PLAN REVIEW CHECKLIST FOR HDD INSTALLATION

GENERAL

1. Given the recent increase in HDPE pipe installation by Horizontal Directional Drilling, or HDD, this checklist has been created to assist the design and plan review process where HDD is proposed.
2. HDD is the trenchless installation of a pipe through a drilled tunnel under an obstacle such as a waterway, road, railroad, etc. HDD is not the same as Bore and Jack.
3. HDD installations must be designed by an engineer, and are typically done using HDPE pipe. See below for minimum design requirements.
4. The engineer will need to verify their design by using a tool such as the Plastics Pipe Institute's "BoreAid" (ppiboreaid.com) and show applicable design parameters in plan/ profile, including entry and exit pits, pipe laydown area, etc.
5. HDD installations may or may not include a casing pipe. Using a casing pipe is preferred when feasible.
    a. If a casing pipe is used, the casing pipe shall be designed to withstand the pulling forces of the installation. Generally, DR11 HDPE should withstand these forces but shall be confirmed by the design engineer.
    b. If a casing is not used, the carrier pipe shall be designed to withstand the pulling forces of the installation as well as an allowable pipe scour (resulting from the pipe pull) which can reduce the pressure class of the pipe. Generally, DR9 HDPE pipe should suffice to accommodate the pull forces and any damage due to scour but shall be confirmed by the design engineer. When pulling a carrier pipe through rocky terrain during an HDD installation, ensure that you use HDPE DR9 pipe.

PLAN VIEW SHALL INCLUDE THE FOLLOWING:

1. A diagram of the laydown area for HDD pipe pulling.
2. "HDD POINT OF ENTRY ANGLE" and "HDD POINT OF EXIT ANGLE" locations.
3. All proposed and existing easements.
4. Boundaries of any CWQZ's in the area.
5. The center line of creeks or rivers.
6. Crossings of other utilities.
7. The "Interception Point" where the pipe goes from open cut to HDD installation.
8. Install a casing pipe (if feasible) that's two sizes larger than the carrier pipe.

PLAN REVIEW CHECKLIST FOR HDD INSTALLATION

PROFILE VIEW SHALL INCLUDE THE FOLLOWING:

1. "HDD POINT OF ENTRY ANGLE" and "HDD POINT OF EXIT ANGLE" locations.
2. The "Interception point" where the pipe goes from open cut to HDD installation, including CL elevation.
3. Clarify "DIPS" pipe (Example callout: *"Prop. 16" Reclaimed WL DR-11 (DIPS) HDPE"*)
4. "PVI station and PVI elevation" at the beginning of each curve section in the profile.
5. "Length" of each curve section in the profile.
6. "Radius of Curvature" of each curve section in the profile.
7. "Pipe Slope %" for each pipe section in the profile.
8. Show casing pipe if one is required.
9. Show the erosion hazard zone (EHZ) and future incision depth line.
10. The total length of the HDD pull and the total length of pipe needed for the HDD crossing.

OVERALL HDD LAYOUT SHEET

1. In addition to the typical Plan and Profile sheets, an "OVERALL HDD LAYOUT" sheet should also be included in the plans for each HDD run. (see example sheet at the end of this guide)

   This sheet should include:

   a. Total HDD length
   b. Geotechnical bore information and water table elevation
   c. HDD point of entry and exit stations with elevations
   d. HDD interception points
   e. Entry and exit angles
   f. % Slopes and radius of curvature
   g. Vertical clearances to existing utilities

2. The plans should have geotechnical data to know what material they're drilling through. This should either be shown in the overall HDD layout sheet, a geotechnical data report (GDR), or both. For a large HDD installation (e.g., larger than 12" diameter, or longer than 500'), the engineer should follow and comply with the UCM Section 2.9.5, Requirements for Geotechnical Investigations for Pipeline Projects.
3. A Special Specification for HDD needs to be included in the Project. For a Site Plan project, include Special Specification SS515 within the plan set using 11x17 sheet format. For a CIP project, SS515 shall be included in the Project Manual, not the plan set.
4. Make sure the plans are providing an easement, at the bore pit location the width of the easement should be twice the depth as the width.

PLAN REVIEW CHECKLIST FOR HDD INSTALLATION

5. A CAV assembly and gate valve shall be installed on both sides of the HDD crossing. (See Figs. 1&2, Pgs. 4&5, for example HDD end connections.)
6. The following General Notes shall be included on all sheets showing HDD installation:
   a. **"INSTALLATION OF PIPE BY HORIZONTAL DIRECTIONAL DRILLING SHALL BE IN FULL COMPLIANCE WITH THESE PLANS AND APPLICABLE COA SPECIFICATIONS. PRIOR TO BEGINNING ANY HDD WORK, THE CONTRACTOR SHALL PROVIDE AND RECEIVE APPROVAL FOR ALL REQUIRED SUBMITTALS THAT PERTAIN TO THE HDD WORK."**
   b. **"CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES ALONG HDD PATH PRIOR TO BEGINNING OF CONSTRUCTION."**
   c. **"LOCATIONS OF HDD POINT OF ENTRY AND POINT OF EXIT SHOWN ARE APPROXIMATE. CONTRACTOR MAY ADJUST HDD ALIGNMENT GEOMETRY AS ACCEPTABLE TO THE ENGINEER AND AUSTIN WATER. ANY ADJUSTMENTS SHALL BE COMPLETELY AND ACCURATELY DOCUMENTED IN THE PROJECT AS-BUILT DRAWINGS. ADJUSTMENTS TO THE HDD ALIGNMENT GEOMETRY FOR THE CONTRACTOR'S CONVENIENCE OR SPECIFIC MEANS AND METHODS SHALL BE AT NO ADDITIONAL COST TO THE OWNER."**
   d. **"ANY GEOTECHNICAL DATA OVERLAIN HEREIN IS FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR TO REFER TO THE PROJECT GBR/GDR AS MAIN SOURCE OF INFORMATION."**

SPECIAL/ STANDARD DETAILS

Include the following Special and Standard Details in the plans:

1. HDPE MJ Adapter (currently Special, to become a Standard)
2. Concrete In-Line Anchor (if needed, Special)

SPECIAL/ STANDARD SPECIFICATIONS

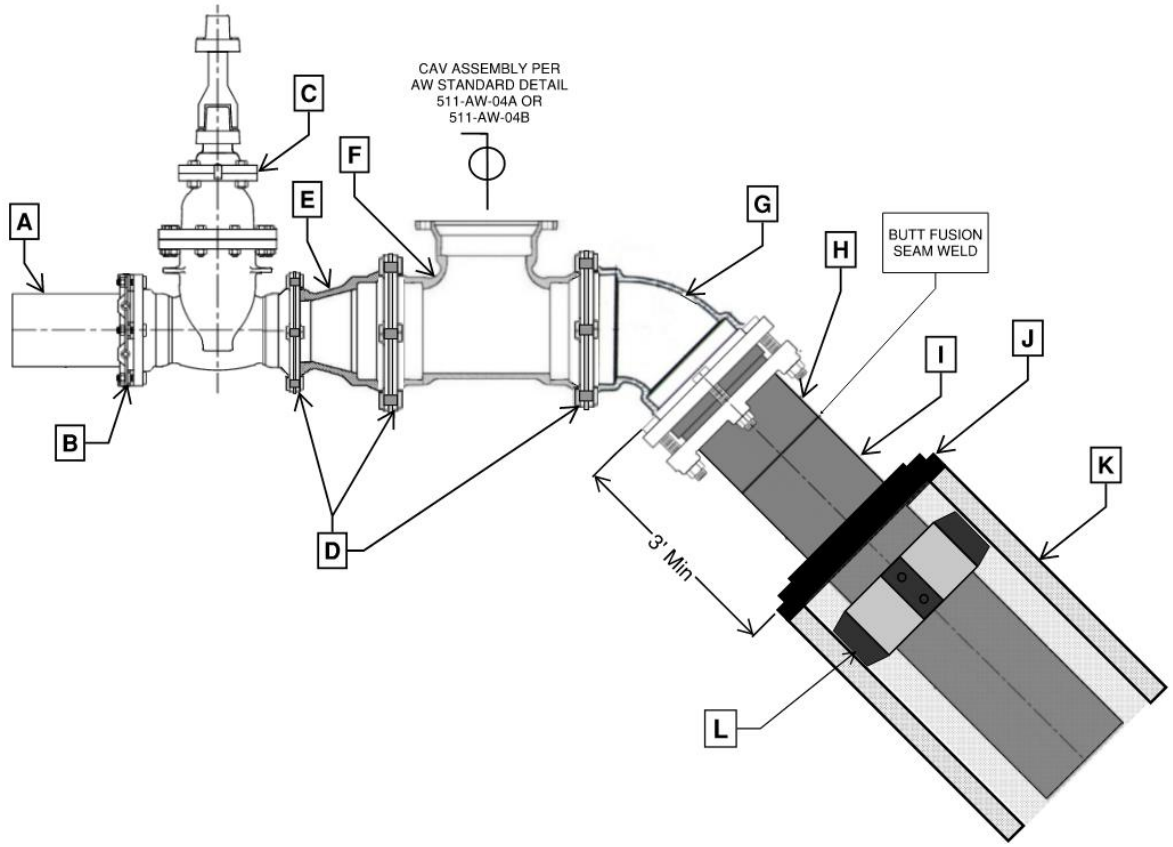
For a Site Plan project, include the following Special Specs within the plan set:

1. SS513 HDPE Pipe and Fittings, 4-inch and Larger (currently Special, to become Standard Spec Item 513)**
2. SS515 Horizontal Directional Drilling (Special)**

**For a CIP project, SS513 and SS515 shall be included in the Project Manual, not the plan set.

PLAN REVIEW CHECKLIST FOR HDD INSTALLATION

FIG. 1: HDD END CONNECTIONS (TRANSITION FROM HDPE TO NON-HDPE PIPE)



A. DI OR PVC PIPE (MUST BE FULLY RESTRAINED TO ACCOMMODATE POISSON FORCES, SEE: TABLE 2)

B. MJ JOINT RESTRAINT

C. MJ VALVE (GATE VALVE - POTABLE/ RECLAIMED OR PLUG VALVE – FORCE MAIN)

D. FOSTER ADAPTER (FOR TYPE I CAV) OR PE x PE DI SPOOL W/ RESTRAINT (FOR TYPE II CAV)

E. MJ x MJ DI REDUCER

F. MJ x MJ x FL AIR ACCUMULATOR TEE w/ CAV ASSEMBLY, TYPE I OR TYPE II, PER AW STANDARD DETAIL 511-AW-01A (POTABLE/ RECLAIMED) OR 511-AW-01B (FORCE MAIN)

G. MJ x MJ DI BEND

H. HDPE MJ ADAPTER

I. HDPE CARRIER PIPE, DR9 (WITHOUT CASING PIPE) OR DR11 (IF CASING PIPE IS REQUIRED)

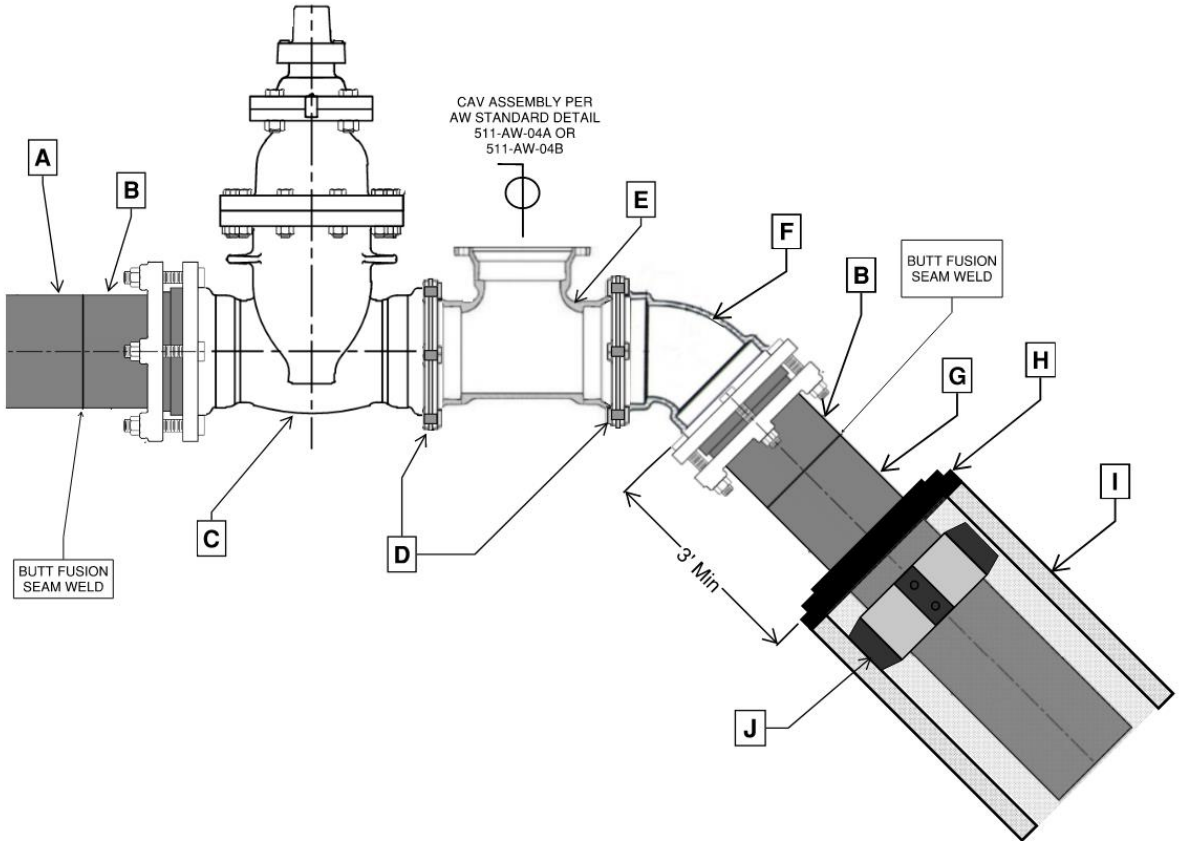
J. END SEAL FOR CASING PIPE

K. HDPE CASING PIPE, DR11 (IF REQUIRED)

L. CASING SPACER (IF REQUIRED)

PLAN REVIEW CHECKLIST FOR HDD INSTALLATION

FIG. 2: HDD END CONNECTIONS (ALL HDPE PIPE)



A. NEW HDPE PIPELINE

B. HDPE MJ ADAPTER

C. MJ VALVE(GATE VALVE - POTABLE/ RECLAIMED or PLUG VALVE – FORCE MAIN)

D. FOSTER ADAPTER (FOR TYPE I CAV) OR PE x PE DI SPOOL W/ RESTRAINT (FOR TYPE II CAV)

E. MJ x MJ x FL AIR ACCUMULATOR TEE w/ CAV ASSEMBLY, TYPE I OR TYPE II, PER AW STANDARD DETAIL 511-AW-01A (POTABLE/ RECLAIMED) OR 511-AW-01B (FORCE MAIN)

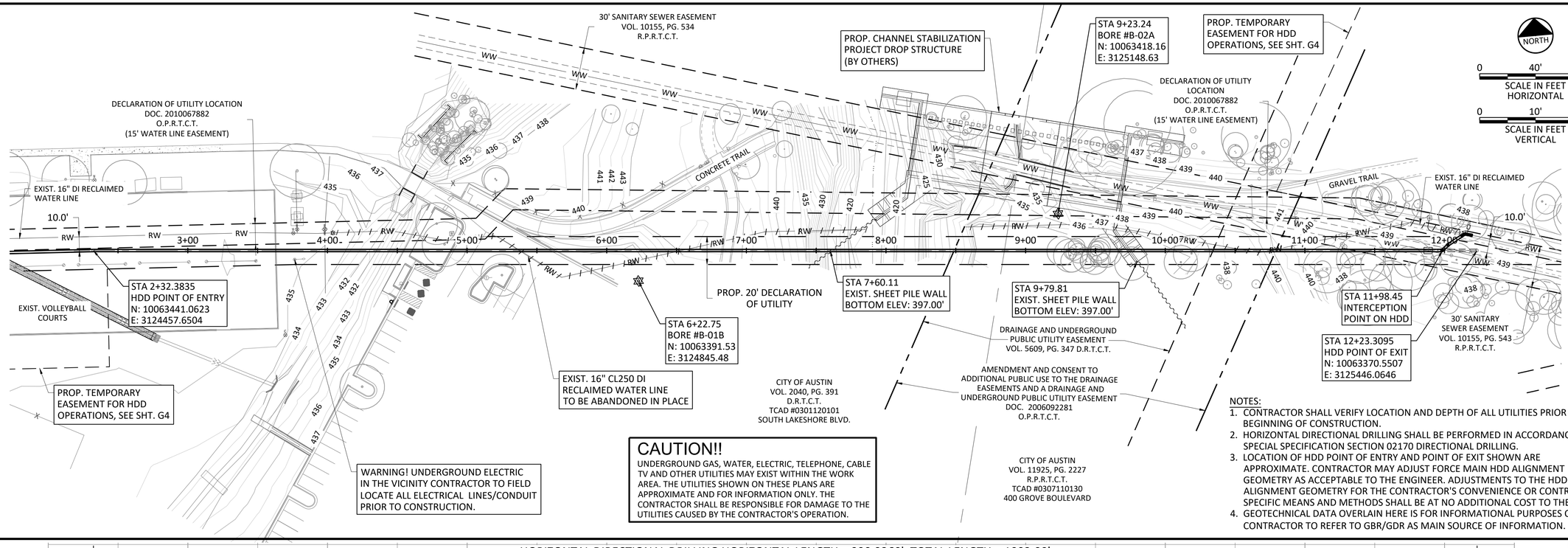
F. MJ x MJ DI BEND

G. HDPE CARRIER PIPE, DR9 (WITHOUT CASING PIPE) OR DR11 (IF CASING PIPE IS REQUIRED)

H. END SEAL FOR CASING PIPE

I. HDPE CASING PIPE, DR11 (IF REQUIRED)

J. CASING SPACER (IF REQUIRED)



Freese and Nichols, Inc.
Texas Registered Engineering Firm F-2144

STATE OF TEXAS
ERIN C. MILLS
120172
LICENSED
PROFESSIONAL ENGINEER
09/17/2024

FREESE NICHOLS
10431 Morado Circle, Suite 300
Austin, Texas 78759
Phone - (512) 617-3100
Web - www.freese.com

CITY OF AUSTIN, TEXAS
KRIEG FIELDS RECLAIMED WATER LINE
PERMANENT RESTORATION
CIVIL
RECLAIMED WATER LINE PLAN AND PROFILE
OVERALL HDD LAYOUT

F&N JOB NO.	AU121296
DATE	09/04/24
DESIGNED	ECM
DRAWN	DDH
REVISED	
CHECKED	DTB
FILE NAME	WTU-AU1-PP-02.dwg

NO. | ISSUE | BY | DATE

VERIFY SCALE
Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET
RW-04
SEQ.

100% DESIGN SUBMITTAL

ACAD Rel: 24.2s (LMS Tech)
Filename: N:\WTU\Drawings\WTU-AU1-PP-02.dwg
Last Saved: 9/9/2024 3:25 PM Saved By: 02568

Plot Date: 9/17/2024 10:01 AM Plot By: 02568 Filename: N:\WTU\Drawings\WTU-AU1-PP-02.dwg