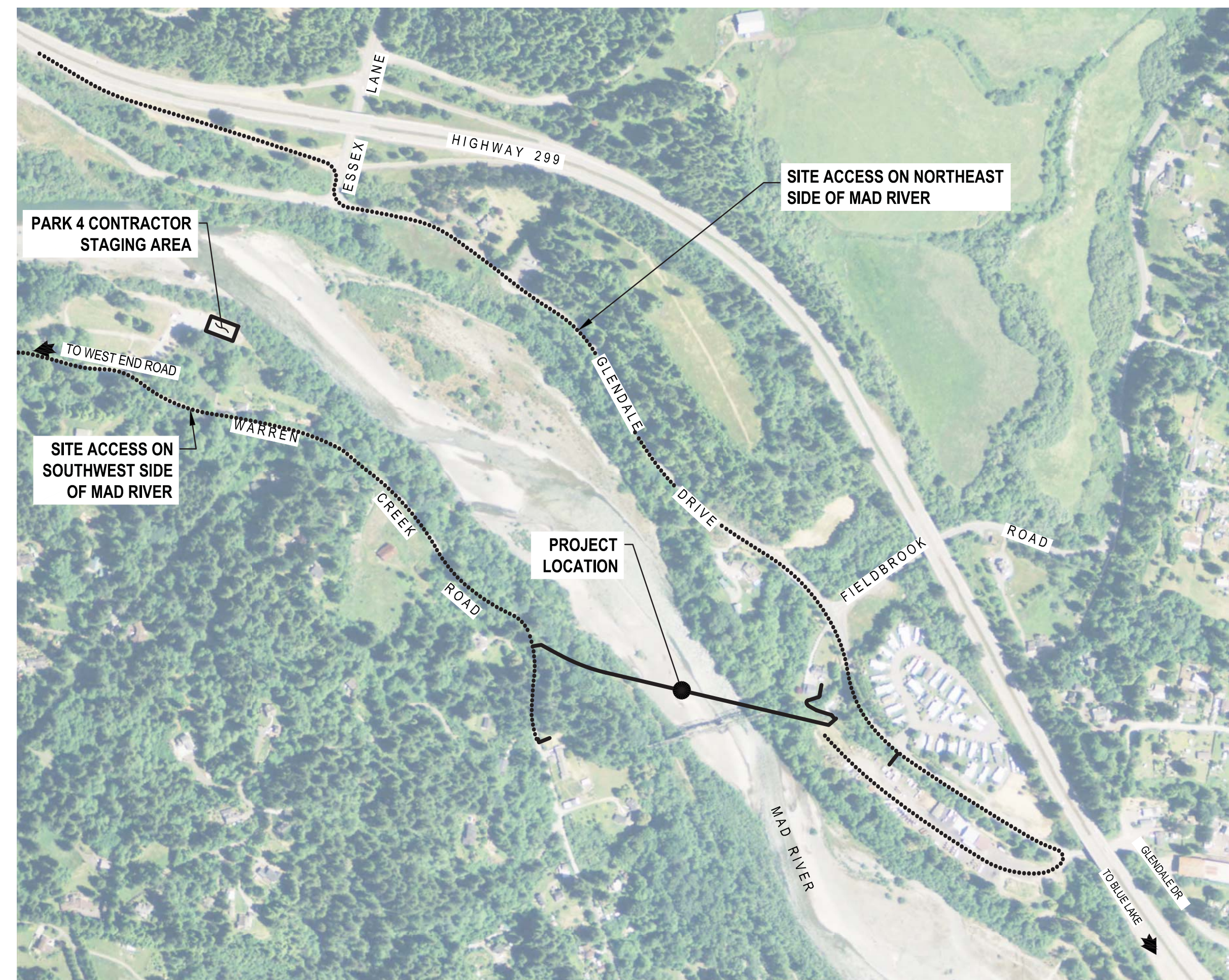
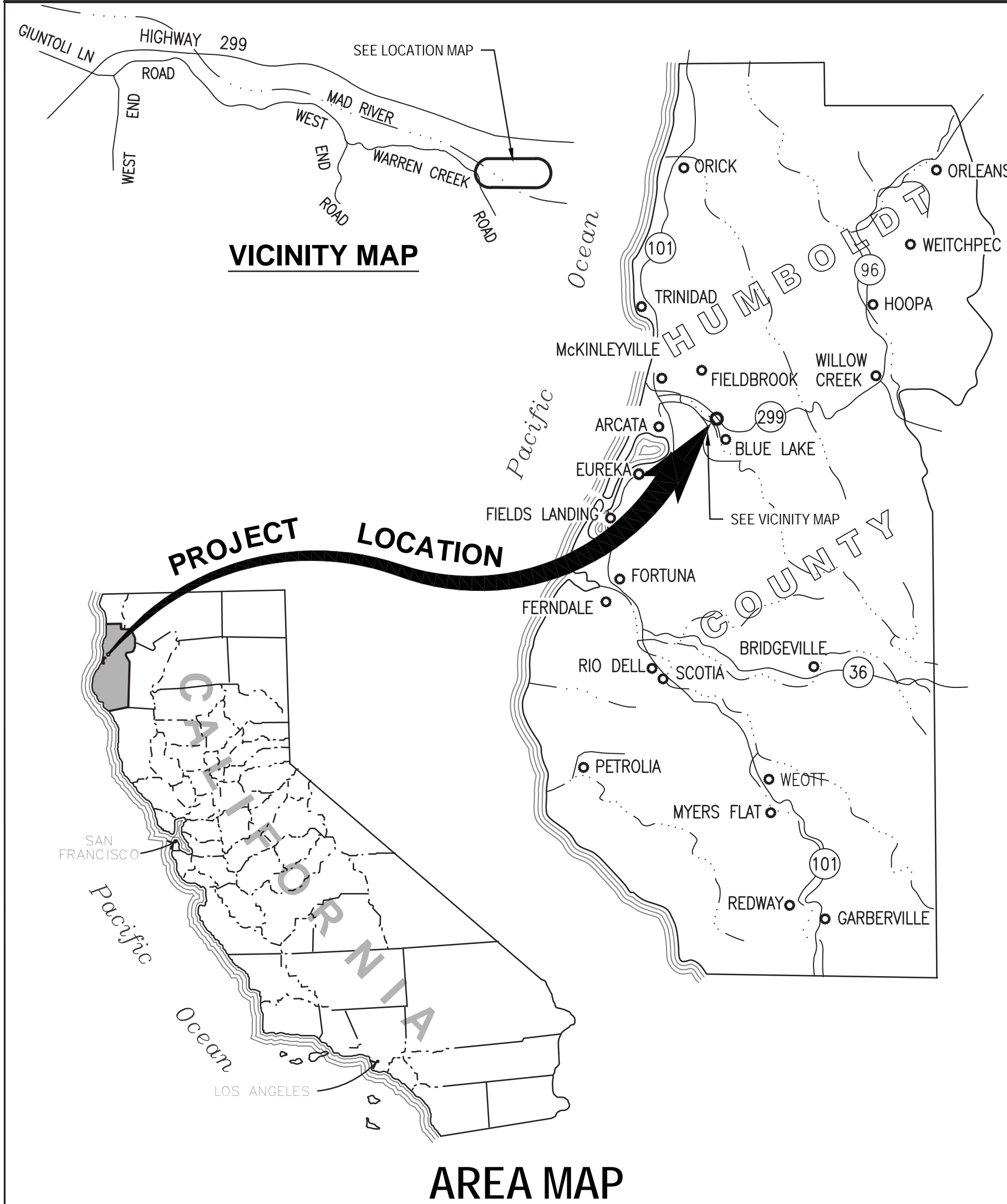
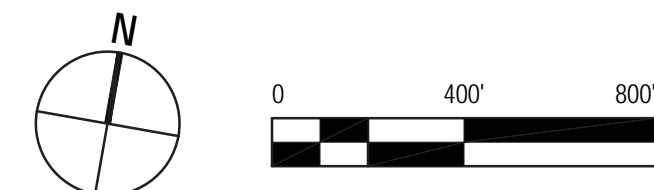


HUMBOLDT BAY MUNICIPAL WATER DISTRICT MAD RIVER PIPELINE CROSSING

FEBRUARY 2018



LOCATION MAP



APPROVALS

PLANS AND SPECIFICATIONS APPROVED BY THE BOARD OF DIRECTORS OF THE HUMBOLDT BAY MUNICIPAL WATER DISTRICT, COUNTY OF HUMBOLDT, STATE OF CALIFORNIA, THIS 8TH DAY OF FEBRUARY, 2018.

GENERAL MANAGER
JOHN FRIEDENBACH

SIGNED

BOARD OF DIRECTORS

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NEAL LATT	VICE PRESIDENT
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ENGINEER: GHD Inc.
PATRICK KASPARI, PE

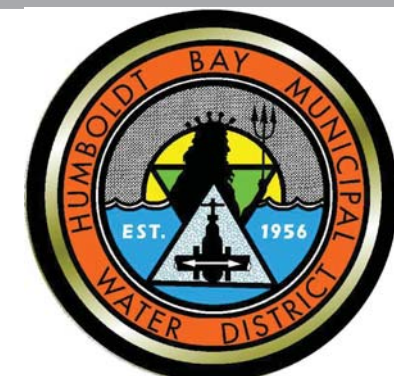
SIGNED

2/08/2018

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No.	Issue	Drawn	Approved	Date
A	ISSUE FOR BID	NS	PK	2/9/18



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Client: HUMBOLDT BAY MUNICIPAL WATER DISTRICT
Project: MAD RIVER PIPELINE CROSSING
Title: COVER SHEET

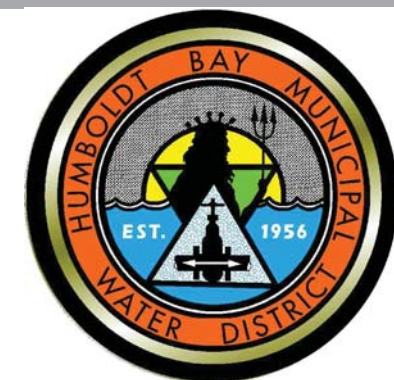
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Sheet No. G-001

ABBREVIATIONS			
∅	DIAMETER	HBMWD	HUMBOLDT BAY MUNICIPAL WATER DISTRICT (DISTRICT)
AB	AGGREGATE BASE	HC	HANDICAP
ABDN	ABANDONED	HCR	HANDICAP ACCESSIBLE RAMP
AC	ACRE, ASPHALT CONCRETE	HDPE	HIGH-DENSITY POLYETHYLENE
ACP	ASBESTOS CEMENT PIPE	HMA	HOT MIX ASPHALT
ACM	ASBESTOS CONTAINING MATERIAL	HORIZ	HORIZONTAL
AD	AREA DRAIN	HT	HEIGHT
ADA	AMERICANS WITH DISABILITIES ACT	HP	HIGH POINT
ALGN	ALIGNMENT	INV	INVERT
APPROX	APPROXIMATE	INST	INSTALL
ARV	AIR RELEASE VALVE	IRR	IRRIGATION
ASB	AGGREGATE SUBBASE		
ASPH	ASPHALT	JP	JOINT POLE
		JT	JOINT TRENCH
BC	BEGIN CURVE		
BEG	BEGIN	L	LEFT
BFP	BACK FLOW PREVENTER	L=	LENGTH (CURVE)
BFV	BUTTERFLY VALVE	LF	LINEAR FEET
BLDC	BUILDING CORNER	LAT	LATERAL
BLDG	BUILDING	LIP	LIP OF GUTTER
BMP	BEST MANAGEMENT PRACTICES	LP	LIGHT POLE, LOW POINT
BO	BLOW OFF	LPFH	LIGHT POLE, HIGH POINT
BOD	BOTTOM OF DOCK	BOL	BOLLARD
BOL	BOLLARD	BOW	BACK OF SIDEWALK
BOW	BACK OF SIDEWALK	BV	BALL VALVE
BV	BALL VALVE	BVC	BEGIN VERTICAL CURVE
BVC	BEGIN VERTICAL CURVE	BW	FINISHED GRADE AT BOTTOM OF WALL
BW	FINISHED GRADE AT BOTTOM OF WALL		
		MA	MEDICAL AIR
		MAX	MAXIMUM
C	CONCRETE OR CIVIL	MEP	MECHANICAL/ELECTRICAL/PLUMBING
CB	CATCH BASIN	MF	MEDIA FILTER
C&G	CURB AND GUTTER	MH	MANHOLE
CG&S/W	CURB, GUTTER & SIDEWALK	MID	MIDDLE
CI	CAST IRON OR CURB INLET	MIN	MINIMUM
CIP	CAST IRON PIPE	MJ	MECHANICAL JOINT
CL	CENTERLINE	MPVC	MIDPOINT OF VERTICAL CURVE
CLR	CLEAR	MON	MONUMENT
CMN	COMMUNICATION		
CMP	CORRUGATED METAL PIPE	N	NORTHING COORDINATE
CO	CLEAN OUT	(N)	NEW
CONC	CONCRETE	NCRA	NORTH COAST RAILROAD AUTHORITY
CONST	CONSTRUCTION OR CONSTRUCT	NIC	NOT IN CONTRACT
CONF	CONFORM TO EXISTING	NO	NUMBER
CR	CONDENSATE RETURN	NTS	NOT TO SCALE
CU	CUBIC		
CWSC	CALIFORNIA WATER SERVICE COMPANY	OHE	OVERHEAD ELECTRIC
CY	CUBIC YARD	O.R.	OFFICIAL RECORDS
		(P)	PROPOSED
D=	DELTA (CURVE)	P	PAVEMENT ELEVATION
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	PA	PLANTER AREA
DEMO	DEMOLISH	PB	PULL BOX
DEPT	DEPARTMENT	PCC	POINT OF COMPOUND CURVATURE
DET	DETAIL		
DI	DROP INLET, DUCTILE IRON	PE	PLAIN END
DIA	DIAMETER	PED	PEDESTRIAN
DIP	DUCTILE IRON PIPE	PERF	PERFORATED
DOM	DOMESTIC	PH	POTHOLE
DW	DOMESTIC WATER	PI	POINT OF INTERSECTION
DWG	DRAWING	PID	POINT ID
		PIV	POST INDICATOR VALVE
E	EASTING COORDINATE, ELECTRIC	PL	PROPERTY LINE
EC	END CURVE	PM	PARKING METER
EG	EXISTING GRADE	PMH	POWER MANHOLE
EL_ELEV	ELEVATION	POC	POINT ON CURVE
ELEC	ELECTRICAL	POI	POINT OF INTERSECTION
EP	EDGE OF PAVEMENT	PP	POWER POLE
EVA	EMERGENCY VEHICLE ACCESS	PRC	POINT OF REVERSE CURVATURE
EVC	END VERTICAL CURVE	PRUE	PRIVATE UTILITY EASEMENT
EX,EXIST.	EXISTING	PT	POINT OF TANGENCY
(E)		PUE	PUBLIC UTILITY EASEMENT
		PVC	POLYVINYL CHLORIDE PIPE
(F)	FUTURE	R	RIGHT
FA	FIRE ALARM	R=	RADIUS (CURVE)
F/C,FC	FACE OF CURB	RC	RELATIVE COMPACTION
FD	FOUND	RCP	REINFORCED CONCRETE PIPE
FDC	FIRE DEPARTMENT CONNECTION	REQ	REQUIRED
FF,FFE	FINISHED FLOOR ELEVATION	RIM	RIM ELEVATION
FG	FINISH GRADE	RJ	RESTRAINED JOINT
FH	FIRE HYDRANT	RP	RADIUS POINT
FL	FLOW LINE	RPBFP	REDUCED PRESSURE BACKFLOW PREVENTER
FLG	FLANGE	RPPA	REDUCED PRESSURE PRINCIPLE ASSEMBLY
FOUND	FOUNDATION	RSC	RECEIVING AND SUPPORT CENTER
FS	FINISHED SURFACE	R/W, ROW	RIGHT OF WAY
FT	FOOT, FEET	RW	RECYCLED WATER
FW	FIRE WATER		
		S	SOUTH, SLOPE
G	GAS, GROUND ELEVATION	SB	SEDIMENT BASIN
GB	GRADE BREAK	SD	STORM DRAIN
GCS	GROUND CONTROL STATION	SDCB	STORM DRAIN CATCH BASIN
GDT	GROUND DATA TERMINAL	SDI	STORM DRAIN INLET
GI	GALVANIZED IRON	SDMH	STORM DRAIN MANHOLE
GI	GREASE INTERCEPTOR	SDCO	STORM DRAIN CLEANOUT
GRD, G	GROUND	SF	SILT FENCE
GV	GATE VALVE	SG	SUBGRADE
		SHLDR	SHOULDER
		SHT	SHEET
		SIM	SIMILAR
		SL	STREETLIGHT
		SMH	SIGNAL MANHOLE
		SS	SANITARY SEWER
		SSCO	SANITARY SEWER CLEANOUT
		SSFM	SANITARY SEWER FORCE MAIN
		SSMH	SANITARY SEWER MANHOLE
		SSPS	SANITARY SEWER PUMP STATION
		SST	STAINLESS STEEL
		STA	STATION
		STD	STANDARD
		S/W	SIDEWALK
		T	TELEPHONE
		TC	TOP OF CURB
		TD	TRENCH DRAIN
		TEL	TELEPHONE
		TEMP	TEMPORARY
		TFC	TOP FACE OF CURB
		TG	TOP OF GRATE ELEVATION
		THK	THICK
		TOD	TOP OF DOCK
		TOE	TOE OF SLOPE
		TRC	TOP OF ROLLED CURB
		TW,TOW	TOP OF WALL
		TS	TOP OF SLAB
		TYP	TYPICAL
		UNO	UNLESS NOTED OTHERWISE
		U/G	UNDERGROUND
		VC	VERTICAL CURVE
		W	WEST, WATER
		WM	WATER METER
		WTR	WATER
		WV	WATER VALVE
		WWF	WELDED WIRE FABRIC
		W	WITH
		YDS	YARDS

SYMBOLS LEGEND	
NEW	EXISTING

ANNOTATION	
	KEYNOTE
	DETAIL NUMBER
	DETAIL INDICATOR
	SECTION LETTER
	SECTION INDICATOR
	SHEET NUMBER ON WHICH SECTION APPEARS
	SHEET NUMBER ON WHICH DETAIL APPEARS
SHEET NOTES	
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2.	THIS IS A STANDARD ABBREVIATION AND LEGEND SHEET, THEREFORE, SOME ABBREVIATIONS AND LEGEND SYMBOLS MAY APPEAR ON THIS SHEET AND MAY NOT BE USED ON THIS PROJECT.

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Date	1/12/2018
Scale	AS NOTED

Client	HUMBOLDT BAY MUNICIPAL WATER DISTRICT
Project	MAD RIVER PIPELINE CROSSING
Title	ABBREVIATIONS & SYMBOLS
Project No.	8411162
Original Size	ANSI D
Sheet No.	G-002
Sheet	2 of 11

GENERAL NOTES

1. GENERAL
 - 1.1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE OSHA REGULATIONS.
 - 1.2. CONTRACTOR SHALL NOTIFY THE OWNER AT LEAST THREE WORKING DAYS PRIOR TO COMMENCEMENT OF WORK OR IF WORK HAS BEEN SUSPENDED FOR A PERIOD OF ONE OR MORE DAYS (WEEKENDS AND HOLIDAYS EXCEPTED).
 - 1.3. THE CONTRACTOR SHALL HAVE A SUPERINTENDENT OR REPRESENTATIVE ON SITE AT ALL TIMES DURING CONSTRUCTION.
 - 1.4. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPLYING WITH ALL CONDITIONS CONTAINED IN PROJECT RELATED PERMITS AND IN OBTAINING ANY OTHER PERMITS THAT MAY BE REQUIRED.
 - 1.5. CONTRACTOR SHALL CONDUCT FIELD REVIEW AND VERIFY ALL LINES, LEVELS AND CONDITIONS PRIOR TO BEGINNING OF ANY WORK. SUBMIT TO DISTRICT A LIST OF IDENTIFIED PROBLEM AREAS.
 - 1.6. ALL MATERIALS REQUIRED FOR THE COMPLETE EXECUTION OF THE PROJECT SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR UNLESS OTHERWISE NOTED. ALL CONSTRUCTION MATERIALS AND METHODS SHALL COMPLY WITH THE PROJECT CONSTRUCTION CONTRACT DOCUMENTS.
 - 1.7. EXISTING FACILITIES INCLUDING, BUT NOT LIMITED TO ROADS, SIDEWALKS, WALLS, FENCES AND STRUCTURES DAMAGED BY CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO MATCH ORIGINAL CONDITION AND TO THE SATISFACTION OF THE AGENCY HAVING JURISDICTION OVER THE IMPROVEMENTS WITHOUT ADDITIONAL COST TO THE DISTRICT.
 - 1.8. ALL LANDSCAPING AND IRRIGATION SYSTEMS OR OTHER PRIVATE IMPROVEMENTS DISTURBED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED IN KIND OR AS DIRECTED BY THE ENGINEER, AT NO ADDITIONAL COST TO OWNER.
 - 1.9. ALL UNDERGROUND IMPROVEMENTS SHALL BE INSTALLED, TESTED, AND APPROVED PRIOR TO FINAL PAVING.
 - 1.10. CONTRACTOR SHALL RESTORE OR REPLACE ANY DAMAGED MONUMENTS RESULTING FROM THEIR OPERATION AND SHALL BEAR ALL COSTS OF SUCH REPLACEMENT, INCLUDING FILING OF A CORNER RECORD.
 - 1.11. THE CONTRACTOR SHALL RECORD THE GPS COORDINATES OF ALL NEW VALVES, BENDS, AND CONNECTIONS TO THE EXISTING SYSTEM. SUBMIT NORTHING AND EASTING COORDINATE INFORMATION TO THE DISTRICT USING THE HORIZONTAL DATUM: US STATE PLANE CCS 1983, CALIFORNIA ZONE 1
 - 1.12. EXISTING SHRUBBERY AND TREES SHALL BE REMOVED OR TRIMMED ONLY AS DIRECTED BY THE ENGINEER AND IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
 - 1.13. CONTRACTOR AGREES TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE JOB SITE DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND THE CONTRACTOR SHALL DEFEND, INDEMNIFY, AND HOLD THE DISTRICT AND THE DISTRICT'S REPRESENTATIVES HARMLESS FROM ANY AND ALL LIABILITY, REAL AND/OR ALLEGED, IN CONJUNCTION WITH THE PERFORMANCE OF THIS PROJECT.
 - 1.14. A SET OF PLANS AND A SET OF SPECIFICATIONS SHALL BE KEPT AT ALL TIMES AT THE JOB SITE ON WHICH ALL CHANGES OR VARIATIONS IN THE WORK, INCLUDING EXISTING UTILITIES, ARE TO BE RECORDED AND/OR CORRECTED DAILY AND SUBMITTED TO THE ENGINEER WHEN THE WORK TO BE DONE IS COMPLETED.
 - 1.15. CONTRACTOR SHALL CONFORM TO EXISTING STREETS, SURROUNDING LANDSCAPES, AND OTHER IMPROVEMENTS WITH A SMOOTH TRANSITION IN PAVING, CURBS, GUTTERS, SIDEWALKS, GRADING, ETC., AND AVOID ANY ABRUPT OR APPARENT CHANGES IN GRADE OR CROSS SLOPES, LOW SPOTS, OR HAZARDOUS CONDITIONS.
 - 1.16. THE DISTRICT RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR TO REPAIR DAMAGE IN CONSTRUCTION ACCESS ROUTES.
 - 1.17. NOTE THAT ALL FITTINGS, BENDS, ELBOWS, ETC. SHOWN ON THESE PLANS ARE PROVIDED AS A GUIDE TO THE CONTRACTOR. CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING ALL FITTINGS REQUIRED TO MAKE CONNECTIONS TO EXISTING SERVICES IN CONFORMANCE WITH THE INTENT SHOWN ON THE PLANS.
 - 1.18. CONSTRUCTION EQUIPMENT SHALL NOT ENTER RIPARIAN AREAS.
 - 1.19. THE CONTRACTOR SHALL TAKE PREVENTATIVE MEASURES TO AVOID ANY SPILLS OR LEAKS ON THE SITE FROM PETROLEUM PRODUCTS. THE CONTRACTOR SHALL PREPARE A SPILL PREVENTION AND RESPONSE PLAN THAT WILL BE APPROVED BY THE ENGINEER. THIS PLAN MUST BE IMPLEMENTED AND ADHERED TO BY THE CONTRACTOR. AT A MINIMUM, THIS PLAN SHALL REQUIRE THAT STAGING, STORAGE AND REFUELING AREAS, AND ANY EQUIPMENT REPAIR OR SIMILAR ACTIVITY TAKING PLACE SHALL OCCUR AT LEAST 100 FEET FROM ANY ACTIVE CHANNEL OR DITCH. REFUELING SHALL ONLY OCCUR IN AREAS APPROVED BY THE ENGINEER.
 - 1.20. ELECTRICAL POWER IS NOT AVAILABLE AT THE SITE AND CONTRACTOR IS RESPONSIBLE FOR PROVIDING ANY NECESSARY POWER.
 - 1.21. CONTRACTOR HAS THE OPTION OF HOT TAPPING INTO THE DISTRICT'S EXISTING WATER LINE TO PROVIDE NECESSARY WATER. HOT TAP SHALL REQUIRE A BACKFLOW PREVENTER ASSEMBLY, AND CONTRACTOR SHALL SUBMIT PROPOSED HOT TAP ASSEMBLY FOR REVIEW AND APPROVAL BY DISTRICT AND ENGINEER PRIOR TO INSTALLATION.
2. REFER TO THE GEOTECHNICAL REPORT:
 - 2.1. FINAL GEOTECHNICAL REPORT, HUMBOLDT BAY MUNICIPAL WATER DISTRICT, WATER TRANSMISSION PIPELINE REPLACEMENT UNDER MAD RIVER, BLUE LAKE AND FIELDBROOK-GLENDALE COMMUNITY SERVICES DISTRICT, HUMBOLDT COUNTY, CALIFORNIA, BY CRAWFORD & ASSOCIATES INC, DECEMBER 14, 2017.
3. CONSTRUCTION
 - 3.1. HOURS OF WORK
 - 3.1.1. DAYTIME WORK HOURS SHALL BE LIMITED TO THE HOURS OF 7:00AM TO 7:00PM, MONDAY THROUGH SATURDAY, EXCEPT AS IDENTIFIED BELOW FOR TUNNELING ACTIVITIES AND CONNECTIONS TO THE EXISTING WATER MAIN. CONSTRUCTION OUTSIDE OF THESE HOURS, ON SUNDAY, OR LEGAL OR COUNTY HOLIDAYS SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
 - 3.1.2. CONTINUOUS PULLBACK MAY BE REQUIRED DURING THE FINAL SEGMENT OF THE HDD PROCESS WHEN THE HDPE PIPELINE IS INSTALLED. DURING THIS PHASE OF THE HDD PROCESS, CONSTRUCTION COULD REQUIRE SOME NIGHTTIME WORK PERIODS FOR INSTALLATION OF THE WATER MAIN. IF REQUIRED, NIGHTTIME WORK PERIODS SHALL BE COORDINATED WITH THE ENGINEER IN ADVANCE, AND APPROVAL SHALL BE GIVEN BY THE ENGINEER PRIOR TO ANY WORK OCCURRING OUTSIDE THE HOURS DESCRIBED ABOVE.
 - 3.1.3. CONTRACTOR SHALL PROVIDE AS MUCH NOTICE AS POSSIBLE, BUT A MINIMUM OF FOURTEEN (14) DAYS' WRITTEN NOTICE PRIOR TO CONNECTING THE NEW PIPELINE TO THE EXISTING PIPELINE. CONTRACTOR SHALL NOT MAKE THESE CONNECTIONS UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE DISTRICT. IT IS ANTICIPATED THAT SOME OF THESE CONNECTIONS MAY NEED TO BE MADE DURING NON-REGULAR WORK HOURS TO MINIMIZE CUSTOMER SERVICE INTERRUPTIONS.
 - 3.2. HOURS FOR EQUIPMENT DELIVERY
 - 3.2.1. EQUIPMENT DELIVERY, SUPPLY DELIVERY, AND SERVICE/FUELING VEHICLES SHALL ONLY ENTER AND EXIT SITE WORK AREAS BY THE APPROVED ACCESS ROADS DURING REGULAR WORKING HOURS AS DESCRIBED ABOVE.
 - 3.3. TRAFFIC CONTROL
 - 3.3.1. THE CONTRACTOR SHALL MAINTAIN ACCESS TO THE ROADWAYS DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN ALL NECESSARY SIGNS, BARRICADES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVEYANCE, AND SAFETY OF THE PUBLIC.
 - 3.3.2. THE CONTRACTOR SHALL OBTAIN AN ENCROACHMENT PERMIT FROM HUMBOLDT COUNTY PRIOR TO BEGINNING THE WORK. AS PART OF THE ENCROACHMENT PERMIT PROCESS, THE CONTRACTOR SHALL PREPARE TRAFFIC CONTROL PLANS FOR REVIEW AND ACCEPTANCE OF PLANNED WORK WITHIN THE PUBLIC RIGHT-OF-WAY. THE DEVELOPMENT AND IMPLEMENTATION OF THE TRAFFIC CONTROL PLANS SHALL INCLUDE, BUT NOT NECESSARILY BE LIMITED TO, TRAFFIC CONTROLS, SIGNS, AND FLAGGERS CONFORMING WITH THE CURRENT CALIFORNIA MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.
 - 3.4. CLEANING, TRASH, DEBRIS, AND STORAGE
 - 3.4.1. THE SITE SHALL BE KEPT FREE OF TRASH AT ALL TIMES. ALL ITEMS USED FOR CONSTRUCTION PURPOSES SHALL BE REMOVED FROM THE SITE AT THE COMPLETION OF CONSTRUCTION.
 - 3.4.2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMMEDIATE OFF-SITE DISPOSAL OF ALL REMOVED OR DEMOLISHED CONSTRUCTION WASTE, INCLUDING BUT NOT LIMITED TO ALL NON-REUSED BITUMINOUS PAVEMENT, CONCRETE, REINFORCEMENT, AND SPOILS AS REQUIRED BY THE ENGINEER AND PER THE SPECIFICATIONS.
 - 3.4.3. STORAGE OF CONSTRUCTION MATERIAL AND EQUIPMENT ON STREETS WILL NOT BE PERMITTED.
 - 3.4.4. A CONTAINED AND COVERED AREA ON-SITE SHALL BE USED FOR STORAGE OF CEMENT BAGS, PAINTS, FLAMMABLES, OILS, FERTILIZERS, PESTICIDES, OR ANY OTHER MATERIALS THAT HAVE POTENTIAL FOR BEING DISCHARGED TO THE MAD RIVER BY WIND OR STORM WATER RUNOFF IN THE EVENT OF A MATERIAL SPILL.
 - 3.4.5. ALL TEMPORARY ON-SITE CONSTRUCTION PILES SHALL BE SECURELY COVERED WITH A TARP OR OTHER DEVICE TO CONTAIN DEBRIS.
 - 3.5. UTILITY LOCATION
 - 3.5.1. LOCATIONS OF ALL EXISTING UTILITIES MAY NOT BE SHOWN OR ARE SHOWN AS APPROXIMATE ONLY. THE CONTRACTOR SHALL POTHOLE TO LOCATE AND USE EXTREME CAUTION WHEN WORKING NEAR THE UTILITIES. THE CONTRACTOR SHALL PROVIDE SUPPORT FOR ALL CROSSING UTILITIES EXPOSED DURING CONSTRUCTION. ANY AND ALL DAMAGE SHALL BE IMMEDIATELY REPAIRED AND/OR RESTORED TO ITS ORIGINAL CONDITION BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
 - 3.5.2. CONTRACTOR TO FIELD LOCATE ALL OVERHEAD UTILITIES PRIOR TO START OF CONSTRUCTION.
 - 3.5.3. CONTRACTOR SHALL POTHOLE AND VERIFY THE EXACT LOCATION, SIZE, TYPE, MATERIAL, AND ELEVATION OF ALL PERTINENT UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. THEIR VERIFICATION SHALL BE COORDINATED BY THE CONTRACTOR WITH THE APPROPRIATE UTILITY ENTITY. THE CONTRACTOR SHALL COOPERATE WITH UTILITY OWNERS TO EXPEDITE THE RELOCATION OR ADJUSTMENT OF THEIR UTILITIES TO MINIMIZE INTERRUPTION OF SERVICE AND DUPLICATION OF WORK. THE CONTRACTOR SHALL EXERCISE CARE WHEN WORKING NEAR EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR ALL DAMAGE, BREAKS, AND/OR LEAKS. IF DAMAGE OCCURS, THE CONTRACTOR SHALL REPAIR UTILITY AT NO ADDITIONAL EXPENSE.
 - 3.5.4. CONTRACTOR SHALL CONFIRM THAT UNDERGROUND SERVICE ALERT (USA) HAS BEEN NOTIFIED AND UTILITIES ARE MARKED OUT IN ACCORDANCE WITH STATE LAW AND THE CONTRACT DOCUMENTS PRIOR TO ANY EXCAVATION.
 - 3.5.5. CONTRACTOR SHALL NOT BEGIN EXCAVATION UNTIL ALL EXISTING UTILITIES HAVE BEEN MARKED IN THE FIELD BY THE UTILITY OWNER RESPONSIBLE FOR THAT PARTICULAR UTILITY. THE CONTRACTOR SHALL NOTIFY EACH UTILITY OWNER AT LEAST 48 HOURS BEFORE STARTING WORK.
 4. HYDROFRACTURE CONTINGENCY PLAN AND PERMITTING
 - 4.1. COMPLIANCE WITH SURFACE SPILL AND HYDROFRACTURE CONTINGENCY PLAN
 - 4.1.1. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OUTLINED IN THE HORIZONTAL DIRECTIONAL DRILLING SURFACE SPILL AND HYDROFRACTURE CONTINGENCY PLAN, HUMBOLDT BAY MUNICIPAL WATER DISTRICT BFG CSD WATER TRANSMISSION PIPELINE REPLACEMENT, MAD RIVER HDD CROSSING, DATED DECEMBER 20, 2017.
 - 4.2. COMPLIANCE WITH CITY, COUNTY, AND STATE PERMITS
 - 4.2.1. CONTRACTOR IS RESPONSIBLE FOR THE ACQUISITION OF AND COMPLIANCE WITH ANY RELEVANT CITY, COUNTY, OR STATE PERMITS NEEDED FOR THE PROPOSED CONSTRUCTION ACTIVITIES INCLUDING, BUT NOT LIMITED TO, TRAFFIC AND ENCROACHMENT PERMITS RELATED TO THE DELIVERY AND HAULING OF CONSTRUCTION EQUIPMENT AND MATERIALS, AND TRAFFIC CONTROL MEASURES (TRAFFIC SAFETY PLAN). THE CONTRACTOR MUST FOLLOW ALL PERTINENT REQUIREMENTS FOR HAULING LARGE VEHICLES OR EQUIPMENT TO THE PROJECT SITE. IF A COUNTY, STATE, OR CITY ROAD IS USED FOR HEAVY EQUIPMENT TRANSPORT OR WIDE LOADS, PERTINENT CLEARANCES MUST BE OBTAINED.
 - 4.2.2. DISTRICT HAS OBTAINED CONFIRMATION FROM THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE, CALIFORNIA STATE WATER QUALITY CONTROL BOARD, AND U.S. ARMY CORPS OF ENGINEERS THAT PERMITS FROM THEIR AGENCIES ARE NOT REQUIRED FOR THIS PROJECT.

DUST AND EXHAUST CONTROL NOTES

- TO ADDRESS THE POTENTIAL FOR DUST AND EXHAUST GENERATION, THE CONTRACTOR IS REQUIRED TO IMPLEMENT THE FOLLOWING DUST AND EXHAUST CONTROL MEASURES TO MINIMIZE THE IMPACTS OF THE WORK. EXHAUST AND DUST LOCATED ALONG WITH ANY REG. EXCLUSION ZONES. CONTRACTOR SHALL MAINTAIN FLAGGING AS NECESSARY AND KEEP ALL EQUIPMENT AND PERSONNEL OUTSIDE EXCLUSION ZONES.
1. ALL EXPOSED SURFACES (E.G., PARKING AREAS, STAGING AREAS, SOIL PILES, GRADED AREAS, AND UNPAVED ACCESS ROADS) SHALL BE WATERED AS NECESSARY DURING DUSTY CONDITIONS.
 2. IF LOOSE MATERIAL BECOMES AIRBORNE DURING TRANSPORTATION, ALL HAUL TRUCKS TRANSPORTING SOIL, SAND, OR OTHER LOOSE MATERIAL OFF-SITE SHALL BE COVERED.
 3. DISTURBED ROADWAYS SHALL BE RE-PAVED AS SOON AS POSSIBLE FOLLOWING WORK IN THE AREA, AS APPROPRIATE.
 4. ALL VISIBLE MUD OR DIRT TRACKED-OUT ONTO ADJACENT PUBLIC ROADS SHALL BE REMOVED USING WET POWER VACUUM STREET SWEEPERS, DAILY OR MORE FREQUENTLY AS NECESSARY. THE USE OF DRY POWER SWEEPING IS PROHIBITED.
 5. CONTRACTOR SHALL CONDUCT ALL EARTH DISTURBING OPERATIONS IN SUCH A MANNER AS TO PRECLUDE WIND BLOWN DIRT AND DUST AND RELATED DAMAGE TO NEIGHBORING PROPERTIES. SUFFICIENT WATERING TO CONTROL DUST IS REQUIRED AT ALL TIMES. CONTRACTOR SHALL ASSUME LIABILITY FOR CLAIMS RELATED TO WIND BLOWN MATERIAL. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER SEDIMENT AND EROSION CONTROL. IF THE DUST CONTROL IS INADEQUATE AS DETERMINED BY THE ENGINEER, THE CONSTRUCTION WORK SHALL BE TERMINATED UNTIL CORRECTIVE MEASURES ARE TAKEN.
 6. IDLING TIMES SHALL BE MINIMIZED BY SHUTTING EQUIPMENT OFF WHEN NOT IN USE.
 7. ALL CONSTRUCTION EQUIPMENT SHALL BE MAINTAINED AND PROPERLY TUNED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

WATER SYSTEM NOTES

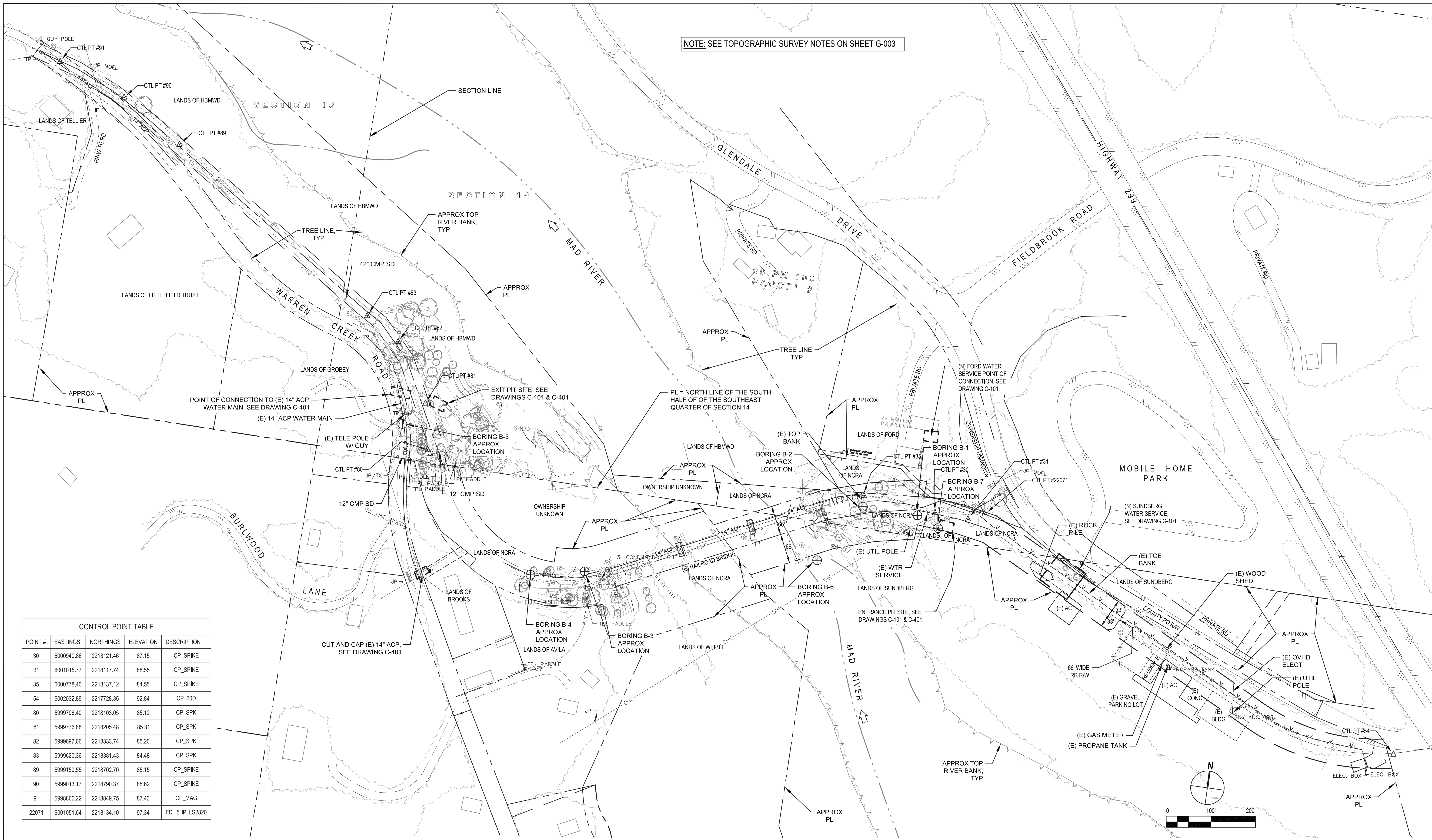
1. ALL MATERIALS TO BE IN CONTACT WITH POTABLE WATER SHALL BE NSF-61 APPROVED.
2. AT WATER LINE CROSSINGS WITH UTILITIES, THE MINIMUM VERTICAL CLEARANCE SHALL BE 12 INCHES.
3. EXCAVATIONS MUST BE KEPT DEWATERED AT ALL TIMES SO AS NOT TO ALLOW CONTAMINATED WATER TO ENTER WATER MAINS.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE LOCATION, DIAMETER, AND TYPE OF EXISTING PIPE SO THAT THE NEW PIPE CAN BE PROPERLY ALIGNED WITH AND FITTED TO THE EXISTING PIPE. THE CONTRACTOR SHALL VERIFY THE TYPE, SIZE AND CONDITION OF EXISTING PIPE PRIOR TO INSTALLING NEW PIPE CONNECTIONS. THE PIPE SHALL BE INSPECTED FOR CORROSION OR OTHER CONDITION THAT WOULD PREVENT AN ADEQUATE CONNECTION
5. DEFLECTION OF PIPE AT JOINTS SHALL COMPLY WITH MANUFACTURER'S SPECIFICATIONS.
6. BENDS MAY NOT BE USED EXCEPT WHEN SHOWN ON THE PLANS OR PERMITTED BY THE ENGINEER.
7. THRUST RESTRAINT SHALL BE PROVIDED AT TEES AND BENDS BY MECHANICAL METHODS UNLESS NOTED OTHERWISE. ON ALL TIE INS AND CONNECTIONS, THERE SHALL BE NO UNRESTRAINED JOINTS WITHIN TEN (10) FEET OF THE CONNECTION OR TIE IN UNLESS NOTED OTHERWISE.
8. ALL BOLTED FITTINGS AND VALVES WHICH ARE BURIED SHALL BE WRAPPED WITH A MINIMUM 16 MILS POLYETHYLENE.
9. ALL FITTINGS, VALVES, AND MATERIALS TO ACCOMPLISH TIE INS SHALL BE ON THE JOB SITE AND CHECKED FOR PROPER FIT PRIOR TO ANY SHUTDOWN OF EXISTING WATER MAINS. ALL TIE INS SHALL BE MECHANICALLY RESTRAINED.
10. NOTE THAT ALL FITTINGS, BENDS, ELBOWS, ETC. SHOWN ON THESE PLANS ARE PROVIDED AS A GUIDE TO THE CONTRACTOR. CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING ALL FITTINGS REQUIRED TO MAKE CONNECTIONS TO EXISTING SERVICES IN CONFORMANCE WITH THE INTENT SHOWN ON THE PLANS.
11. TIE-INS TO EXISTING MAINS SHALL BE MADE AFTER CHLORINATION, BACTERIAL, AND PRESSURE TESTS ARE COMPLETED AND APPROVED BY ENGINEER. TIE-INS AND SYSTEM INTERRUPTIONS SHALL BE COORDINATED WITH THE DISTRICT AND CUSTOMERS, AND A MINIMUM OF 14 CALENDAR DAYS NOTICE SHALL BE PROVIDED BY THE CONTRACTOR TO THE ENGINEER PRIOR TO ANY INTERRUPTION IN SERVICE. EXCAVATIONS BY THE CONTRACTOR FOR TIE INS MUST BE APPROVED THE DAY BEFORE WORK IS TO COMMENCE AT EACH TIE IN.
12. EXISTING PIPE SHALL NOT BE CUT AND ABANDONED UNTIL THE NEW PIPE IS INSTALLED, TESTED, AND APPROVED BY THE ENGINEER.
13. MISALIGNMENT SHALL BE CORRECTED BY THE REALIGNMENT OF THE NEW PIPE TO BE CONNECTED. CONTRACTOR SHALL PROVIDE ALL FITTINGS AND PIPE MATERIALS NEEDED TO CONNECT THE NEW PIPE TO THE EXISTING PIPE.
14. IF THE TOTAL DEFLECTION OF ALL JOINTS IN THE TIE IN AREA IS 11.25 DEGREES OR GREATER, ADEQUATE RESTRAINT MUST BE PROVIDED.
15. PIPES TO BE DEMOLISHED SHALL BE REMOVED EITHER BY SAW CUTTING, REMOVING A COMPLETE PIPE SECTION TO AN EXISTING JOINT, OR OTHER ADEQUATE MEANS WHICH RESULTS IN A CLEAN JOINT FOR CAPPING AND CONNECTING TO A NEW PIPE.
16. WATER FROM TESTING WATERLINES IS TO BE FLUSHED FROM THE PIPE, DECHLORINATED, AND DISPOSED OF PER THE SPECIFICATIONS. FLUSHING SHALL NOT BEGIN UNTIL AN APPROVED DECHLORINATION AND DISPOSAL MECHANISM IS IN PLACE AND FUNCTIONING.
17. THE CONTRACTOR SHALL NOT OPERATE EXISTING VALVES. ALL REQUIRED OPERATION OF EXISTING VALVES SHALL BE COORDINATED WITH OWNER IN ADVANCE, AND OWNER'S PERSONNEL WILL OPEN AND CLOSE VALVES AS REQUIRED.

TOPOGRAPHIC SURVEY NOTES

- A) THE PURPOSE OF THIS SURVEY DATA PRESENTED HEREIN IS TO SUPPLEMENT A PRIOR SURVEY PERFORMED IN 2014 BY POINTS WEST SURVEYING FOR THE HUMBOLDT BAY MUNICIPAL WATER DISTRICT (HBMWD) PROJECT TO REPLACE THE WATER LINE THAT NOW EXISTS ON THE AMRR RAILROAD BRIDGE. THIS ADDITIONAL WORK IS A TOPOGRAPHIC SURVEY (ONLY); ADJACENT PROPERTY LINES ARE APPROXIMATE ONLY BASED ON ASSESSOR PARCEL MAPS. SURVEY WAS PERFORMED IN MAY AND JUNE 2017, AND SUPPLEMENTED FURTHER BY ADDITIONAL TOPOGRAPHIC SURVEY WORK IN DECEMBER 2017 AND JANUARY 2018.
- B) SURVEY UPDATE INCLUDES AREA ON WESTERLY SIDE OF RIVER ON HBMWD PROPERTY IDENTIFIED AS AREA FOR RECEIVING PIT OF HORIZONTAL DIRECTIONAL DRILL (HDD), A STRIP OF LAND 100 FEET LONG ON THE OLD RAILROAD BED PROPOSED FOR ACCESS, A STRIP 10-15' WIDE ALONG THE PROPOSED PIPE ALIGNMENT, AND OTHER AREAS. TREES 12 INCH AND BIGGER WERE LOCATED EXCEPT ON THE STRIP CROSSING RIVER BED. ON THE EAST SIDE OF THE RIVER THE TOPOGRAPHY WAS UPDATED TO REFLECT THE GROUND AS FILLED NEAR THE BEGINNING OF THE PROPOSED BORE AND A STRIP OF LAND ON THE SUNDBERG PARCEL BEING CONSIDERED AS A 'LAYDOWN' AREA. NO UNDERGROUND UTILITIES WERE LOCATED IN 'LAYDOWN' AREA. IN DECEMBER 2017 AND JANUARY 2018, ADDITIONAL AREAS ON BOTH SIDES OF RIVER WERE SURVEYED. THE AREA ADJACENT TO LANDS OF FORD INCLUDES AN AREA FOR WHICH NO UNDERGROUND UTILITY MAPPING WAS AVAILABLE. CURRENT OWNER (RELATED TO ORIGINAL UTILITY INSTALLER, NOW DECEASED) HAS NO KNOWLEDGE OF LOCATION OF EXISTING UNDERGROUND UTILITIES. ORIGINAL TOPOGRAPHIC SURVEY DATA FROM 2014 WAS NOT VERIFIED/MODIFIED EXCEPT AS NOTED ABOVE.
- C) THE FOLLOWING SURVEY NOTES 1 THROUGH 4 ARE TAKEN FROM 2014 SURVEY; SURVEY CONTROL FOR THIS WORK IS BASED ON ORIGINAL WORK- SEE NOTE 2 BELOW.
 1. THE PURPOSE OF THIS SURVEY IS TO SHOW EXISTING TOPOGRAPHY, PROPERTY LINES AND/OR EASEMENTS IN THE VICINITY OF THE HUMBOLDT BAY MUNICIPAL WATER DISTRICT (HBMWD) WATER LINE WHICH CROSSES THE MAD RIVER OVER AN EXISTING AMRR RAILROAD BRIDGE IN GLENDALE, CALIFORNIA. SURVEY WAS PERFORMED BETWEEN MAY AND AUGUST 2014. UNDERGROUND UTILITIES SHOWN HEREON ARE BASED ON TIES MADE IN THE FIELD TO VISIBLE UTILITY STRUCTURES AND PLANS PROVIDED BY PG&E AND HBMWD. AN UNDERGROUND CROSSING OF A SUDENLINK CABLE LINE ALONG BRIDGE WAS LOCATED- IT RUNS UNDERGROUND ON WEST SIDE FROM A POLE DROP, THEN ON A CONDUIT ACROSS BRIDGE WHERE IT THEN GOES OVERHEAD ON EAST SIDE. HBMWD CONNECTIONS TO LANDS OF SUNDBERG WERE LOCATED AS WELL AS WATER METERS ON EAST SIDE OF BRIDGE- NO PLANS SHOWING SIZE OR ROUTING WERE AVAILABLE ON THOSE CONNECTIONS. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED, OR THAT THEY ARE IN THE EXACT LOCATION SHOWN. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
 2. COORDINATES FOR THIS SURVEY ARE CALIFORNIA COORDINATE SYSTEM OF 1983 (CCS83) BASED ON A GPS SURVEY. THE MAPPING ANGLE IS 1 DEGREE 19 MINUTES 43 SECONDS- ROTATE BEARINGS COUNTERCLOCKWISE BY THIS ANGLE TO OBTAIN 'TRUE' OR GEODETIC BEARINGS. GRID DISTANCES SHOWN SHOULD BE DIVIDED BY THE COMBINED SCALE FACTOR OF 0.99989575 TO OBTAIN GROUND DISTANCES. BOTH MAPPING ANGLE AND COMBINED SCALE FACTOR ARE TAKEN AT CONTROL POINT NUMBER 1. HORIZONTAL CONTROL IS BASED ON NGS PID 'AC9254', AN NGS HPGN NETWORK POINT IN ARCATATA (2010.0 EPOCH). VERTICAL CONTROL IS BASED ON NGS PID 'LV0608', NAVD 88 DATUM.
 3. ORTHOPHOTO IS FROM NATION AGRICULTURAL IMAGERY PROGRAM (NAIP), DATED 2016, AND IS INTENDED FOR GENERAL ORIENTATION PURPOSES ONLY AND MAY NOT REFLECT CURRENT SITE CONDITIONS INCLUDING LOCATION OF RIVER, GRAVEL, ETC.
 4. ONLY TREES 12 INCH AND LARGER WERE LOCATED DURING THE COURSE OF THIS SURVEY. NUMEROUS OTHER TREES EXIST AND ARE NOT SHOWN.

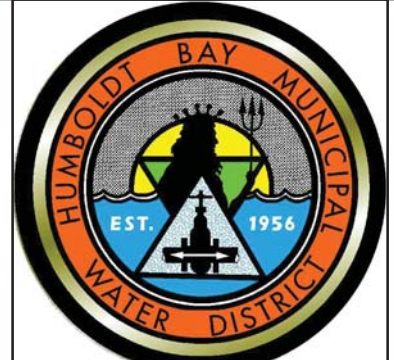
							Bar is one inch on original size sheet 						Drawn S. DAVIS Designer N. STEVENS		Client HUMBOLDT BAY MUNICIPAL WATER DISTRICT Project MAD RIVER PIPELINE CROSSING	
											Drafting Check P. KASPARI Design Check P. KASPARI		Title GENERAL NOTES			
											Project Manager P. KASPARI Date 1/12/2018		Project No. 8411162			
											This document shall not be used for construction unless signed and sealed for construction.		Original Size ANSI D Sheet No. G-003			
											Scale AS NOTED		Sheet 3 of 11			

NOTE: SEE TOPOGRAPHIC SURVEY NOTES ON SHEET G-003



CONTROL POINT TABLE				
POINT #	EASTINGS	NORTHINGS	ELEVATION	DESCRIPTION
30	6000940.86	2218121.46	87.15	CP_SPIKE
31	6001015.77	2218117.74	88.55	CP_SPIKE
35	6000778.40	2218137.12	84.55	CP_SPIKE
54	6002032.89	2217728.35	92.84	CP_60D
80	5999796.40	2218103.05	85.12	CP_SPK
81	5999776.88	2218205.48	85.31	CP_SPK
82	5999697.06	2218333.74	85.20	CP_SPK
83	5999620.36	2218381.43	84.48	CP_SPK
89	5999150.55	2218702.70	85.15	CP_SPIKE
90	5999013.17	2218790.37	85.62	CP_SPIKE
91	5998860.22	2218849.75	87.43	CP_MAG
22071	6001051.64	2218134.10	97.34	FD_5"IP_LS2820

A	ISSUE FOR BID	NS	PK	2/9/18
No.	Issue	Drawn	Approved	Date



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Project Manager	P. KASPARI	Date	1/12/2018
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Client	HUMBOLDT BAY MUNICIPAL WATER DISTRICT		
Project	MAD RIVER PIPELINE CROSSING		
Title	EXISTING CONDITIONS & SURVEY CONTROL		
Project No.	8411162		
Original Size	ANSI D		
Sheet No.	G-004		
Sheet	4 of 11		

UNIFIED SOIL CLASSIFICATION (ASTM D 2487-06)			
MATERIAL TYPES	CRITERIA FOR ASSIGNING SOIL GROUP NAMES	GRAPHIC SYMBOL	SOIL GROUP NAMES
GRAVELS	Clean Gravels Cu ≥ 4 AND 1 ≤ Cc ≤ 3		GW WELL-GRADED GRAVEL
	Gravels with fines Cu < 4 AND/OR 1 > Cc > 3		GP POORLY-GRADED GRAVEL
SANDS	Clean Sands Cu ≥ 6 AND 1 ≤ Cc ≤ 3		SW WELL-GRADED SAND
	Sands with fines Cu < 6 AND/OR 1 > Cc > 3		SP POORLY-GRADED SAND
SILTS AND CLAYS	Inorganic PI AND PLOTS ON OR ABOVE "A" LINE		ML SILTY SAND
	Organic PI PLOTS ON OR ABOVE "A" LINE		OL ORGANIC CLAY OR SILT
SILTS AND CLAYS	Inorganic PI PLOTS BELOW "A" LINE		CL LEAN CLAY
	Organic LL (oven dried) < 0.75 LL (not dried)		CH FAT CLAY
HIGHLY ORGANIC SOILS	Primarily organic matter, dark color, organic odor		MH ELASTIC SILT
			OH ORGANIC CLAY OR SILT

NOTE: $C_u = D_{60}/D_{10}$
 $C_c = (D_{30})^2 / D_{10} \times D_{60}$

GRAVELS
>50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE

SANDS
>50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE

SILTS AND CLAYS
LIQUID LIMIT < 50

LIQUID LIMIT > 50

PLASTICITY CHART

GROUND WATER LEVELS
Water level at time of drilling

BORING LOG / TEST PIT LEGEND AND SOIL DESCRIPTIONS

LEGEND OF ROCK MATERIALS

- IGNEOUS ROCK
- SEDIMENTARY ROCK
- METAMORPHIC ROCK

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

DESCRIPTION	BODY OF ROCK	FRACTURE SURFACES	GENERAL CHARACTERISTICS
FRESH	NO DISCOLORATION, NOT OXIDIZED	NO DISCOLORATION OR OXIDATION	HAMMER RINGS WHEN CRYSTALLINE ROCKS ARE STRUCK.
SLIGHTLY WEATHERED	DISCOLORATION OR OXIDATION IS LIMITED TO SURFACE OR, OR SHORT DISTANCE FROM FRACTURES; SOME FELDSPAR CRYSTALS ARE DULL.	MINOR TO COMPLETE DISCOLORATION OR OXIDATION OF MOST SURFACES.	HAMMER RINGS WHEN CRYSTALLINE ROCKS ARE STRUCK. BODY OF ROCK NOT WEAKENED.
MODERATELY WEATHERED	DISCOLORATION OR OXIDATION EXTENDS FROM FRACTURES USUALLY THROUGHOUT; Fe-Mg MINERALS ARE "MOTTLED"; FELDSPAR CRYSTALS ARE "CLOUDY."	ALL FRACTURE SURFACES ARE DISCOLORED OR OXIDIZED.	HAMMER DOES NOT RING WHEN ROCK IS STRUCK. BODY OF ROCK IS SLIGHTLY WEAKENED.
INTENSELY WEATHERED	DISCOLORATION OR OXIDATION THROUGHOUT; ALL FELDSPARS AND Fe-Mg MINERALS ARE ALTERED TO CLAY TO SOME EXTENT, OR CHEMICAL ALTERATION PRODUCES IN-SITU DISAGGREGATION, SEE GRAIN BOUNDARY CONDITIONS.	ALL FRACTURE SURFACES ARE DISCOLORED OR OXIDIZED, SURFACES FRAGILE.	DULL SOUND WHEN STRUCK WITH HAMMER, USUALLY CAN BE BROKEN WITH MODERATE TO HEAVY MANUAL PRESSURE. OR BY LIGHT HAMMER BLOW WITHOUT REFERENCE TO PLANES OF WEAKNESS SUCH AS JOINTS OR LAYERS, FRACTURES, OR VEINLETS. ROCK IS SIGNIFICANTLY WEAKENED.
DECOMPOSED	DISCOLORED OR OXIDIZED THROUGHOUT, BUT RESISTANT MINERALS SUCH AS QUARTZ MAY BE UNALTERED; ALL FELDSPAR AND Fe-Mg MINERALS ARE COMPLETELY ALTERED TO CLAY.	CAN BE GRANULATED BY HAND. RESISTANT MINERALS SUCH AS QUARTZ MAY BE PRESENT AS "STRINGERS" OR "DIKES."	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

CALTRANS SOIL & ROCK LOGGING MANUAL (2010)			
DESCRIPTION	THICKNESS / SPACING	DESCRIPTION	CRITERIA
MASSIVE	GREATER THAN 10"	EXTREMELY HARD	CANNOT BE SCRATCHED WITH A POCKETKNIFE OR SHARP PICK. CAN ONLY BE CHIPPED WITH REPEATED HEAVY HAMMER BLOWS
VERY THICKLY BEDDED	3" - 10"	VERY HARD	CANNOT BE SCRATCHED WITH A POCKETKNIFE OR SHARP PICK. BREAKS WITH REPEATED HEAVY HAMMER BLOWS.
THICKLY BEDDED	1" - 3"	HARD	CAN BE SCRATCHED WITH A POCKETKNIFE OR SHARP PICK WITH DIFFICULTY (HEAVY PRESSURE). BREAKS WITH MODERATE HAMMER BLOWS.
MODERATELY BEDDED	4" - 1"	MODERATELY HARD	CAN BE SCRATCHED WITH POCKETKNIFE OR SHARP PICK WITH LIGHT OR MODERATE PRESSURE. BREAKS WITH HEAVY HAMMER BLOWS.
THINLY BEDDED	1" - 4"	MODERATELY SOFT	CAN BE GROOVED 1/8" INCH DEEP WITH A POCKETKNIFE OR SHARP PICK WITH MODERATE OR HEAVY MANUAL PRESSURE.
VERY THINLY BEDDED	1/2" - 1"	SOFT	CAN BE GROOVED OR GOUGED EASILY BY A POCKETKNIFE OR SHARP PICK WITH LIGHT PRESSURE.
LAMINATED	LESS THAN 1/2"	VERY SOFT	CAN BE READILY INDENTED, GROOVED OR GOUGED WITH FINGERNAIL, OR CARVED WITH A POCKETKNIFE. BREAKS WITH LIGHT MANUAL PRESSURE.

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LOG OF BORING B1			
ELEVATION (ft)	DEPTH (ft)	FIELD	LABORATORY
84	1	Lean Clay (CL) 7.5YR 4/4 (brown), dry, medium stiff, trace fine gravel, trace woody organics.	
82	2	CLAYEY SAND WITH GRAVEL (SC) 7.5YR 4/4 (brown), dry, stiff, 20-30% fine to medium rounded to subrounded gravel, 30-40% fine to coarse sand (low to medium), occasional coarse gravel to cobble, gravels are basalt, quartzite, quartz, chlorite, feldspars.	19 28 9.1 131.1
80	3	Lean Clay (CL) 10YR 4/2 (dark grayish brown), dry to moist, stiff, trace coarse sand, fine gravel.	
78	4	CLAYEY SAND WITH GRAVEL (SC) 10YR 4/2 (dark grayish brown) with 10YR 2/1 (black) siltstone (thin) in some residual fractures, stiff, shows structure of source rock.	16 33
76	5	Lean Clay (CL) 10YR 4/2 (dark grayish brown), dry to moist, stiff, trace coarse sand, fine gravel.	
74	6	METAMORPHIC ROCK, Meta-Argillite, 10YR 3/1 (very dark gray), dry to moist, moderately to slightly weathered, moderately soft to moderately hard.	
72	7	METAMORPHIC ROCK, Meta-Argillite, Moderately soft.	
70	8	METAMORPHIC ROCK, Meta-Argillite, Hard to moderately hard, fresh rock.	
68	9	Bottom of borehole at 17.5 ft bgs	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LOG OF BORING B2			
ELEVATION (ft)	DEPTH (ft)	FIELD	LABORATORY
84	1	Lean Clay (CL) 7.5YR 4/4 (brown), dry, moderately stiff, trace gravel, trace woody organics.	
82	2	SANDY lean CLAY (CL) 7.5YR 4/4 (brown), dry, stiff, minor orange yellow staining, 30% fine to medium subrounded gravel, 10% fine to coarse sand.	19 32 101.4
80	3	GRAVELLY lean CLAY WITH SAND (CL) 7.5YR 4/4 (brown), dry, stiff, up to 40% fine to coarse rounded to subrounded gravel, 20% fine to coarse sand, majority of gravel is quartzite.	
78	4	SANDY lean CLAY (CL) 7.5YR 4/4 (brown), dry, stiff, minor orange yellow staining, 30% fine to medium subrounded gravel, 10% fine to coarse sand.	
76	5	Lean Clay (CL) 10YR 3/2 (very dark grayish brown), dry, stiff, 10-20% fine to medium gravel, 10% fine sand.	
74	6	Lean Clay (CL) 10YR 4/2 (dark grayish brown) with 2 YR 3/3 (dark reddish brown) staining, 10YR 5/1 (gray) with some 2 YR 3/3 (dark reddish brown) and minor decomposed to 2.5 YR 5/8 (light silver brown), moderately to slightly weathered, moderately soft to soft.	24 41 8.7 131.1 22
72	7	METAMORPHIC ROCK, Meta-Argillite, some 2.5 YR 3/3 (dark reddish brown) staining, 10YR 5/1 (gray) with some 2 YR 3/3 (dark reddish brown) and minor decomposed to 2.5 YR 5/8 (light silver brown), moderately to slightly weathered, moderately soft to soft.	
70	8	METAMORPHIC ROCK, Meta-Argillite, 10YR 5/1 (gray), fresh, moderately hard to hard.	
68	9	Bottom of borehole at 24.9 ft bgs	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LOG OF BORING B3			
ELEVATION (ft)	DEPTH (ft)	FIELD	LABORATORY
84	1	Lean Clay (CL) 5YR 4/4 (reddish brown), dry, moderately stiff, 10% sand.	
82	2	SANDY lean CLAY (CL) 10YR 4/5 (dark yellowish brown), dry, stiff, trace to 5% fine subrounded gravel, 30% fine sand, minor woody organics.	
80	3	Lean Clay (CL) 10YR 4/6 (dark yellowish brown), dry, stiff, 10% fine sand, some 2-5mm dark brown to black bands.	
78	4	GRAVELLY lean CLAY WITH SAND (CL) 10YR 4/3 (brown), dry to moist, very stiff, 10-20% fine to medium angular gravel (residual rock), 10YR 5/2 (grayish brown), dense.	21 47
76	5	Lean Clay (CL) 10YR 4/6 (dark yellowish brown), dry, stiff, 10% fine sand, some 2-5mm dark brown to black bands.	
74	6	METAMORPHIC ROCK, Meta-Argillite, 7.5YR 4/3 (brown) with 7.5 YR 2.5/2 (very dark brown) staining in fractures, moderately weathered, moderately hard.	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LOG OF BORING B4			
ELEVATION (ft)	DEPTH (ft)	FIELD	LABORATORY
84	1	GRAVELLY lean CLAY (CL) 5YR 4/4 (reddish brown), dry, moderately stiff, 25% fine to medium gravel, 10% sand.	
82	2	Lean Clay (CL) 5YR 4/4 (reddish brown), dry, stiff, trace sand.	
80	3	CLAYEY SAND WITH GRAVEL (SC) Mottled color (brown, reddish brown, dark brown, grayish brown), dry, very stiff, dense.	24 29 10.6 122.8
78	4	CLAYEY SAND WITH GRAVEL (SC) 10YR 4/6 (dark yellowish brown), dry, stiff, black staining on related fracture faces, retained structure from source rock.	
76	5	Lean Clay (CL) WITH SAND (CL) 10YR 4/1 (dark gray), dry to moist, stiff.	
74	6	Lean Clay (CL) WITH SAND (CL) 10YR 3/4 (dark yellowish brown), dry to moist, stiff, dense, rock structure retained.	
72	7	METAMORPHIC ROCK, Meta-Argillite, 10YR 4/1 (dark gray), becomes harder with depth, starts at moderately hard and slightly weathered, rock is fresh and hard at 15.5 feet.	
70	8	METAMORPHIC ROCK, Meta-Argillite, 10YR 4/1 (dark gray), becomes harder with depth, starts at moderately hard and slightly weathered, rock is fresh and hard at 15.5 feet.	
68	9	Bottom of borehole at 15.5 ft bgs	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LOG OF BORING B5			
ELEVATION (ft)	DEPTH (ft)	FIELD	LABORATORY
84	1	SILTY SAND WITH GRAVEL (SM), fill base most, light brown, approximately 40% low plasticity fines, 30% rounded to subrounded sand, 30% fine to medium gravel.	
82	2	SANDY lean CLAY (CL) stiff, light orange brown, moist, 60% medium plasticity fines with slow clayey and low to medium toughness, 30% poorly graded sand, 10% subrounded fine gravel.	
80	3	GRAVELLY lean CLAY (CL) stiff, moist, 70% medium plasticity fines, 10% sand, 20% fine gravel with occasional medium to coarse gravel.	
78	4	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
76	5	METAMORPHIC ROCK, Meta-argillite, weathering red, light yellowish brown, intensely weathered, soft to moderately soft, increasing hardness with depth.	
74	6	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
72	7	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
70	8	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
68	9	Bottom of borehole at 15.5 ft bgs	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LOG OF BORING B6			
ELEVATION (ft)	DEPTH (ft)	FIELD	LABORATORY
84	1	Lean Clay (CL) 5YR 4/4 (reddish brown), dry, moderately stiff, 10% sand.	
82	2	SANDY lean CLAY (CL) stiff, light orange brown, moist, 60% medium plasticity fines with slow clayey and low to medium toughness, 30% poorly graded sand, 10% subrounded fine gravel.	
80	3	GRAVELLY lean CLAY (CL) stiff, moist, 70% medium plasticity fines, 10% sand, 20% fine gravel with occasional medium to coarse gravel.	
78	4	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
76	5	METAMORPHIC ROCK, Meta-argillite, weathering red, light yellowish brown, intensely weathered, soft to moderately soft, increasing hardness with depth.	
74	6	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
72	7	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
70	8	Lean Clay (CL) (in-situ residual soil) stop bedrock.	
68	9	Bottom of borehole at 15.5 ft bgs	

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

No.	Issue	Drawn	Approved	Date
A	ISSUE FOR BID	NS	PK	2/9/18

LEGEND OF ROCK MATERIALS

PERCENT CORE RECOVERY (REC) & ROCK QUALITY DESIGNATION (RQD)

WEATHERING DESCRIPTORS FOR INTACT ROCK

LEGEND OF ROCK MATERIALS

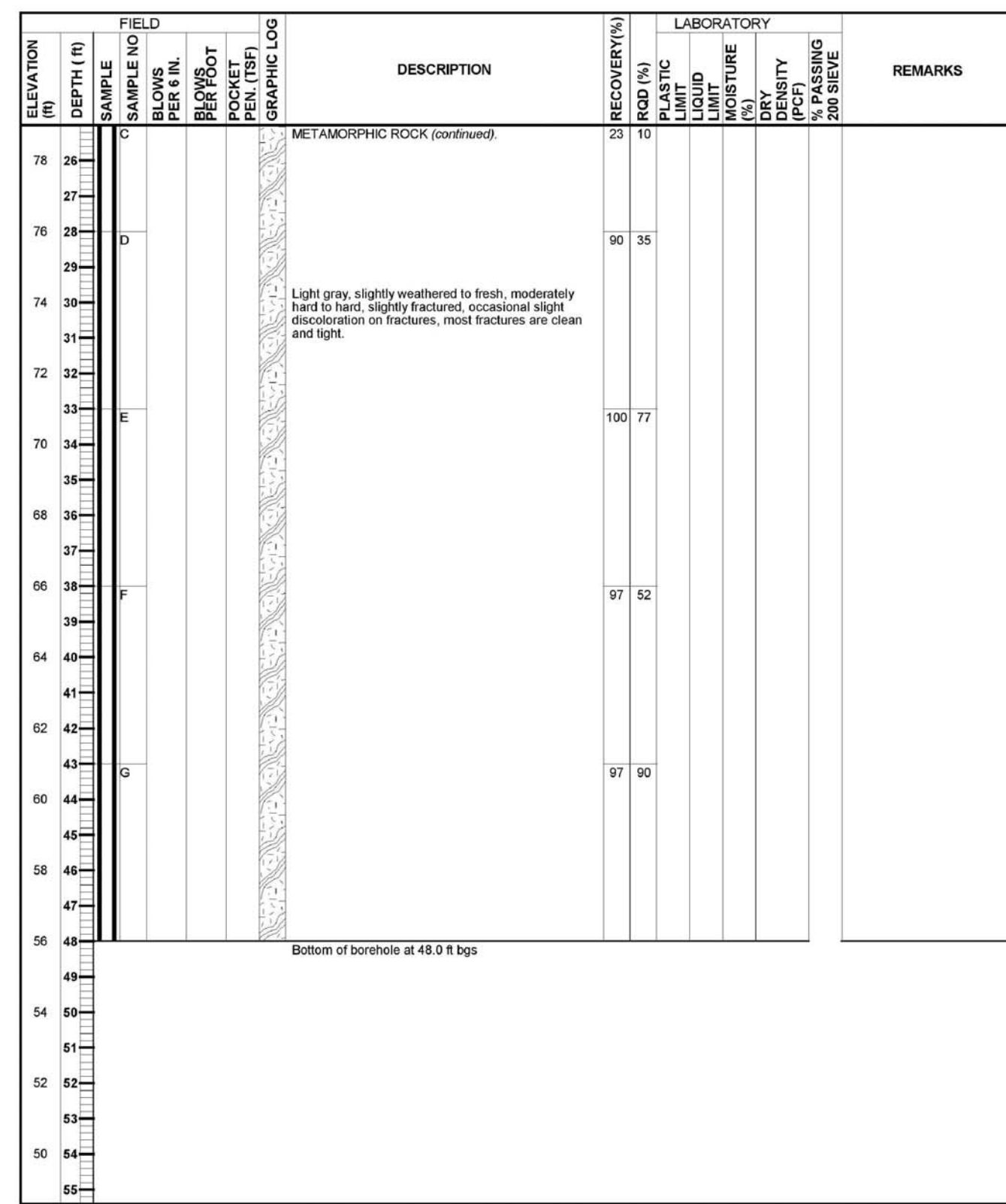
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WEATHERING DESCRIPTORS FOR INTACT ROCK

LEGEND OF ROCK MATERIALS

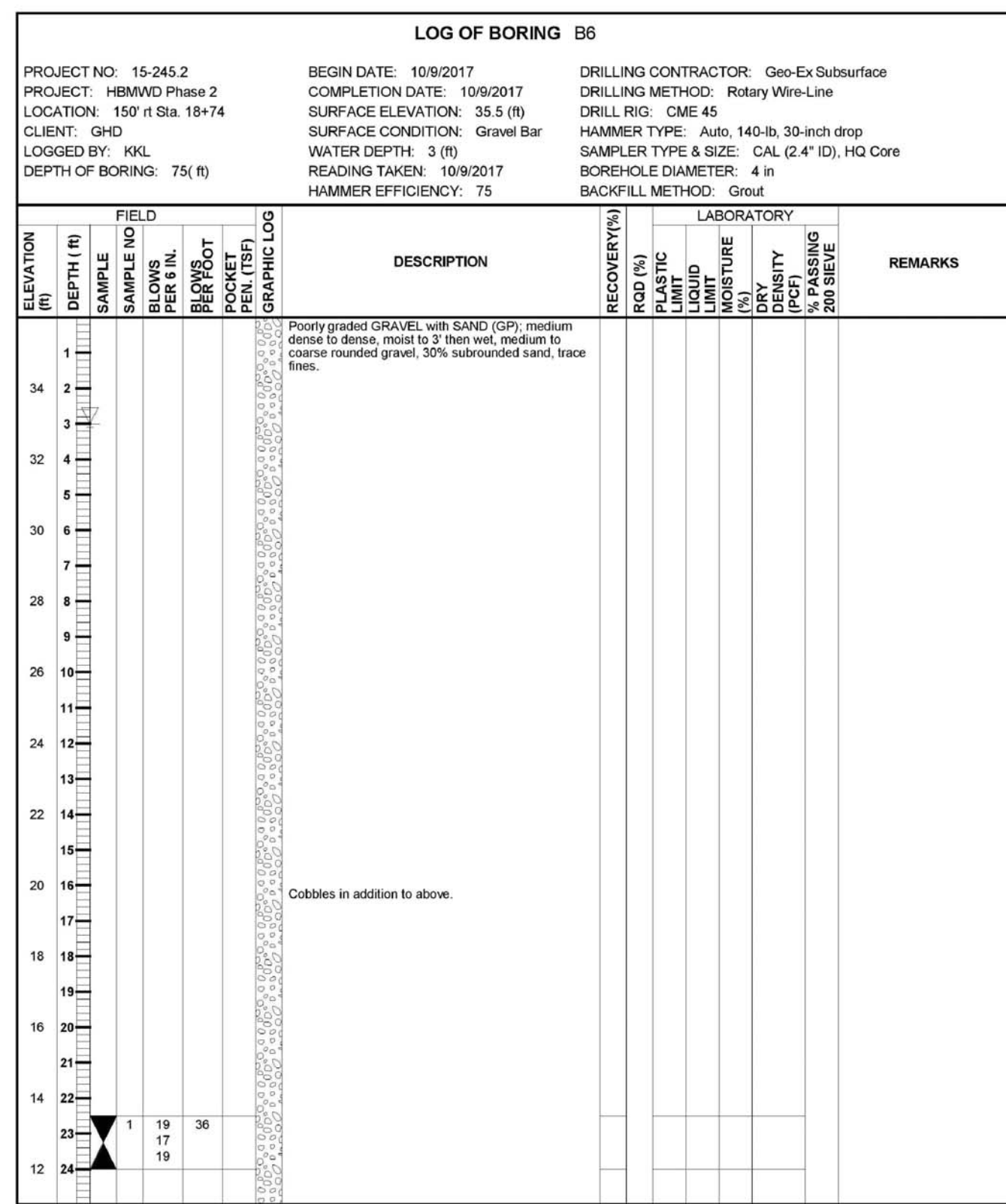
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WEATHERING DESCRIPTORS FOR INTACT ROCK



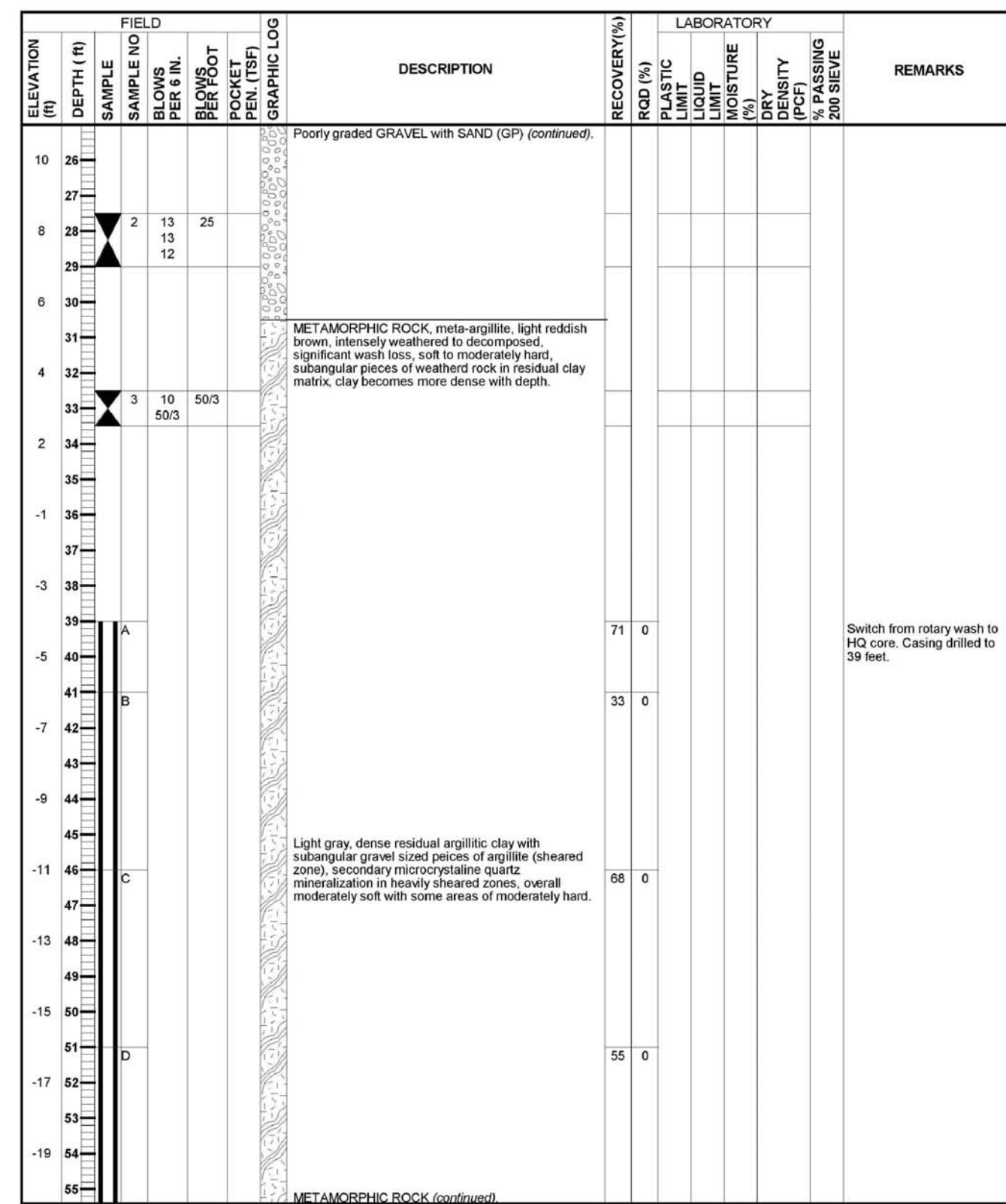
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PROJECT NUMBER: 15-245.2
PROJECT: HBMWD Phase 2
BORING: B6
ENTRY BY: NBM
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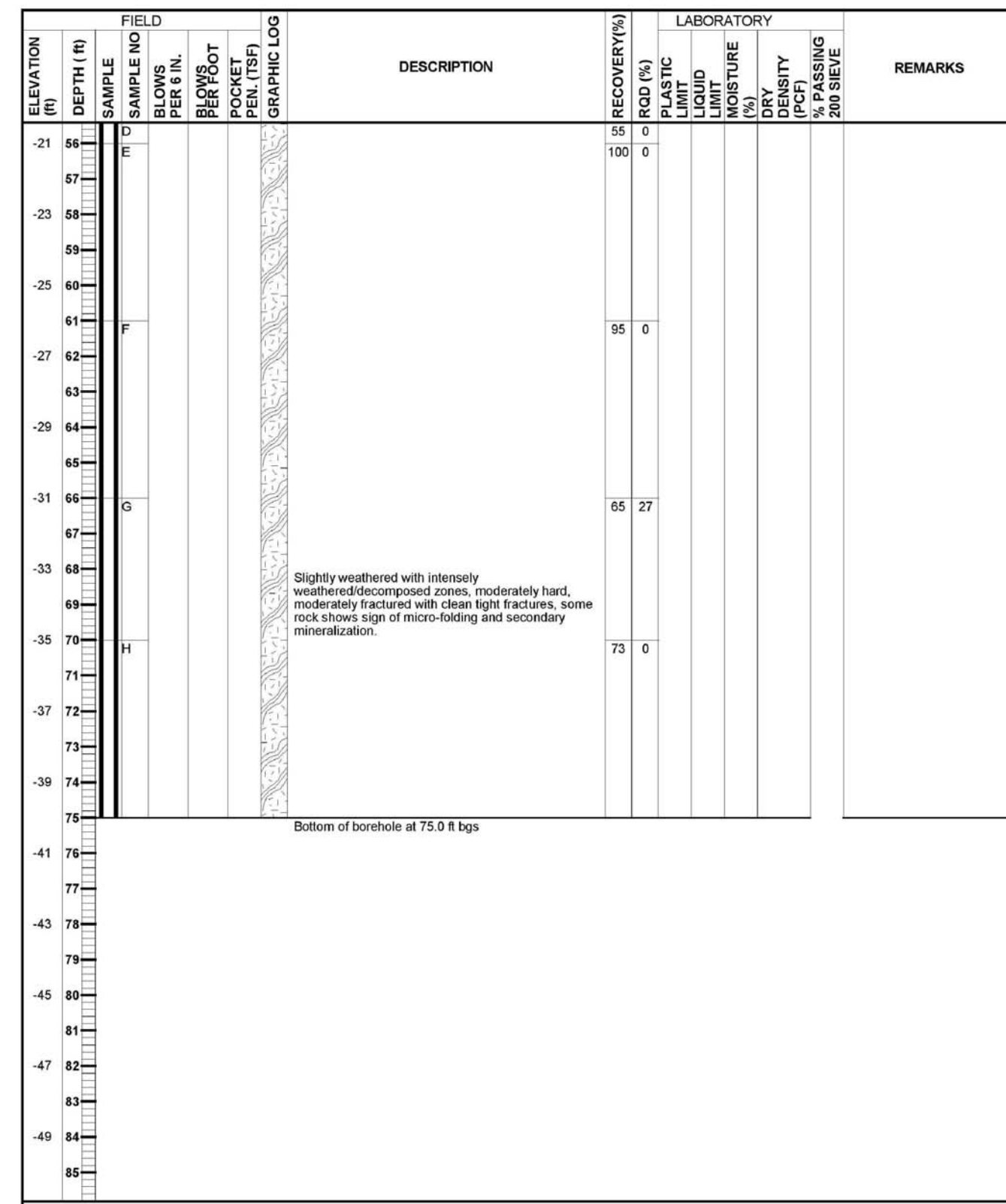
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PROJECT NUMBER: 15-245.2
PROJECT: HBMWD Phase 2
BORING: B6
ENTRY BY: NBM
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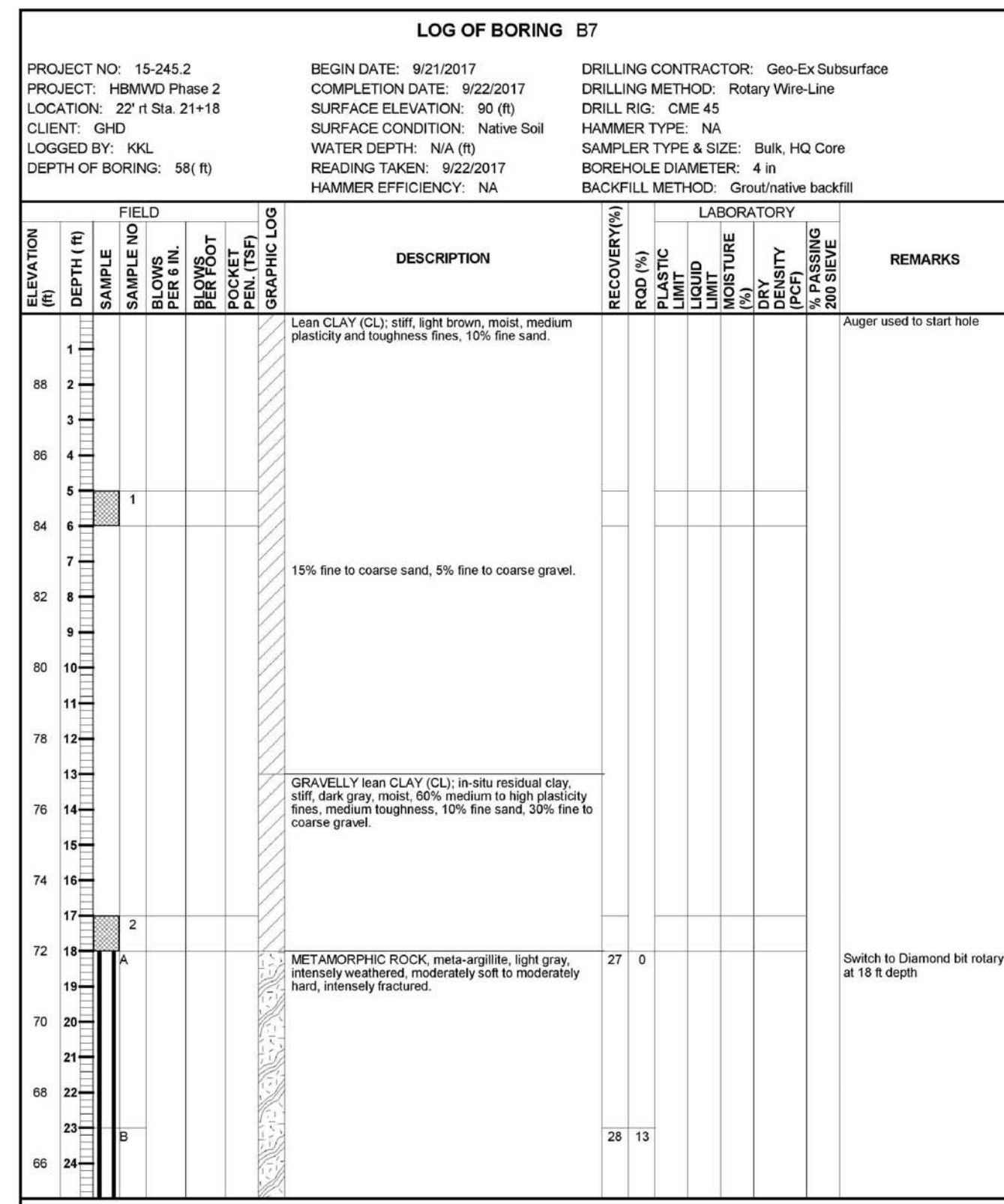
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PROJECT NUMBER: 15-245.2
PROJECT: HBMWD Phase 2
BORING: B6
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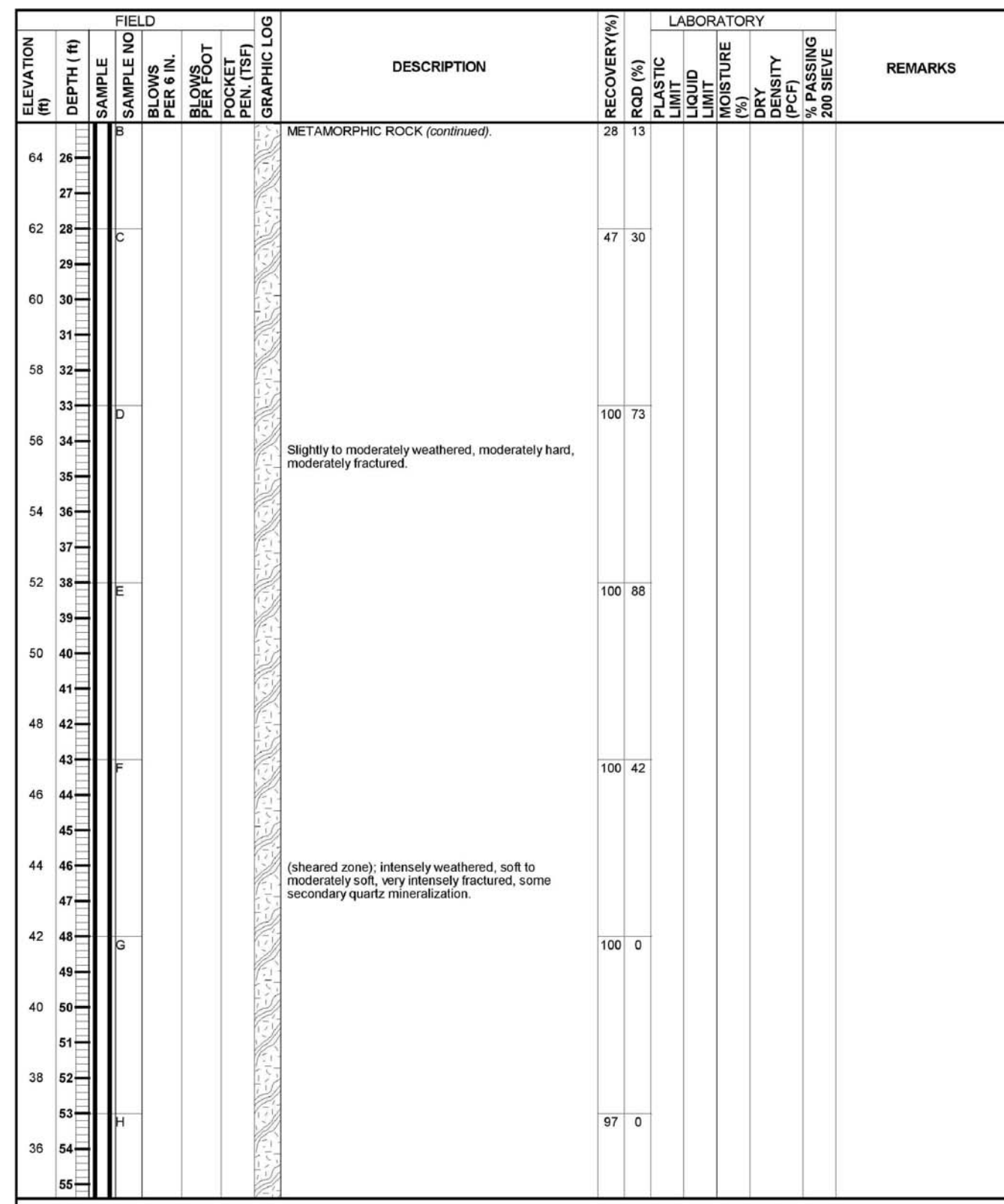
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PROJECT: HBMWD Phase 2
BORING: B6
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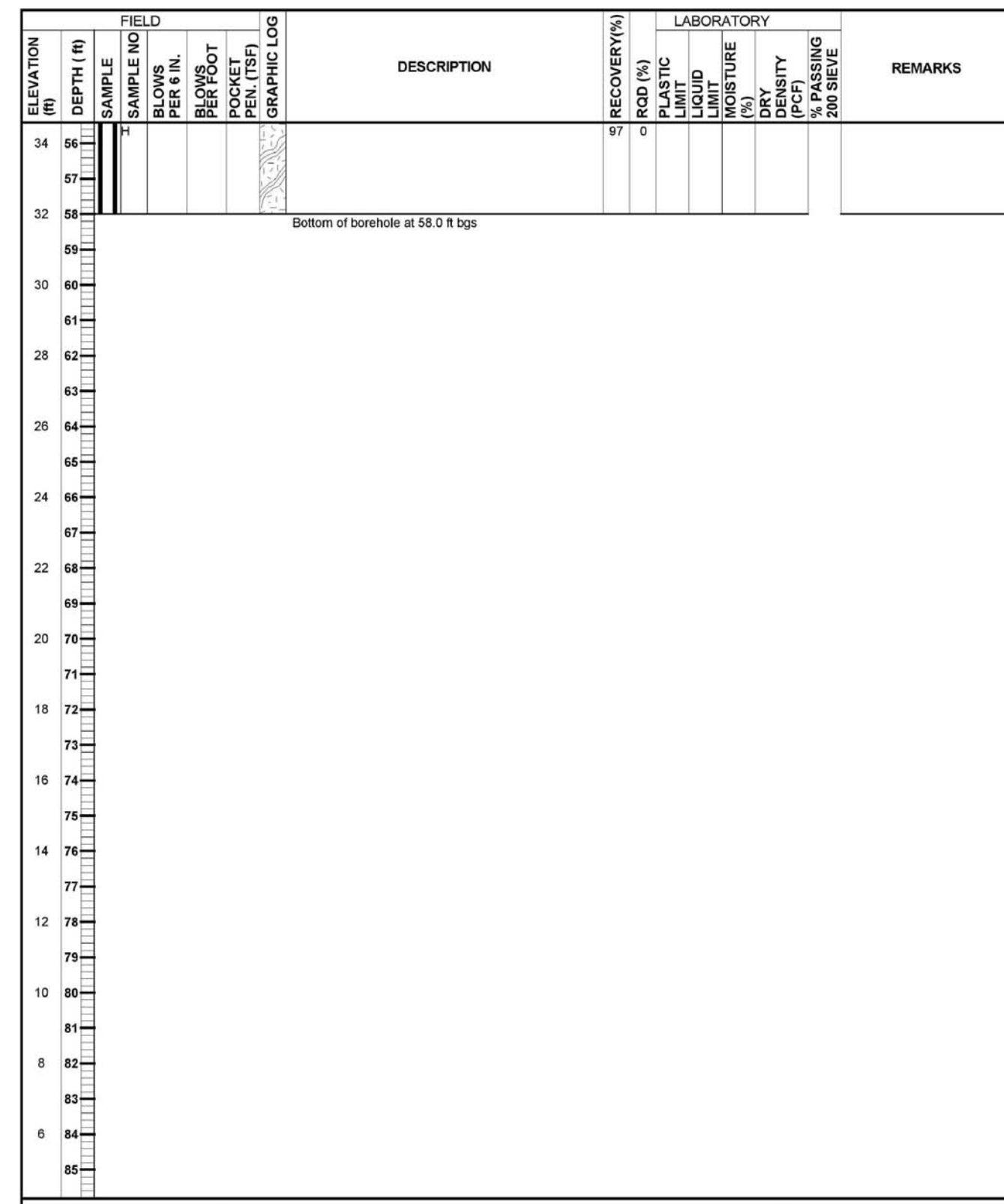
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PROJECT NUMBER: 15-245.2
PROJECT: HBMWD Phase 2
BORING: B7
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PROJECT NUMBER: 15-245.2
PROJECT: HBMWD Phase 2
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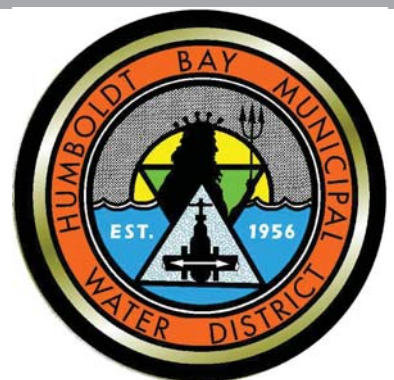


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PROJECT NUMBER: 15-245.2
PROJECT: HBMWD Phase 2
BORING: B7
ENTRY BY: NBM
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NOTE:
SEE SHEET G-004 FOR A PLAN VIEW OF APPROXIMATE BORING LOCATIONS AND SHEET C-101 FOR AN INTERPRETATION OF THE GEOTECHNICAL PROFILE ALONG THE HDD ALIGNMENT. REFERENCE THE GEOTECHNICAL REPORT, "HUMBOLDT BAY MUNICIPAL WATER DISTRICT, WATER TRANSMISSION PIPELINE REPLACEMENT UNDER MAD RIVER, BLUE LAKE AND FIELDBROOK-GLENDALE COMMUNITY SERVICES DISTRICT," CRAWFORD & ASSOCIATES, DECEMBER 14, 2017, FOR ADDITIONAL INFORMATION. THE GEOTECHNICAL REPORT IS INCLUDED AS AN ATTACHMENT TO THE TECHNICAL SPECIFICATIONS.

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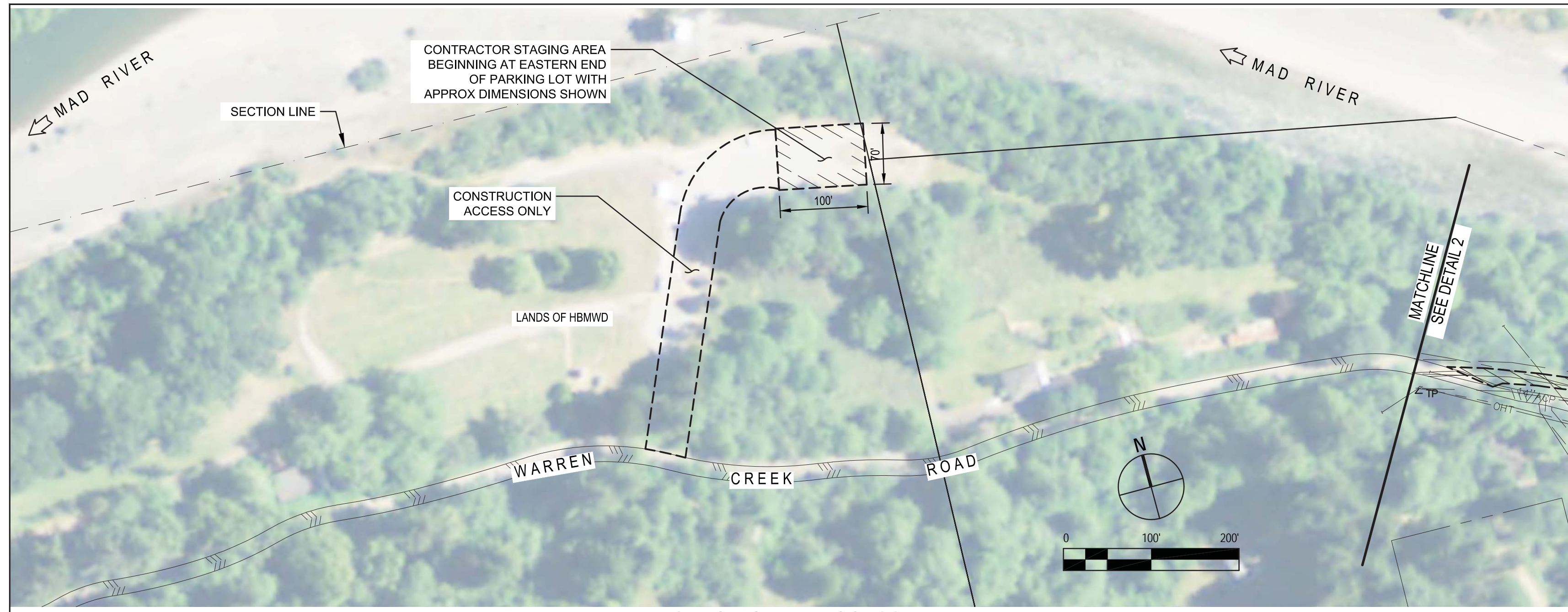
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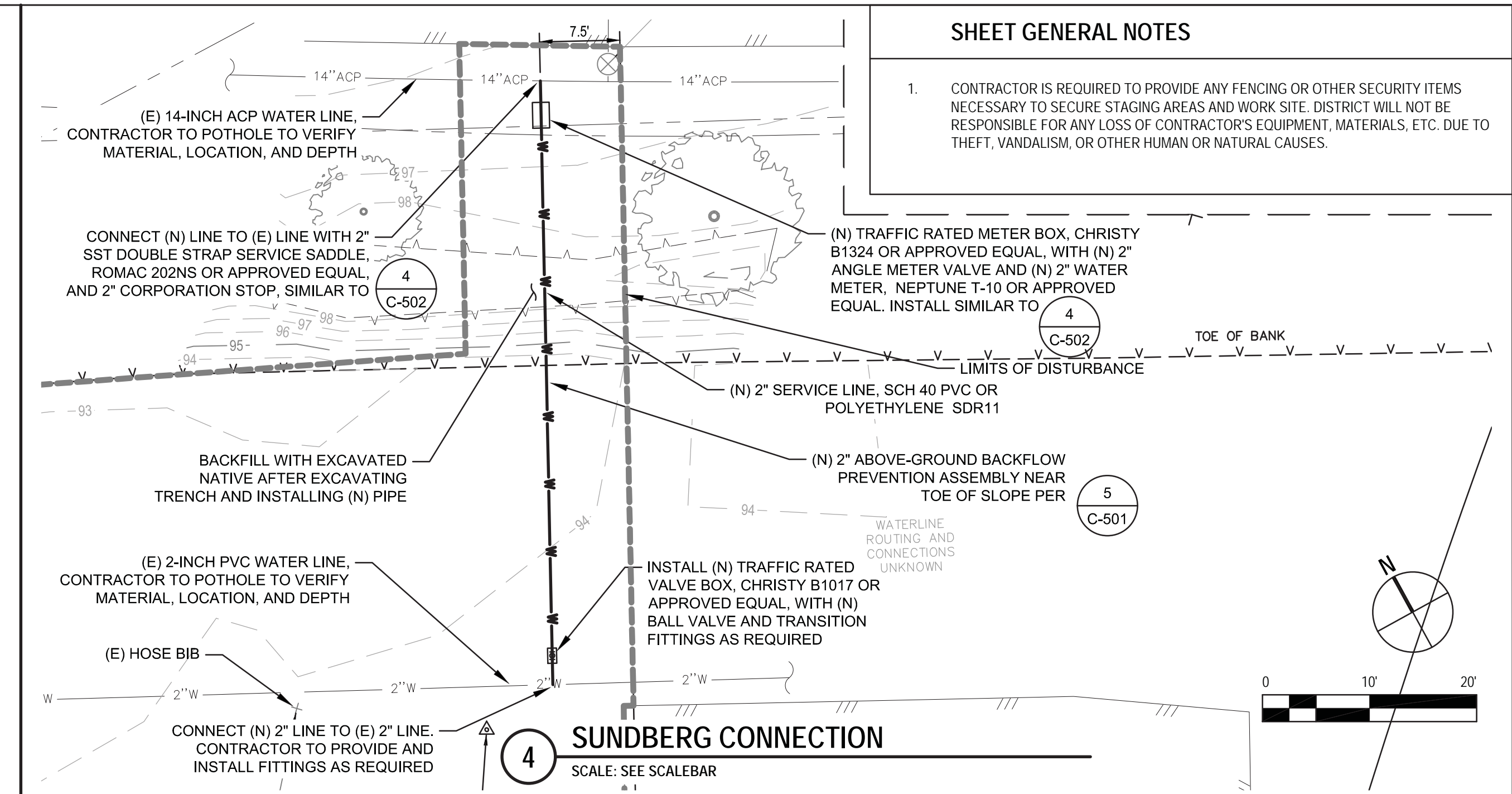
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Drafting Check	P. KASPARI	Design Check	P. KASPARI
Project Manager	P. KASPARI	Date	1/12/2018
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Project	MAD RIVER PIPELINE CROSSING		
Title	BORING LOGS 2 OF 2		
Project No.	8411162		
Original Size	ANSI D		
Sheet No.	G-006		
Sheet	6 of 11		



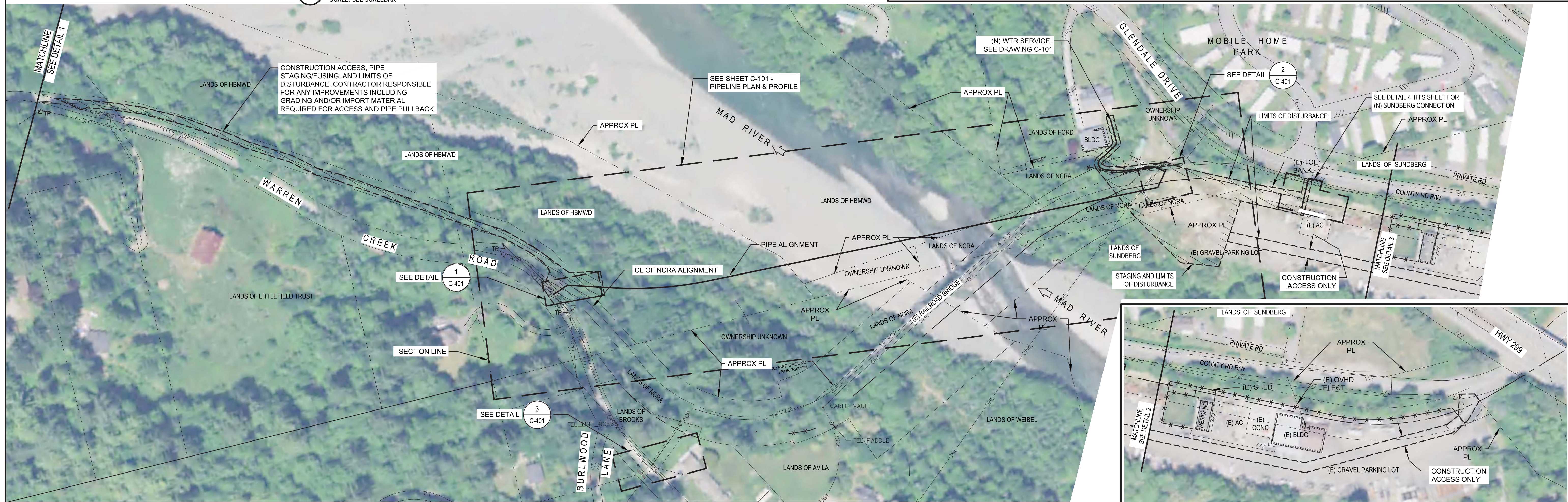
1 PARK 4 STAGING AND ACCESS
SCALE: SEE SCALEBAR



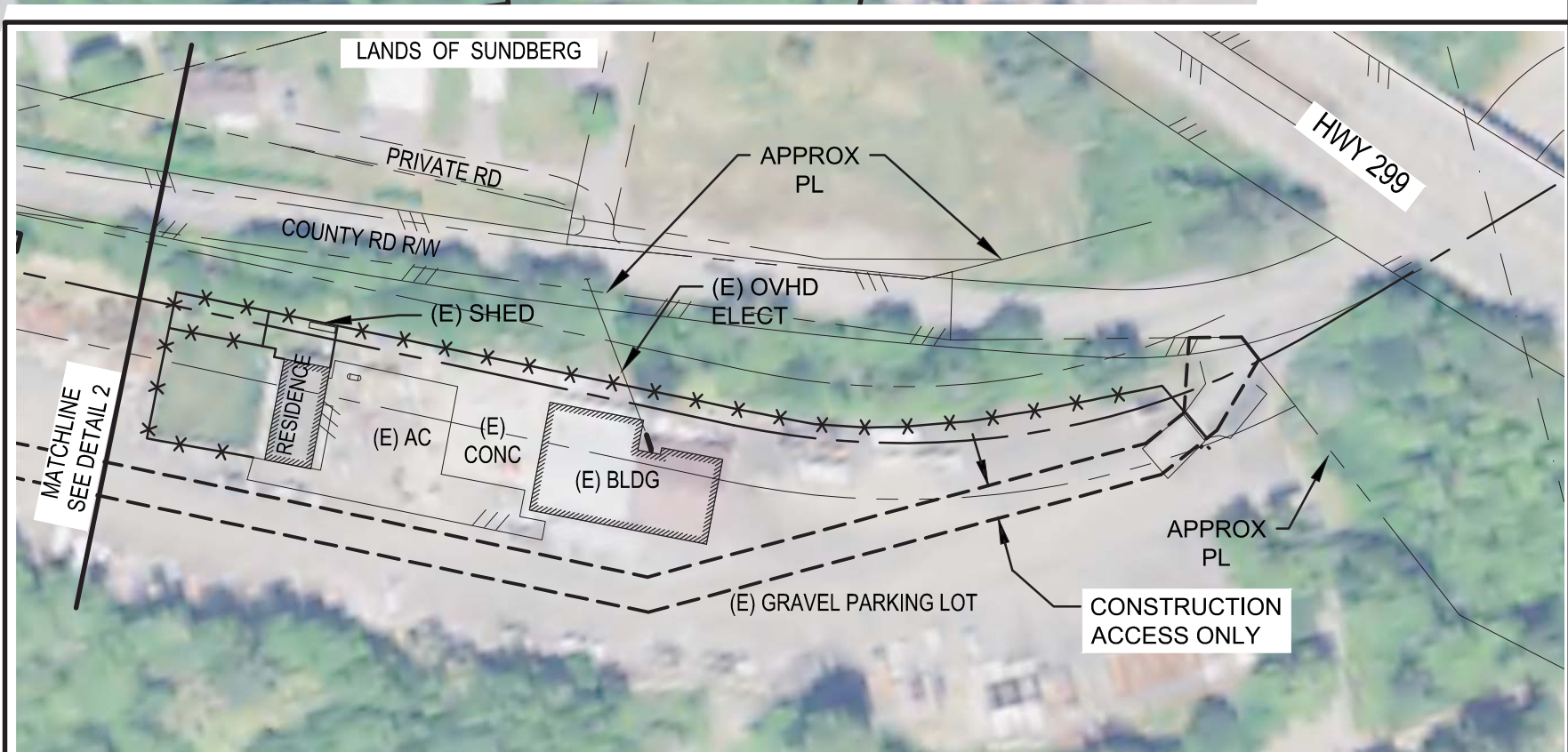
SHEET GENERAL NOTES

1. CONTRACTOR IS REQUIRED TO PROVIDE ANY FENCING OR OTHER SECURITY ITEMS NECESSARY TO SECURE STAGING AREAS AND WORK SITE. DISTRICT WILL NOT BE RESPONSIBLE FOR ANY LOSS OF CONTRACTOR'S EQUIPMENT, MATERIALS, ETC. DUE TO THEFT, VANDALISM, OR OTHER HUMAN OR NATURAL CAUSES.

4 SUNDBERG CONNECTION
SCALE: SEE SCALEBAR

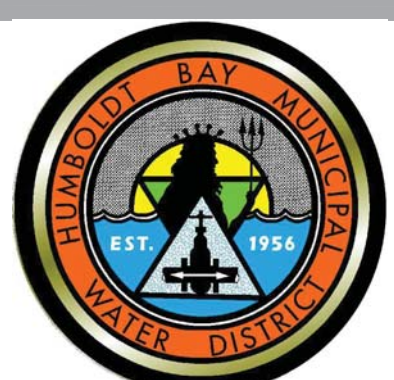


2 OVERALL CONSTRUCTION PLAN KEY, STAGING, AND ACCESS
SCALE: SEE SCALEBAR



3 EAST SIDE CONTINUATION - ACCESS PLAN
SCALE: SEE SCALEBAR

A		ISSUE FOR BID	NS	PK	2/9/18
No.	Issue		Drawn	Approved	Date



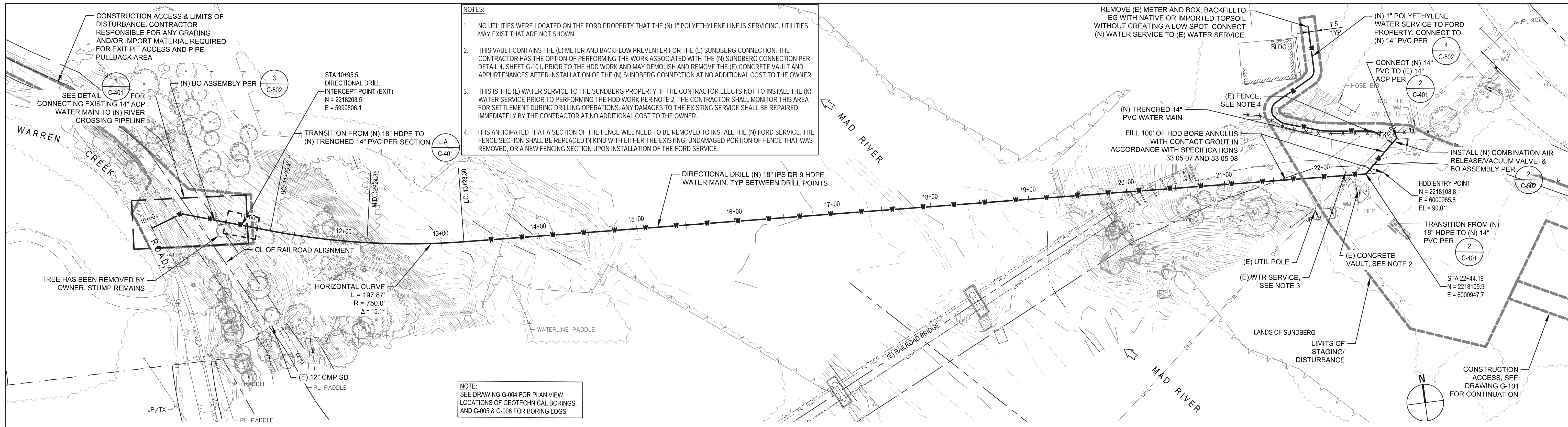
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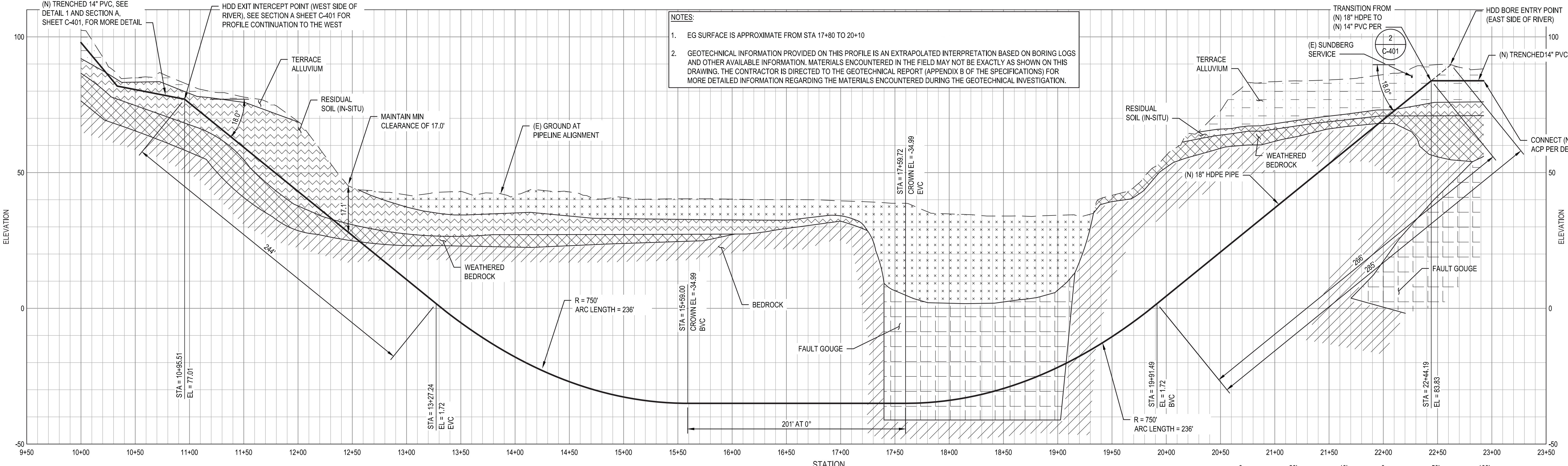
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Project	MAD RIVER PIPELINE CROSSING		
Title	CONSTRUCTION STAGING & ACCESS PLAN, OVERALL CONSTRUCTION PLAN KEY, AND SUNDBERG CONNECTION		
Project No.	8411162		
ANSI D	Original Size	Sheet No.	G-101
		Sheet	7 of 11

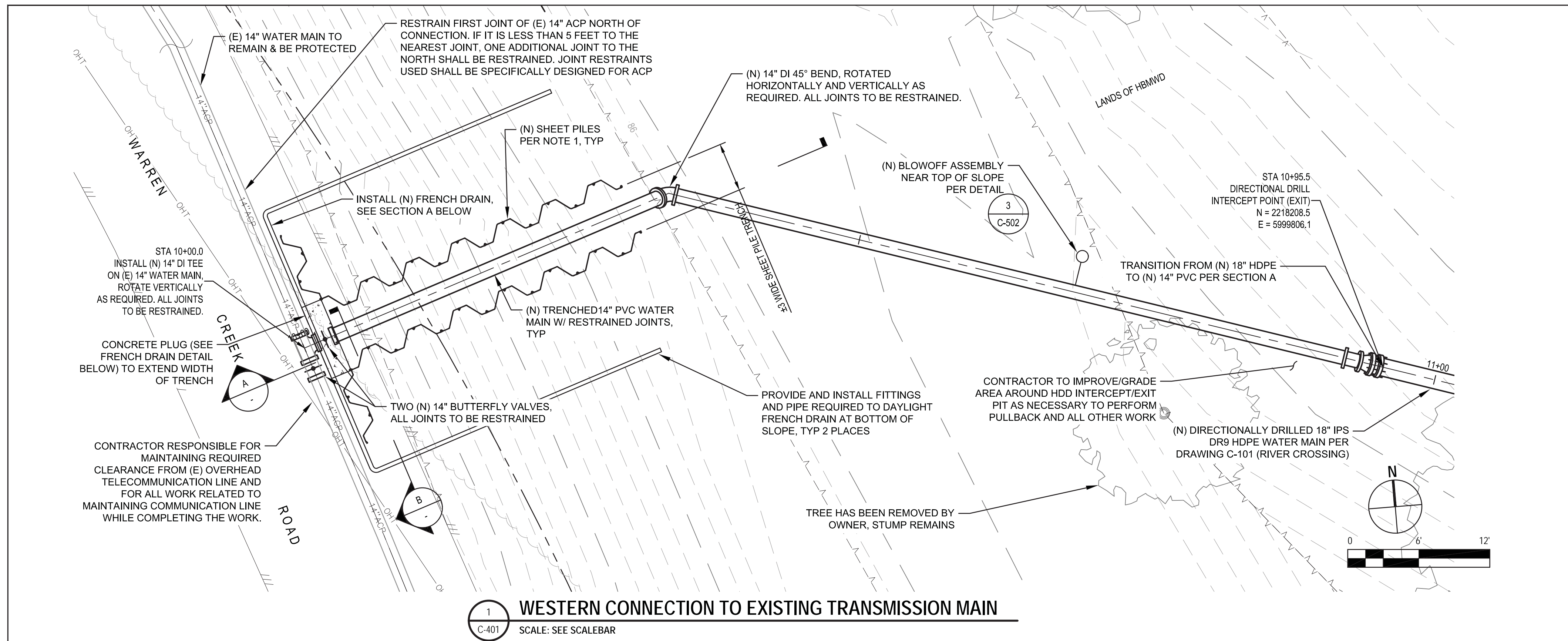


1 PIPELINE CROSSING - PLAN VIEW
SCALE: SEE SCALEBAR

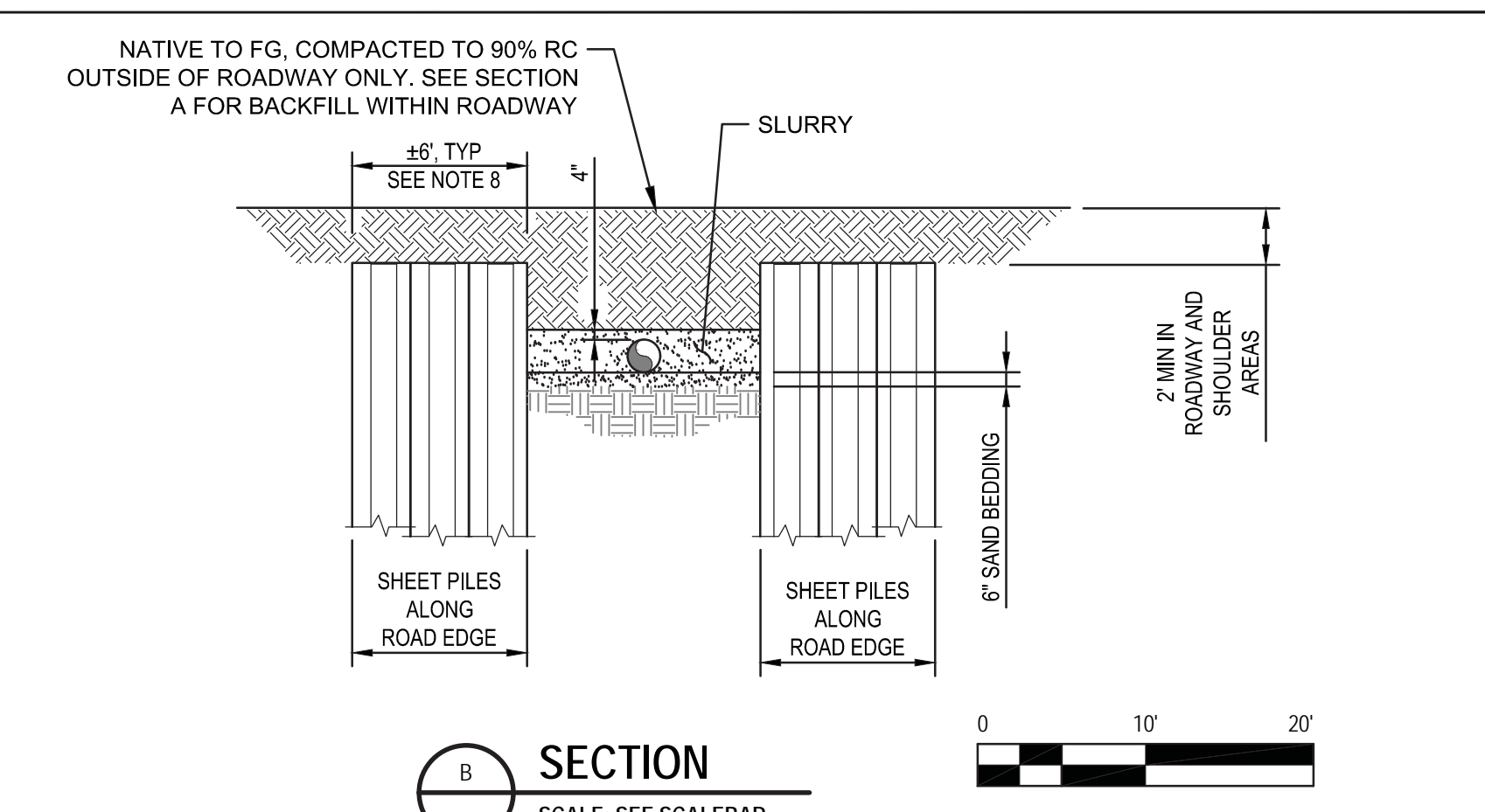


2 PIPELINE CROSSING - PROFILE
SCALE: SEE SCALEBAR

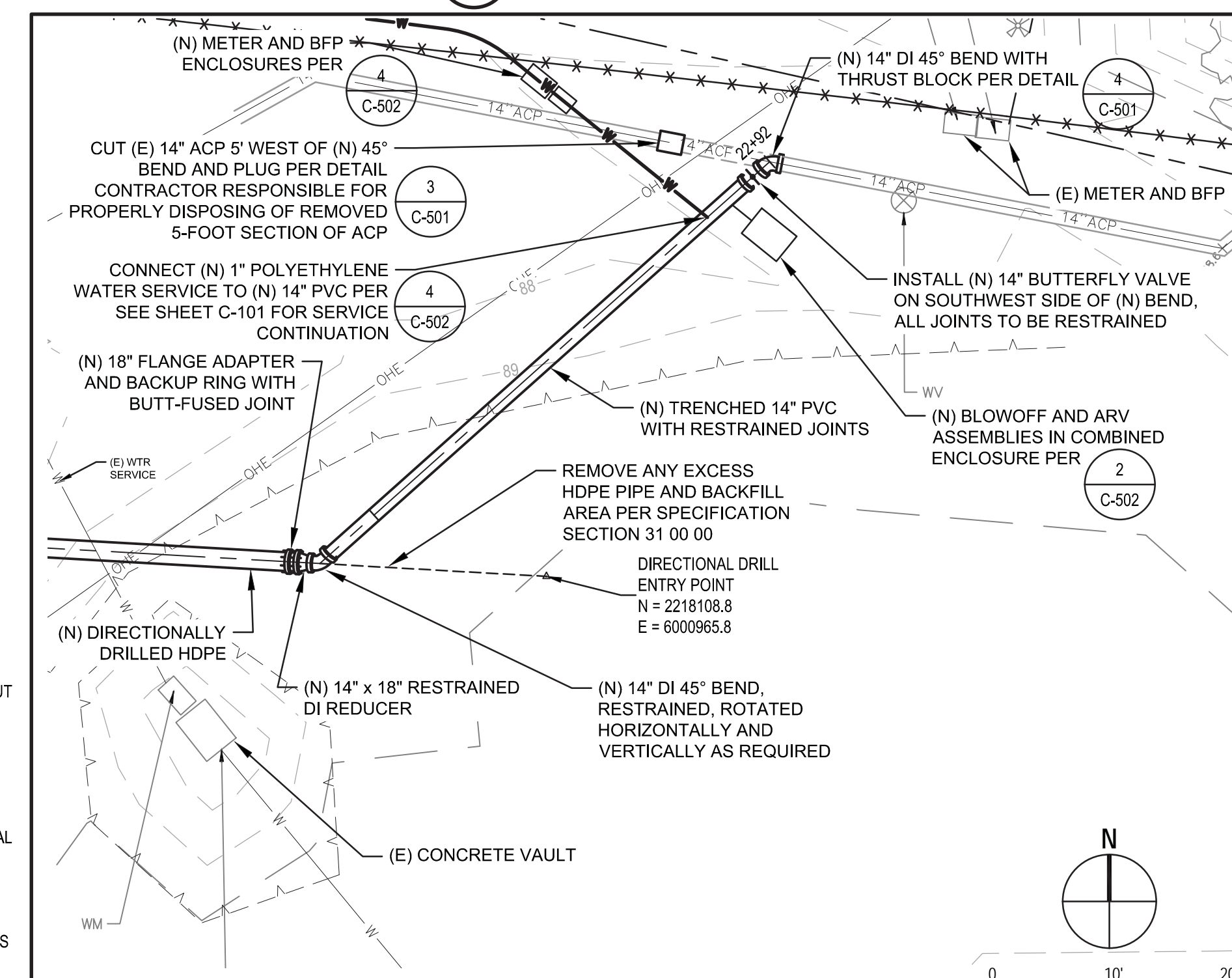
		Bar is one inch on original size sheet 						Client HUMBOLDT BAY MUNICIPAL WATER DISTRICT Project MAD RIVER PIPELINE CROSSING Title PIPELINE PLAN AND PROFILE Project No. 8411162 Original Size ANSI D Sheet No. C-101	
Drawn S. DAVIS Drafting Check P. KASPARI Project Manager P. KASPARI	Designer N. STEVENS Design Check P. KASPARI Date 1/12/2018 Scale AS NOTED	Issue NS Drawn PK Approved 2/9/18 Date	Reuse of Documents This document and the ideas and designs incorporated herein, as an instrument of professional service, is the property of GHD and shall not be reused in whole or in part for any other project without GHD's written authorization. © 2018 GHD	GHD Inc. 718 Third Street Eureka California 95501 USA T 1 707 443 8326 F 1 707 444 8330 W www.ghd.com	This document shall not be used for construction unless signed and sealed for construction.	Sheet 8 of 11			



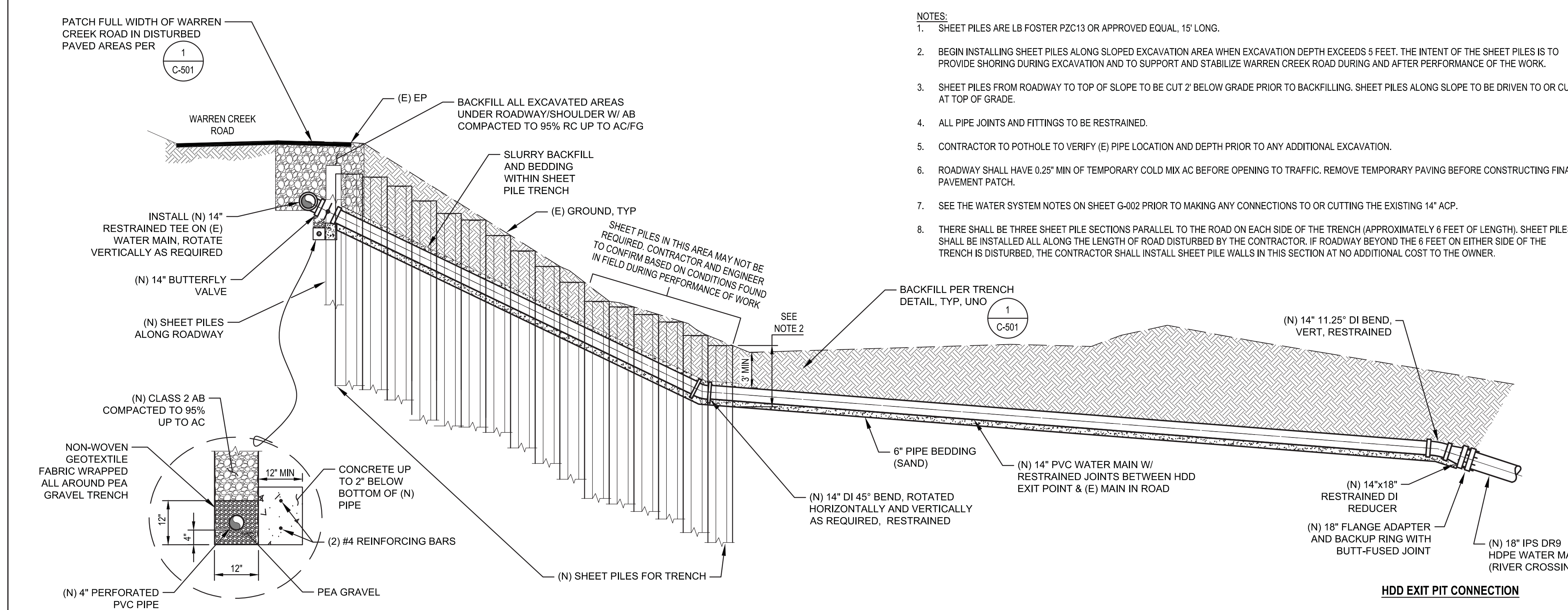
1 WESTERN CONNECTION TO EXISTING TRANSMISSION MAIN
SCALE: SEE SCALEBAR



B SECTION
SCALE: SEE SCALEBAR



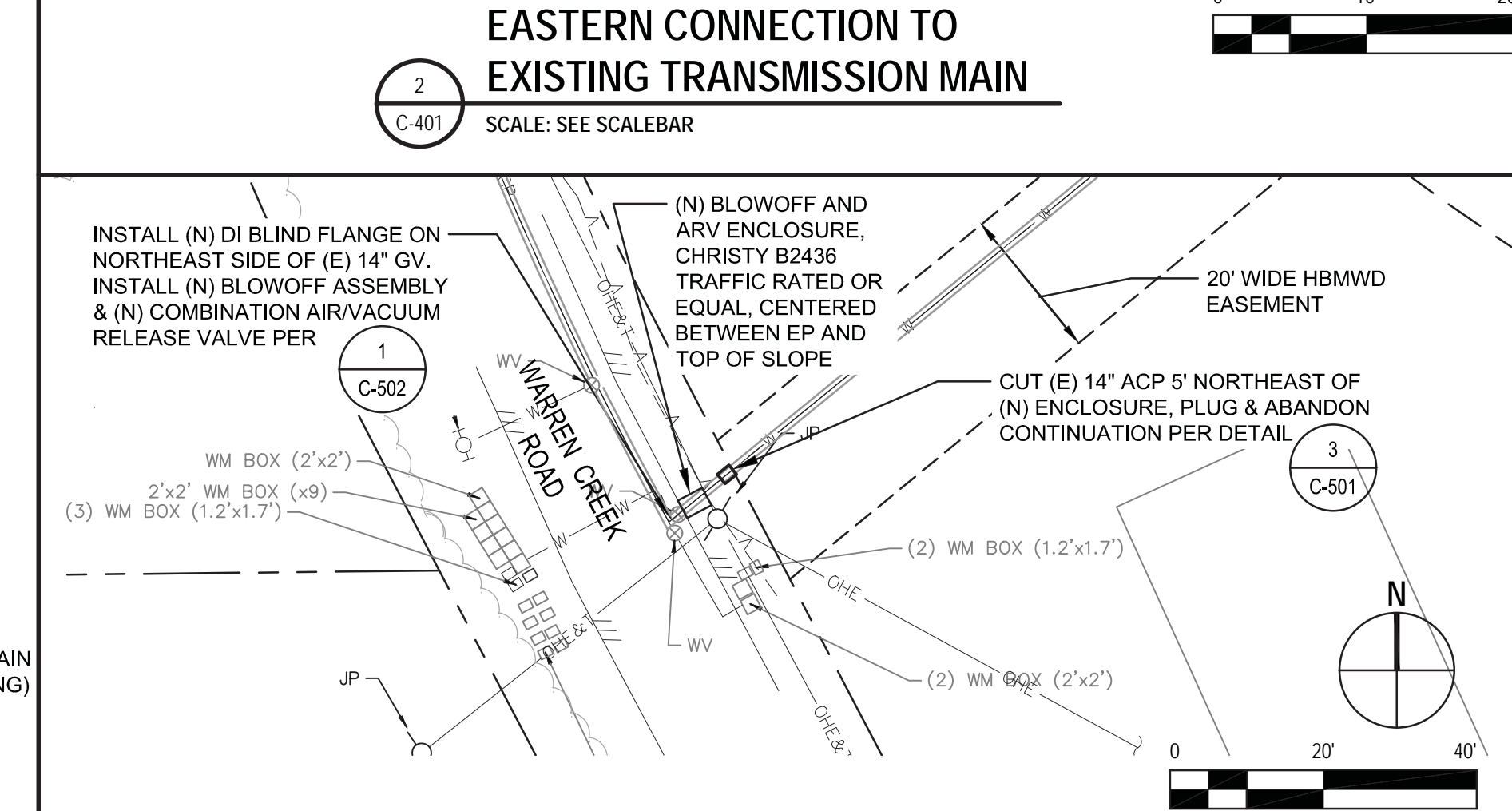
2 EASTERN CONNECTION TO EXISTING TRANSMISSION MAIN
SCALE: SEE SCALEBAR



A SECTION
SCALE: SEE SCALEBAR

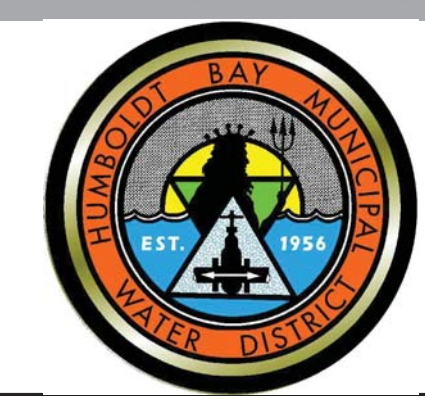
PATCH FULL WIDTH OF WARREN CREEK ROAD IN DISTURBED PAVED AREAS PER 1 C-501

- NOTES:
1. SHEET PILES ARE LB FOSTER PZC13 OR APPROVED EQUAL, 15' LONG.
 2. BEGIN INSTALLING SHEET PILES ALONG SLOPED EXCAVATION AREA WHEN EXCAVATION DEPTH EXCEEDS 5 FEET. THE INTENT OF THE SHEET PILES IS TO PROVIDE SHORING DURING EXCAVATION AND TO SUPPORT AND STABILIZE WARREN CREEK ROAD DURING AND AFTER PERFORMANCE OF THE WORK.
 3. SHEET PILES FROM ROADWAY TO TOP OF SLOPE TO BE CUT 2' BELOW GRADE PRIOR TO BACKFILLING. SHEET PILES ALONG SLOPE TO BE DRIVEN TO OR CUT AT TOP OF GRADE.
 4. ALL PIPE JOINTS AND FITTINGS TO BE RESTRAINED.
 5. CONTRACTOR TO POTHOLE TO VERIFY (E) PIPE LOCATION AND DEPTH PRIOR TO ANY ADDITIONAL EXCAVATION.
 6. ROADWAY SHALL HAVE 0.25\"
 7. SEE THE WATER SYSTEM NOTES ON SHEET G-002 PRIOR TO MAKING ANY CONNECTIONS TO OR CUTTING THE EXISTING 14\"
 8. THERE SHALL BE THREE SHEET PILE SECTIONS PARALLEL TO THE ROAD ON EACH SIDE OF THE TRENCH (APPROXIMATELY 6 FEET OF LENGTH). SHEET PILES SHALL BE INSTALLED ALL ALONG THE LENGTH OF ROAD DISTURBED BY THE CONTRACTOR. IF ROADWAY BEYOND THE 6 FEET ON EITHER SIDE OF THE TRENCH IS DISTURBED, THE CONTRACTOR SHALL INSTALL SHEET PILE WALLS IN THIS SECTION AT NO ADDITIONAL COST TO THE OWNER.



3 MODIFY EXISTING RIVER CROSSING PIPELINE
SCALE: SEE SCALEBAR

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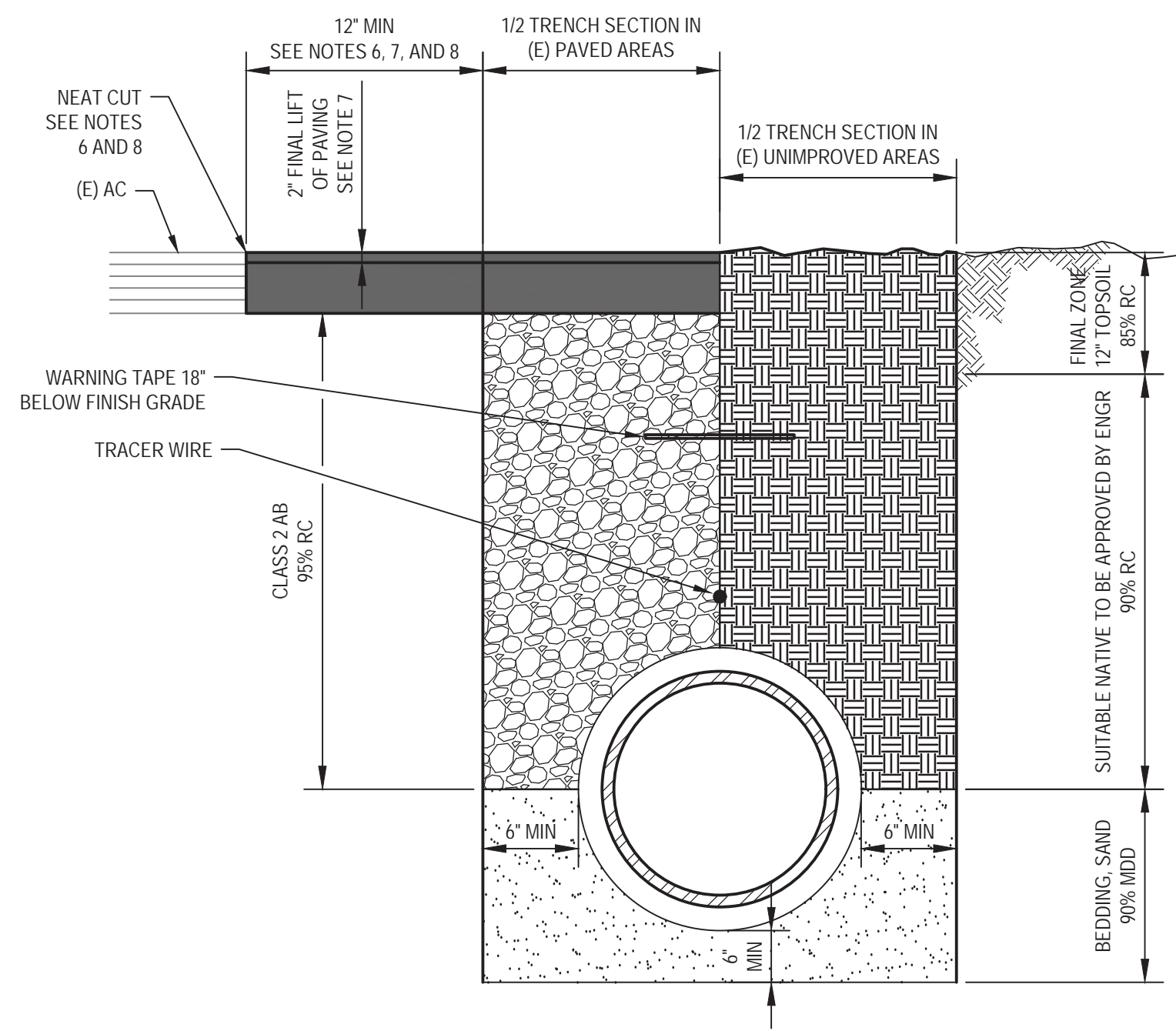
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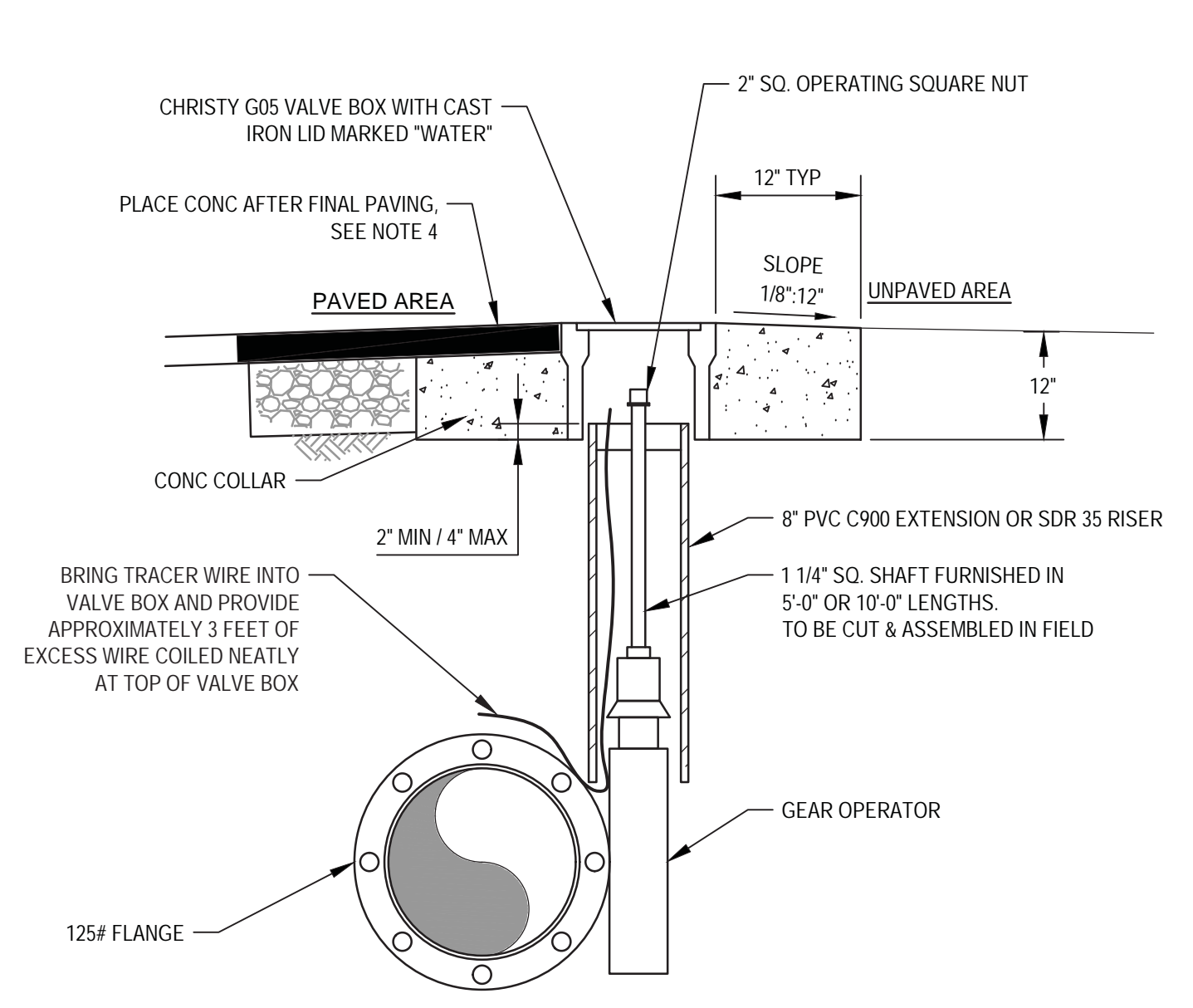
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Project	MAD RIVER PIPELINE CROSSING		
Title	CONNECTION AND ABANDONMENT DETAILS		
Project No.	8411162		
Original Size	ANSI D		
Sheet No.	C-401		
Sheet	9 of 11		



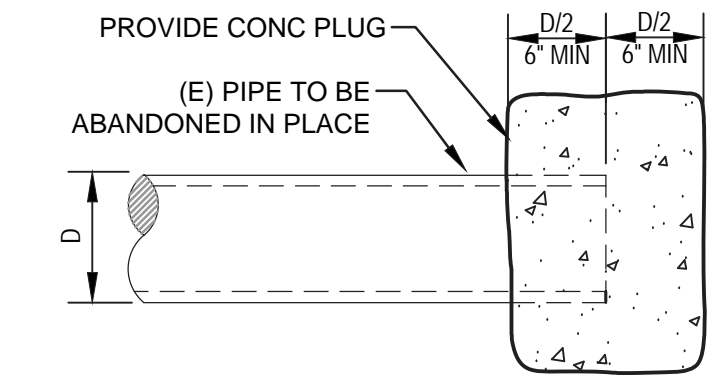
- NOTES:**
- REFER TO THE SPECIFICATION SECTION 31 23 00 (TRENCHING, BACKFILLING, AND COMPACTING) FOR EXCAVATION AND BACKFILL REQUIREMENTS.
 - ASPHALT CONCRETE (AC) MUST BE SAWCUT FULL DEPTH.
 - IF DISTANCE BETWEEN EDGE OF TRENCH TO EDGE OF PAVEMENT IS 4' OR LESS, THEN REPLACE ALL AC UP TO EDGE OF PAVEMENT.
 - FINAL PAVING SHALL CONSIST OF THE FULL WIDTH OF WARREN CREEK ROAD FOR THE ENTIRE SECTION DISTURBED.
 - THESE ARE MINIMUM REQUIREMENTS. IF OTHER JURISDICTIONAL (CITY, COUNTY, STATE) AGENCY REQUIREMENTS EXCEED THOSE SHOWN, THE HIGHER REQUIREMENTS SHALL BE MET.
 - ASPHALT CONCRETE (AC) MUST BE SAWCUT FULL DEPTH.
 - AC SHALL BE TYPE B, 1/2" MAX; AND MEDIUM GRADING. TO ENSURE ADEQUATE BONDING, A TACK COAT (SS-1) SHALL BE APPLIED OVER EXISTING AC PAVEMENT AND A PRIMECOAT (MC-250) SHALL BE APPLIED OVER COMPACTED AB (SS-1 MAY BE SUBSTITUTED FOR EXISTING STREETS). USE OF MC-250 SHALL COMPLY WITH EPA (ENVIRONMENTAL PROTECTION AGENCY) REGULATIONS.
 - SPRAY AC JOINT WITH SS-1.
 - PACK PAVING THICKNESS SHALL BE 4" MIN.

1 TYPICAL TRENCH SECTIONS IN IMPROVED AND UNIMPROVED AREAS
C-501 NOT TO SCALE

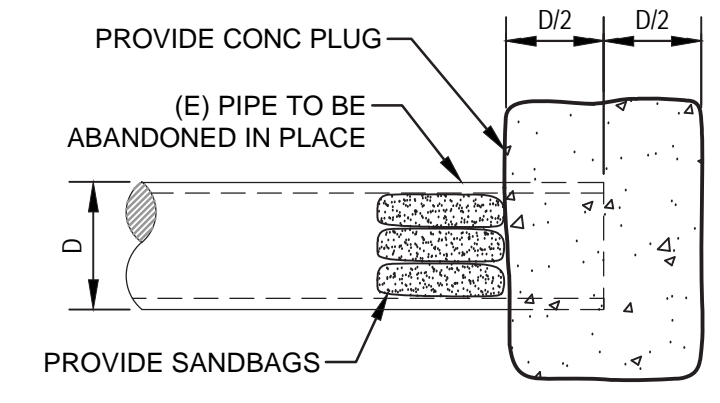


- NOTES:**
- VALVE BOX & LID SHALL BE RATED FOR AASHTO H-20 LOADINGS AS MANUFACTURED BY CHRISTY (No. G05).
 - ALL LIDS & GRADE RINGS SHALL HAVE MACHINED SEATING SURFACES.
 - EXTENSIONS SHALL BE AS MANUFACTURED FOR THE VALVE BOX SUPPLIED OR HDPE OR PVC PIPE OF CORRECT SIZE CAN BE USED.
 - VALVE BOX IS PLACED AFTER ROADWAY IS PAVED, CONSTRUCT CONC BASE TO TOP OF PAVEMENT.

2 STANDARD BUTTERFLY VALVE INSTALLATION DETAIL
C-501 NOT TO SCALE



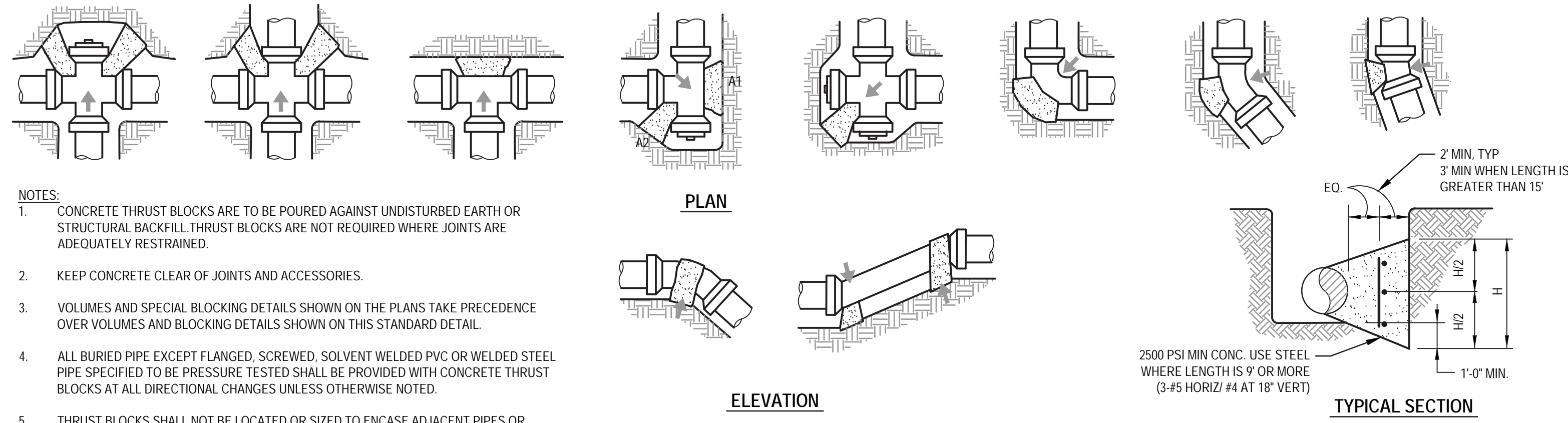
12" DIAMETER PIPE AND SMALLER



14" DIAMETER PIPE AND LARGER

- NOTES:**
- PIPE PLUGS SHALL BE INSTALLED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
 - SHALL BE INSPECTED BY THE OWNER'S REPRESENTATIVE BEFORE COVERING.

3 PLUG AND ABANDON EXISTING WATER MAIN
C-501 NOT TO SCALE



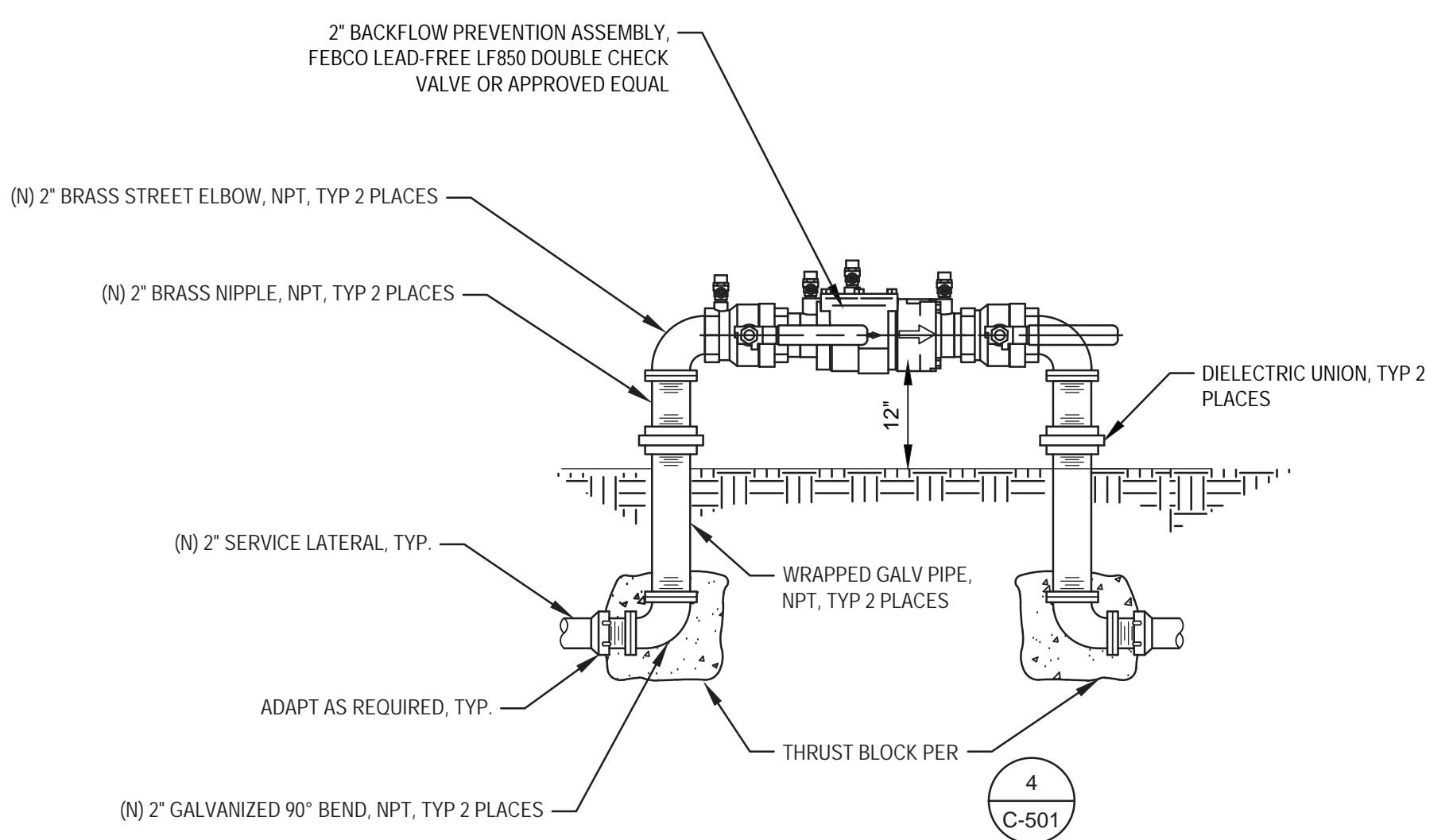
- NOTES:**
- CONCRETE THRUST BLOCKS ARE TO BE POURED AGAINST UNDISTURBED EARTH OR STRUCTURAL BACKFILL. THRUST BLOCKS ARE NOT REQUIRED WHERE JOINTS ARE ADEQUATELY RESTRAINED.
 - KEEP CONCRETE CLEAR OF JOINTS AND ACCESSORIES.
 - VOLUMES AND SPECIAL BLOCKING DETAILS SHOWN ON THE PLANS TAKE PRECEDENCE OVER VOLUMES AND BLOCKING DETAILS SHOWN ON THIS STANDARD DETAIL.
 - ALL BURIED PIPE EXCEPT FLANGED, SCREWED, SOLVENT WELDED PVC OR WELDED STEEL PIPE SPECIFIED TO BE PRESSURE TESTED SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS AT ALL DIRECTIONAL CHANGES UNLESS OTHERWISE NOTED.
 - THRUST BLOCKS SHALL NOT BE LOCATED OR SIZED TO ENCASE ADJACENT PIPES OR FITTINGS.
 - THE SIZE AND WEIGHT OF ALL UPLIFT THRUST BLOCKS SHALL BE AS DETERMINED BY ENGINEER.
 - THE BEARING AREAS ARE BASED ON TEST PRESSURE OF 150 PSI AND ALLOWABLE SOIL BEARING STRESS OF 1000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:
BEARING AREA = (TEST PRESSURE / 150) x (1000 / SOIL BEARING STRESS) x (TABLE VALUE)
 - THRUST BLOCKS REQUIRED AT ALL CHANGES IN DIRECTION OF PIPING UNLESS NOTED OTHERWISE.
 - CONTRACTOR TO PROVIDE ALL COMPONENTS.
 - ALL PIPE AND FITTINGS SHALL BE WRAPPED IN POLYETHYLENE TO PREVENT CORROSION AND CONC ADHESION.

BEARING AREA OF THRUST BLOCK IN SQ. FT.

PIPE SIZE	TEE, WYE, PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED		45° BEND	22 1/2° BEND	11 1/4° BEND
			A1	A2			
2, 4	1.5	2	2	1.5	1.5	1	1
6	3	4.5	4.5	3	2.5	1.5	1
8	5	7	7	5	4	2	1
10	8	12	12	8	7	3	2
12	12	17	17	12	10	5	3
14	14	19.5	19.5	14	11	6	4
16	15	21.5	21.5	15	12	6	4

PIPE SIZE	TEE, WYE, PLUG OR CAP	90° BEND PLUGGED CROSS	TEE PLUGGED		45° BEND	22 1/2° BEND	11 1/4° BEND
			A1	A2			
18	19	27	27	19	15	8	6
20	24	34	34	24	18	10	8
22	29	41	41	29	22	12	10
24	34	48	48	34	26.5	14	12
32	39	55	55	39	31.5	16	14

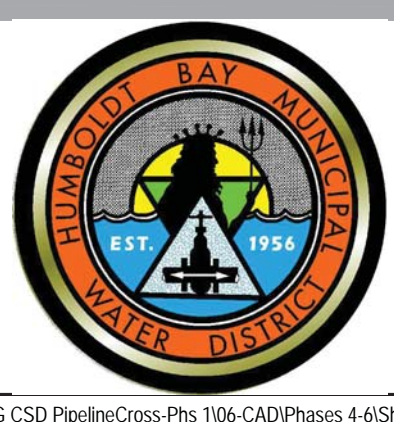
4 TYPICAL THRUST BLOCK DETAILS
C-501 NOT TO SCALE



5 ABOVE-GROUND BACKFLOW PREVENTER ASSEMBLY
C-501 NOT TO SCALE

- NOTES:**
- INSTALL PER LOCAL CODE.
 - CONTRACTOR TO PROVIDE ALL COMPONENTS.

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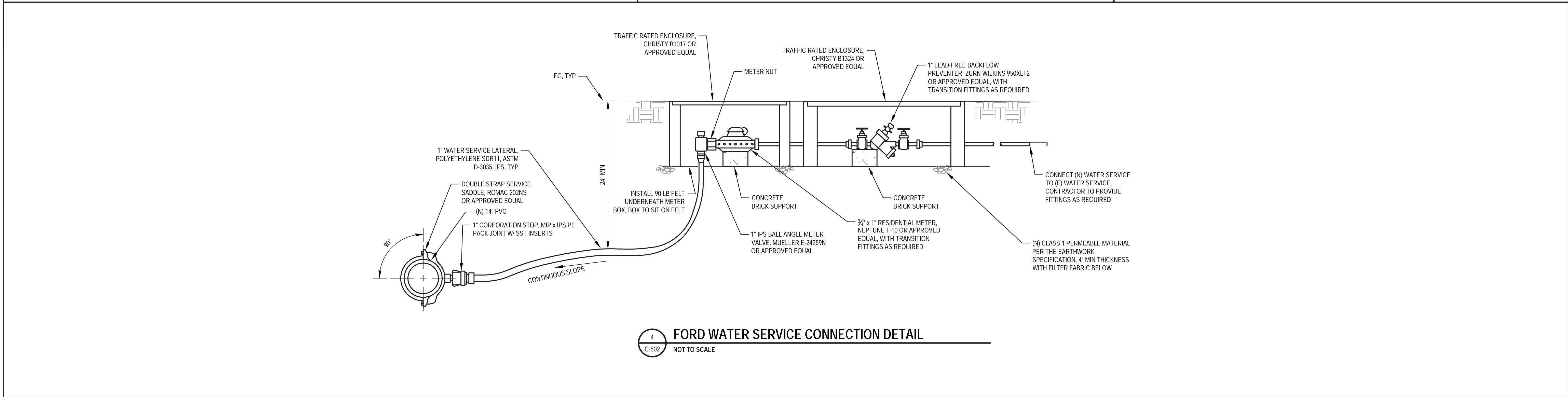
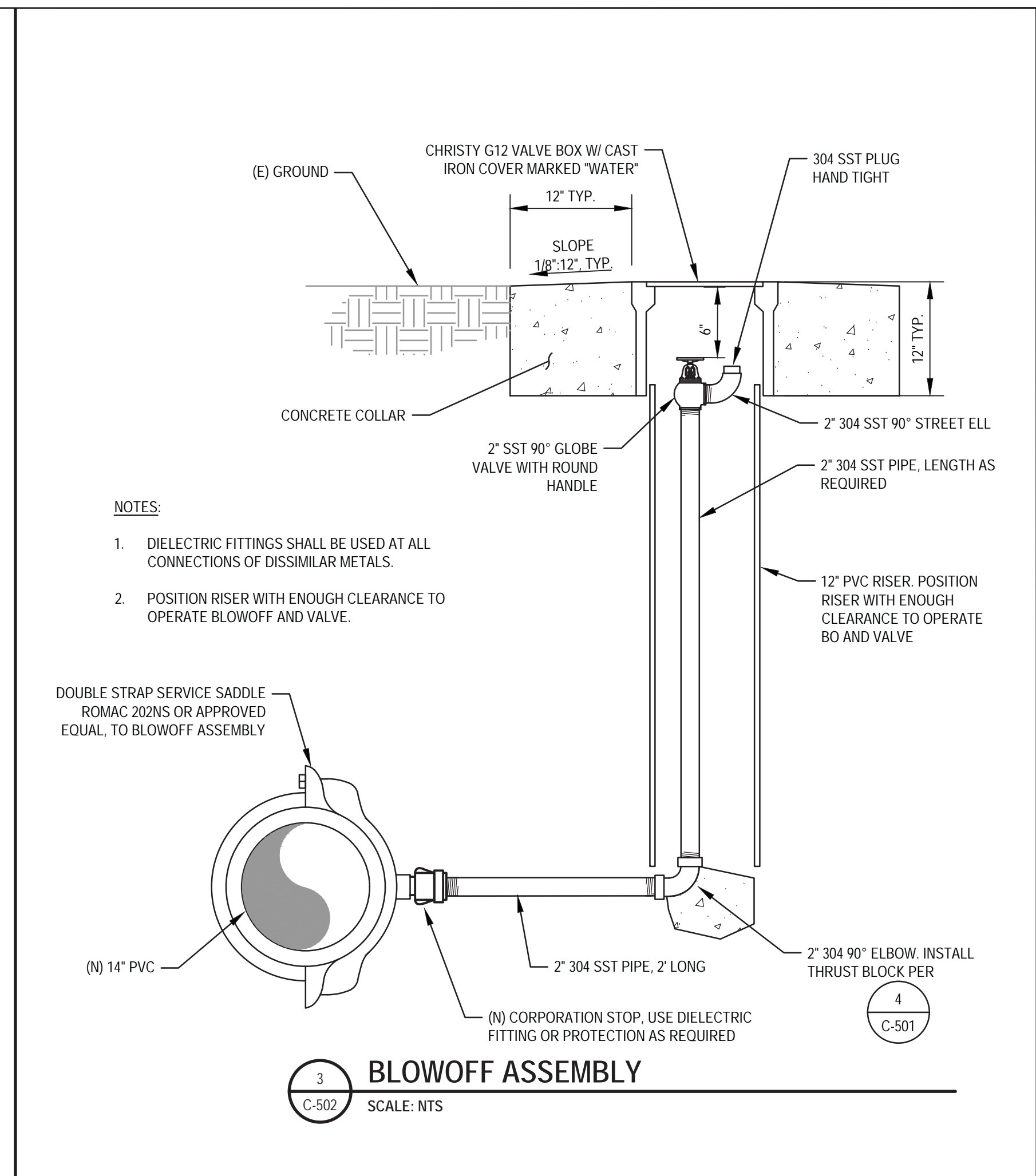
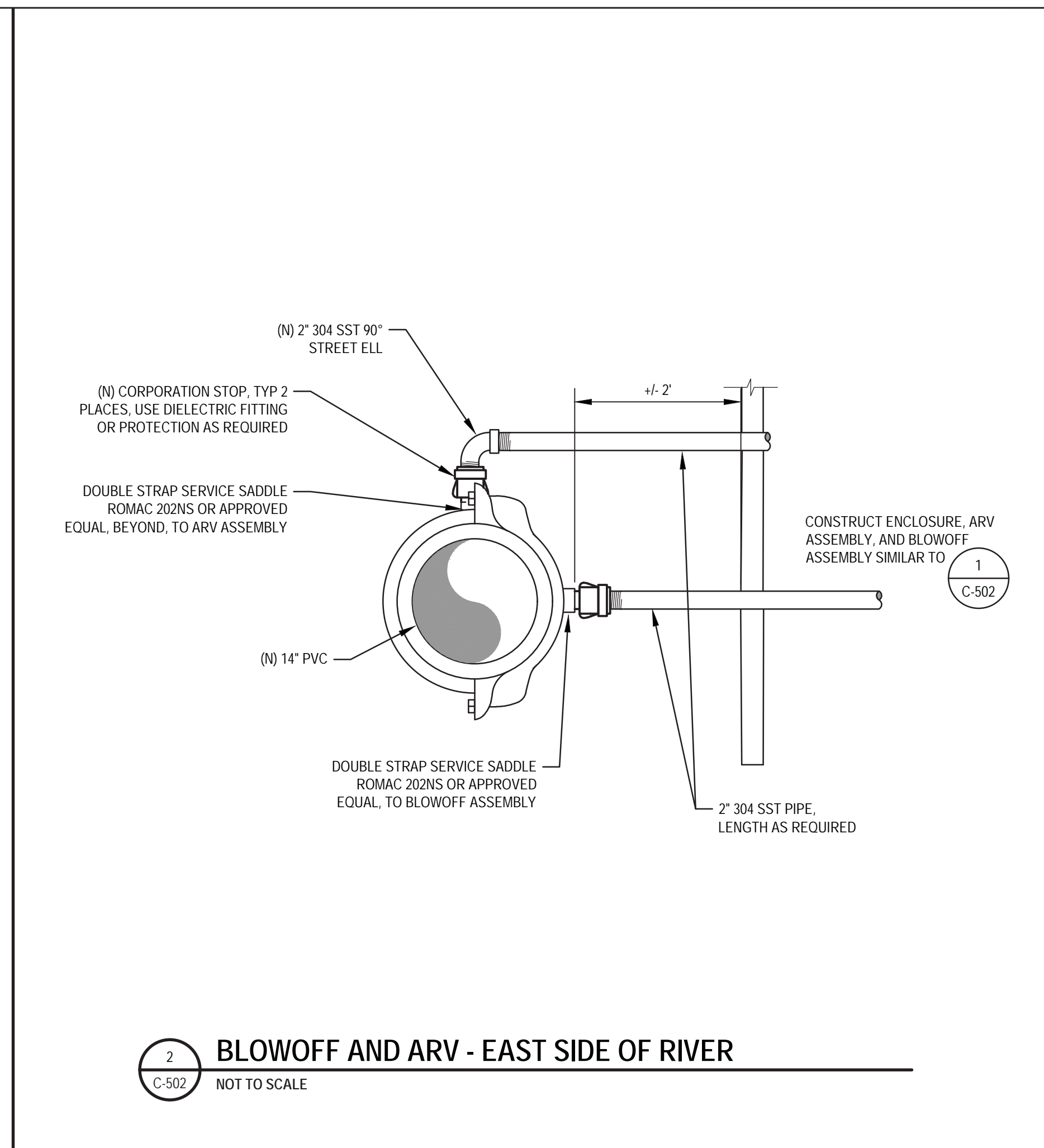
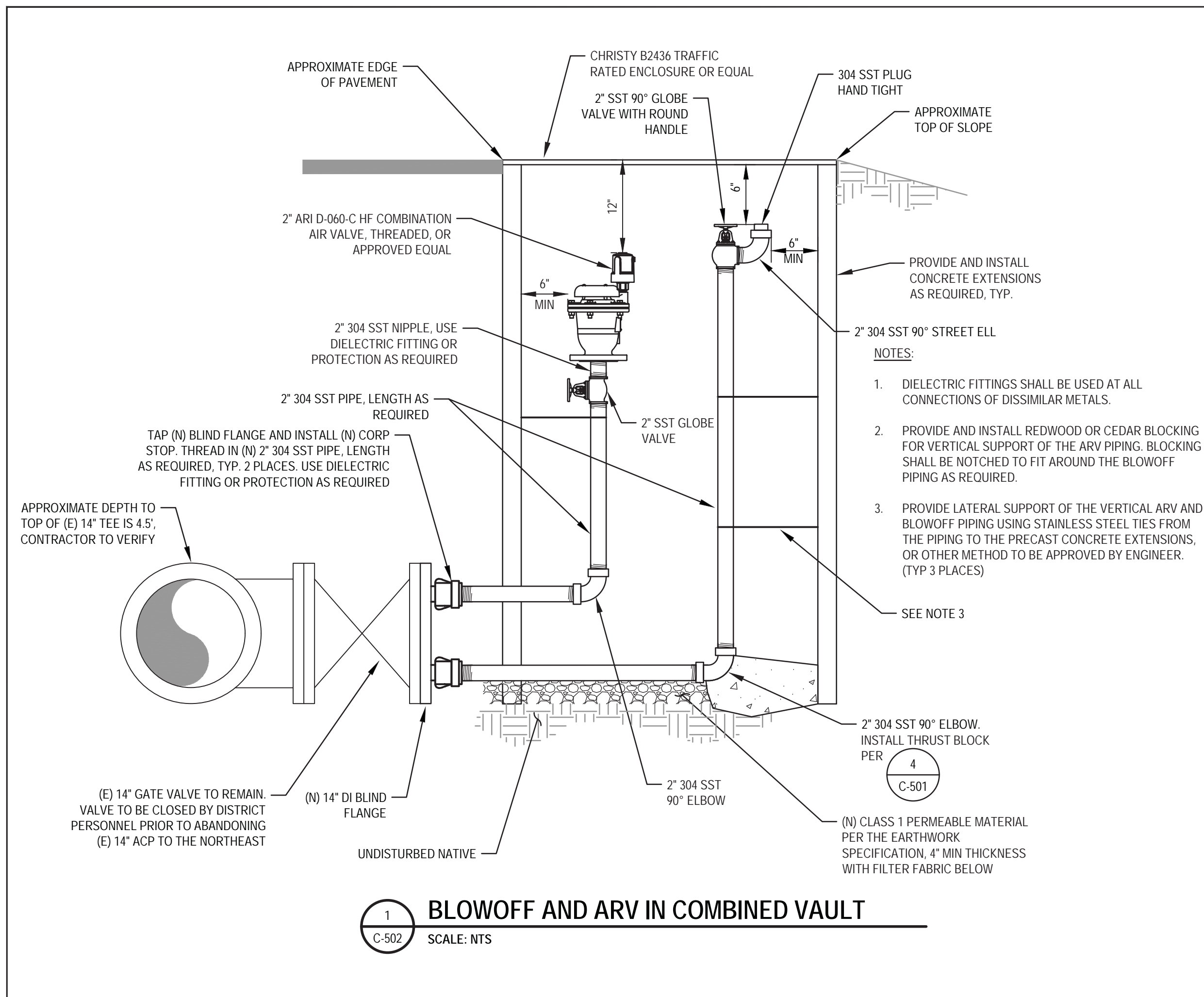
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Project Manager	P. KASPARI	Date	1/12/2018
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Project	MAD RIVER PIPELINE CROSSING		
Title	CIVIL DETAILS - 1 OF 2		
Project No.	8411162		
Original Size	ANSI D		
Sheet No.	C-501		



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