

1200

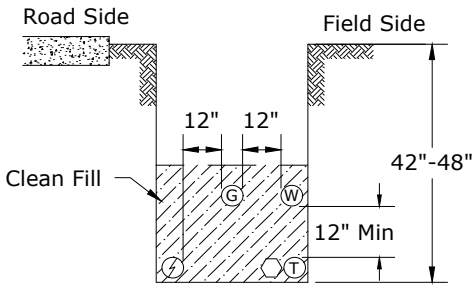
UNDERGROUND GENERAL AND TRENCHING

9/2/2019

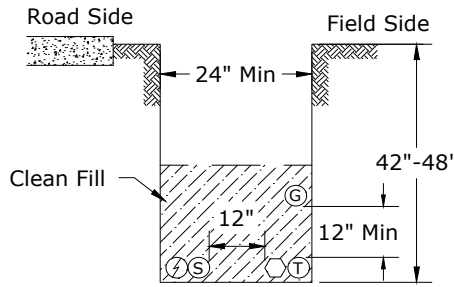
C	UA1	Basic Trench Requirements
~	UC1	Conduit Requirements
~	UD1	Directional Boring Specifications
~	UVE1	Underground Vault 120 V Wiring
~	UVSP1	Underground Vault - Sump Pump

N	New Standard
R	Redrawn Standard
C	Changed Standard
~	No Change

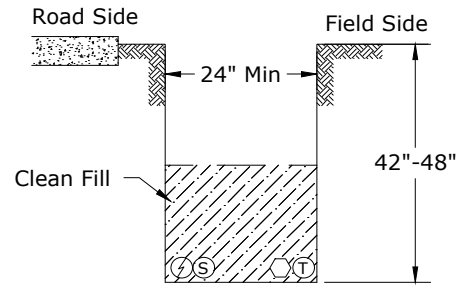
The trench configurations below are shown with 1ø primary. Conduits for 2ø primary cable should lay side-by-side. Conduits for 3ø primary cable should be tie-wrapped to form an equilateral triangle (see Detail A).



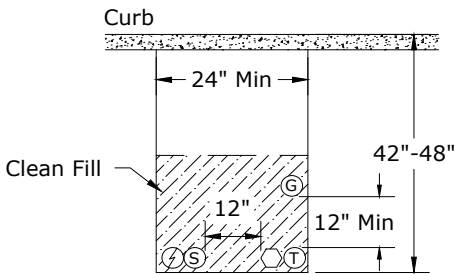
1ø Trench With Gas & Water



1ø and Secondary Trench With Gas

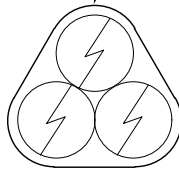


1ø and Secondary Trench Without Gas

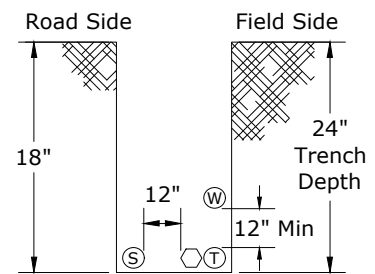


1ø and Secondary Street Crossing

Tie wrap conduits in equilateral shape every 5 feet



DETAIL A
Additional Requirements for 3ø Trenches



Secondary & Communications

Notes:

1. All primary and secondary power cables are in conduit.
2. Select backfill or controlled density fill (CDF) may be required.
3. Construction scrap material or trash of any kind is not allowed in any part of the trench.

Legend:

- Ⓟ Primary Power
- Ⓣ Telephone
- Ⓤ Gas
- Ⓢ Secondary Power
- Ⓜ TV Cable
- Ⓦ Water Service Only
- Ⓡ CPU Fiber (2" conduit)

Rev. 5 - Changed million feeder and 3Ø 1/0 configuration to triangular w/o spacers, added trench w/ water service, and added CPU Fiber.

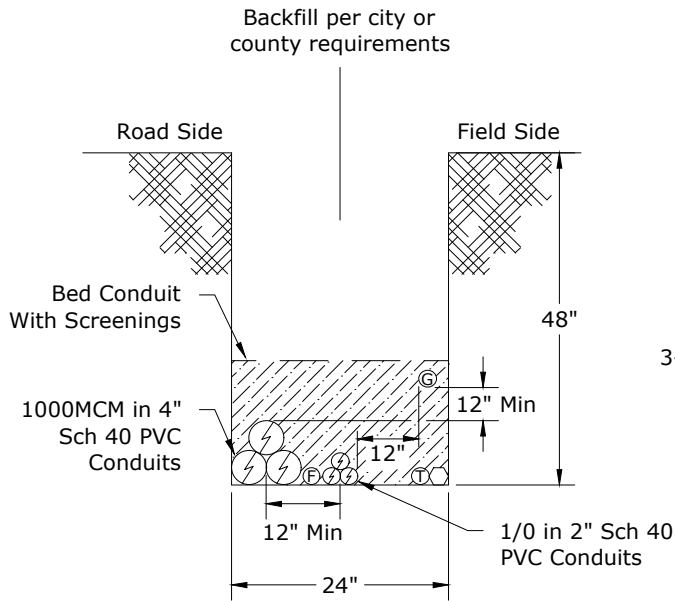


CONSTRUCTION STANDARDS

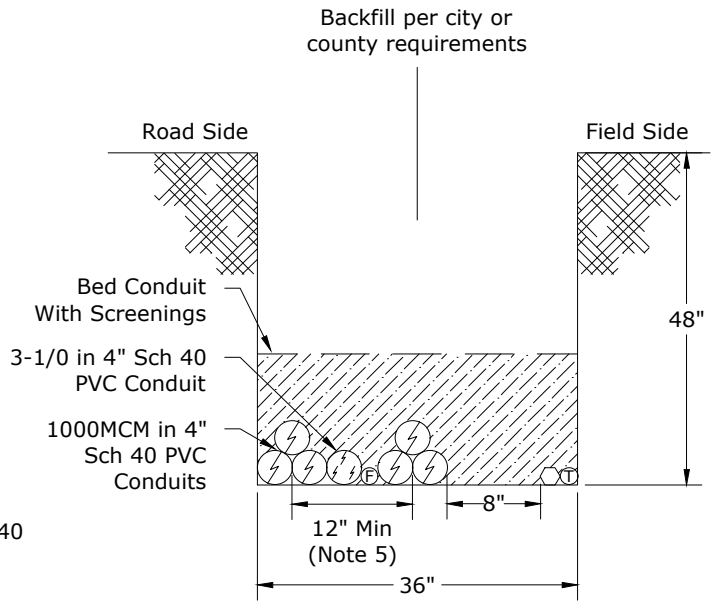
BASIC TRENCH REQUIREMENTS

REVISIONS

Δ	DATE	ENGR	OPS
2	12/29/04	LB	AH
3	5/30/07	LB	AH
4	12/14/09	KJP	
5	8/22/19	CM	GM



1000MCM With 1/0 Trench



2-1000MCM With 3Ø-1/0 Trench

Note: 3Ø conduits (4" and 2") are to be tie wrapped in a triangular configuration every 5 feet. See Detail A on page 1.

Notes:

1. All primary and secondary power cables are in conduit.
2. Select backfill or controlled density fill (CDF) may be required.
3. Construction scrap material or trash of any kind is not allowed in any part of the trench.
4. Caution tape is required one foot above the top 1000 MCM conduit (on screenings).
5. 12-inch minimum horizontal separation applies to both parallel feeders and to different feeders.

Legend:

- Ⓛ Primary Power
- Ⓣ Telephone
- ⓐ Gas
- Ⓢ Secondary Power
- Ⓟ TV Cable
- Ⓦ Water Service Only
- ⓕ CPU Fiber (2" conduit)

Rev. 5 - Changed million feeder and 3Ø 1/0 configuration to triangular w/o spacers, added trench w/ water service, and added CPU Fiber.



CONSTRUCTION STANDARDS

BASIC TRENCH REQUIREMENTS

REVISIONS

Δ	DATE	ENGR	OPS
2	12/29/04	LB	AH
3	5/30/07	LB	AH
4	12/14/09	KJP	
5	8/22/19	CM	GM

PAGE:
2 of 2

UA1

CAD FILE:
UA1




APP: HWH/GW
DATE: 1/22/80

SECTION
1200

ALL CONDUIT SHALL BE GRAY ELECTRICAL CONDUIT AND SHALL BE UL LISTED AND NEMA TC-2 OR TC-3 LABELED -- NO OTHER PIPE IS ACCEPTABLE.

1. All primary and secondary cables shall be in conduit.
2. All road and street crossings shall be in schedule 40, PVC, gray electrical conduit or polyethylene of equal or greater strength specifications. Pipe with other designated use is not acceptable.
3. All risers above finished grade shall be in schedule 80 PVC.
4. Acceptable conduit sizes are as follows:
 - 1Ø, 1/0 primary cable in 1-2" conduit
 - 3Ø, 1/0 primary cable in 1-4" or 3-2" conduits
 - Triplex secondary cable in 1-3" conduit
 - 3Ø, 1000MCM cable in 3-4" conduits
5. Where rock is encountered and the depths shown on UA1 cannot be accomplished, a lesser depth with schedule 80 conduit* and/or control density fill (CDF) may be approved.* Contact CPU Engineering.
6. All conduit terminations shall have end bells or bushings.
7. All conduits that terminate into energized enclosures shall be installed by qualified personnel with a CPU standby person.
8. All conduit runs shall be designed to limit pulling tension to the values specified on UCP1.
9. All conduit ends shall be chamfered 45° x 1/4" internally at all straight ends (not belled ends).
10. All conduits installed for future use shall be marked with 3M electrical markers within six inches at both ends. All ends shall be elbowed up as per Std. ULE (section 1500). The elbow shall NOT be glued to the conduit. The elbow shall be covered with a CPU loop enclosure.
11. Sufficient select backfill shall be placed to prevent crushing of the conduits due to trucks and other heavy equipment.
12. Unused conduits shall have removable plugs designed for that purpose in both ends.
13. Road and street crossings may be either trenched and backfilled, bored or pushed whichever is acceptable to the governing agency.
14. All street and road crossings shall be at property lines.
15. Where conduit bends are required, they shall meet the requirements for cable pulling in the construction specifications. Only manufactured radii are acceptable. No heated bends.
16. A condulet (LB) shall never be used.
17. Conduit sweeps shall be 24" secondary* and 36" primary radius.
18. Conduits installed for futures should be plumbed into transformer with elbows and capped. Flex pipe is not acceptable.
19. Conduits shall be installed so that cable is pulled toward the end bells to avoid scraping cable on sharp edges of conduit.
20. All cut ends of conduits shall be square.
21. Steel mandrels shall be pulled through the conduits to detect damage and debris.


Rev 3: Updated Notes Have A *

	<h2 style="margin: 0;">CONSTRUCTION STANDARDS</h2> <h3 style="margin: 0;">CONDUIT REQUIREMENTS</h3>		REVISIONS			
		DATE	ENGR	OPS		
	1	2/23/00	HWH	MA		
	2	12/29/04	LB	AH		
3	5/30/07	LB	AH			
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PAGE: 1 of 1	<h1 style="margin: 0;">UC1</h1>		CAD FILE: UC1	APP: DATE: 9/94	SECTION 1200	

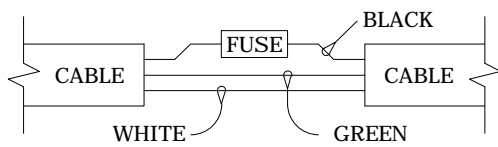
DIRECTIONAL BORING SPECIFICATIONS

1. DIRECTIONAL DRILLING SHALL BE PERFORMED ONLY BY CPU APPROVED ELECTRICAL CONTRACTORS ON JOBS THAT HAVE BEEN PRE-APPROVED FOR DIRECTIONAL DRILLING.
2. DIRECTIONAL DRILLING EQUIPMENT SHALL BE PRE-APPROVED BY CPU.
3. DIRECTIONAL DRILLING EQUIPMENT SHALL BE OPERATED ONLY BY PERSONNEL WHO HAVE BEEN CERTIFIED OR APPROVED BY CPU OR A CPU ACCEPTED AGENCY.
4. CONDUIT INSTALLATIONS SHALL BE 2", 4" OR 6" GRAY*POLYETHYLENE PIPE OF NOT-LESS-THAN STANDARD RADIUS DIMENSION (SDR) 13.5. (OUTSIDE DIAMETER DIVIDED BY WALL THICKNESS NLT 13.5). ALL CONDUIT WILL MEET ASTM STANDARDS FOR CONSTRUCTION AND INSTALLATION OF POLYETHYLENE (PE) CONDUIT. CONDUIT INSTALLATIONS USING PVC CONDUIT SHALL HAVE DESIGNS, MATERIAL AND INSTALLATION PRACTICES PRE-APPROVED BY CPU.
5. ALL CONNECTION TO PVC SWEEPS OR CONDUIT WILL BE FULLY GLUED USING IRS WELD-ON 600 ADHESIVE OR CPU APPROVED EQUIVALENT. GLUE USED TO FASTEN PVC TO PVC SHALL BE IRS WELD ON 721 WITH A COMPATIBLE PRIMER (OR APPROVED EQUIVALENT GLUE AND PRIMER).
6. A PLOT AND TRACK OF THE BORE USING THE BORE EQUIPMENT SOFTWARE, OR A CERTIFIED COPY OF A SURVEYED PROFILE OF THE BORE, SHALL BE PROVIDED TO CPU BEFORE ACCEPTANCE OF THE INSTALLATION.
7. THE DEPTH OF THE CONDUIT SHALL BE IDENTIFIED BY A STAKE WITH THE DEPTH EVERY 10 FEET ALONG THE ROUTE IN UNPAVED AREAS AND BY THE DEPTH WRITTEN IN MARKER PAINT EVERY 10 FEET ALONG THE ROUTE IN PAVED AREAS.
8. THE CONDUIT DEPTHS SHALL CONFORM TO THE CPU STANDARDS OF 42" NOMINAL DEPTH, NOT LESS THAN 36", NOR GREATER THAN 48". ANY OTHER DEPTH SHALL REQUIRE PRIOR APPROVAL BY CPU.
9. ALL INSTALLED CONDUITS SHALL BE "PROOFED" USING THE APPROPRIATE MANDREL, AND HAVE A 2500 POUND, 3/4" SEQUENTIALLY-NUMBERED, CONTINUOUS "MULE TAPE" INSTALLED FOR FUTURE CABLE PULLING. CERTIFICATION OF THE TEST MANDRELING SHALL BE PROVIDED TO CPU PRIOR TO ACCEPTANCE BY THE UTILITY.
10. CPU RESERVES THE OPTION TO REQUIRE "POTHOLING" TO DETERMINE DEPTH AND LOCATION FOR ANY INSTALLATIONS THAT ARE QUESTIONABLE. THE "POTHOLING" WILL BE AT THE CONTRACTOR'S EXPENSE.

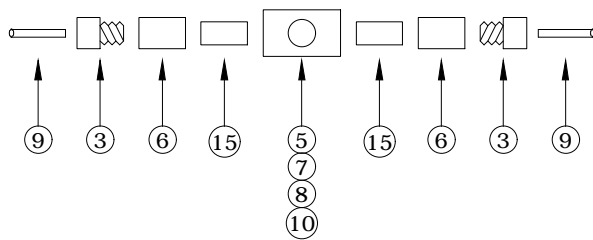
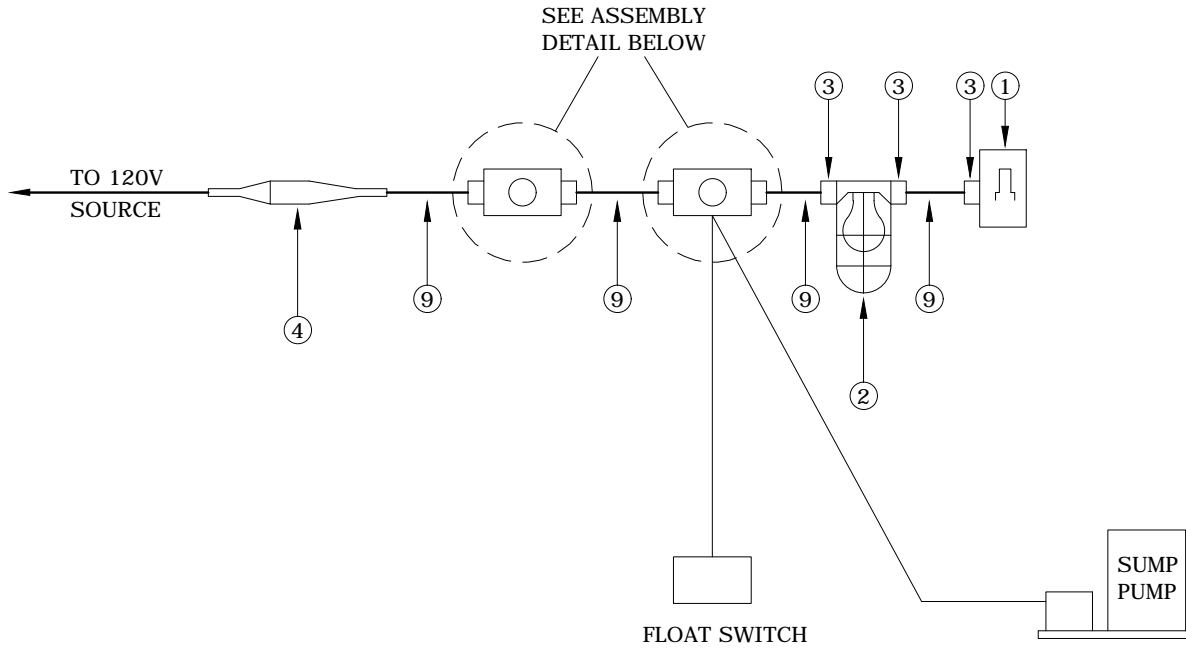
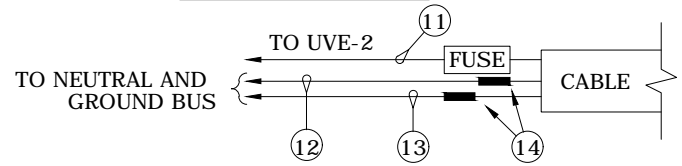
Rev 2: Added "Gray" to Item #4 and 3/4" mule tape in all conduit in Item #9

	CONSTRUCTION STANDARDS		REVISIONS																				
	DIRECTIONAL BORING SPECIFICATIONS		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;"></th> <th style="width: 20%;">DATE</th> <th style="width: 20%;">ENGR</th> <th style="width: 20%;">OPS</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">12/29/04</td> <td style="text-align: center;">LB</td> <td style="text-align: center;">AH</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">12/14/09</td> <td style="text-align: center;">KJP</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		DATE	ENGR	OPS	1	12/29/04	LB	AH	2	12/14/09	KJP									
		DATE	ENGR	OPS																			
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2	12/14/09	KJP																					
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**DETAIL ITEM 4
REMOTE SOURCE**



**DETAIL ITEM 4
IN VAULT SOURCE**



STORE ITEM 10 NEAR RECEPTACLE
WHEN NOT IN USE.

**RECEPTACLE ASSEMBLY
(TYPICAL)**

R1 - REDRAWN IN CAD



CONSTRUCTION STANDARDS
UNDERGROUND VAULT
120 VOLT WIRING

PAGE:
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UVE1

CAD FILE:
UVE1

REVISIONS			
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REDRAWN IN CAD			
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

MATERIAL LIST

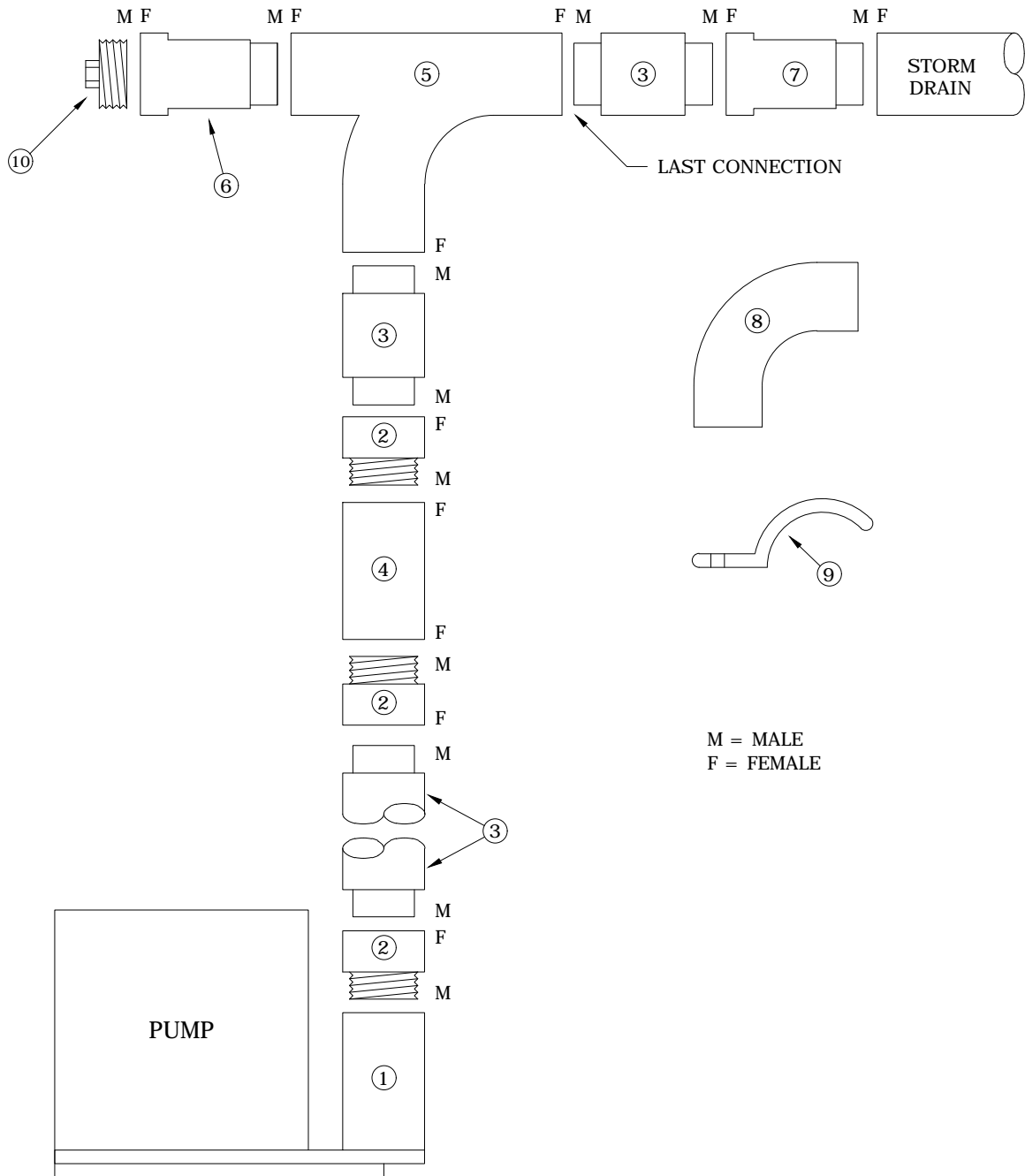
ITEM	QTY.	DESCRIPTION	TDM.
1	1	SWITCH, DUST-TIGHT, WATER-TIGHT, 125V, 20A SQUARE 'D' CAT #KW-1	2290
2	1	LIGHT FIXTURE, VAPOR-TIGHT, 150V WITH GLOBE, GUARD AND BASE WITH 2 - 3/4" NPT HUBS HUBBELL CAT #NVX15CHG	2291
3	7	CONNECTOR, STRAIGHT, 3/4" NPT HUB SIZE, MALE, NYLON HUBBELL #SHC-1037-CR	2292
4	1	FUSE HOLDER, HOMAC #SLK	2309
5	2	BOX, CONDUIT, PVC, TYPE FSC, 3/4"	2293
6	4	ADAPTER, FEMALE, 3/4", PVC	1586
7	2	POWER OUTLET, CHROME PLATED BRASS 30A, 3 WIRE, 125V, HUBBELL #60CM63	2294
8	2	ADAPTER, HUBBELL #60CM75 FOR ITEM #7	2295
9	A.R.	CORD, PORTABLE, TYPE STO 3 CONDUCTOR 10 AWG	2296
10	2	ADAPTER, TWIST LOCK MALE 30A TO STRAIGHT BLADE FEMALE 30A, HUBBELL #31CM29	2297
11	A.R.	CONDUCTOR #10 CU BLACK	2298
12	A.R.	CONDUCTOR #10 CU WHITE	2299
13	A.R.	CONDUCTOR #10 CU BARE	2300
14	2	SPLICE COVER, STREET LIGHT, HOMAC FSS20	2115
15	A.R.	CONDUIT, PVC, SCH 40, 3/4"	1564

	CONSTRUCTION STANDARDS		REVISIONS			
	UNDERGROUND VAULT 120 VOLT WIRING		DATE	ENGR	OPS	
			1	2/23/00	HWH	MA
			△ REDRAWN IN CAD			
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			DATE:	4/94	1200	

NOTES:

1. THIS WIRING DIAGRAM IS TYPICAL ONLY. EACH VAULT REQUIRES SPECIAL CONSIDERATION TO LOCATE EACH COMPONENT FOR OPTIMUM UTILIZATION.
2. LOCATE THE LIGHT SWITCH AS CLOSE TO THE LADDER AS POSSIBLE BUT PROTECT IT FROM DAMAGE WHEN EQUIPMENT IS BEING MOVED IN OR OUT.
3. THE 120 VOLT SOURCE MAY BE FROM A TRANSFORMER IN THE VAULT OR FROM AN EXTERNAL SOURCE.
4. THE FLOAD SWITCH LOCATION MUST BE CALCULATED FOR EACH VAULT SEPARATELY. THE LOCATION DEPENDS UPON THE AMOUNT OF OIL IN THE EQUIPMENT IN THE VAULT. REFER THIS TO ENGINEERING.
5. LOCATE RECEPTACLES AS HIGH AS POSSIBLE TO MINIMIZE THE PROBABILITY OF BEING SUBMERGED.
6. LOCATE FUSE ON OR NEAR THE CEILING
7. FUSE IS 600 VOLT, 30 AMP, 13/32" x 1 1/2" NON-GLASS TYPE.
8. CONNECTOR, ITEM 3, SCREWS DIRECTLY INTO HUB.
9. THE NEUTRAL MAY COME FROM ANY AVAILABLE SOURCE WITHIN THE VAULT IF THE 120 VOLT SOURCE IS INTERNAL. IF THE SOURCE IS EXTERNAL, IT MUST INCLUDE A NEUTRAL.

	CONSTRUCTION STANDARDS UNDERGROUND VAULT 120 VOLT WIRING		REVISIONS			
				DATE	ENGR	OPS
	1	2/23/00	HWH	MA		
	 REDRAWN IN CAD					
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NOTES:

- 1. ALL PIPE AND FITTINGS MUST BE SCHEDULE 40 SEWER TYPE. SEWER AND WATER FITTINGS DON'T FIT TOGETHER EXCEPT AT THREADED JOINTS.
- 2. THIS SPECIFICATION IS TYPICAL ONLY. LOCATION OF STORM DRAIN WILL DICTATE PIPE ROUTING.
- 3. LOCATE CHECK VALVE CLOSE TO PUMP AND IN THE VERTICAL POSITION.
- 4. PUMP MUST BE IN VAULT SUMP.
- 5. SEE UVE FOR ELECTRICAL CONNECTIONS.

R1 - REDRAWN IN CAD




CONSTRUCTION STANDARDS
 UNDERGROUND VAULT
 SUMP PUMP

REVISIONS			
NO.	DATE	ENGR	OPS
1	2/23/00	HWH	MA
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APP:		SECTION	
DATE: 4/92		1200	

MATERIAL LIST

ITEM	QTY.	DESCRIPTION	TDM.
1	1	SUMP PUMP	1955
2	3	ADAPTER, MALE, 2" PLASTIC, SEWER	2353
3	A. R.	PIPE, SEWER, PLASTIC, 2"	2301
4	1	CHECK VALVE, 2", BRONZE	2354
5	1	COMBINATION Y, 2", PLASTIC	2355
6	1	CLEANOUT FITTING 2", PLASTIC	2356
7	1	REDUCER, PLASTIC, SEWER, 2" x __	A. R.
8	A. R.	1/4 BEND, PLASTIC, SEWER, 2"	2308
9	A. R.	CLAMP, PIPE, 2", ONE BOLT	2307
10	1	CLEANOUT PLUG 2"	2358

	CONSTRUCTION STANDARDS		REVISIONS			
	UNDERGROUND VAULT SUMP PUMP		DATE	ENGR	OPS	
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		△ REDRAWN IN CAD				
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