3				
2				
1				
0	11/30/10	CECCONI	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

SECTION 29 - NETWORKS, VAULTS
AND TRANSCLOSURES
TABLE OF CONTENTS

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29.00-00A

29.14 NETWORK PROTECTORS

FOR MAINTENANCE ONLY DRAWINGS

THE FOR MAINTENANCE ONLY DRAWINGS LISTED BELOW ARE NOT CONTAINED IN THE PRINTED SPEC BOOK, BUT ARE AVAILABLE ONLINE

29.03 TRANSCLOSURES AND VAULT LAYOUT

STANDARD PROCEDURES BULLETIN

A TRANSFORMER VAULT IS AN ENCLOSED COMPARTMENT WITHIN A BUILDING OR BELOW GROUND LEVEL ESPECIALLY DESIGNED FOR THE TYPE TRANSFORMERS SPECIFIED BY THE COMPANY.

A TRANSFORMER ENCLOSURE IS A SPECIAL COMPARTMENT SUITABLE FOR INSTALLING COMPANY'S STANDARD TRANSFORMERS. SUCH ENCLOSURE MAY UTILIZE THE CUSTOMER'S BUILDING WALL(S) AS ONE OR MORE SIDES OF THE ENCLOSURE.

ALL ENCLOSURES MUST HAVE A REMOVABLE COVER APPROVED BY THE ENGINEER EXCEPT THOSE LOCATED IN IN ISOLATED OR PROTECTED AREAS WHERE, IN THE WRITTEN OPINION OF THE ENGINEER, THERE IS NO REASONABLY FORESEEABLE DANGER OF ACCESS BY MINORS, WORKMEN AND OTHER MEMBERS OF THE PUBLIC.

ONLY AUTHORIZED COMPANY PERSONNEL SHALL HAVE ACCESS TO TRANSFORMER VAULTS OR ENCLOSURES AND ALL ENTRY DOORS SHALL BE KEPT LOCKED UNLESS ATTENDED.

ENTRY DOORS SHALL HAVE A STURDY HASP SUITABLE FOR COMPANY'S STANDARD LOCK OR LOCK TUMBLERS WITHIN THE DOOR TO ACCOMMODATE COMPANY'S STANDARD KEY. SELF-LOCKING DOORS AND DOORS WITH LOCK TUMBLERS SHALL BE READILY OPENED FROM THE INSIDE WITHOUT A KEY.

COMPANY'S STANDARD "DANGER HIGH VOLTAGE" SIGN SHALL BE AFFIXED TO THE OUTSIDE OF ALL ENTRY DOORS OF TRANSFORMER VAULTS INSIDE OF BUILDINGS AND OF TRANSFORMER ENCLOSURES. THIS SIGN SIGN SHOULD BE SECURELY AFFIXED AND MAINTAINED AT A PLACE EASILY SEEN.

3				
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1				
0	10/21/10	DANNA	GUINN	ELKINS
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TRANSFORMER VAULTS

AND ENCLOSURES

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GENERAL

IT IS THE CUSTOMER'S RESPONSIBILITY TO PROVIDE A TRANSFORMER LOCATION OUTSIDE OF THE BUILDING THAT ALLOWS US TO USE OUR STANDARD MINERAL OIL FILLED TRANSFORMERS AND STANDARD FUSING METHODS. IF THIS IS NOT POSSIBLE, PROGRESS ENERGY WILL INSTALL TRANSFORMERS, SWITCHES AND FUSES INSIDE A BUILDING IN A CUSTOMER SUPPLIED VAULT THAT IS IN COMPLIANCE WITH NEC ARTICLE 450. THIS ARTICLE STATES THAT UNDER CERTAIN CONDITIONS, MINERAL OIL TRANSFORMERS CAN BE INSTALLED INSIDE BUILDINGS. HOWEVER, TO AVOID CONFUSION AND TO KEEP PROGRESS ENERGY FROM HAVING TO MONITOR CONTINUED COMPLIANCE WITH THESE CONDITIONS, ALL VAULTS WITHIN A BUILDING WILL BE EQUIPPED WITH TRANSFORMERS USING A LESS FLAMMABLE DIELECTRIC. IN ADDITION THE TRANSFORMER(S) WILL BE FUSED WITH CURRENT LIMITING FUSES. AS MENTIONED IN THE FUSE SECTION ABOVE, THIS CURRENT LIMITING FUSE (CL) REDUCES THE AMOUNT OF I-SQUARED TIME LET-THROUGH CURRENT AVAILABLE TO A PRIMARY FAULT WITHIN THE TRANSFORMER TANK. THE LESS FLAMMABLE DIELECTRIC, COOPER "FR3", RAISES THE FIRE POINT OF THE TRANSFORMER DIELECTRIC TO ABOVE 300° C. THIS COMBINATION GREATLY REDUCES THE CHANCE OF CATASTROPHIC FAILURE DURING A PRIMARY FAULT IN THE TRANSFORMER.

TRANSFORMERS

SPECIAL THREE-PHASE VAULT TRANSFORMERS ARE AVAILABLE. THESE TRANSFORMERS ARE STAINLESS STEEL UNITS AND ARE FILLED WITH LESS-FLAMMABLE FLUID. THEY ARE ALSO FULLY RATED FOR OPERATION IN A 50°C AMBIENT ENVIRONMENT.

FOR VAULT TRANSFORMER BANKS CONSISTING OF BANKED SINGLE-PHASE UNITS, STANDARD SINGLE-PHASE DOUBLE BUSHING TRANSFORMERS CAN BE USED PROVIDING THEY ARE MODIFIED. USE A STANDARD STAINLESS STEEL UNIT WHEN AVAILABLE. THESE UNITS SHOULD BE DRAINED AND FLUSHED OF THE EXISTING MINERAL OIL AND FILLED WITH A LESS-FLAMMABLE FLUID SUCH AS FR3. ARRANGEMENTS SHOULD BE MADE WITH THE TRANSFORMER SHOP TO HAVE THIS DONE. THE TRANSFORMERS SHOULD ALSO BE CONVERTED FROM LIVE BUSHINGS TO BUSHING WELLS IN THE TRANSFORMER SHOP. THE TRANSFORMERS SHOULD BE DERATED FOR OPERATION IN THE HIGHER AMBIENT TEMPERATURE CONDITIONS BY 1.5% FOR EACH 1°C ABOVE A 30°C AMBIENT.

FUSES

FULL RANGE CURRENT LIMITING SUBMERSIBLE FUSES ARE AVAILABLE FOR USE IN VAULTS.

3				
2				
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0	10/19/10	DANNA	GUINN	ELKINS
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VAULTS INSIDE OR ON TOP OF BUILDINGS

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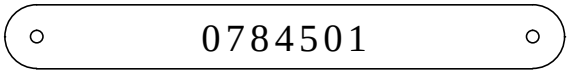
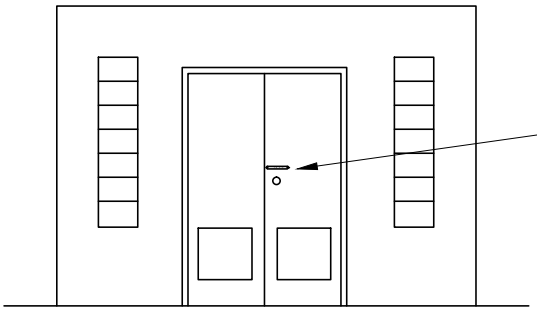
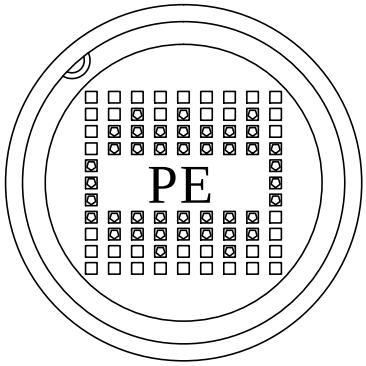
DWG. 29.00-06



INSTALL DIS-ID NUMBERS (CN 44034_) ON BACKING PLATE (CN 440006) AND PLACE ON EQUIPMENT AS INDICATED BELOW.

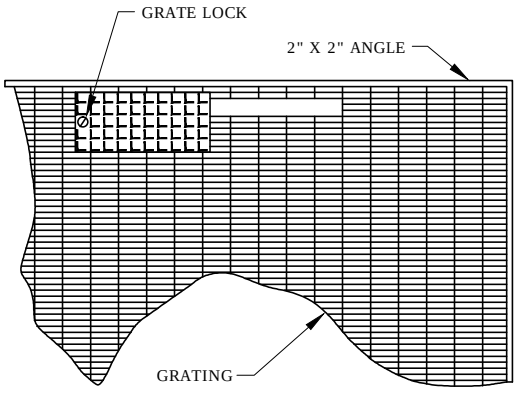


INSTALL ON FRONT OF DOOR AS SHOWN. ADDITIONAL ID NUMBER PLATES SHOULD BE INSTALLED ON INSIDE OF DOOR.



INSTALL DIS-ID NUMBER PLATE ON INSIDE OF MANHOLE.

MANHOLES AND SWITCH MANHOLES
STREET AND ALLEY VAULTS



INSTALL DIS-ID NUMBER PLATE ON INSIDE OF SIDEWALK VAULT.

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
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INSTALLATION OF COORDINATE NUMBERS

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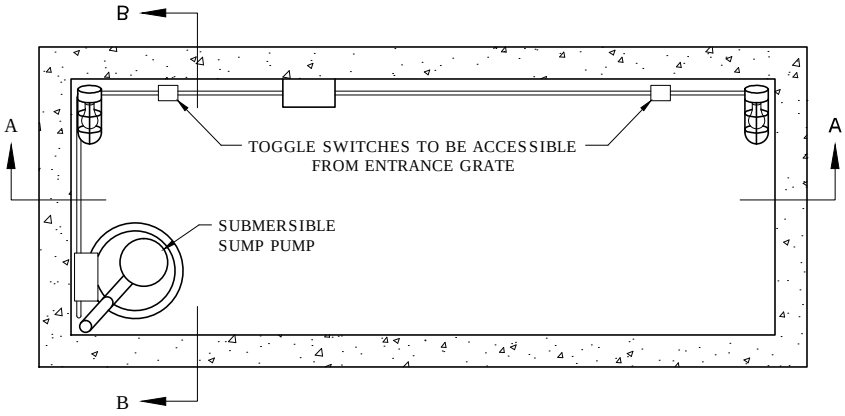
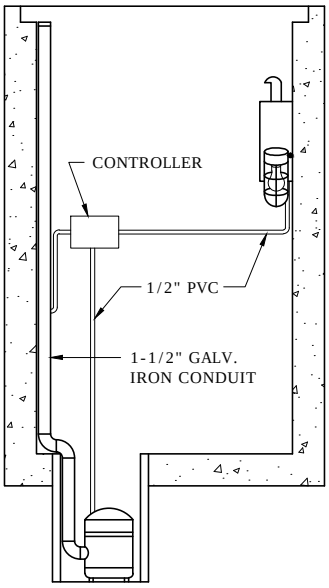
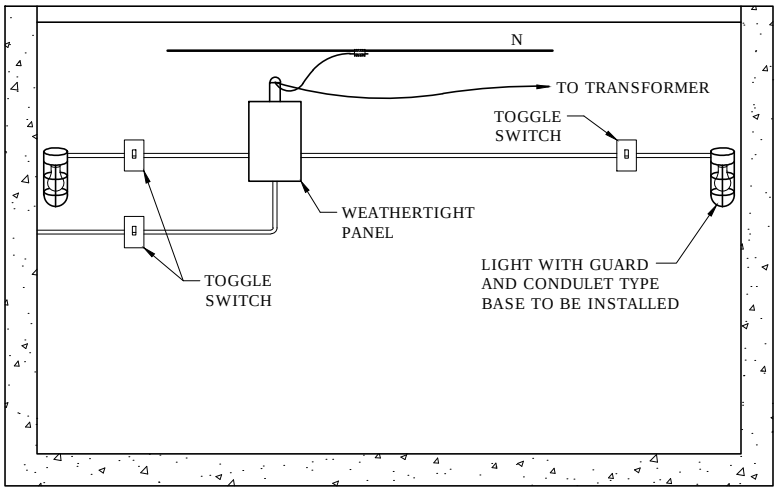
DWG. 29.00-08



PLAN VIEW



SECTION B-B



SECTION A-A

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

SIDEWALK AREA VAULT LIGHTS AND SUMP PUMP TYPICAL INSTALLATION

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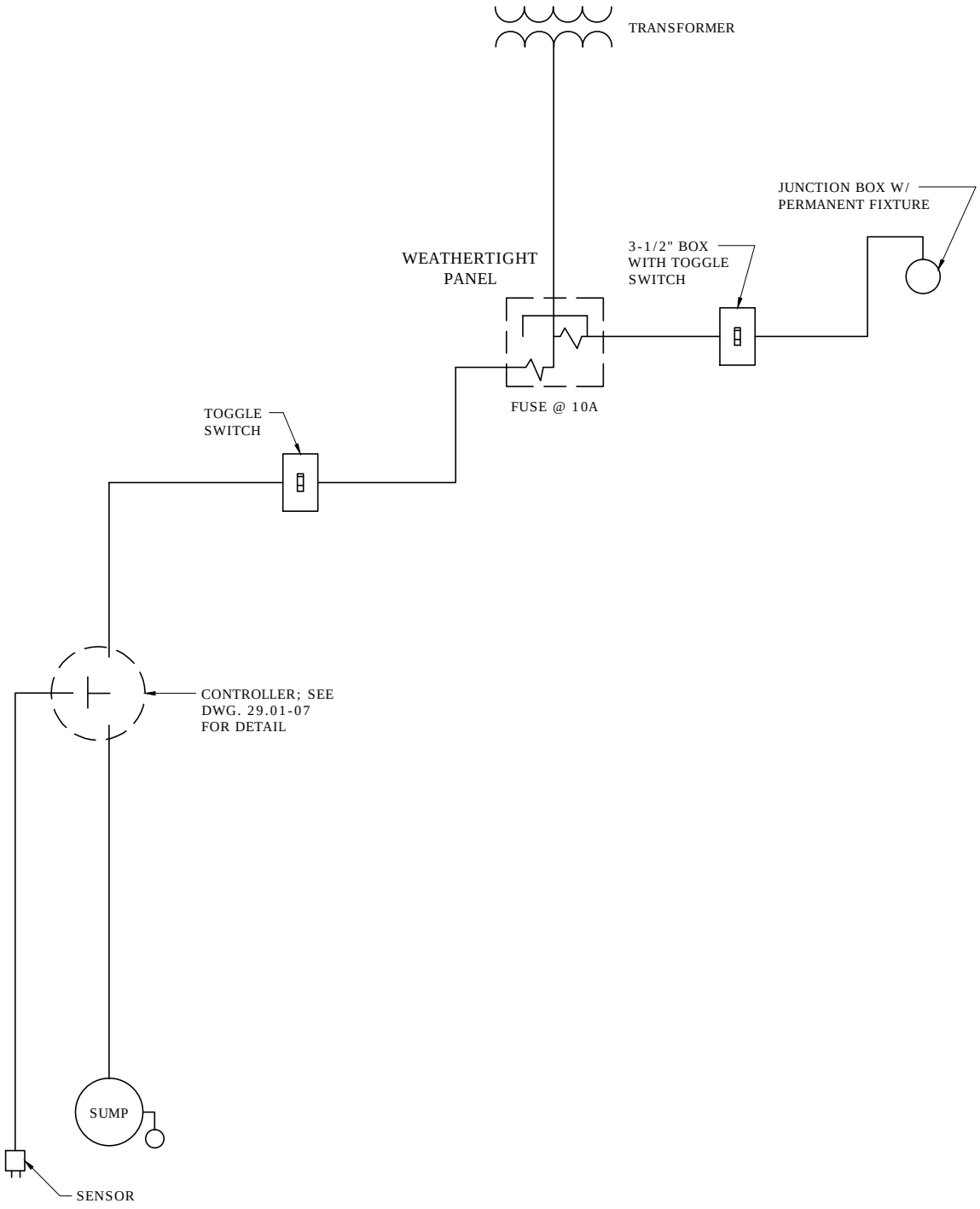
FLA

DWG. 29.01-07



NOTES:

1. GROUND ALL METAL PARTS (SUMP, LIGHTS, AND PANEL).

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
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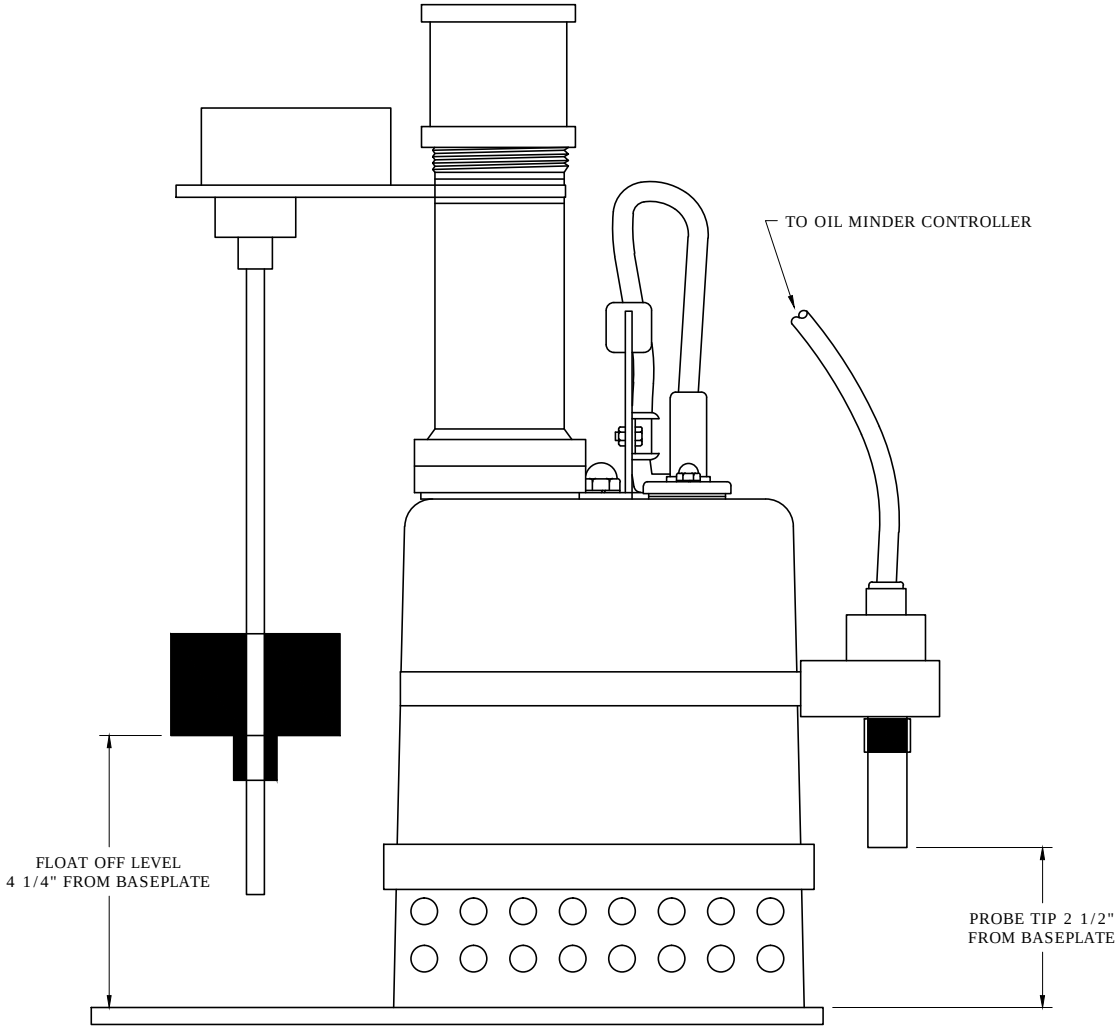
ELECTRICAL SCHEMATIC FOR SIDEWALK VAULT

Duke Energy®

FLA

DWG. 29.01-09



EBARA OIL MINDER PUMP
CU NTOM1QTHPF
CN 328763
MODEL 32P76706.35
INCLUDES FLOAT
OIL PROBE COMES WITH OIL MINDER

TITON (EBARA PUMP)
WITH VERTICAL FLOAT MOUNT
1/3 HP 115 VOLT
31 GPM

NOTES:

1. USE PUMP WITH STANCOR OIL MINDER CONTROLLER. SEE DWG. 29.01-13.

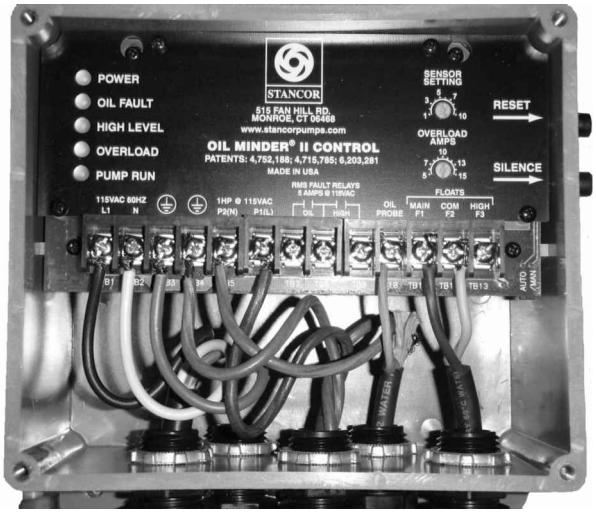
2. OIL-MINDER PROBE TIP MUST BE BELOW FLOAT OFF LEVEL. ADJUST FLOAT ACCORDINGLY.

3				
2				
1	8/7/14	DANNA	DANNA	ADCOCK
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

OIL MINDER SYSTEM

DEC	DEM	DEP	DEF
			X

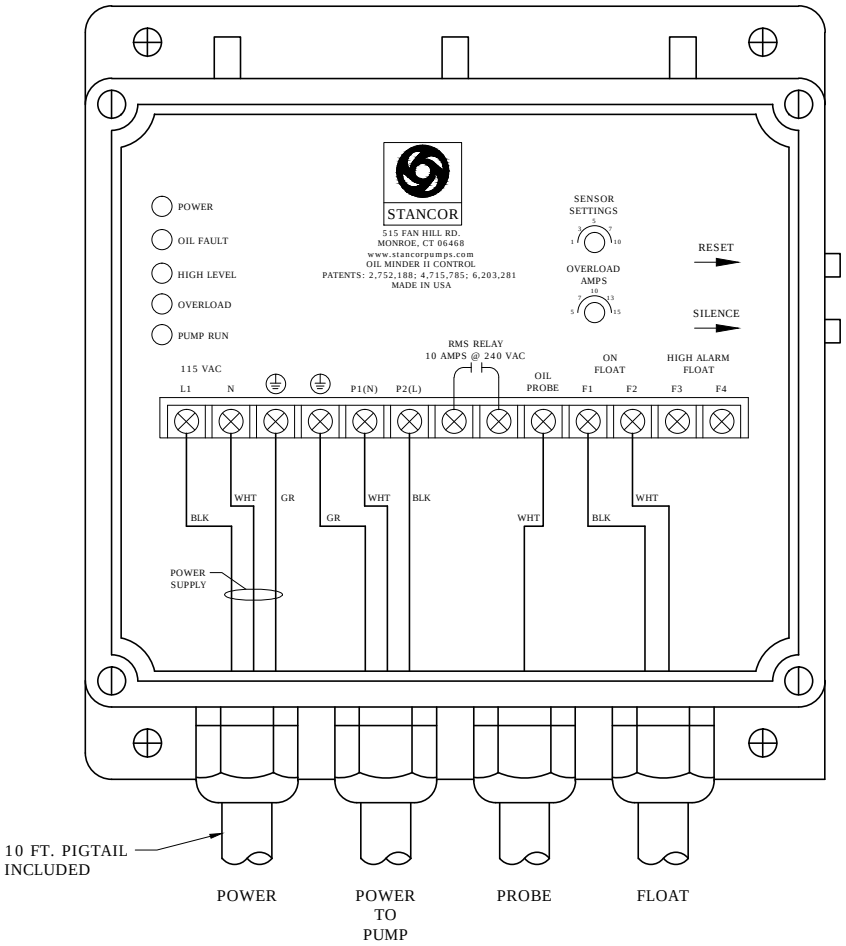
29.01-11



OIL MINDER CONTROL BOX

CU NTOMCNTRL1QTHPF

CN 328767



3					STANCOR OIL MINDER SYSTEM OM-2000 CONTROLLER
2					
1					
0	10/5/10	DANNA	GUINN	ELKINS	
REVISED		BY	CK'D	APPR.	

Duke Energy®

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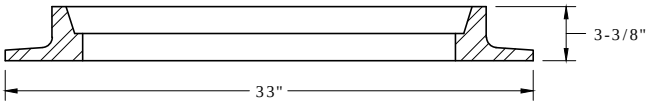
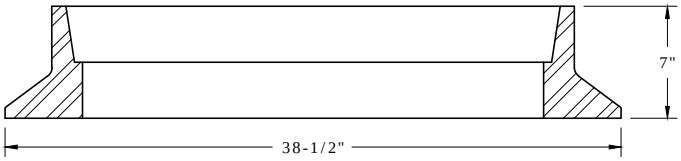
DWG. 29.01-13



CAST IRON RING FOR USE ON TOP OF MANHOLE, 3-3/8" HIGH

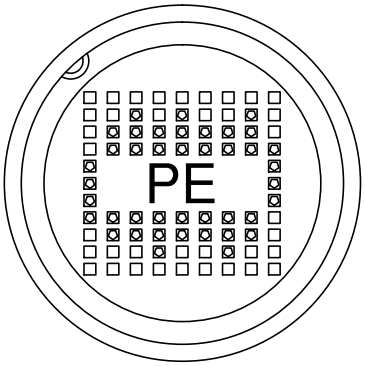
CU NCKMH3SF
CN 9220176326



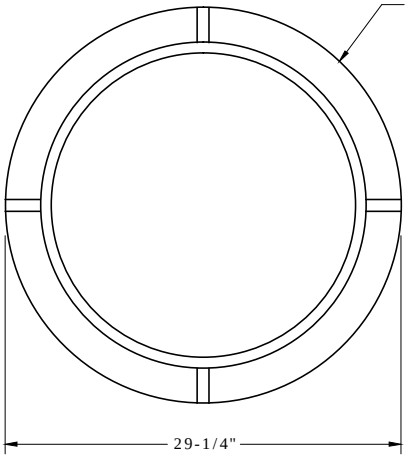
CAST IRON RING FOR USE ON TOP OF MANHOLE, 7" HIGH

CU NCKMH7SF
CN 9220176327

CU CVRMH29SF, CN 9220176401
MANHOLE COVER, 29-1/4" DIAMETER
CAST IRON - FITS CN 9220176326 AND CN 9220176327



MANHOLES AND SWITCH MANHOLES
STREET AND ALLEY VAULTS



MANHOLE EXTENSION RING

CU NCKMH1SF
CN 320795

NOTES:

1. OTHER SIZE EXTENSION RINGS AVAILABLE BY SPECIAL ORDER THROUGH DISTRIBUTION STANDARDS.

3				
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0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

VAULT MANHOLE COVER AND RING

Duke Energy

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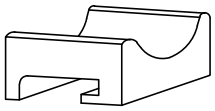
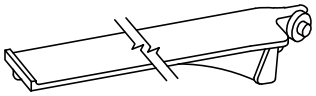
DWG. 29.01-15

CABLE RACKING EQUIPMENT				
		TYPE	CATALOG NUMBER	COMPATIBLE UNIT
	RACK, CABLE SUPPORT	33-1/3" GALVANIZED STEEL	320774	NTRK33P33F
	INSULATOR, PORCELAIN STEP	SINGLE HOOK 2-1/6" X 1-3/4" X 3", GROOVE RADIUS 1-7/16"	080103	NTISF
	STEPS, CABLE SUPPORT - GALVANIZED IRON	11-7/8" - 12-1/4" LENGTH	320526	NTSS12F
		14-7/8" TO 15-1/4" LENGTH	320528	NTSS15F

3				
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1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

CABLE RACKING EQUIPMENT

CATALOG NUMBERS

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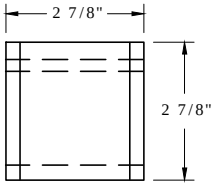
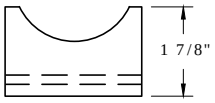
DWG. 29.07-03

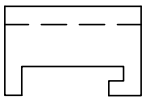
PORCELAIN INSULATOR



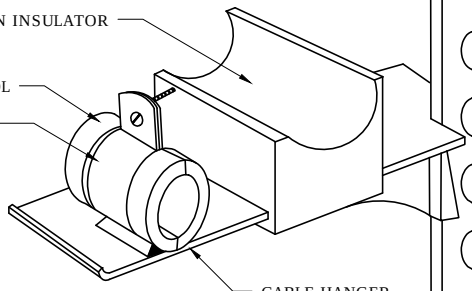
TOP VIEW

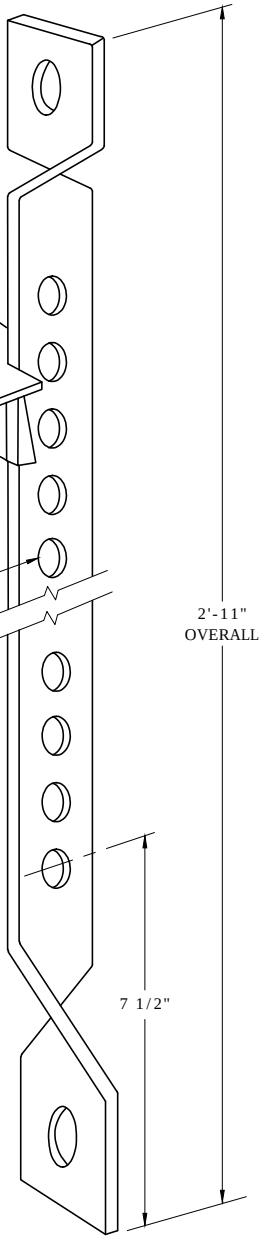


FRONT VIEW

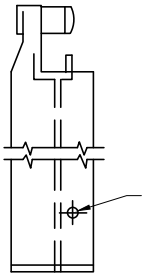


SIDE VIEW

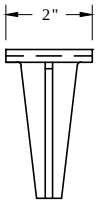




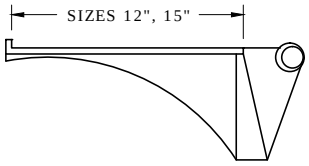
CABLE HANGER



TOP VIEW

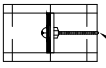


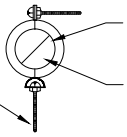
FRONT VIEW

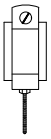


SIDE VIEW

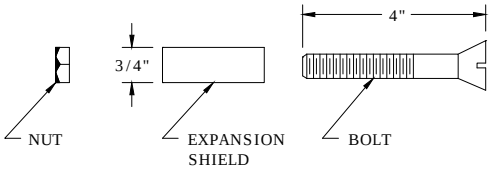
PORCELAIN SPOOL CLAMP







TOP VIEW FRONT VIEW SIDE VIEW



NOTES:

1. DRILL 3/4" HOLE IN CONCRETE APPROX. 2" DEEP FOR LEAD EXPANSION SHIELD.

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

CABLE RACKING EQUIPMENT DETAIL

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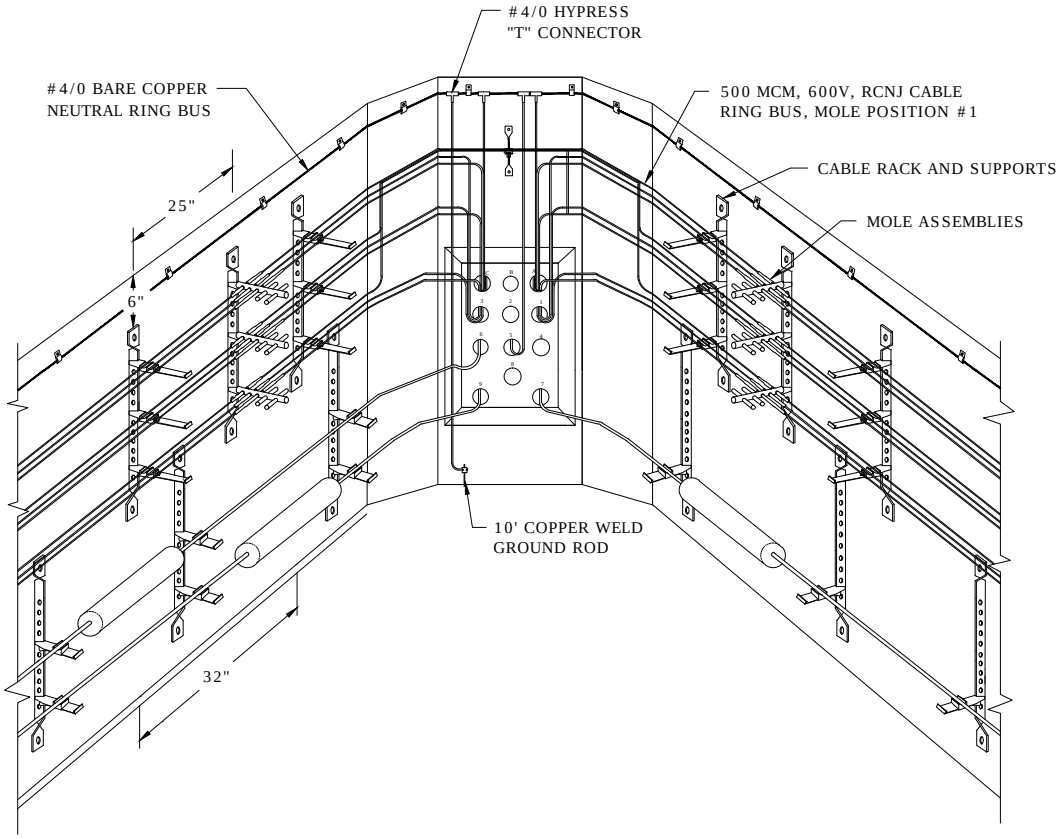
DWG. 29.07-07



DUCT NO.	CONDUIT ROUTING	TYPICAL CABLE INSTALLATION	STANDARD MOLE * POSITION	MOLIMETER REQUIRED	FIREPROOFING REQUIRED
A	SERVICE CONDUITS	3- #2, 2/0, 4/0 OR 500 MCM-1/C 600V RCNJ CABLES AND CODE RUBBER NEUTRAL	#3 OR #5	REDUCED SECTION FOR 500 MCM ONLY	NO
B		SPARE			
**C		3- #2, 2/0, 4/0 OR 500 MCM-1/C 600V RCNJ CABLES AND CODE RUBBER NEUTRAL	#3 OR #5	REDUCED SECTION FOR 500 MCM ONLY	NO
1	PRIMARY AND SECONDARY CONDUIT TIES MANHOLE TO MANHOLE	3- #4/0 OR 500 MCM-1/C, 600V, RCNJ CABLES	#2	#4/0 OR 500 MCM	NO
2		SPARE (SECONDARY)			
3		3- #4/0 OR 500 MCM-1/C, 600V, RCNJ CABLES	#2	#4/0 OR 500 MCM	NO
4		SPARE (PRIMARY OR SECONDARY)			
5		#4/0 BARE TINNED COPPER NEUTRAL			
6		#4/0-3/C, 15KV, PILC CABLE			YES
7		#4/0-3/C, 15KV, PILC CABLE			YES
8		SPARE (PRIMARY)			
9		#4/0-3/C, 15KV, PILC CABLE			YES

* MOLE POSITIONS ARE NUMBERED FROM WALL TO CENTER OF MANHOLE

** SERVICE DUCTS ARE LETTERED CONSECUTIVELY AS INSTALLED.

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

CABLE RACKING CONFIGURATION

STANDARD 2-WAY MANHOLE

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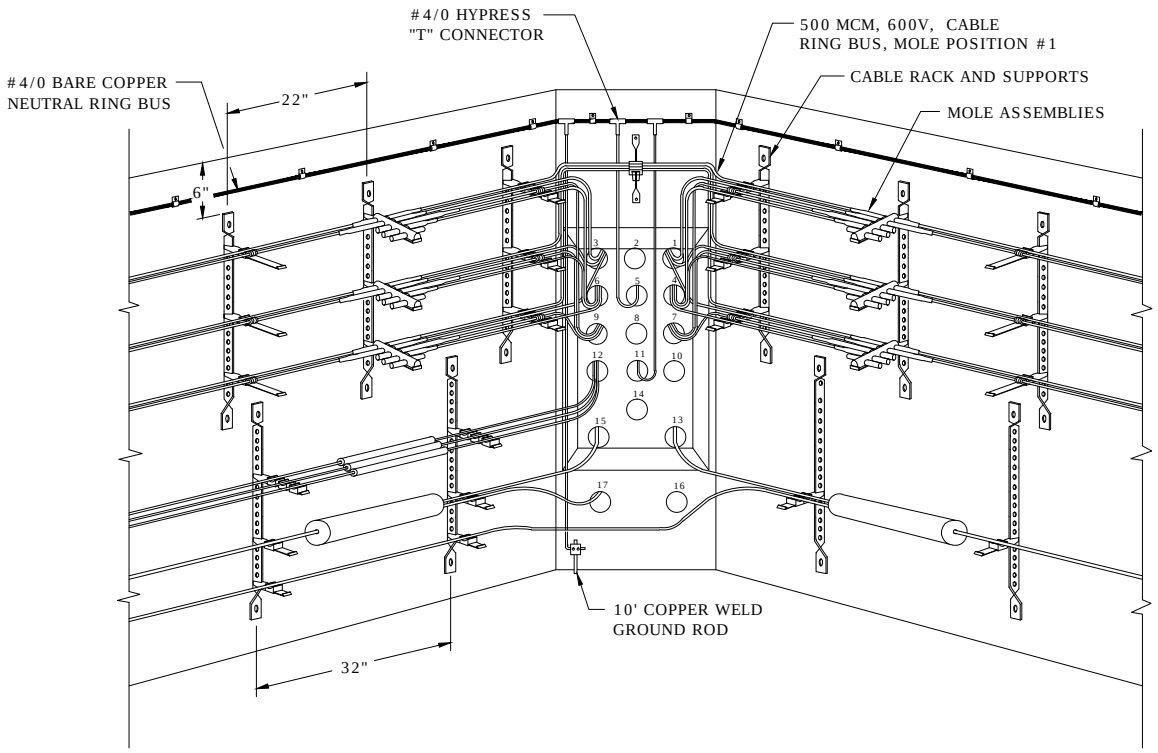

DUCT NO.	CONDUIT ROUTING	TYPICAL CABLE INSTALLATION	STANDARD MOLE *POSITION	MOLIMETER REQUIRED	FIREPROOFING REQUIRED
1	SECONDARY CONDUIT TIES, TRANS. VAULT TO MANHOLE	3-500 MCM-1/C, 600V, RCNJ CABLES	#2	NO	NO
2		SPARE			
3		3-500 MCM-1/C, 600V, RCNJ CABLES	#2	NO	NO
4		3-500 MCM-1/C, 600V, RCNJ CABLES	#4	NO	NO
5		#4/0 BARE TINNED COPPER NEUTRAL			
6		3-500 MCM-1/C, 600V, RCNJ CABLES	#4	NO	NO
7	PRIMARY AND SECONDARY CONDUIT TIES MANHOLE TO MANHOLE	3-500MCM OR #4/0, 1/C, 600V, RCNJ CABLES	#3	#4/0 OR 500 MCM	NO
8		SPARE (SECONDARY)			
9		3-500MCM OR #4/0, 1/C, 600V, RCNJ CABLES	#3	#4/0 OR 500 MCM	NO
10		SPARE PRIMARY OR SECONDARY			
11		#4/0 BARE TINNED COPPER NEUTRAL			
12		3-1/C, 15KV, PILC OR RCNJ CABLES			YES
13		#4/0-3/C, 15KV, PILC CABLE			YES
14		SPARE (PRIMARY)			
15		#4/0-3/C, 15KV, PILC CABLE			YES
16	PRIMARY CONDUIT TIES, TRANS. VAULT TO MANHOLE	SPARE			
17		#1/0-3/C, 15KV, PILC CABLE			YES

*MOLE POSITIONS ARE NUMBERED FROM WALL TO CENTER OF MANHOLE

3					
2					
1					
0	10/5/10	DANNA	GUINN	ELKINS	
REVISED		BY	CK'D	APPR.	

CABLE RACKING CONFIGURATION

STANDARD 4-WAY MANHOLE VAULTED CONNECTED

Duke Energy®

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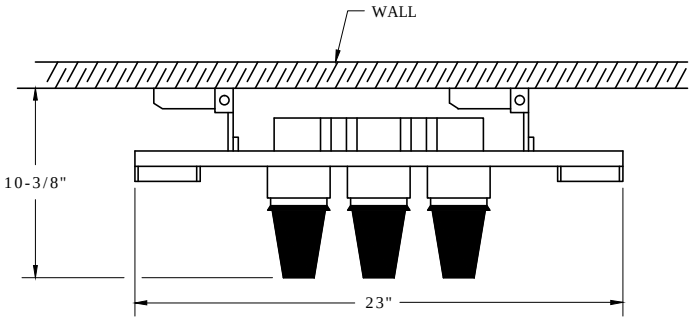
DWG. 29.07-11

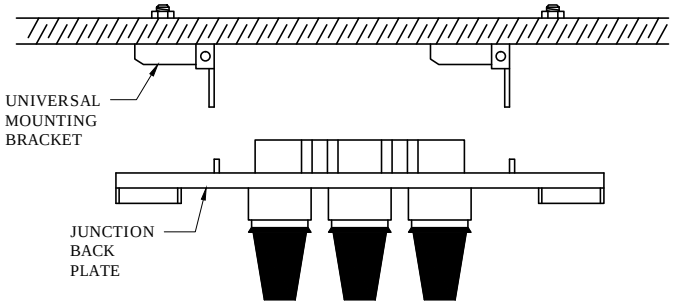
STEP 1

LOOSELY ATTACH UNIVERSAL MOUNTING BRACKETS TO JUNCTION BACK PLATE AND PLACE ASSEMBLY AGAINST WALL. ADJUST BRACKETS FOR PROPER ALIGNMENT AND MARK THEIR LOCATION ON WALL.



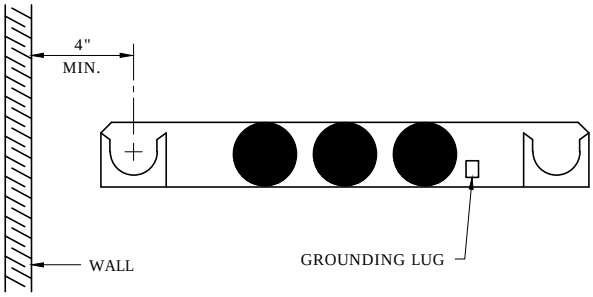
STEP 2

DETACH UNIVERSAL MOUNTING BRACKETS FROM JUNCTION BACK PLATE. MOUNT BRACKETS ON WALL ACCORDING TO MARKS MADE IN STEP 1.



STEP 3

WITH UNIVERSAL MOUNTING BRACKETS SECURE, FASTEN BACK PLATE (WITH JUNCTION ATTACHED) TO MOUNTING BRACKETS, MAKING SURE PARKING STANDS ARE IN UPRIGHT POSITION.

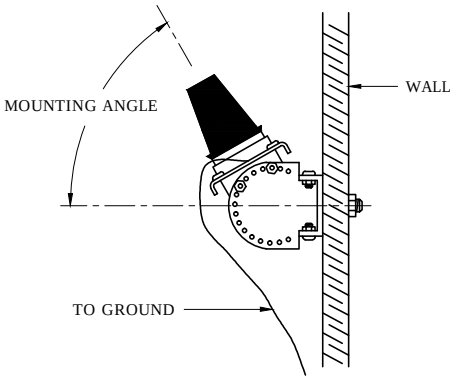


STEP 4

ADJUST MOUNTING ANGLE TO DESIRED POSITION.

FOR PAD-MOUNTED APPLICATIONS
SEE DWGS. 25.01-03A, 25.01-03B
25.01-10A, 25.01-10B AND 25.01-11.

CU FDTHR153WWMTF
CN 326223



STEP 5

TIGHTEN ALL BOLTS SECURELY TO ASSURE NO MOVEMENT DURING OPERATION. GROUND JUNCTION BRACKET TO SYSTEM GROUND USING #4 BC.

REMOVE PROTECTIVE CAPS, CLEAN AND LUBRICATE JUNCTION BUSHING INTERFACE WITH SILICONE GREASE PROVIDED. MATE THREE LOADBREAK ELBOWS TO JUNCTION BUSHINGS FOLLOWING APPLICABLE LOADMAKE OPERATING PROCEDURE.

NOTES:

1. IF ELBOW IS CLOSED INTO A FAULT, REPLACE ELBOW AND JUNCTION.

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

LOADBREAK THREE-WAY JUNCTION - WALL MOUNTED

Duke Energy®

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DWG. 29.08-01

FEED THRU BUSHINGS		
COMPATIBLE UNIT	CATALOG NUMBER	DESCRIPTION
FDTHR153WWMTF	326223	FEED THRU TAP, 3-WAY, FOR 200 AMP ELBOW TERMINATORS WITH MOUNTING BRACKET
FDTHR154WWMTF	326224	FEED THRU TAP, 4-WAY, FOR 200 AMP ELBOW TERMINATORS WITH MOUNTING BRACKET

NOTES:

1. USE 600 AMP SWITCH ANGLE BRACKET (CN 070282) FOR MOUNTING OF FEED THRU BUSHING BRACKET.
2. GROUND BRACKET TO #2 CU GROUND GRID.

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

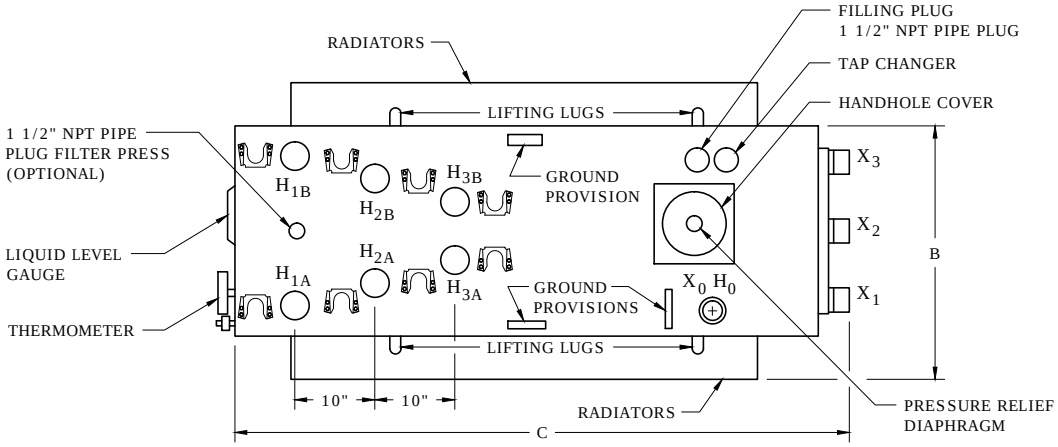
LOADBREAK JUNCTION -

BRACKET MOUNTED

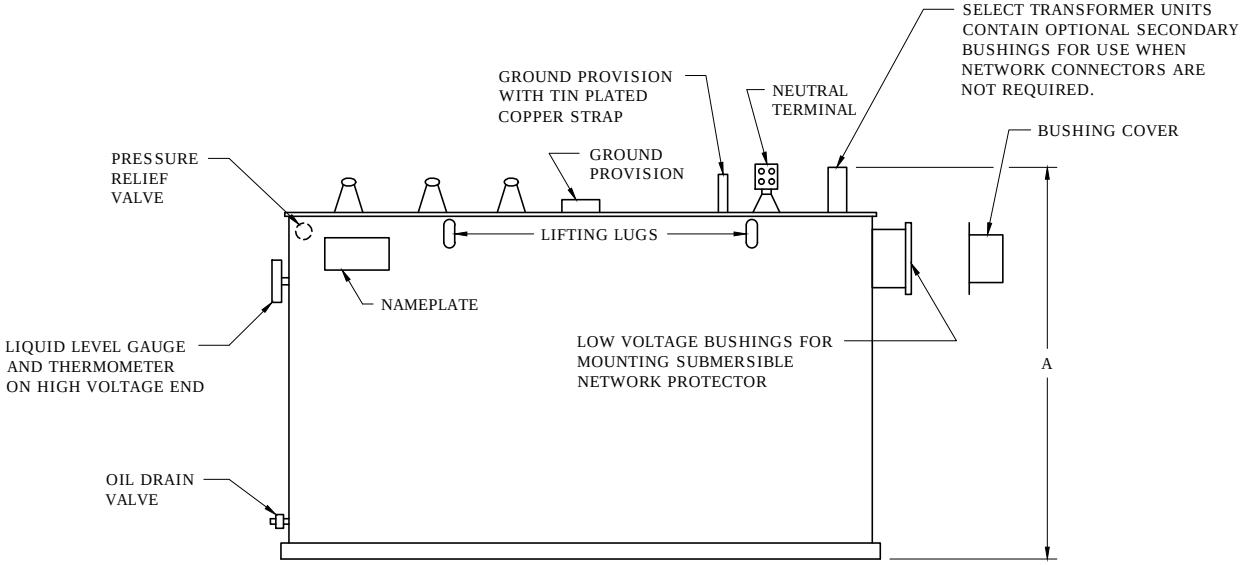
Duke Energy®

FLA

DWG. 29.08-03



PLAN VIEW



SIDE VIEW

SIZE (KVA)	MAXIMUM DIMENSION (INCHES)		
	A	B	C
500	68	38	82
750 - 1000	93	44	92
1500	108	52	155

NOTES:

1. H_{1B}, H_{2B}, H_{3B} INDICATE LOCATION OF BUSHING WELLS FOR LOOP FEED REQUIREMENTS WITH ADDITIONAL ACCESSORY PARKING LOADBREAK TYPE BRACE.

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

THREE-PHASE VAULT TRANSFORMERS

Duke Energy®

FLA

DWG. 29.09-07

TRANSFORMERS - URBAN COMMERCIAL DISTRIBUTION (UCD)

THREE-PHASE VAULT STYLE, FOR USE WHERE PHYSICAL SURROUNDINGS DO NOT PERMIT THE USE OF PAD-MOUNTS. HAS STANDARD PAD-MOUNT STYLE HIGH SIDE BUSHING WELLS AND THROATED SECONDARY CONFIGURATION TO ALLOW ATTACHMENT OF A NETWORK PROTECTOR.

TRANSFORMER UNITS FOR CLEARWATER AND ST. PETERSBURG NETWORK ARE AVAILABLE IN THEIR RESPECTIVE OPERATION CENTERS.

BEFORE OPENING NEW UNITS, REVIEW NETWORK TRANSFORMER AVAILABILITY WITH NETWORK FOREMAN.

CATALOG NUMBER	COMPATIBLE UNIT	DESCRIPTION
3301700500	TUT500NOCU12YBF	500 KVA 120/208 MINERAL OIL WITH TAP CHANGER, 7.2 KV PRIMARY WITH THROAT
3301700750	TUT750NOCU12YBF	750 KVA 120/208 MINERAL OIL WITH TAP CHANGER, 7.2 KV PRIMARY WITH THROAT
9220189023	TU500NOCU12YBF	500 KVA 120/208 MINERAL OIL WITH TAP CHANGER, 7.2 KV PRIMARY NO THROAT
9220189024	TU750NOCU12YBF	750 KVA 120/208 MINERAL OIL WITH TAP CHANGER, 7.2 KV PRIMARY NO THROAT
9220204447	TUT500NOCU12YFF	500 KVA 277/480 MINERAL OIL WITH TAP CHANGER, 7.2 KV PRIMARY WITH THROAT
9220068446	TUT750NOCU12YFF	750 KVA 277/480 MINERAL OIL WITH TAP CHANGER, 7.2 KV PRIMARY WITH THROAT

NOTES:

1. CATALOG NUMBERS ARE NOT AVAILABLE FOR OTHER TRANSFORMER SIZES. CONTACT DISTRIBUTION STANDARDS FOR SPECIAL ORDERS.

REVISED		BY	CK'D	APPR.
3				
2				
1	5/7/12	DANNA	BURLISON	ELKINS
0	10/5/10	DANNA	GUINN	ELKINS

THREE-PHASE VAULT TRANSFORMERS

Progress Energy

FLA

DWG. 29.09-13

SUGGESTED INSTALLATION EQUIPMENT (NOT SUPPLIED WITH KIT)

- CABLE PREPARATION TOOLS
- TYCO ELECTRONICS P63 CABLE PREPARATION KIT OR CABLE MANUFACTURER APPROVED SOLVENT
- CLEAN, LINT-FREE CLOTHS
- NON-CONDUCTING ABRASIVE CLOTH, 120 GRIT OR FINER
- ELECTRICIAN'S TAPE
- CONNECTOR(S) AND INSTALLATION TOOLS
- TYCO ELECTRONICS RECOMMENDED TORCH

SAFETY INSTRUCTIONS

DANGER: WHEN INSTALLING ELECTRICAL POWER SYSTEM ACCESSORIES, FAILURE TO FOLLOW APPLICABLE PERSONAL SAFETY REQUIREMENTS AND WRITTEN INSTALLATION INSTRUCTIONS COULD RESULT IN FIRE OR EXPLOSION AND SERIOUS OR FATAL INJURIES.

TO AVOID RISK OF ACCIDENTAL FIRE OR EXPLOSION WHEN USING GAS TORCHES, ALWAYS CHECK ALL CONNECTIONS FOR LEAKS BEFORE IGNITING THE TORCH AND FOLLOW THE TORCH MANUFACTURER'S SAFETY INSTRUCTIONS.

TO MINIMIZE ANY EFFECTS OF FUMES PRODUCED DURING INSTALLATION, ALWAYS PROVIDE GOOD VENTILATION OF CONFINED WORK SPACES.

TYCO ELECTRONICS HAS NO CONTROL OVER FIELD CONDITIONS WHICH INFLUENCE PRODUCT INSTALLATION, IT IS UNDERSTOOD THAT THE USER MUST TAKE THIS INTO ACCOUNT AND APPLY THEIR OWN EXPERIENCE AND EXPERTISE WHEN INSTALLING PRODUCT.

CLEANING THE CABLE

USE AN APPROVED SOLVENT, SUCH AS THE ONE SUPPLIED IN THE P63 CABLE PREP KIT, TO CLEAN THE CABLE. BE SURE TO FOLLOW THE MANUFACTURER'S INSTRUCTIONS. FAILURE TO FOLLOW THESE INSTRUCTIONS COULD LEAD TO PRODUCT FAILURE.

SOME NEWER SOLVENTS DO NOT EVAPORATE QUICKLY AND NEED TO BE REMOVED WITH A CLEAN, LINT-FREE CLOTH. FAILURE TO DO SO COULD CHANGE THE VOLUME RESISTIVITY OF THE SUBSTRATE OR LEAVE A RESIDUE ON THE SURFACE.

PLEASE FOLLOW THE MANUFACTURER'S INSTRUCTIONS CAREFULLY.

RECOMMENDED TYCO ELECTRONICS TORCHES

INSTALL HEAT-SHRINKABLE CABLE ACCESSORIES WITH A "CLEAN BURNING" TORCH, I.E. A PROPANE TORCH THAT DOES NOT DEPOSIT CONDUCTIVE CONTAMINANTS ON THE PRODUCT.

CLEAN BURNING TORCHES INCLUDE THE TYCO ELECTRONICS FH-2629, FH-2649 (USES REFILLABLE PROPANE CYLINDERS) AND FH-2618A (USES DISPOSABLE CYLINDER).

ADJUSTING THE TORCH

ADJUST REGULATOR AND TORCH AS REQUIRED TO PROVIDE AN OVERALL 12" BUSHY FLAME. THE FH-2629 WILL BE ALL BLUE, THE OTHER TORCHES WILL HAVE A 3" TO 4" YELLOW TIP. USE THE YELLOW TIP FOR SHRINKING.

REGULATOR PRESSURE

FH-2618A	FULL PRESSURE
FH-2649	25 PSIG
FH-2629	15 PSIG

GENERAL SHRINKING INSTRUCTIONS

- APPLY OUTER 3" TO 4" TIP OF THE FLAME TO HEAT-SHRINKABLE MATERIAL WITH A RAPID BRUSHING MOTION
- KEEP FLAME MOVING TO AVOID SCORCHING
- UNLESS OTHERWISE INSTRUCTED, START SHRINKING TUBE AT CENTER, WORKING FLAME AROUND ALL SIDES OF THE TUBE TO APPLY UNIFORM HEAT

TO DETERMINE IF A TUBE HAS COMPLETELY RECOVERED, LOOK FOR THE FOLLOWING, ESPECIALLY ON THE BACK AND UNDERSIDE OF THE TUBE.

1. UNIFORM WALL THICKNESS.
2. CONFORMANCE TO SUBSTRATE.
3. NO FLAT SPOTS OR CHILL MARKS.
4. VISIBLE SEALANT FLOW IF THE TUBE IS COATED.

NOTE: WHEN INSTALLING MULTIPLE TUBES, MAKE SURE THAT THE SURFACE OF THE LAST TUBE IS STILL WARM BEFORE POSITIONING AND SHRINKING THE NEXT TUBE. IF INSTALLED TUBE HAS COOLED, RE-HEAT THE ENTIRE SURFACE.

3				
2				
1				
0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR
1000 KCM AL SHIELD THREE 1/C
TO 1000 KCM AL COMPRESSED SUBMARINE 3/C

Duke Energy®

FLA

DWG. 29.11-01

1. PRODUCT SELECTION

THE KITS SPECIFIED BELOW ARE PER PROGRESS ENERGY SPECIFICATION FPC #203-277 FOR 3/C SUBMARINE CABLE SPECIFICATION GS-2 FOR 1/C FEEDER CABLE WITH 0.175" INSULATION.

TABLE 1

CABLE DIMENSIONS

TYCO ELECTRONICS KIT NUMBER	CONNECTOR CATALOG NUMBER	NOMINAL CONDUCTOR SIZE (AWG/KCMIL)	MAX. CONDUCTOR LENGTH	MAX. CONDUCTOR O.D.
HVS-T-1551-PE	CSBS-20C-500C-SOS	4/0 CU - 4/0 CU	4.0"	1.2"
HVS-T-1552-PE	ASBS-350C-750	500 CU - 500 AL	6.0"	1.52"
HVS-T-1553-PE	ASBS-600C-1000	750 CU - 1000 AL	8.0"	1.75"

2. CHECK THE GROUND BRAID

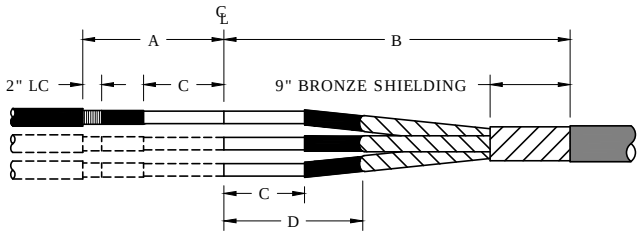
THE KITS SPECIFIED BELOW HAVE BEEN DESIGNED PER PROGRESS ENERGY REQUIREMENT OF BONDING THE LC SHIELD OR CONCENTRIC SHIELDING WIRES OF THE 1/C FEEDER CABLE TO THE COPPER TAPE SHIELD AND BRONZE CORRUGATED SHIELD OF THE 3/C SUBMARINE CABLE. SHIELD CONTINUITY IS BEING CARRIED ACROSS THE SPLICE BUT NOT NEUTRAL EMPATHIC CONTINUITY. NO EXTERNAL GROUNDING PROVISIONS ARE BEING PROVIDED.

3. PREPARE CABLES

CHOOSE THE SPLICE TYPE (CHOICE 1 OR 2) AND FOLLOW THE DIRECTIONS GIVEN.

CHOICE 1: LC SHIELD

USE THE DIMENSIONS SHOWN IN TABLE 2 AND PREPARE THE CABLES AS SHOWN. REMOVE ANY FILLERS TO THE OVERALL SHIELD CUTBACK. TERMINATE INDIVIDUAL SHIELDING TAPE AND LC SHIELD. SECURE WITH COPPER FOIL TAPE PROVIDED.



CHOICE 2: JACKETED CONCENTRIC NEUTRAL CABLE

USE THE DIMENSIONS SHOWN IN TABLE 2 AND PREPARE THE CABLES AS SHOWN. REMOVE ANY FILLERS TO THE OVERALL SHIELD CUTBACK. TERMINATE INDIVIDUAL SHIELDING TAPE AND LC SHIELD. SECURE WITH COPPER FOIL TAPE PROVIDED.

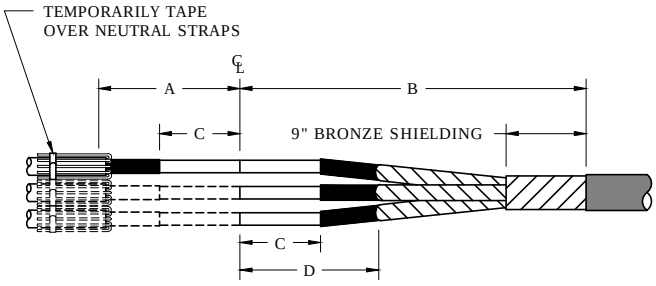


TABLE 2

TYCO ELECTRONICS KIT NUMBER	1/C JACKET CUTBACK "A"	3/C JACKET CUTBACK "B"	SEMI-CON CUTBACK "C"	COPPER TAPE CUTBACK "D"
HVS-T-1551-PE	12"	22"	5"	8"
HVS-T-1552-PE	13"	24"	6"	10"
HVS-T-1553-PE	13"	24"	7"	10"

3				
2				
1				
0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR
1000 KCM AL SHIELD THREE 1/C TO
1000 KCM AL COMPRESSED SUBMARINE 3/C

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DWG. 29.11-03

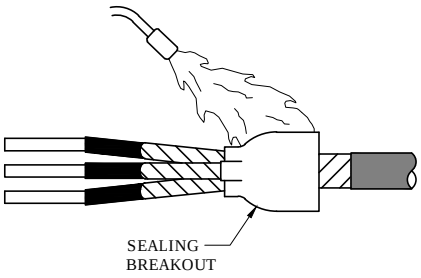
4. PREPARE THE CABLE ENDS FOR THE SHEARBOLT CONNECTORS. THE CABLE PREPARATION LENGTH IS EQUAL TO 1/2 LENGTH MINUS 1/8".

KIT	CONNECTOR CATALOG NUMBER	LENGTH	REMOVE INSULATION
HVS-T-1551-PE	CSBS-20C-500	4"	1-7/8"
HVS-T-1552-PE	ASBS-350C-750	6"	2-7/8"
HVS-T-1553-PE	ASBS-600C-1000	8"	3-7/8"

5. POSITION SEALING BREAKOUT; SHRINK IN PLACE

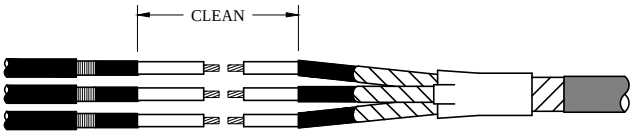
POSITION THE SEALING BREAKOUT OVER THE CABLE JACKET SO THAT THE INSIDE BUTTS UP HARD AGAINST THE BRONZE SHIELD CUTBACK.

SHRINK IN PLACE STARTING AT THE FINGERS AND WORKING TOWARD THE OTHER END.



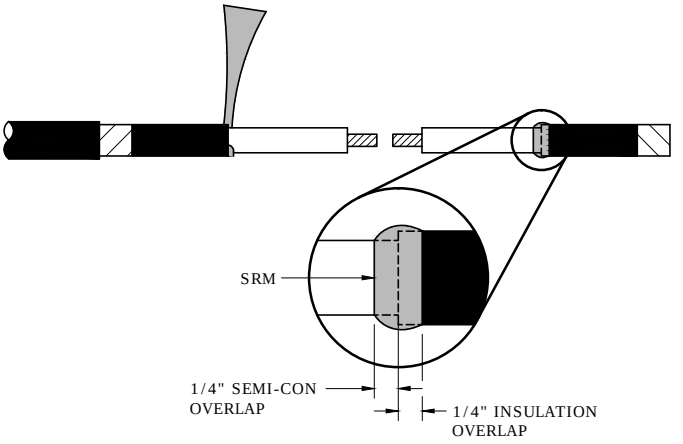
6. ABRADE INSULATION

ABRADE THE INSULATION, IF NECESSARY, TO REMOVE IMBEDDED SEMI-CON AND CLEAN AS SHOWN.



7. APPLY STRESS RELIEF MATERIAL (SRM) AT SEMI-CON CUTBACKS

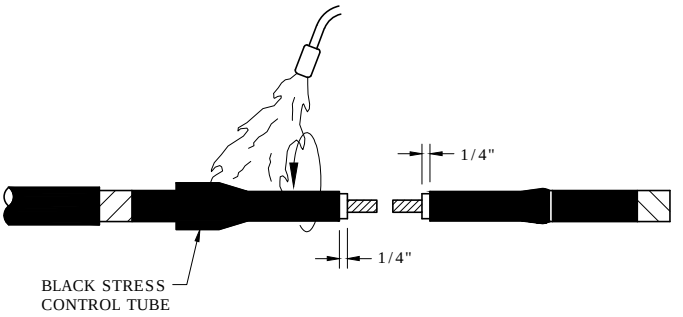
REMOVE BACKINGS FROM THE SHORT ANGLE-CUT PIECE OF SRM. PLACE TIP OF SRM AT SEMI-CON CUTBACK, STRETCH AND TIGHTLY WRAP TO FILL SEMI-CON STEP. OVERLAP SEMI-CON AND INSULATION AS SHOWN. TAPER SRM DOWN TO MEET INSULATION. REPEAT ON OTHER TWO CABLES.



8. POSITION BLACK STRESS CONTROL TUBE; SHRINK IN PLACE

PLACE A BLACK STRESS CONTROL TUBE OVER EACH CABLE 1/4" FROM THE INSULATION CUTBACK AS SHOWN.

BEGIN SHRINKING FROM THE EXPOSED CONDUCTOR. WORK THE TORCH AROUND ALL SIDES TOWARD THE OTHER END OF THE TUBE.



3				
2				
1				
0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR 1000 KCM AL SHIELD THREE 1/C TO 1000 KCM AL COMPRESSED SUBMARINE 3/C

Duke Energy®

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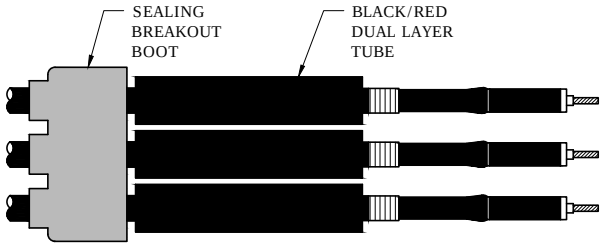
DWG. 29.11-05

9. POSITION SPLICE COMPONENTS

PLACE SEALING BREAKOUT BOOT OVER THE 1/C CABLES WITH THE FINGERS POINTING AWAY FROM THE SPLICE CENTER.

PLACE ONE BLACK/RED DUAL LAYER TUBE OVER EACH CLEAN 1/C CABLE.

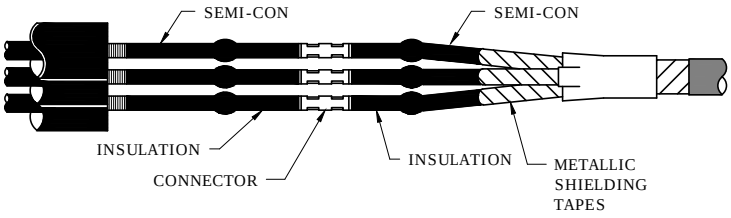


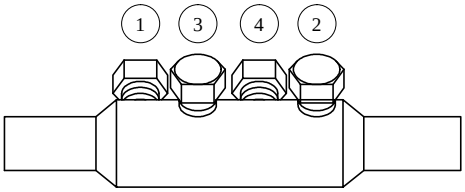
10. INSTALL CONNECTOR

COMPLETE STEPS 10-12 WORKING ON ONE PHASE AT A TIME

INSTALL ALUMINUM OR COPPER SHEARBOLT CONNECTOR. INSULATION SHOULD BE BUTTED UP TIGHT AGAINST THE CONNECTOR ON BOTH SIDES.

HAND TIGHTEN THE SHEAR BOLTS SO THAT THE CONNECTOR STAYS IN PLACE. ALTERNATELY TIGHTEN THE BOLT SET BY HALF TURNS WITH A SOCKET WRENCH UNTIL THE BOLTS SHEAR OFF. FOLLOW THE TIGHTENING SEQUENCE AS SHOWN. FILE SMOOTH ANY REMAINING PART OF THE SHEAR BOLT THAT REMAINS HIGHER THAN THE CONNECTOR.





11. APPLY YELLOW MASTIC OVER CONNECTOR

COMPLETE STEPS 10-12 WORKING ON ONE PHASE AT A TIME

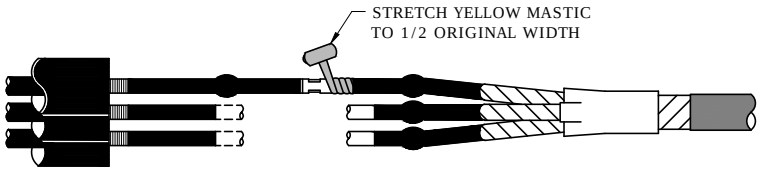
CLEAN CONNECTOR AREA AND INSULATION USING AN APPROVED SOLVENT.

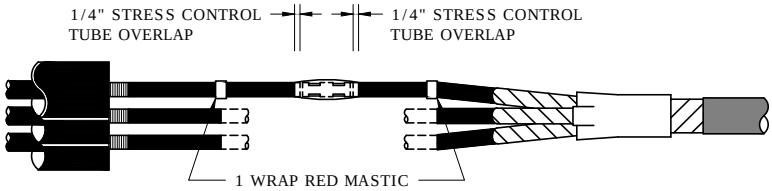
REMOVE BACKING FROM ONE SIDE OF THE LONG STRIP OF YELLOW MASTIC. ROLL THE YELLOW MASTIC AND REMAINING BACKING STRIP INTO A CONVENIENT SIZE. REMOVE THE REMAINING BACKING STRIP AND TIGHTLY WRAP THE YELLOW MASTIC AROUND THE CONNECTOR.

CONTINUE TO WRAP THE SRM ONTO THE STRESS CONTROL TUBE 1/4" AS SHOWN.

CONTINUE TO WRAP YELLOW MASTIC ACROSS THE AREA UNTIL THE LEVEL IS ONE LAYER LARGER IN DIAMETER THAN THE DIAMETER OF THE STRESS CONTROL TUBE.

WRAP ONE LAYER OF RED SEALANT AT THE END OF THE STRESS CONTROL TUBE.

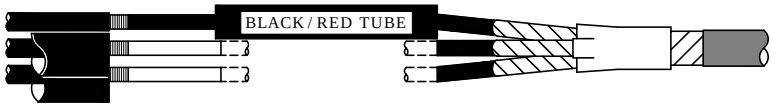




12. POSITION TUBE OVER CONNECTION

COMPLETE STEPS 10-12 WORKING ON ONE PHASE AT A TIME

CENTER BLACK/RED TUBE OVER COMPLETED CONNECTOR AREA.



3				
2				
1				
0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR 1000 KCM AL SHIELD THREE 1/C TO 1000 KCM AL COMPRESSED SUBMARINE 3/C

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DWG. 29.11-07

13. POSITION BLACK/RED TRIPLE LAYER TUBES; SHRINK IN PLACE

VERIFY THE BLACK/RED TRIPLE LAYER TUBES ARE CENTERED OVER THE JOINT AND EXTEND OVER THE RED SEALANT ON BOTH ENDS.

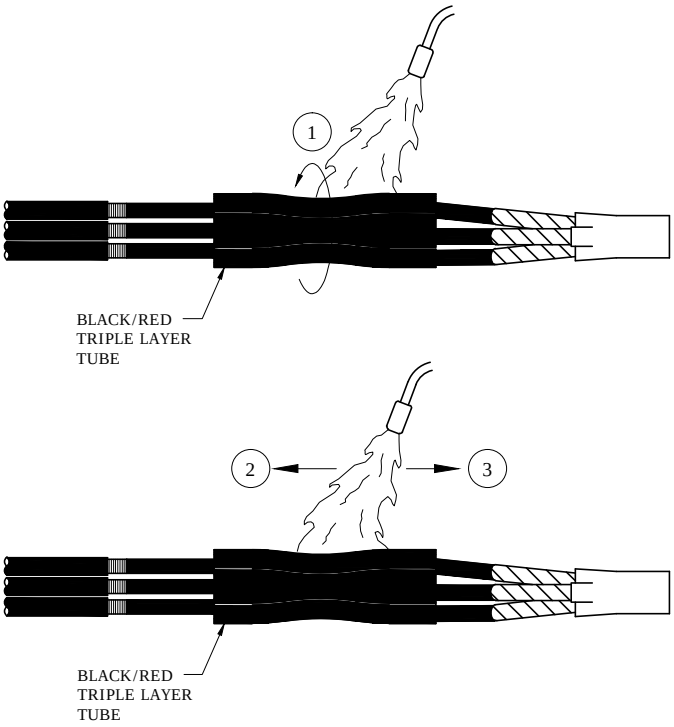
1. SHRINK ALL THREE TUBES AT ONCE. BEGIN SHRINKING IN CENTER OF TUBES, WORKING TORCH AROUND ALL SIDES OF THE TUBES. PAY PARTICULAR ATTENTION TO THE BACK AND UNDERSIDE OF THE TUBES.

2. SHRINK FROM THE CENTER TOWARD ONE END, UNTIL FULLY RECOVERED.

3. RETURN TO THE CENTER AND SHRINK TOWARD THE OTHER END UNTIL FULLY RECOVERED.

NOTE: AFTER COMPLETING THE ABOVE STEPS, THE RAISED EDGES ON THE SURFACE SHOULD DISAPPEAR. ABSENCE OF RIDGES CAN BE OBSERVED BY VISUAL INSPECTION BY FEELING SURFACE WITH A GLOVED HAND. POST HEAT ANY RIDGES UNTIL THE SURFACE IS SMOOTH.

NOTE: DO NOT POINT THE FLAME AT THE CABLE SEMI-CON.



14. CONNECT SHIELDS

CHOOSE THE SPLICE TYPE BELOW AND FOLLOW THE DIRECTIONS.

CHOICE 1: LC SHIELD CABLE

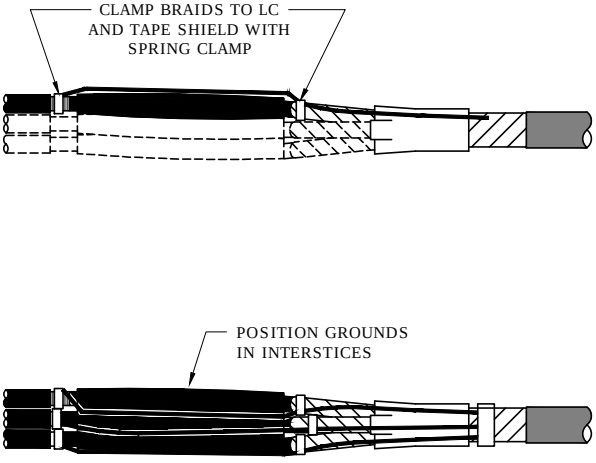
LAY GROUND WIRE OR BRAIDS ACROSS AND ATTACH TO LC SHIELD ON 1/C PHASES USING SPRING CLAMPS AND COPPER TAPE ON 3/C SIDE, AS SHOWN.

LAY THE THREE BRAIDS ACROSS THE JOINT EVENLY SPACED AROUND THE JOINT CIRCUMFERENCE SO THAT THE BRAIDS OVERLAP THE MESH AND TEMPORARILY TAPE THE BRAIDS IN POSITION.

MAKE TWO WRAPS OF THE LARGE SPRING CLAMP OVER THE BRAIDS AND BRONZE SHEATH.

REMOVE THE TEMPORARY TAPE.

FOLD BACK THE OVERLAPPING BRAIDS OVER THE SPRING CLAMP AND WRAP THE REMAINING SPRING CLAMP. TIGHTEN AND SECURE THE SPRING CLAMP. CUT OFF EXCESS BRAIDS.



3				
2				
1				
0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR
1000 KCM AL SHIELD THREE 1/C
TO 1000 KCM AL COMPRESSED SUBMARINE 3/C

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CHOICE 2: JACKETED CONCENTRIC NEUTRAL CABLE

BUNDLE GROUND WIRES OF EACH 1/C PHASE TOGETHER. LAY BRAIDS ACROSS THE SPLICE AND CONNECT BUNDLED 1/C SHIELD WIRES TO BRAIDS USING CUSTOMER SUPPLIED CRIMP CONNECTORS. ATTACH BRAIDS TO COPPER TAPE SHIELD.

LAY THE THREE BRAIDS ACROSS THE JOINT EVENLY SPACED AROUND THE JOINT CIRCUMFERENCE SO THAT THE BRAIDS OVERLAP THE MESH AND TEMPORARILY TAPE THE BRAIDS IN POSITION.

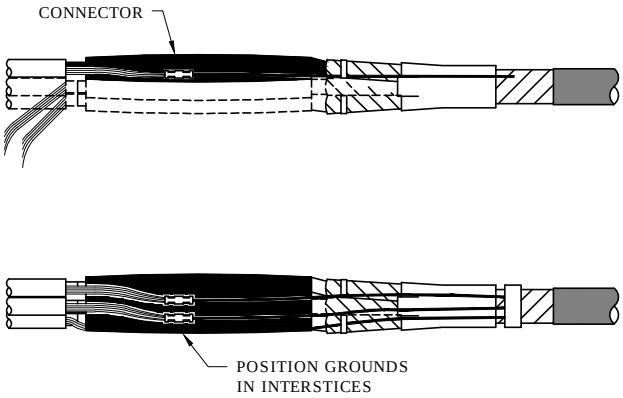
MAKE TWO WRAP OF THE LARGE SPRING CLAMP OVER THE BRAIDS AND BRONZE SHEATH.

REMOVE THE TEMPORARY TAPE.

FOLD BACK THE OVERLAPPING BRAIDS OVER THE SPRING CLAMP AND WRAP THE REMAINING SPRING CLAMP. TIGHTEN AND SECURE THE SPRING CLAMP. CUT OFF EXCESS BRAIDS.

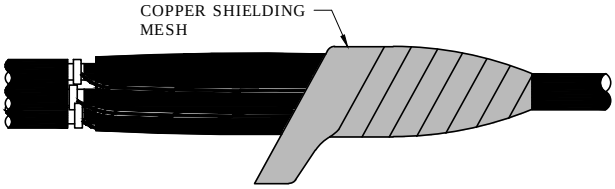
CLAMP EACH PHASE BRAID TO THE COPPER TAPE SHIELD OF THE PHASE.

GO TO STEP 15.



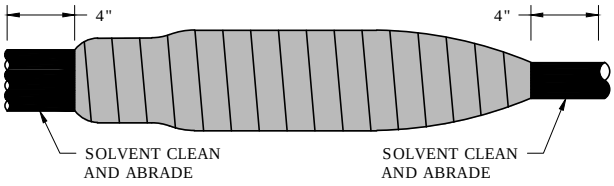
15. INSTALL THE SHIELDING MESH

STARTING AT THE 3/C CUTBACK, WRAP ONE HALF-LAPPED LAYER OF 2" WIDE COPPER MESH OVER THE EXPOSED BRONZE SHEATH AND BRAID ATTACHMENT, ACROSS THE SPLICES AND TIE OFF AT THE 3-1/C JACKETS AS SHOWN.



16. CLEAN CABLES

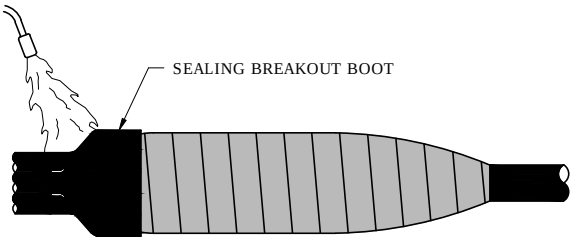
SOLVENT CLEAN AND ABRADE CABLE JACKETS (OR LEAD SHEATH) AS SHOWN USING AN OIL-FREE SOLVENT



17. POSITION SEALING BREAKOUT BOOT; SHRINK IN PLACE

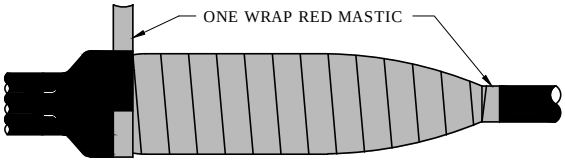
MAKE SURE THAT THE FULL LENGTH OF THE FINGERS OF THE BREAKOUT BOOT ARE OVER THE EXTRUDED DIELECTRIC CABLE JACKETS WITH THE BODY EXTENDING OVER THE SPLICES.

SHRINK IN PLACE STARTING AT THE FINGERS AND WORKING TOWARD THE SPLICE CENTER.



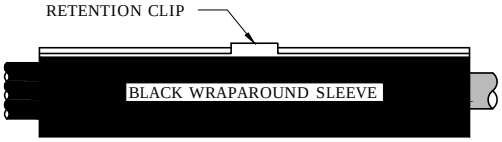
18. APPLY RED MASTIC

APPLY ONE WRAP OF RED MASTIC OVER THE BODY OF THE BREAKOUT BOOT AND ONE LAYER OVER THE 3/C JACKET AS SHOWN.



19. POSITION WRAPAROUND SLEEVE

REMOVE OR TAPE OVER ALL SHARP POINTS TO PREVENT PUNCTURE OF WRAPAROUND SLEEVE. REMOVE BACKING FROM WRAPAROUND SEALING SLEEVE AND CENTER SLEEVE OVER SPLICE. SLIDE METAL RETENTION CLIP ONTO THE BUTTED RAILS.



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0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR 1000 KCM AL SHIELD THREE 1/C TO 1000 KCM AL COMPRESSED SUBMARINE 3/C

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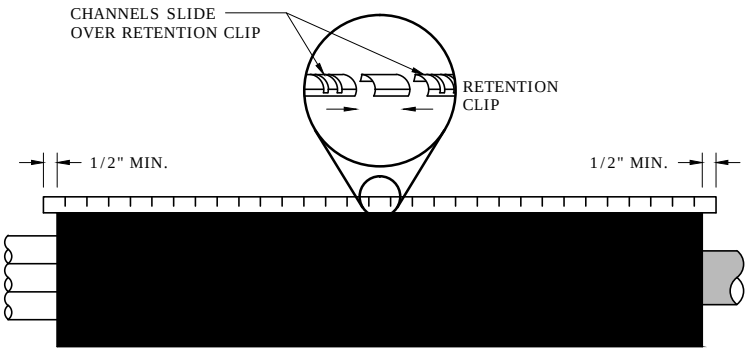
20. INSTALL CHANNELS

SLIDE CHANNELS TOWARD THE CENTER FROM EACH END OF THE SLEEVE AND OVER THE RETENTION CLIP. A MINIMUM OF 1/2" OF CHANNEL SHOULD BE EXTENDED BEYOND THE EDGES OF THE SLEEVE.

IF CHANNELS SLIDE ON EASILY, GO TO STEP 21. IF CHANNEL FIT SEEMS TIGHT, CONTINUE WITH NEXT PARAGRAPH.

AS SHOWN IN ILLUSTRATION 'A', MAKE SURE FLAP IS NOT PINCHED BETWEEN THE RAILS. PUSH THE SLEEVE UP FROM THE BOTTOM AND DOWN FROM THE TOP WHILE SLIDING ON CHANNEL AS SHOWN IN ILLUSTRATION 'B'. THE IDEA IS TO FLATTEN THE RAILS TOGETHER TO PREVENT THE CHANNELS FROM BINDING.



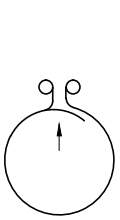


ILLUSTRATION 'A'

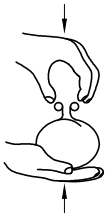


ILLUSTRATION 'B'

21. SHRINK THE WRAPAROUND SLEEVE

PREHEAT EVENLY ALONG BOTH SIDES OF THE RAIL/CHANNEL AREA UNTIL THIS AREA BEGINS TO SHRINK. TO ACHIEVE UNIFORM HEATING, MOVE THE FLAME BACK AND FORTH FROM ONE SIDE OF THE CHANNEL TO THE OTHER AS SHOWN IN ILLUSTRATION 'C' WHILE MOVING FLAME ALONG THE ENTIRE LENGTH OF THE CHANNEL AS SHOWN IN ILLUSTRATION 'D' UNTIL THE SLEEVE STARTS TO SHRINK. THIS TECHNIQUE WILL ASSURE A PROPERLY PREHEATED RAIL AND CHANNEL AREA.

BEGIN SHRINKING AT THE CENTER OF THE SLEEVE AND WORK TOWARD EACH END.

APPLY HEAT UNTIL THE SLEEVE IS FULLY SHRUNK AND THE HEAT-SENSITIVE GREEN PAINT IS COMPLETELY CONVERTED TO BLACK. CONTINUE HEATING THE RAIL/ CHANNEL AREA FOR ANOTHER FIVE SECONDS PER FOOT. A WHITE LINE SHOULD BE VISIBLE IN THE CHANNEL GAPS INDICATING SUFFICIENT HEATING.

NOTE: GREEN HEAT-SENSITIVE PAINT WILL TURN BLACK AS THE SLEEVE SHRINKS IN PLACE.

THIS COMPLETES THE SPLICE.

NOTE: ALLOW TO COOL BEFORE MOVING OR PLACING IN SERVICE.

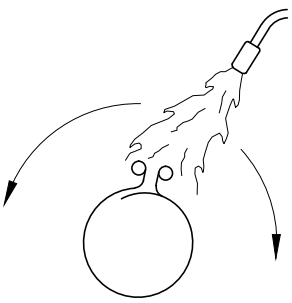


ILLUSTRATION 'C'

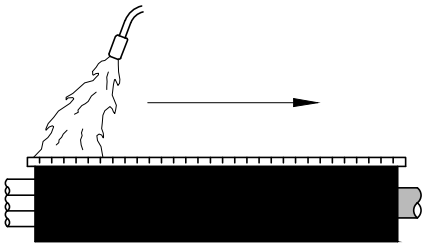
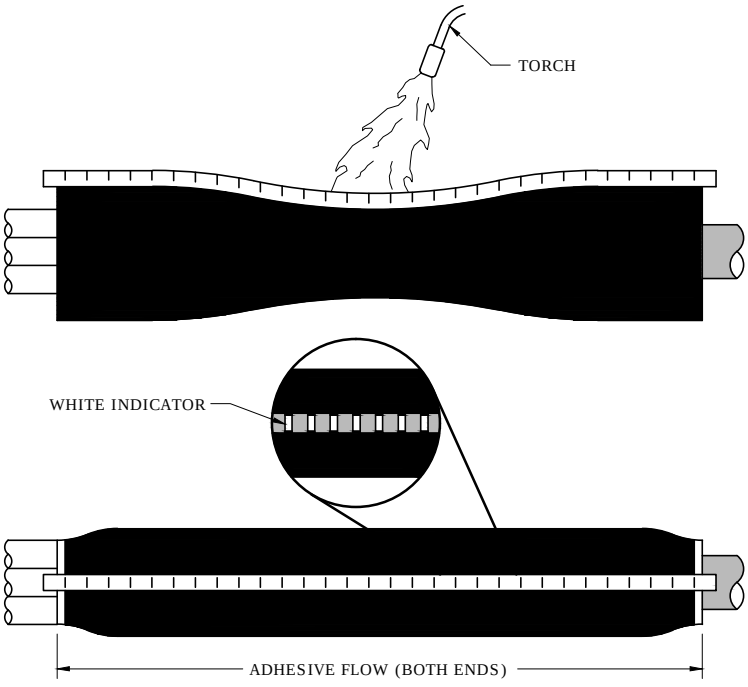


ILLUSTRATION 'D'



3				
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0	11/30/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

INSTALLATION INSTRUCTIONS FOR 1000 KCM AL SHIELD THREE 1/C TO 1000 KCM AL COMPRESSED SUBMARINE 3/C

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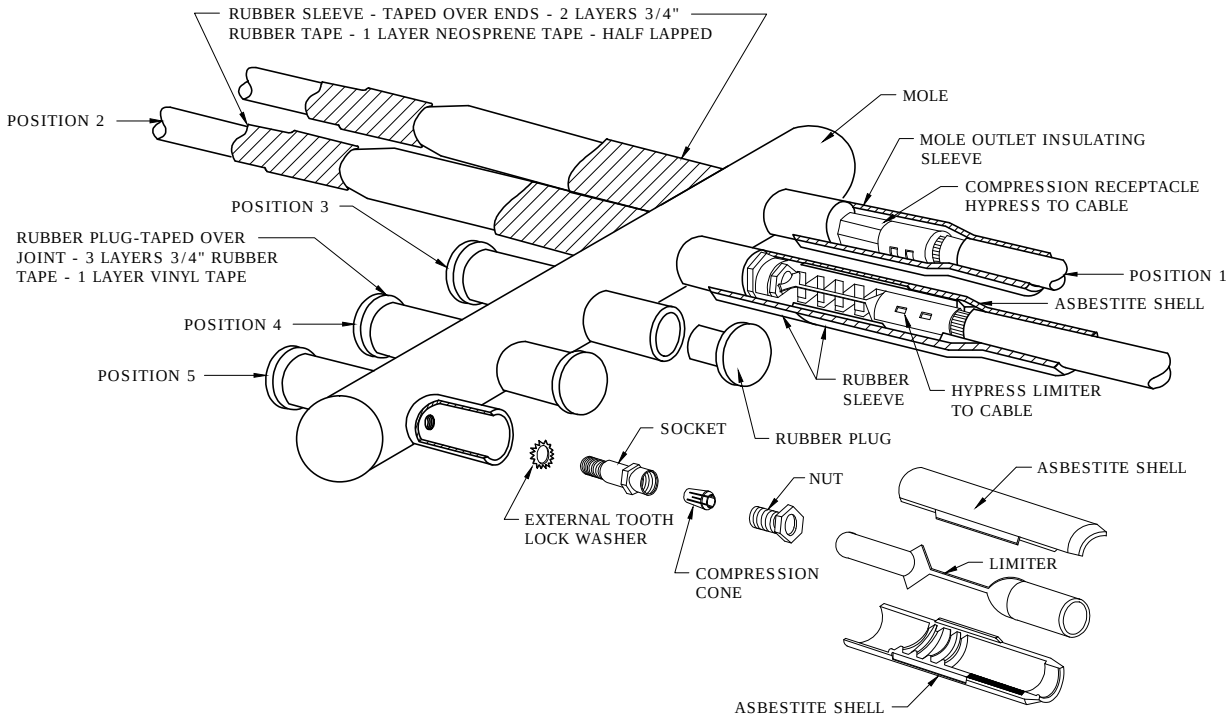

CABLE POSITION	PLACEMENT	CABLE TYPE
1	CLOSEST TO WALL	JUMPER
2	-	STREET MAIN OR TRANSFORMER LEAD
3	-	STREET MAIN OR TRANSFORMER LEAD
4	-	SERVICE
5	FURTHEST FROM WALL	SERVICE

NOTES:

1. SAND, CLEAN AND PREPARE TAPING SURFACES OF MOLE, CABLE, SLEEVES AND PLUGS. APPLY LIQUID ADHESIVE (CN 9220264758).

REVISED		BY	CK'D	APPR.
3				
2				
1	2/19/14	DANNA	DANNA	ADCOCK
0	10/5/10	DANNA	GUINN	ELKINS

SECONDARY CABLE
MOLE CONNECTION DETAILS

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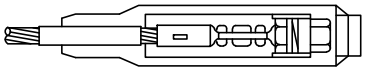
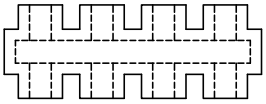
LIMITERS



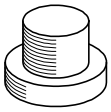
ITEM	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
LINK ONLY	4/0	9220191136	MOLLINK40F
LINK ONLY	500	9220191123	MOLLINK500F
HALF LINK ONLY	4/0	9220191126	MOLHLINK40F
HALF LINK ONLY	500	9220191129	MOLHLINK500F
RECEPTACLE TYPE ASSEMBLY CABLE TO MULTI-OUTLET TO CLEAR FAULTED SECONDARY CABLE IN SECONDARY NETWORKS INCLUDES LINK, SHELL AND RUBBER SLEEVE	4/0 STRAND LINE	312503	MOLLIMASBLY40F
	500 KCM LINE	312552	MOLLIMASBLY500F

MOLE - 600V MECHANICAL ASSEMBLY, TYPE 2-WAY, PRE-INSULATED



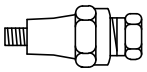
ITEM	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
CONNECTOR, STUD MOLE 600V MECHANICAL TYPE, STUD BASE, PRE-INSULATED "STUD MOLE"	8 HOLE, 1500 AMP	312204	MOLBC8P15F
	10 HOLE, 1500 AMP	312205	MOLBC10P15F
	16 HOLE, 1500 AMP	9220191936	MOLBC16P15F

PLUGS



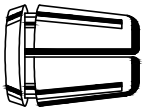
ITEM	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
POSITION PLUGS, MULTI-OUTLET RECEPTACLE MOLE PLUG	1500 AMP	313153	MOLPP15F
END PLUG	1500 AMP	9220191120	MOLEP15F
END PLUG	2000 AMP	9220191431	MOLEP20F

SOCKETS



ITEM	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
SOCKET AND NUT ASSEMBLY CABLE TO MULTI-OUTLET RECEPTACLE	4/0 STRANDED MAXIMUM	313353	MOLSN40F
	500 MCM MAXIMUM	313355	MOLSN500F

CONES



CORRESPONDING SOCKET	*TYPE	CATALOG NUMBER	COMPATIBLE UNIT
313353	#6 CABLE	9220191119	MOLCONE6F
	#2 CABLE	9220191138	MOLCONE2F
	1/0 CABLE	313382	MOLCONE10F
	4/0 CABLE	313386	MOLCONE40F
313355	500 CABLE	313388	MOLCONE500F

*CONTACT DISTRIBUTION STANDARDS TO REQUEST OTHER CONE SIZES

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

SECONDARY CABLE

MOLE CONNECTION CATALOG NUMBERS

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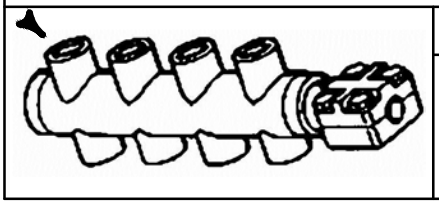
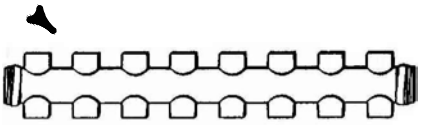
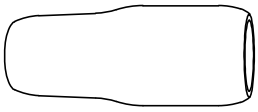
STUD MOLE				
	ITEM	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
	STUD MOLE, 2000 AMP	8 POS	9220191124	MOSTUD8P20F

MOLE INSULATION ONLY				
	ITEM	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
	MOLE INSULATION, 1500 AMP	8 POS	9220191121	MOLCOV8P15F
	MOLE INSULATION, 1500 AMP	10 POS	9220191122	MOLCOV10P15F
	MOLE INSULATION, 1500 AMP	16 POS	9220191938	MOLCOV16P15F

CONNECTOR		
ITEM	CATALOG NUMBER	COMPATIBLE UNIT
CONNECTOR 4/0, TEE	9220191133	MOLTEE40F

HYDENT SOCKET		
ITEM	CATALOG NUMBER	COMPATIBLE UNIT
4/0 SOCKET	9220191130	MOLHYSOC40F
500 SOCKET	9220191131	MOLHYSOC500F

MOLE INSULATION ONLY			
	ITEM	CATALOG NUMBER	COMPATIBLE UNIT
	COVER FOR SOCKET AND NUT ASSEMBLY	313205	MOLCONECOVEF

REVISED		BY	CK'D	APPR.
3				
2				
1	7/15/11	DANNA	BURLISON	ELKINS
0	10/5/10	DANNA	GUINN	ELKINS

SECONDARY CABLE

MOLE CONNECTION CATALOG NUMBERS

Progress Energy

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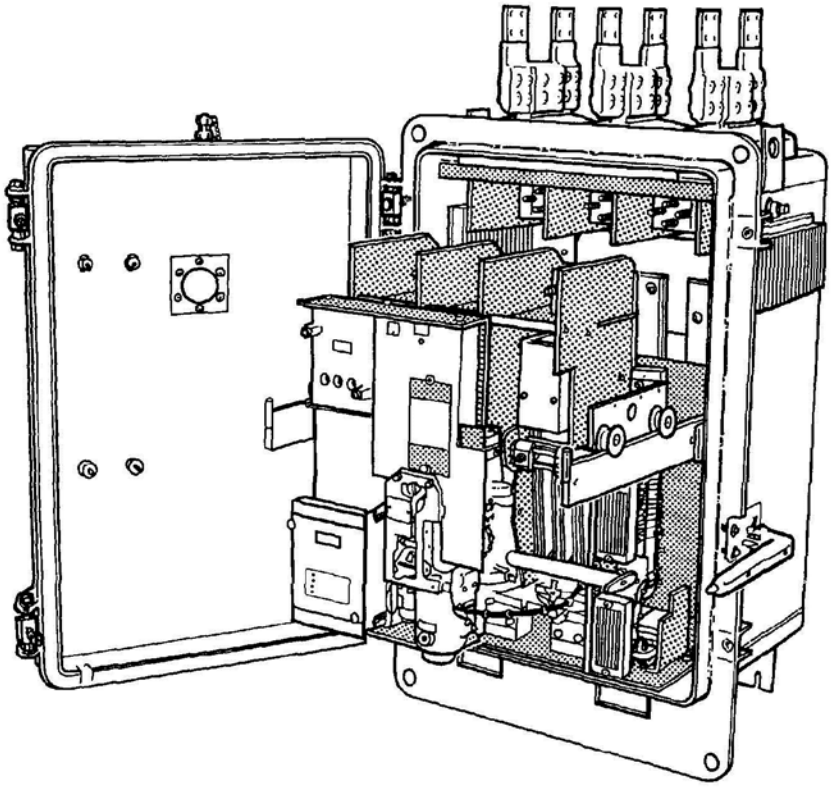

RATING	VOLTAGE	TYPE	CATALOG NUMBER	COMPATIBLE UNIT
1600 AMP	125/216V	CM22	9220191118	NPR1600CM22216F
1875 AMP	125/216V	CM22	9220191137	NPR1875CM22216F
1875 AMP	277/480V	CM22	9220197374	NPR1875CM22480F
2500 AMP	125/216V	CM22	9220236978	NPR2500CM22216F
5100 AMP	277/480V	CMR8	-	NPR5100CMR8480F

NOTES:

1. SEE NETWORK FOREMAN FOR PART AVAILABILITY ON PROTECTORS IN SERVICE OR FOR LIKE FOR LIKE UNIT CHANGEOUT. SEE DISTRIBUTION STANDARDS FOR NETWORK PROTECTOR UPGRADES.

3				
2	11/30/12	DANNA	DANNA	ADCOCK
1	2/13/12	DANNA	BURLISON	ELKINS
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

NETWORK PROTECTORS

GENERAL INFORMATION

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NETWORK PROTECTOR			NETWORK TRANSFORMER		
CONTINUOUS RMS CURRENT RATING (A)	INTERRUPTING RATING, RMS SYMMETRICAL (A)	CLOSE AND LATCH RATING, RMS SYMMETRICAL (A)	NAMEPLATE RATING (KVA)	NAMEPLATE RMS CURRENT (A)	PROTECTOR RATING AS % OF TRANSFORMER NAMEPLATE CURRENT
800	30,000	25,000	225	600	133
1200	30,000	25,000	300	800	150
1600	30,000	25,000	500	1333	120
1875	30,000	25,000	500	1333	141
2000	35,000	35,000	500	1333	150
2250	35,000	35,000	500	1333	169
2500	60,000	40,000	750	2000	125
2825	60,000	40,000	750	2000	141
3000	60,000	40,000	1000	2667	112
3500	60,000	40,000	1000	2667	131
4500	60,000	40,000	1000	2667	169

REVISED		BY	CK'D	APPR.
3				
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0	10/5/10	DANNA	GUINN	ELKINS

NETWORK PROTECTOR

TRANSFORMER TO PROTECTOR RATINGS

Duke Energy®

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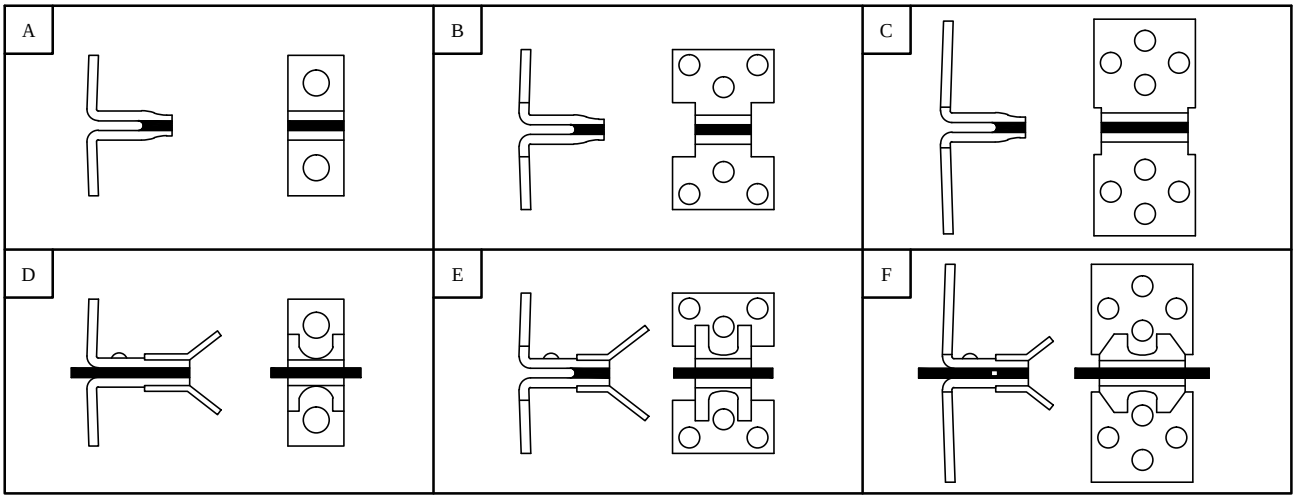
DWG. 29.14-03

WESTINGHOUSE LOW LOSS LEAD ALLOY STANDARD SPEED FUSES USED ON NETWORK PROTECTORS						
	NETWORK PROTECTOR ENCLOSURE					
	OPEN OR VENTILATED		SUBMERSIBLE OR NEMA 1A SEMI-DUST-TIGHT		FUSE STYLE NUMBER	FUSE CONFIGURATION
	PROTECTOR AMPERE RATING	CURVE 250300	PROTECTOR AMPERE RATING	CURVE 250300		
125/216 VOLTS	800	1			1173006	A
	1200	2	800	1	1173007	
	1600	3	1200	2	1173008	
			1600	3	1173010	
	1875	4			1173009	
			1875	4	1173011	
	2000	4			1346880	B
	2250	5	2000	4	1346881	
			2250	5	2A9867G06	
	2500	5			1346917	C
	2825	6	2500	5	1247325	
			2825	6	1291274	
	3000	6			1247325	
			3000	6	12A3822G07	
	3500	7			1291274	
			3500 *	7	12A3822G07	
277/480 VOLTS	800	1			1254871	D
	1200	2	800	1	1254872	
	1600	3	1200	2	1300550	
			1600	3	1300551	
	1875	4			1346424	
			1875	4	14A579G06	
	2000	4			1300552	E
	2250	5	2000	4	1300553	
			2250	5	1300564	
	2500	5			1491538	F
	2825	6	2500	5	1332318	
			2825	6	1615572	
	3000	6			1332318	
			3000	6	15A4106G04	
	3500	7			1615572	
			3500 *	7	15A4106G04	

* SUBMERSIBLE UNITS ONLY



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0	10/5/10	DANNA	GUINN	ELKINS	
REVISED		BY	CK'D	APPR.	

NETWORK PROTECTOR
CM-22 PROTECTOR
FUSE TYPES

Duke Energy®

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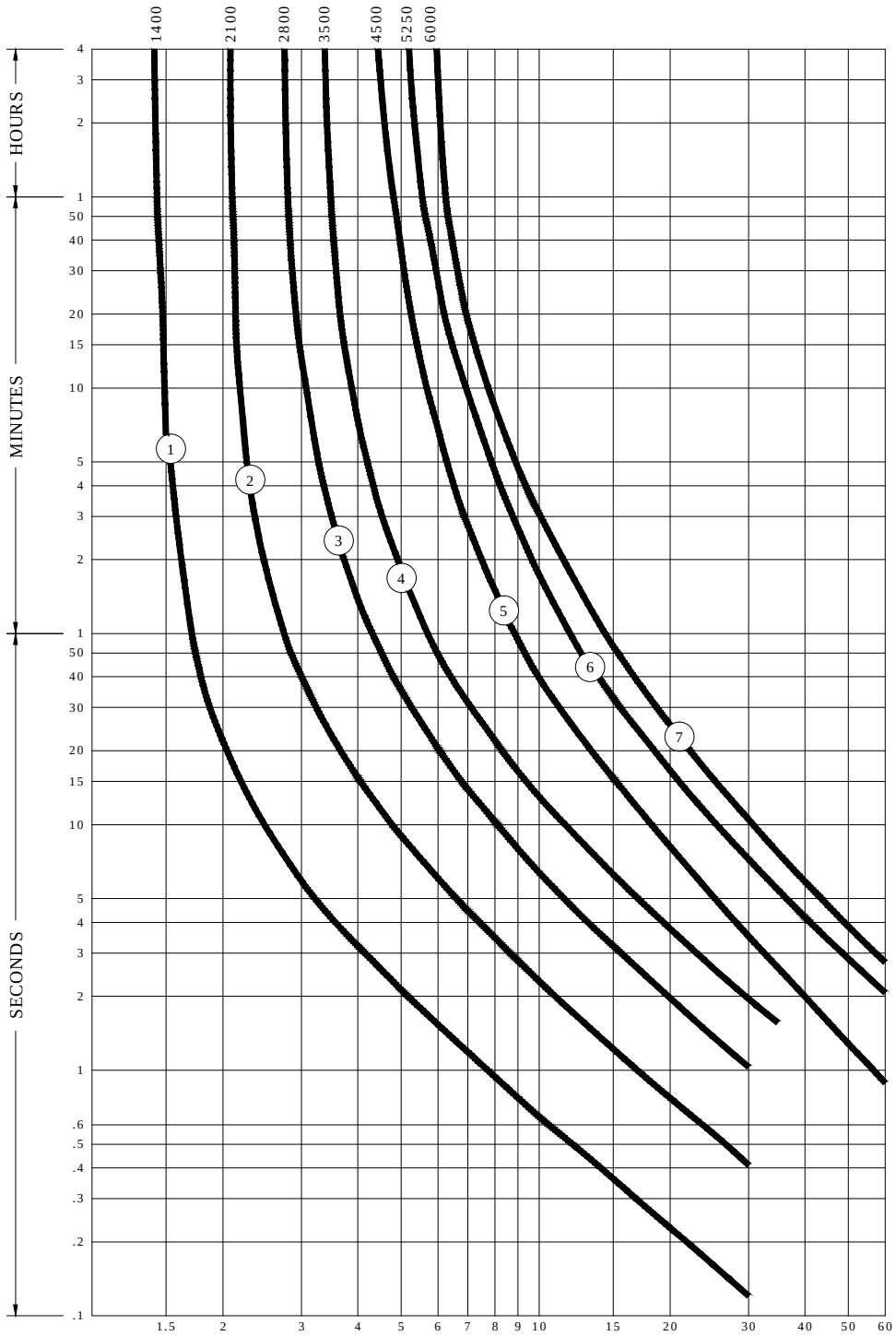
DWG. 29.14-05

ALLOY FUSE FOR TYPE CM-22 PROTECTORS - CHARACTERISTIC CURVES 250300



CURRENT - 1000 AMPERES

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2				
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0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

NETWORK PROTECTOR
CM-22 PROTECTOR
FUSE CURVES

Duke Energy®

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DWG. 29.14-07

THE TYPE CM-22 NETWORK PROTECTOR CONSISTS OF AN AUTOMATIC, ELECTRICALLY-OPERATED AIR CIRCUIT BREAKER, WHICH INCLUDES A TRIPPING MECHANISM, SUITABLE CONTROL EQUIPMENT, AND NETWORK RELAYS. THE ENTIRE OPERATION OF THE PROTECTOR IS USUALLY CONTROLLED BY TWO RELAYS:

- THE MASTER RELAY (TYPE CN-33)
- THE PHASING RELAY (TYPE CNJ)

OPERATION

THE TYPES CN-33 AND CNJ RELAYS WERE DESIGNED TO CONTROL THE OPERATION OF THE CM-22 NETWORK PROTECTOR WHICH ARE USED FOR THE CONTROL AND PROTECTION OF THE COMPANY'S NETWORK SYSTEMS. THIS SYSTEM IS A LOW VOLTAGE A/C NETWORK SYSTEM WHICH IS AN INTERCONNECTED GRID OR MESH OF LOW VOLTAGE MAINS, FROM WHICH THE CUSTOMERS' SERVICES ARE TAKEN, SUPPLIED THROUGH A NUMBER OF NETWORK TRANSFORMER BANKS OVER TWO OR MORE HIGH VOLTAGE FEEDERS. NETWORK PROTECTORS ARE CONNECTED IN THE SECONDARY LEADS OF NETWORK TRANSFORMER BANKS TO PROVIDE MEANS FOR DISCONNECTING ANY HIGH VOLTAGE OR PRIMARY FEEDER AND ITS ASSOCIATED NETWORK TRANSFORMERS FROM THE SECONDARY GRID OR NETWORK.

THE CHARACTERISTICS FOR THE TYPE CN-33 NETWORK MASTER RELAY ARE SUCH THAT IT WILL OPERATE TO CLOSE THE NETWORK PROTECTOR WHEN THE VOLTAGE ON THE TRANSFORMER SIDE OF THE PROTECTOR IS APPROXIMATELY EQUAL TO OR GREATER THAN AND SUBSTANTIALLY IN PHASE WITH THE VOLTAGE ON THE NETWORK SIDE OF THE PROTECTOR.

ALSO, THE CN-33 NETWORK MASTER RELAY WILL TRIP THE PROTECTOR WHEN THE FLOW OF POWER THROUGH THE PROTECTOR IS REVERSED, THAT IS, THE FLOW IS FROM THE NETWORK TO THE TRANSFORMER BANK.

AN ADDITIONAL RELAY IS USED TO OPERATE THE NETWORK PROTECTOR. THE CNJ PHASING RELAY IS USED ALONG WITH THE CN-33 TO PREVENT THE NETWORK PROTECTOR FROM CLOSING UNDER VOLTAGE CONDITIONS WHICH WOULD PRODUCE A REVERSAL OF POWER WHEN THE PROTECTOR CLOSED THUS CAUSING IT TO IMMEDIATELY REOPEN. SUCH REPEATED CLOSING AND OPENING OF THE NETWORK PROTECTOR WITHOUT ANY CHANGES IN LOAD AND VOLTAGE CONDITIONS ON THE SYSTEM OTHER THAN THOSE PRODUCED BY THE OPERATION OF THE PROTECTOR IS REFERRED TO AS PUMPING. THE CONTACTS OF THE CNJ AND THE CN-33 RELAY THAT ARE USED IN THE CLOSING CIRCUIT ARE IN SERIES WITH EACH OTHER. IN OTHER WORDS, BOTH OF THESE RELAYS HAVE TO BE PICKED UP (ENERGIZED) AND THEIR CONTACTS CLOSED BEFORE THE PROTECTOR WILL CLOSE.

SITUATION	RESPONSE
1. PROTECTOR CLOSED, POWER FLOWING TO THE NETWORK	1. PROTECTOR WILL REMAIN CLOSED. CN-33
2. PROTECTOR CLOSED, POWER FLOWING TO TRANSFORMER	2. PROTECTOR WILL OPEN RELAY CN-33
3. PROTECTOR OPEN, NETWORK AND TRANSFORMER VOLTAGE EQUAL	3. PROTECTOR WILL REMAIN OPEN
4. FEEDER DEAD, PROTECTOR OPEN, NETWORK ENERGIZED	4. PROTECTOR WILL REMAIN OPEN CN-33 & CNJ
5. TRANSFORMER VOLTAGE HIGHER AND LEADING THE NETWORK AND APPROXIMATELY IN PHASE	5. PROTECTOR WILL CLOSE CN-33 & CNJ RELAY
6. PROTECTOR OPEN, NETWORK DE-ENERGIZED.	6. PROTECTOR WILL REMAIN OPEN. CN-33
7. TRANSFORMER AND NETWORK IN A CROSSED PHASE SITUATION	7. PROTECTOR WILL REMAIN OPEN, CN-33 RELAY

3				
2				
1				
0	10/5/10	DANNA	GUINN	ELKINS
REVISED		BY	CK'D	APPR.

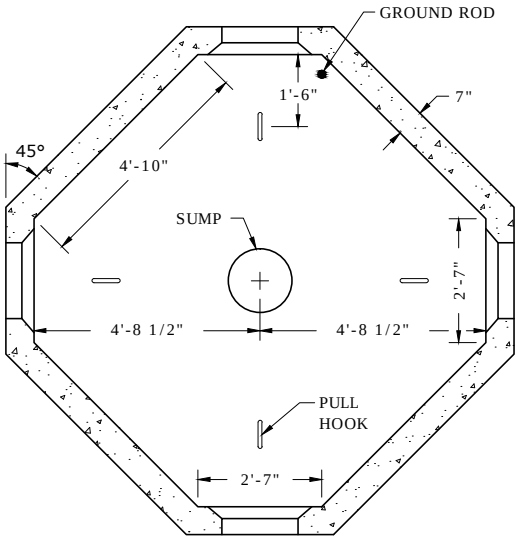
NETWORK PROTECTOR - GENERAL OPERATION

W/E/M RELAY

Duke Energy®

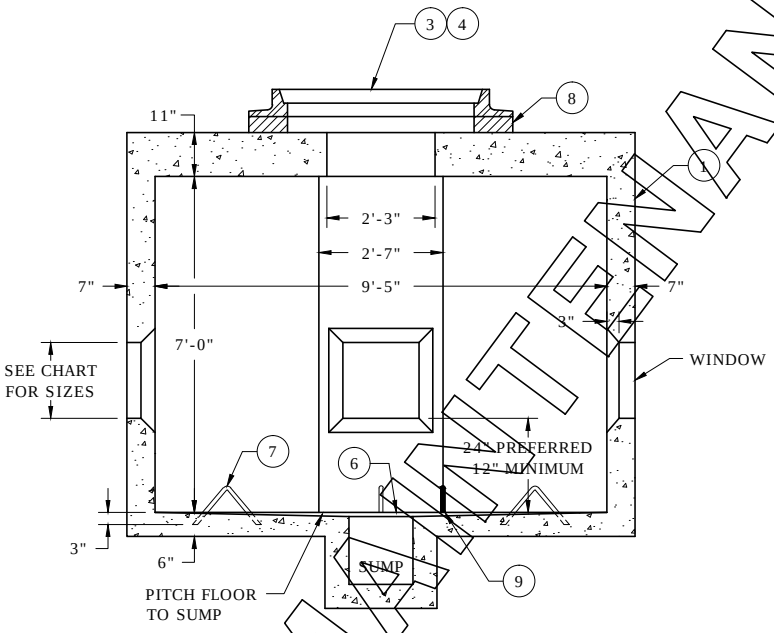
FLA

DWG. 29.14-09



PLAN VIEW

WINDOW SIZES	
NO. OF DUCTS	SIZE OF WINDOW
1 OR 2	20" X 7"
3	20" X 12"
6 OR 8	20" X 20"
9	20" X 25"
12	20" X 32"
15	20" X 38"
17	20" X 45"



SIDE SECTION

BILL OF MATERIALS

MACRO UNIT	CU ITEM NO.	COMPATIBLE UNIT	QTY REQ'D	CATALOG NUMBER	QTY PER CU	DESCRIPTION
	1	-	1	-	10	CONCRETE, YARDS
	2	-	1	-	1003	REINFORCING STEEL 5/8", FT. (NOT SHOWN)
	3	-	1	-	1	MANHOLE RING
	4	-	1	-	1	MANHOLE COVER
	5	-	1	-	1	SUMP PIPE (NOT SHOWN)
	6	-	1	-	1	SUMP COVER
	7	-	1	-	4	PULL HOOKS
	8	-	1	-	AS REQ'D.	CEMENT BRICK
	9	-	1	-	2	GROUND ROD 1/2" X 10"

REVISED	BY	CK'D	APPR.
3			
2			
1			
O 9/27/11	GUINN	BURLISON	ELKINS

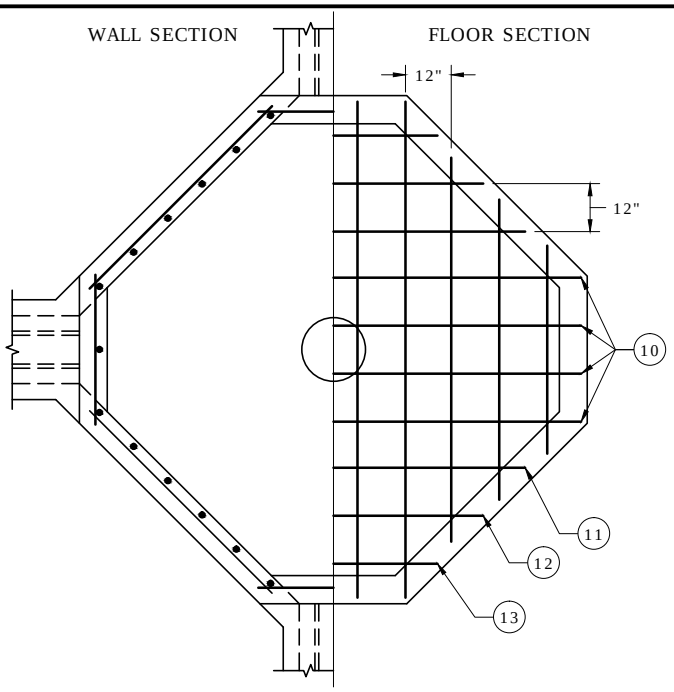
FOUR WAY MANHOLE CONSTRUCTION DETAILS

(FMO)

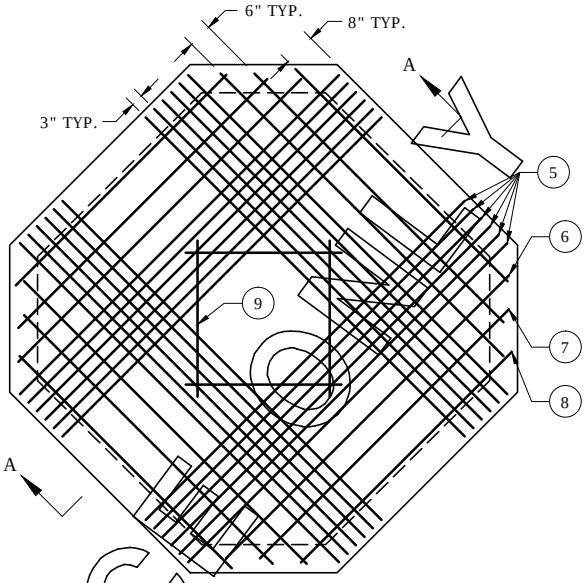
Progress Energy

FLA

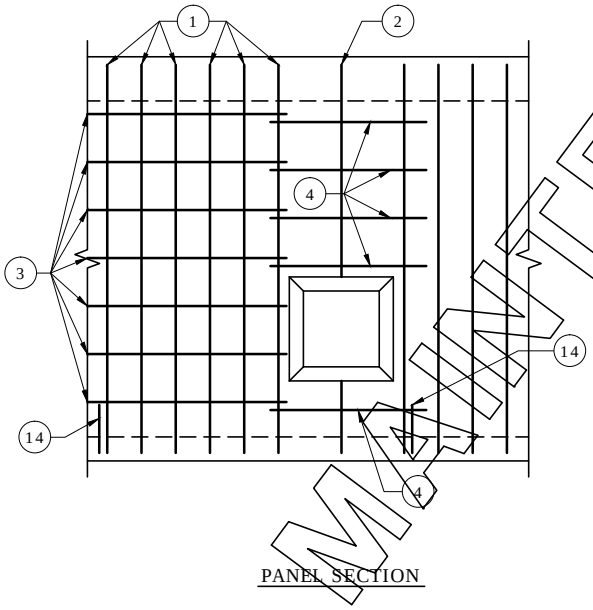
DWG. 29.03-17



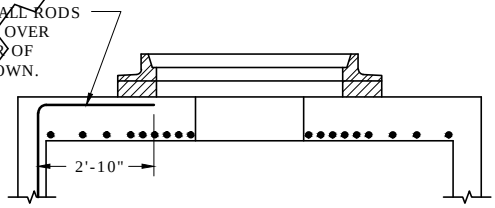
REINFORCING DETAIL



ROOF REINFORCING DETAIL



PANEL SECTION



SECTION A-A

REINFORCING RODS			
ITEM NO.	QTY REQ'D	LENGTH	DESCRIPTION
1	24	10'-10"	WALLS (VERTICAL)
2	4	8'-2"	WALLS (VERTICAL)
3	26	5'-6"	WALLS (HORIZONTAL)
4	20	3'-3"	WALLS (HORIZONTAL)
5	24	9'-5"	ROOF
6	4	8'-4"	ROOF
7	4	7'-4"	ROOF
8	4	6'-3"	ROOF
9	4	3'-3"	ROOF
10	8	10'-4"	ROOF
11	4	8'-0"	ROOF
12	4	6'-3"	ROOF
13	4	4'-4"	ROOF
14	24	1'-0"	ROOF

NOTES:

1. ALL REINFORCING TO BE 5/8" ROUND STRUCTURAL GRADE BARS WITH ASTM A-305 DEFORMATION. BARS TO BE 1-1/2" MIN. FROM SURFACE OF CONCRETE.

2. CONCRETE TO HAVE A 28 DAY MIN. STRENGTH OF 3,000 PSI.

REVISED	BY	CK'D	APPR.
3				
2				
1				
O 9/27/11	GUINN	BURLISON	ELKINS

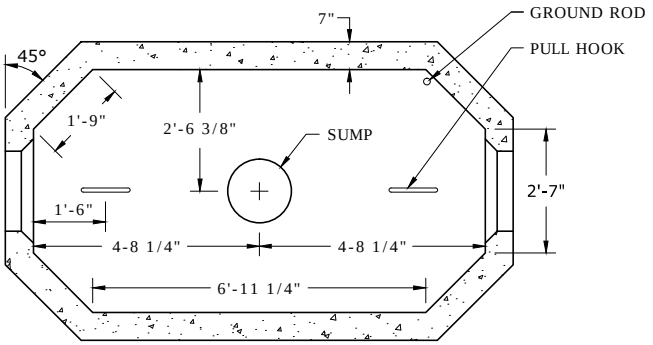
FOUR WAY MANHOLE REINFORCING DETAILS

(FMO)

Progress Energy

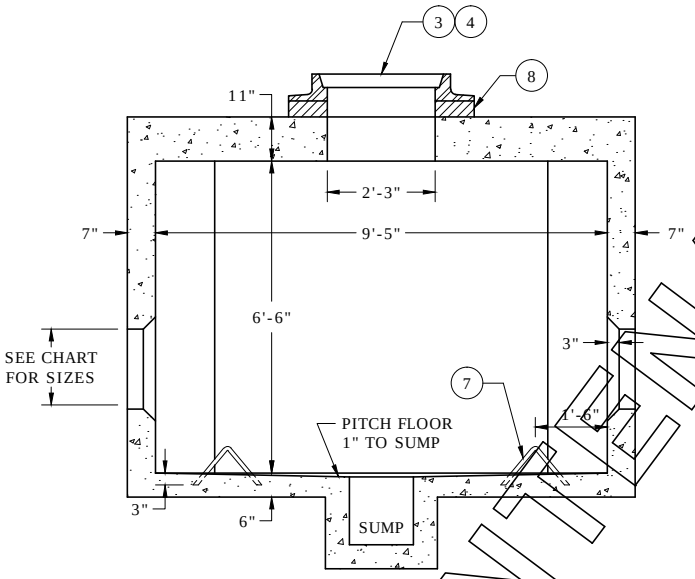
FLA

DWG. 29.03-19

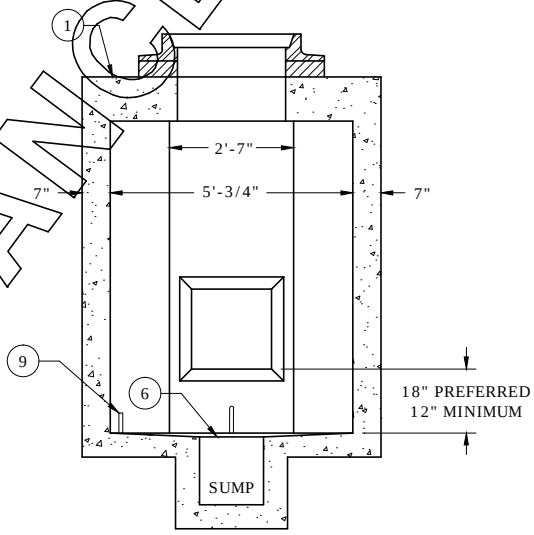


PLAN VIEW

WINDOW SIZES	
NO. OF DUCTS	SIZE OF WINDOW
1 OR 2	20" X 7"
3	20" X 12"
6 OR 8	20" X 20"
9	20" X 25"
12	20" X 32"
15	20" X 38"
17	20" X 45"



SIDE SECTION



END SECTION

BILL OF MATERIALS

MACRO UNIT	CU ITEM NO.	COMPATIBLE UNIT	QTY REQ'D	CATALOG NUMBER	QTY PER CU	DESCRIPTION
-	1	-	1	-	7	CONCRETE, YARDS
	2	-	1	-	894	REINFORCING STEEL, 5/8", FT. (NOT SHOWN)
	3	-	1	-	1	MANHOLE RING
	4	-	1	-	1	MANHOLE COVER
	5	-	1	-	1	SUMP PIPE (NOT SHOWN)
	6	-	1	-	1	SUMP COVER
	7	-	1	-	2	PULL HOOKS
	8	-	1	-	AS REQ'D.	CEMENT BRICK
	9	-	1	-	2	GROUND ROD, 1/2" X 10"

3				
2				
1				
O	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

TWO WAY MANHOLE CONSTRUCTION DETAILS

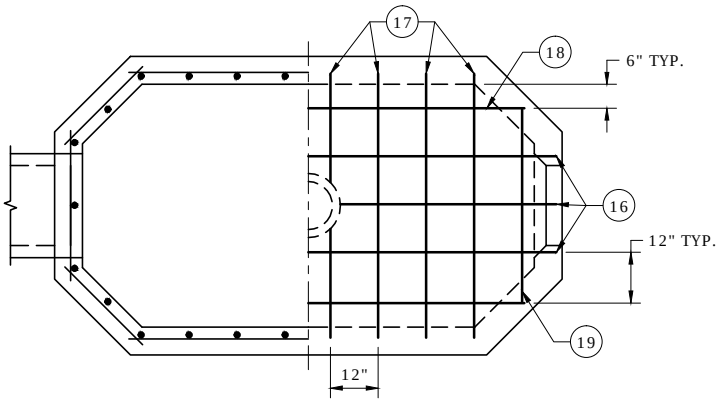
(FMO)

Progress Energy

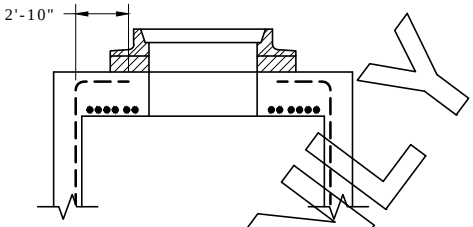
FLA

DWG. 29.03-21

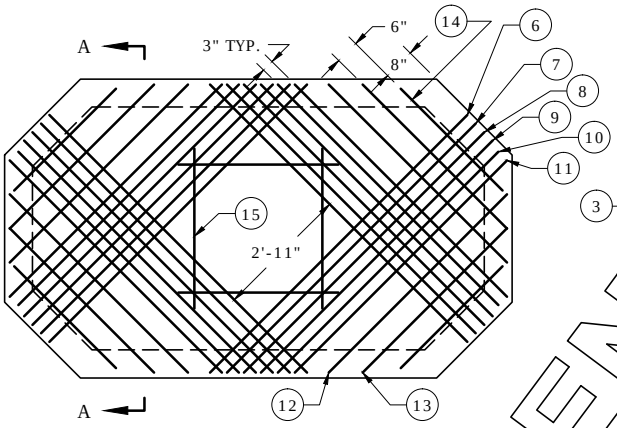
WALL SECTION FLOOR SECTION



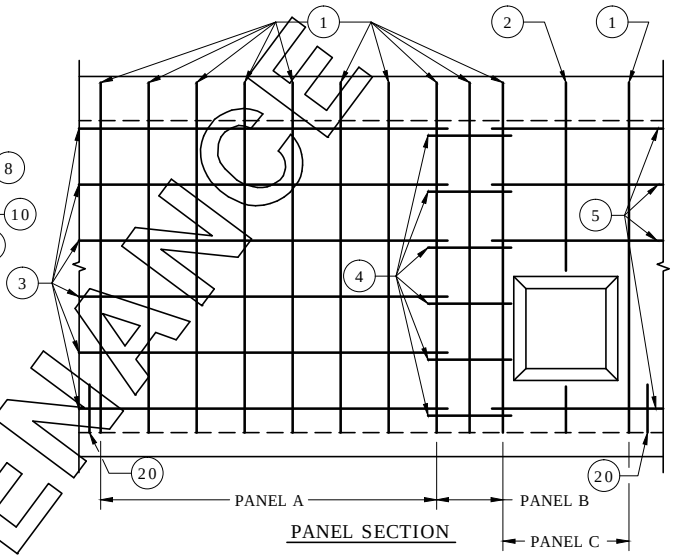
REINFORCING DETAIL



SECTION A-A



ROOF REINFORCING DETAIL



PANEL SECTION

REINFORCING RODS			
ITEM NO.	QTY REQ'D	LENGTH	DESCRIPTION
1	24	10'-4"	WALLS (VERTICAL)
2	2	4'-8"	WALLS (VERTICAL)
3	12	7'-6"	WALLS (HORIZONTAL)
4	24	2'-4"	WALLS (HORIZONTAL)
5	8	3'-4"	WALLS (HORIZONTAL)
6	4	7'-7"	ROOF
7	4	7'-4"	ROOF
8	4	7'-1"	ROOF
9	4	6'-10"	ROOF
10	4	6'-6"	ROOF
11	4	6'-3"	ROOF
12	4	5'-3"	ROOF
13	4	4'-3"	ROOF
14	4	3'-0"	ROOF
15	4	3'-4"	ROOF
16	3	10'-4"	FLOOR
17	8	5'-6"	FLOOR
18	2	9'-0"	FLOOR
19	2	4'-0"	FLOOR
20	24	1'-0"	FLOOR

NOTES:

1. ALL REINFORCING TO BE 5/8" ROUND STRUCTURAL GRADE BARS WITH ASTM A-305 DEFORMATION. BARS TO BE 1-1/2" MIN. FROM SURFACE OF CONCRETE.

2. CONCRETE TO HAVE A 28 DAY MIN. STRENGTH OF 3,000 PSI.

3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

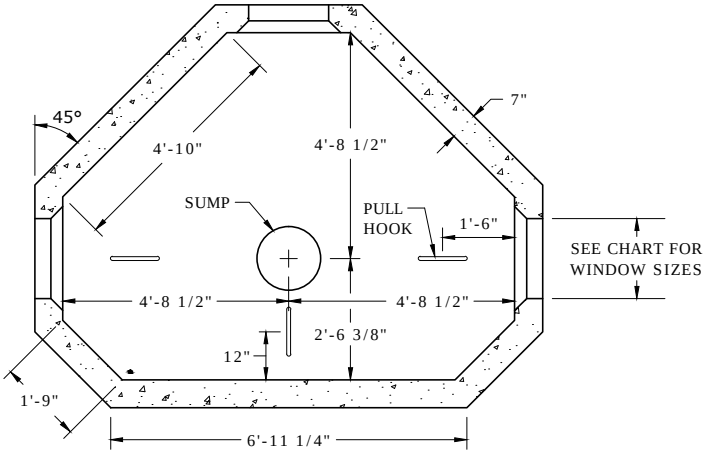
TWO WAY MANHOLE CONSTRUCTION DETAILS

(FMO)

Progress Energy

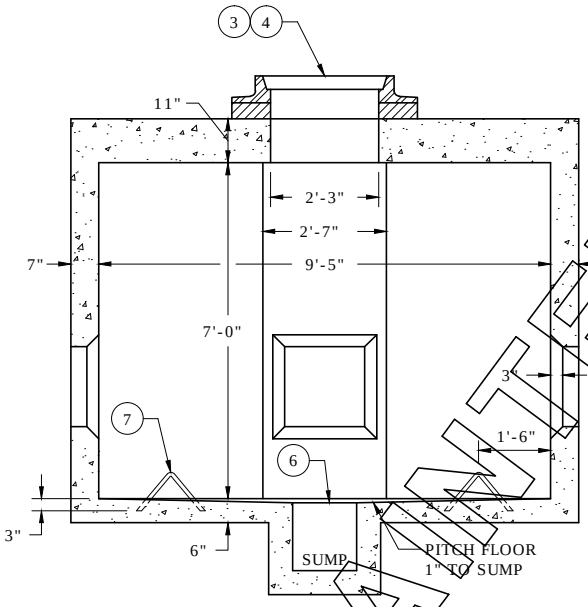
FLA

DWG. 29.03-23

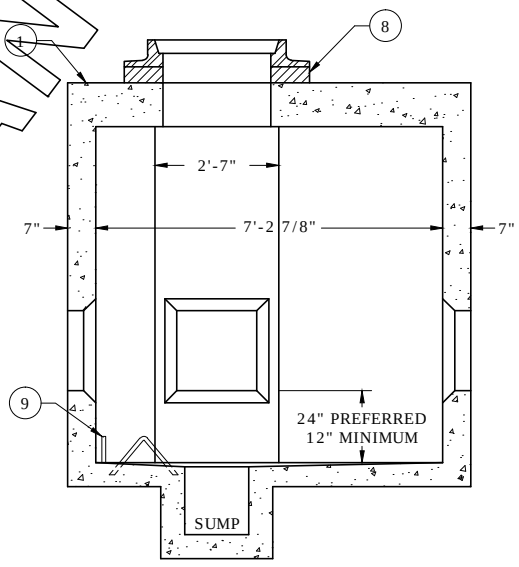


PLAN VIEW

WINDOW SIZES	
NO. OF DUCTS	SIZE OF WINDOW
1 OR 2	20" X 7"
3	20" X 12"
6 OR 8	20" X 20"
9	20" X 25"
12	20" X 32"
15	20" X 38"
17	20" X 45"



SIDE SECTION



END SECTION

BILL OF MATERIALS

MACRO UNIT	CU ITEM NO.	COMPATIBLE UNIT	QTY REQ'D	CATALOG NUMBER	QTY PER CU	DESCRIPTION
	1	-	1	-	9	CONCRETE, CUBIC YARDS
	2	-	1	-	936	REINFORCING STEEL, 5/8", FT. (NOT SHOWN)
	3	-	1	-	1	MANHOLE RING
	4	-	1	-	1	MANHOLE COVER
	5	-	1	-	1	SUMP PIPE (NOT SHOWN)
	6	-	1	-	1	SUMP COVER
	7	-	1	-	3	PULL HOOKS
	8	-	1	-	AS REQ'D.	CEMENT BRICK
	9	-	1	-	2	GROUND ROD, 1/2" X 10"

REVISED	BY	CK'D	APPR.
3			
2			
1			
0 9/27/11	GUINN	BURLISON	ELKINS

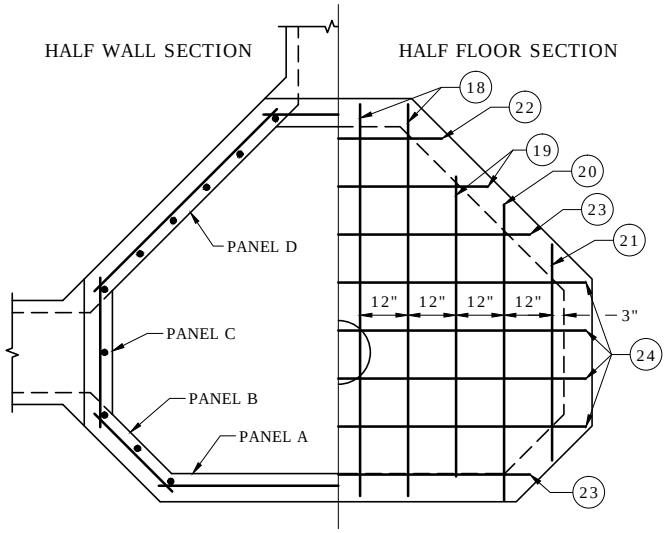
THREE WAY MANHOLE CONSTRUCTION DETAILS

(FMO)

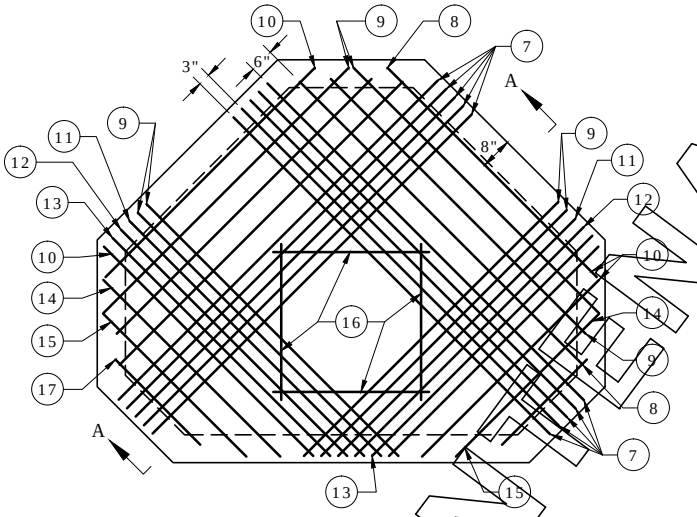
Progress Energy

FLA

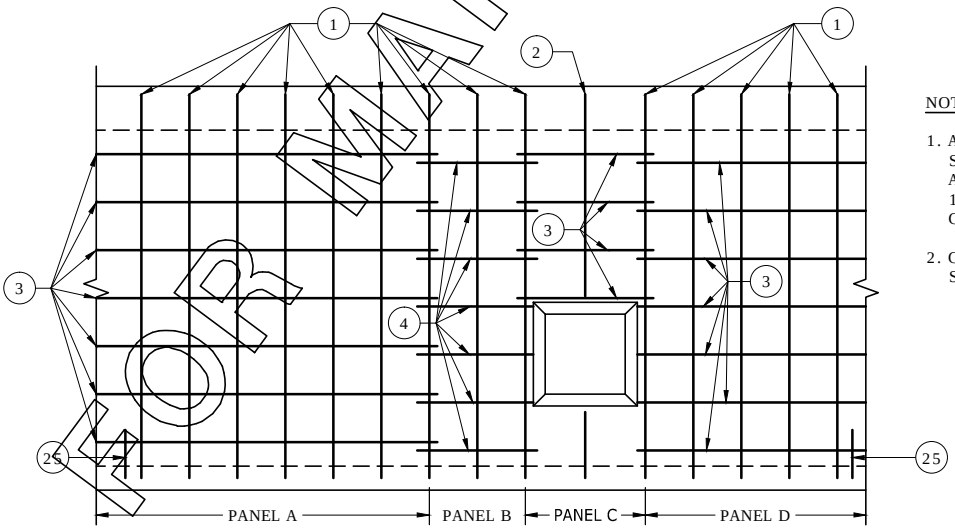
DWG. 29.03-25



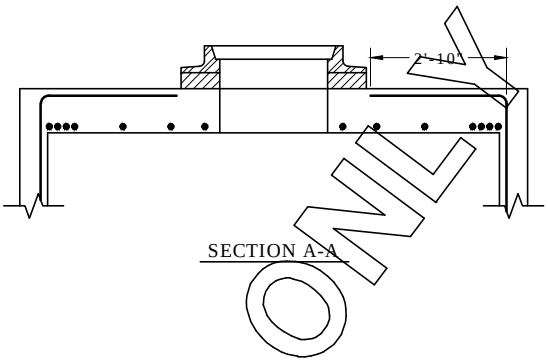
REINFORCING DETAIL



ROOF REINFORCING DETAIL



PANEL SECTION



REINFORCING RODS

ITEM NO.	QTY REQ'D	LENGTH	DESCRIPTION
1	24	10'-10"	WALLS (VERTICAL)
2	3	5'-2"	WALLS (VERTICAL)
3	7	7'-10"	WALLS (HORIZONTAL)
4	14	2'-6"	WALLS (HORIZONTAL)
5	14	5'-6"	WALLS (HORIZONTAL)
6	15	3'-3"	WALLS (HORIZONTAL)
7	12	9'-5"	ROOF
8	2	8'-4"	ROOF
9	6	7'-6"	ROOF
10	4	6'-2"	ROOF
11	2	7'-1"	ROOF
12	2	6'-10"	ROOF
13	2	6'-7"	ROOF
14	2	5'-4"	ROOF
15	2	4'-4"	ROOF
16	4	3'-3"	ROOF
17	2	2'-6"	ROOF
18	4	8'-2"	FLOOR
19	3	6'-3"	FLOOR
20	2	6'-2"	FLOOR
21	2	4'-6"	FLOOR
22	1	4'-4"	FLOOR
23	1	8'-0"	FLOOR
24	4	10'-4"	FLOOR
25	24	1'-0"	FLOOR

NOTES:

1. ALL REINFORCING TO BE 5/8" ROUND STRUCTURAL GRADE BARS WITH ASTM A-305 DEFORMATION. BARS TO BE 1 1/2" MIN. FROM SURFACE OF CONCRETE.

2. CONCRETE TO HAVE A 28 DAY MIN. STRENGTH OF 3,000 PSI.

REVISED	BY	CK'D	APPR.
3			
2			
1			
0 9/27/11	GUINN	BURLISON	ELKINS

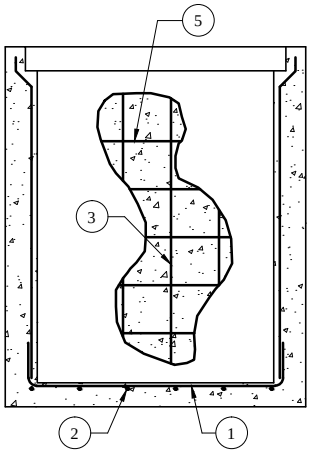
THREE WAY MANHOLE REINFORCING DETAILS

(FMO)

Progress Energy

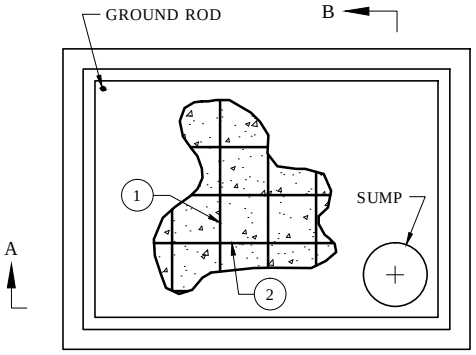
FLA

DWG. 29.03-27

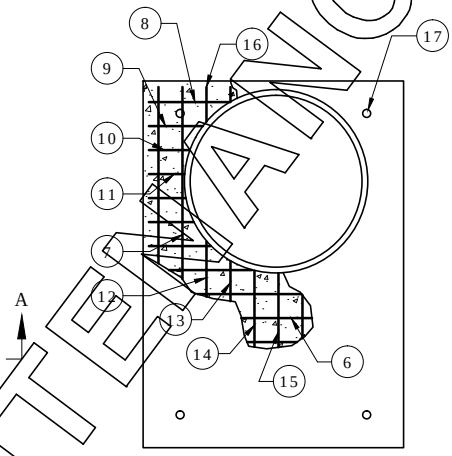


SECTION B-B

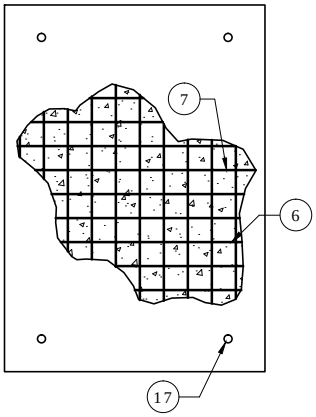
REINFORCING RODS			
ITEM NO.	QTY REQ'D	LENGTH	DESCRIPTION
1	6	7'-6"	5/8" REINFORCING ROD - FLOOR
2	6	9'-6"	5/8" REINFORCING ROD - FLOOR
3	28	6'-9" / 7'-9"	5/8" REINFORCING ROD - WALLS (VERTICAL)
4	12	8'-0"	5/8" REINFORCING ROD - WALLS (HORIZONTAL)
5	12	6'-0"	5/8" REINFORCING ROD - WALLS (HORIZONTAL)
6	22	3'-5"	1/2" REINFORCING ROD - SLAB
7	15	5'-1 1/2"	1/2" REINFORCING ROD - SLAB
8	4	1'-1"	1/2" REINFORCING ROD - SLAB
9	4	0'-8"	1/2" REINFORCING ROD - SLAB
10	4	0'-6"	1/2" REINFORCING ROD - SLAB
11	4	0'-5"	1/2" REINFORCING ROD - SLAB
12	2	2'-9"	1/2" REINFORCING ROD - SLAB
13	2	2'-6"	1/2" REINFORCING ROD - SLAB
14	2	2'-5"	1/2" REINFORCING ROD - SLAB
15	1	2'-4"	1/2" REINFORCING ROD - SLAB
16	2	0'-7"	1/2" REINFORCING ROD - SLAB
17	8	0'-5"	3/4" GALVANIZED PIPE NIPPLE



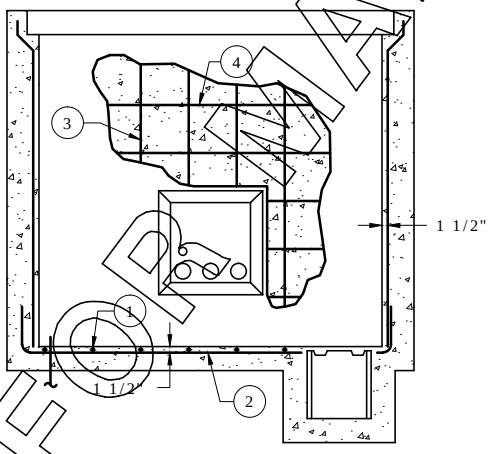
PLAN VIEW



ROOF SLAB WITH MANHOLE RING



ROOF SLAB



SECTION A-A

NOTES:

1. BEND ALL FLOOR REINFORCING RODS UP 12" AND TIE TO VERTICAL REINFORCING RODS IN WALLS.
2. SLAB REINFORCING RODS TO BE ON 4" CENTERS AND PLACES IN CENTER OF SLAB.
3. WALL AND FLOOR REINFORCING RODS TO BE ON 12" CENTERS.
4. ALL REINFORCING TO BE 5/8" ROUND STRUCTURAL GRADE BARS WITH ASTM STD. A-305 DEFORMATION. 1-1/2" MIN. FROM SURFACE.
5. CONCRETE TO HAVE A 28 DAY MINIMUM STRENGTH OF 3,000 PSI.

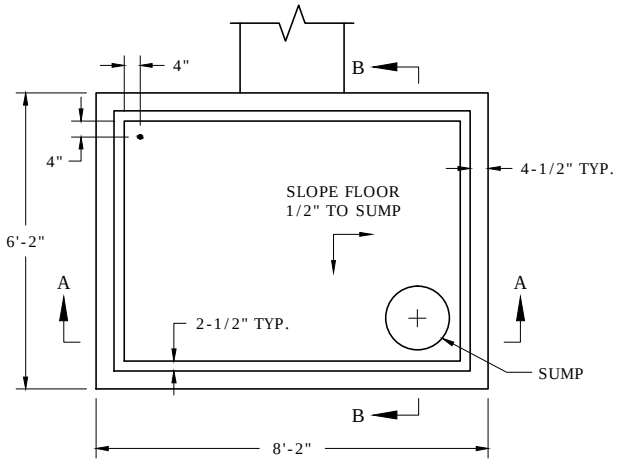
3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

SWITCH MANHOLE REINFORCING DETAILS (FMO)

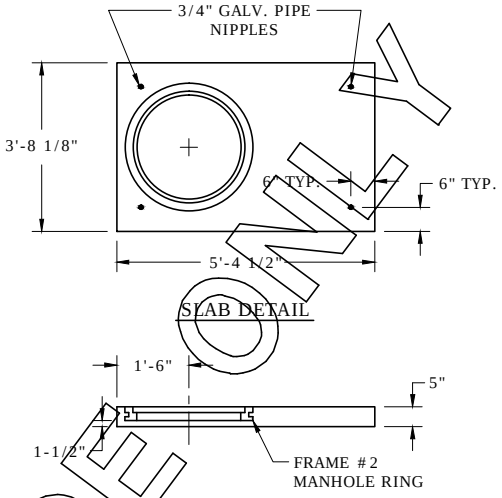
Progress Energy

FLA

DWG. 29.03-29

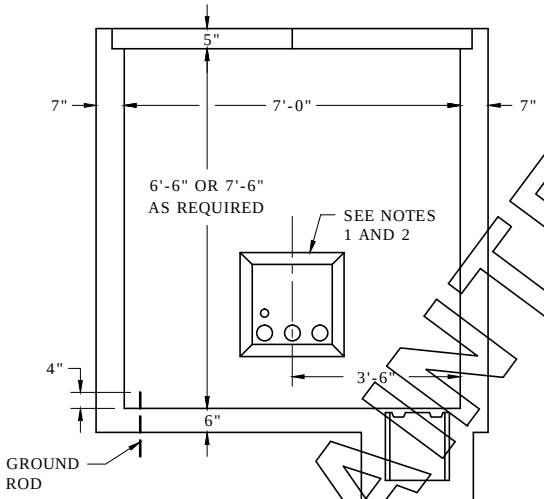


PLAN VIEW

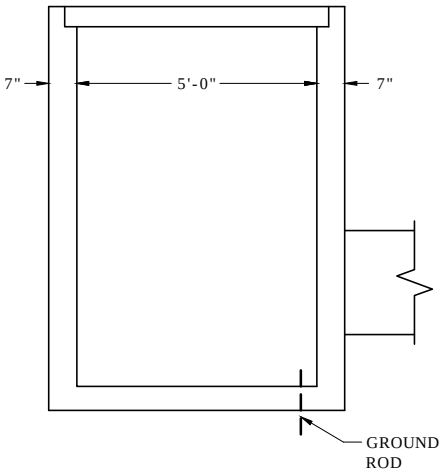


SLAB DETAIL

SLAB DETAIL



SECTION A-A



SECTION B-B

NOTES:

1. DUCTS TO ENTER MANHOLE HORIZONTALLY ON GIVEN CENTERLINE DIMENSION OF MANHOLE WINDOW OPENING.

2. THREE 4" DUCTS FOR PRIMARY CABLE TO SWITCH. ONE 2" DUCT FOR SECONDARY CABLE TO MANHOLE LIGHTS AND AUTOMATIC SUMP PUMP.

3. SLAB NO. 2 TO BE OF SAME DIMENSIONS AS SLAB NO. 1 BUT WITHOUT MANHOLE RING.

3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

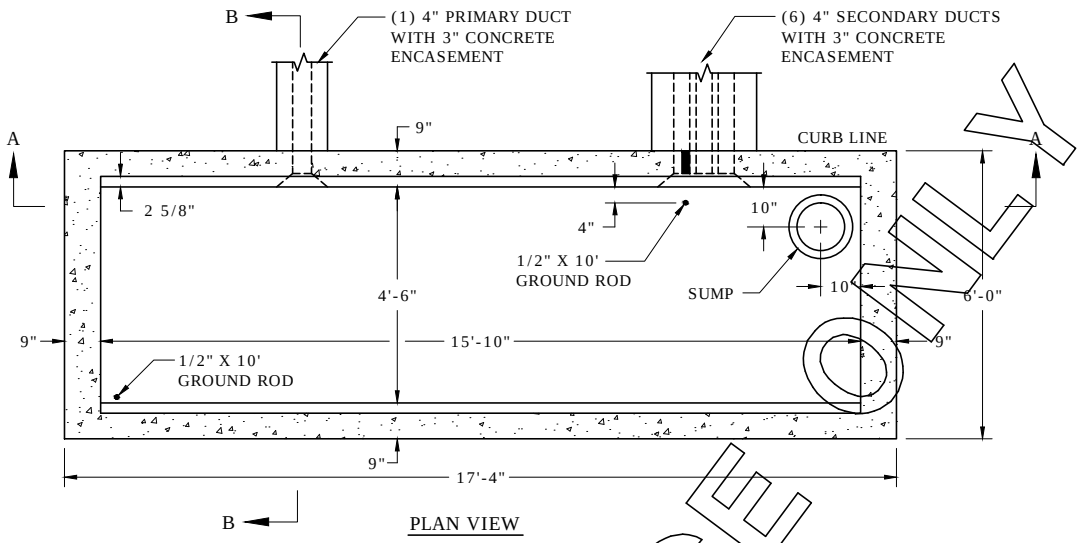
SWITCH MANHOLE CONSTRUCTION DETAILS

(FMO)

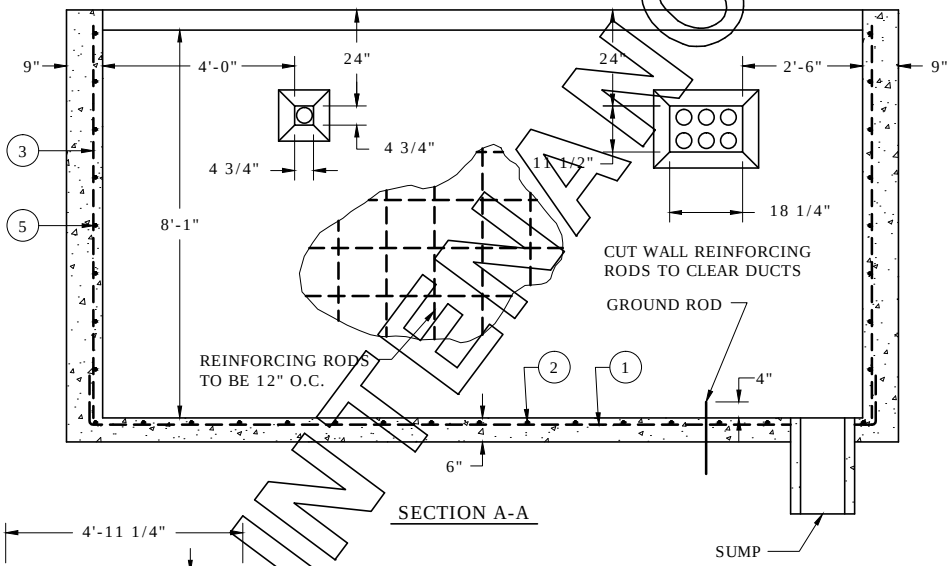
Progress Energy

FLA

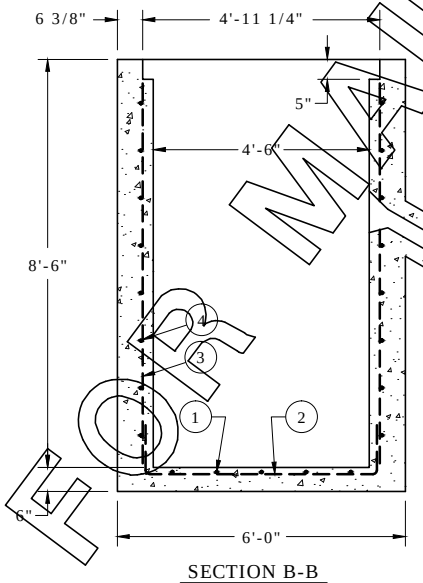
DWG. 29.03-31



PLAN VIEW



SECTION A-A



SECTION B-B

BILL OF MATERIALS			
ITEM NO.	QTY REQ'D	LENGTH	DESCRIPTION
1	5	19'-0"	5/8" REINFORCING RODS - FLOOR
2	16	6'-6"	5/8" REINFORCING RODS - FLOOR
3	42	8'-0"	5/8" REINFORCING RODS - WALLS (VERTICAL)
4	16	16'-6"	5/8" REINFORCING RODS - WALLS (HORIZONTAL)
5	16	5'-0"	5/8" REINFORCING RODS - WALLS (HORIZONTAL)

NOTE: ALL REINFORCING RODS TO BE 1 1/2" MINIMUM FROM CONCRETE SURFACE. FLOOR AND WALL RODS TO BE ON 12" CENTERS

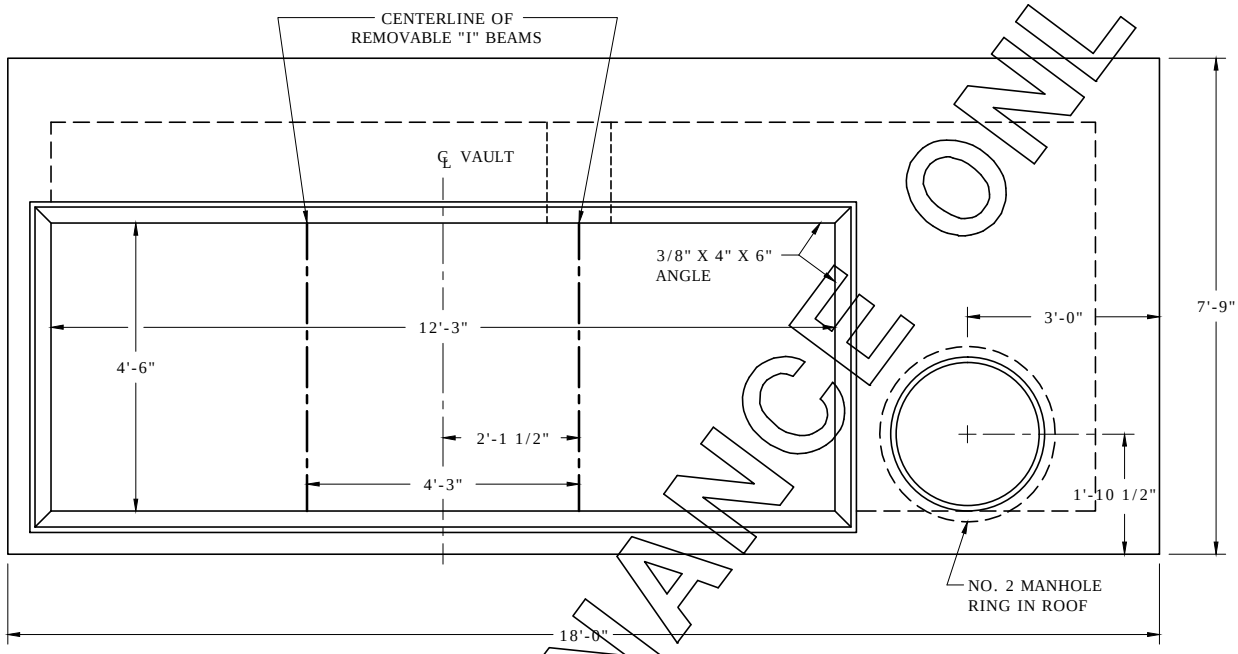
REVISED	BY	CK'D	APPR.
3			
2			
1			
0 9/27/11	GUINN	BURLISON	ELKINS

SIDEWALK AREA VAULT CONSTRUCTION DETAILS (FMO)

Progress Energy

FLA

DWG. 29.03-33



PLAN VIEW

3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

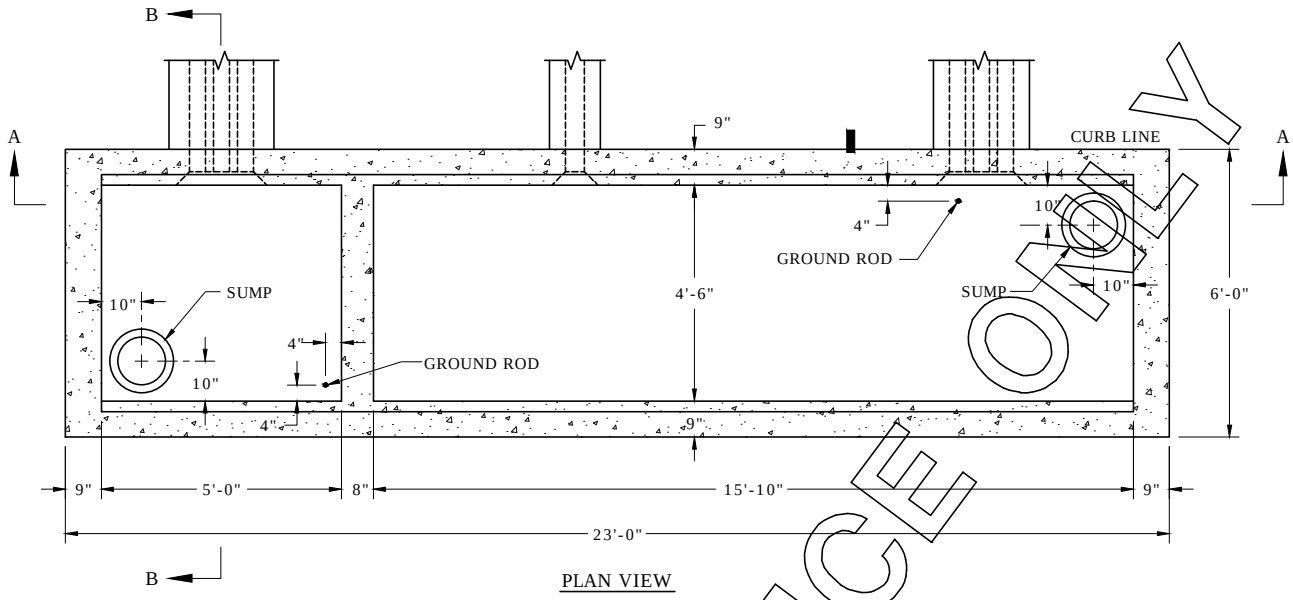
STREET AREA VAULT CONSTRUCTION DETAILS

(FMO)

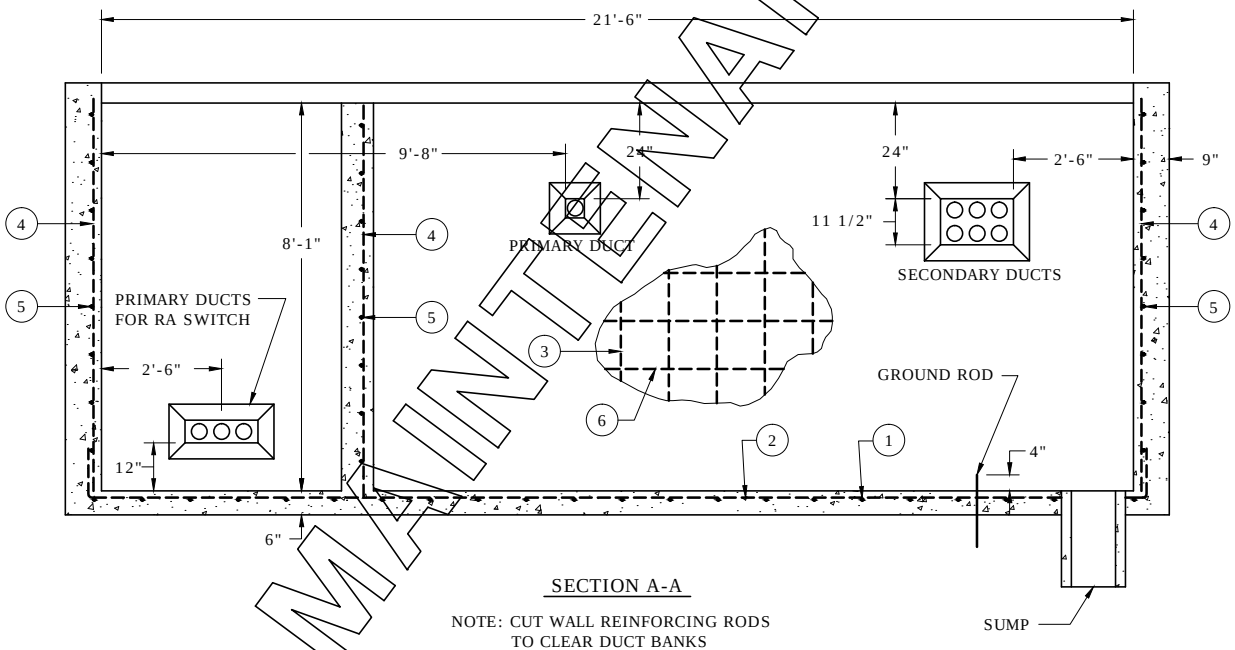
Progress Energy

FLA

DWG. 29.03-35



PLAN VIEW



SECTION A-A

NOTE: CUT WALL REINFORCING RODS TO CLEAR DUCT BANKS

BILL OF MATERIALS			
ITEM NO.	QTY REQ'D	LENGTH	DESCRIPTION
1	23	6'-10"	5/8" REINFORCING ROD
2	5	23'-10"	5/8" REINFORCING ROD
3	47	8'-1"	5/8" REINFORCING ROD
4	10	8'-6"	5/8" REINFORCING ROD
5	26	4'-10"	5/8" REINFORCING ROD
6	16	21'-10"	5/8" REINFORCING ROD

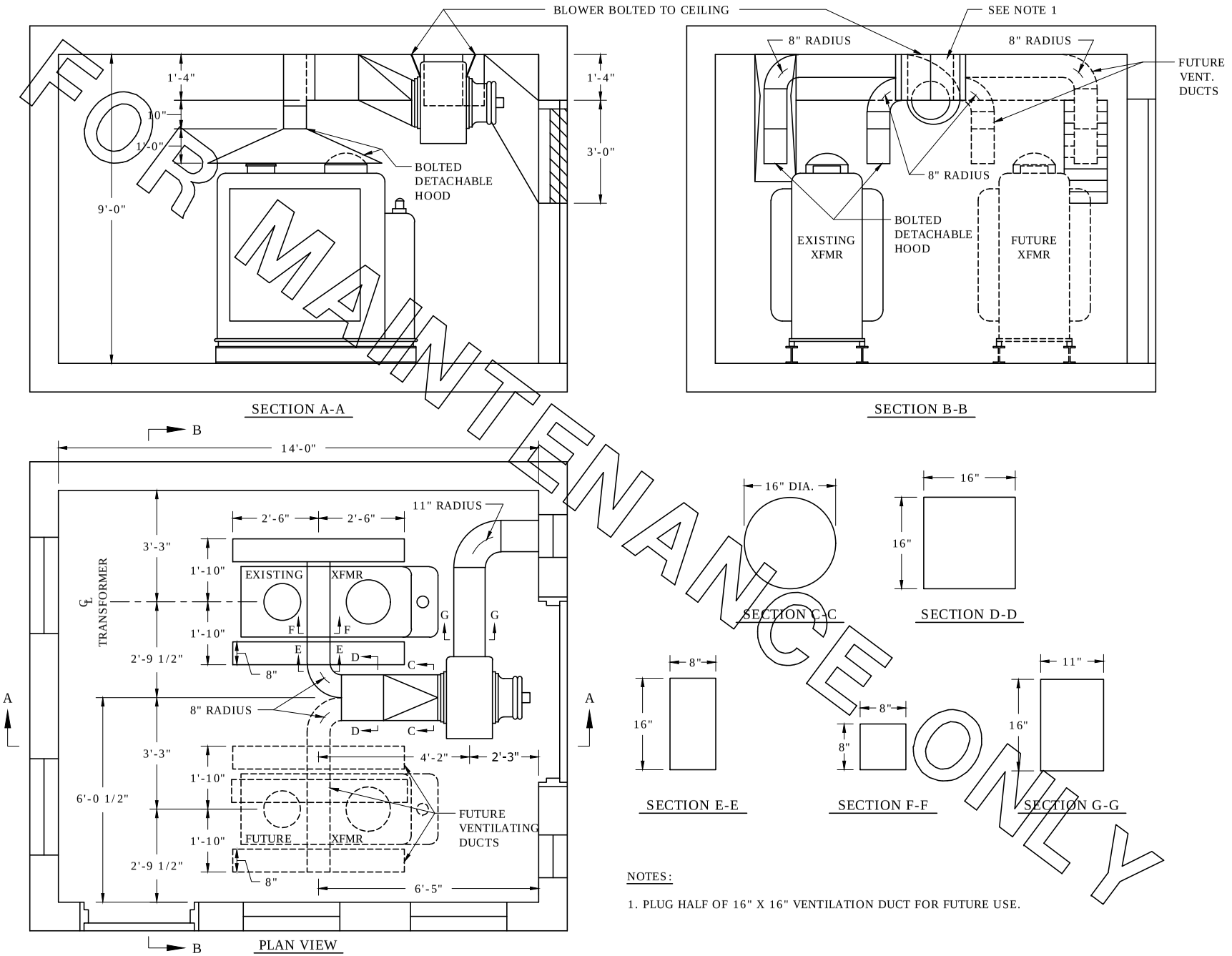
REVISED		BY	CK'D	APPR.
3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS

SIDEWALK AREA SWITCH VAULT CONSTRUCTION DETAILS (FMO)

Progress Energy

FLA

DWG. 29.03-37



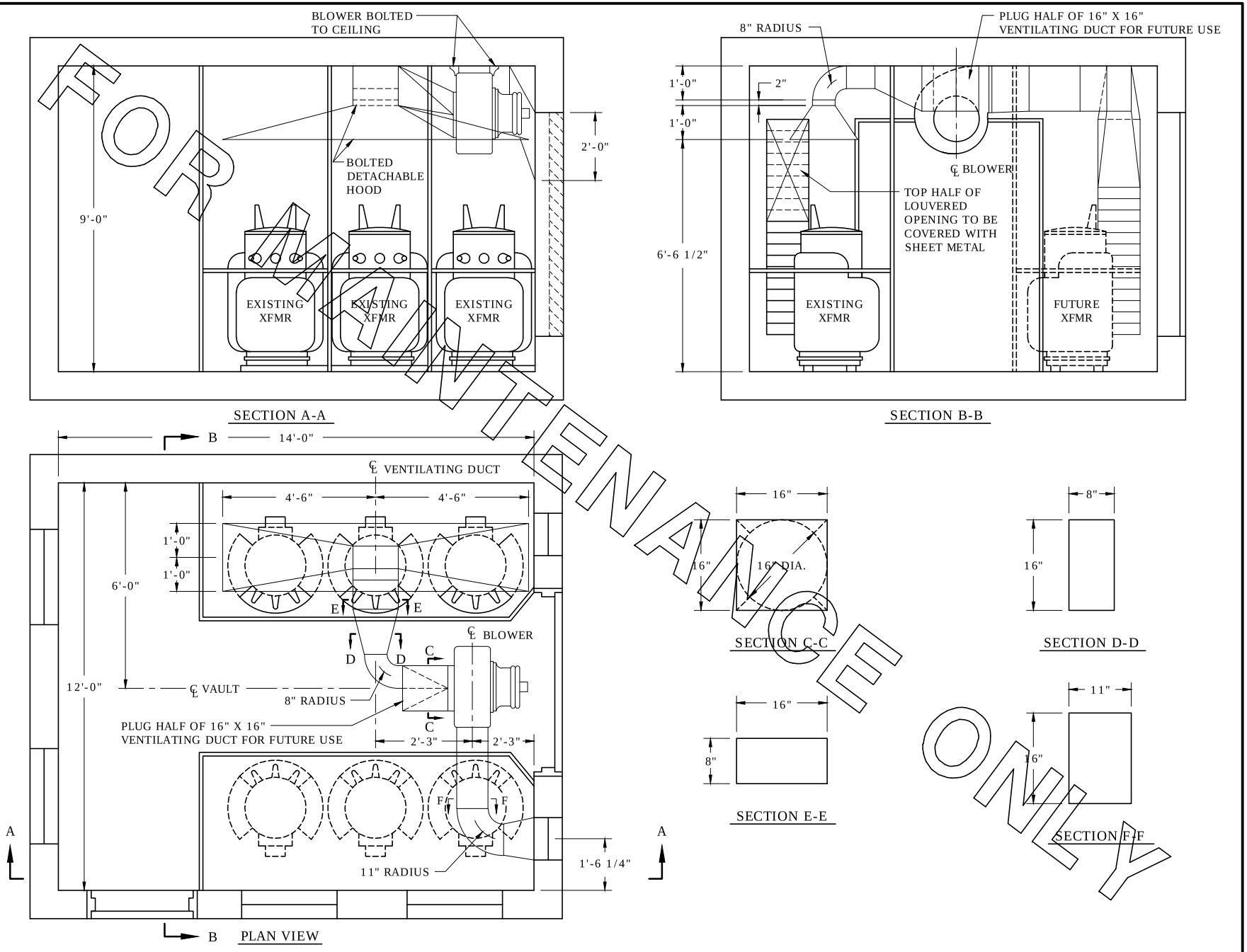
REVISED	BY	CK'D	APPR.
0 9/27/11	GUINN	BURLISON	ELKINS
1			
2			
3			

TYPICAL BUILDING VAULT
VENTILATION SYSTEM
NETWORK TYPE TRANSFORMER (FMO)

Progress Energy

FLA

DWG. 29.03-43



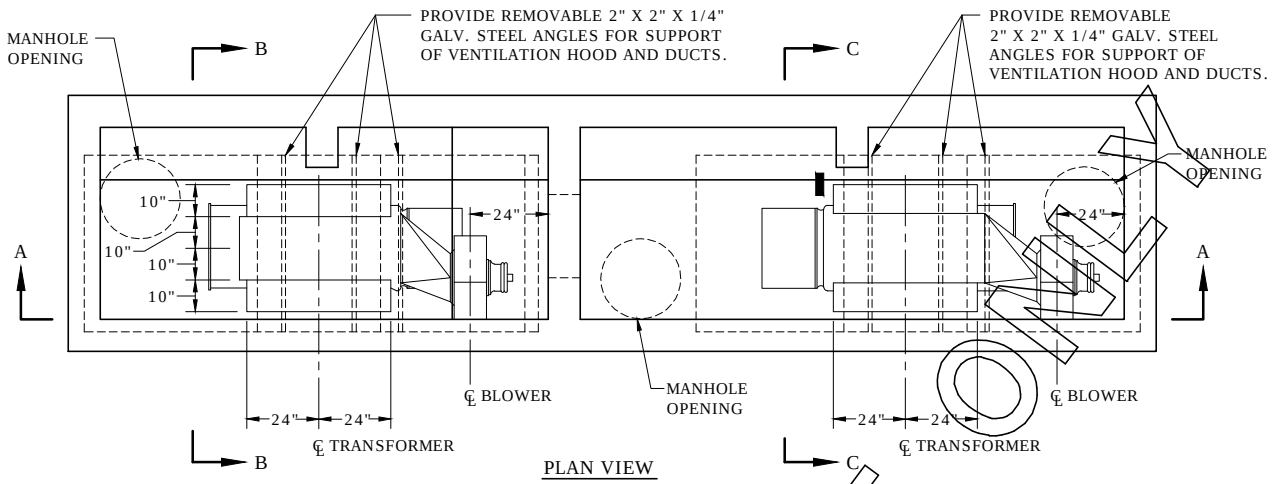
REVISED	BY	CK'D	APPR.
0 9/27/11	GUINN	BURLISON	EIKINS
1			
2			
3			

TYPICAL BUILDING VAULT
VENTILATION SYSTEM
SINGLE-PHASE TRANSFORMER (FMO)

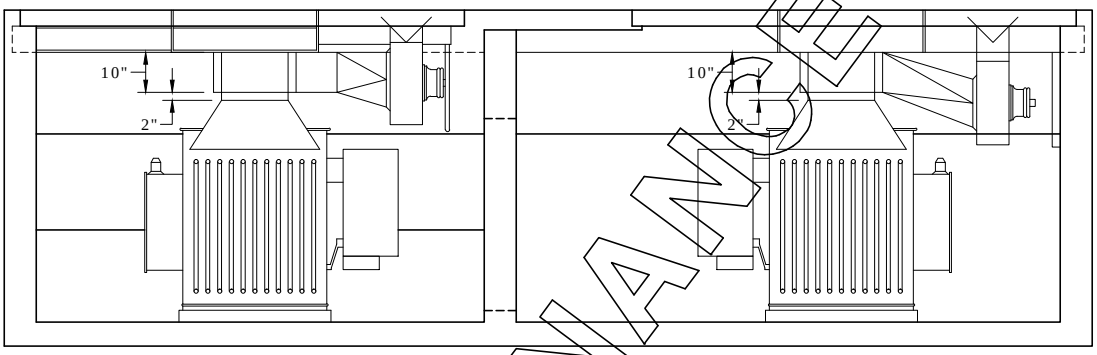
Progress Energy

FLA

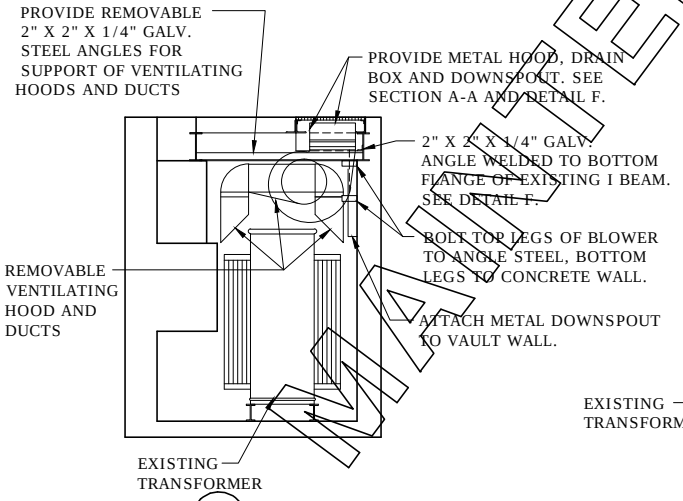
DWG. 29.03-45



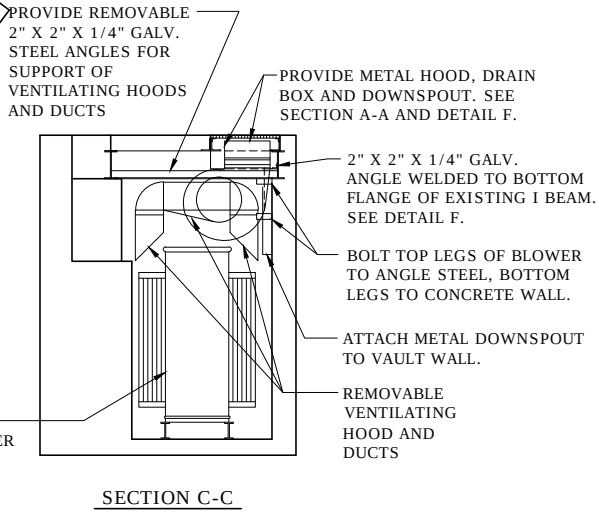
PLAN VIEW



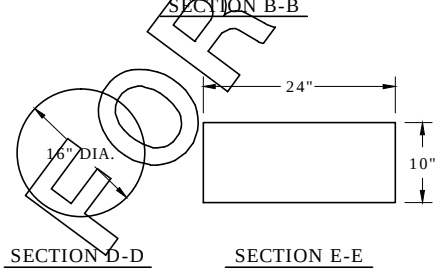
SECTION A-A



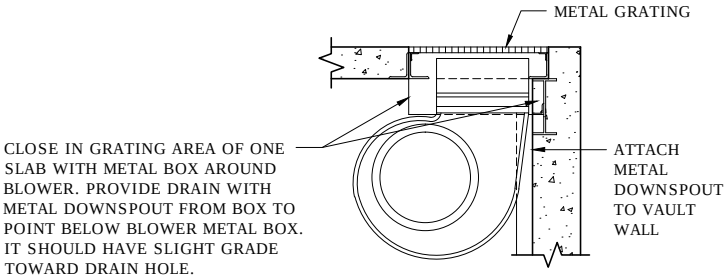
SECTION B-B



SECTION C-C



SECTION D-D SECTION E-E



DETAIL F

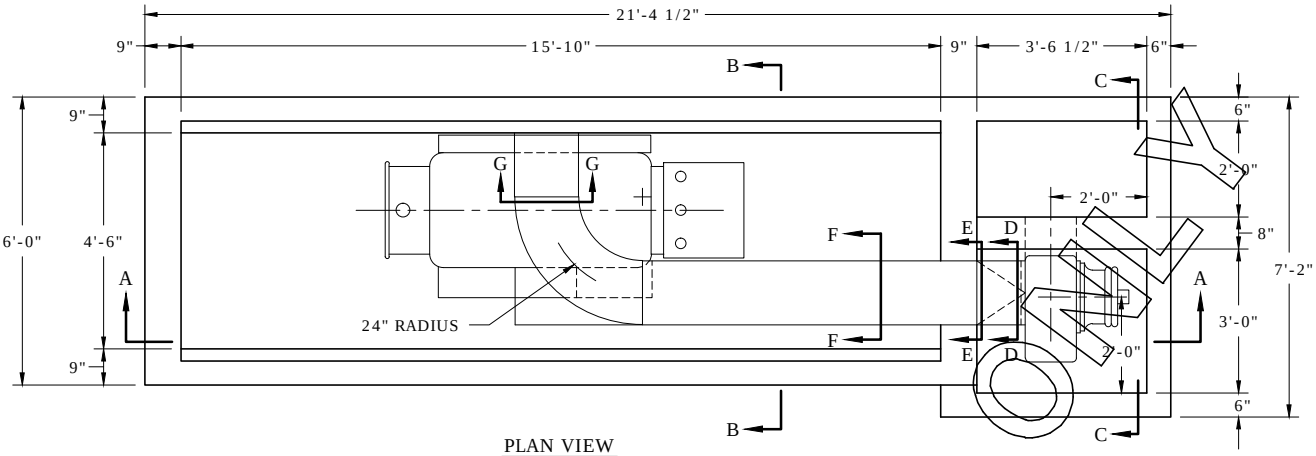
3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

TYPICAL STREET AREA VAULT VENTILATION SYSTEM (FMO)

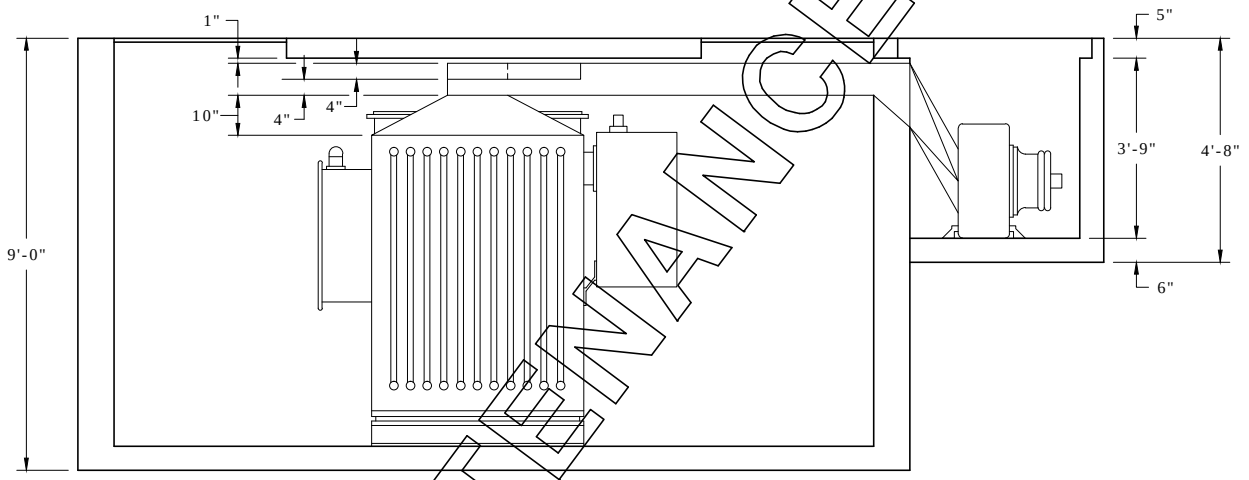
Progress Energy

FLA

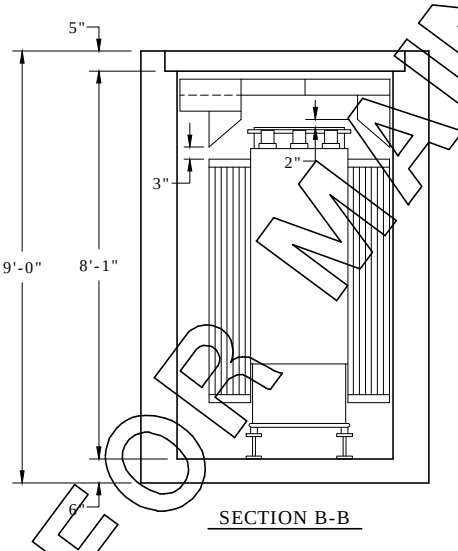
DWG. 29.03-47



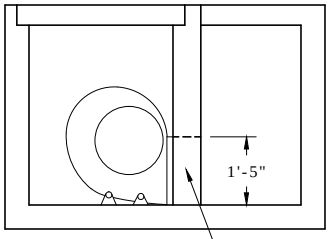
PLAN VIEW



SECTION A-A

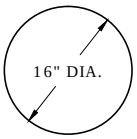


SECTION B-B

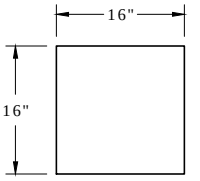


LINE OPENING IN 8" BLOCK WALL WITH SHEET METAL DUCT

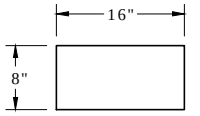
SECTION C-C



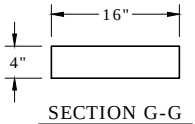
SECTION D-D



SECTION E-E



SECTION F-F



SECTION G-G

3				
2				
1				
0	9/27/11	GUINN	BURLISON	ELKINS
REVISED		BY	CK'D	APPR.

TYPICAL SIDEWALK VAULT VENTILATION SYSTEM (FMO)

Progress Energy

FLA

DWG. 29.03-49