

The sanitary sewer design concept has been reviewed and approved for compliance with the New Castle County Standard Specifications and the Ten State Standards. This review and approval is limited solely to the issue of compliance with the aforementioned standards and specifications, and New Castle County shall not be responsible for any other aspect or matter related to the design or installation of the proposed sanitary sewer. *Dale H. 1/4/17*

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PREPARED BY THE CONSULTING FIRM OF  
**WR&A**  
WHITMAN, REQUARDY & ASSOCIATES, LLP  
ENGINEERS • ARCHITECTS • PLANNERS  
EST. 1952

PROFESSIONAL SEAL  
No. 794  
DELAWARE  
REGISTERED PROFESSIONAL ENGINEER

RECOMMENDED  
*J.M.M.*  
DATE 12/19/2011  
UR-07

36" X 36" X 3/16" COPPER CONTRACT PLATE 12/22/2011 3:53:27 PM

<p><b>DELAWARE DEPARTMENT OF TRANSPORTATION</b></p>	ADDENDUMS / REVISIONS	<p>NOT TO SCALE</p> <p>US 301, SR 896 TO SR 1</p>	CONTRACT	BRIDGE NO.	<p>UTILITY CONSTRUCTION DETAILS</p>	SHEET NO.
			T20091308	DESIGNED BY: J.A.S. / K.A.H.		776
			COUNTY	CHECKED BY: J.M.M.		TOTAL SHTS.
			NEW CASTLE			875



**Z-580** MANHOLE\_PULLBOX

**ITEM**    **MATERIAL DESCRIPTION**    **STOCK NO.**    **MH18X6X7P**

A	PRE-CAST RECTANGULAR MANHOLE INSIDE DIMENSION 18" X 8" X 7'H OUTSIDE DIMENSION 17'-4" X 7'-4" X 8'H	0113-0178	1
B	MANHOLE RIM	4218-1018	1
C	MANHOLE COVER	4203-3534	1
D	INCREMENT RING, 8"	0113-0194	1

**NOTES:**

- MH18X6X7P is the approved manhole for use with all standard primary cables (Z-829) and splices (Z-814). The inside dimensions are 18" X 8" X 7'H. This is a non-stacked material; it must be ordered by PMR, and can be delivered to the excavation site.
- A mastic compound for sealing the 2 manhole sections will be provided by the manufacturer at the time of delivery.
- Duct banks are 6" terminators (pvc waterproof sealing ring).
- Pulling irons are centered on the narrow walls of the bottom section and approximately 12" off the floor.
- 8-5/8" ceiling inserts are strategically placed.
- 2-4/0 bare cu wires (w/n 3330-9220) will be inserted through the wall of the bottom section. One (1) on each long wall for internal and external grounding purposes. At a minimum, the tails should be 18" internally and 30" externally. See Z-805 for grounding details.
- The 'lump' hole is 4" deep and approximately 12" in diameter, and located in the center.

PHI ACE / DP    POWER DISTRIBUTION STANDARDS    PRE-CAST MANHOLE

**Z-580.1** MANHOLE\_ACC

**MATERIAL DESCRIPTION**    **STOCK NO.**    **MH-RIM**    **MH-COVER**    **INC-RING**

MANHOLE RIM	4218-1018	1		3	8	9
MANHOLE COVER	4203-3534		1			
INCREMENT RING, 3"	0113-0188			1		
INCREMENT RING, 6"	0113-0194			1	1	
INCREMENT RING, 8"	0113-0202					1

**NOTE:**  
Increment rings are available in 3", 6" or 8" thickness. These rings shall be used to adjust the manhole rim to match the final grade surface.

PHI ACE / DP    POWER DISTRIBUTION STANDARDS    MANHOLE COMPONENTS

**Z-805**

**MATERIAL DESCRIPTION**    **STOCK NO.**    **GRD-PADMT**    **GRD-4X**

RGD, GROUND, GALV., 5/8" x 4' MIN. (8' REQ.)	9800-0113	8	1
CONNECTOR, GROUND RGD	3825-0015	1	
#2 S.D. CU WIRE	3330-0119	8	
COUPLING, GROUND ROD, THREADLESS	9900-3482	5	1

**NOTES:**

- All driven grounds on delta or ungrounded wye connected circuits shall have a measured resistance of 25 ohms or less.

PHI ACE / DP    POWER DISTRIBUTION STANDARDS    GROUNDING OF PADMOUNTED EQUIPMENT

**Z-805.1**

**MATERIAL DESCRIPTION**    **STOCK NO.**    **GRD-MH-IN**    **GRD-MH-OUT**

2C 3/2"-250 GROUND ROD CONNECTOR	0103-0635	2	
COUPLING, GROUND ROD, THREADLESS	9900-3482	10	
RGD, GROUND, GALV., 5/8" x 4'	9800-0113	12	
4/0-4/0 WIRE CONNECTOR, BRONZE	3825-0088		2
4/0 CU CBL, 18 STD. S.D.	3400-2212		30
4/0 CU BARE S.D.	3330-9220	30	

**NOTES:**

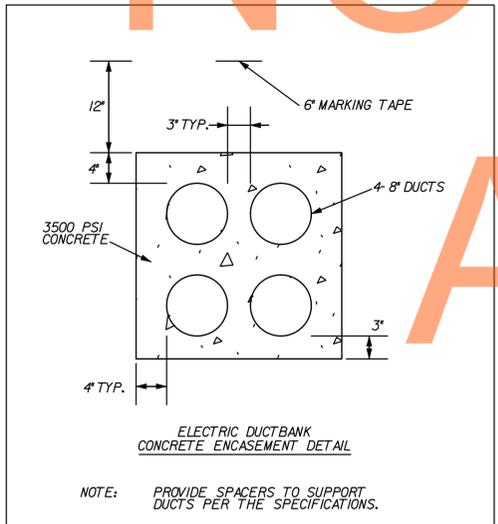
- (S.N. 3330-9220) will be inserted through both walls by the manufacturer. A 4/0 Cu bare (minimum 30" external and 18" internal) tail will be provided for the ground connections.
- Both grounding locations (GRD-MH-IN and GRD-MH-OUT) shall be "tied" together. The external ground locations should be connected with a 4/0 bare copper s.d. (S.N. 3330-9220). The internal grounds should be connected with a 4/0 copper covered wire 18 str. s.d. (S.N. 3400-2212).
- GRD-MH-IN shall be attached to the wall rocks when the hole is rock-out, see Z-582.
- All driven grounds on delta or ungrounded wye connected circuits shall have a measured resistance of 25 ohms or less.

PHI ACE / DP    POWER DISTRIBUTION STANDARDS    MANHOLE GROUNDING

DRAFT

NOT FOR BIDDING

AUGUST 2015



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ADDENDUMS / REVISIONS	

**US 301,  
SR 896 TO SR 1**

CONTRACT T200911308	BRIDGE NO.
COUNTY NEW CASTLE	DESIGNED BY: SES CHECKED BY: BRT

**UTILITY RELOCATION  
ELECTRICAL DETAILS**





MISS UTILITY OF DELMARVA  
 CALL BEFORE YOU DIG  
 1-800-282-8555 (IN DEL.)  
 PLEASE GIVE TWO WORKING DAYS  
 ADVANCE NOTICE

THIS DRAWING DOES NOT INCLUDE NECESSARY  
 COMPONENTS FOR CONSTRUCTION SAFETY.

ALL CONSTRUCTION MUST BE DONE IN COMPLIANCE WITH  
 THE OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970  
 AND ALL RULES AND REGULATIONS THERETO APPURTENANT.

## GENERAL CONSTRUCTION NOTES

### ARTESIAN WATER COMPANY NOTES:

- BIDS ARE TO BE BASED ON THE DRAWINGS PROVIDED. THIS IS TO INCLUDE ALL RESTORATION NOTED ON THE DRAWING.
- ALL MATERIAL AND INSTALLATION SHALL CONFORM TO ARTESIAN WATER COMPANY, INC. SPECIFICATIONS AND 10 STATES STANDARDS.
- DEPTH OF THE PROPOSED WATER MAIN SHALL BE A MINIMUM OF 42" FROM FINISHED GRADE TO TOP OF PIPE, WHEN APPLICABLE.
- DEPTH OF THE PROPOSED WATER MAIN MAY VARY DUE TO EXISTING FACILITIES.
- 18" VERTICAL CLEARANCE BETWEEN ALL UTILITIES IS TO BE MAINTAINED.
- 10' HORIZONTAL SEPARATION IS TO BE MAINTAINED BETWEEN EXIST. SANITARY SEWER AND PROPOSED WATER MAIN.
- ALL RESTORATION SHALL BE TO DeIDOT'S UTILITIES DESIGN MANUAL AND STANDARD CONSTRUCTION DETAILS.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTACT THE STATE INSPECTOR FOR STATE RELEASED TYPE C SELECT BORROW.
- REMOVE ALL VALVE BOXES FROM ABANDONED MAINS AFTER THE NEW WATER MAIN HAS BEEN CHARGED.
- EXISTING UTILITIES ARE SHOWN IN ACCORDANCE WITH BEST AVAILABLE INFORMATION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND ALLOW FOR THEIR LOCATION.
- THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE EXISTING UTILITIES AND MAINTAIN UNINTERRUPTED SERVICE AND ANY DAMAGE DONE TO THEM DUE TO HIS NEGLIGENCE SHALL BE IMMEDIATELY AND COMPLETELY REPAIRED AT HIS EXPENSE.
- TEMPORARY 2" BLOW OFFS ARE REQUIRED AT ALL TIE INS, ON THE DEAD END SIDE OF THE WATER VALVE. THE CONTRACTOR IS TO REMOVE BLOW OFF AFTER FLUSHING IS COMPLETE.
- VACUUM EXCAVATION METHOD IS TO BE USED FOR TEST HOLES WHERE EXISTING UTILITIES CROSS PROPOSED WATER SERVICES IN PAVING.

## EXISTING FEATURES

AWC WATER	
	EXISTING WATER MAIN
	MAIN LINE VALVE
	HYDRANT
	CAP
	SLEEVE
	CASING
	PLUG
	WATER SERVICE
	AWC EASEMENT LINE
	ABANDONED WATER MAIN
	HORIZONTAL BEND
	VERTICAL BEND

DELDOT	
	DRAINAGE PIPE
	CATCH BASIN
	RIGHT-OF-WAY LINE
	EDGE OF PAVEMENT
	EASEMENTS

UTILITY	
	GAS LINE
	SEWER LINE
	SEWER MANHOLE
	AERIAL LINE
	AERIAL POLE
	AERIAL POLE GUIDE WIRE

## PROPOSED FEATURES

AWC WATER	
	WATER MAIN
	MAIN LINE VALVE
	HYDRANT
	CAP
	SLEEVE
	CASING
	PLUG
	WATER SERVICE
	HORIZONTAL BEND
	VERTICAL BEND

DELDOT	
	DRAINAGE PIPE
	CATCH BASIN
	RIGHT-OF-WAY LINE
	EDGE OF PAVEMENT
	EASEMENTS
	CLEAR ZONE
	DENIAL OF ACCESS

UTILITY	
	GAS LINE
	SEWER LINE
	SEWER MANHOLE
	AERIAL LINE
	AERIAL POLE
	AERIAL POLE GUIDE WIRE

DRAFT  
NOT FOR BIDDING  
AUGUST 2015

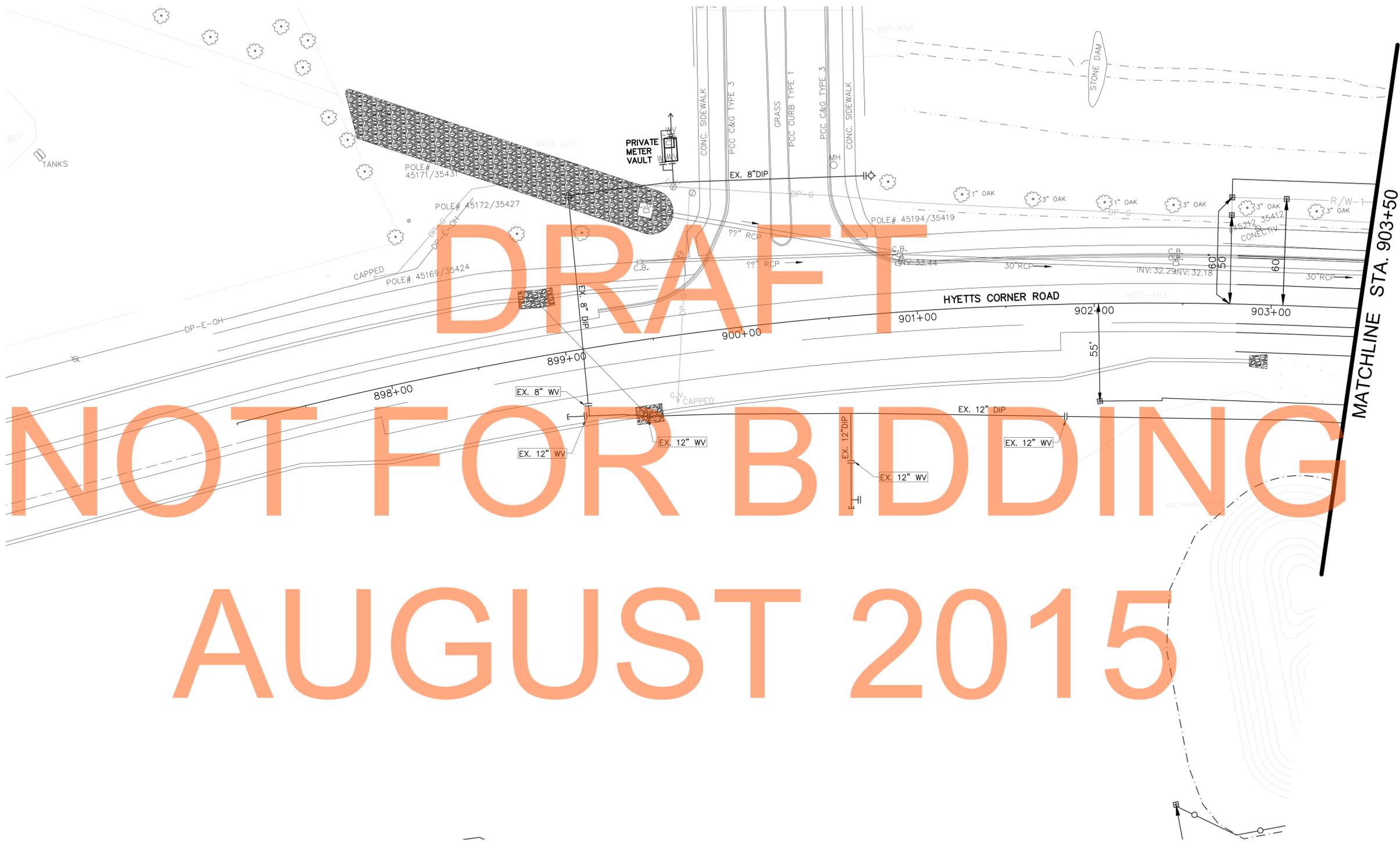
ADDENDUMS / REVISIONS

US 301,  
SR 896 TO SR 1

CONTRACT T200911308	BRIDGE NO.
COUNTY NEW CASTLE	DESIGNED BY: WFT
	CHECKED BY: CGH

UTILITY RELOCATION  
PLAN

UR-12
SHEET NO. 781
TOTAL SHTS. 875



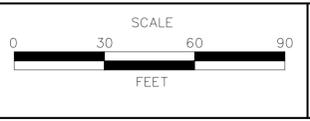
DRAFT

NOT FOR BIDDING

AUGUST 2015

MATCHLINE STA. 903+50

ADDENDUMS / REVISIONS

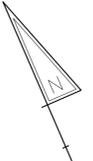


US 301,  
SR 896 TO SR 1

CONTRACT	BRIDGE NO.
T200911.308	
COUNTY	DESIGNED BY: WFT
NEW CASTLE	CHECKED BY: CGH

UTILITY RELOCATION  
PLAN

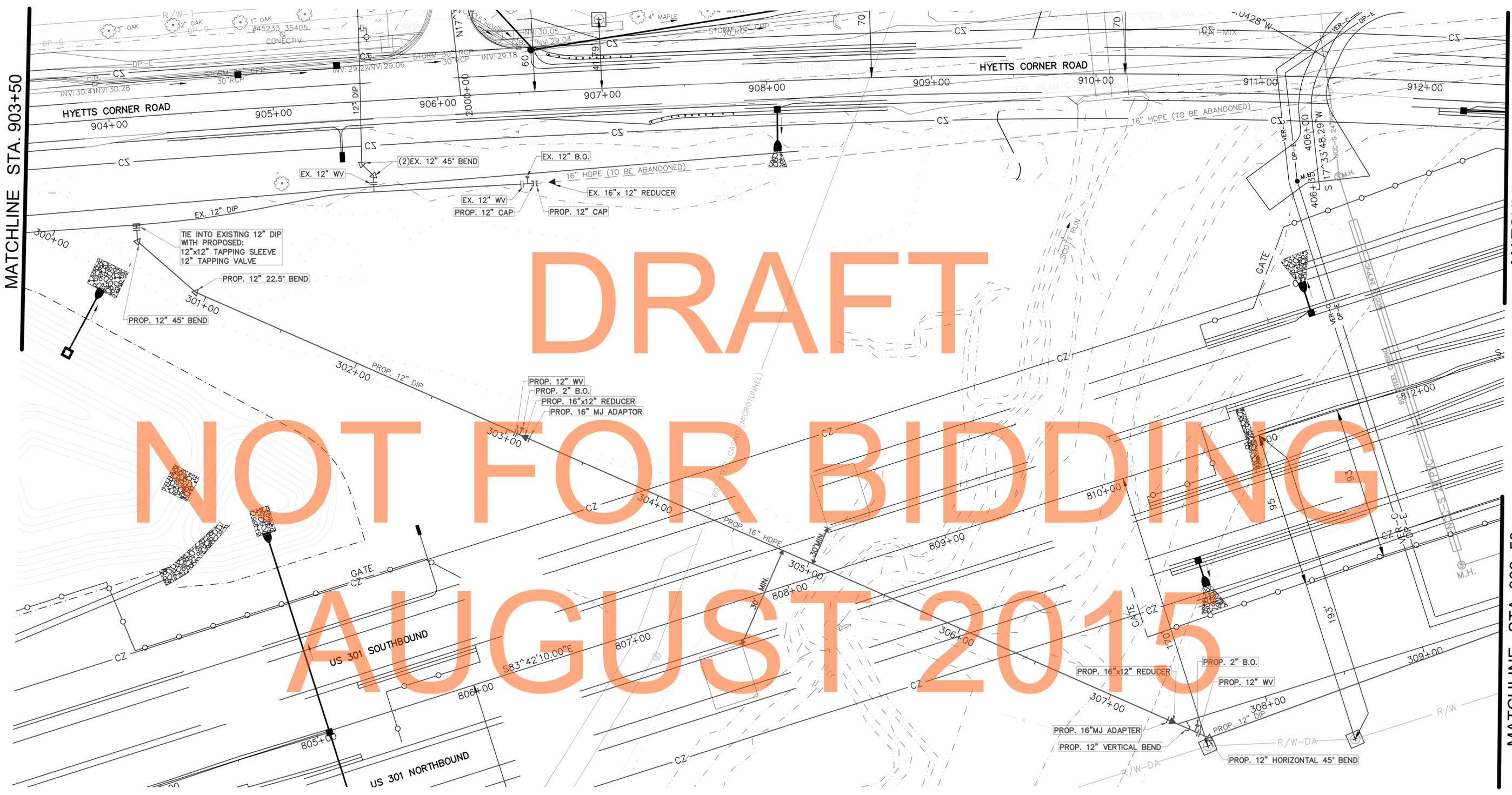
UR-13
SHEET NO.
782
TOTAL SHTS.
875



MATCHLINE STA. 903+50

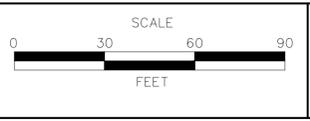
MATCHLINE STA. 912+50

MATCHLINE STA. 309+50



DRAFT  
NOT FOR BIDDING  
AUGUST 2015

ADDENDUMS / REVISIONS

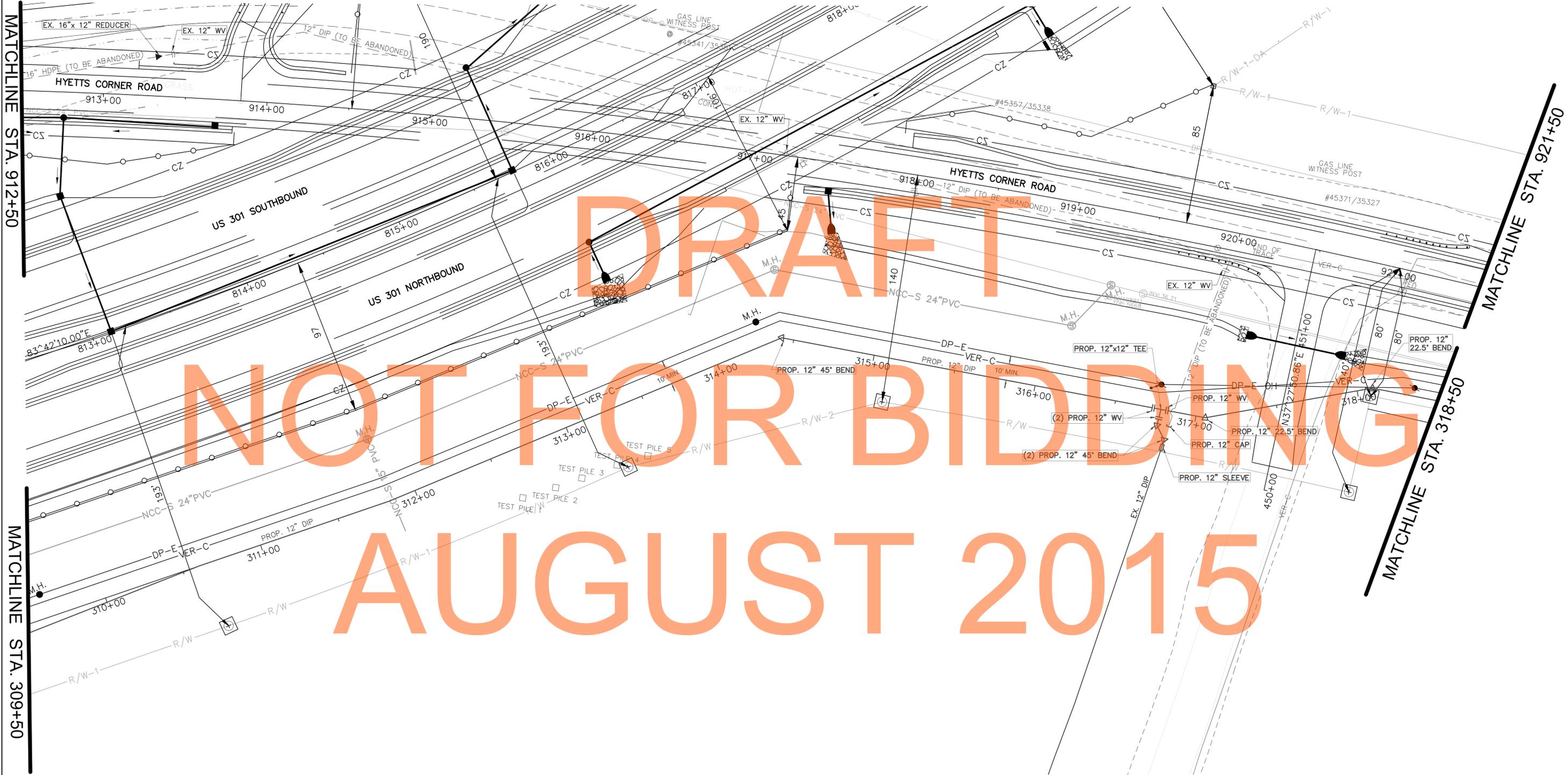
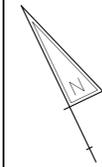


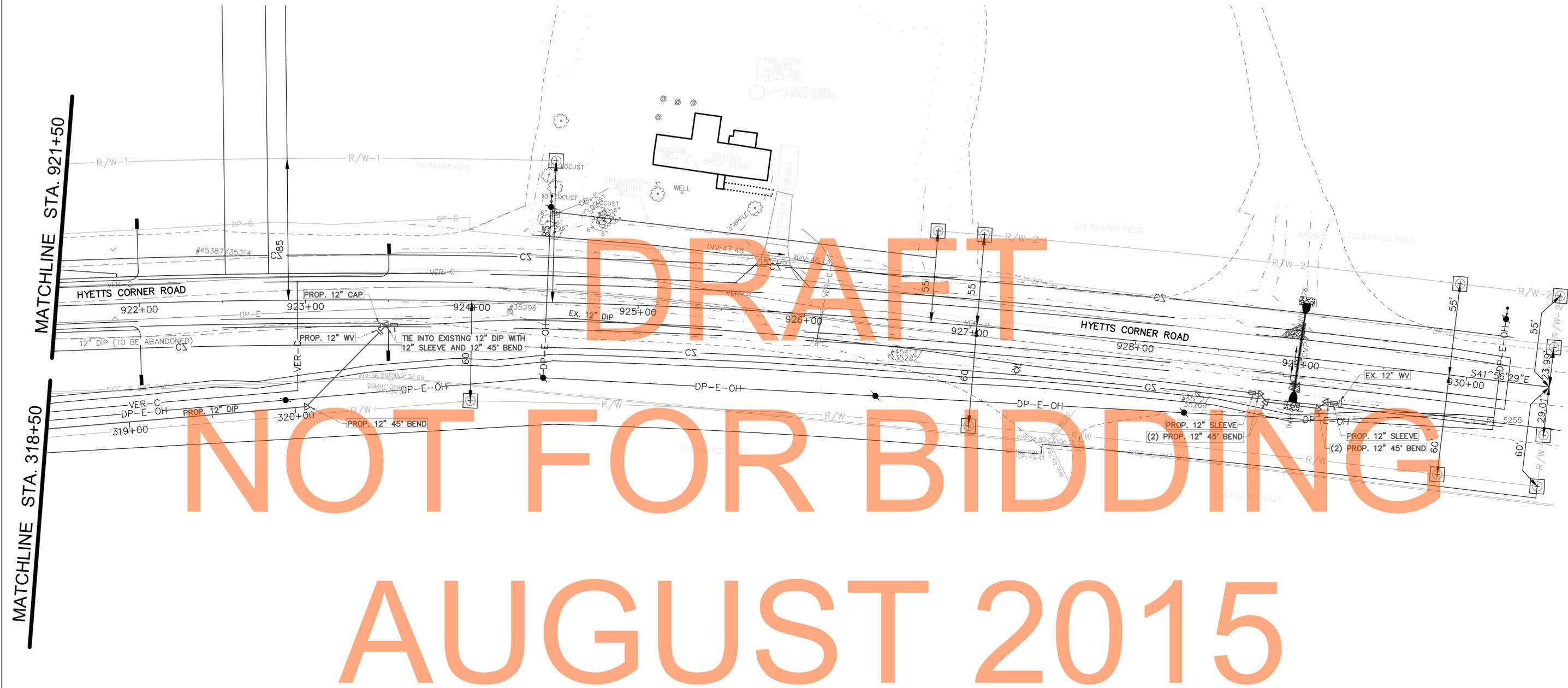
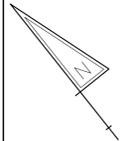
US 301,  
SR 896 TO SR 1

CONTRACT T200911308	BRIDGE NO.
COUNTY NEW CASTLE	DESIGNED BY: WFT
	CHECKED BY: CGH

UTILITY RELOCATION  
PLAN

UR-14
SHEET NO. 783
TOTAL SHTS. 875





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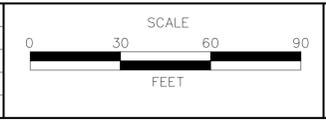
NOT FOR BIDDING

AUGUST 2015

MATCHLINE STA. 921+50

MATCHLINE STA. 318+50

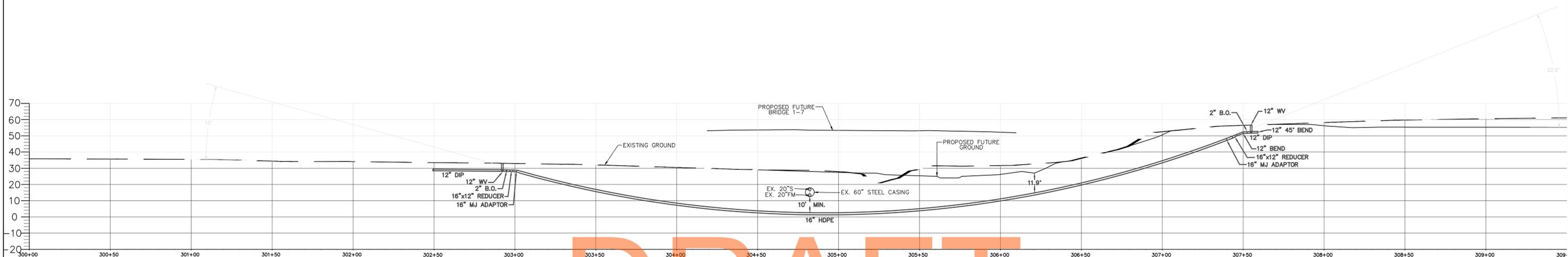
ADDENDUMS / REVISIONS	



US 301,  
SR 896 TO SR 1

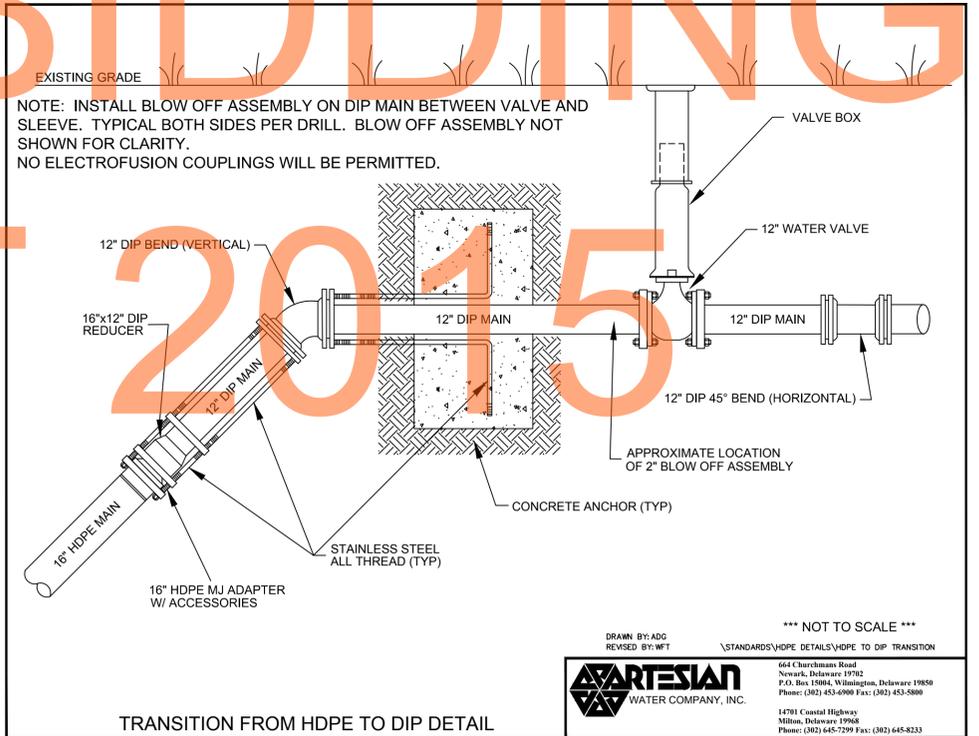
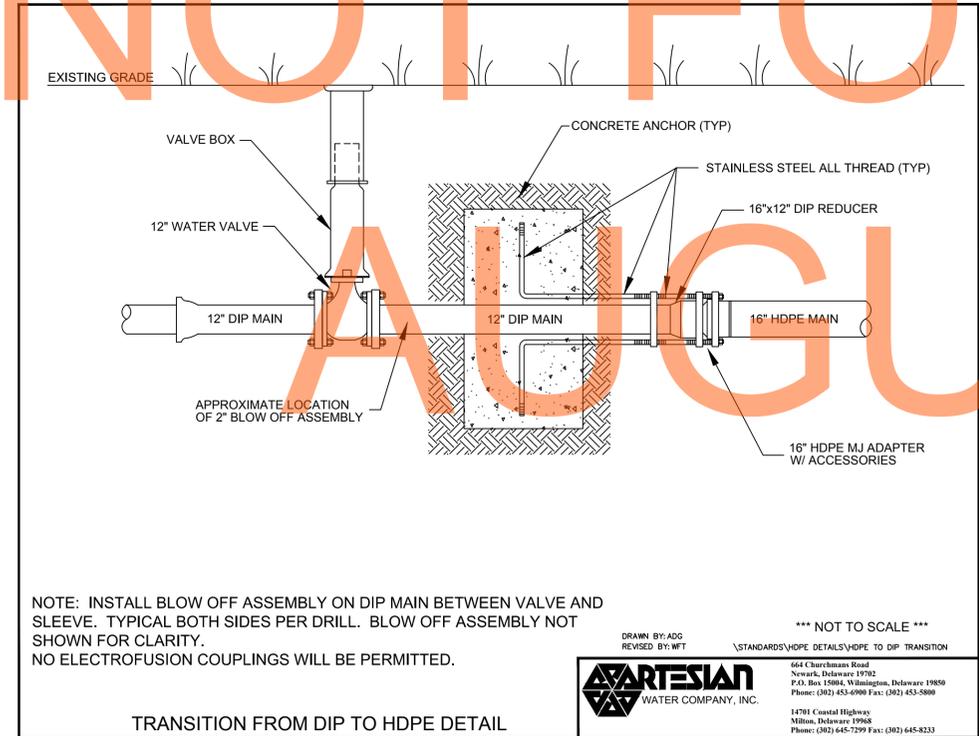
CONTRACT T200911308	BRIDGE NO.
COUNTY NEW CASTLE	DESIGNED BY: WFT
	CHECKED BY: CGH

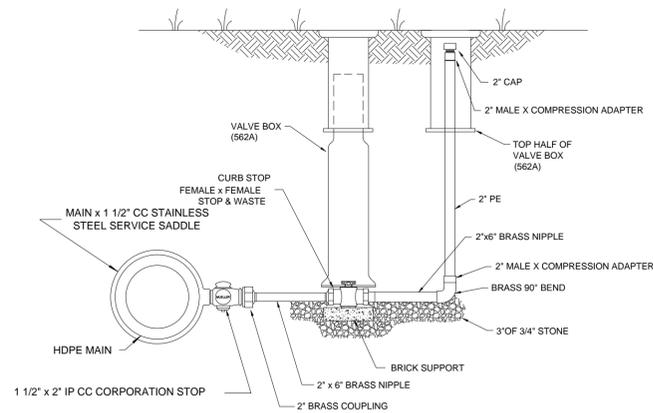
UTILITY RELOCATION  
PLAN



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NOT FOR BIDDING





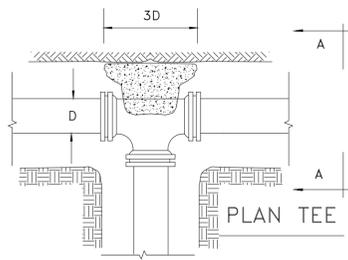
2" BLOW OFF DETAIL  
TAPPED FROM SIDE OF MAIN  
NOT TO SCALE 1/9/06

DRAFT

NOT FOR BIDDING

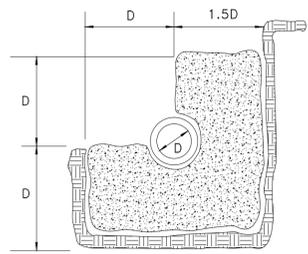
AUGUST 2015

AWCBS - 5

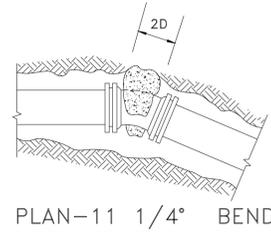


TEE

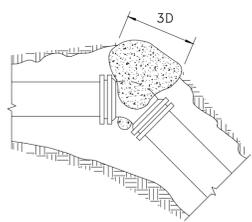
PIPE SIZE "D"	1.5D	2D	3D
20"	30"	40"	60"
16"	24"	32"	48"
12"	18"	24"	36"
8"	12"	16"	24"
6"	9"	12"	18"
4"	9"	12"	18"



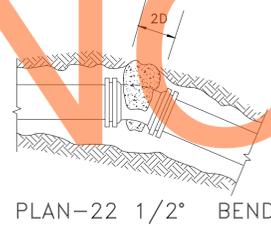
SECTION A-A



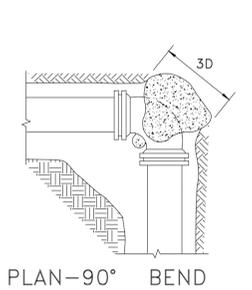
PLAN-11 1/4° BEND



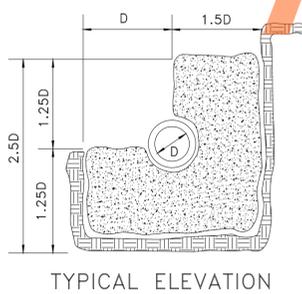
PLAN-45° BEND



PLAN-22 1/2° BEND

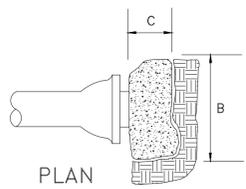


PLAN-90° BEND

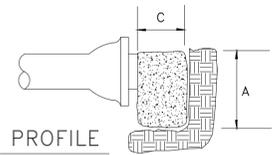


TYPICAL ELEVATION

AWCBS - 2



PLAN



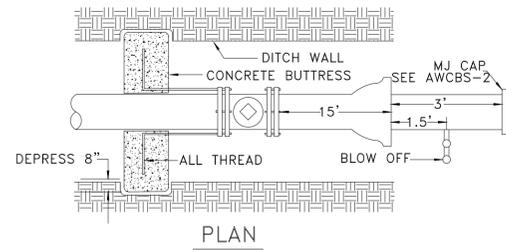
PROFILE

PLUG OR CAP

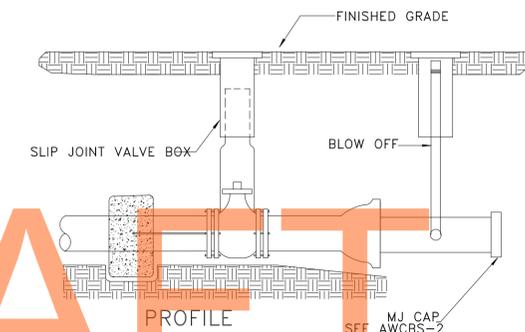
SIZE	A	B	C
4	1'-0"	1'-6"	1'-0"
6	1'-0"	1'-6"	1'-0"
8	1'-6"	2'-0"	1'-3"
12	2'-0"	3'-0"	1'-6"

BUTTRESSES FOR PLUGS AND CAPS

AWCBS - 3

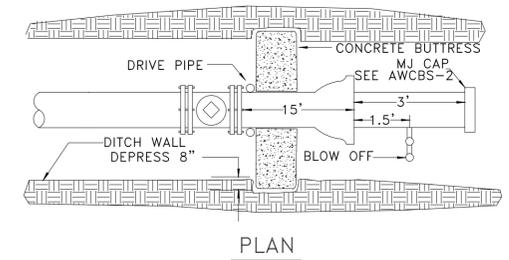


PLAN

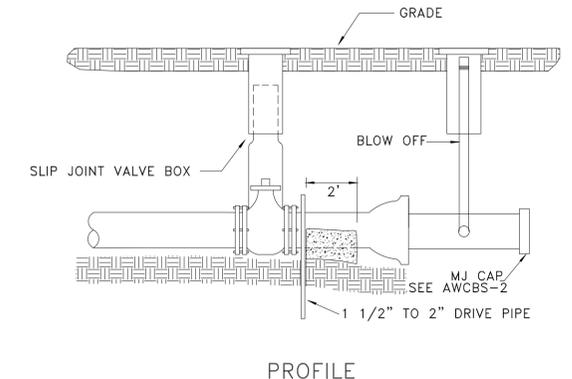


PROFILE

AWCBS - 1

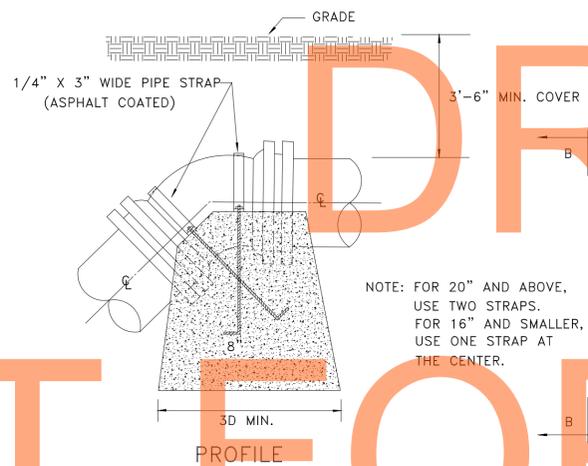


PLAN



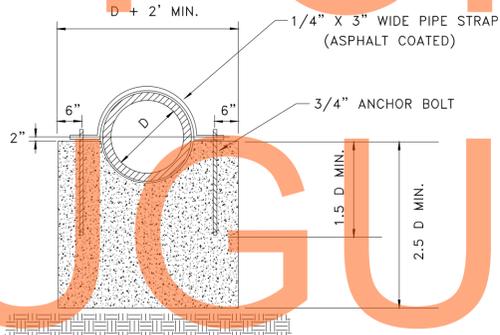
PROFILE

AWCBS - 6



PROFILE

NOTE: FOR 20" AND ABOVE, USE TWO STRAPS. FOR 16" AND SMALLER, USE ONE STRAP AT THE CENTER.

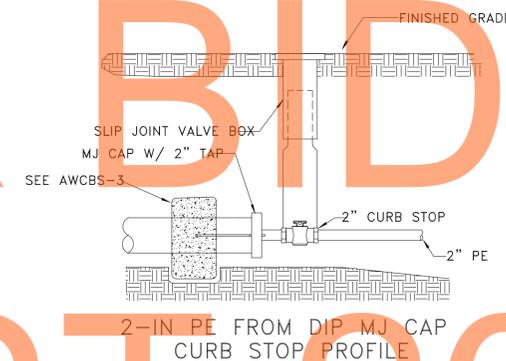


SECTION B-B

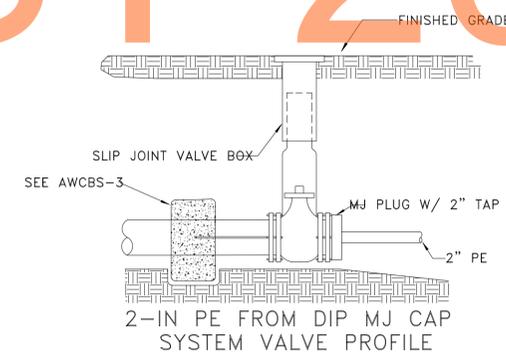
STANDARD REACTION BACKING FOR VERTICAL BENDS

PIPE SIZE "D"	1.25D	1.5D	2D	2.5D	3D
20"	25"	30"	40"	50"	60"
16"	20"	24"	32"	40"	48"
12"	15"	18"	24"	30"	36"
8"	10"	12"	16"	20"	24"
6"	7.5"	9"	12"	15"	18"
4"	7.5"	9"	12"	15"	18"

AWCBS - 8



2-IN PE FROM DIP MJ CAP CURB STOP PROFILE



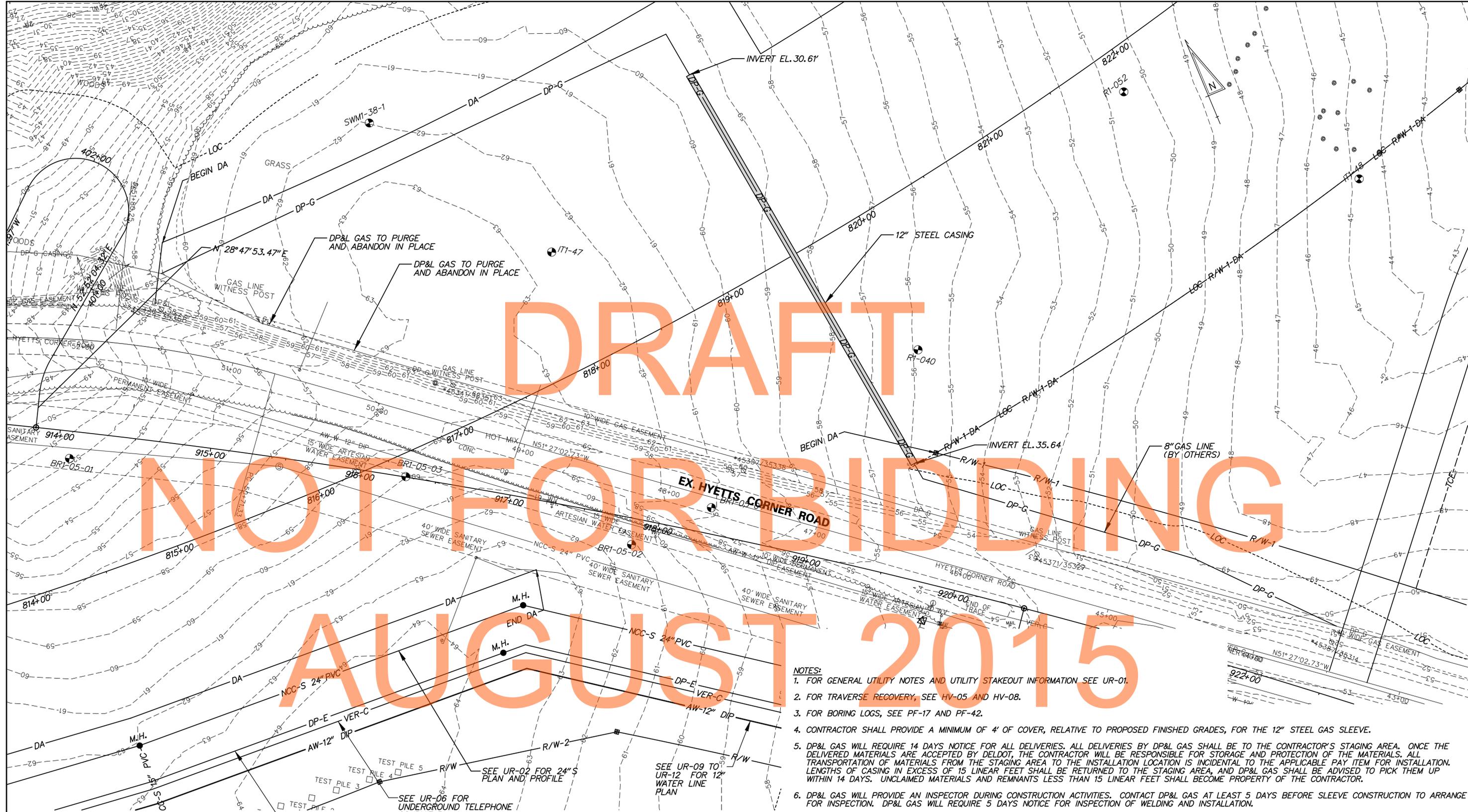
2-IN PE FROM DIP MJ CAP SYSTEM VALVE PROFILE

SPECIFICATIONS DUE TO CHANGE WITHOUT NOTICE. CONTACT ARTESIAN WATER CO. FOR LATEST REVISIONS.

GENERAL NOTES

1. ALLOW SUFFICIENT SPACE TO HAVE AN ACCESS TO BOLTS IN THE MECHANICAL JOINT.
2. STRENGTH OF CONCRETE SHOULD BE 2500 P.S.I. (MIN.) AFTER 28 DAYS.
3. ALL REACTION BACKING TO EXTEND TO UNDISTURBED EARTH.
4. WHEN USING MECHANICAL JOINT, USE TAR PAPER BETWEEN FITTING AND CONCRETE.

DRAFT  
NOT FOR BIDDING  
AUGUST 2015



- NOTES:**
1. FOR GENERAL UTILITY NOTES AND UTILITY STAKEOUT INFORMATION SEE UR-01.
  2. FOR TRAVERSE RECOVERY, SEE HV-05 AND HV-08.
  3. FOR BORING LOGS, SEE PF-17 AND PF-42.
  4. CONTRACTOR SHALL PROVIDE A MINIMUM OF 4' OF COVER, RELATIVE TO PROPOSED FINISHED GRADES, FOR THE 12" STEEL GAS SLEEVE.
  5. DP&L GAS WILL REQUIRE 14 DAYS NOTICE FOR ALL DELIVERIES. ALL DELIVERIES BY DP&L GAS SHALL BE TO THE CONTRACTOR'S STAGING AREA. ONCE THE DELIVERED MATERIALS ARE ACCEPTED BY DELDOT, THE CONTRACTOR WILL BE RESPONSIBLE FOR STORAGE AND PROTECTION OF THE MATERIALS. ALL TRANSPORTATION OF MATERIALS FROM THE STAGING AREA TO THE INSTALLATION LOCATION IS INCIDENTAL TO THE APPLICABLE PAY ITEM FOR INSTALLATION. LENGTHS OF CASING IN EXCESS OF 15 LINEAR FEET SHALL BE RETURNED TO THE STAGING AREA, AND DP&L GAS SHALL BE ADVISED TO PICK THEM UP WITHIN 14 DAYS. UNCLAIMED MATERIALS AND REMNANTS LESS THAN 15 LINEAR FEET SHALL BECOME PROPERTY OF THE CONTRACTOR.
  6. DP&L GAS WILL PROVIDE AN INSPECTOR DURING CONSTRUCTION ACTIVITIES. CONTACT DP&L GAS AT LEAST 5 DAYS BEFORE SLEEVE CONSTRUCTION TO ARRANGE FOR INSPECTION. DP&L GAS WILL REQUIRE 5 DAYS NOTICE FOR INSPECTION OF WELDING AND INSTALLATION.
  7. ALL PERMANENT CASING MATERIALS WHICH WILL BECOME PART OF THE DP&L GAS FACILITY SHALL BE FURNISHED BY DP&L GAS. ALL MATERIALS REQUIRED FOR CONSTRUCTION OF THE CASING SHALL BE FURNISHED BY THE CONTRACTOR.
  8. COORDINATE WITH DELDOT'S SURVEYOR TO OBTAIN UTILITY AS-BUILTS PRIOR TO TRENCH BACKFILL.
  9. AFTER CASING INSTALLATION IS COMPLETE AND ACCEPTED, DP&L GAS WILL INSTALL GAS LINE, MAKE CONNECTIONS, AND PURGE EXISTING DP&L GAS FACILITIES DESIGNATED FOR RELOCATION.
  10. THE CONTRACTOR SHALL INSTALL 2" STEEL VENT PIPES AND A 90-DEGREE ELLE ON EACH END OF THE PIPE PER THE SPECIAL PROVISIONS.
  11. ALL WORK RELATED TO INSTALLATION OF THE STEEL CASING, VENT PIPES, ELLES, ETC. SHALL BE INCIDENTAL TO ITEM 614908 - INSTALL STEEL CASING PIPE, 12". SEE SPECIAL PROVISIONS.

**PLAN**

10/31/2014 10:29:53 AM  
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 10/31/2014 10:29:53 AM

ADDENDUMS / REVISIONS	

<b>US 301, SR 896 TO SR 1</b>	
CONTRACT T200911308	BRIDGE NO.
COUNTY NEW CASTLE	DESIGNED BY: S.E.S.
	CHECKED BY: B.R.T.

<b>UTILITY RELOCATION PLAN STEEL CASING INSTALLATION FOR GAS LINE</b>	

UR-20	SHEET NO. 789
	TOTAL SHTS. 875