

# INDEX TO DRAWINGS:

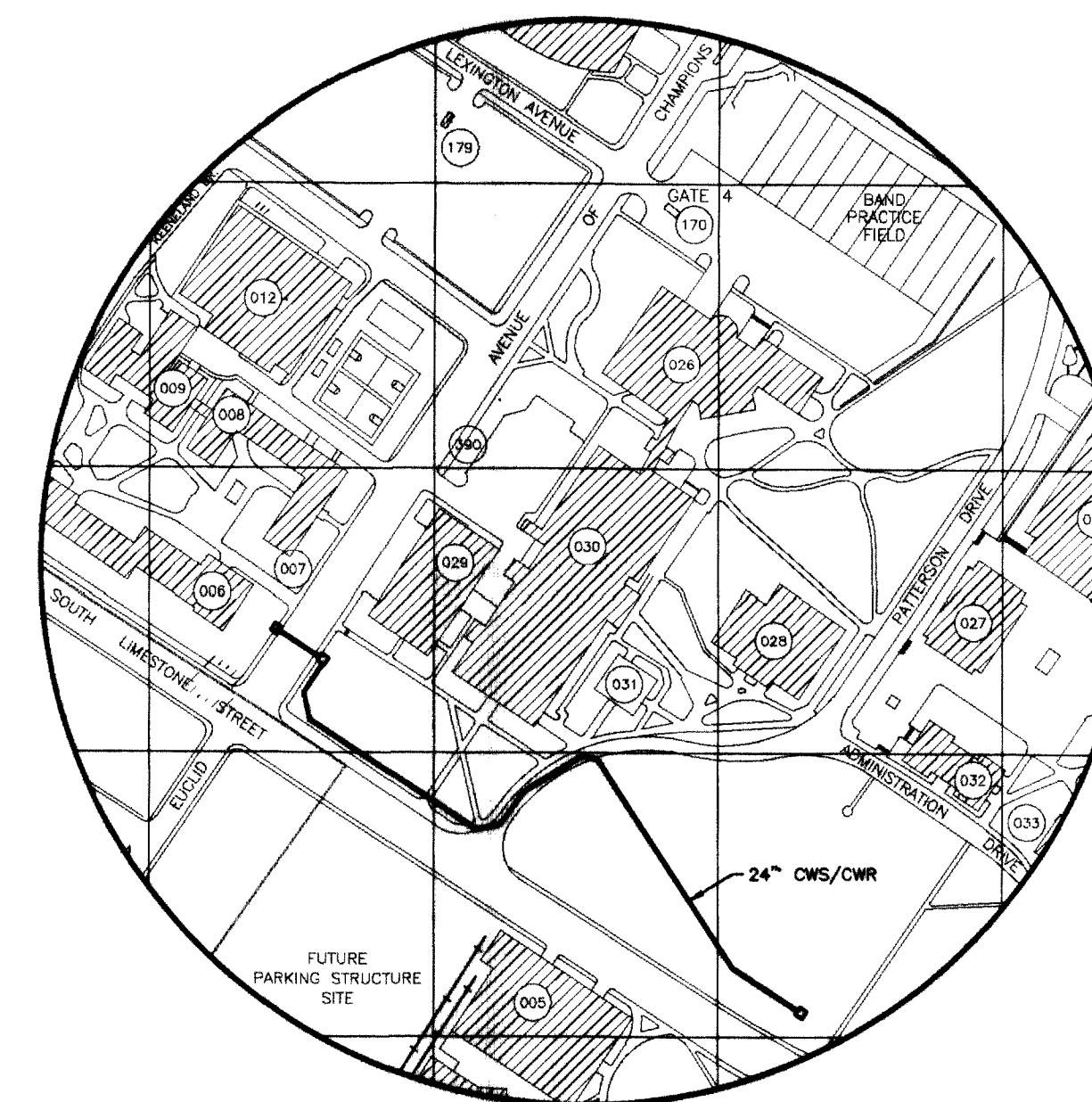
## NORTH CAMPUS CHILLED WATER MAINS PROJECT NO. 1592.00



A Tradition of Value

**SF** Staggs and Fisher  
Consulting Engineers, Inc.  
3264 Lochness Drive  
Lexington, Kentucky 40517

**ZBA**  
ZBA, INC.—ENGINEERS/CONSULTANTS  
36 E. SEVENTH ST. SUITE 200 CINCINNATI, OHIO 45202



VICINITY MAP

<u>DRAWING NUMBER</u>	<u>TITLE</u>
--	COVER SHEET
M-1	PARTIAL SITE PLAN "A"
M-2	PARTIAL SITE PLAN "B"
M-3	PROFILES "A" & "B"
M-4	ENLARGED DETAILS AND SECTIONS
M-5	ENLARGED DETAILS AND SECTIONS
M-6	DETAILS
M-7	STRUCTURAL DETAILS
M-8	STRUCTURAL DETAILS

### REFERENCE DRAWINGS

<u>DRAWING NUMBER</u>	<u>TITLE</u>
1	UTILITY SURVEY - EXISTING CONDITIONS. QL-B
2	UTILITY SURVEY - EXISTING CONDITIONS. QL-B
3	UTILITY SURVEY - EXISTING CONDITIONS. QL-B
4	UTILITY SURVEY - EXISTING CONDITIONS. QL-B

RECORD DRAWINGS DATE 4/29/99

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STAGGS & FISHER CONSULTING ENGINEERS, INC.

**FINAL DOCUMENTS**

FEBRUARY 1997

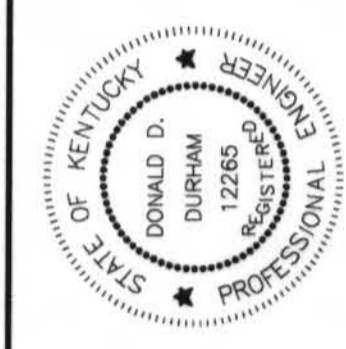
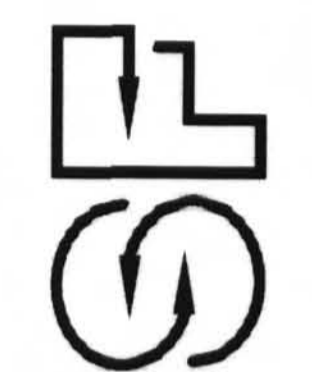
PROJECT NO. 1592.00

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NO.









FINAL DOCUMENTS

PARTIAL SITE PLAN 'B'  
UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER MAINS  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

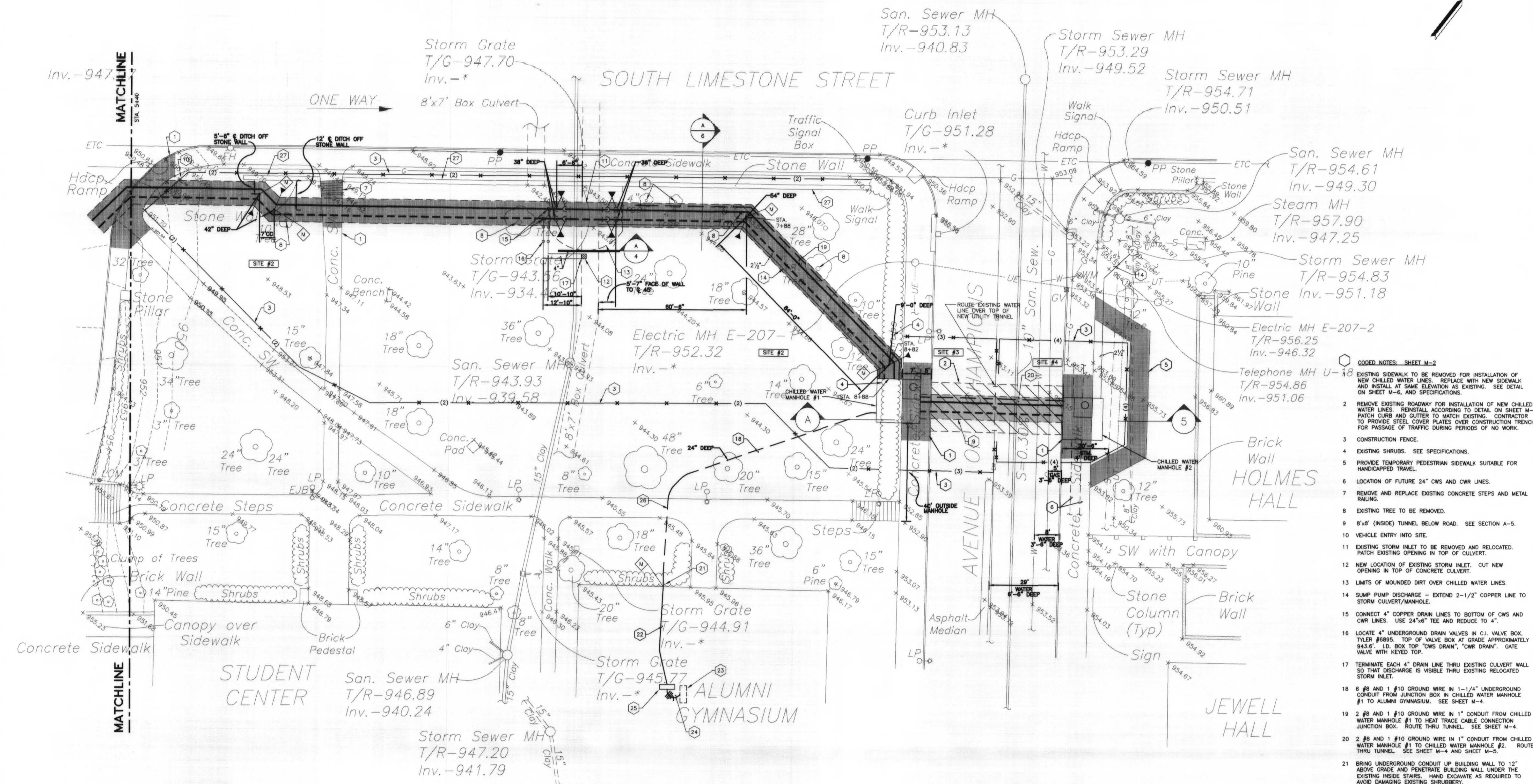
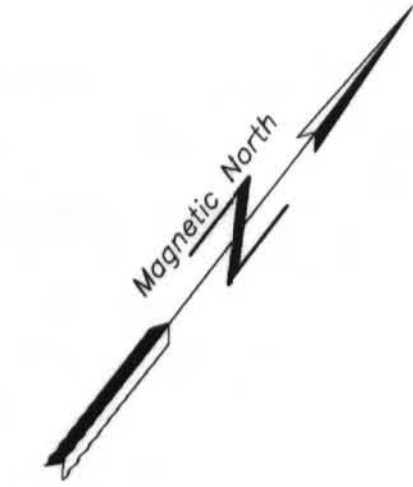
PROJECT NO. 1592.00  
DATE FEB., 1995

DRAWN BY DDD  
CHECKED BY DDD  
SCALE 1" = 20'  
REVISED

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SHEET

M-2



CODED NOTES: SHEET M-2

- EXISTING SIDEWALK TO BE REMOVED FOR INSTALLATION OF NEW CHILLED WATER LINES. REPLACE WITH NEW SIDEWALK AND INSTALL AT SAME ELEVATION AS EXISTING. SEE DETAIL ON SHEET M-6, AND SPECIFICATIONS.
- REMOVE EXISTING ROADWAY FOR INSTALLATION OF NEW CHILLED WATER LINES. REINSTALL ACCORDING TO DETAIL ON SHEET M-6. PATCH CURB AND GUTTER TO MATCH EXISTING. CONTRACTOR TO PROVIDE STEEL COVER PLATES OVER CONSTRUCTION TRENCH FOR PASSAGE OF TRAFFIC DURING PERIODS OF NO WORK.
- CONSTRUCTION FENCE.
- EXISTING SHRUBS. SEE SPECIFICATIONS.
- PROVIDE TEMPORARY PEDESTRIAN SIDEWALK SUITABLE FOR HANDICAPPED TRAVEL.
- LOCATION OF FUTURE 24" CWS AND CWR LINES.
- REMOVE AND REPLACE EXISTING CONCRETE STEPS AND METAL RAILING.
- EXISTING TREE TO BE REMOVED.
- 8" x 8" (INSIDE) TUNNEL BELOW ROAD. SEE SECTION A-5.
- VEHICLE ENTRY INTO SITE.
- EXISTING STORM INLET TO BE REMOVED AND RELOCATED. PATCH EXISTING OPENING IN TOP OF CULVERT.
- NEW LOCATION OF EXISTING STORM INLET. CUT NEW OPENING IN TOP OF CONCRETE CULVERT.
- LIMITS OF MOUNDED DIRT OVER CHILLED WATER LINES.
- SUMP PUMP DISCHARGE - EXTEND 2-1/2" COPPER LINE TO STORM CULVERT/MANHOLE.
- CONNECT 4" COPPER DRAIN LINES TO BOTTOM OF CWS AND CWR LINES. USE 24"x6" TEE AND REDUCE TO 4".
- LOCATE 4" UNDERGROUND DRAIN VALVES IN C.I. VALVE BOX, TYLER #6895. TOP OF VALVE BOX AT GRADE APPROXIMATELY 943.6'. I.D. BOX TOP "CWS DRAIN", "CWR DRAIN". GATE VALVE WITH KEYS TOP.
- TERMINATE EACH 4" DRAIN LINE THRU EXISTING CULVERT WALL SO THAT DISCHARGE IS VISIBLE THRU EXISTING RELOCATED STORM INLET.
- 6 #8 AND 1 #10 GROUND WIRE IN 1-1/4" UNDERGROUND CONDUIT FROM JUNCTION BOX IN CHILLED WATER MANHOLE #1 TO ALUMNI GYMNASIUM. SEE SHEET M-4.
- 2 #8 AND 1 #10 GROUND WIRE IN 1" CONDUIT FROM CHILLED WATER MANHOLE #1 TO HEAT TRACE CABLE CONNECTION JUNCTION BOX. ROUTE THRU TUNNEL. SEE SHEET M-4.
- 2 #8 AND 1 #10 GROUND WIRE IN 1" CONDUIT FROM CHILLED WATER MANHOLE #1 TO CHILLED WATER MANHOLE #2. ROUTE THRU TUNNEL. SEE SHEET M-4 AND SHEET M-5.
- BRING UNDERGROUND CONDUIT UP BUILDING WALL TO 12" ABOVE GRADE AND PENETRATE BUILDING WALL UNDER THE EXISTING INSIDE STAIRS. HAND EXCAVATE AS REQUIRED TO AVOID DAMAGING EXISTING SHRUBBERY.
- 6 #8 AND 1 #10 GROUND WIRE IN 1-1/4" CONDUIT. BRING CONDUIT UP UNDER STARWELL TO ABOVE CEILING THEN TO NEW SUB-PANEL 1-DA.
- EXISTING 120/208V PANELBOARD 1-D. INSTALL A NEW 60 AMP 3 POLE BREAKER IN SPARE SPACES TO FEED NEW SUB-PANEL 1-DA. MOVE EXISTING CIRCUITS TO PANELBOARD 1-DA IF REQUIRED TO INSTALL NEW 3 POLE BREAKER.
- NEW PANELBOARD 1-DA, 120/208V, 3-PHASE, 4 WIRE, 20 SPACE. PROVIDE 8 20 AMP 1 POLE BREAKERS AND 1 20 AMP 2 POLE BREAKERS IN PANELBOARD SURFACE MOUNT ON EXISTING WALL.
- PUSH CONDUIT UNDER EXISTING SIDEWALKS AS REQUIRED.
- DO NOT DISTURB BEARINGS OF EXISTING WALL FOOTER DURING EXCAVATION.

RECORD DRAWINGS DATE 4/29/99

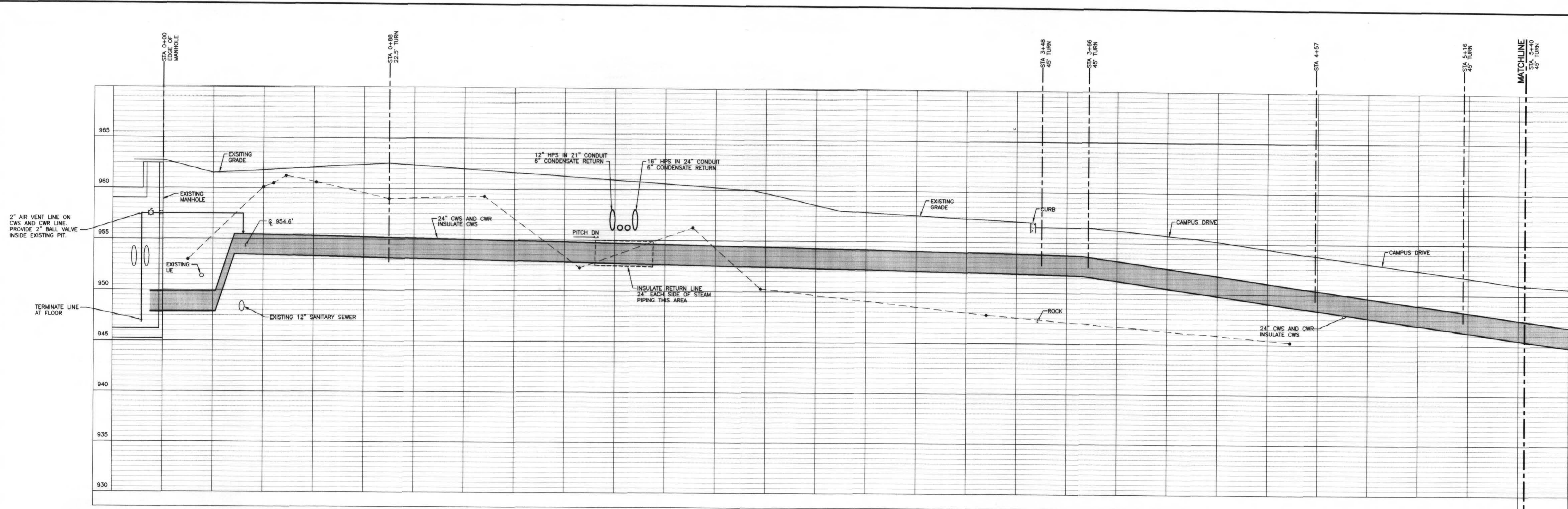
These record drawings have been prepared, in part, on the basis of information compiled and furnished by others. The Engineer will not be responsible for any errors or omissions which have been incorporated into this document as a result.  
STAGGS & FISHER CONSULTING ENGINEERS, INC.

GRAPHIC SCALE: 1" = 20'  
CONTOUR INTERVAL = 1'

THE CONTRACT DRAWINGS SHOW THE APPROXIMATE LOCATION OF THE EXISTING AND NEW SUBSURFACE UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL LOCATIONS. IF ANY CHARTERED, UNCHARTERED OR MISLOCATED UTILITY SERVICE IS INTERRUPTED FOR ANY REASON, THE CONTRACTOR WILL WORK CONTINUOUSLY TO RESTORE SERVICE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.

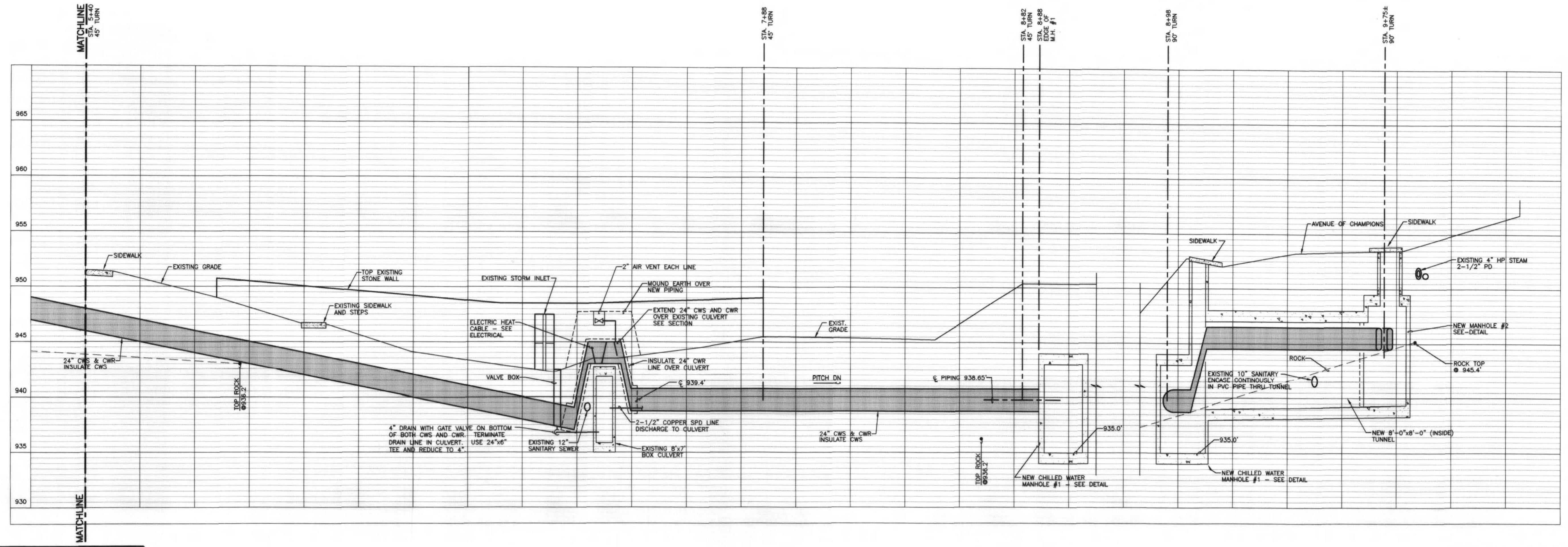
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**PROFILE - A**  
 HORIZONTAL SCALE: 1" = 20'-0" (APPROXIMATE)  
 VERTICAL SCALE: 1" = 5'-0"

- GENERAL NOTES:**
1. FIELD VERIFY ALL DIMENSIONS AND ELEVATIONS.
  2. DRAWINGS INDICATE APPROXIMATE LOCATION OF UTILITIES. ALL UTILITIES MUST REMAIN IN SERVICE. PROVIDE TEMPORARY SUPPORTS WHERE NEW CHILLED WATER PASSES UNDER EXISTING. IF EXPOSED SYSTEM MEDIA IS SUBJECT TO FREEZING, PROVIDE TEMPORARY FREEZE PROTECTION.



**PROFILE - B**  
 HORIZONTAL SCALE: 1" = 20'-0" (APPROXIMATE)  
 VERTICAL SCALE: 1" = 5'-0"

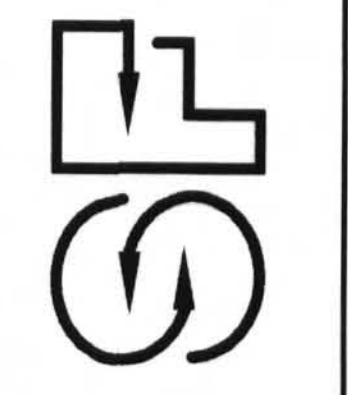
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FINAL DOCUMENTS

**Staggs and Fisher**  
 Consulting Engineers, Inc.  
 3284 Lochness Drive  
 Lexington, Kentucky 40517  
 (606)-271-3246



**PROFILES A AND B**  
 UNIVERSITY OF KENTUCKY  
 NORTH CAMPUS CHILLED WATER MAINS  
 LEXINGTON, FAYETTE COUNTY, KENTUCKY

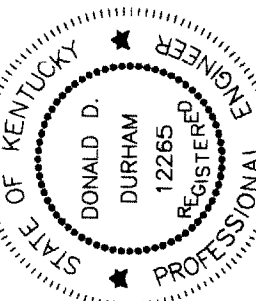
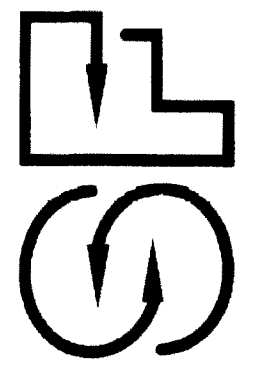
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SHEET  
**M-3**

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Consulting Engineers, Inc.  
3254 Lochness Drive  
Lexington, Kentucky 40517  
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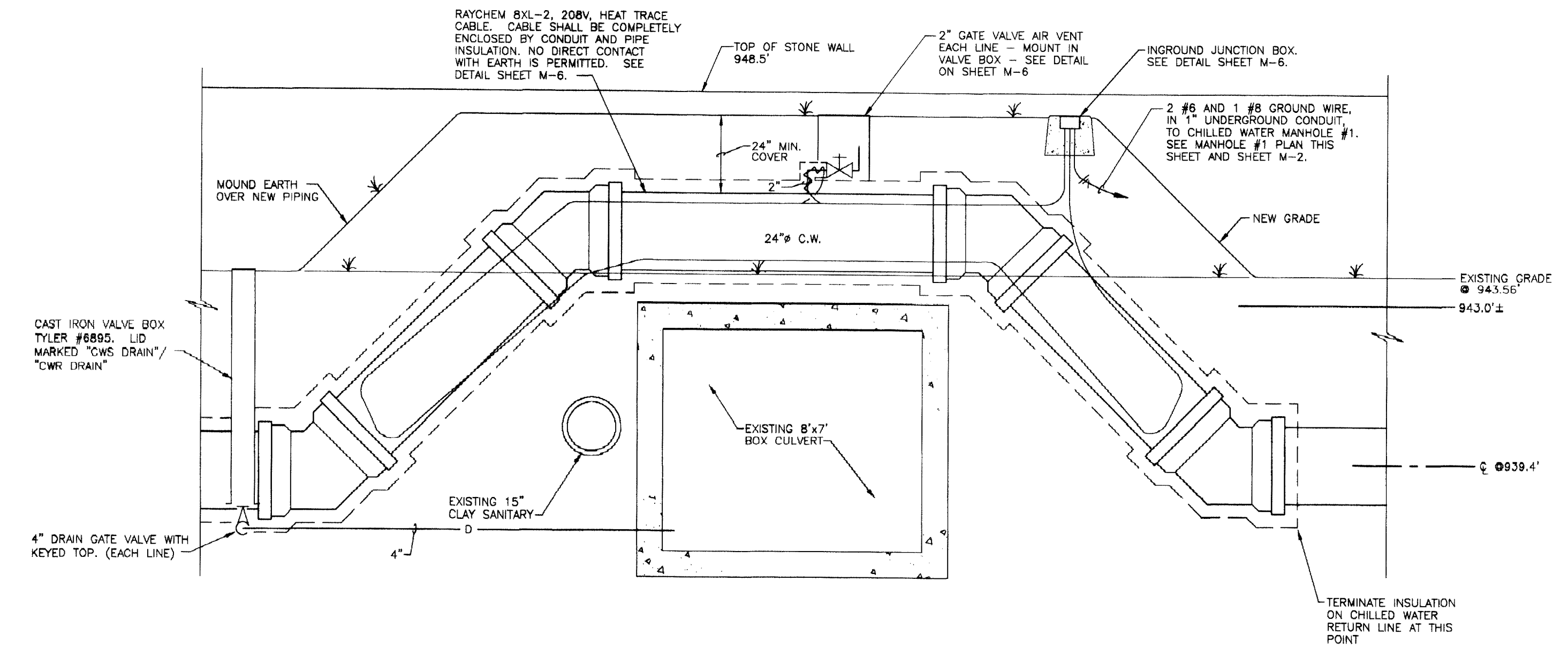


ENLARGED DETAILS AND SECTIONS  
UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER MAINS  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

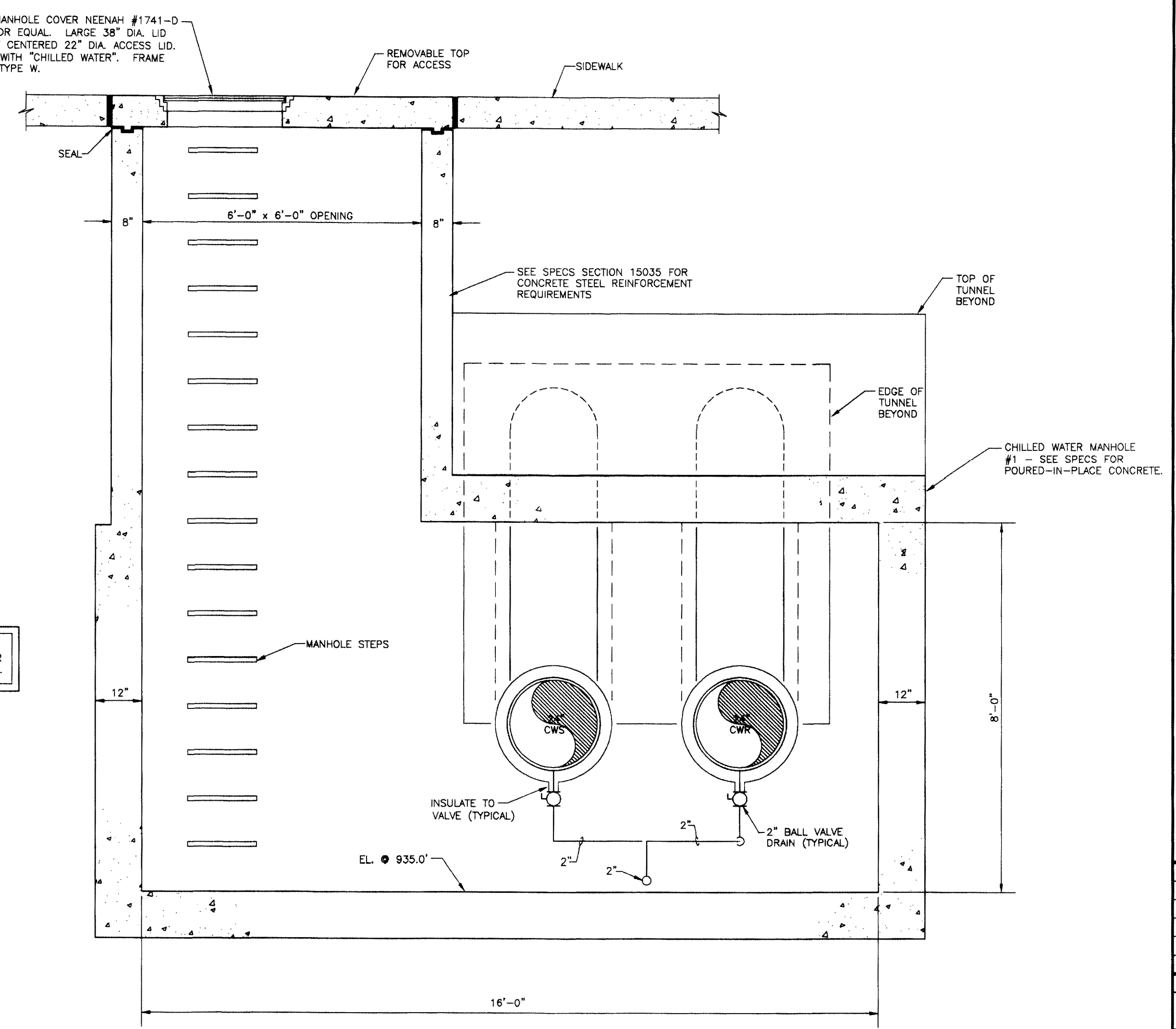
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SHEET

M-4

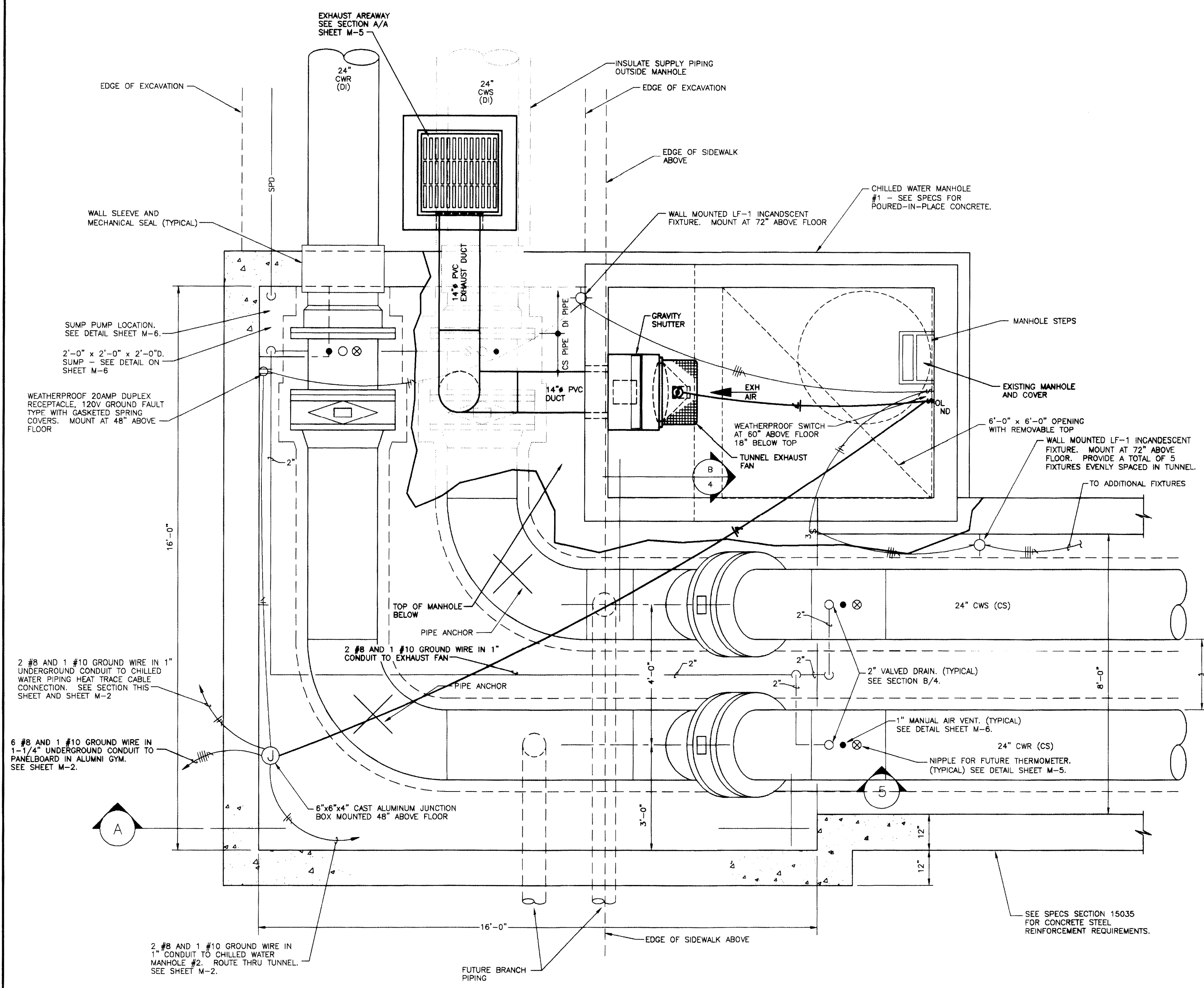


SECTION 4  
SCALE: 3/8" = 1'-0"



SECTION B  
SCALE: 1/2" = 1'-0"

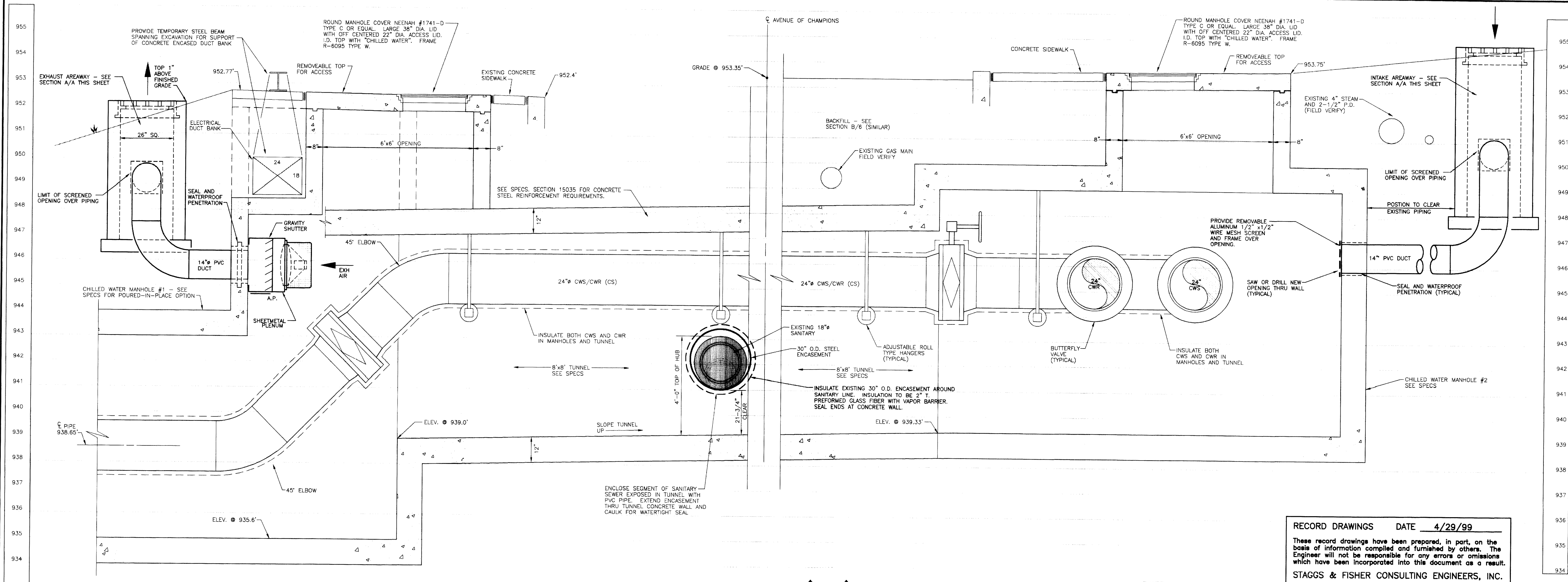
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PLAN - CHILLED WATER MANHOLE #1  
SCALE: 1/2" = 1'-0"

THE CONTRACT DRAWINGS SHOW THE APPROXIMATE LOCATION OF THE EXISTING AND NEW SUBSURFACE UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL LOCATIONS. IF ANY CHARTED, UNCHARTED OR UNSPECIFIED UTILITY SERVICES IS INTERRUPTED FOR ANY REASON, THE CONTRACTOR WILL WORK CONTINUOUSLY TO RESTORE SERVICE TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST TO THE OWNER.

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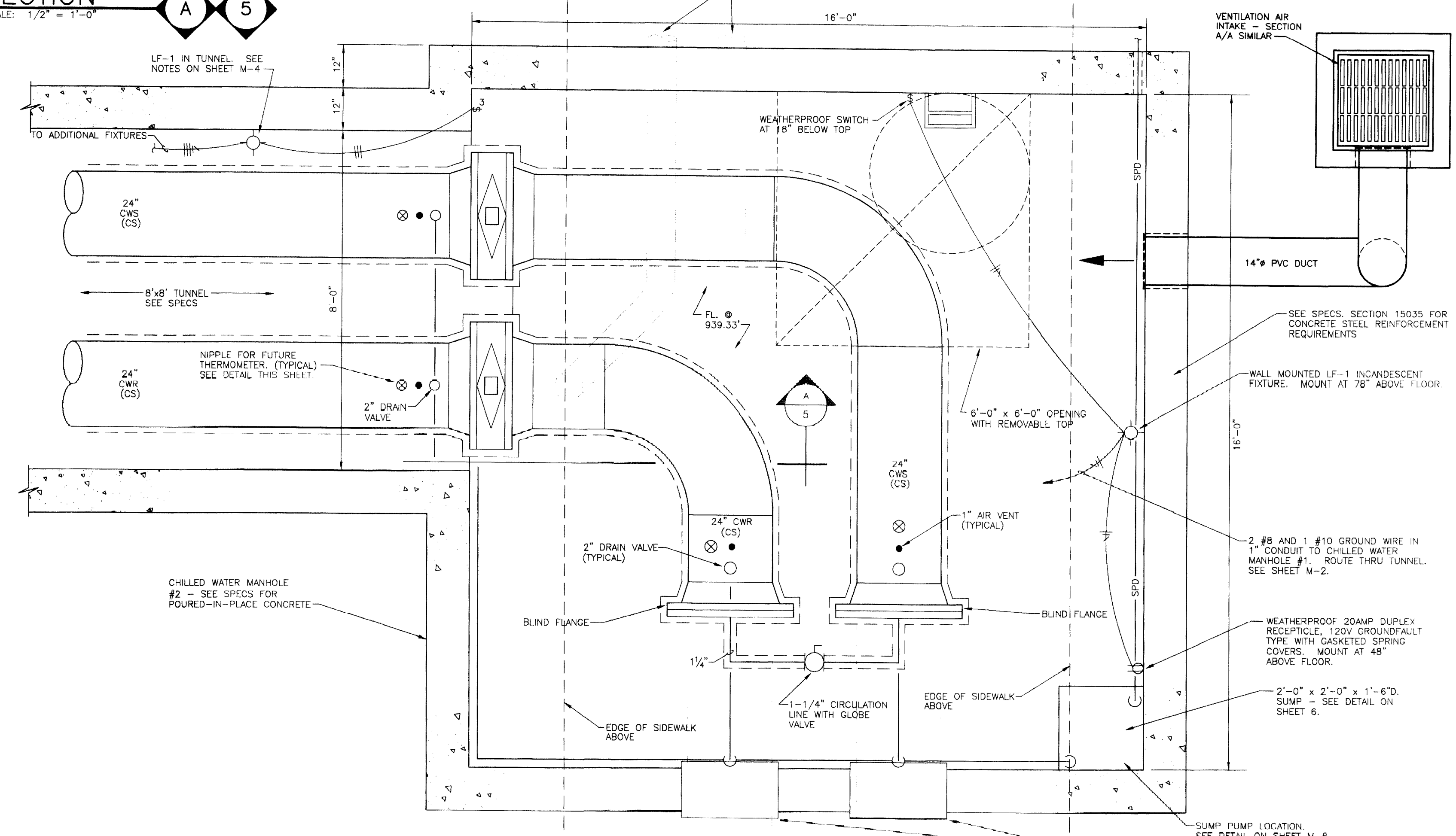


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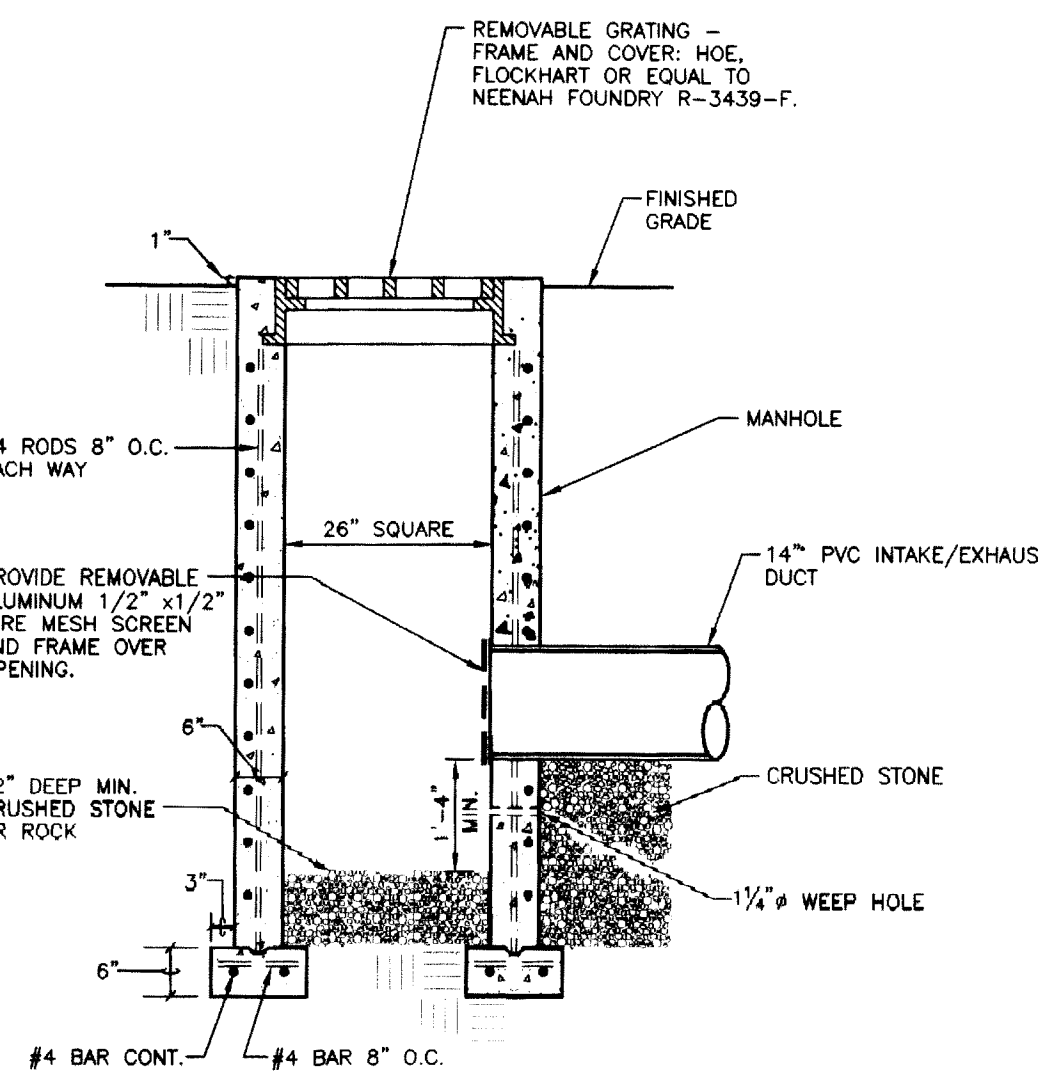
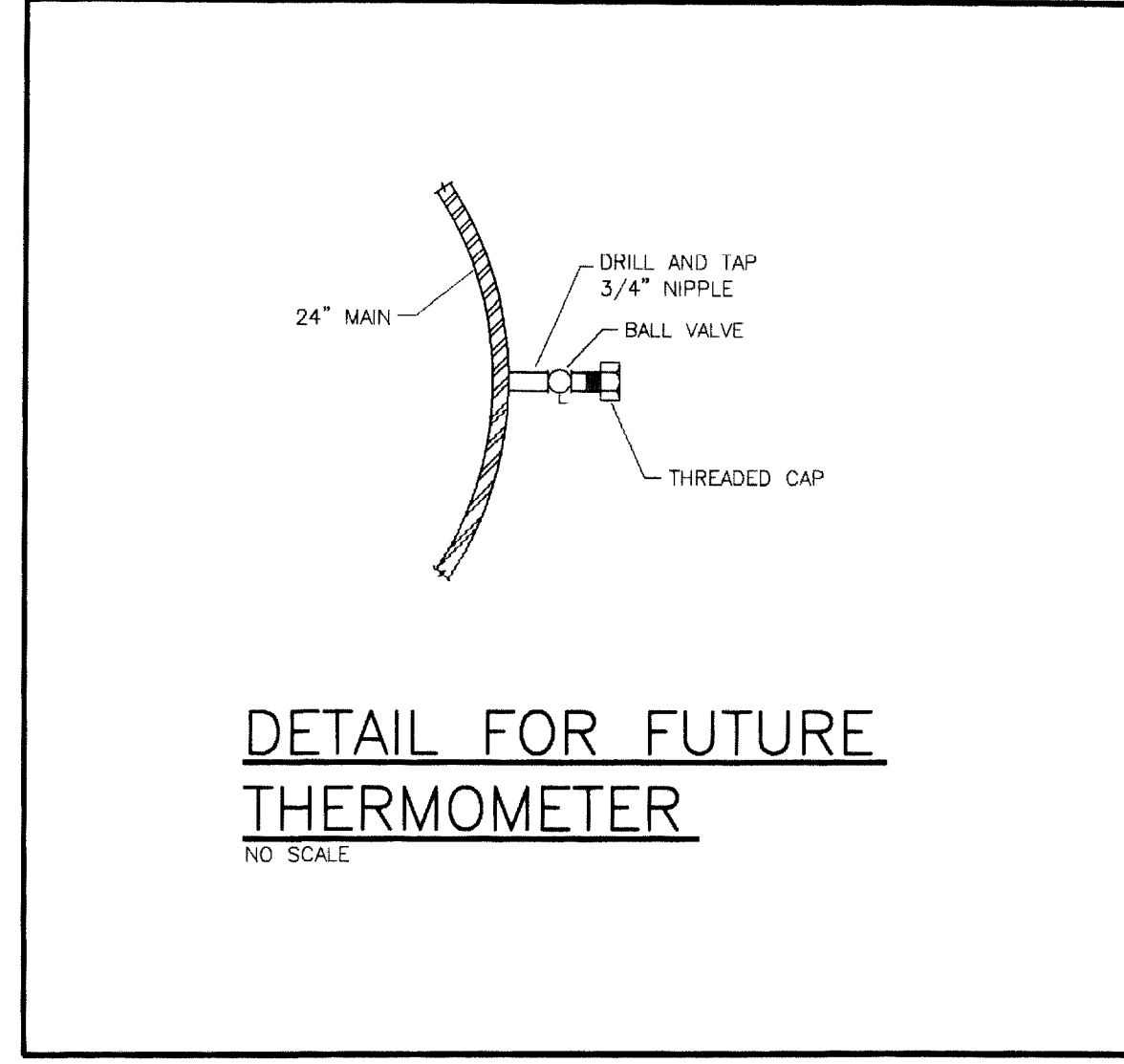
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SECTION A-5  
SCALE: 1/2" = 1'-0"



TUNNEL EXHAUST FAN  
GREENHECK EQUAL TO MODEL #SE2-16 (LEVEL-2) RATED FOR 2000 CFM AT 0.30" W.C., 1750 RPM, DIRECT DRIVE 1/4 H.P., 115V/60 CY. PROVIDE MOTOR SIDE GUARD, GRAVITY SHUTTER, ALL WELDED CONSTRUCTION.

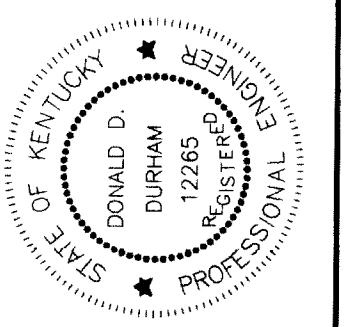
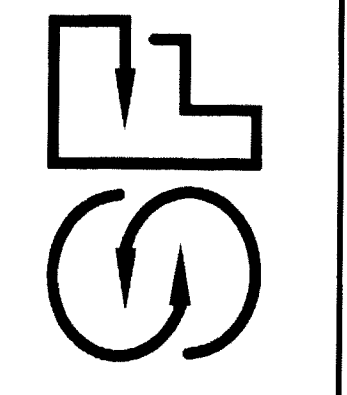


SECTION A-A  
SCALE: 1/2" = 1'-0"

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PLAN - CHILLED WATER MANHOLE #2  
SCALE: 1/2" = 1'-0"

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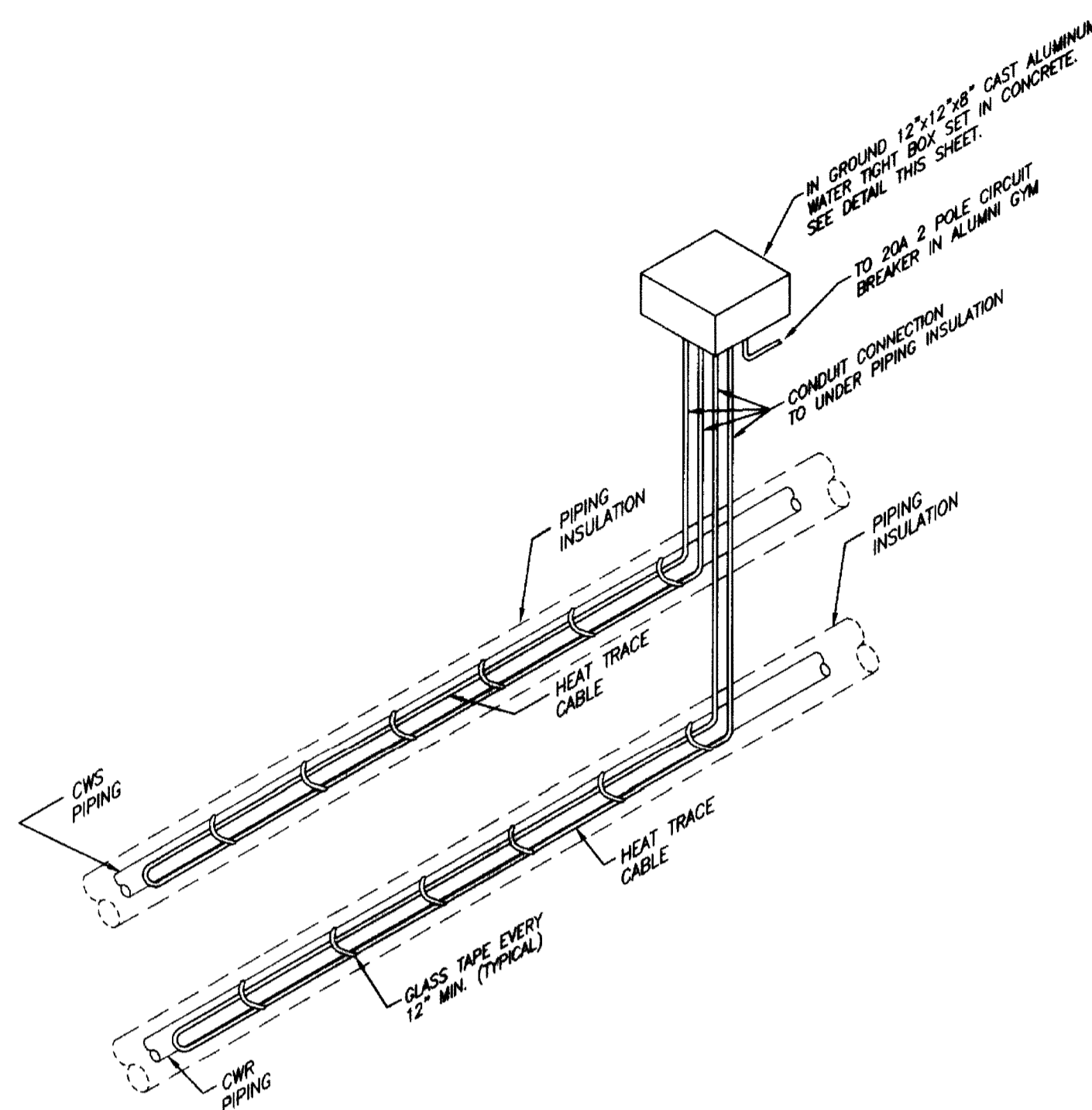
ENLARGED DETAILS AND SECTIONS  
UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER MAINS  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

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DATE FEB. 199  
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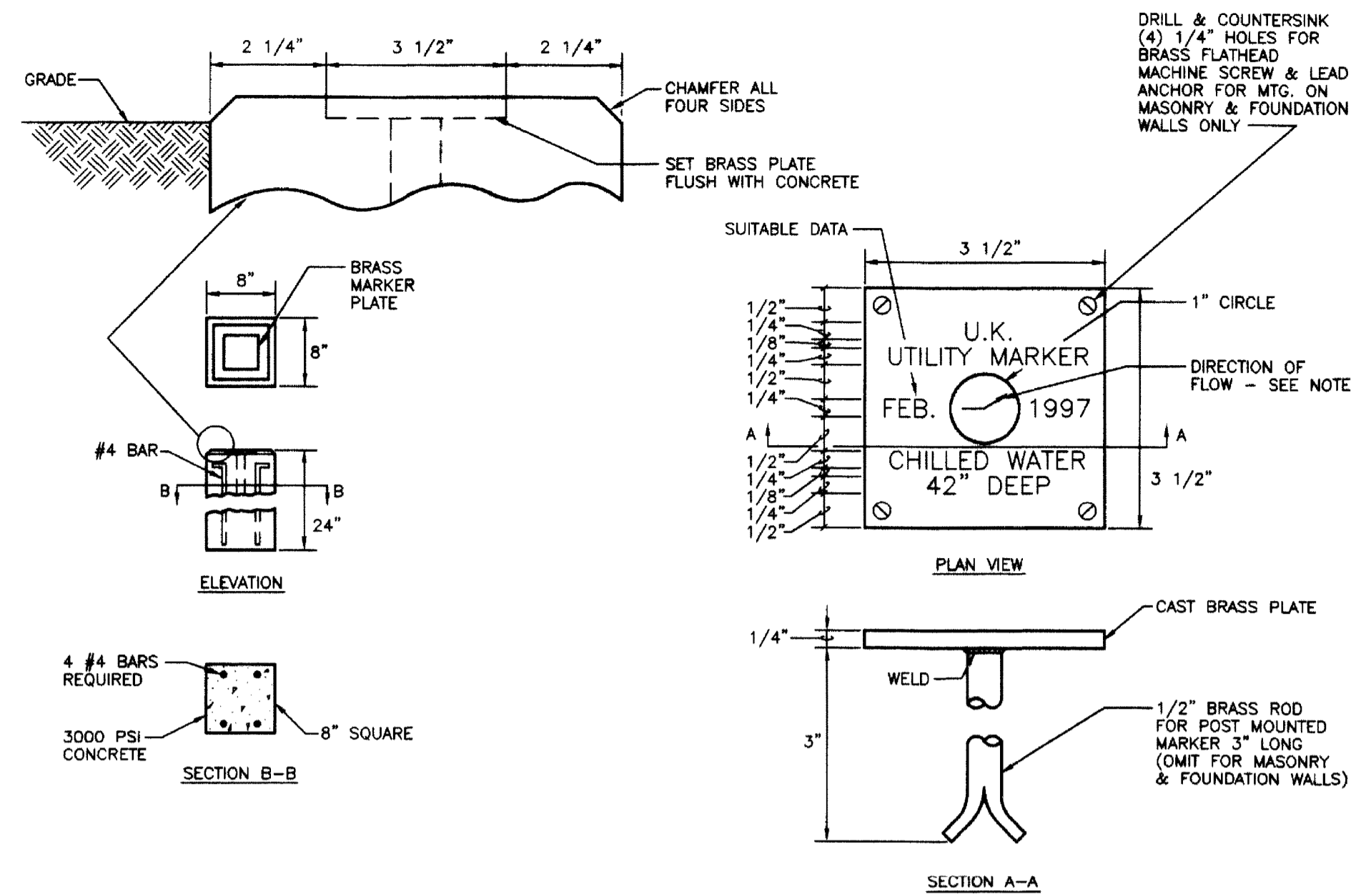
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SHEET M-5





**INSTALLATION DETAIL HEAT TRACE CABLE**  
NO SCALE

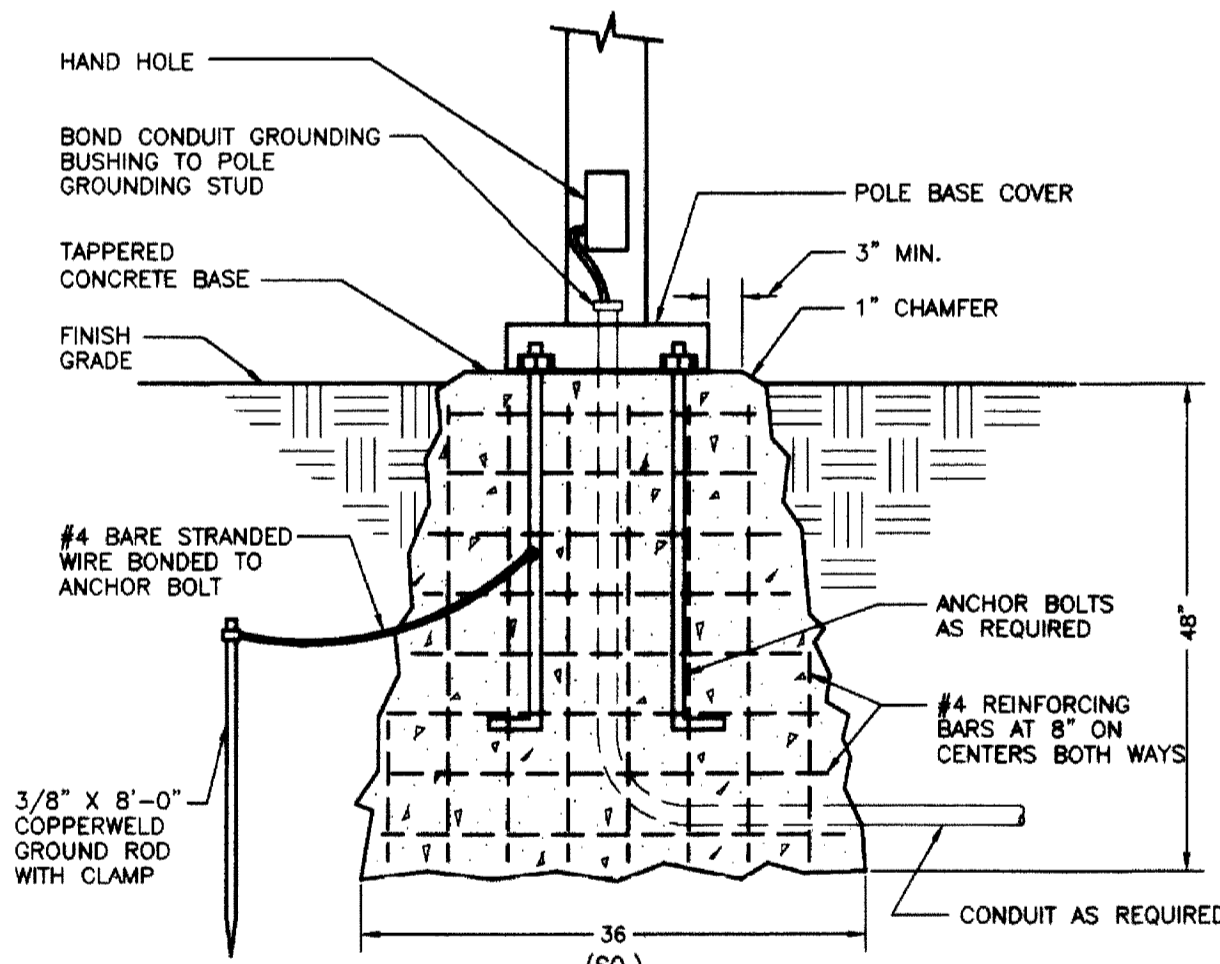


- NOTES:**
1. MARKERS SHALL BE LOCATED WHERE INDICATED ON DRAWINGS.
  2. BRASS MARKERS SHALL BE CAST BY BRUCE FOX COMPANY, NEW ALBANY, INDIANA, OR EQUAL.
  3. ALL LETTERING SHALL BE OF THE RAISED TYPE. LETTERING SHOWN ON MARKER IS FOR EXAMPLE ONLY. LETTERING TO BE RAISED 1/8\".
  4. AT THE CONTRACTOR'S OPTION, ONE MARKER MAY BE USED FOR COMPANION MAINS THAT ARE LOCATED CLOSE TOGETHER SUCH AS STEAM AND CONDENSATE PUMP DISCHARGE PIPING OR CHILLED WATER SUPPLY AND CHILLED WATER RETURN PIPING. PROVIDE ARROW FOR EACH MAIN.
  5. CONTRACTOR SHALL FURNISH A COMPLETE LIST FOR APPROVAL OF ALL MARKERS SHOWING NAMES, ARROWS, DEPTH AND DATE.
  6. WHEN UTILITY MARKERS ARE INSTALLED OVER LINES AT A POINT OF DIRECTION CHANGE, THE ARROW ON THE MARKERS SHALL BE "ANGLED" AS REQUIRED TO IMPLY THIS ROUTING.

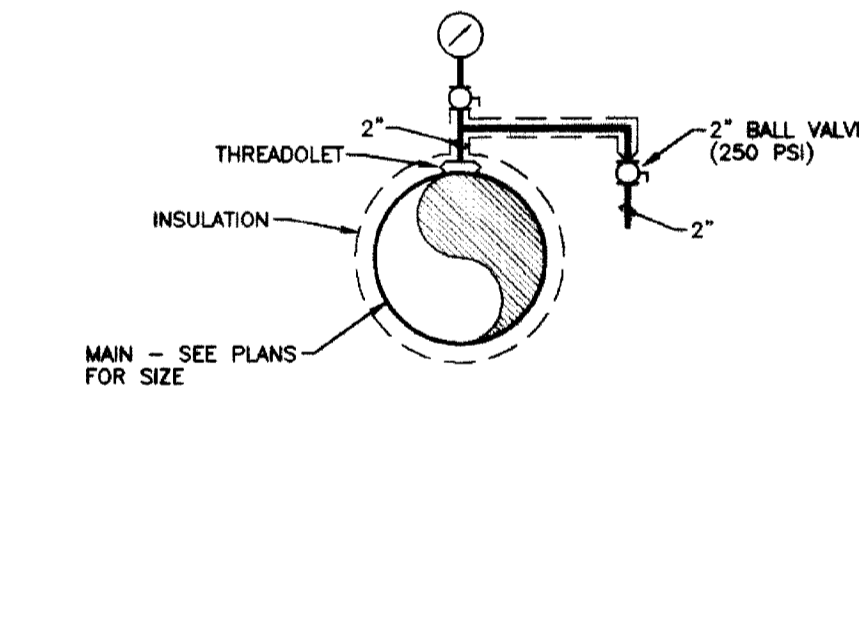
**UTILITY SERVICE MARKER DETAIL**  
NO SCALE

LEGEND	
CHILLED WATER SUPPLY	CWS
CHILLED WATER RETURN	CWR
TEE (UP/DOWN SIDE)	
ELBOW (UP/DOWN SIDE)	
BUTTERFLY VALVE	
BALL VALVE	
GATE VALVE	
NOT IN CONTRACT	N.I.C.
GAS	
PIPING TO BE REMOVED	
THRUST BLOCKS	
CONSTRUCTION FENCE	
SUMP PUMP DISCHARGE	SPD
UTILITY MARKER	
CONSTRUCTION FENCE NUMBER	(1)
CODED SHEET NOTE NUMBERS	
NIPPLE FOR THERMOMETER	
PIPE ANCHOR	

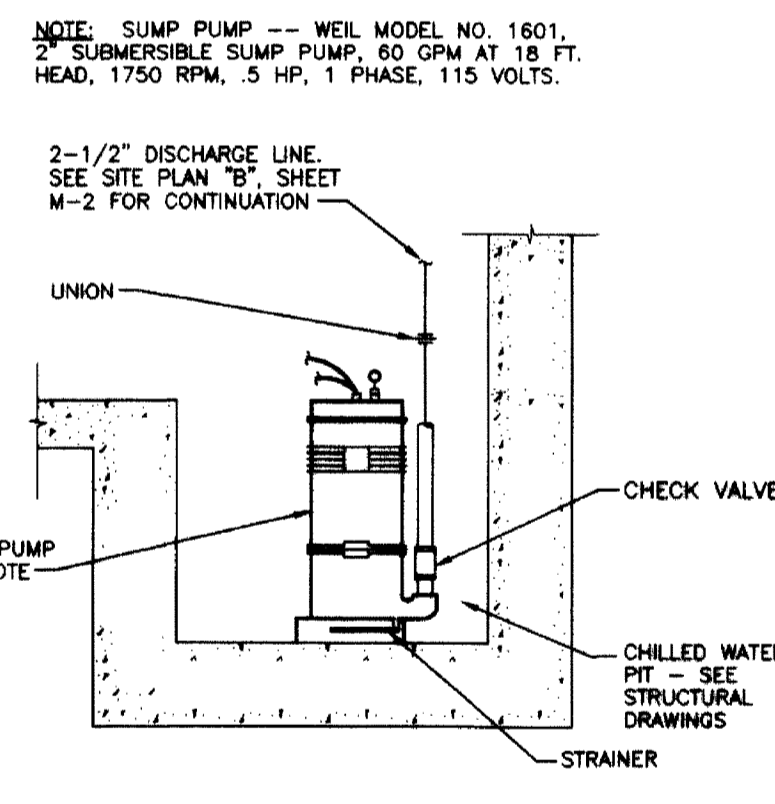
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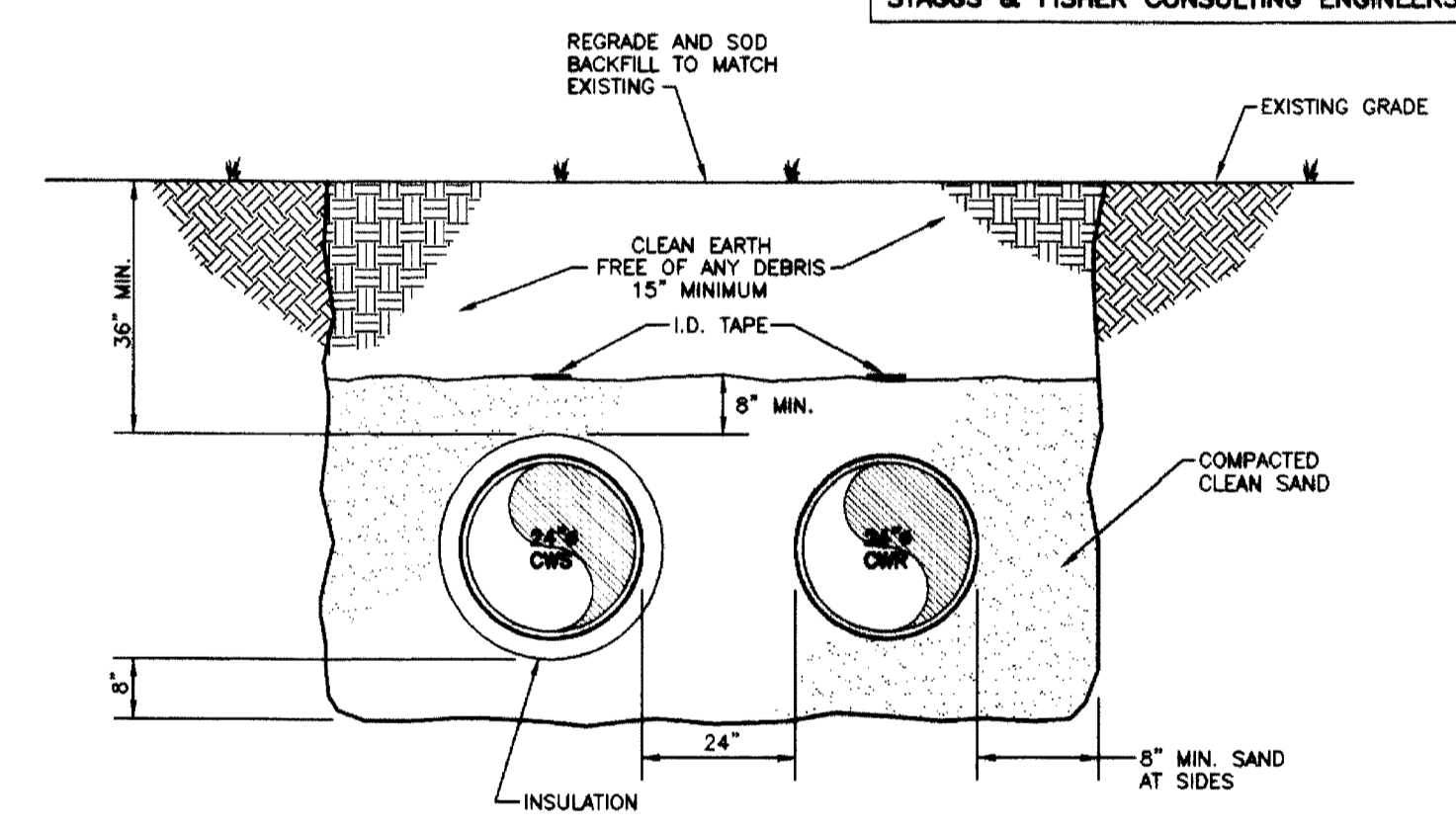
**BASE DETAIL LIGHTING STANDARD**  
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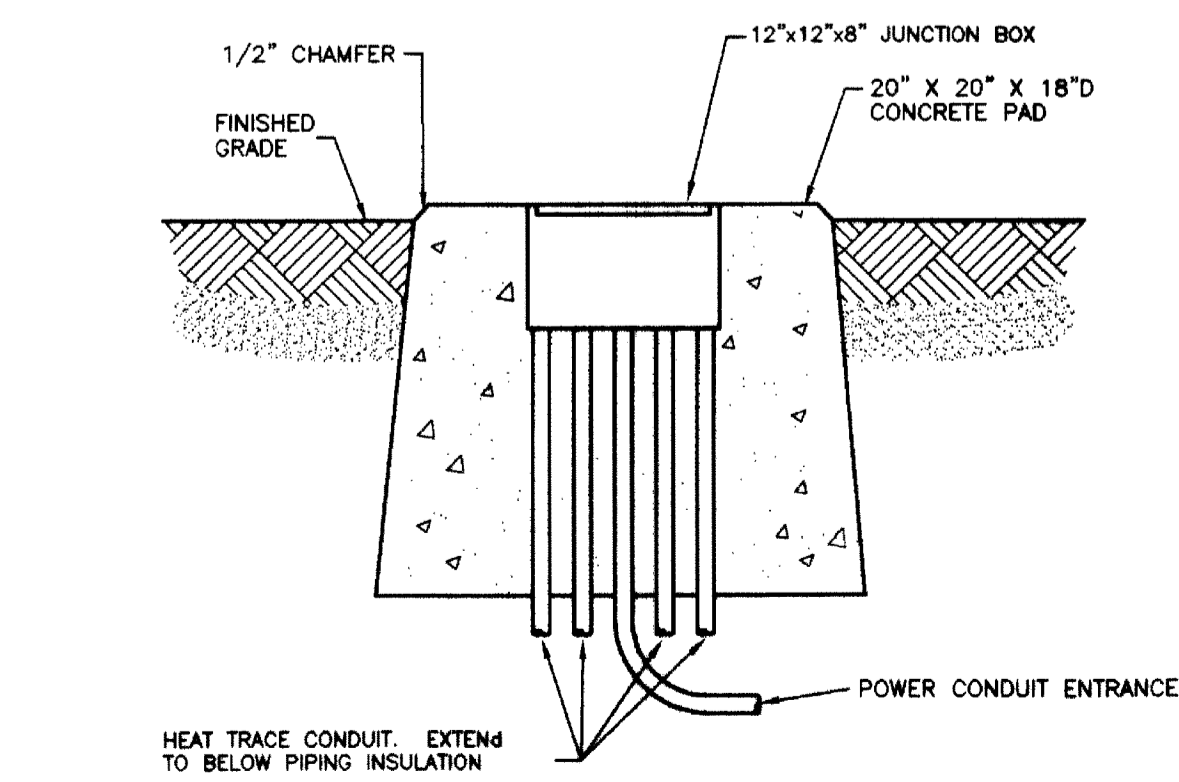
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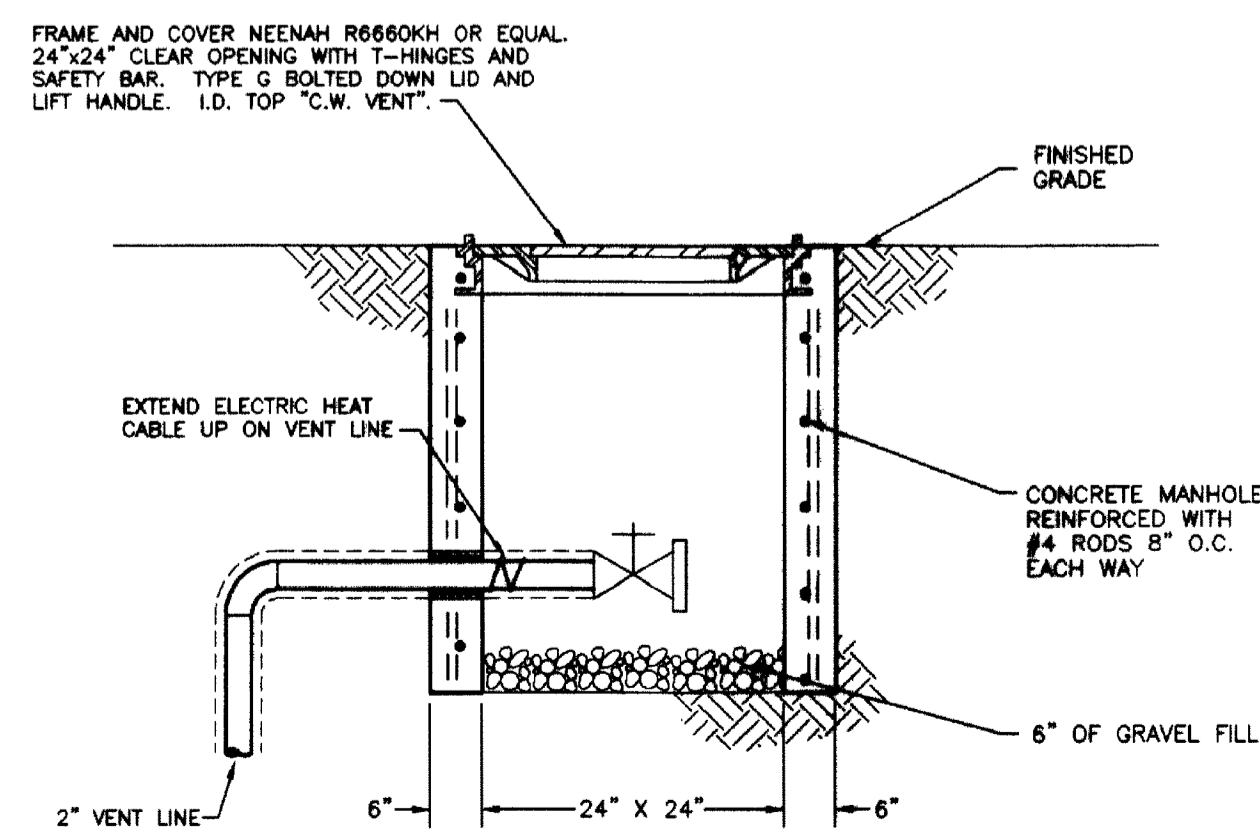
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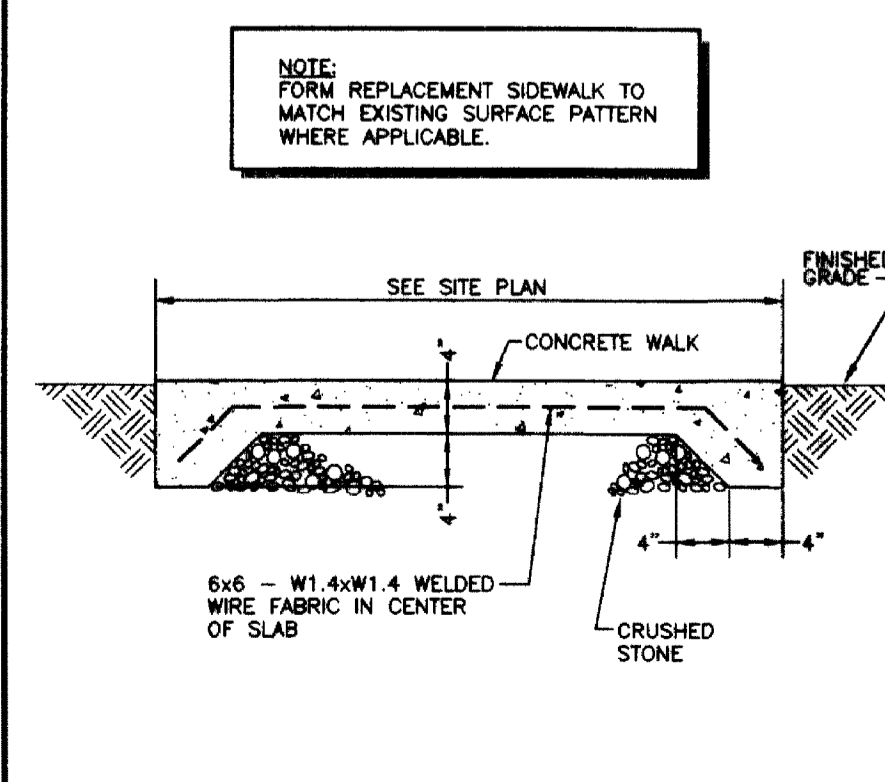
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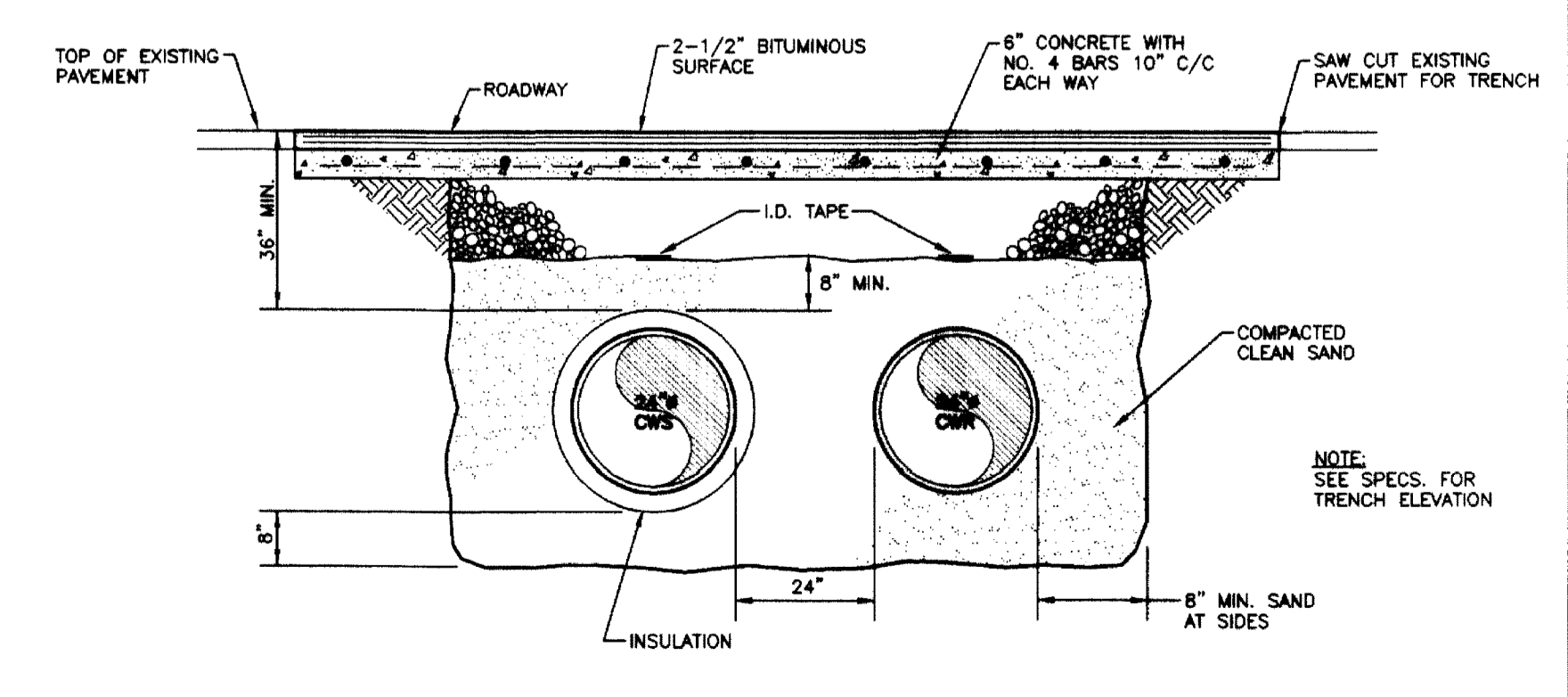
**INSTALLATION DETAIL FOR HEAT TRACE JUNCTION BOX**  
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**CHILLED WATER VENT VALVE PIT DETAIL**  
NO SCALE



**TYPICAL SIDEWALK DETAIL**  
NO SCALE



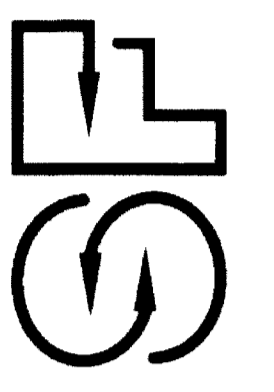
**SECTION B-6**  
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**DETAILS**  
UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER MAINS  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

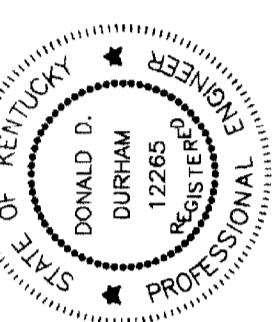
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SHEET  
**M-6**

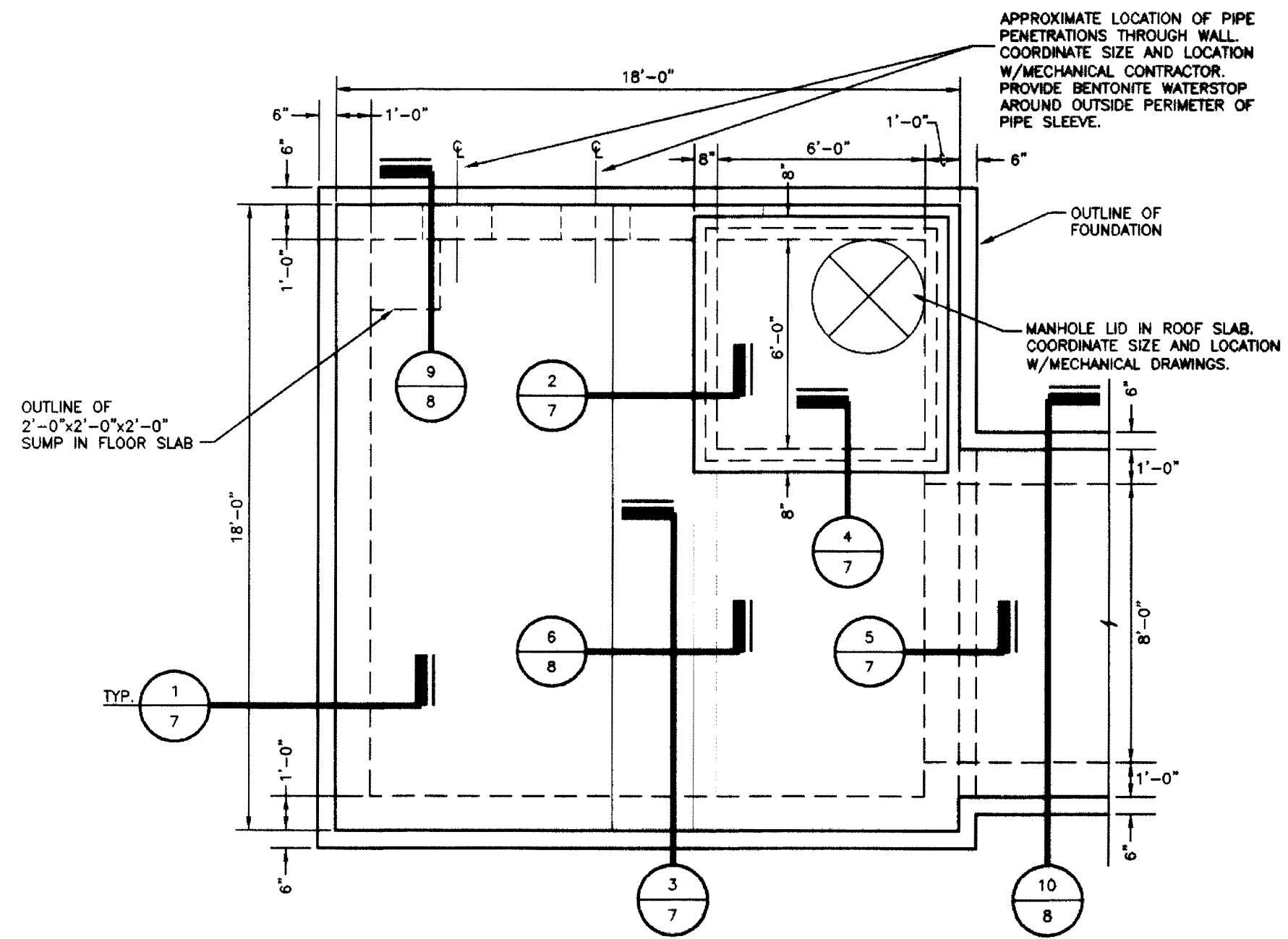
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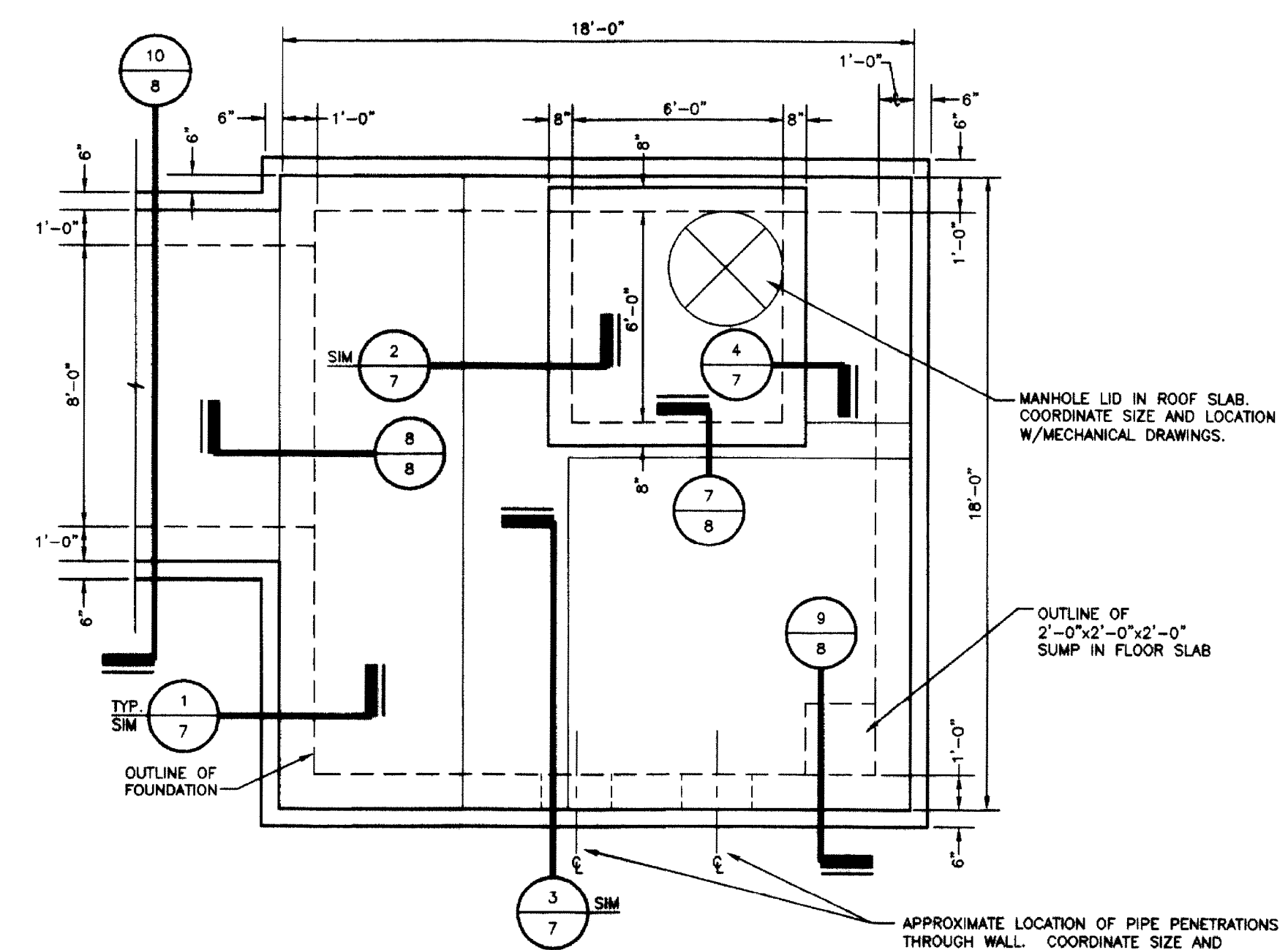
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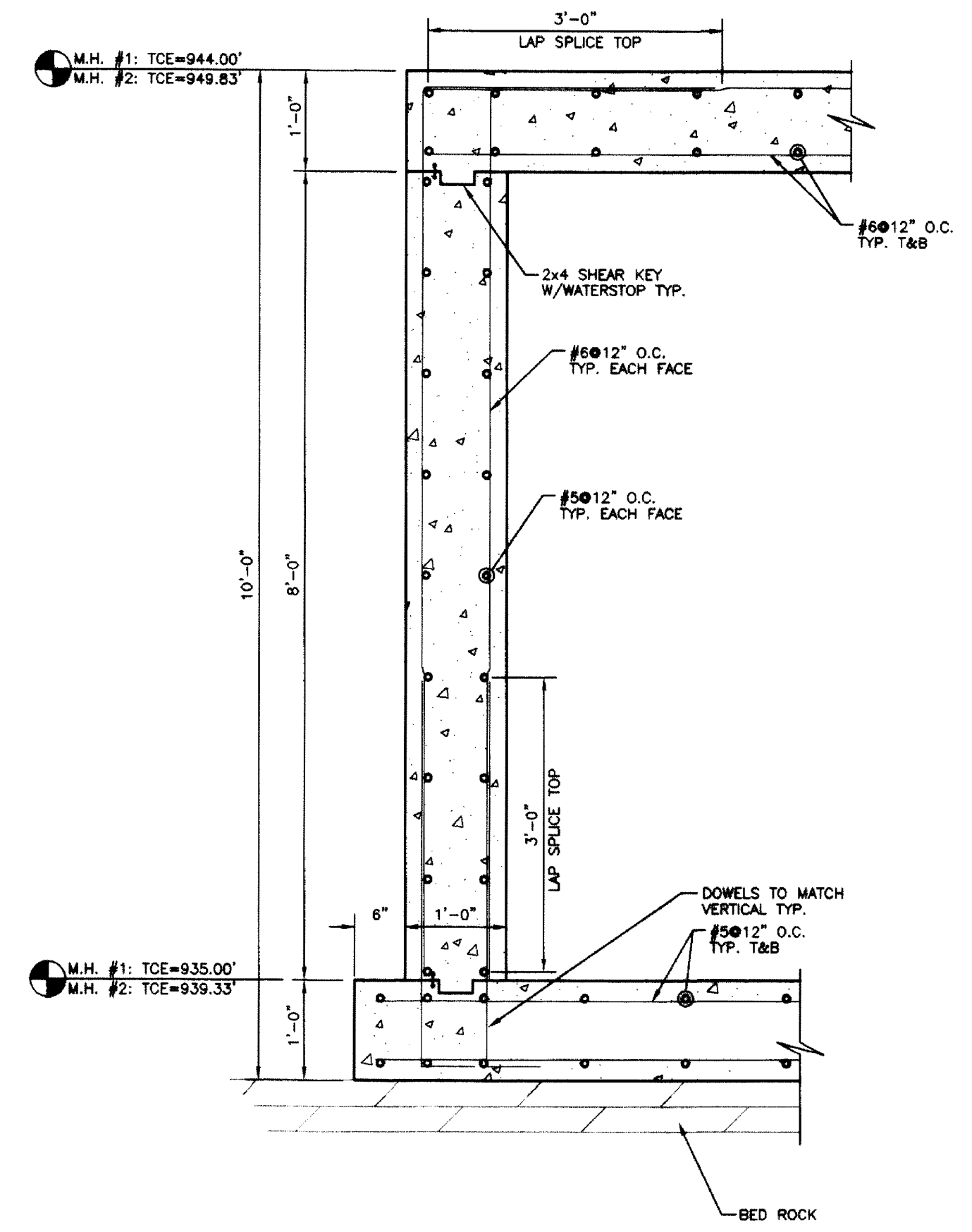
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PLAN - CHILLED WATER MANHOLE #1  
1/4" = 1'-0"

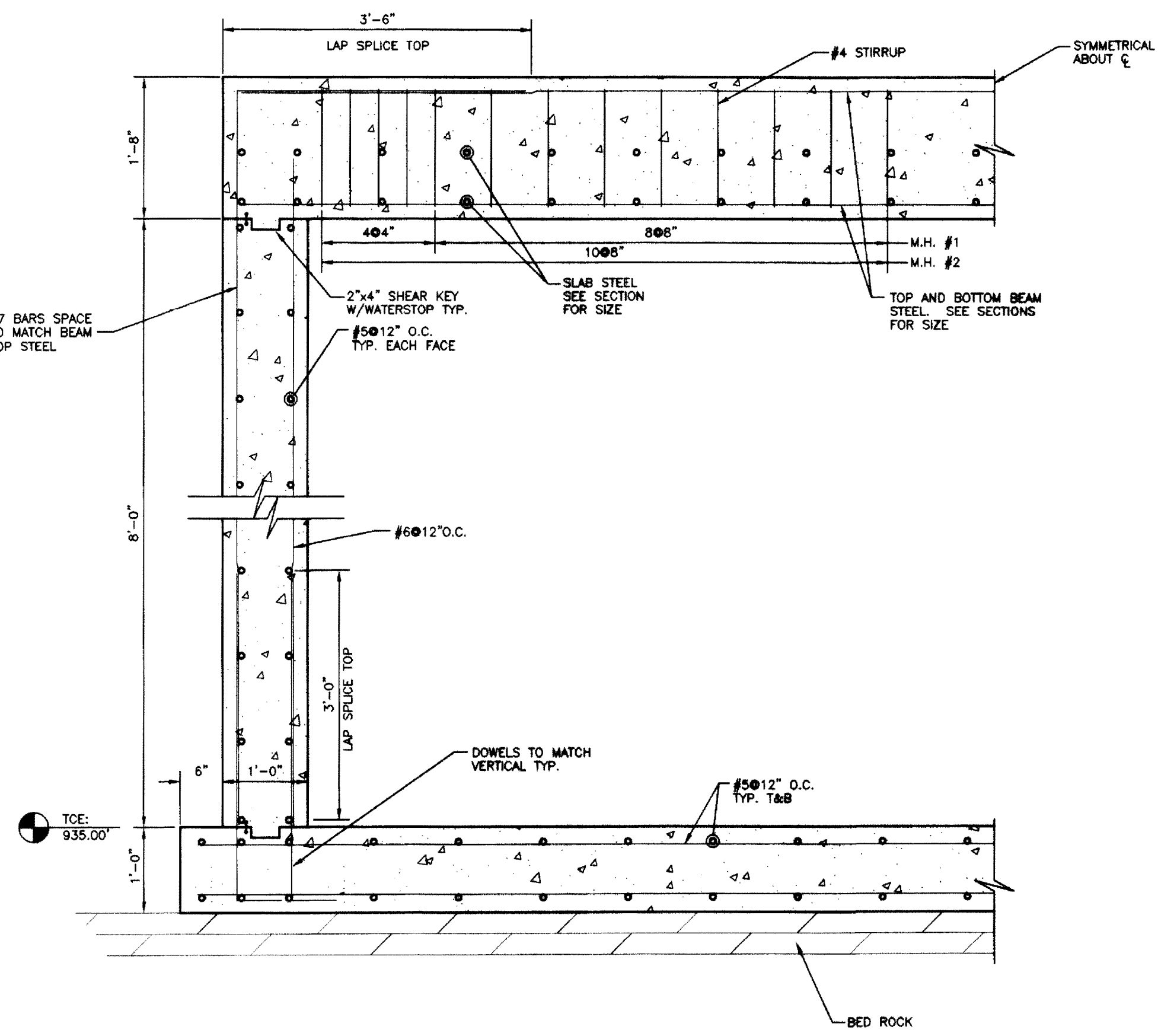


PLAN - CHILLED WATER MANHOLE #2  
1/4" = 1'-0"

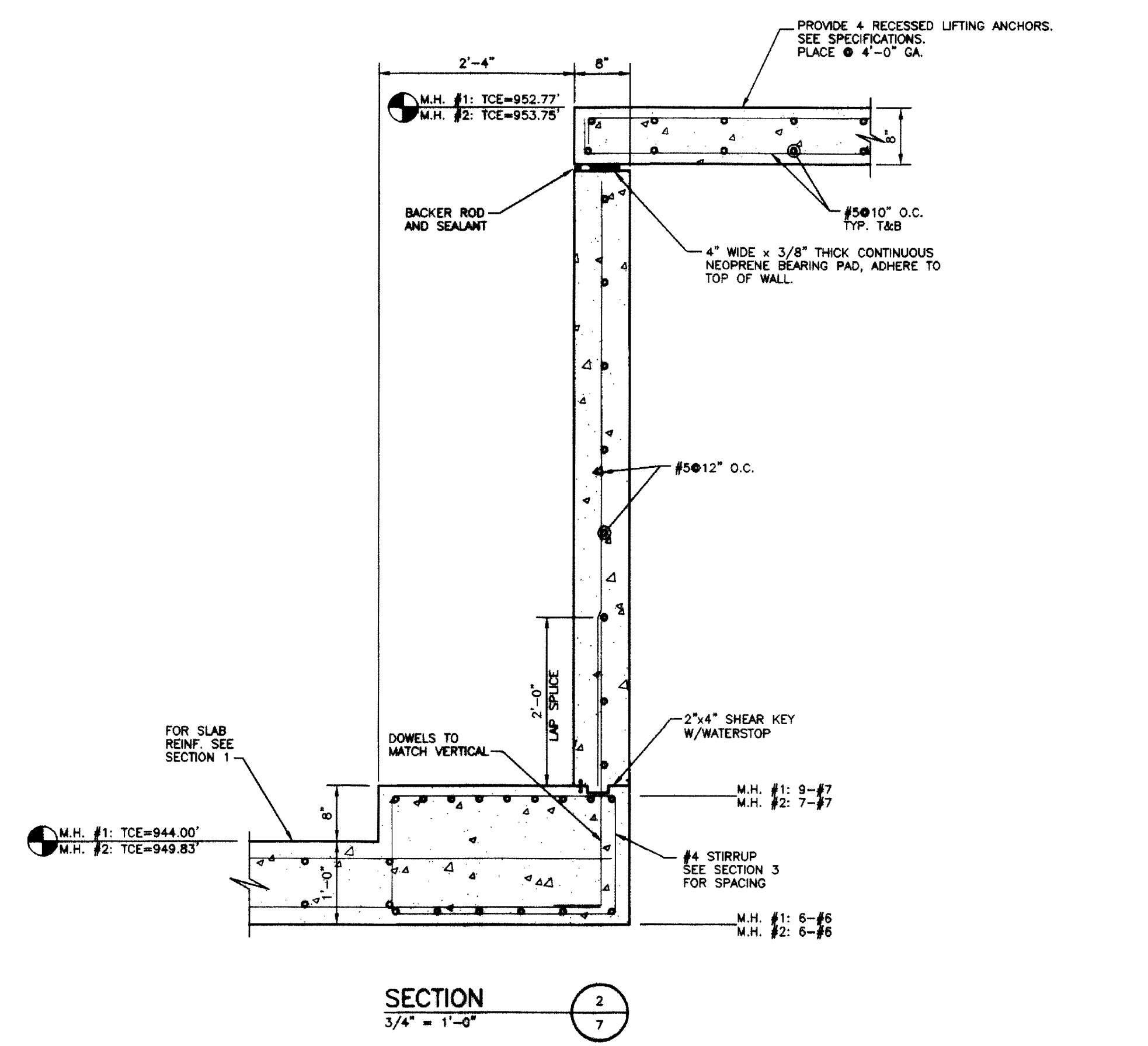


SECTION 1  
3/4" = 1'-0"

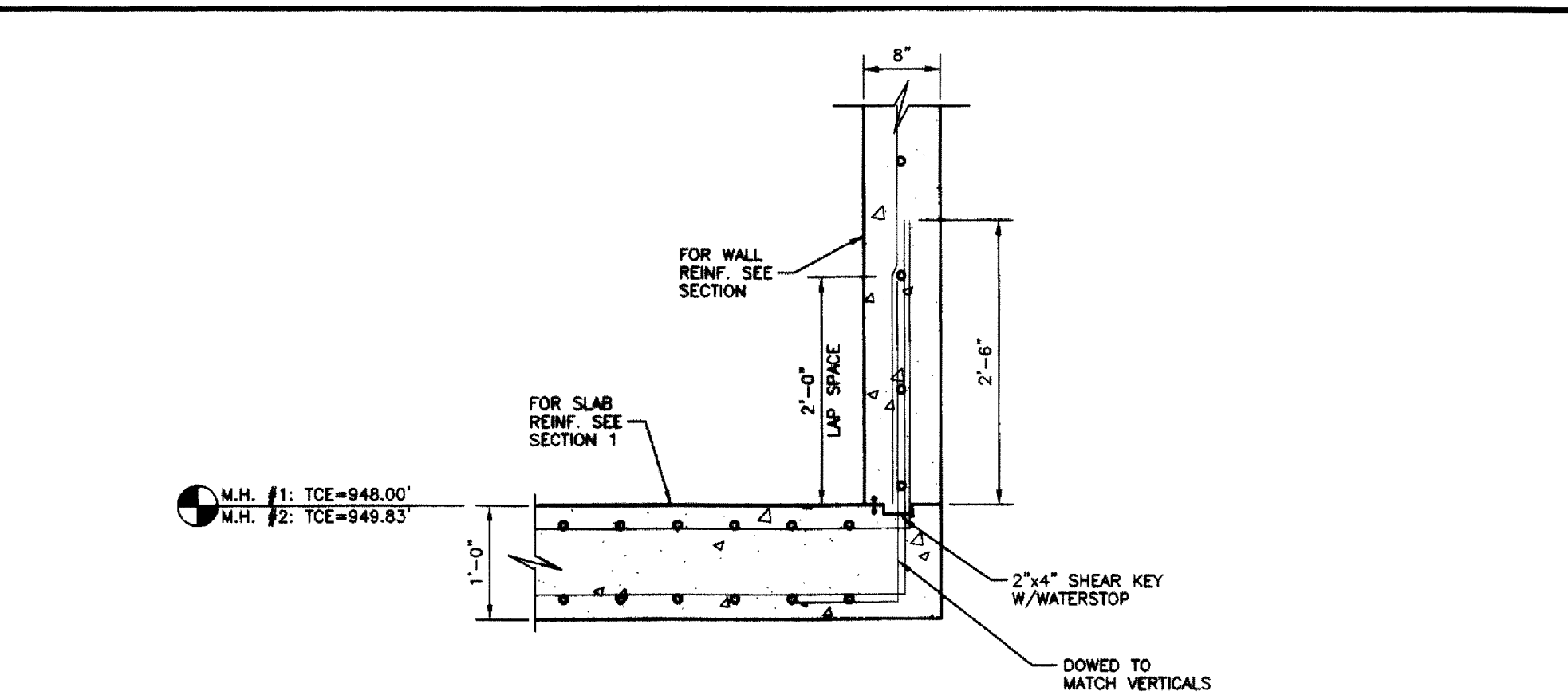
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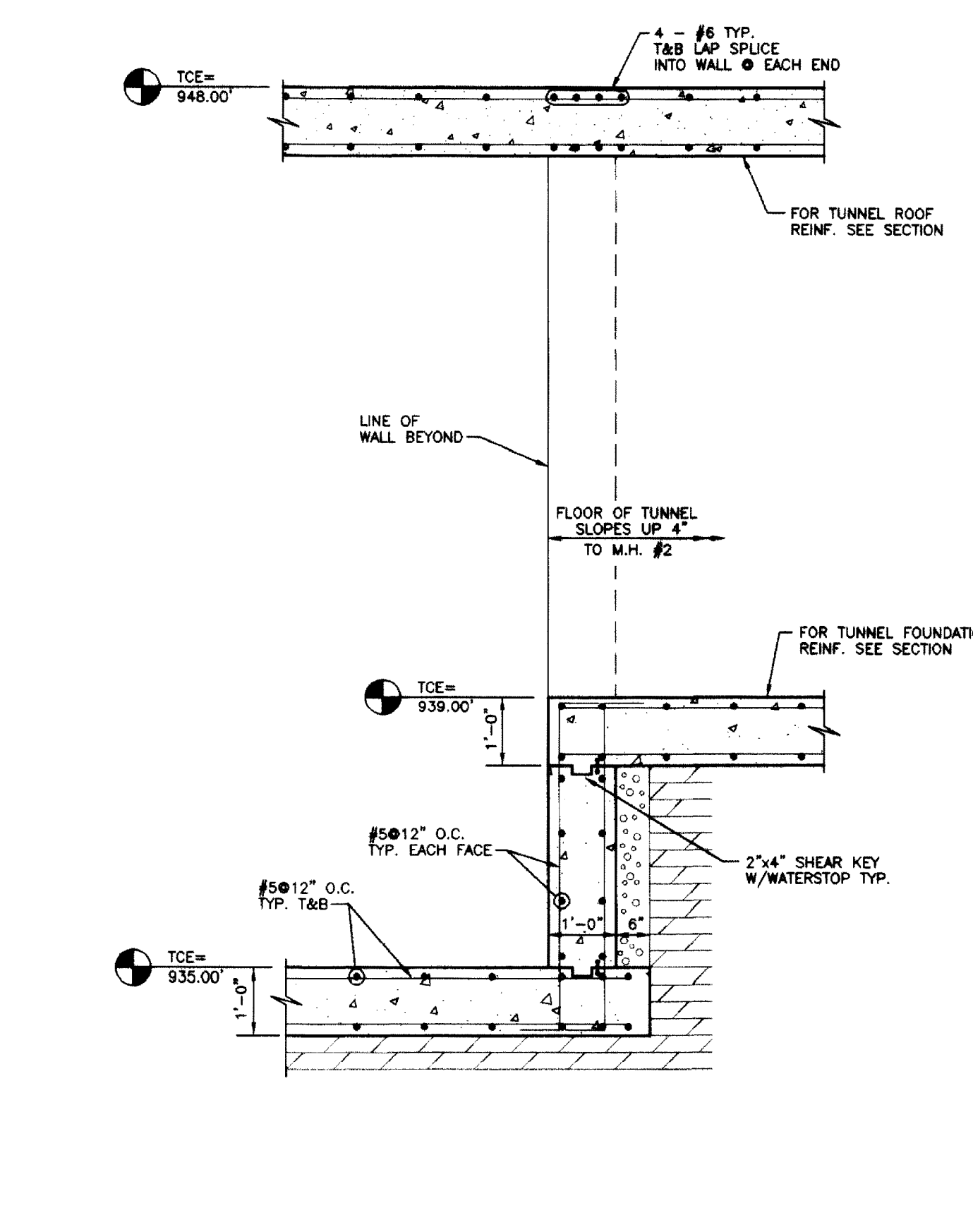
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3/4" = 1'-0"



SECTION 2  
3/4" = 1'-0"



SECTION 4  
3/4" = 1'-0"



SECTION 5  
1/2" = 1'-0"

FINAL DOCUMENTS

STRUCTURAL DETAILS AND SECTIONS  
UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER MAINS  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

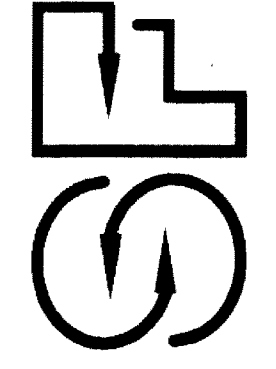
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DATE FEB., 1999  
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SCALE  
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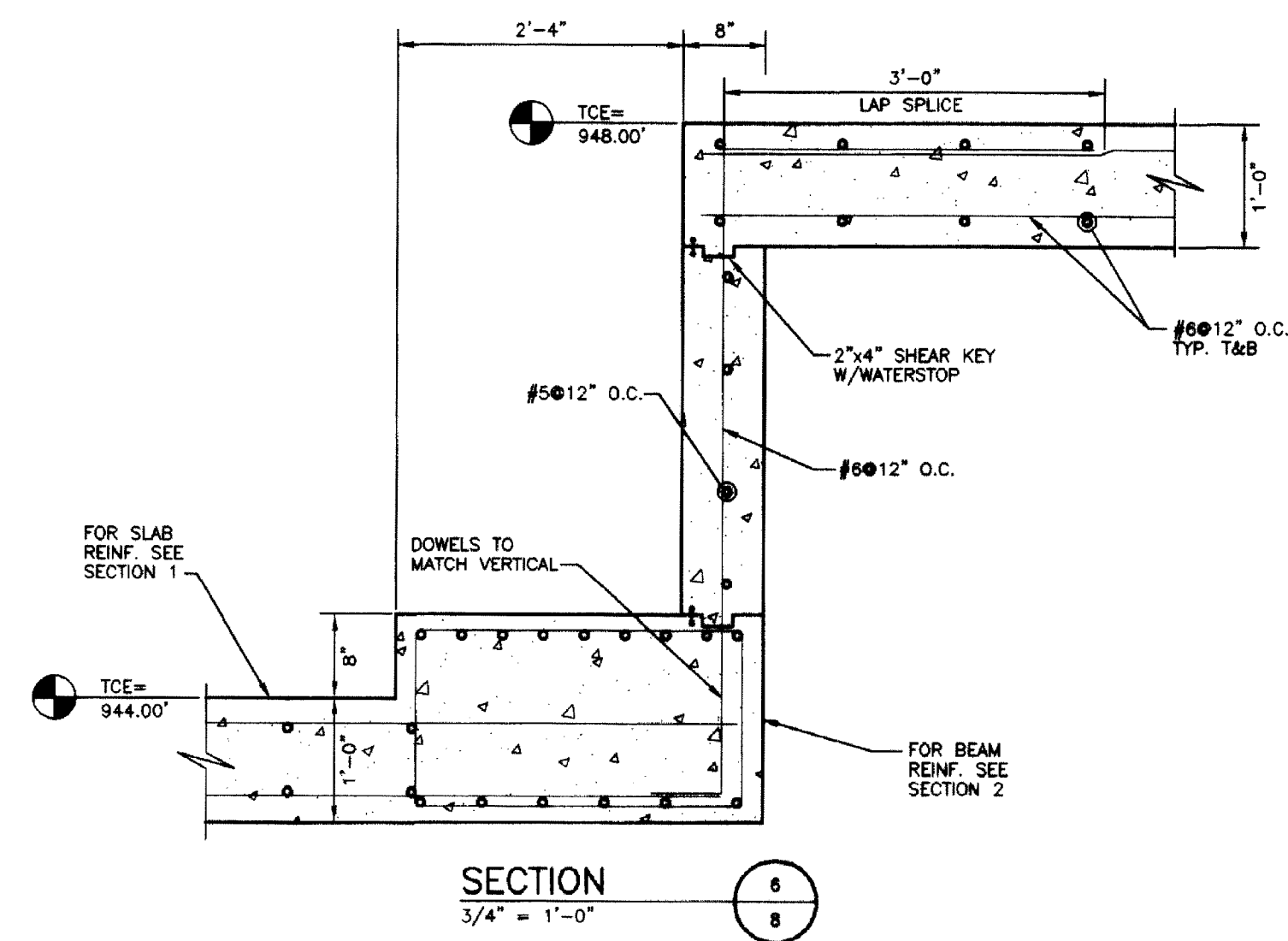
M-7

Staggs and Fisher  
Consulting Engineers, Inc.  
3264 Lochness Drive  
Lexington, Kentucky 40517  
(606)-271-3246

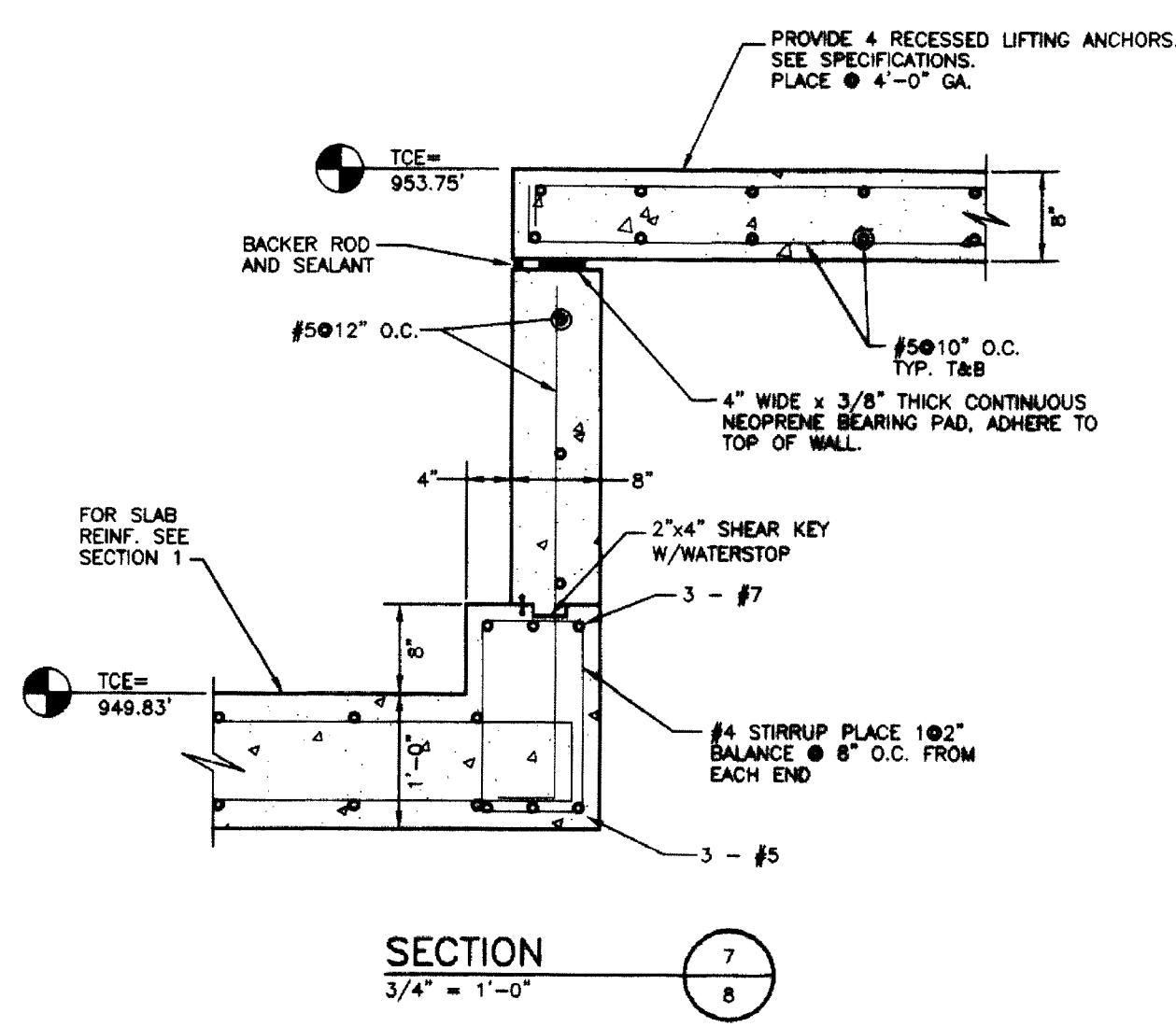


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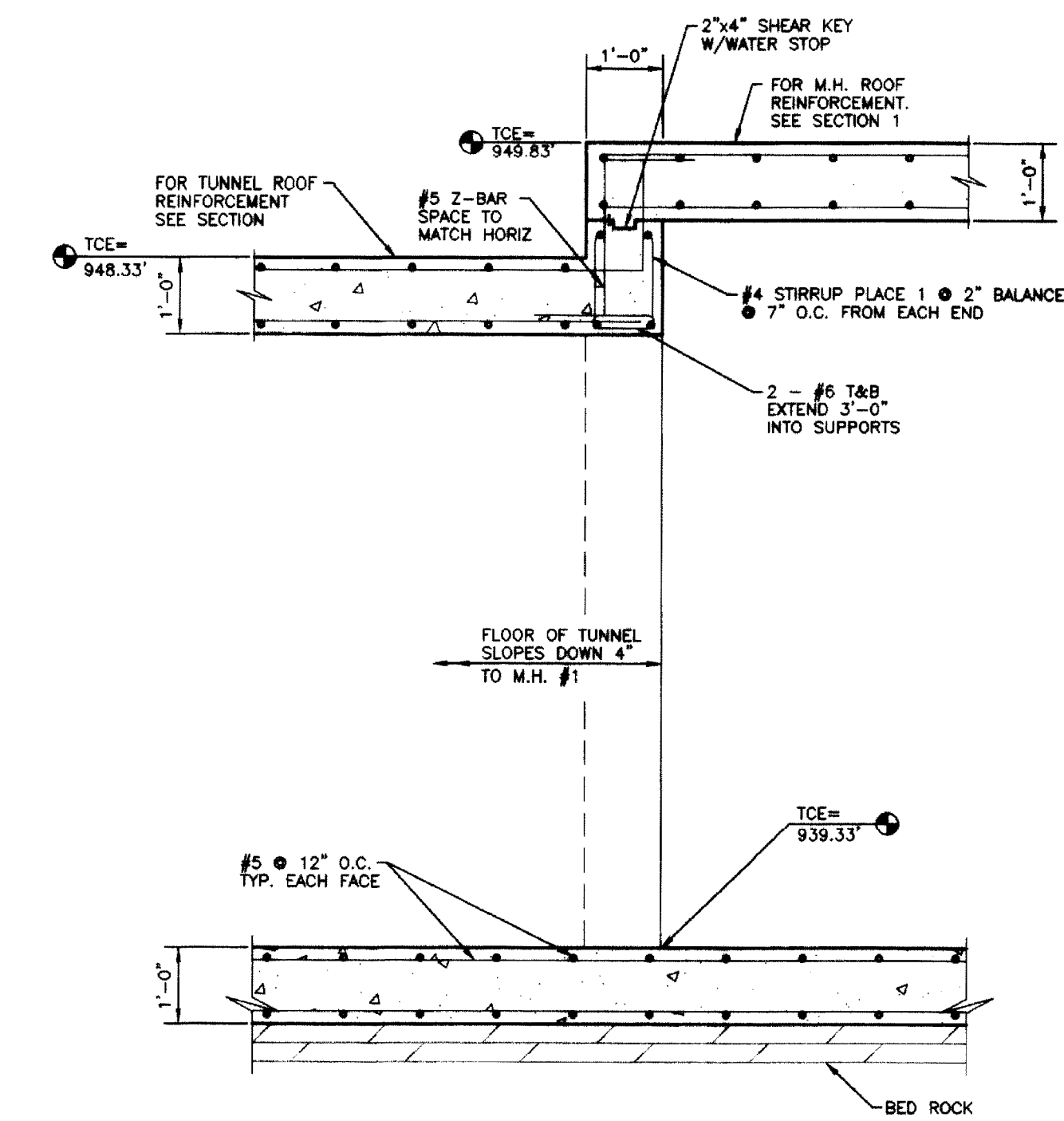




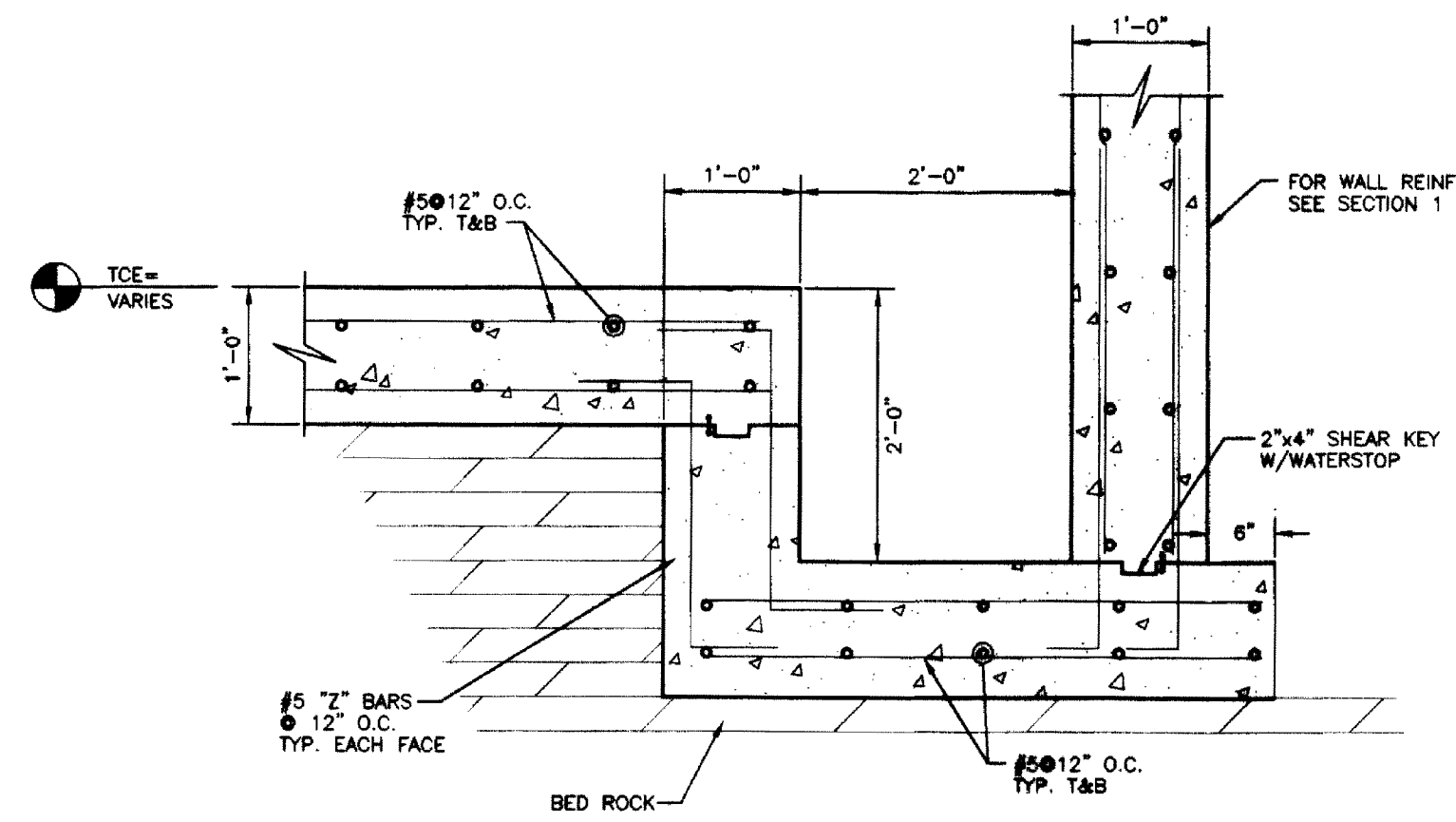
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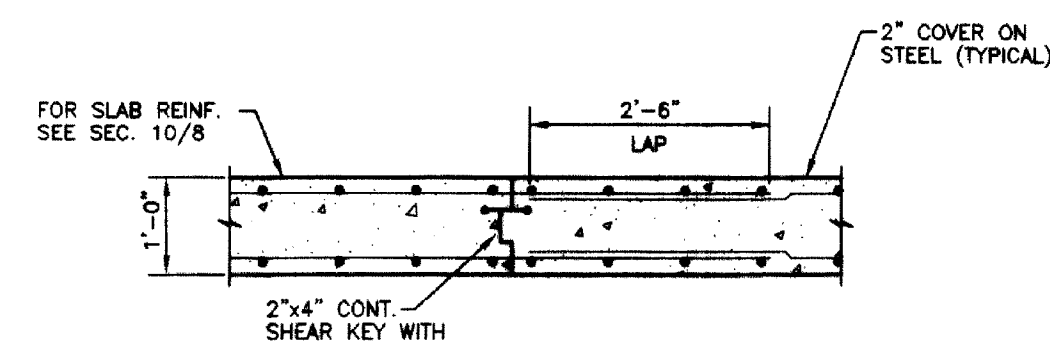
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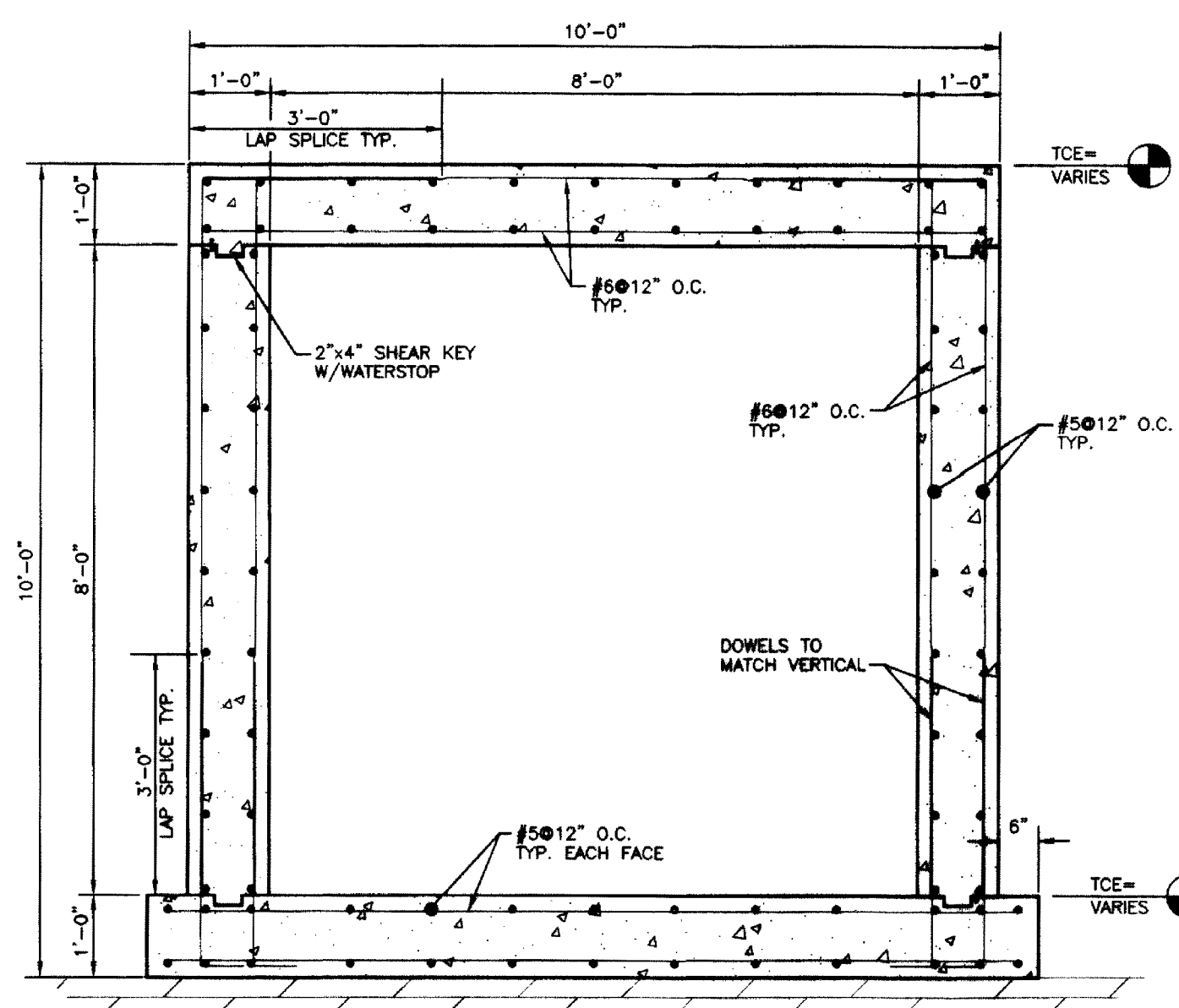
SECTION 8  
1/2" = 1'-0"



SECTION 9  
3/4" = 1'-0"



TYPICAL CONSTRUCTION JOINT  
IN TUNNEL WALL / ROOF  
NO SCALE



SECTION 10  
1/2" = 1'-0"

PART I

A. NOTES TO THE CONTRACTOR

- DRAWINGS REPRESENT THE DESIRED RESULT OF CONSTRUCTION. THE METHODS OF CONSTRUCTION AND THE RISKS INVOLVED DURING CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL MAINTAIN THE BUILDING'S STRUCTURAL INTEGRITY AT ALL STAGES OF CONSTRUCTION.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS DURING CONSTRUCTION AND REPORT TO THE ARCHITECT/ENGINEER DURING CONSTRUCTION ANY DISCREPANCIES.
- CONTRACTOR'S PROPOSED SUBSTITUTIONS SHALL BE APPROVED BY THE ARCHITECT/ENGINEER PRIOR TO COMMENCING ANY PERTINENT WORK.

B. DESIGN CRITERIA

THIS STRUCTURE HAS BEEN DESIGNED ACCORDING TO THE KENTUCKY BUILDING CODE AND FOR THE SPECIFIC LOADS WHICH ARE LISTED BELOW.

- ROAD SURCHARGE = 200 PSF
- PIPE HANGERS = 50 PSF
- AASHTO H20-44 DESIGN TRUCK LOAD

C. FOUNDATION, FILLING, AND EXCAVATION (SOIL REPORT)

THE FOLLOWING SOIL (ROCK) DESIGN INFORMATION HAS BEEN ASSUMED BY THE STRUCTURAL ENGINEER OF RECORD (S.E.R.). THE ACTUAL SOIL (ROCK) BEARING CAPACITIES AND SOIL COMPACTION REQUIREMENTS SHALL BE VERIFIED PRIOR TO COMMENCING WORK. THE S.E.R. IS NOT RESPONSIBLE FOR ANY PROBLEMS THAT OCCUR BECAUSE THESE ASSUMPTIONS OR FOR REDESIGN SERVICES IF THE ACTUAL VALUES DIFFER FROM THOSE LISTED BELOW.

- ROCK BEARING CAPACITY = 5000 PSF
- FOOTINGS SHALL BEAR ON UNWEATHERED SOUND ROCK AND THE BOTTOM OF ALL FOOTINGS SHALL BE PLACED ON A LEVEL SURFACE.
- DO NOT PLACE BACKFILL AGAINST MANHOLE OR TUNNEL WALLS UNTIL ROOF STRUCTURE IS IN PLACE.

D. CAST IN PLACE CONCRETE

- PRIOR TO FABRICATION, SUBMIT SHOP DRAWINGS FOR FABRICATION, BENDING AND PLACEMENT OF CONCRETE REINFORCEMENT. COMPLY WITH ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" SHOWING BAR SCHEDULES, STIRRUP SPACING, DIAGRAMS OF BENT BARS, ARRANGEMENT OF CONCRETE REINFORCEMENT. INCLUDE SPECIAL REINFORCEMENT REQUIRED AND OPENINGS THROUGH CONCRETE STRUCTURES.
- SUBMIT LABORATORY TEST REPORTS FOR CONCRETE MATERIALS AND MIX DESIGN TEST AS SPECIFIED BELOW.
- ALL CONCRETE SHALL DEVELOP 4000 PSI COMPRESSIVE STRENGTH IN 28 DAYS.
- REINFORCING BARS SHALL BE DEFORMED AND SHALL CONFORM TO ASTM A615, F<sub>y</sub> = 60 KSI.
- SPICES IN CONTINUOUS VERTICAL OR HORIZONTAL REINFORCING BARS SHALL BE PER LATEST EDITION OF ACI 318 OR (40) BAR DIAMETER LAP SPLICE WHICH EVER IS GREATER UNLESS NOTED AND SHALL BE EITHER CONTINUOUS OR SPLICED WITH DOWELS AT CORNERS.
- CLEARANCES BETWEEN REINFORCING BARS AND CONCRETE SURFACES SHALL BE AS FOLLOWS:

	MINIMUM COVER, IN
a) CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH	3
b) CONCRETE EXPOSED TO EARTH OR WEATHER:	
#6 THROUGH #18 BARS	2
#5 BAR AND SMALLER	1-1/2
c) CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:	
SLABS, WALLS: #11 AND SMALLER	3/4
BEAMS: PRIMARY REINFORCEMENT, STIRRUPS	1-1/2

PART II

ABBREVIATIONS

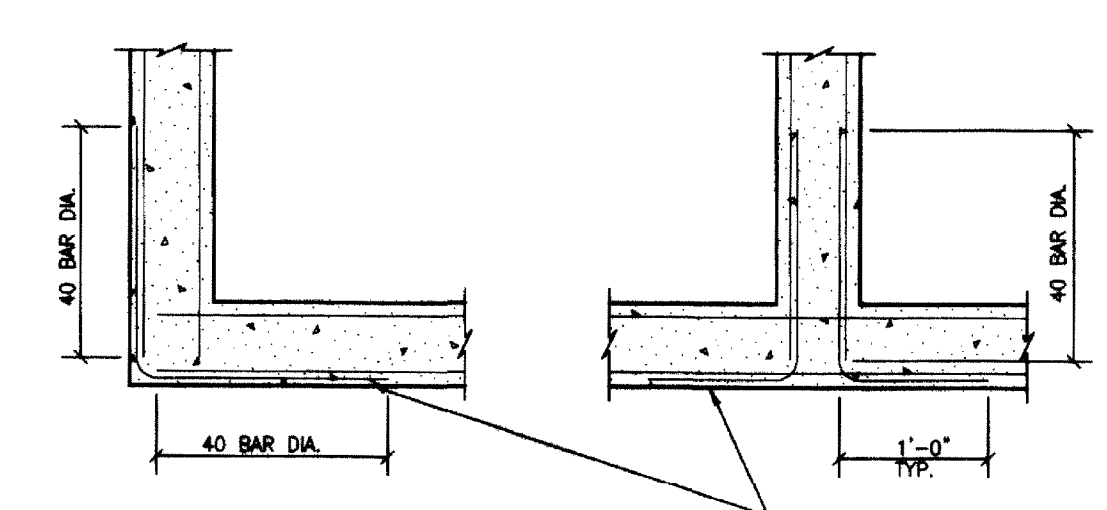
W/	WITH
T&B	TOP AND BOTTOM
T.C.E.	TOP OF CONCRETE ELEVATION
GA.	GALVE
REINF.	REINFORCING
O.C.	ON CENTER
GALV.	GALVANIZED

PART III

MATERIAL SPECIFICATIONS

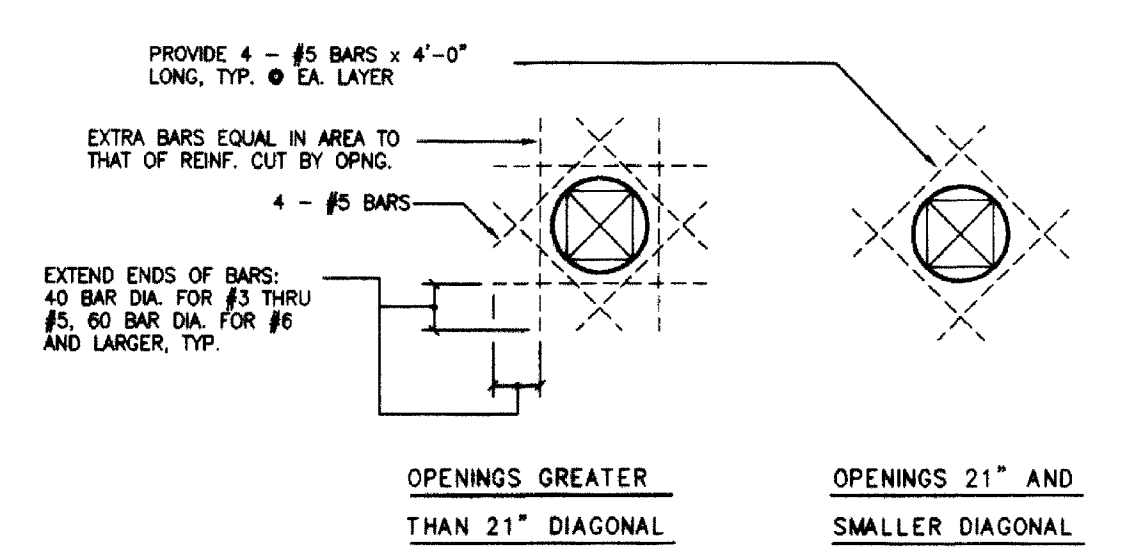
- RECESSED LIFTING ANCHORS - P-52 SL (4 TON X 3 3/4") (HOT DIPPED GALV.) COMPLETE W/
  - P-61 SL SETTING PLATE (HOT DIPPED GALV.)
  - P-62 SL COUNTER SUNK SCREW (HOT DIPPED GALV.)
  - P-66 SL TAPPED PLATE (HOT DIPPED GALV.)
  - P-56 RECESS PLUG MANUFACTURED BY DAYTON SUPERIOR OR EQUIVALENT.
- ONE-PART NONSAG URETHANE SEALANT FOR USE NT: USE ONE OF THE FOLLOWING OR EQUIVALENT PRODUCTS:
  - "DYNATROL 1"; PECORA CORP.
  - "SIKAFLEX-1A"; SIKA CORP.
  - "SIKAFLEX-15UM"; SIKA CORP.
  - "SONOLASTIC NP 11"; SONNEBORN BUILDING PRODUCTS DIV., REKXORD CHEMICAL PRODUCTS INC.
  - "DYMONIC" TREMCO INC.
- PLASTIC FOAM JOINT FILLERS: PREFORMED, COMPRESSIBLE, RESILIENT, NONWAXING, NON EXTRUDING STRIPS OF FLEXIBLE, NON GASSING PLASTIC FOAM OF MATERIAL INDICATED BELOW, NONABSORBENT TO WATER AND GAS, AND OF SIZE, SHAPE AND DENSITY TO CONTROL SEALANT DEPTH AND OTHERWISE CONTRIBUTE TO PRODUCING OPTIMUM SEALANT PERFORMANCE.
  - EITHER OPEN CELL POLYURETHANE FOAM OR CLOSED-CELL POLYETHYLENE FOAM, UNLESS OTHERWISE INDICATED, SUBJECT TO APPROVAL OF SEALANT MANUFACTURER, FOR COLD-APPLIED SEALANTS ONLY.

- WATERSTOPS: PROVIDE FLAT, DUMBBELL TYPE OR CENTER BULB TYPE WATERSTOPS AT CONSTRUCTION JOINTS AND OTHER JOINTS AS SHOWN. SIZE TO SUIT JOINTS.
    - POLYVINYL CHLORIDE (PVC) WATERSTOPS: CORPS OF ENGINEERS CRD-C572.
- PART IV  
CONTRACT SPECIFICATIONS
- 1.0 SUBMITTALS
- PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT DATA WITH APPLICATION AND INSTALLATION INSTRUCTIONS, INCLUDING REINFORCEMENT, ADMIXTURES, PATCHING COMPOUNDS, CURING COMPOUNDS AND ANY OTHERS THAT MAY BE REQUESTED BY THE ENGINEER.
  - SHOP DRAWINGS: GENERAL: SUBMIT TWO (2) SETS OF PRINTS AND ONE (1) SET TO THE ENGINEER FOR HIS REVIEW. ALL DRAWINGS SHALL BE A COMPLETE SET OF ORIGINAL DRAWINGS CREATED BY THE SUPPLIER.
  - MIX DESIGN: SUBMIT MIX DESIGN 40 DAYS PRIOR TO USE. DESIGN SUBMITTAL SHALL INCLUDE CEMENT TYPE, AGGREGATE GRADATION, COMPRESSIVE STRENGTH AT 7 DAYS AND 28 DAYS, SLUMP, AIR CONTENT, AND ADMIXTURES.
- 2.0 CONCRETE - QUALITY
- READY-MIXED CONCRETE COMPLYING WITH THESE SPECIFICATIONS AND CONFORMING TO ASTM DESIGNATION C-94, STRENGTH METHOD SHALL BE USED.
- B. TYPE CONCRETE:
- MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS - AS INDICATED ON DRAWINGS.
  - SLUMP - 3 TO 5 INCHES.
  - AIR CONTENT - 4%
- C. USE OF ADMIXTURES IS PROHIBITED EXCEPT WHERE WRITTEN CONSENT IS GIVEN BY ENGINEER.
- 3.0 COLD WEATHER REQUIREMENTS
- PROCEDURES SHALL BE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE "RECOMMENDED PRACTICE FOR WINTER CONCRETING" (ACI-306).
  - QUALITY CONTROL TESTING
- A. ENGAGE A TESTING LABORATORY ACCEPTABLE TO ENGINEER AT CONTRACTOR'S EXPENSE TO PERFORM THE FOLLOWING SERVICES:
- QUALIFICATION OF PROPOSED MATERIALS AND THE ESTABLISHMENT OF MIX DESIGNS IN ACCORDANCE WITH "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE," ACI 318, LATEST EDITION.
  - SAMPLING FRESH CONCRETE, ASTM C 172, EXCEPT MODIFIED FOR SLUMP TO COMPLY WITH ASTM C94. SAMPLING AND TESTING FOR QUALITY CONTROL DURING PLACEMENT OF CONCRETE SHALL INCLUDE THE FOLLOWING: (AS DIRECTED BY ENGINEER)
    - SLUMP: ASTM C 143; ONE TEST FOR EACH SET OF COMPRESSIVE STRENGTH TEST SPECIMENS.
    - AIR CONTENT: ASTM C 173, VOLUMETRIC METHOD FOR LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE, ASTM C 231 PRESSURE FOR NORMAL WEIGHT CONCRETE; ONE FOR EACH SET OF COMPRESSIVE STRENGTH TEST SPECIMENS.
    - CONCRETE TEMPERATURE: TEST HOURLY WHEN AIR TEMPERATURE IS 40 DEGREES F (4 DEGREES C) AND BELOW, AND WHEN 80 DEGREES F (27 DEGREES C) AND ABOVE.
    - COMPRESSION TEST SPECIMEN: ASTM C 31; ONE SET OF 4 STANDARD CYLINDERS FOR EACH COMPRESSIVE STRENGTH TEST, UNLESS OTHERWISE DIRECTED. MOLD AND STORE CYLINDERS FOR LABORATORY CURED TEST SPECIMENS EXCEPT WHEN FIELD-CURE TEST SPECIMENS ARE REQUIRED, 1 RESERVED FOR LATER TESTING IF REQUIRED.
    - COMPRESSIVE STRENGTH TESTS: ASTM C 39; ONE SET FOR EACH 100 CU.YDS. OR FRACTION THEREOF, OF EACH CONCRETE CLASS PLACED IN ANY ONE DAY OR FOR EACH 5,000 SQ. FT. OF SURFACE AREA PLACED; 1 SPECIMEN TESTED AT 7 DAYS, 2 SPECIMENS TESTED AT 28 DAYS, 1 RESERVED FOR LATER TESTING IF REQUIRED.
  - WHEN FREQUENCY OF TESTING WILL PROVIDE LESS THAN 5 STRENGTH TESTS FOR A GIVEN CLASS OF CONCRETE, CONDUCT TESTING FROM AT LEAST 5 RANDOMLY SELECTED BATCHES OR FROM EACH BATCH IF FEWER THAN 5 ARE USED.
  - WHEN TOTAL QUANTITY OF A GIVEN CLASS OF CONCRETE IS LESS THAN 50 CU. YDS. STRENGTH TEST MAY BE WAIVED BY ENGINEER IF, IN HIS JUDGMENT, ADEQUATE EVIDENCE OF SATISFACTORY STRENGTH IS PROVIDED.
  - WHEN STRENGTH OF FIELD-CURED CYLINDERS IS LESS THAN 85% OF COMPANION LABORATORY-CURED CYLINDERS, EVALUATE CURRENT OPERATIONS AND PROVIDE CORRECTIVE PROCEDURES FOR PROTECTING AND CURING THE IN-PLACE CONCRETE.
  - STRENGTH LEVEL OF CONCRETE WILL BE CONSIDERED SATISFACTORY IF 90% OF STRENGTH TEST RESULTS AND AVERAGES OF ALL SETS OF THREE CONSECUTIVE STRENGTH TEST RESULTS EQUAL OR EXCEED SPECIFIED COMPRESSIVE STRENGTH, AND NO INDIVIDUAL STRENGTH TEST RESULT FALLS BELOW SPECIFIED COMPRESSIVE BY MORE THAN 500 PSI.
- D. ADDITIONAL TESTS: THE TESTING SERVICE WILL MAKE ADDITIONAL TESTS OF IN-PLACE CONCRETE WHEN TEST RESULTS INDICATE SPECIFIED CONCRETE STRENGTHS AND OTHER CHARACTERISTICS HAVE NOT BEEN ATTAINED IN THE STRUCTURE, AS DIRECTED BY ENGINEER. TESTING SERVICE MAY CONDUCT TESTS TO DETERMINE ADEQUACY OF CONCRETE BY CORED CYLINDERS COMPLYING ASTM C 42, OR BY OTHER METHODS AS DIRECTED. CONTRACTOR SHALL PAY FOR SUCH TESTS CONDUCTED, AND ANY OTHER ADDITIONAL TESTING AS MAY BE REQUIRED, WHEN UNACCEPTABLE CONCRETE IS VERIFIED.



CORNER INTERSECTION

- NOTE:
- PROVIDE CORNER BARS AT ALL CORNERS & INTERSECTIONS.
  - TERMINATE TOP CONT. BARS W/ STANDARD ACI HOOK AT ALL CORNERS & INTERSECTIONS.



TYPICAL REINFORCING AT OPENINGS  
IN CONCRETE WALLS

RECORD DRAWINGS DATE 4/29/99

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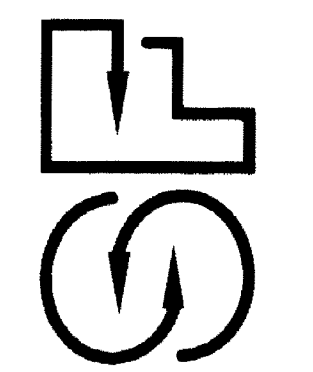
STAGGS & FISHER CONSULTING ENGINEERS, INC.

FINAL DOCUMENTS

STRUCTURAL DETAILS AND SPECIFICATIONS

UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER MAINS  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

Staggs and Fisher  
Consulting Engineers, Inc.  
3264 Lochness Drive  
Lexington, Kentucky 40517  
(606) 271-3246



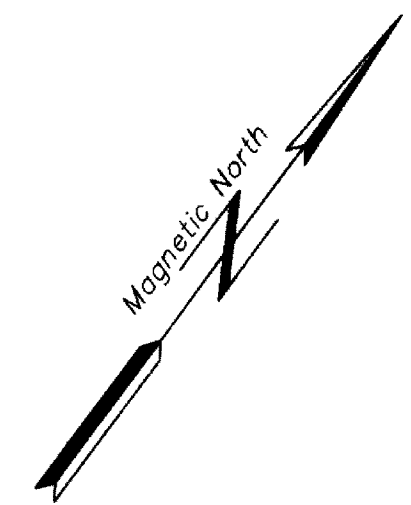
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DATE FEB. 1999

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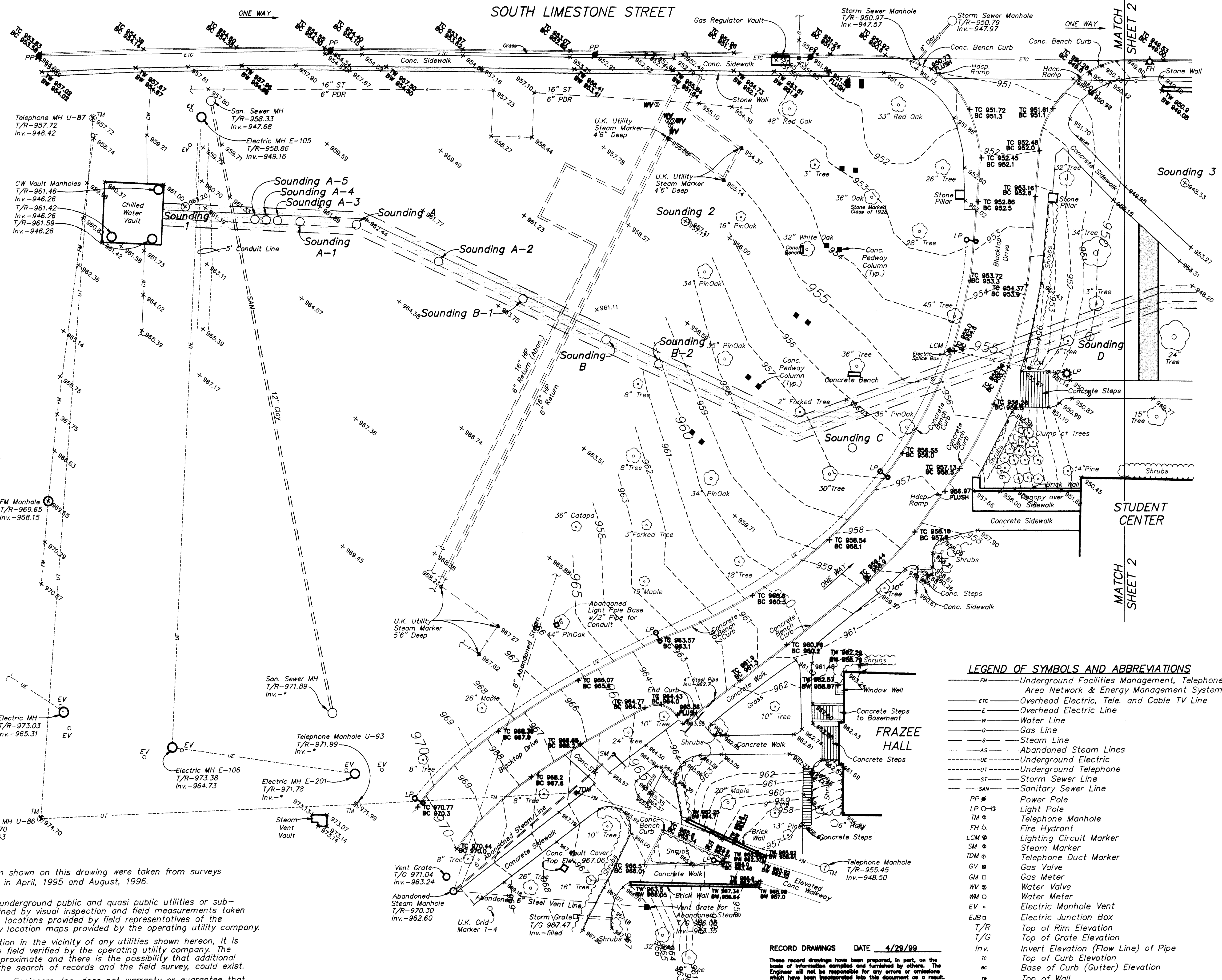
SHEET

M-8





SOUNDING TABLE		
Sounding	Top of Hole Elevation (ft.)	Top of Rock Elevation (ft.)
1	961.2	953.0
2	957.2	947.7
3	948.5	943.0
4	944.7	936.2
5	953.9	945.4
6	954.8	941.8
7	956.5	952.2
8	960.2	951.2
9	960.3	950.3
10	960.7	952.0
A	962.7	959.0
A-1	962.5	960.7
A-2	963.5	958.9
A-3	962.4	960.9
A-4	962.2	960.6
A-5	962.0	960.0
B	961.6	956.5
B-1	963.3	952.2
B-2	960.0	949.9
C	956.8	947.7
D	950.3	945.1
E	947.4	941.3
F	944.2	936.1
G	940.2	931.9

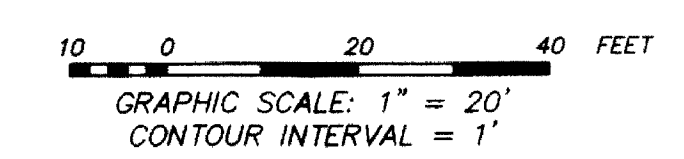


**NOTES**

- Topographic and survey information shown on this drawing were taken from surveys performed by FSM Engineers, Inc., in April, 1995 and August, 1996.
- The locations, sizes and types of underground public and quasi public utilities or sub-structures shown hereon were obtained by visual inspection and field measurements taken at the time of the survey; physical locations provided by field representatives of the operating utility company and utility location maps provided by the operating utility company. Prior to any design or construction in the vicinity of any utilities shown hereon, it is recommended that the locations be field verified by the operating utility company. The locations shown hereon are only approximate and there is the possibility that additional utility lines, not discovered during the search of records and the field survey, could exist. Fuller, Mossbarger, Scott and May Engineers, Inc. does not warranty or guarantee that the underground utility information shown hereon is accurate or complete. Any contractor, owner or designer using the information shown hereon is hereby forewarned that any excavation upon this site may result in the discovery of additional underground utilities not shown hereon.

- LEGEND OF SYMBOLS AND ABBREVIATIONS**
- FM — Undergrnd Facilities Management, Telephone, Local Area Network & Energy Management System
  - ETC — Overhead Electric, Tele. and Cable TV Line
  - E — Overhead Electric Line
  - W — Water Line
  - G — Gas Line
  - S — Steam Line
  - AS — Abandoned Steam Lines
  - UE — Underground Electric
  - UT — Underground Telephone
  - ST — Storm Sewer Line
  - SAN — Sanitary Sewer Line
  - PP — Power Pole
  - LP — Light Pole
  - TM — Telephone Manhole
  - FH — Fire Hydrant
  - LCM — Lighting Circuit Marker
  - SM — Steam Marker
  - TDM — Telephone Duct Marker
  - GV — Gas Valve
  - GM — Gas Meter
  - WV — Water Valve
  - WM — Water Meter
  - EV — Electric Manhole Vent
  - EJB — Electric Junction Box
  - T/R — Top of Rim Elevation
  - T/G — Top of Grate Elevation
  - Inv. — Invert Elevation (Flow Line) of Pipe
  - tc — Top of Curb Elevation
  - bc — Base of Curb (Gutter) Elevation
  - tw — Top of Wall
  - bw — Bottom of Wall

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Fuller, Mossbarger, Scott & May  
 ENGINEERS  
 1409 N. Forbes Rd.  
 Lexington, Kentucky 40511-2001  
 606-253-6074

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UTILITY SURVEY - EXISTING CONDITIONS  
 QUALITY LEVEL B

UNIVERSITY OF KENTUCKY  
 NORTH CAMPUS CHILLED WATER LINE  
 LEXINGTON, FAYETTE COUNTY, KENTUCKY

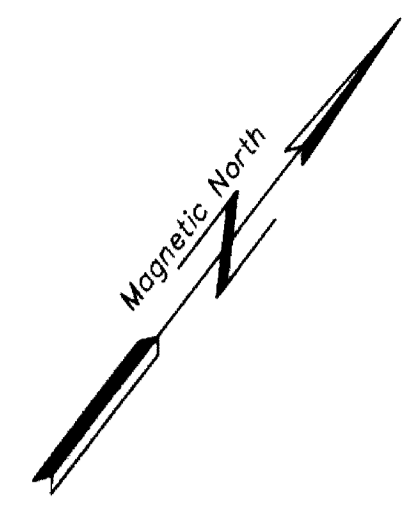
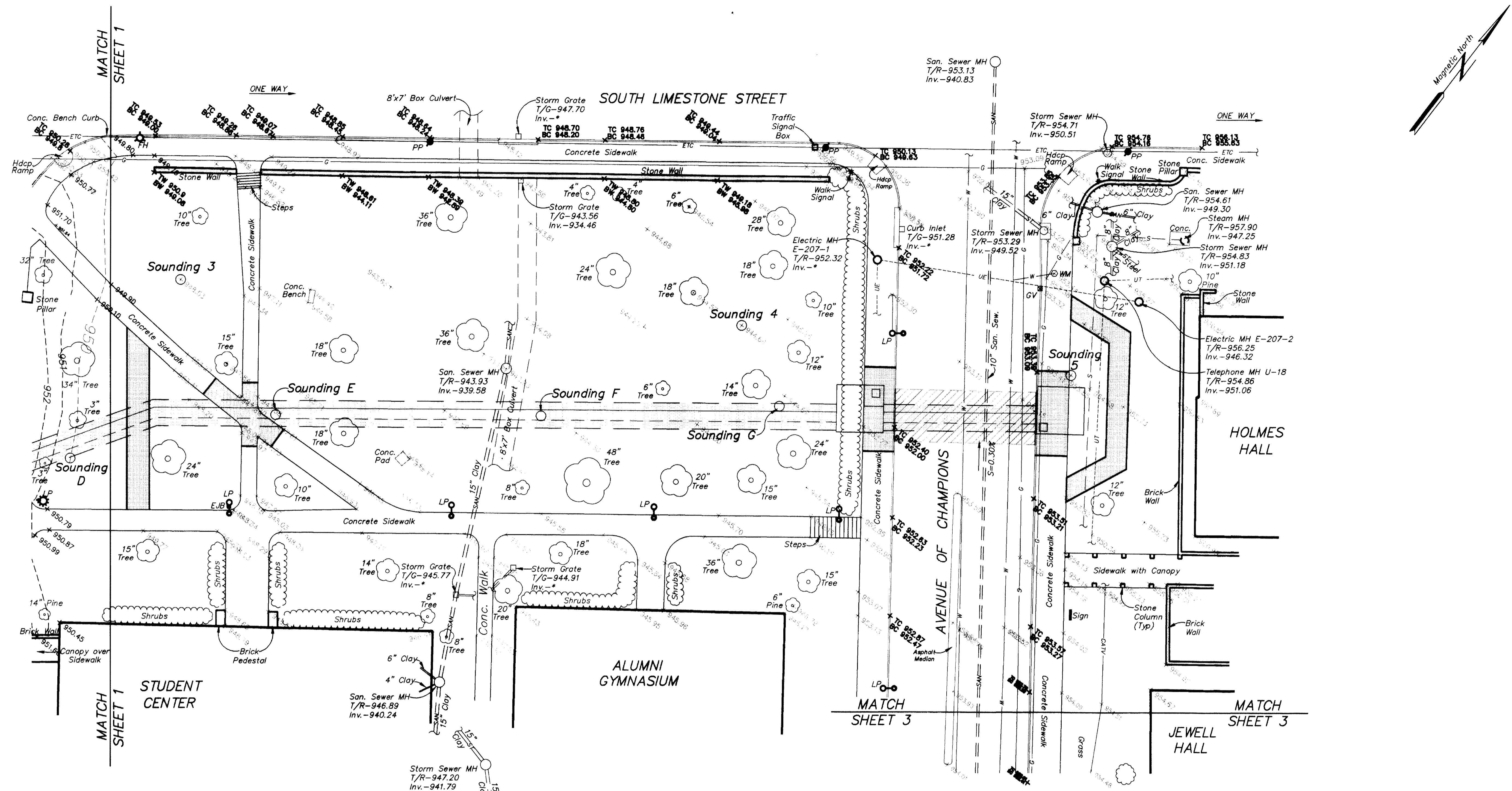
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PROJECT NO. 96220  
 DATE SEPT. 1996  
 DRAWN BY DYO/BFS  
 CHECKED BY EEL  
 CHECKED BY SLM  
 SCALE 1" = 20'  
 REVISED  
 1. 7/96 Additional Boring  
 Locations and Minor Revisions to Topo

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SHEET 1 OF 4





- LEGEND OF SYMBOLS AND ABBREVIATIONS**
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  - tc ——— Top of Curb Elevation
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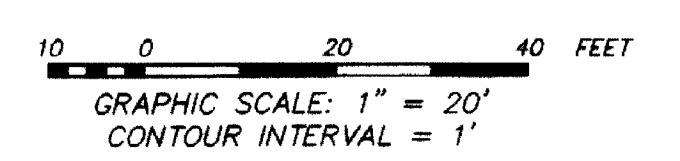
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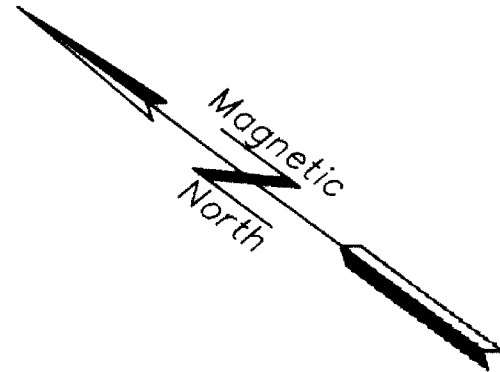
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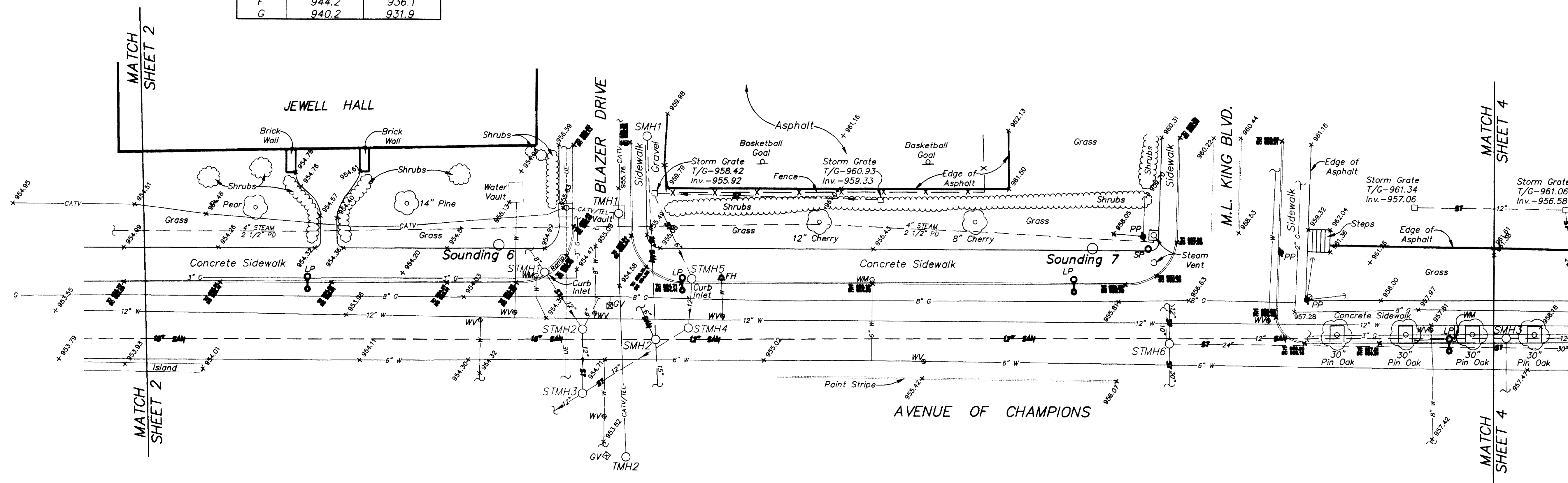




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A	962.7	959.0
A-1	962.5	960.7
A-2	963.5	958.9
A-3	962.4	960.9
A-4	962.2	960.6
A-5	962.0	960.0
B	961.6	956.5
B-1	963.3	952.2
B-2	960.0	949.9
C	956.8	947.7
D	950.3	945.1
E	947.4	941.3
F	944.2	936.1
G	940.2	931.9

**NOTES**

- Topographic and survey information shown on this drawing was taken from a survey performed by FSM Engineers, Inc., in November, 1996.
- The locations, sizes and types of underground public and quasi public utilities or sub-structures shown hereon were obtained by visual inspection and field measurements taken at the time of the survey; physical locations provided by field representatives of the operating utility company and utility location maps provided by the operating utility company. Prior to any design or construction in the vicinity of any utilities shown hereon, it is recommended that the locations be field verified by the operating utility company. The locations shown hereon are only approximate and there is the possibility that additional utility lines, not discovered during the search of records and the field survey, could exist. Fuller, Mossbarger, Scott and May Engineers, Inc. does not warranty or guarantee that the underground utility information shown hereon is accurate or complete. Any contractor, owner or designer using the information shown hereon is hereby forewarned that any excavation upon this site may result in the discovery of additional underground utilities not shown hereon.



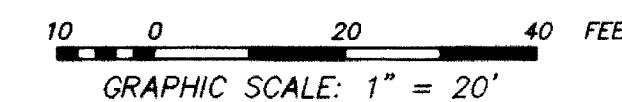
- |  |  |
|--|--|
| <p>STMH1<br/>Storm Sewer Manhole<br/>at Curb Inlet<br/>T/R-954.73<br/>Inv.-951.28 (8")<br/>Inv.-951.15 (12")</p> <p>STMH2<br/>Storm Sewer Manhole<br/>T/R-954.50<br/>Inv.-952.33 (6")<br/>Inv.-950.50 (12")<br/>Inv.-949.67 (12")</p> <p>STMH3<br/>Storm Sewer Manhole<br/>T/R-954.37<br/>Inv.-948.96 (12")<br/>Inv.-947.54 (12")</p> <p>STMH4<br/>Storm Sewer Manhole<br/>T/R-954.68<br/>Inv.-950.43 (12")<br/>Inv.-950.26 (12")</p> <p>STMH5<br/>Storm Sewer Manhole<br/>at Curb Inlet<br/>T/R-954.83<br/>Inv.-952.08 (6")<br/>Inv.-951.87 (12")</p> | <p>STMH6<br/>Storm Sewer Manhole<br/>T/R-956.04<br/>Inv.-949.71 (12")<br/>Inv.-949.21 (10")<br/>Inv.-947.54 (24")<br/>Inv.-946.63 (30")</p> <p>SMH1<br/>Sanitary Sewer Manhole<br/>T/R-956.83<br/>Inv.-949.50 (15")</p> <p>SMH2<br/>Sanitary Sewer Manhole<br/>T/R-954.78<br/>Inv.-947.03 (6")<br/>Inv.-942.45 (12")<br/>Inv.-942.45 (15")</p> <p>TMH1<br/>Telephone Manhole<br/>T/R-955.55<br/>Bottom-948.22</p> <p>TMH2<br/>Telephone Manhole<br/>T/R-953.90<br/>CATV-949.90<br/>Bottom-948.90</p> |
|--|--|

- LEGEND**
- SAN — Sanitary Sewer Line
  - SF — Storm Sewer Line
  - W — Water Line
  - G — Gas Line
  - CATV — Cable TV Line
  - UE --- Underground Electric Line
  - PP Power Pole
  - LP Light Pole
  - SP Traffic Light Pole
  - WM Water Meter
  - WV Water Valve
  - GM Gas Meter
  - GV Gas Valve
  - FH Fire Hydrant
  - STMH Storm Sewer Manhole
  - SMH Sanitary Sewer Manhole
  - TMH Telephone Manhole
  - T/R Top of Rim Elevation
  - T/G Top of Grate Elevation
  - Inv. Invert (Flow Line) of Pipe/Structure
  - TC Top of Curb Elevation
  - BC Base of Curb (Gutter Line) Elevation

RECORD DRAWINGS DATE 4/29/99

These record drawings have been prepared, in part, on the basis of information compiled and furnished by others. The Engineer will not be responsible for any errors or omissions which have been incorporated into this document as a result.

STAGGS & FISHER CONSULTING ENGINEERS, INC.



UTILITY SURVEY - EXISTING CONDITIONS  
QUALITY LEVEL B

UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER LINE  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

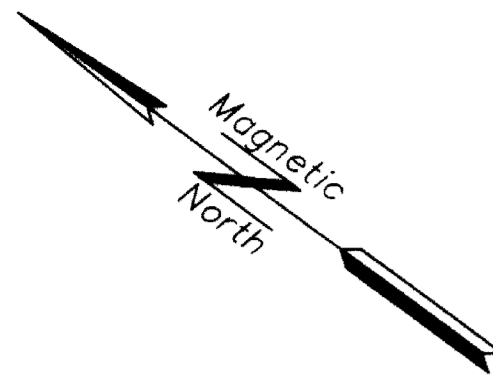
PROJECT NO.	96220
DATE	NOV., 1996
DRAWN BY	BFS
CHECKED BY	EEL
CHECKED BY	SLM
SCALE	1" = 20'
REVISED	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

SHEET  
**3 OF 4**

Fuller Mossbarger Scott & May ENGINEERS

Fuller Mossbarger Scott & May ENGINEERS, INC.  
1409 N. Forbes Rd.  
Lexington, Kentucky 40511-2050  
606-253-0574





SOUNDING TABLE		
Sounding	Top of Hole Elevation (ft.)	Top of Rock Elevation (ft.)
1	961.2	953.0
2	957.2	947.7
3	948.5	943.0
4	944.7	936.2
5	953.9	945.4
6	954.8	941.8
7	956.5	952.2
8	960.2	951.2
9	960.3	950.3
10	960.7	952.0
A	962.7	959.0
A-1	962.5	960.7
A-2	963.5	958.9
A-3	962.4	960.9
A-4	962.2	960.6
A-5	962.0	960.0
B	961.6	956.5
B-1	963.3	952.2
B-2	960.0	949.9
C	956.8	947.7
D	950.3	945.1
E	947.4	941.3
F	944.2	936.1
G	940.2	931.9

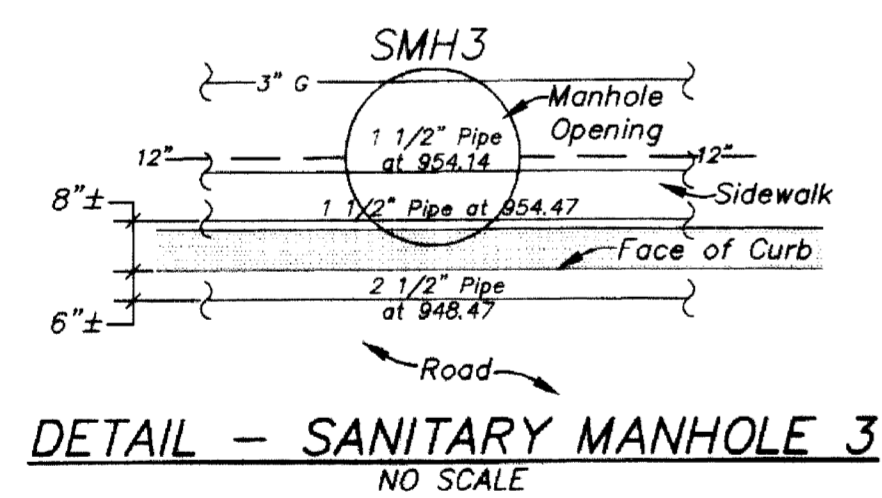
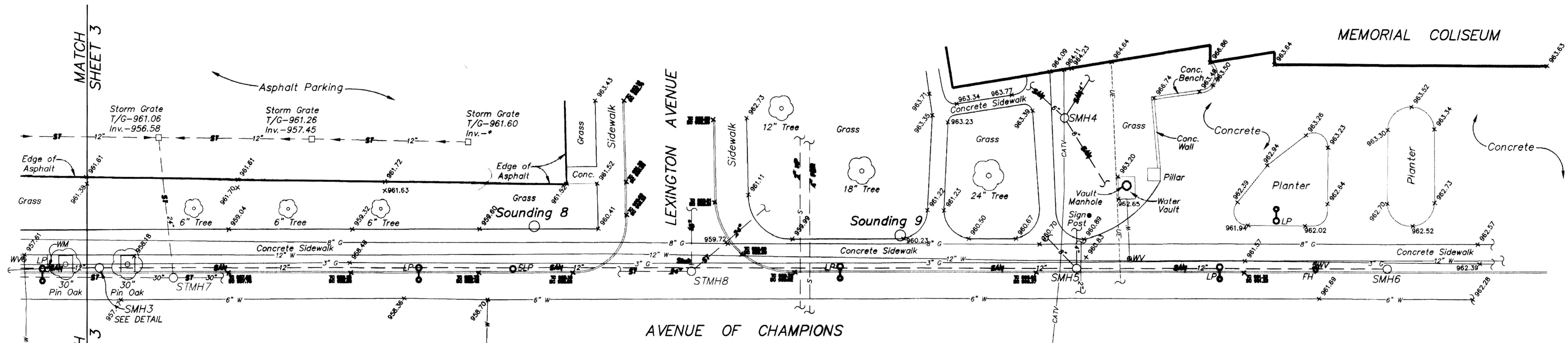
**NOTES**

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FULLER  
MOSSBARGER  
SCOTT AND MAY  
ENGINEERS, INC.  
1409 N. Forbes Rd.  
Lexington, Kentucky  
40511-2050  
606-253-6574

**FSM**  
ENGINEERS

Fuller  
Mossbarger  
Scott &  
May

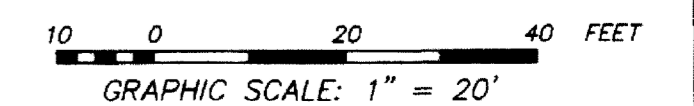


- LEGEND**
- SAN — Sanitary Sewer Line
  - ST — Storm Sewer Line
  - W — Water Line
  - G — Gas Line
  - CATV — Cable TV Line
  - UE — Underground Electric Line
  - S — Steam Line
  - PP ● Power Pole
  - LP ○ Light Pole
  - SP ○ Traffic Light Pole
  - WM ○ Water Meter
  - WV ○ Water Valve
  - GM □ Gas Meter
  - GV □ Gas Valve
  - FH ○ Fire Hydrant
  - STMH ○ Storm Sewer Manhole
  - SMH ○ Sanitary Sewer Manhole
  - TMH ○ Telephone Manhole
  - T/R Top of Rim Elevation
  - T/G Top of Grate Elevation
  - Inv. Invert (Flow Line) of Pipe/Structure
  - TC 967.85 Top of Curb Elevation
  - BC 967.85 Base of Curb (Gutter Line) Elevation

- |   |  |
|---|--|
| STMH7<br>Storm Sewer Manhole<br>T/R-957.45<br>Inv.-950.12 (24")<br>Inv.-949.28 (30")              | SMH4<br>Sanitary Sewer Manhole<br>T/R-963.36<br>Inv.-959.86 (4")<br>Inv.-959.69 (6")<br>Inv.-959.69 (8")                       |
| STMH8<br>Storm Sewer Manhole<br>T/R-959.26<br>Inv.-952.84 (15")<br>(Blocked)<br>Inv.-952.31 (24") | SMH5<br>Sanitary Sewer Manhole<br>T/R-960.85<br>Inv.-958.60 (4")<br>Inv.-955.60 (8")<br>Inv.-946.85 (12")<br>Depth-949.35 (2") |
| SMH3<br>Sanitary Sewer Manhole<br>T/R-957.64<br>Inv.-945.06 (12")                                 | SMH6<br>Sanitary Sewer Manhole<br>T/R-962.11<br>8" Vertical Pipe<br>Top-957.78<br>Water Surface-950.28<br>Bottom-948.36        |

Existing topography in this area was taken from mapping supplied by the University of Kentucky, and is shown solely for the purpose of locating Sounding 10.

RECORD DRAWINGS DATE 4/29/99  
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STAGGS & FISHER CONSULTING ENGINEERS, INC.



UTILITY SURVEY - EXISTING CONDITIONS  
QUALITY LEVEL B

UNIVERSITY OF KENTUCKY  
NORTH CAMPUS CHILLED WATER LINE  
LEXINGTON, FAYETTE COUNTY, KENTUCKY

PROJECT NO.	96220
DATE	NOV., 1996
DRAWN BY	BFS
CHECKED BY	EFL
CHECKED BY	SLM
SCALE	1" = 20'
REVISED	
1	
2	
3	
4	
5	
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8	