
# PROCEDURES MANUAL

# FOR RICHMOND UTILITIES

# INFRASTRUCTURE DEVELOPMENT

# 2002

# REVISED 2007

# INDEX OF STANDARD DRAWINGS

DRAWING NO. DRAWING DESCRIPTION

## SANITARY SEWER DETAILS



## WATER TRANSMISSION MAIN DETAILS



## MISCELLANEOUS DETAILS – WATER AND SEWER



| DATE | REVISION |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

INDEX OF DRAWINGS

NOTES:

*TOP SOIL SHALL BE STRIPPED AND STORED AT BEGINNING OF CONSTRUCTION. IT SHALL BE REPLACED ON TOP 12 INCHES OF ALL TRENCHES AND/OR AREAS DISTURBED BY CONSTRUCTION.

*ALL SANITARY SEWERS SHALL HAVE LOW PRESSURE AIR TEST, DEFLECTION TEST, AND VACUUM TESTED PER SPECIFICATIONS. VIDEO TAPING MAY OR MAY NOT BE REQUIRED.

*SEWERS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATER MAIN. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.

*SURFACE DRAINAGE SHALL BE MAINTAINED ON A DAY-BY-DAY BASIS.

*THE CONTRACTOR WILL BE REQUIRED TO DISPOSE OF ALL EXCESS EXCAVATED MATERIAL FROM THE SEWER LINE CONSTRUCTION.

*THE SANITARY INLET SHALL BE AT A MINIMUM OF 6 INCHES ABOVE THE TOP OF BOTH OF THE ADJACENT SANITARY MANHOLES.

*IN THE EVENT IT IS NOT POSSIBLE TO MAINTAIN THE INLET 6 INCHES ABOVE THE ADJACENT MANHOLES. THE DEVELOPER AND/OR BUILDER SHALL PROVIDE AN ADEQUATE MEANS TO PUMP TO PUBLIC SANITARY SEWER. THIS SHALL BE DETERMINED BY THE ENGINEER.

*NOTE: TYPICAL JOINT BETWEEN DIFFERENT PIPE TYPES

A FLEXIBLE NEOPRENE BOOT COUPLING WITH STAINLESS STEEL CONTRACTING CLAMPS IS REQUIRED TO CONNECT DIFFERENT CLAY PIPE TO PVC OR CLAY PIPE TO D.I. PIPE.

*EXACT SIZES, DEPTHS, MATERIALS AND LOCATIONS OF EXISTING UTILITIES ARE UNKNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF THESE FAR ENOUGH IN ADVANCE OF THE PIPELINE OPERATION SO AS NOT TO CAUSE ANY UNNECESSARY DELAYS. RELOCATION OF EXISTING UTILITIES FOUND TO BE IN DIRECT CONFLICT WITH THIS CONTRACT SHALL BE ACCOMPLISHED BY THE OWNER OF THE UTILITIES INVOLVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES HAVING PROPERTY IN THE AREA PRIOR TO EXCAVATION. CONTINUOUS COMMUNICATIONS ON A DAY TO DAY BASIS WILL BE REQUIRED. THE UTILITY COMPANIES ARE AS FOLLOWS:

ELECTRIC COMPANIES CONTACT-
BLUEGRASS ELECTRIC CO-OP CORP.,
KENTUCKY UTILITIES COMPANY, OR
CLARK ENERGY.

TELEPHONE CONTACT-
SOUTH CENTRAL BELL

GAS CONTACT-
RICHMOND UTILITIES BOARD, COLUMBIA
GAS OR DELTA GAS.

WATER CONTACT-
RICHMOND UTILITIES BOARD

KENTUCKY STATUTES (KRS 367.4901 THRU 367.4917) REQUIRE THAT ALL EXCAVATORS PLANNING EXCAVATION OR DEMOLITION WORK SHALL CALL ALL UTILITY COMPANIES IN THE AREA AND AN UNDERGROUND PROTECTION SERVICE SUCH AS "BUD" (1-800-752-6007) AT LEAST TWO (2) WORKING DAYS BEFORE COMMENCING WORK TO NOTIFY UTILITY COMPANIES IN THE AREA WITH UNDERGROUND FACILITIES OF THE PLANNED EXCAVATION OR DEMOLITION ACTIVITIES.

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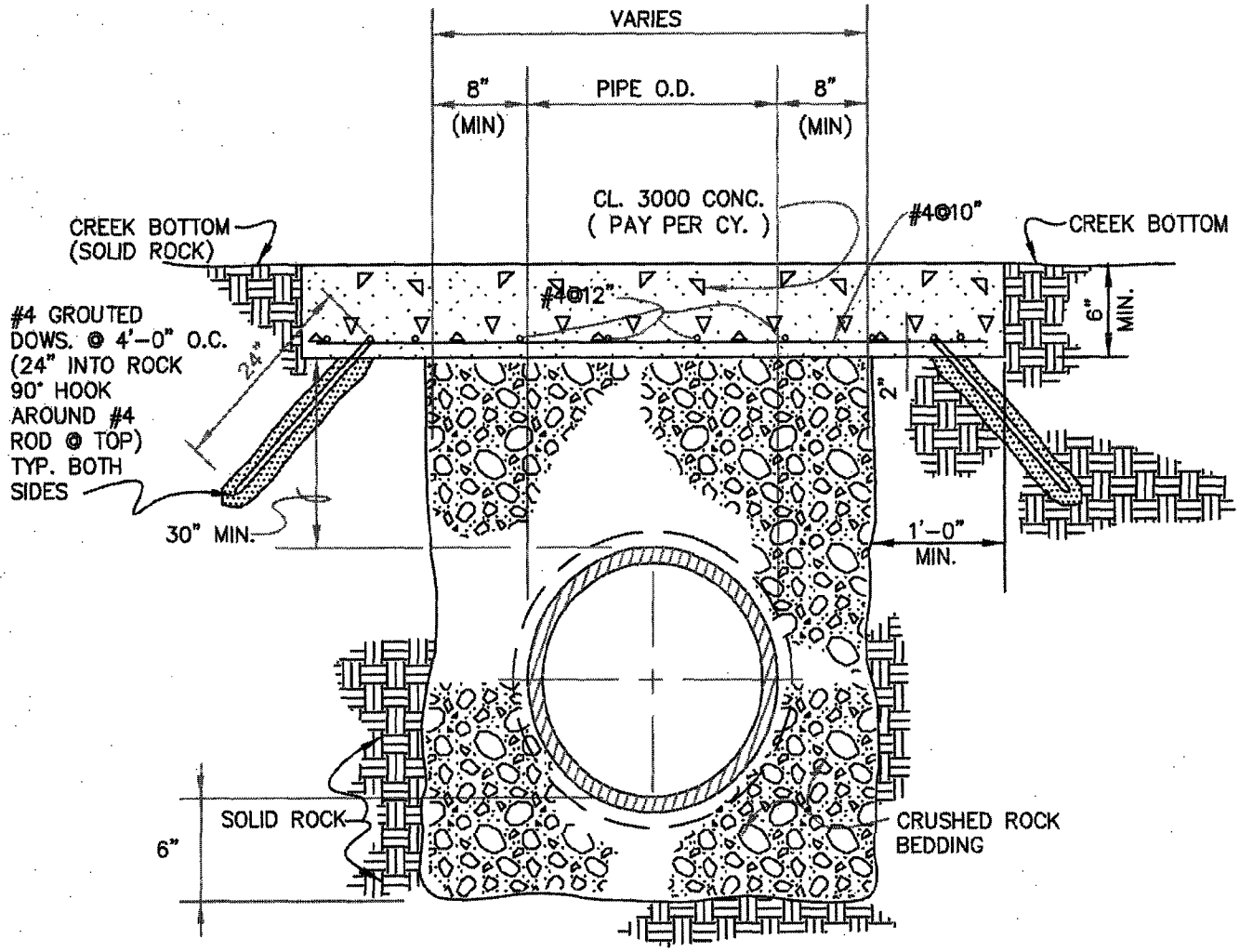
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
GENERAL CONSTRUCTION NOTES

JUNE, 1996 | DWG. NO. S1




# CONCRETE CAP AT CREEK CROSSING

ALL SIZE PIPE
N T S

| DATE | REVISION |
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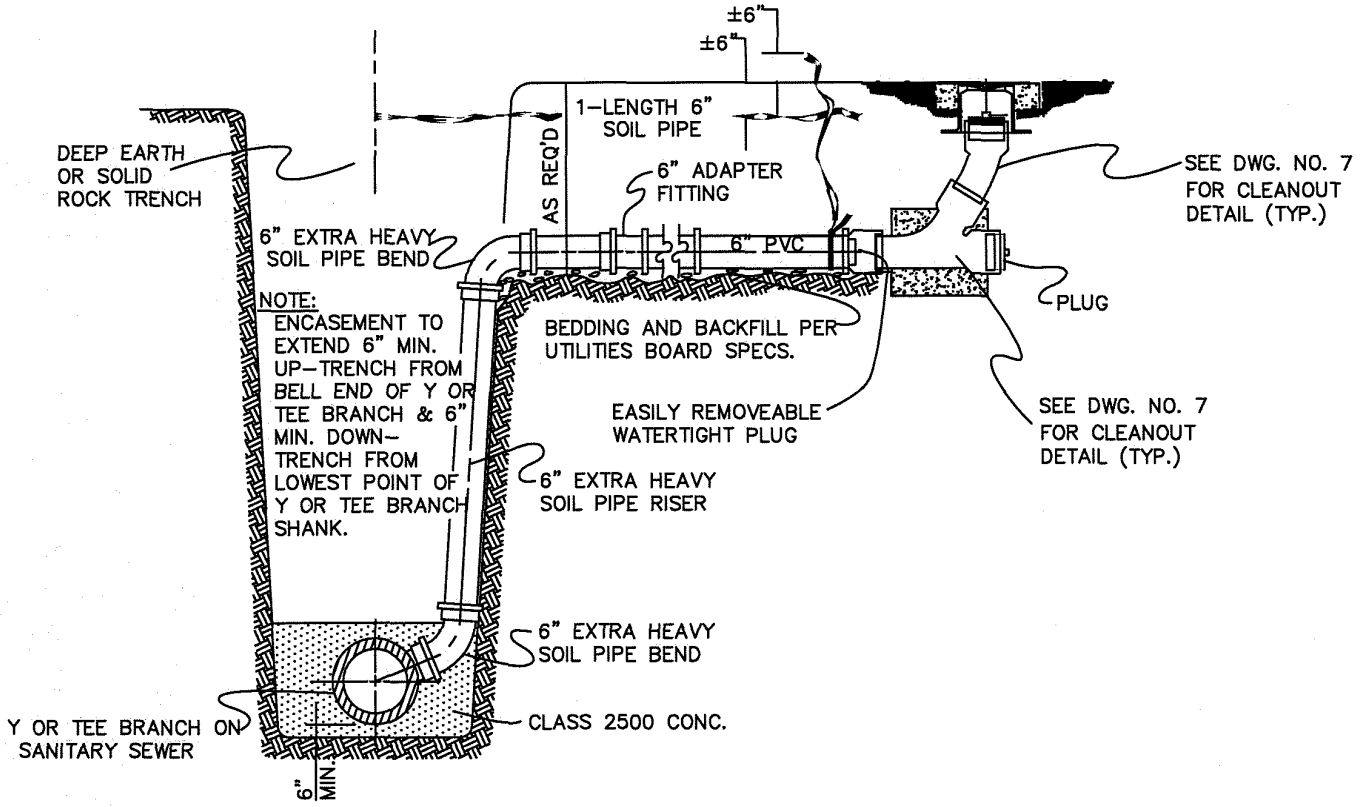
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

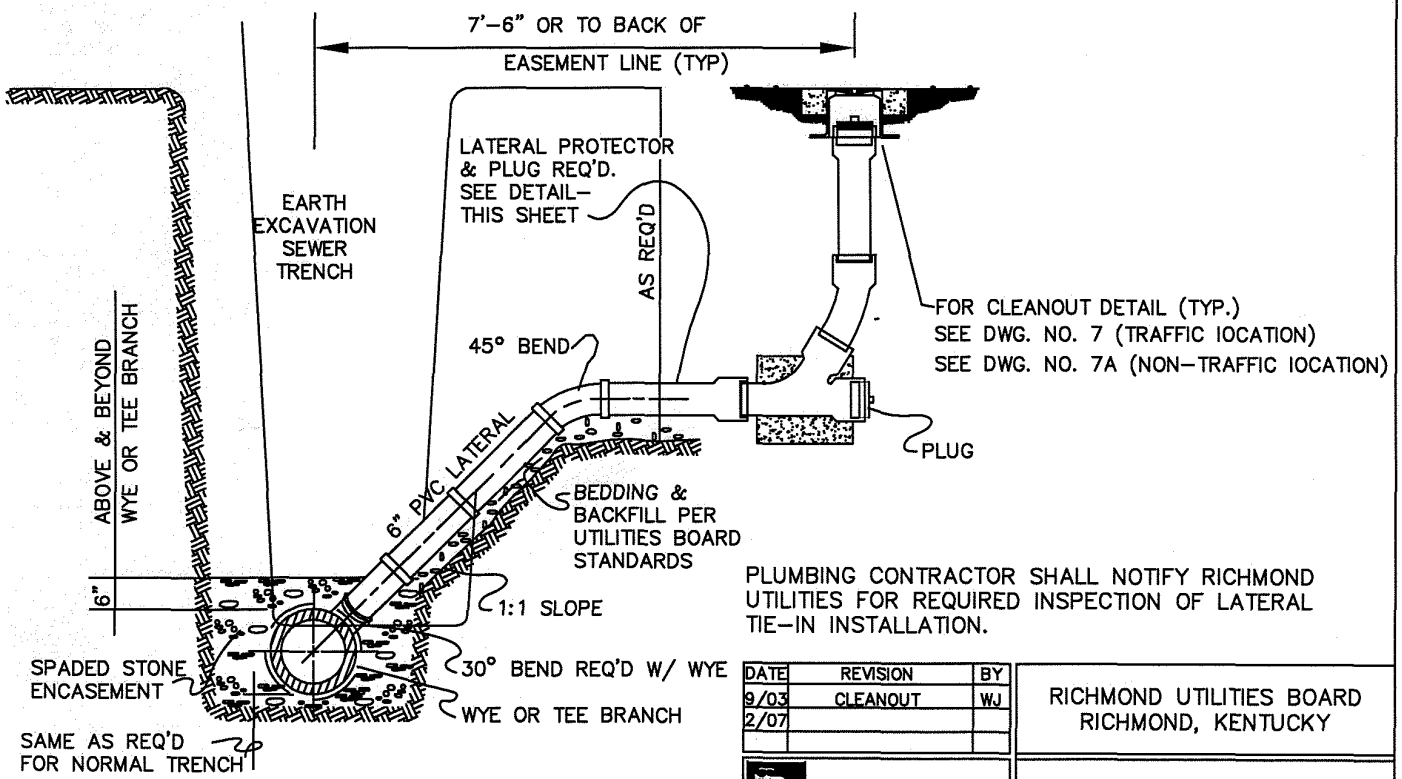
SANITARY SEWER
CONCRETE CAP AT CREEK CROSSING

JUNE, 1996 | DWG. NO. S2




## TYPICAL DETAIL SEWER LATERALS IN DEEP TRENCHES

( NARROW R OF W &/OR SOLID ROCK )




PLUMBING CONTRACTOR SHALL NOTIFY RICHMOND UTILITIES FOR REQUIRED INSPECTION OF LATERAL TIE-IN INSTALLATION.

## TYPICAL DETAIL SEWER LATERALS

N T S

| DATE | REVISION | BY |
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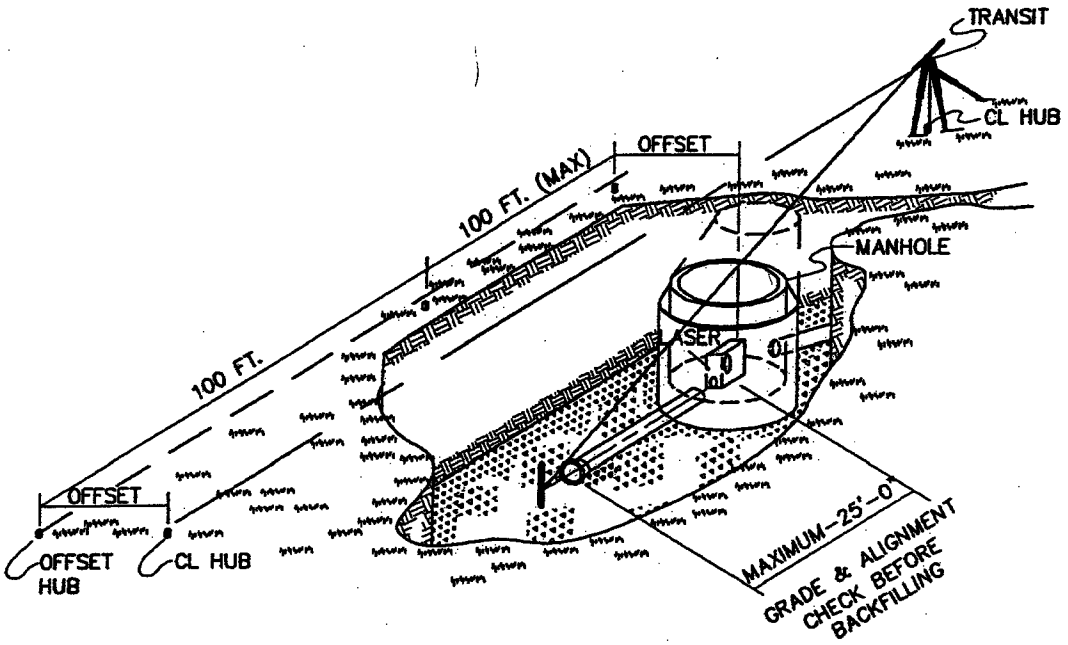
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER LATERALS

JUNE, 1996 | DWG. NO. S3




TYPICAL LASER ALIGNMENT EQUIPMENT SET UP
NO SCALE

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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

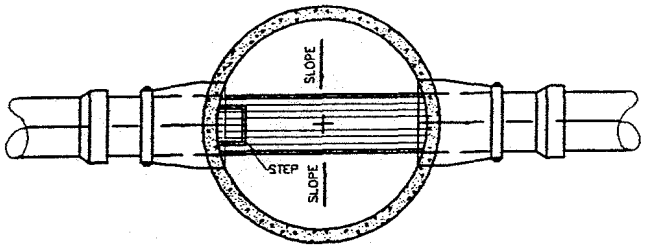
SANITARY SEWER
LASER ALIGNMENT SET UP

JUNE, 1996 | DWG. NO. S3A

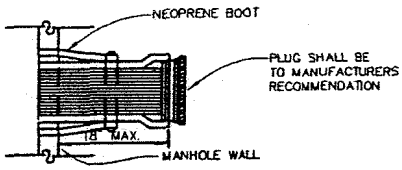
K:\RICHMONE UAL\170-S3A.dwg, 08/06/2002 04:08:48 PM, Ron

## GENERAL NOTES FOR PRECAST MANHOLES

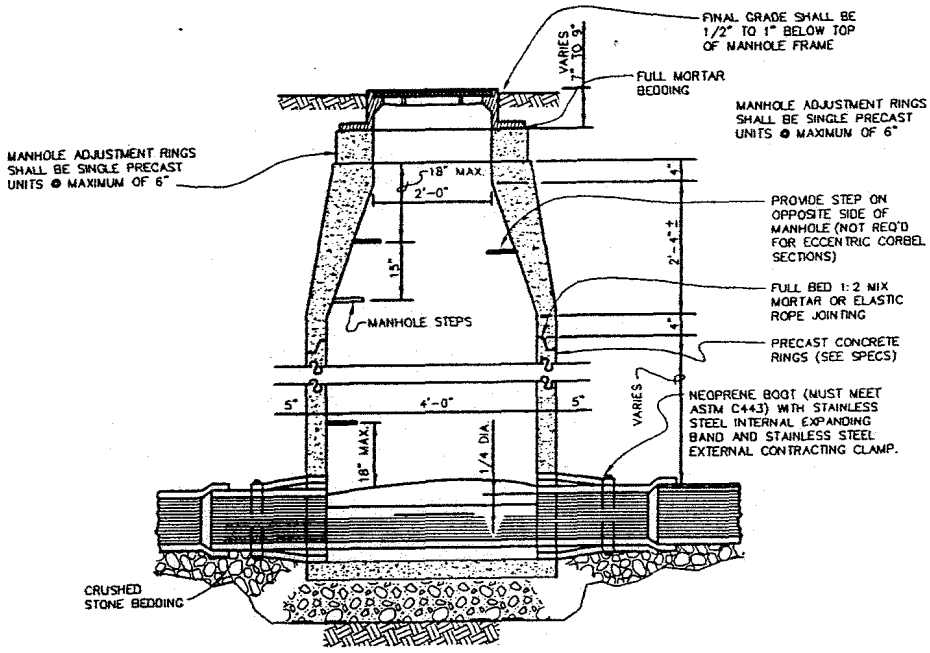
- STANDARD PRECAST CORBELS SHALL BE USED ON 4'-0" I.D. MANHOLES OVER 5'-0" DEEP AND ON 5'-0" I.D. MANHOLES OVER 7'-0" DEEP, UNLESS OTHERWISE NOTED ON THE PLANS.
- SLABS ARE DETAILED FOR USE IN TRAFFIC AND NON-TRAFFIC AREAS. ALL SLABS SHALL BE CLEARLY MARKED "TRAFFIC" OR "NON-TRAFFIC".
- PRECAST CONCRETE MANHOLE DEVELOPED BASE WITH FORMED CHANNELS REQUIRED.




LOWER PLAN




SECTION
TYPICAL STUB AND PLUG
AT MANHOLE WALL




**5'-0" INSIDE DIAMETER USED ON 30" AND LARGER SEWER LINES.
*5'-0" INSIDE DIAMETER USED ON 15" AND LARGER SEWER LINES WHEN LINE TURNS 45° OR MORE.

SECTION
STANDARD MANHOLE

# PRECAST CONCRETE MANHOLES – TYPICAL DETAILS

A S T M SPEC. C-478, LATEST REVISION FOR MANHOLE SECTIONS
ECCENTRIC CORBEL SECTION IS ACCEPTABLE (LOCATE VERTICAL WALL DOWNSTREAM; WHERE FLAT TOP IS USED, OFFSET ACCESS OPENING OVER DOWNSTREAM SIDE).

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RICHMOND UTILITIES

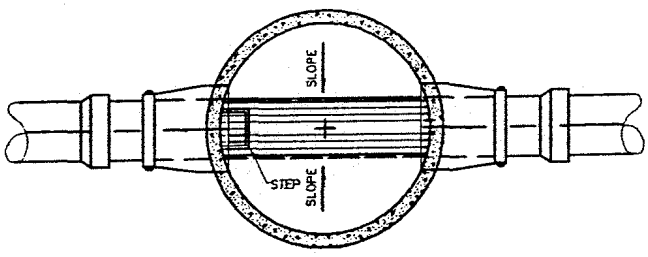
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
STANDARD MANHOLES

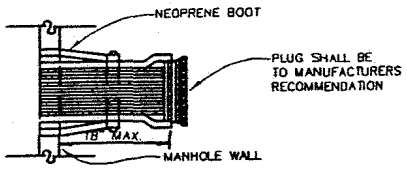
JUNE, 1996 | DWG. NO. S4

## GENERAL NOTES FOR PRECAST MANHOLES

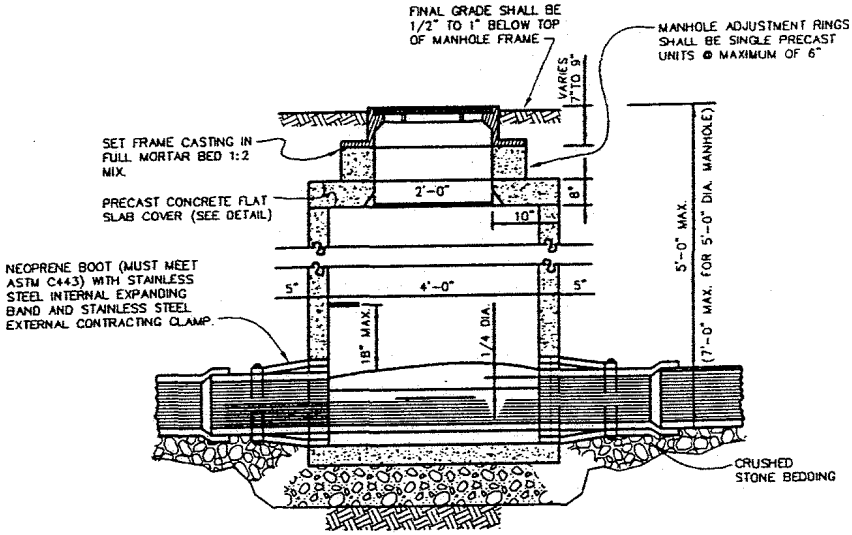
- STANDARD PRECAST CORBELS SHALL BE USED ON 4'-0" I.D. MANHOLES OVER 5'-0" DEEP AND ON 5'-0" I.D. MANHOLES OVER 7'-0" DEEP, UNLESS OTHERWISE NOTED ON THE PLANS.
- SLABS ARE DETAILED FOR USE IN TRAFFIC AND NON-TRAFFIC AREAS. ALL SLABS SHALL BE CLEARLY MARKED "TRAFFIC" OR "NON-TRAFFIC".
- PRECAST CONCRETE MANHOLE DEVELOPED BASE WITH FORMED CHANNELS REQUIRED.




LOWER PLAN




SECTION
TYPICAL STUB AND PLUG
AT MANHOLE WALL




**5'-0" INSIDE DIAMETER USED ON 30" AND LARGER SEWER LINES.
*5'-0" INSIDE DIAMETER USED ON 15" AND LARGER SEWER LINES WHEN LINE TURNS 45° OR MORE.

SECTION
SHALLOW MANHOLE

# PRECAST CONCRETE MANHOLES – TYPICAL DETAILS

A S T M SPEC. C-478, LATEST REVISION FOR MANHOLE SECTIONS
ECCENTRIC CORBEL SECTION IS ACCEPTABLE (LOCATE VERTICAL WALL DOWNSTREAM; WHERE FLAT TOP IS USED, OFFSET ACCESS OPENING OVER DOWNSTREAM SIDE).

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RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
STANDARD SHALLOW MANHOLES

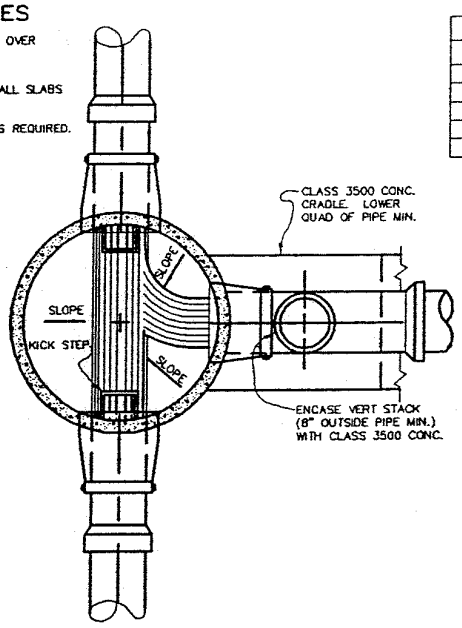
JUNE, 1996 | DWG. NO. S4A

## GENERAL NOTES FOR PRECAST MANHOLES

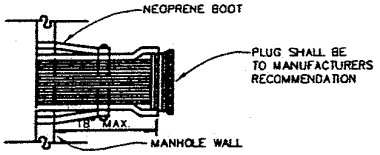
- STANDARD PRECAST CORBELS SHALL BE USED ON 4'-0" I.D. MANHOLES OVER 5'-0" DEEP AND ON 5'-0" I.D. MANHOLES OVER 7'-0" DEEP, UNLESS OTHERWISE NOTED ON THE PLANS.
- SLABS ARE DETAILED FOR USE IN TRAFFIC AND NON-TRAFFIC AREAS. ALL SLABS SHALL BE CLEARLY MARKED "TRAFFIC" OR "NON-TRAFFIC".
- PRECAST CONCRETE MANHOLE DEVELOPED BASE WITH FORMED CHANNELS REQUIRED.

| PIPE SUPPORT TABLE | | | |
|---|---|---|---|
| SPAN | "T" | STEEL | SEAT "B" |
| 0' - 4' | 7" | 3 - #5 | 1' - 0" |
| 4' - 6' | 9" | 3 - #6 | 1' - 0" |
| 6' - 8' | 11" | 3 - #7 | 1' - 6" |
| 8' - 10' | 13" | 3 - #8 | 1' - 9" |
| 10' - 12' | 15" | 3 - #9 | 2' - 0" |

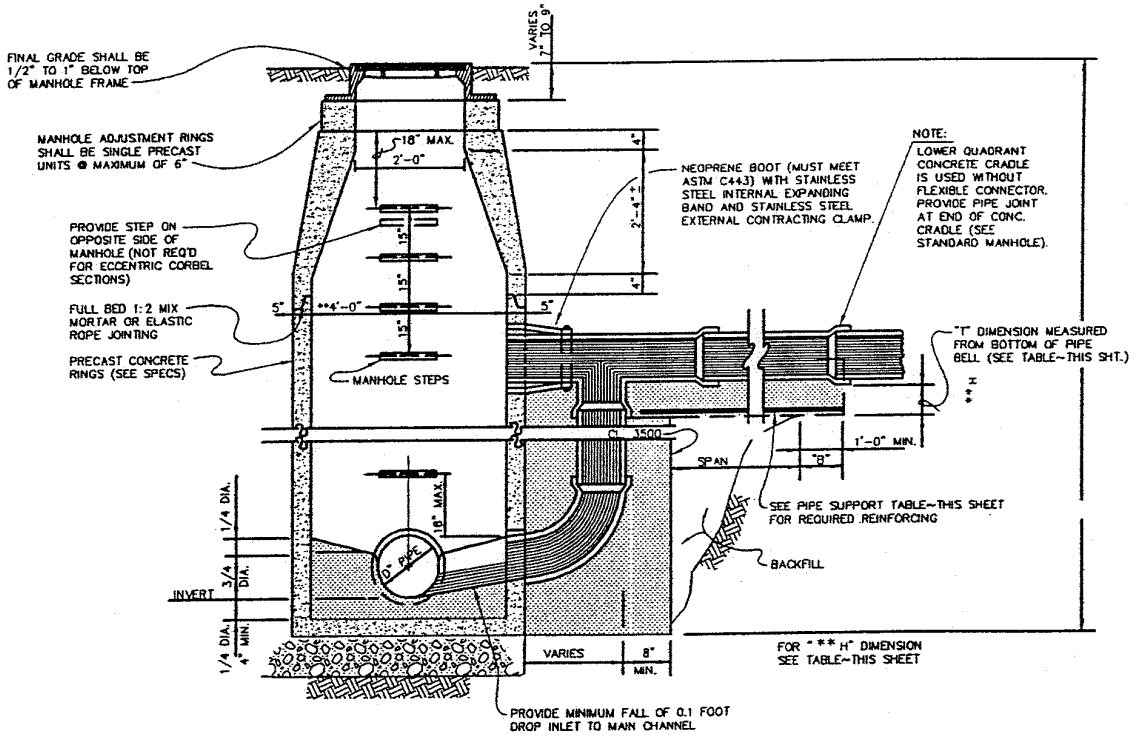
* REINFORCING SHOWN IS THE MINIMUM ALLOWED & SHALL BE PLACED WITH 2" COVER IN BOTTOM OF CRADLE INCREASE THE NUMBER OF RODS BY ONE FOR EACH 6" INCREMENT THAT CRADLE WIDTH EXCEEDS 1' - 6". (I.E. FOR CRADLE SPAN OF 7' & CRADLE WIDTH OF 2'-6". USE 5-#7)




LOWER PLAN




SECTION
TYPICAL STUB AND PLUG
AT MANHOLE WALL




SECTION
DROP MANHOLE

# PRECAST CONCRETE MANHOLES – TYPICAL DETAILS

A S T M SPEC. C-478, LATEST REVISION FOR MANHOLE SECTIONS
ECCENTRIC CORBEL SECTION IS ACCEPTABLE (LOCATE VERTICAL WALL DOWNSTREAM; WHERE FLAT TOP IS USED, OFFSET ACCESS OPENING OVER DOWNSTREAM SIDE).

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RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
DROP MANHOLES

JUNE, 1996 | DWG. NO. S4B

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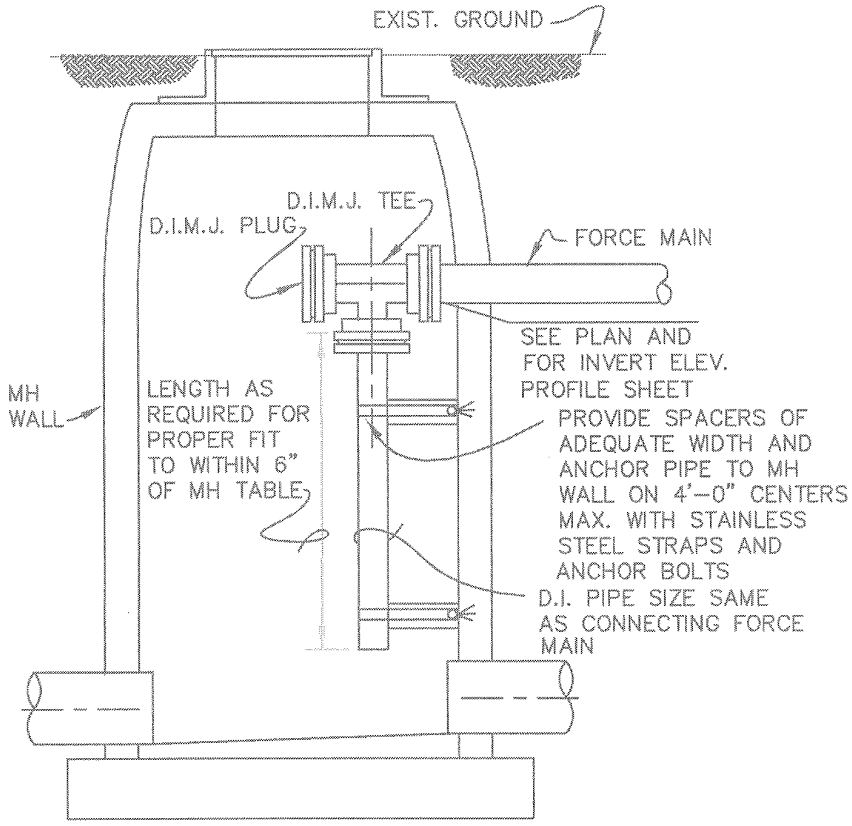


# DETAIL
# INSIDE DROP CONNECTION

NOT TO SCALE

## NOTE:
## TO BE USED DURING EMERGENCIES ONLY

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|---|---|
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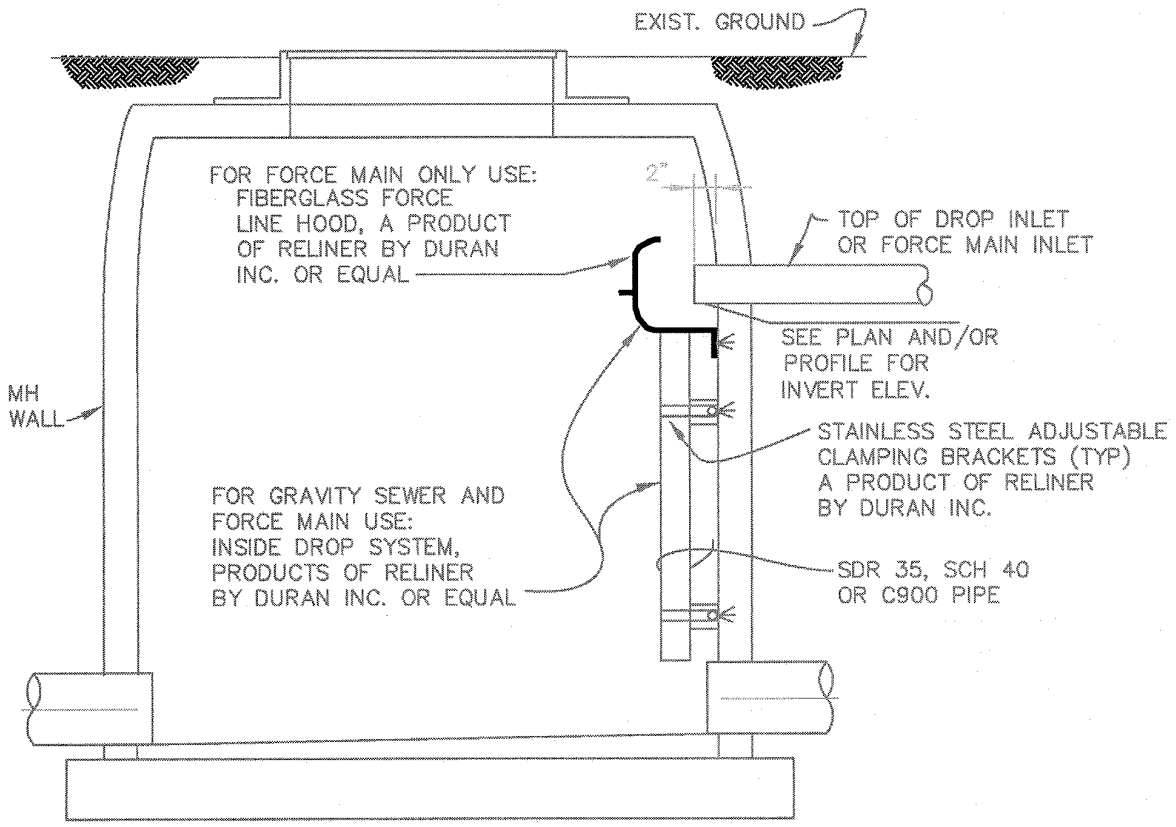
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
INSIDE/OUTSIDE DROP CONNECTIONS

JUNE, 1996 | DWG., NO. S5




# DETAIL
# INSIDE DROP CONNECTION

NOT TO SCALE

NOTE:
TO BE USED WHEN INLET IS
3' OR MORE ABOVE BENCH
ON EXISTING MANHOLES ONLY
PRE-APPROVAL BY RU REQUIRED

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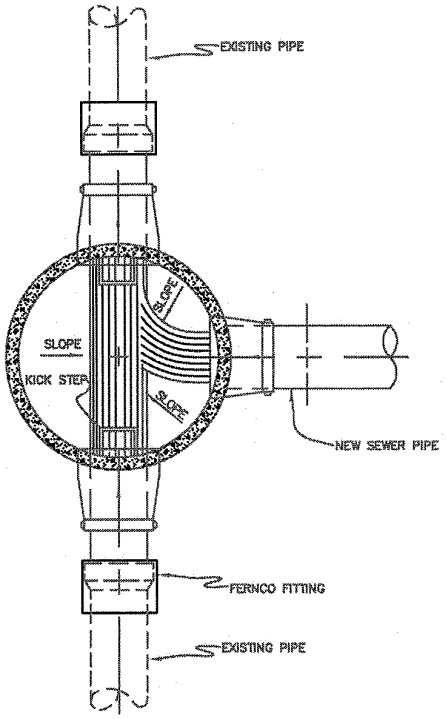
RICHMOND UTILITIES

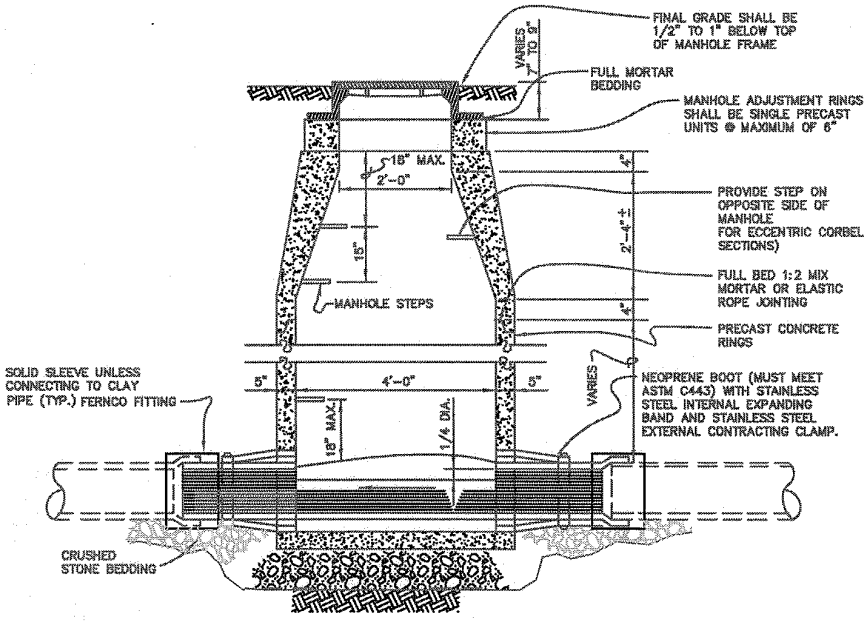
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
FORCE MAIN/GRAVITY SEWER
INSIDE DROP CONNECTION

SEPT, 2002 | DWG. NO. S5A




LOWER PLAN




SECTION
STANDARD MANHOLE

# DETAIL — NEW GRAVITY SEWER TO EXISTING GRAVITY SEWER

| DATE | REVISION |
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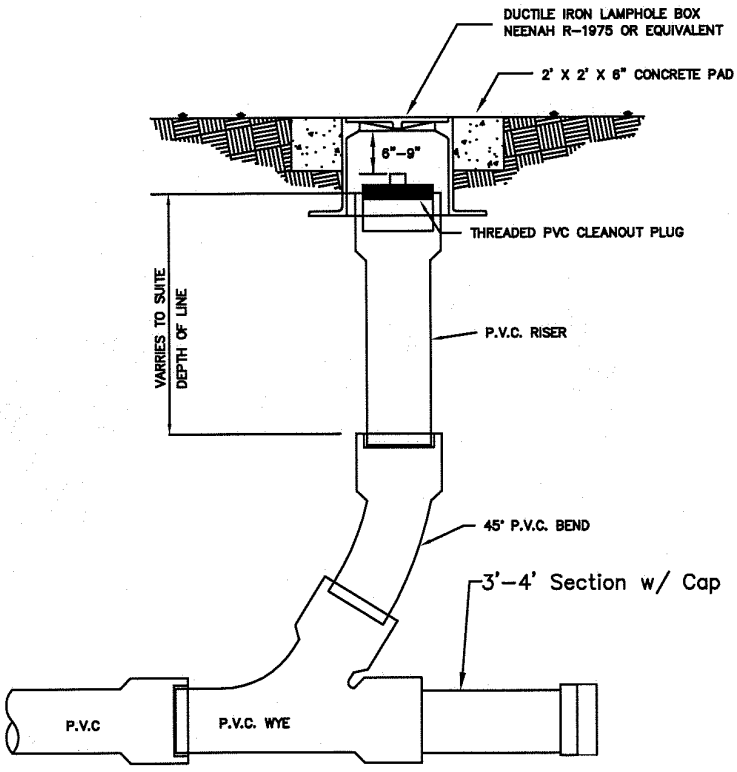
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
NEW GRAVITY SEWER TO
EXISTING GRAVITY SEWER

JUNE, 1996 | DWG. NO. S6




LAMP HOLE CLEANOUT

| DATE | REVISION |
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| 9/03 | |
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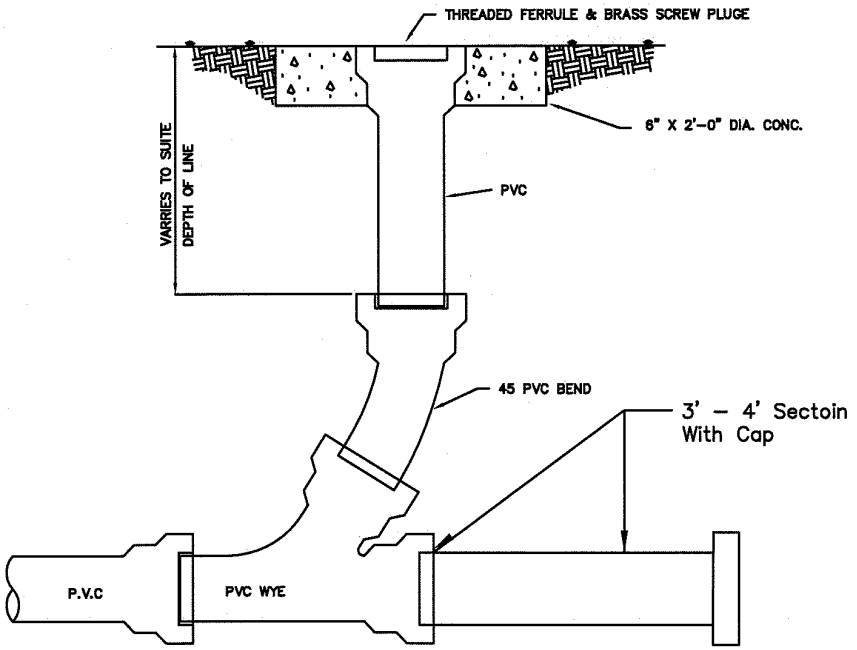
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
LAMP HOLE CLEANOUT

SEPT. 2003 | DWG. NO. 7

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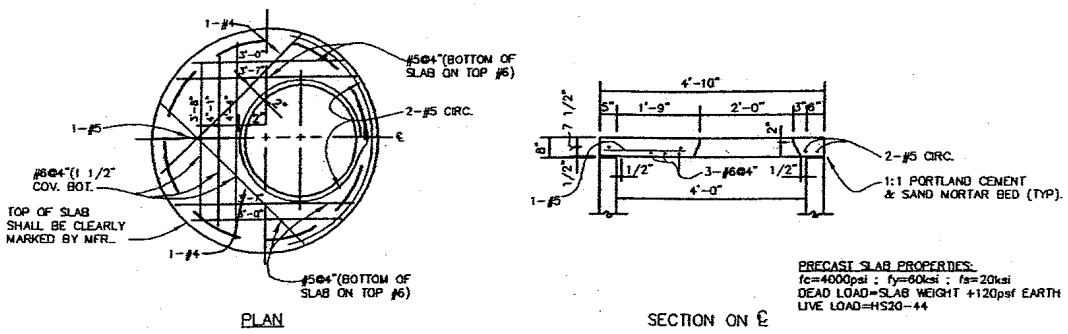
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

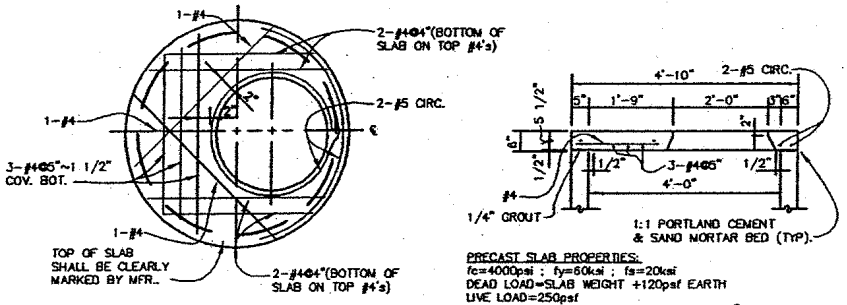
SANITARY SEWER CLEANOUT

SEPT. 2003 | DWG. NO. 7A



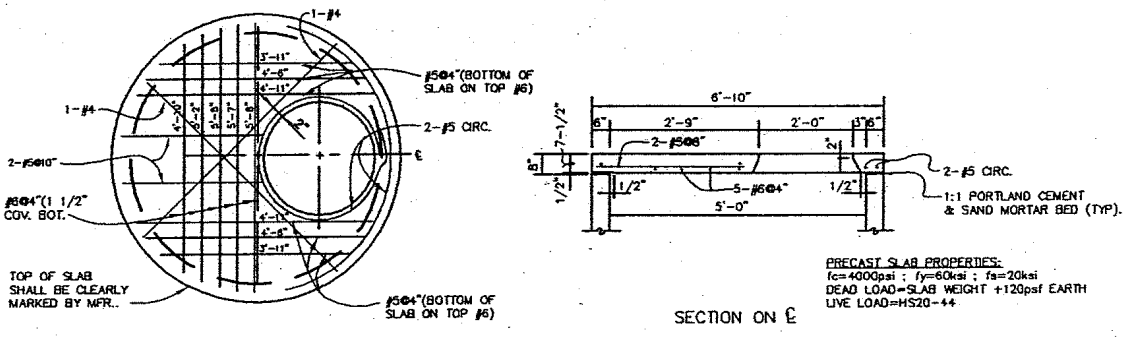

PLAN SECTION ON ℄

## PRECAST TOP SLABS FOR 4'-0" I.D. TRAFFIC MANHOLES



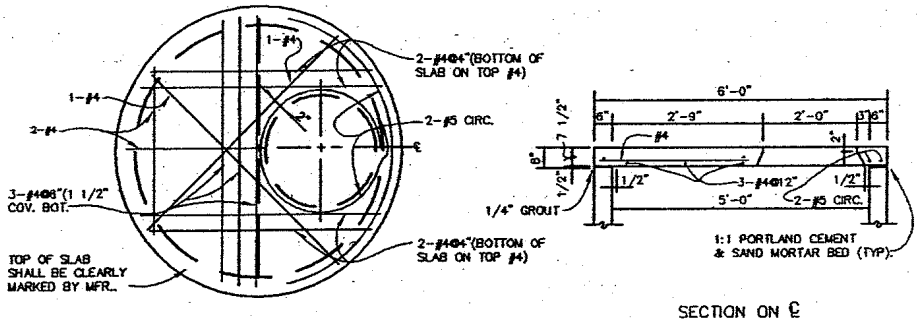

PLAN SECTION ON ℄

## PRECAST TOP SLABS FOR 4'-0" I.D. NON-TRAFFIC MANHOLES




PLAN SECTION ON ℄

## PRECAST TOP SLABS FOR 5'-0" I.D. TRAFFIC MANHOLES




SECTION ON ℄

PLAN

## PRECAST TOP SLABS FOR 5'-0" I.D. NON-TRAFFIC MANHOLES

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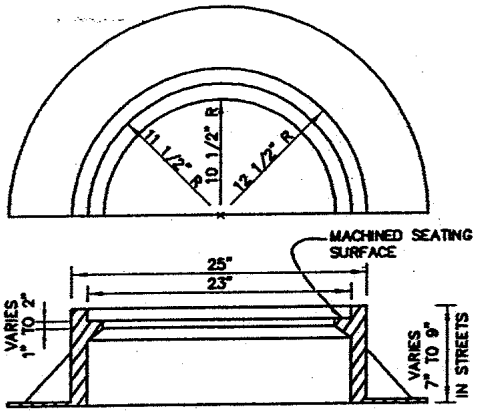
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
TOP SLAB FOR
SANITARY SEWER MANHOLES

JUNE 1996 | DWG NO. S8

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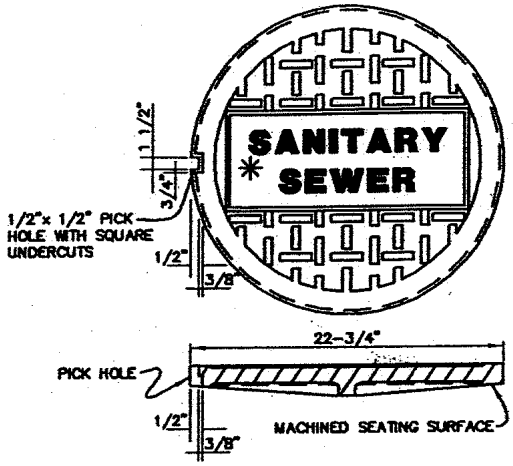


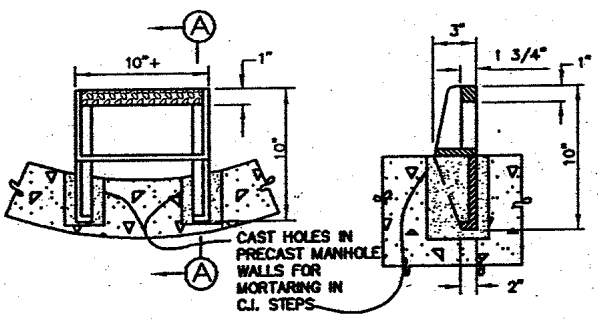

COVER

# MANHOLE FRAME AND COVER

( REFER TO SPECIFICATIONS FOR WEIGHTS )

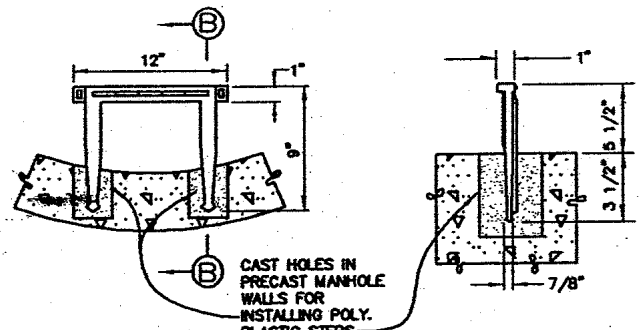
✳NOTE:
LETTERING TO READ PER APPLICATION "STORM SEWER", "SANITARY SEWER", OR "WATER"

FRAMES AND COVERS TO HAVE COMBINED WEIGHT OF 425 POUNDS AND BE CLASSIFIED TRAFFIC WEIGHTS.




PLAN SECTION "A"–"A"

CAST IRON




PLAN SECTION "B"–"B"

POLYPROPYLENE PLASTIC ENCAPSULATED STEEL

# MANHOLE STEPS FOR PRECAST CONCRETE MANHOLES

| DATE | REVISION |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

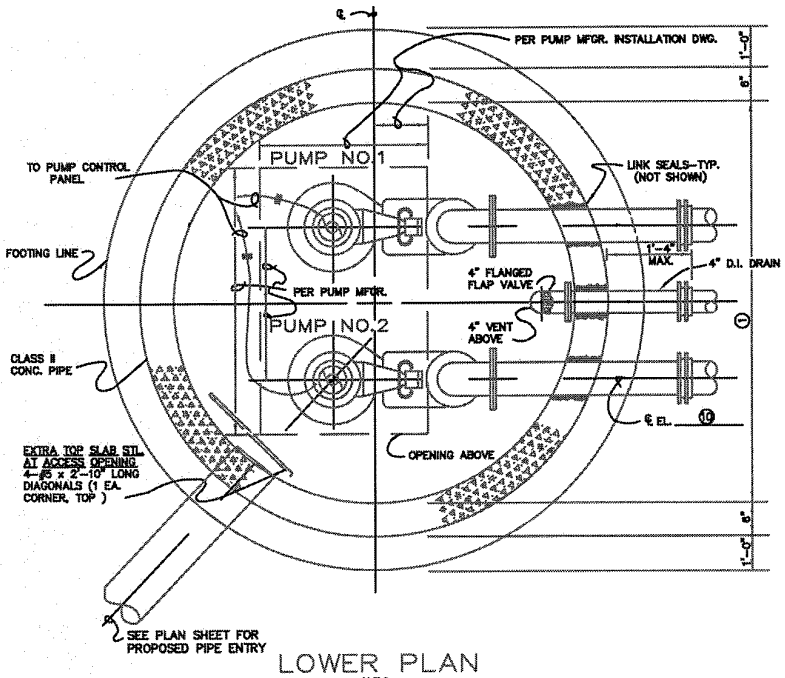
SANITARY SEWER
MANHOLE FRAME, COVER & STEPS

JUNE 1996 | DWG NO 59

NOTE:

WET WELL IS A CLASS 1, DIVISION 1, GROUP D ATMOSPHERE

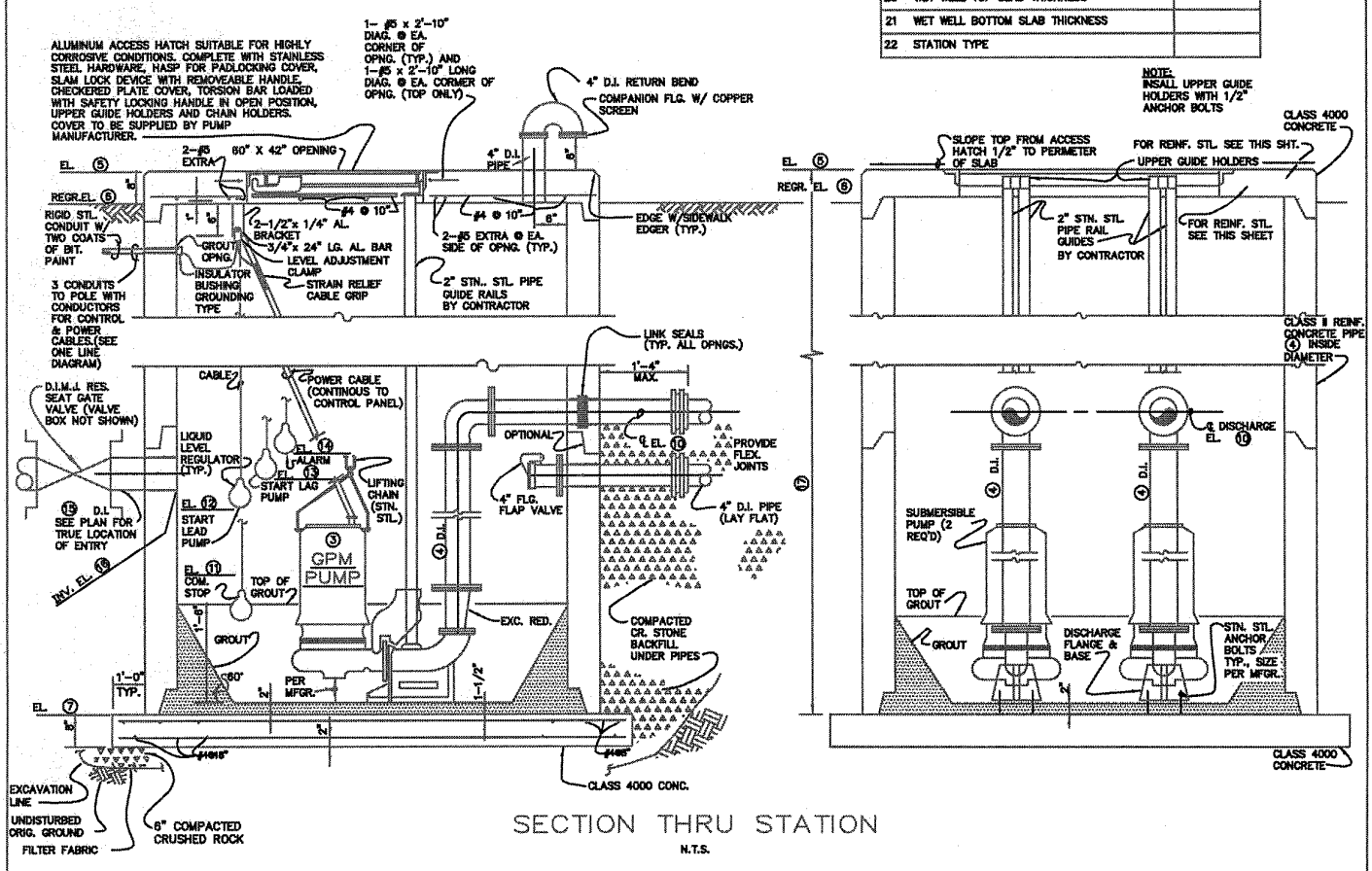
NOTE:
- Piping, Valves, Fittings, Etc. Inside Station Except Guide Rails Shall Have Coal Tar Shop Coats. Pumps & Motors Shall Have Shop Coat Of Kop-Coat Bituminastic Mill Undercoat. Field Painting Shall Be 2 Coats Of Kop-Coat Bituminastic No. 50. Drying Time Between Coats And Application Shall Be Per Manufacturer's Recommendations. Contractor Shall Submit Recommendations To The Engineer.
- Pumping Station Is Subject To Flotation Until Construction Is Completed, Including Backfill & Regrade. The Contractor Shall Take All Steps Necessary to Prevent Flotation During Construction.
- Access Hatch Must Be Set Such As To Allow Guide Rails From Pump Discharge Flanged Connection To Be Vertical For Correct Operation.
- See Mfgr's Installation Drawings For True Dimensions Off Centerline For Pumps And Access Hatch Locations.
- For Electrical And Controls Details See Dwg. No.___.




LOWER PLAN
N.T.S.

## PUMPING STATION DATA

| | ITEM | PUMP STA. |
|---|---|---|
| 1 | WET WELL DIAMETER | |
| 2 | VALVE VAULT DIAMETER | |
| 3 | PUMP CAPACITY | |
| 4 | FORCE MAIN SIZE | |
| 5 | TOP OF TOP SLAB (WET WELL) | |
| 6 | REGRADE | |
| 7 | TOP OF BOTTOM SLAB (WET WELL) | |
| 8 | TOP OF TOP SLAB (VALVE VAULT) | |
| 9 | TOP OF BOTTOM SLAB (VALVE VAULT) | |
| 10 | CL. DISCHARGE PIPE ELEVATION | |
| 11 | PUMP COMMON STOP ELEVATION | |
| 12 | START LEAD PUMP ELEVATION | |
| 13 | START LAG PUMP ELAVATION | |
| 14 | PUMP ALARM ELEVATION | |
| 15 | GRAVITY SEWER SIZE | |
| 16 | INVERT ELEVATION-GRAVITY SEWER | |
| 17 | WET WELL DEPTH | |
| 18 | VALVE VAULT DEPTH | |
| 19 | PUMP MOTOR H.P., PHASE | |
| 20 | WET WELL TOP SLAB THICKNESS | |
| 21 | WET WELL BOTTOM SLAB THICKNESS | |
| 22 | STATION TYPE | |




SECTION THRU STATION
N.T.S.

NOTE:
ALL INFLUENT LINES MUST CONNECT INTO A MANHOLE BEFORE THE WETWELL

SEE DWG. NO. S10A FOR VALVE VAULT DETAILS

| DATE | REVISION |
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| 2/07 | |
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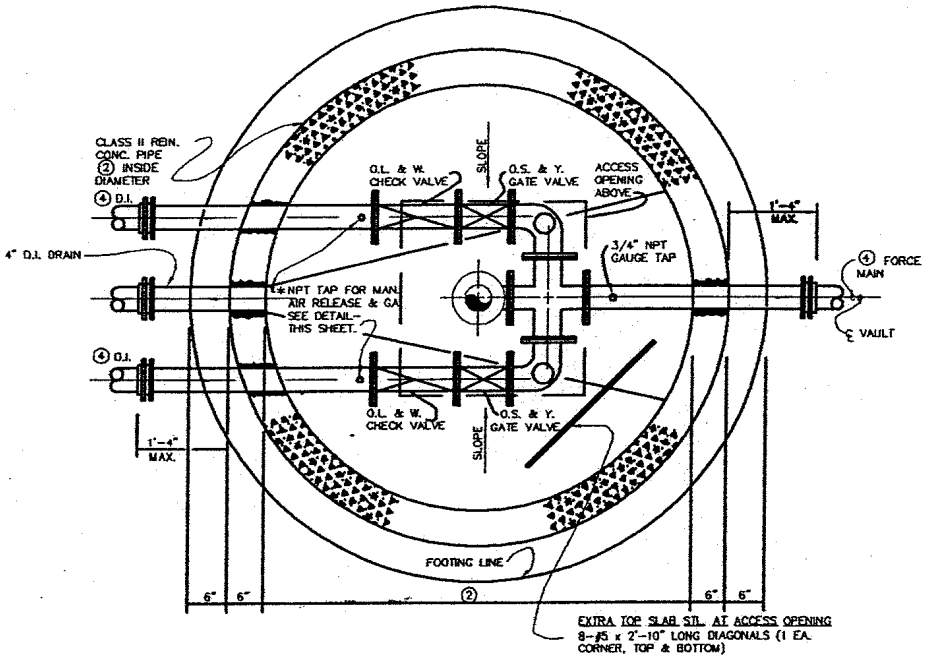
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY
NTS

SANITARY SEWER
SANITARY SEWER PUMPING STATION WET WELL

JUNE, 1996 | DWG. NO. S10

NOTE: * For Electrical And Controls Details-
See Dwg. No. ___




## LOWER PLAN OF VALVE VAULT

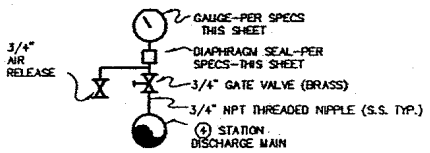
N.T.S.

## DIAPHRAGM SEAL SPECS

Liquid Filled Diaphragm Seals Shall Be Installed On All Gauges. Diaphragm Seals Shall Be Of The Continuous Duty Type, 3 Piece Construction With 1/4" Flushing Connection 316 Stainless Steel Lower Housing And Diaphragm Materials, 1/4" Gauge Connection And 1/2" Lower Connection. Viton Diaphragms Are Required On Low Range Pressure Applications (Less Than 15 psig.) Housing Bolts Shall Also Be Stainless Steel. Acceptable Models Are Marsh 42-01, Helicoid 100-H, Or Equal. Diaphragm Seals Shall Be "permanently" Attached To Gauges By Installation Of A Lead Sealed Wire Connecting The Two. This Is To Prevent Accidental Loss Of Fill Fluid. Fill Fluid Shall Be Factory Installed Silicone.

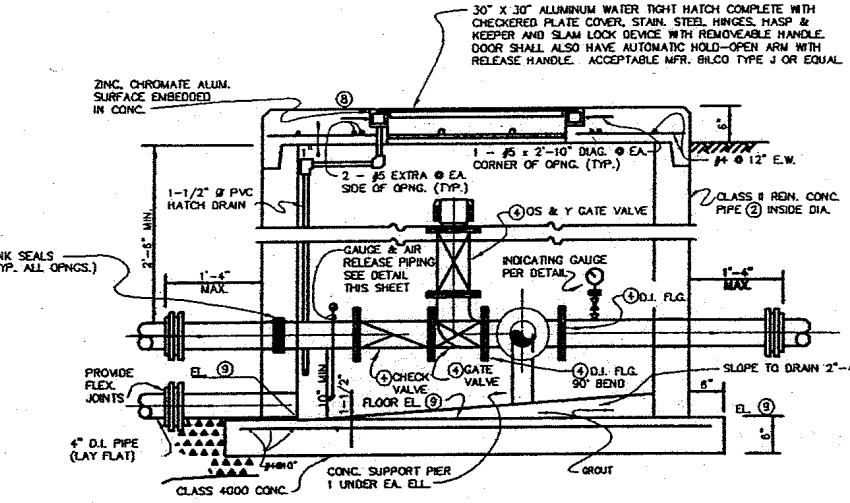
## GAUGE SPECIFICATIONS

Gauge Shall Have Phosphor Bronze Bourdon Tubes, White Laminated Phenol Dials. Gauges Shall Be 4-1/2" And Have Micrometer Adjustment Of Pointers And Black Phenol, Black Cast Iron, Brass Or Aluminum Case And Ring, Rotary Gear Design, Corrosion Resistant, Stn. St. Movement, Blowout Protection, And Bronze Sockets W\ Wrench Flats. Accuracy Shall Be Within 1/2 Of 1% Of The Scale Range. They Shall Be Manufactured By HELICOID GAUGE DIVISION, "#10"; JAMES P. MARSH CORP. "MASTERGAUGE"; ASHCROFT; U.S. GAUGE; Or Equal. All Gauges Shall Be Precalibrated (0-60 psi/140 ft).



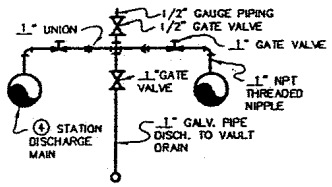

## DETAIL INDICATING GAUGE

NTS




## SECTION THRU VALVE VAULT

N.T.S.




## AIR RELEASE PIPING & INDICATING GAUGE

NTS

SEE DWG NO. S10
FOR PUMP STATION
DATA

| DATE | REVISION |
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| 2/02 | |
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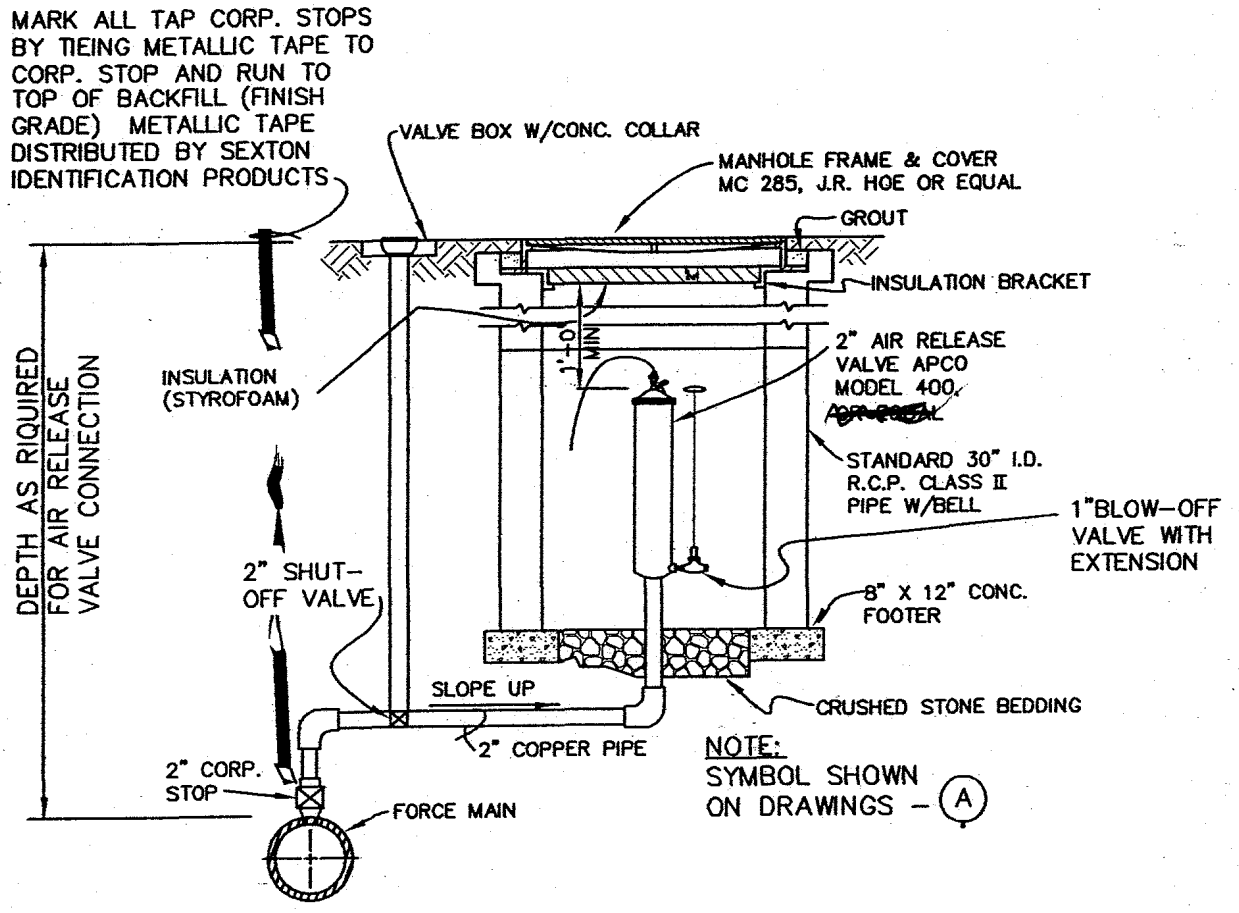
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY
NTS

SANITARY SEWER
SANITARY SEWER PUMPING STATION VALVE VAULT

JUNE, 1996 | DWG. NO. S10A




# DETAIL – AUTOMATIC AIR RELEASE VALVE ASSEMBLY FOR SEWAGE FORCE MAIN

NOT TO SCALE

| DATE | REVISION |
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| 2/02 | |
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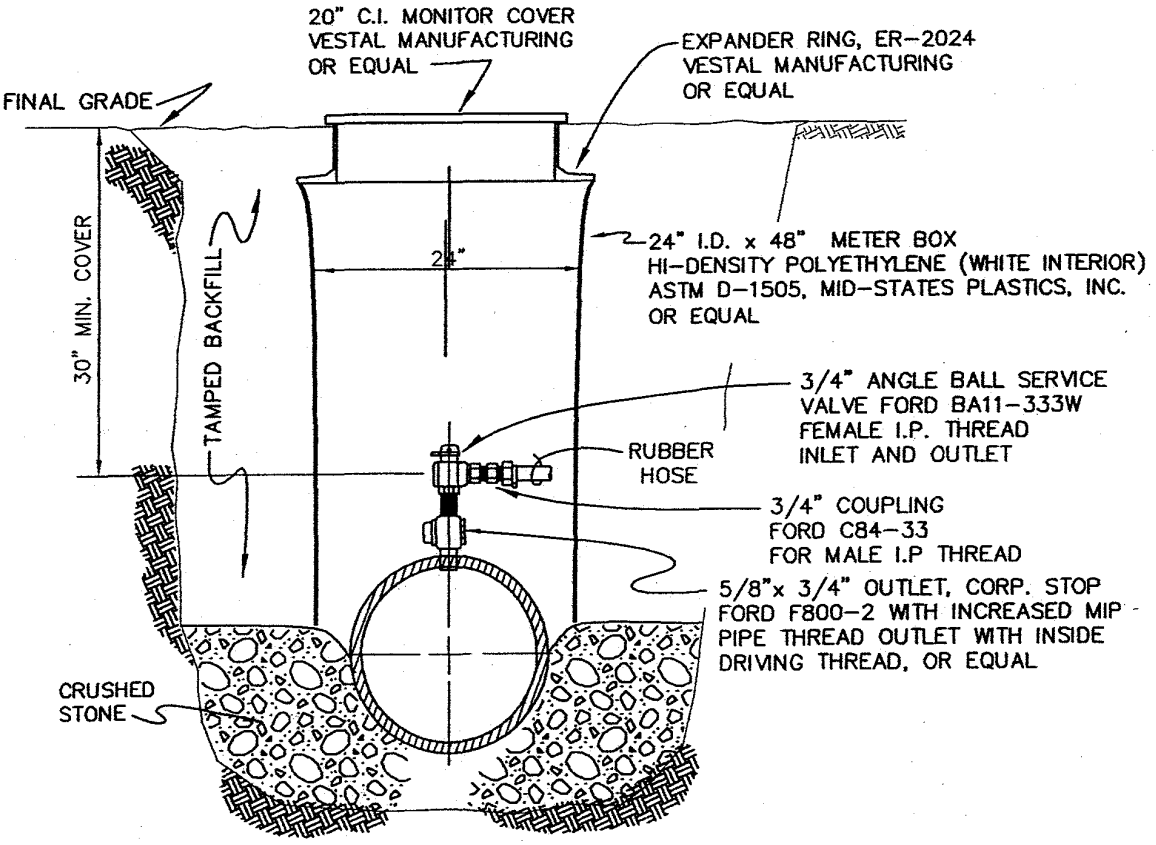
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
AUTOMATIC AIR RELEASE

JUNE 1996 | DWG NO. S11




# DETAIL MANUAL AIR RELEASE VALVE ASSEMBLY

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| DATE | REVISION |
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| 2/02 | |
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RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
MANUAL AIR RELEASE

JUNE, 1996 | DWG. NO. S12

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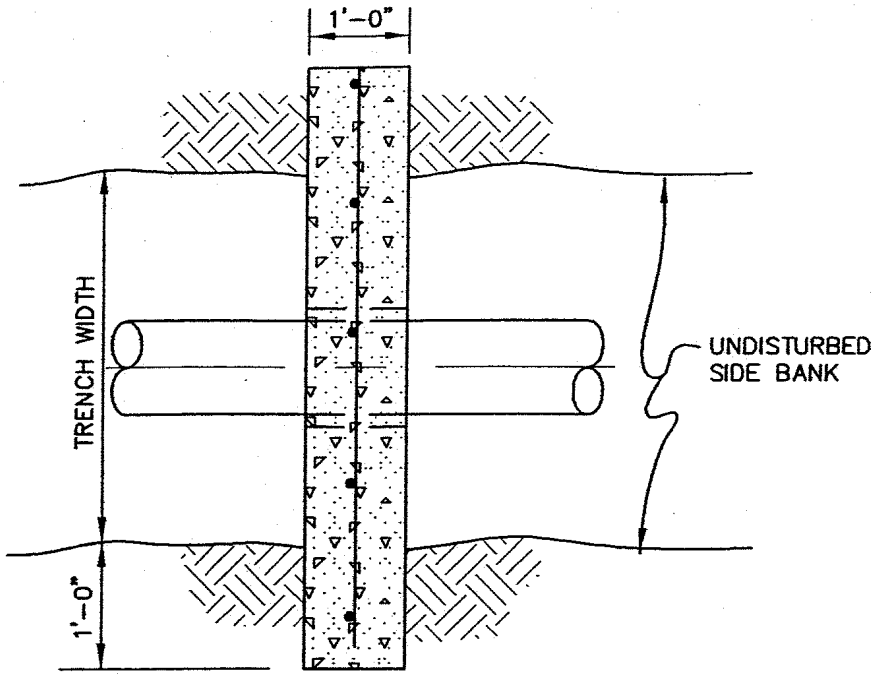
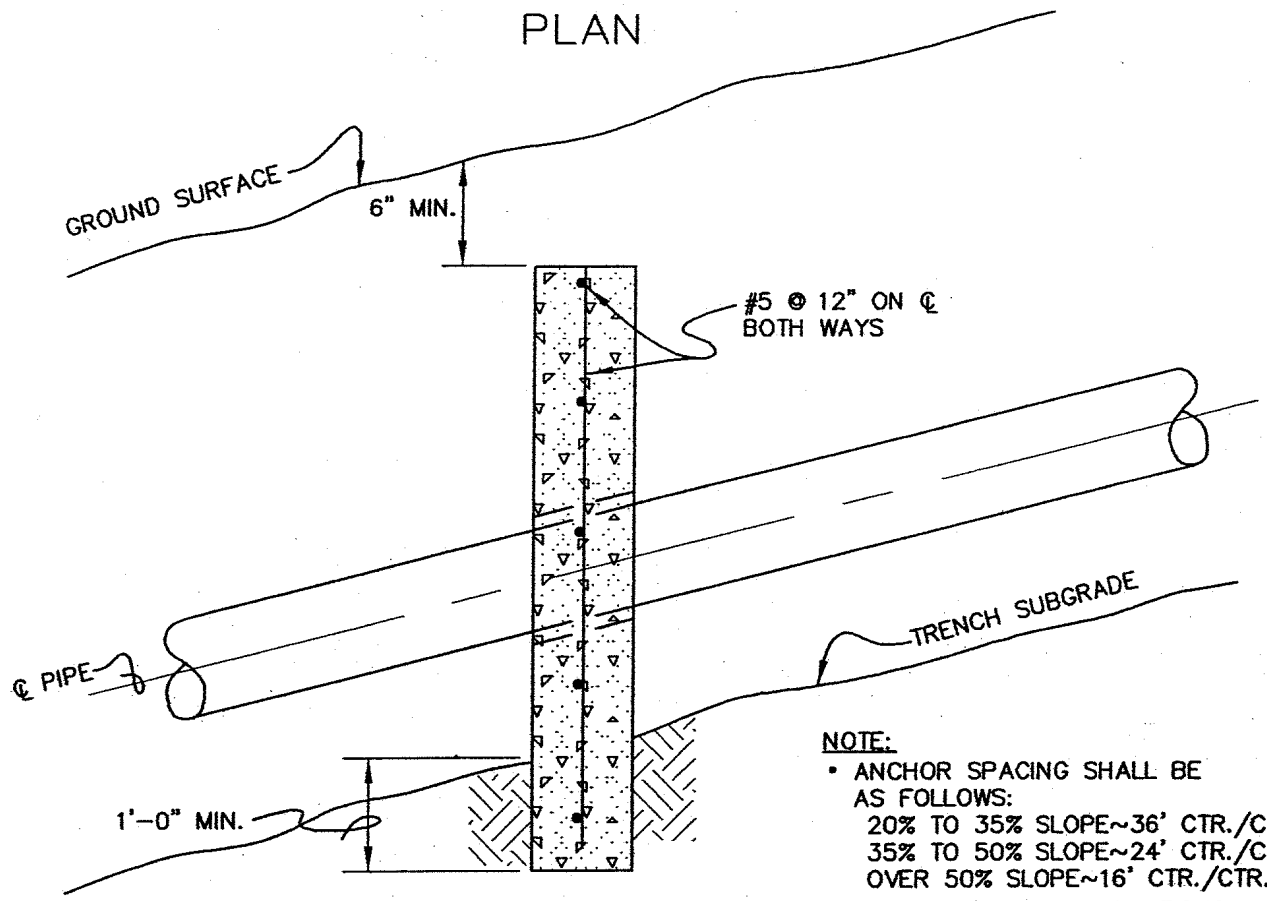



PLAN




ELEVATION

NOTE:

- ANCHOR SPACING SHALL BE AS FOLLOWS:
  20% TO 35% SLOPE~36' CTR./CTR.
  35% TO 50% SLOPE~24' CTR./CTR.
  OVER 50% SLOPE~16' CTR./CTR.
- SEE PROFILES FOR LOCATIONS OF CONCRETE PIPE ANCHORS.

# PIPE ANCHOR (CONCRETE)

N.T.S.

| DATE | REVISION |
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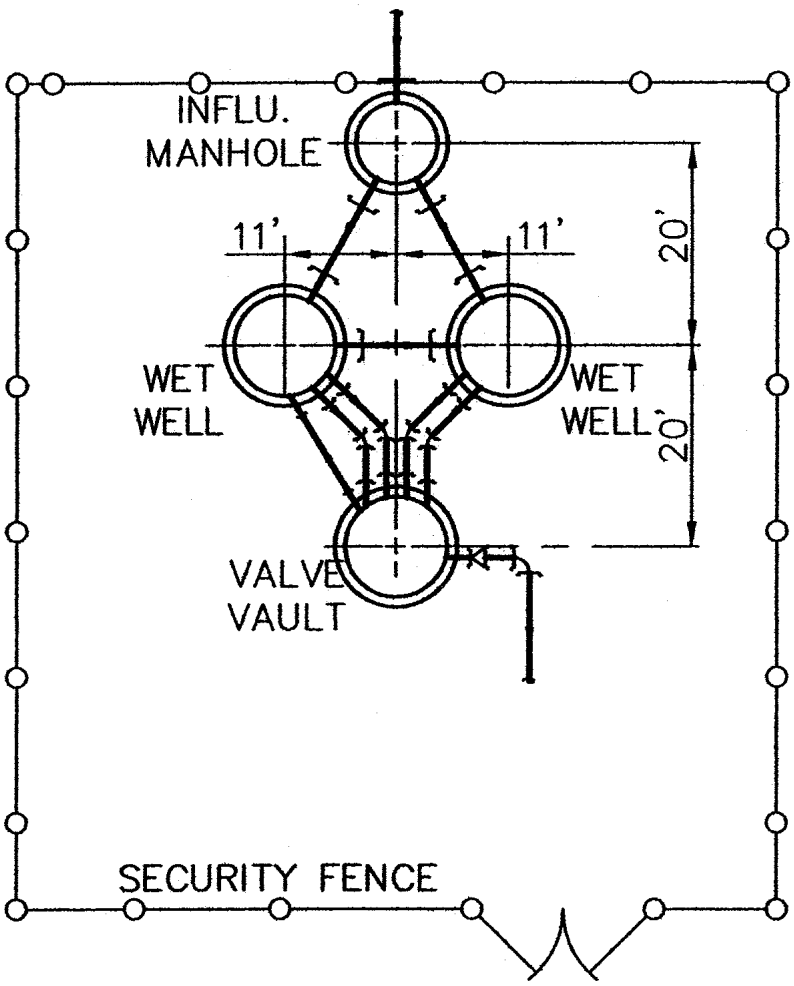
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
PIPE ANCHOR (CONCRETE)

JUNE, 1996 | DWG. NO. S13

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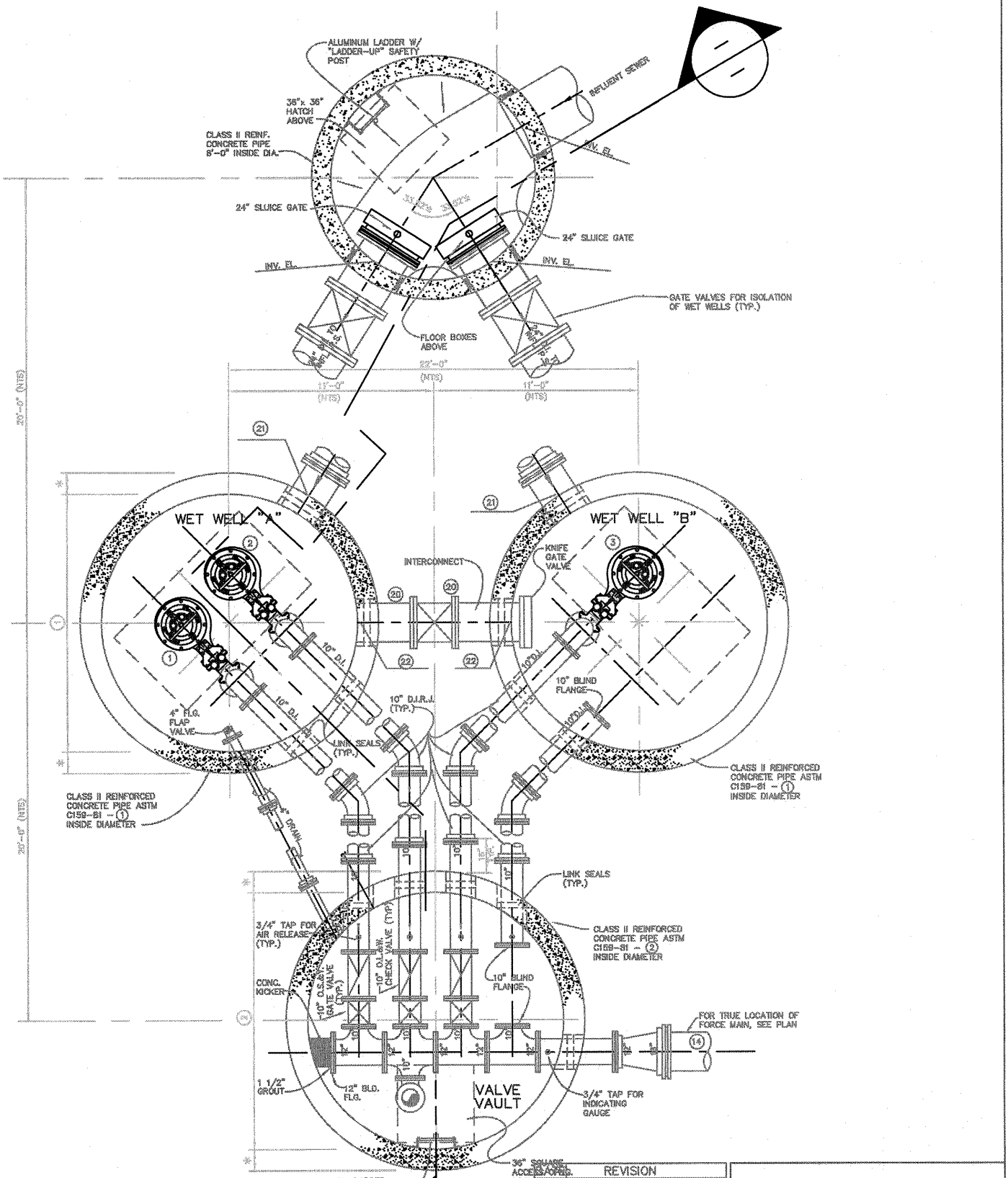
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
DUAL PUMPING STATION SITE PLAN

NOV, 2002 | DWG. NO. S14




LOWER PLAN

NOT TO SCALE

| REVISION |
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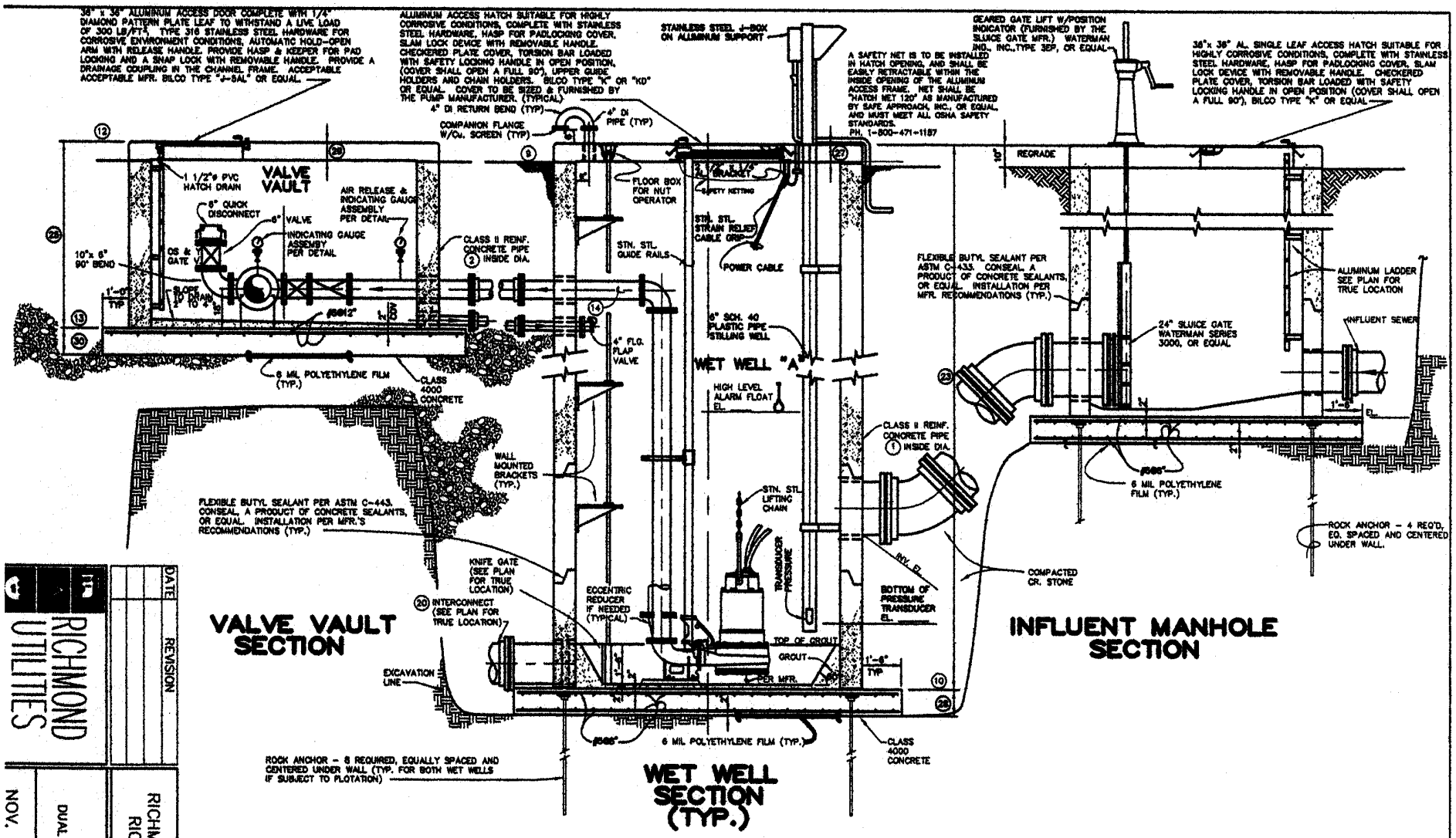
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

SANITARY SEWER
DUAL PUMPING STATION LAYOUT

NOV., 2002 | DWG. NO. S14A




**NOTES:**

- ACCESS HATCH FOR PUMPS (FURNISHED BY PUMP MFR.) SHALL BE SET SUCH AS TO ALLOW GUIDE RAILS FROM PUMP DISCHARGE FLANGED CONNECTION TO BE VERTICAL FOR CORRECT OPERATION.
- SEE MFR'S INSTALLATION DRAWINGS FOR TRUE DIMENSIONS OFF CENTERLINE FOR PUMPS AND ACCESS HATCH.
- WALL THICKNESS * PER PRECAST MANUFACTURER.
- PIPING, VALVES, FITTINGS, PUMPS, MOTORS, ETC. INSIDE STATION AND VALVE VAULT, EXCEPT GUIDE RAILS SHALL HAVE 2 FIELD COATS OF KOP-COAT HI-GARD (4-6 DRY MILS). DRYING TIME BETWEEN COATS AND APPLICATION SHALL BE PER
- IF THE CURVATURE OF THE WALL WHERE A LINK SEAL IS PROPOSED TO BE INSTALLED IS TOO GREAT TO ALLOW INSTALLATION OF THE LINK SEAL, WITHIN MANUFACTURER'S RECOMMENDATIONS, A NEOPRENE BOOT SHALL BE USED ON THE OUTSIDE OF THE STRUCTURE WITH A GROUT RING AND NON-SHRINK GROUT USED ON THE INTERIOR.

RICHMOND UTILITIES

| DATE | REVISION |
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RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
DUAL PUMPING STATION SECTION

NOV. 2002 | DWG. NO. S14B

# DUAL PUMPING STATION DATA

| ITEM | INFLUENT PUMP STATION | |
|---|---|---|
| (1) WET WELL DIAMETER "A" & "B" | 10 FT | |
| (2) VALVE VAULT DIAMETER | 10 FT | |
| (3) PUMP CAPACITY #1 | ____ GPM | |
| (4) PUMP CAPACITY #2 | ____ GPM | |
| (5) PUMP CAPACITY #3 | ____ GPM | |
| (6) FORCE MAIN SIZE | ____ INCH | |
| (7) TOP OF TOP SLAB (WET WELL) "A" & "B" | ELEV. | |
| (9) REGRADE | ELEV. | |
| (10) TOP OF BOTTOM SLAB (WET WELL) "A" | ELEV. | |
| (11) TOP OF BOTTOM SLAB (WET WELL) "B" | ELEV. | |
| (12) TOP OF TOP SLAB (VALVE VAULT) | ELEV. | |
| (13) TOP OF BOTTOM SLAB (VALVE VAULT) | ELEV. | |
| (14) CL. DISCHARGE PIPE ELEVATION | ELEV. | |
| (15) PUMP COMMON STOP ELEVATION | ELEV. | |
| (16) START LEAD PUMP ELEVATION (VFD) | ELEV. | |
| (17) START 1st LAG PUMP ELAVATION | ELEV. | |
| (18) START 2nd LAG PUMP ELEVATION | ELEV. | |
| (19) GRAVITY SEWER SIZE | ____ INCH | |
| (20) INTERCONNECT SEWER PIPE | ____ INCH | |
| (21) INVERT ELEVATION-GRAVITY SEWER | ELEV. | |
| (22) INVERT ELEVATION INTERCONNECT | EIEV. | |
| (23) WET WELL DEPTH "A" | ___ FT. | |
| (24) WET WELL DEPTH "B" | ___ FT. | |
| (25) VALVE VAULT DEPTH | ___ FT | |
| (26) PUMP MOTOR H.P., PHASE | ___ HP, ___ PHASE | |
| (27) WET WELL TOP SLAB THICKNESS | 10 INCH | |
| (28) WET WELL BOTTOM SLAB THICKNESS | 12 INCH | |
| (29) VALVE VAULT TOP SLAB THICKNESS | 10 INCH | |
| (30) VALVE VAULT BOTTOM SLAB THICKNESS | 12 INCH | |
| (31) PUMP ALARM ELEVATION | ELEV. | |

| DATE | REVISION |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

SANITARY SEWER
DUAL PUMPING STATION PUMP DATA

NOV, 2002 | DWG. NO. S14C

GENERAL NOTES FOR WATER MAINS:

*MINIMUM COVER OVER WATER PIPE TO BE 36" (42" in KYDOH R/W).
*MAXIMUM COVER OVER WATER PIPE TO BE 48".

*MINIMUM COVER OVER VALVE NUT TO BE 12". MAXIMUM COVER OVER VALVE NUTS TO BE 48". WHERE VALVES ARE BURIED DEEPER THAN 36" A 3/4 "OR 1" SOLID STEEL VALVE OPERATING NUT EXTENSION SHALL BE REQUIRED AND SECURED TO VALVE OPERATING NUT

*CONTACTOR SHALL HAVE RICHMOND UTILITIES PERSONNEL ON SITE WHEN DIGGING OVER OR AROUND UTILITY LINES AND PUMP STATIONS. CONTRACTOR SHALL SCHEDULE EXCAVATION WITH RICHMOND UTILITIES DEPARTMENT SUPERVISORS, CALL 859-623-2323

*EXACT SIZES, DEPTHS, MATERIALS AND LOCATIONS OF EXISTING UTILITIES ARE UNKNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF THESE FAR ENOUGH IN ADVANCE OF THE PIPELINE OPERATION SO AS NOT TO CAUSE ANY UNNECESSARY DELAYS. RELOCATION OF EXISTING UTILITIES FOUND TO BE IN DIRECT CONFLICT WITH THIS CONTRACT SHALL BE ACCOMPLISHED BY THE OWNER OF THE UTILITIES INVOLVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES HAVING PROPERTY IN THE AREA PRIOR TO EXCAVATION. CONTINUOUS COMMUNICATIONS ON A DAY TO DAY BASIS WILL BE REQUIRED. THE UTILITY COMPANIES ARE AS FOLLOWS:

ELECTRIC COMPANIES CONTACT-
BLUEGRASS ELECTRIC CO-OP CORP.,
KENTUCKY UTILITIES COMPANY, OR
CLARK ENERGY.

TELEPHONE CONTACT-
SOUTH CENTRAL BELL

GAS CONTACT-
RICHMOND UTILITIES BOARD, COLUMBIA
GAS OR DELTA GAS.

WATER CONTACT-
RICHMOND UTILITIES BOARD

KENTUCKY STATUTES (KRS 367.4901 THRU 367.4917) REQUIRE THAT ALL EXCAVATORS PLANNING EXCAVATION OR DEMOLITION WORK SHALL CALL ALL UTILITY COMPANIES IN THE AREA AND AN UNDERGROUND PROTECTION SERVICE SUCH AS "BUD" (1-800-752-6007) AT LEAST TWO (2) WORKING DAYS BEFORE COMMENCING WORK TO NOTIFY UTILITY COMPANIES IN THE AREA WITH UNDERGROUND FACILITIES OF THE PLANNED EXCAVATION OR DEMOLITION ACTIVITIES.

*CONCRETE BLOCKING OF FITTINGS REQUIRED.

*CONCRETE LINE MARKERS TO BE LOCATED AT PROPERTY AND OR FENCE LINES AS DIRECTED BY RICHMOND UTILITIES.

*WHEREVER POSSIBLE, FIRE HYDRANTS SHALL BE LOCATED FOR MINIMUM DEPTH OF BURY. EXTENSIONS REQUIRED FOR DEEPER INSTALLATIONS.

*ALL PVC PIPE TO BE ASTM SDR 21, CL. 200. ALL DUCTILE IRON PIPE 12" AND LARGER SHALL BE CLASS 350 UNLESS OTHERWISE NOTED.

*DISTANCES SHOWN ALONG PIPELINE ARE HORIZONTAL DISTANCES BETWEEN HORIZONTAL ANGLES OF 90° AND/OR MATCH LINES EXCEPT WHERE PROFILES ARE SHOWN.

*ALL TIE-IN LOCATIONS SHALL BE UNCOVERED PRIOR TO CONSTRUCTION TO MAINTAIN PROPER ALIGNMENT AND ELEVATION OF NEW CONNECTIONS.

*CONTRACTOR SHALL INVENTORY REQUIRED MATERIALS, TRENCH DEWATERING EQUIPMENT, AND ASSEMBLE IF NECESSARY ALL REQUIRED FITTINGS PRIOR TO CUT-INS SO SO TO INSURE MINIMUM DOWN TIME FOR CONNECTION AND WITNESS BY RICHMOND UTILITIES.

*SURFACE DRAINAGE SHALL BE MAINTAINED ON A DAY-BY-DAY BASIS.

*THE CONTRACTOR WILL BE REQUIRED TO DISPOSE OF ALL EXCESS EXCAVATED MATERIAL FROM WATER MAIN AND SERVICE LINE CONSTRUCTION.

*EXACT SIZES, DEPTHS, MATERIALS AND LOCATIONS OF SEWER SERVICES AND BRANCH SEWERS ARE UNKNOWN. THE CONTRACTOR SHALL ACCURATELY DETERMINE THESE AHEAD OF HIS TRENCHING OPERATION, AND HAVE THE NECESSARY MATERIALS TO MAKE MAKE THE TIE-INS AS THE PIPE LAYING PROGRESSES.

*CROSSINGS OF ALL STREETS, DRIVEWAYS AND PAVED PARKING AREAS SHALL BE BACKFILLED PER SPECS TO THE TOP OF THE TRENCH SURFACE.

*ALL ROCKS, CLODS, EARTH AND OTHER LARGE MATERIAL SHALL BE REMOVED FROM THE TRENCH BOTTOM PRIOR TO PLACEMENT OF THE BEDDING.

*ALL CULVERTS AND CROSS DRAINS AT STREETS, DRIVES AND ENTRANCES NEAR THE WORK AREA SHALL BE PROTECTED. IF IN THE PATH OF THE SEWER DITCH, THEY SHALL BE REMOVED AND RELAYED AS PART OF THE TRENCHING AND BACKFILL OPERATION.

*PLACE #12 THW COPPER WIRE ( SEE STANDARD DETAIL FOR MAIN INSTALLATION).

| DATE | REVISION |
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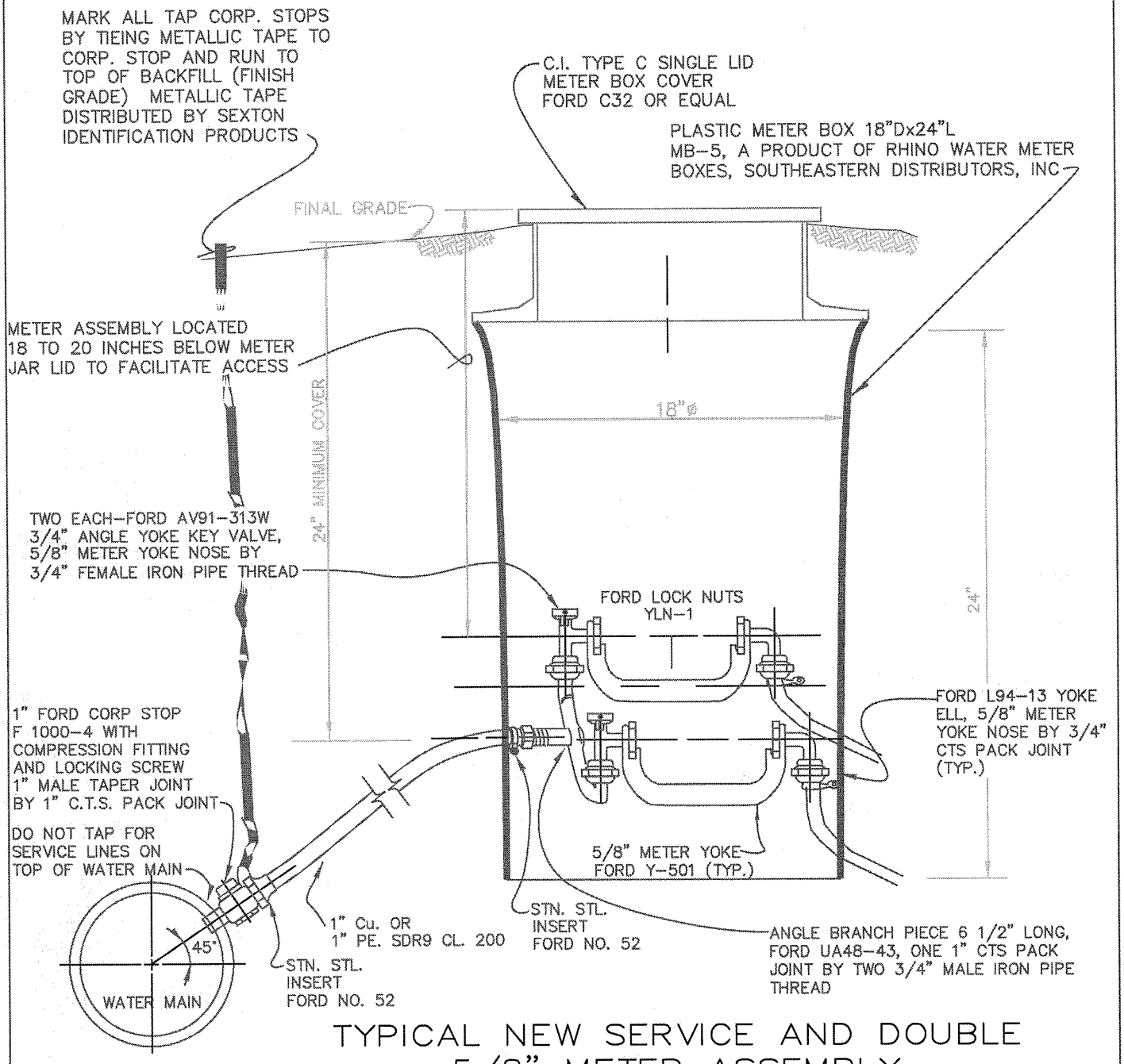
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

WATER TRANSMISSION MAIN
GENERAL CONSTRUCTION NOTES

JUNE, 1996 | DWG. NO. W1




# TYPICAL NEW SERVICE AND DOUBLE 5/8" METER ASSEMBLY

NOT TO SCALE

| DATE | REVISION |
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| 2/07 | |
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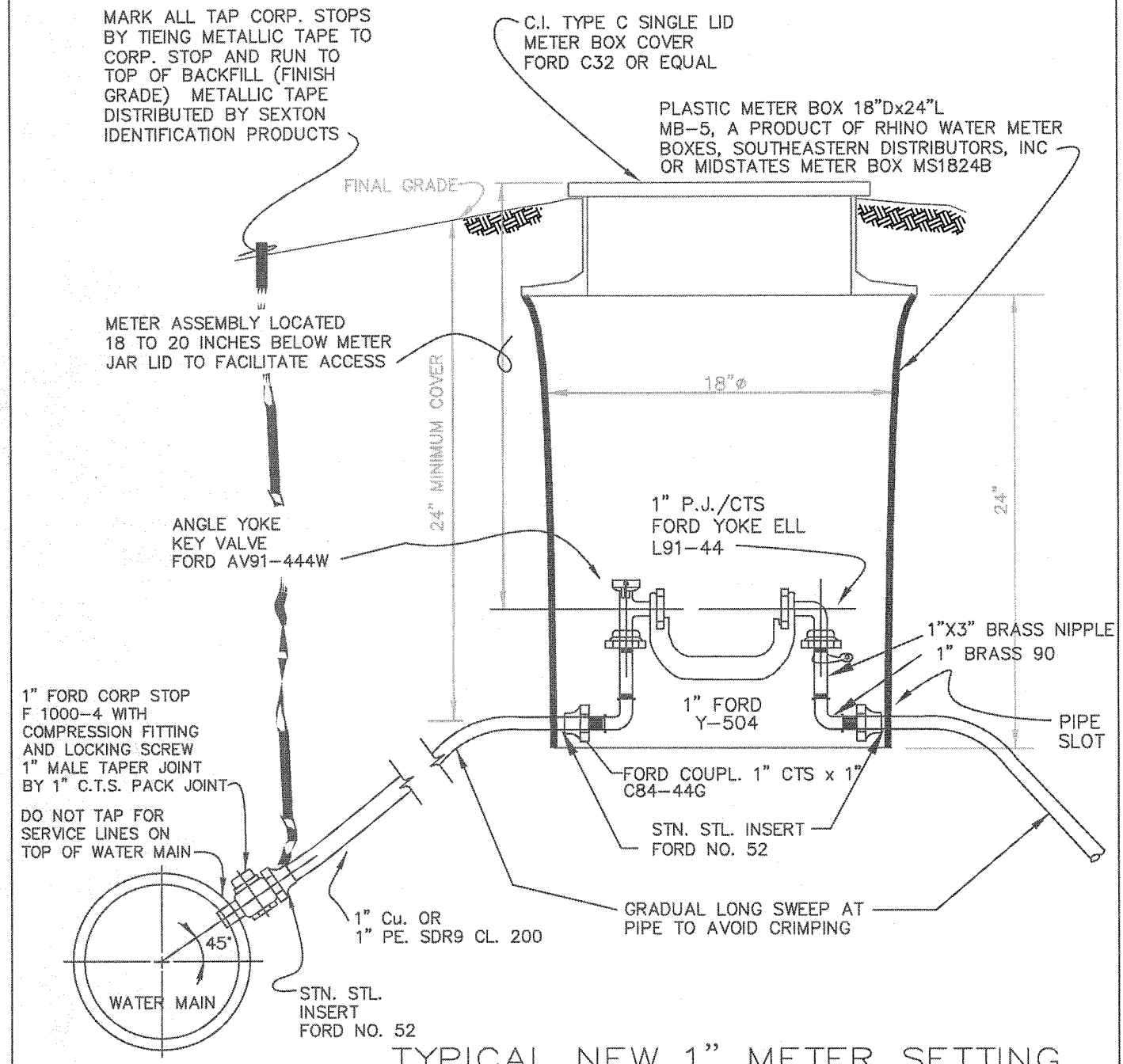
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

WATER TRANSMISSION MAIN
WATER SERVICE &
DOUBLE METER ASSEMBLY

JUNE, 1996 | DWG. NO. W2




# TYPICAL NEW 1" METER SETTING

NOT TO SCALE

| DATE | REVISION |
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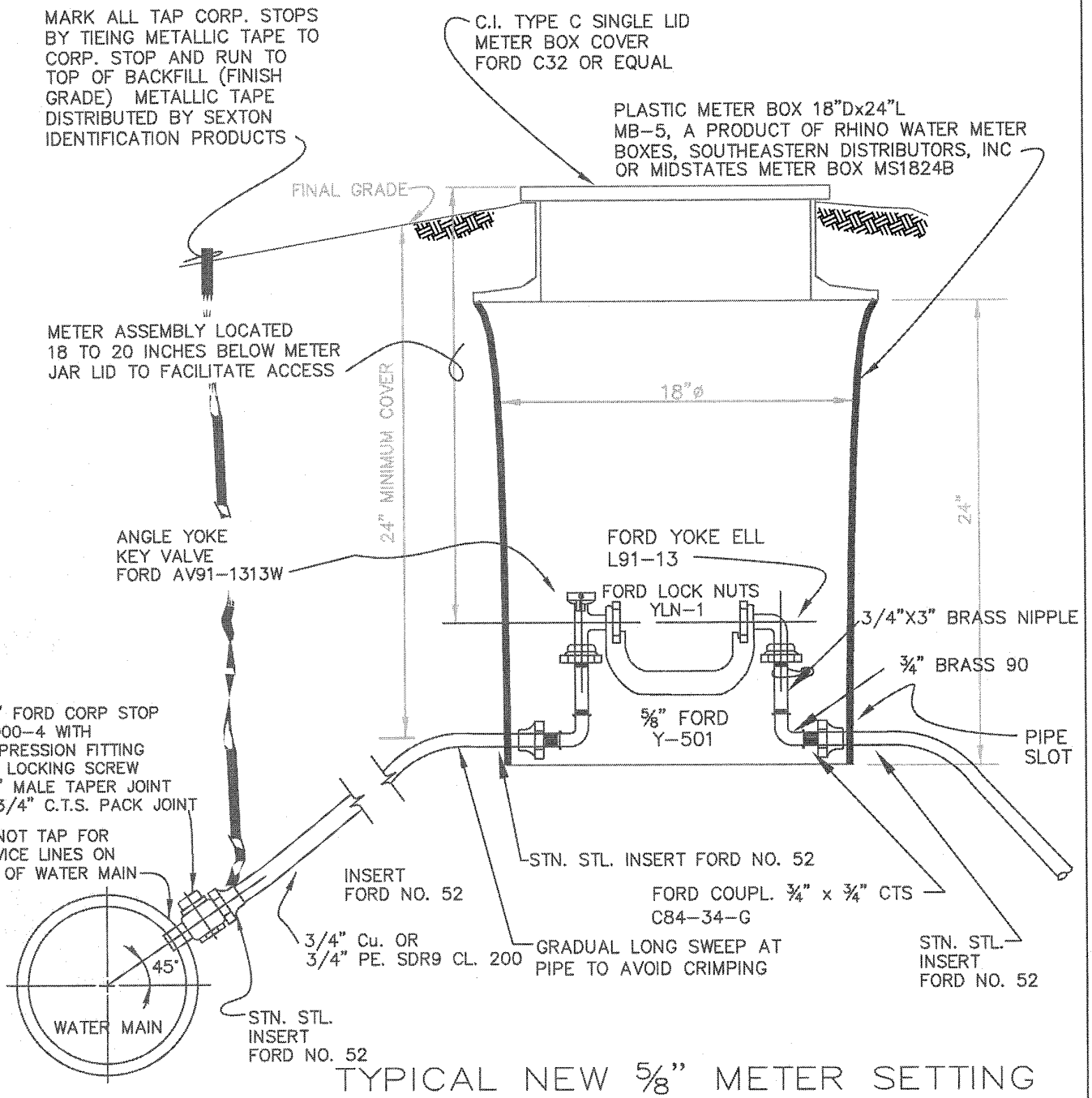
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

WATER TRANSMISSION MAIN
WATER METER SETTING

JUNE, 1996 | DWG. NO. W3




# TYPICAL NEW 5/8" METER SETTING

NOT TO SCALE

FOR PVC PIPE USE FORD BRASS SADDLE STYLE S-70 OR S-90 FOR PVC C-900

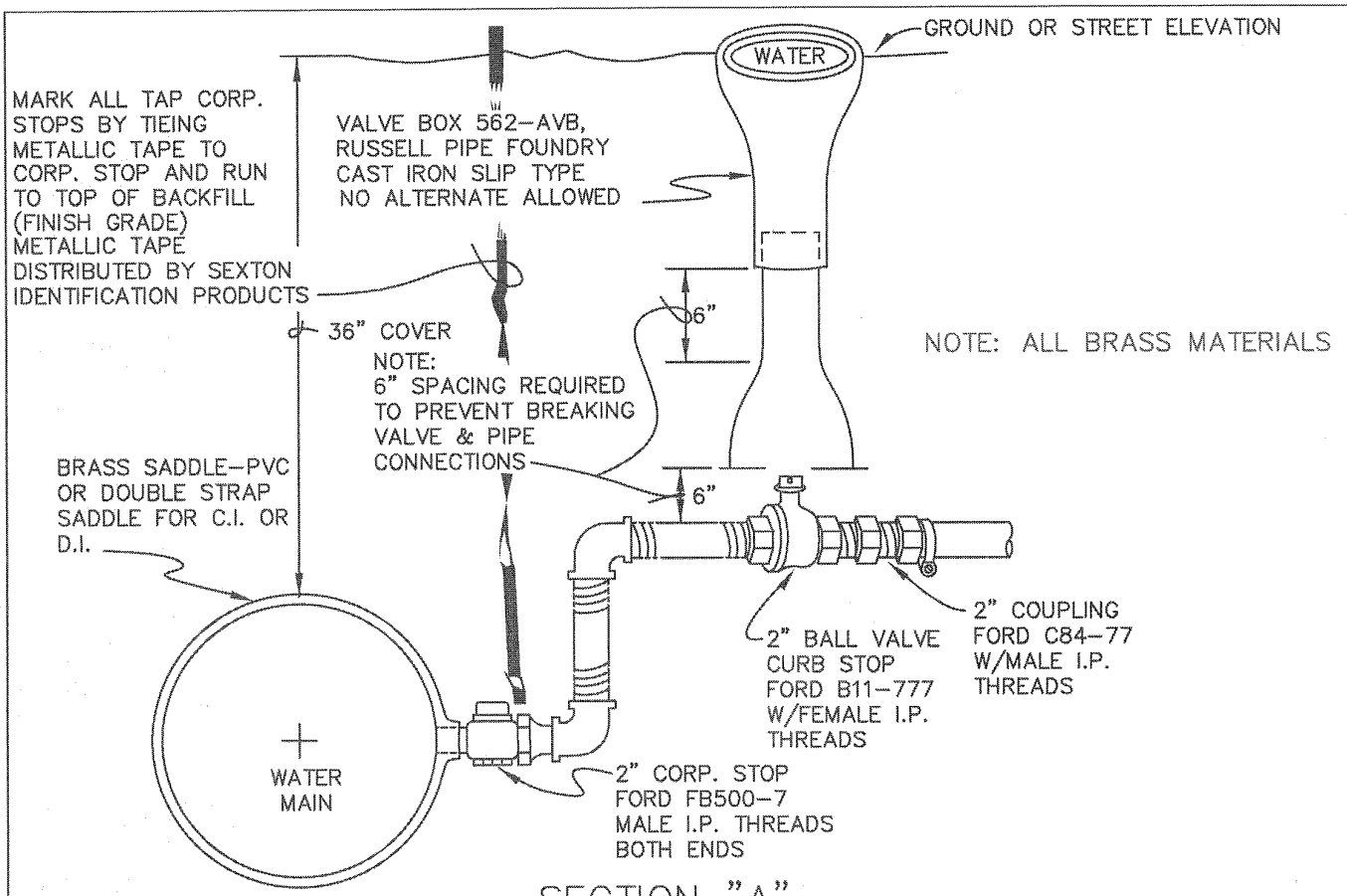
| DATE | REVISION |
|---|---|
| 2/07 | |

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

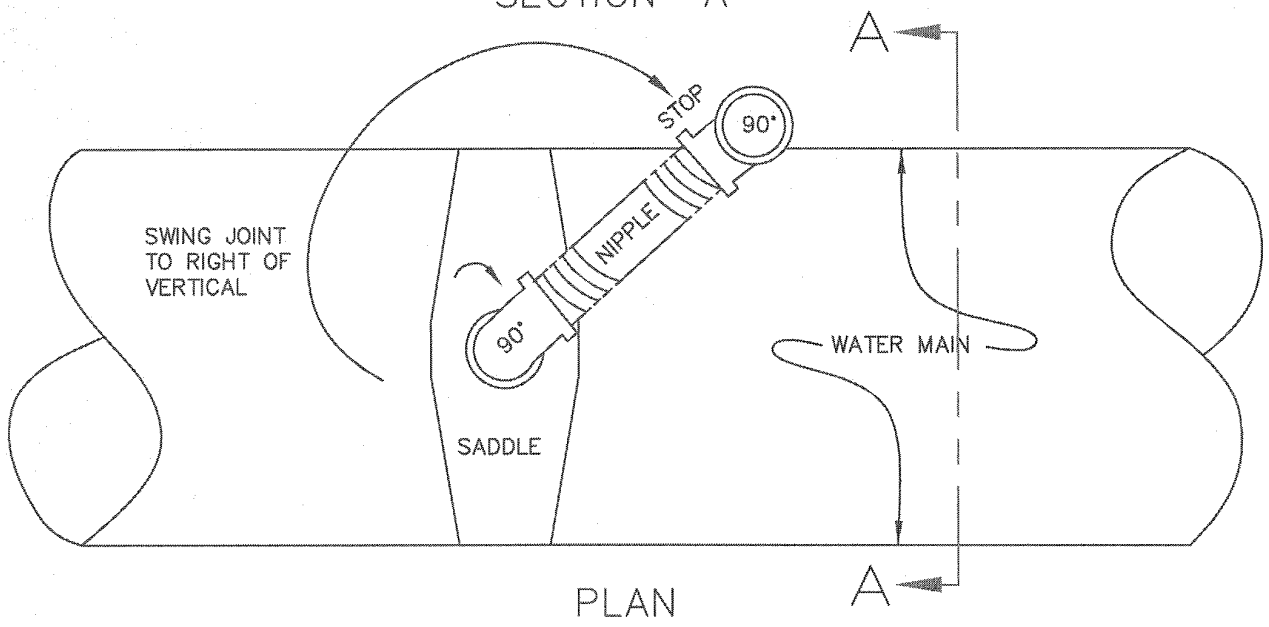
RICHMOND UTILITIES

WATER TRANSMISSION MAIN
WATER METER SETTING

JUNE, 1996 | DWG. NO. W3A




SECTION "A"




PLAN

# 2" TAP ILLUSTRATION

NOTE: ALL BRASS MATERIALS

NOTE: CONSULT RICHMOND UTILITIES WATER DEPT. PRIOR TO PURCHASING MATERIALS FOR 2" TAP. RICHMOND UTILITIES MUST INSPECT ALL 2" TAPS, SERVICE LINES AND METER SETS PRIOR TO BACKFILLING.

| DATE | REVISION |
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| 2/02 | |
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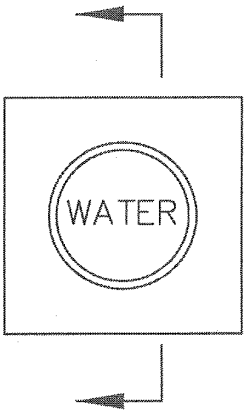
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

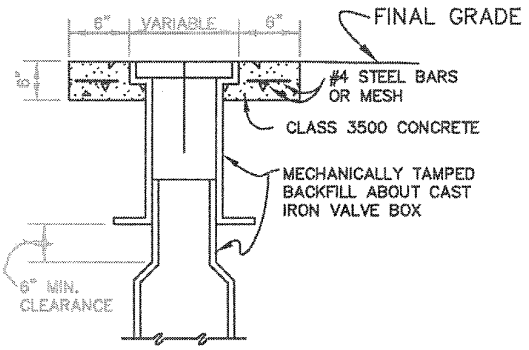
RICHMOND UTILITIES

WATER TRANSMISSION MAIN
2" TAP ILLUSTRATION

JUNE, 1996 | DWG. NO. W4




PLAN

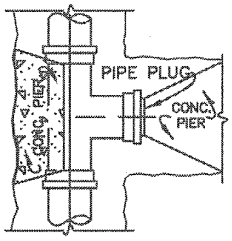



SECTION

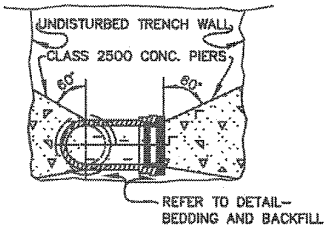
# CONCRETE VALVE BOX COLLAR

(REQUIRED ON ALL VALVES)
NOT TO SCALE

NOTE:
IF MECHANICAL JOINT PLUG IS USED ON THE BRANCH, NO BLOCKING WILL BE REQUIRED ON THE PLUG. THE SIDE OF THE TEE SHALL BE BLOCKED IN ALL CASES.



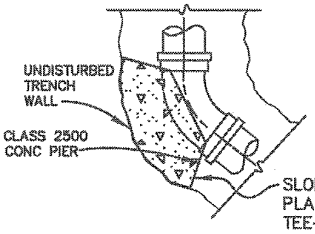

PLAN




SECTION

NOTE:
REFER TO DWG. NO. M10 FOR CONCRETE BACKING DIMENSIONS

# TYPICAL DETAIL OF CONCRETE BACKING AT TEES & PLUGS




PLAN

# TYPICAL DETAIL OF CONCRETE BACKING AT BENDS VERTICAL & HORIZONTAL

NOT TO SCALE

| DATE | REVISION |
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| 2/02 | |
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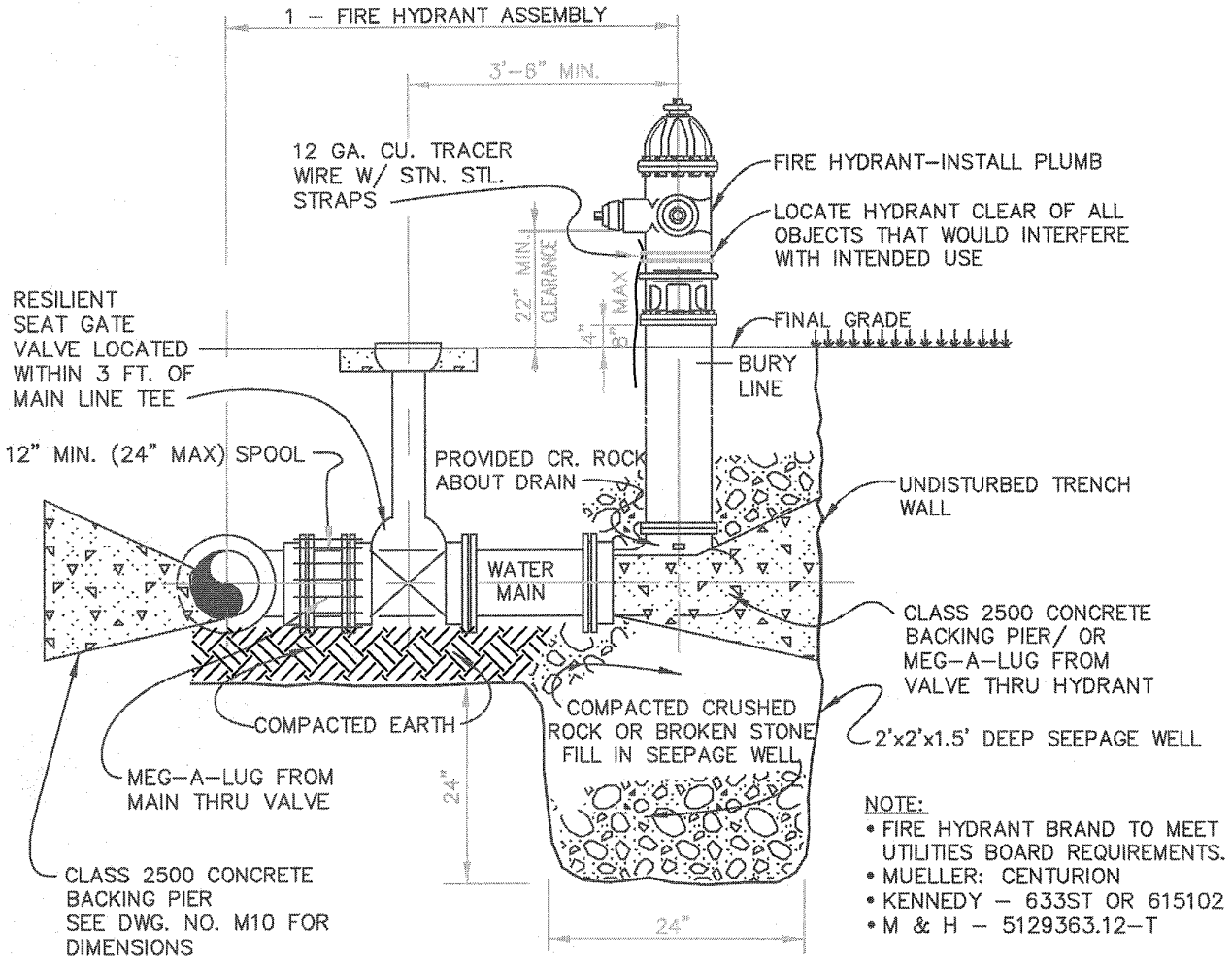
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

WATER TRANSMISSION MAIN
CONCRETE BACKING AT
TEES, BENDS & PLUGS
VALVE BOX CONCRETE COLLAR

JUNE, 1996 | DWG. NO. W5




## SECTION

# FIRE HYDRANT SETTING

N T S

| DATE | REVISION |
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| 2/07 | |
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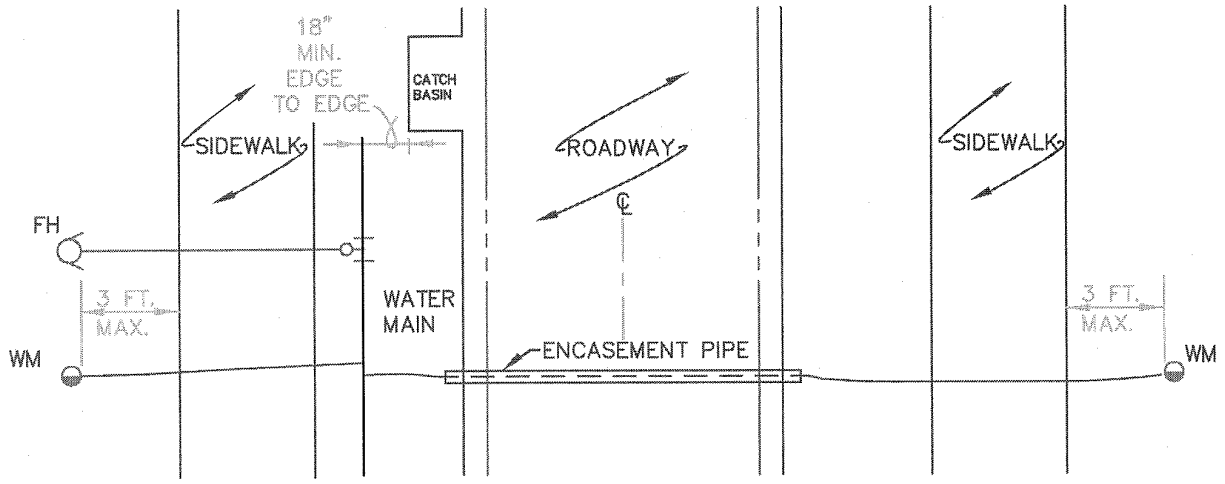
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

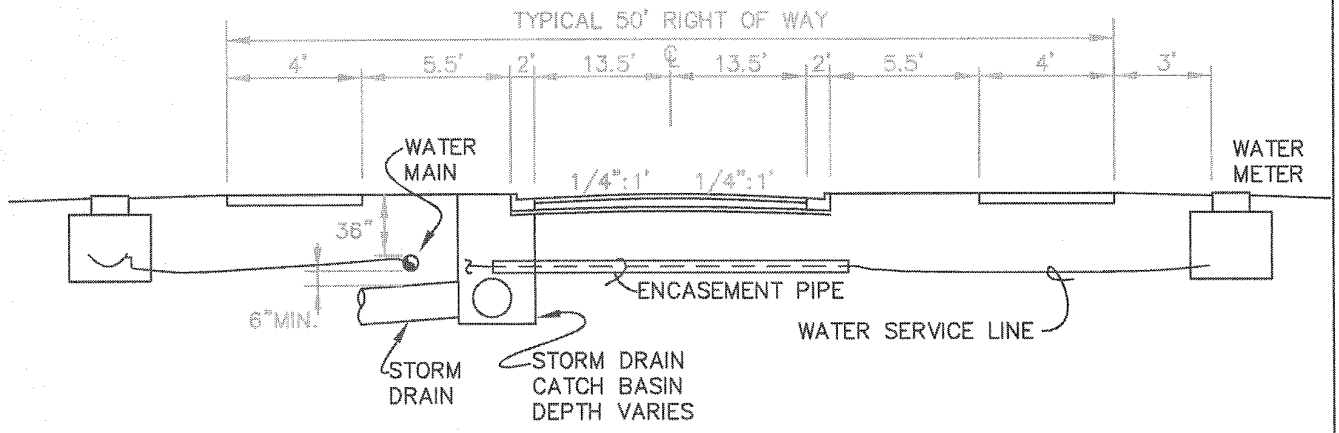
RICHMOND UTILITIES

WATER TRANSMISSION MAIN
FIRE HYDRANT SETTING

JUNE, 1996 | DWG. NO. W6




PLAN




ELEVATION

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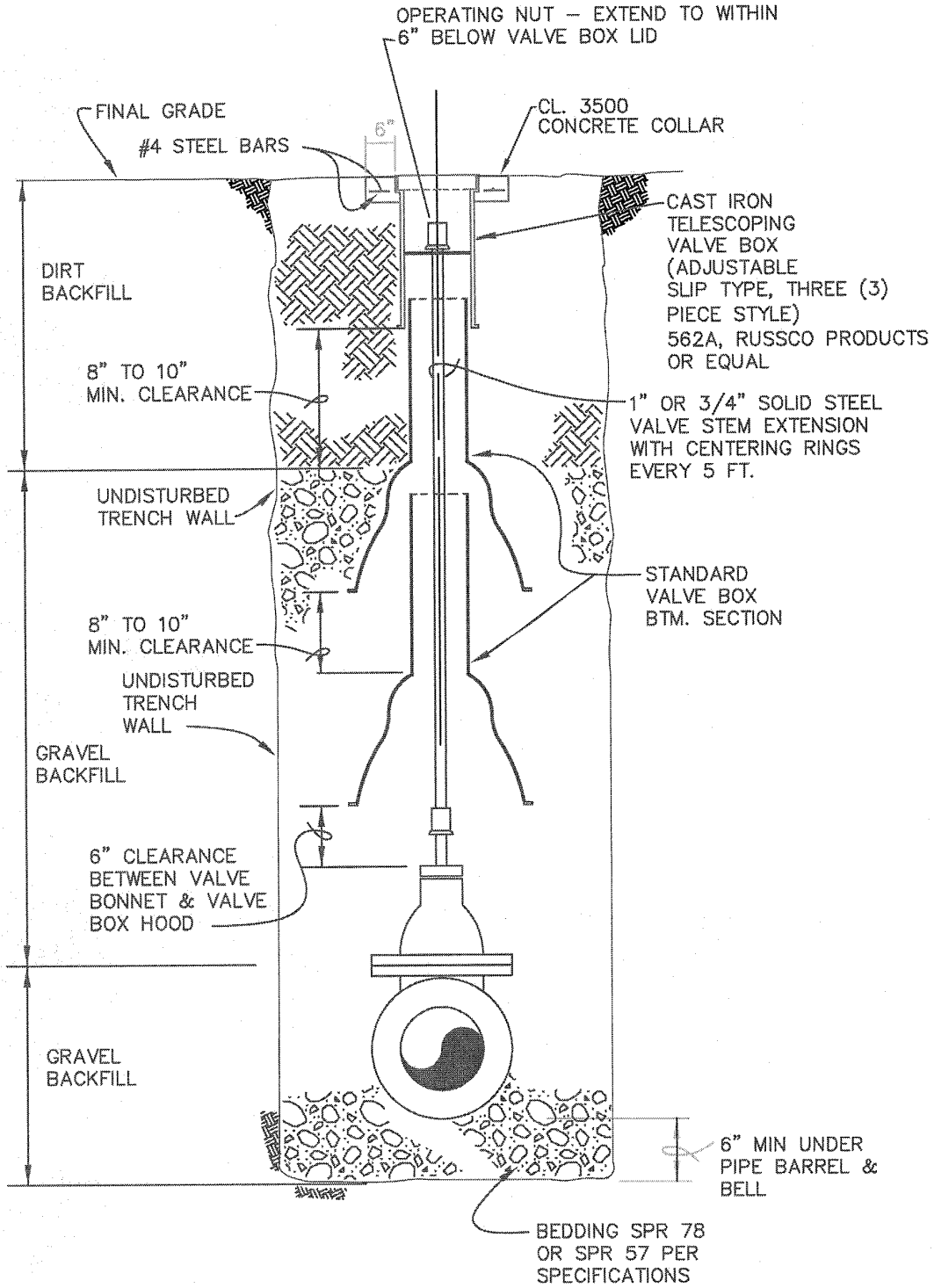
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

WATER TRANSMISSION MAIN
WATER LINE, HYDRANT & METER
(ROAD LOCATIONS)

JUNE, 1996 | DWG. NO. W7




# VALVE STEM EXTENSIONS & VALVE BOX STACKING DETAIL

NOT TO SCALE

| DATE | REVISION |
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| 2/07 | |
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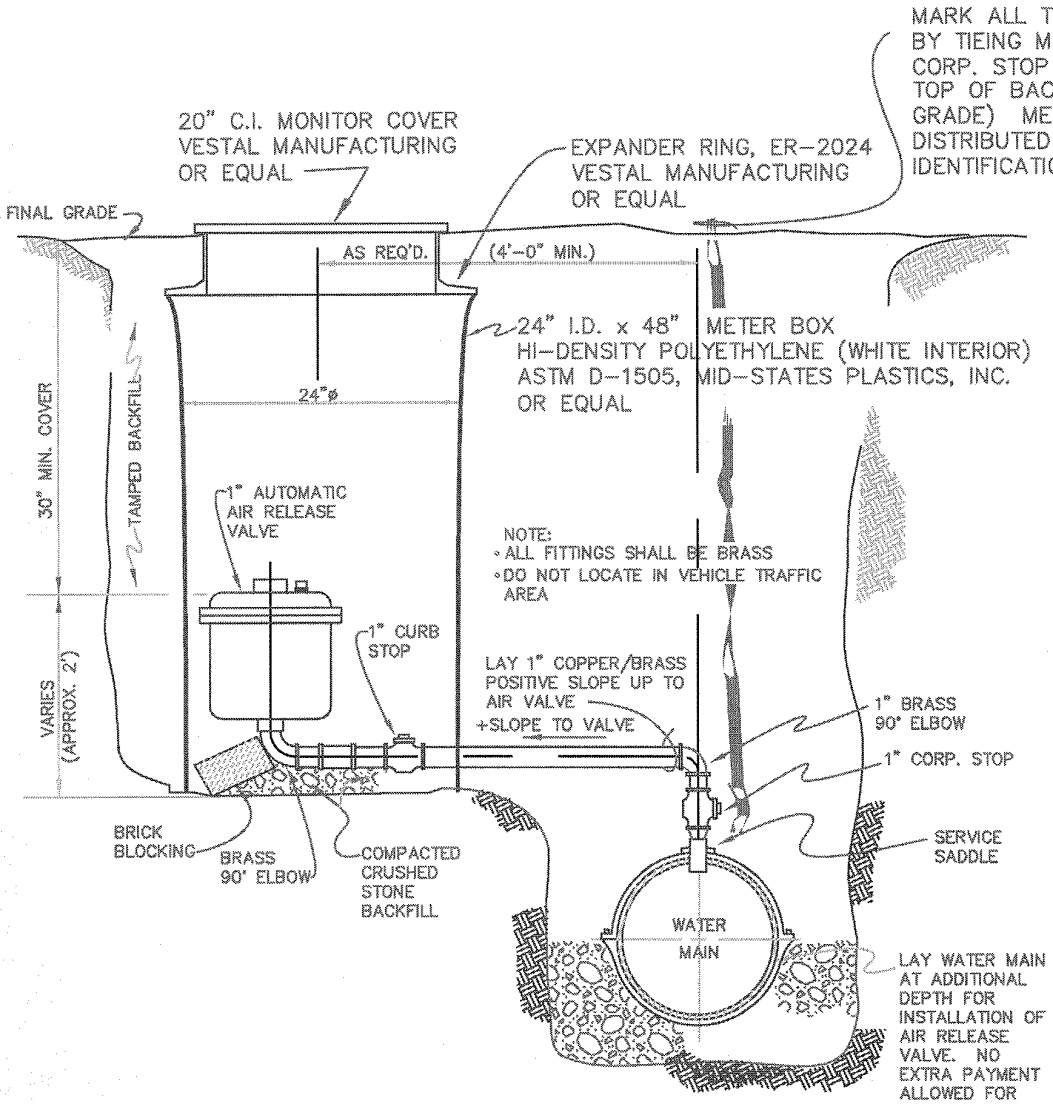
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

WATER TRANSMISSION MAIN
VALVE STEM EXTENSIONS &
VALVE BOX STACKING DETAIL

JUNE, 1996 | DWG. NO. W8




DETAIL AUTOMATIC AIR RELEASE VALVE ASSEMBLY

N T S

| DATE | REVISION |
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| 2/02 | |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

WATER TRANSMISSION MAIN
AUTOMATIC AIR RELEASE VALVE ASSEMBLY

FEB., 2002 | DWG. NO. W9

GENERAL NOTES FOR FORCE MAINS:

*CONTACTOR SHALL HAVE RICHMOND UTILITIES PERSONNEL ON SITE WHEN DIGGING OVER OR AROUND UTILITY LINES AND PUMP STATIONS. CONTRACTOR SHALL SCHEDULE EXCAVATION WITH RICHMOND UTILITIES DEPARTMENT SUPERVISORS, CALL 859-623-2323

*EXACT SIZES, DEPTHS, MATERIALS AND LOCATIONS OF EXISTING UTILITIES ARE UNKNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE EXACT LOCATION OF THESE FAR ENOUGH IN ADVANCE OF THE PIPELINE OPERATION SO AS NOT TO CAUSE ANY UNNECESSARY DELAYS. RELOCATION OF EXISTING UTILITIES FOUND TO BE IN DIRECT CONFLICT WITH THIS CONTRACT SHALL BE ACCOMPLISHED BY THE OWNER OF THE UTILITIES INVOLVED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITY COMPANIES HAVING PROPERTY IN THE AREA PRIOR TO EXCAVATION. CONTINUOUS COMMUNICATIONS ON A DAY TO DAY BASIS WILL BE REQUIRED. THE UTILITY COMPANIES ARE AS FOLLOWS:

ELECTRIC COMPANIES CONTACT-
BLUEGRASS ELECTRIC CO-OP CORP.,
KENTUCKY UTILITIES COMPANY, OR
CLARK ENERGY.

TELEPHONE CONTACT-
SOUTH CENTRAL BELL

GAS CONTACT-
RICHMOND UTILITIES BOARD, COLUMBIA
GAS OR DELTA GAS.

WATER CONTACT-
RICHMOND UTILITIES BOARD

KENTUCKY STATUTES (KRS 367.4901 THRU 367.4917) REQUIRE THAT ALL EXCAVATORS PLANNING EXCAVATION OR DEMOLITION WORK SHALL CALL ALL UTILITY COMPANIES IN THE AREA AND AN UNDERGROUND PROTECTION SERVICE SUCH AS "BUD" (1-800-752-6007) AT LEAST TWO (2) WORKING DAYS BEFORE COMMENCING WORK TO NOTIFY UTILITY COMPANIES IN THE AREA WITH UNDERGROUND FACILITIES OF THE PLANNED EXCAVATION OR DEMOLITION ACTIVITIES.

*MIN. COVER OVER FORCE MAIN TO BE 36" (42" IN KYDOH R/W).
*MAX. COVER OVER FORCE MAIN TO BE 36" (42" IN KYDOH R/W).
*CONCRETE BLOCKING OF FITTINGS REQUIRED.

*LAY NEW MAIN UNDER EXISTING WATER LINES AND GAS LINES, EXCEPT AS APPROVED BY RICHMOND UTILITIES BOARD.

*ALL PVC PIPE TO BE CL. 200. ALL WATER MAIN PIPE 12" AND LARGER SHALL BE DUCTILE IRON MINIMUM CLASS 350.

*DISTANCES SHOWN ALONG PIPELINE ARE HORIZONTAL DISTANCES BETWEEN HORIZONTAL ANGLES OF 90° AND/OR MATCH LINES EXCEPT WHERE PROFILES ARE SHOWN.

*ALL TIE-IN LOCATIONS SHALL BE UNCOVERED PRIOR TO CONSTRUCTION TO MAINTAIN PROPER ALIGNMENT AND ELEVATION OF NEW CONNECTIONS.

*CONTRACTOR SHALL INVENTORY REQUIRED MATERIALS, TRENCH DEWATERING EQUIPMENT, AND ASSEMBLE IF NECESSARY ALL REQUIRED FITTINGS PRIOR TO CUT-INS SO SO TO INSURE MINIMUM DOWN TIME FOR CONNECTION AND WITNESS BY RICHMOND UTILITIES.

*SURFACE DRAINAGE SHALL BE MAINTAINED ON A DAY-BY-DAY BASIS.

*THE CONTRACTOR WILL BE REQUIRED TO DISPOSE OF ALL EXCESS EXCAVATED MATERIAL FROM WATER MAIN AND SERVICE LINE CONSTRUCTION.

*EXACT SIZES, DEPTHS, MATERIALS AND LOCATIONS OF SEWER SERVICES AND BRANCH SEWERS ARE UNKNOWN. THE CONTRACTOR SHALL ACCURATELY DETERMINE THESE AHEAD OF HIS TRENCHING OPERATION, AND HAVE THE NECESSARY MATERIALS TO MAKE MAKE THE TIE-INS AS THE PIPE LAYING PROGRESSES.

*CROSSINGS OF ALL STREETS, DRIVEWAYS AND PAVED PARKING AREAS SHALL BE BACKFILLED PER SPECS TO THE TOP OF THE TRENCH SURFACE.

*ALL ROCKS, CLODS, EARTH AND OTHER LARGE MATERIAL SHALL BE REMOVED FROM THE TRENCH BOTTOM PRIOR TO PLACEMENT OF THE BEDDING.

*ALL CULVERTS AND CROSS DRAINS AT STREETS, DRIVES AND ENTRANCES NEAR THE WORK AREA SHALL BE PROTECTED. IF IN THE PATH OF THE SEWER DITCH, THEY SHALL BE REMOVED AND RELAYED AS PART OF THE TRENCHING AND BACKFILL OPERATION.

*PLACE #12 THW COPPER WIRE ( SEE STANDARD DETAIL FOR MAIN INSTALLATION).

*NO SEWAGE WILL BE DISCHARGED TO STREAMS, DITCHES OR GROUND. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL PUMPS, HOSES LABOR AND EQUIPMENT ACCESSORY TO BYPASS MANHOLES OR SECTIONS OF LINE WHICH ARE OPEN FOR ANY REASON.

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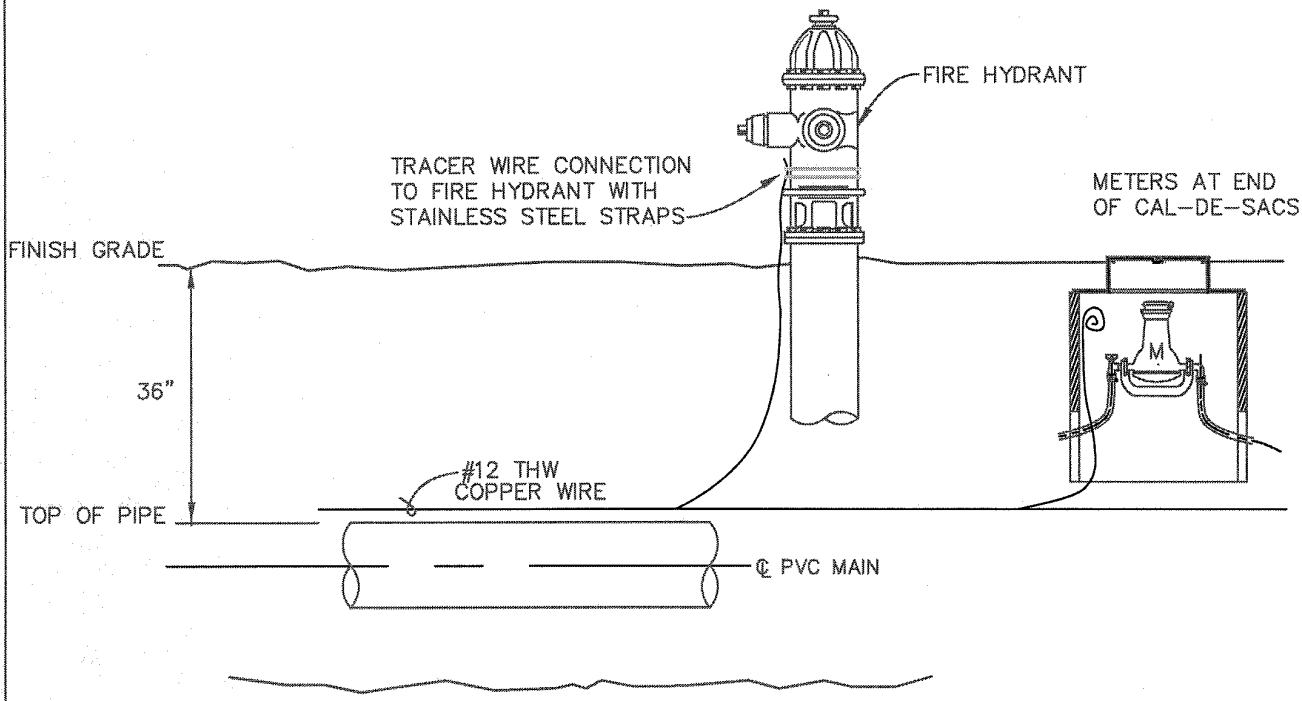
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
GENERAL CONSTRUCTION NOTES

JUNE, 1996 | DWG. NO. M1




NOTES:

1. PLACE #12 THW COPPER WIRE DIRECTLY OVER PIPE.
2. WIRE TO BE TIED TO ALL FIRE HYDRANT AND METERS AT END OF CAL-DE-SACS.

# TYPICAL MAIN WITH #12 THW COPPER WIRE COPPER TRACER WIRE INSTALLATION

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| DATE | REVISION |
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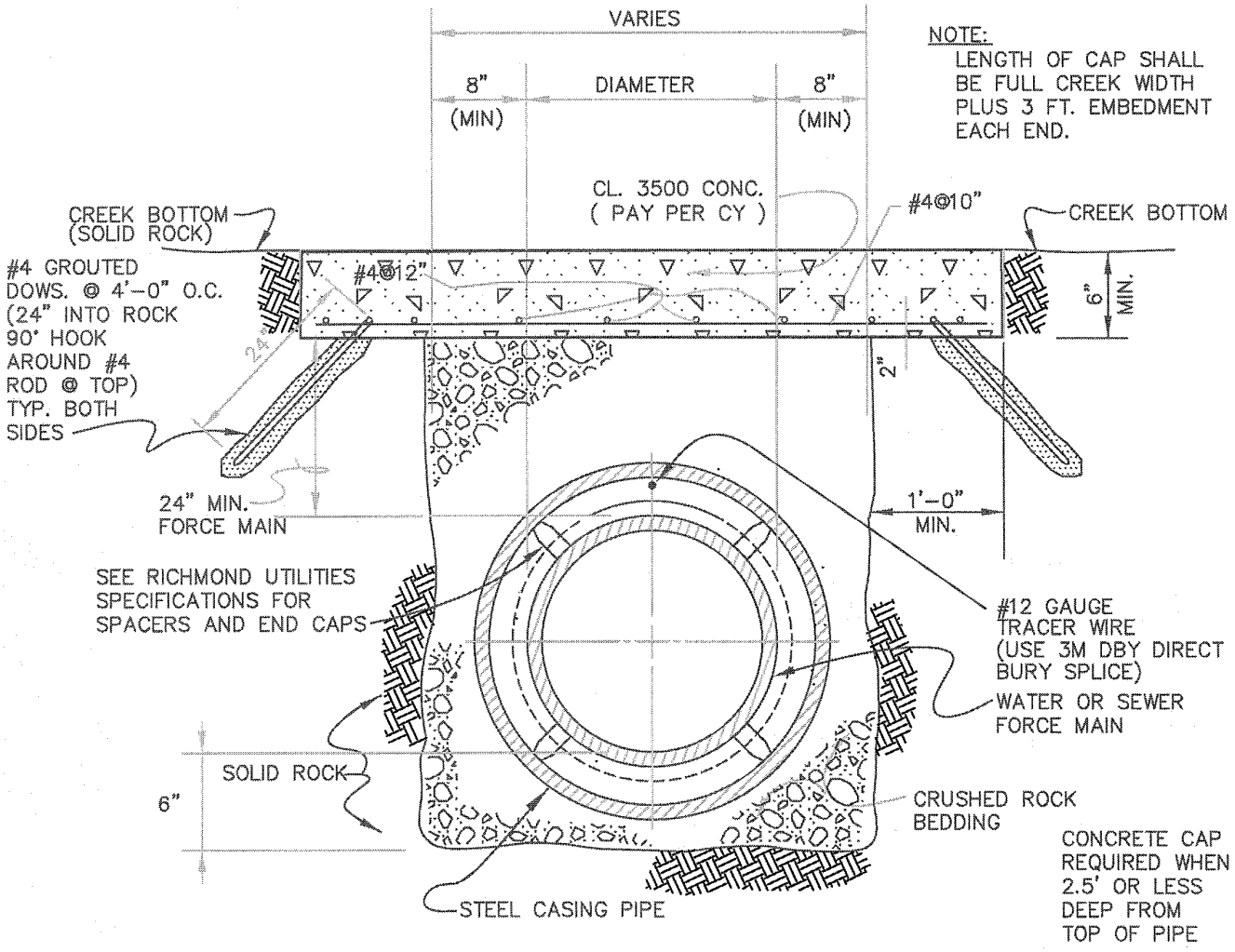
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
TYPICAL COPPER TRACE WIRE

JUNE, 1996 | DWG. NO. M2




# CONCRETE CAP AT CREEK CROSSING

ALL SIZE PIPE
N T S

| DATE | REVISION |
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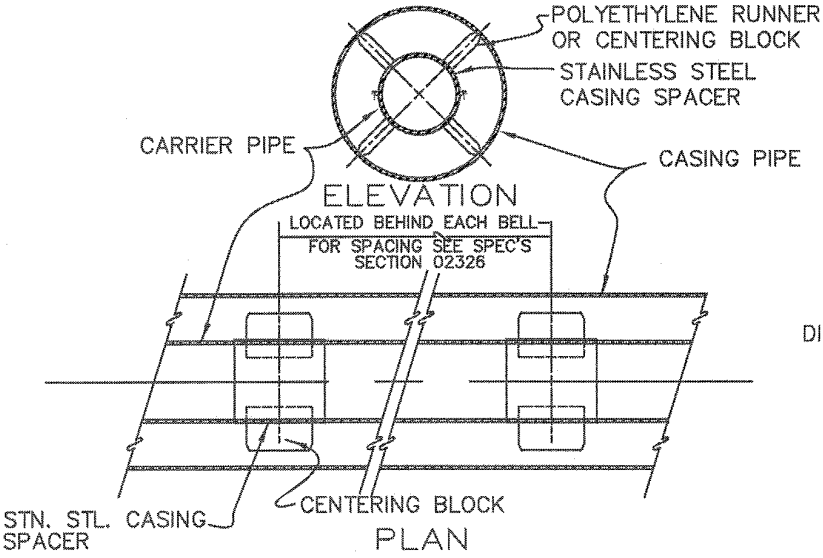
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
CONCRETE CAP AT CREEK CROSSING

JUNE, 1996 | DWG., NO. M3

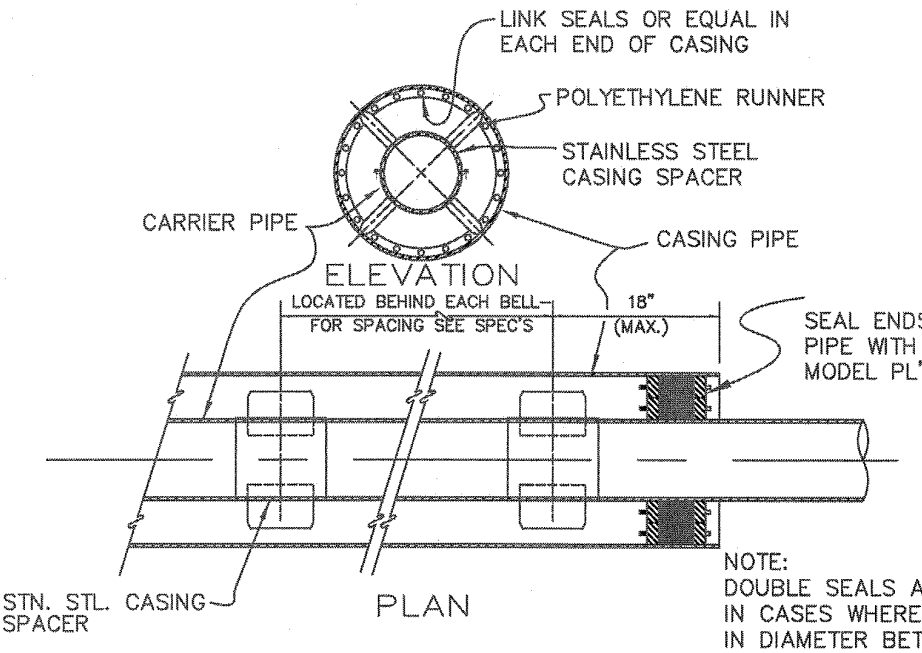



## SPACER TABLE

| PIPEINE DIAMETER (in.) | MAXIMUM SPACING (ft.) |
|---|---|
| 2– 2 1/2 | 4 |
| 3–8 | 7 |
| 10–26 | 10 |
| 28 | 9 |
| 30 | 8 |
| 32 | 7 |
| 34 | 6 |
| 36–38 | 5.5 |
| 40–44 | 5 |
| 46–48 | 4 |

# DETAIL
# CARRIER PIPE POSITIONING
# IN CASING PIPE

NOT TO SCALE




NOTE:
DOUBLE SEALS ARE REQUIRED IN CASES WHERE DIFFERENCE IN DIAMETER BETWEEN CARRIER AND CASING PIPE IS TOO LARGE. OTHERWISE SEALING SHALL BE SINGLE SEAL.

# DETAIL
# CARRIER PIPE POSITIONING
# IN CASING PIPE

NOT TO SCALE

| DATE | REVISION |
|---|---|
| 2/07 | |
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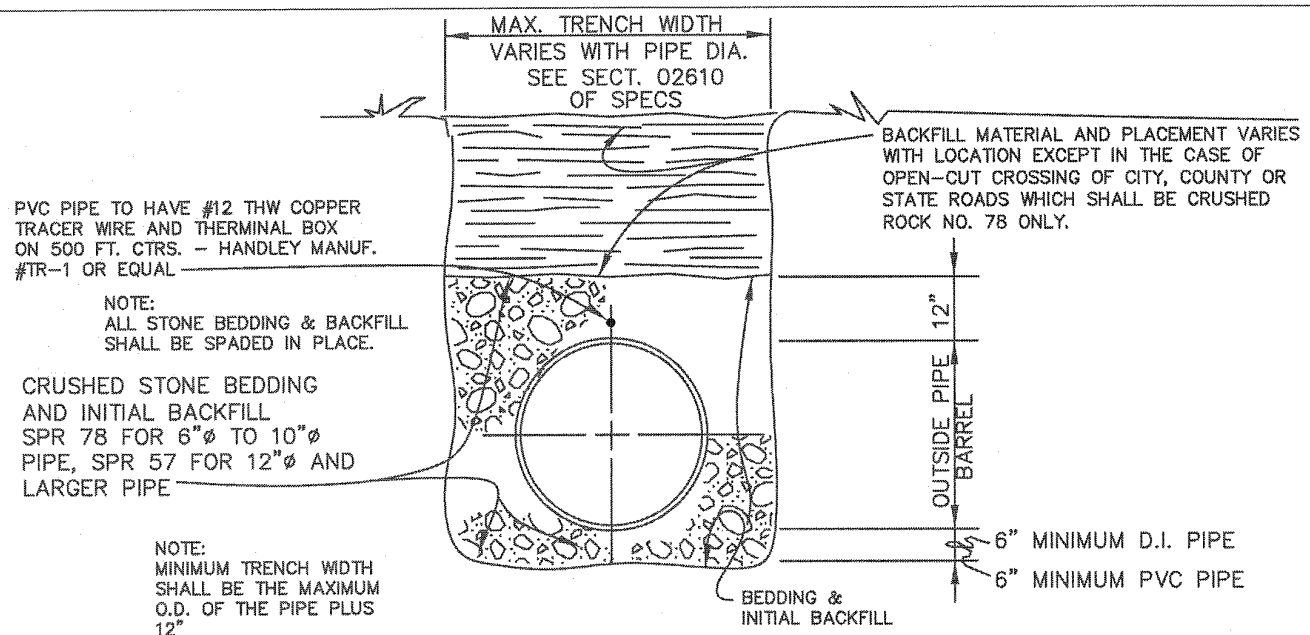
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

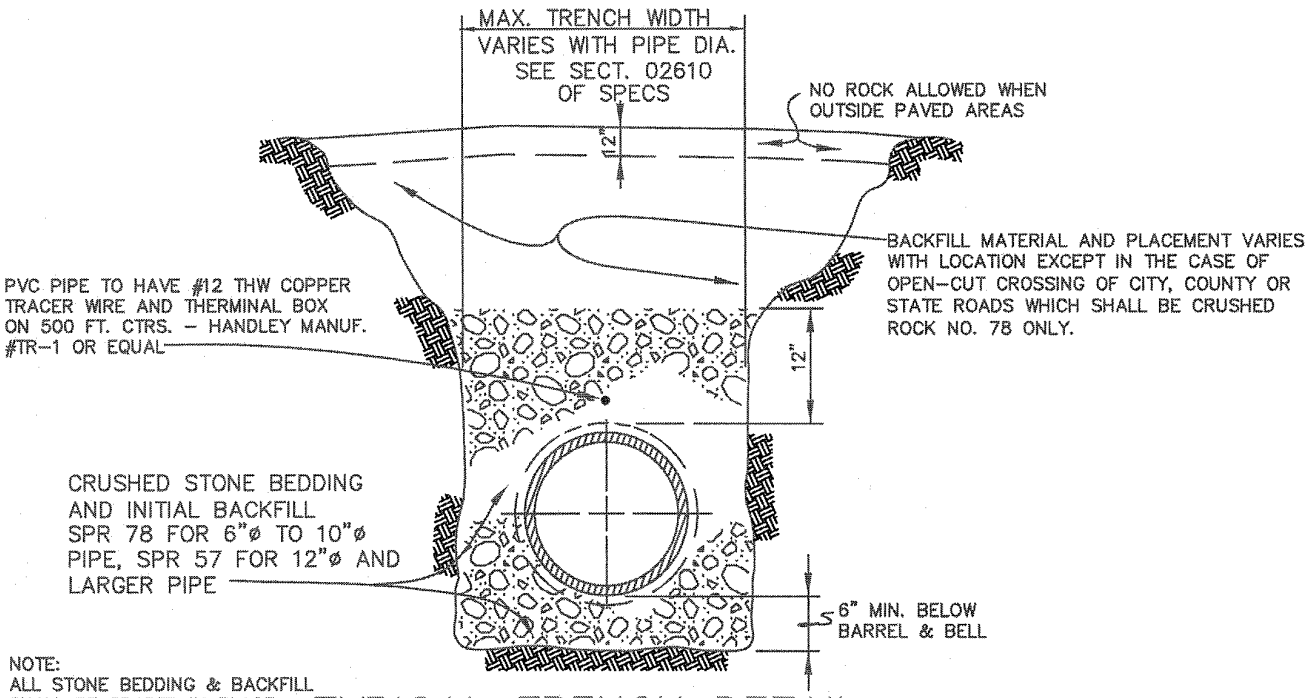
MISCELLANEOUS DETAILS
WATER & SEWER
CARRIER PIPE POSITIONING
IN CASING PIPE

JUNE, 1996 | DWG. NO. M4




# TYPICAL TRENCH DETAIL
# WATER MAIN CONSTRUCTION
# PVC PIPE & DUCTILE IRON PIPE

N T S




NOTE:
ALL STONE BEDDING & BACKFILL SHALL BE SPADED IN PLACE.

# TYPICAL TRENCH DETAIL
# SEWAGE FORCE MAIN CONSTRUCTION
# BEDDING ON EARTH
# OR IN SOLID ROCK
# (PVC AND POLYETHYLENE PIPE)

d=6" THRU 16" PIPE

| DATE | REVISION |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
TRENCH DETAILS

JUNE, 1996 | DWG. NO. M5

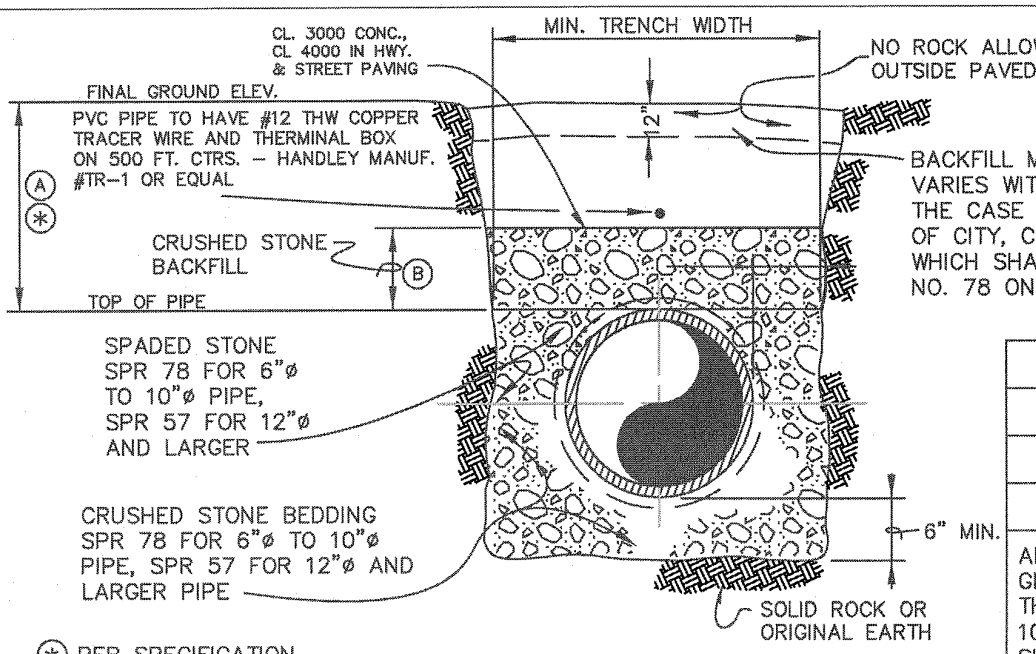
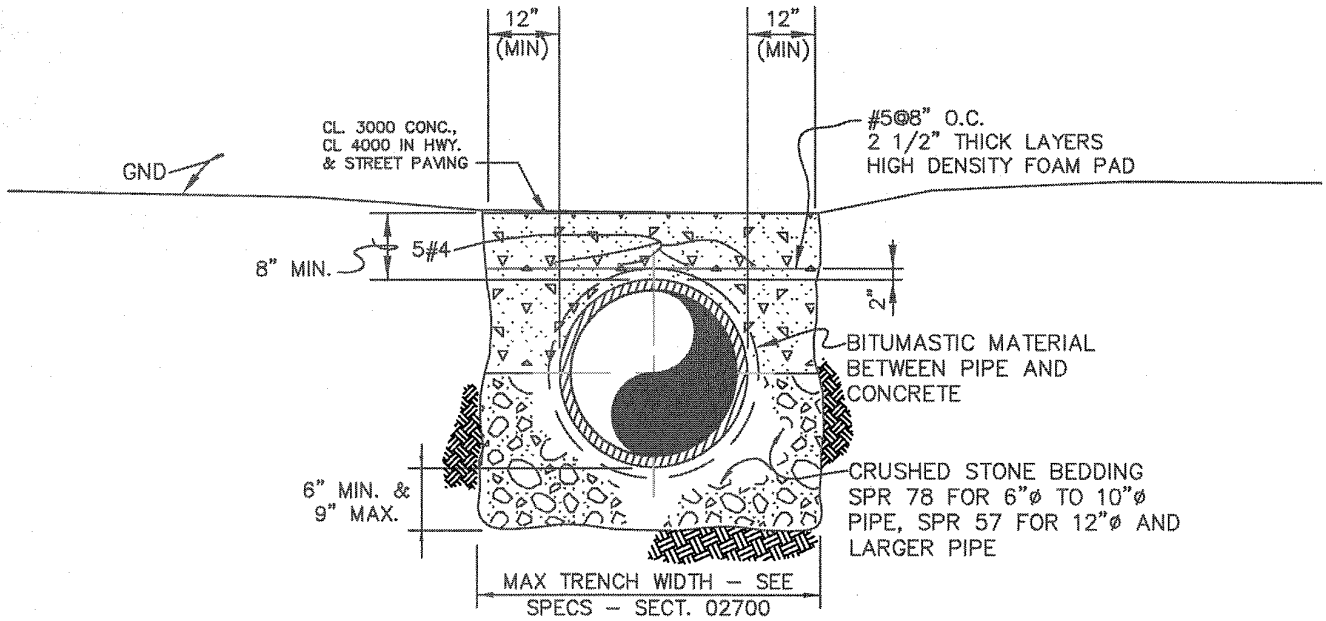



TABLE 1

| PVC | A | B |
|---|---|---|
| PVC | 4' | 12" |
| PVC | 4'–10' | 18" |
| D.I | 10' & OVER | 12" |
| ALL DEPTHS GREATER THAN 10' DEEP SHALL BE DUCTILE IRON | | |

# TRENCH DETAIL GRAVITY SEWER CONSTRUCTION PVC PIPE & DUCTILE IRON PIPE

d = 6" THRU 16" PIPE
N T S




# CONCRETE ARCH ON FIRM EARTH OR IN SOLID ROCK AT SHALLOW COVER

NOTE:
APPLICABLE TO SHALLOW COVER FOR IMPACT PROTECTION

| | REVISION |
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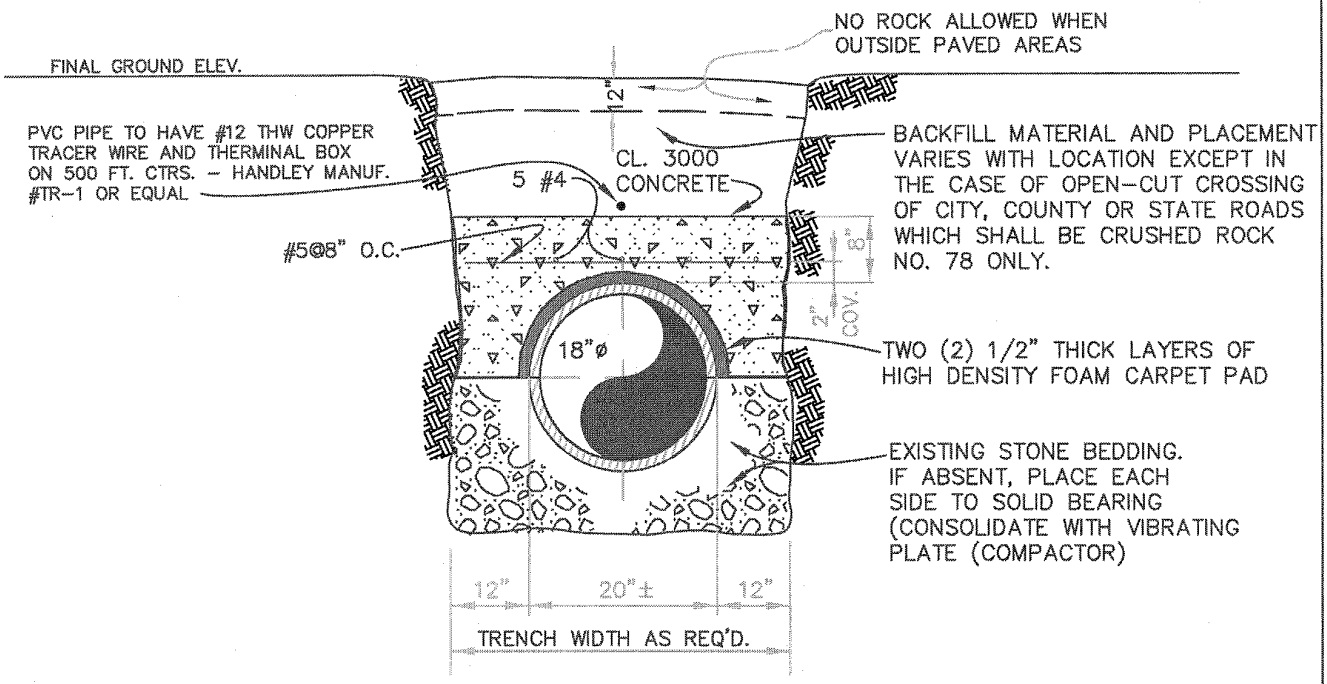
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

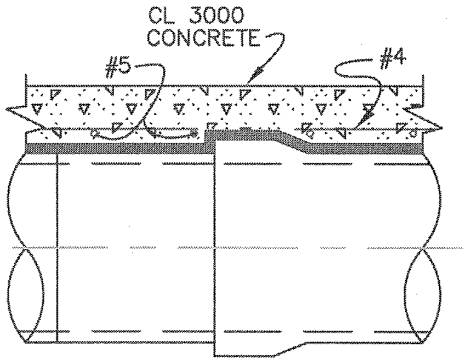
RICHMOND UTILITIES

MISCELLANEOUS DETAILS
WATER & SEWER
GRAVITY SEWER TRENCH DETAIL & SHALLOW COVER CONCRETE ARCH

JUNE, 1996 | DWG. NO. M6




# TRENCH DETAIL WITH CONCRETE ARCH




## ELEVATION

| DATE | REVISION |
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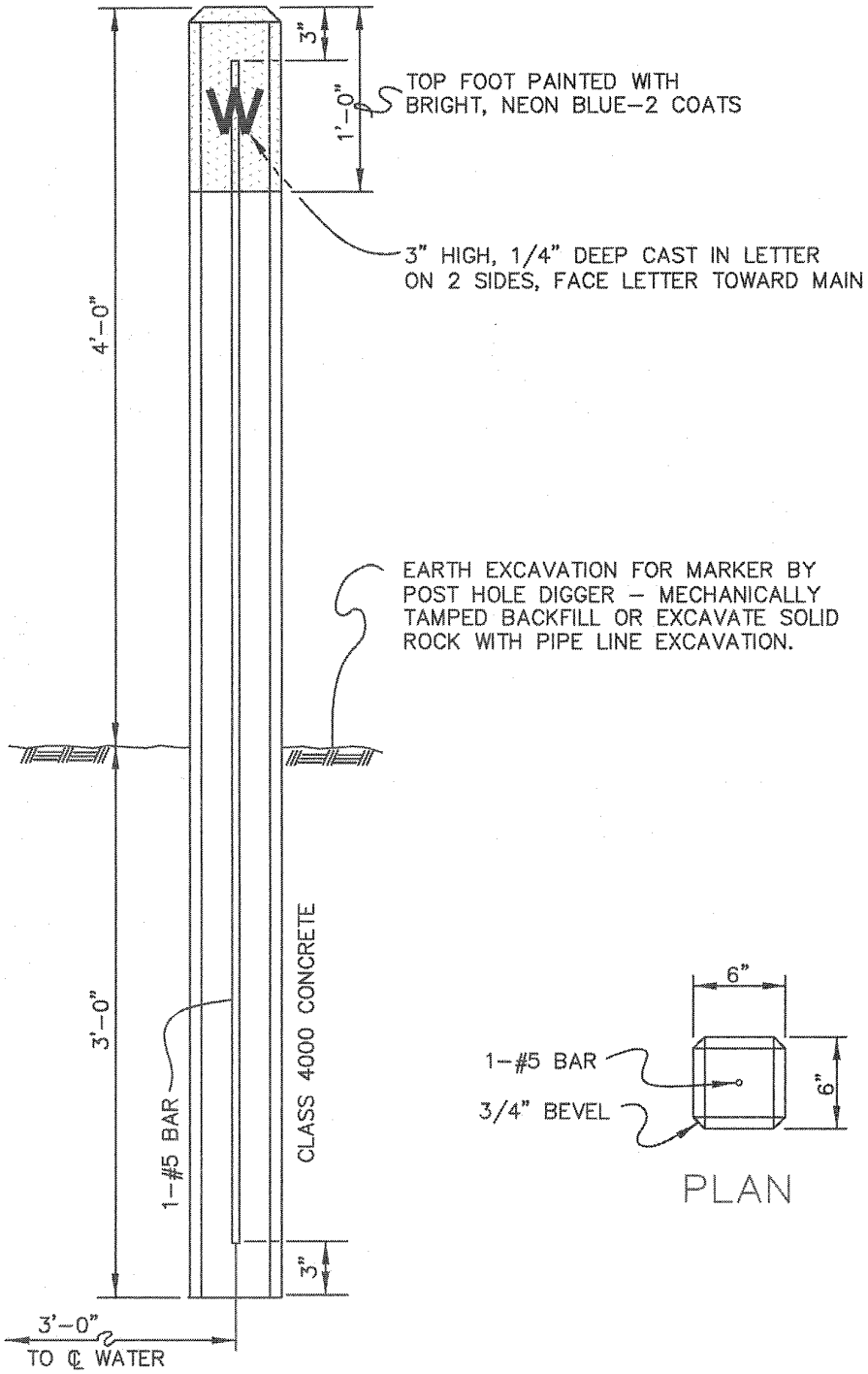
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
CONCRETE ARCH

JUNE, 1996 | DWG. NO. M6A




ELEVATION




PLAN

# DETAIL
# CONCRETE LINE MARKER

NOT TO SCALE

| DATE | REVISION |
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| 2/02 | |
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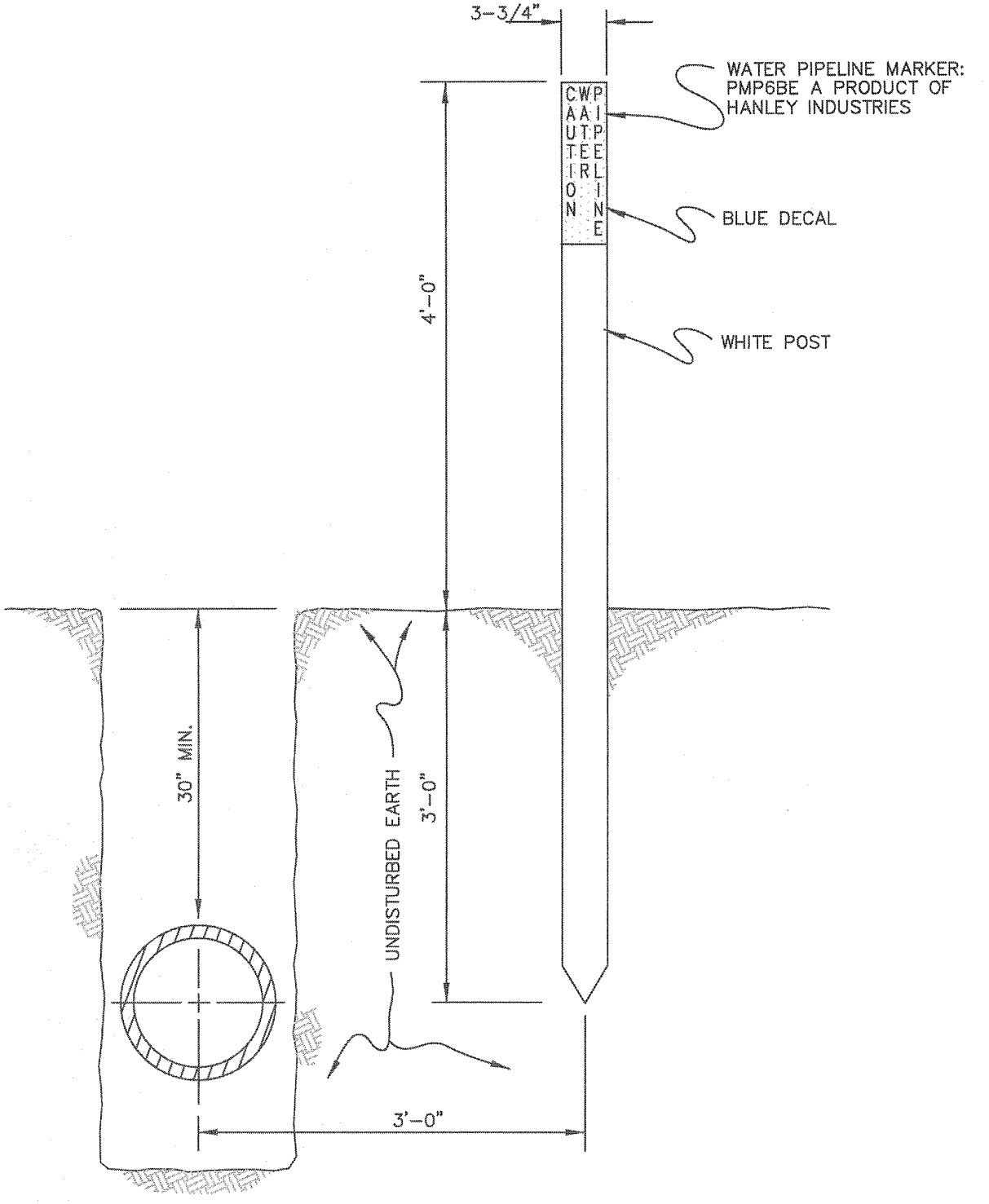
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
CONCRETE LINE MARKER

FEB., 2002 | DWG. NO. M7




# DETAIL
# FLEXIBLE FIBERGLASS
# COMPOSITION LINE MARKER

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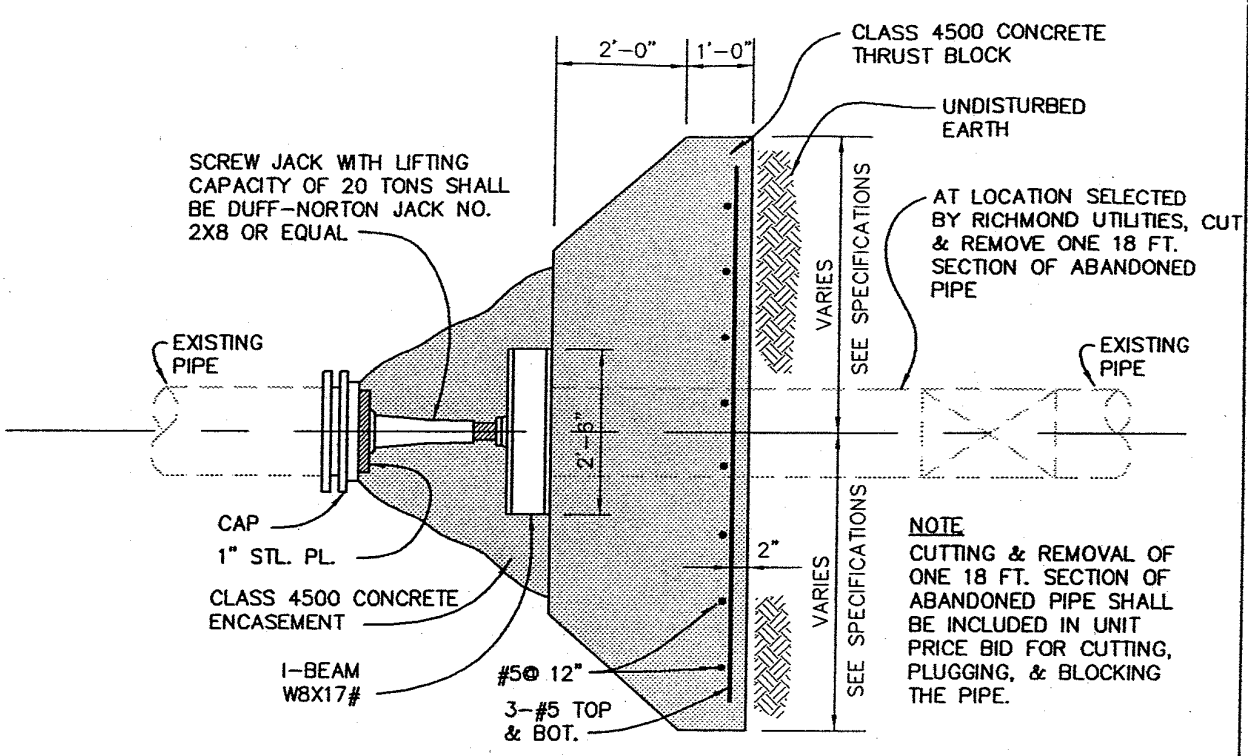
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
FIBERGLASS LINE MARKER

FEB., 2002 | DWG. NO. M7A




NOTES

THRUST BLOCK SHALL BE 4'-0" HIGH & CENTERED ABOUT THE EXISTING PIPE.

# CUT & BLOCK EXISTING MAIN

NOT TO SCALE

| DATE | REVISION |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
CUT & BLOCK EXISTING MAIN

FEB 2002 | DWG NO M8

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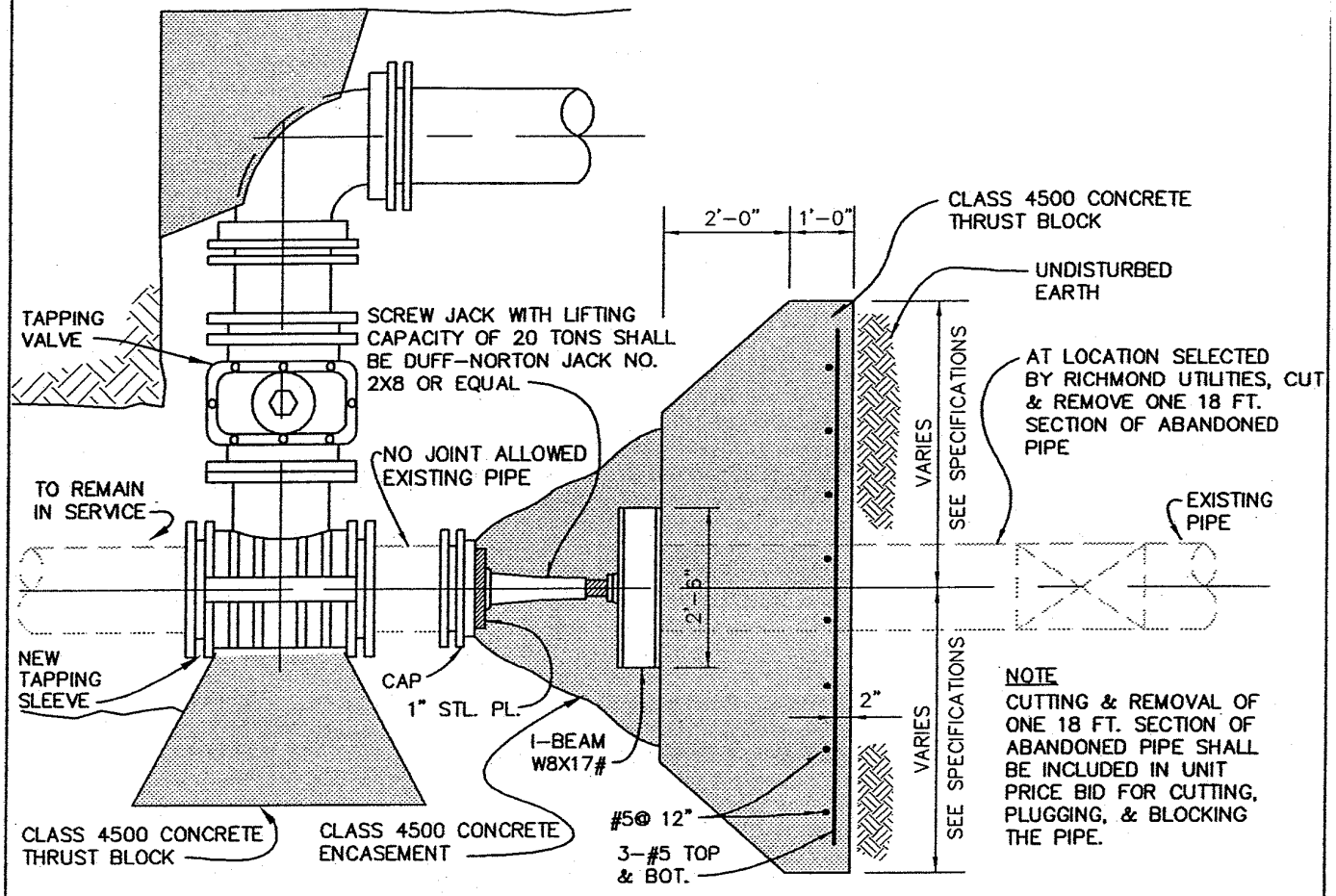


NOTES

THRUST BLOCK SHALL BE 4'-0" HIGH & CENTERED ABOUT THE EXISTING PIPE.

# KILL MAIN LINE

NOT TO SCALE

| DATE | REVISION |
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RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
KILL MAIN LINE

FEB., 2002 | DWG. NO. M8A

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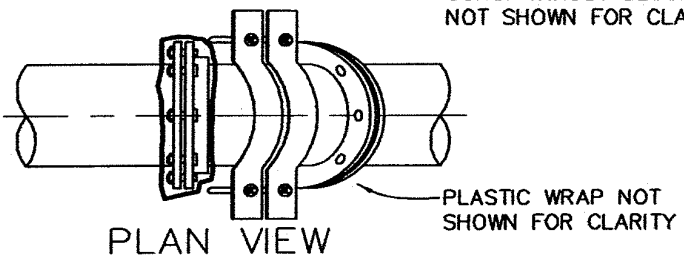
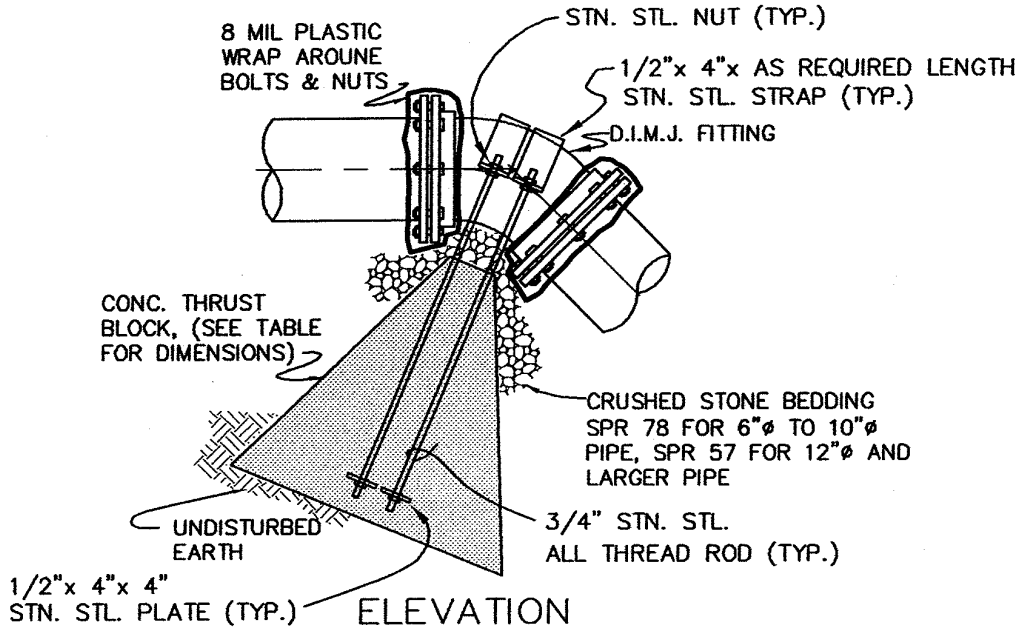
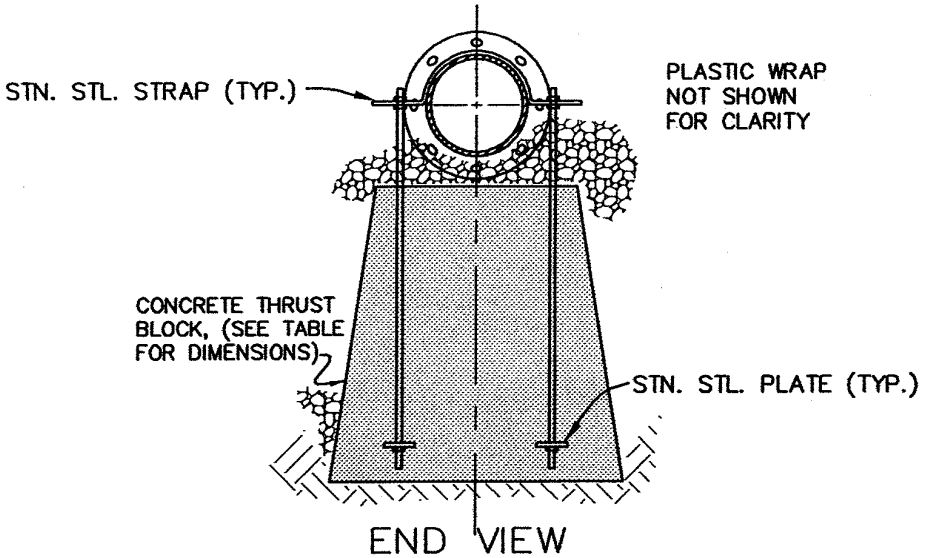



PLAN VIEW




ELEVATION




END VIEW

| DATE | REVISION |
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RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
VERTICAL OVERBEND & THRUST BLOCK

FEB., 2002 | DWG. NO. M9

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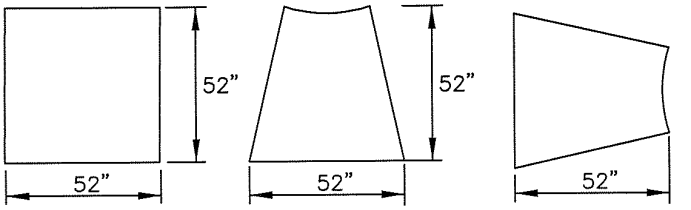
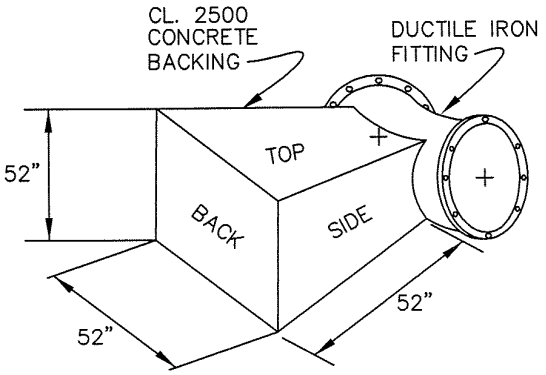



BACK VIEW TOP VIEW SIDE VIEW




ISOMETRIC VIEW

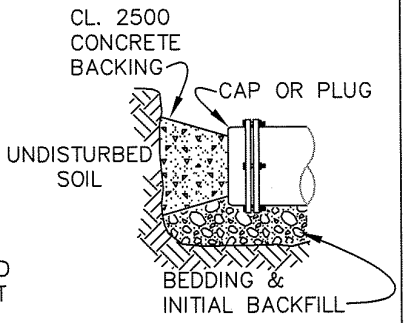
## TABLE 1

TEST PRESSURE: 150 PSI ALL TYPES SOIL

| PIPE DIA. INCHES | 90° | PLUG/ TEE | 45° | 22 1/2° | 11 1/4° |
|---|---|---|---|---|---|
| 4 | 14 | 12 | 12 | 12 | 12 |
| 6 | 20 | 18 | 18 | 18 | 18 |
| 8 | 28 | 22 | 20 | 18 | 18 |
| 10 | 34 | 28 | 24 | 18 | 18 |
| 12 | 40 | 34 | 30 | 24 | 24 |

(1) TO OBTAIN THE NUMBER IN INCHES – MEASURE THE LENGTH, WIDTH AND DEPTH THE THRUST BLOCK TO BE INSTALLED SEE APPROPRIATE PRESSURE AND SOIL TYPE TO READ DOWN TO CORRECT PIPE DIAMETER AND ACROSS TABLE TO CORRECT FITTING.

(2) REINFORCEMENT STEEL RODS MAY BE NEEDED BY RICHMOND UTILITIES FOR LARGER THRUST BLOCK.




ELEVATION

## TABLE 2

TEST PRESSURE: 350 PSI SANDY CLAY SOIL

| PIPE DIA. INCHES | 90° | PLUG/ TEE | 45° | 22 1/2° | 11 1/4° |
|---|---|---|---|---|---|
| 4 | 18 | 18 | 18 | 18 | 18 |
| 6 | 26 | 22 | 20 | 18 | 18 |
| 8 | 35 | 30 | 24 | 18 | 18 |
| 10 | 44 | 36 | 32 | 32 | 24 |
| 12 | 52 | 44 | 38 | 28 | 24 |
| 14 | 62 | 52 | 46 | 32 | 24 |
| 16 | 70 | 58 | 52 | 36 | 26 |
| 18 | 78 | 66 | 58 | 42 | 30 |
| 20 | 88 | 72 | 64 | 46 | 32 |
| 24 | 104 | 88 | 76 | 56 | 40 |

## TABLE 3

TEST PRESSURE: 350 PSI HARD CLAY SOIL

| PIPE DIA. INCHES | 90° | PLUG/ TEE | 45° | 22 1/2° | 11 1/4° |
|---|---|---|---|---|---|
| 4 | 18 | 18 | 18 | 18 | 18 |
| 6 | 18 | 18 | 18 | 18 | 18 |
| 8 | 24 | 22 | 18 | 18 | 18 |
| 10 | 32 | 26 | 24 | 18 | 18 |
| 12 | 38 | 32 | 28 | 20 | 20 |
| 14 | 44 | 36 | 32 | 24 | 24 |
| 16 | 50 | 42 | 36 | 26 | 26 |
| 18 | 56 | 46 | 42 | 30 | 30 |
| 20 | 62 | 52 | 46 | 32 | 32 |
| 24 | 74 | 62 | 54 | 40 | 40 |

## TABLE 4

TEST PRESSURE: 350 PSI SHALE SOIL

| PIPE DIA. INCHES | 90° | PLUG/ TEE | 45° | 22 1/2° | 11 1/4° |
|---|---|---|---|---|---|
| 4 | 18 | 18 | 18 | 18 | 18 |
| 6 | 18 | 18 | 18 | 18 | 18 |
| 8 | 18 | 18 | 18 | 18 | 18 |
| 10 | 22 | 18 | 18 | 18 | 18 |
| 12 | 26 | 22 | 20 | 18 | 18 |
| 14 | 30 | 26 | 24 | 18 | 18 |
| 16 | 36 | 30 | 21 | 18 | 18 |

## TABLE 5

TEST PRESSURE: 130 PSI SOLID ROCK

| PIPE DIA. INCHES | 90° | PLUG/ TEE | 45° | 22 1/2° | 11 1/4° |
|---|---|---|---|---|---|
| 4 | 18 | 18 | 18 | 18 | 18 |
| 6 | 18 | 18 | 18 | 18 | 18 |
| 8 | 18 | 18 | 18 | 18 | 18 |
| 10 | 20 | 18 | 18 | 18 | 18 |
| 12 | 24 | 20 | 18 | 18 | 18 |
| 14 | 26 | 22 | 20 | 18 | 18 |

| DATE | REVISION |
|---|---|
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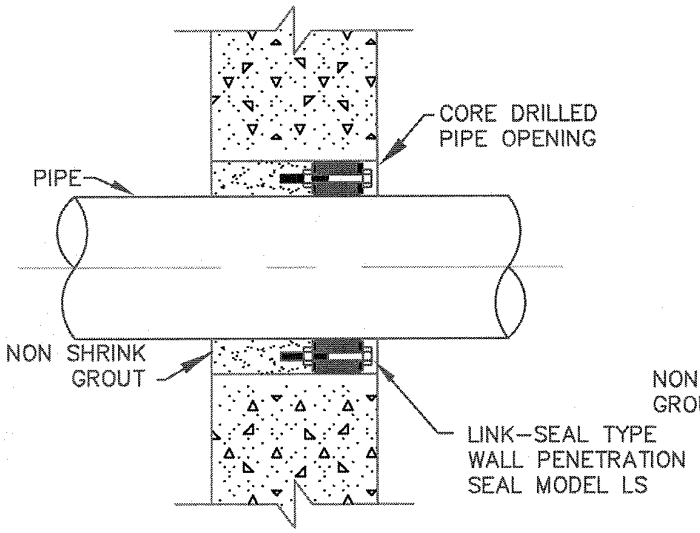
RICHMOND UTILITIES

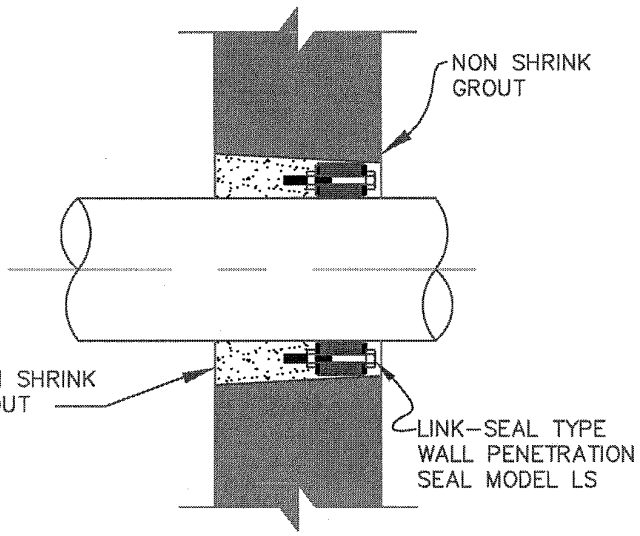
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
WATER & SANITARY FORCE MAIN
THRUST BLOCK DETAIL

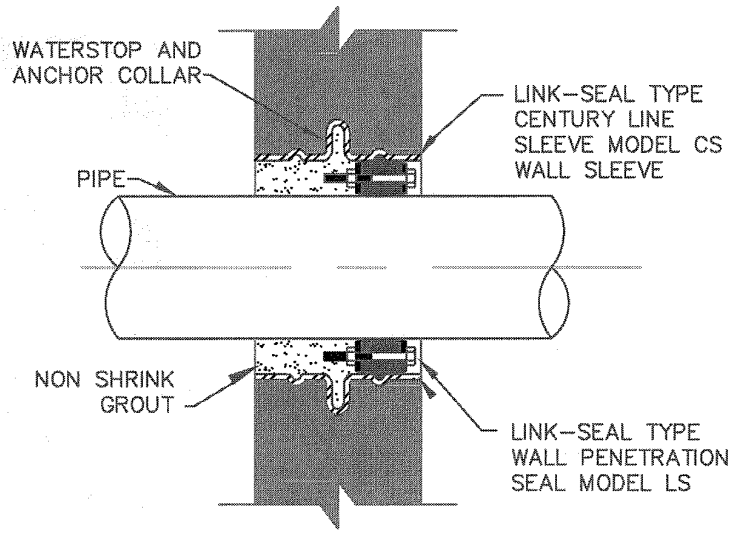
FEB., 2002 | DWG. NO. M10



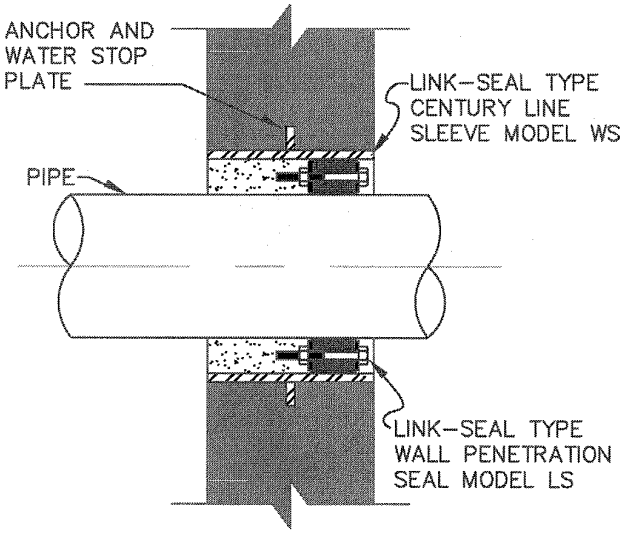

CORE
PIPE OPNG. IN NEW
OR EXISTING WALL OR SLAB




BOX-OUT
PIPE OPNG. IN
NEW WALL OR SLAB




WALL SLEEVE
IN NEW WALL
OR SLAB




WALL SLEEVE
IN NEW WALL
OR SLAB
(NOT TO BE USED IN
WATER HOLDING BASIN)

# PIPE PENETRATION THROUGH CONCRETE WALLS OR SLABS

NOT TO SCALE

| DATE | REVISION |
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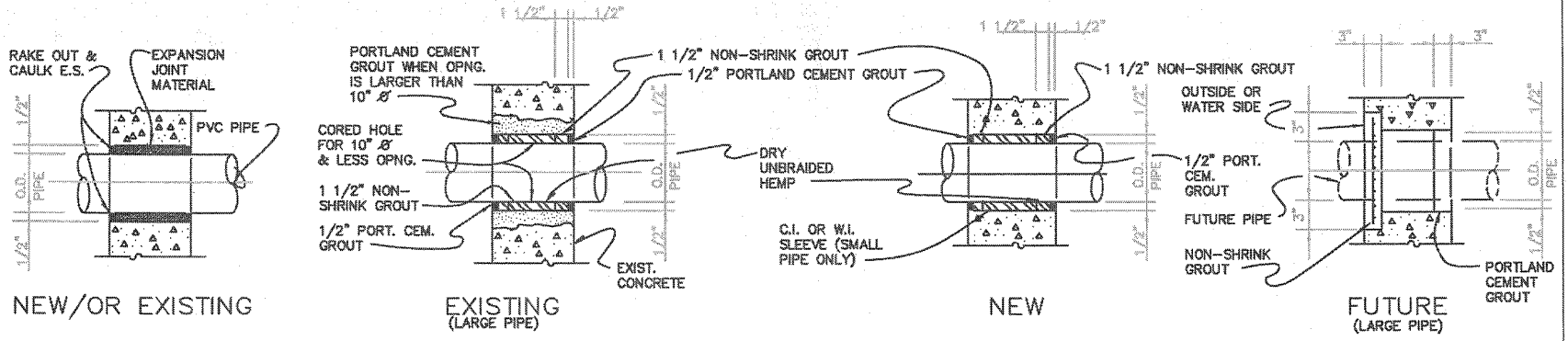
RICHMOND UTILITIES

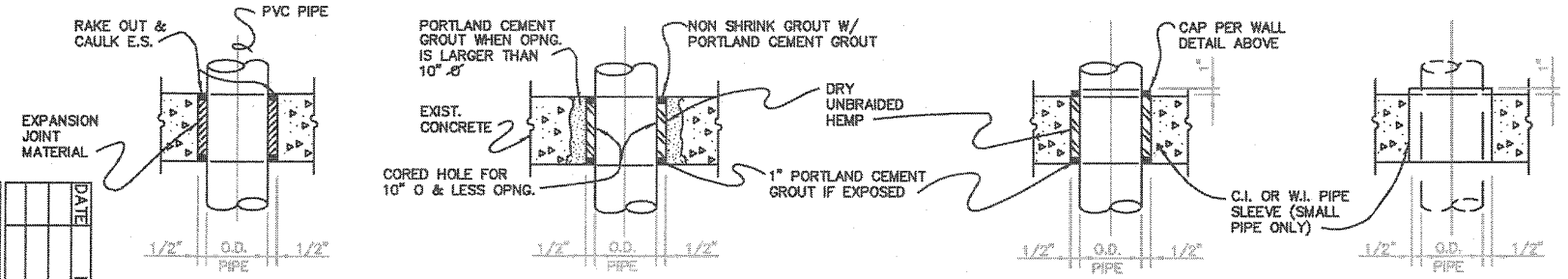
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
PIPE PENETRATIONS THRU WALLS OR SLABS
(LINK SEALS)

FEB., 2002 | DWG. NO. M11




## PIPE THROUGH WALLS




## PIPE THROUGH SLABS

NOTE:
ONLY SMALL PIPE (STEEL, W.I., COPPER HARD RUBBER OR RUBBER HOSE) IN NEW CONSTRUCTION SHALL HAVE C.I. OR G.W.I. SLEEVE.
LARGE & SMALL PIPE SHALL BE CAULKED W/DRY BRAIDED OR UNBRAIDED HEMP & GROUTED PER DETAILS AND SPECIFICATIONS.

PORTLAND & NON SHRINK GROUT MIX SHALL BE PROPORTIONED PER SECTION 03300 OF THE SPECIFICATIONS.
OPENINGS THRU SLABS FOR FUTURE LARGE PIPE SHALL BE LOCATED & DETAILED ON THE PLANS.

# TYPICAL JOINTS BETWEEN CONCRETE & PIPE

NTS

RICHMOND UTILITIES

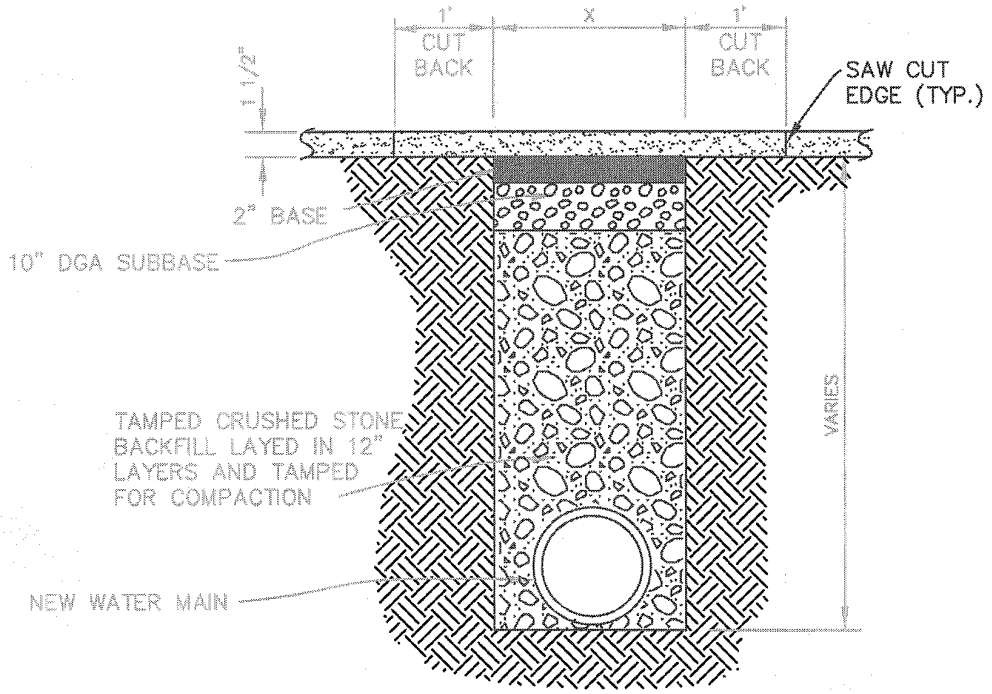
| DATE | REVISION |
|---|---|
| | |

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
PIPE THRU
WALLS OR SLABS

FEB., 2002

DWG. NO. M11A




X = WIDTH OF EXCAVATION

PROVIDE A MINIMUM 6" GRAVEL BEDDING BENEATH PIPE

NOTE:
REPLACE BITUMINOUS PAVEMENT WITH SAME TYPE AND DEPTH AS EXISTING PAVEMENT.

BITUMINOUS SURFACE

# DETAIL – SURFACE RESTORATION METHOD FOR CITY AND COUNTY STREETS, ROADS AND PARKING AREAS

NOT TO SCALE

| DATE | REVISION |
|---|---|
| 2/02 | |
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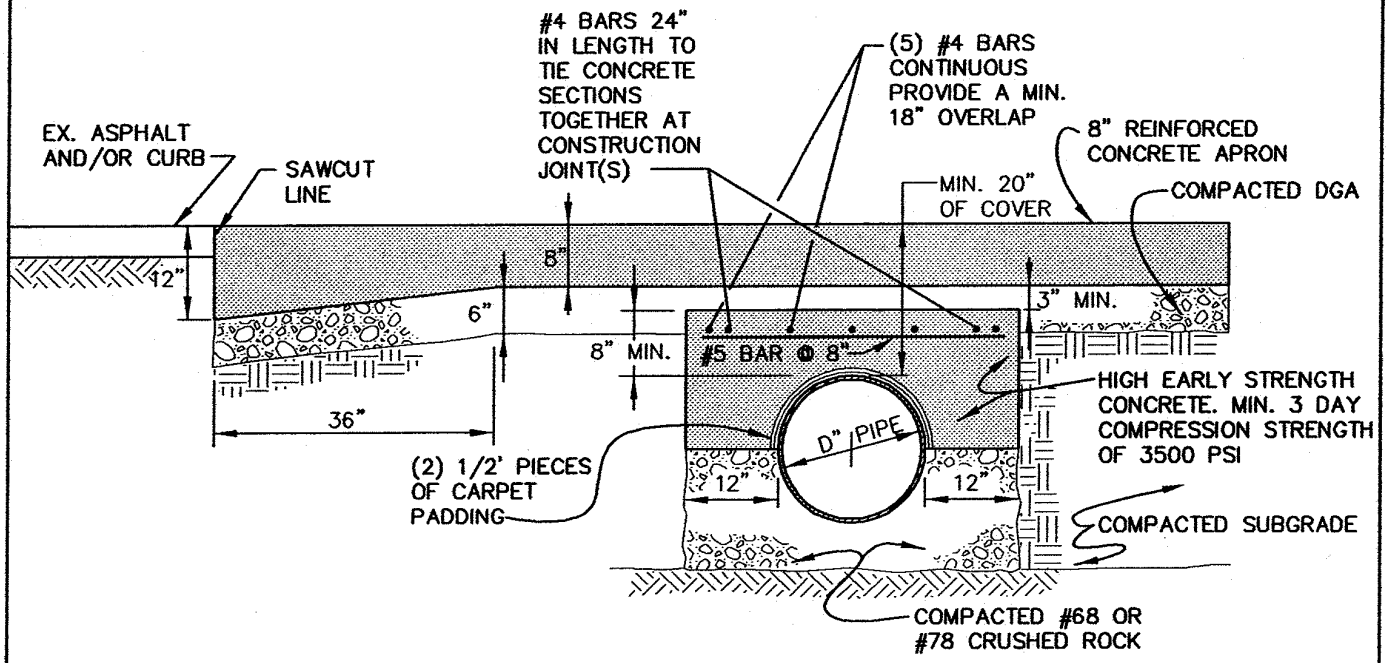
RICHMOND UTILITIES

RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

MISCELLANEOUS DETAILS
WATER & SEWER
ROADWAY
SURFACE RESTORATION

JUNE, 1996 | DWG. NO. M12




# CONCRETE ARCH OVER PIPE IN ROADWAY (WHERE WATER MAIN IS LESS THAN 36" DEEP)

| DATE | REVISION |
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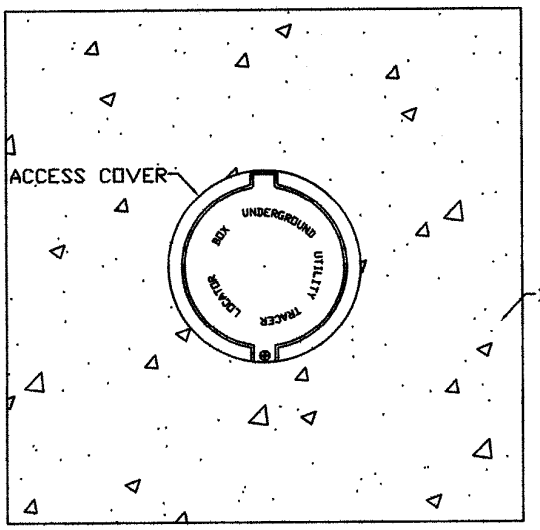
RICHMOND UTILITIES BOARD
RICHMOND, KENTUCKY

RICHMOND UTILITIES

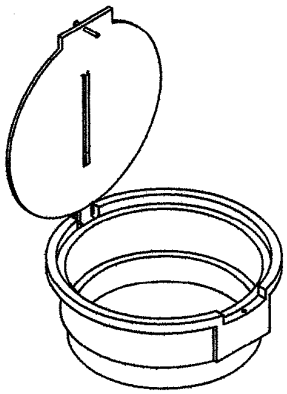
MISCELLANEOUS DETAILS
WATER & SEWER
CONCRETE ARCH OVER PIPE IN ROADWAY

AUG, 2002 | DWG. NO. M13

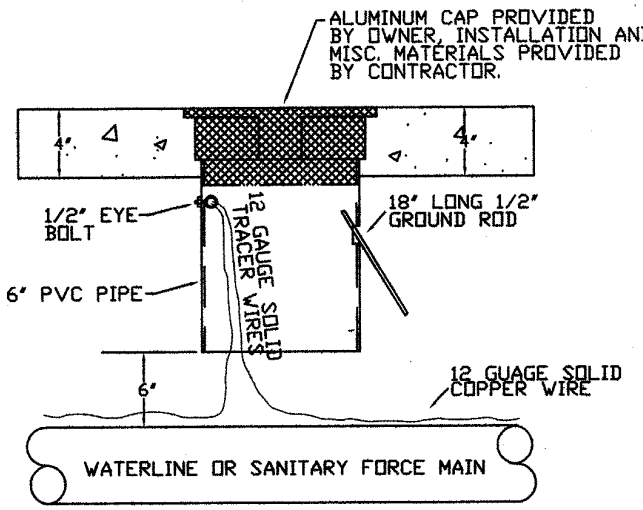
K:\RICHMOND JAL\170-M-13.dwg, 08/15/2002 02:01:42 PM, Ron



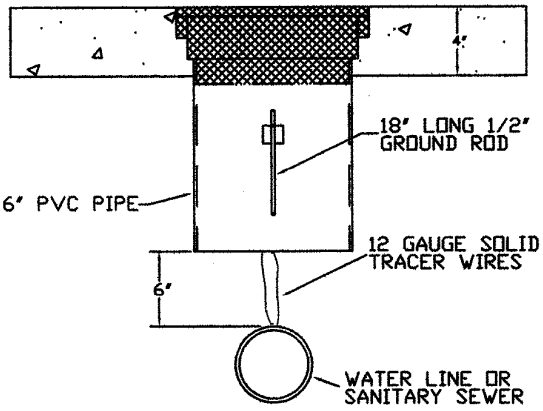

TOP VIEW



ISOMETRIC VIEW




FRONT VIEW




SIDE VIEW

NOTE: ANY SPLICES IN TRACER WIRE REQUIRE A HEAT SHRINK KIT.
ACCESS COVER SHOWN NOT TO SCALE.

NOTE: TRACER WIRE LOCATOR BOXES ARE TO BE LOCATED AT THE BEGINNING, TERMINATION AND EVERY 500' ALONG ALL NEWLY CONSTRUCTED UTILITY LINES.

| | | | |
|---|---|---|---|
| Scale N.T.S.<br>Drawn by M.B.I.<br>Approved P.T.B.<br>Date 5/24/95 | DETAIL NO.<br>A-001 | TRACER WIRE BOX DETAIL | DIAMOND ENGINEERING INC. |

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Professional Surveyors
Planners & Construction Management
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Fax (606) 473-5432
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M 14