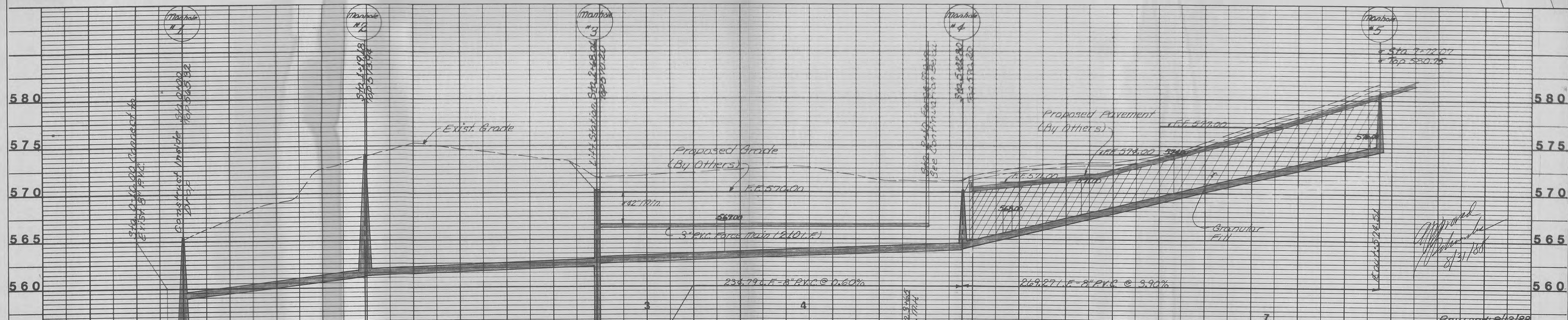


NOTE:
Existing underground (U/G), overhead (O.H.) utilities and drainage structures have been plotted from available information and therefore, their locations must be considered approximate only. It is the responsibility of the individual Contractors to notify the utility companies before actual construction.



GBA
GEORGE BUTLER ASSOCIATES, INC.
CONSULTING ENGINEERS/ARCHITECTS
LANDSCAPE ARCHITECTS/PLANNERS

OFFICE:
225 SOUTH MAIN STREET
SUITE 200
O'FALLON, MISSOURI 63366
PHONE (314) 272-2444

ABRAM'S SANITARY SEWER
PREPARED FOR:
ABRAM'S, ROTHMAN & COMPANY
SUITE 200 1221 S. BRENTWOOD BLVD.
ST. LOUIS, MISSOURI 63117
PHONE: 863-3311

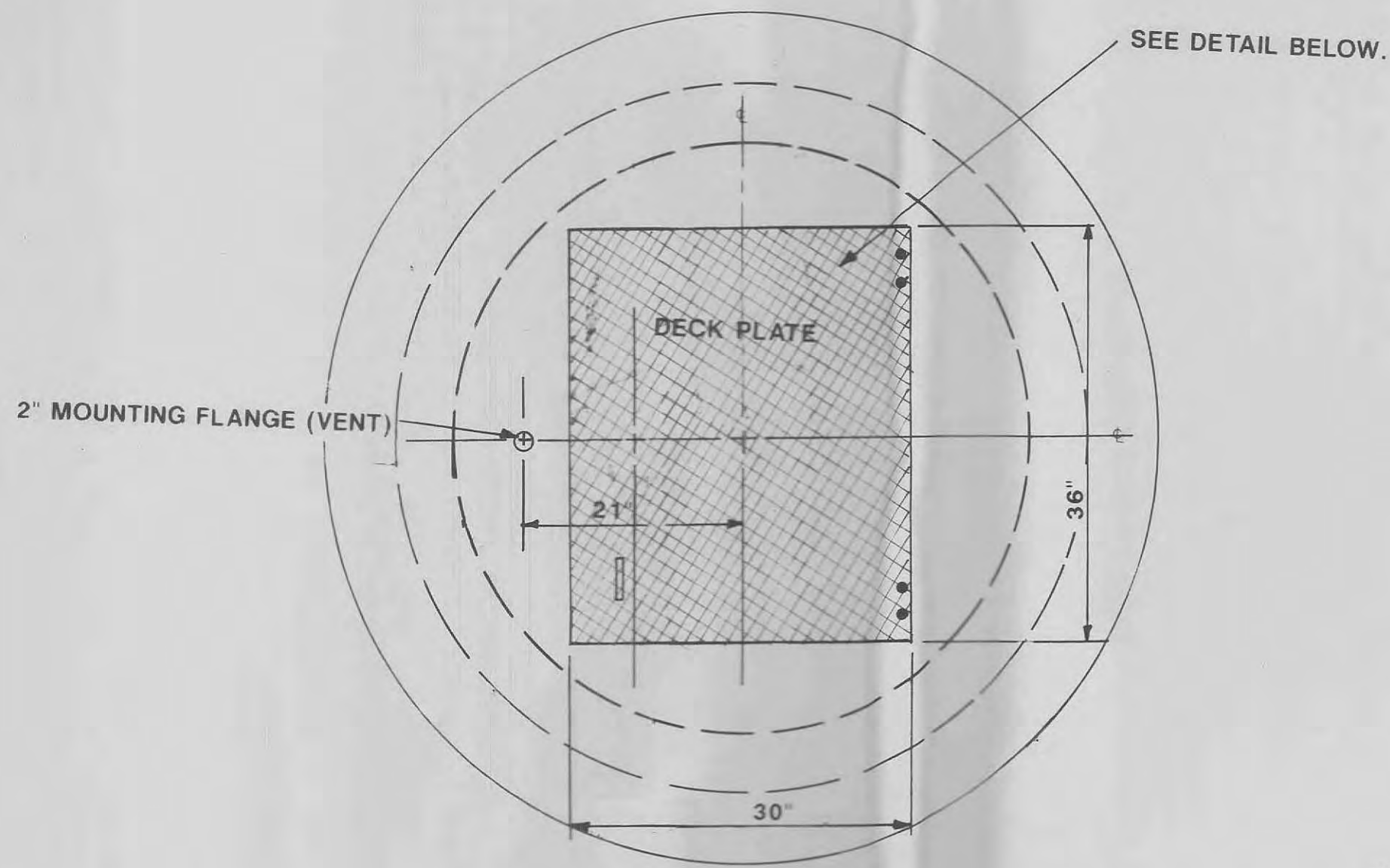
DESIGNED BY: F.L.K. DRAWN BY: G.R.P. CHECKED BY: G.R.H.

STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER
GERALD R. HURLBERT
NUMBER E-19844

JOB NO. 5157
DATE June, 1988
SCALE As Shown
SHEET 1 OF 3

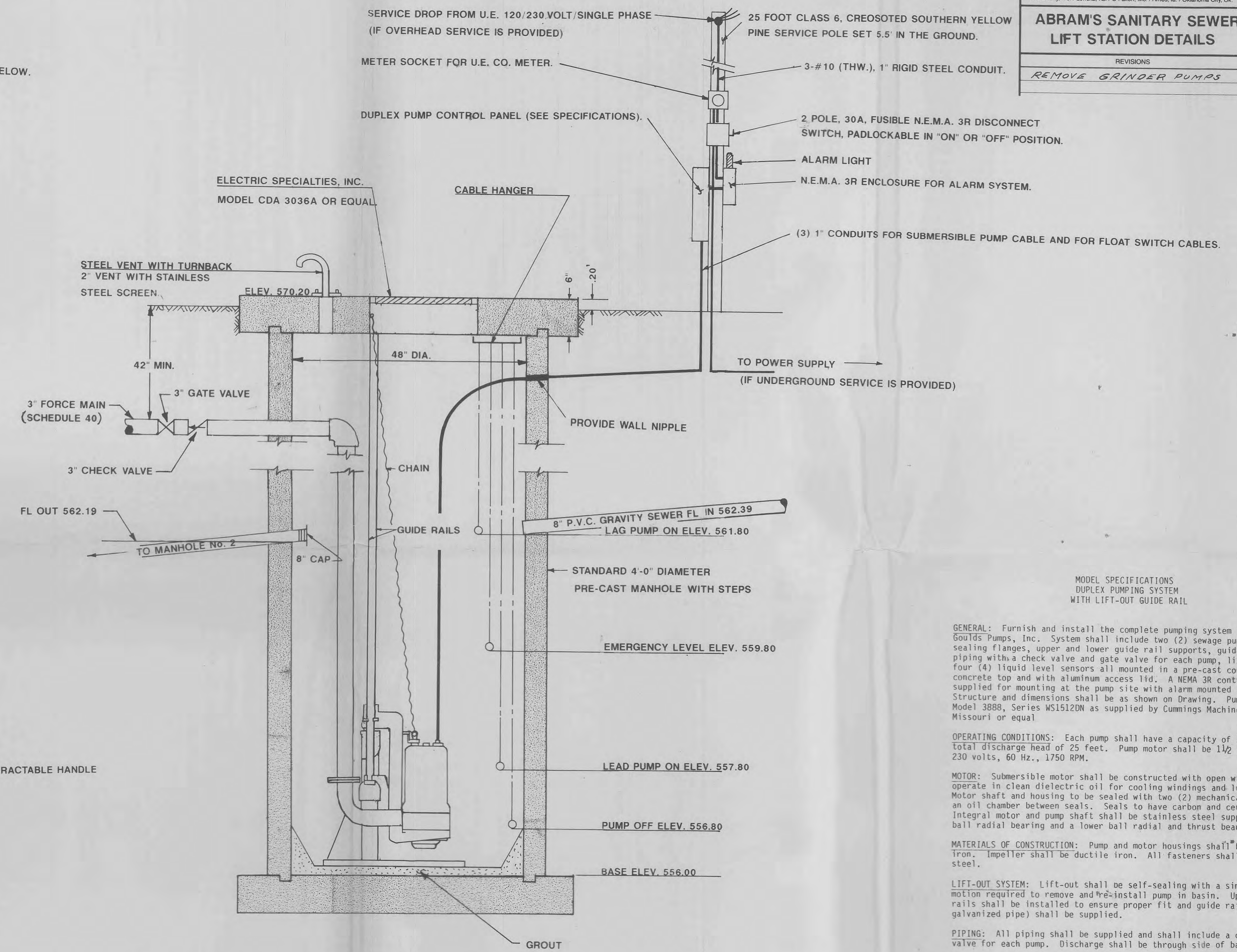
NOTE: SERVICE POLE IS NOT DRAWN TO SCALE.

GBA GEORGE BUTLER ASSOCIATES, INC. Engineers / Architects / Landscape Architects / Planners Kansas City, Mo. / Lenexa, Ka. / O'Fallon, Mo. / Ames, Ia. / Oklahoma City, Ok.		DATE: <i>June 1988</i>
DESIGN BY: <i>F.L.K.</i>		
DRAWN BY: <i>C.R.P.</i>		
PROJECT NO.: <i>5157</i>		
SHEET NO.	TOTAL SHEETS	
2	3	
REVISIONS		BY DATE
REMOVE GRINDER PUMPS		<i>F.L.K.</i> <i>8/12/88</i>



TOP VIEW LIFT STATION

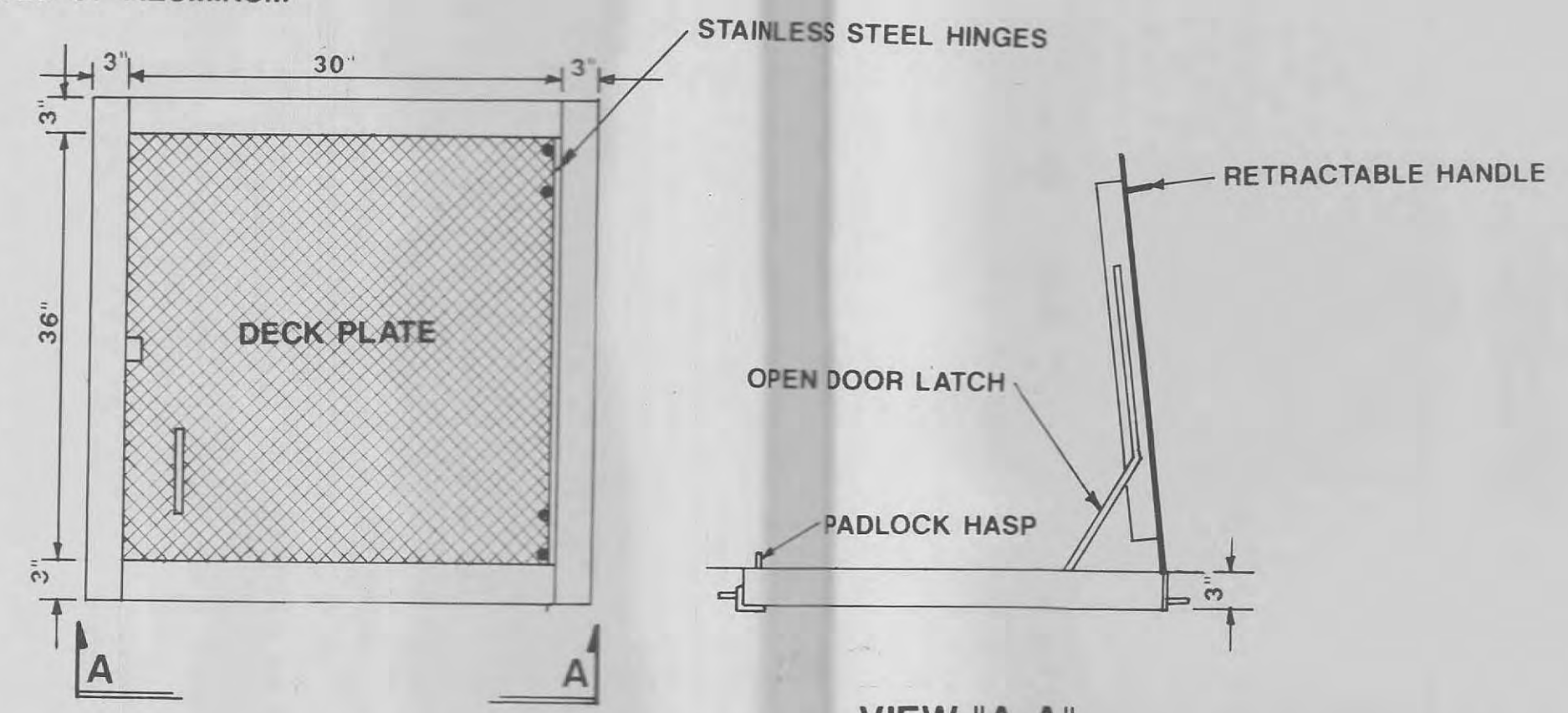
NOT TO SCALE



FORCE MAIN / SEWAGE PUMP DETAIL

NOT TO SCALE

NOTE: CONSTRUCTED OF ALUMINUM



PLAN VIEW

VIEW "A-A"

FRAME DETAIL

TYPICAL SINGLE DOOR ACCESS COVER

NOT TO SCALE

NOTE: LOAD LIMIT 150 LBS./ SQ. FT.. CONTRACTOR TO MOUNT IN CONCRETE COVER.

MODEL SPECIFICATIONS
DUPLIX PUMPING SYSTEM
WITH LIFT-OUT GUIDE RAIL

GENERAL: Furnish and install the complete pumping system as manufactured by Goulds Pumps, Inc. System shall include two (2) sewage pumps with lift-out sealing flanges, upper and lower guide rail supports, guide rails, internal piping with a check valve and gate valve for each pump, lifting chain, with four (4) liquid level sensors all mounted in a pre-cast concrete basin with a concrete top and with aluminum access lid. A NEMA 3R control panel shall be supplied for mounting at the pump site with alarm mounted as indicated. Structure and dimensions shall be as shown on Drawing. Pumps shall be Goulds Model 3888, Series WS1512DN as supplied by Cummings Machinery Company, O'Fallon, Missouri or equal.

OPERATING CONDITIONS: Each pump shall have a capacity of 160 GPM against a total discharge head of 25 feet. Pump motor shall be 1 1/2 horsepower, 1 phase, 230 volts, 60 Hz., 1750 RPM.

MOTOR: Submersible motor shall be constructed with open windings and shall operate in clean dielectric oil for cooling windings and lubricating bearings. Motor shaft and housing to be sealed with two (2) mechanical shaft seals with an oil chamber between seals. Seals to have carbon and ceramic seal faces. Integral motor and pump shaft shall be stainless steel supported by an upper ball radial bearing and a lower ball radial and thrust bearing.

MATERIALS OF CONSTRUCTION: Pump and motor housings shall be high quality cast iron. Impeller shall be ductile iron. All fasteners shall be 304 stainless steel.

LIFT-OUT SYSTEM: Lift-out shall be self-sealing with a simple up and down motion required to remove and re-install pump in basin. Upper and lower guide rails shall be installed to ensure proper fit and guide rails (2" Sch. 40 galvanized pipe) shall be supplied.

PIPING: All piping shall be supplied and shall include a check valve and gate valve for each pump. Discharge shall be through side of basin.

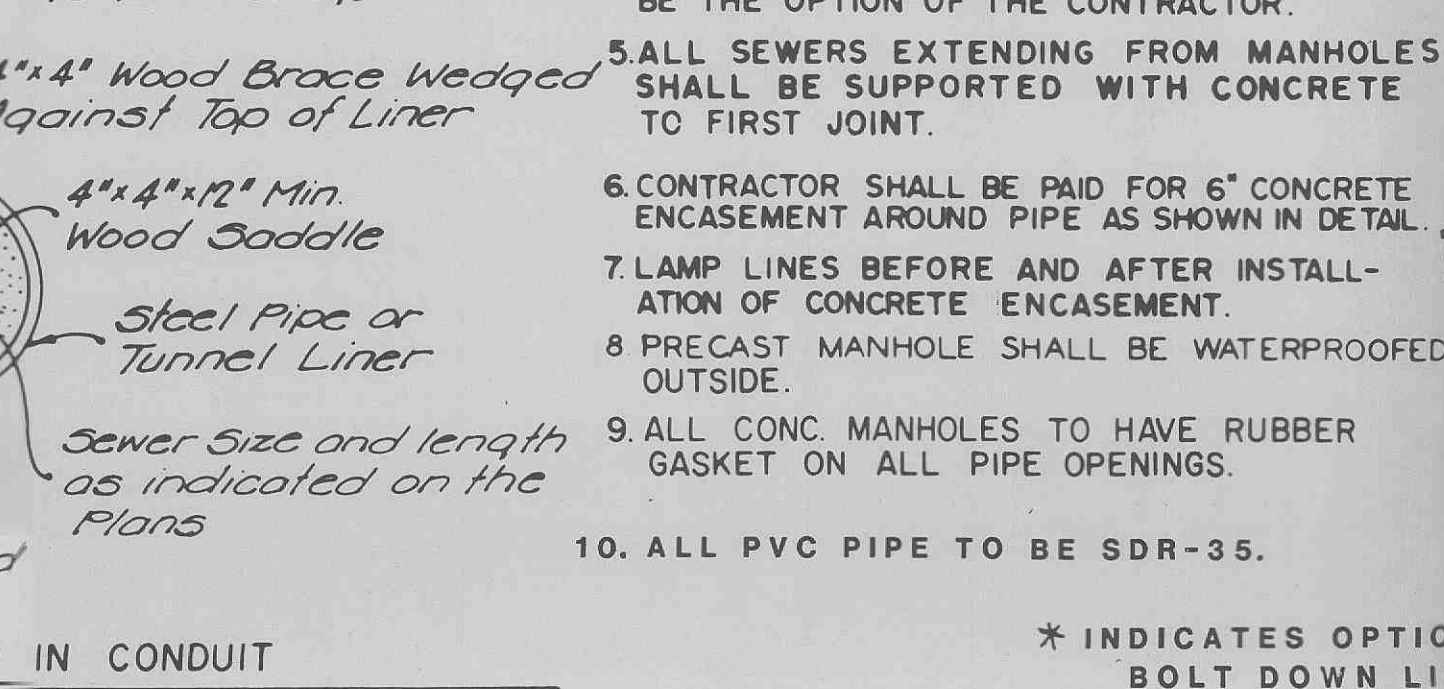
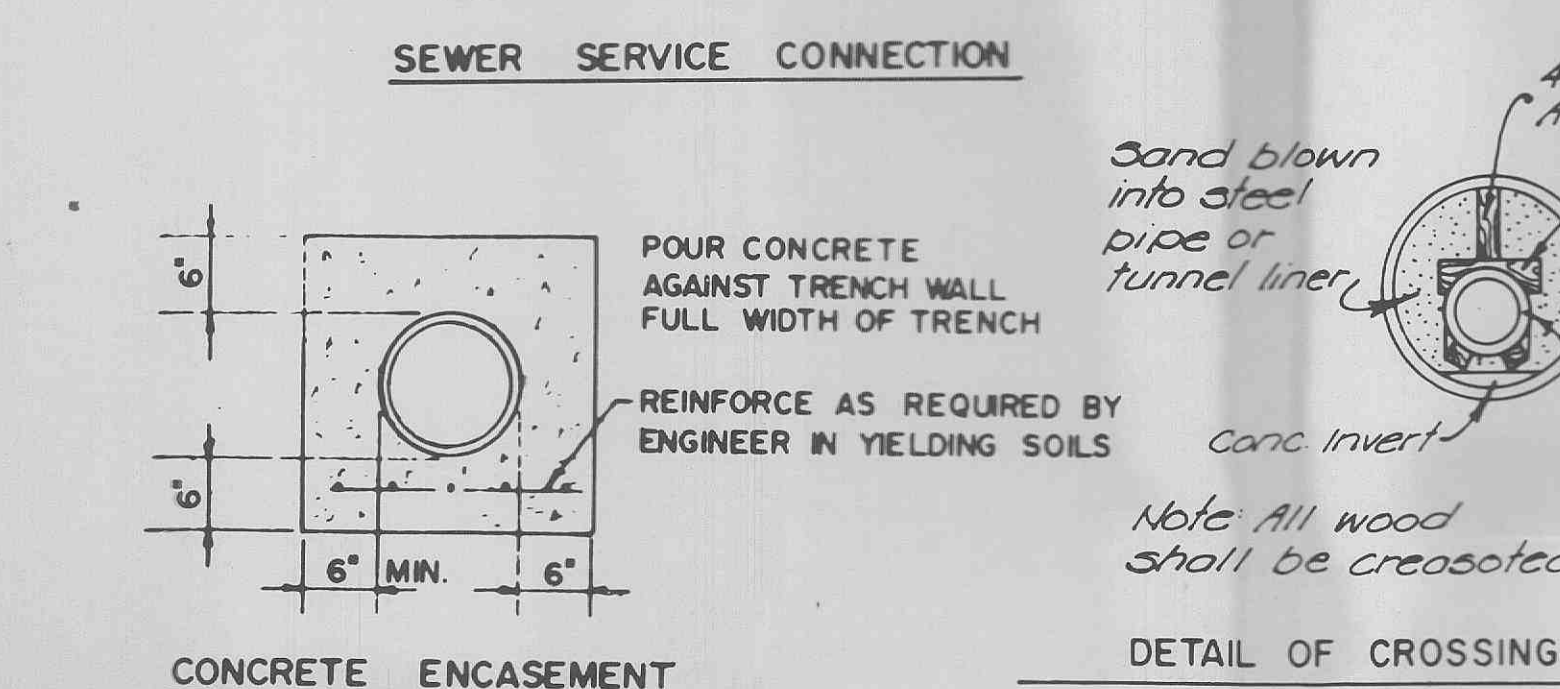
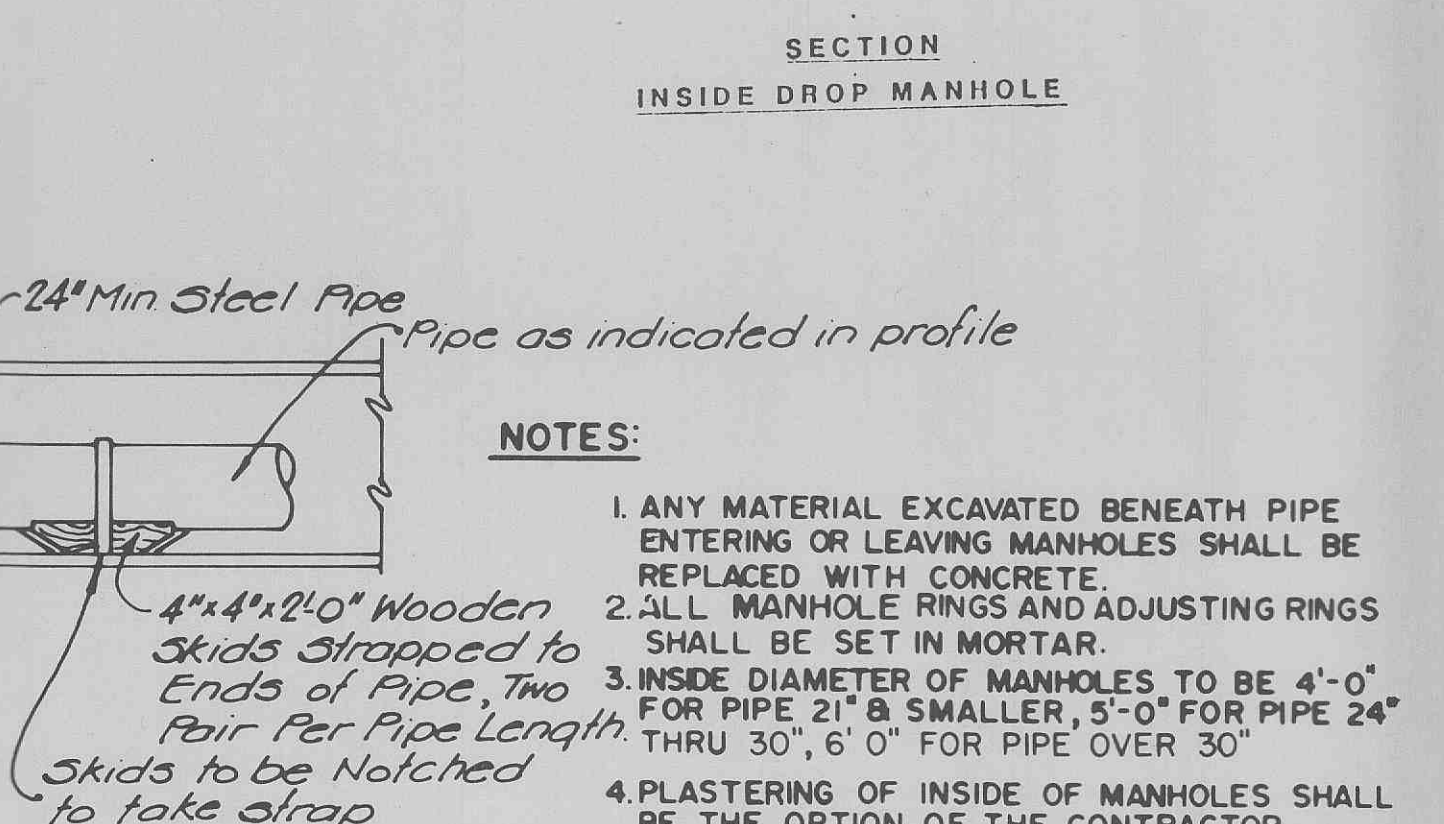
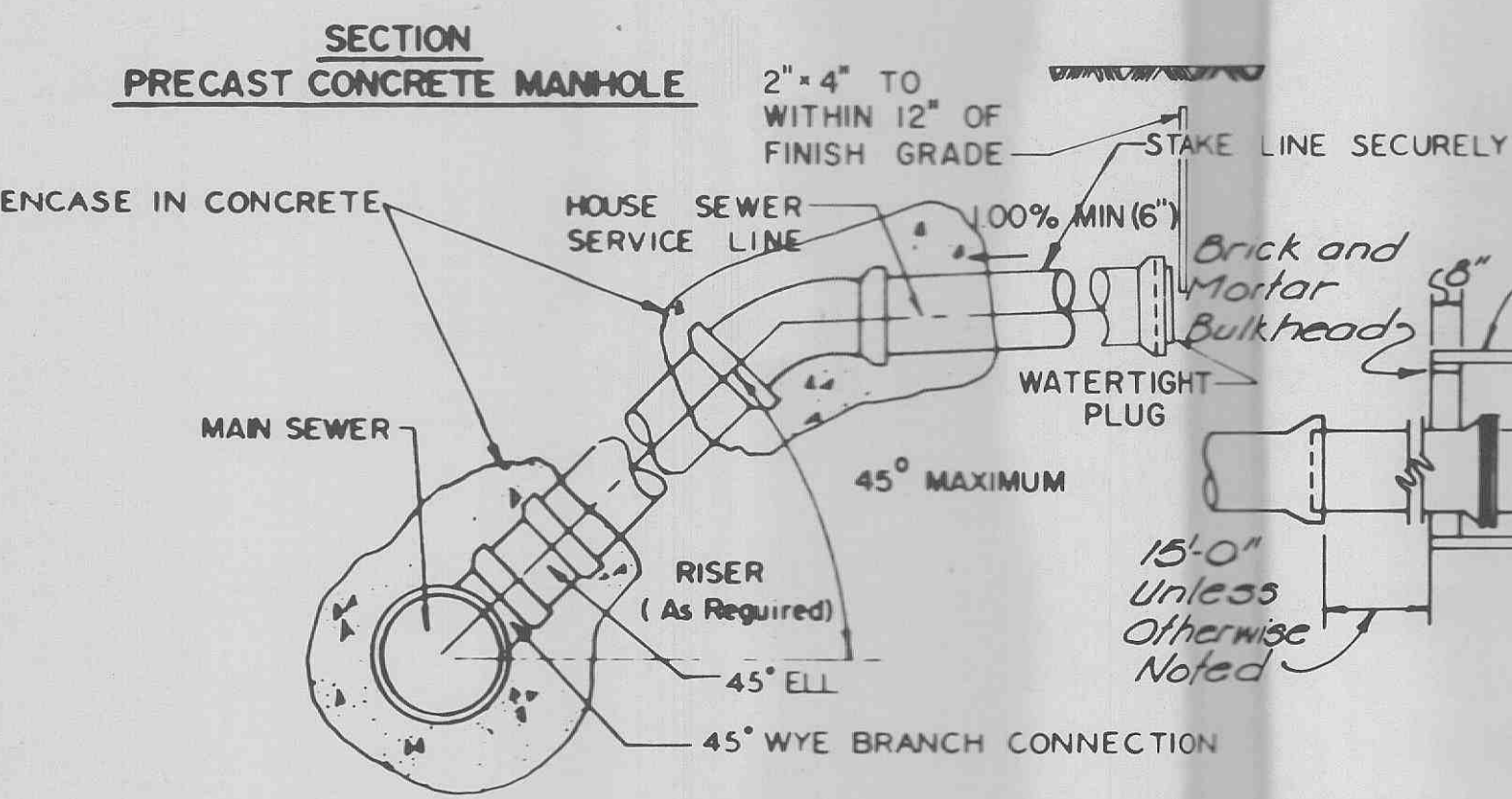
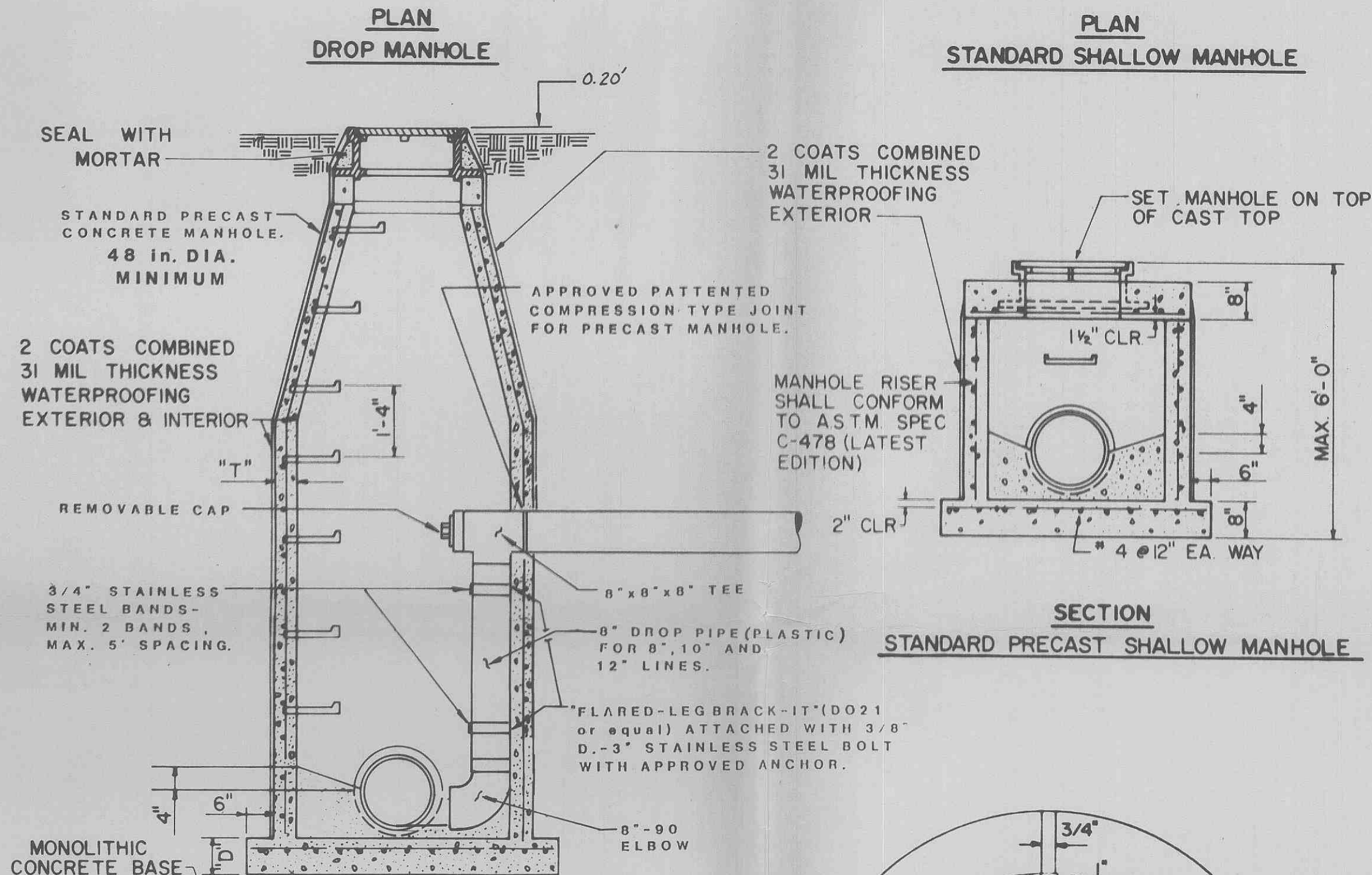
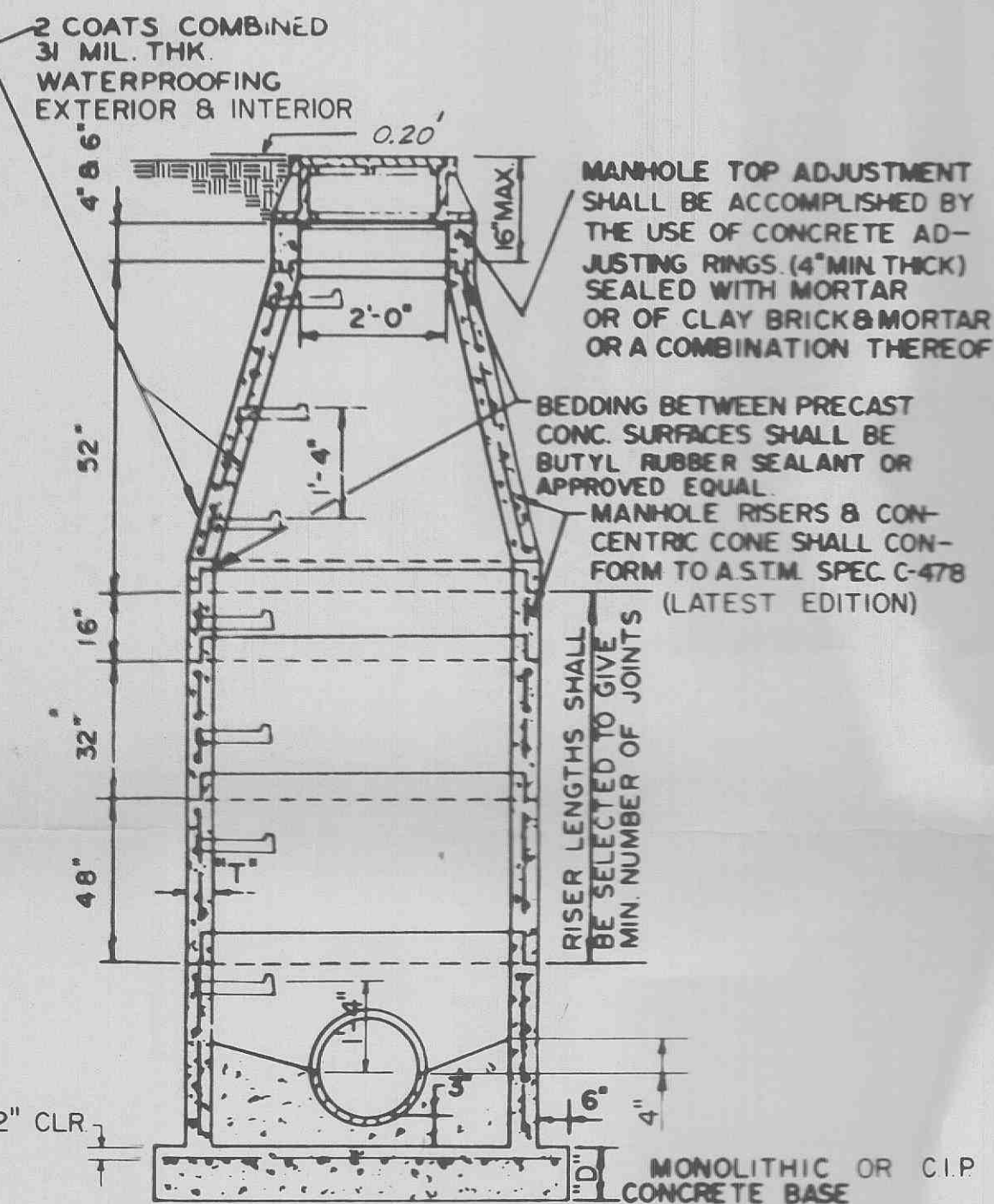
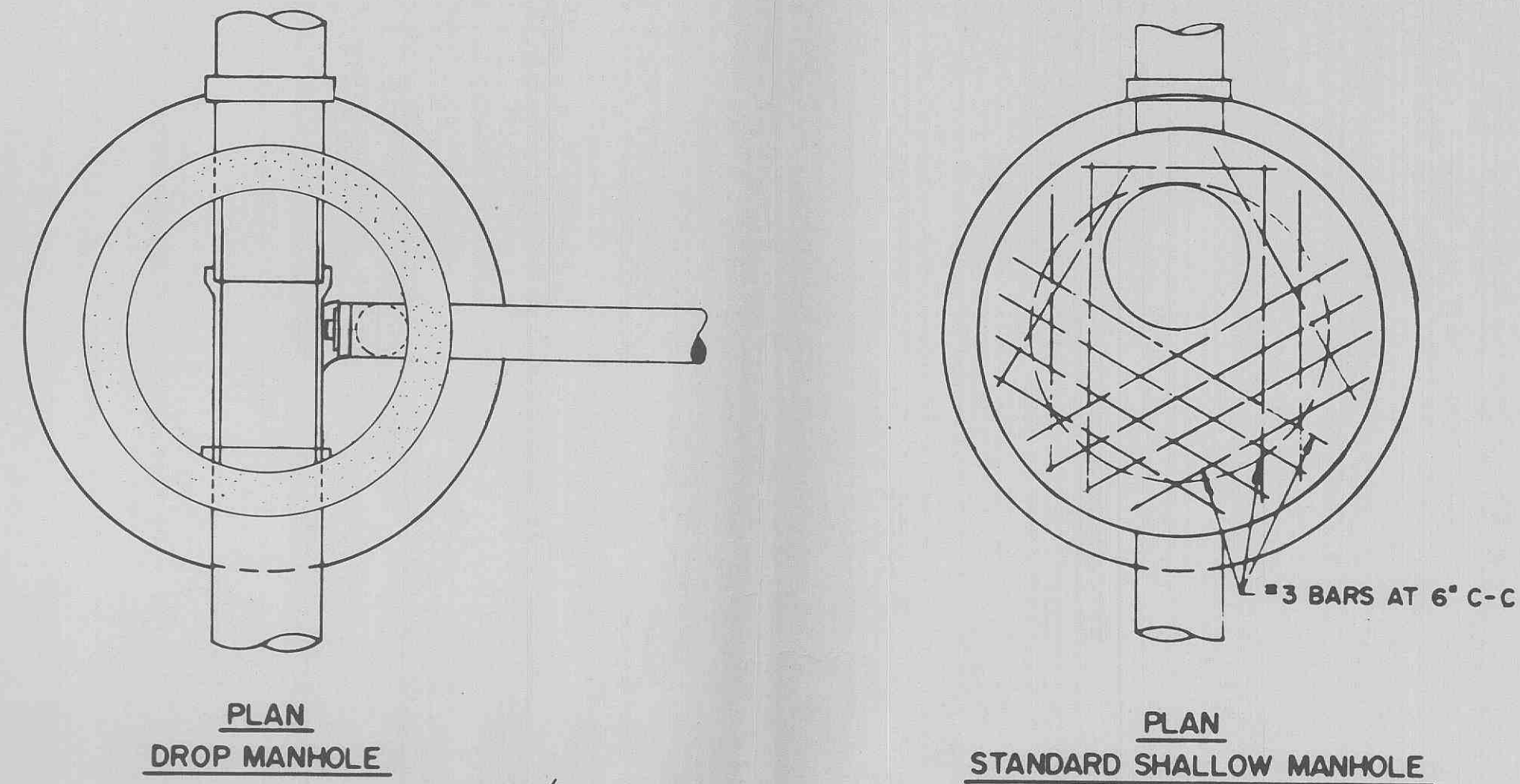
LEVEL CONTROL: Four (4) liquid level sensors shall be supplied and shall control "PUMP OFF", "LEAD PUMP ON", "LAG PUMP ON" and "EMERGENCY ALARM LEVEL". The sensors shall consist of a mercury switch encapsulated in a polypropylene float. The float shall have an internal weight and external weights shall not be required. The sensors shall be suspended from the basin cover.

SUMP BASIN: The pre-cast concrete basin shall have an inside diameter of 4 feet, 0 inches and depth of 14 feet, 2 inches. The basin cover shall be 60 inches diameter and 6 inches thick and shall include an aluminum access lid. Access lid shall be capable of supporting 150 lbs./SF and shall include hasps.

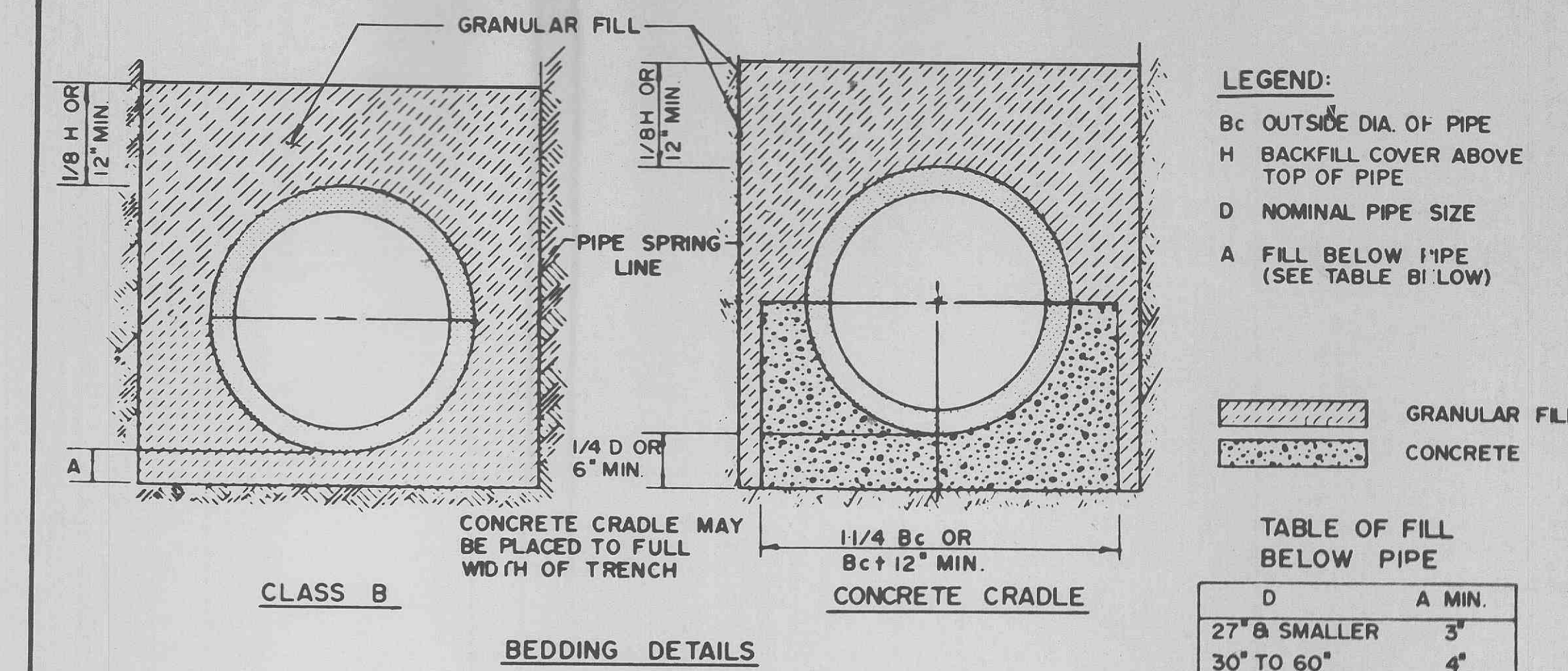
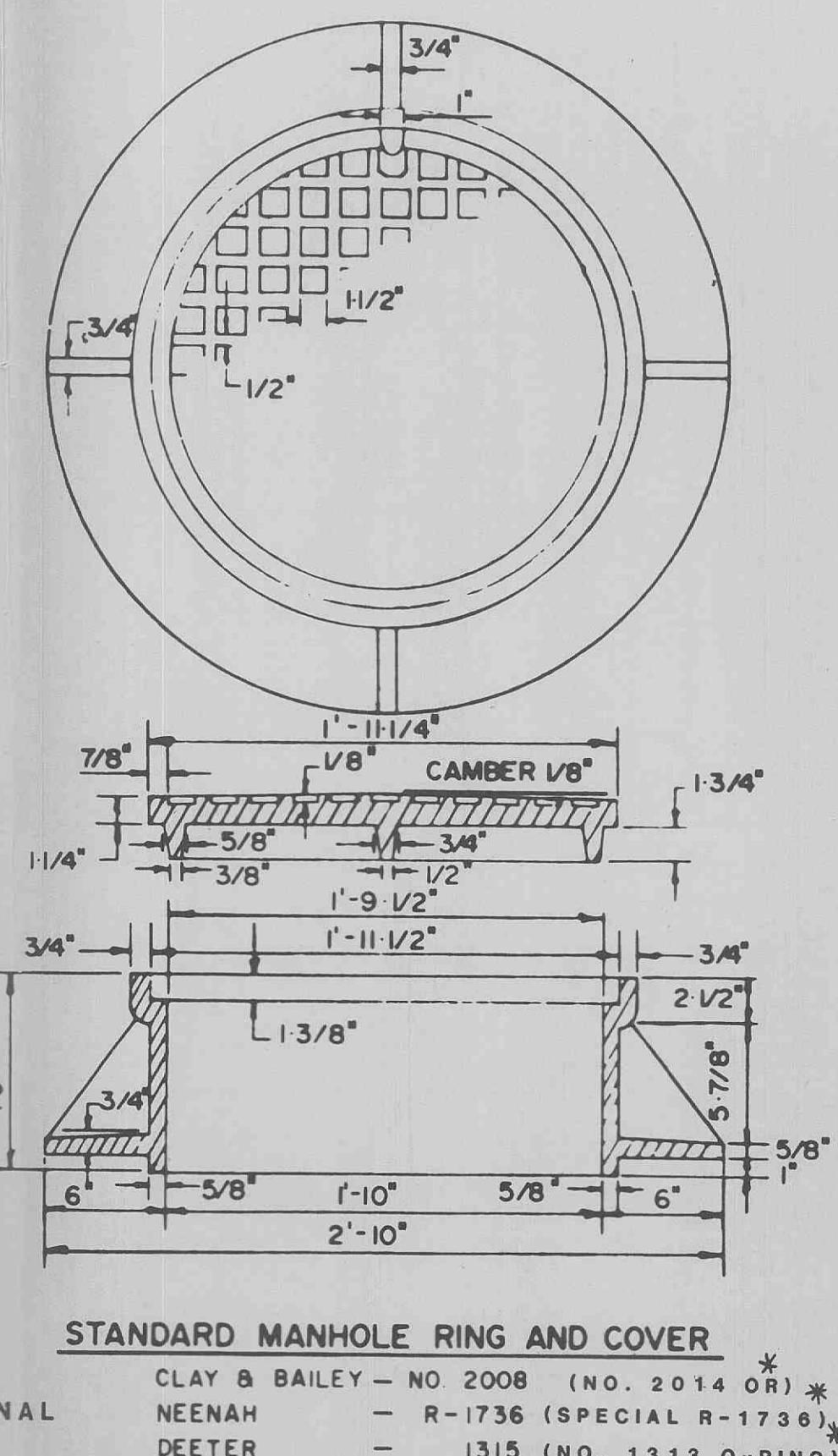
CONTROL PANEL: Control panel shall have a NEMA 3R enclosure for outside mounting. A circuit breaker, magnetic starter with ambient compensated overload relays, H-O-A selector, and 24 volt transformer with fused secondary shall be provided for each pump. An automatic alternator shall alternate the lead-lag sequence on each successive cycle of operation.

ALARMS: An alarm system shall be provided as indicated on drawing. Alarm shall consist of alarm light mounted on a NEMA 3R enclosure. An additional liquid level sensor shall be supplied with the alarm system.

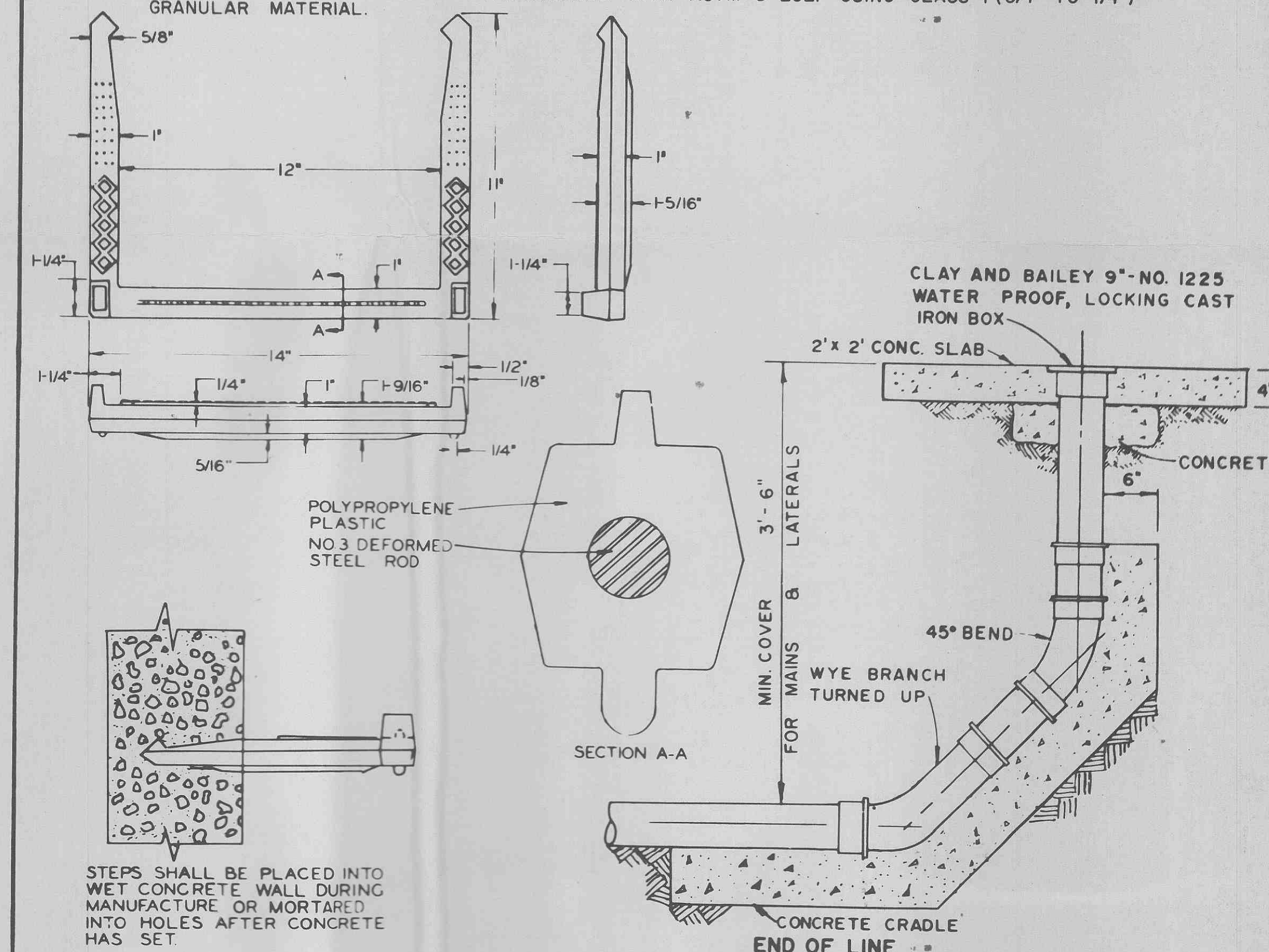
WALL THICKNESS		MANHOLE BASE THICKNESS	
DIA. M.H.	"T" DIM PRE CAST	DEPTH (FEET)	"D" DIM.
42" & 48"	5"	0-20	8" w/ 4 BARS @ 12" CTRS EACH WAY
60"	6"	20-30	8" w/ 4 BARS @ 9" CTRS EACH WAY
72"	7"	30-40	10" w/ 5 BARS @ 10" CTRS EACH WAY



- NOTES:**
1. ANY MATERIAL EXCAVATED BENEATH PIPE ENTERING OR LEAVING MANHOLES SHALL BE REPLACED WITH CONCRETE.
 2. ALL MANHOLE RINGS AND ADJUSTING RINGS SHALL BE SET IN MORTAR.
 3. INSIDE DIAMETER OF MANHOLES TO BE 4'-0" FOR PIPE 21" & SMALLER, 5'-0" FOR PIPE 24" THRU 30", 6'-0" FOR PIPE OVER 30"
 4. PLASTERING OF INSIDE OF MANHOLES SHALL BE THE OPTION OF THE CONTRACTOR.
 5. ALL SEWERS EXTENDING FROM MANHOLES SHALL BE SUPPORTED WITH CONCRETE TO FIRST JOINT.
 6. CONTRACTOR SHALL BE PAID FOR 6" CONCRETE ENCASEMENT AROUND PIPE AS SHOWN IN DETAIL.
 7. LAMP LINES BEFORE AND AFTER INSTALLATION OF CONCRETE ENCASEMENT.
 8. PRECAST MANHOLE SHALL BE WATERPROOFED OUTSIDE.
 9. ALL CONC. MANHOLES TO HAVE RUBBER GASKET ON ALL PIPE OPENINGS.
 10. ALL PVC PIPE TO BE SDR-35.



- LEGEND:**
- Bc OUTSIDE DIA. OF PIPE
H BACKFILL COVER ABOVE TOP OF PIPE
D NOMINAL PIPE SIZE
A FILL BELOW PIPE (SEE TABLE B' LOW)
- GRANULAR FILL
CONCRETE
- TABLE OF FILL BELOW PIPE**
- | D | A MIN. |
|---------------|--------|
| 27" & SMALLER | 3" |
| 30" TO 60" | 4" |
| 66" & LARGER | 6" |
- NOTES:**
1. GRANULAR FILL TO BE CRUSHED STONE OR PEA GRAVEL WITH NOT LESS 95% PASSING 1/2" AND NOT LESS THAN 95% TO BE RETAINED ON A #4, TO BE PLACED IN NOT MORE THAN 6" LAYERS AND COMPACTED BY SLICING WITH A SHOVEL. (1/2" & #4 REFERS TO SIEVE SIZE)
 2. ALL BEDDING DETAILS APPLY TO BUILDING SEWER SERVICE LINES AS WELL AS OTHER SEWERS.
 3. CONCRETE CRADLE SHALL BE USED WHEN TRENCH WIDTH EXCEEDS 24" PLUS THE PIPE DIAMETER.
 4. PVC PIPE SHALL BE BEDDED IN ACCORDANCE WITH ASTM D 2321 USING CLASS I (3/4" TO 1/4") GRANULAR MATERIAL.



MANHOLE STUBOUT

GBA
GEORGE BUTLER ASSOCIATES
CONSULTING ENGINEERS ARCHITECTS
LANDSCAPE ARCHITECTS PLANNERS

OFFICES:
SUITE 305 AIRWAY OFFICE CENTER
4210 JOHNSON DRIVE, SHAWNEE MISSOURI, KANSAS 66205
1100 CITY CENTER SQUARE
1100 MAIN / KANSAS CITY / MISSOURI 64105
SUITE 134 LAKE SIDE PLAZA II
6700 CORPORATE DRIVE, KANSAS CITY, MISSOURI 64120

SANITARY SEWER EXTENSIONS
ABRAM'S SANITARY SEWER
CONSTRUCTION DETAILS
FOR THE
CITY OF O'FALLON, MISSOURI

DESIGNED BY Std DRAWN BY Std CHECKED BY Std

JOB NO 5157
DATE June, 88
SCALE As Shown
SHEET 3 OF 3

REGISTERED PROFESSIONAL ENGINEER
GERALD R. HURLBERT
NUMBER E-19844