TREE PROTECTION NOTES:

1. THE CONTRACTOR SHALL PROVIDE STRAPPED ON PLANKING TO A HEIGHT OF EIGHT FEET (8'-0"), OR TO THE LIMITS OF THE LOWER BRANCHING, UPON ALL TREES THAT ARE LOCATED WITHIN THE VICINITY OF ANY PROPOSED CONSTRUCTION

2. ANY ROOTS EXPOSED BY CONSTRUCTION ACTIVITY SHALL BE PRUNED FLUSH WITH THE SOIL. BACK FILL ROOT AREAS WITH GOOD QUALITY TOP SOIL AS SOON AS POSSIBLE. IF EXPOSED AND ROOT AREA IS NOT BACK FILLED WITHIN TWO (2) DAYS, COVER WITH ORGANIC MATERIAL IN A MANNER WHICH REDUCES SOIL TEMPERATURE, AND MINIMIZES WATER LOSS DUE TO EVAPORATION.

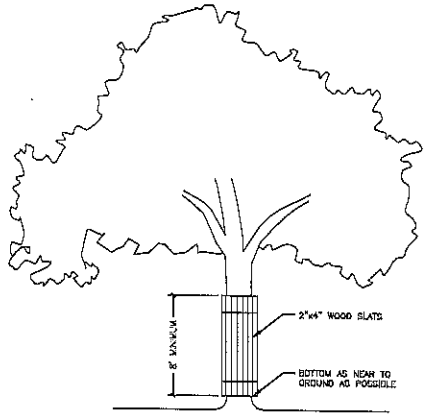
3. PRIOR TO EXCAVATION OR GRADE CUTTING WITHIN TREE DRIPLINE. MAKE A CLEAN CUT BETWEEN DISTURBED AND UNDISTURBED ROOT ZONES WITH A ROCK SAW OR SIMILAR EQUIPMENT TO MINIMIZE DAMAGE TO REMAINING ROOTS.

4. TREES MOST HEAVILY IMPACTED BY CONSTRUCTION ACTIVITIES SHOULD BE WATERED DEEPLY ONCE A WEEK DURING PERIODS OF HOT, DRY WEATHER. TREE CROWNS SHOULD BE SPRAYED WITH WATER PERIODICALLY TO REDUCE DUST ACCUMULATION.

5. ANY TRENCHING REQUIRED FOR THE INSTALLATION OF LANDSCAPE IRRIGATION SHALL BE PLACED AS FAR FROM EXISTING TREE TRUNK AS POSSIBLE.

6. NO LANDSCAPE TOPSOIL GREATER THAN FOUR INCHES (4") SHALL BE PERMITTED WITHIN THE DRIPLINE OF A TREE. NO SOIL IS PERMITTED ON THE ROOT FLARE OF ANY TREE.

7. PRUNING TO PROVIDE CLEARANCE FOR STRUCTURES, VEHICULAR TRAFFIC, AND EQUIPMENT SHALL TAKE PLACE BEFORE CONSTRUCTION BEGINS.



1 TREE PROTECTION
SCALE: N.T.S.

NOTES

1. STEEL POSTS WHICH SUPPORT THE SILT FENCE SHALL BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POST MUST BE EMBEDDED A MINIMUM OF 1".

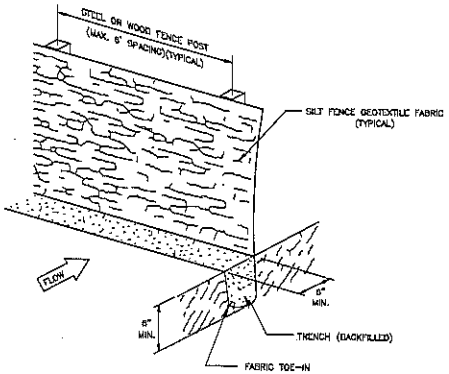
2. THE TOE OF THE SILT FENCE SHALL BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWNSLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CAN NOT BE TRENCHED INTO THE SURFACE (E.G. PAVEMENT), THE FABRIC FLAP SHALL BE WEIGHTED DOWN WITH WASHED GRAVEL ON UPHILL SIDE TO PREVENT FLOW UNDER FENCE.

3. THE TRENCH MUST BE A MINIMUM OF 6" DEEP AND 6" WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

4. INSPECTION SHALL BE MADE WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.

5. SILT FENCE SHALL BE REMOVED WHEN THE SITE IS COMPLETED STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

6. ACCUMULATED SILT SHALL BE REMOVED WHEN IT REACHES A DEPTH OF 6". THE SILT SHALL BE DISPOSED OF ON AN APPROVED SITE AND IN SUCH A MANNER THAT WILL NOT CONTRIBUTE TO ADDITIONAL SILTATION.



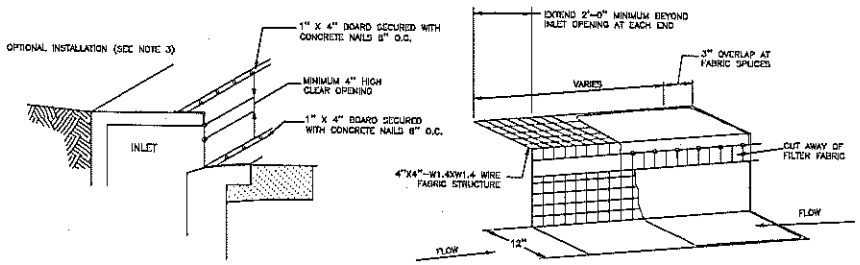
2 SILT FENCE
SCALE: N.T.S.

NOTES:

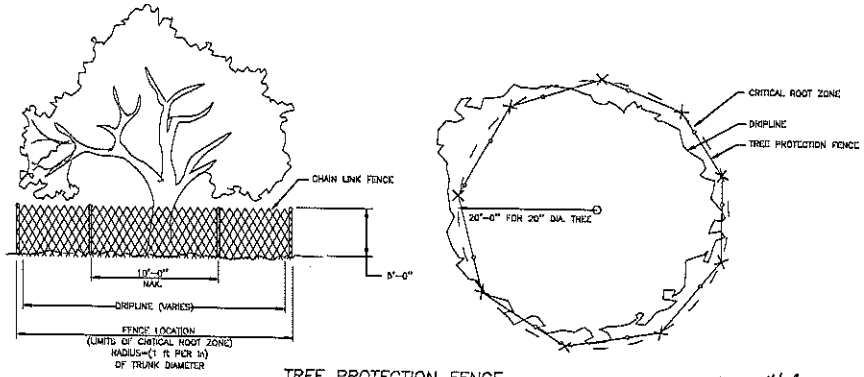
1. CONTRACTOR TO SECURE FILTER FABRIC WITH SANDBAGS LOCATED AT A MAXIMUM SPACING OF 3' ON CENTER.

2. A SECTION OF FILTER FABRIC SHALL BE REMOVED AS SHOWN ON THIS DETAIL OR AS DIRECTED BY THE ENGINEER OR DESIGNATED REPRESENTATIVE. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR HOG RINGS AT THIS LOCATION.

3. FOR LOCATIONS PRONE TO DAMAGE FROM TRAFFIC THE CONTRACTOR, UPON APPROVAL OF THE ENGINEER OR DESIGNATED REPRESENTATIVE, MAY USE THE OPTION OF SECURING THE FILTER FABRIC WITH A BOARD AND CONCRETE NAILS/RAMSET IN THE CONFIGURATION IDENTIFIED ON THIS DETAIL.



3 CURB INLET PROTECTION
SCALE: N.T.S.



4 TREE PROTECTION FENCE
TYPE A-CHAIN LINK
SCALE: N.T.S.

STATE OF TEXAS
MONTY L. CLARK
90804
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PROFESSIONAL ENGINEER

No.	Date	By	Revisions

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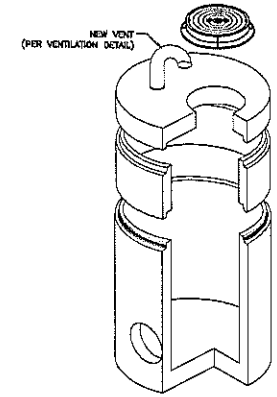
Drawing Title: MISCELLANEOUS DETAILS - SHEET 1	Project Title: UNDERGROUND UTILITIES		Date: 3/1/13
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: MLC / Drawn: DGR	Project No.: 674-10-101
Approved: Project Manager: VICTOR GAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Drawing No.: C7.1
			Dwg. 21 of 28

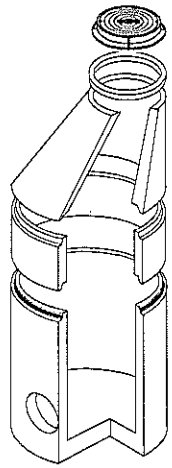
Veterans Affairs

VA FORM 08-6231, FEB. 1982

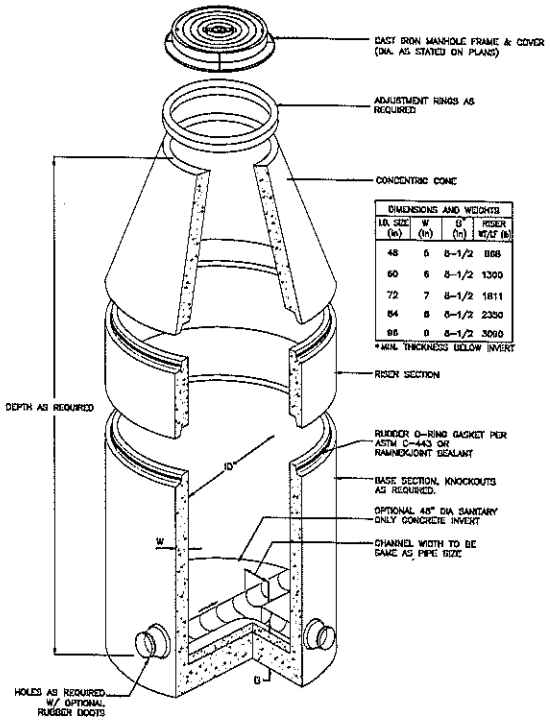
GPO: 1983-400-243



SHOWN WITH FLAT TOP



SHOWN WITH ECCENTRIC CONE



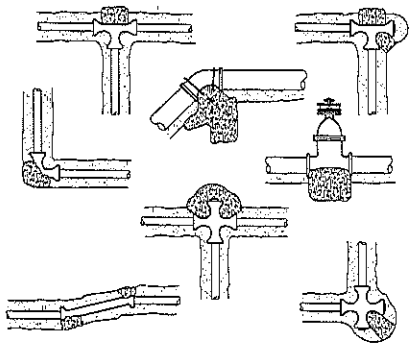
DIMENSIONS AND WEIGHTS			
I.D. SIZE (in)	W (in)	B* (in)	RISER WT/LF (lb)
48	6	8-1/2	868
60	6	8-1/2	1300
72	7	8-1/2	1811
84	8	8-1/2	2350
96	8	8-1/2	3090

* MIN. THICKNESS BELOW INVERT

NOTES

1. LIFTING INSERTS AS REQUIRED.
2. ALL JOINTS SHALL BE SEALED w/ RUBBER O-RING GASKET OR RAM-NEK JOINT SEALANT.
3. STRUCTURE TO BE PLACED ON MIN. 6" STABILIZED BASE.
4. PRECAST MANHOLES SHALL CONFORM TO THE LATEST CITY OF TEMPLE SPECIFICATIONS.
5. MANHOLE FRAMES SHALL HAVE 32" RING AND LID ASSEMBLY.
6. ALL NEW MANHOLES ARE TO HAVE AN ECCENTRIC CONE UNLESS OTHERWISE STATED ON PLANS.

1 PRECAST CONCRETE MANHOLE FOR SANITARY SEWER
SCALE: N.T.S.

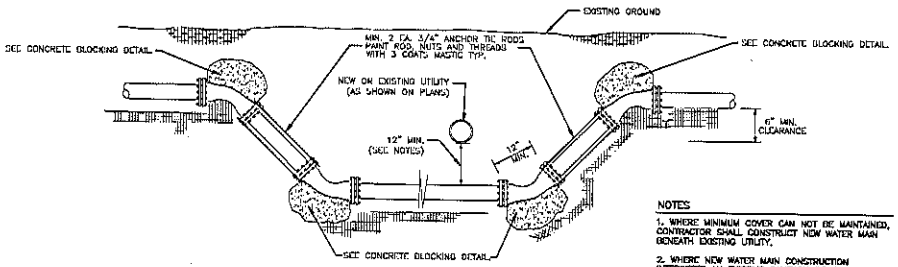


MAXIMUM SQ.FT. BEARING AREA REQUIRED AT 150 PSI

PIPE	11-1/4°	22-1/2°	45°	90°	VALVES, TEES & DEAD ENDS
2"	0.2	0.2	0.5	0.8	0.6
4"	0.5	0.8	1.7	2.7	2.1
6"	0.9	1.5	3.0	5.0	4.0
8"	1.4	2.9	5.0	10.0	6.5
10"	2.0	4.5	9.0	16.2	12.0
12"	3.0	6.8	12.0	21.0	15.0
18"	6.2	14.0	23.0	50.0	30.0
20"	11	21	47.2	78	55

1. AREA IS BASED ON 1000 PSF ALLOWABLE BEARING PRESSURE.
2. WHEN SOFT CLAY IS ENCOUNTERED THE BEARING AREAS SHALL BE DOUBLED.
3. USE CONCRETE FORMS TO KEEP CONCRETE CLEAR OF ALL BOLTS AND FLANGES.
4. TABLE IS BASED ON AWWA NO. 23 PVC PIPE DESIGN MANUAL.
5. TABLE DOES NOT APPLY FOR VERTICAL FORCES.

2 TYPICAL CONCRETE THRUST BLOCKING
SCALE: N.T.S.



NOTES

1. WHERE MINIMUM COVER CAN NOT BE MAINTAINED, CONTRACTOR SHALL CONSTRUCT NEW WATER MAIN BENEATH EXISTING UTILITY.
2. WHERE NEW WATER MAIN CONSTRUCTION INTERSECTS AN EXISTING SANITARY SEWER MAIN, CONTRACTOR SHALL CONSTRUCT THE NEW WATER MAIN PER TCEQ STANDARDS AND GUIDELINES.

3 UTILITY CROSSING
SCALE: N.T.S.

3-1-13

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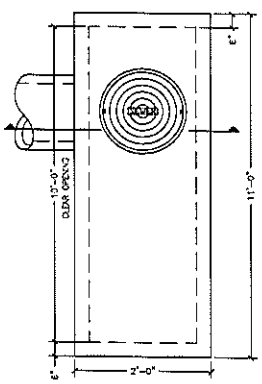
Drawing Title: MISCELLANEOUS DETAILS - SHEET 2
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF
Approved: Project Manager: VICTOR CAW, P.E.

Project Title: UNDERGROUND UTILITIES
Building Number: SITE
Checked: MLC
Drawn: DGR
Location: TEMPLE VAMC - TEMPLE, TEXAS

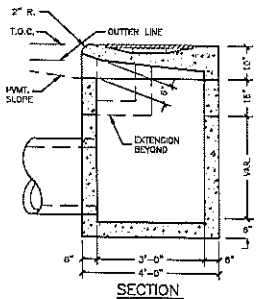
Date: 3/1/13
Project No. 674-10-101
Drawing No. C7.2
Dwg. 22 of 28

Veterans Affairs

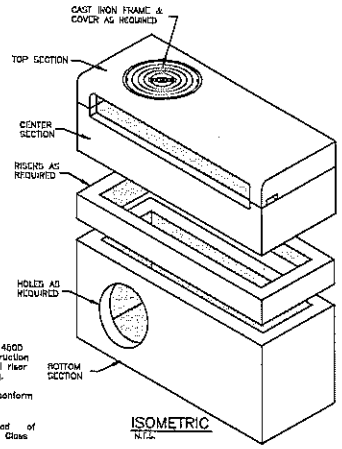
VA FORM 08-5231, FEB. 1983
USGPO: 1983-400-283



PLAN
N.T.S.



SECTION
N.T.S.



ISOMETRIC
N.T.S.

SPECIFICATIONS

CONCRETE : Class 1 concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth. Rated for H-20 Loading.

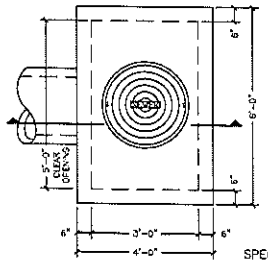
REINFORCEMENT: Grade 60 reinforced. No. 4 steel rebar to conform to ASTM A615 on required centers or equal.

C.I. CASTINGS: Cast iron frames and grates are manufactured of grey cast iron conforming to ASTM A48-76 Class 30.

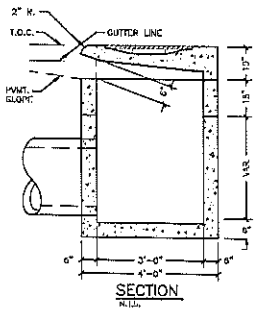
NOTES:

1. SOME INLETS MAY USE COMBINATION OF TOP SECTION ONLY/TOP + CENTER SECTION/ OR TOP + CENTER + BOTTOM SECTION, DEPENDING ON INLET DEPTH.

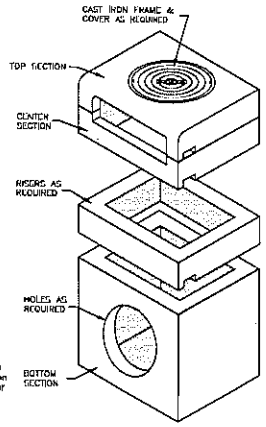
1 PRECAST 10' CURB INLET
SCALE: N.T.S.



PLAN
N.T.S.



SECTION
N.T.S.



ISOMETRIC
N.T.S.

SPECIFICATIONS

CONCRETE : Class 1 concrete with of design strength of 4500 PSI at 28 days. Unit is of monolithic construction at floor and first stage of wall with sectional riser to required depth. Rated for H-20 Loading.

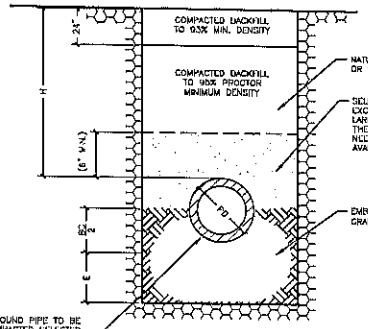
REINFORCEMENT: Grade 60 reinforced. No. 4 steel rebar to conform to ASTM A615 on required centers or equal.

C.I. CASTINGS: Cast iron frames and grates are manufactured of grey cast iron conforming to ASTM A48-76 Class 30.

2 PRECAST 5' CURB INLET
SCALE: N.T.S.

PIPE DIAMETER (INCHES)	TRENCH WIDTH (FEET)
18	3.0
18	3.4
21	3.8
24	4.1
27	4.5
33	5.2
36	5.6

DEPTH OF BEDDING MATERIAL BELOW PIPE	
D (INSIDE DIA.)	E (MIN.)
27" OR SMALLER	3"
30" TO 60"	4"
66" AND LARGER	6"



E = DEPTH OF BEDDING MATERIAL BELOW PIPE
H = BACKFILL COVER ABOVE TOP OF PIPE

INSTALLATION WILL BE AS SHOWN OR AS DESCRIBED IN GENERAL SPECIFICATIONS FOR CONSTRUCTION OF THE NORTH TEXAS COUNCIL OF GOVERNMENTS (NTCOG SPECS)

NOTES:

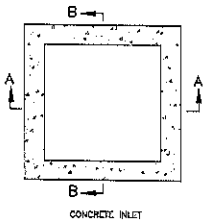
1. WHERE STREET OR ALLEY IS CROSSED BY THE STORM SEWER A 95% PROCTOR MIN. DENSITY WILL BE REQUIRED.

2. TRENCH WIDTHS BASED ON 1.25 BC + 1.0 WHERE BC IS THE OUTSIDE DIAMETER OF THE PIPE IN FEET.

3. TRENCH WIDTHS SHOWN ARE MINIMUM FOR PROPER PLACEMENT AND COMPACTION OF EMBEDMENT AND BACKFILL.

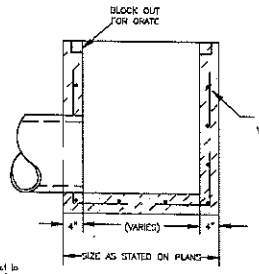
4. TRENCH WIDTHS SHOWN WILL BE USED FOR CALCULATIONS OF ROCK EXCAVATION WHEN DESIGNATED AS A PAY ITEM.

3 REINFORCED CONCRETE PIPE INSTALLATION
SCALE: N.T.S.

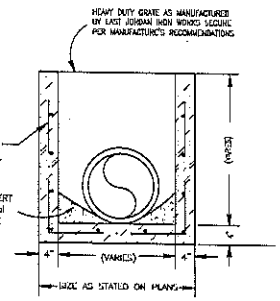


PLAN

Note. Contractor may elect to provide Pre-Cast Concrete box in lieu of Cast in Place box shown.



SECTION A–A



SECTION B–B

EAST JORDAN IRON WORKS, INC.
10 WEST FIFTH STREET
SAN ANGELO, TEXAS 76903-5302
(800) MANHOLE ((800) 626-4653

4 STANDARD CONCRETE INLET
SCALE: N.T.S.

3-1-13

MONTY L. CLARK
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ENGINEER
STATE OF TEXAS

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Drawing Title: MISCELLANEOUS DETAILS - SHEET 3

Project Title: UNDERGROUND UTILITIES

Date: 3/1/13

Project No.: 674-10-101

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Building Number: SITE | Checked: MLC | Drawn: DGR

Approved: Project Manager: VICTOR GAW, P.E.

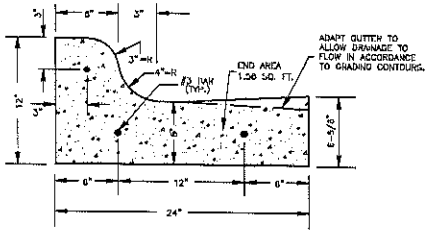
Location: TEMPLE VAMC – TEMPLE, TEXAS

Drawing No.: C7.3

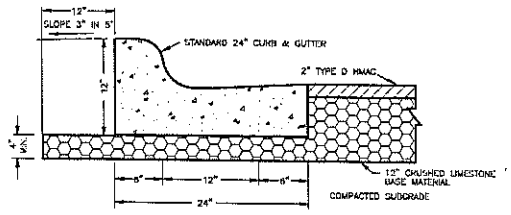
Dwg. 23 of 28

Veterans Affairs

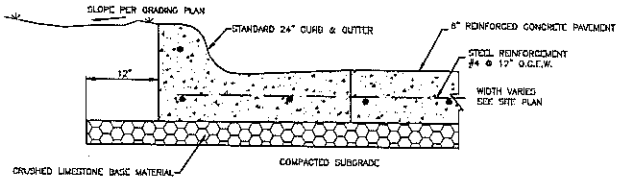
U.S. GOVERNMENT PRINTING OFFICE: 1983-400-285



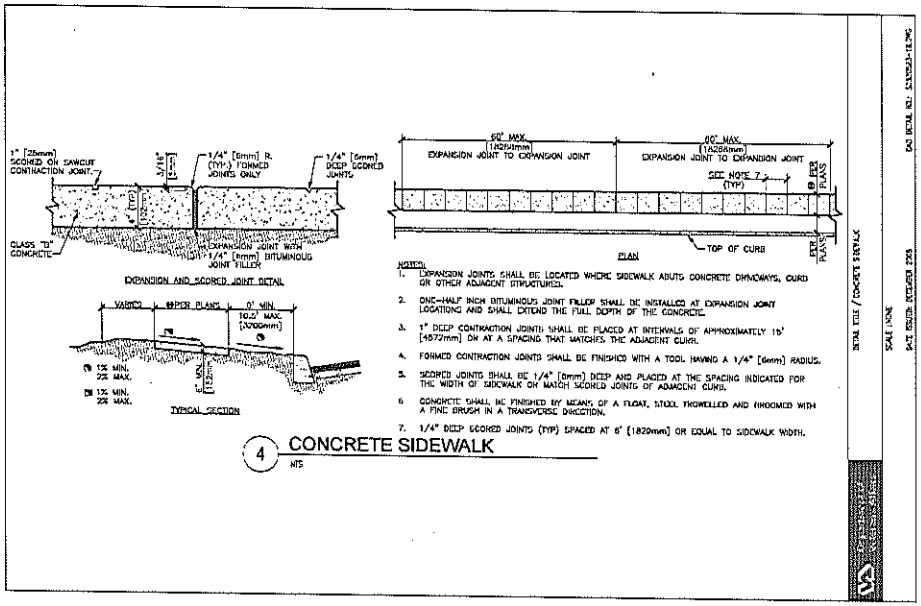
1 STANDARD 24" CURB AND GUTTER
SCALE: N.T.S.



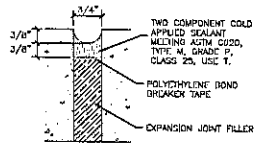
2 TYPICAL PAVEMENT SECTION
SCALE: N.T.S.



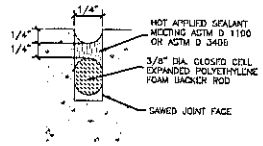
3 REINFORCED CONCRETE PAVEMENT SECTION
SCALE: N.T.S.



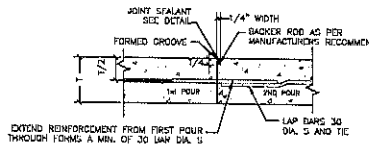
4 CONCRETE SIDEWALK
NTS



5 JOINT SEALANT DETAIL FOR EXPANSION JOINT
SCALE: N.T.S.



6 JOINT SEALANT DETAIL FOR BUTT, SAWED, AND CONSTRUCTION JOINT
SCALE: N.T.S.



8 TYPICAL CONSTRUCTION JOINT
SCALE: N.T.S.

JOINT NOTES:

T = PAVEMENT THICKNESS

1. CONTRACTOR MAY ELECT TO USE DOWELED CURB OR MONOLITHIC CURB

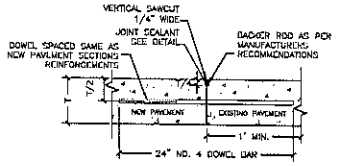
2. DOWEL BARS PLACED INTO EXISTING PAVEMENT SHALL BE DRILLED INTO PAVEMENT HORIZONTALLY BY USE OF A MECHANICAL RIG. DRILLING BY HAND IS TO ACCEPTABLE. SECURE DOWEL BARS IN EXISTING PAVING WITH EPOXY GROUT.

3. POLYETHYLENE FOAM BACKER ROD DOES NOT SIT ON BOTTOM OF SAW-CUT JOINT. PLACE AT DEPTH INDICATED IN DETAIL.

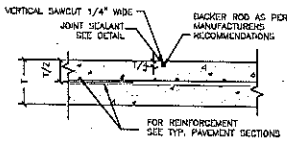
4. IF SEALANT PROTRUDES ABOVE SURFACE OF THE PAVEMENT IT MUST BE REMOVED AND REPLACED.

5. SUBMIT MANUFACTURER'S LITERATURE FOR SEALANT, DOCUMENTING PRODUCT COMPLIES WITH ASTM SPECIFICATIONS AND PROVIDING MANUFACTURER'S RECOMMENDATIONS FOR APPLICATION. FOLLOW MANUFACTURER'S RECOMMENDATIONS ON USE OF THE PRODUCT.

6. THE CONSTRUCTION JOINT IS TO BE USED BETWEEN SEPARATE POURS OF NEW PAVEMENT. NOTE THAT IT REQUIRES THE REINFORCEMENT TO BE EXTENDED THROUGH THE FORM TO TIE TO NEXT POUR. THE BUTT JOINT IS TO BE USED BETWEEN EXISTING CONCRETE PAVEMENT (STREET OR DRIVEWAY) AND PROPOSED PAVEMENT, UNLESS AN EXPANSION JOINT IS CALLED FOR.



7 TYPICAL BUTT JOINT
SCALE: N.T.S.



9 TYPICAL SAWED JOINT
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Drawing Title: MISCELLANEOUS DETAILS - SHEET 4	Project Title: UNDERGROUND UTILITIES		Date: 3/1/13
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: MLC	Drawn: DGR
Approved: Project Manager: VICTOR GAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Project No. 674-10-101
			Drawing No. C7.4
			Dwg. 24 of 28

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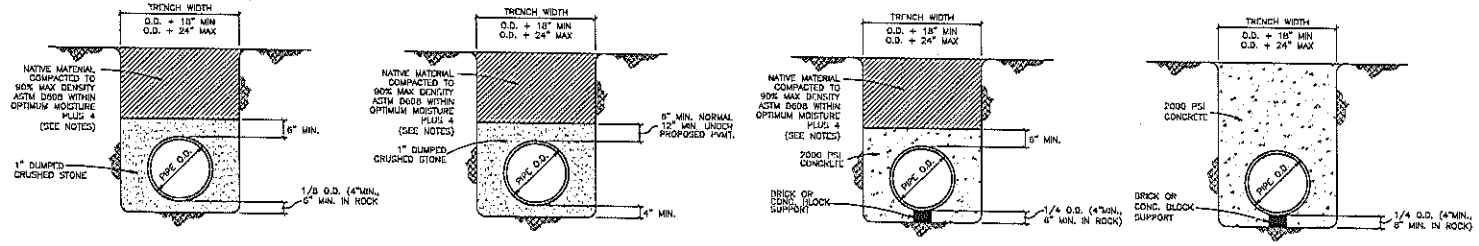
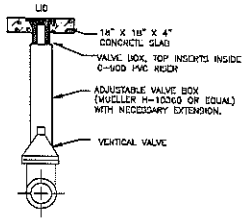


PIPE EMBEDMENT
NOT TO SCALE

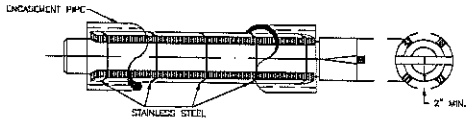
NOTES

1. AT LOCATIONS WHERE NEW UTILITIES ARE TO BE CONSTRUCTED BENEATH NEW AND/OR EXISTING PAVED ROADWAYS, THE CONTRACTOR SHALL BACKFILL WITH COMPACTED CRUSHED LIMESTONE BASE MATERIAL PER MUNICIPALITY REQUIREMENTS.

1 PIPE EMBEDMENT
SCALE: N.T.S.

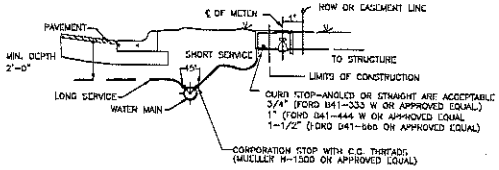


2 TYPICAL GATE VALVE
SCALE: N.T.S.



1. FOUR (4X4) PRESSURE-TREATED GRADE #2 OR BETTER LUMBER, 4"X4" PLASTIC LUMBER EQUALLY SPACED AROUND THE PIPE, MUST BE PROVIDED, OR PLASTIC SPACERS (PACI OR APPROVED EQUAL) SPACED EQUALLY AT 3 FT. O.C..
2. THE FOUR WOOD MEMBERS SHALL EXTEND THE FULL LENGTH OF THE PIPE, EXCLUDING THE COUPLING ON INTEGRAL BELL AND BE SECURELY FASTENED TO THE PIPE BY (1/2 INCH WIDE X 0.03 INCH THICK) STAINLESS STEEL STRAPS & STAINLESS STEEL CLIPS POSITIONED IN NOTCHES (VERY FAR "B") FELT.
3. THREE-FOURTHS (3/4) INCH WIDE GAGE NO. 10 GALVANIZED STEEL BANDS AND GALVANIZED SCREWS SHALL CONNECT THE TOP TWO WOOD MEMBERS, OR PLASTIC SPACERS, TO THE OTHER SIDE OF THE COUPLING OR INTEGRAL BELL. IT RESTRAINED JOINTS ARE NOT USED.
4. THE LEADING EDGE OF THE WOOD MEMBERS SHALL BE ROUNDED TO PREVENT "HANGING UP" ON THE WELDS OR OTHER OBSTRUCTIONS IN THE CASING.
5. ENDS OF THE ENCASEMENT PIPE WILL BE SECURELY & PERMANENTLY SEALED TO PREVENT INFLOW OF MOISTURE (BRICK & MORTAR, OR RUBBER CASING BOOTS).
6. STEEL CASING PIPE MUST BE 30 KSI MIN YIELD STRENGTH.
7. BOTH INSIDE & OUTSIDE OF STEEL CASING PIPE SHALL BE THOROUGHLY COATED WITH AN APPROVED RUST RESISTING PAINT.

3 PVC PIPE THROUGH CASING DETAIL
SCALE: N.T.S.



SECTION

GENERAL NOTES FOR SERVICE CONNECTIONS:

1. SERVICE TAPS ON PVC REQUIRE DOUBLE STRAP OF SINGLE WIDE STAINLESS STEEL STRAP, BRONZE, EPOXY COATED DUCTILE IRON OR DUCTILE IRON, SERVICE SADDLE/CLAMP (MUELLER 10120 OR FORD 202 OR APPROVED EQUAL) W/ C.C. THREADS.
2. SERVICE TAPS ON C.I. OR D.I. PIPE MAY BE MADE USING A CORPORATION STOP (4" OR LARGER MAIN) OR USING THE SERVICE CLAMPS SPECIFIED IN NO. 1 ABOVE (2" AND SMALLER MAIN).
3. WHERE A DOUBLE STRAP SADDLE IS REQUIRED, THE CONTRACTOR MAY SUBSTITUTE A "SINGLE BAND" SADDLE, IF THE BAND INCORPORATES TWO OR MORE ADJUSTMENT BOLTS AND THE OVERALL WIDTH OF THE SADDLE IS EQUAL TO OR GREATER THAN THE WIDTH OF THE DOUBLE STRAP SADDLE.
4. CURB STOPS WILL BE OF THE "BALL VALVE" VARIETY (FORD B42-333, ETC.)

4 SERVICE CONNECTION
SCALE: N.T.S.

3-1-13

MONTY L. CLARK 30014 LICENSED PROFESSIONAL ENGINEER

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Drawing Title: MISCELLANEOUS DETAILS - SHEET 5	Project Title: UNDERGROUND UTILITIES		Date: 3/1/13
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: MLC / Drawn: DGR	Project No.: 674-10-101
Approved: Project Manager: VICTOR GAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Drawing No.: C7.5
			Dwg. 25 of 28

Veterans Affairs

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INSTALLATION OF PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS

1. SCOPE

1.1 THIS PRACTICE COVERS THE INSTALLATION OF THE PRECAST REINFORCED CONCRETE BOX SECTIONS CAST MONOLITHICALLY AND INTENDED TO BE USED FOR THE CONVEYANCE OF STORM WATER, INDUSTRIAL WASTES AND SEWAGE, AND FOR PASSAGEWAYS.

1.2 THE VALUES GIVEN IN PARENTHESES ARE MATHEMATICAL CONVERSIONS TO SI UNITS THAT ARE PROVIDED FOR INFORMATION ONLY AND ARE NOT CONSIDERED STANDARD.

2. REFERENCED DOCUMENTS

2.1 ATSM STANDARDS:

C822 TERMINOLOGY RELATING TO CONCRETE PIPE AND RELATED PRODUCTS.

C1433 SPECIFICATION FOR PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS FOR CULVERTS, STORM DRAINS, AND SEWERS

C1433M SPECIFICATION FOR PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS FOR CULVERTS, STORM DRAINS, AND SEWERS (METRIC)

C1577 SPECIFICATION FOR PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS FOR CULVERTS, STORM DRAINS, AND SEWERS DESIGNED ACCORDING TO AASHTO LRFD

D698 TEST METHODS FOR LABORATORY COMPACTION CHARACTERISTICS OF SOIL USING STANDARD EFFORT (12 400 ft-lbf/ft³(600 kN-m/m³))

D2487 PRACTICE FOR CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES (UNIFIED SOIL CLASSIFICATION SYSTEM)

2.2 ASCE STANDARD
ASCE 26 STANDARD PRACTICE FOR THE DIRECT DESIGN OF BURIED PRECAST CONCRETE BOX SECTIONS.

2.3 AASHTO STANDARDS:
AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DIV. II, SECTION 27

AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, SECTION 27

AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

AASHTO M145 CLASSIFICATION OF SOILS AND SOIL-AGGREGATE MIXTURES FOR HIGHWAY CONSTRUCTION PURPOSES

3. TERMINOLOGY

3.1 FOR DEFINITIONS OF TERMS RELATING TO PRECAST CONCRETE BOX SECTIONS, SEE TERMINOLOGY C822

3.2 FOR TERMINOLOGY RELATED TO SOIL CLASSIFICATIONS, SEE PRACTICE D2487

3.3 FOR TERMINOLOGY AND DEFINITIONS OF TERMS RELATING TO STRUCTURAL DESIGN, SEE ASCE 26.

3.4 DETAIL ILLUSTRATES THE INSTALLATION TERMINOLOGY.

4. SIGNIFICANCE AND USE

4.1 THIS PRACTICE IS USEFUL AS A REFERENCE BY AN OWNER AND THE OWNER'S ENGINEER IN PREPARING PROJECT SPECIFICATIONS.

5. GENERAL

5.1 THE PRECAST REINFORCED CONCRETE BOX SECTION/SOIL SYSTEM SHALL BE CONSTRUCTED TO CONFORM TO THE DIMENSIONS AND REQUIREMENTS SPECIFIED OR SHOWN ON THE PLANS AND TO THIS PRACTICE. ADDITIONALLY, FOR HIGHWAY PROJECTS, THE PRECAST REINFORCED CONCRETE BOX SECTION/SOIL SYSTEM SHALL CONFORM TO THE REQUIREMENTS OF SECTION 27 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES OR AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS AS APPROPRIATE. THE OWNERS ADVISED TO PROVIDE OR REQUIRE ADEQUATE INSPECTION OF THE BOX SECTION INSTALLATION AT THE CONSTRUCTION SITE.

6. EXCAVATION

6.1 TRENCHES SHALL BE EXCAVATED TO THE DIMENSIONS AND GRADE SPECIFIED ON THE PLANS OR AS ORDERED BE THE OWNER. THE WIDTH OF TRENCHES SHALL BE KEPT TO THE MINIMUM REQUIRED FOR INSTALLATION OF THE BOX SECTIONS AND PROPER COMPACTION OF THE SIDEFILL.

6.2 WHEN LEDGE ROCK, COMPACTED ROCKS, OR OTHER UNYIELDING FOUNDATION MATERIAL IS ENCOUNTERED, IT SHALL BE REMOVED TO THE REQUIREMENTS SHOWN ON THE PLANS. OVER-EXCAVATED AREAS SHALL BE BACKFILLED WITH APPROVED MATERIALS SPECIFIED FOR THE LEVELING COURSE.

6.3 THE CONTRACTOR SHALL MAKE SUCH PROVISIONS AS REQUIRED TO ENSURE THE ADEQUATE DRAINAGE OF THE TRENCH TO PROTECT THE LEVELING COURSE DURING THE CONSTRUCTION OPERATIONS. WHERE SURFACE WATER OR GROUNDWATER CONDITIONS EXIST, THE SITE AND TRENCH SHALL BE DEWATERED.

7. FOUNDATION

7.1 THE FOUNDATION SHALL BE MODERATELY FIRM TO HARD IN SITU MATERIAL, STABILIZED SOIL, OR COMPACTED FILL MATERIAL.

7.2 WHEN UNSUITABLE OR UNSTABLE MATERIAL IS ENCOUNTERED, THE FOUNDATION SHALL BE STABILIZED OR REMOVED AND REPLACED WITH FIRM AND STABLE FOUNDATION MATERIAL.

7.3 WHERE GROUNDWATER AND SOIL CHARACTERISTICS CONTRIBUTE TO THE MIGRATION OF SOIL FINES INTO OR OUT OF THE FOUNDATION, LEVELING COURSE, OR OVERFILL MATERIALS, METHODS TO PREVENT MIGRATION SHALL BE PROVIDED.

7.4 BOX SECTIONS SHALL BE INSTALLED OVER AN UNYIELDING FOUNDATION, INCLUDING CONCRETE, SHALL BE CUSHIONED SO AS TO PREVENT NON-UNIFORM BEARING IN ACCORDANCE WITH SECTION 8.

8. LEVELING COURSE

8.1 A MINIMUM 3 IN (75 MM) LEVELING COURSE, AS SHOWN IN DETAIL, SHALL BE CONSTRUCTED OF CLEAN COARSE GRAINED SOILS: USCS SW, SP, GW, GP OR ANY SOIL BEGINING WITH ONE OF THOSE SYMBOLS AND WITH 12% OR LESS PASSING A #200 (75μm) SIEVE (AASHTO M145, A-1, A-3). THE NOMINAL AGGREGATE SIZE SHALL NOT BE GREATER THAN 1 IN. (25MM) (#57 AGGREGATE). IN THE EVENT THAT THE LEVELING COURSE CONSISTS OF LAYERS WITH THE UPPER LAYER BEING CLEAN, UNCOMPACTED SAND, THAT LAYER SHALL BE A MAXIMUM THICKNESS OF 2 IN (50MM) TO PREVENT NON-UNIFORM SETTLEMENT FROM PERSONNEL AND EQUIPMENT DURING THE INSTALLATION PROCESS.

8.2 IN SITU MATERIAL THAT PROVIDE A SUITABLE LEVELING COURSE IN ACCORDANCE WITH THIS PRACTICE SHALL BE ACCEPTABLE.

8.3 IF ROCK STRATA OR BOULDERS ARE ENCOUNTERED UNDER THE BOX SECTION WITHIN THE LIMITS OF THE REQUIRED LEVELING COURSE, THE ROCK OR BOULDERS SHALL BE REMOVED AND REPLACED WITH ADDITIONAL LEVELING COURSE MATERIALS.

8.4 A CONCRETE SLAB IS NOT AN APPROPRIATE LEVELING COURSE.

9. BOX SECTION PLACEMENT AND JOINING

9.1 BOX SECTIONS SHALL BE INSTALLED TO THE LINE AND GRADE SHOWN IN CONTRACT DOCUMENTS. JOINING SHALL BE IN ACCORDANCE WITH BOX SECTION MANUFACTURER'S RECOMMENDATIONS.

NOTE 1-(ADVISORY): WORK SHOULD BE STARTED AT THE LOWEST END OF THE BOX SECTION LINE, AND WITH THE BELL OR GROOVE END POINTING UPSTREAM, LAYING SPIGOTS INTO BELLS WHERE APPLICABLE.

9.2 ADJUSTMENTS IN GRADE BY EXERTING FORCE ON THE BOX SECTION WITH EXCAVATING EQUIPMENT OR BY LIFTING AND DROPPING THE BOX SECTION SHALL BE PROHIBITED. IF THE INSTALLATION BOX SECTION IS NOT ON GRADE, THE BOX SECTION SHALL BE COMPLETELY UNJOINED, THE GRADE CORRECTED, AND THE BOX SECTION THEN REJOINED.

9.3 PROPER FACILITIES AND EQUIPMENT SHALL BE PROVIDED FOR HOISTING AND LOWERING THE BOX SECTIONS WITHOUT DISTURBING THE LEVELING COURSE AND THE SIDES OF THE EXCAVATION OR DAMAGING THE BOX SECTIONS.

9.4 THE ENDS OF THE BOX SECTIONS SHALL BE FREE OF ANY DELETERIOUS MATERIALS THAT WOULD PREVENT PROPER JOINING OR SEALING OF ADJACENT SECTIONS.

9.5 THE BOX SECTION SHALL BE JOINED SO THAT WHEN LAID ON THE LEVELING COURSE, IT SHALL FORM A SMOOTH, UNIFORM LINE OF SECTIONS.

NOTE 2-(ADVISORY): PROPER EQUIPMENT, SUCH AS COME-ALONG OR PULLER, SHOULD BE UTILIZED TO JOIN SECTIONS TOGETHER.

9.6 UNLESS DESIGNED OTHERWISE, MULTIPLE BOX SECTIONS IN PARALLEL MULTI-CELL INSTALLATIONS REQUIRE POSITIVE LATERAL BEARING BETWEEN THE SIDES OF ADJACENT BOX SECTIONS. COMPACTED GRANULAR BACKFILL, FLOWABLE FILL, OR GROUTING BETWEEN THE SECTIONS ARE CONSIDERED MEANS OF PROVIDING POSITIVE BEARING.

9.7 PRECAST REINFORCED CONCRETE BOX SECTIONS SHALL BE HANDLED WITH REASONABLE CARE. IF DRAGGING SECTIONS CAUSES DAMAGE, THEN THIS PRACTICE SHALL BE DISCONTINUED. CARE SHALL BE TAKEN TO PREVENT BOX SECTIONS FROM STRIKING ROCK OR OTHER HARD OBJECTS DURING PLACEMENT.

9.8 EACH JOINT SHALL BE SEALED TO PREVENT MIGRATION OF SOIL FINES AS SPECIFIED IN THE PROJECT SPECIFICATIONS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

9.9 IF REQUIRED BY THE CONTRACT DOCUMENTS, EACH JOINT SHALL MEET THE SPECIFIED INFILTRATION AND EXFILTRATION REQUIREMENTS.

9.10 UNLESS OTHERWISE APPROVED BY THE OWNER, LOADS FROM CONSTRUCTION EQUIPMENT TRANSFERRED TO A BOX SECTION BEFORE, DURING, OR AFTER FILL PLACEMENT, EITHER DIRECTLY THROUGH THE FILL, SHALL NOT BE GREATER THAN THE LOADS ASSUMED IN THE DESIGN (SEE SECTION 14, ADEQUATE PROTECTION FROM CONSTRUCTION LOADS).

10. SIDEFILL

10.1 WHEN THE SOIL-STRUCTURE INTERACTION FACTOR USED IN THE DESIGN IS BASED ON COMPACTED FILL AT THE SIDES OF THE BOX, THE SIDEFILL SHALL BE AS REQUIRED BY THE CONTRACT DOCUMENTS, BUT NOT LESS THAN CLEAN, COARSE-GRAINED SOILS (USCS SW, SP, GP, OR AASHTO M145, A-1, A-3), OR COARSE-GRAINED SOILS WITH FINES (USCS GM, GC, SM, SC, OR AASHTO M145, A-2-4, A-2-5, A-2-6) COMPACTED TO AT LEAST 90% STANDARD PROCTOR (SEE TEST METHODS D698). THE SIDEFILL SHALL BE BROUGHT UP ON BOTH SIDES OF THE BOX SECTION THAT PLACEMENT WILL NOT DISJOINT OR CREATE LATERAL MOVEMENT IN THE BOX SECTION.

10.2 WHEN THE SOIL-STRUCTURE INTERACTION FACTOR USED IN THE DESIGN IS NOT BASED ON COMPACTED FILL AT THE SIDES OF THE BOX SECTION, THE USE OF NATIVE SOILS IS ACCEPTABLE. SIDEFILL SHALL BE FREE OF DEBRIS, ORGANIC MATTER, FROZEN MATERIAL OR LARGE STONES WITH A DIAMETER GREATER THAN 3 IN. (75MM).

10.3 PONDING OR JETTING TO COMPACT THE SIDEFILL SHALL BE PERMITTED ONLY WHERE SOIL CONDITIONS PERMIT FREE DRAINAGE AND ONLY WITH THE APPROVAL OF THE OWNER.

11. OVERFILL

11.1 OVERFILL SHALL BE CONSTRUCTED AS SPECIFIED. OVERFILL MATERIAL SHALL BE PLACED IN LAYERS WITH NO GREATER THAN THE MAXIMUM THICKNESS SPECIFIED AND COMPACTED TO THE REQUIRED DENSITY.

11.2 THE SOIL SHALL BE APPROVED MATERIAL CONTAINING NO DEBRIS, ORGANIC MATTER, FROZEN MATERIAL OR LARGE STONES WITH A DIAMETER GREATER THAN 3 IN. (75MM), WHICHEVER IS LESS.

11.3 WHEN IMPACT OR VIBRATORY EQUIPMENT IS USED FOR COMPACTION, CARE SHALL BE TAKEN IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, TO AVOID DAMAGING THE BOX SECTIONS.

12. SHEATHING REMOVAL AND TRENCH SHIELD ADVANCEMENT

12.1 UNLESS SHEATHING IS TO BE LEFT IN PLACE, IT SHALL BE PULLED OUT IN VERTICAL INCREMENTS TO PERMIT PLACEMENT AND COMPACTION OF FILL MATERIAL FOR THE FULL WIDTH OF THE TRENCH.

12.2 WHEN TRENCH SHIELDS OR BOXES ARE MOVED, PREVIOUSLY PLACED BOX SECTION SHALL NOT BE DISTURBED. IF SUCH A DISTURBANCE OCCURS, DEADMAN ANCHORS OR OTHER MEANS SHALL BE USED TO RESTRAIN PREVIOUSLY PLACED BOX SECTIONS. VOIDS IN THE SIDEFILL THAT ARE CREATED BY MOVEMENT OF A SHIELD OR BOX SHALL BE FILLED AND COMPACTED IN ACCORDANCE WITH SECTION 10 OF THIS PRACTICE.

13. PRECAST CONCRETE APPURTENANCES

13.1 MANHOLES, PIPE, JUNCTION BOXES, AND OTHER ADJOINING APPURTENANCES SHALL BE INSTALLED IN A MANNER THAT WILL MINIMIZE DIFFERENTIAL SETTLEMENT BETWEEN BOX SECTION AND APPURTENANCE.

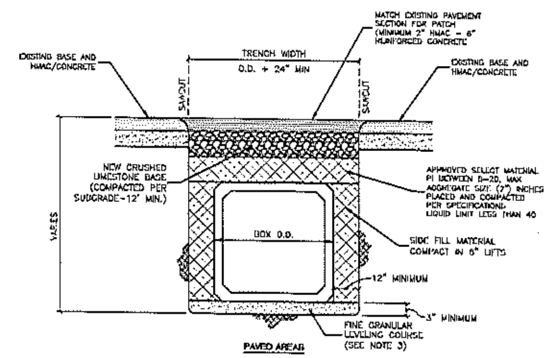
13.2 PRECAST CONCRETE FITTINGS, SUCH AS TEES AND WYES, SHALL BE BEDDED, INSTALLED, AND OVERFILLED WITH THE SAME MATERIAL AND IN THE SAME MANNER AS THE PRECAST CONCRETE BOX SECTIONS TO PREVENT DIFFERENTIAL SETTLEMENT BETWEEN BOX SECTION AND FITTINGS.

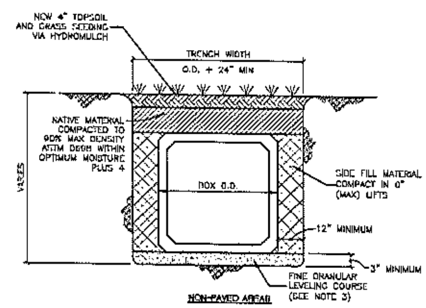
14. ADEQUATE PROTECTION FROM CONSTRUCTION LOADS

14.1 CONSTRUCTION LOADS SHALL BE CONSIDERED IN DESIGN IF CONSTRUCTION EQUIPMENT MUST PASS OVER THE BOXES DURING PROJECT CONSTRUCTION. IF NECESSARY, COMPACTED OVERFILL IN THE FORM OF A RAMP SHALL BE CONSTRUCTED OVER THE TOP OF THE BOX SECTION SUCH THAT THE EQUIPMENT LOAD ON THE BOX SECTION DOES NOT EXCEED THE BOX SECTION DESIGN STRENGTH. THE RAMP PROFILE SHALL BE FREE OF ABRUPT CHANGES IN GRADE THAT WOULD CAUSE CONCENTRATED LOADS OR PREVENT THE UNIFORM DISTRIBUTION OF LOADS THROUGH ALL AXLES OF PASSING EQUIPMENT. IN AN EMBANKMENT INSTALLATION, THE OVERFILL SHALL EXTEND A MINIMUM OF ONE BOX SECTION OR SPAN 3 FT (900MM), WHICHEVER IS GREATER, BEYOND EACH SIDE OF THE BOX SECTION TO PREVENT POSSIBLE LATERAL DISPLACEMENT OF THE BOX SECTION. IF A LARGE VOLUME OF CONSTRUCTION TRAFFIC MUST CROSS AN INSTALLED LINE OF BOX SECTIONS, THE POINT OF CROSSING SHALL BE CHANGED OCCASIONALLY TO MINIMIZE THE POSSIBILITY OF LATERAL DISPLACEMENT.

15. SAFETY

15.1 SAFETY REQUIREMENTS FOR CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.





NOTES:

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3. A MINIMUM 3 INCH LEVELING COURSE SHALL BE CONSTRUCTED OF CLEAN COARSE GRAINED SOIL AND CONTAIN 12% OR LESS PASSING A #200 SIEVE. THE NOMINAL MAXIMUM AGGREGATE SIZE SHALL NOT BE GREATER THAN 1 INCH.
4. INSTALL PRECAST CONCRETE BOX PER MANUFACTURES RECOMMENDATIONS.
5. USE OF NATIVE SOIL FOR SIDE FILL SHALL BE FREE OF DEBRIS, ORGANIC MATTER, OR LARGE STONES WITH A DIAMETER GREATER THAN 3 INCHES.
6. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE COMPACTION TESTING OF BACKFILL SUBGRADE.

5-1-13

(1) REINFORCED CONCRETE BOX EMBEDMENT
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Drawing Title: MISCELLANEOUS DETAILS - SHEET 6	Project Title: UNDERGROUND UTILITIES		Date: 3/1/13
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: MLC	Drawn: DGR
Approved: Project Manager: VICTOR CAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Project No. 674-10-101
			Drawing No. C7.6
			Dwg. 26 of 28

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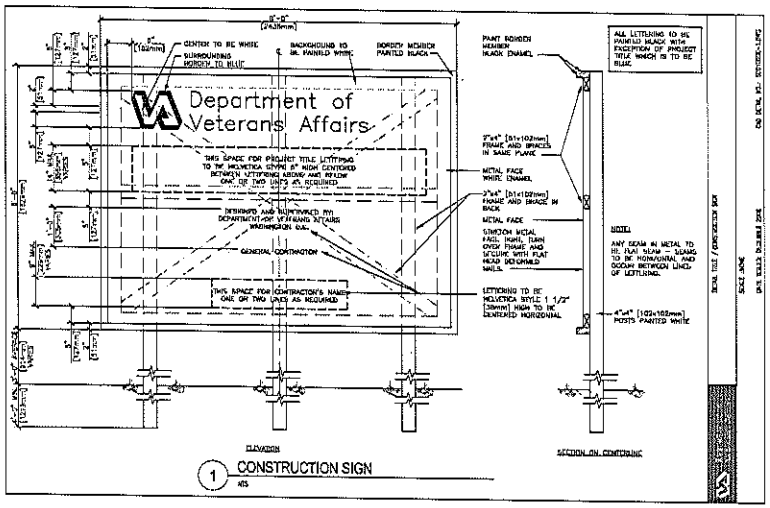

1 CONSTRUCTION SIGN
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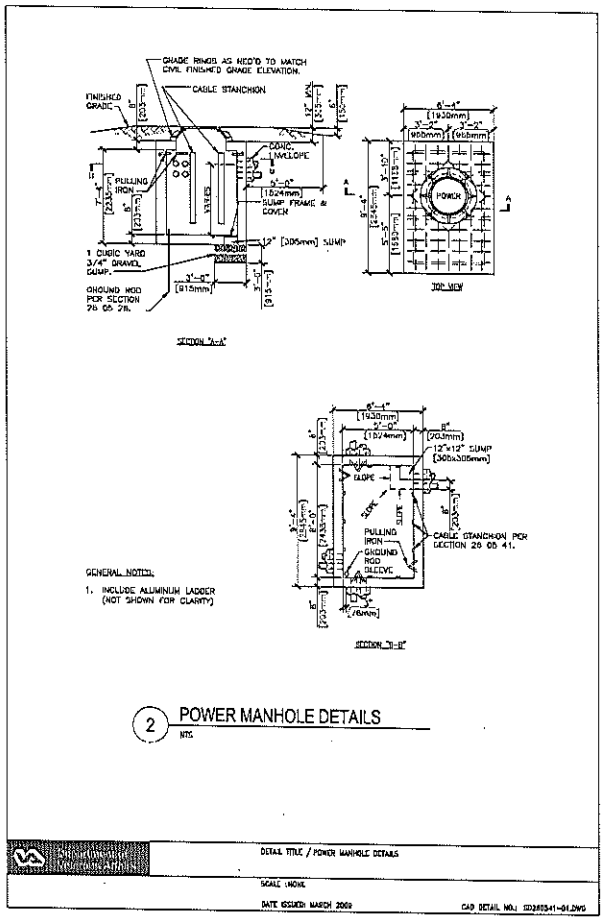

2 POWER MANHOLE DETAILS
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Drawing Title: MISCELLANEOUS DETAILS - SHEET 7	Project Title: UNDERGROUND UTILITIES		Date: 3/1/13
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: MLC	Drawn: DGR
Approved: Project Manager: VICTOR GAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Project No.: 674-10-101
			Drawing No.: C7.7
			Dwg. 27 of 28

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VA FORM 06-9231, FEB. 1983

U.S. GOVERNMENT PRINTING OFFICE: 1983-400-280

1. MATERIAL AND COMPACTION REQUIREMENTS FOR PIPE BEDDING/SHADING SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR THE APPLICABLE UTILITY PIPE.
2. TRENCH BACKFILL SHALL COMMENCE 1 FOOT [305mm] ABOVE THE TOP OF PIPE AND SHALL BE PER SECTION 31 20 00.
3. BACKFILL COMPACTION REQUIREMENTS SHALL BE PER SECTION 31 20 00.
4. THE 1 FOOT [305mm] TRENCH "SHOULDER" AREAS SHALL BE DELETED FOR TYPE 2 TRENCHES.
5. ABC SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 12 16.
6. PORTLAND CEMENT CONCRETE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 03 30 53.
7. ASPHALTIC TACK MATERIAL SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 12 16.
8. ASPHALTIC CONCRETE SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 12 16 FOR THE TYPE SPECIFIED.
9. BITUMINOUS SURFACE TREATMENT (CHIP SEAL) SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 12 13 FOR THE TYPE SPECIFIED.
10. LOAD TRANSFER DOWELS FOR JOINTS TRANSVERSE TO THE ROADWAY CENTERLINE SHALL BE SMOOTH STEEL DOWELS IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 32 05 23. DOWELS SHALL BE SIZED AND SPACED AS FOLLOWS:

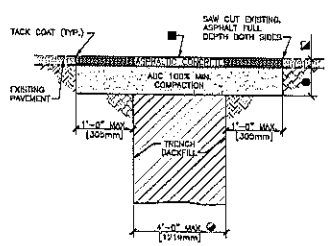
PCCP THICKNESS	DOWEL SIZE	DOWEL LENGTH	DOWEL SPACING
6" [150mm]	#5 [No. 16]	12" [305mm]	18" [455mm]
7" [180mm]	#5 [No. 16]	15" [380mm]	15" [380mm]
8" [180mm]	#5 [No. 16]	15" [380mm]	12" [305mm]
10" [180mm]	#10 [No. 19]	15" [380mm]	12" [305mm]

11. DEFORMED TIE BARS SHALL BE USED IN TRENCH PATCHES LONGITUDINAL TO THE ROADWAY CENTERLINE WHEN THE TRENCH LENGTH IS GREATER THAN 50 FEET [15240mm]. TIE BARS SHALL BE 24 INCHES [610mm] LONG, DEFORMED #4 [No. 13] BARS FOR PCCP LESS THAN 8 INCHES [200mm] THICK AND #5 [No. 16] BARS IF 8 INCHES [200mm] THICK OR MORE. TIE BARS SHALL BE PLACED 30 INCHES [760mm] CENTER-TO-CENTER.
12. HOLES SHALL BE DRILLED 1 FOOT [305mm] INTO THE EXISTING SLAB FOR TIE BARS AND 2 INCHES [140mm] FOR DOWELS. HOLES SHALL BE OF A DIAMETER SUFFICIENT TO ACCOMMODATE THE TIE BAR ANCHORAGE OR DOWEL CAP. TIE BARS SHALL BE ANCHORED WITH AN APPROVED HIGH VISCOSITY EPOXY.
13. IF THE CONCRETE SLAB REMAINING NEXT TO A LONGITUDINAL OR TRANSVERSE JOINT IS LESS THAN 6 FEET [1820mm] AT ITS NARROWEST WIDTH, REMOVE AND REPLACE THE EXISTING CONCRETE TO THE JOINT.

DETAIL TITLE / UTILITY TRENCH PATCH NOTES

SCALE: NONE

DATE ISSUED: DECEMBER 2008 CAD DETAIL NO.: 50321216-04.DWG



- FOR TRENCH WIDTHS EXCEEDING 4' [1219mm] REFER TO VA STANDARD DETAIL 32 12 16-02 "TYPE 2 UTILITY TRENCH PATCH". FOR TRENCH WHERE PORTLAND CEMENT CONCRETE (PCC) PAVEMENT EXISTS, REFER TO 32 12 16-03 "TYPE 3 UTILITY TRENCH PATCH".
- 2" [50mm] MINIMUM OR THICKNESS OF EXISTING PAVEMENT WHICHEVER IS GREATER.
- BITUMINOUS SURFACE TREATMENT (CHIPSEAL) REQUIRED ONLY FOR LONGITUDINAL TRENCHES WITH WIDTHS GREATER THAN 6' [1829mm].
- 4" [100mm] MINIMUM ABC OR THICKNESS OF EXISTING GRANULAR BASE COURSE MATERIALS (E.G. ABC & SELECT MATERIAL) WHICHEVER IS GREATER.

REFER TO VA STANDARD DETAIL 32 12 16-04 "UTILITY TRENCH PAVEMENT PATCH NOTES" FOR ADDITIONAL INFORMATION.

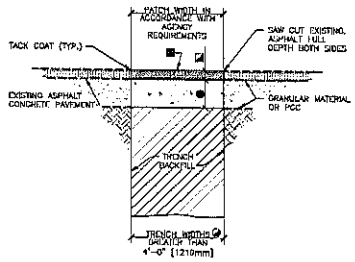
2 TYPE 1 UTILITY TRENCH PATCH

NTS

DETAIL TITLE / TYPE 1 UTILITY TRENCH PATCH

SCALE: NONE

DATE ISSUED: DECEMBER 2008 CAD DETAIL NO.: 50321216-01.DWG



- FOR TRENCH WIDTHS 4' [1219mm] OR LESS REFER TO VA STANDARD DETAIL 32 12 16-01 "TYPE 1 UTILITY TRENCH PATCH". FOR TRENCH WHERE PORTLAND CEMENT CONCRETE (PCC) PAVEMENT EXISTS, REFER TO 32 12 16-03 "TYPE 3 UTILITY TRENCH PATCH".
- 2" [50mm] MINIMUM OR THICKNESS OF EXISTING PAVEMENT WHICHEVER IS GREATER.
- BITUMINOUS SURFACE TREATMENT (CHIPSEAL) REQUIRED ONLY FOR LONGITUDINAL TRENCHES WITH WIDTHS GREATER THAN 6' [1829mm].
- 4" [100mm] MINIMUM ABC OR THICKNESS OF EXISTING GRANULAR BASE COURSE MATERIALS (E.G. ABC & SELECT MATERIAL) WHICHEVER IS GREATER. PORTLAND CEMENT CONCRETE (PCC) THICKNESS EQUAL TO EXISTING.

REFER TO VA STANDARD DETAIL 32 12 16-04 "UTILITY TRENCH PAVEMENT PATCH NOTES" FOR ADDITIONAL INFORMATION.

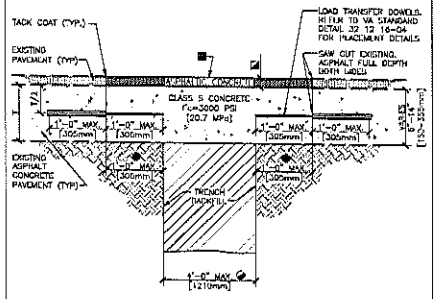
3 TYPE 2 UTILITY TRENCH PATCH

NTS

DETAIL TITLE / TYPE 2 UTILITY TRENCH PATCH

SCALE: NONE

DATE ISSUED: DECEMBER 2008 CAD DETAIL NO.: 50321216-02.DWG



- FOR TRENCH WIDTHS EXCEEDING 4' [1219mm] DOWEL LOAD TRANSFER DOWELS.
- 2" [50mm] MINIMUM OR THICKNESS OF EXISTING PAVEMENT WHICHEVER IS GREATER.
- BITUMINOUS SURFACE TREATMENT (CHIPSEAL) REQUIRED ONLY FOR LONGITUDINAL TRENCHES WITH WIDTHS GREATER THAN 6' [1829mm].
- REFER TO NOTE 13 ON VA STANDARD DETAIL 32 12 16-04 "UTILITY TRENCH PAVEMENT PATCH NOTES".

REFER TO VA STANDARD DETAIL 32 12 16-04 "UTILITY TRENCH PAVEMENT PATCH NOTES" FOR ADDITIONAL INFORMATION.

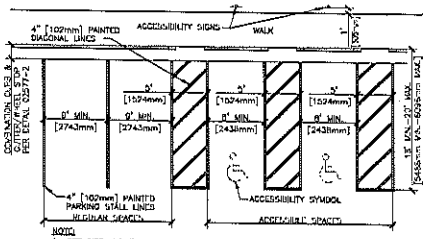
4 TYPE 3 UTILITY TRENCH PATCH

NTS

DETAIL TITLE / TYPE 3 UTILITY TRENCH PATCH

SCALE: NONE

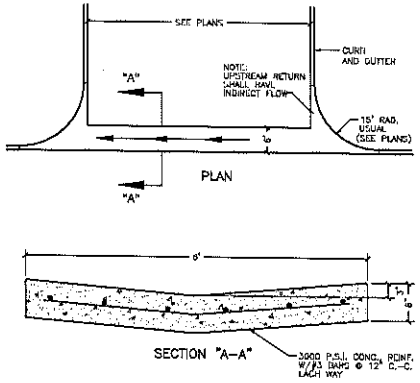
DATE ISSUED: DECEMBER 2008 CAD DETAIL NO.: 50321216-03.DWG



NOTE:
1. SEE SITE AND ENGINEERING DESIGN MANUAL FOR PARKING BAY WIDTHS.
2. SEE VA BARRIER FREE DESIGN HANDBOOK H-08-13 FOR ACCESSIBLE SPACE QUANTITIES AND SIGNAGE.
3. ACCESSIBLE SPACE FOR VANS MUST BE 11' [3300mm] WIDE WITH 5' [1524mm] ACCESS AISLES AND BE DESIGNATED FOR VANS ONLY.

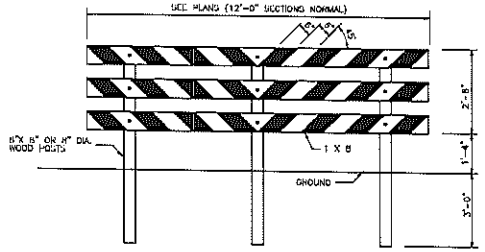
5 PARKING STALL LAYOUT

NTS



6 CONCRETE VALLEY

SCALE: N.T.S.



NOTES:

ALL LUMBER COMPONENTS TO BE PAINTED WITH A MINIMUM OF 2 COATS OF WHITE PAINT.

RAILS SHALL BE REFLECTORIZED RED AND REFLECTORIZED WHITE STRIPED ON ONE SIDE.

STRIPING SHALL COVER FULL WIDTH OF RAILS.

7 TYPE III BARRICADE

SCALE: N.T.S.

3-1-13

MONTY L. CLARK 90604 REGISTERED PROFESSIONAL ENGINEER

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Drawing Title: MISCELLANEOUS DETAILS - SHEET 8

Project Title: UNDERGROUND UTILITIES

Date: 3/1/13

Project No.: 674-10-101

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR GAW, P.E.

Building Number: SITE | Checked: MLC | Drawn: DGR

Location: TEMPLE VAMC - TEMPLE, TEXAS

Drawing No.: C7.8

Dwg. 28 of 28

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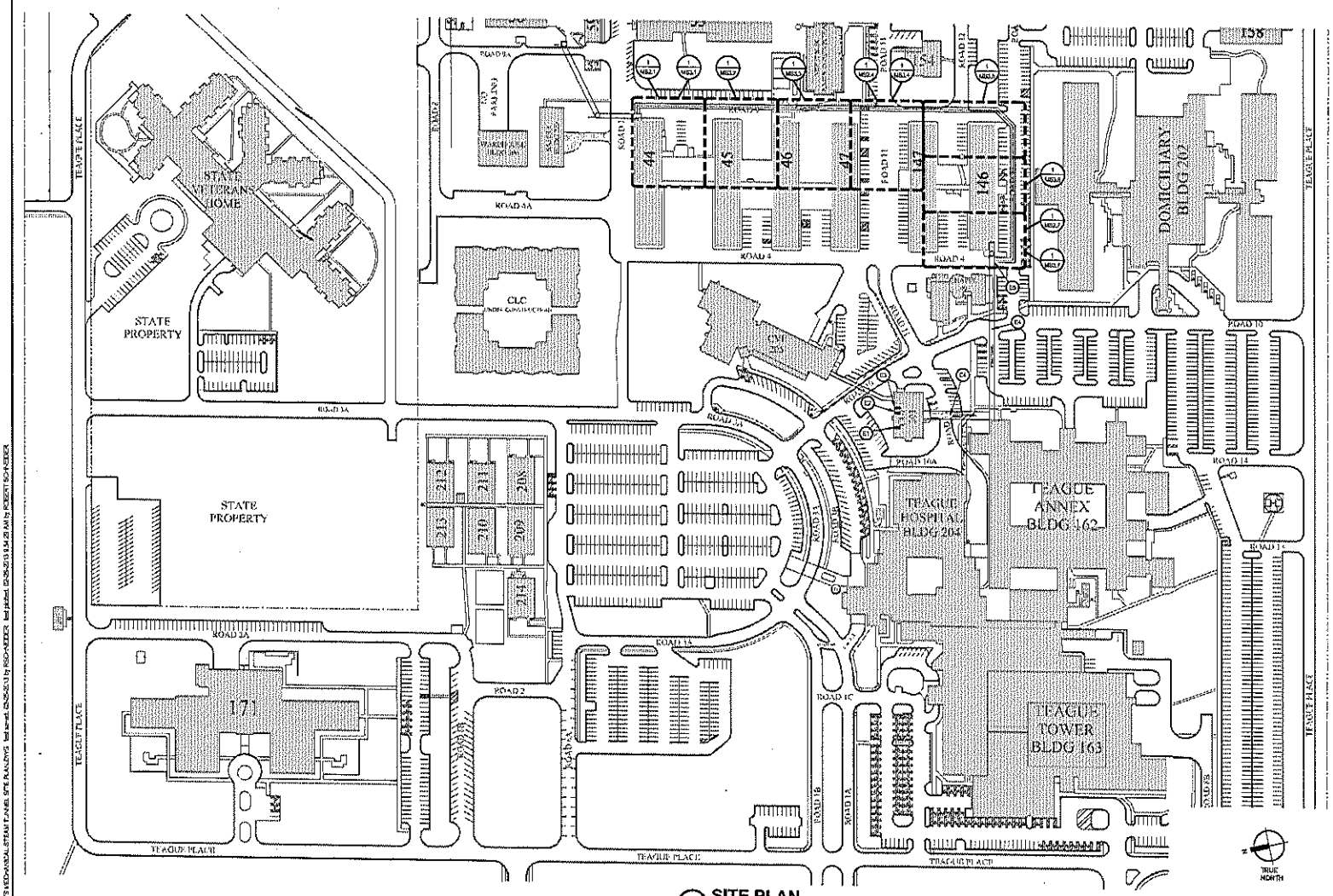
U.S. GOVERNMENT PRINTING OFFICE: 1983-400-285



1 SITE PLAN

SCALE: 1" = 100'-0"

ELECTRICAL GENERAL NOTES

1. ALL NEW ELECTRICAL FIXTURES, RECEPTACLES & EQUIPMENT ARE TO BE SERVED FROM EXISTING PANEL BOARDS IN CENTRAL UTILITY PLANT (CUP) BLDG. 203. SEE KEYED NOTES THIS PAGE FOR APPROXIMATE PANEL LOCATIONS.
2. ALL CONDUIT RUNS SHALL BE GALVANIZED RIGID OR IMC WITH MALLEABLE IRON TYPE 'FD' BOXES WITH MALLEABLE IRON COVERS.

ELECTRICAL NOTES:

(E1) APPROXIMATE LOCATION OF EXISTING PANEL 'CPHEV' (EQUIPMENT BRANCH) TO BE UTILIZED TO SERVE VENT FAN IN NEW TUNNEL & PNL 'CPLEB' TO BE UTILIZED TO SERVE SUMP PUMP IN TUNNEL.

(E2) APPROXIMATE LOCATION OF EXISTING PANEL 'CPHLS' (LIFE SAFETY BRANCH) TO BE UTILIZED TO SERVE LIGHTING IN NEW TUNNEL.

(E3) APPROXIMATE LOCATION OF EXISTING PANEL 'CPL' (NORMAL SOURCE) PANEL TO BE UTILIZED TO SERVE RECEPTACLES IN NEW TUNNEL.

(E4) ROUTE HOMERUNS THROUGH EXISTING TUNNEL TO BE IN POINT TO NEW TUNNEL. (NOTE E5)

(E5) BEGINNING OF NEW TUNNEL CONSTRUCTION SEE SHEETS MEL1 THROUGH MEL7 FOR FIXTURES, RECEPTACLES & EQUIPMENT TO BE INSTALLED IN NEW TUNNEL.

LEGEND

- - - - - - - - EXISTING TO REMAIN
———— NEW WORK

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O'CONNELL ROBERTSON
CR PROJECT NO. 0917.05

Drawing Title: STEAM TUNNEL SITE PLAN

Project Title: UNDERGROUND UTILITIES

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR GAW, P.E.

Building Number: SITE | Checked: NP | Drawn: KF

Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013

Project No.: 674-10-101

Drawing No.: CU1.0

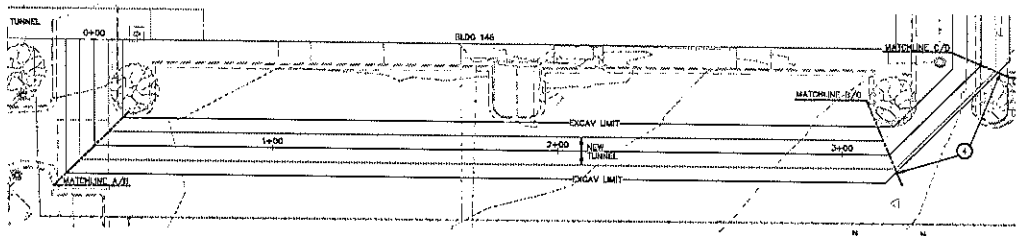
Veterans Affairs

VA FORM 08-6236, FEB. 1983

U.S. GOVERNMENT PRINTING OFFICE: 1983-400-285

MECHANICAL NOTES :

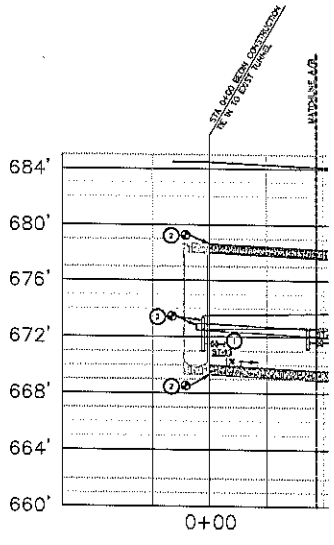
1. STEAM TRAP TO DISCHARGE INTO PUMPED CONDENSATE RETURN (NOT SHOWN). SEE DETAILS 2-4/M54.2.
2. SOUTH TUNNEL TIE IN. CONNECT TO EXISTING TUNNEL & PIPING. SEE DETAILS 4 & 5/M54.2.
3. CONDENSATE DRAIN SLOPED WITH TUNNEL FLOOR, TYP.
4. EXCAVATION LIMITS NARROW TO AVOID DISTURBING TREE ROOT SYSTEM. SHORE AS NECESSARY.
5. NEW PRECAST TUNNEL (TYP).



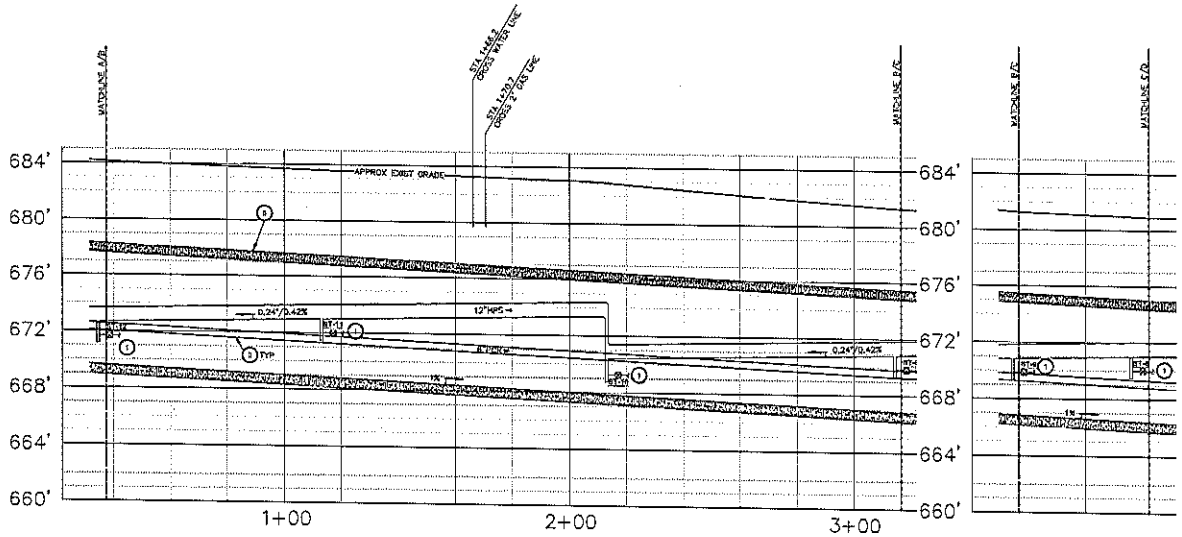
1 UTILITY TUNNEL PLAN - SEGMENTS A, B, C
SCALE: 1" = 20'

PLAN NORTH

TRUE NORTH



A SEGMENT "A" TUNNEL PROFILE
SCALE: 1" = 20' HORIZ, 1" = 4' VERT



B SEGMENT "B" TUNNEL PROFILE
SCALE: 1" = 20' HORIZ, 1" = 4' VERT

C SEGMENT "C" TUNNEL PROFILE
SCALE: 1" = 20' HORIZ, 1" = 4' VERT

LEGEND

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- NEW WORK

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O'CONNELL ROBERTSON
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INTERIORS
DR PROJECT NO. 0917.06

Drawing Title: MECHANICAL PLAN & PROFILE

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR CAW, P.E.

Project Title: UNDERGROUND UTILITIES

Building Number: SITE | Checked: NP | Drawn: KF

Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013

Project No.: 674-10-101

Drawing No.: CU1.1

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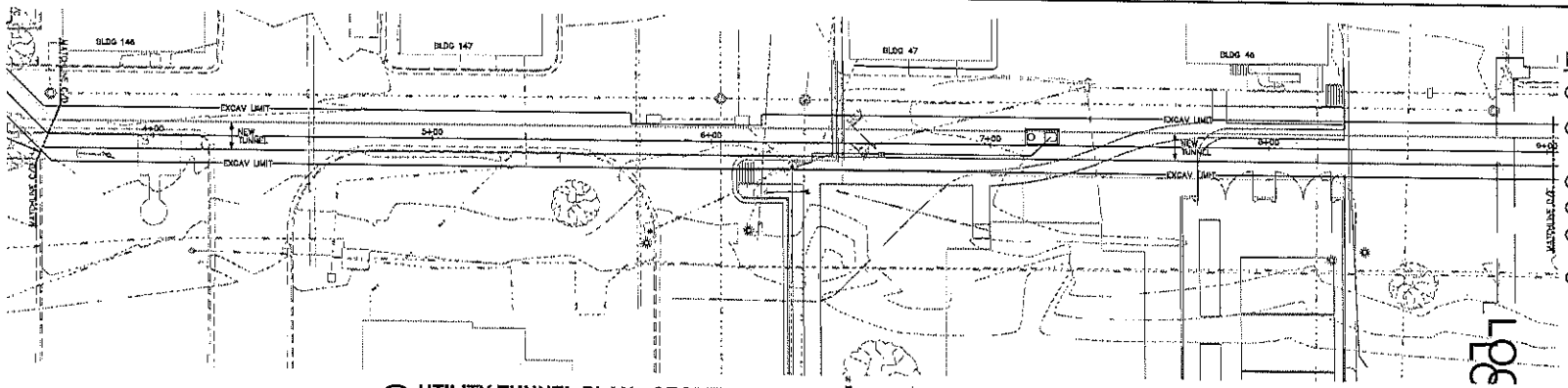


1 UTILITY TUNNEL PLAN - SEGMENT D

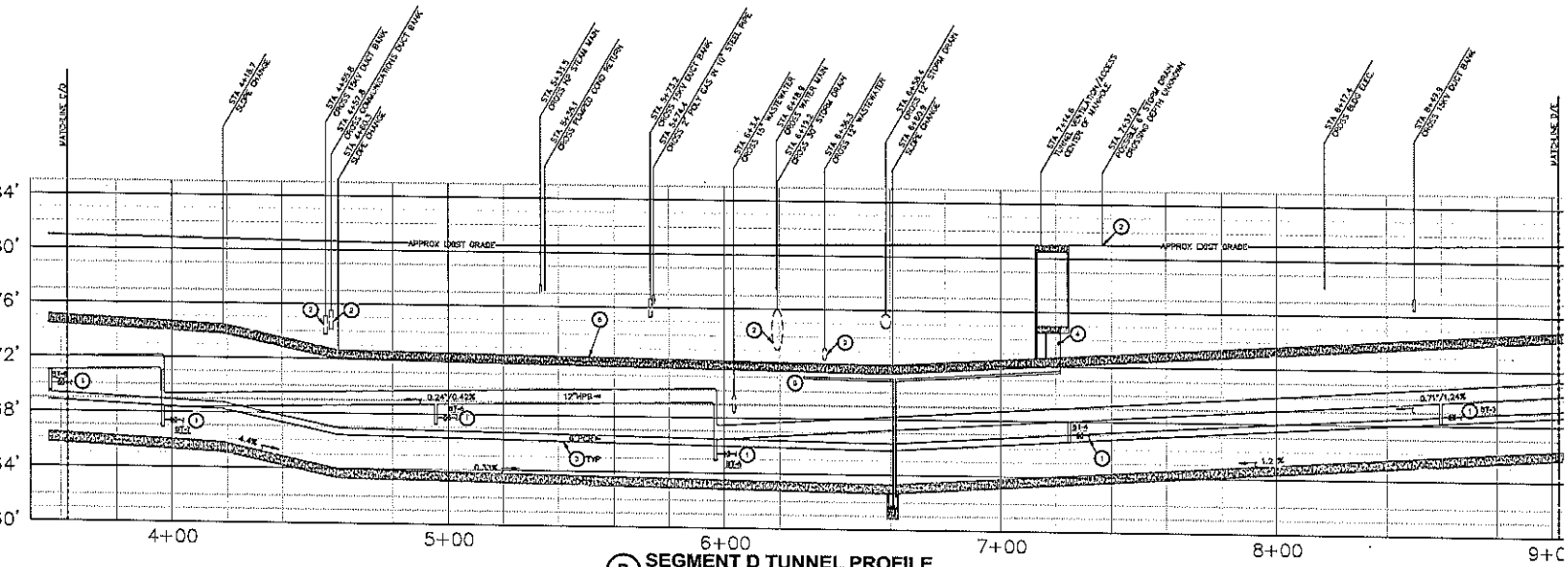
SCALE: 1" = 20'

PLAN NORTH

TRUE NORTH

MECHANICAL NOTES :

1. STEAM TRAP TO DISCHARGE INTO PUMPED CONDENSATE RETURN (NOT SHOWN). SEE DETAILS 2-4/MS4.2.
2. AT THE START OF THE PROJECT THE CONTRACTOR SHALL VERIFY THE DEPTH OF THIS UTILITY. IF THE DEPTH VARIES FROM WHAT IS SHOWN, THEN THE ARCHITECT SHALL BE NOTIFIED SO THAT THE DESIGN CAN BE ADJUSTED.
3. CONDENSATE DRAIN SLOPED WITH TUNNEL FLOOR, TYP.
4. 2" AREAWAY DRAIN FROM TUNNEL/ACCESS POINT, GRAVITY DRAIN TO SUMP PIT.
5. 2" SUMP DISCHARGE TO NEW STORM DRAIN INLET EXIT TUNNEL AT APPROX STA 5+28.64. COORDINATE TIE IN TO INLET WITH CIVIL. SEE C2.2.
6. NEW PRECAST TUNNEL (TYP).



D SEGMENT D TUNNEL PROFILE

SCALE: 1" = 20' HORIZ, 1" = 4' VERT

LEGEND

- EXISTING TO REMAIN
- NEW WORK

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O'CONNELL ROBERTSON
ARCHITECTURE
ENGINEERING
INTERIORS
OR PROJECT NO. 0917.05

Drawing Title: MECHANICAL PLAN & PROFILE

Project Title: UNDERGROUND UTILITIES

Date: 2/26/2013

Project No.: 674-10-101

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR GAW, P.E.

Building Number: SITE

Checked: NP

Drawn: KF

Location: TEMPLE VAMC - TEMPLE, TEXAS

Drawing No.: CU1.2

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VA FORM 08-6231, FEB. 1982

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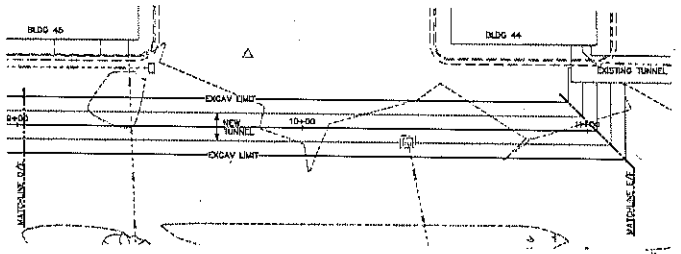
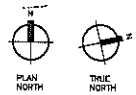
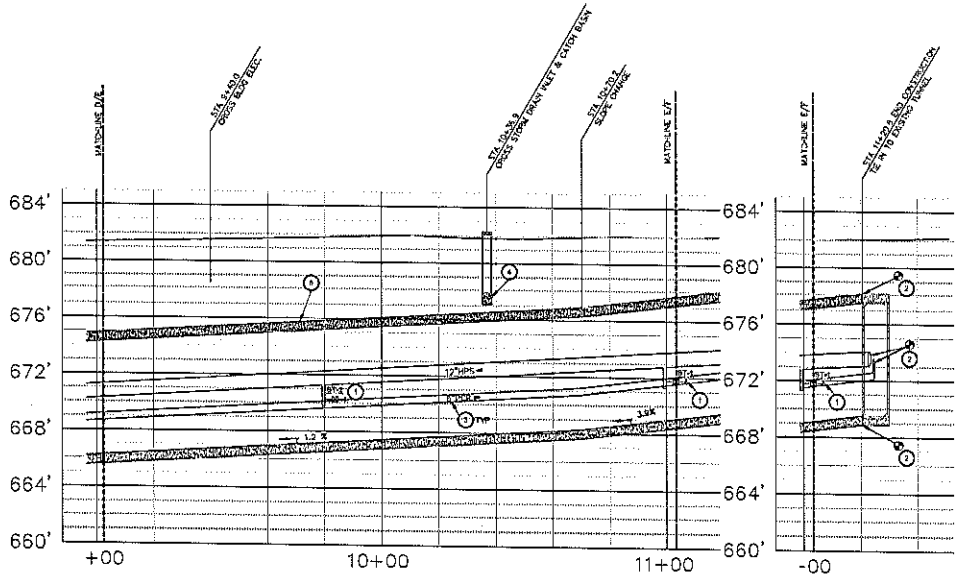


1 UTILITY TUNNEL PLAN - SEGMENT E, F

SCALE: 1" = 20'





E SEGMENT E TUNNEL PROFILE

SCALE: 1" = 20' HORIZ, 1" = 4' VERT

F SEGMENT F TUNNEL PROFILE

SCALE: 1" = 20' HORIZ, 1" = 4' VERT

MECHANICAL NOTES :

1. STEAM TRAP TO DISCHARGE INTO PUMPED CONDENSATE RETURN (NOT SHOWN). SEE DETAILS 2-4/MC4.2.
2. NORTH TUNNEL TIE IN. CONNECT TO EXISTING TUNNEL & PIPING. SEE DETAILS 6 & 7/MC4.3.
3. CONDENSATE DRAIN SLOPED WITH TUNNEL FLOOR, TYP.
4. STORM INLET TO BE REMOVED AND REPLACED. REFERENCE C2.3.
5. NEW PRECAST TUNNEL (TYP).

LEGEND

- EXISTING TO REMAIN
- NEW WORK

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ENGINEERING
ARCHITECTURE
MATERIALS
OR PROJECT NO. 6917.08

ENGINEERING FIRM O'CONNELL ROBERTSON FIRM REGISTRATION NO. F-2708

Drawing Title	MECHANICAL PLAN & PROFILE
Approved: Chief, Engineering Services	DAVID SUMMERS, CHIEF
Approved: Project Manager	VICTOR CAW, P.E.
Project Title	UNDERGROUND UTILITIES
Building Number	SITE
Checked	NP
Drawn	KF
Location	TEMPLE VAMC – TEMPLE, TEXAS
Date	2/26/2013
Project No.	674-10-101
Drawing No.	CU1.3
Dwg. of	

Veterans Affairs

VA FORM 08-6231, FEB. 1983

U.S. GOVERNMENT PRINTING OFFICE: 1983-400-285

GENERAL ABBREVIATIONS

ABV.	ABOVE	MFR.	MANUFACTURER
A.F.F.	ABOVE FINISH FLOOR	MAX.	MAXIMUM
AHU	AIR HANDLING UNIT	MECH.	MECHANICAL
ALUM.	ALUMINUM	MIN.	MINIMUM
APPROX.	APPROXIMATELY	MISC.	MISCELLANEOUS
ARCH.	ARCHITECT/ARCHITECTURAL	MTD.	MOUNTED
BD.	BOARD	MTL.	METAL
B.O.	BOTTOM OF	N.C.	NORMALLY CLOSED
BLDG.	BUILDING/BUILDINGS	N.I.C.	NOT IN CONTRACT
CLG.	CEILING	NO.	NUMBER
C.L.	CENTERLINE	N.O.	NORMALLY OPEN
COL.	COLUMN	N.T.S.	NOT TO SCALE
CONC.	CONCRETE	O.C.	ON CENTER
CR	CONDENSATE RETURN	OAF	OUTSIDE AIR FAN
CV	CONSTANT VOLUME	O.D.	OUTSIDE DIAMETER
CONST.	CONSTRUCTION	OPN'G.	OPENING
CONT.	CONTINUOUS	PL.	PLATE
CORR.	CORRIDOR	PR	PUMPED RETURN
DEMO.	DEMOLITION	PVC	POLYVINYLCHLORIDE
DIA.	DIAMETER	RAD.	RADIUS
DIM.	DIMENSION	REINF.	REINFORCE/REINFORCING
DDC	DIRECT DIGITAL CONTROLS	REQ'D.	REQUIRED
DR	DRIP RETURN	RA	RETURN AIR
DWG.	DRAWING/DRAWINGS	RAF	RETURN AIR FAN
DN.	DOWN	RTU	ROOFTOP UNIT
EA.	EACH	SCHED.	SCHEDULE
ELEC.	ELECTRICAL	SECT.	SECTION
ELEV.	ELEVATION	SHT.	SHEET
EQ.	EQUAL	SIM.	SIMILAR
EQUIP.	EQUIPMENT	SPECS.	SPECIFICATIONS
EF	EXHAUST FAN	STL.	STEEL
EXP.	EXPANSION	STRUCT.	STRUCTURAL
EXIST.	EXISTING	SA	SUPPLY AIR
EXH.	EXHAUST	SAF	SUPPLY AIR FAN
FOB	FLAT ON BOTTOM	SMH	STEAM MANHOLE
FOT	FLAT ON TOP	SPF	SMOKE PURGE FAN
FT.	FOOT/FEET	SUSP.	SUSPENDED
GA.	GAUGE	T.O.	TOP OF
GALV.	GALVANIZED	TYP.	TYPICAL
GYP.	GYPSUM	U.N.O.	UNLESS NOTED OTHERWISE
HT.	HEIGHT	VAV	VARIABLE AIR VOLUME
HORIZ.	HORIZONTAL	VFD	VARIABLE FREQUENCY DRIVE
I.D.	INSIDE DIAMETER	VERT.	VERTICAL
IN.	INCH/INCHES	VR	VACUUM RETURN
INSUL.	INSULATE/INSULATION	W/	WITH
LG.	LONG/LENGTH	W/O	WITHOUT
MATL.	MATERIAL		

HVAC SYMBOL SCHEDULE

NOT ALL WILL APPEAR ON THE DRAWINGS

SYMBOL	IDENTIFICATION	SYMBOL	IDENTIFICATION
	DIRECTION OF SLOPE (OR PITCH)		NEW POINT OF CONNECTION TO EXISTING
	DIRECTION OF FLOW		REMOVE BACK TO HERE
	UNION		THERMOSTAT OR TEMP SENSOR (# = ZONE CONTROLLED)
	TOP CONNECTION (45° OR 90°)		HUMIDISTAT (# = ZONE CONTROLLED)
	BOTTOM CONNECTION (45° OR 90°)		EXTERNALLY INSULATED DUCT, SIZE INDICATED INSIDE FREE AIRWAY WIDTH (SIDE SHOWN) X DEPTH
	SIDE CONNECTION (TEE)		
	CAPPED OUTLET (TOP CONNECTION)		MANUAL VOLUME DAMPER
	DROP (ON RISE) IN PIPE		
	BALL VALVE		DUCT MOUNTED FIRE DAMPER
	GATE VALVE		DUCT MOUNTED FIRE/SMOKE DAMPER
	GATE VALVE WITH QUICK-COUPLE HOSE CONNECTOR		DUCT MOUNTED SMOKE DAMPER
	BALANCING VALVE (OPEN)		SPACE STATIC PRESSURE SENSOR
	BALANCING VALVE (CLOSED)		DUCT MOUNTED STATIC PRESSURE SENSOR
	BUTTERFLY VALVE		DUCT MOUNTED SMOKE DETECTOR
	CHECK VALVE		EXPANSION JOINT. NUMBER DENOTES COMPRESSION CAPACITY DUE TO THERMAL EXPANSION OF PIPE (IN.).
	STRAINER		PIPE ANCHOR.
	2-WAY CONTROL VALVE		PIPE MOVEMENT GUIDE.
	3-WAY CONTROL VALVE		
	GAS COCK		
	ORIFICE UNION		
	ELL TURNED UP (RISER)		
	ELL TURNED DOWN		
	THERMOMETER		
	PRESSURE GAUGE		
	STEAM TRAP		
	GAUGE TAP (PETE'S PLUG)		
	TRIPLE DUTY VALVE		

STEAM TRAP SCHEDULE

TRAP NO.	LOCATION	CAPACITY AT MIN. DIFF. PRESS. (LB./HR.)	MINIMUM DIFF. PRESS. (PSIG)	MAXIMUM DIFF. PRESS. (PSIG)	TRAP TYPE TYPE	TRAP PIPE SIZE (IN.)
ST-1	STEAM TUNNEL	50	50	125	IB	1/2"
ST-2	STEAM TUNNEL	240	50	125	IB	1/2"
ST-3	STEAM TUNNEL	240	50	125	IB	1/2"
ST-4	STEAM TUNNEL	270	50	125	IB	1/2"
ST-5	STEAM TUNNEL	270	50	125	IB	1/2"
ST-6	STEAM TUNNEL	250	50	125	IB	1/2"
ST-7	STEAM TUNNEL	200	50	125	IB	1/2"
ST-8	STEAM TUNNEL	50	50	125	IB	1/2"
ST-9	STEAM TUNNEL	120	50	125	IB	1/2"
ST-10	STEAM TUNNEL	210	50	125	IB	1/2"
ST-11	STEAM TUNNEL	200	50	125	IB	1/2"
ST-12	STEAM TUNNEL	180	50	125	IB	1/2"
ST-13	STEAM TUNNEL	50	50	125	IB	1/2"

IB – INVERTED BUCKET TRAP

CODE COMPLIANCE

ALL MECHANICAL AND PLUMBING WORK SHALL BE IN COMPLIANCE WITH THE FOLLOWING:

1. INTERNATIONAL BUILDING CODE, INTERNATIONAL MECHANICAL & INTERNATIONAL PLUMBING CODES (2009 EDITIONS).
2. ASHRAE STANDARD 90.1–2007 – ENERGY STANDARD FOR BUILDINGS, EXCEPT LOW-RISE RESIDENTIAL BUILDINGS.
3. NATIONAL FIRE PROTECTION ASSOCIATION, NFPA 101, LIFE SAFETY CODE.
4. NATIONAL FIRE PROTECTION ASSOCIATION, NFPA 90A, STANDARD FOR INSTALLATION OF AIR CONDITIONING & VENTILATING SYSTEMS.

HVAC PIPING

NOT ALL WILL APPEAR ON THE DRAWINGS

HPS	HIGH PRESSURE STEAM (80 PSI)
PCR	PUMPED CONDENSATE RETURN
G	NATURAL GAS
MPS	MEDIUM PRESSURE STEAM
LPS	LOW PRESSURE STEAM
CR	STEAM CONDENSATE RETURN (GRAVITY)
DR	STEAM CONDENSATE DRIP RETURN
VR	STEAM CONDENSATE VACUUM RETURN

FAN SCHEDULE

MARK	EF-1
TYPE	SIDEWALL PROP
SERVICE	STEAM TUNNEL
MAX. CFM	6126
E.S.P. IN WG.	0.5
DRIVE	DIRECT
RPM	1750
MIN. H.P. (W)	0.75
V / PH / CYC	460/60/3
LOCATION	ACCESS / VENTILATION STRUCTURE
INTERLOCK W/	CONTINUOUS
NOTES	1 THROUGH 5

NOTES:

1. PROVIDE WITH BACKDRAFT DAMPER AND DISCONNECT SWITCH.
2. TEFC MOTOR.
3. PROVIDE WITH FLUSH ENERGY SHORT HOUSING
4. WEATHER RESISTANT POLYESTER COATING. PROTECTIVE COATING
5. SPRING ISOLATORS.

PUMP SCHEDULE

MARK	SP-1
SERVICE	STEAM TUNNEL
GPM	60
HEAD FT. WG	20
SUCTION SIZE	N/A
DISCHARGE SIZE	2
RPM	3400
MIN. H.P.	0.5
V / PH / CYC	115/1/60
TYPE	SUBMERSIBLE HIGH TEMP DUPLEX SUMP
SUP. DIA. / IN.	N/A
NOTES	1

1. PROVIDE WITH CONTROL BOX.

GENERAL NOTES

1. ALL CONSTRUCTION/DEMOLITION INDICATED ON THE DRAWINGS REFLECTS ASSUMPTIONS CONCERNING EXISTING CONDITIONS BASED ON AVAILABLE INFORMATION. VISITS TO THE JOB SITE AND LOCATIONS & ARRANGEMENTS OF EXISTING FACILITIES. IT SHALL BE INCUMBENT UPON EACH CONTRACTOR TO VISIT THE SITE PRIOR TO BIDDING, SATISFY HIMSELF AS TO EXISTING CONDITIONS.
2. VERIFY ALL DIMENSIONS AFFECTING EACH ITEM OF THE WORK.
3. FOR CLARITY PURPOSES, NOT ALL EQUIPMENT, DUCTWORK, PIPING, ETC. MAY BE SHOWN IN EACH VIEW.
4. REFER TO ALL DRAWINGS FOR DEMOLITION WORK INVOLVED IN THIS CONTRACT. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OR REVISION OF SERVICES COVERED BY HIS TRADE.
5. CUT & PATCH TO ACCOMMODATE THE WORK UNLESS NOTED OTHERWISE.
6. COORDINATE VERY CLOSELY WITH OTHER TRADES CONCERNING WORK DONE ABOVE CEILINGS, WORKING OUT PROBLEMS OF CONFLICT PRIOR TO INSTALLATION OF THE WORK.
7. SEAL PENETRATIONS OF FIRE AND/OR SMOKE RATED WALL, FLOORS & PARTITIONS USING "UL" APPROVED SEALANT AND/OR METHODS.
8. ANY WORK THAT WILL REQUIRE THE CONTRACTOR TO WORK OUTSIDE THE DEMOLITION/CONSTRUCTION AREA SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND THE VA COTR.
9. REFER TO SPECIFICATIONS CONCERNING PHASING OF THE DEMOLITION & CONSTRUCTION WORK.
10. MAINTAIN EACH BUILDING IN A SAFE & WEATHER-TIGHT CONDITION.
11. IF ANY ASBESTOS CONTAINING MATERIAL IS DISCOVERED OR SUSPECTED, THE CONTRACTOR SHALL IMMEDIATELY CEASE ANY & ALL WORK IN THAT AREA, COVER THE EXPOSED MATERIAL IN PLASTIC CONTAINMENT WITHOUT DISTURBING THE EXPOSED MATERIAL AND CONTACT THE VA & ARCHITECT.
12. ACCESS PANELS ARE REQUIRED IN GYPSUM BOARD CEILINGS FOR ALL VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. & SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE ARCHITECTURAL SPECIFICATIONS.
13. COORDINATE THE LOCATION OF WALL PENETRATIONS WITH STRUCTURAL ELEMENTS. PROVIDE AT NEW WALL PENETRATIONS SLEEVES 1" LARGER IN DIAMETER THAN THE PIPE INSULATION & EXTENDING 1-1/2" BEYOND FINISHED SURFACES. FILL ANNULAR SPACE ON INTERIOR WALL PENETRATIONS WITH FIRESTOPPING INSULATION & CAULK.
14. SALVAGED EQUIPMENT SHALL BE REMOVED TO A SITE OF THE OWNERS CHOOSING, WITHIN A 40 MILE RADIUS OF THE SITE. DEMOLISHED EQUIPMENT THAT THE OWNER DOES NOT WANT TO SALVAGE SHALL BE REMOVED FROM SITE BY THE CONTRACTOR.

No.	Date	By	Revisions

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O'CONNELL ROBERTSON
CIR PROJECT NO. 0917.06

ENGINEERING FIRM
O'CONNELL ROBERTSON
FIRM REGISTRATION NO. F-2708

Drawing Title: MECHANICAL NOTES AND SYMBOLS

Project Title: UNDERGROUND UTILITIES

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR CAW, P.E.

Building Number: SITE | Checked: NP | Drawn: KF

Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013

Project No.: 674-10-101

Drawing No.: M1.1

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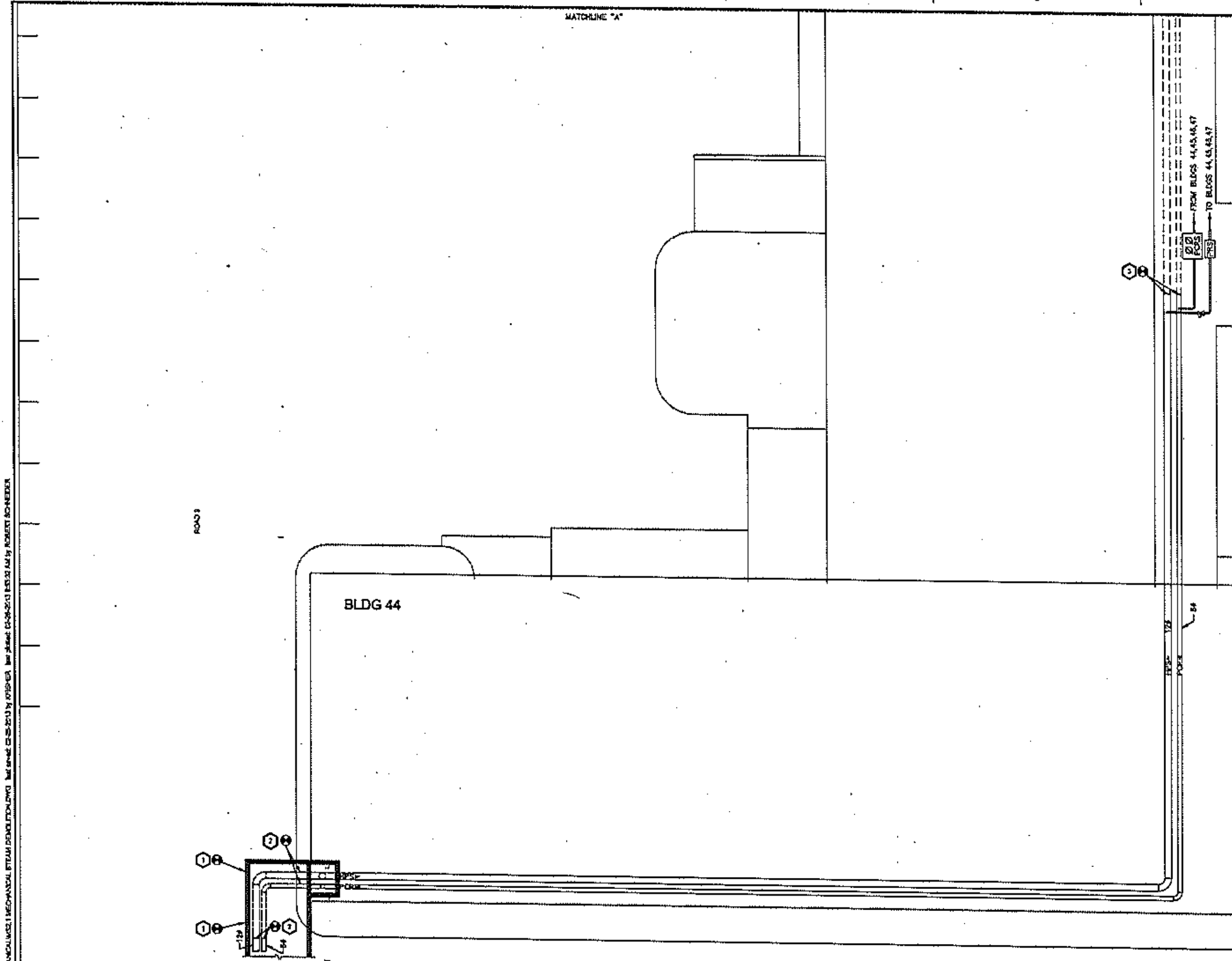

1 EXISTING STEAM DISTRIBUTION - PARTIAL PLAN
SCALE: 1/8" = 1'-0"

DEMOLITION NOTES:

1. REMOVE TUNNEL WALL TO THE EXTENTS SHOWN. SHORE UP TUNNEL WALLS PRIOR TO DEMOLITION OF WALL.
2. REMOVE PIPING TO THE EXTENTS SHOWN.
3. CUT PIPE AT LOCATION SHOWN. CRAWLSPACE PIPING MAINS TO THE SOUTH TO BE ABANDONED IN PLACE. PIPING MAINS TO THE NORTH TO BE UTILIZED TO SERVE BLDGS 44, 45, 46 & 47.

TRUE NORTH

LEGEND

TO BE REMOVED
EXISTING TO REMAIN
ABANDON IN PLACE

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O'CONNELL ROBERTSON
OR PROJECT NO. 0917.08

Drawing Title	MECHANICAL STEAM DEMOLITION
Approved: Chief, Engineering Services	DAVID SUMMERS, CHIEF
Approved: Project Manager	VICTOR GAW, P.E.
Project Title	UNDERGROUND UTILITIES
Building Number	SITE
Checked	NP
Drawn	KF
Location	TEMPLE VAMC – TEMPLE, TEXAS
Date	2/26/2013
Project No.	674-10-101
Drawing No.	MS2.1

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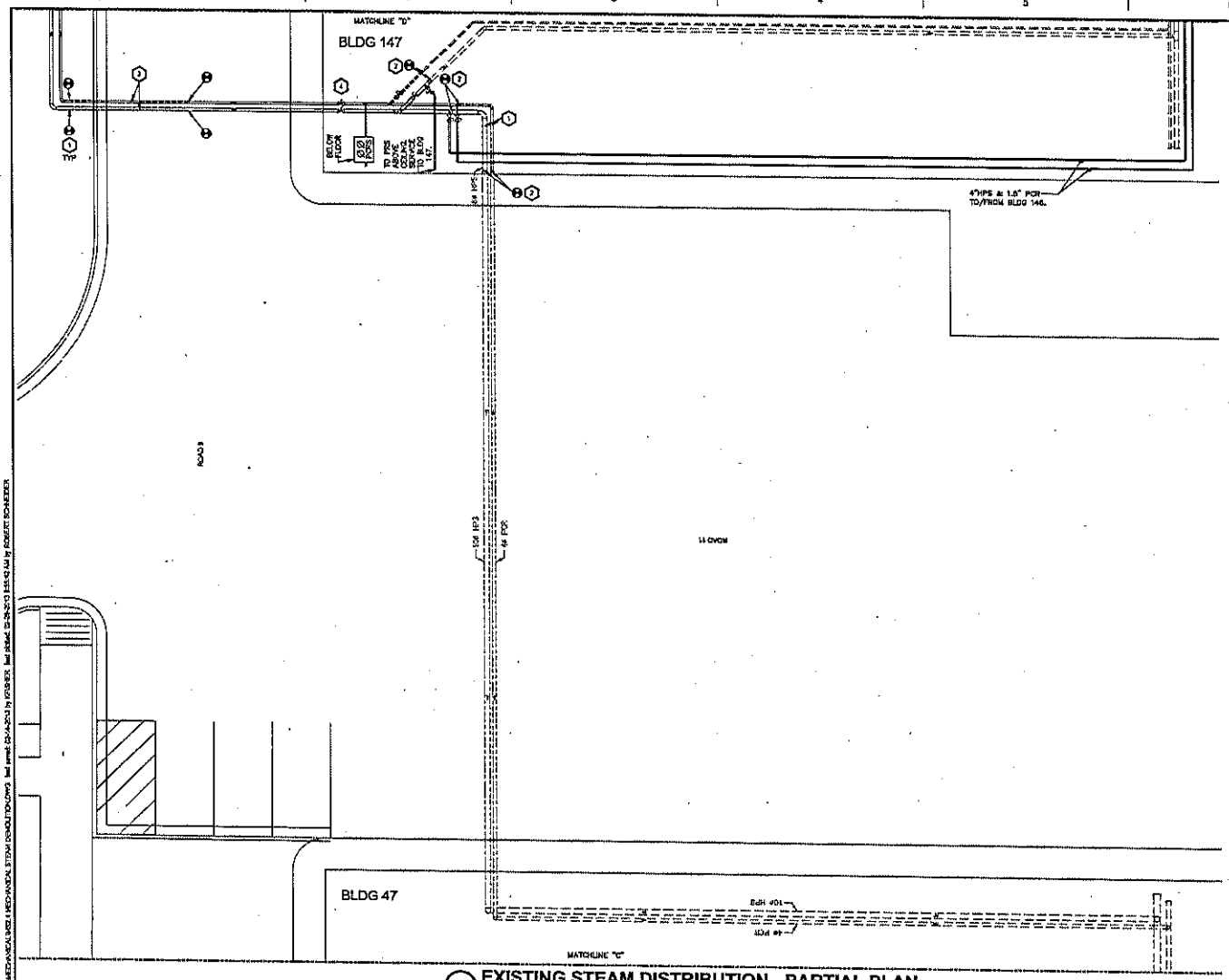

DEMOLITION NOTES:

1. REMOVE PIPING TO THE EXTENTS SHOWN.
2. CUT AND CAP PIPING.
3. PIPING TO REMAIN DURING INSTALLATION OF NEW TUNNEL. CROSSOVER FROM OLD PIPING TO TUNNEL SHALL OCCUR AT SAME TIME AS NORTH AND SOUTH TIE-INS.

TRUE NORTH

LEGEND

- TO BE REMOVED
- EXISTING TO REMAIN
- ABANDON IN PLACE

1 EXISTING STEAM DISTRIBUTION - PARTIAL PLAN

SCALE: 1/8" = 1'-0"

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O'DONNELL ROBERTSON
ARCHITECTURE
INTERIORS
CR PROJECT NO. 0917.05

Drawing Title: MECHANICAL STEAM DEMOLITION

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR GAW, P.E.

Project Title: UNDERGROUND UTILITIES

Building Number: SITE

Checked: NP

Drawn: KF

Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013

Project No.: 674-10-101

Drawing No.: MS2.4

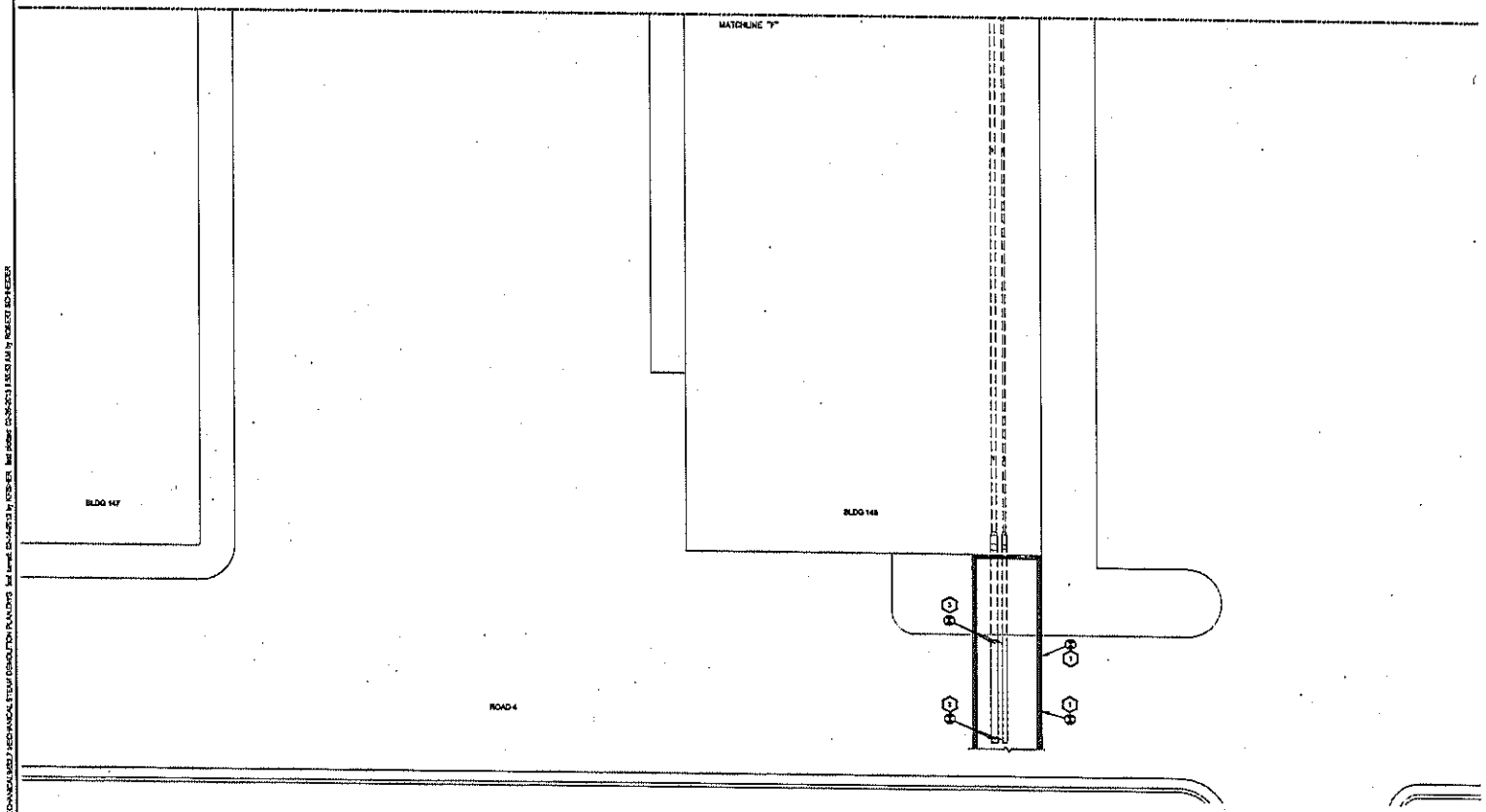
Veterans Affairs

VA FORM 08-6231, FEB. 1983

U.S. GOVERNMENT PRINTING OFFICE: 1983-420-343

DEMOLITION NOTES:

1. REMOVE TUNNEL WALL TO THE EXTENTS SHOWN. SHORE UP TUNNEL WALLS PRIOR TO DEMOLITION OF WALL.
2. REMOVE PIPING TO THE EXTENTS SHOWN.
3. REMOVE PIPING TO THE EXTENTS SHOWN. CAP & REPAIR INSULATION.



LEGEND

- TO BE REMOVED
- EXISTING TO REMAIN
- ABANDON IN PLACE

1 EXISTING STEAM DISTRIBUTION - PARTIAL PLAN

SCALE: 1/8" = 1'-0"

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O'CONNELL ROBERTSON

OR PROJECT NO. 0917.05

ENGINEERING FIRM
O'CONNELL ROBERTSON
FIRM REGISTRATION NO. F-2709

Drawing Title	MECHANICAL STEAM DEMOLITION
Approved: Chief, Engineering Services	DAVID SUMMERS, CHIEF
Approved: Project Manager	VICTOR GAW, P.E.
Project Title	UNDERGROUND UTILITIES
Building Number	SITE
Checked	NP
Drawn	KF
Location	TEMPLE VAMC – TEMPLE, TEXAS
Date	2/26/2013
Project No.	674-10-101
Drawing No.	MS2.7
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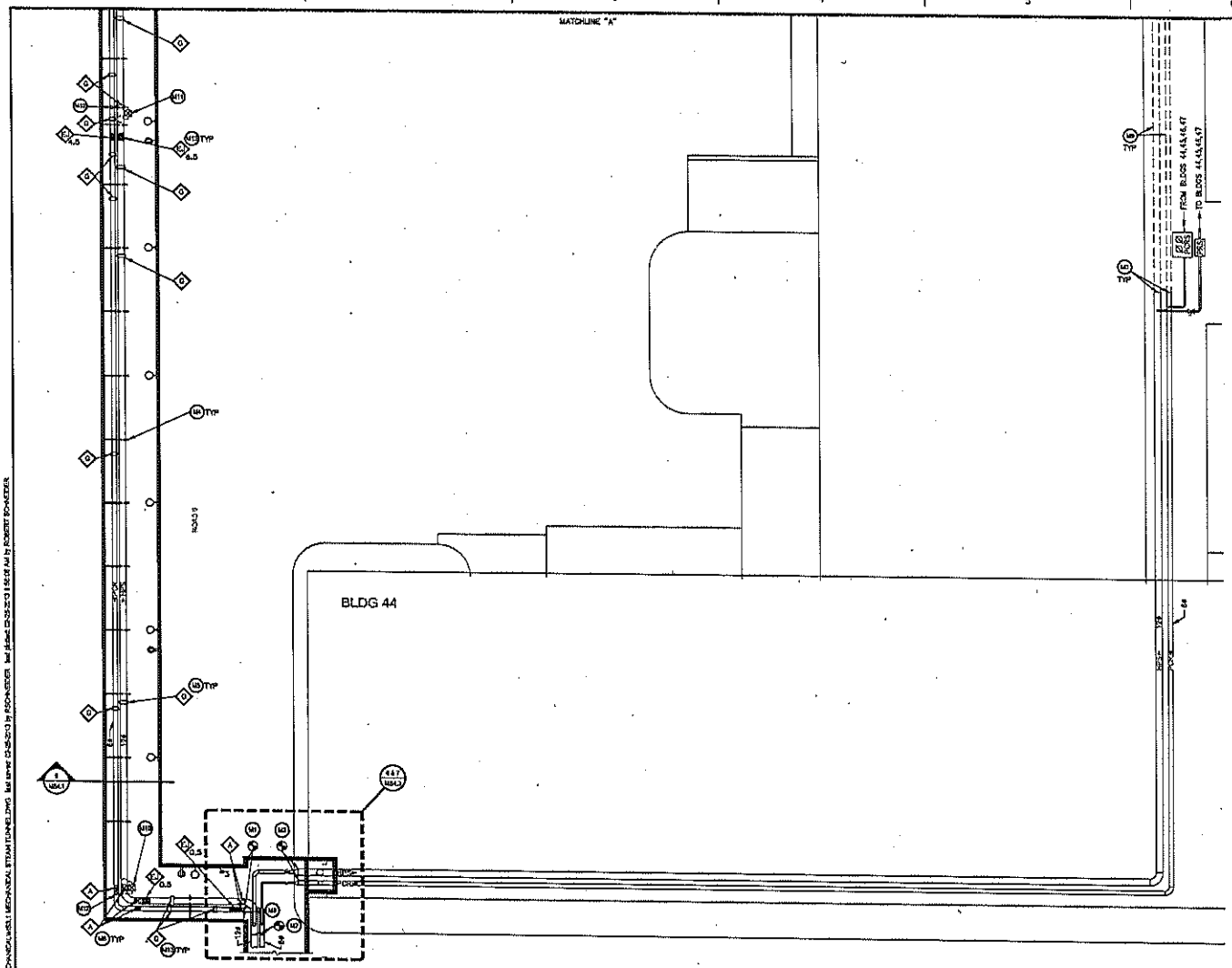
VA FORM 08-1231, FEB. 1963

MS2.5, ENVIRONMENT PRINTING OFFICE: 1993-400-385



1 UTILITY TUNNEL - PARTIAL PLAN
SCALE: 1/8" = 1'-0"

MECHANICAL NOTES:

M1 CONNECT NEW TUNNEL TO EXISTING TUNNEL.

M2 CONNECT NEW STEAM AND CONDENSATE PIPING TO EXISTING.

M3 CAP STEAM AND CONDENSATE MAINS WHERE SHOWN.

M4 PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.

M5 PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.

M6 PIPE ANCHOR. SEE DETAIL 1/MS4.1.

M7 NOT USED.

M8 OFFSET PCR TO BELOW HPG.

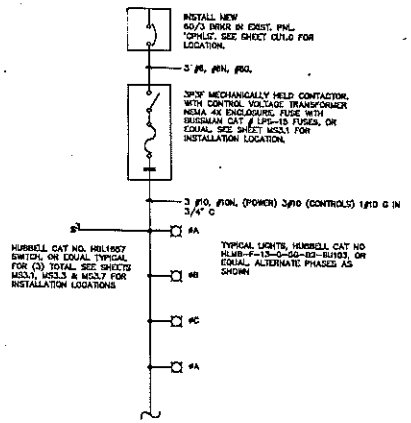
M9 STEAM AND CONDENSATE PIPING ABANDONED IN PLACE.

M10 ST-1 – STEAM TRAP AND DRIP LEG. SEE DETAIL 2/MS4.2.

M11 ST-2 – STEAM TRAP AND DRIP LEG. SEE DETAIL 2/MS4.2.

M12 CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.

M13 GUIDES AND EXPANSION JOINTS TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,6,8/MS4.1.



1 TUNNEL LIGHTING DIAGRAM
SCALE: 1/8" = 1'-0"

TRUE NORTH

LEGEND

EXISTING TO REMAIN
NEW WORK
ABANDON IN PLACE

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ENGINEERING FIRM
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Drawing Title: MECHANICAL STEAM TUNNEL
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF
Approved: Project Manager: VICTOR GAW, P.E.
Project Title: UNDERGROUND UTILITIES
Building Number: SITE
Checked: NP
Drawn: KF
Location: TEMPLE VAMC – TEMPLE, TEXAS
Date: 2/26/2013
Project No.: 674-10-101
Drawing No.: MS3.1
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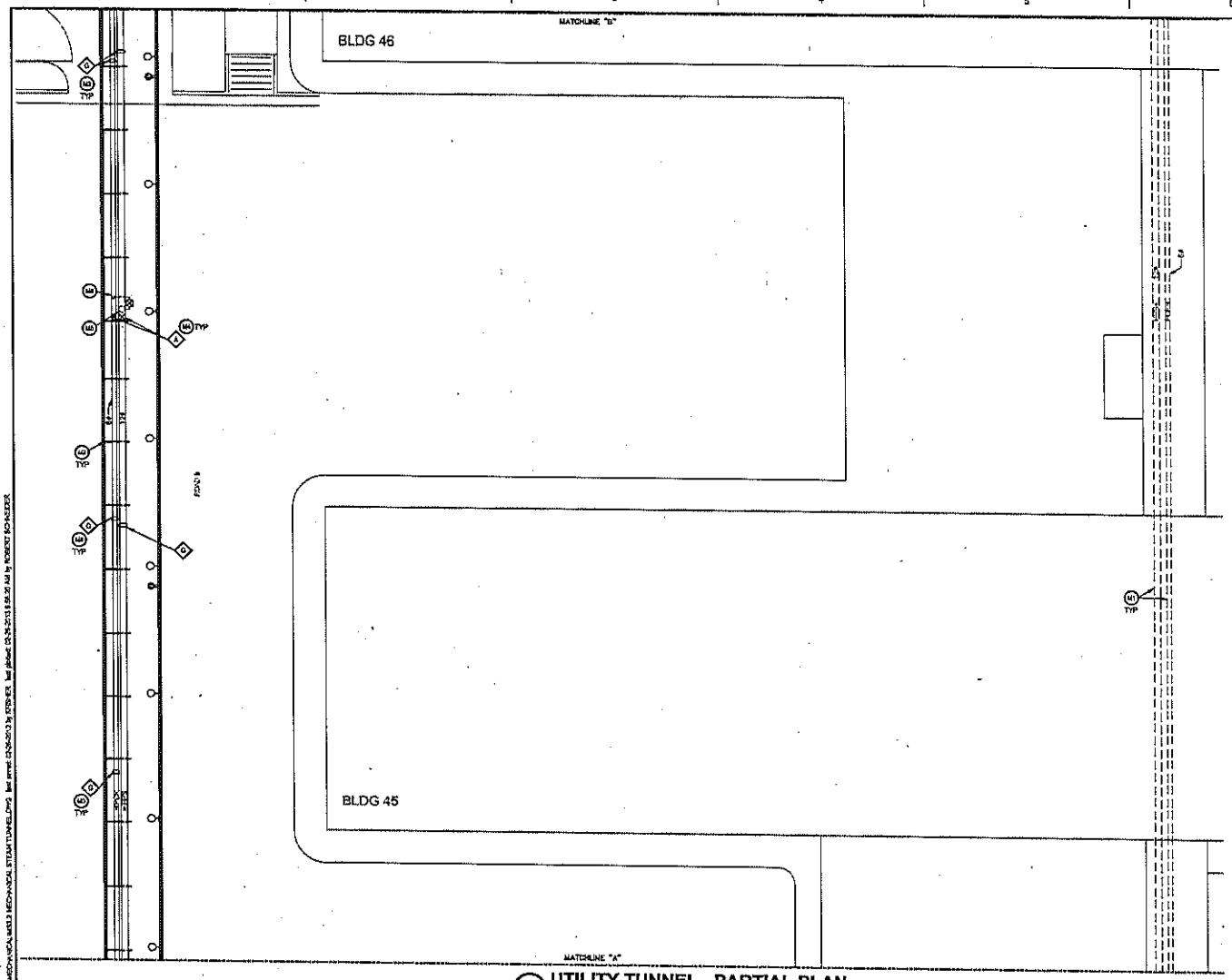
VA.R. GOVERNMENT PRINTING OFFICE 1983-400-285



MECHANICAL NOTES:

- (M1) STEAM AND CONDENSATE PIPING ABANDONED IN PLACE.
- (M2) PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.
- (M3) PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.
- (M4) PIPE ANCHOR. SEE DETAIL 1/MS4.1.
- (M5) ST-3 – STEAM TRAP AND DRIP LEG. SEE DETAIL 2/MS4.2.
- (M6) CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.
- (M7) NOT USED.
- (M8) GUIDES AND EXPANSION JOINTS TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,5,6/MS4.1.

LEGEND

- EXISTING TO REMAIN
- NEW WORK
- ABANDON IN PLACE

1 UTILITY TUNNEL - PARTIAL PLAN

SCALE: 1/8" = 1'-0"

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OR PROJECT NO. 0617.05

ENGINEERING FIRM
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FIRM REGISTRATION NO. F-2706

Drawing Title: MECHANICAL STEAM TUNNEL
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF
Approved: Project Manager: VICTOR GAW, P.E.

Project Title: UNDERGROUND UTILITIES
Building Number: SITE
Checked: NP
Drawn: KF
Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013
Project No.: 674-10-101
Drawing No.: MS3.2
Dwg. of

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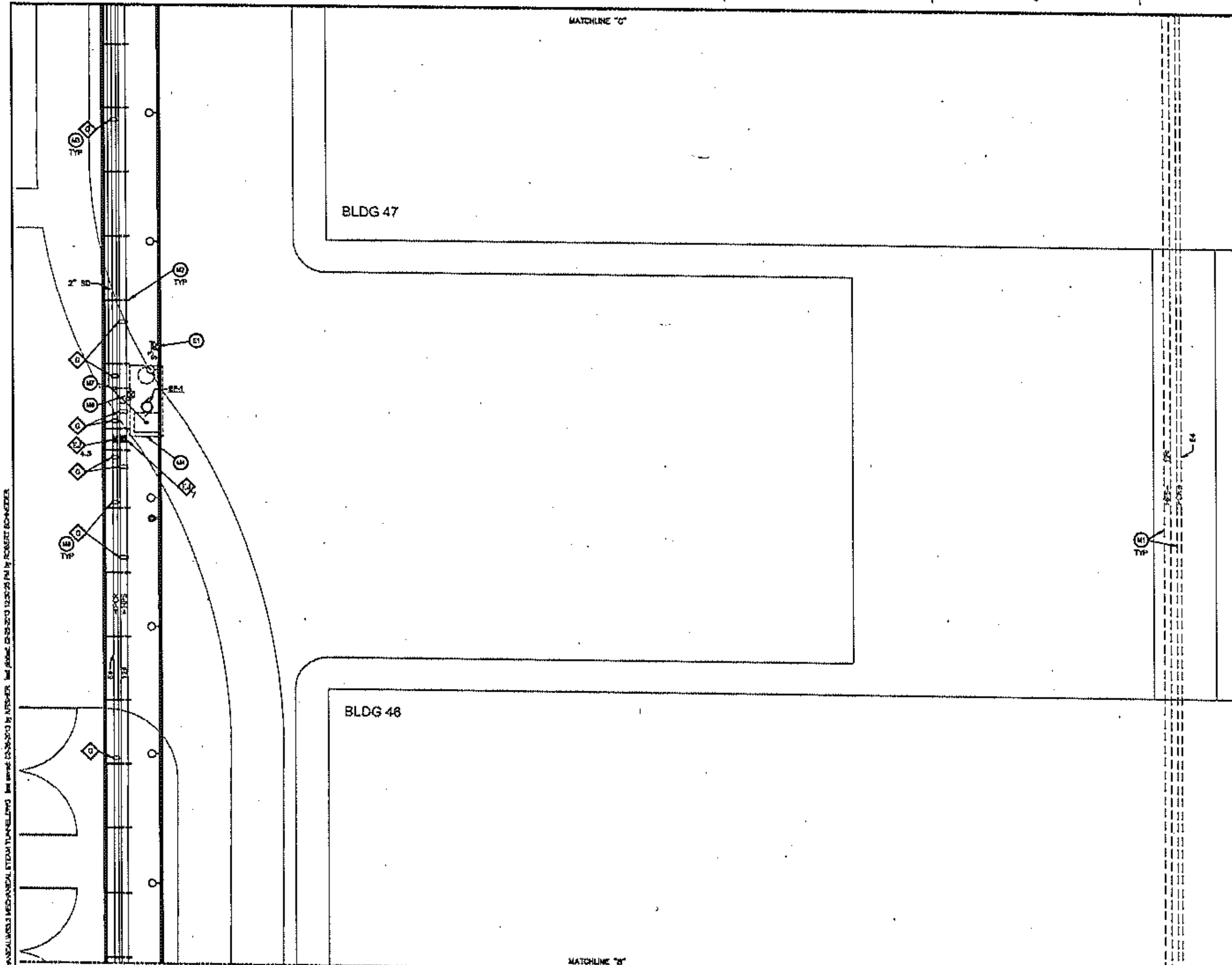
VA FORM 08-6231, FEB. 1967

U.S. GOVERNMENT PRINTING OFFICE: 1982-600-285



1 UTILITY TUNNEL - PARTIAL PLAN

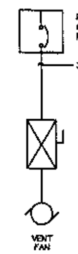
SCALE: 1/8" = 1'-0"

MECHANICAL NOTES:

- (M1) STEAM AND CONDENSATE PIPING ABANDONED IN PLACE.
- (M3) PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.
- (M2) PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.
- (M4) ACCESS/VENTILATION STRUCTURE. SEE DETAIL 1-3/MS4.3.
- (M5) NOT USED.
- (M6) ST-4 – STEAM TRAP AND DRIP LEG. SEE DETAIL 2/MS4.2.
- (M7) CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.
- (M8) GUIDES AND EXPANSION JOINTS TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,5,6/MS4.1.

ELECTRICAL NOTES:

- (E1) STARTER FOR EXHAUST FAN 'EF-1'. SEE DETAIL 1 THIS SHEET FOR WIRING.



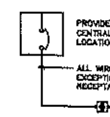
PROVIDE NEW 30/3 42KAIC BREAKER IN EXISTING CENTRAL PLANT PANEL 'CPHEB'. SEE SHEET CU1.0 FOR LOCATION.

3 #8, #8, 1" C

STARTER SHALL BE SIZE 0 FUSIBLE COMBINATION TYPE IN NEMA 4X STAINLESS ENCLOSURE. PROVIDE WITH CONTROL VOLTAGE TRANSFORMER & HAND-OFF-AUTOMATIC SELECTOR SWITCH.

2 VENT FAN WIRING

SCALE: N.T.S.



PROVIDE NEW 20/1 10KAIC BREAKER IN EXISTING CENTRAL PLANT PNL 'CPL' SEE SHEET CU1.0 FOR LOCATION

ALL WIRING TO BE #6, #6N, #10G, 3/4"C WITH THE EXCEPTION OF #12 TAP CONDUCTORS TO RECEPTACLES.

CONTD.

TYPICAL RECEPTACLE IN 'FD' BOXES ALL RECEPTACLES SHALL BE GFCI TYPE MOUNTED AT 48" AFF.

3 RECEPTACLE WIRING

SCALE: N.T.S.

TRUE NORTH

LEGEND

- EXISTING TO REMAIN
- NEW WORK
- ABANDON IN PLACE

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O'CONNELL ROBERTSON
OR PROJECT NO. 0817.03
ENGINEERING FIRM O'CONNELL ROBERTSON

Drawing Title	MECHANICAL STEAM TUNNEL
Approved: Chief, Engineering Services	DAVID SUMMERS, CHIEF
Approved: Project Manager	VICTOR GAW, P.E.
Project Title	UNDERGROUND UTILITIES
Building Number	SITE
Checked	NP
Drawn	KF
Location	TEMPLE VAMC – TEMPLE, TEXAS
Date	2/28/2013
Project No.	674-10-101
Drawing No.	MS3.3
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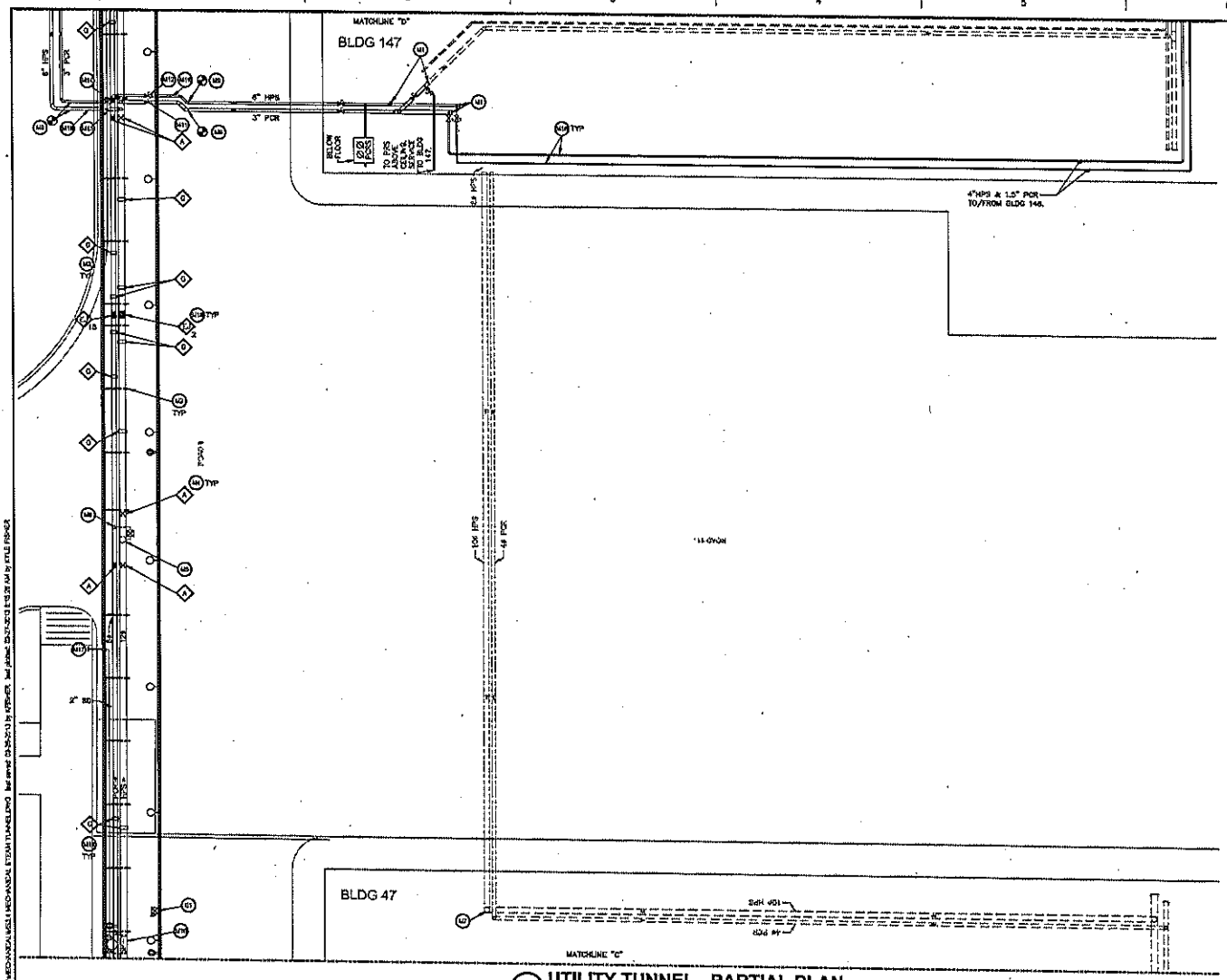

1 UTILITY TUNNEL - PARTIAL PLAN

SCALE: 1/8" = 1'-0"

MECHANICAL NOTES:

- M1 CAP STEAM AND CONDENSATE WHERE SHOWN. ADD NIPPLE IF NECESSARY
- M2 PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.
- M3 PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.
- M4 PIPE ANCHOR. SEE DETAIL 1/MS4.1.
- M5 STEAM MAIN VERTICAL RISE. ST-A ~ STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.
- M6 CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.
- M7 STEAM AND CONDENSATE RETURN PIPES TO BE ABANDONED IN PLACE. PIPES TURN DOWN AND ARE DIRECT BURIED FROM THIS LOCATION TO BLDG. 147.
- M8 NOT USED.
- M9 CONNECT TO EXISTING PIPING AND CONTINUE NEW PIPING THROUGH TUNNEL WALL. SEE DETAIL 3/MS4.1.
- M10 3'x3'x3' DEEP SUMP PIT AT TUNNEL LOW POINT. SEE DETAIL 5/MS4.2.
- M11 INSTALL GATE VALVE IN HPS LINE WHERE SHOWN. GATE VALVE CAPABLE OF SHUTTING OFF STEAM TO BLDG 146 & 147.
- M12 INSTALL GATE VALVE IN PCR LINE WHERE SHOWN. GATE VALVE CAPABLE OF SHUTTING OFF CONDENSATE RETURN FROM BLDG 146 & 147.
- M13 INSTALL GATE VALVE IN HPS LINE WHERE SHOWN. GATE VALVE CAPABLE OF SHUTTING OFF STEAM TO BLDG 154 & BLDG 202 (DOM).
- M14 INSTALL 4" TEE IN THE VERTICAL DROP AT THIS LOCATION. GATE VALVE SHOWN IN PCR LINE CAPABLE OF SHUTTING OFF CONDENSATE RETURN FROM BLDG 154 & BLDG 202 (DOM).
- M15 INSTALL WELDED NIPPLE WHERE GATE VALVE WAS REMOVED.
- M16 EXISTING CONDENSATE RETURN AND STEAM PIPING TO BE REUSED.
- M17 CONNECT 2" SUMP DISCHARGE TO NEW CURB INLET. SEE C2.2.
- M18 GUIDES AND EXPANSION JOINTS TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,5,6/MS4.1.
- M19 EXISTING CATHODIC PROTECTION FOR THE DIRECT BURIED PIPE SHALL BE MODIFIED TO MATCH EXISTING AND MADE CONTINUOUS FOR THE NEW DIRECT BURIED PIPE.

ELECTRICAL NOTES:

- E1 STARTER FOR SUMP PUMP 'SP-1'. SEE THIS SHEET FOR DETAIL.

PROVIDE NEW 20/1 BREAKER IN EXISTING PANEL 'CPLED' SEE SHEET CU1.0 FOR LOCATION

2#8, #10G, 3/4"C

GFCI RECEPTACLE ADJACENT TO PUMP AT 48" AFF.

2 SUMP PUMP WIRING

SCALE: NTS

TRUE NORTH

LEGEND

- EXISTING TO REMAIN
- NEW WORK
- ABANDON IN PLACE

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CONNELL ROBERTSON
OR PROJECT NO. 0417.06

Drawing Title: MECHANICAL STEAM TUNNEL	Project Title: UNDERGROUND UTILITIES		Date: 2/26/2013
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: NP	Project No.: 674-10-101
Approved: Project Manager: VICTOR CAW, P.E.	Location: TEMPLE VAMC – TEMPLE, TEXAS	Drawn: KF	Drawing No.: MS3.4

Veterans Affairs

MECHANICAL NOTES:

(M1) PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.

(M2) PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.

(M3) PIPE ANCHOR. SEE DETAIL 1/MS4.1.

(M4) STEAM MAIN VERTICAL RISE, ST-8 – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.

(M5) CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.

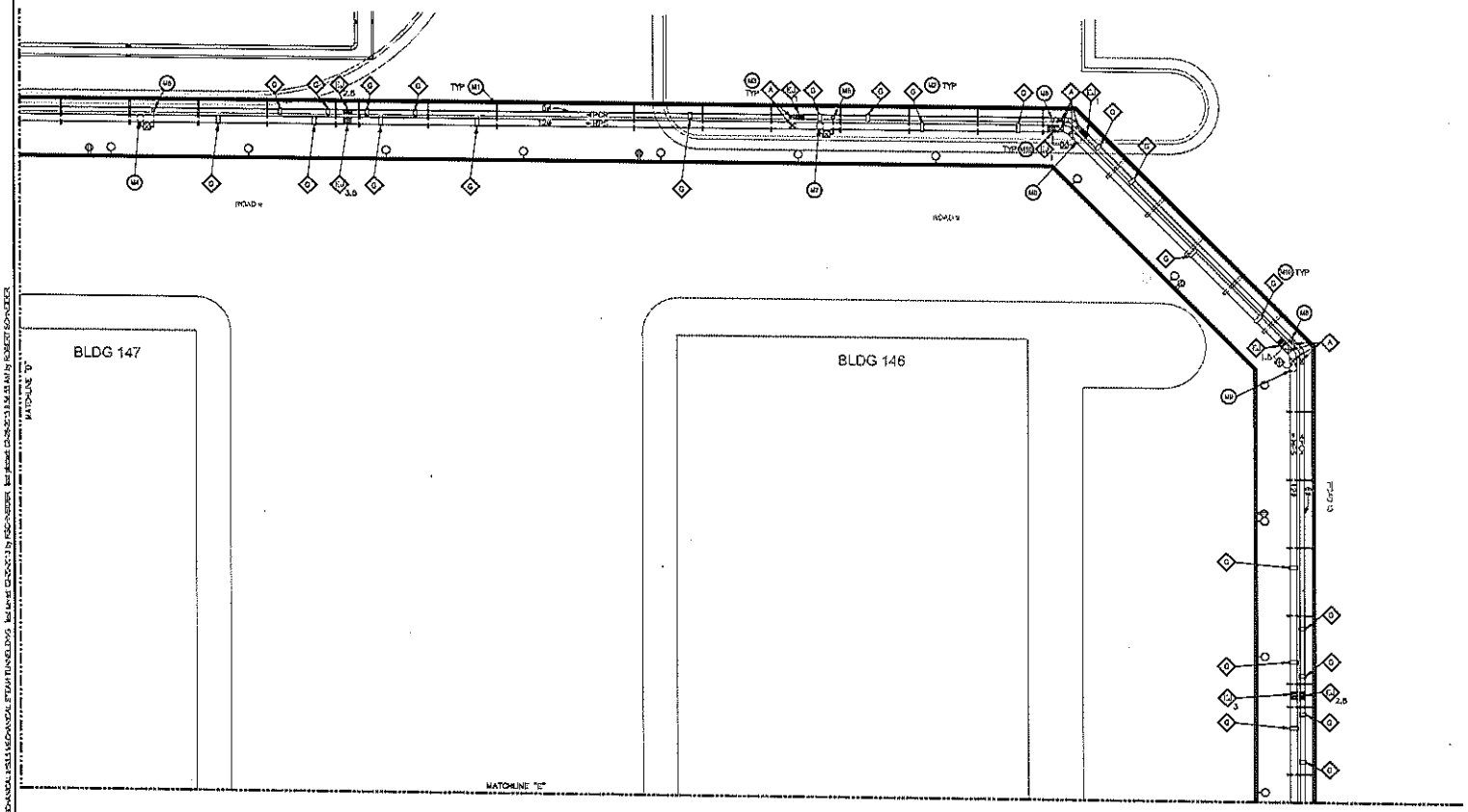
(M6) NOT USED.

(M7) STEAM MAIN VERTICAL RISE, ST-7 – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.

(M8) STEAM MAIN VERTICAL RISE, ST-9 – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.

(M9) STEAM MAIN VERTICAL RISE, ST-11 – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.

(M10) GUIDES AND EXPANSION JOINTS TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,5,6/MS4.1.



LEGEND

- EXISTING TO REMAIN
- NEW WORK
- ABANDON IN PLACE

1 UTILITY TUNNEL - PARTIAL PLAN

SCALE: 1/8" = 1'-0"

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O'CONNELL ROBERTSON
ARCHITECTURE ENGINEERING INTERIORS
OR PROJECT NO. 6017.08

ENGINEERING FIRM
O'CONNELL ROBERTSON
FIRM REGISTRATION NO. F-2526

Drawing Title	MECHANICAL STEAM TUNNEL
Approved: Chief, Engineering Services	DAVID SUMMERS, CHIEF
Approved: Project Manager	VICTOR CAW, P.E.
Project Title	UNDERGROUND UTILITIES
Building Number	SITE
Checked	NP
Drawn	KF
Location	TEMPLE VAMC – TEMPLE, TEXAS
Date	2/26/2013
Project No.	674-10-101
Drawing No.	MS3.5
Dwg. of	

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VA FORM 08-6231, FEB. 1983

U.S. GOVERNMENT PRINTING OFFICE: 1983-400-230

MECHANICAL NOTES:

(M1) PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.

(M2) PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.

(M3) PIPE ANCHOR. SEE DETAIL 1/MS4.1

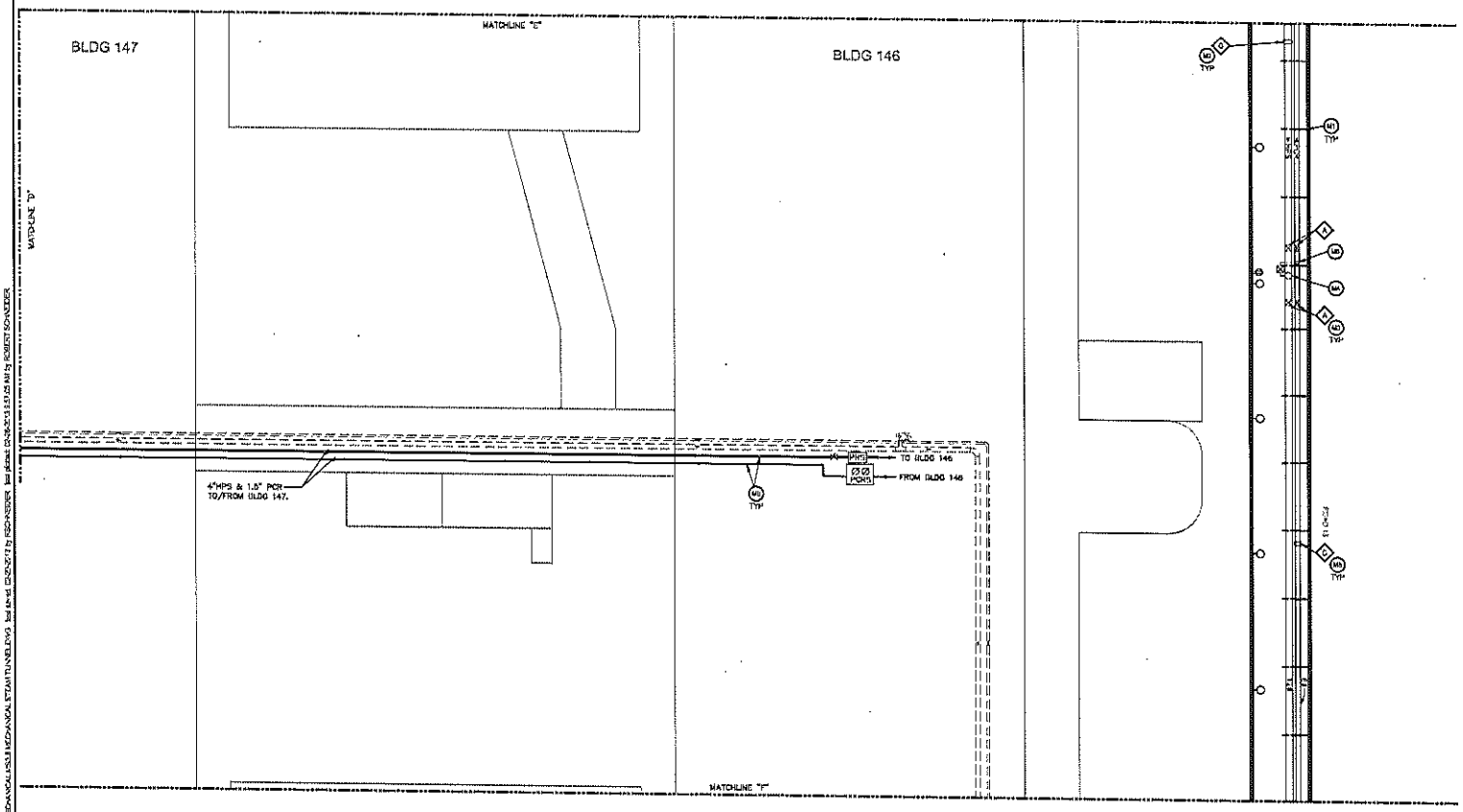
(M4) STEAM MAIN VERTICAL RISE. ST-1Q – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.

(M5) CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.

(M6) EXISTING CONDENSATE RETURN AND STEAM PIPING TO BE REUSED.

(M7) NOT USED.

(M8) GUIDES TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,5,6/MS4.1.



1 UTILITY TUNNEL - PARTIAL PLAN
SCALE: 1/8" = 1'-0"

TRUE NORTH

LEGEND

- EXISTING TO REMAIN
- NEW WORK
- ABANDON IN PLACE

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O'CONNELL ROBERTSON
OR PROJECT NO. 0917.05

3/26/13

Drawing Title: MECHANICAL STEAM TUNNEL
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF
Approved: Project Manager: VICTOR CAW, P.E.

Project Title: UNDERGROUND UTILITIES
Building Number: SITE
Checked: NP
Drawn: KF
Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013
Project No.: 674-10-101
Drawing No.: MS3.6
Dwg. of

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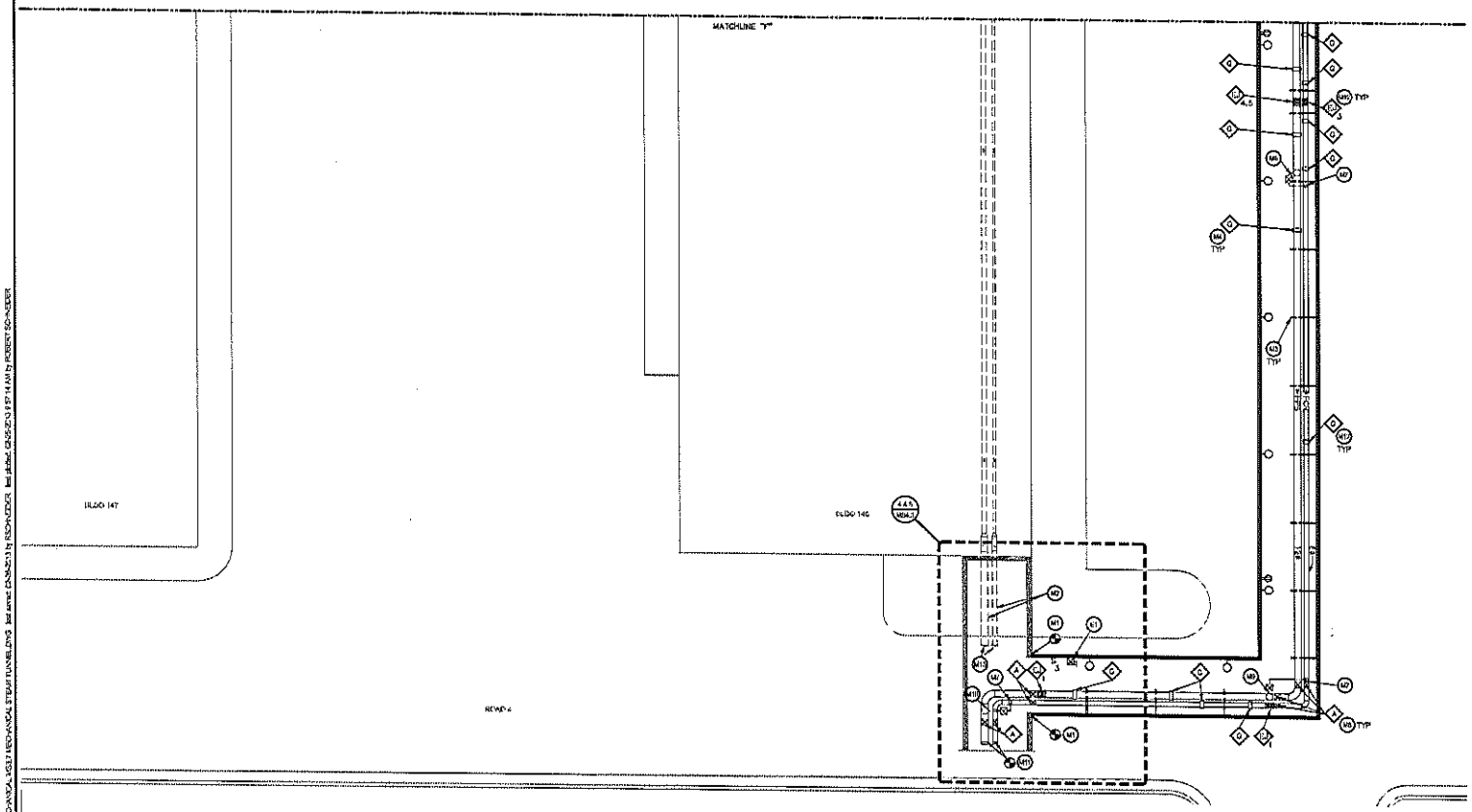
U.S. GOVERNMENT PRINTING OFFICE: 1983-400-285



1 UTILITY TUNNEL - PARTIAL PLAN

SCALE: 1/8" = 1'-0"

MECHANICAL NOTES:

- M1 CONNECT NEW TUNNEL TO EXISTING TUNNEL.
- M2 STEAM AND CONDENSATE PIPING ABANDONED IN PLACE.
- M3 PIPING SUPPORT STRUCTURE. TYPICAL SPACING 10' ON CENTER. SEE DETAIL 7/MS4.1.
- M4 PIPE GUIDE BETWEEN SUPPORTS. SEE DETAIL 1/MS4.2.
- M5 PIPE ANCHOR. SEE DETAIL 1/MS4.1.
- M6 STEAM MAIN VERTICAL RISE. ST-11 – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.
- M7 CONNECT TO CONDENSATE RETURN VIA SPARGE PIPE. SEE DETAIL 4/MS4.2.
- M8 NOT USED.
- M9 STEAM MAIN VERTICAL RISE. ST-12 – STEAM TRAP, AND DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.
- M10 ST-13 – STEAM TRAP, AND VENTED DRIP LEG IN THIS LOCATION. SEE DETAIL 2/MS4.2.
- M11 CONNECT TO EXISTING STEAM AND CONDENSATE RETURN PIPING.
- M12 GUIDES AND EXPANSION JOINTS TO BE SUPPORTED BY CHANNEL ACCORDING TO DETAILS 4,5,6/MS4.1.
- M13 CAP STEAM AND CONDENSATE WHERE SHOWN. ADD NIPPLE IF NECESSARY

ELECTRICAL NOTES:

- E1 LIGHTING CONTRACTOR. SEE SHEET MS3.1 FOR WIRING.

LEGEND

- EXISTING TO REMAIN
- NEW WORK
- ABANDON IN PLACE

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O'CONNELL ROBERTSON
CIR PROJECT NO. 0917.06

Drawing Title: MECHANICAL STEAM TUNNEL

Project Title: UNDERGROUND UTILITIES

Date: 2/26/2013

Project No.: 674-10-101

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR GAW, P.E.

Building Number: SITE | Checked: NP | Drawn: KF

Location: TEMPLE VAMC – TEMPLE, TEXAS

Drawing No.: MS3.7

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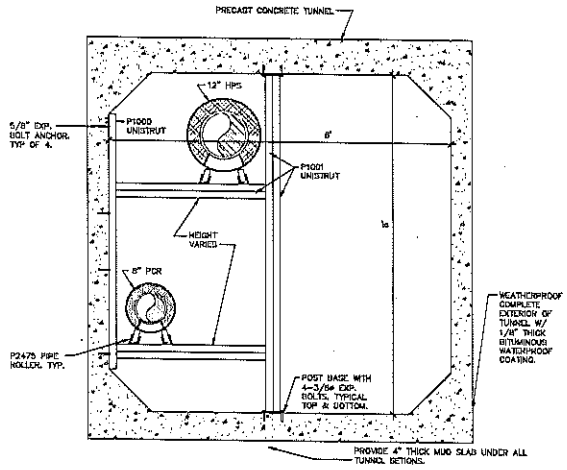
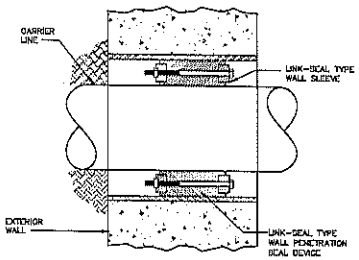
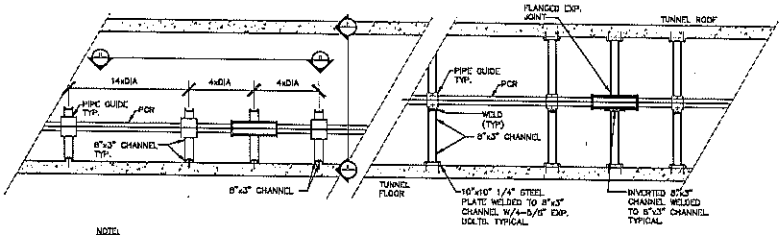


7 TYPICAL UNISTRUT VERTICAL SUPPORT SECTION
NOT TO SCALE



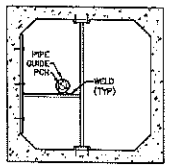
TYPICAL BELOW GRADE INSTALLATIONS

3 TYP. PIPE PENETRATION W/LINK-SEAL WALL SLEEVE
NOT TO SCALE



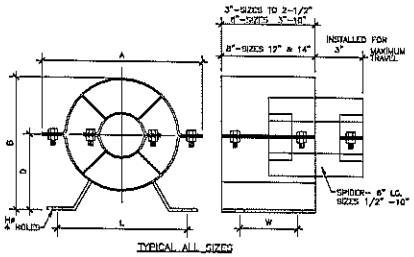
NOTE:
1. ONLY CONDENSATE SHOWN FOR CLARITY.

6 TYPICAL GUIDE & EXPANSION JOINT SUPPORT DETAIL
NOT TO SCALE



5 SECTION D-D
NOT TO SCALE

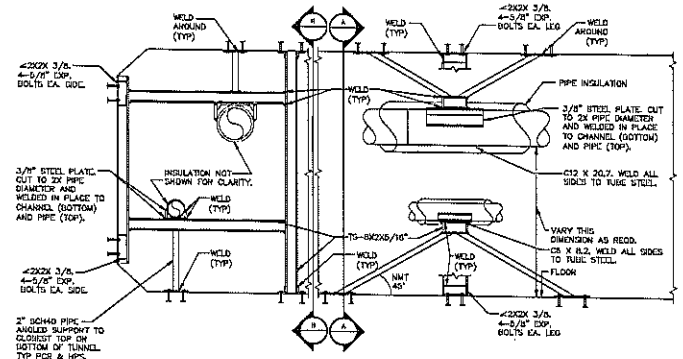
4 SECTION E-E
NOT TO SCALE



TYPICAL ALL SIZES

NOM. SIZE (IPS)	PIPE EXP. (INCHES)	INSULAT. THK. (INCHES)	D. HEIGHT (INCHES)	DIMENSIONS (INCHES)				
				A	B	L	W	H
1/2"	3	1.5	3.00	8.44	6.34	7.06	1.5	0.625
3/4"	3	1.5	3.00	8.44	6.34	7.06	1.5	0.625
1"	3	1.5	3.00	8.44	6.34	7.06	1.5	0.625
1 1/4"	3	1.5	3.88	9.50	7.25	7.81	1.5	0.625
1 1/2"	3	1.5	3.88	9.50	7.25	7.81	1.5	0.625
2"	3	1.5	3.88	9.50	7.25	7.81	1.5	0.625
2 1/2"	3	1.5	4.88	10.63	8.00	8.75	4.0	0.625
3"	6	1.5	4.88	10.63	8.00	8.75	4.0	0.625
3 1/2"	6	1.5	5.00	10.13	10.19	7.50	4.0	0.625
4	6	1.5	5.00	12.13	10.19	7.50	4.0	0.625
5	6	1.5	5.00	13.75	12.0	7.38	4.0	0.625
6	6	1.5	5.00	13.75	12.0	7.38	4.0	0.625
8	6	2	6.00	17.38	15.06	11.0	4.0	0.750
10	6	2	6.75	19.50	17.88	11.0	4.0	0.750
12	6	2	12.0	22.75	21.75	13.0	6.0	0.750
14	6	2	12.0	22.75	21.75	13.0	6.0	0.750

2 TYP. PIPE GUIDES
NOT TO SCALE



NOTE:
1. INSULATE ANCHOR AS INDICATED FOR COLD PIPING.
2. ANCHOR PIPING TO FLOOR OR CEILING STRUCTURE AS NOTED IN PLANS.

1 HORIZONTAL PIPE ANCHOR DETAIL
NOT TO SCALE

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ARCHITECTURE ENGINEERING INTERIORS
DR PROJECT NO. 0917.05

ENGINEERING FIRM
O'CONNELL ROBERTSON
FIRM REGISTRATION NO. F-3782

Drawing Title: MECHANICAL STEAM DETAILS	Project Title: UNDERGROUND UTILITIES		Date: 2/26/2013
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: NP	Drawn: KF	Project No. 674-10-101
Approved: Project Manager: VICTOR CAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Drawing No. MS4.1 Dwg. of

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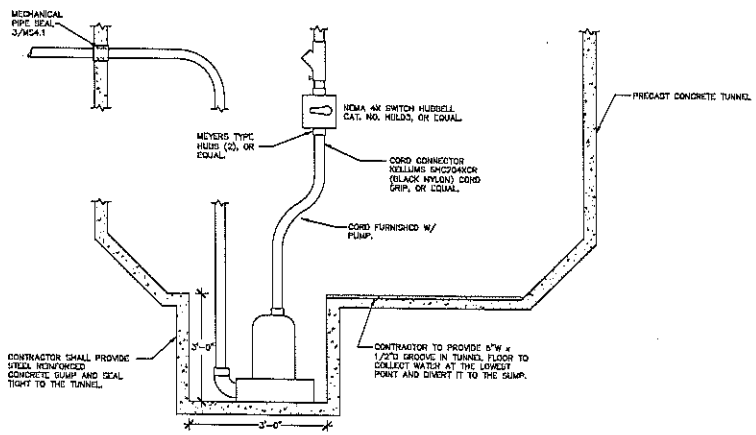
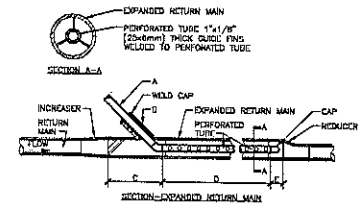


5 SUMP PUMP SECTION

SCHEMATIC ONLY - NOT TO SCALE



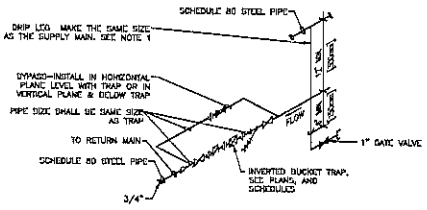
A	SIZE, TRAP DISCHARGE LINE	1/2" [15mm]	3/4" [20mm]
B	SIZE, 45° WELDING NIPPLE	1" [20mm]	1-1/4" [32mm]
C	LENGTH OF EXPANDED MAIN AHEAD OF TRAP DISCHARGE PIPE	7" [175mm]	7" [175mm]
D	LENGTH OF PERFORATED PIPE	16-1/2" [415mm]	16-1/2" [415mm]
E	LENGTH OF EXPANDED MAIN OF FOLLOWING PERFORATED PIPE	2" [50mm]	2" [50mm]

RETURN MAIN SIZE	UP TO 1-1/2" [40mm]	2" [50mm]	3" [75mm] & OVER
EXPANDED RETURN MAIN SIZE		2-1/2" [65mm]	SAME SIZE

NOTES:
1. 1/2" [15mm] PERFORATED TUBE SHALL HAVE 40 - 1/8" [16mm] DIAMETER HOLES SPACED 1-1/2" [40mm] O.C. IN 4 ROWS.
2. 3/4" [20mm] PERFORATED TUBE SHALL HAVE 75 - 1/8" [8mm] DIAMETER HOLES SPACED 1-1/2" [40mm] O.C. IN 6 ROWS.
3. HOLES IN TUBE SHALL BE SPACED EQUALLY AROUND PERIMETER.

4 HIGH AND MEDIUM PRESSURE STEAM TRAP SPARGED DISCHARGE INTO PUMPED CONDENSATE RETURN LINE

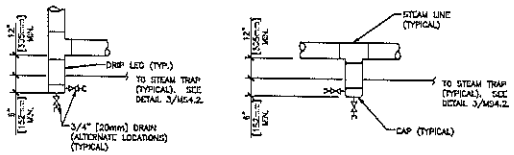
NOT TO SCALE



NOTES:
1. ALL DRIP POINTS ON STEAM MAINS SHALL BE PROVIDED WITH A 12" MINIMUM HIGH DRIP LEG FROM BOTTOM OF STEAM MAIN TO TRAP INLET. DRIP LEG SHALL HAVE 8" SCALE POCKET BELOW TRAP INLET.
2. PROVIDE BYPASS PIPING.
3. ECCENTRIC REDUCERS ONLY TO BE USED WITH FLAT ON BOTTOM.
4. STRAINER TO BE MOUNTED WITH BASKET ON SIDE.

3 INVERTED BUCKET STEAM TRAP ASSEMBLY

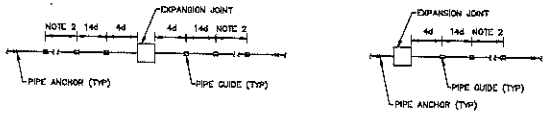
NOT TO SCALE



NOTES:
1. DRIP POCKET PIPE SIZE SAME AS STEAM MAIN UNLESS OTHERWISE NOTED.
2. PLACE STEAM DRIP POCKET AT REGULAR INTERVALS AS SHOWN ON PLAN AND AT ALL ELEVATION CHANGES.

2 STEAM LINE DRIP POCKET

NOT TO SCALE



NOTES:
1. d= PIPE DIAMETER. INSTALL ALL PIPE GUIDES PER MFR'S REQUIREMENTS. THE DIMENSIONS AND GUIDE QUANTITIES SHOWN HERE AND ON THE PLANS ARE MINIMUMS.
2. PROVIDE ADDITIONAL PIPE GUIDES BETWEEN EXPANSION JOINTS AND ANCHOR POINTS PER MANUFACTURE'S REQUIREMENTS.

1 PIPE GUIDE POSITION DETAIL

NOT TO SCALE

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ENGINEERING FIRM O'CONNELL ROBERTSON FIRM REGISTRATION NO. F-3784

Drawing Title: MECHANICAL STEAM DETAILS	Project Title: UNDERGROUND UTILITIES		Date: 2/26/2013
Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF	Building Number: SITE	Checked: NP	Drawn: KF
Approved: Project Manager: VICTOR CAW, P.E.	Location: TEMPLE VAMC - TEMPLE, TEXAS		Project No.: 674-10-101
			Drawing No.: MS4.2

Veterans Affairs

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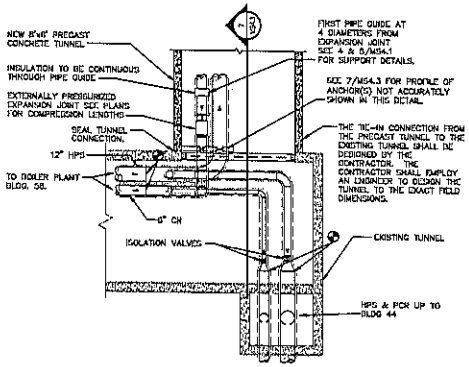
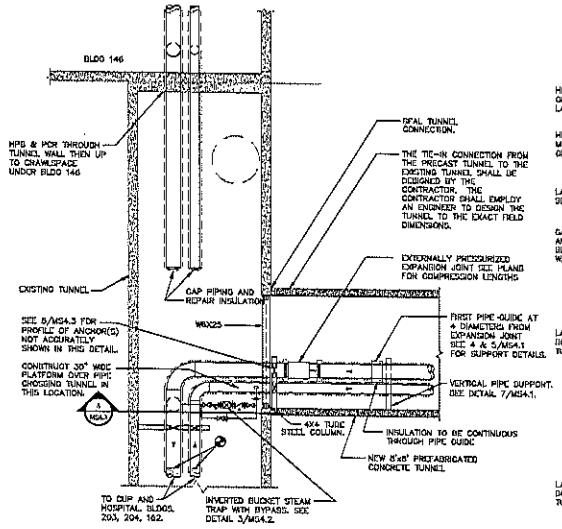


NORTH TUNNEL TIE-IN PLAN

6 SCALE: 1/4" = 1'-0"

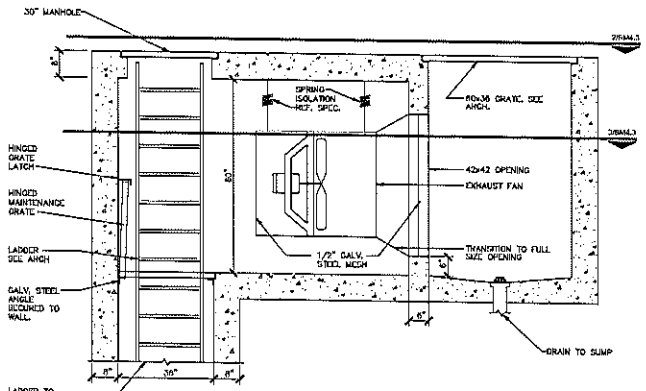
TRUE NORTH



SOUTH TUNNEL TIE-IN PLAN

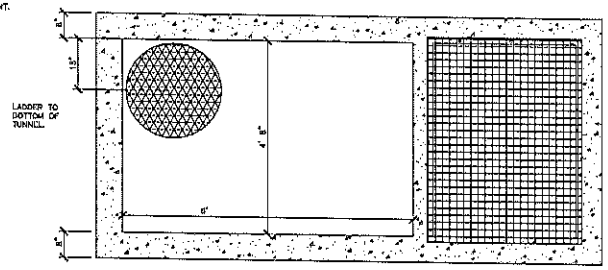
4 SCALE: 1/4" = 1'-0"

TRUE NORTH



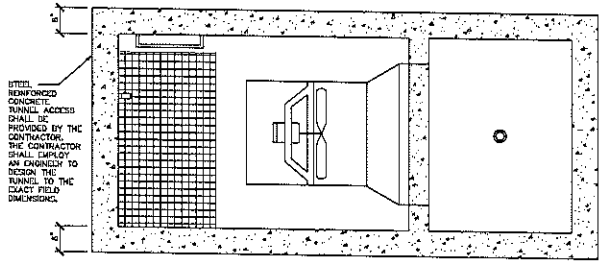
TUNNEL VENTILATION/ACCESS SECTION

1 SCHEMATIC ONLY - NOT TO SCALE



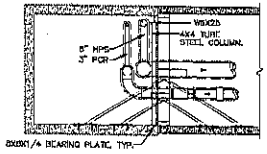
TUNNEL VENTILATION/ACCESS PLAN

2 SCHEMATIC ONLY - NOT TO SCALE



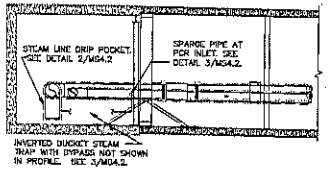
TUNNEL VENTILATION/ACCESS PLAN

3 SCHEMATIC ONLY - NOT TO SCALE



NORTH TUNNEL TIE-IN SECTION

7 SCALE: 1/4" = 1'-0"



SOUTH TUNNEL TIE-IN SECTION

5 SCALE: 1/4" = 1'-0"

No.	Date	By	Revisions

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FIRM REGISTRATION NO. F-1705

Drawing Title	MECHANICAL STEAM DETAILS
Project Title	UNDERGROUND UTILITIES
Date	2/26/2013
Project No.	674-10-101
Approved: Chief, Engineering Services	DAVID SUMMERS, CHIEF
Building Number	SITE
Checked	NP
Drawn	KF
Approved: Project Manager	VICTOR CAW, P.E.
Location	TEMPLE VAMC – TEMPLE, TEXAS
Drawing No.	MS4.3
Dwg. of	

Veterans Affairs

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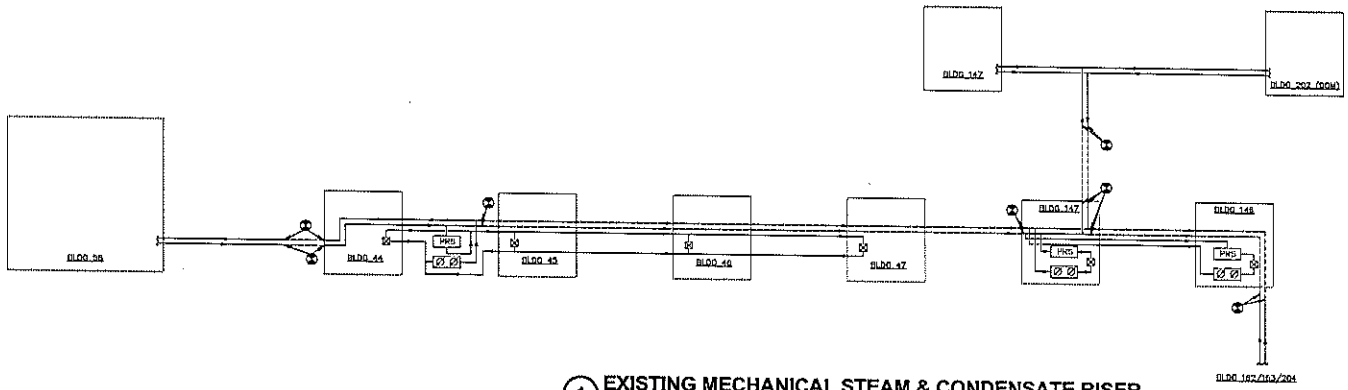
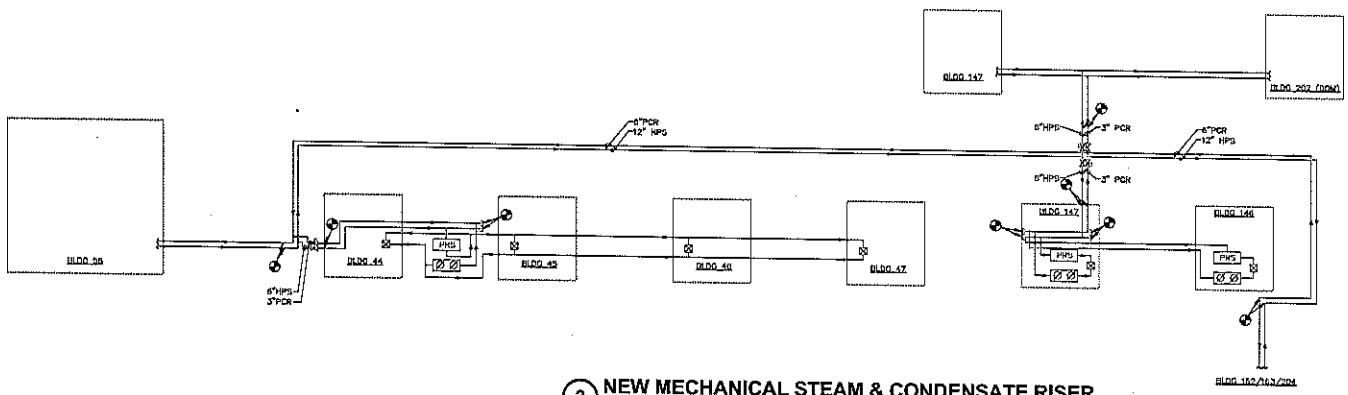


1 EXISTING MECHANICAL STEAM & CONDENSATE RISER

SCALE: NTS

LEGEND

- TO BE REMOVED OR ABANDON IN PLACE
- EXISTING TO REMAIN



2 NEW MECHANICAL STEAM & CONDENSATE RISER

SCALE: NTS

LEGEND

- EXISTING TO REMAIN
- NEW WORK

No.	Date	By	Revisions

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ENGINEERING FIRM
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FIRM REGISTRATION NO. F-2779

Drawing Title: MECHANICAL RISER DIAGRAMS

Approved: Chief, Engineering Services: DAVID SUMMERS, CHIEF

Approved: Project Manager: VICTOR GAW, P.E.

Project Title: UNDERGROUND UTILITIES

Building Number: SITE | Checked: NP | Drawn: KF

Location: TEMPLE VAMC – TEMPLE, TEXAS

Date: 2/26/2013

Project No.: 674-10-101

Drawing No.: MS5.1

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