



Humboldt Bay Municipal Water District Mad River Pipeline Crossing Project Bid Addendum #1

The purpose of this Addendum is to modify the Contract Documents for the subject project. This Addendum shall become part of said Contract Documents.

Bidders shall acknowledge receipt of this Addendum in their bid proposal.

This Addendum addresses the following items and questions:

1. Construction staking
 - i) The District will contract independently with Points West Surveying to provide construction staking services for the project. Bid Item #2 (Construction Staking) shall be struck from the Bid Schedule in the Contractor's bid, and any location in the Specifications directing the Contractor to provide construction staking services shall be revised to say that the District will provide construction staking services.
2. Disposal of drilling mud and solid cuttings
 - i) The District will allow the Contractor to use a portion of the Park 1 site shown on the attached Figure 1 for drilling mud and solid cuttings disposal. The Contractor can chose to utilize any or all of the area within the footprint shown on Figure 1. The Contractor will be responsible for removing and stockpiling the topsoil from the footprint and digging down to the depth necessary to contain the spoils, up to but not exceeding four feet from the ground surface. Contractor shall not excavate within the drip line of any existing trees. Contractor shall enclose the entire area in six-foot-tall portable chain link fencing as required to prevent access by the public. Contractor will then haul spoils to the location and place them within the containment. At the end of the project, the Contractor will then be required to spread the spoils uniformly throughout the containment, cover spoils with the removed soil, and cap with the removed topsoil. Contractor shall then grade the site to uniformly transition into the surrounding topography and broadcast seed and weed-free rice straw throughout the area per the Specifications. Contractor is responsible for sediment and erosion control for this area throughout the project if this option is chosen. The Contractor will not be required to water or maintain the seed or straw after placement. Contractor is free to utilize this option or use any other appropriate disposal method.
3. Availability of water for the project
 - i) The District will install a 4-inch hot tap on their existing waterline on the Glendale Drive/entrance side of the project for the Contractor's use (see revised note 1.21 on the attached Sheet G-003). The District will hot tap the line near the entry pit site and will work with the selected Contractor to finalize the exact hot tap location. The District will then install a 4-inch flanged ductile iron spool and a meter from the hot tap valve to approximately the ground surface. The flow meter will be provided by the District for tracking purposes only; the



Contractor will not be required to pay for water usage. The Contractor shall then install a 4-inch backflow preventer and any other valves, fittings, or appurtenances required to transfer the water from this point to the point of use.

4. Overlapping notes on Sheet G-003
 - i) On the Issue for Bid drawings, General Note 4.2.3 was overlapping with Dust and Exhaust Control Note 1. This has been revised in the attached Sheet G-003.
5. Unconfined compressive strength (UCS) of the bedrock as opposed to the UCS of the fault gouge
 - i) Bedrock UCS values are provided in Table 2, Section 8.2 of the geotechnical report for the project (Appendix B of the Specifications). The UCS values presented are assumed to be representative of the hardest rock that will be encountered during the horizontal directional drilling (HDD) process. From the geotechnical investigation, it was determined that the fault gouge is no longer intact rock. It has been reworked by movement across the fault such that it is a mixture of parent rock and residual soil (essentially very stiff to hard clay with chunks of rock). Therefore, the material can't be characterized by a single strength value. Contractors are directed to the core recovery of the gouge as seen in the core photos in the geotechnical report. This may give contractors the best feel for the gouge strength, as lab test results would not necessarily be representative. For general comparison, one could likely expect the fault gouge to have unconfined compressive strengths on the order of 50-100 psi, which is far less than the UCS of the rock, but is strong as a residual soil. It is difficult to know the orientation of the rock/fault contact, but it is probably not vertical, as the faults in the area are mapped as thrust faults, which are low-angle faults. This could pose some steering challenges through the transitions between bedrock and fault gouge. Contractors are directed to read the geotechnical report to develop an understanding of the subsurface conditions that will be encountered during the HDD process.
6. Differing site conditions clause
 - i) A Differing Site Conditions clause has been included as item B-6 in the General Conditions of the Specifications.
7. Will the hydrofracture calculation results performed during the design be provided to the Contractors?
 - i) Hydrofracture calculation input parameters and results have been attached to this Addendum. However, this does not absolve the winning Contractor of the requirement to submit calculations of maximum allowable and minimum required drilling fluid pressures, as the results of the analysis are largely a function of the means and methods chosen by the Contractor.
8. If there is a frac-out at the fault gouge and the Contractor is not able to resolve the issue, what is the course of action?



13. Is there enough length along the railroad alignment to stage and fuse the HDPE pipe in one string for pullback?
- i) Yes. 1,183 linear feet of HDPE will be installed per drawing C-101, and there is approximately 1,200 feet of staging length along the railroad alignment between the HDD exit point and Warren Creek Road.

END OF ADDENDUM

2/26/18
Date

Signature

MAD RIVER

SHEET GENERAL NOTES

1. CONTRACTOR MAY UTILIZE ANY OR ALL OF THE AREA WITHIN THE DRILLING MUD AND SOLIDS DISPOSAL FOOTPRINT SHOWN ON THIS FIGURE.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND STOCKPILING TOPSOIL FROM THE FOOTPRINT PRIOR TO DISPOSAL OF ANY SPOILS, AS WELL AS DIGGING DOWN TO THE DEPTH NECESSARY TO CONTAIN THE SPOILS, UP TO BUT NOT EXCEEDING FOUR FEET FROM THE GROUND SURFACE. CONTRACTOR SHALL NOT EXCAVATE WITHIN THE DRIP LINE OF ANY EXISTING TREES.
3. CONTRACTOR SHALL ENCLOSE THE AREA WITH SIX-FOOT-TALL PORTABLE CHAIN LINK FENCING AS REQUIRED TO PREVENT ACCESS BY THE PUBLIC.
4. UPON PROJECT COMPLETION, CONTRACTOR SHALL UNIFORMLY SPREAD THE SPOILS THROUGHOUT THE CONTAINMENT AREA, COVER THE SPOILS WITH EXCAVATED SOIL, AND CAP WITH THE REMOVED TOPSOIL. CONTRACTOR SHALL THEN GRADE THE SITE TO UNIFORMLY TRANSITION INTO THE SURROUNDING TOPOGRAPHY AND BROADCAST SEED AND WEED-FREE RICE STRAW THROUGHOUT THE AREA PER THE SPECIFICATIONS.
5. CONTRACTOR IS RESPONSIBLE FOR SEDIMENT AND EROSION CONTROL FOR THIS AREA IF THIS OPTION IS CHOSEN.
6. CONTRACTOR WILL NOT BE REQUIRED TO WATER OR MAINTAIN THE SEED OR STRAW AFTER PLACEMENT.
7. CONTRACTOR MAY UTILIZE THIS OPTION OR ANY OTHER APPROPRIATE DISPOSAL METHOD.

(E) STORM DRAIN

305'

DRILLING MUD AND SOLID CUTTINGS DISPOSAL AREA

(E) STORM DRAIN INLET

(E) TRASH CAN AND BOLLARD

(E) PICNIC TABLE

(E) FIRE PIT

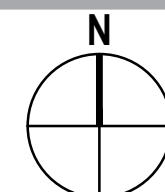
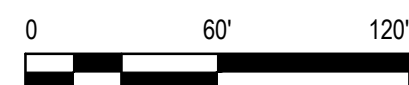
(E) 51" WATER MAIN

190'

(E) 16" WATER MAIN

HBMWD ESSEX CONTROL BUILDING
7270 WEST END RD, ARCATA, CA

WEST END RD



Humboldt Bay Municipal Water District
Mad River Pipeline Crossing Project
Drilling Mud and Solid Cuttings Disposal Area
HBMWD Essex Facility - Park 1
Bid Addendum #1

Project No. 8411162
Figure No. 1
Date 2/23/2018

Filename: G:\Legacy\Projects\01055 HBMWD\8411162 HBMWD-BLFG CSD PipelineCross-Phs 1\06-CAD\Phases 4-6\Figures\Mad River Crossing_Addendum 01_Drill Mud Disposal.dwg
Plot Date: 23 February 2018 - 11:23 AM

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. THE DISTRICT WILL INSTALL A 4-INCH HOT TAP ON THEIR EXISTING WATERLINE ON THE GLENDALE DRIVE/ENTRANCE SIDE OF THE PROJECT FOR THE CONTRACTOR'S USE. THE DISTRICT WILL HOT TAP THE LINE NEAR THE ENTRY PIT SITE AND WILL WORK WITH THE SELECTED CONTRACTOR TO FINALIZE THE EXACT HOT TAP LOCATION. THE DISTRICT WILL THEN INSTALL A 4-INCH FLANGED DUCTILE IRON SPOOL AND A METER FROM THE HOT TAP VALVE TO APPROXIMATELY THE GROUND SURFACE. THE FLOW METER WILL BE PROVIDED BY THE DISTRICT FOR TRACKING PURPOSES ONLY; THE CONTRACTOR WILL NOT BE REQUIRED TO PAY FOR WATER USAGE. THE CONTRACTOR SHALL THEN INSTALL A 4-INCH BACKFLOW PREVENTER AND ANY OTHER VALVES, FITTINGS, OR APPURTENANCES REQUIRED TO TRANSFER THE WATER FROM THIS POINT TO THE POINT OF USE. THE CONTRACTOR SHALL SUBMIT THE PROPOSED BACKFLOW PREVENTER FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO INSTALLING THE BACKFLOW PREVENTER OR USING THE CONNECTION.
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 BFLG 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.
 - 4.2.3. DISTRICT SHALL PERFORM BIRD SURVEY PRIOR TO THE START OF THE WORK AND SHALL FLAG ANY NESTS LOCATED ALONG WITH ANY REQ. EXCLUSION ZONES. CONTRACTOR SHALL MAINTAIN FLAGGING AS NECESSARY AND KEEP ALL EQUIPMENT AND PERSONNEL OUTSIDE EXCLUSION ZONES.

DUST AND EXHAUST CONTROL NOTES

- TO ADDRESS THE POTENTIAL FOR DUST AND EXHAUST GENERATION, THE CONTRACTOR IS REQUIRED TO IMPLEMENT THE FOLLOWING Bmps, WHICH APPLY TO GROUND DISTURBING MAINTENANCE ACTIVITIES AND EQUIPMENT EXHAUST.
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 0.99998575 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 'ACS254', AN NGS HPGN NETWORK POINT IN ARCATTA (2010.0 EPOCH). VERTICAL CONTROL IS BASED ON NGS PID 'LV0608', NAVD 88 DATUM.
 3. ORTHOPHOT 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 		 <p>GHD Inc. 718 Third Street Eureka California 95501 USA T 1 707 443 8326 F 1 707 444 8330 W www.ghd.com</p>	Drawn S. DAVIS Designer N. STEVENS Drafting Check P. KASPARI Design Check P. KASPARI Project Manager P. KASPARI Date 1/12/2018 This document shall not be used for construction unless signed and sealed for construction. Scale AS NOTED	Client HUMBOLDT BAY MUNICIPAL WATER DISTRICT Project MAD RIVER PIPELINE CROSSING Title GENERAL NOTES Project No. 8411162 Original Size ANSI D Sheet No. G-003 Sheet 3 of 11
B ADDENDUM #1 NS PK 2/23/18 A ISSUE FOR BID NS PK 2/9/18 No. Issue Drawn Approved Date					

Hydrofracture Calculation Input Parameters

Owner: HBMWD
 Project: Mad River HDD Crossing
 Design Level: 100%

Date: 2/7/2018
 Engineer: MSW

Geotechnical Properties:

	Soil Layer 1 Channel B	Soil Layer 2 Terrace A	Soil Layer 3 Residual S	Soil Layer 4 Fault Gouge	Soil Layer 5 W Bedrock	Units
Elevation at Entry	100	See	See	See	See	ft
Elevation at Exit	100	Graph	Graph	Graph	Graph	ft
Friction Angle (ϕ) =	36	0	0	0	0	deg
Cohesion (c) =	0	1200	3000	4000	6000	lb/ft ²
Shear Modulus (G) =	75000	50000	75000	150000	200000	lb/ft ²
γ_{water}^* =	62.4	62.4	62.4	62.4	62.4	lb/ft ³
Soil Bulk Unit Weight (γ)	125	120	125	130	140	lb/ft ³
Effective Submerged Unit Weight (γ')	62.6	57.6	62.6	67.6	77.6	lb/ft ³
Total Effective Stress (σ'_o)						
Groundwater Elevation	30					ft
Soil Bulk Unit Weight (γ)						

Drilling Fluid Properties:

		Units
Mud Weight (γ_{mud})	11	lb/gal
Viscosity (μ)	80	cp
Yield Point (τ_y)	25	lb/100 ft ²
Flow Rates:		
Pilot Bore	250	gal/min
1st Reaming Pass (R1)	300	gal/min
2nd Reaming Pass (R2)	400	gal/min
3rd Reaming Pass (R3)	400	gal/min
4th Reaming Pass (R4)	200	gal/min
Pullback	200	gal/min

Bore Properties:

	Diameter (in)	Radius (ft)
Pilot Bore (R0)	12	0.5
1st Reaming Pass (R1)	20	0.8333333
2nd Reaming Pass (R2)	27	1.125
3rd Reaming Pass (R3)		0
4th Reaming Pass (R4)		0
Drill Pipe (Rd)	5.5	0.2291667
Product Pipe (Rp)	18	0.75
Final Bore Radius	27	1.125

Hydrofracture Risk Analysis for the Pilot Bore of the HBMWD Water Line Crossing of the Mad River

