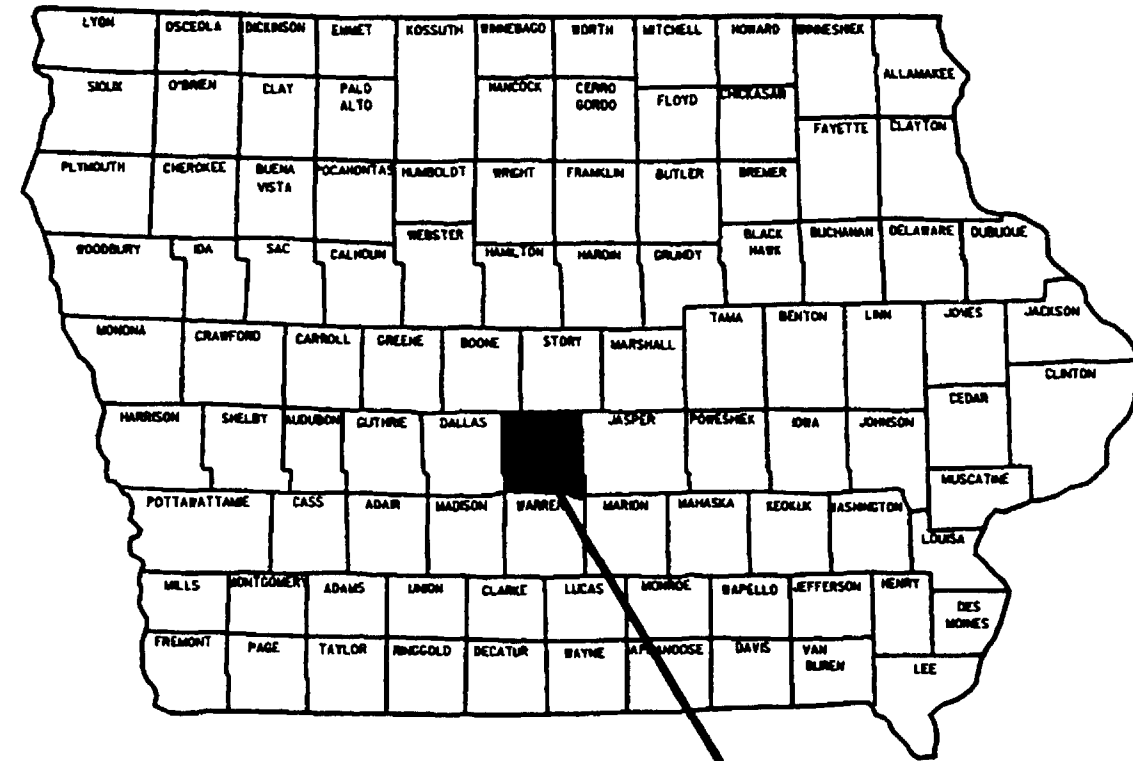


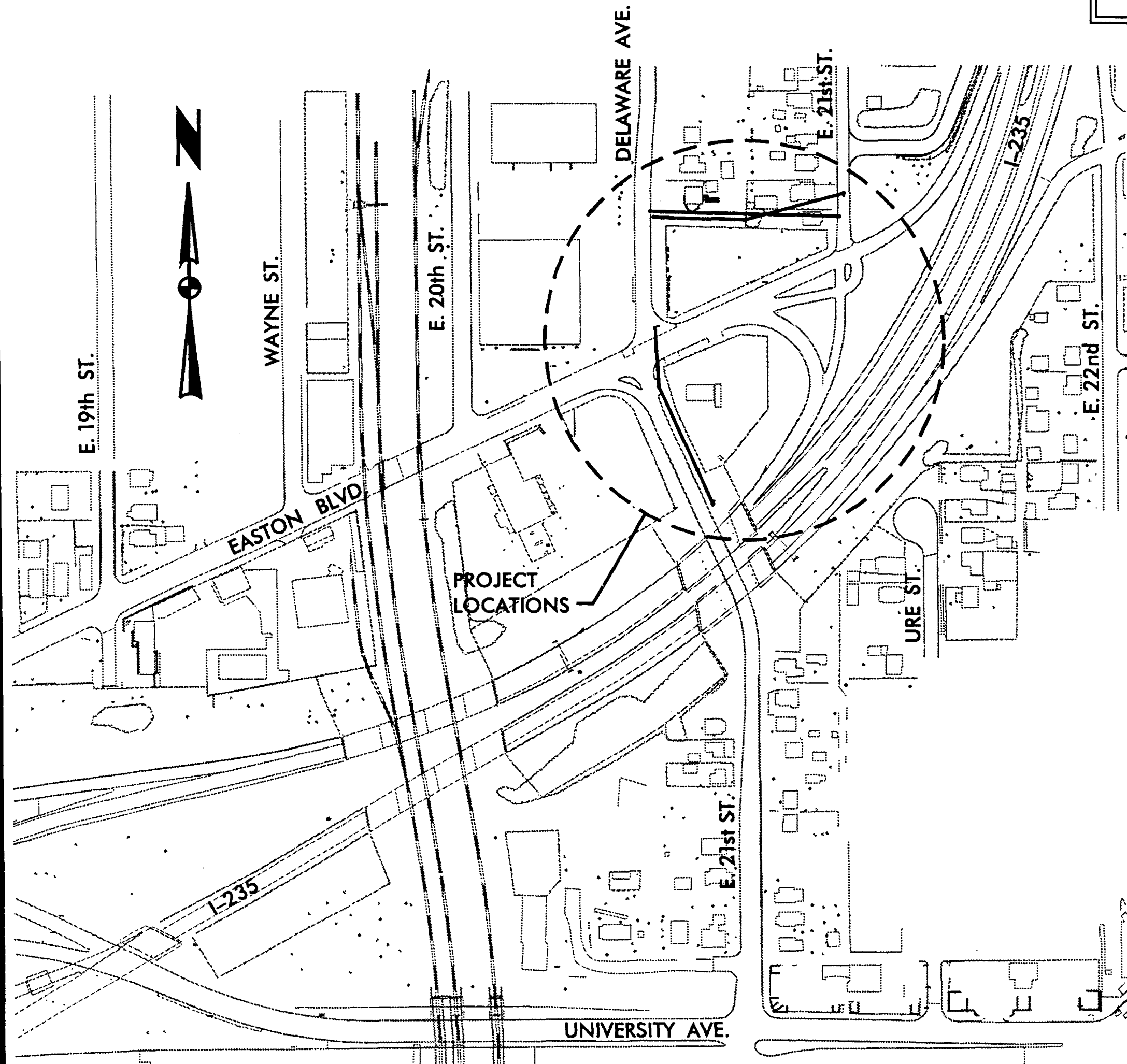
POLK COUNTY I-235 SANITARY SEWER AND WATER MAIN RELOCATION - GROUP 2

DESIGNER: GAP & SRL
 DRAWER: MAJ
 25-JAN-2002 09:27

LETTING DATE
MAR. 26, 2002



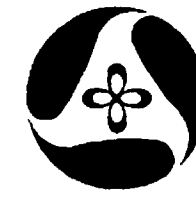
POLK COUNTY



LOCATION MAP



CITY OF DES MOINES



Iowa Department of Transportation
 Project Development Division

PLANS OF PROPOSED IMPROVEMENT ON THE

INTERSTATE ROAD SYSTEM

POLK COUNTY

**I-235 SANITARY SEWER AND WATER MAIN
 RELOCATION - GROUP 2**

SCALE: As Noted

The Iowa Department of Transportation Metric Standard Specifications for Highway and Bridge Construction, series 2001, plus current supplemental specifications and special provisions shall apply to construction work on this project.

Value Engineering Saves. Refer to Standard Notation 203-4 on Sheet C.02.

Form 520003 12-97

I hereby certify that this project was constructed in accordance with the contract and that the "as-built" plans were prepared under my supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Project Engineer _____ Date _____

My license renewal date is December 31, 2002.

2002 Van Haulen & Assoc. Steve Hauler
 Year Contractor Project Inspector

CORRECTED BY GARY CRABTREE JAN. 7 2004
 CHECKED BY CHRISTY MCCLAIN 1-12-04

TOTAL SHEETS	27
PROJECT NUMBER	IM-235-2(472)11- -13-77
R.O.W. PROJECT NUMBER	IM-235-2(444)0- -13-77
PROJECT IDENTIFICATION NUMBER	99-77-235-332-07

INDEX OF SHEETS	
105-3 09-27-94	
NO.	DESCRIPTION
A.01-A.02	Title Sheet and Legend
A.03	Project Location, Bench Marks and Soil Borings
C.01-C.03	Estimate of Quantities, Standard Notes
J.01-J.04	Traffic Control Plans
M.01-M.02	Sanitary Sewer Plan and Profiles
Q.01	Soil Boring Logs
R.01-R.02	Water Main Plan and Details
U.01-U.12	Misc. Detail Sheets
C.01	EXTRA WORK ORDERS

**CONSTRUCT IN ACCORDANCE WITH
 URBAN STANDARD SPECIFICATIONS
 FOR PUBLIC IMPROVEMENTS**

METRIC STANDARD ROAD PLANS					
105-4 09-27-94					
The following Standard Road Plans shall be considered applicable to construction work on this project.					
NUMBER	DATE	NUMBER	DATE	NUMBER	DATE
RA-56	03-26-96	RR-10	04-30-02		
RB-3	01-12-99				
RH-50	04-27-99				
RH-51	10-03-00				
RH-52	08-20-96				
RS-1	10-27-98				
RS-2	10-27-98				
RS-3	06-06-95				
RS-20	08-20-96				
RS-268	10-28-97				

REVISIONS

APPROVED

 CITY ENGINEER, LICENSED P.E. RAH DATE 25 JAN 02

147
KQH

INDEX OF SEALS		
SHEET NO.	NAME	TYPE
A.01	G. Alan Peterson	Primary Signature Block
R.01	Ross A. Hillsman	Water Main Plan & Details
ALL	WES W. MUSGROVE	ASBUILTS

I hereby certify that this plan was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Signature:
 G. ALAN PETERSON
 Printed or Typed Name
 My license renewal date is December 31, 2002.

Pages or sheets covered by this seal: _____
 A.01-A.03, C.01-C.03, J.01-J.04, M.01-M.02, U.01-U.12

STANDARD SYMBOLS

	Interstate Highway Symbol		Septic Tank		Guardrail (Beam or Cable)
	U.S. Highway Symbol		Cistern		GP Guard Post (one or two)
	Iowa Highway Symbol		L.P. Gas Tank (No Footing)		Guard Post (over two)
	County Road Highway Symbol		Underground Storage Tank		FP Filler Pipe
	Evergreen Tree		Latrine		GV Gas Valve
	Deciduous Tree		Luminaire		WV Water Valve
	Fruit Tree		Traffic Signal		SL Speed Limit Sign
	Shrub (Bushes)		Traffic Signal with Luminaire		MM Mile Marker Post
	Timber		Telephone Pedestal		SIGN Sign
	Hedge		Television Pedestal		WHU Water Hook Up
	Stump		Telephone Pole		RT Radio Tower
	Swamp		Telephone Pole (Second Company)		TA Tower Anchor
	Rock Outcrop		Telephone Pole (Third Company)		EB Electric Box
	Broken Concrete		Telephone Pole (Fourth Company)		TCB Traffic Signal Control Box
	Revetment (Rip Rap)		Telephone Pole (Fifth Company)		RRB Rail Road Signal Control Box
	Cemetery		Power Pole		TSB Telephone Switch Box
	Grave		Power Pole (Second Company)		
	Cave		Power Pole (Third Company)		
	Sink Hole		Power Pole (Fourth Company)		
	Board Fence		Power Pole (Fifth Company)		
	Chain Link or Security Fence		Electrical Highline Tower (Metal or Concrete)		
	Wire Fence		Telephone Riser Pole		
	Terrace		Power Riser Pole		
	Earth Dam or Dike (Existing)		Telegraph Pole		
	Earth Dam or Dike (Proposed)		Satellite TV Dish		
	Tile Outlet		Existing Water Line		
	Edge of Water		Existing Water Line (Second Company)		
	Existing Drainage		Existing Sanitary Sewer Line		
	Proposed Drainage		Existing Telephone Line		
	Right of Way Rail or Lot Corner		Existing Telephone Line (Second Company)		
	Concrete Monument		Existing Fiber Optics Telephone Line		
	Well		Existing Storm Sewer Line		
	Windmill		Existing Gas Line		
	Beehive Intake		Existing High Pressure Gas Line		
	Existing Intake		Existing Gas Line (Second Company)		
	Proposed Intake		Existing High Pressure Gas Line (Second Company)		
	Existing Utility Access (Manhole)		Existing Power Line		
	Proposed Utility Access (Manhole)		Existing Power Line (Second Company)		
	Fire Hydrant		Cable Television Line		
	Water Hydrant (Rural)				

UTILITY INFORMATION

City of Des Moines Engineering
602 East First Street
Des Moines, Iowa 50309
(515) 283-4953

MidAmerican Energy
666 Grand Ave.
Des Moines, Iowa
Emergency (800) 595-5325 (Gas)
Emergency (800) 799-4443 (Electric)
Customer Service (888) 4ASKMEC

Des Moines Water Works
2201 Valley Drive
Des Moines, Iowa
(515) 283-8725

Qwest Communications
Builder Services (800) 526-3557

RIGHT OF WAY LEGEND

- Proposed Right of Way
- Existing Right of Way
- Existing and Proposed Right of Way
- Easement and Existing Right of Way
- Borrow
- Easement (Temporary)
- Easement
- Excess
- Property Line
- A/C Access Control

CONVENTIONAL SIGNS

- Station Reference Point Survey Line
- Section Corner
- Proposed Profile Grade
- Railroad
- Existing Proposed Field Tile
- Existing Proposed Culverts
- Stream



Legend And Symbol Information Sheet

(Symbols are Typical Only, actual size may vary)

DRAWER: MAJ DESIGNER: GAP & SRL 25-JAN-2002 09:30 \\dm2\Projects\F\15764\dm\15764_a02.dgn

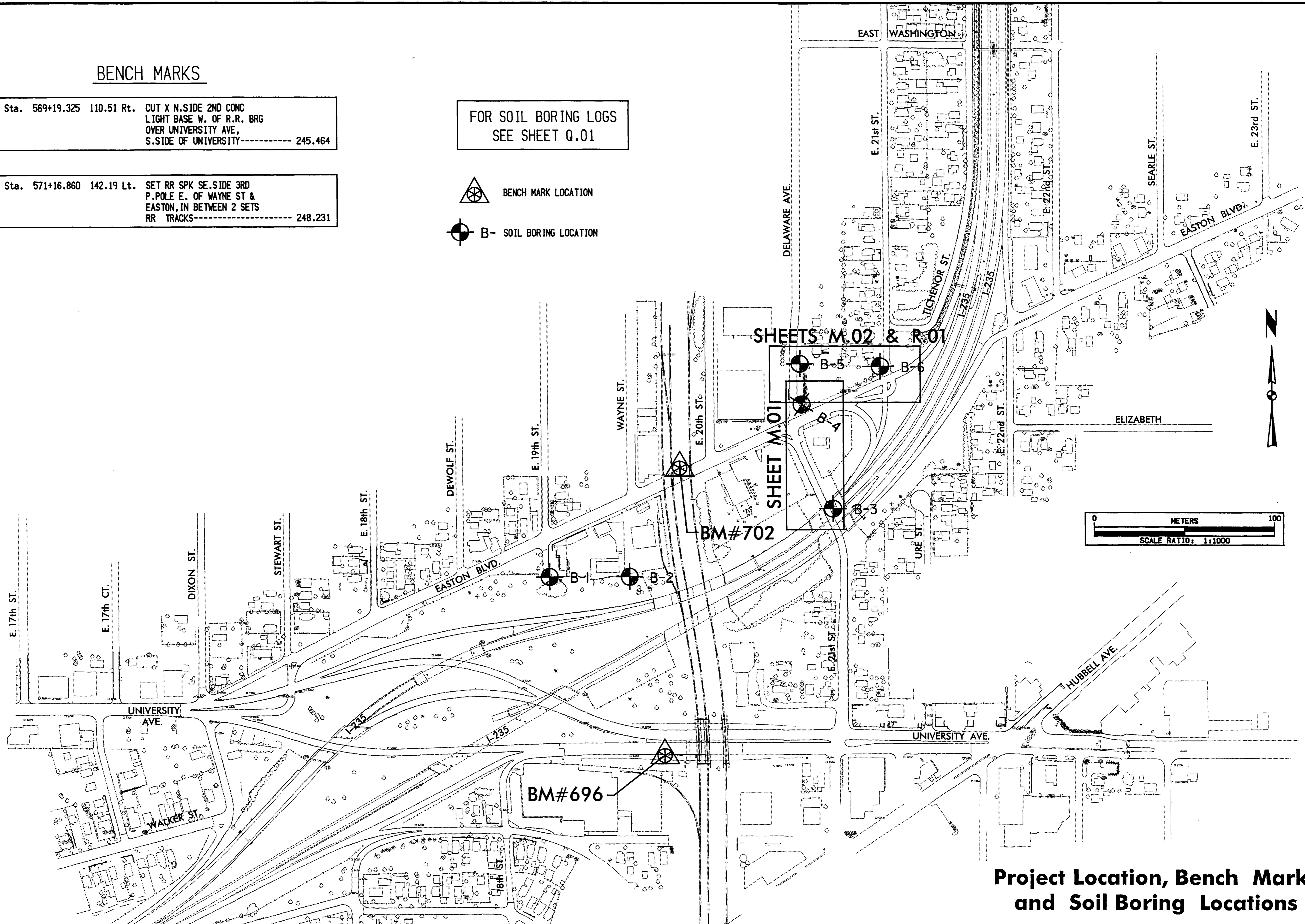
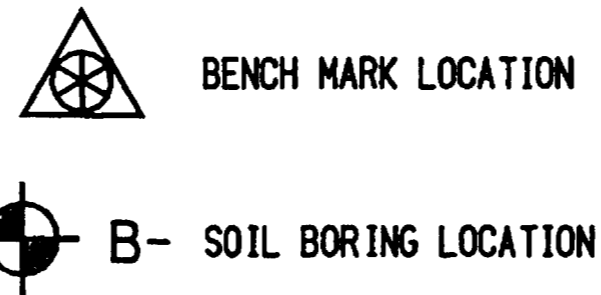


BENCH MARKS

No. 696 Sta. 569+19.325 110.51 Rt. CUT X N.SIDE 2ND CONC
LIGHT BASE W. OF R.R. BRG
OVER UNIVERSITY AVE,
S.SIDE OF UNIVERSITY----- 245.464

No. 702 Sta. 571+16.860 142.19 Lt. SET RR SPK SE.SIDE 3RD
P.POLE E. OF WAYNE ST &
EASTON, IN BETWEEN 2 SETS
RR TRACKS----- 248.231

FOR SOIL BORING LOGS
SEE SHEET Q.01



**Project Location, Bench Marks
and Soil Boring Locations**

DRAWER: MJJ
DESIGNER: GAP & SRL
25-JAN-2002 09:31
\\0am2\Projects\15764\15764.dgn\15764_a03.dgn

ESTIMATED PROJECT QUANTITIES

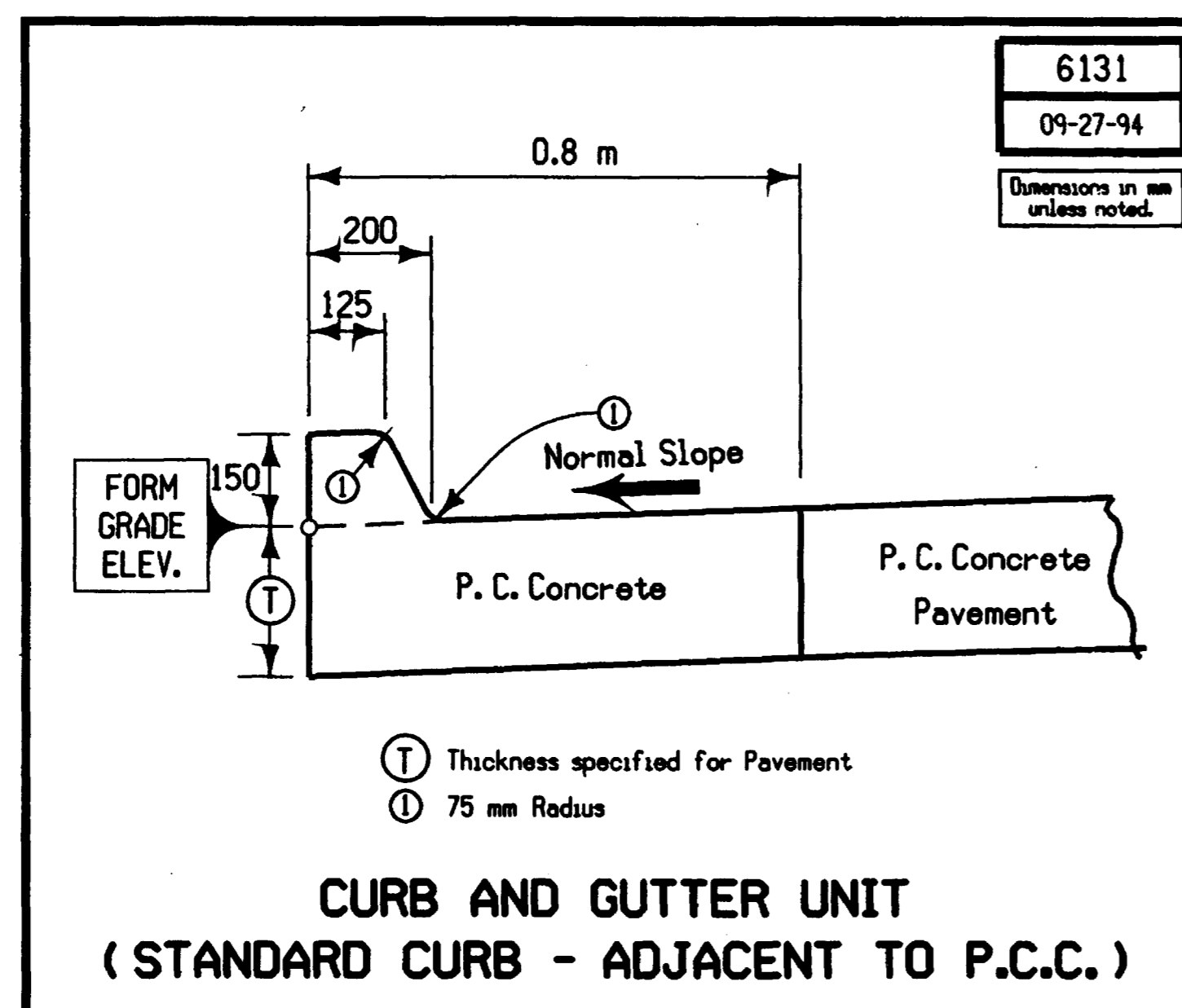
100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
122	2212--100300	PATCHES, FULL DEPTH REPAIR	M2	5.0	14.210
124	2213--100100	RMVL OF CURB	M	30.0	9.800
123	2312--100400	PATCHES BY COUNT REPAIR	EA	2.0	1.000
125	2312--110100	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE	MG	58.0	0.000
126	2402--401050	GRANULAR BACKFILL	M3	180.0	0.000
127	2506--100000	FLOWABLE MORTAR	M3	37.8	16.050
128	2512--110000	PCC CURB, AS PER PLAN	M	30.0	9.800
129	2519--425000	REMOVE AND REINSTALL CHAIN LINK FENCE	M	9.0	10.000
130	2526--001000	CONSTRUCTION SURVEY	LS	1.0	\$10,000.000
131	2528--101000	TRAFFIC CONTROL	LS	1.0	\$2500.000
132	2529--101100	FULL DEPTH FINISH PATCHES BY COUNT	EA	2.0	1.000
134	2529--103100	HMA (COMPOSITE SECTION)	MG	30.0	2.920
133	2529--101200	FULL DEPTH FINISH PATCHES BY AREA	M2	90.0	160.070
135	2533--100000	MOBILIZATION	LS	1.0	\$10,000.000
136	2598--020200	WATER MAIN, PVC 200mm DIA	M	98.0	93.800
137	2598--090020	WATER MAIN FITTINGS	KG	54.9	54.000
138	2598--270200	WATER VALVE, GATE MECHANICAL JOINT 200mm	EA	1.0	1.000
139	2598--300020	FIRE HYDRANT ASSEMBLY	EA	2.0	2.000
140	2599--999901	DUCTILE IRON SANITARY SEWER PIPE 400 MM DIA	M	6.1	5.800
141	2599--999901	UNCLASSIFIED SANITARY SEWER 250mm DIA	M	98.5	97.500
142	2599--999901	UNCLASSIFIED SANITARY SEWER 375mm DIA	M	90.8	96.900
143	2599--999911	FOUNDATION ROCK	MG	20.0	0.000
144	2599--999915	CONFLICT MANHOLE	EA	1.0	1.000
145	2599--999915	CONNECTION TO EXISTING UTILITY ACCESS	EA	1.0	2.000
146	2599--999915	PREPARE EXCAVATION FOR TAPPING SLEEVE & VALVE	EA	1.0	1.000
147	2599--999915	UTILITY ACCESS, TYPE A	EA	2.0	2.000
148	2599--999915	UTILITY ACCESS, TYPE I	EA	3.0	2.000
149	2601--101200	SEEDING AND FERTILIZING	HA	0.05	0.085
150	2601--104200	MULCHING	HA	0.05	0.000
151	2601--106000	SODDING	M2	1100.0	935.400

TABULATION OF EROSION CONTROL DETAILS

100-11
09-27-94

LOCATION	OVER-SEEDING & FERTILIZING	SEEDING and FERTILIZING	MULCHING	SPECIAL DITCH CONTROL		SOD	CROWN-VETCH SEEDING	SEEDING SPECIAL AREAS	DITCH RESHAPING	MOWING
				Wood Excelsior Mat	m ²					
Station to Station	ha	ha	ha		m ²	m ²	ha	ha	m	ha
10+00	10+97		0.05	0.05						
20+00	20+97					1100				



ESTIMATE REFERENCE INFORMATION

100-4B
07-15-97

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
1	2212--100300	PATCHES, FULL DEPTH REPAIR
3	2312--100400	PATCHES BY COUNT REPAIR
11	2529--101100	FULL DEPTH FINISH PATCHES BY COUNT
12	2529--103100	HMA (COMPOSITE SECTION)
13	2529--101200	FULL DEPTH FINISH PATCHES BY AREA SEE TAB 102-6C ON SHEET C.02 FOR LOCATIONS AND ADDITIONAL INFORMATION.
2	2213--100100	RMVL OF CURB SEE TAB 110-4 ON SHEET C.02 FOR LOCATIONS. CONTRACTOR TO DISPOSE OF AS PER ST'D NOTE 213-1.
4	2312--110100	GRANULAR SURFACING ON ROAD, CLASS A CRUSHED STONE TO BE USED FOR TEMPORARY SURFACING. USED DENSITY OF 2250 KG/M3 FOR ESTIMATING PURPOSES.
5	2402--401050	GRANULAR BACKFILL CONSTRUCT IN ACCORDANCE WITH URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS
6	2506--100000	FLOWABLE MORTAR FILL SEWER WITH FLOWABLE MORTAR TO ABANDON.
7	2512--110000	PCC CURB, AS PER PLAN SEE TAB 110-4 ON SHEET C.02 FOR AREAS OF LOCATION TO BE REPLACED WHERE EXISTING CURB IS BEING REMOVED.
10	2528--101000	TRAFFIC CONTROL INCLUDES SAFETY CLOSURE SEE TAB 108-13A ON SHEET C.01 FOR LOCATION AND ADDITIONAL INFORMATION.
15	2598--020200	WATER MAIN, PVC 200mm DIA
16	2598--090020	WATER MAIN FITTINGS
17	2598--270200	WATER VALVE, GATE MECHANICAL JOINT 200mm
18	2598--300020	FIRE HYDRANT ASSEMBLY
23	2599--999911	FOUNDATION ROCK
26	2599--999915	PREPARE EXCAVATION FOR TAPPING SLEEVE & VALVE SEE SHEETS R.02 AND SPECIAL PROVISIONS FOR METHOD OF MEASUREMENT AND BASIS OF PAYMENT.
19	2599--999901	DUCTILE IRON SANITARY SEWER PIPE 400 MM DIA FOR METHOD OF MEASUREMENT SEE 2504.05 AND BASIS OF PAYMENT SEE 2504.06 OF THE STANDARD SPECIFICATIONS. SEE SHEETS U.01 THRU U.12 AND SPECIAL PROVISIONS FOR METHOD OF MEASUREMENT AND BASIS OF PAYMENT.
20	2599--999901	UNCLASSIFIED SANITARY SEWER 250mm DIA
21	2599--999901	UNCLASSIFIED SANITARY SEWER 375mm DIA
27	2599--999915	UTILITY ACCESS, TYPE A
28	2599--999915	UTILITY ACCESS, TYPE I SEE SHEETS U.01 THRU U.12 AND SPECIAL PROVISIONS FOR MEASUREMENT AND BASIS OF PAYMENT.
24	2599--999915	CONFLICT MANHOLE EXACT LOCATION OF CONFLICT MANHOLE I WILL BE DETERMINED BY THE ENGINEER BASED ON THE STORM SEWER PLANS ON IM-NHS-235-2(340)11-03-77 SEE SPECIAL PROVISIONS FOR MEASUREMENT AND BASIS OF PAYMENT.
25	2599--999915	CONNECTION TO EXISTING UTILITY ACCESS CONNECT TO EXISTING MANHOLE 2. SEE SPECIAL PROVISIONS FOR MEASUREMENT AND BASIS OF PAYMENT.
29	2601--101200	SEEDING AND FERTILIZING
30	2601--104200	MULCHING
31	2601--106000	SODDING SEE TAB 100-11 ON SHEET C.01 FOR LOCATIONS AND ADDITIONAL INFORMATION.

EXTRA WORK ORDERS (472)

NO.	DESCRIPTION	UNIT	TOTAL
1560	SAWCUT FOR E. 21 ST STREET PAVEMENT REMOVAL	LUMP SUM	\$ 1,011.74
1565	REMOVAL OF PAVEMENT (E. 21 ST STREET)	Sq. METER	\$ 1,547.874
1570	CLASS 1D EXCAVATION FORDOWN & BORROW	Cu. METER	502.313
1575	SPECIAL BACKFILL MATERIAL	Cu. METER	1301.85
1580	CONSTRUCTION SURVEY	LUMP SUM	\$ 3,850.00
1585	SPECIAL STORM SEWER CONFLICT STRUCTURE	LUMP SUM	\$ 45,380.00
1590	TYPE M-F UTILITY ACCESS	EACH	1.0
1595	CONC. 100D STORM SEWER 375MM	METER	10.4
1600	MOBILIZATION, REPLACEMENT PAVEMENT, E. 21 ST STREET	LUMP SUM	\$ 1,100.00
1605	STD/S-F PCC PAVEMENT CL.C CL.3 200MM	Sq. METER	1667.99

TABULATION OF SAFETY CLOSURES

108-13A
10-28-97

Refer to Section 2518 of the Standard Specifications

STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
10+85	1*		EASTON BLVD.

* INCIDENTAL TO CONTRACT

TABULATION OF FULL-DEPTH PATCHES

102-6C
10-02-01
Not a Bid Item

COUNT	LOCATION STATION OR MILEPOST	LANE L,R or B	DIMENSION		Patch Thickness mm	PCC PATCHES			HMA PATCHES m ²	COMPOSITE HMA Mg	SUBBASE (PATCHES) m ²	75 mm P.E. SUBDRAIN OUTLET PIPE # m	'CD' JOINTS Number	'CT' JOINTS Number	ANCHOR LUGS REMOVAL Number	REMARKS
			LENGTH x WIDTH m			WITH DOWELS m ²	WITHOUT DOWELS m ²	C R C m ²								
1	10+88	B	20	5	Match Exist.	70				30						EASTON BLVD.
1	20+97	L	4	5	Match Exist.	20										E 21st. N OF EASTON, SANITARY SEWER
1	19+97	R	1	2.5	Match Exist.				2.5							DELAWARE AVE.
1	20+94	L	1	2.5	Match Exist.				2.5							E 21st. N OF EASTON, WATER MAIN

LIST OF INTAKES AND UTILITY ACCESSES

104-5A
MODIFIED

NUMBER	LOCATION	TYPE (1)	RIM Elev.	NOTE
MH-A	STA. 10+00	I	246.23	
MH-I	STA. 10+19	SPECIAL	246.21	CONFLICT MANHOLE
MH-B	STA. 10+66	A	246.46	
MH-C	STA. 20+00	I	246.83	
MH-D	STA. 20+47	A	246.13	
MH-E	STA. 20+99	I	246.25	

(1) URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS MANUAL, SECTION 6020, FIGURES 6020.1, 6020.4

TABULATION OF CURB REMOVAL

110-4
MODIFIED

STATION TO STATION	SIDE	LENGTH m	REMARKS
10+70, 0.4m RT	10+80, 2.7m RT	15	SHT. M.01
10+60, 2.7m LT	10+62, 0.5m RT	5	SHT. M.01
19+98, 5m LT	19+98, 5m RT	10	SHT. M.02

Project	Type of Work
IM-235-2(304)7--13-77	Cottage Grove Bridge
IM-235-2(306)7--13-77	MLK Bridge
BRFIM-235-2(320)9--05-77	3rd St. Bridge
BRFIM-235-2(321)9--05-77	2nd St. Bridge
IM-235-2(305)7--13-77	Grade & Pave (Cottage Grove and MLK)
IM-235-2(442)7--13-77	24th St. San. Sewer Project
BRFIM-235-2(322)9--05-77	Des Moines River Bridge
IM-235-2(326)9--13-77	E 6th St. Bridge
IM-235-2(344)11--13-77	UP RR Bridge
BRFIM-235-2(347)11--05-77	21 st St. Bridge
IM-235-2(460)8--13-77	San. Sewer at School St.
IM-235-2(456)12--13-77	San. Sewer Project
IM-235-2(463)11--13-77	San. Sewer Project
IM-235-2(330)9--13-77	E 9th St. Bridge
IM-235-2(458)10--13-77	San/St. Sev E 12th to E 5th, north side Bridge Fencing
IM-235-2(468)1--13-77	San. Sewer near Easton
IM-235-2(472)7--13-77	San. Sewer near East High School
IM-235-2(462)10--13-77	Water main relocation at Washington St.
IM-235-2(474)13--13-77	Guthrie Ave. Traffic Signal Contractor

09-27-94 204-2
All holes resulting from operations of the contractor, including removal of guardrail posts, fence posts, utility poles, or foundation studies, shall be filled and consolidated to finished grade as directed by the engineer to prevent future settlement. The voids shall be filled as soon as practical - preferably the day created and not later than the following day. Any portion of the right-of-way or project limits (including borrow areas and operation sites) disturbed by any such operations shall be restored to an acceptable condition. This operation shall be considered incidental to other bid items in project.

09-27-94 212-1
Sounding and test boring data shown on plans were accumulated for designing and estimating purposes. Their appearance on the plan does not constitute a guarantee that conditions other than those indicated will not be encountered.

10-02-01 213-1
It shall be the contractor's responsibility to provide waste areas or disposal sites for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project. These areas shall not impact wetlands or "Waters Of The U.S." No payment for overhaul will be allowed for material hauled to these sites. No material shall be placed within the right-of-way, unless specifically stated in the plans or approved by the engineer.

09-27-94 221-3
Estimated quantity for new concrete pavement includes all integral curb, all street returns and special areas of repairs to connecting pavements.

09-27-94 221-4
In order to avoid any unnecessary surface breaks or premature spalling, the contractor is cautioned to exercise extreme care when performing any of the necessary saw cutting operations for the proposed pavement removal.

09-27-94 232-5
The contractor shall not disturb desirable grass areas and desirable trees outside the construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service areas will be subject to the approval of the resident engineer.

09-27-94 232-6
Selective clearing will be required on this project. Any trees outside of the construction limits shall be removed only by the approval of the engineer.

09-27-94 232-8
The top 150 millimeters of the disturbed areas shall be free of rock and debris and shall be suitable for the establishment of vegetation, subject to the approval of the Engineer.

10-28-97 232-10
The contractor is expected to have materials, equipment, and labor available on a daily basis to install and maintain erosion control features on the project. This may involve seeding, silt fence, rock ditch checks, silt basins, or silt dikes.

07-15-97 241-2
Where indicated on the plans or when directed by the Engineer, existing sewer and drainage pipes which are to be abandoned in place shall be completely blocked with permanent bulkheads composed of either class X concrete or brick masonry. Salvaged brick may be used provided they are sound and meet the approval of the Engineer. This work shall be considered as incidental work and the cost of such blocking of abandoned sewers and drainage pipes shall be considered to be included in the contract price for other items.

09-27-94 251-1
The contractor shall be responsible to maintain access to individual properties during construction. Relocated access shall be completed to individual properties prior to removal of existing access. If the permanent access cannot be completed prior to removal of the existing access, the contractor shall provide and maintain an alternate access. Temporary Granular Surfacing will be paid for as a contract item or by extra work.

09-27-94 251-3
A plan for stage construction of local accesses which are required to remain open to traffic during construction shall be submitted by the contractor for approval by the engineer.

09-27-94 252-1
Blading and shaping as well as any other incidental work in preparation for any maintenance of temporary crossing or detours shall be considered incidental to other work on the project. Additional surfacing needed for temporary crossings or detours during construction shall be furnished and spread at contract price.

09-21-99 262-3
BEFORE YOU DIG:
IOWA 1-CALL# 1-800-292-8989

SC-1
All work involved in this project shall be constructed on City owned right-of-way or easements obtained by the City. Contractor shall restrict his construction operations to within the designated right-of-way or construction easements. No materials, excavated material, or equipment shall be stored on, parked on, deposited on, or driven over any private property unless written authorization is obtained from the property owner by the contractor. A copy of such written agreement shall be made available to the City and the Engineer.

TRAFFIC CONTROL PLAN

108-23
09-27-94

TRAFFIC WILL BE MAINTAINED ON EAST 21ST STREET SOUTH OF EASTON AND ON DELAWARE AVENUE AT ALL TIMES. THE EASTERN QUADRANT OF THE INTERSECTION OF DELAWARE AVENUE AND EASTON BOULEVARD WILL BE TEMPORARILY CLOSED DURING CONSTRUCTION AT SAID INTERSECTION. THE CONTRACTOR SHALL BE REQUIRED TO GIVE THE RESIDENT CONSTRUCTION ENGINEER 72 HOURS NOTICE PRIOR TO THE PLANNED CLOSURE.

TRAFFIC CONTROL ON THE PROJECT SHALL BE IN ACCORDANCE WITH STANDARD ROAD PLANS RS-2 AND RS-26B. FOR ADDITIONAL COMPLEMENTARY INFORMATION, REFER TO PART VI OF THE MANUAL ON UNIFORM TRAFFIC DEVICES (MUTCD) AND THE CURRENT SUPPLEMENTAL SPECIFICATIONS FOR TRAFFIC CONTROL.

ALL TRAFFIC CONTROL DEVICES SHALL BE FURNISHED, ERECTED, MAINTAINED, AND REMOVED BY THE CONTRACTOR.

WHERE POSSIBLE, ALL POST MOUNTED SIGNS SHALL BE PLACED AT LEAST 0.6 METERS BEYOND THE CURB.

THE LOCATION FOR STORAGE OF EQUIPMENT BY THE CONTRACTOR DURING NONWORKING HOURS SHALL BE AS APPROVED BY THE ENGINEER IN CHARGE OF CONSTRUCTION.

PROPOSED SIGN SPACING MAY BE MODIFIED AS APPROVED BY THE ENGINEER TO MEET EXISTING FIELD CONDITIONS OR TO PREVENT OBSTRUCTION OF THE MOTORIST'S VIEW OF PERMANENT SIGNING.

PERMANENT SIGNING THAT CONVEYS A MESSAGE CONTRARY TO THE MESSAGE OF THE TEMPORARY SIGNING, AND NOT APPLICABLE TO THE WORKING CONDITIONS, SHALL BE COVERED BY THE CONTRACTOR WHEN DIRECTED BY THE ENGINEER.

PROPOSED CHANGES IN THE TRAFFIC CONTROL PLAN SHALL BE REVIEWED WITH THE OFFICE OF CONSTRUCTION BEFORE CHANGES ARE MADE.

LIST OF SANITARY SEWER PIPE

SCI-1

LINE NUMBER	LOCATION		TYPE OF PIPE	PIPE DIAMETER	LENGTH OF LINE	SLOPE %	FLOW LINES			NOTE
	From	To					INLET Elevation	OUTLET Elevation	OTHER Elevation	
1	MH-A	STA. 10+16	(1)	375	16.0	0.150	243.51	243.49		SHT. M.01
2	STA. 10+16	STA. 10+22	(1)	400	6.1	0.150	243.52	243.51	243.07 (4)	SHT. M.01 (3)
3	STA. 10+22	MH-B	(1)	375	44.0	0.150	243.59	243.52		SHT. M.01
4	MH-B	MH-2	(1)	375	30.8	0.150	243.64	243.59		SHT. M.01
5	MH-C	MH-D	(1)	250	47.0	0.081	243.80	243.76		SHT. M.02
6	MH-D	MH-E	(1)	250	51.5	0.081	243.84	243.80		SHT. M.02

- (1) SEE SCI-2, SANITARY SEWER PIPE MATERIALS.
- (2) NOT USED
- (3) PIPE THROUGH STORM SEWER CONFLICT MANHOLE
- (4) ESTIMATED STORM SEWER INVERT EL. AT CONFLICT MANHOLE.

SANITARY SEWER PIPE MATERIALS

SCI-2

PIPE NO.	ALTERNATES FOR PIPE MATERIAL	REQUIRED PIPE BEDDING AND HAUNCH SUPPORT	REQUIRED PRIMARY AND SECONDARY BACKFILL TO 300mm ABOVE THE TOP OF PIPE	
			TRENCH WIDTH LESS THAN 1.2m AT TOP OF PIPE	TRENCH WIDTH GREATER THAN 1.2m AT TOP OF PIPE
1	2	4	5	6
2	3	4	5	6
3	2	4	5	6
4	2	4	5	6
5	2	4	5	6
6	2	4	5	6

- 1. NOT USED
- 2. MATERIAL ALLOWABLE BY SECTION 4010, 2.01 OF URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
- 3. DIP, AWWA C151
- 4. CLASS I GRANULAR BEDDING MATERIAL, SECTION 3010, 2.03 URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS
- 5. CLASS I, CLASS II, CLASS III, OR CLASS IVA MATERIAL, SECTION 3010, 2.03 THROUGH 2.06 URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.
- 6. PC CONCRETE ARCH, REINFORCED FOR 4.8 LOAD FACTOR, SECTION 3010, 2.11 AND FIGURE 3010.3 URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS.

TABULATION OF SPECIAL EVENTS

102-15
09-27-94

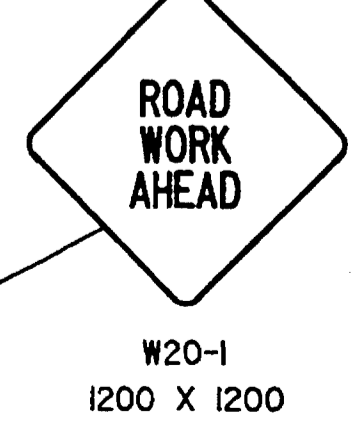
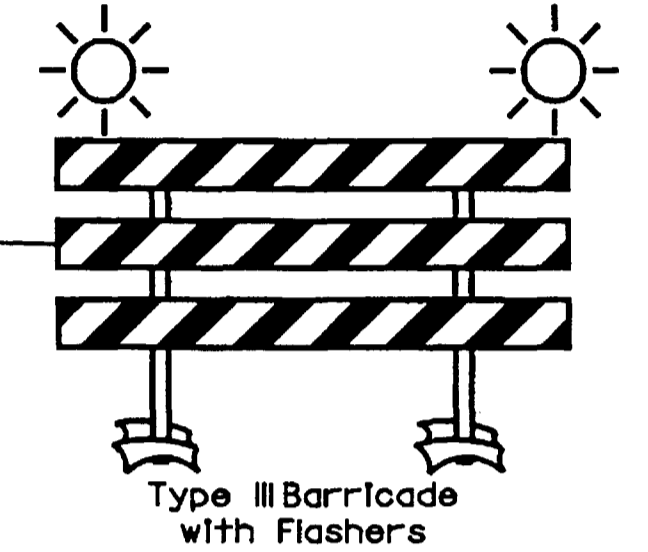
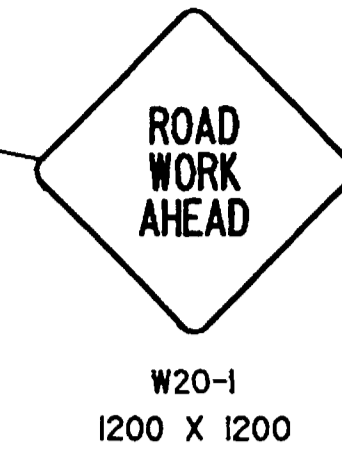
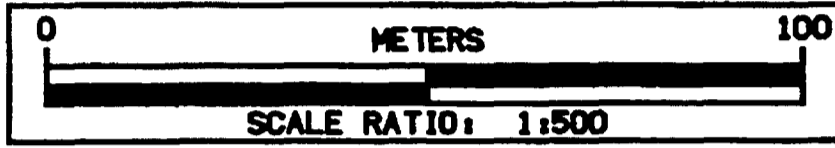
EVENT	LOCATION	DATE/S
World Pork Expo	Des Moines-Fairgrounds	June 23-24,2002
Drake Relays	Des Moines	April 26-27,2002
Nat'l. Balloon Classic	Indianola	August 8-18,2002
Iowa State Fair	Des Moines-Fairgrounds	August 8-19,2002
Iowa High School Wrestling Tournaments	Des Moines Vets Auditorium	February 25-28,2002 February 27-March 1,2003
Girls State Basketball Tournament	Des Moines Vets Auditorium	March 4-8,2002 March 10-15,2003
Boys State Basketball Tournament	Des Moines Vets Auditorium	March 11-16,2002 March 17-22,2003
IOWA STATE FOOTBALL 2002	UNIVERSITY OF IOWA FOOTBALL 2002	
Oct. 5 Oct. 12 Nov. 2 Nov. 23	Sept. 14 Sept. 21 Oct. 5 Oct. 12 Nov. 2 Nov. 9	

STAGING NOTES

108-26
09-27-94

- 1. CONSTRUCT SEWER FROM MANHOLE C TO MANHOLE E.
- 2. CONNECT MANHOLE C ON DELAWARE.
- 3. CONNECT MANHOLE E ON EAST 21ST. STREET.
- 4. CUT AND PLUG SEWER ON EAST 21ST. STREET AT MANHOLE E.
- 5. CONSTRUCT SEWER FROM MANHOLE A TO EXISTING MH-2.
- 6. CONNECT TO MANHOLE A
- 7. CONNECT TO MH-2.
- 8. CUT AND PLUG SEWER AT MANHOLE 2.
- 9. CUT AND PLUG SEWER AT MANHOLE A.

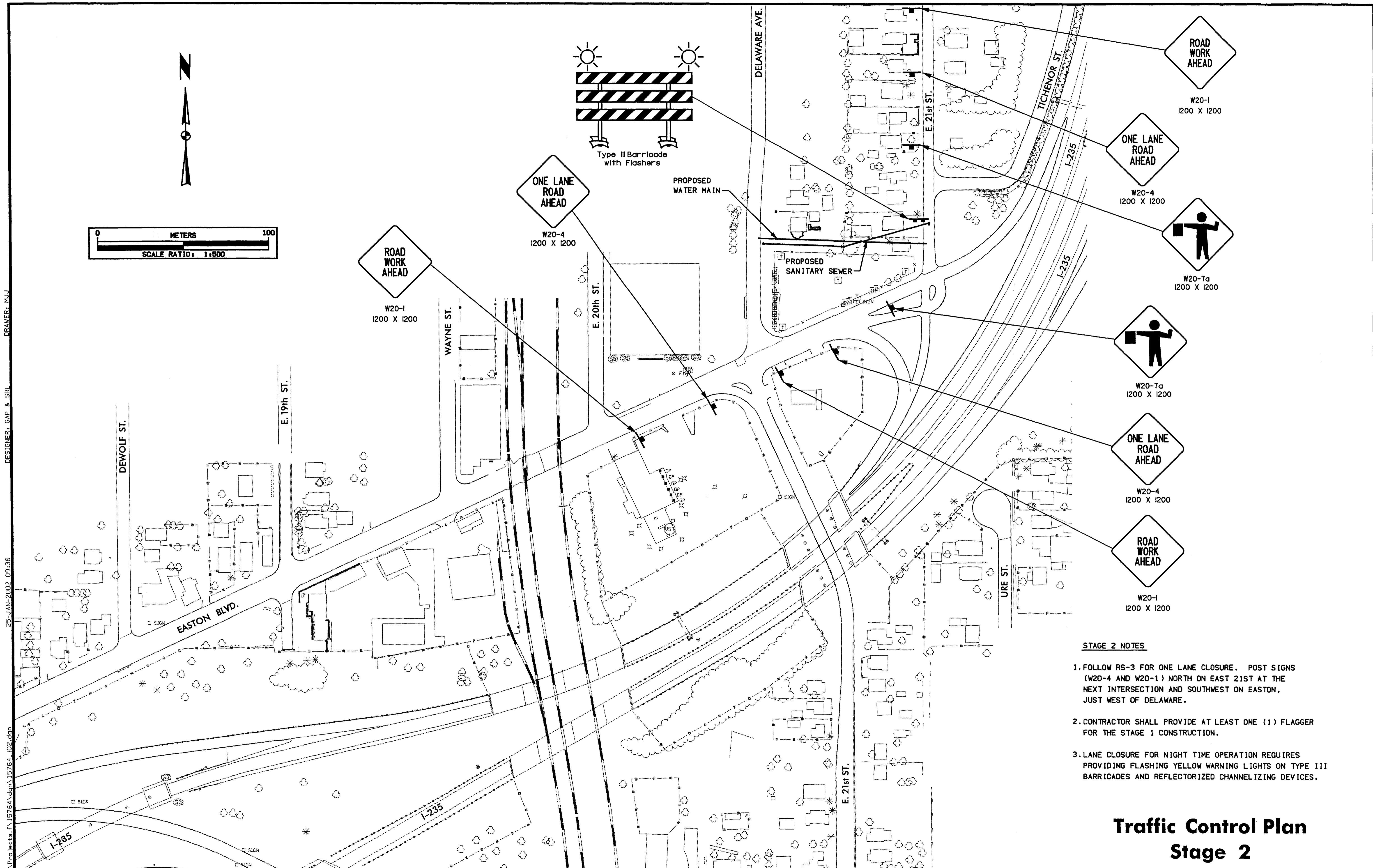




- STAGE 1 NOTES**
1. FOLLOW RS-3 FOR ONE LANE CLOSURE. POST SIGNS (W20-4 AND W20-1) NORTH ON DELAWARE AT THE NEXT INTERSECTION AND SOUTH ON EAST 21ST AT THE NEXT INTERSECTION.
 2. CONTRACTOR SHALL PROVIDE AT LEAST ONE (1) FLAGGER FOR THE STAGE 1 CONSTRUCTION.
 3. LANE CLOSURE FOR NIGHT TIME OPERATION REQUIRES PROVIDING FLASHING YELLOW WARNING LIGHTS ON TYPE III BARRICADES AND REFLECTORIZED CHANNELIZING DEVICES.

**Traffic Control Plan
Stage 1**

DRAWER: M.J.J.
 DESIGNER: GAP & SRL
 25-JAN-2002 09:35
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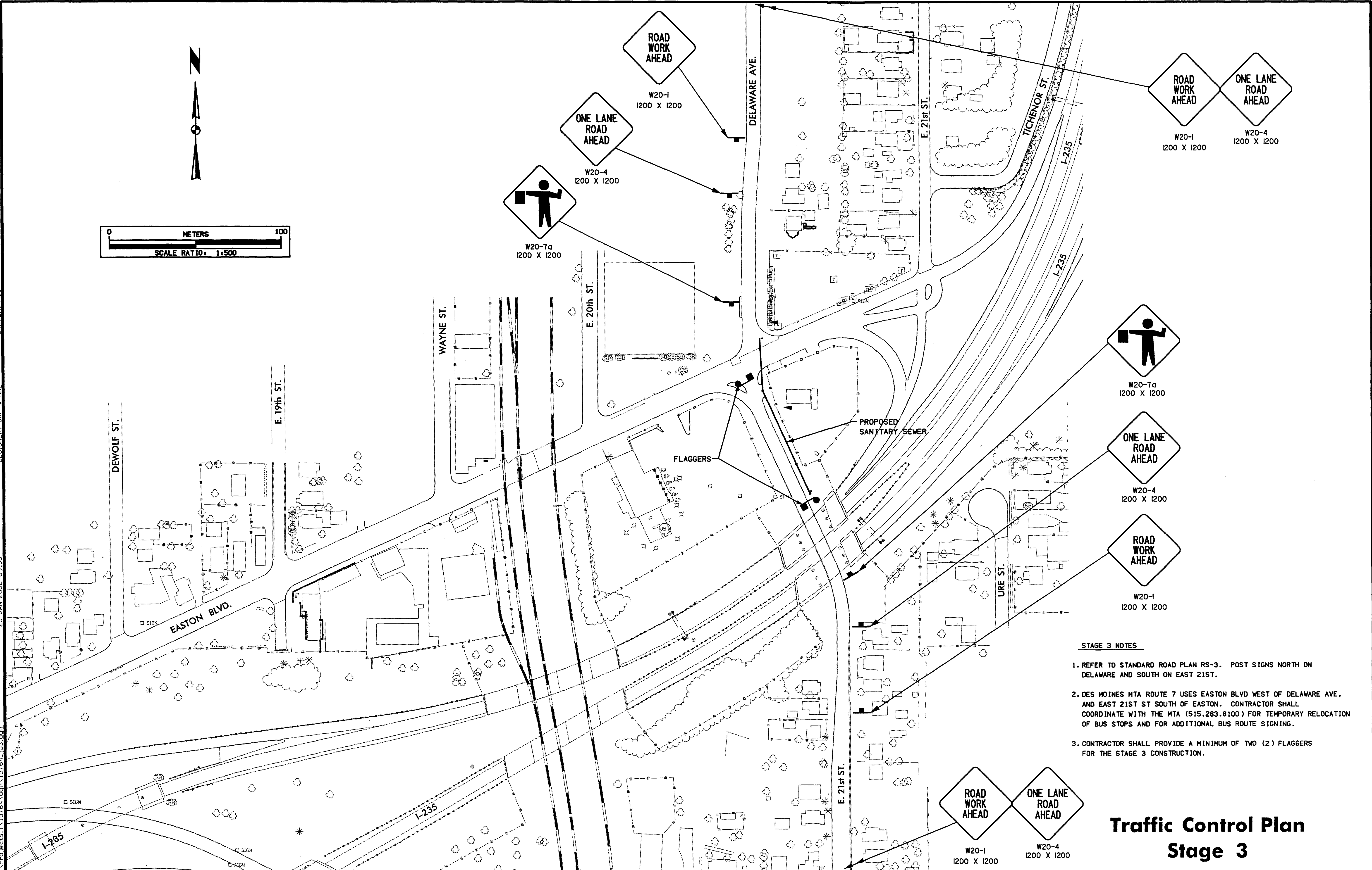
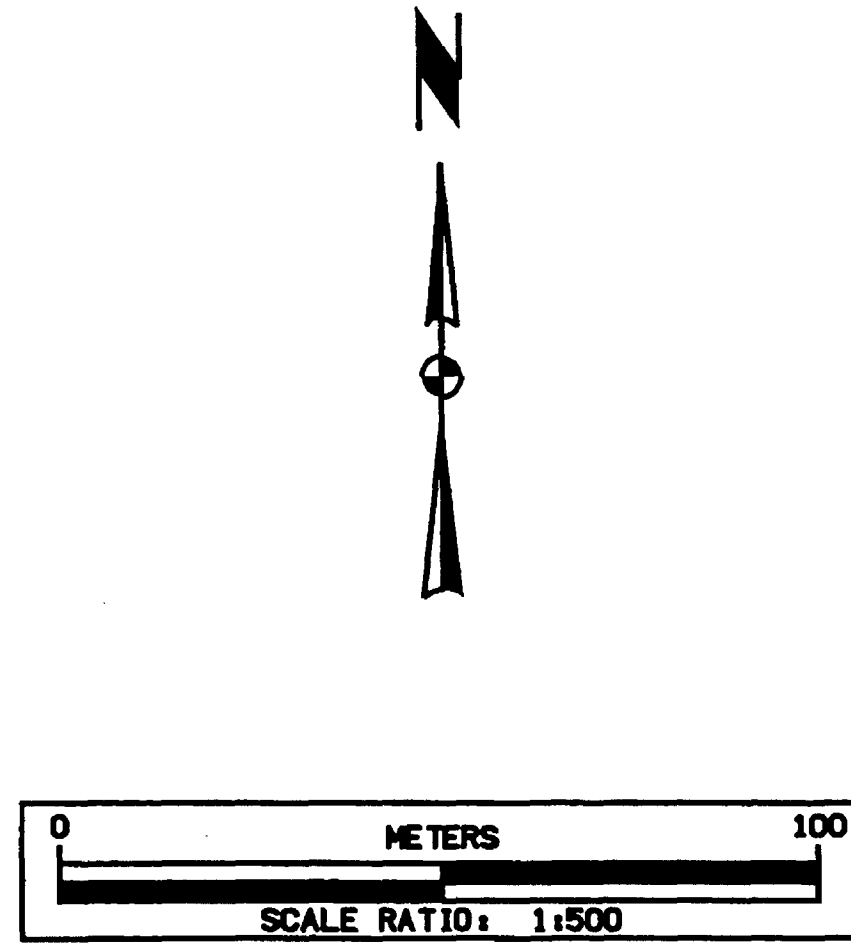


25-JAN-2002 09:36
 DESIGNER: GAP & SRL
 DRAWER: MJJ
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- STAGE 2 NOTES**
1. FOLLOW RS-3 FOR ONE LANE CLOSURE. POST SIGNS (W20-4 AND W20-1) NORTH ON EAST 21ST AT THE NEXT INTERSECTION AND SOUTHWEST ON EASTON, JUST WEST OF DELAWARE.
 2. CONTRACTOR SHALL PROVIDE AT LEAST ONE (1) FLAGGER FOR THE STAGE 1 CONSTRUCTION.
 3. LANE CLOSURE FOR NIGHT TIME OPERATION REQUIRES PROVIDING FLASHING YELLOW WARNING LIGHTS ON TYPE III BARRICADES AND REFLECTORIZED CHANNELIZING DEVICES.

Traffic Control Plan Stage 2

25-JAN-2002 09:36 \\dsm\Projects\15764\15764.dgn 15764_03.dgn DESIGNER: GAP & SRL DRAWER: MJJ



- STAGE 3 NOTES**
1. REFER TO STANDARD ROAD PLAN RS-3. POST SIGNS NORTH ON DELAWARE AND SOUTH ON EAST 21ST.
 2. DES MOINES MTA ROUTE 7 USES EASTON BLVD WEST OF DELAWARE AVE, AND EAST 21ST ST SOUTH OF EASTON. CONTRACTOR SHALL COORDINATE WITH THE MTA (515.283.8100) FOR TEMPORARY RELOCATION OF BUS STOPS AND FOR ADDITIONAL BUS ROUTE SIGNING.
 3. CONTRACTOR SHALL PROVIDE A MINIMUM OF TWO (2) FLAGGERS FOR THE STAGE 3 CONSTRUCTION.

Traffic Control Plan Stage 3

25-JAN-2002 09:37 \\Dsm2\Projects\15764\dgn\15764_104.dgn DESIGNER: GAP & SBL DRAWER: MUJ



STAGE 4 NOTES

1. CONTRACTOR SHALL KEEP ONE LANE OPEN USING STEEL PLATES OR SHALL CLOSE AND SIGN PER RS-268 (SIMILAR TO SITUATION 4).
2. PLACE W20-1 60 M EACH WAY ON DELAWARE, AND ON EAST 21ST (SOUTH OF EASTON).
3. ON EAST 21ST, NORTH OF EASTON, POST PER RS-268, SITUATION 3.
4. PLACE W20-3 AT FIRST INTERSECTION NORTH OF EASTON ON EAST 21ST.
5. CONTRACTOR SHALL PROVIDE 3 SIGNS, "EASTON BLVD. CLOSED EAST OF DELAWARE". ONE TO BE PLACED ON EAST 21ST STREET AT UNIVERSITY. ONE TO BE PLACED AT EASTON AND UNIVERSITY. ONE TO BE PLACED AT EAST 21ST AND GUTHRIE.



M4-10
1200 X 450

**EASTON BLVD. CLOSED
EAST OF DELAWARE**

**ROAD
WORK
AHEAD**
W20-1
1200 X 1200

**ROAD
CLOSED
60M**
W20-3
1200 X 1200

**ROAD
WORK
AHEAD**
W20-1
1200 X 1200

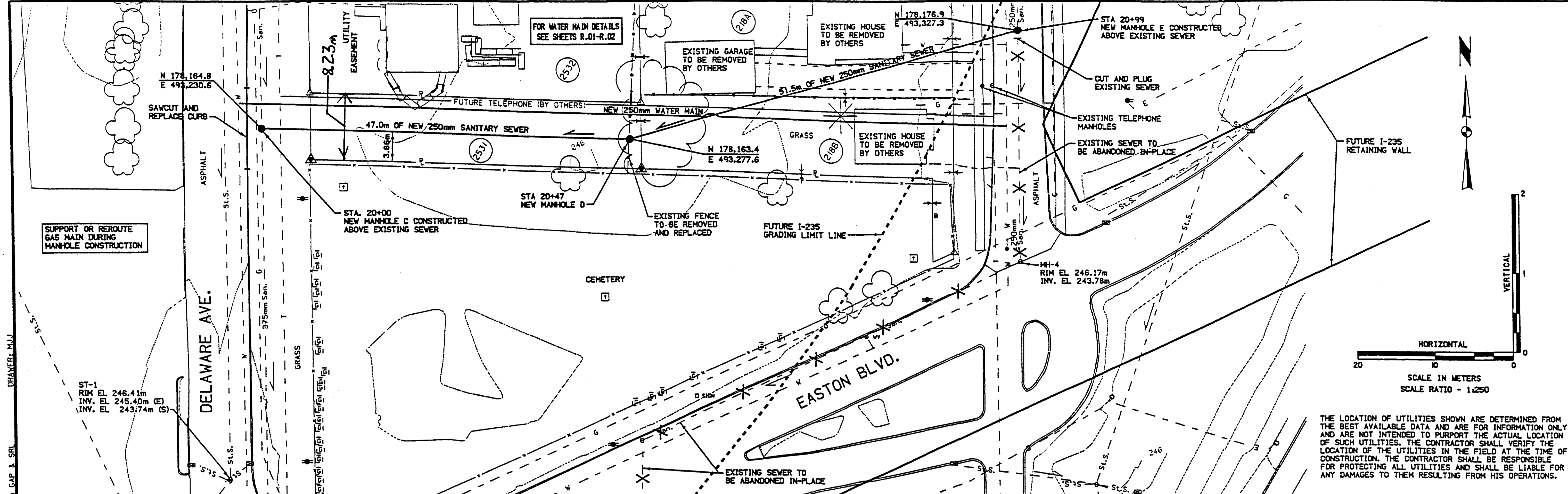
**EASTON BLVD. CLOSED
EAST OF DELAWARE**

**ROAD
CLOSED
RIGHT**
M20-3
1200 X 1200

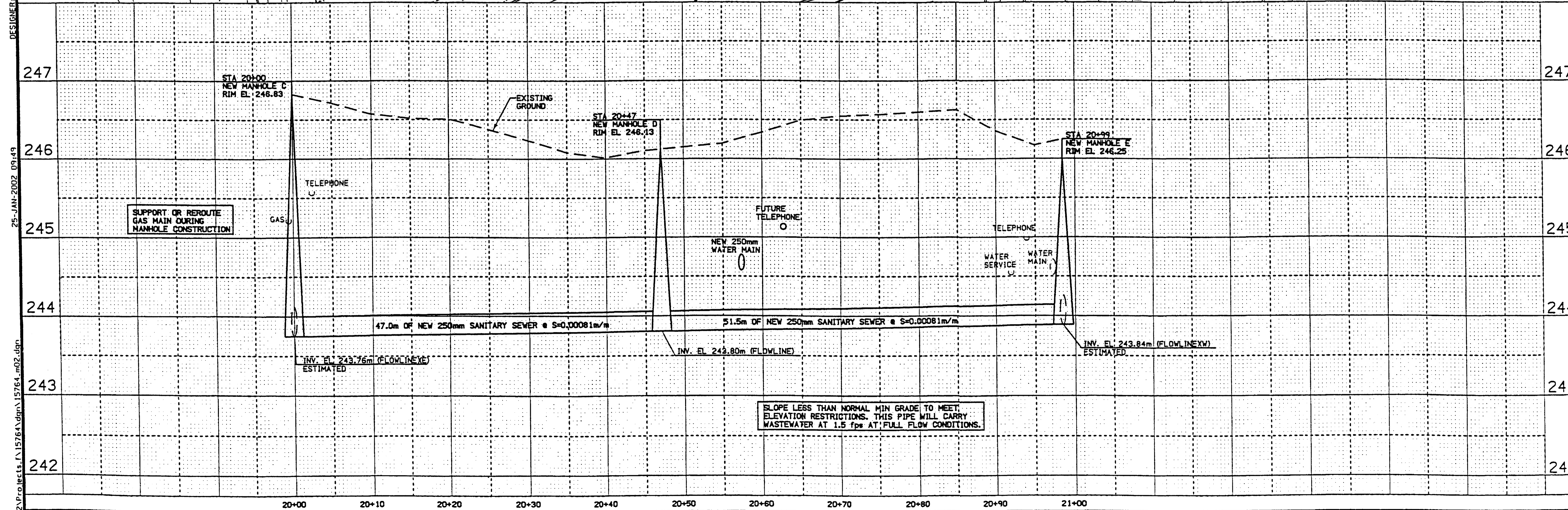
**ROAD
WORK
AHEAD**
W20-1
1200 X 1200

**EASTON BLVD. CLOSED
EAST OF DELAWARE**

**Traffic Control Plan
Stage 4**



THE LOCATION OF UTILITIES SHOWN ARE DETERMINED FROM THE BEST AVAILABLE DATA AND ARE FOR INFORMATION ONLY AND ARE NOT INTENDED TO PURPORT THE ACTUAL LOCATION OF SUCH UTILITIES. THE CONTRACTOR SHALL VERIFY THE LOCATION OF THE UTILITIES IN THE FIELD AT THE TIME OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL UTILITIES AND SHALL BE LIABLE FOR ANY DAMAGES TO THEM RESULTING FROM HIS OPERATIONS.



SLOPE LESS THAN NORMAL MIN GRADE TO MEET ELEVATION RESTRICTIONS. THIS PIPE WILL CARRY WASTEWATER AT 1.5 FPS AT FULL FLOW CONDITIONS.

DRAWN: MJJ
DESIGNER: GAP & SRL
25-JAN-2002 09:49
\\Dsn2\p\proj\sects\15764\ddm\15764.m02.dgn

25-JAN-2002 09:42
 D:\m2\Projects\F\15764\vdgm\15764.g01.dgn
 DESIGNER: GAP & SRI
 DRAWER: MJJ

LOG OF BORING NO. 1										Page 1 of 1	
OWNER		ARCHITECT/ENGINEER									
1-235 & Delaware Des Moines, Iowa		Stanley Consultants, Inc.									
SITE		PROJECT									
I-235 & Delaware Des Moines, Iowa		I-235 Sanitary Sewer Relocation Group 2									
GRAPHIC LOG	DEPTH (ft.)	SAMPLES			TESTS						
		USCS SYMBOL NUMBER	RECOVERY TYPE	SFT-N BLOWS / FT.	MOISTURE, %	DRY DENSITY PCF	UNCONFINED COMPRESSIVE STRENGTH PSF				
DESCRIPTION											
0.6 7" CONCRETE											
Sandy lean CLAY, light brown											
2.5											
Sandy SILT, light brown											
3.5											
SAND, yellow-brown											
6.5											
Sandy lean CLAY, trace gravel, light brown											
10.0											
Bottom of Boring											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		BORING STARTED		11-17-01	
WL	None	WD			
TEAM Services, Inc.		BORING COMPLETED		11-17-01	
WL		RIG	Rig 24	FOREMAN	DH
WL		APPROVED	JCC	JOB #	1-939

LOG OF BORING NO. 2										Page 1 of 1	
OWNER		ARCHITECT/ENGINEER									
1-235 & Delaware Des Moines, Iowa		Stanley Consultants, Inc.									
SITE		PROJECT									
I-235 & Delaware Des Moines, Iowa		I-235 Sanitary Sewer Relocation Group 2									
GRAPHIC LOG	DEPTH (ft.)	SAMPLES			TESTS						
		USCS SYMBOL NUMBER	RECOVERY TYPE	SFT-N BLOWS / FT.	MOISTURE, %	DRY DENSITY PCF	UNCONFINED COMPRESSIVE STRENGTH PSF				
DESCRIPTION											
0.5 Fill - SILT, with coarse sand and gravel, brown											
1.5 Fill - coarse crushed LIMESTONE, with coarse sand, brown											
2.5 Fill - medium to coarse SAND, with gravel											
4.0 Fill - lean CLAY, with sand, trace gravel, dark gray											
5.0 Fill - coarse crushed LIMESTONE, with lean clay											
Clayey SAND, light brown											
- with gravel, color change to brown @ about 7'											
10.0											
Bottom of Boring											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		BORING STARTED		11-21-01	
WL	None	WD			
TEAM Services, Inc.		BORING COMPLETED		11-21-01	
WL		RIG	Rig 24	FOREMAN	DH
WL		APPROVED	JCC	JOB #	1-939

LOG OF BORING NO. 3										Page 1 of 1	
OWNER		ARCHITECT/ENGINEER									
1-235 & Delaware Des Moines, Iowa		Stanley Consultants, Inc.									
SITE		PROJECT									
I-235 & Delaware Des Moines, Iowa		I-235 Sanitary Sewer Relocation Group 2									
GRAPHIC LOG	DEPTH (ft.)	SAMPLES			TESTS						
		USCS SYMBOL NUMBER	RECOVERY TYPE	SFT-N BLOWS / FT.	MOISTURE, %	DRY DENSITY PCF	UNCONFINED COMPRESSIVE STRENGTH PSF				
DESCRIPTION											
0.2 Topsoil - organic matter											
Fill - SILT, with sand and organic matter, light brown											
2.0 - with crushed gravel @ about 1'											
Sandy lean CLAY, trace gravel, light brown											
3.5 - color change to dark brown @ about 2.5'											
Lean CLAY, with sand, olive gray											
11.0											
Sandy lean CLAY, with gravel and ferrous staining, gray											
15.0											
Bottom of Boring											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		BORING STARTED		11-17-01	
WL	None	WD			
TEAM Services, Inc.		BORING COMPLETED		11-17-01	
WL		RIG	Rig 24	FOREMAN	DH
WL		APPROVED	JCC	JOB #	1-939

LOG OF BORING NO. 4										Page 1 of 1	
OWNER		ARCHITECT/ENGINEER									
1-235 & Delaware Des Moines, Iowa		Stanley Consultants, Inc.									
SITE		PROJECT									
I-235 & Delaware Des Moines, Iowa		I-235 Sanitary Sewer Relocation Group 2									
GRAPHIC LOG	DEPTH (ft.)	SAMPLES			TESTS						
		USCS SYMBOL NUMBER	RECOVERY TYPE	SFT-N BLOWS / FT.	MOISTURE, %	DRY DENSITY PCF	UNCONFINED COMPRESSIVE STRENGTH PSF				
DESCRIPTION											
Topsoil - organic matter											
1.0 Fill - SILT, with organic matter, brick debris, and rock chips, light brown											
3.0 Fill - sandy lean CLAY, with brick debris, trace gravel, dark brown											
5.5 Sandy lean CLAY, trace gravel and organic matter, light brown											
11.0											
SILT, with ferrous seams, gray											
15.0											
Bottom of Boring											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		BORING STARTED		11-17-01	
WL	None	WD	13'		
TEAM Services, Inc.		BORING COMPLETED		11-17-01	
WL		RIG	Rig 24	FOREMAN	DH
WL		APPROVED	JCC	JOB #	1-939

LOG OF BORING NO. 5										Page 1 of 1	
OWNER		ARCHITECT/ENGINEER									
1-235 & Delaware Des Moines, Iowa		Stanley Consultants, Inc.									
SITE		PROJECT									
I-235 & Delaware Des Moines, Iowa		I-235 Sanitary Sewer Relocation Group 2									
GRAPHIC LOG	DEPTH (ft.)	SAMPLES			TESTS						
		USCS SYMBOL NUMBER	RECOVERY TYPE	SFT-N BLOWS / FT.	MOISTURE, %	DRY DENSITY PCF	UNCONFINED COMPRESSIVE STRENGTH PSF				
DESCRIPTION											
0.2 Topsoil - organic matter											
SILT, dark brown											
2.5 Sandy lean CLAY, trace gravel, dark brown											
- color change to light brown @ about 4.5'											
11.0											
Sandy lean CLAY, trace gravel and ferrous staining, light gray											
12.5 Sandy lean CLAY, trace gravel, light brown											
15.0											
Bottom of Boring											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		BORING STARTED		11-17-01	
WL	None	WD			
TEAM Services, Inc.		BORING COMPLETED		11-17-01	
WL		RIG	Rig 24	FOREMAN	DH
WL		APPROVED	JCC	JOB #	1-939

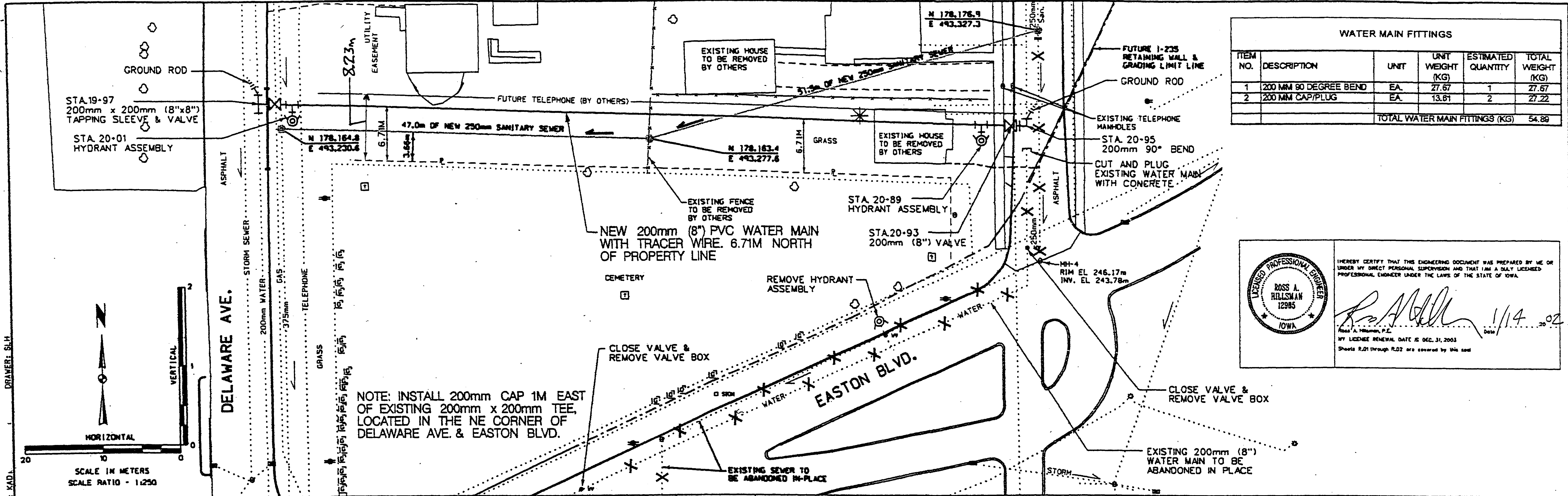
LOG OF BORING NO. 6										Page 1 of 1	
OWNER		ARCHITECT/ENGINEER									
1-235 & Delaware Des Moines, Iowa		Stanley Consultants, Inc.									
SITE		PROJECT									
I-235 & Delaware Des Moines, Iowa		I-235 Sanitary Sewer Relocation Group 2									
GRAPHIC LOG	DEPTH (ft.)	SAMPLES			TESTS						
		USCS SYMBOL NUMBER	RECOVERY TYPE	SFT-N BLOWS / FT.	MOISTURE, %	DRY DENSITY PCF	UNCONFINED COMPRESSIVE STRENGTH PSF				
DESCRIPTION											
Organic SILT, gray											
- color change to brown @ about 2.5'											
3.5 Lean CLAY, trace sand, light brown											
6.0 Sandy lean CLAY, trace gravel, light gray											
8.5 Lean CLAY, trace sand and gravel, light brown											
11.0											
- trace ferrous staining, color change to light gray @ about 11'											
- color change to light gray-brown @ about 13'											
15.0											
Bottom of Boring											

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL AND ROCK TYPES. IN-SITU, THE TRANSITION MAY BE GRADUAL.

WATER LEVEL OBSERVATIONS		BORING STARTED		11-17-01	
WL	None	WD			
TEAM Services, Inc.		BORING COMPLETED		11-17-01	
WL		RIG	Rig 24	FOREMAN	DH
WL		APPROVED	JCC	JOB #	1-939

FOR SOIL BORING LOCATIONS
SEE SHEET A.03

Soil Boring Logs

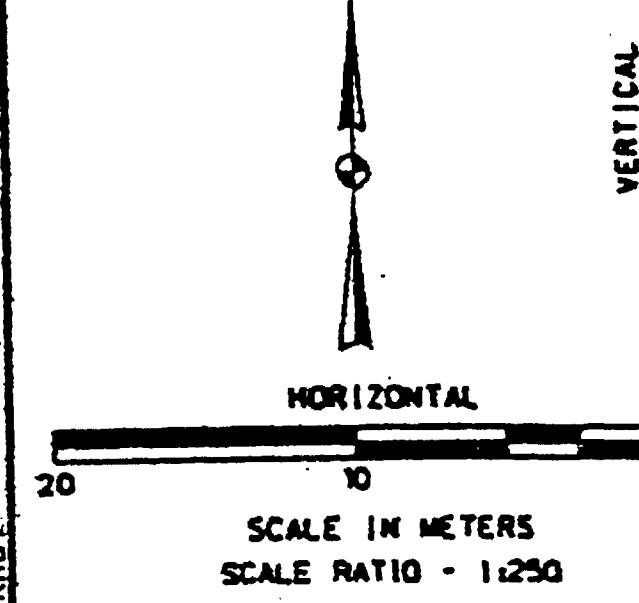


WATER MAIN FITTINGS					
ITEM NO.	DESCRIPTION	UNIT	UNIT WEIGHT (KG)	ESTIMATED QUANTITY	TOTAL WEIGHT (KG)
1	200 MM 90 DEGREE BEND	EA.	27.67	1	27.67
2	200 MM CAP/PLUG	EA.	13.81	2	27.22
TOTAL WATER MAIN FITTINGS (KG)					54.89

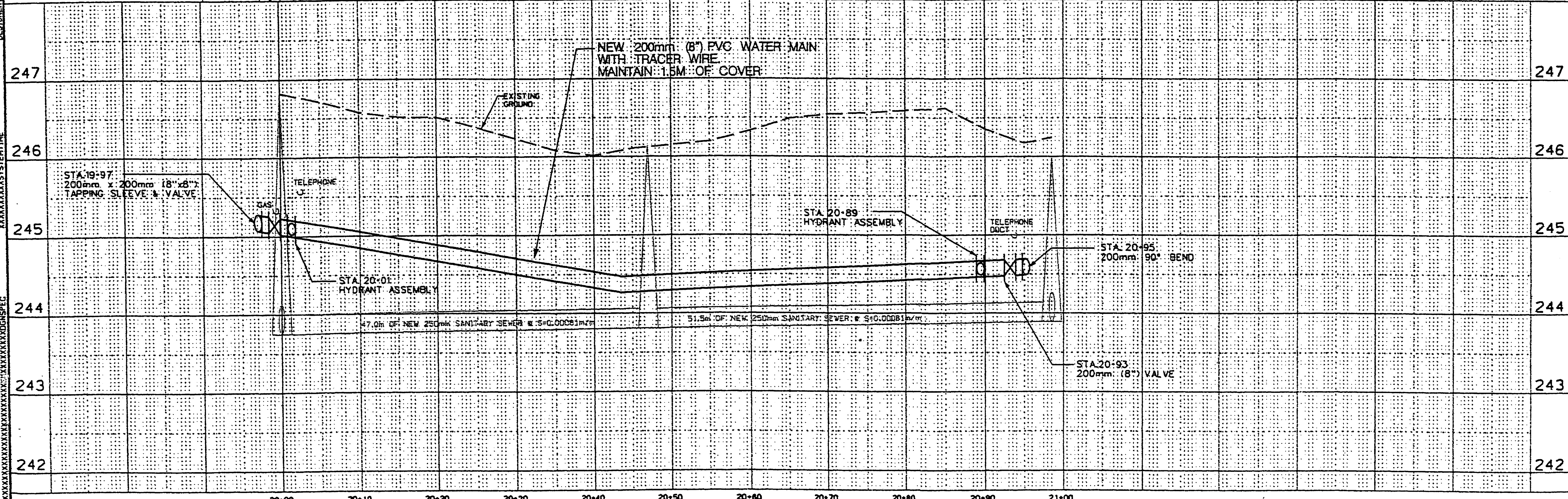
I HEREBY CERTIFY THAT THE ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

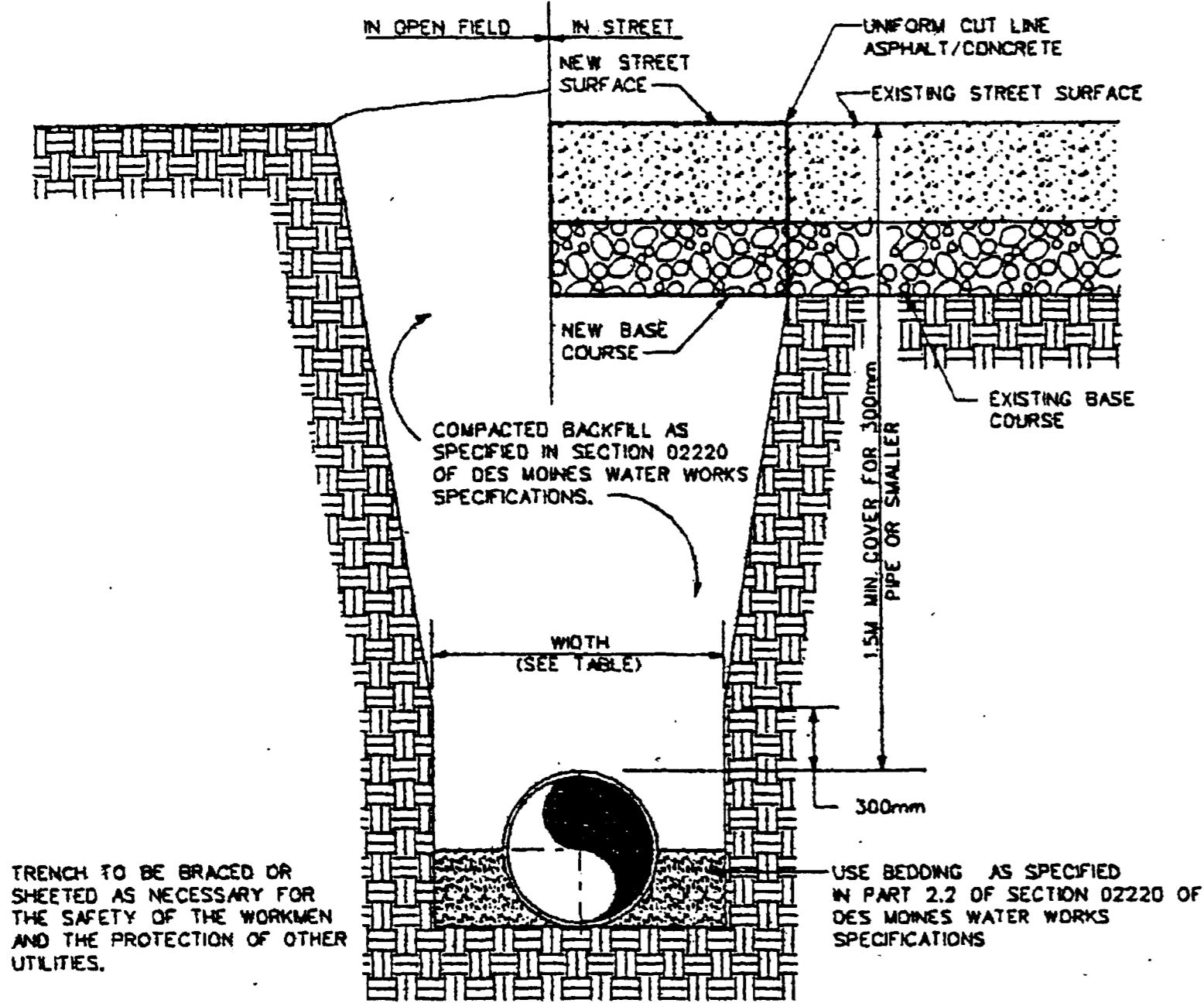
Date: 1/14/02

MY LICENSE RENEWAL DATE IS DEC. 31, 2003
Sheets R.01 through R.02 are covered by this seal



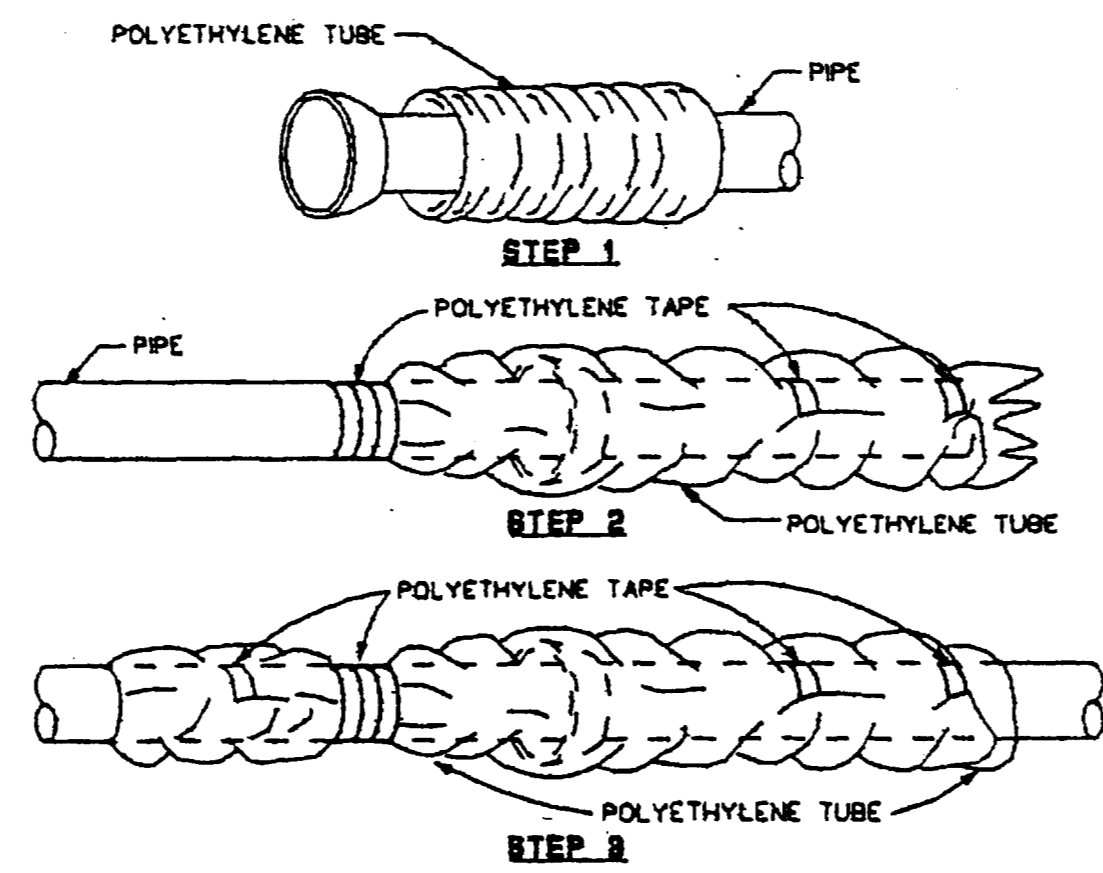
NOTE: INSTALL 200mm CAP 1M EAST OF EXISTING 200mm x 200mm TEE, LOCATED IN THE NE CORNER OF DELAWARE AVE. & EASTON BLVD.





PIPE DIAMETER	MINIMUM WIDTH	MAXIMUM WIDTH
100mm	400mm	700mm
150mm	450mm	750mm
200mm	500mm	800mm
300mm	600mm	900mm
400mm	700mm	1M
500mm	800mm	1.1M

TYPICAL TRENCH SECTION
Not to Scale

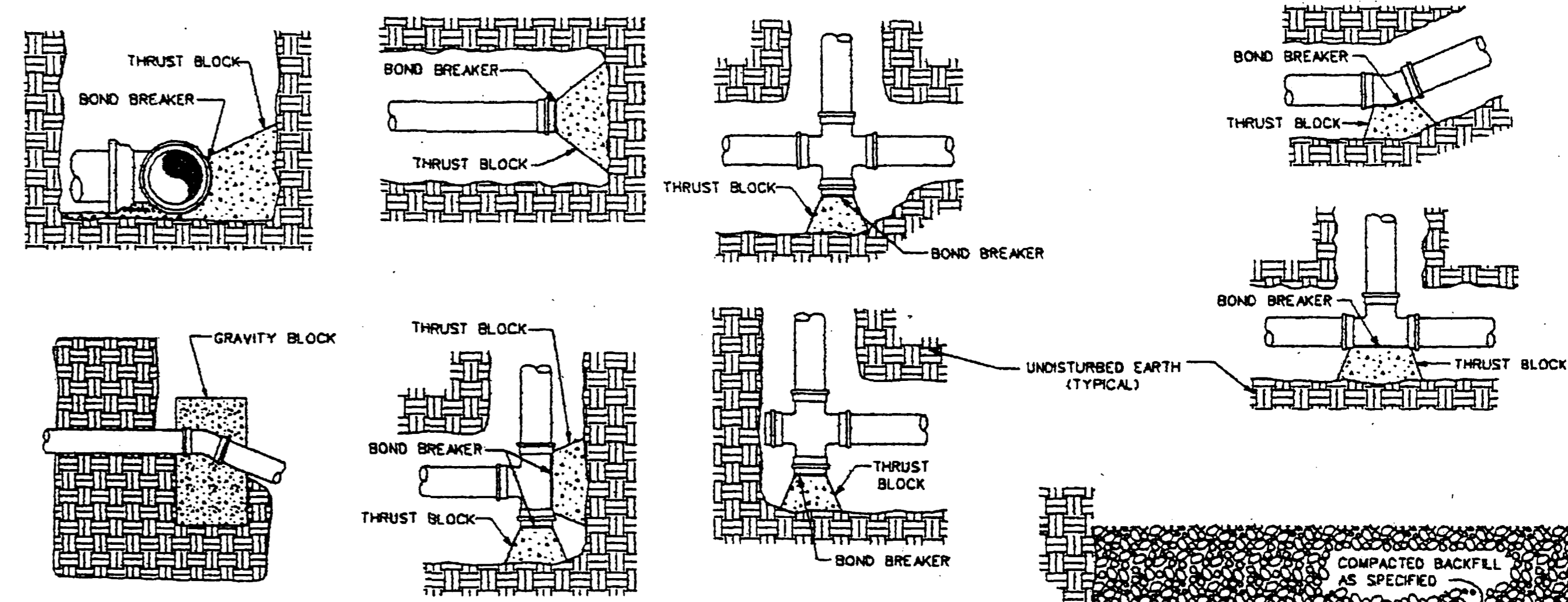


FIELD INSTALLATION - POLYETHYLENE WRAP

- Step 1 - Place tube of polyethylene material on pipe prior to lowering it into the trench
- Step 2 - Pull the tube over the length of pipe. Tape tube to pipe at joint. Fold material around the adjacent spigot end and wrap with tape to hold the plastic tube in place
- Step 3 - Overlap first tube with adjacent tube and secure with plastic adhesive tape. The polyethylene tube covering the pipe shall be loose. Excess material shall be neatly drawn up around the pipe barrel, folded on top and taped in place.

Note: Iron pipe fittings, including valves and hydrants shall be wrapped with two layers of polyethylene material. The wrapping shall extend at least 1' beyond the fitting joints onto the adjoining pipe and shall be fastened to the pipe with plastic tape. Tape shall be used as needed to hold wrap in place. Either polyethylene sheets or slit tubing may be used.

POLYETHYLENE WRAP DETAIL
Not to Scale



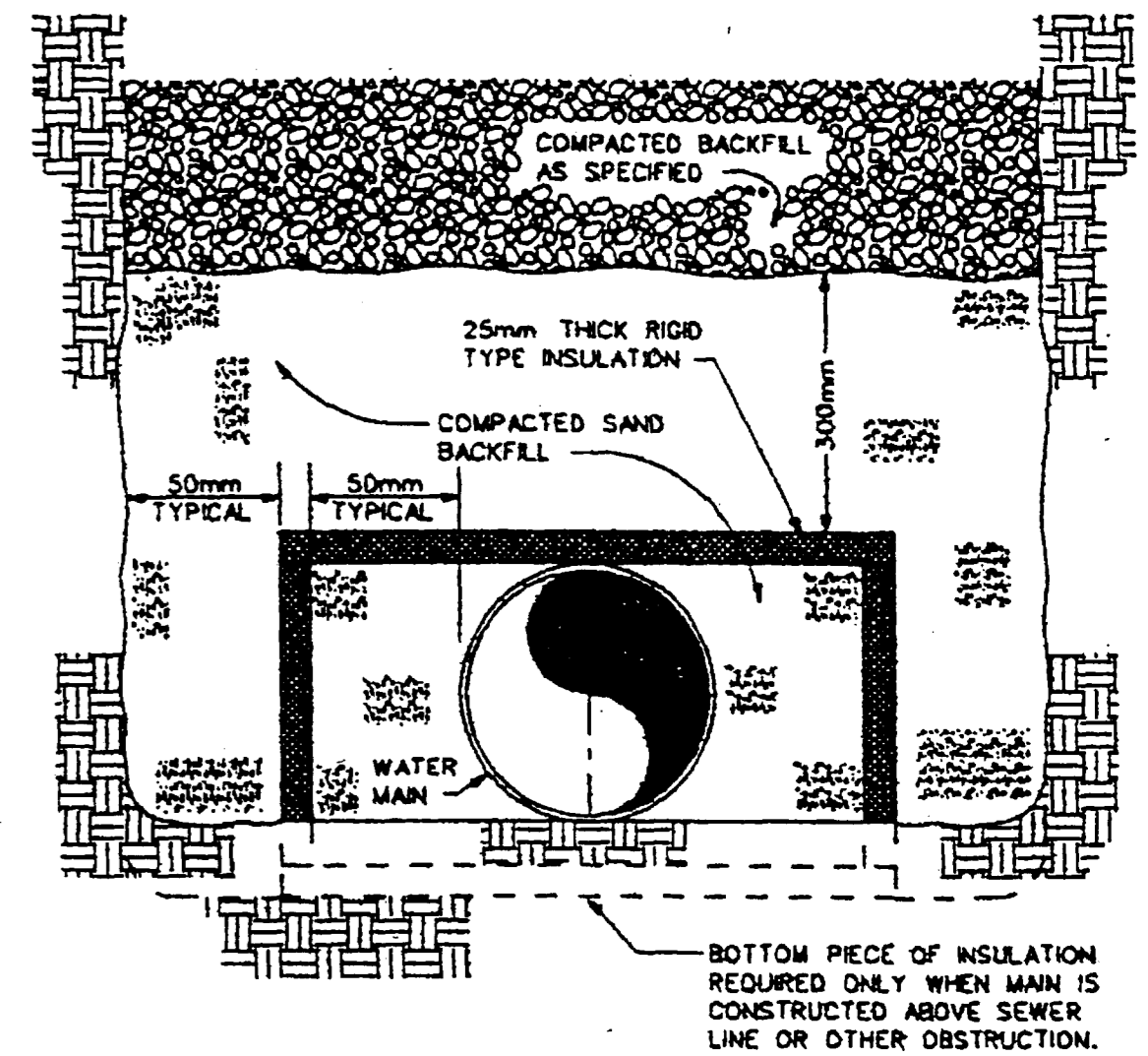
VOLUME OF GRAVITY BLOCK
CUBIC METERS (CUBIC YARDS)

PIPE SIZE (INCHES)	ANGLE OF DEFLECTION (DEGREES)			
	11.25	22.5	45	90
100 (4)	.13 (.16)	.33 (.43)	.70 (.90)	1.04 (1.36)
150 (6)	.18 (.18)	.33 (.43)	.70 (.90)	1.04 (1.36)
200 (8)	.24 (.30)	.59 (.78)	1.21 (1.57)	1.80 (2.33)
300 (12)	.51 (.65)	1.28 (1.63)	2.67 (3.33)	3.78 (4.82)
400 (16)	.90 (1.16)	2.20 (2.85)	4.47 (5.80)	6.80 (8.88)
500 (20)	1.38 (1.78)	3.37 (4.37)	6.87 (8.97)	10.12 (13.14)
600 (24)	1.91 (2.47)	4.78 (6.17)	9.73 (12.63)	14.36 (18.64)
750 (30)	2.95 (3.82)	7.33 (9.51)	14.97 (19.43)	22.07 (28.66)

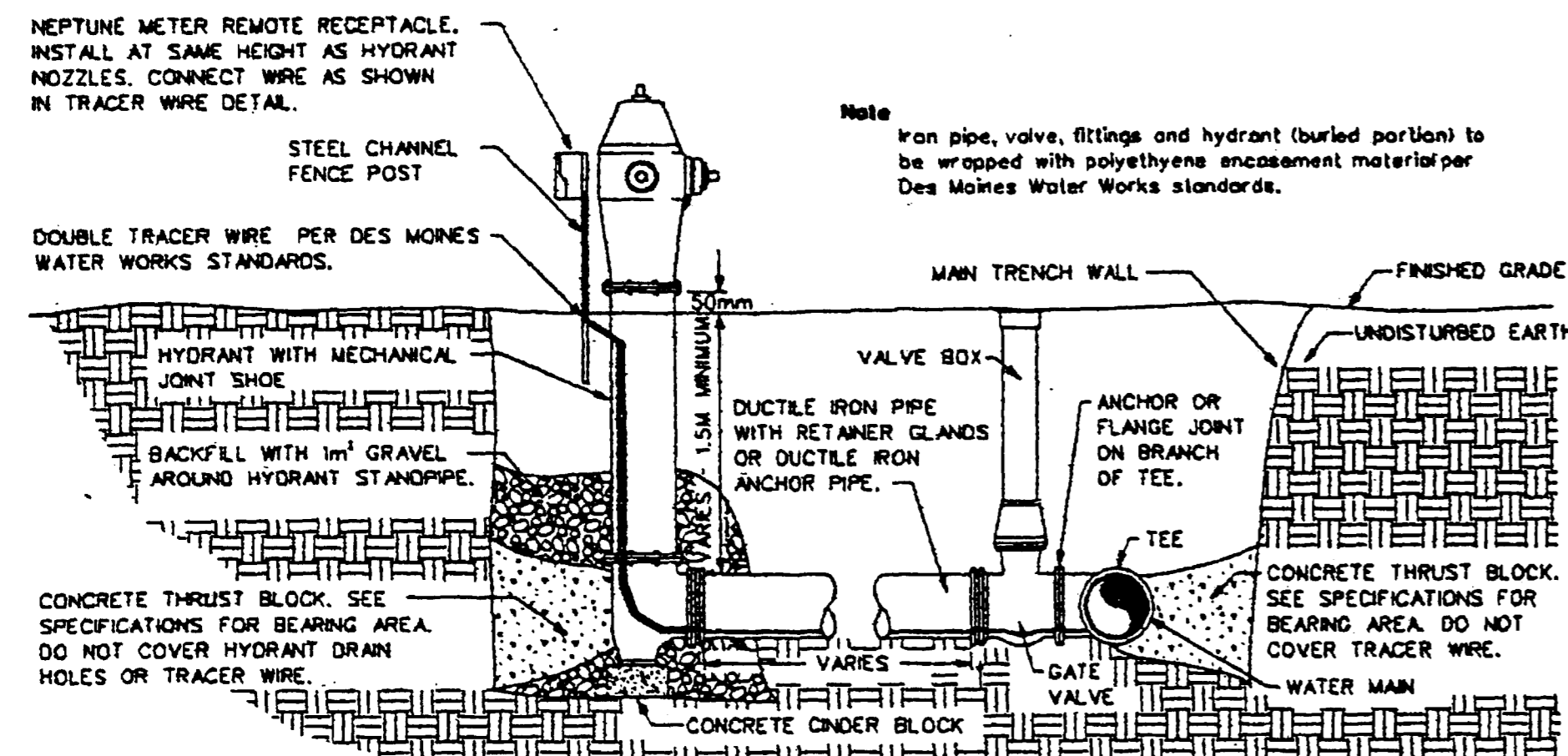
AREA OF THRUST BLOCK
SQUARE METERS (SQUARE FEET) DI PIPE

PIPE SIZE (INCHES)	HORIZONTAL ANGLE OF DEFLECTION (DEGREES)				TEE BRANCH CAP, PLUG
	11.25	22.5	45	90	
100 (4)	.10 (1)	.10 (1)	.19 (2)	.28 (3)	.28 (3)
150 (6)	.10 (1)	.19 (2)	.28 (3)	.56 (6)	.37 (4)
200 (8)	.10 (1)	.28 (3)	.56 (6)	.85 (10)	.55 (7)
300 (12)	.28 (3)	.56 (6)	1.12 (12)	2.05 (22)	1.46 (16)
400 (16)	.47 (5)	1.03 (11)	1.98 (21)	3.54 (38)	2.82 (27)
500 (20)	.75 (8)	1.48 (16)	2.98 (32)	5.48 (59)	3.91 (42)
600 (24)	1.12 (12)	2.14 (23)	4.28 (46)	7.82 (84)	5.49 (59)
750 (30)	1.68 (18)	3.35 (36)	6.51 (70)	12 (120)	8.47 (91)

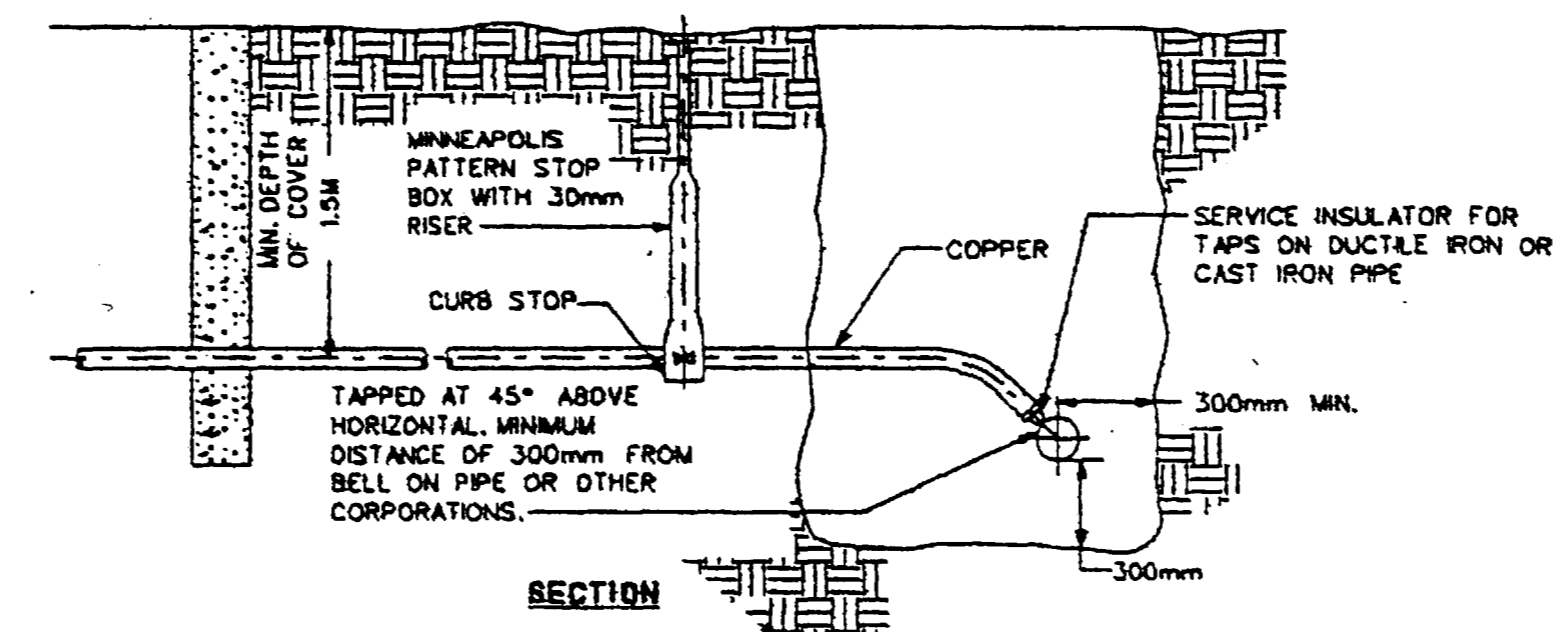
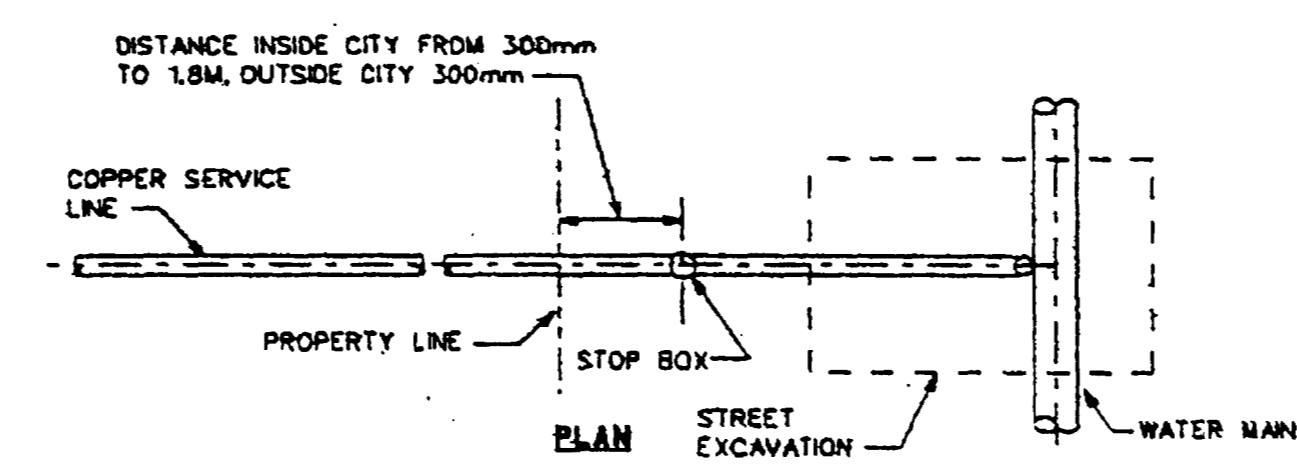
Note: Restrained joints may be used in lieu of blocking with prior approval of this Engineering Office.



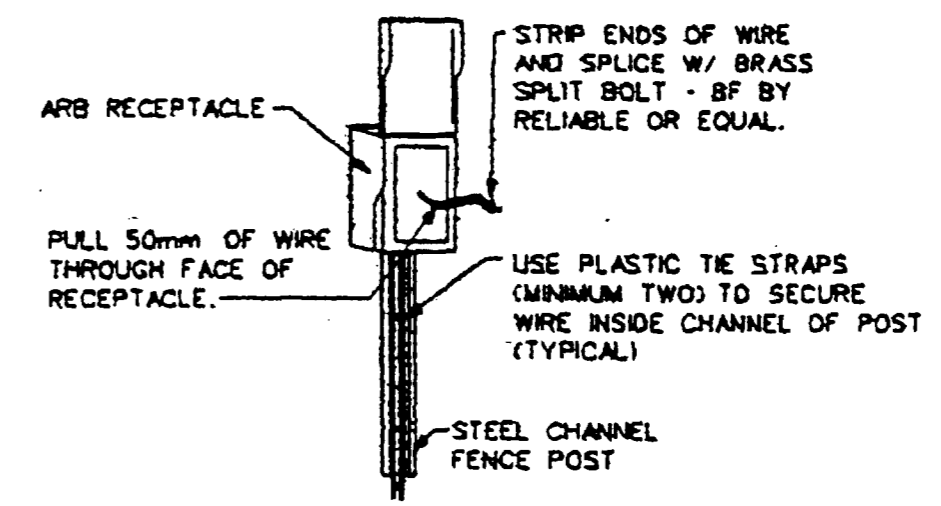
PIPE INSULATION DETAIL
Not to Scale



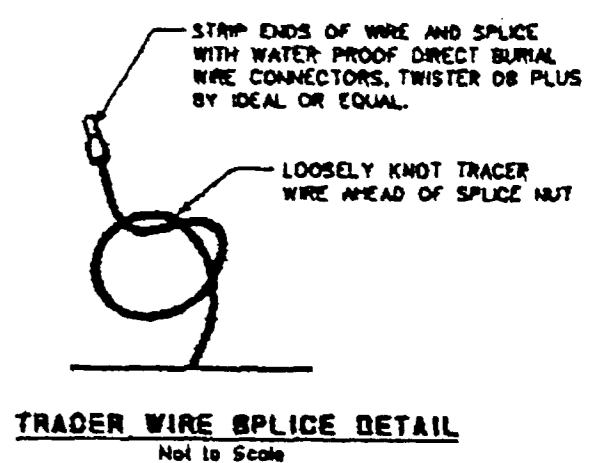
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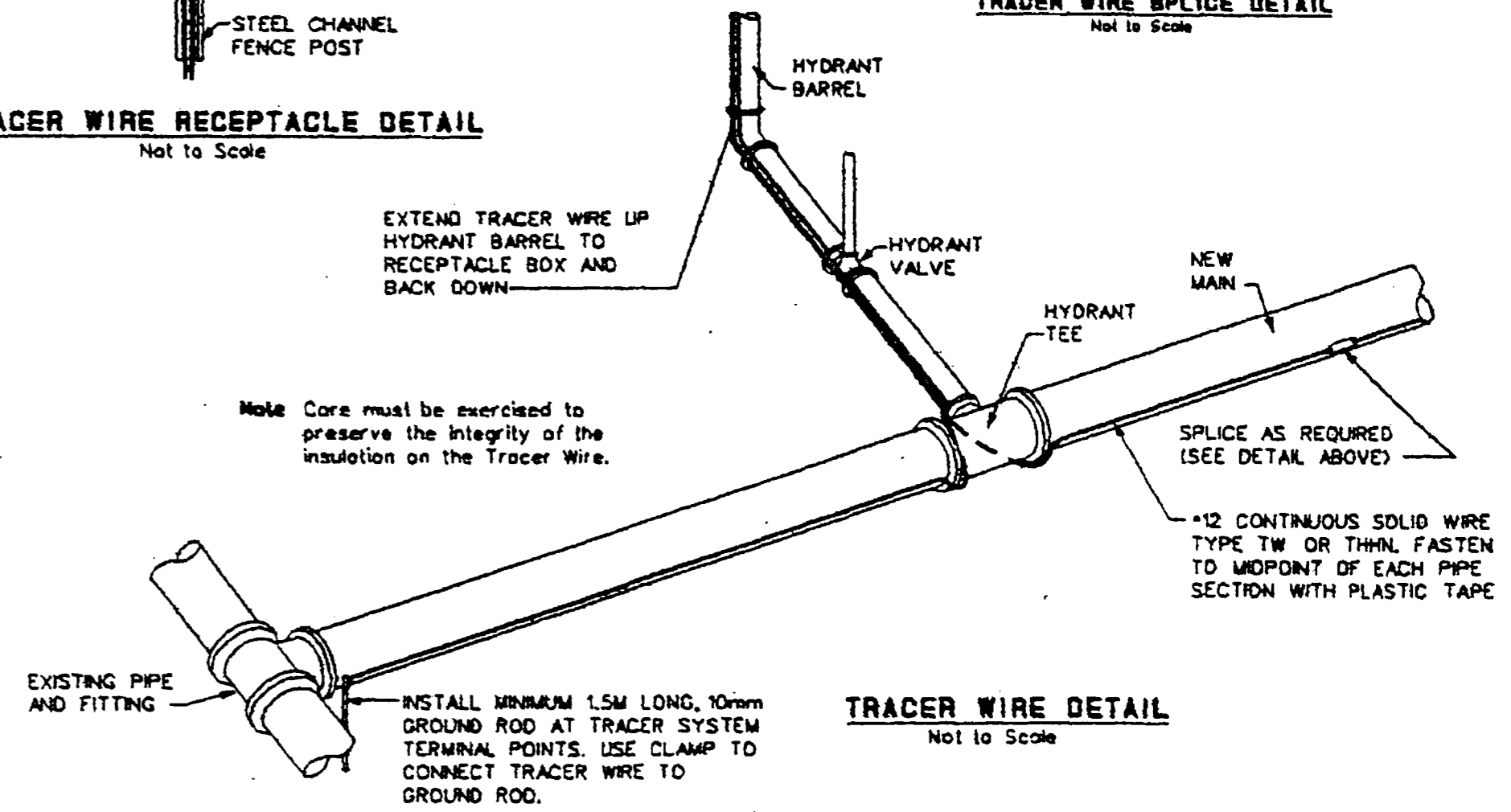
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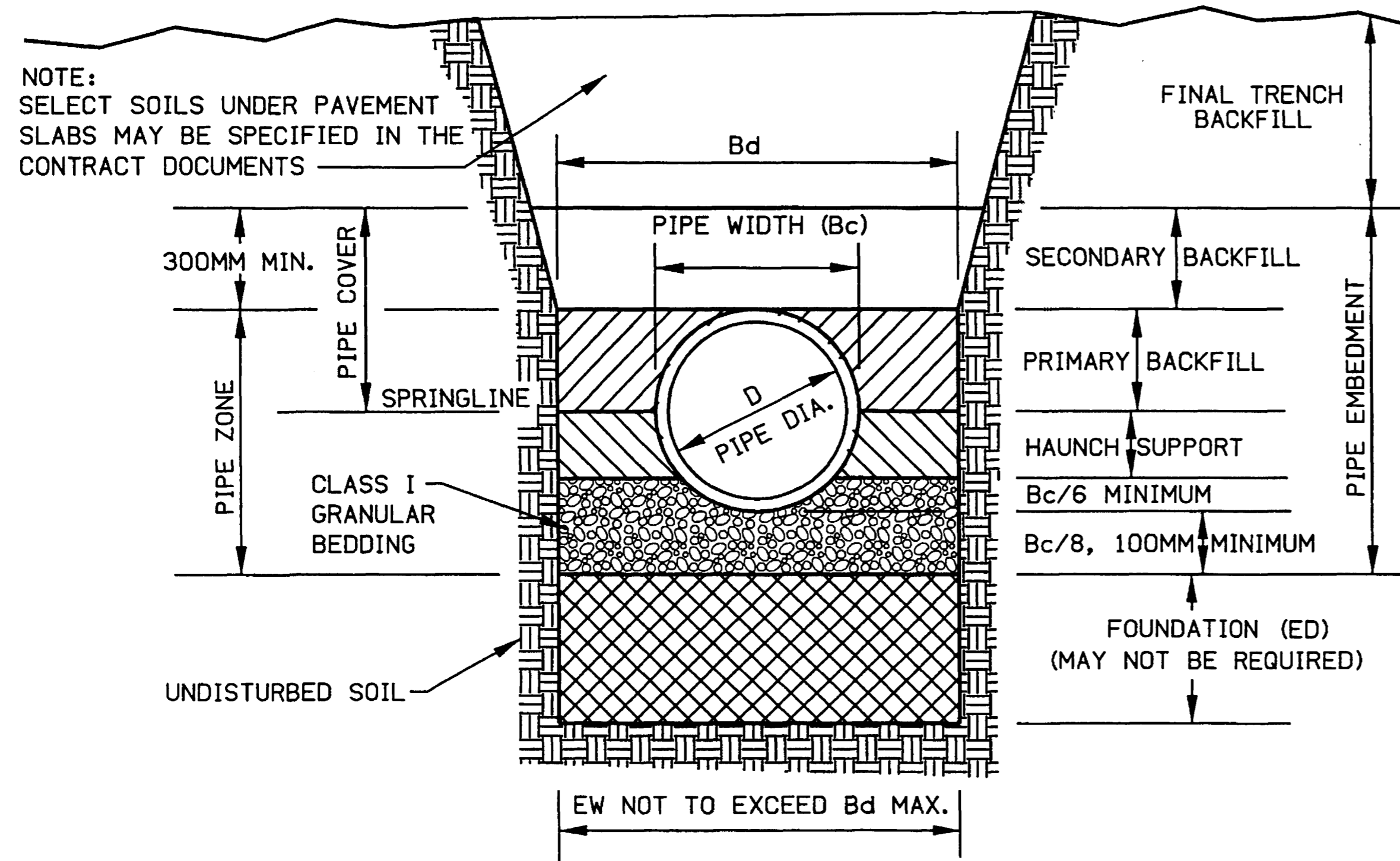
TRACER WIRE RECEPTACLE DETAIL
Not to Scale



TRACER WIRE SPLICE DETAIL
Not to Scale



TRACER WIRE DETAIL
Not to Scale



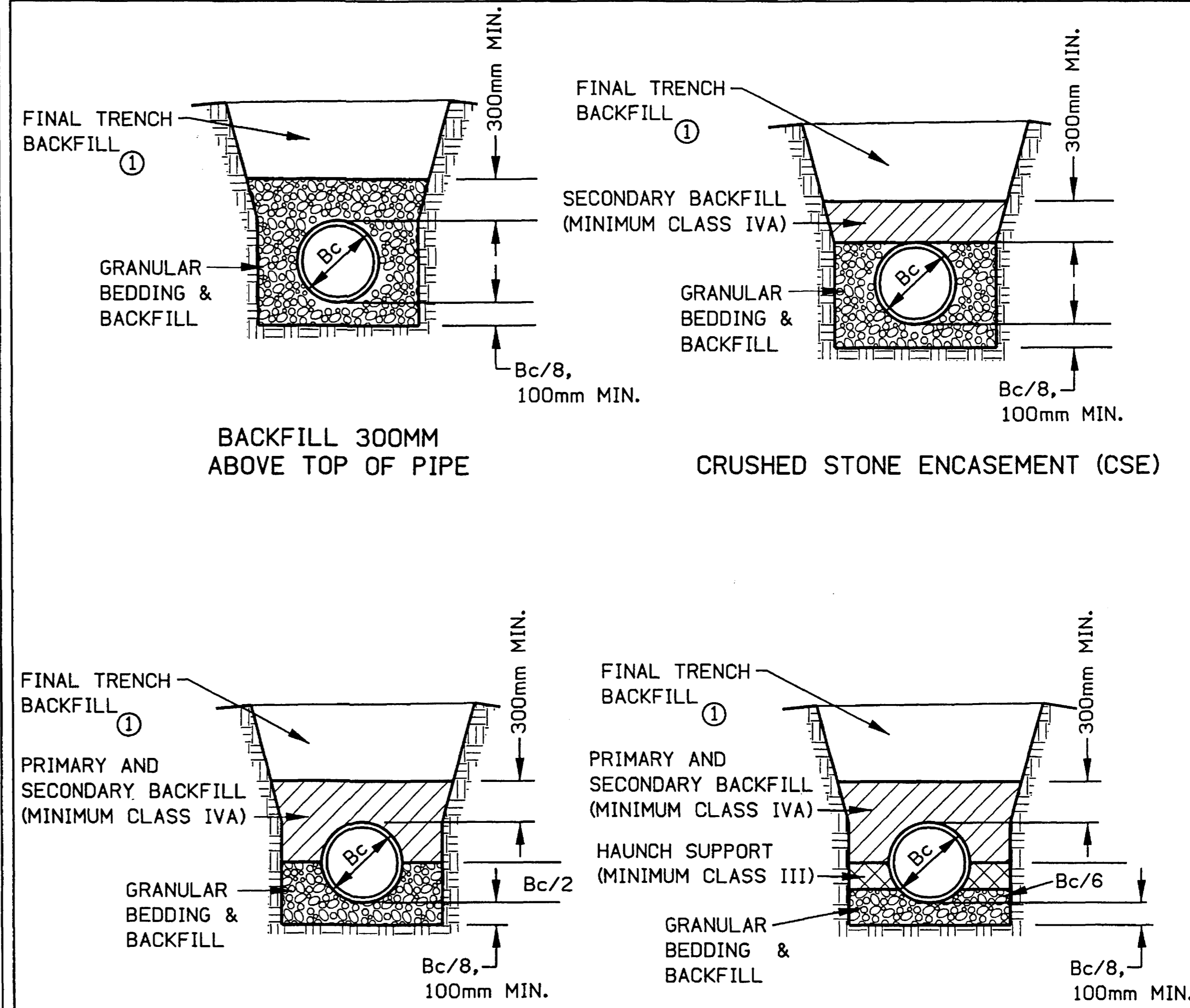
NOTE: SELECT SOILS UNDER PAVEMENT SLABS MAY BE SPECIFIED IN THE CONTRACT DOCUMENTS

NOTES:

- HAND PLACED BACKFILL SHALL BE SELECTED, FINELY DIVIDED EXCAVATED MATERIAL FREE FROM DEBRIS, STONES, ORGANIC MATTER OR FROZEN LUMPS AND CAREFULLY COMPACTED.
- CLEAN CRUSHED STONE FOR BEDDING:
 - 25MM MATERIAL FOR PIPE SIZES (D) 450MM OR LESS
 - 38MM MATERIAL FOR PIPE SIZES (D) GREATER THAN 450MM (SEE SECTION 3010, 2.03)
- TRENCH WIDTH (RIGID PIPE)
MAX WIDTH: $Bd = 1.25(Bc) + 300MM$
MIN. WIDTH: $Bd = Bc + 450MM$
 - TRENCH WIDTH (SEMI-RIGID AND FLEXIBLE PIPE)
MIN. WIDTH: $Bd = 1.25(Bc) + 300MM$
OR: $Bd = Bc + 450MM$
 - TRENCH WIDTH REQUIREMENTS MAY BE MODIFIED BY JURISDICTIONAL ENGINEER BASED UPON SITE CONDITIONS
 Bd = TRENCH WIDTH AT TOP OF PIPE
 EW = EXCAVATION WIDTH AT BOTTOM OF TRENCH

DEPTH OF BEDDING MATERIAL BELOW PIPE = $BC/8$, 100MM MINIMUM
- EXTRA FOUNDATION ROCK (CLEAN CRUSHED STONE - 64MM MATERIAL) WHEN REQUIRED SHALL BE PLACED BELOW NORMAL BEDDING. MEASUREMENT SHALL BE MADE IN CUBIC METER (LENGTH X EW X ED) AND PAID AT THE UNIT PRICE BID.
- FOR ROCK EXCAVATION, THE TRENCH SHALL BE OVER EXCAVATED A MINIMUM OF 150MM AND REFILLED WITH NORMAL BEDDING.

1	01/25/01		PIPE EMBEDMENT DETAILS	FIGURE: 3010.1
REV.	DATE	BY		FIGURE: 3010.1
DATE: 01-01-98				SHEET 1 OF 3



- CLASS B BACKFILL** **CLASS C BACKFILL**
- ① FINAL TRENCH BACKFILL SHALL BE MINIMUM CLASS IV A. CLASS IVB MAY BE USED IF APPROVED BY THE JURISDICTIONAL ENGINEER. PLACE CLASS II MATERIAL BELOW THE FINAL TOP 600MM OF BACKFILL UNDER PAVEMENT SLABS.
- HIGHER QUALITY MATERIALS REPRESENTED BY LOWER CLASS NUMBERS. SEE SECTION 3010, 2.03 - 2.08 FOR MATERIAL PROPERTIES.

			PIPE EMBEDMENT DETAILS	SEE SHEET 3 FOR CHART
REV.	DATE	BY		FIGURE: 3010.1
DATE: 01/25/01				SHEET 2 OF 3

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

DRAWER: M.J.J. DESIGNER: GAP & SRI 25-JAN-2002 09:43 \\Dsm2\Projects\15764\15764.dgn

25-JAN-2002 09:44
 DESIGNER: GAP & SEL
 DRAWER: MJJ
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DATE: 01/25/01

REV. DATE

BY

PIPE EMBEDMENT DETAILS

SHEET 3 OF 3

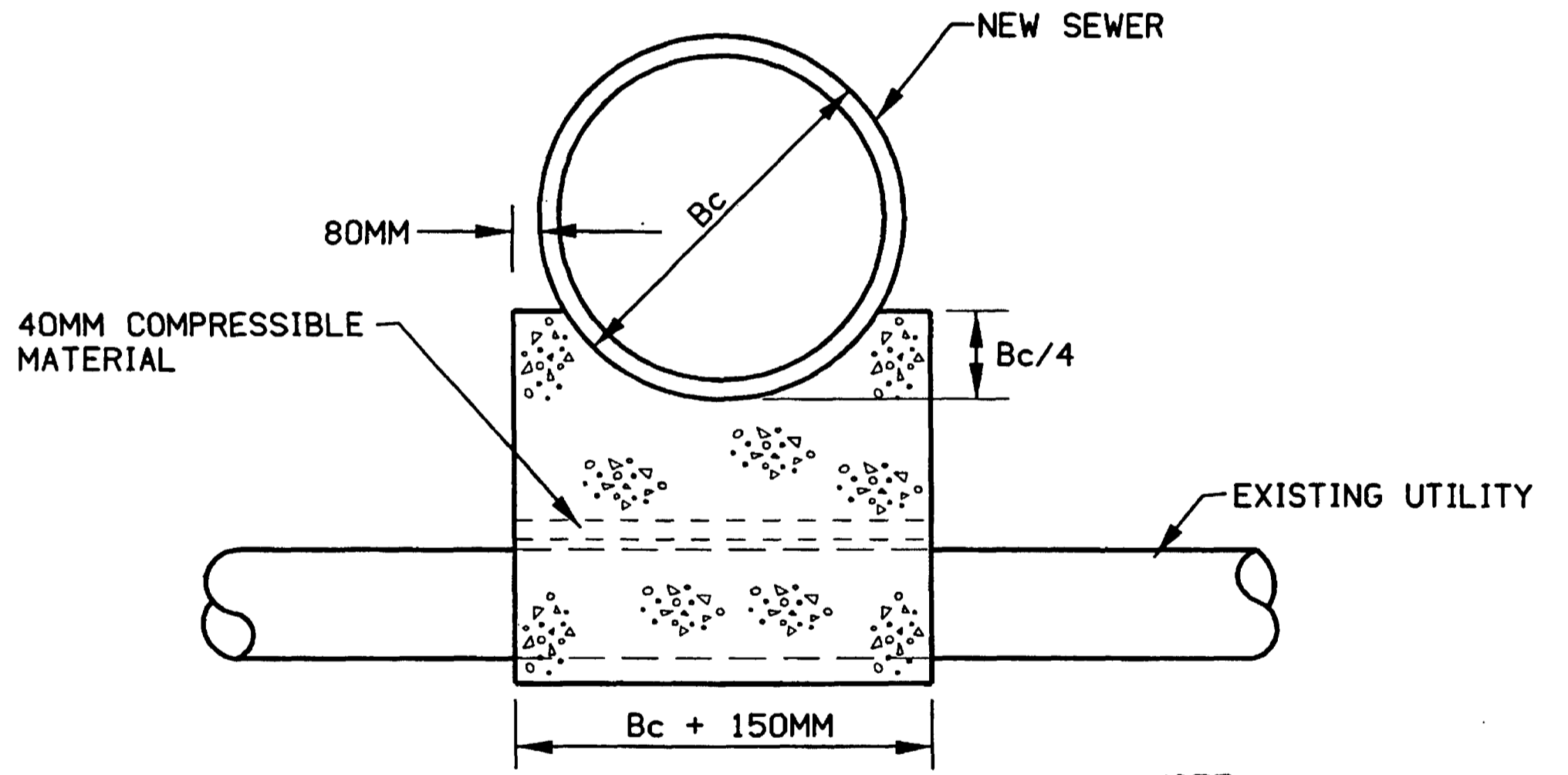
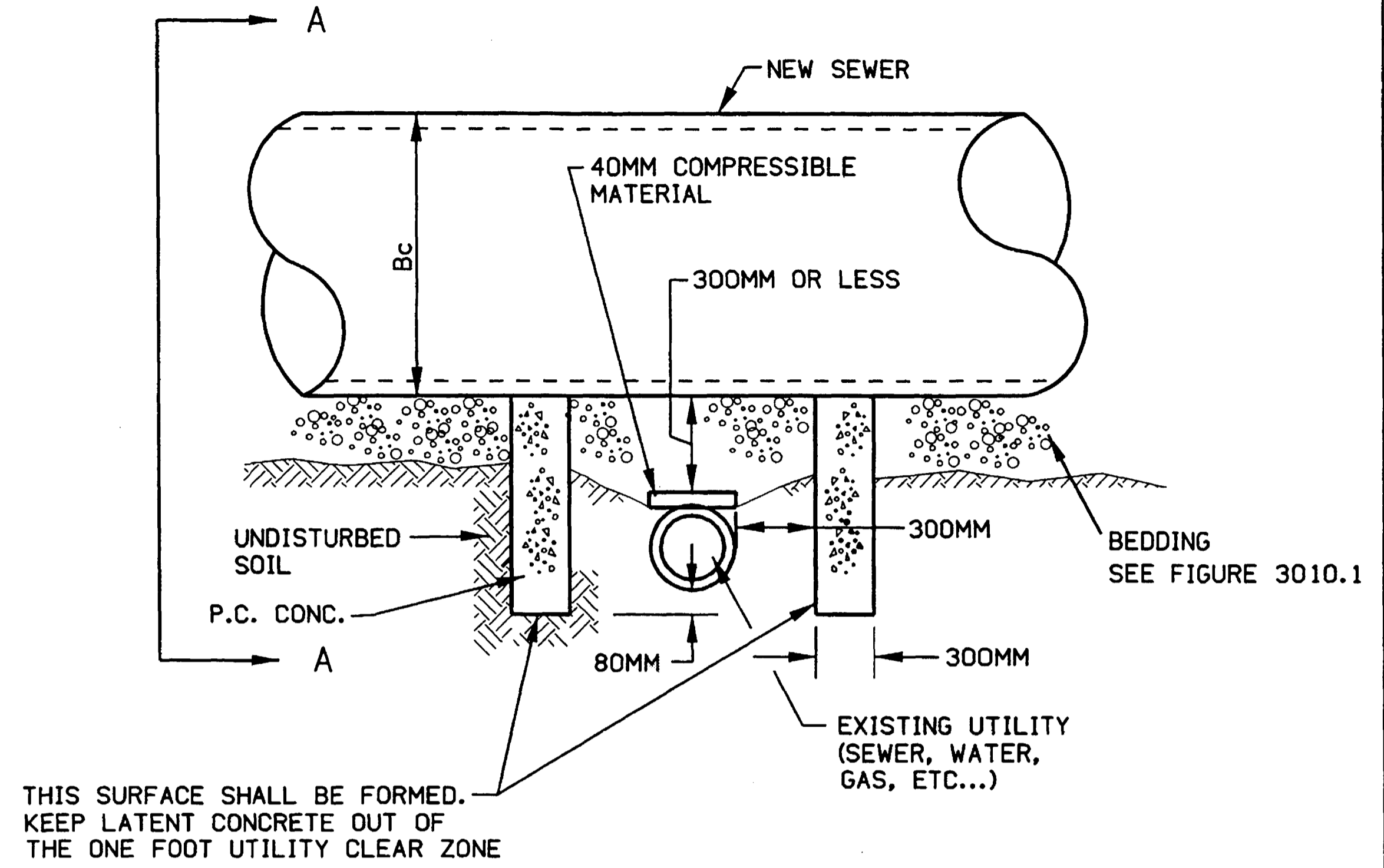
FIGURE: 3010.1

Type of Pipe	Material	Use	Allowable Depth of Fill Above Top of Pipe, M			
			Class C Backfill	Class B Backfill	CSE	Backfill 300MM Above the Top of Pipe
Rigid Pipe Stiffness >4490 kPa	RCP; ASTM C 76 Class III; 300MM-600MM	Storm, Gravity	Up to 2.4	Up to 3.0	Up to 3.0	Up to 3.0
	RCP; ASTM C 76 Class III; 675MM-2100MM	Storm, Gravity	Up to 3.0	Up to 4.0	Up to 4.0	Up to 4.0
	RCP; ASTM C 76 Class IV; 300MM-600MM	Storm, Gravity	Up to 3.6	Up to 4.8	Up to 4.8	Up to 4.8
	RCP; ASTM C 76 Class IV; 600MM-675MM	Storm, Gravity	Up to 4.8	Up to 7.0	Up to 7.0	Up to 7.0
	RCP; ASTM C 76 Class V; 300MM-525MM	Storm, Gravity	Up to 5.8	Up to 7.6	Up to 7.6	Up to 7.6
	RCP; ASTM C 76 Class V; 600MM-2100MM	Storm, Gravity	Up to 9.1	Up to 12.2	Up to 12.2	Up to 12.2
	RCAP; ASTM C 506 (Class A III); 450MM-2100MM Equiv.	Storm, Gravity				Up to 4.0
	RCEP; ASTM C507 (Class HE III); 450MM-2100MM Equiv.	Storm, Gravity				Up to 2.7
	RCEP; ASTM C507 (Class VE IIII); 900MM-2100MM Equiv.	Storm, Gravity				Up to 4.0
	Ductile Iron; AWWA C151 (Class 52); 200MM-1350MM	Sanitary, Gravity	Up to 15.2, No Bedding Required			
	Ductile Iron; AWWA C151 (Class 52); 100MM-1600MM	Sanitary, Force Main	Up to 15.2, No Bedding Required			
	Extra Strength, VCP; ASTM C 700 200MM-250MM	Sanitary, Gravity	Up to 4.8	Up to 6.0	Up to 7.3	Up to 7.3
	Extra Strength, VCP; ASTM C 700 300MM-525MM	Sanitary, Gravity	Up to 3.6	Up to 4.6	Up to 5.5	Up to 5.5
	Extra Strength, VCP; ASTM C 700 600MM-1050MM	Sanitary, Gravity	Up to 4.0	Up to 5.5	Up to 7.0	Up to 7.0
Semi-Rigid Pipe Stiffness 1055 to 4480 kPa	PVC; ASTM D 3034 (SDR 23.5); 200MM-375MM	Sanitary, Gravity			Up to 9.1	Up to 9.1
	PVC; ASTM D 2680 (Truss); 200MM-375MM	Sanitary, Gravity			Up to 9.1	Up to 9.1
	PVC; AWWA C900 (DR18); 100MM-300MM	Sanitary, Force Main	Up to 9.1, No Bedding Required			
	PVC; AWWA C905 (DR18); 350MM-600MM	Sanitary, Force Main	Up to 9.1, No Bedding Required			
Flexible Pipe Stiffness 320 to 1040 kPa	PVC; ASTM D 3034 (SDR 35 & 26); 200MM-375MM	Sanitary, Gravity				Up to 9.1
	PVC; ASTM F 679 (T-1 Wall); 450MM-675MM	Sanitary, Gravity				Up to 9.1
	PVC; ASTM F 949 (A-2000); 200MM-900MM	Sanitary, Gravity				Up to 9.1
	PVC; ASTM F 1803 (Closed Profile); 525MM-900MM	Sanitary, Gravity				Up to 9.1
	PVC; ASTM F 949 (A-2000); 300MM-900MM	Storm, Gravity			Up to 9.1	Up to 9.1
	HDPE; AASHTO M 294 ; 300MM	Storm, Gravity				Up to 3.4
Pipe Stiffness 150 to 310 kPa	HDPE; AASHTO M 294 ; 375MM-900MM	Storm Gravity				Up to 3.4

- Notes:
- Lined reinforced concrete pipe (LRCP), used for sanitary sewer applications, shall follow depth requirements of RCP (minimum Class IV).
 - Allowable depth of bury may be modified by Jurisdictional Engineer based upon site conditions and installation methods.
 - Water Main Pressure Pipe: In areas where sand or other suitable soil backfill is available, Water Main Pressure Pipe (excluding PE Pipe) may be backfilled with these natural materials (Class I material not required) using a flat trench bottom and bell hole shaping.

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

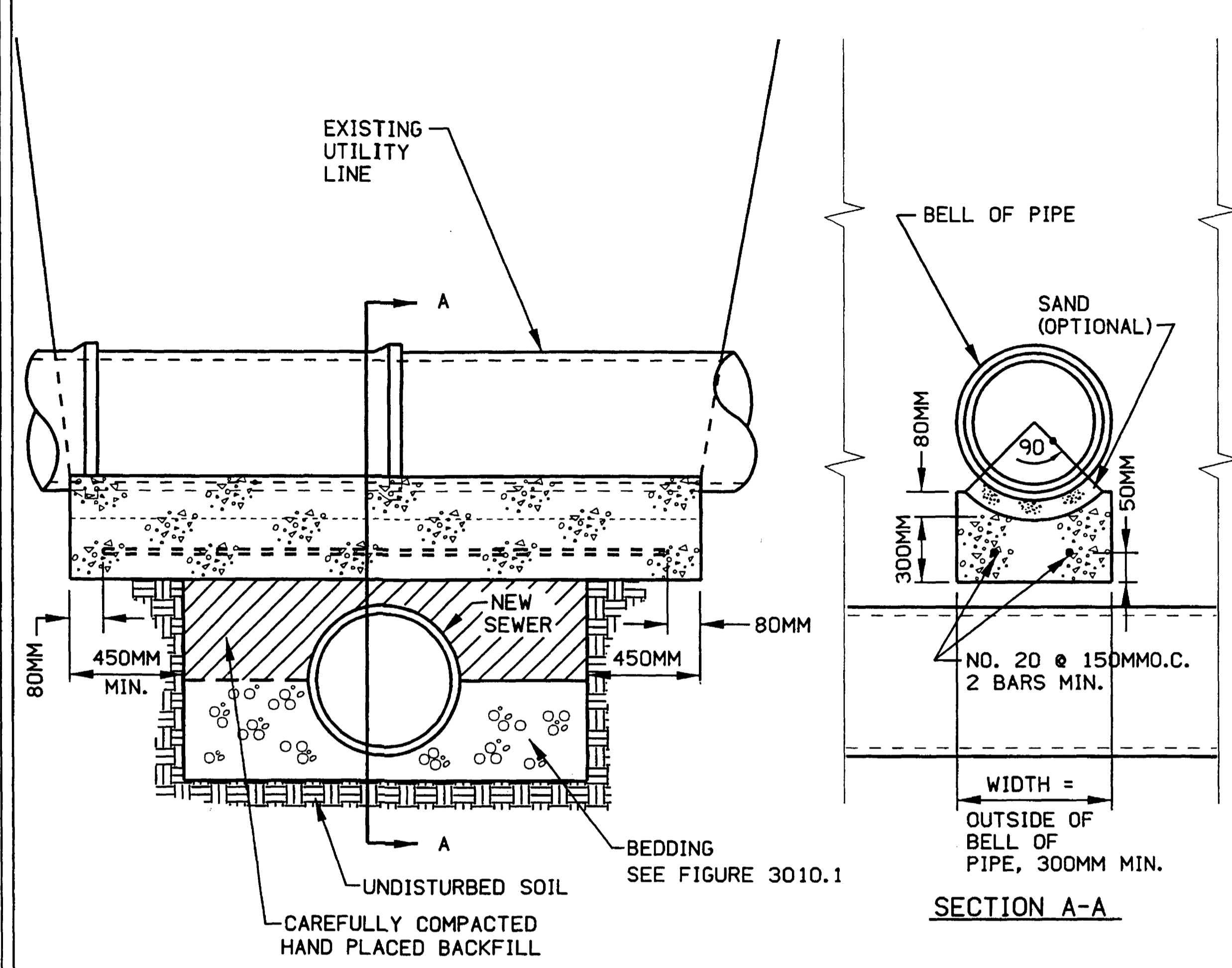
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DESIGNER: GAP & SBL
25-JAN-2002 09:44



SECTION A-A

NOTE:
INSTALL PIPE SUPPORT FOR ALL NEW SEWERS 300MM IN DIAMETER OR LARGER WHEN CLEARANCE BETWEEN BOTTOM OF NEW SEWER AND TOP OF EXISTING LINE IS 300MM OR LESS.

REV.	DATE	BY	SEWER PIPE SUPPORT OVER EXISTING UTILITY	FIGURE: 3010.4
	01-01-98			SHEET 1 OF 1

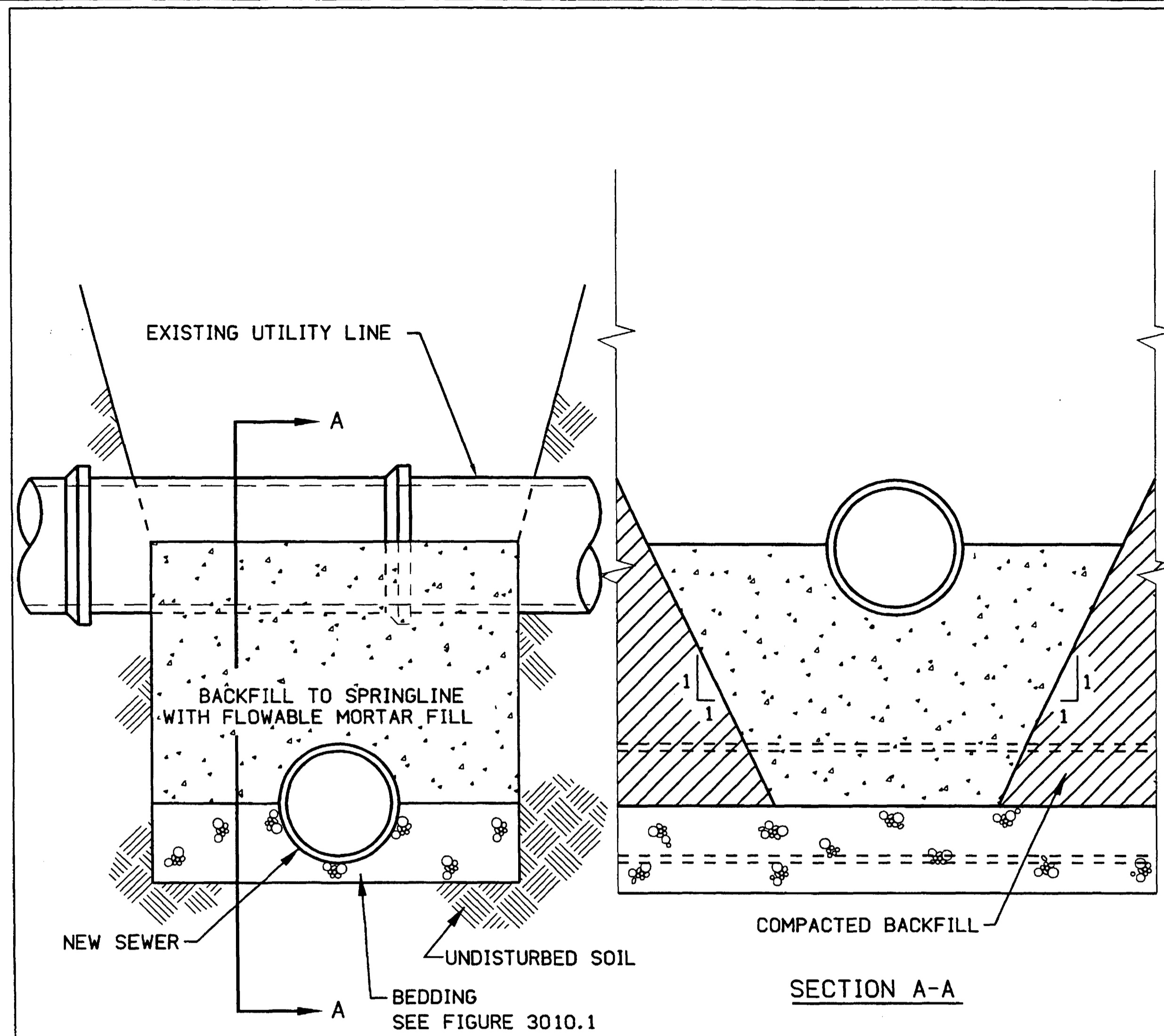


NOTES:
REINFORCED CONCRETE BEAM UTILITY LINE SUPPORT TO BE USED WHEN NEW SEWER EXCAVATION IS CROSSING UNDER AN EXISTING UTILITY LINE (SEWER LINES, WATER LINES, GAS LINES, ETC...) AS DIRECTED BY THE ENGINEER.
ALLOW CONCRETE TO CURE A MIN. OF 48 HOURS BEFORE COMPLETING BACKFILL.
SPECIAL DESIGN REQUIRED FOR TRENCH WIDTH GREATER THAN 2M OR TRENCH DEPTH GREATER THAN 4.5M.

REV.	DATE	BY	REINFORCED P.C. CONCRETE BEAM UTILITY LINE SUPPORT	FIGURE: 3010.5
	01-01-98			SHEET 1 OF 1

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

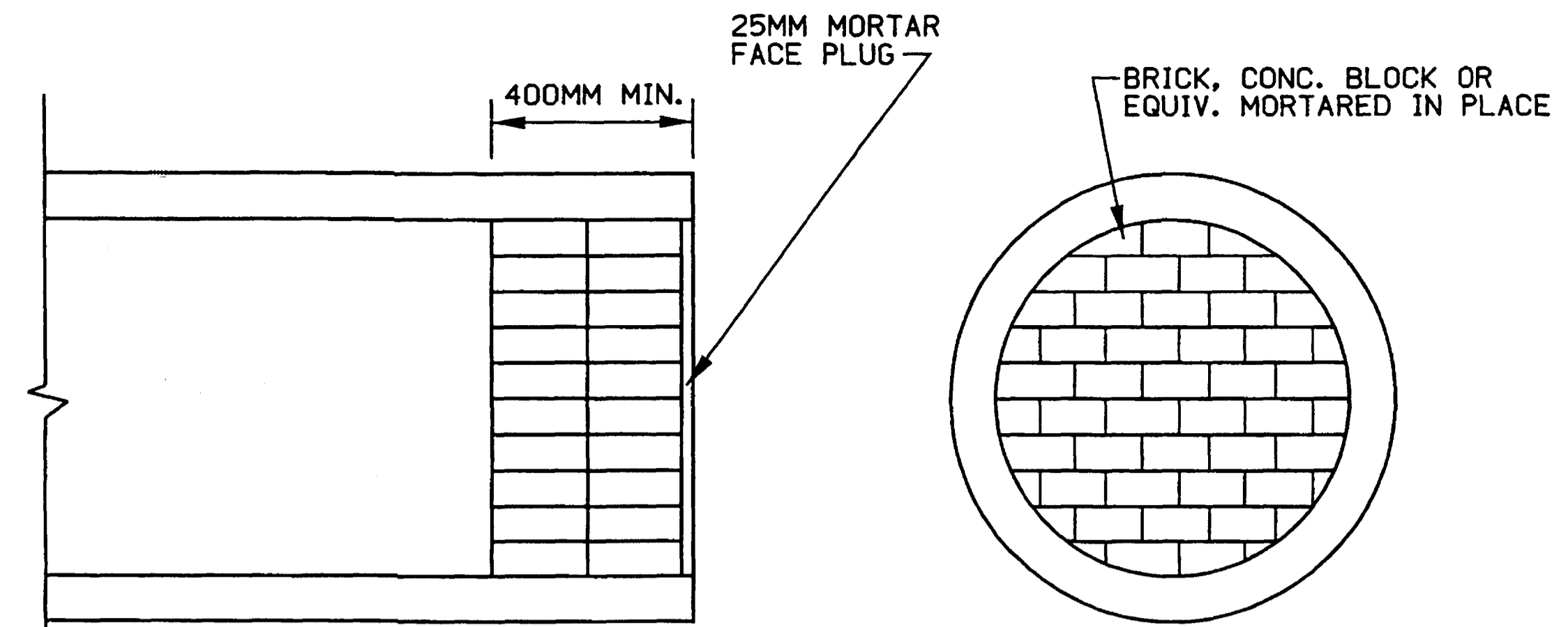
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DESIGNER: GAP & SEL
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NOTES:

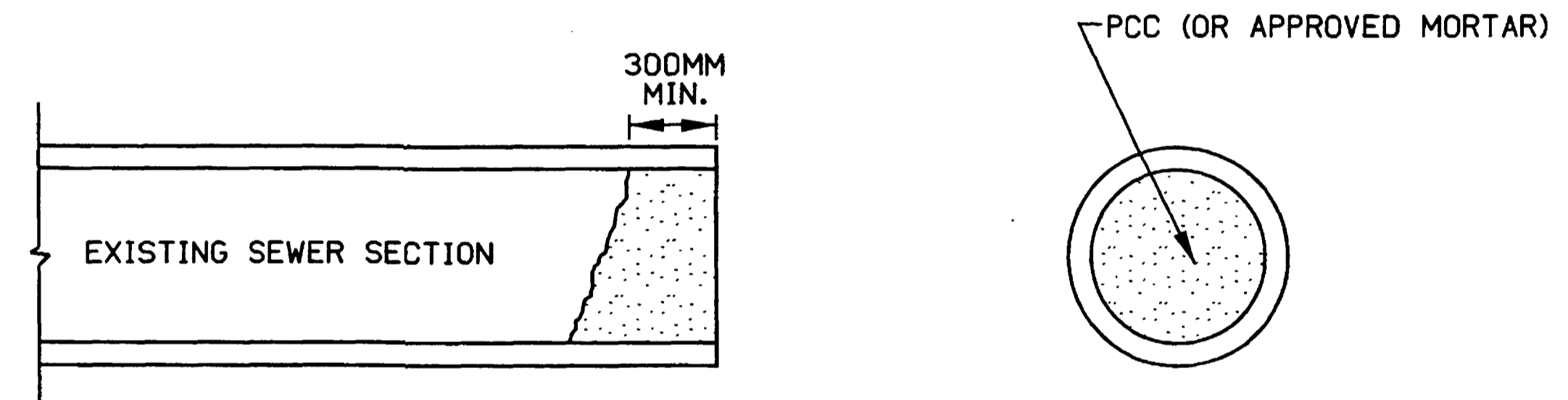
1. FLOWABLE MORTAR FILL UTILITY LINE SUPPORT TO BE USED WHEN NEW UTILITY EXCAVATION IS CROSSING UNDER AN EXISTING UTILITY LINE (SEWER LINES, WATER LINES, GAS LINES, ETC.) AS DIRECTED BY THE ENGINEER.
2. ALLOW FLOWABLE MORTAR FILL TO CURE A MINIMUM OF 24 HRS. BEFORE COMPLETING BACKFILL.
3. UNCOMPACTED BACKFILL SHALL BE TRIMMED AWAY FROM SLOPES BEFORE POURING FLOWABLE MORTAR.
4. SIDE SLOPES OF FLOWABLE MORTAR FILL TO BE 1:1 SLOPE OR GREATER. SEE SECTION A-A.

REV.	DATE	BY	FLOWABLE MORTAR FILL UTILITY LINE SUPPORT	FIGURE: 3010.6
	DATE: 01-01-98			SHEET 1 OF 1



STANDARD SEWER PLUG

FOR PLUGGING EXISTING SEWER (OVER 450MM DIA.)



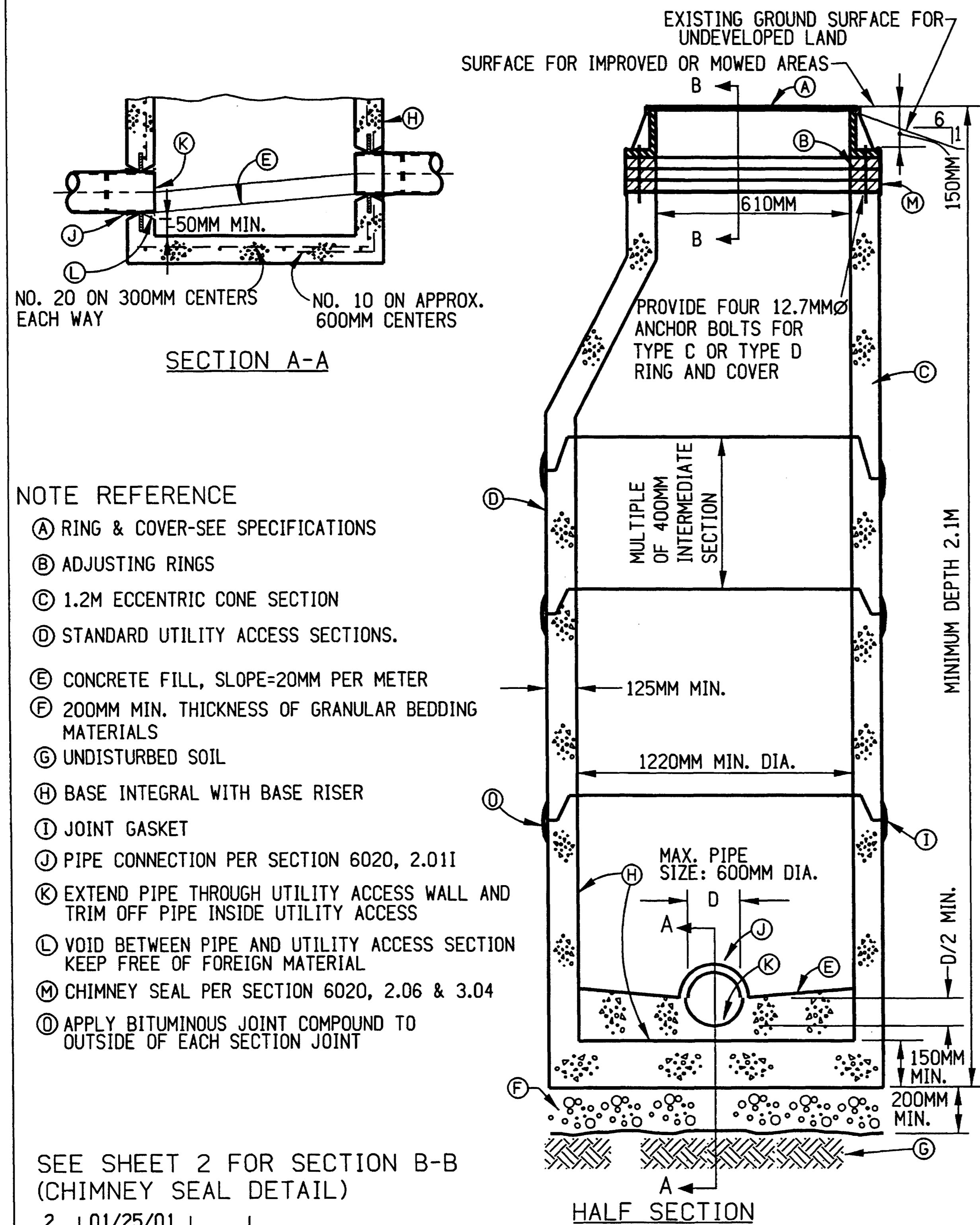
STANDARD SEWER PLUG

FOR PLUGGING EXISTING SEWER (450MM AND SMALLER)

REV.	DATE	BY	STANDARD SEWER PLUG	FIGURE: 4010.2
	DATE: 01-01-98			SHEET 1 OF 1

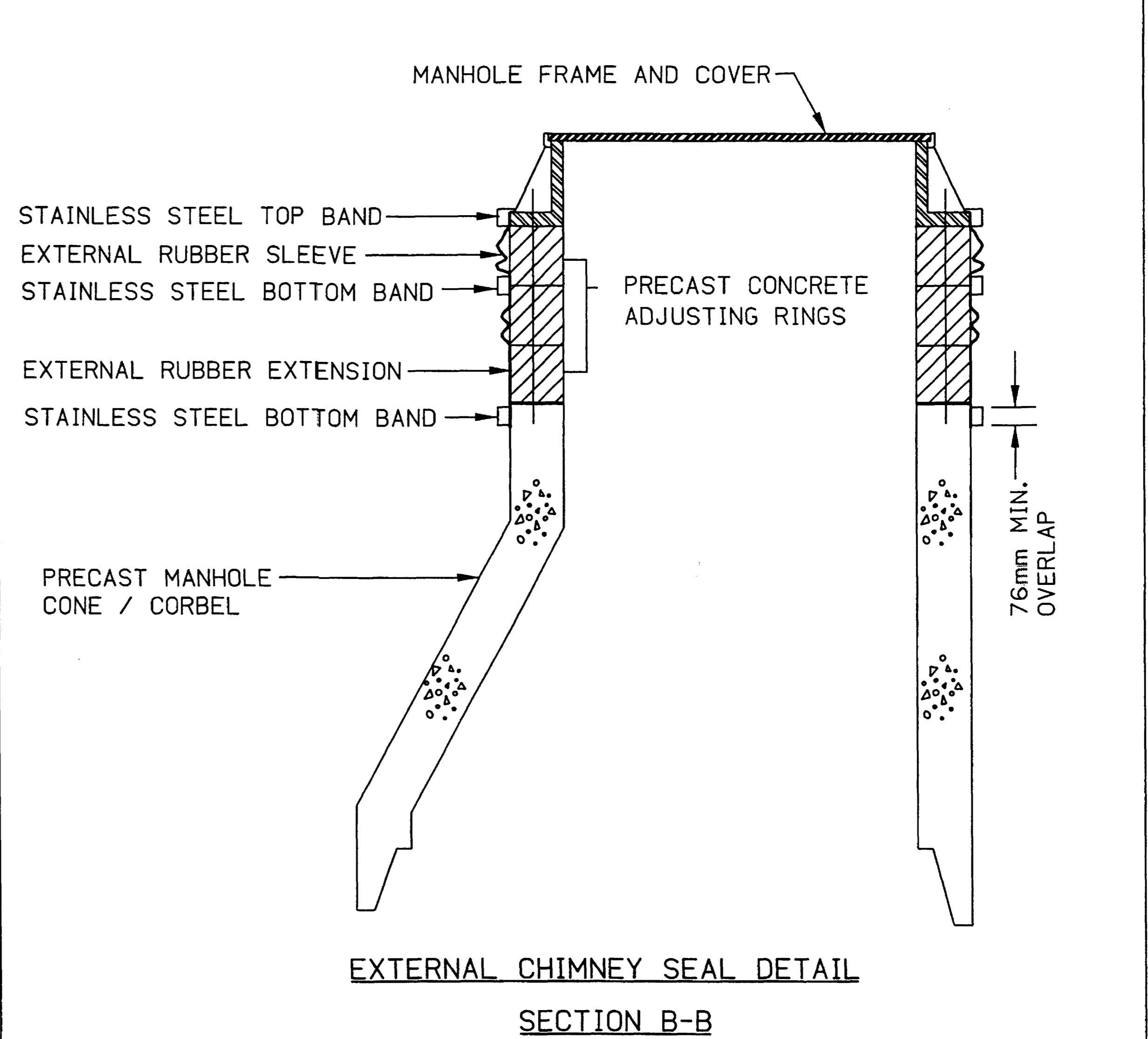
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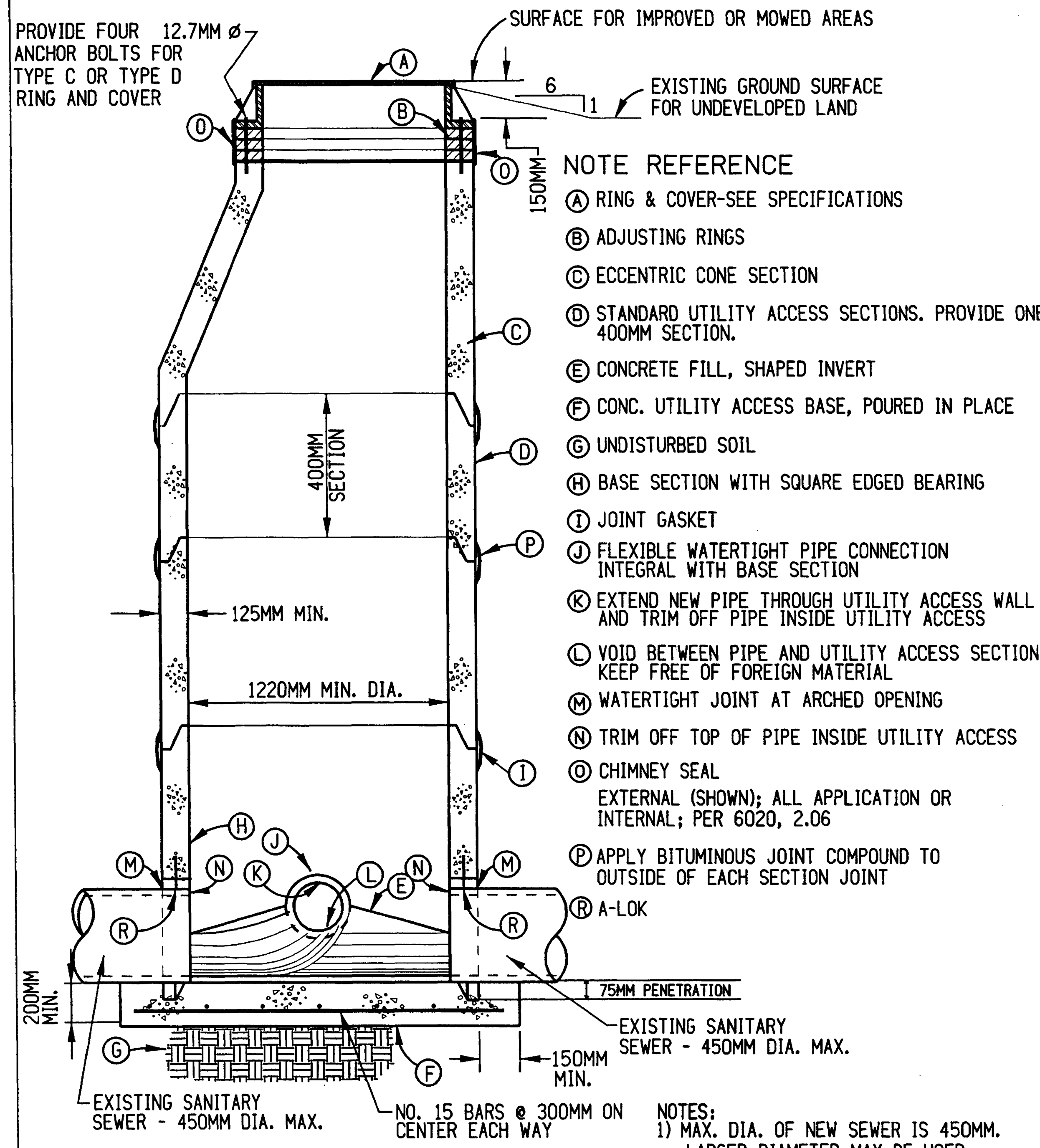
SEE SHEET 2 FOR SECTION B-B (CHIMNEY SEAL DETAIL)

2	01/25/01			
1	JAN, 1999			
REV.	DATE	BY	TYPE "A" UTILITY ACCESS (SANITARY SEWER)	FIGURE: 6020.1
DATE: 01-01-98				SHEET 1 OF 2



1	01/25/01			
REV.	DATE	BY	TYPE "A" UTILITY ACCESS (SANITARY SEWER)	FIGURE: 6020.1
DATE: 01-25-99				SHEET 2 OF 2

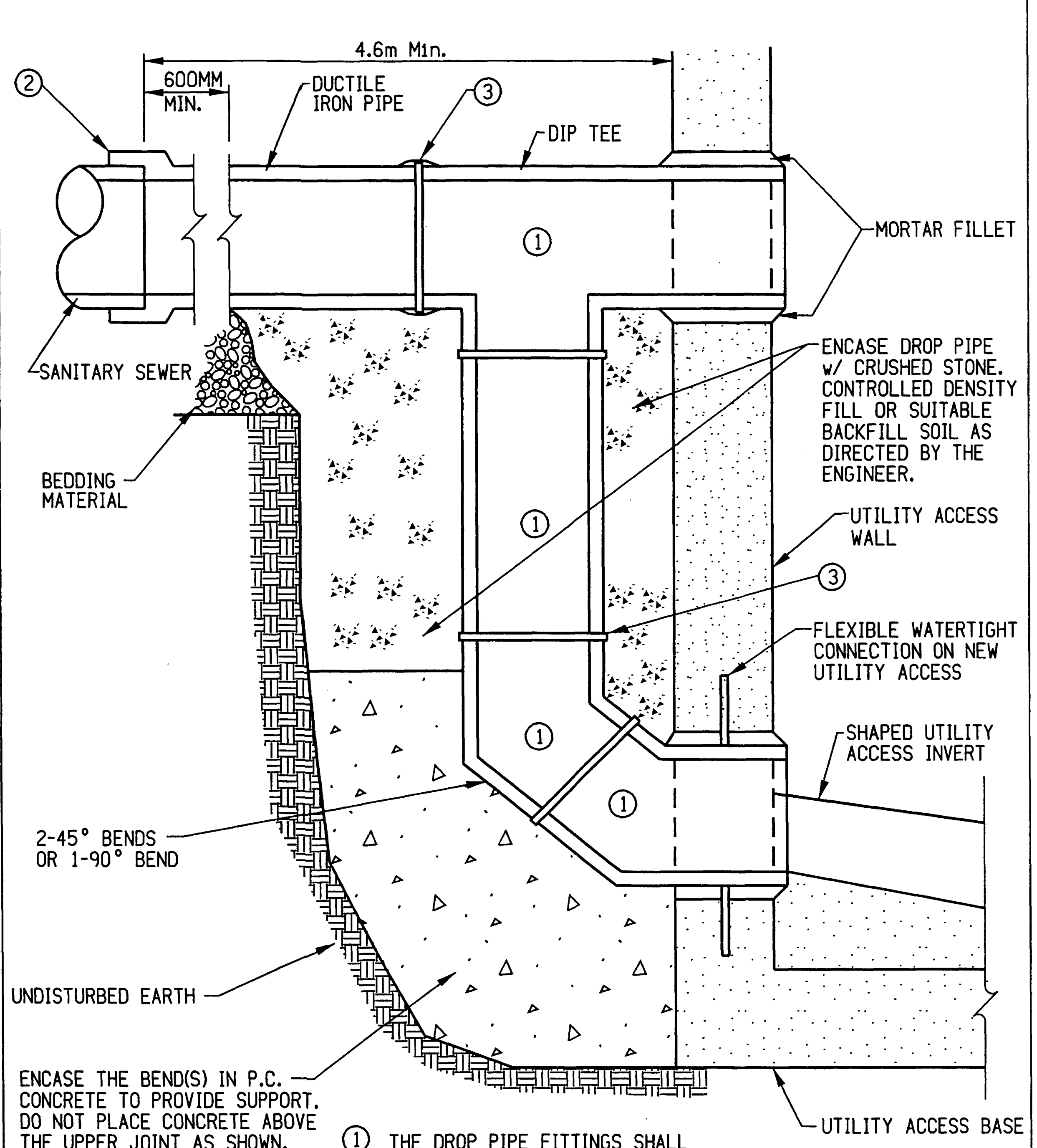
FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS



- NOTE REFERENCE
- (A) RING & COVER-SEE SPECIFICATIONS
 - (B) ADJUSTING RINGS
 - (C) ECCENTRIC CONE SECTION
 - (D) STANDARD UTILITY ACCESS SECTIONS. PROVIDE ONE 400MM SECTION.
 - (E) CONCRETE FILL, SHAPED INVERT
 - (F) CONC. UTILITY ACCESS BASE, POURED IN PLACE
 - (G) UNDISTURBED SOIL
 - (H) BASE SECTION WITH SQUARE EDGED BEARING
 - (I) JOINT GASKET
 - (J) FLEXIBLE WATERTIGHT PIPE CONNECTION INTEGRAL WITH BASE SECTION
 - (K) EXTEND NEW PIPE THROUGH UTILITY ACCESS WALL AND TRIM OFF PIPE INSIDE UTILITY ACCESS
 - (L) VOID BETWEEN PIPE AND UTILITY ACCESS SECTION KEEP FREE OF FOREIGN MATERIAL
 - (M) WATERTIGHT JOINT AT ARCHED OPENING
 - (N) TRIM OFF TOP OF PIPE INSIDE UTILITY ACCESS
 - (O) CHIMNEY SEAL
EXTERNAL (SHOWN); ALL APPLICATION OR INTERNAL; PER 6020, 2.06
 - (P) APPLY BITUMINOUS JOINT COMPOUND TO OUTSIDE OF EACH SECTION JOINT
 - (R) A-LOK

NOTES:
 1) MAX. DIA. OF NEW SEWER IS 450MM. LARGER DIAMETER MAY BE USED WITH JURISDICTIONAL ENGINEER APPROVAL.
 2) TO BE USED ONLY WHEN BOTH EXISTING SANITARY LINES WILL REMAIN IN PLACE
 3) MIN. DEPTH 2.1M

1	01/25/01			
REV.	DATE	BY	TYPE "I" UTILITY ACCESS (SANITARY SEWER)	FIGURE: 6020.4
DATE: 01-01-98				SHEET 1 OF 1

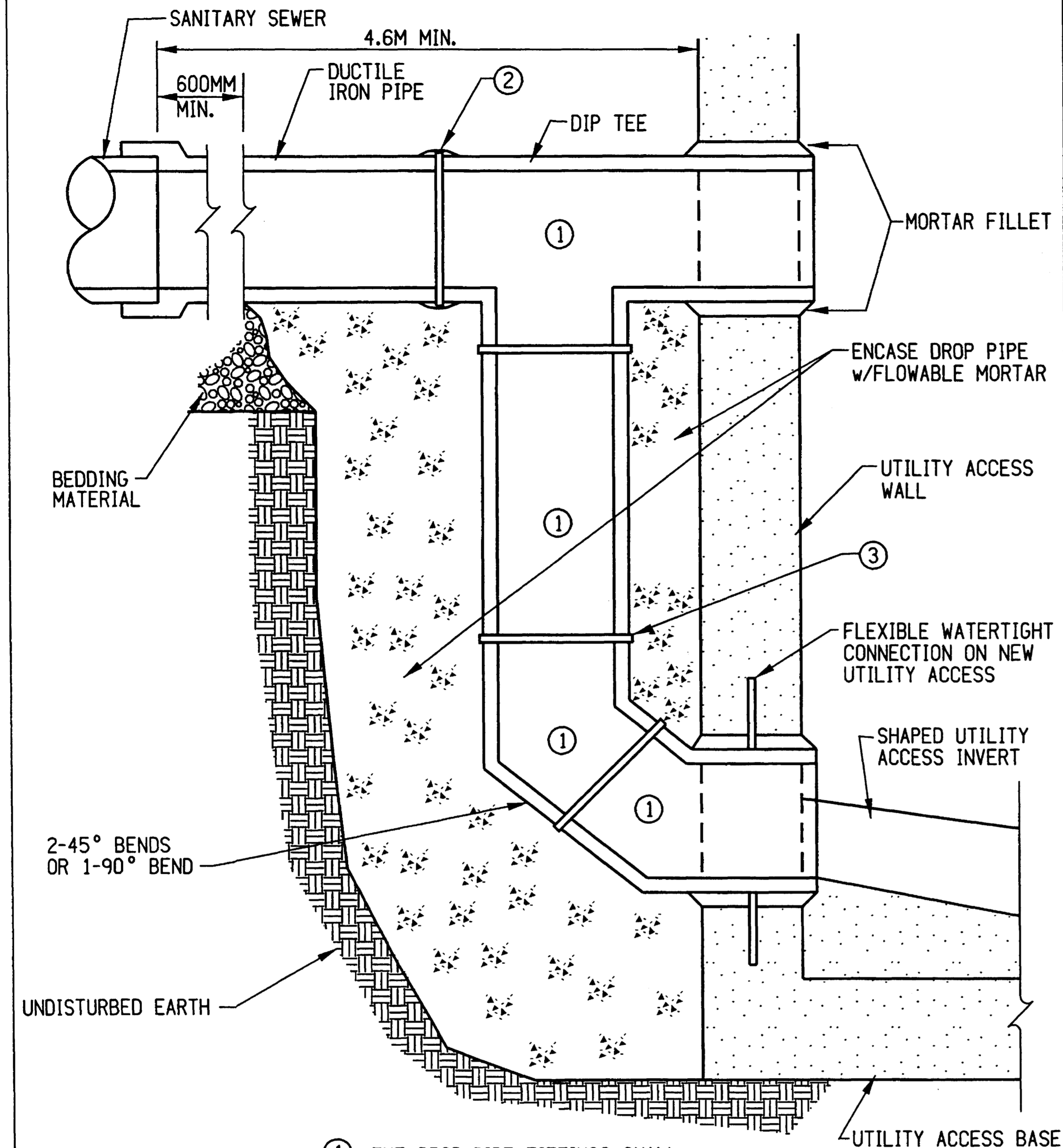


- ENCASE THE BEND(S) IN P.C. CONCRETE TO PROVIDE SUPPORT. DO NOT PLACE CONCRETE ABOVE THE UPPER JOINT AS SHOWN.
- (1) THE DROP PIPE FITTINGS SHALL BE DUCTILE IRON PIPE OF THE SAME SIZE AS THE SEWER BEING CONSTRUCTED.
 - (2) WRAP JOINT TO KEEP OUT FLOWABLE MORTAR.
 - (3) CONSTRUCT DROP WITH MECHANICAL JOINT FITTINGS.

1	01/25/99			
REV.	DATE	BY	DROP CONNECTION (SANITARY SEWER) CONCRETE ENCASED	FIGURE: 6020.6A
DATE: 01-01-98				SHEET 1 OF 1

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

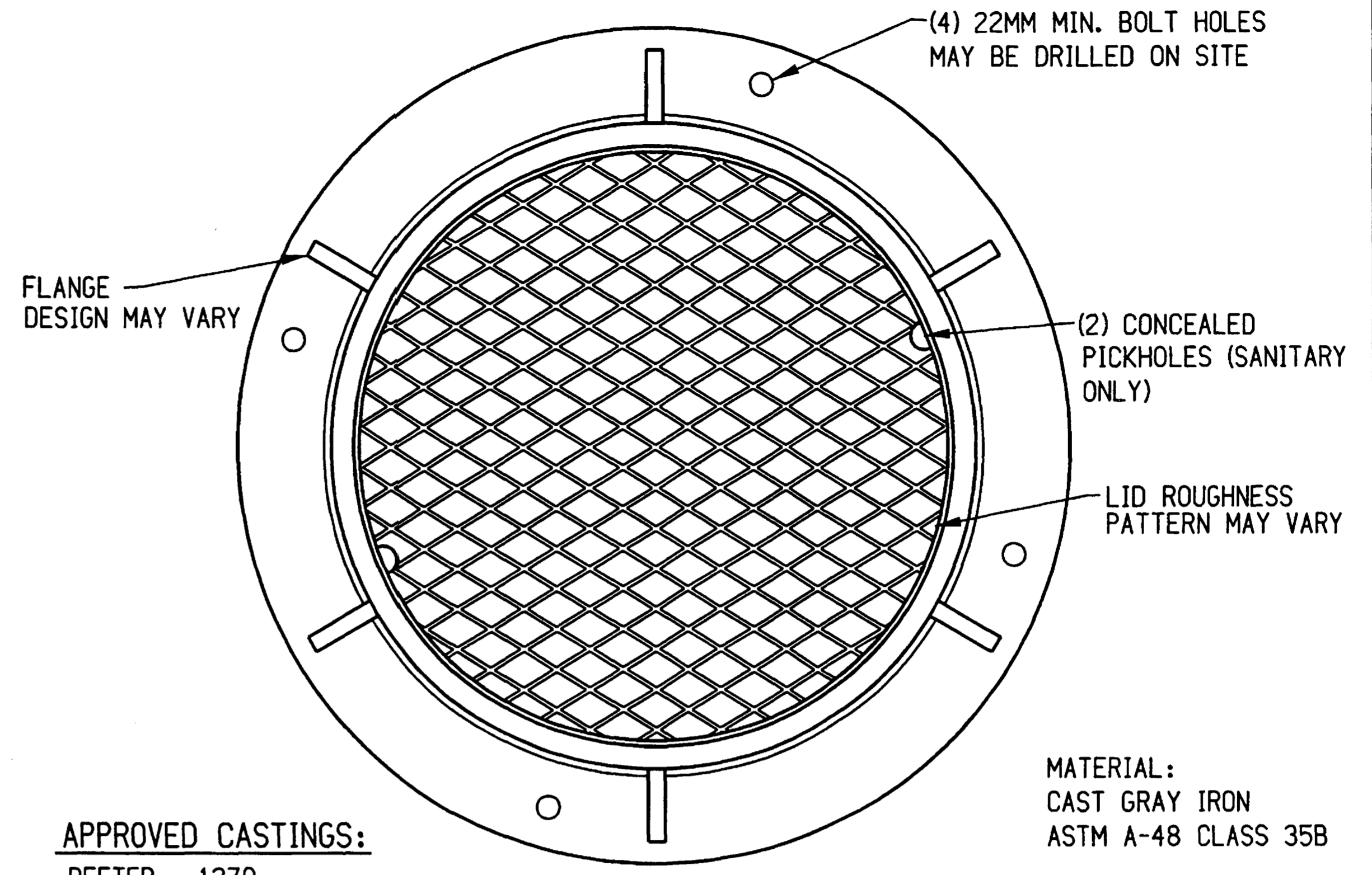
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2-45° BENDS
OR 1-90° BEND

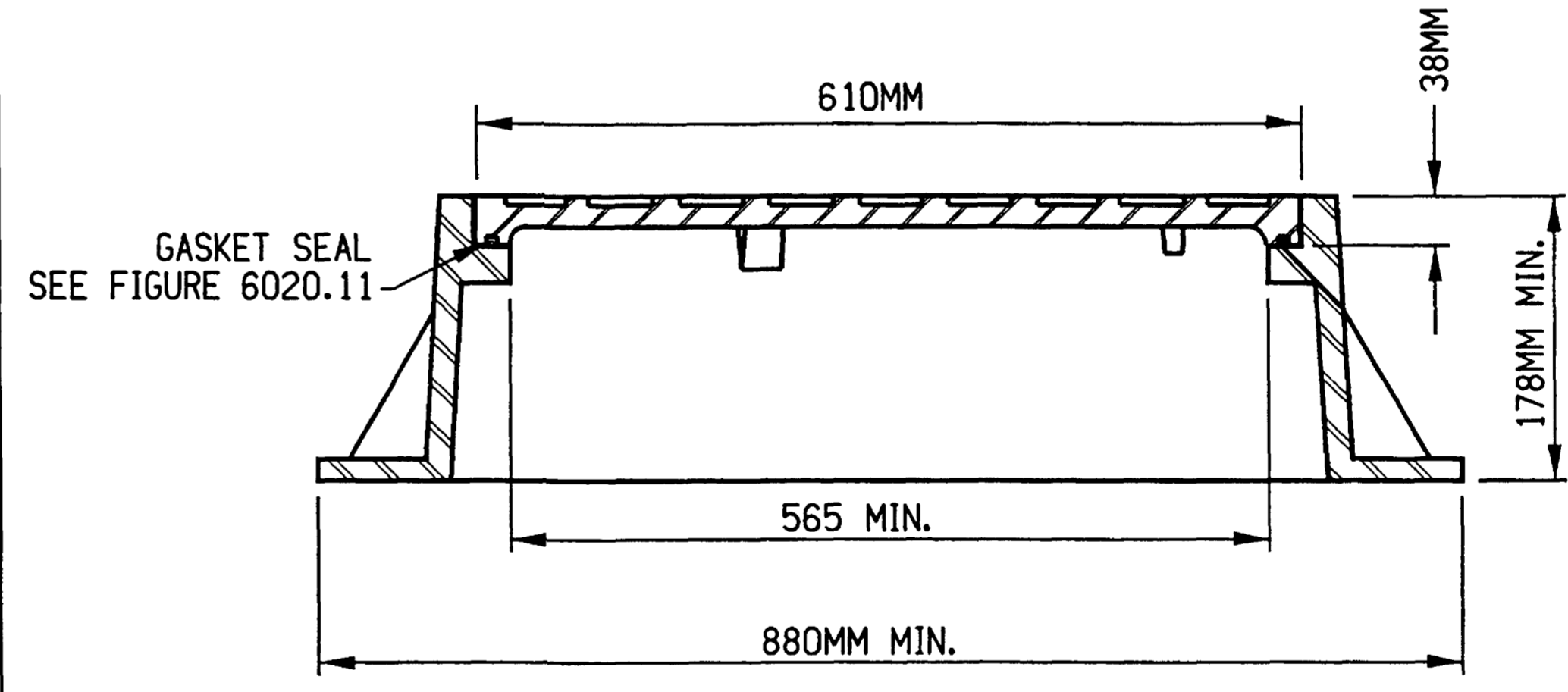
- ① THE DROP PIPE FITTINGS SHALL BE DUCTILE IRON PIPE OF THE SAME SIZE AS THE SEWER BEING CONSTRUCTED.
- ② WRAP JOINT TO KEEP OUT FLOWABLE MORTAR.
- ③ CONSTRUCT DROP WITH MECHANICAL JOINT FITTINGS.

REV.	DATE	BY	DROP CONNECTION (SANITARY SEWER) FLOWABLE MORTAR ENCASED	FIGURE: 6020.6B SHEET 1 OF 1
DATE: 01-01-98				



APPROVED CASTINGS:
DEETER - 1270
E. JORDAN - 1120 W/GASKET SEAL
NEENAH - 1670 A

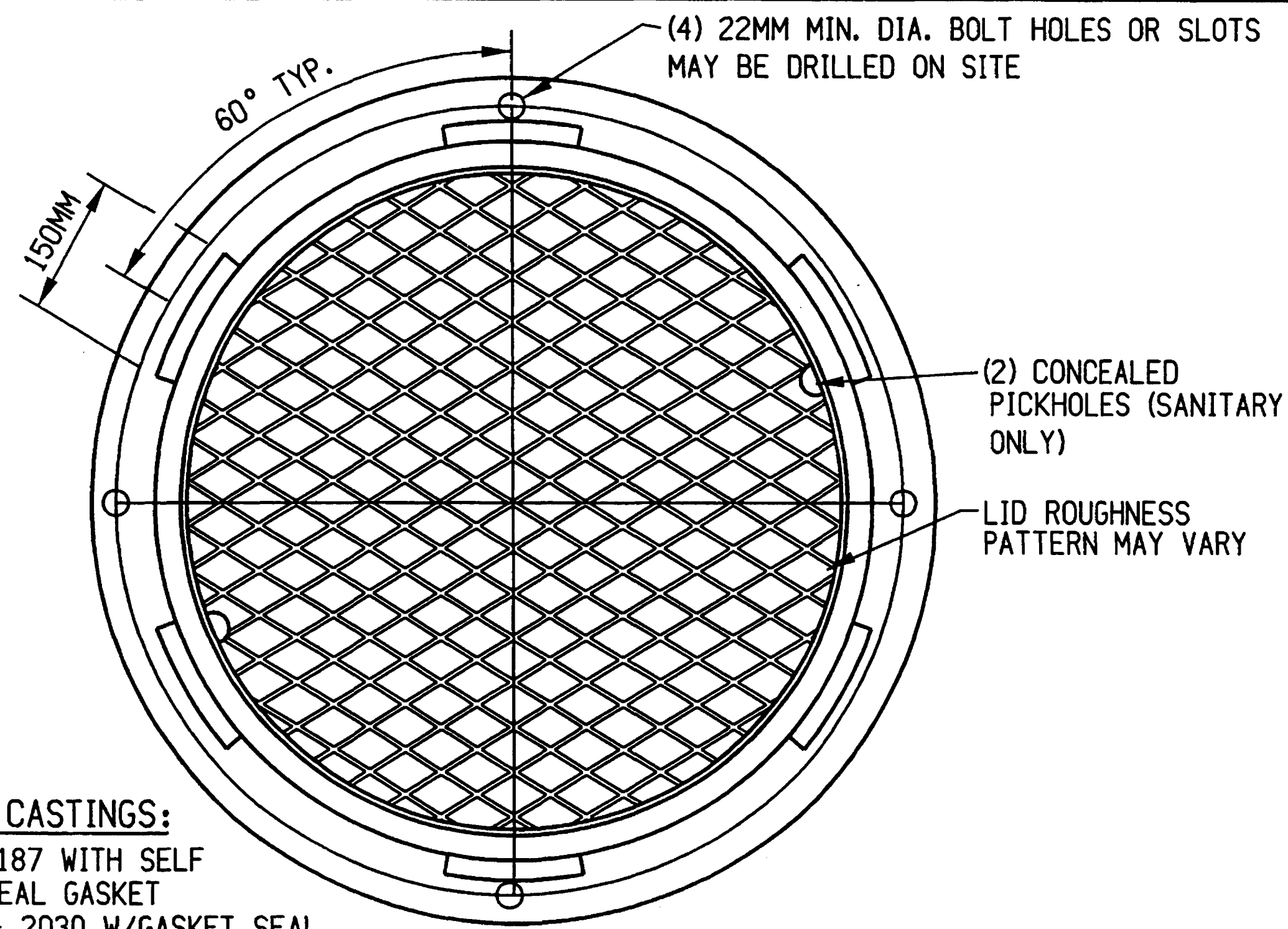
MATERIAL:
CAST GRAY IRON
ASTM A-48 CLASS 35B



1	01/25/01		TYPE "A" RING AND COVER (SANITARY SEWER)	FIGURE: 6020.7 SHEET 1 OF 1
REV.	DATE	BY		
DATE: 01-01-98				

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

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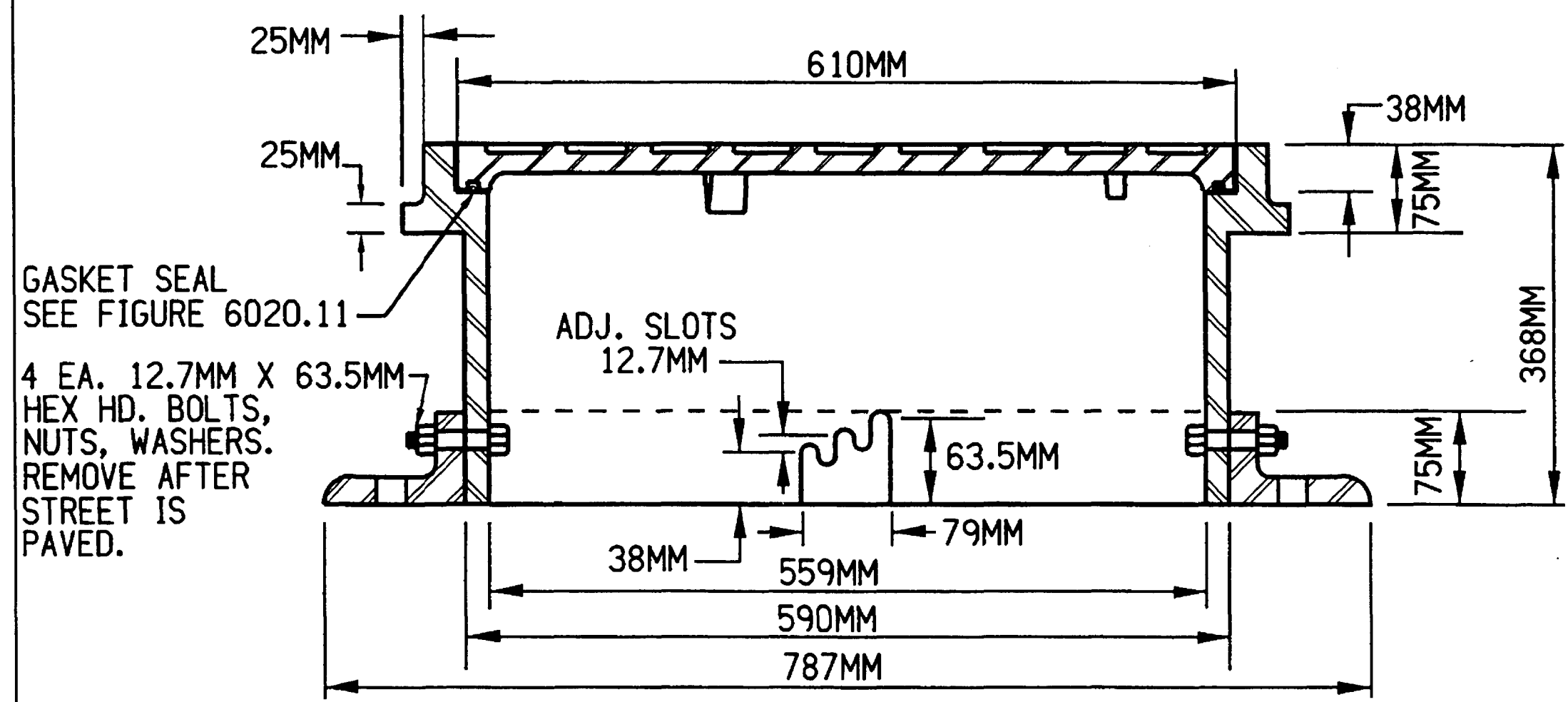
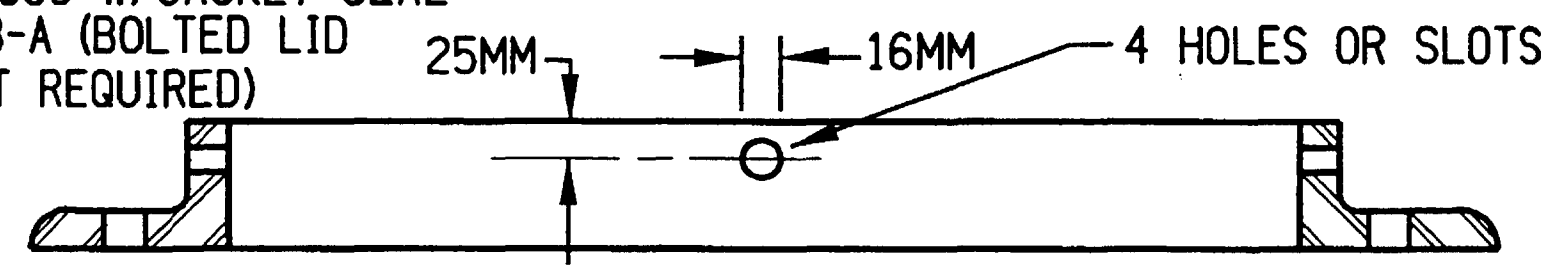


APPROVED CASTINGS:

DEETER - 1187 WITH SELF SEAL GASKET

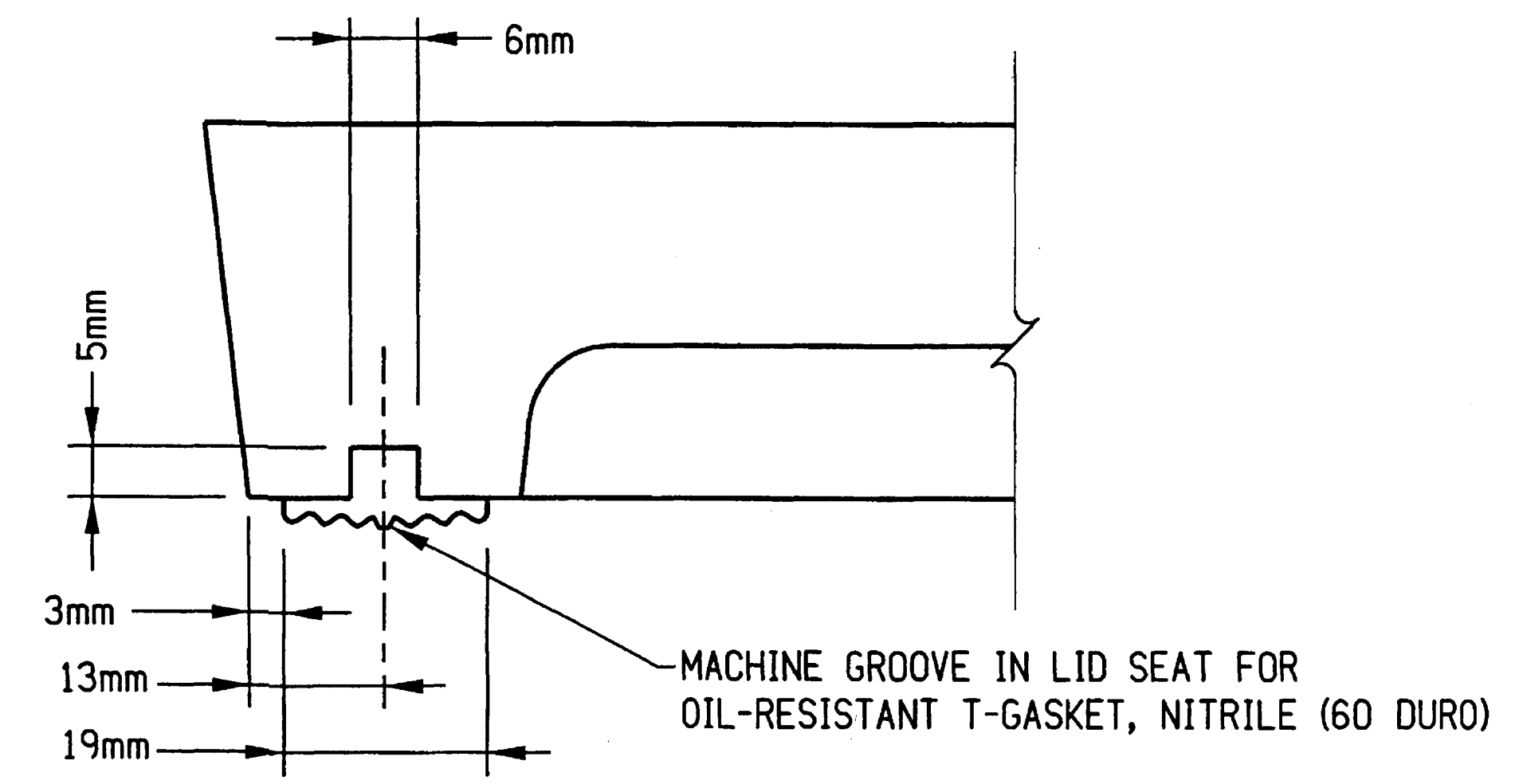
E. JORDAN - 2030 W/GASKET SEAL

NEENAH - 1673-A (BOLTED LID NOT REQUIRED)

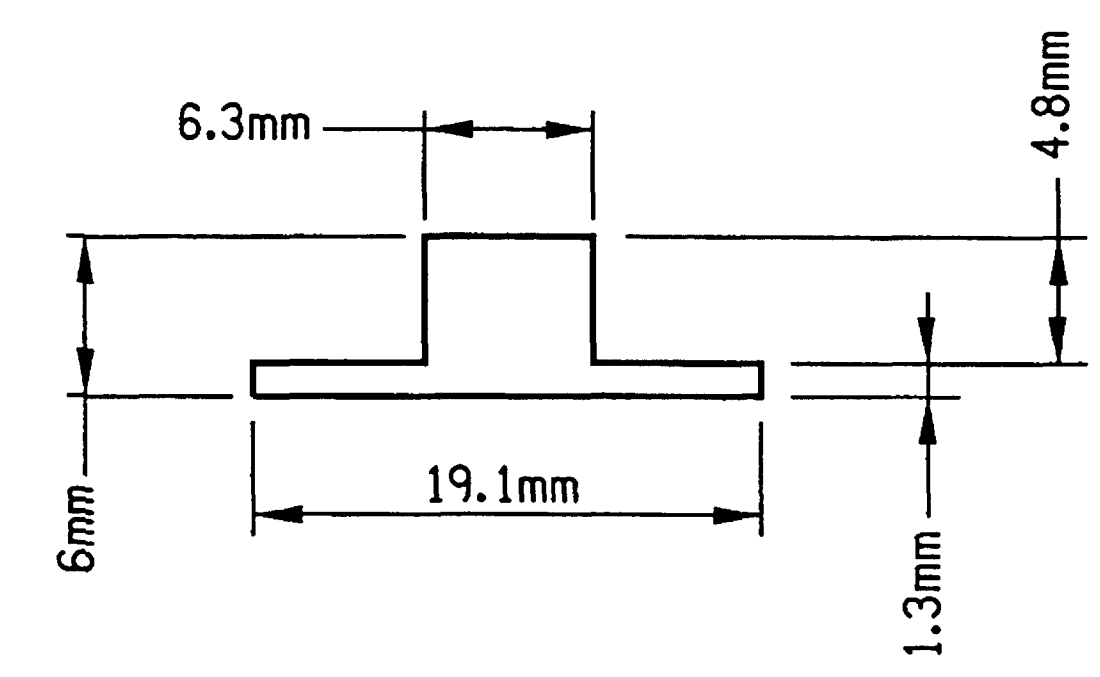


MATERIAL:
CAST GRAY IRON
ASTM A-48 CLASS 35B

1	01/25/01		TYPE "B" RING AND COVER (SANITARY SEWER)	FIGURE: 6020.8
REV.	DATE	BY		
DATE: 01-01-98			SHEET 1 OF 1	



GROOVE DETAIL

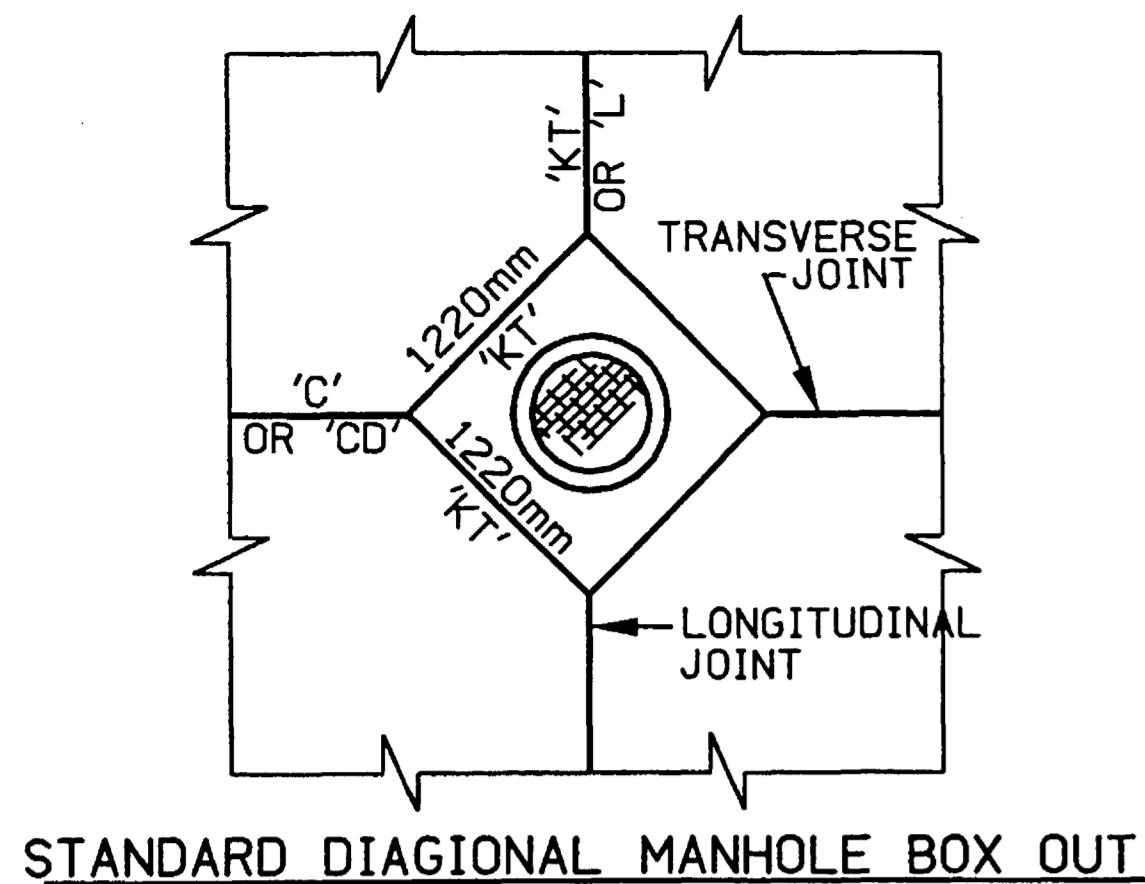


GASKET DETAIL

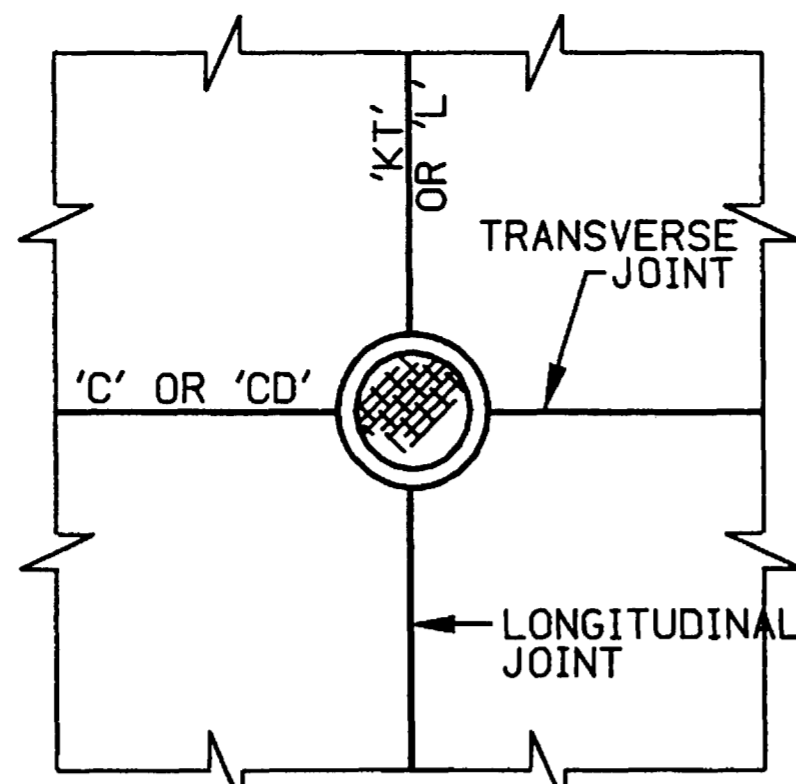
			UTILITY ACCESS COVER GASKET (SANITARY SEWER)	FIGURE: 6020.11
REV.	DATE	BY		
DATE: 01-01-98			SHEET 1 OF 1	

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

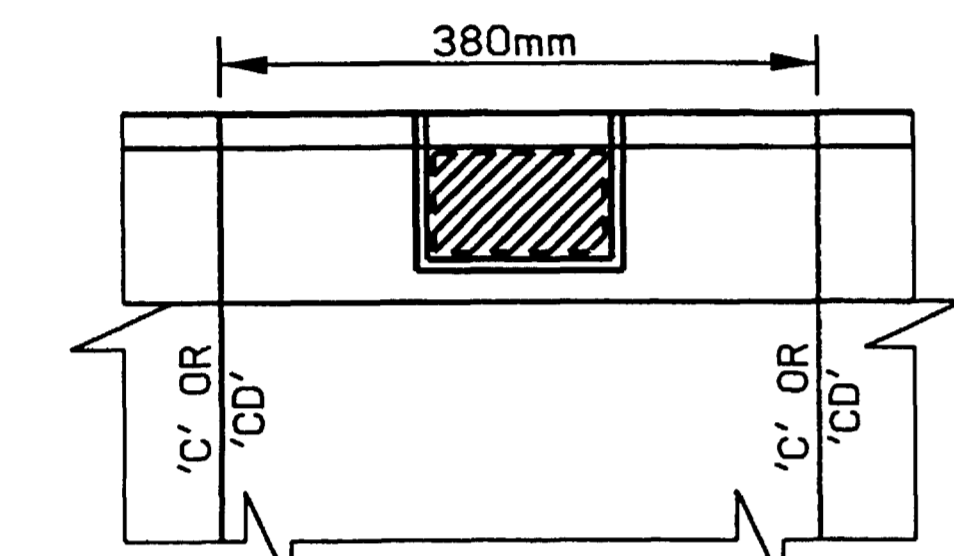
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DESIGNER: GAP & SRL
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STANDARD DIAGONAL MANHOLE BOX OUT



OPTIONAL MANHOLE PLACEMENT (NO BOXOUT) FOR TELESCOPING (3 PIECE) MANHOLE ONLY



SIZE BOX OUT AS SHOWN IN FIGURE 6030.16 INTAKE BOX OUT

- STANDARD DIAGONAL MANHOLE BOXOUT REQUIRED IF TYPE A OR C MANHOLE IS ALLOWED IN P.C.C. PAVING.
- OPTIONAL MANHOLE PLACEMENT (WITHOUT BOXOUT) MAY BE USED UPON APPROVAL OF JURISDICTIONAL ENGINEER.
- WHEN PAVEMENT JOINTS DO NOT INTERSECT THE MANHOLE AT ITS CENTER USE MANHOLE BOXOUT TO PROVIDE JOINT CONTINUITY.
- SHORTEN JOINTING PATTERN ON EITHER SIDE OF OPENING TO PERMIT JOINTS TO INTERSECT ROUND CASTING AND FALL AT THE EDGES OF BOXOUTS FOR RECTANGULAR STRUCTURES.
- BOXOUTS ARE REQUIRED WHENEVER A MANHOLE IS REPAIRED IN AN EXISTING PAVEMENT.

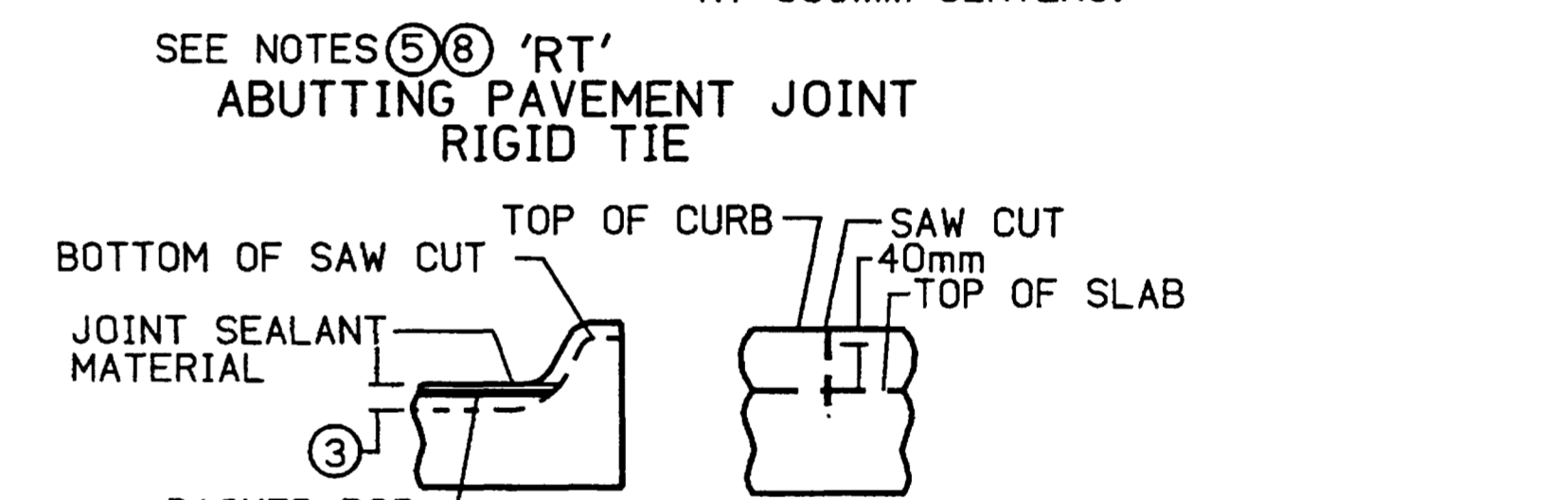
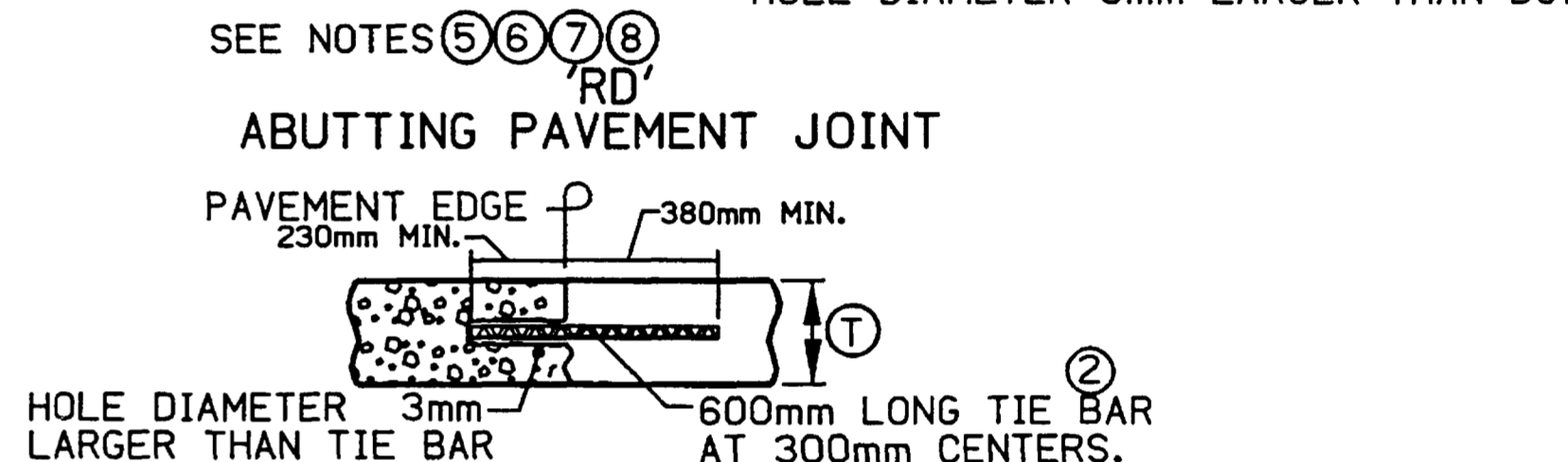
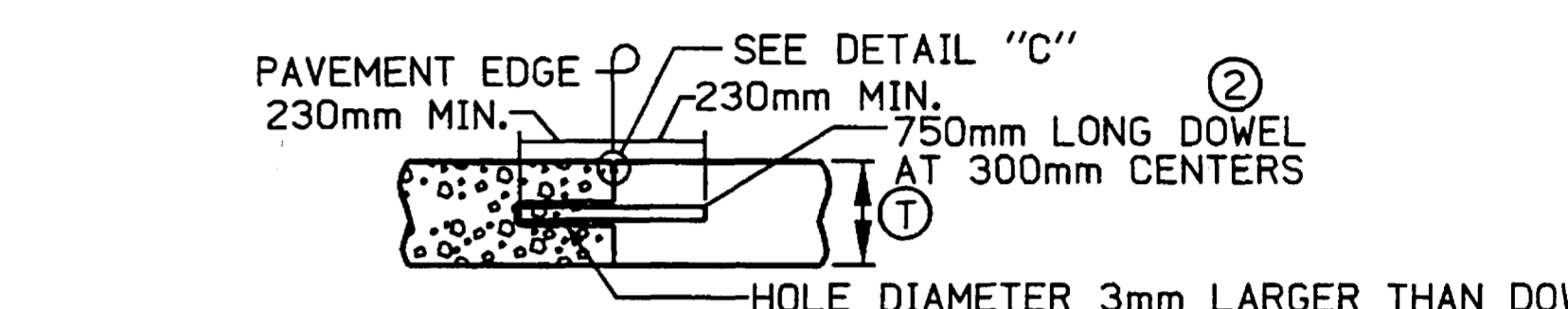
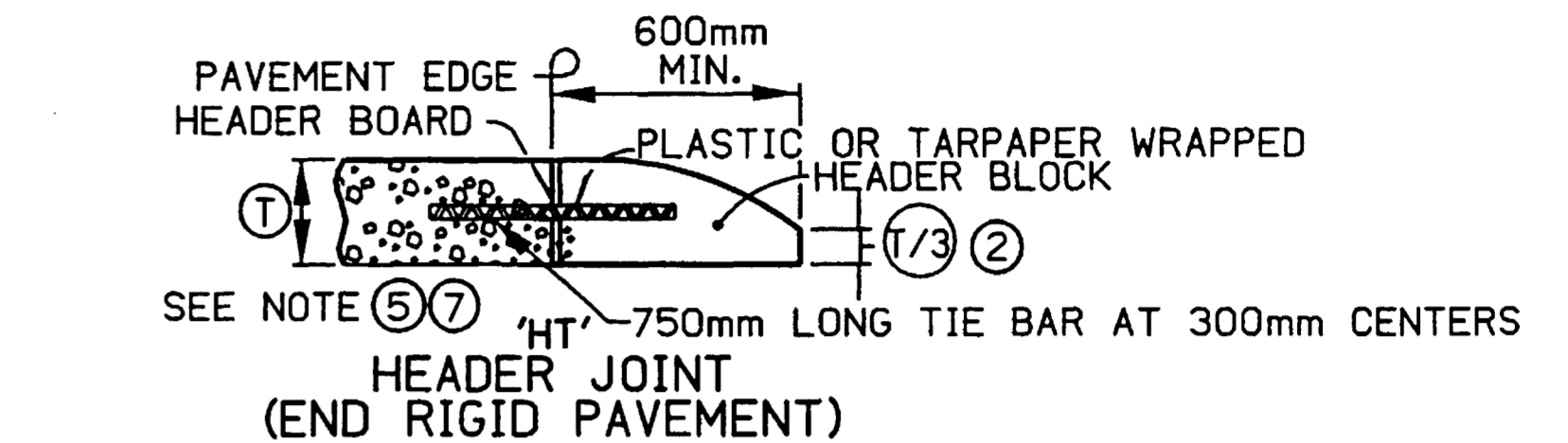
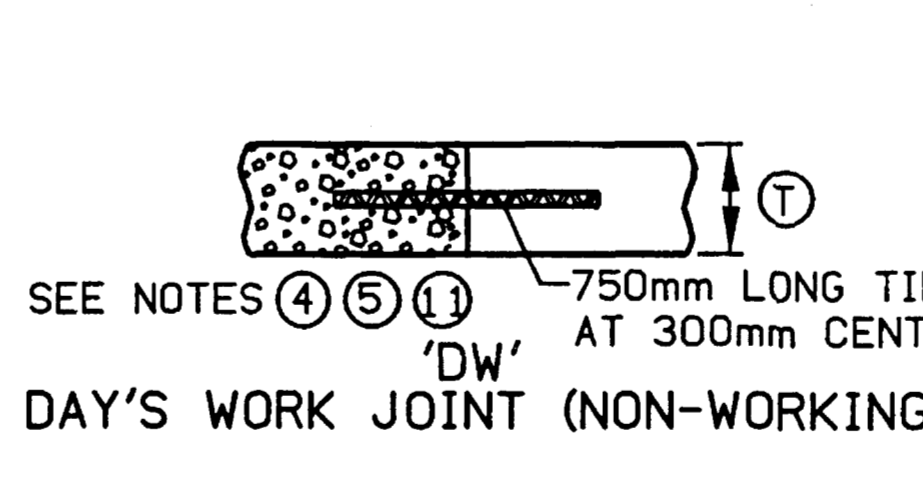
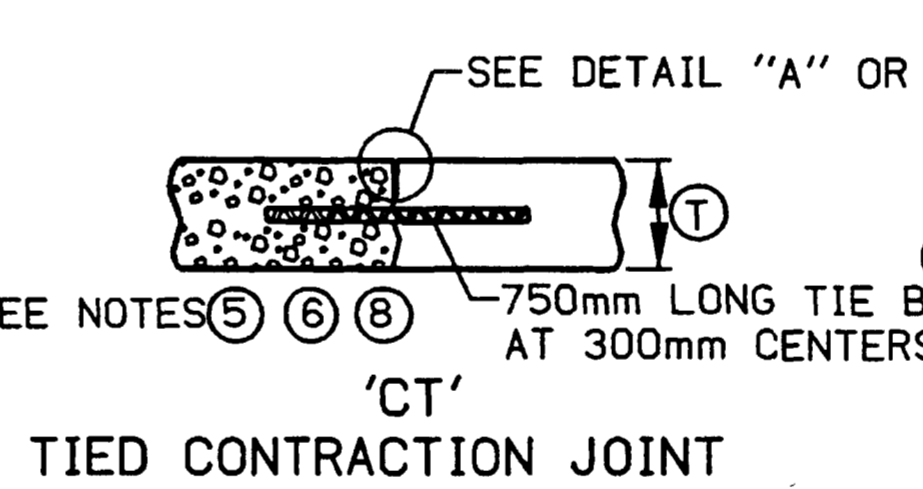
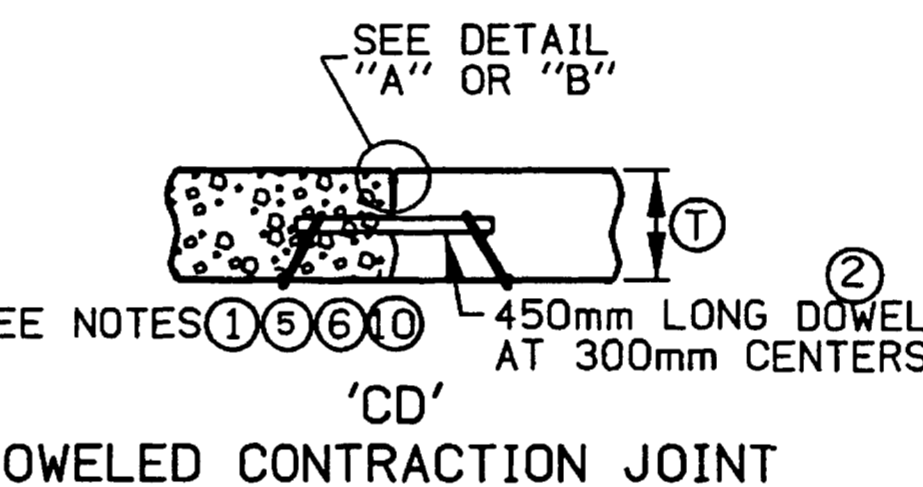
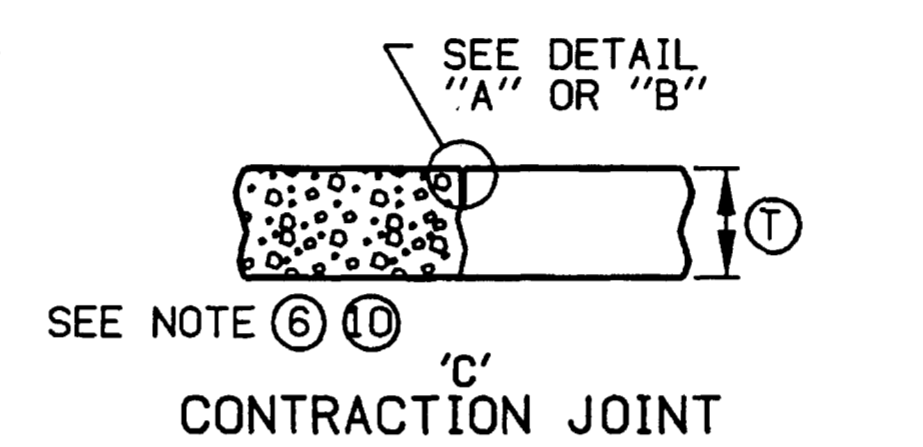
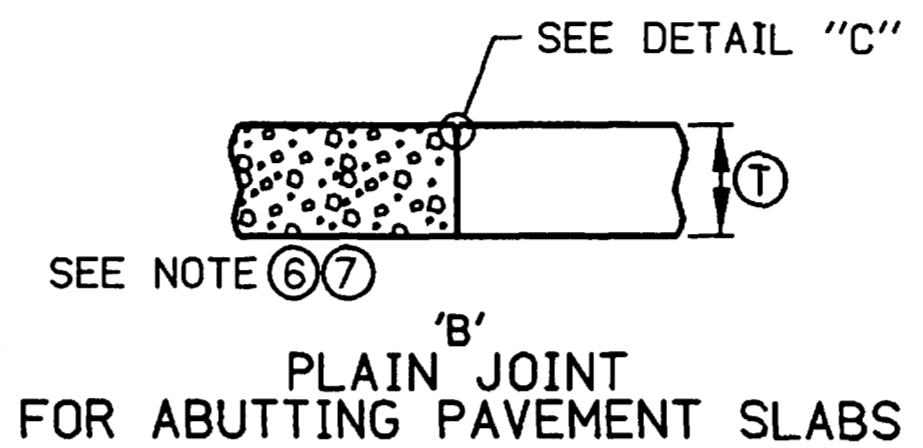
REV.	1
DATE	01/25/01
BY	

DATE: 01-01-98

JOINTS (TRANSVERSE CONTRACTION)

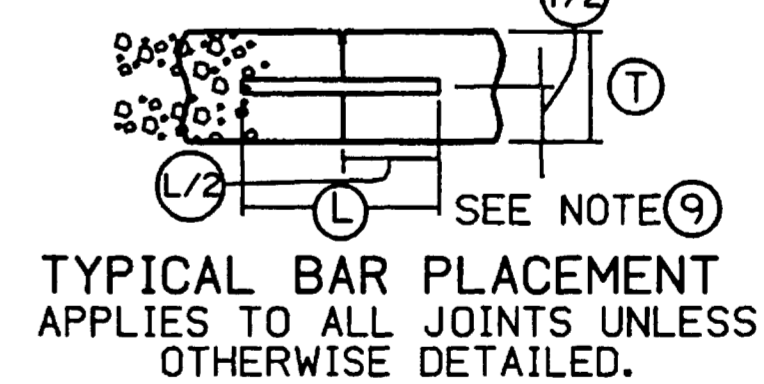
FIGURE: 7010.4A

SHEET 1 OF 2



NOTE: MATCH 'CT', 'CD' OR 'C' JOINT IN PAVEMENT. 'C' JOINT IN CURB

SEE SHEET 2 FOR DETAILS AND GENERAL NOTES.



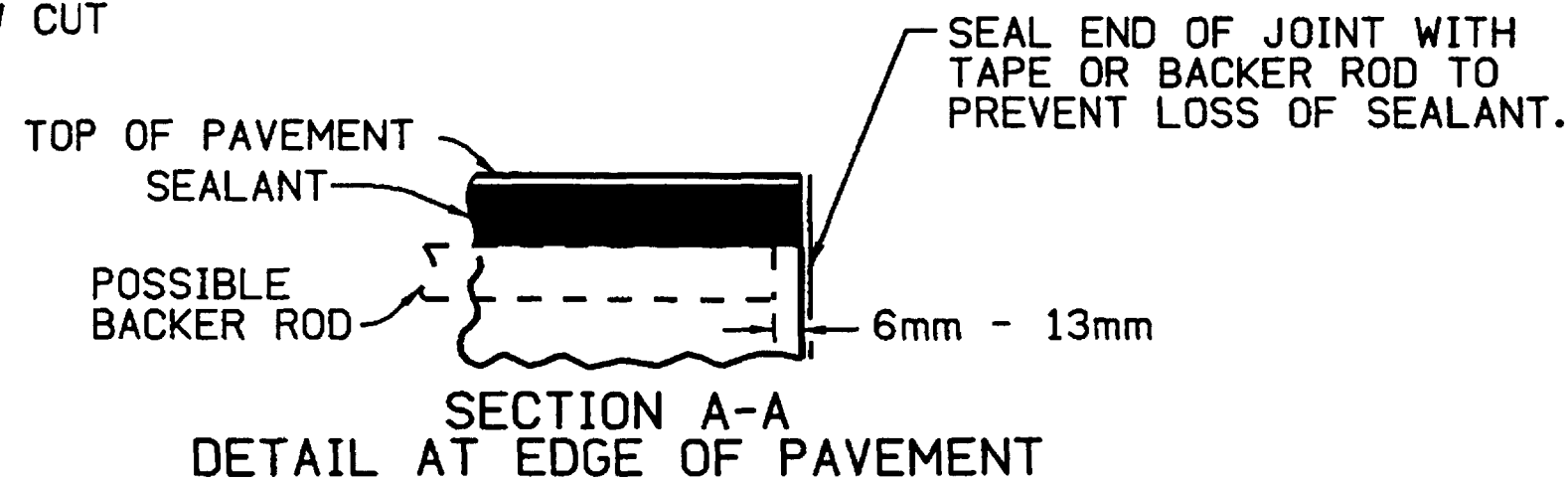
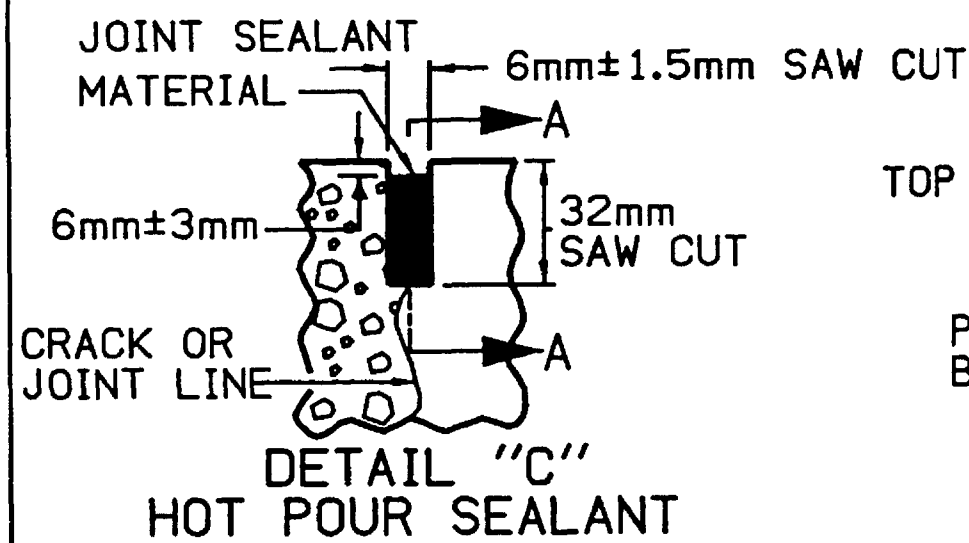
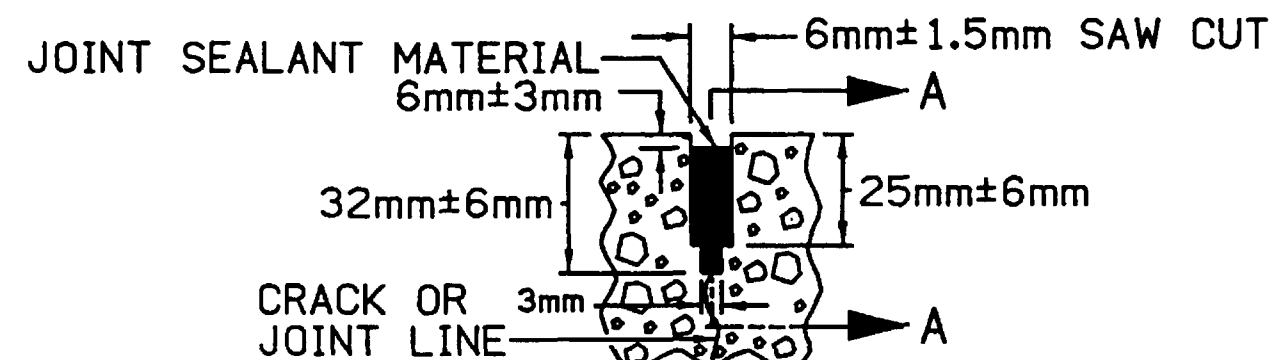
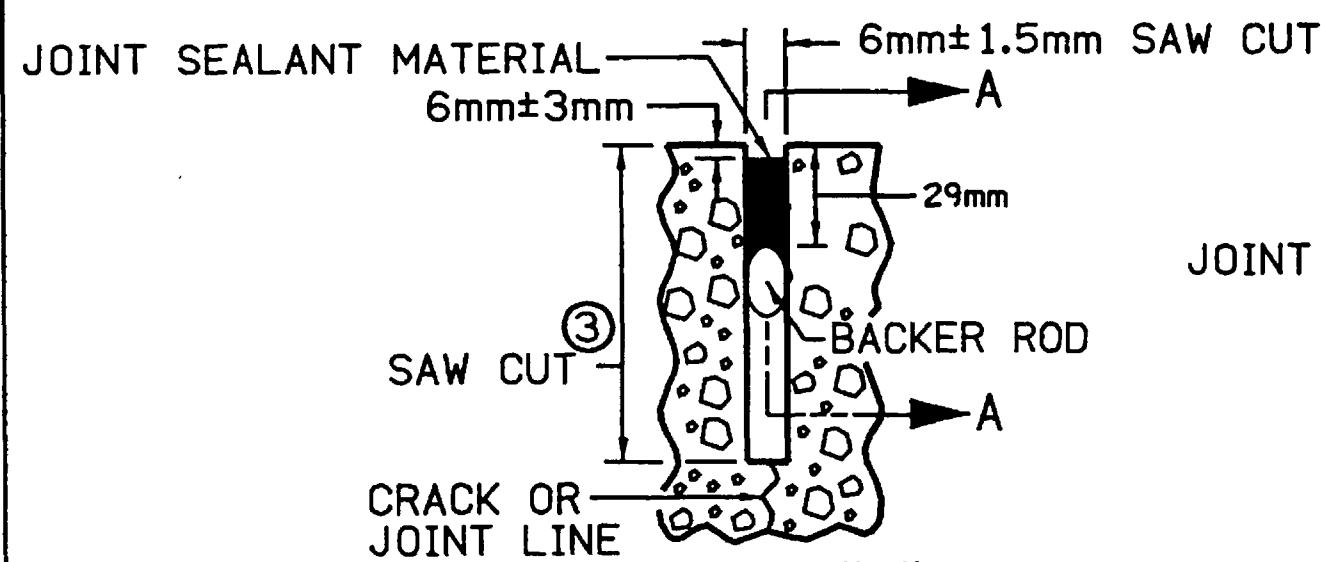
BAR SIZE TABLE			
①	< 200mm	≥ 200mm < 250mm	≥ 250mm
DOWEL SIZE	19mm	32mm	40mm
TIE BAR SIZE	#19	#32	#36

TYPICAL BAR PLACEMENT APPLIES TO ALL JOINTS UNLESS OTHERWISE DETAILED.

REV.	DATE	BY	JOINT LOCATIONS AROUND MANHOLES AND INTAKES	FIGURE: 7010.2B
	DATE: 01/25/01			
			SHEET 1 OF 1	

FIGURES ON THIS SHEET ARE REPRODUCED FROM URBAN STANDARD SPECIFICATIONS FOR PUBLIC IMPROVEMENTS AND HAVE BEEN CONVERTED FROM ENGLISH UNITS TO METRIC UNITS

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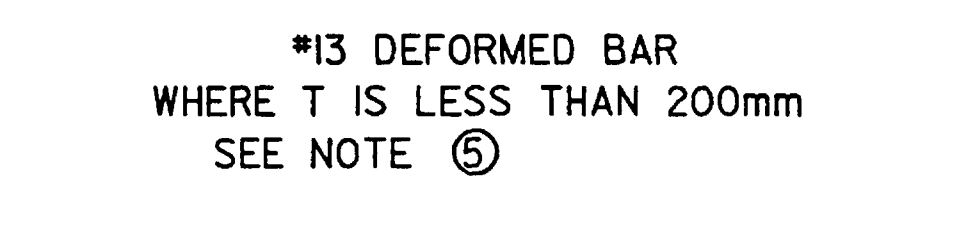
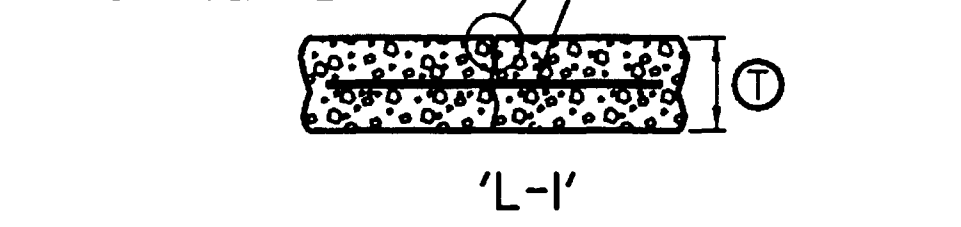
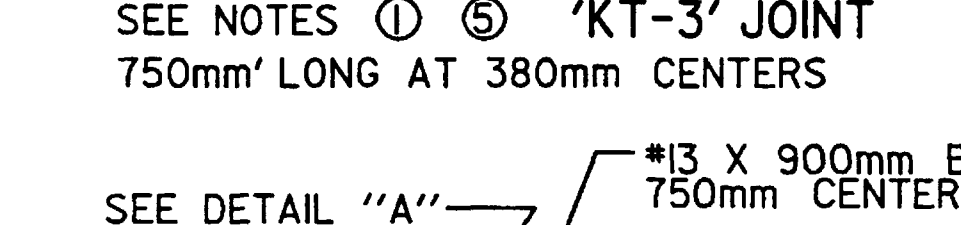
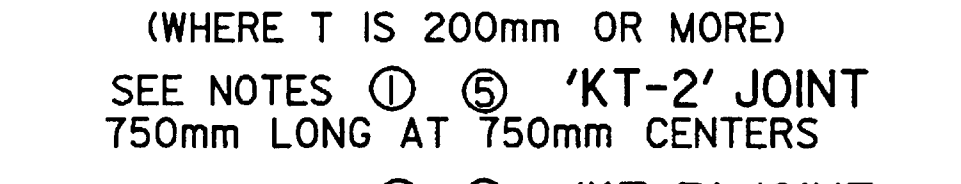
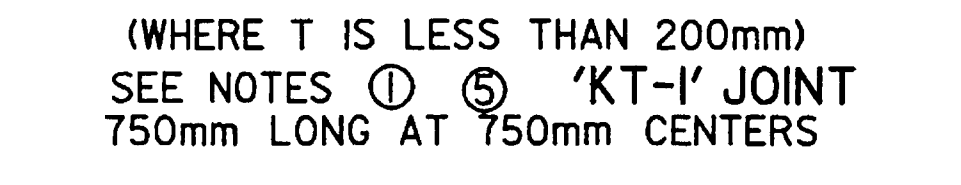
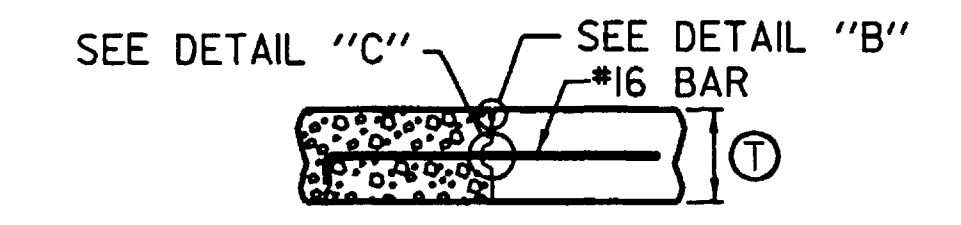
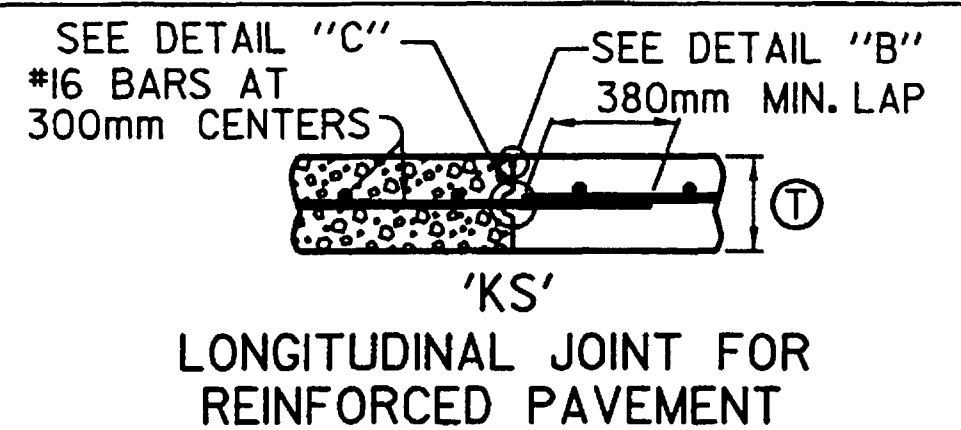
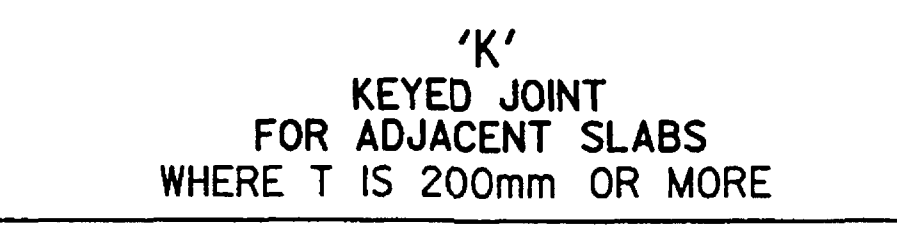
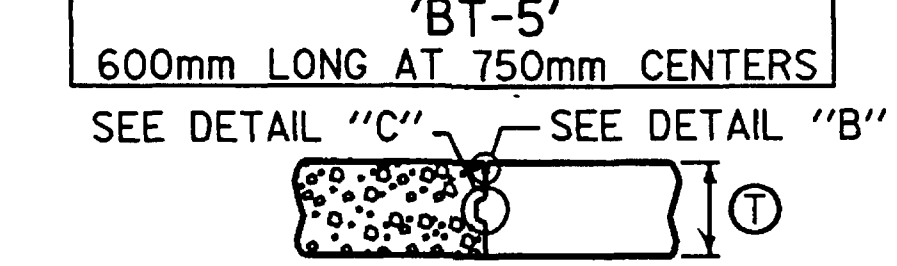
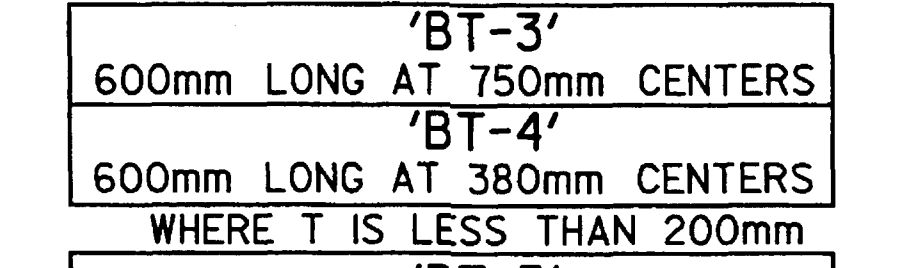
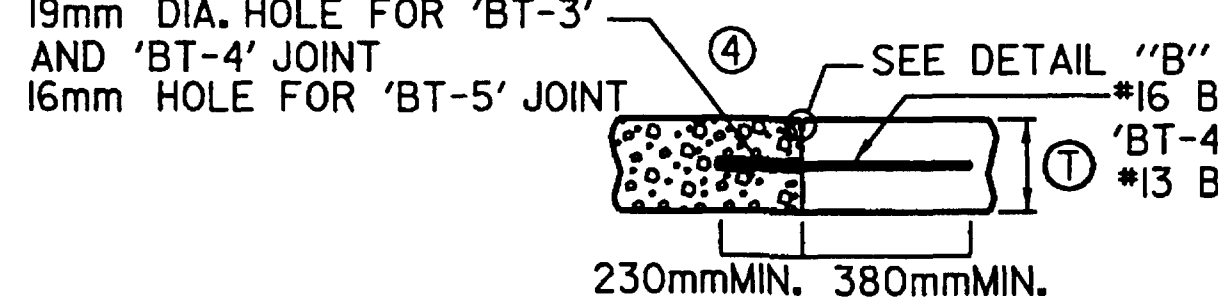
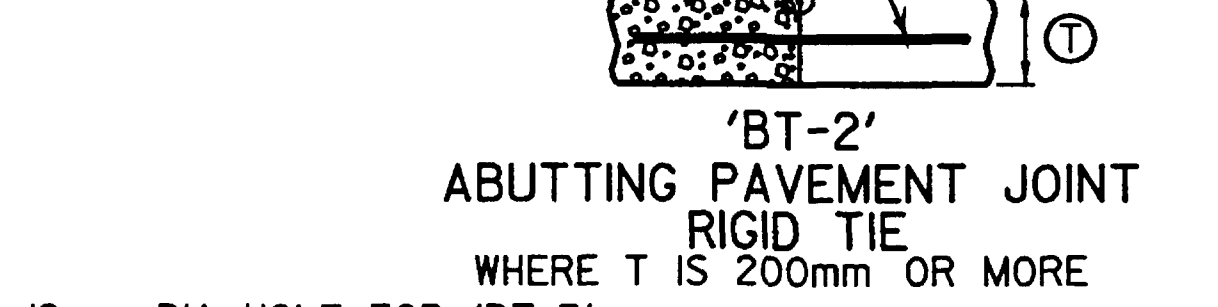
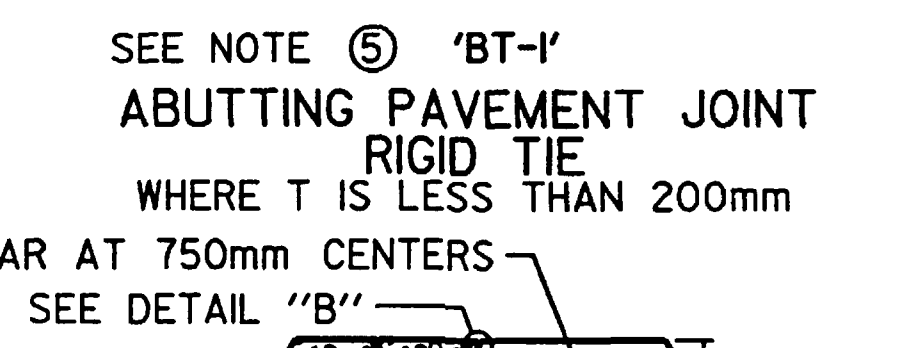
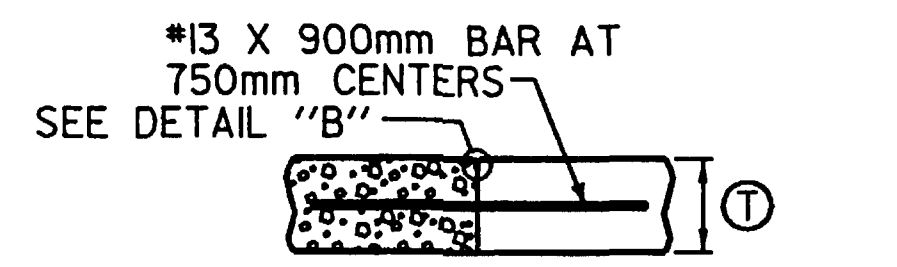
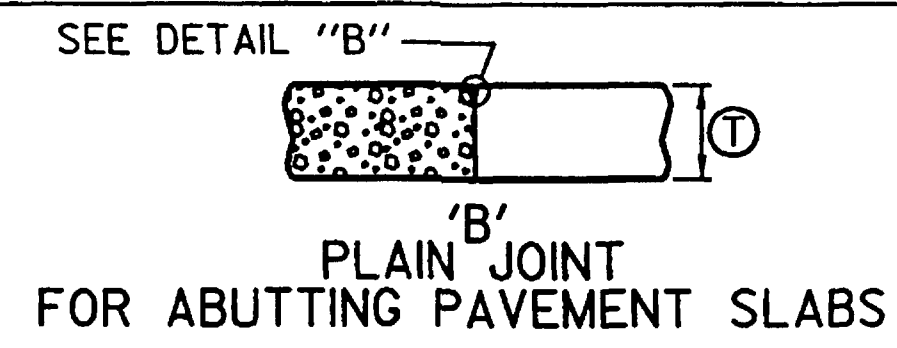
NOTES:

- ① FREE MOVING ENDS OF DOWEL SUPPORT ASSEMBLY SHALL BE PLACED ALTERNATELY ACROSS JOINTS.
- ② REFER TO BAR SIZE TABLE
- ③ DEPTH OF SAWCUT SHALL BE T/3, EXCEPT 'C' JOINT SHALL BE T/4.
- ④ 'DW' JOINT SHALL BE LOCATED AT A MIDPANEL LOCATION BETWEEN FUTURE 'C' OR 'CD' JOINTS. IT SHALL BE NO CLOSER THAN 1500mm TO A 'C' OR 'CD' JOINT.
- ⑤ BARS IN TRANSVERSE JOINTS SHALL BE PLACED SO THAT NO BAR WILL BE CLOSER THAN 150mm TO ANY LONGITUDINAL JOINT (CENTERLINE OR LANELINE). THE DISTANCE TO THE FIRST BAR FROM EDGE OF PAVEMENT WILL VARY FROM 150mm TO 300mm DEPENDING UPON PAVEMENT WIDTH.
- ⑥ JOINTS SHALL BE SEALED ACCORDING TO THE STANDARD AND SUPPLEMENTAL SPECIFICATIONS ON "SEALING JOINTS".
- ⑦ EDGE WITH 6mm TOOL FOR LENGTH OF JOINT INDICATED IF FORMED; EDGING NOT REQUIRED WHEN CUT WITH DIAMOND BLADE SAW. REMOVE HEADER BLOCK AND BOARD WHEN SECOND SLAB IS POURED.
- ⑧ PLACEMENT OF DOWELS OR TIE BARS SHALL BE IN ACCORDANCE WITH SECTION 7010, 3.04 F.
- ⑨ WHEN TIEING INTO OLD PAVEMENT, ① REPRESENTS THE DEPTH OF SOUND PORTLAND CEMENT CONCRETE.
- ⑩ UNLESS OTHERWISE SPECIFIED, TRANSVERSE CONTRACTION JOINTS IN MAINLINE PAVEMENT SHALL BE 'CD' WHEN ① IS GREATER OR EQUAL TO 200mm. 'C' WHEN ① IS LESS THAN 200mm.
- ⑪ 'RT' JOINT MAY BE USED IN LIEU OF 'DW' JOINT AT THE END OF THE DAYS WORK. ANY PAVEMENT DAMAGED DUE TO THE DRILLING SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE.

REV.	1
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JOINTS (LONGITUDINAL CONTRACTION)

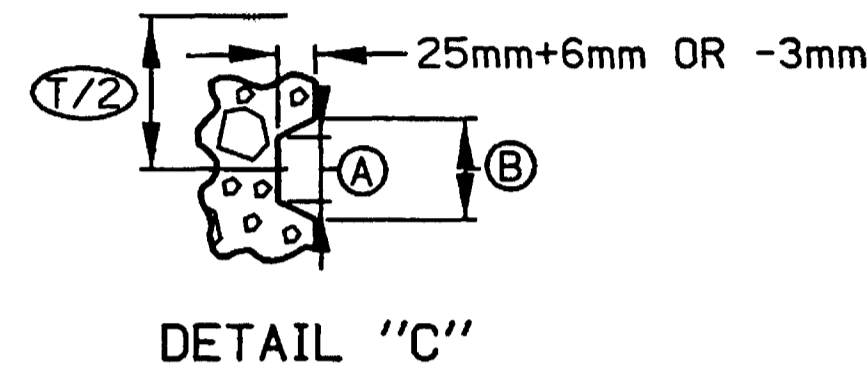
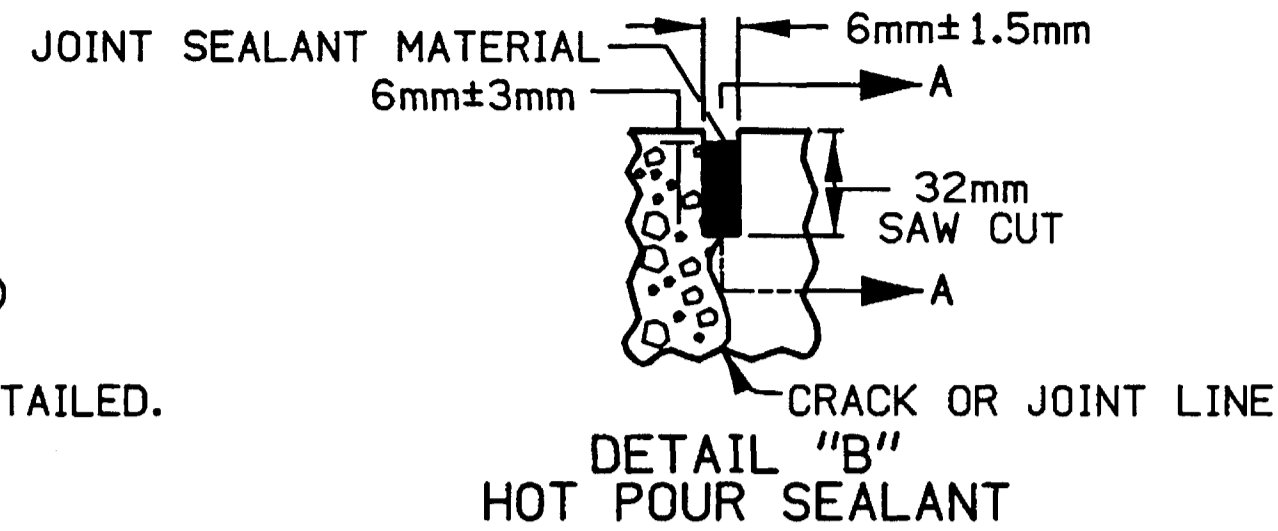
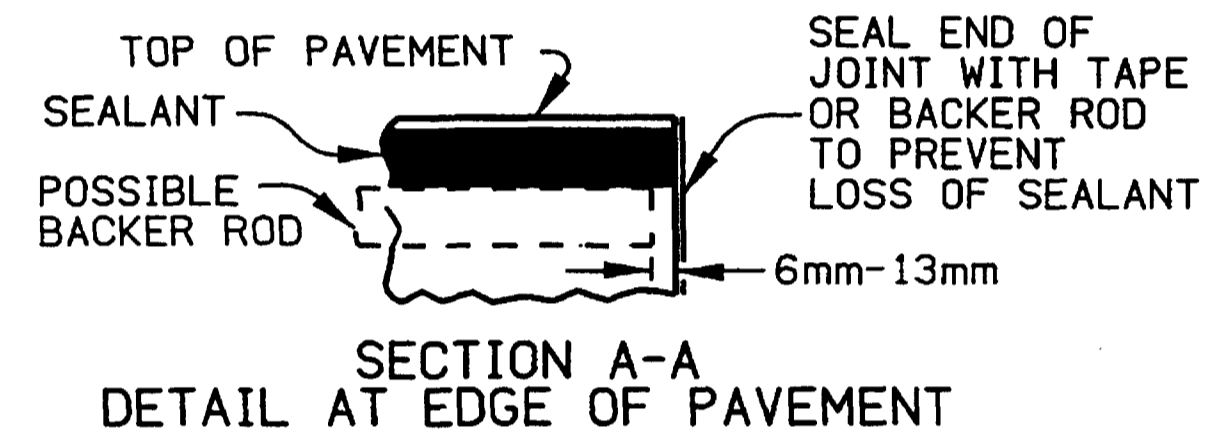
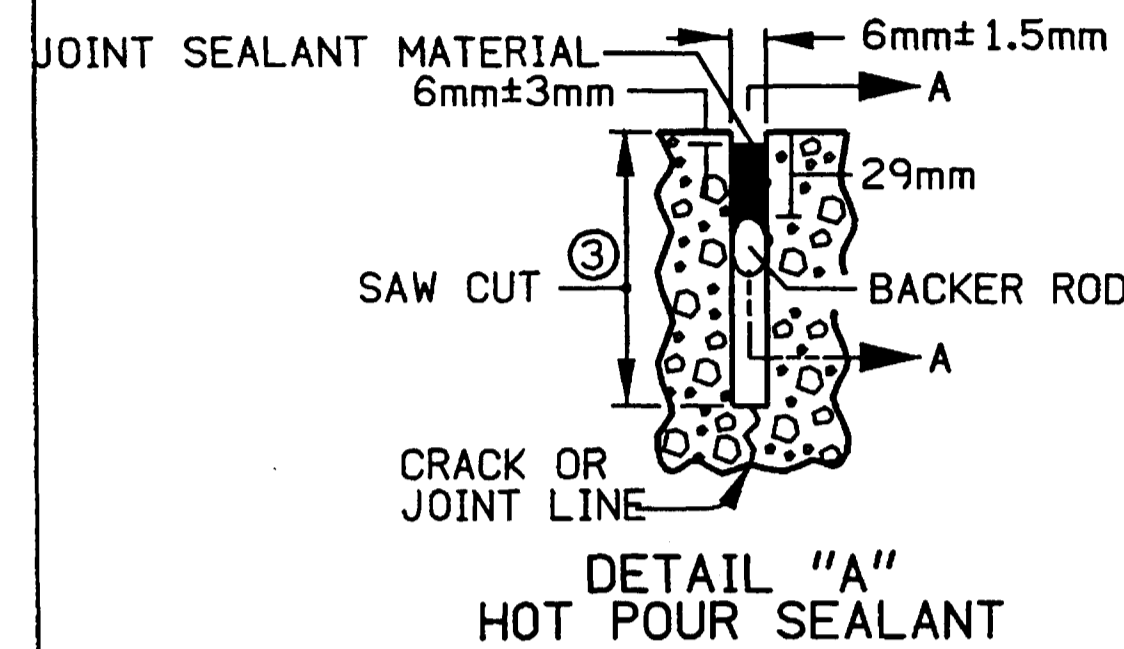
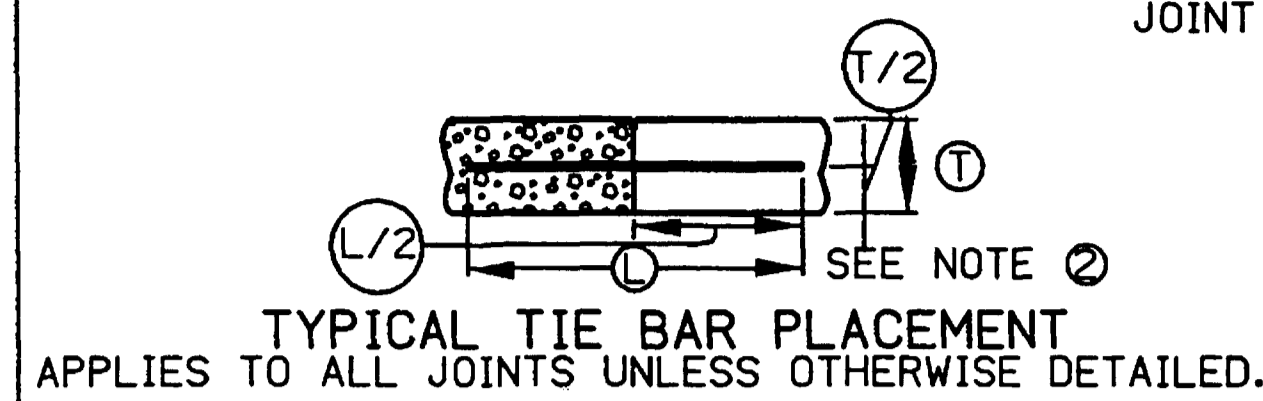
SHEET 1 OF 2



REV.	1	DATE	01/25/01	BY		FIGURE: 7010.4A
DATE: 01-01-98						SHEET 2 OF 2

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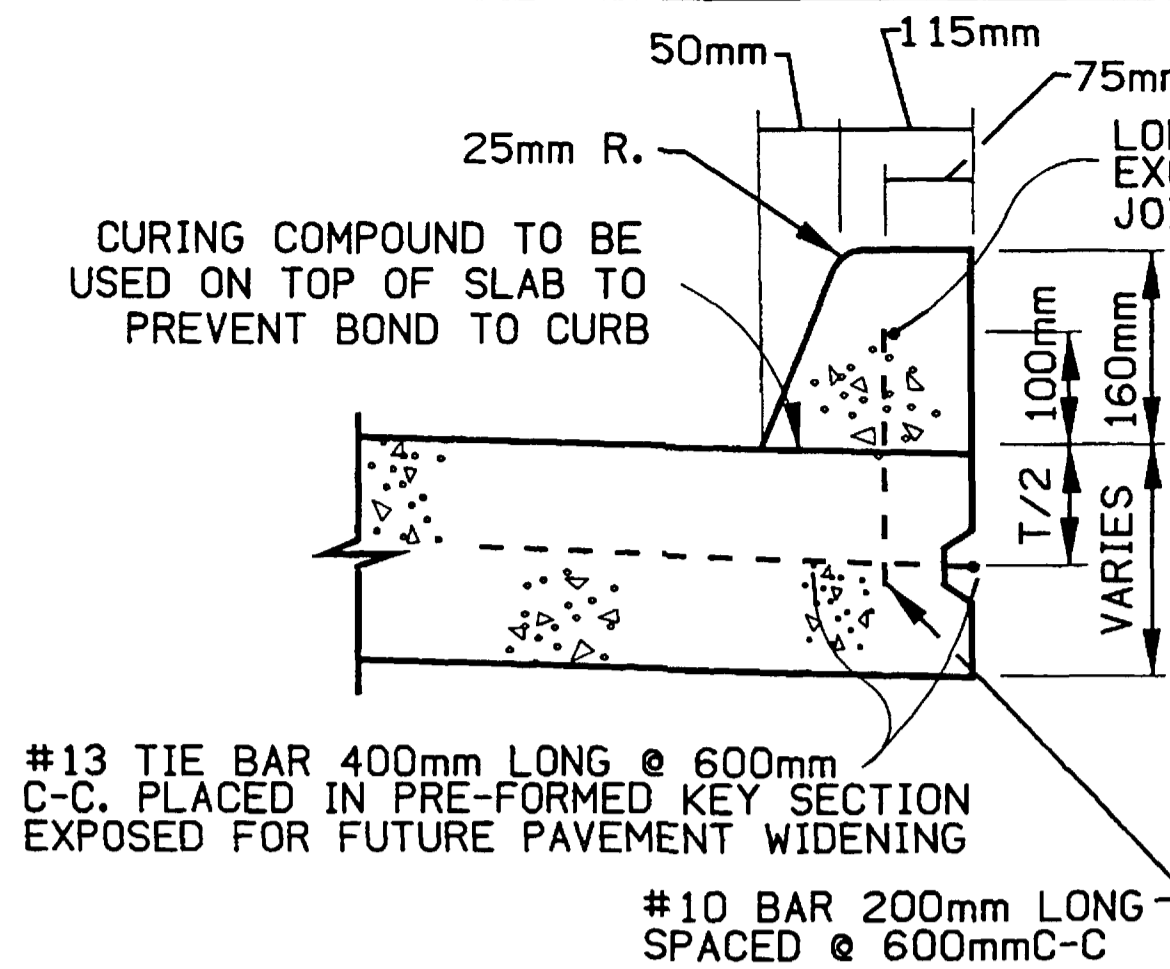


KEYWAY DIMENSIONS			
KEYWAY TYPE	PAVEMENT THICKNESS	(A)	(B)
STANDARD	200mm OR GREATER	45mm	70mm
NARROW	LESS THAN 200mm	25mm	50mm

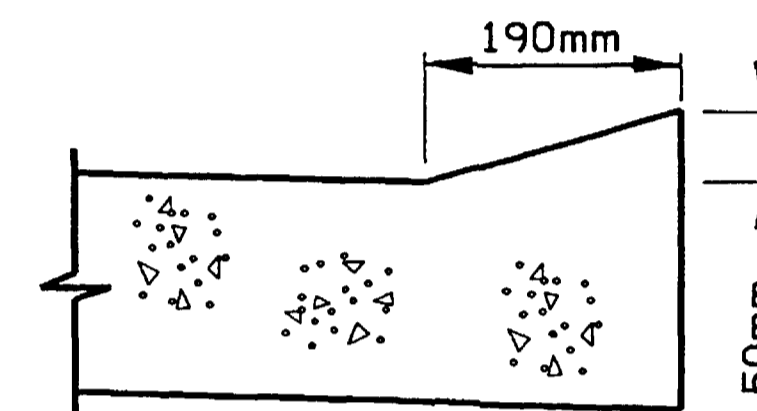
NOTES:

- BAR SUPPORTS MAY BE NECESSARY FOR FIXED FORM PAVING, SUBJECT TO THE JURISDICTIONAL ENGINEER'S APPROVAL, TO INSURE THE BAR REMAINS IN A HORIZONTAL POSITION IN THE PLASTIC CONCRETE.
- WHEN TIEING INTO OLD PAVEMENT, (T) REPRESENTS THE DEPTH OF SOUND PORTLAND CEMENT CONCRETE.
- DEPTH OF SAWCUT SHALL BE T/3.
- PLACEMENT OF DOWELS OR TIE BARS SHALL BE IN ACCORDANCE WITH SECTION 7010, 3.04. EPOXY FOR ANCHORING BARS INTO EXISTING PAVEMENT SHALL BE IN ACCORDANCE WITH SECTION 7010, 2.02 O.
- THE FOLLOWING JOINTS ARE INTERCHANGEABLE, SUBJECT TO THE POURING SEQUENCE:
'BT-1' AND 'L-1'
'KT-2' AND 'L-2'
'KT-3' AND 'L-3'

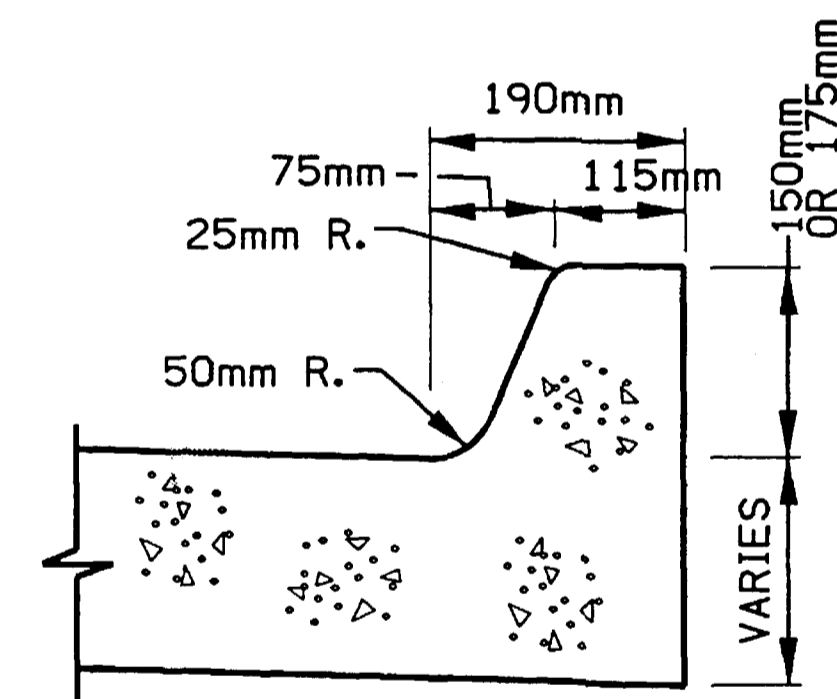
1	01/25/01				
REV.	DATE	BY	JOINTS (LONGITUDINAL CONTRACTION)		FIGURE: 7010.4B
	DATE: 01-01-98				SHEET 2 OF 2



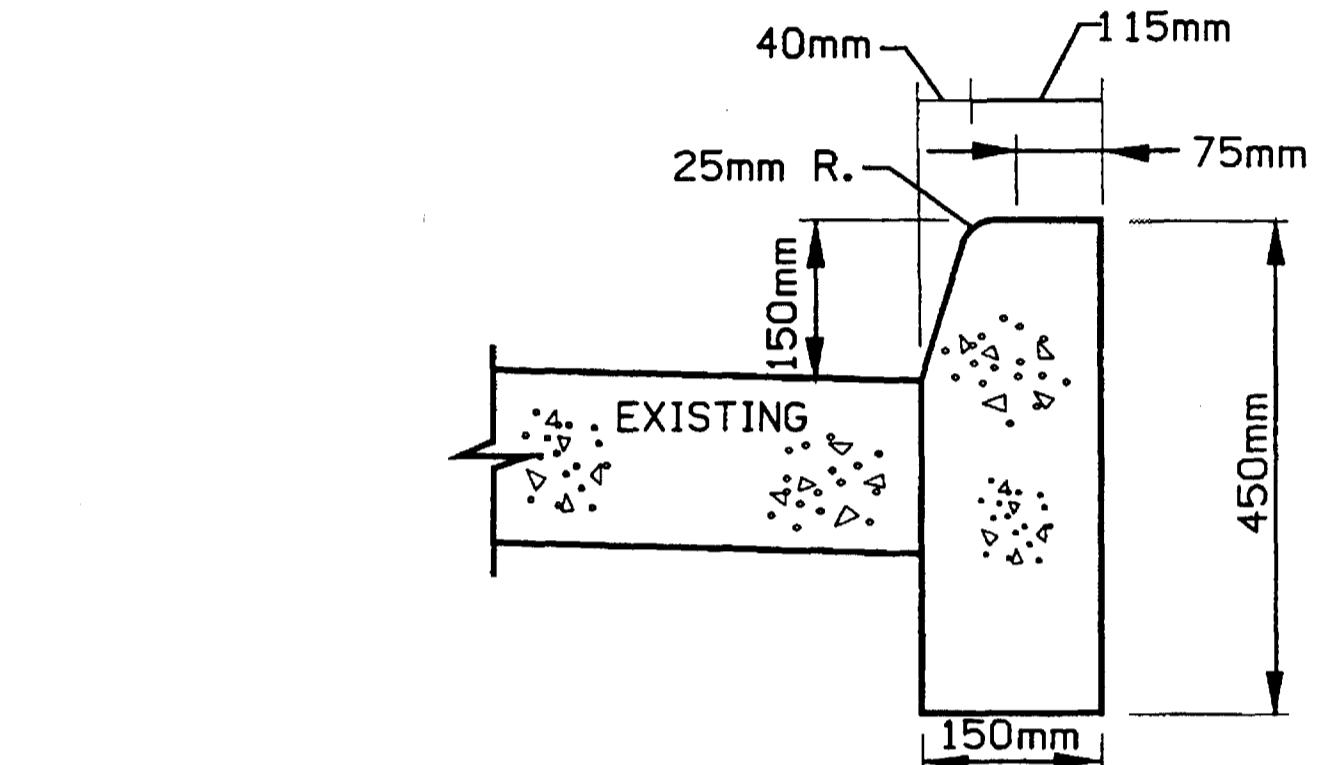
REMOVABLE P.C.C. CURB



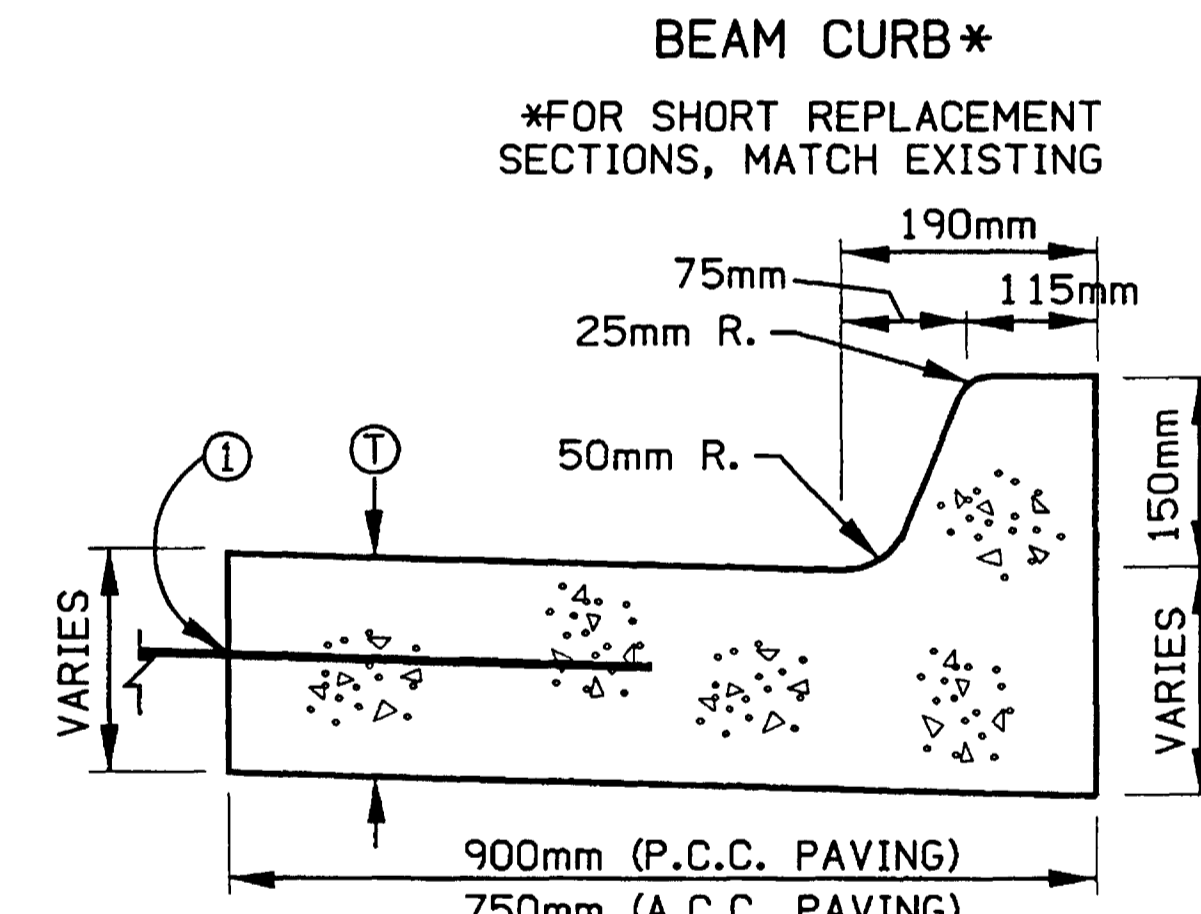
DRIVEWAY DROP CURB



150mm OR 175mm P.C.C. INTEGRAL CURB



INTEGRAL 150mm SLOPED CURB



STANDARD P.C.C. CURB & GUTTER

- (1) 'BT-1' OR 'L-1' JOINT WHERE T IS LESS THAN 200mm
'KT-2' OR 'L-2' JOINT WHERE T IS GREATER THAN OR EQUAL TO 200mm

1	01/25/01				
REV.	DATE	BY	P.C. CONCRETE CURB DETAILS		FIGURE: 7010.7A
	DATE: 03-03-98				SHEET 1 OF 1

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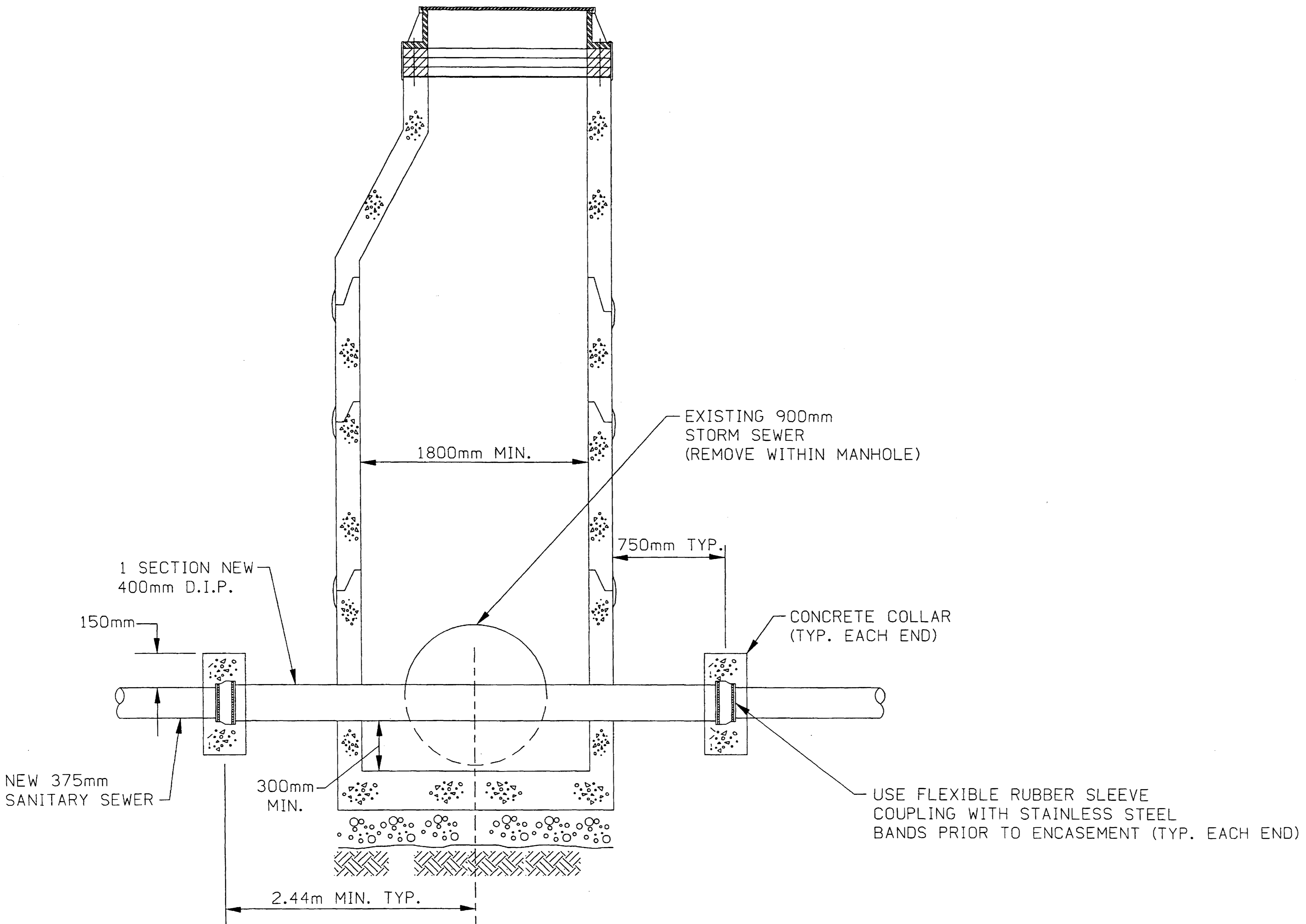


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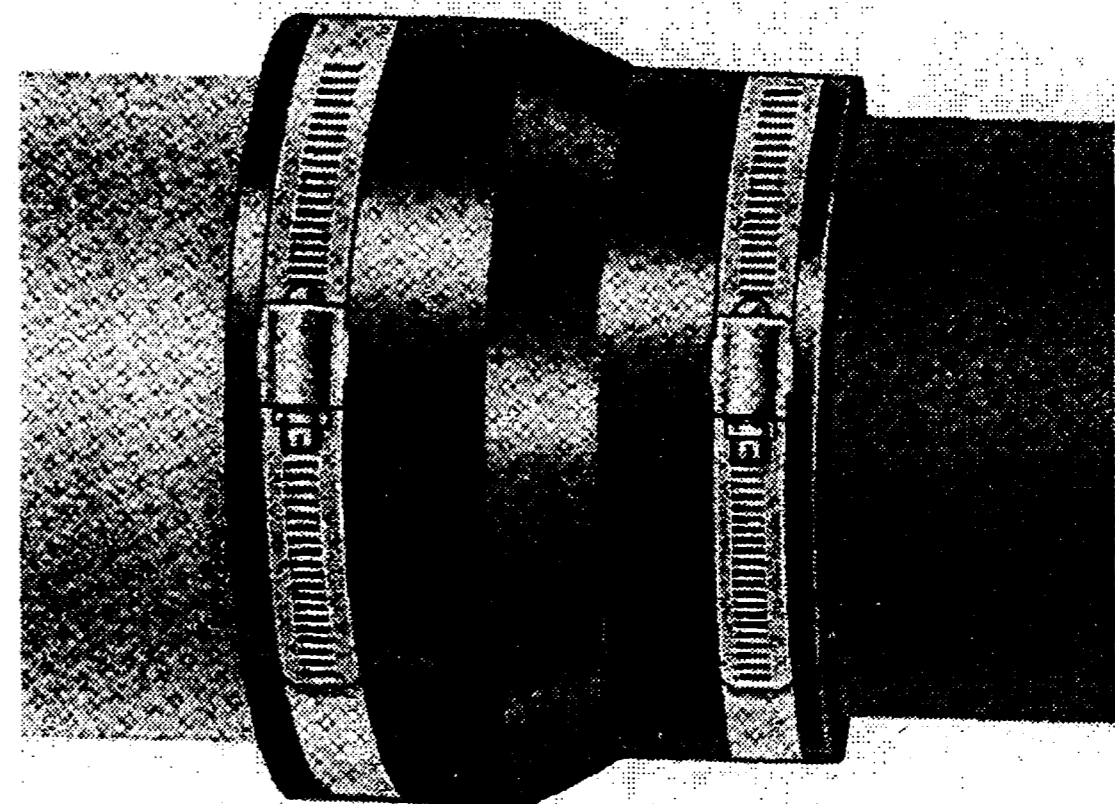
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"CONFLICT" MANHOLE FOR SANITARY SEWER/STORM SEWER INTERSECTION



FLEXIBLE RUBBER SLEEVE COUPLING