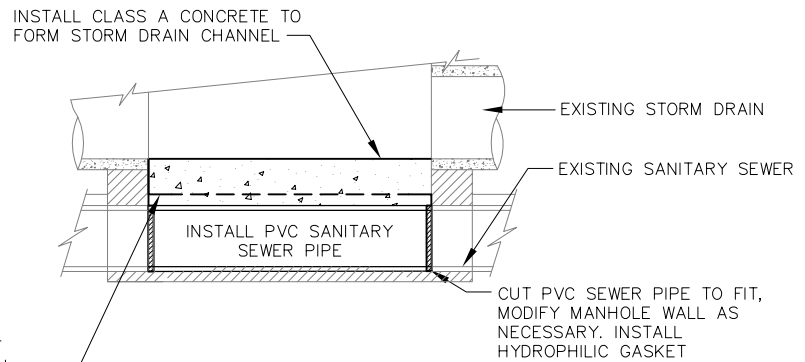


**CROSS SECTION**



REMOVE BRICK INVERT AS NEEDED TO INSTALL PVC SANITARY SEWER PIPE TO APPROPRIATE ELEVATIONS

**SECTION A-A**

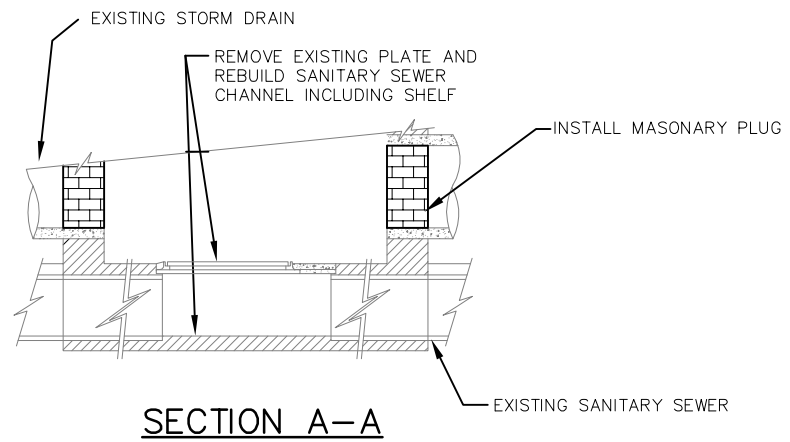
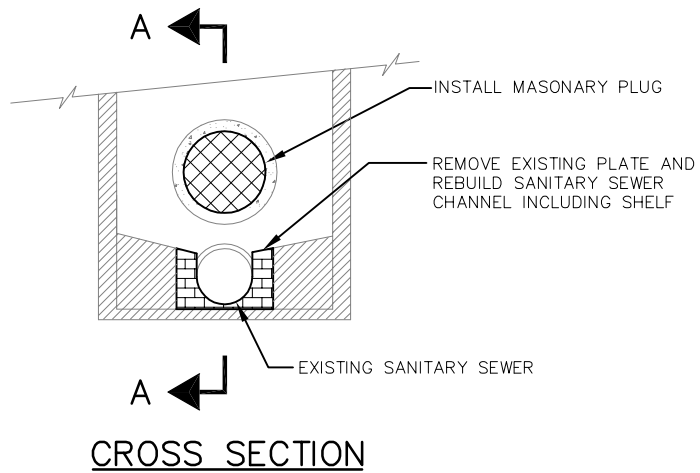
95% DETAILS  
NOT FOR CONSTRUCTION



**COMMON MANHOLE SEPARATION - TYPE 2  
COMMON MANHOLE CONVERTED TO DRAIN MANHOLE DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.10</b>
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95% DETAILS  
NOT FOR CONSTRUCTION



**COMMON MANHOLE SEPARATION - TYPE 5  
COMMON MANHOLE CONVERTED TO SEWER MANHOLE DETAIL**

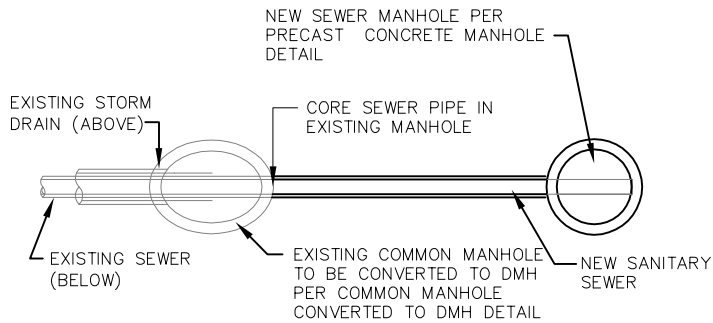
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

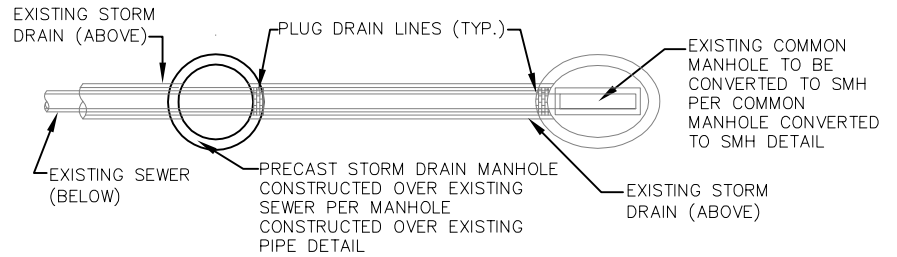
SPEC. SECTION REF#: 02252

**2252.13**



PLAN  
END OF LINE COMMON MANHOLE TO BE  
CONVERTED TO DMH DETAIL

- NOTES:
1. UNLESS OTHERWISE NOTED, PROPOSED PIPE TO MATCH INSIDE DIAMETER OF EXISTING PIPE
  2. UNLESS OTHERWISE NOTED, PROPOSED SEWER SHALL BE PVC AND PROPOSED DRAIN SHALL BE RCP



PLAN  
END OF LINE COMMON MANHOLE TO BE  
CONVERTED TO SMH DETAIL

- NOTES:
1. LOCATE ALL EXISTING STORM DRAIN CONNECTIONS WITHIN THE PORTION OF EXISTING STORM DRAIN THAT IS TO BE ABANDONED AND RECONNECT THOSE CONNECTIONS TO THE STORM DRAIN.
  2. ANY PORTION OF THE EXISTING STORM DRAIN THAT IS TO BE ABANDONED IN PLACE SHALL BE FILLED WITH FLOWABLE CONCRETE FILL AND PLUGGED.
  3. VERIFY ALL DRAIN CONNECTIONS TO THE PROPOSED ABANDONED SECTION OF DRAIN, IF ANY LIVE CONNECTIONS EXIST, COORDINATE WITH THE ENGINEER TO PROVIDE RECONNECTION. IF SERVICE IS NOT LIVE, THE CONNECTION AT THE STORM DRAIN SHALL BE PLUGGED

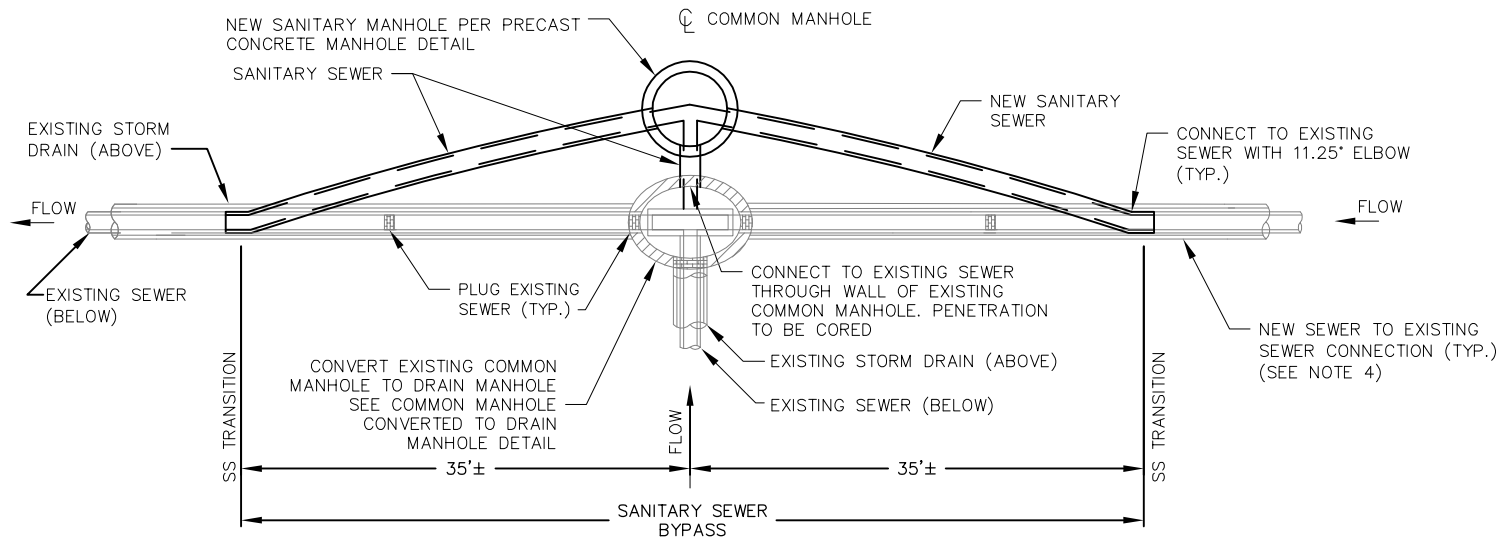
95% DETAILS  
 NOT FOR CONSTRUCTION



**COMMON MANHOLE SEPARATION - TYPE 1**  
**END OF LINE CONVERSIONS**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.9</b>
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**NOTES:**

1. LOCATE ALL EXISTING SEWER CONNECTIONS WITHIN THE PORTION OF EXISTING SEWER THAT IS TO BE ABANDONED AND RECONNECT THOSE CONNECTIONS TO THE SEWER.
2. ANY PORTION OF THE EXISTING SEWER THAT IS TO BE ABANDONED IN PLACE SHALL BE FILLED WITH FLOWABLE CONCRETE FILL AND PLUGGED.
3. VERIFY ALL SEWER CONNECTIONS TO THE PROPOSED ABANDONED SECTION OF SEWER, IF ANY LIVE CONNECTIONS EXIST, COORDINATE WITH THE ENGINEER TO PROVIDE RECONNECTION. IF SERVICE IS NOT LIVE, THE CONNECTION AT THE SEWER SHALL BE PLUGGED.
4. SEE THE APPROPRIATE SPECIFICATION OR STANDARD FOR THE PROPOSED SEWER MATERIAL FOR PIPE TO PIPE CONNECTION REQUIREMENTS.

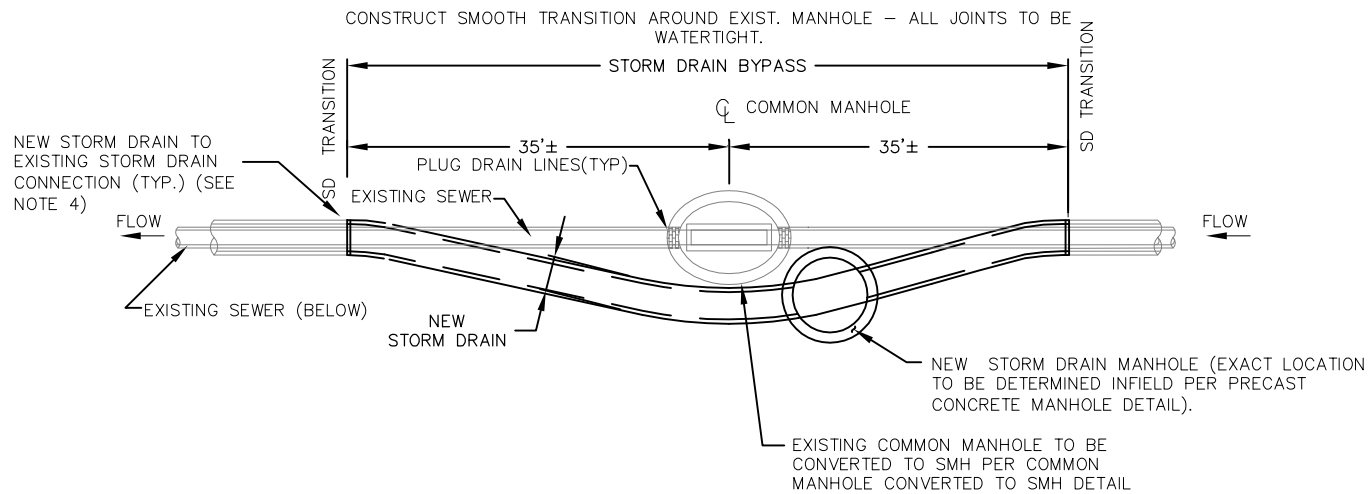
95% DETAILS  
NOT FOR CONSTRUCTION



**COMMON MANHOLE SEPARATION - TYPE 4  
SANITARY SEWER BYPASS (WITH LATERAL)**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.12</b>
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NOTES:

1. LOCATE ALL EXISTING STORM DRAIN CONNECTIONS WITHIN THE PORTION OF EXISTING STORM DRAIN THAT IS TO BE ABANDONED AND RECONNECT THOSE CONNECTIONS TO THE STORM DRAIN.
2. ANY PORTION OF THE EXISTING STORM DRAIN THAT IS TO BE ABANDONED IN PLACE SHALL BE FILLED WITH FLOWABLE CONCRETE FILL AND PLUGGED.
3. VERIFY ALL DRAIN CONNECTIONS TO THE PROPOSED ABANDONED SECTION OF DRAIN, IF ANY LIVE CONNECTIONS EXIST, COORDINATE WITH THE ENGINEER TO PROVIDE RECONNECTION. IF SERVICE IS NOT LIVE, THE CONNECTION AT THE STORM DRAIN SHALL BE PLUGGED.
4. SEE THE APPROPRIATE SPECIFICATION OR STANDARD FOR THE PROPOSED STORM DRAIN MATERIAL FOR PIPE TO PIPE CONNECTION REQUIREMENTS.

95% DETAILS  
NOT FOR CONSTRUCTION

CAMBRIDGE  
DEPARTMENT  
OF PUBLIC  
**THE WORKS**

COMMON MANHOLE SEPARATION - TYPE 3  
STORM DRAIN BYPASS

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

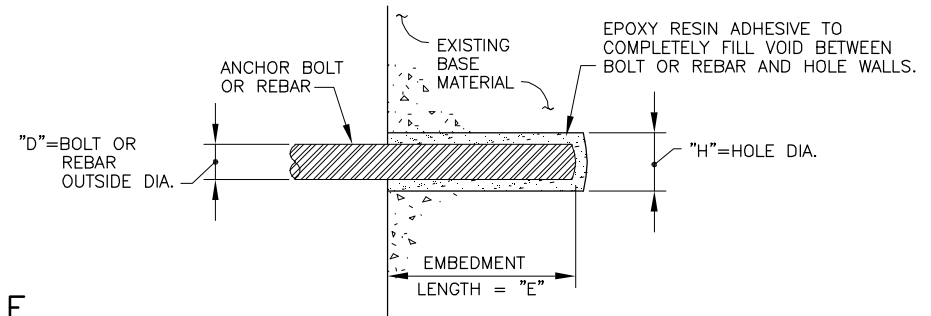
SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02252

2252.11

	BOLT OR REBAR OUTSIDE DIAMETER "D" (INCHES)	REQUIRED EMBEDMENT LENGTH "E" (INCHES)	REQUIRED HOLE DIAMETER "H" (INCHES)	REQUIRED ALLOWABLE ADHESIVE BOND STRENGTH IN 4,000 psi CONCRETE USING S.F. = 4.0
ANCHOR BOLTS	3/8	3 3/8	7/16	2,270
	1/2	4 1/2	9/16	4,360
	5/8	5 5/8	3/4	7,545
	3/4	6 3/4	7/8	9,735
	7/8	7 7/8	1	10,595
	1	9	1 1/8	14,890
	1 1/4	11 1/4	1 3/8	22,940
	1 1/2	13 1/2	1 5/8	32,360
REBAR	#3 BAR	4 1/2	1/2	3,970
	#4 BAR	6	5/8	6,590
	#5 BAR	7 1/2	3/4	9,825
	#6 BAR	9	7/8	13,735
	#7 BAR	10 1/2	1	18,210
	#8 BAR	12	1 1/8	23,465
	#9 BAR	13 1/2	1 3/8	32,015



## TYPICAL EPOXY DOWELLING DETAIL & SCHEDULE

### NOTES:

1. DRILL HOLES, CLEAN OUT AND INSTALL EPOXY AND BOLT OR REBAR IN STRICT CONFORMANCE WITH EPOXY MANUFACTURER'S WRITTEN RECOMMENDATIONS. REFER TO CAST IN PLACE CONCRETE FOR EPOXY REQUIREMENTS.
2. UNLESS OTHERWISE INDICATED ON DRAWINGS, PROVIDE THE EMBEDMENT LENGTH AND HOLE DIAMETER INDICATED IN THE SCHEDULE ABOVE, FOR THE BOLT OR REBAR SIZE REQUIRED.
3. REQUIRED EPOXY BOND STRENGTHS ARE BASED ON A SAFETY FACTOR (S.F.) OF 4.0.
4. PROVIDE STAINLESS STEEL SCREEN RODS IN HOLES IN HOLLOW BASE MATERIALS (MASONRY CAVITY WALLS).
5. UNLESS OTHERWISE INDICATED ALL ANCHOR BOLTS SHALL BE OF GALVANIZED A36 THREADED ROD STOCK. WHERE STAINLESS STEEL ANCHORS ARE REQUIRED THEY SHALL BE AISI TYPE 316 (ASTM A193).



## EPOXY DOWELL DETAIL

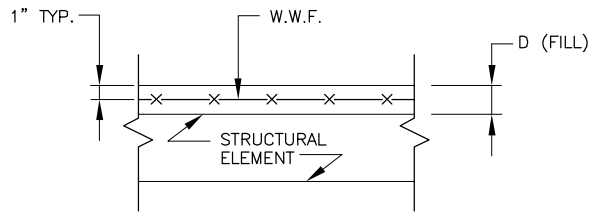
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 03300

3300.2



NOTE:  
 1. PROVIDE W.W.F. IN CONCRETE FILL, SIZE AS TABULATED, UNLESS OTHERWISE NOTED.

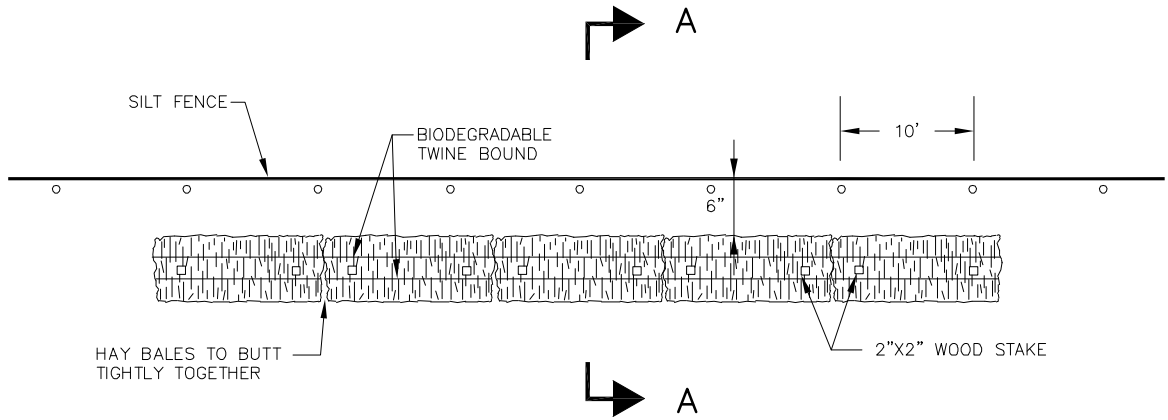
D	W.W.F.
2" TO 4"	6x6 - W 1.4 x W 1.4
5" TO 8"	6x6 - W 2.0 x W 2.0
9" PLUS	6x6 - W 2.9 x W 2.9



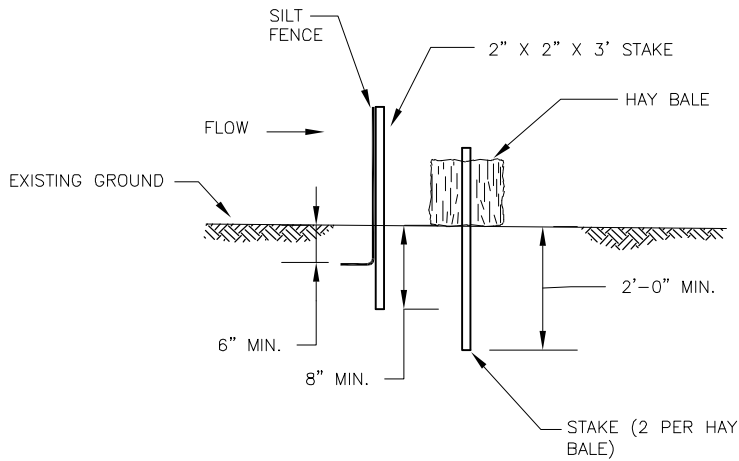
**TYPICAL WELDED WIRE FABRIC  
 FOR CONCRETE FILL DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 03300	<b>3300.3</b>
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**EROSION BARRIER  
HAY BALES AND SILT FENCE PLAN**



**SECTION A-A**



**SILT FENCE**

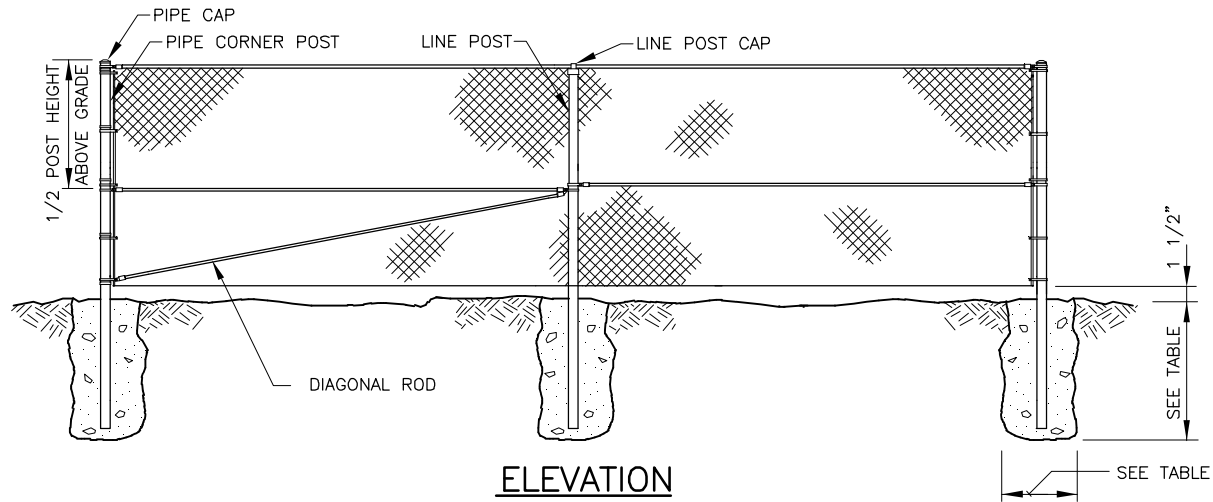
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 2/2005

SPEC. SECTION REF#: 01500

**1500.1**



**ELEVATION**

POST SETTING REQUIREMENT			
TYPE OF POST	HOLE DIA. AT TOP*	HOLE DEPTH	POST EMBEDMENT
LINE	9"	38"	36"
TERMINAL	12"	38"	36"

\*MIN. HOLE DIAMETER IN SOFT OR LOOSE SOIL SHALL BE 18"

**NOTES:**

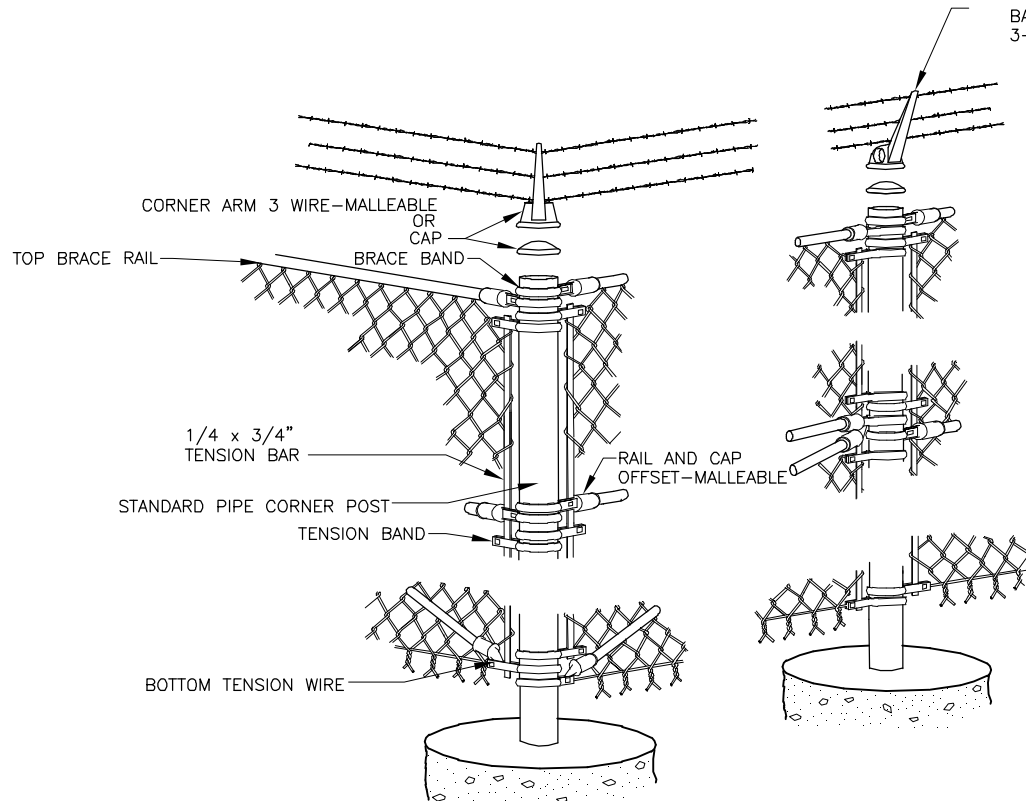
1. POST SPACING: LINE POSTS SHALL BE EVENLY SPACED, CENTER TO CENTER.
2. BARBED WIRE ARM WHERE REQUIRED SHALL BE PER CHAIN LINK FENCES AND GATES, AND CHAIN LINK FENCE DETAIL 2.
3. POST FOOTING SHALL HAVE A 1" CROWN FINISH
4. SEE CHAIN LINK FENCE DETAIL 2 FOR CHAIN LINK FENCE ASSEMBLY, ALTERNATE POSTS, AND FABRIC SELVAGE DETAILS.



**CHAIN LINK FENCE DETAIL 1**

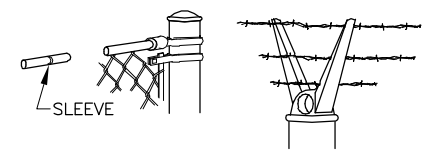
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02830	<b>2830.1</b>
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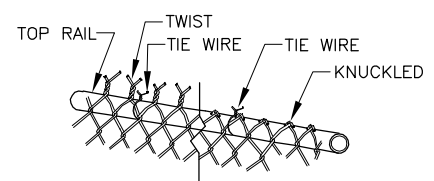
**CHAIN LINK FENCE ASSEMBLY**  
WITH ONE-PIECE BARBED WIRE ARM (3-WIRE)

BARBED WIRE ARM  
3-WIRE-ONE PIECE

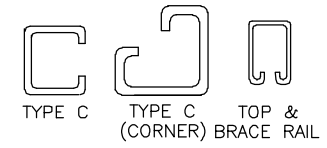


ONE-PIECE (6-WIRE)

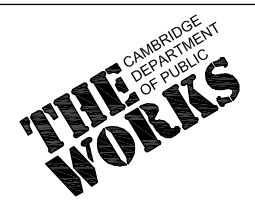
**BARBED WIRE ARM**



**FABRIC SELVAGE**



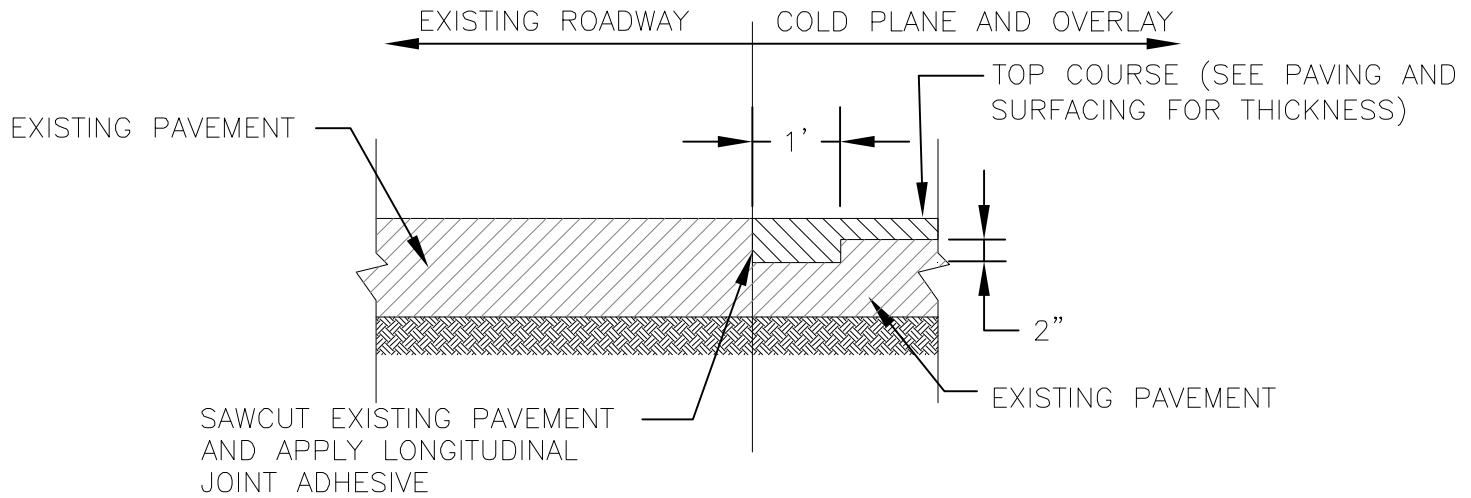
**ALTERNATE POSTS**  
SEE CHAIN LINK FENCES AND GATES



**CHAIN LINK FENCE DETAIL 2**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02830	<b>2830.2</b>
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NOTES:

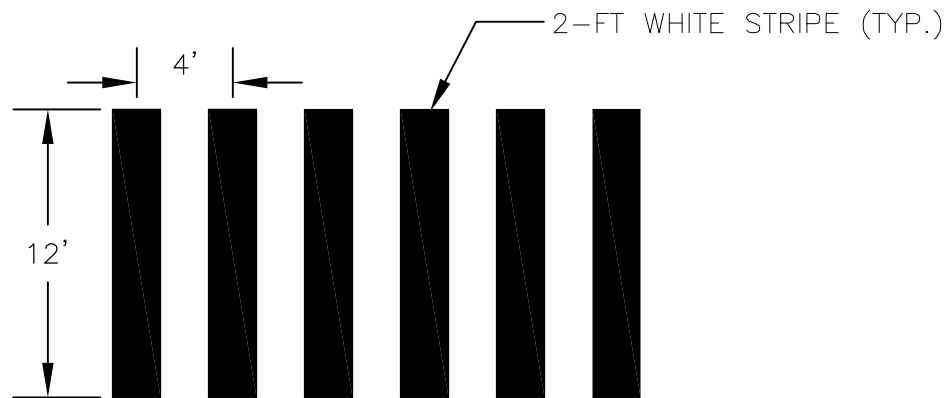
1. CLEAN ALL COLD PLANED SURFACES BEFORE APPLYING JOINT ADHESIVE AND FINAL PAVEMENT



**COLD PLANE AND OVERLAY JOINT DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02500	<b>2500.2</b>
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CAMBRIDGE STANDARD CROSSWALK



CAMBRIDGE STANDARD CROSSWALK

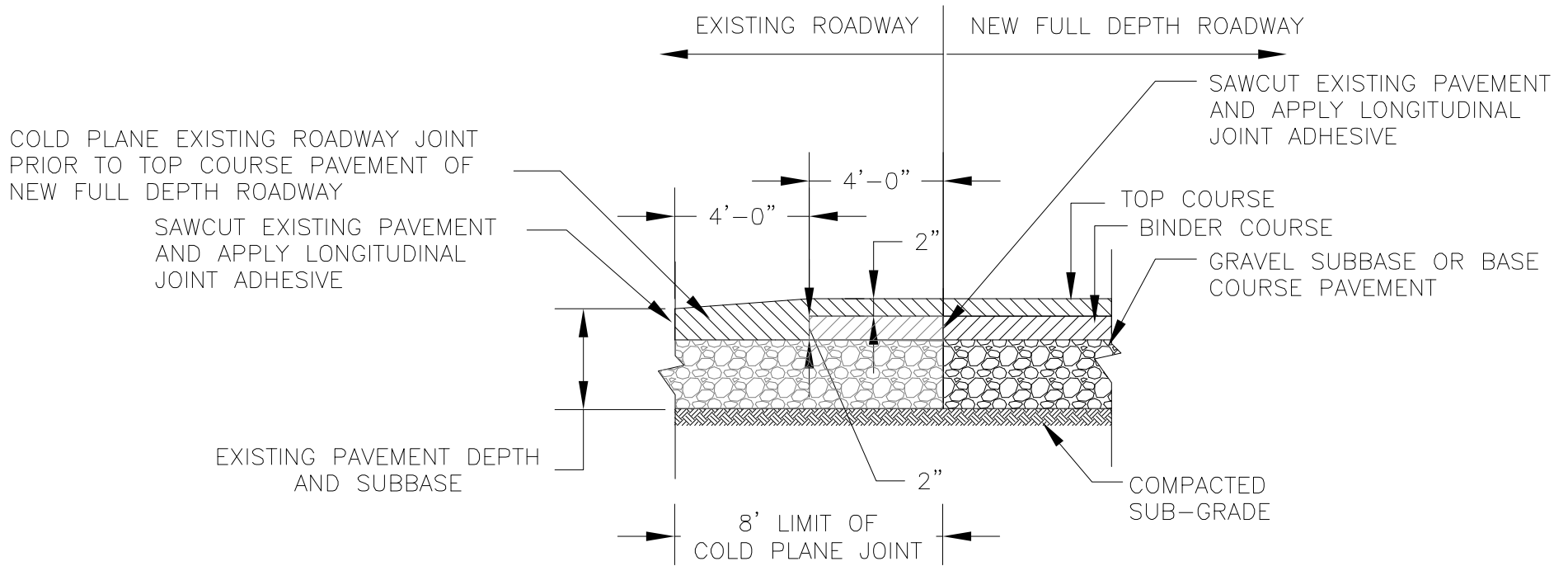
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

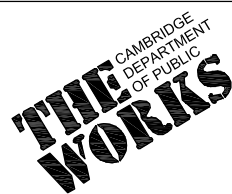
SPEC. SECTION REF#: 02577

**2577.1**



NOTES:

1. CLEAN ALL COLD PLANED SURFACES BEFORE APPLYING JOINT ADHESIVE AND FINAL PAVEMENT



**FULL DEPTH PAVEMENT JOINT DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

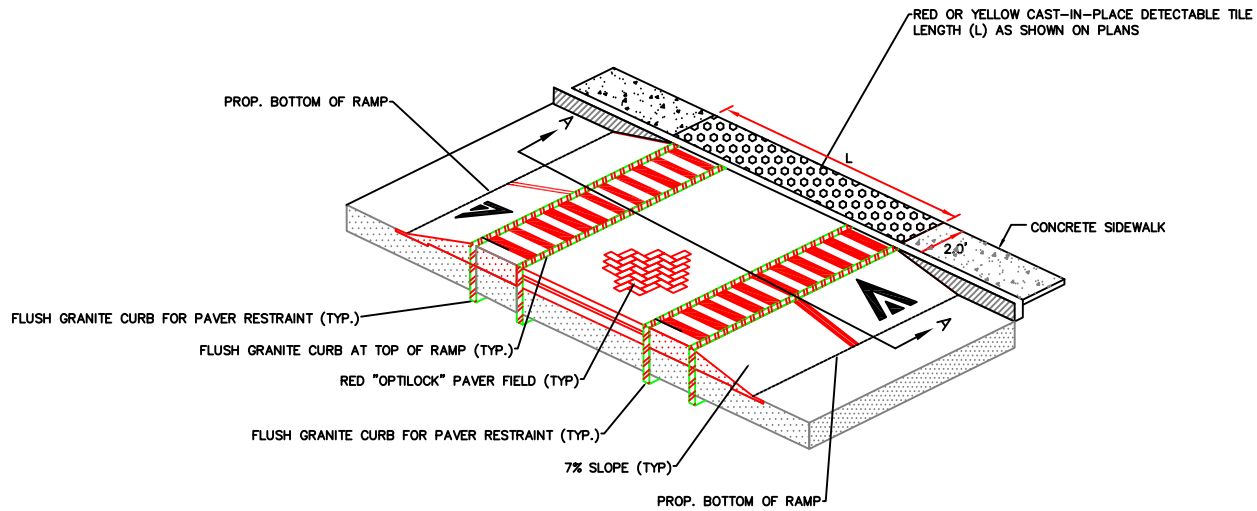
SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02500

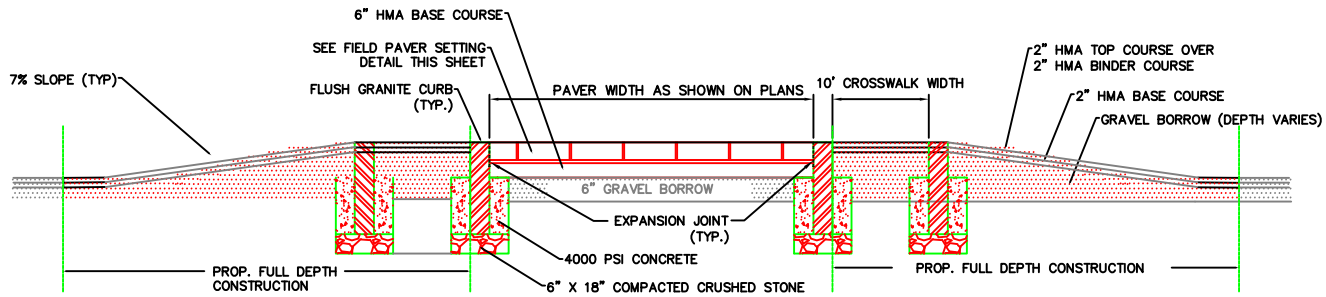
**2500.3**

RAISED INTERSECTION / RAISED CROSSWALK DETAILS

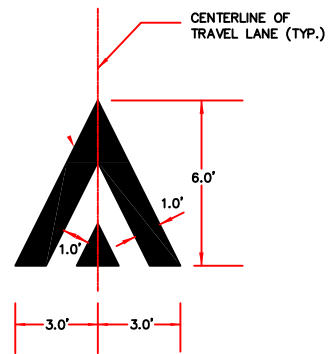


MID-BLOCK RAISED CROSSWALK ISOMETRIC PLAN

NTS

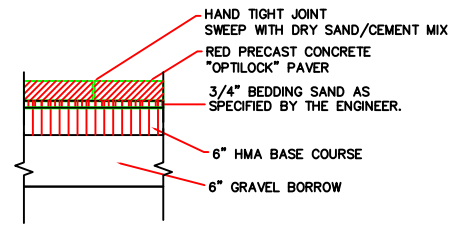


SECTION A-A



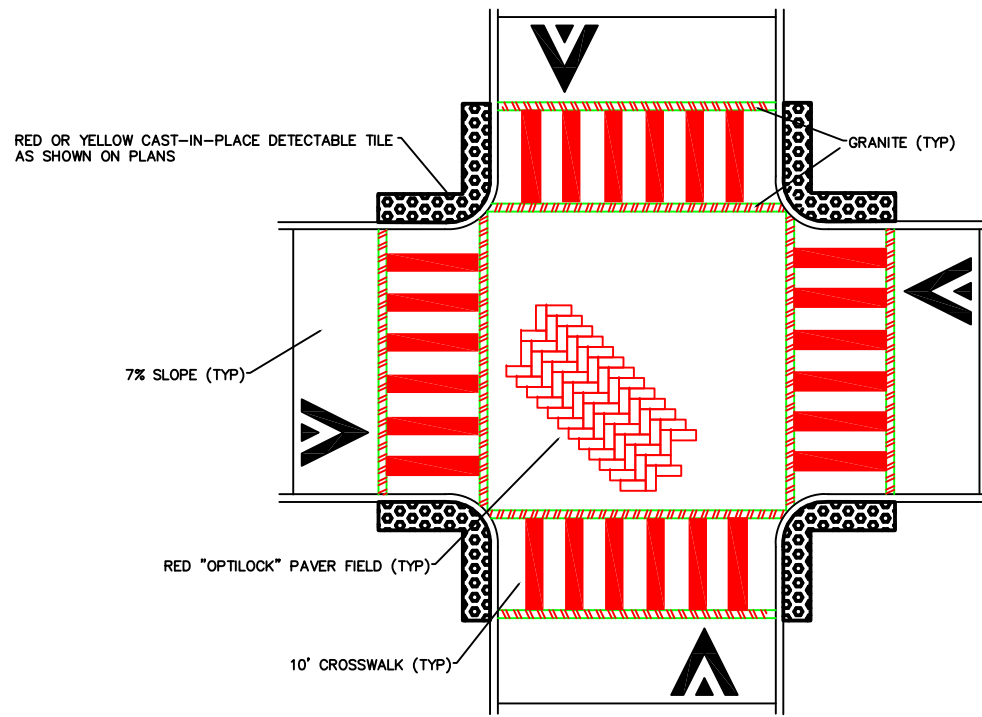
RAMP MARKING DETAIL

NTS

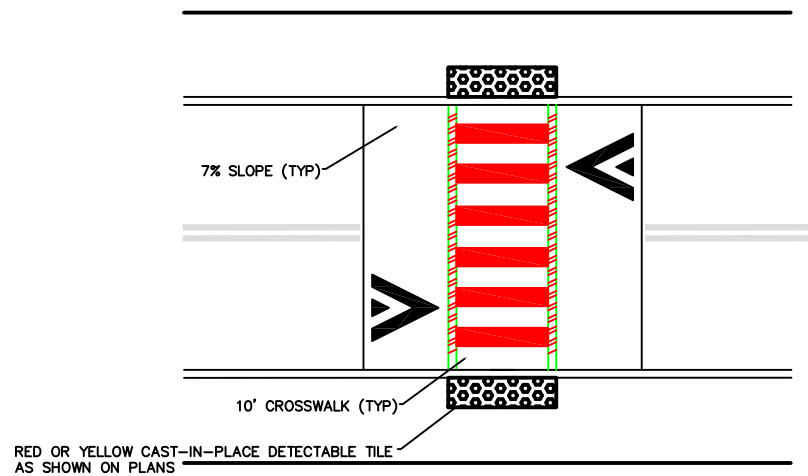


"FIELD" PAVER SETTING DETAIL

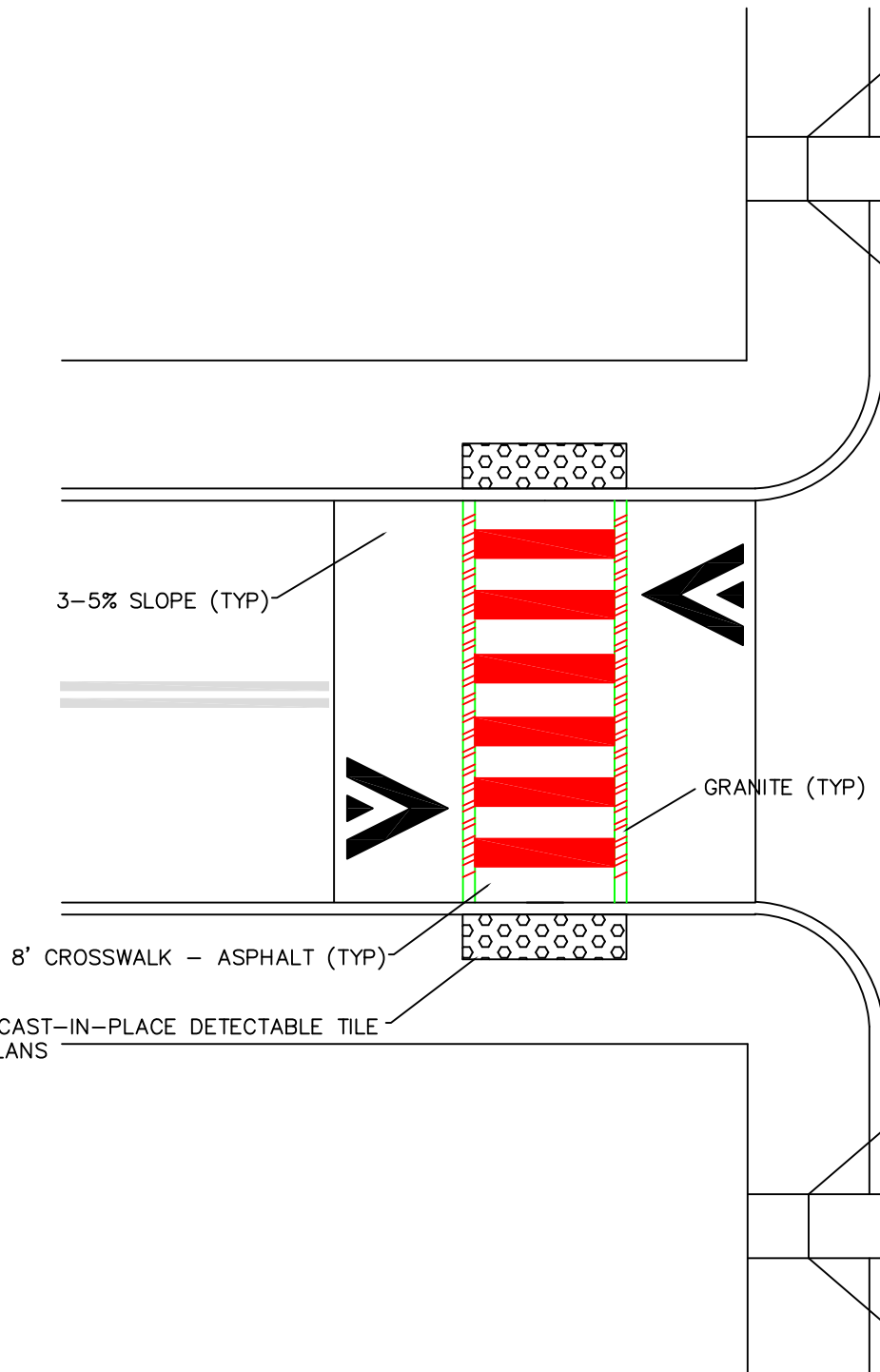
NTS



4-WAY RAISED INTERSECTION PLAN  
NTS



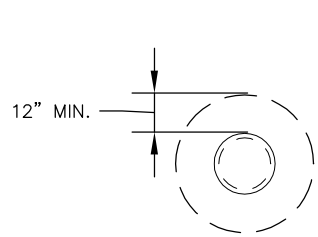
MID-BLOCK RAISED CROSSWALK PLAN  
NTS



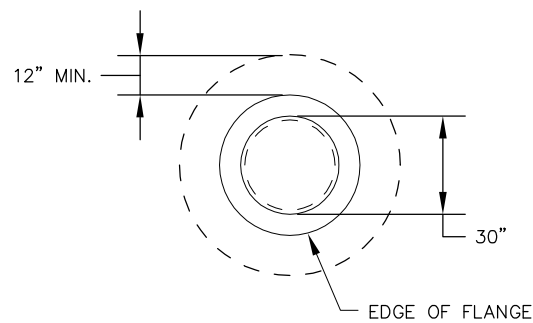
ALTERNATIVE PEDESTRIAN RAMP DESIGN  
FOR SIDE STREETS

NTS

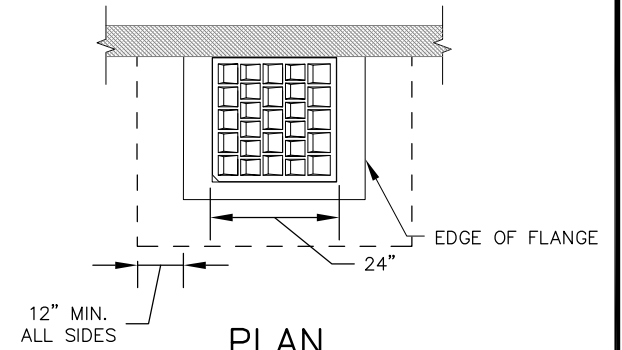
- \* MAY BE USED ON SIDE STREETS WITH A STOP SIGN
- \* USE 18" CURB
- \* DESIGN MUST ENSURE PROPER DRAINAGE



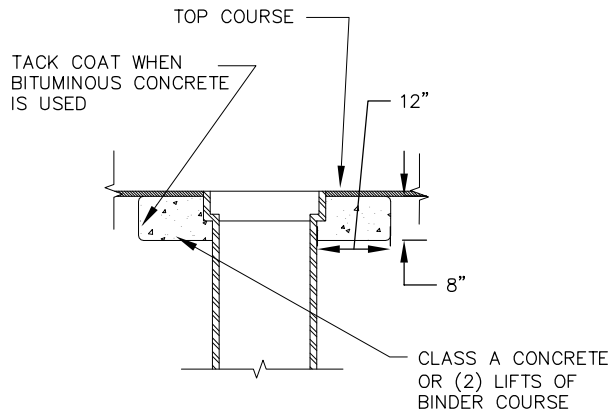
PLAN



PLAN

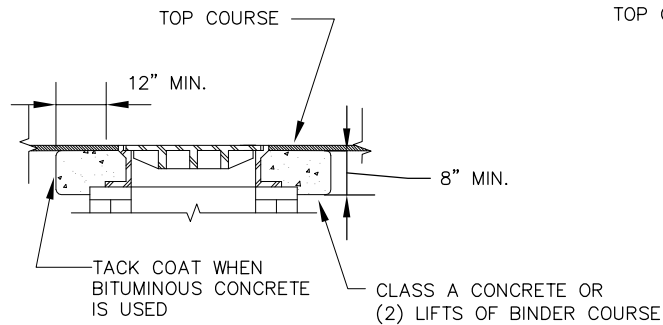


PLAN



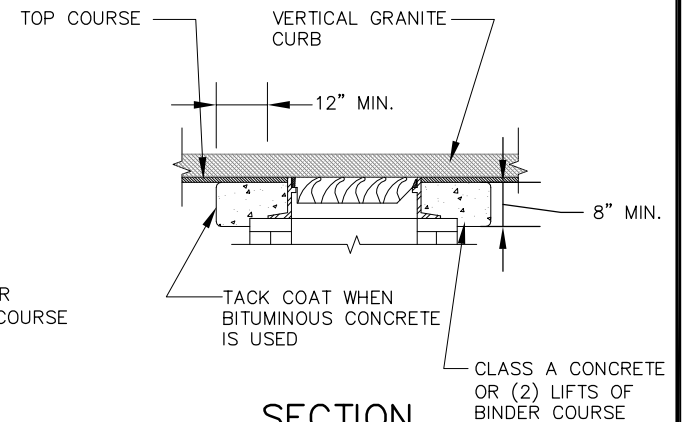
SECTION

GATE BOXES



SECTION

MANHOLES



SECTION

CATCH BASINS

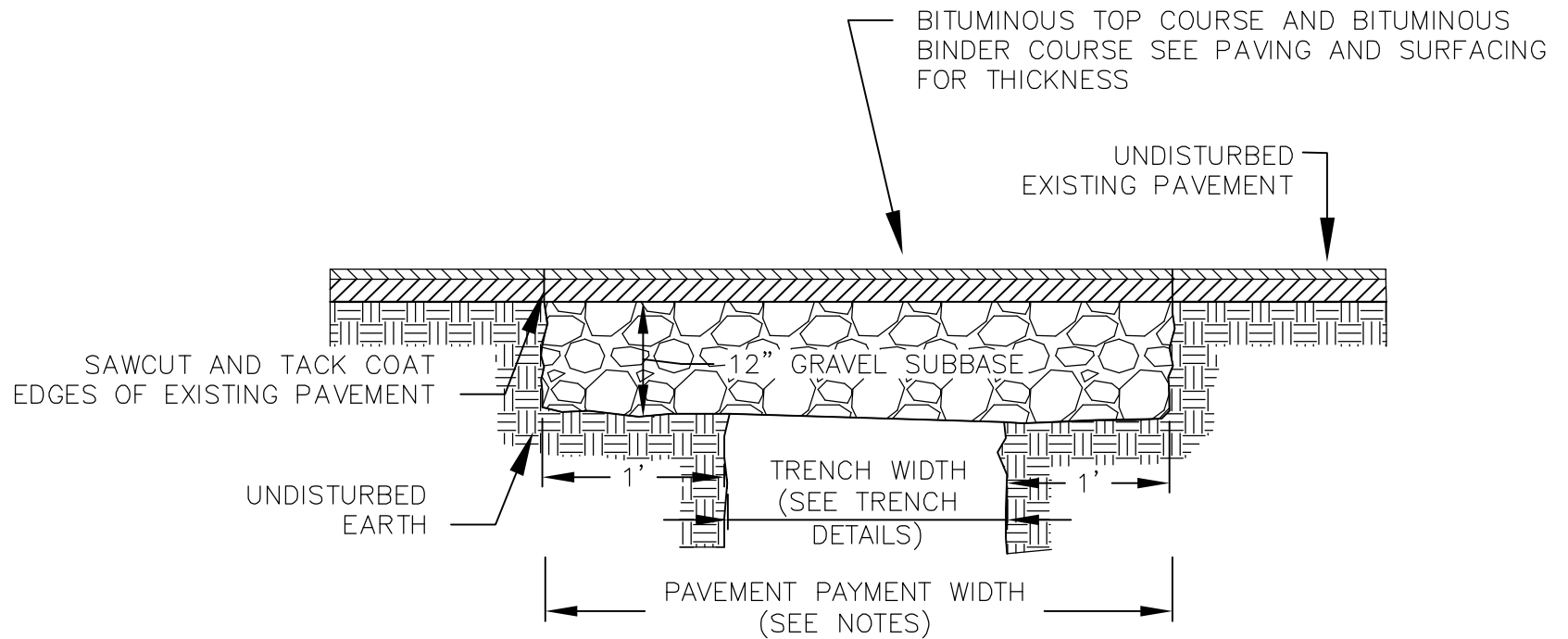
95% DETAILS  
NOT FOR CONSTRUCTION



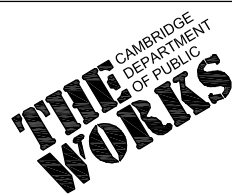
**RAISING CASTINGS DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.14</b>
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- NOTES:
1. PERMANENT TRENCH PAVEMENT PAYMENT WIDTH SHALL BE THE TRENCH PAY LIMIT PLUS 2 FEET
  2. TEMPORARY TRENCH PAVEMENT PAYMENT WIDTH SHALL BE EQUAL TO THE TRENCH PAYMENT LIMIT
  3. REMOVE AND DISPOSE ALL TEMPORARY PAVEMENT AS REQUIRED. RESTORE AND COMPACT SUBBASE AS REQUIRED PRIOR TO PERMANENT TRENCH PAVEMENT.



## TRENCH PAVEMENT DETAIL

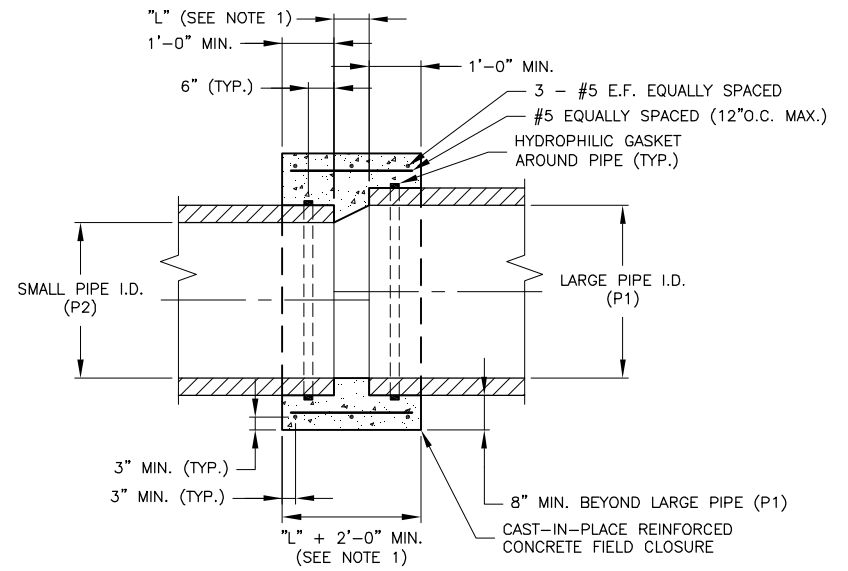
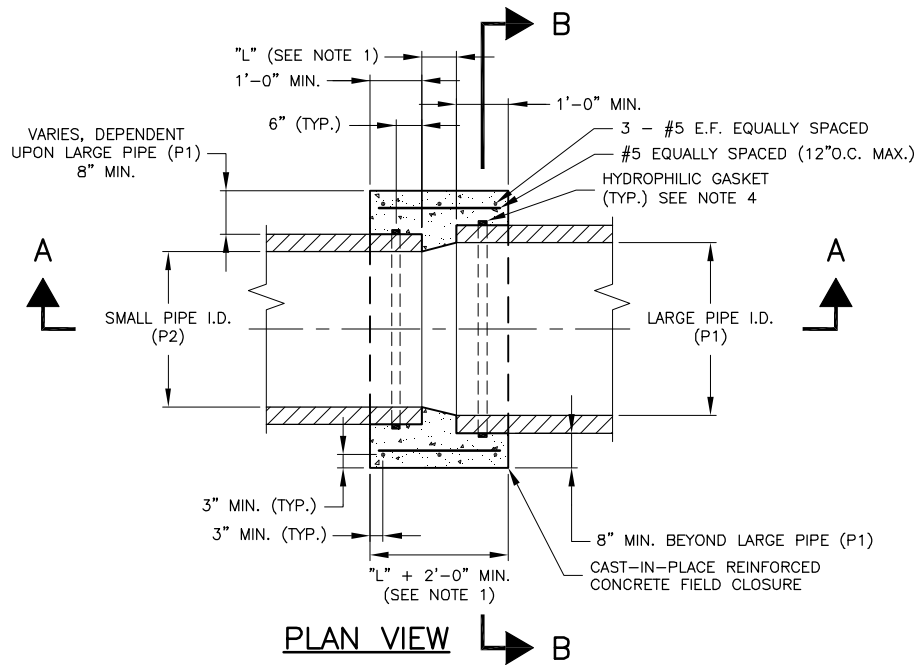
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

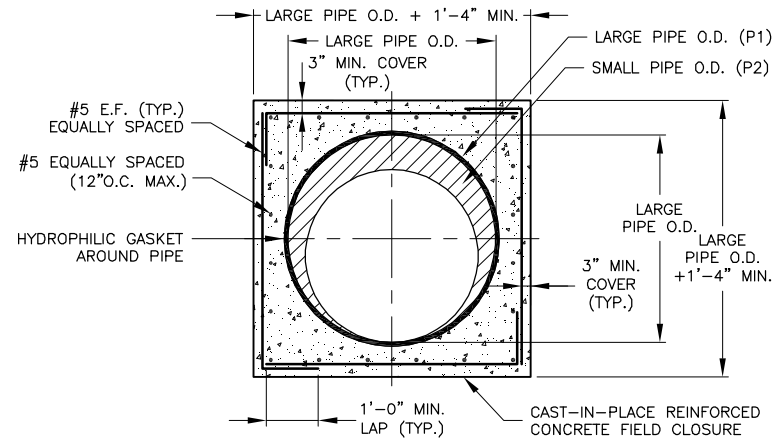
SPEC. SECTION REF#: 02500

2500.1



SECTION A-A

- NOTES:
1. SPACING BETWEEN PIPES (L) DEPENDS ON PIPE SIZES, FOR PIPES OF THE SAME SIZE USE 4". THE DISTANCE "L" EQUALS THE LARGE PIPE I.D. MINUS THE SMALL PIPE I.D. TIMES TWO [ $L=(P1-P2) \times 2$ ] BUT NO LESS THAN 4".
  2. PROPOSED PIPE INVERT SHALL MATCH EXISTING PIPE INVERT UNLESS OTHERWISE NOTED.
  3. SAND BLAST EXISTING PIPE PERIMETER AND APPLY BONDING AGENT PRIOR TO CONCRETE ENCASEMENT.
  4. CONCRETE AND REBAR REQUIREMENTS SHALL CONFORM TO CAST-IN-PLACE CONCRETE.
  5. LOCATION OF FIELD CLOSURE SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL.
  6. FOR NON-PRESSURE PIPES OF DIFFERENT MATERIALS OR SIZES.



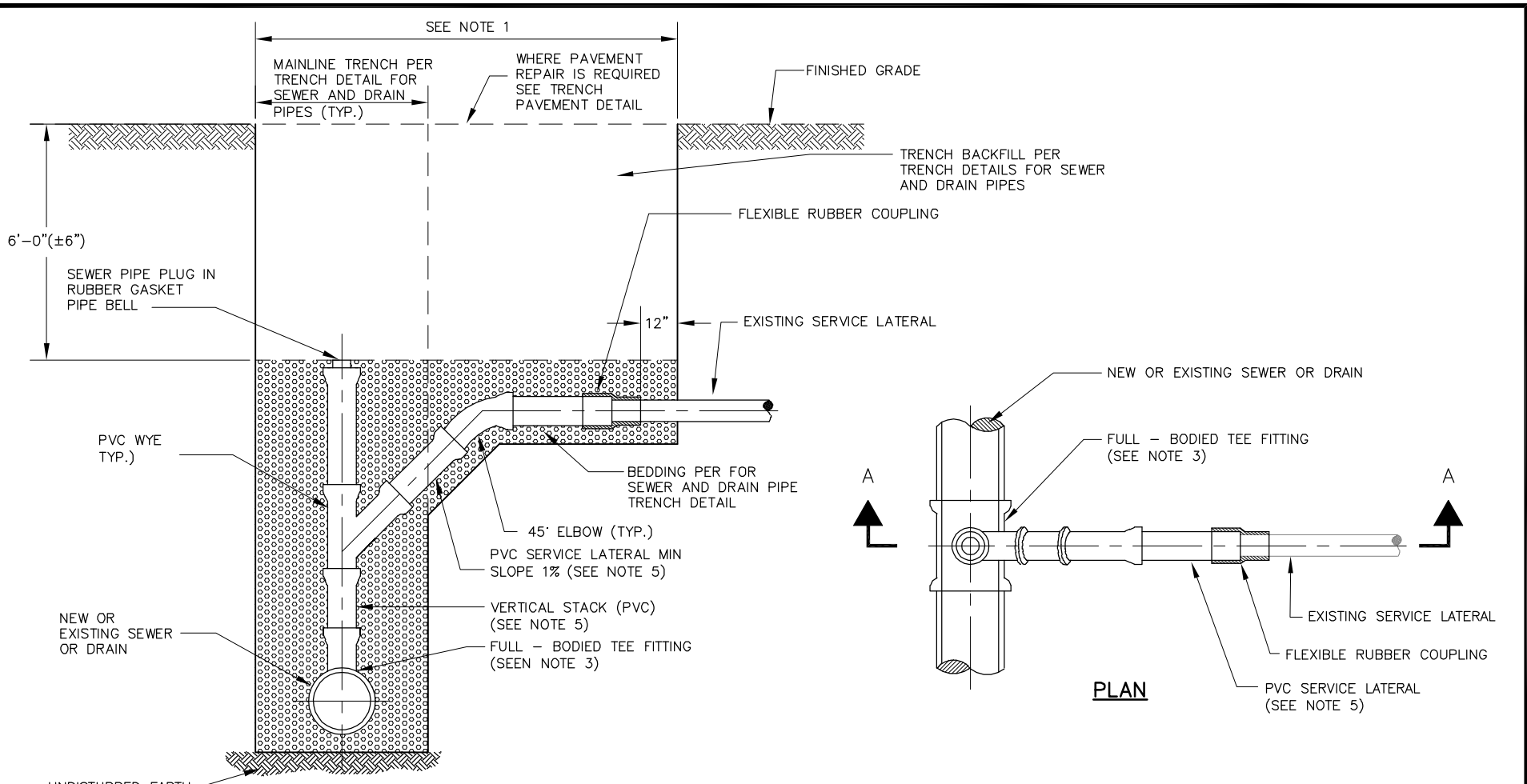
SECTION B-B



CAST IN PLACE FIELD CLOSURE

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 03300	3300.1
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**SECTION A-A**

- NOTES:
1. REPLACE EXISTING SERVICE LATERAL TO EXTENT REQUIRED.
  2. EXCAVATE AND REMOVE EXISTING LATERAL AS REQUIRED TO ALLOW RECONSTRUCTION.
  3. FOR SEWER AND DRAIN SERVICE CONNECTIONS 18" IN DIAMETER OR GREATER A TEE INSERT OR EQUAL MAY BE USED.
  4. FOR SERVICE CONNECTIONS < 12' DEEP FROM INVERT OF MAINLINE PIPE TO GRADE SEE SEWER OR DRAIN SERVICE CONNECTION DETAIL.
  5. SEWER AND DRAIN LATERALS SHALL BE SIZED TO FIT ANTICIPATED FLOWS BUT SHALL NOT BE LESS THAN 6" FOR SEWER AND 8" FOR DRAIN SERVICES.



**SEWER OR DRAIN SERVICE CONNECTION WITH CHIMNEY > 12' DEEP**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02622	<b>2622.2</b>
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		EXISTING PIPE MATERIAL				
NEW PIPE MATERIAL		BRICK	RCP	DI	VC	PLASTIC
	BRICK	1	1	1	1	1
	RCP	1	1	1	1	1
	DI	1	1	2	2	2
	VC	1	1	2	2	2
	PLASTIC	1	1	2	2	2

PIPE CONNECTION TABLE\*

TYPE 1 = CONCRETE COLLAR

TYPE 2 = TRANSITION COUPLING (DRESSER OR EQUAL)

\* SERVICE LATERALS 200mm [8"] OR LESS SHALL BE FERNCO-TYPE.



**PIPE TO PIPE CONNECTIONS**

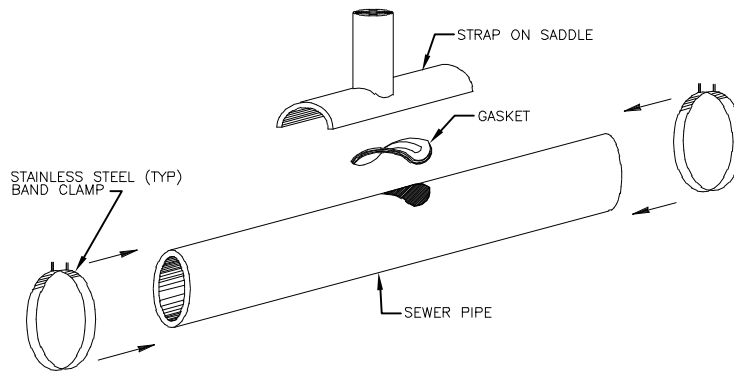
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

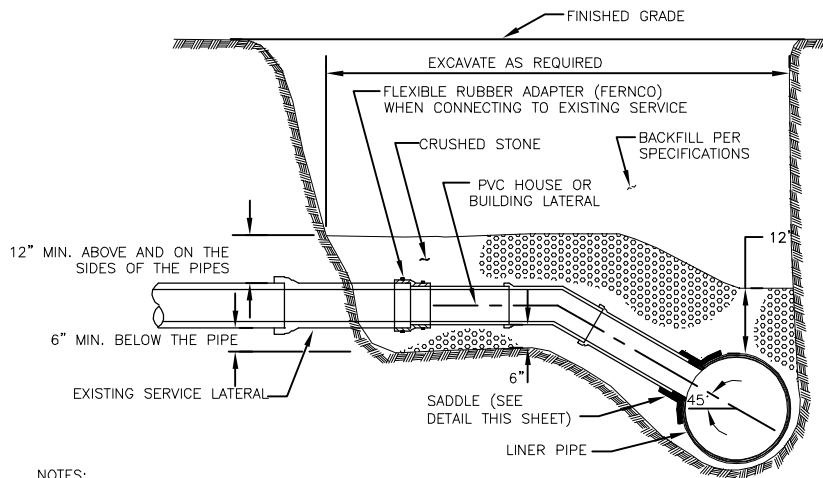
DATE OF ISSUE: 4/04

SPEC. SECTION REF#: 02622

**2622.4**



**SADDLE CONNECTION - PLAN**  
NOT TO SCALE



NOTES:  
1. REPLACE EXISTING SERVICE LINE TO EXTENT SHOWN ON PLAN/PROFILES AND AS SPECIFIED.

**SADDLE CONNECTION - SECTION**  
NOT TO SCALE



**SEWER OR DRAIN SERVICE CONNECTION  
SADDLE CONNECTION**

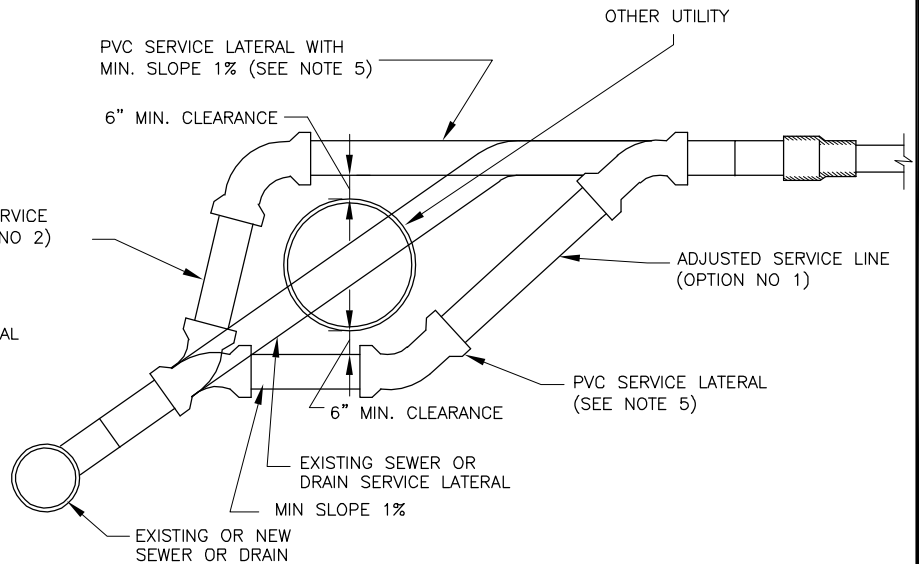
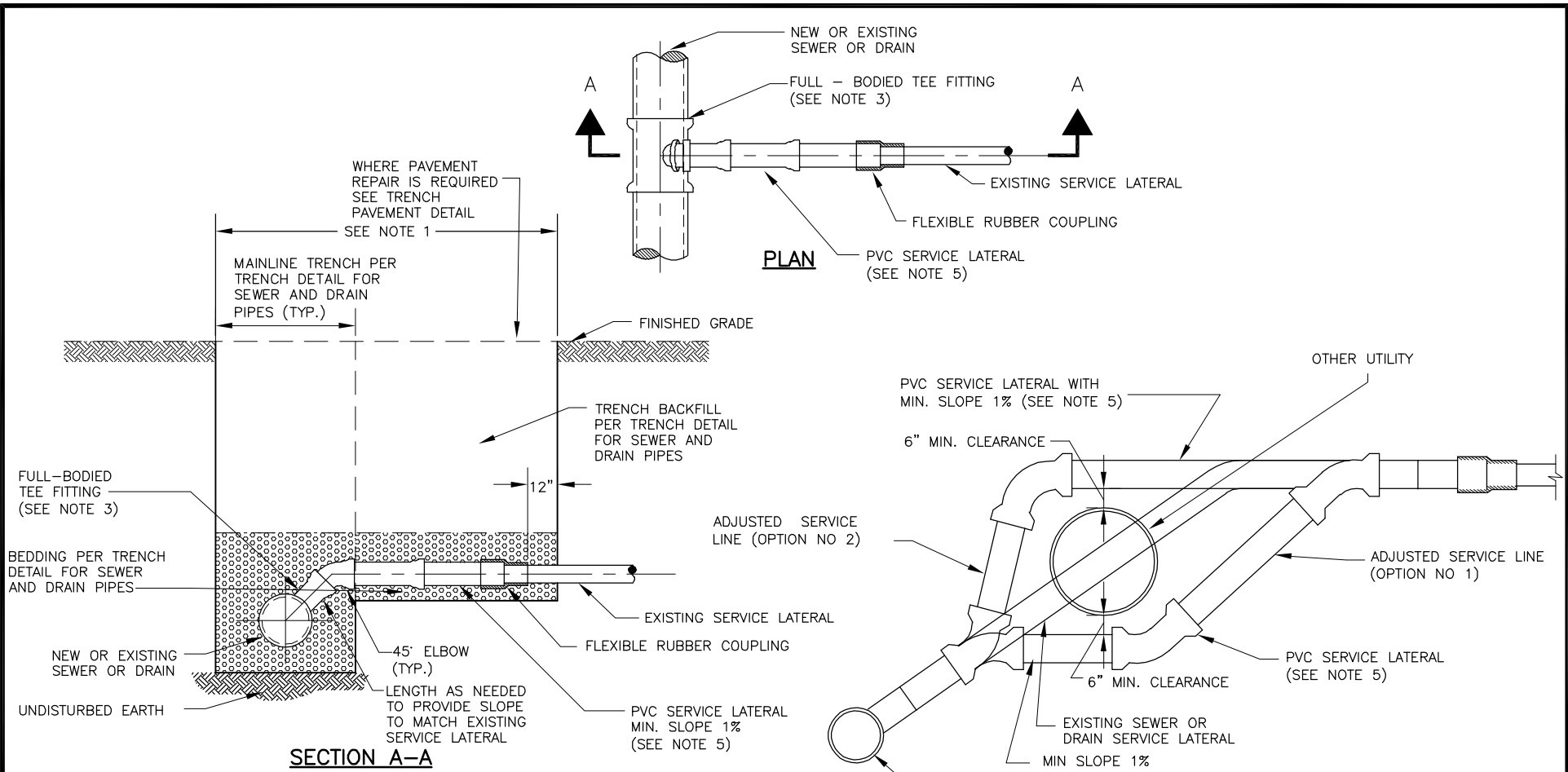
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 03/06

SPEC. SECTION REF#: 02622

**2622.3**



**SECTION A-A**  
**SEWER OR DRAIN SERVICE CONNECTION < 12' DEEP**

- NOTES:
1. REPLACE EXISTING SERVICE LATERAL TO EXTENT REQUIRED.
  2. EXCAVATE AND REMOVE EXISTING LATERAL AS REQUIRED TO ALLOW RECONSTRUCTION.
  3. FOR SEWER AND DRAIN SERVICE CONNECTIONS TO MAINLINE 18" IN DIAMETER OR GREATER AN INSERTA TEE OR EQUAL MAY BE USED.
  4. FOR SERVICE CONNECTIONS > 12' DEEP FROM INVERT OF MAINLINE PIPE TO FINISHED GRADE, SEE CHIMNEY DETAIL.
  5. SEWER AND DRAIN LATERALS SHALL BE SIZED TO FIT ANTICIPATED FLOWS BUT SHALL NOT BE LESS THAN 6" FOR SEWER SERVICES AND 8" FOR DRAIN SERVICES

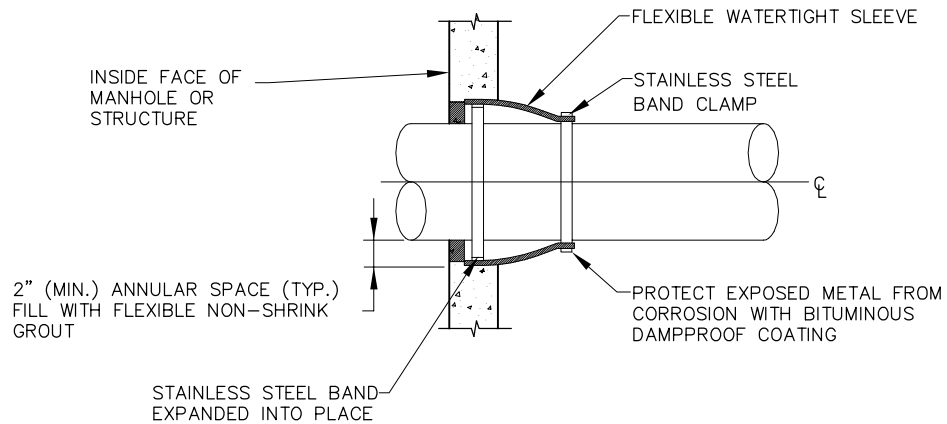
**SEWER OR DRAIN SERVICE LATERAL RECONNECTION FOR CONFLICTS WITH OTHER UTILITIES**



**SEWER OR DRAIN SERVICE CONNECTION**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02622	2622.1
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**NOTE:**

1. PRECAST OPENING OR CORE DRILLED INTO EXISTING STRUCTURE. SIZE VARIES TO ACCOMMODATE EXTENSION BONNET FLANGE DIAMETER OR PIPE.

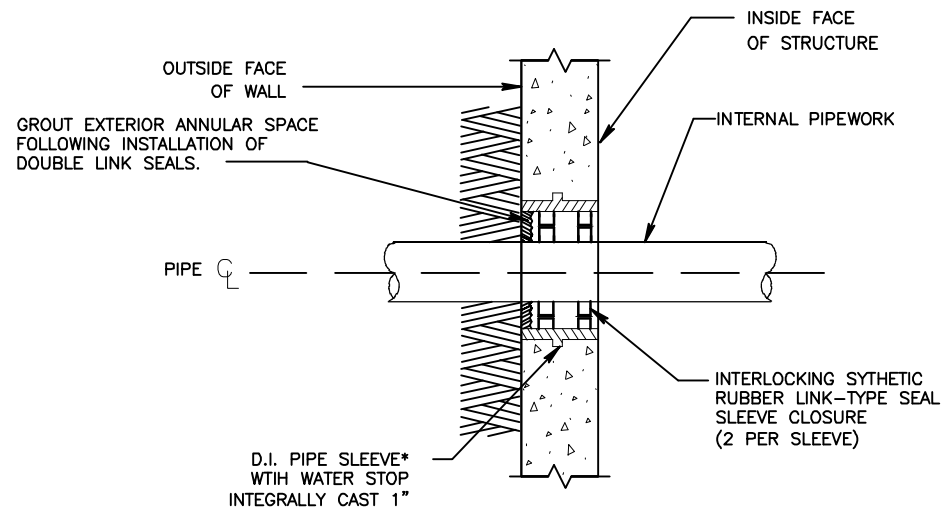
95% DETAILS  
NOT FOR CONSTRUCTION



**FLEXIBLE SLEEVE CONNECTION DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.15</b>
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\*SIZE OF SLEEVE TO SUIT PIPE SIZE AND SEAL.



## BURIED WALL PIPE SLEEVE CLOSURE

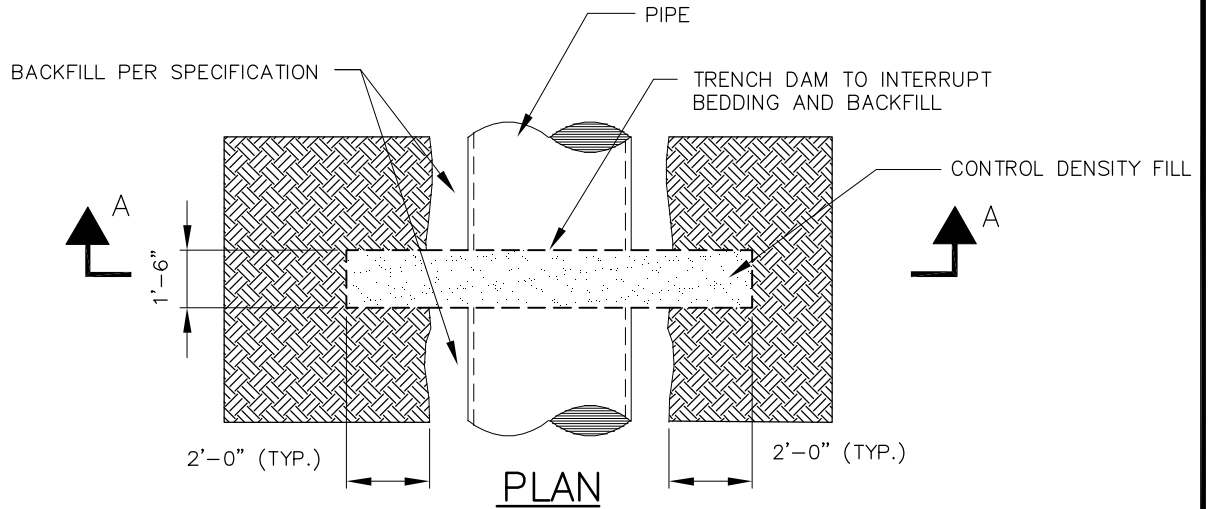
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

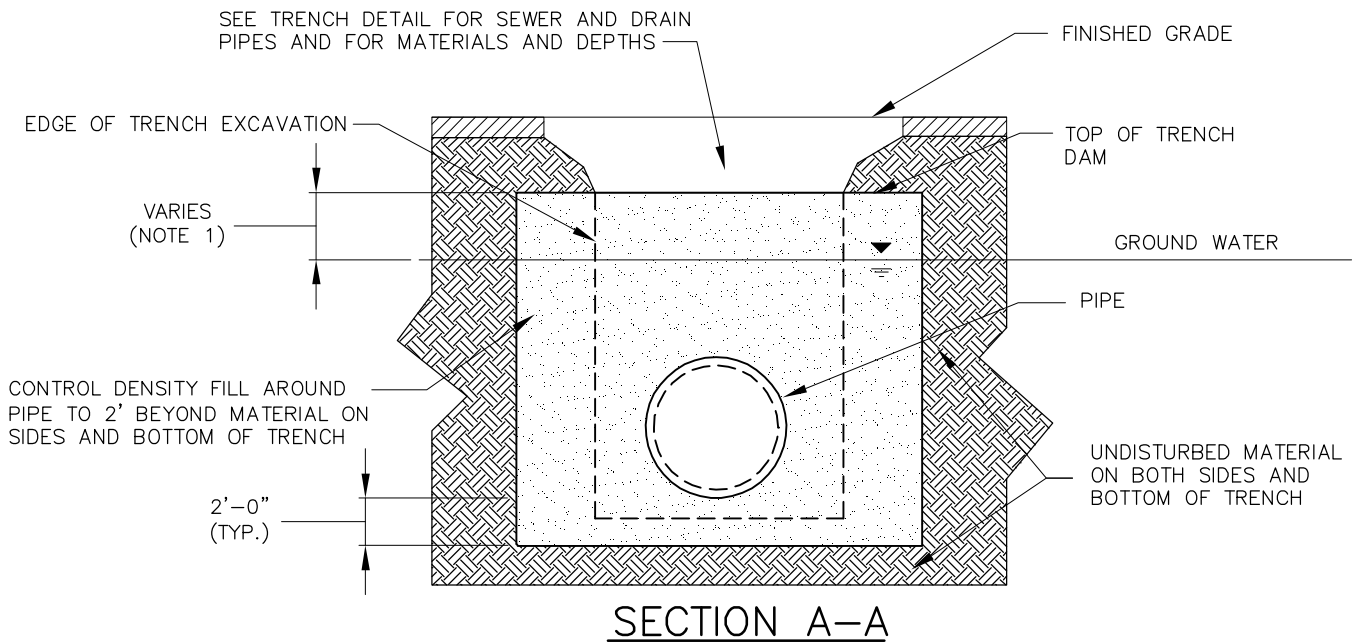
DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 03300

**3300.4**



NOTES:  
 1. NOTCH TRENCH DAM A MINIMUM OF 2'-0" BEYOND UNDISTURBED MATERIAL ON SIDES AND BOTTOM OF TRENCH.



NOTES:  
 1. THE TOP OF THE TRENCH DAM SHALL EXTEND A MINIMUM OF 5'-0" ABOVE THE GROUND WATER LEVEL, AS DETERMINED BY THE NEAREST BORING OR BY THE ENGINEER, BUT SHALL NOT EXCEED A DEPTH OF 1'-0" BELOW FINISHED GRADE.  
 2. TRENCH DAMS SHALL BE INSTALLED AS INDICATED ON THE CONTRACT DRAWINGS OR AS DIRECTED BY THE ENGINEER.  
 3. IF PIPE MATERIAL IS DUCTILE IRON USE A NON FLY ASH BASED CONTROL DENSITY FILL



**TRENCH DAM DETAIL**

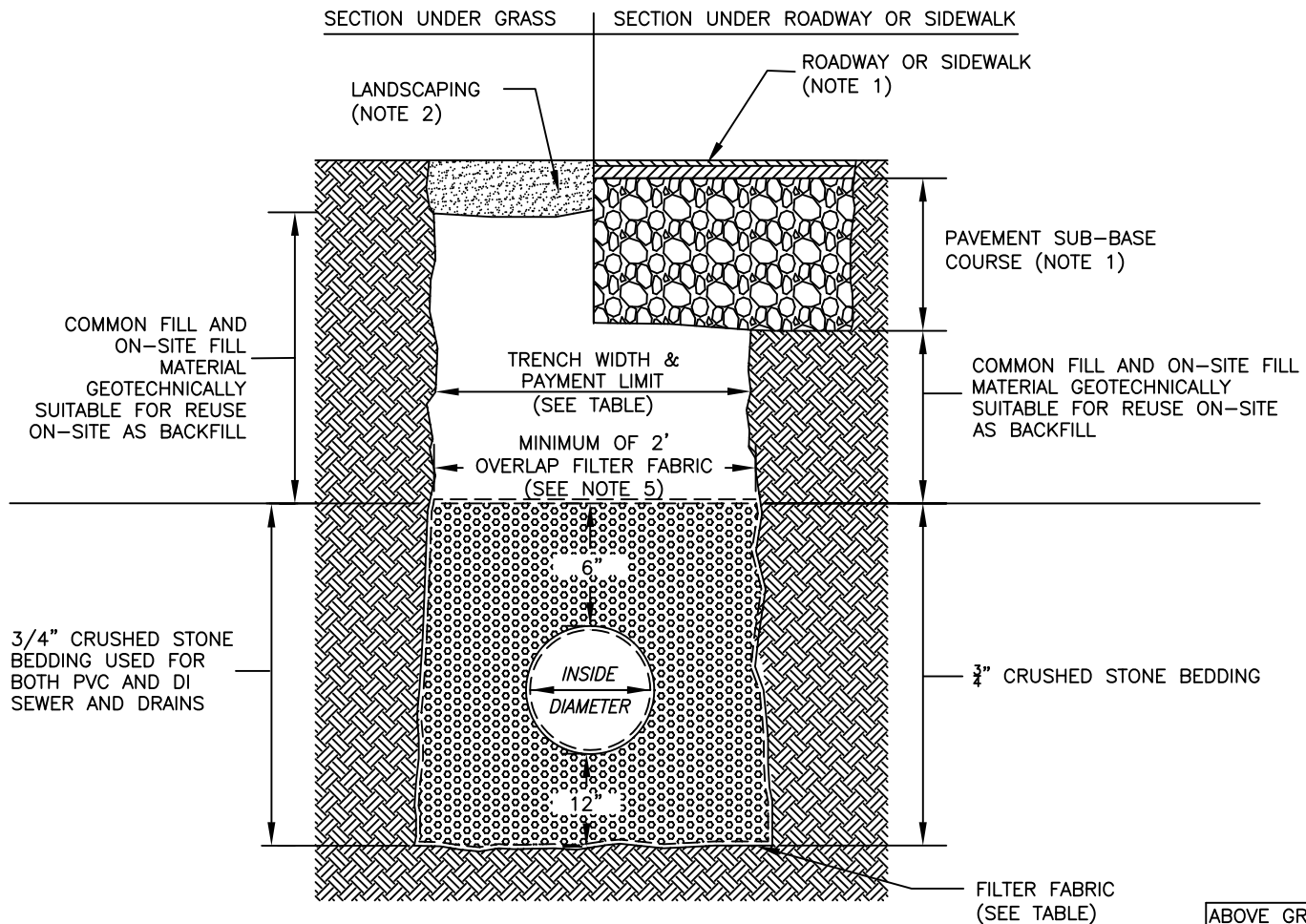
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02210

**2210.2**



- NOTES:
1. REFER TO PAVING AND SURFACING, AND CURBS, WALKS AND DRIVEWAYS REQUIREMENTS.
  2. REFER TO LANDSCAPING REQUIREMENTS
  3. REFER TO "TRENCH PAY LIMIT TABLE FOR PIPES" FOR PAYMENT OF ALL ITEMS IN WHICH PAY TRENCH WIDTH IS A VARIABLE FOR CALCULATIONS OF QUANTITIES EXCEPT FOR TRENCH PAVEMENT
  4. REFER TO TRENCH PAVEMENT DETAIL FOR PAVEMENT PAYMENT WIDTHS

TRENCH PAY LIMIT TABLE FOR PIPES

PIPE SIZE (DIA.)	MAX TRENCH WIDTH
LESS THAN 2"	2'-0"
2" TO 6"	3'-0"
8" TO 22"	4'-0"
24" & GREATER	I.D. + 2'-0"

I.D. = INSIDE DIMENSION

FOR TRENCHES GREATER THAT 5' DEEP ADD MAXIMUM 3' FOR TEMPORARY SUPPORT OF EXCAVATION

FILTER FABRIC USE

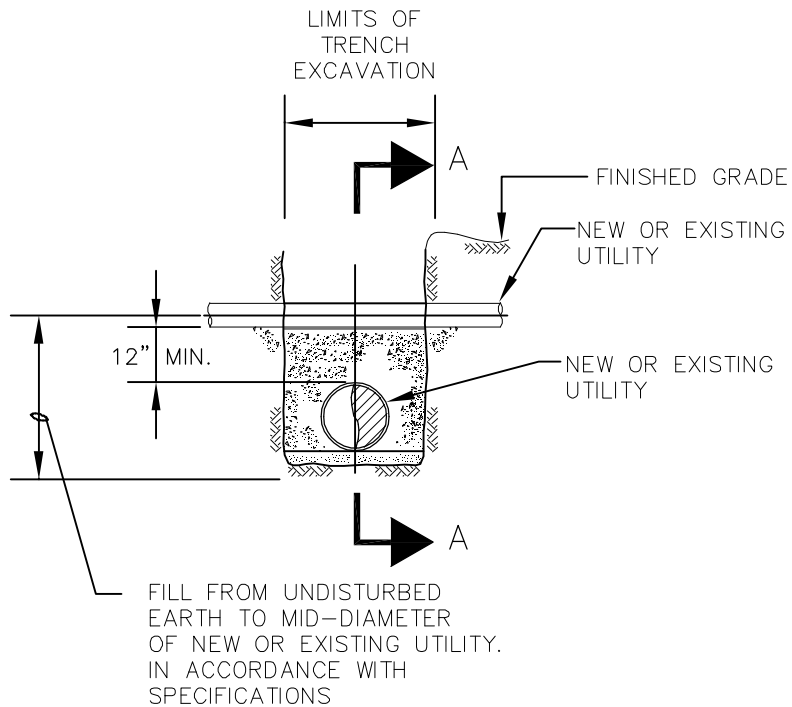
	SOIL TYPE	
	SILT OR CLAY	GRANULAR SOIL
ABOVE GROUND WATER	FILTER FABRIC NOT REQUIRED	FILTER FABRIC NOT REQUIRED
BELOW GROUND WATER	FILTER FABRIC REQUIRED	FILTER FABRIC NOT REQUIRED



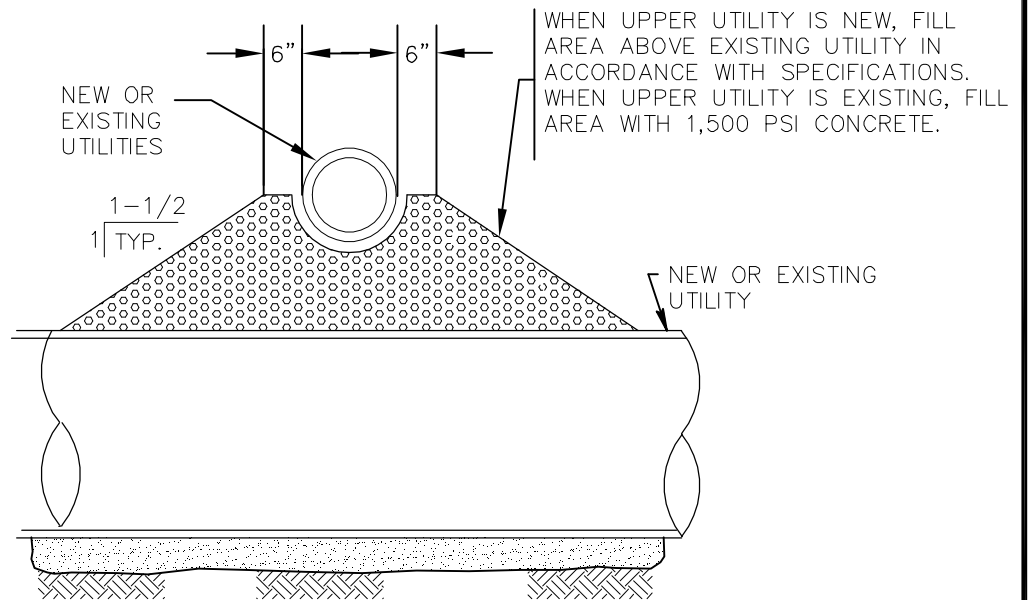
## TRENCH DETAIL FOR SEWER AND DRAIN PIPES

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 04/11	SPEC. SECTION REF#: 02210	2210.1
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ELEVATION



SECTION A-A



**UTILITY CROSSING DETAIL**

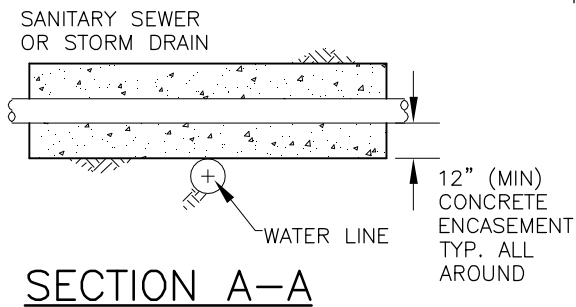
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

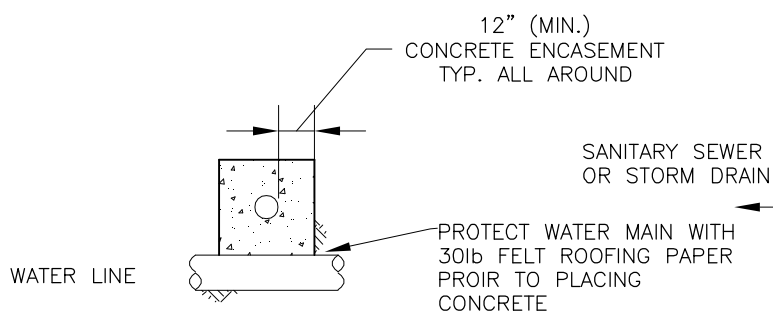
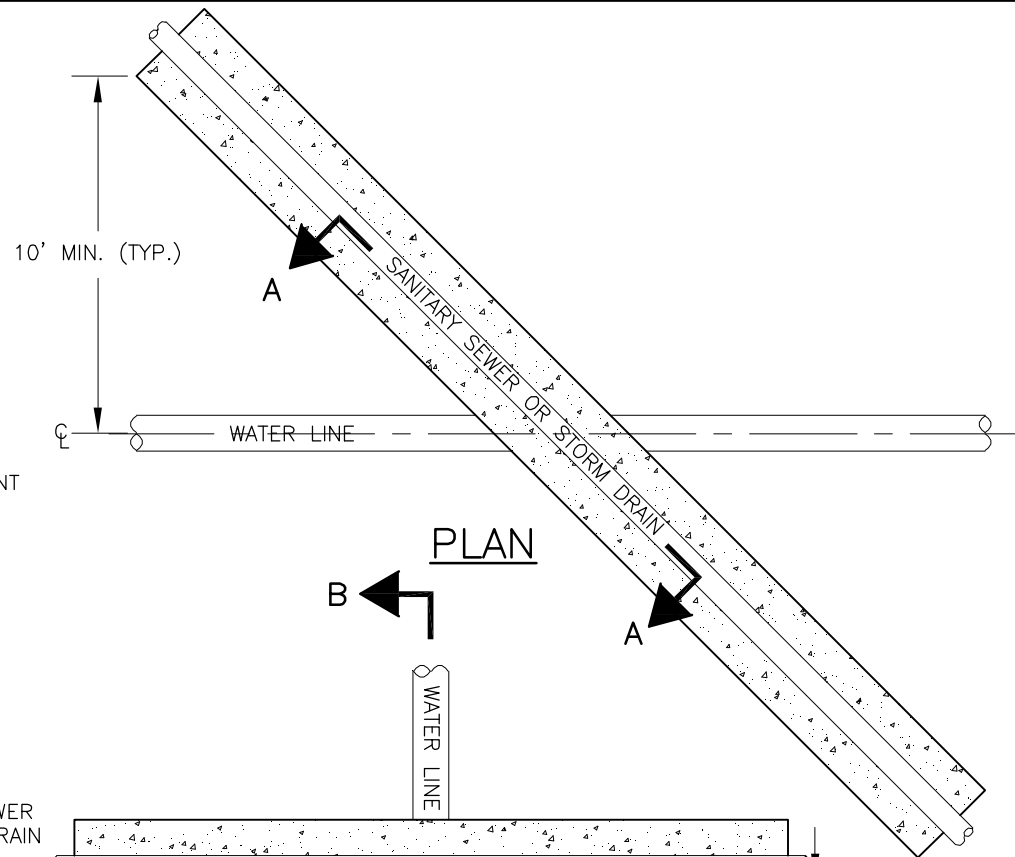
DATE OF ISSUE: 03/06

SPEC. SECTION REF#: 02622

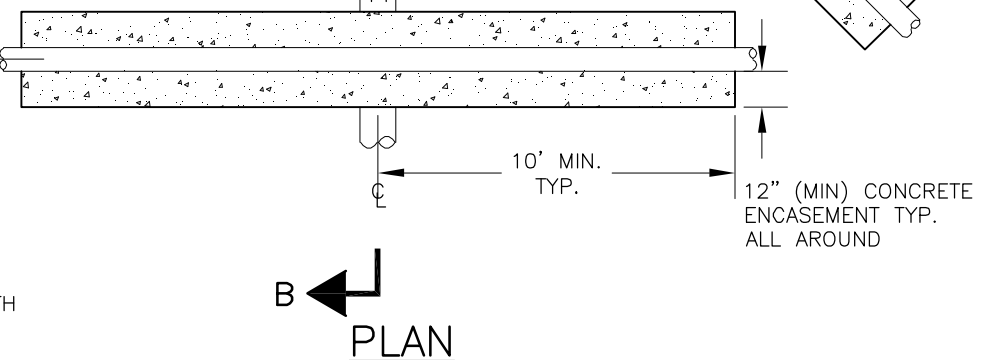
**2622.5**



**SECTION A-A**



**SECTION B-B**



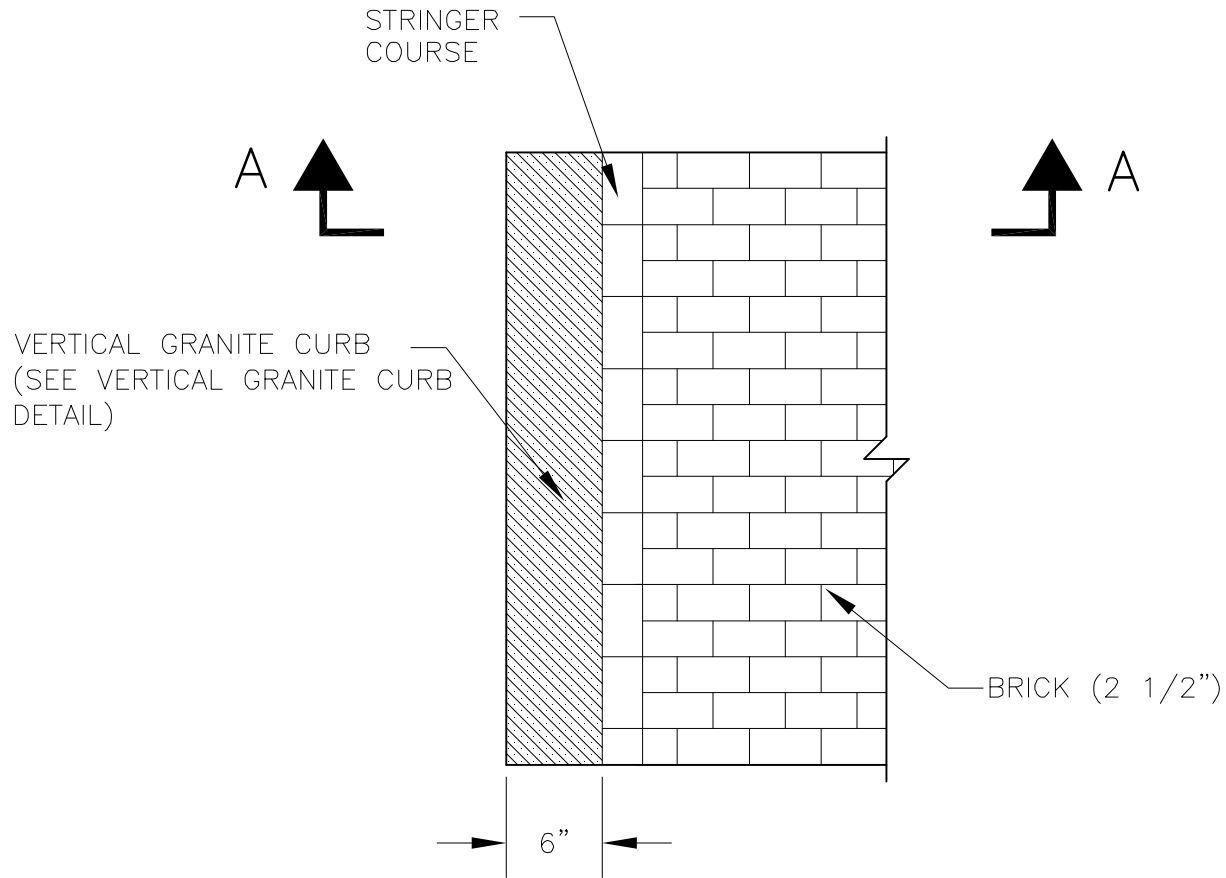
NOTE:  
1. CONCRETE SHALL HAVE A MINIMUM 3,000 PSI STRENGTH



**STORM DRAIN AND SANITARY SEWER CROSSING ABOVE WATER MAIN**

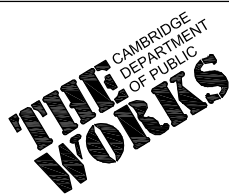
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02630	<b>2630.1</b>
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NOTE:  
 AROUND HYDRANTS, UTILITY POLES SIGN POSTS ETC., SEE  
 EXPANSION JOINT DETAIL

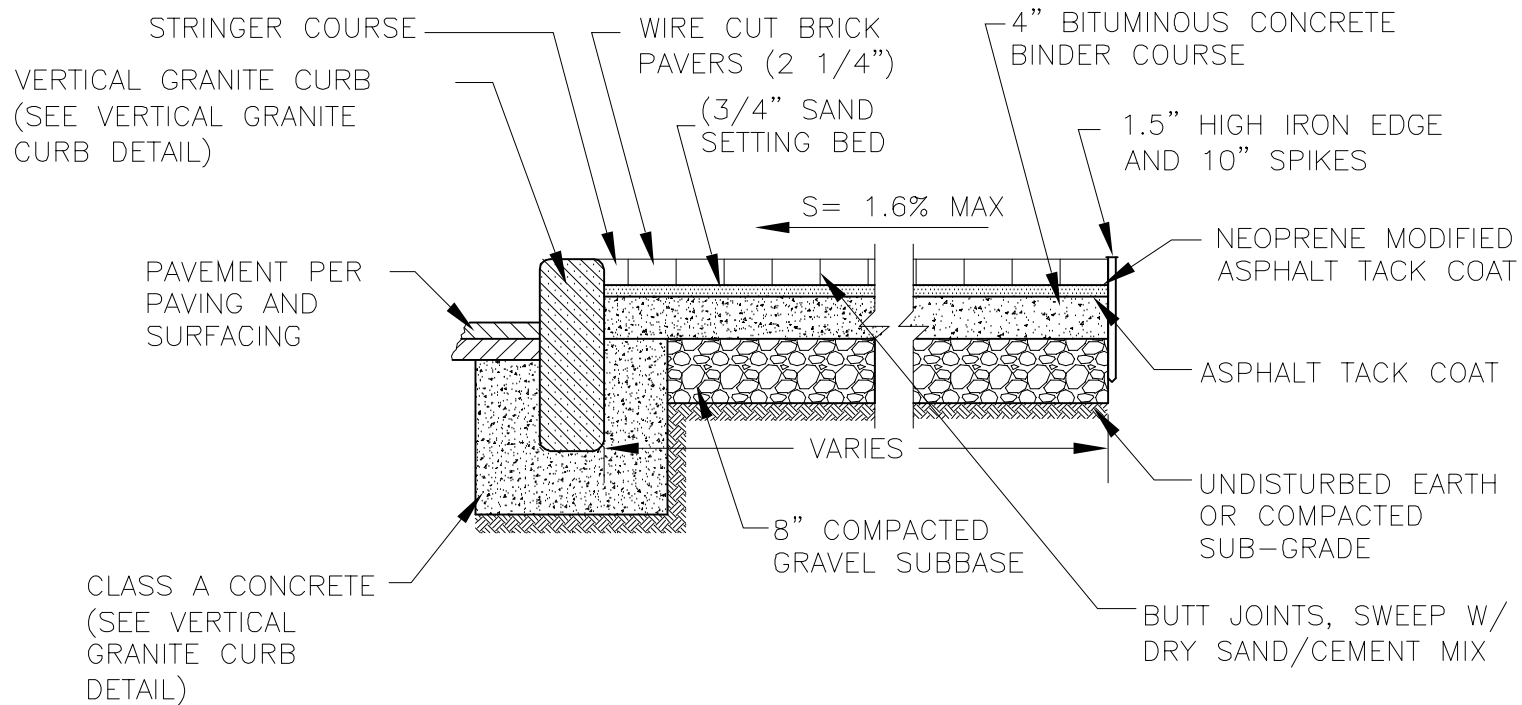
PLAN



**BRICK SIDEWALK DETAIL - PLAN**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

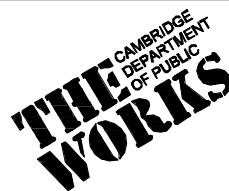
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.8</b>
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## SECTION A-A

**NOTES:**

1. SIDEWALKS SHALL MATCH WIDTH AND SLOPE OF EXISTING SIDEWALKS UNLESS OTHERWISE NOTED.
2. BITUMINOUS CONCRETE BINDER COURSE SHALL BE 6" DEPTH (IN TWO 3" COURSES) AT DRIVEWAYS. REFER TO PROJECT DRAWINGS OR ENGINEER'S INSTRUCTIONS FOR LOCATIONS
3. FOR NORMAL BRICK LAYOUT PATTERN, SEE DETAIL 2524.8



### BRICK SIDEWALK DETAIL - SECTION

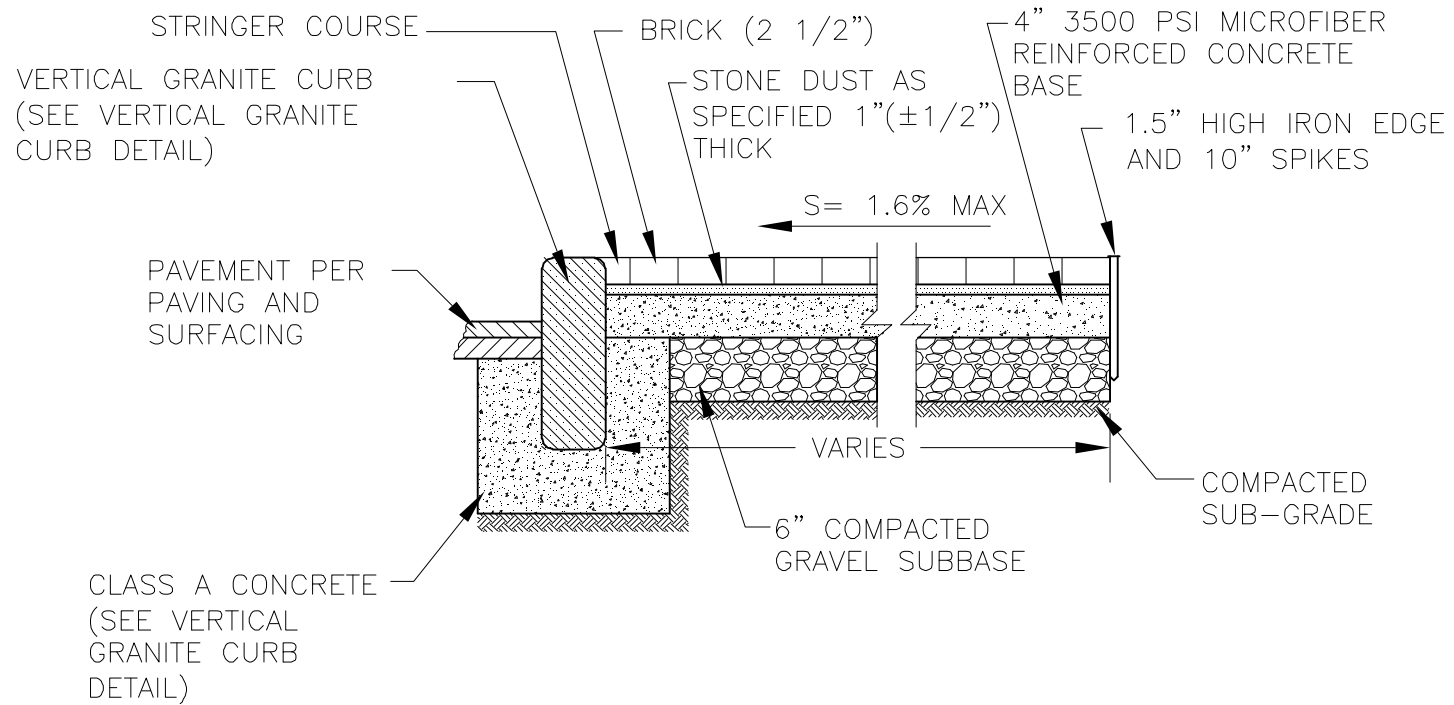
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 09/08

SPEC. SECTION REF#: 02524

**2524.9**



## SECTION A-A

**NOTES:**

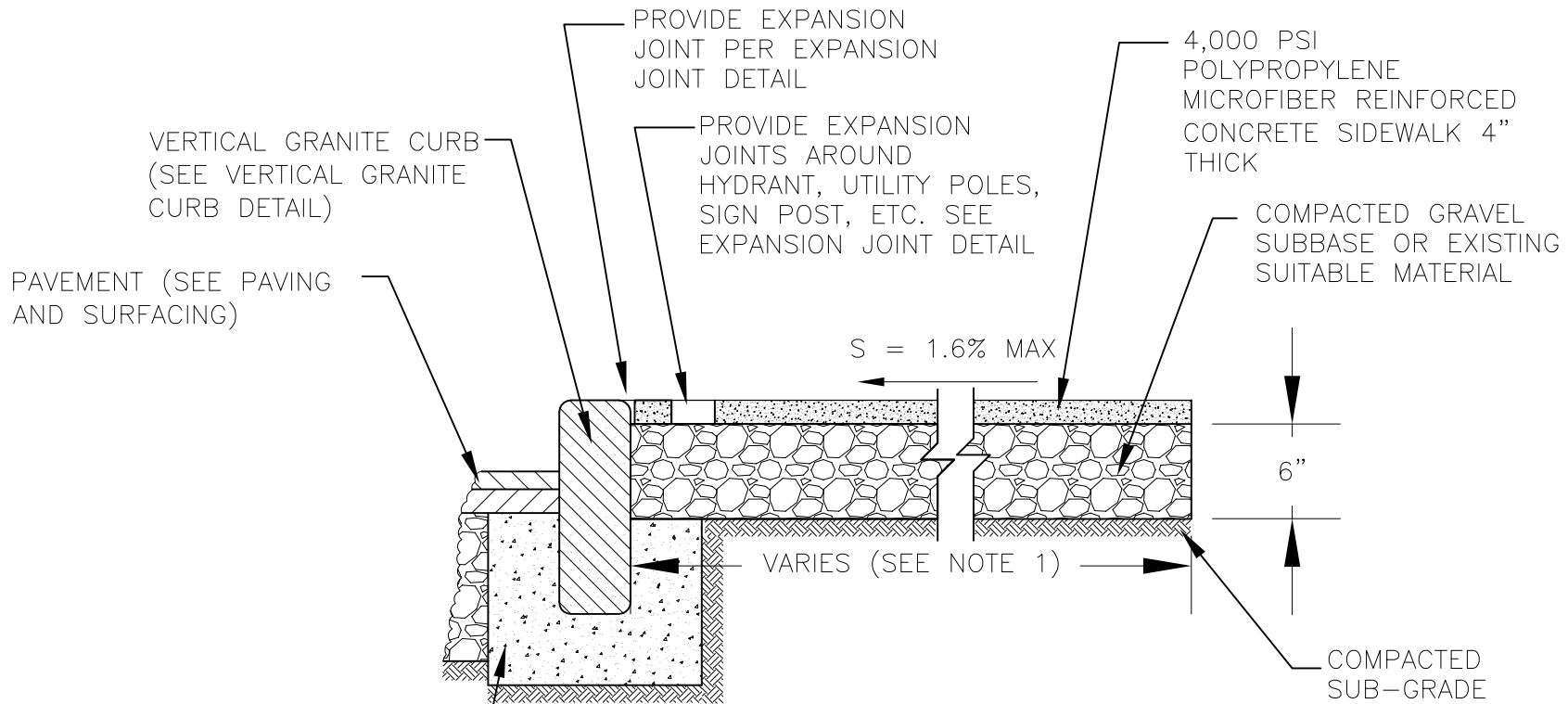
1. SIDEWALKS SHALL MATCH WIDTH AND SLOPE OF EXISTING SIDEWALKS UNLESS OTHERWISE NOTED.



### BRICK SIDEWALK DETAIL - SECTION

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.9</b>
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NOTE:  
 1. NEW SIDEWALK SHALL MATCH WIDTH OF EXISTING SIDEWALK UNLESS OTHERWISE NOTED.

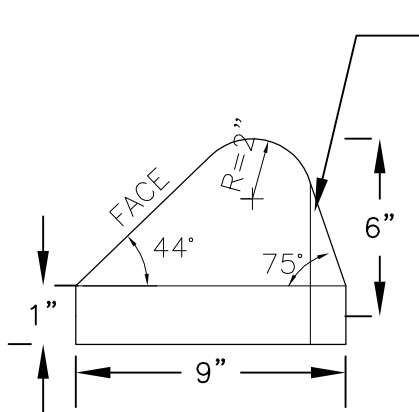
95% DETAILS  
 NOT FOR CONSTRUCTION



**CEMENT CONCRETE SIDEWALK DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.3</b>
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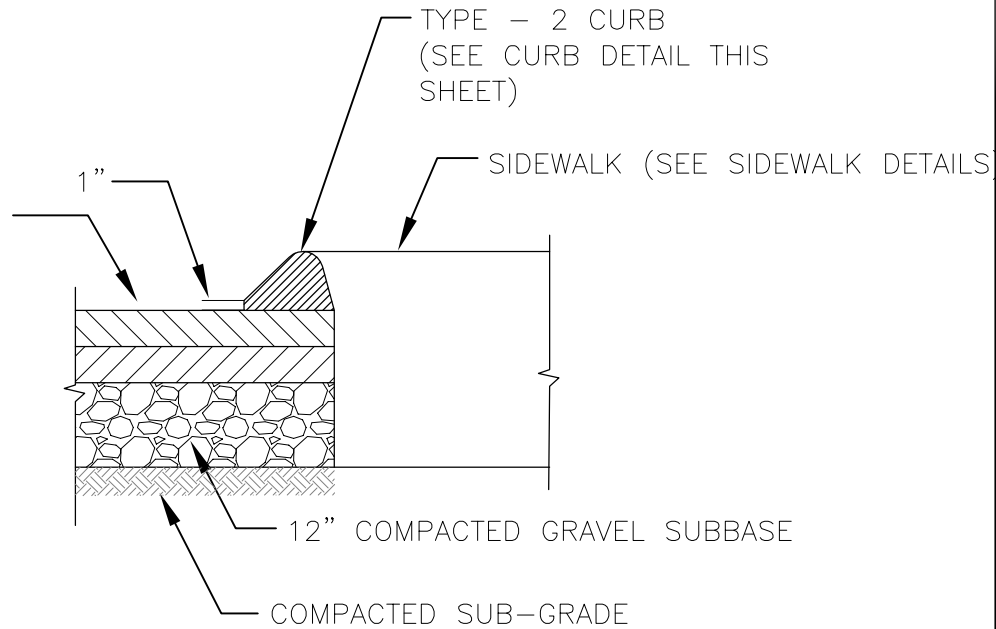


VERTICAL BACK  
OPTIONAL AND AS  
APPROVED

**CURB DETAIL**

CURB IS TYPE-2 PER MHD  
CONSTRUCTION STANDARDS

PAVEMENT PER  
PAVING AND  
SURFACING



TYPE - 2 CURB  
(SEE CURB DETAIL THIS  
SHEET)

SIDEWALK (SEE SIDEWALK DETAILS)

12" COMPACTED GRAVEL SUBBASE

COMPACTED SUB-GRADE

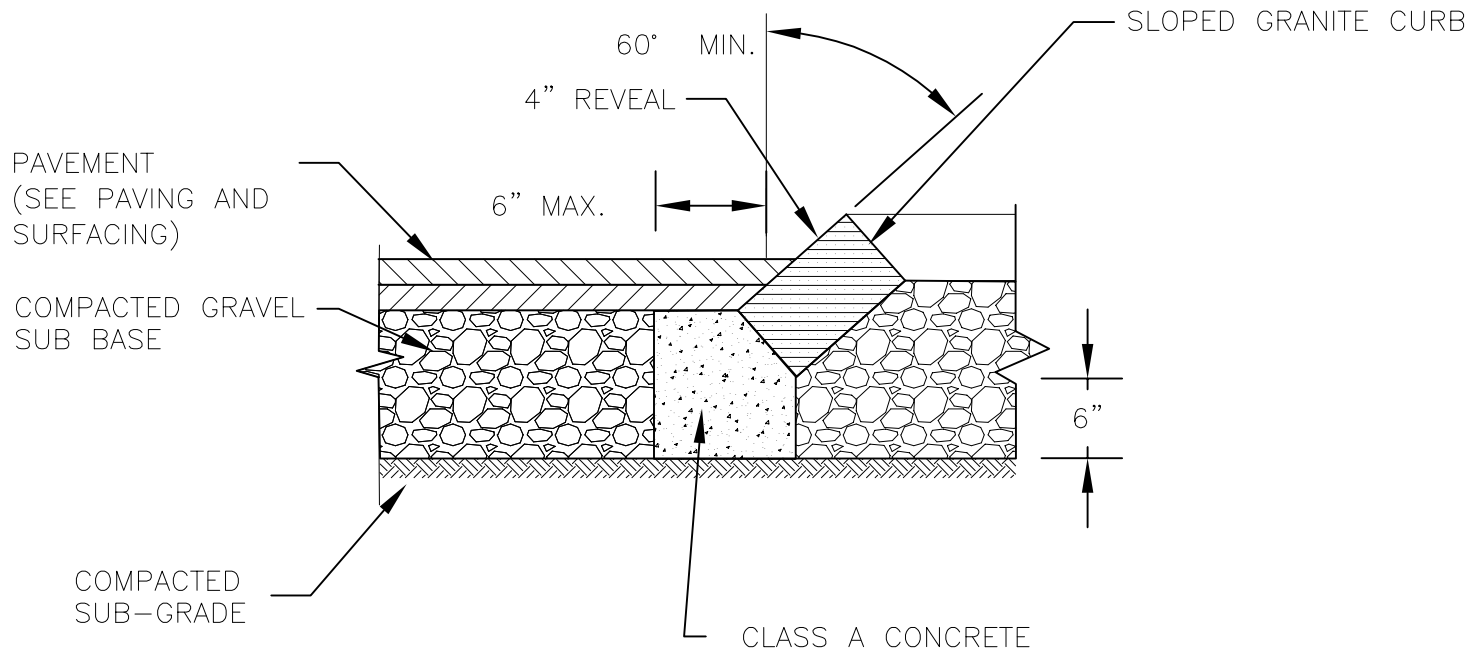
95% DETAILS  
NOT FOR CONSTRUCTION



**BITUMINOUS CONCRETE CURB DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.9</b>
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NOTES:

1. PLACE AND COMPACT GRAVEL PRIOR TO SETTING SLOPED GRANITE CURB

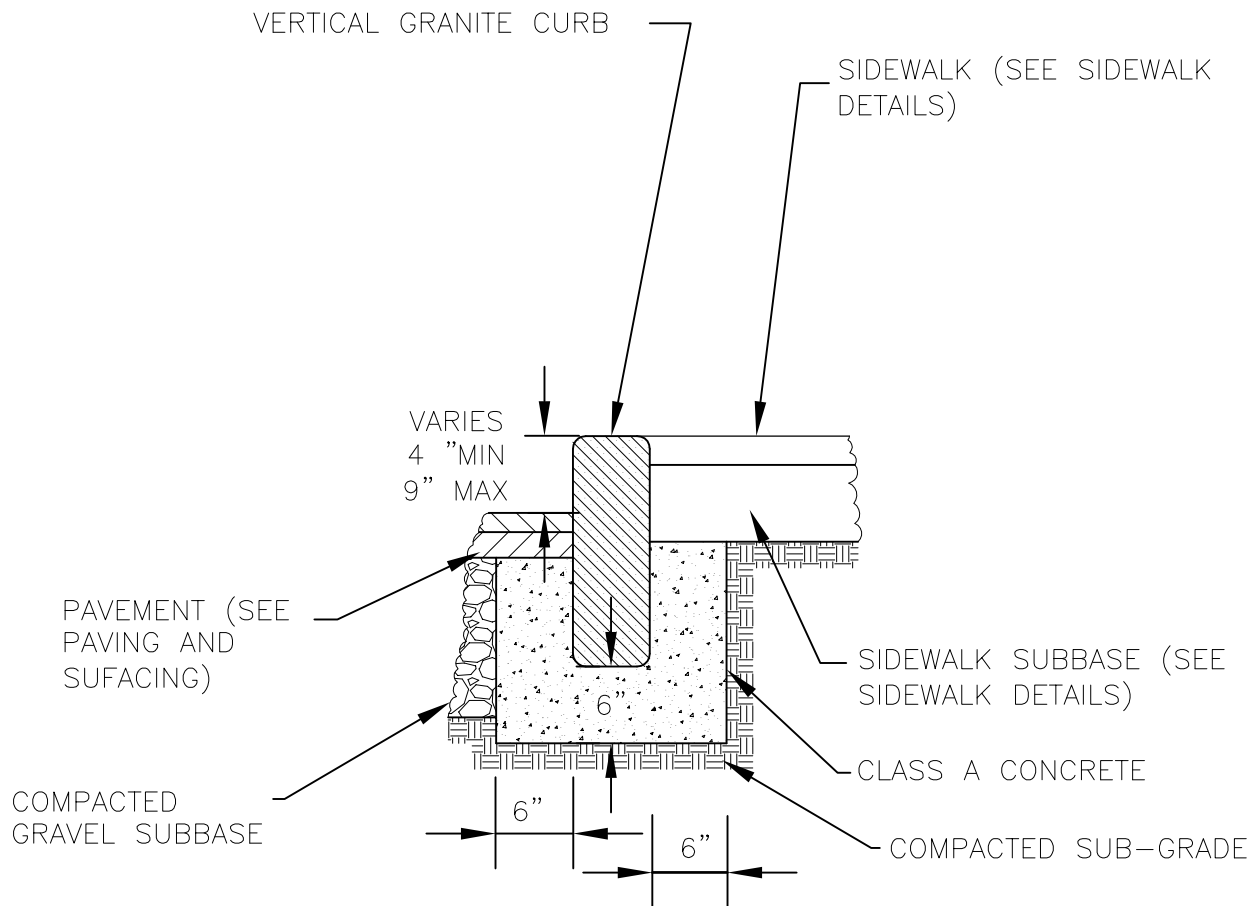
95% DETAILS  
NOT FOR CONSTRUCTION



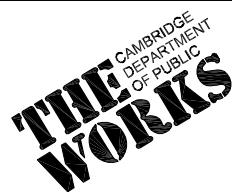
SLOPED GRANITE CURB DETAIL

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	2524.2
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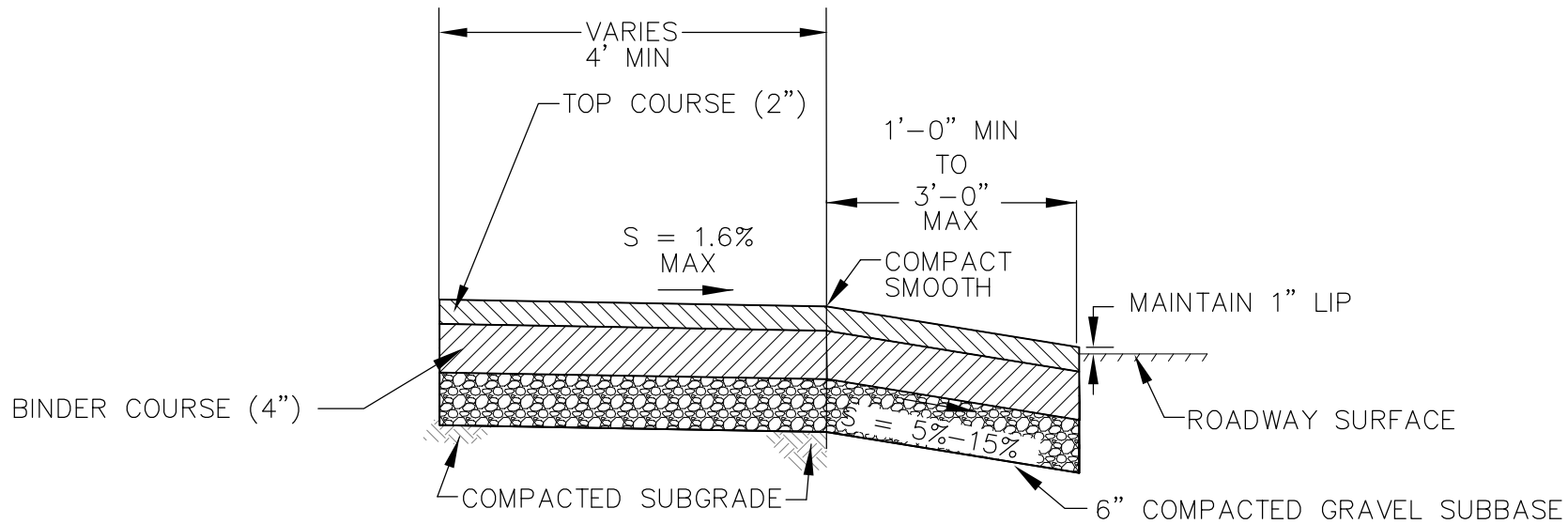
95% DETAILS  
NOT FOR CONSTRUCTION



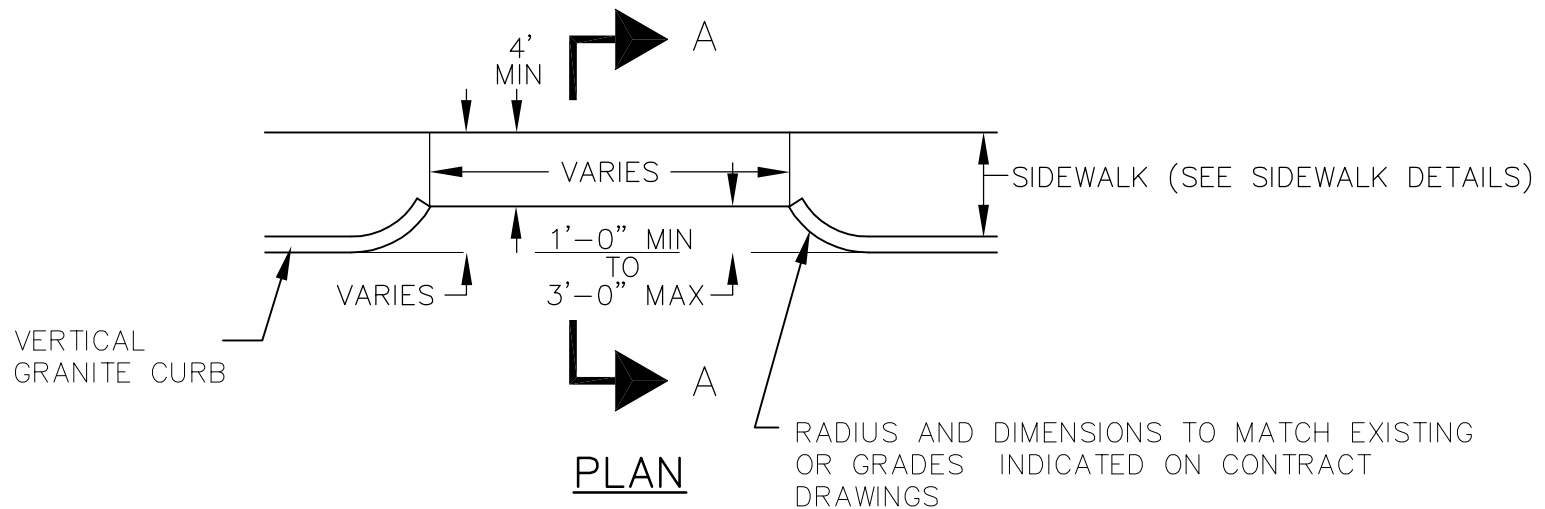
### VERTICAL GRANITE CURB DETAIL

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.1</b>
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**SECTION A-A**



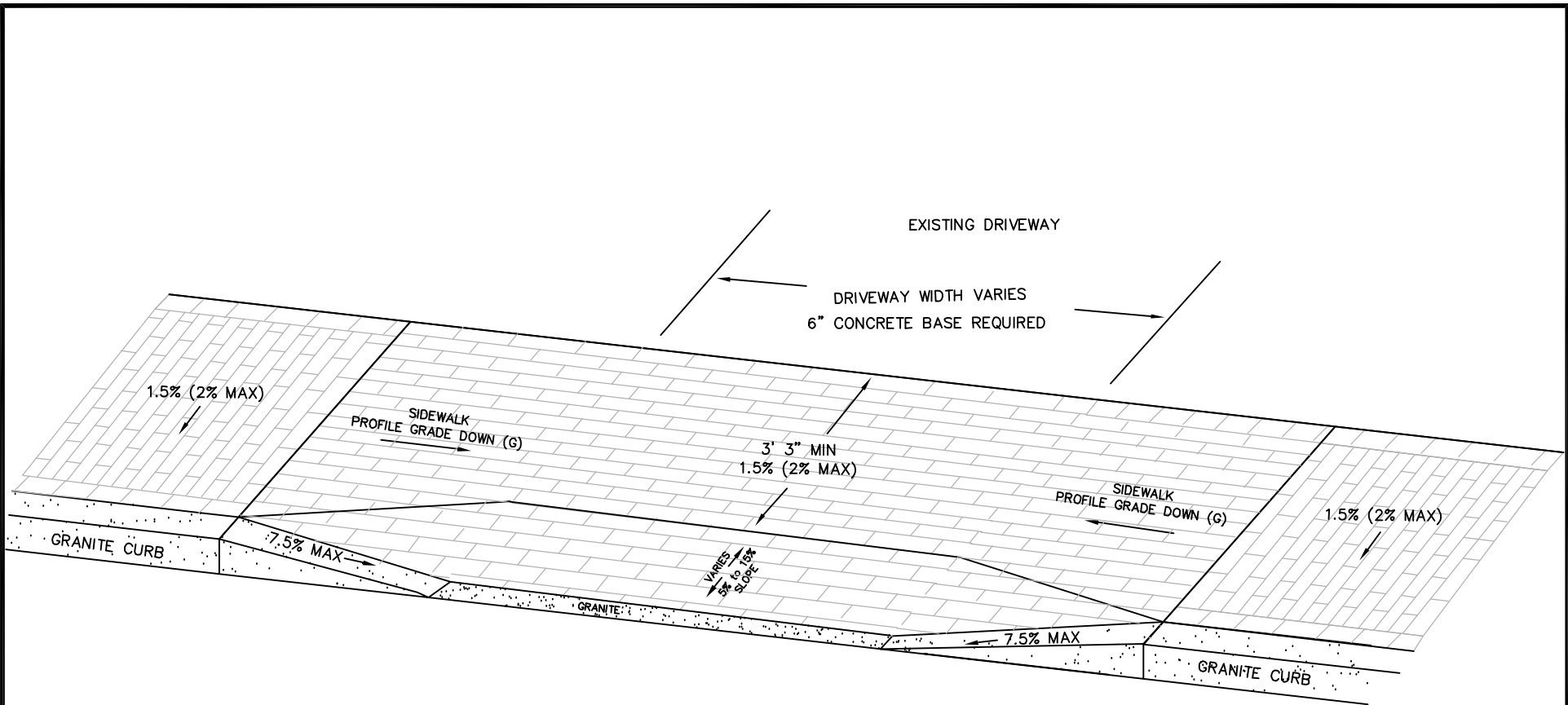
95% DETAILS  
NOT FOR CONSTRUCTION



**BITUMINOUS CONCRETE DRIVEWAY APRON DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

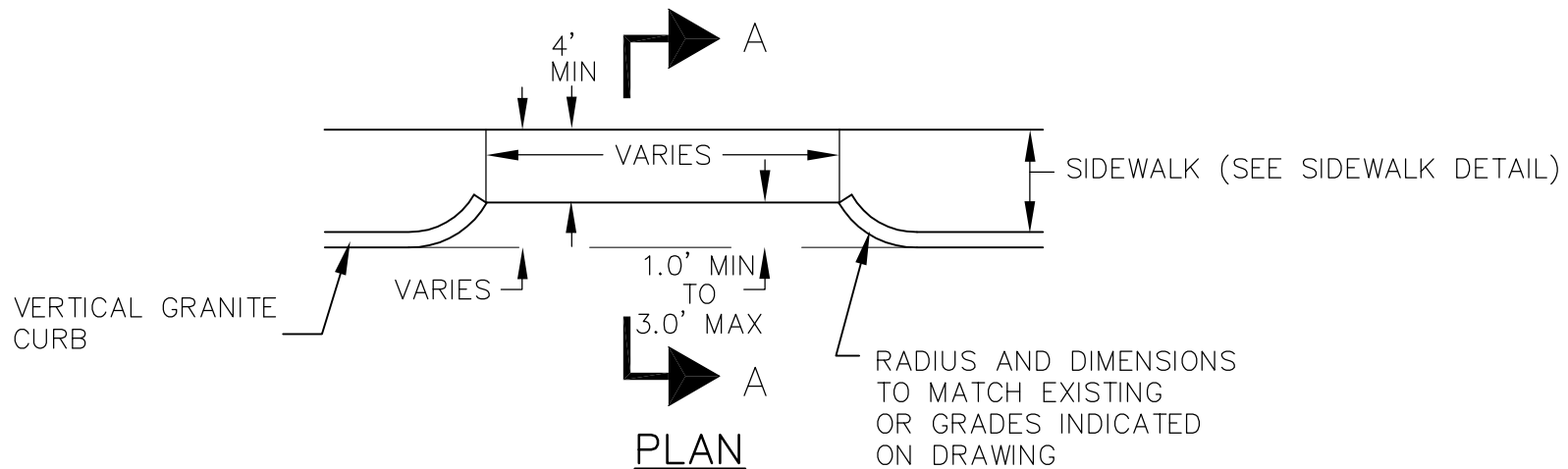
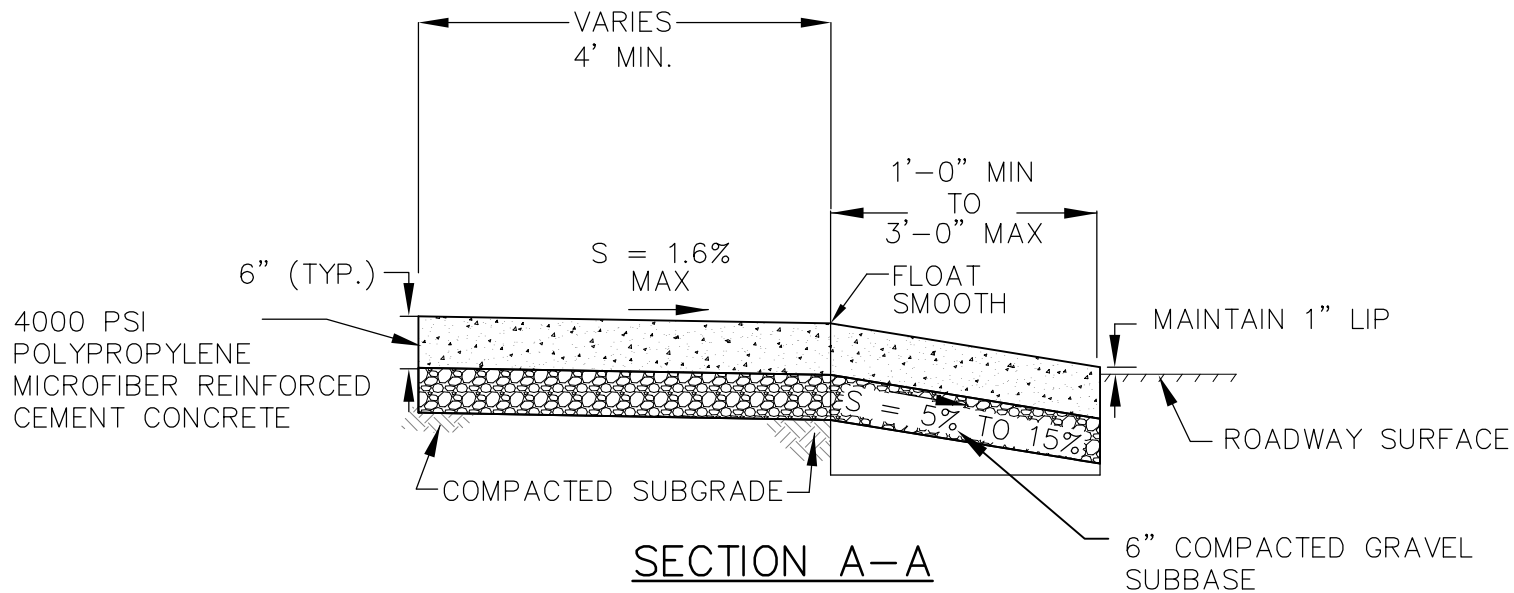
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.6</b>
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**BRICK DRIVEWAY APRON DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 03/06	SPEC. SECTION REF#: 02524	2524.10
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95% DETAILS  
NOT FOR CONSTRUCTION

CAMBRIDGE  
DEPARTMENT  
OF PUBLIC  
**THE WORKS**

**CEMENT CONCRETE DRIVEWAY APRON DETAIL**

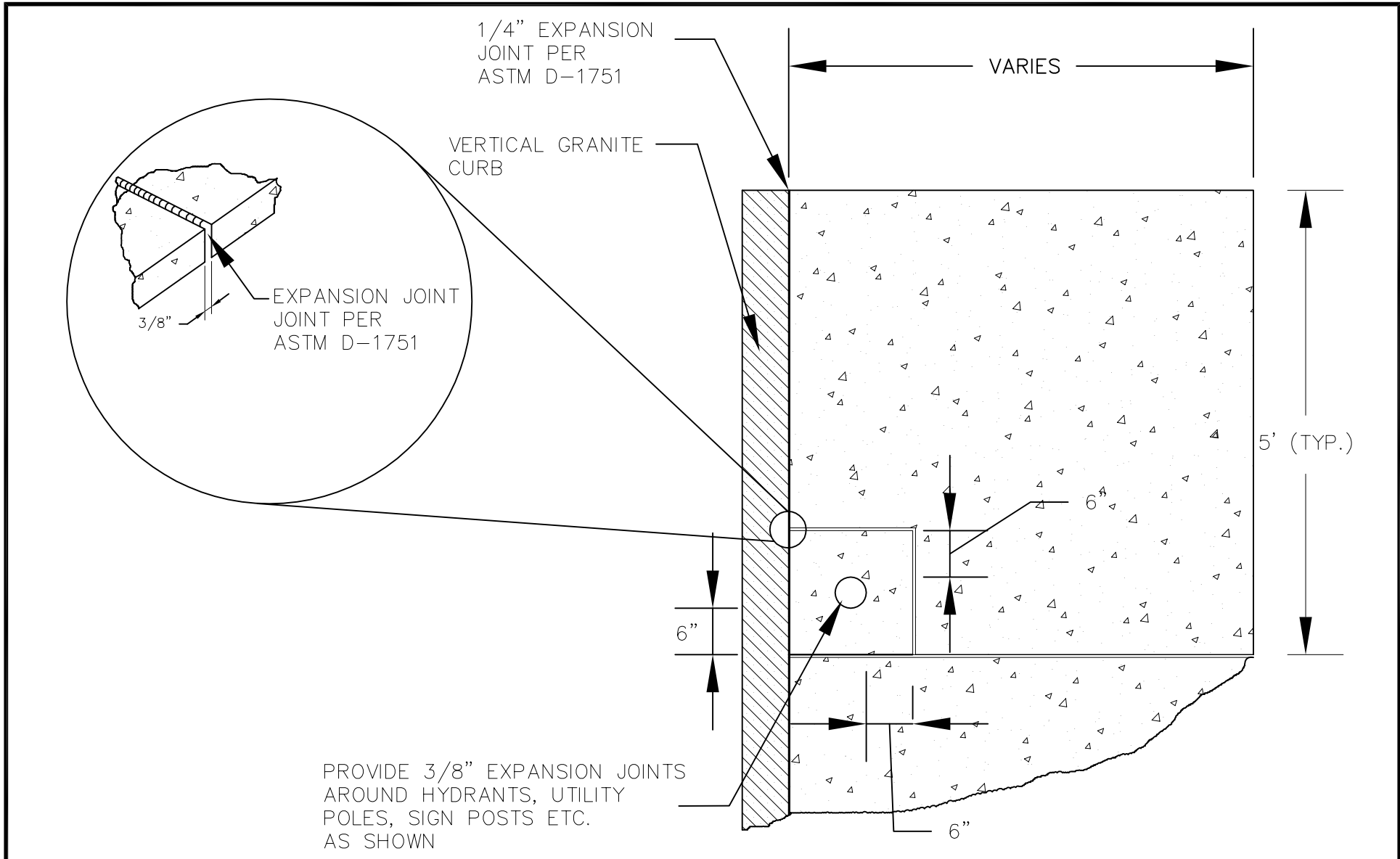
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02524

**2524.5**



PROVIDE 3/8" EXPANSION JOINTS  
 AROUND HYDRANTS, UTILITY  
 POLES, SIGN POSTS ETC.  
 AS SHOWN

95% DETAILS  
 NOT FOR CONSTRUCTION

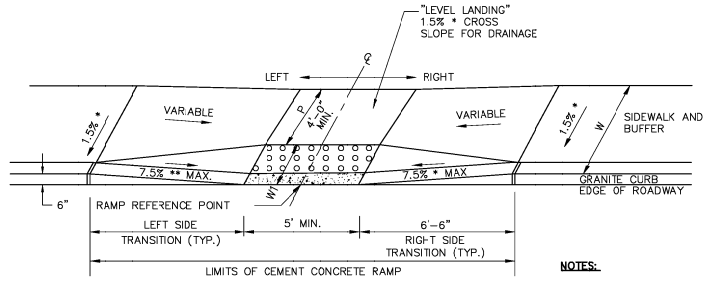


**SIDEWALK EXPANSION JOINT DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

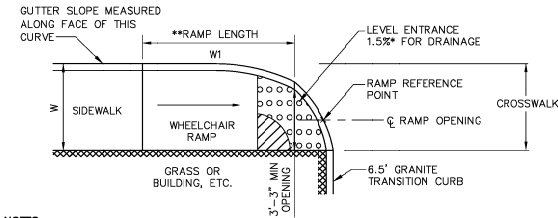
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02524	<b>2524.4</b>
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### WHEELCHAIR RAMP PERPENDICULAR



- NOTES:**
- SEE CONSTRUCTION STANDARD M/E 107.2.0
  - \* CONSTRUCTION TOLERANCE ±0.5%
  - \*\* SEE CONSTRUCTION STANDARD M/E 107.9.0

### WHEELCHAIR RAMP SINGLE DIRECTION WITH LEVEL ENTRANCE

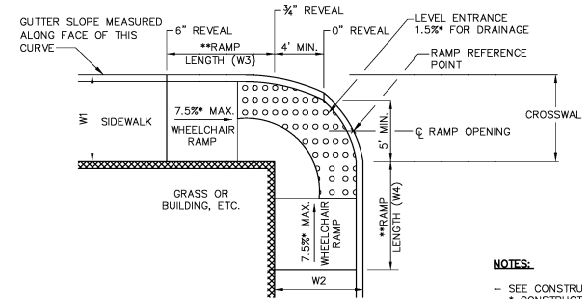


- NOTES:**
- SEE CONSTRUCTION STANDARD M/E 107.2.0
  - \* CONSTRUCTION TOLERANCE ±0.5%
  - \*\* SEE CONSTRUCTION STANDARD M/E 107.9.0

WCR#	RAMP REFERENCE POINT		WIDTH OF SIDEWALK & BUFFER (W)	WIDTH OF RAMP OPENING	ROADWAY GUTTER SLOPE	RAMP LENGTH (W1)
	STA.	OFFSET				
9	120+90.42	27.00' LT	7.00'	5.00'	0.96%	3.25'
10	121+16.51	27.00' LT	7.00'	5.00'	0.96%	7.67'

WCR#	RAMP REFERENCE POINT		LENGTH OF PRIMARY RAMP (W1)	WIDTH OF SIDEWALK & BUFFER (W)	WIDTH OF RAMP	PATH FOR TRAVEL (P)	ROADWAY GUTTER SLOPE		TRANSITION LENGTH	
	STA.	OFFSET					LEFT	RIGHT	LEFT	RIGHT
1	103+47.45	28.54' LT	2.00'	6.00'	5.00'	4.00'	-2.60%	-2.60%	11.00'	6.50'
2	103+81.28	28.13' LT	2.00'	7.00'	5.00'	5.00'	2.60%	2.60%	6.50'	11.00'
3	111+84.39	27.91' LT	2.00'	6.00'	5.00'	4.00'	-0.72%	-3.30%	7.67'	6.50'
4	112+13.80	27.98' LT	2.00'	6.00'	5.00'	4.00'	3.30%	-0.40%	6.50'	6.50'
5	112+38.62	22.50' LT	2.00'	7.00'	5.00'	5.00'	-0.40%	-0.40%	7.67'	6.50'
6	112+38.62	22.50' RT	3.00'	7.00'	5.00'	4.00'	0.40%	0.40%	6.50'	7.67'
7	120+78.75	22.50' LT	2.00'	7.00'	5.00'	5.00'	0.96%	0.96%	6.50'	3.83'
8	120+78.75	22.50' RT	3.00'	7.00'	5.00'	4.00'	-0.96%	-0.96%	7.67'	6.50'
1'	127+62.58	28.00' RT	2.00'	6.00'	5.00'	4.00'	-1.98%	-1.98%	9.00'	6.50'
12	128+00.00	28.00' RT	2.00'	6.00'	5.00'	4.00'	2.98%	2.98%	6.50'	11.00'
14	128+42.09	28.00' LT	2.00'	6.50'	5.00'	4.50'	0.32%	0.32%	6.50'	3.83'
15	128+56.22	22.50' LT	2.00'	7.00'	5.00'	5.00'	0.32%	-0.74%	3.25'	6.50'
16	128+56.22	22.50' RT	3.00'	7.00'	5.00'	4.00'	0.74%	0.74%	6.50'	7.67'
17	133+76.82	22.50' LT	2.00'	7.00'	5.00'	5.00'	-0.43%	-0.43%	7.67'	6.50'
18	133+76.82	22.50' RT	3.00'	7.00'	5.00'	4.00'	0.43%	0.43%	6.50'	7.67'
19	133+90.36	36.11' LT	2.00'	6.00'	5.00'	4.00'	-3.69%	-3.69%	7.00'	6.50'
20	134+26.09	36.00' LT	2.00'	7.00'	5.00'	5.00'	1.69%	1.69%	6.50'	9.00'
21	138+55.00	22.50' LT	3.00'	7.00'	5.00'	4.00'	-0.51%	-0.51%	7.67'	6.50'

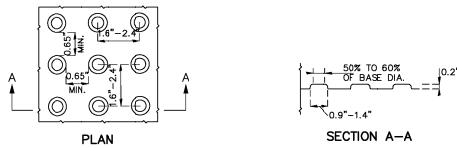
### WHEELCHAIR RAMP FOR 'T' INTERSECTION



- NOTES:**
- SEE CONSTRUCTION STANDARD M/E 107.2.0
  - \* CONSTRUCTION TOLERANCE ±0.5%
  - \*\* SEE CONSTRUCTION STANDARD M/E 107.9.0

WCR#	RAMP REFERENCE POINT		WIDTH OF SIDEWALK & BUFFER (W1)	WIDTH SIDEWALK (W2)	WIDTH OF RAMP OPENING	ROADWAY GUTTER SLOPE		RAMP LENGTH	
	STA.	OFFSET				CONCORD	SIDE ST.	W3	W4
13	128+10.00	27.50' LT	7.00'	6.35'	5.00'	-0.74%	-0.40%	7.67'	6.50'

### DETECTABLE WARNING PANEL TYPICAL INSTALLATION



DESIGNED BY: S. MURPHY  
 DRAWN BY: S. MURPHY  
 CHECKED BY: L. SHERMAN  
 CROSS CHECKED BY: K. JOHNSON  
 APPROVED BY: L. SHERMAN  
 DATE: JANUARY 2010

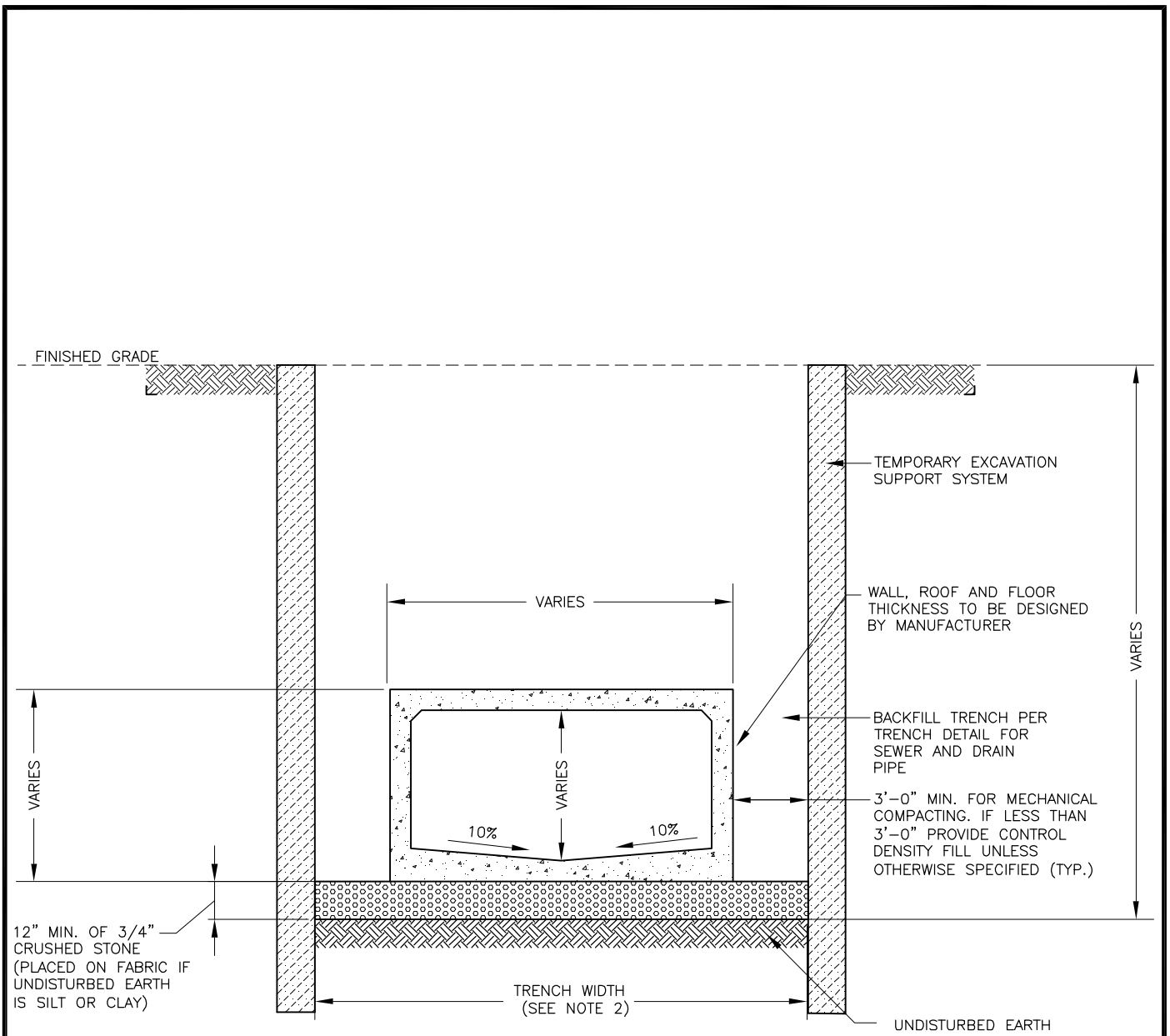
**CDM**  
 58 Exchange Terrace  
 Providence, RI 02903  
 Tel: (401) 751-8860  
 consulting • engineering • construction • operations

CITY OF CAMBRIDGE, MASSACHUSETTS  
 DEPARTMENT OF PUBLIC WORKS AND WATER DEPARTMENT

### WHEELCHAIR RAMP DETAILS

PROJECT NO.  
 FILE NAME:  
 SHEET NO.  
 Accession No: 0139-P-xxxx

REV. NO.	DATE	DRWN	CHKD	REMARKS



NOTES:

1. PRECAST REINFORCED CONCRETE BOX SECTIONS MANUFACTURED IN ACCORDANCE WITH PRECAST REINFORCED CONCRETE BOX CULVERT. WATERTIGHT GASKET JOINTS TO BE PROVIDED AS SPECIFIED.
2. TRENCH PAY LIMIT FOR BOX CULVERT IS OUTSIDE DIMENSION (WIDTH) PLUS 3' FOR TEMPORARY SUPPORT OF EXCAVATION PLUS SPACE BETWEEN CULVERT AND TEMPORARY SUPPORT OF EXCAVATION TO A MAXIMUM OF 6' TOTAL.



BOX CULVERT DETAIL - PLAN

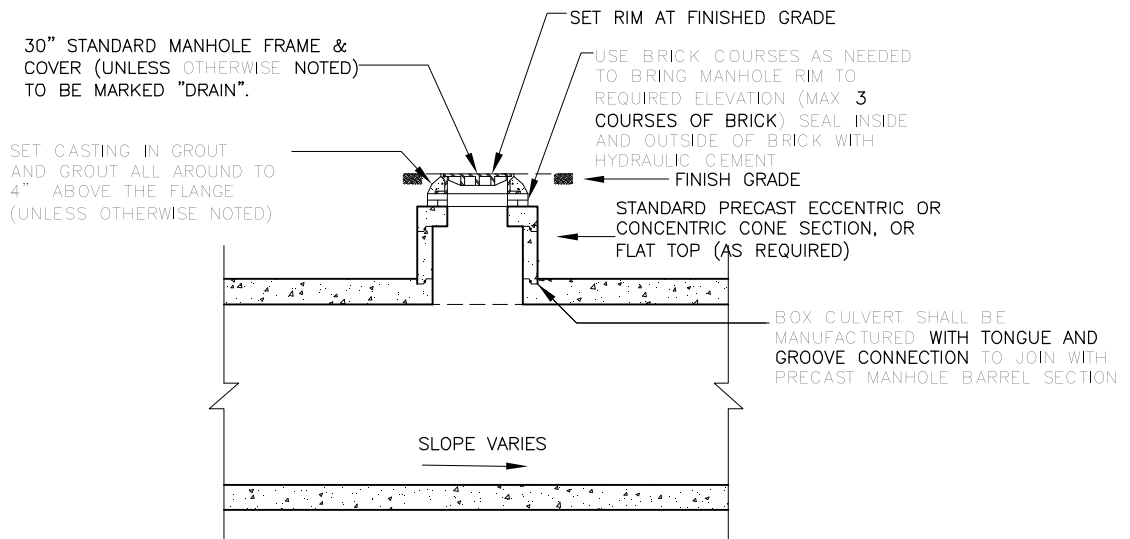
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02715

2715.1



LONGITUDINAL SECTION



**BOX CULVERT DETAIL - SECTION**

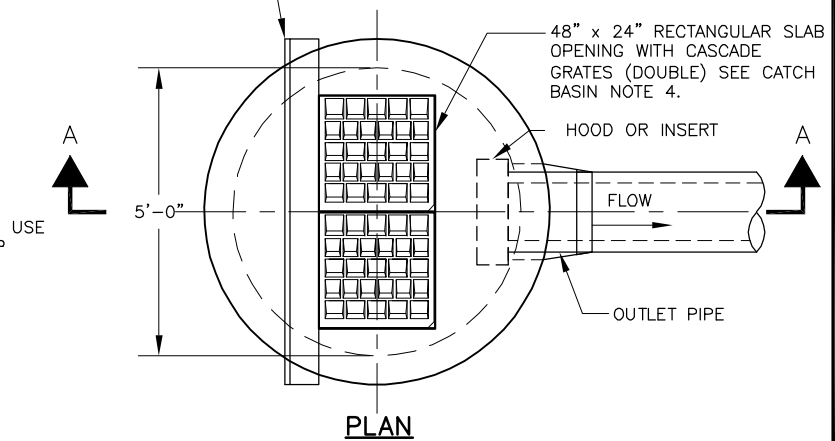
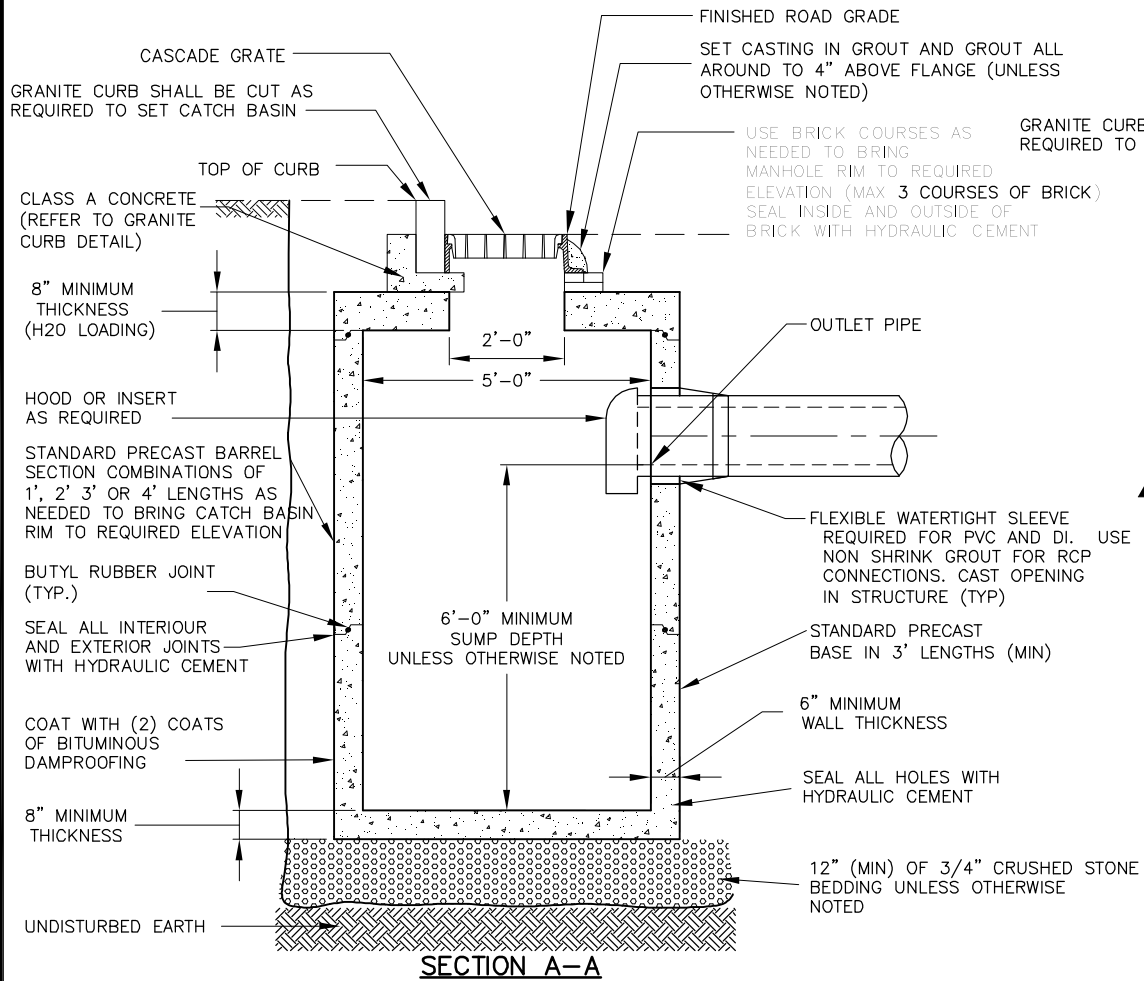
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02715

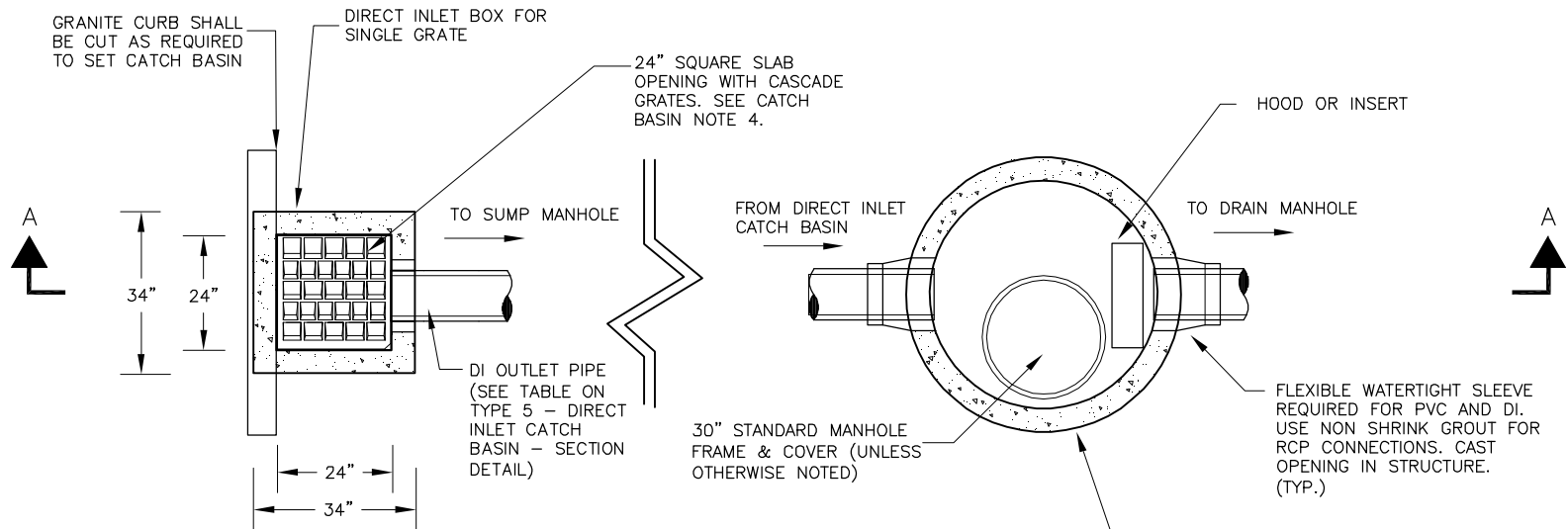
**2715.2**



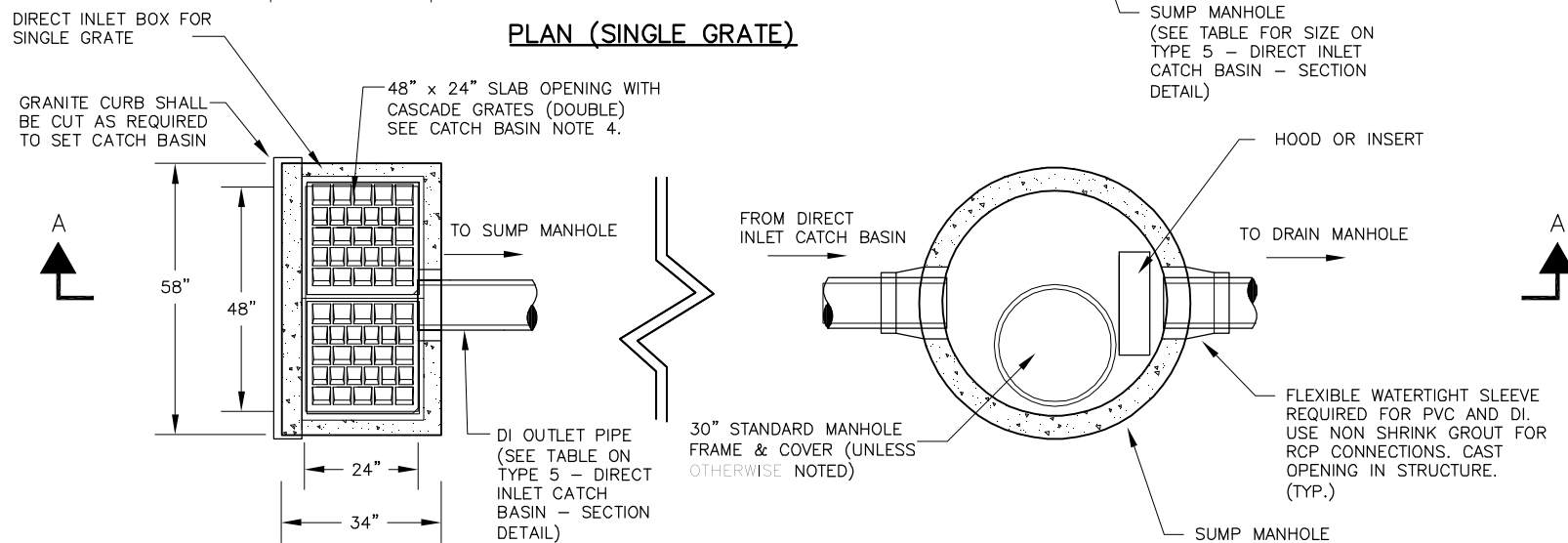
**TYPE 2 - DOUBLE GRATE CATCH BASIN**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02604	<b>2604.3</b>
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**PLAN (SINGLE GRATE)**



**PLAN (DOUBLE GRATE)**



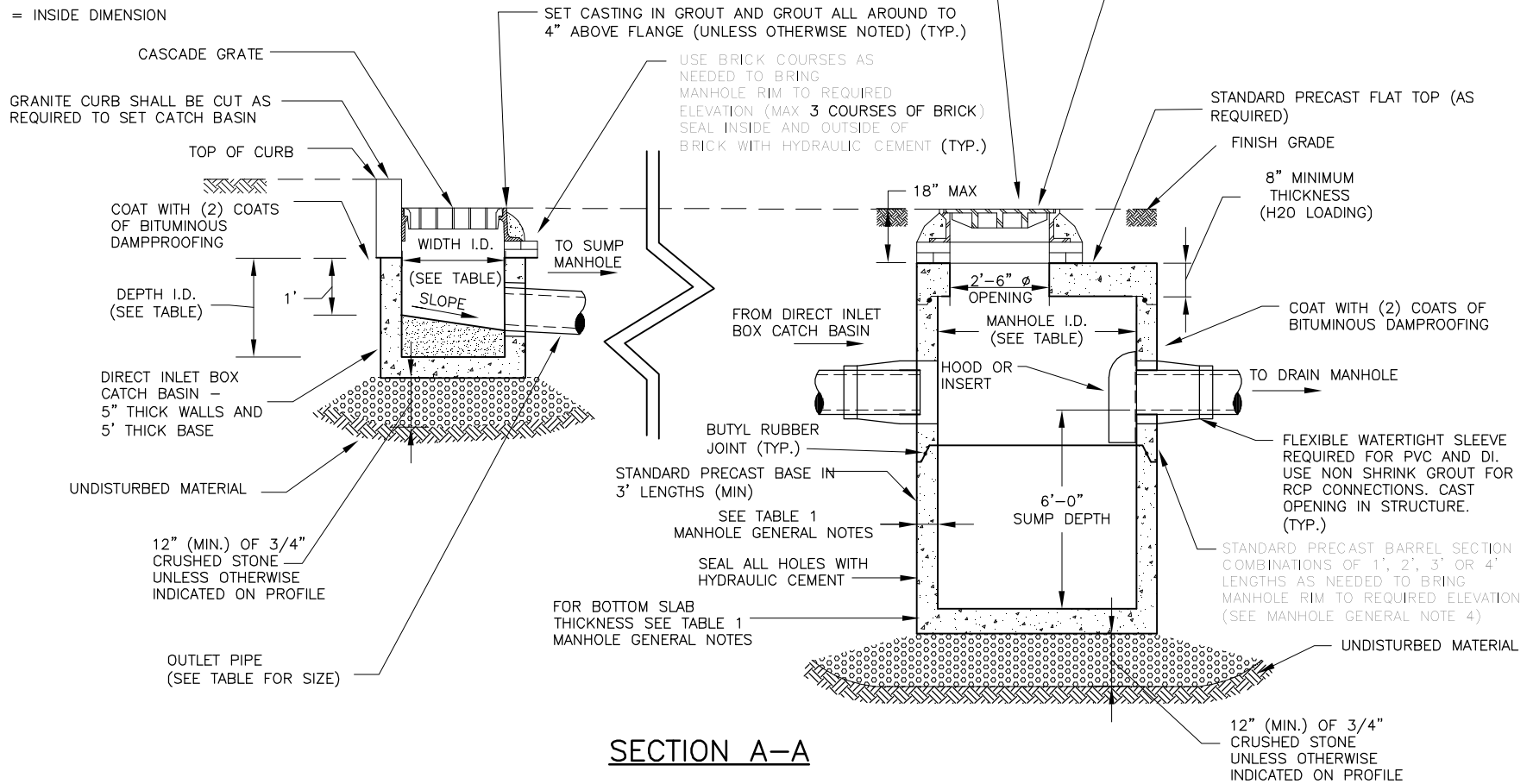
<b>TYPE 5 - DIRECT INLET CATCH BASIN - PLAN</b>			
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS			
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02604	<b>2604.6</b>

PRECAST INLET BOX AND SUMP MANHOLE SIZE TABLE

	PRECAST DIRECT INLET BOX			OUTLET PIPE	SUMP MANHOLE
	WIDTH (I.D.)	LENGTH (I.D.)	DEPTH (I.D.)	Ø (I.D.)	Ø (I.D.)
SINGLE GRATE	24"	24"	24"	12"	4'
DOUBLE GRATE	24"	48"	36"	15"	5'

I.D. = INSIDE DIMENSION

30" STANDARD MANHOLE FRAME & COVER  
(UNLESS OTHERWISE NOTED) TO BE  
MARKED "DRAIN"



SECTION A-A



TYPE 5 - DIRECT INLET CATCH BASIN - SECTION

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02604

2604.5

TRENCH PAY LIMIT TABLE FOR CATCH BASINS

WALL THICKNESS	MAX TRENCH WIDTH
LESS THAN 6"	I.D. + 5'-0"
6" TO 12"	I.D. + 6'-0"
13" TO 18"	I.D. + 7'-0"
19" & GREATER	O.D. + 6'-0"

I.D. = INSIDE DIMENSION  
O.D. = OUTSIDE DIMENSION

FOR TRENCHES GREATER THAN 5' DEEP ADD 3'  
FOR TEMPORARY SUPPORT OF EXCAVATION

GENERAL CATCH BASIN NOTES:

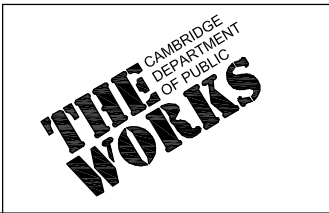
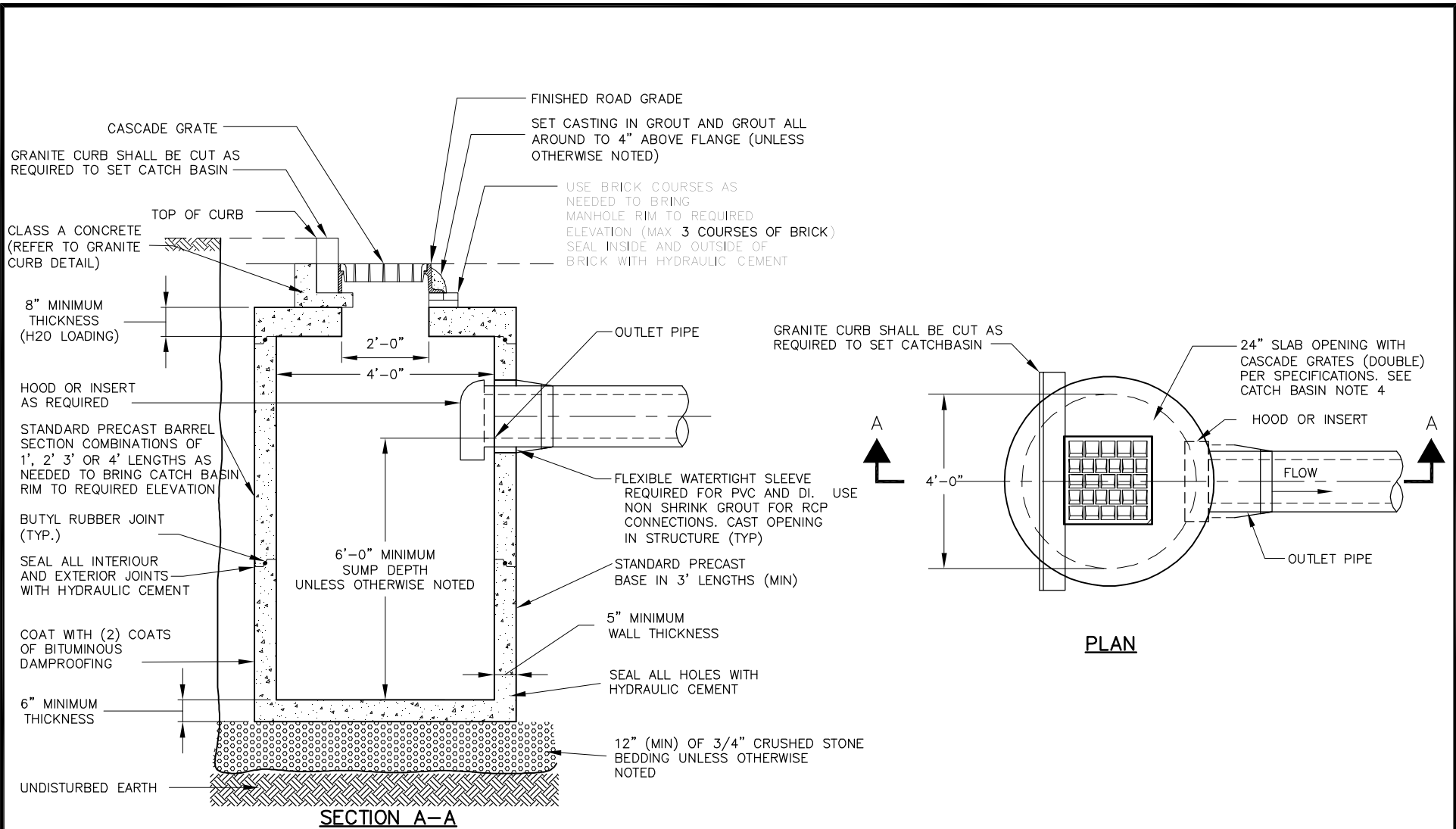
1. FACE OF PIPE SHALL NOT PROJECT MORE THAN 4-INCHES FROM FACE OF WALL ALONG CENTERLINE OF PIPE.
2. DESIGN PRECAST SECTIONS WITH FRAME AND GRATE FOR AASHTO H20 LOADING UNLESS OTHERWISE NOTED.
3. PRECAST TOP SLAB OPENING CAN BE CENTERED OR OFFSET AS NECESSARY.
4. GRATE VANES SHALL BE INSTALLED IN DIRECTION TO RECEIVE FLOWS.



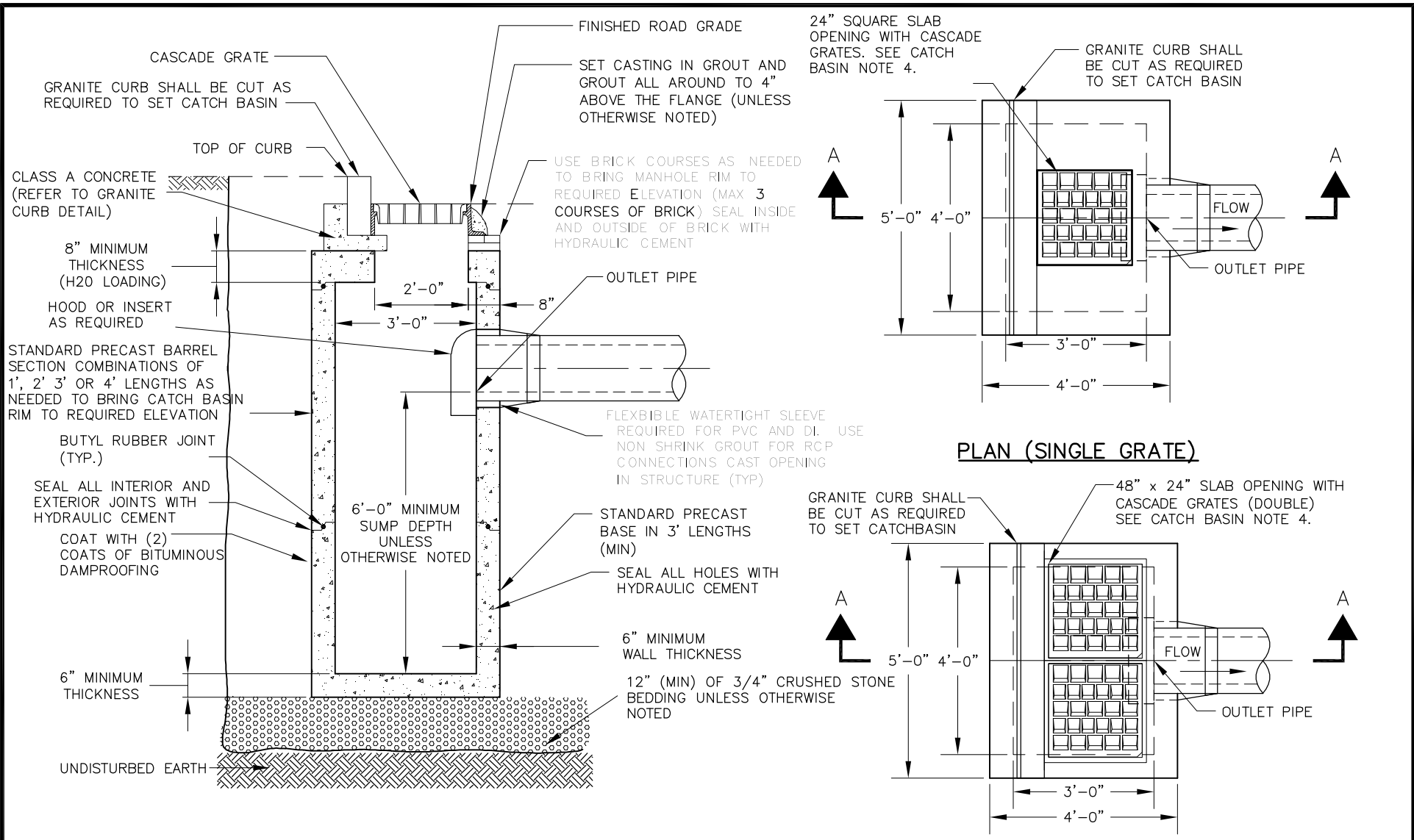
## CATCH BASIN GENERAL NOTES

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02604	<b>2604.1</b>
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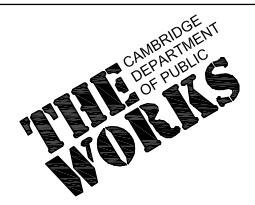
<b>TYPE 1 - SINGLE GRATE CATCH BASIN</b>			
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS			
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02604	<b>2604.2</b>



**SECTION A-A**

**PLAN (SINGLE GRATE)**

**PLAN (DOUBLE GRATE)**



**TYPE 3-CATCH BASIN WITH (SINGLE) CASCADE GRATE AND  
 TYPE 4-CATCH BASIN WITH (DOUBLE) CASCADE GRATE**

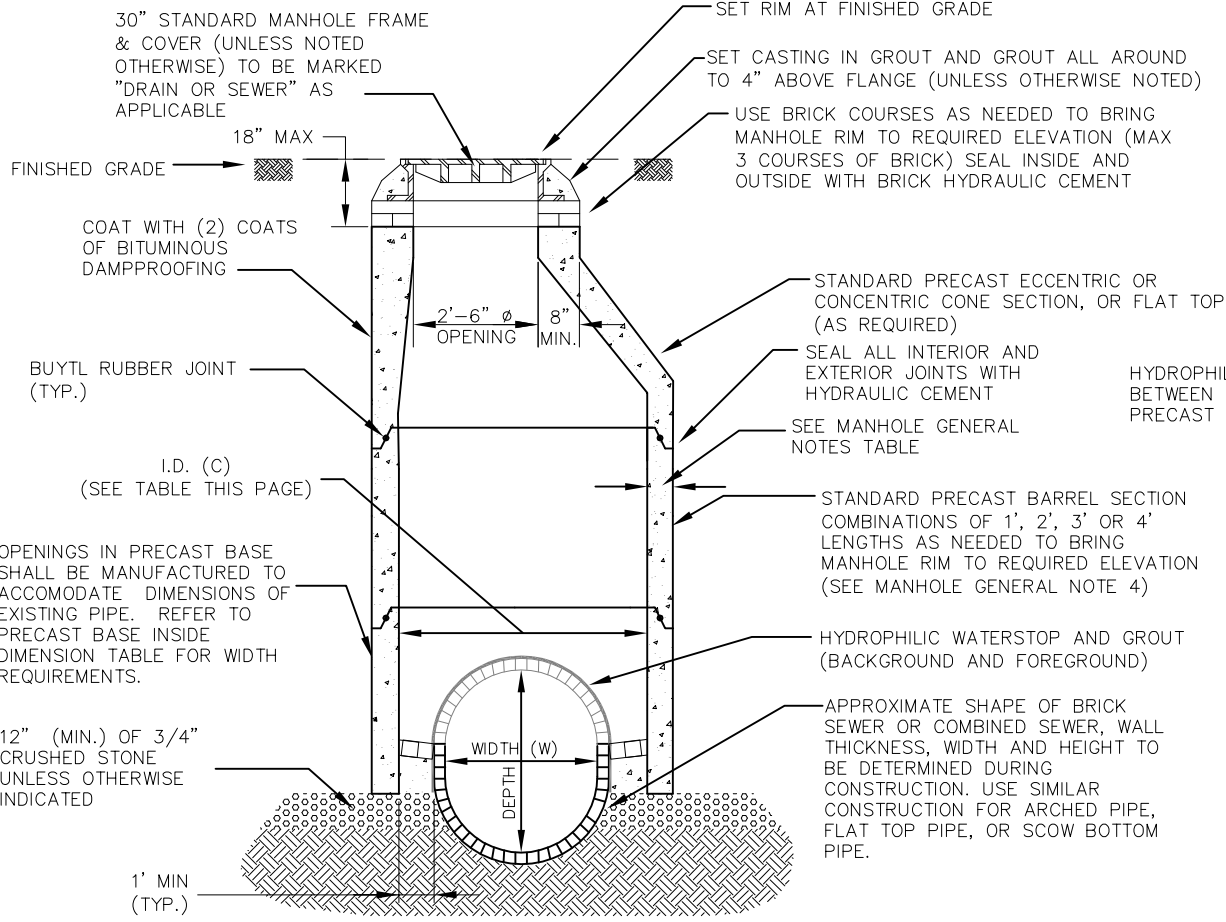
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02604	<b>2604.4</b>
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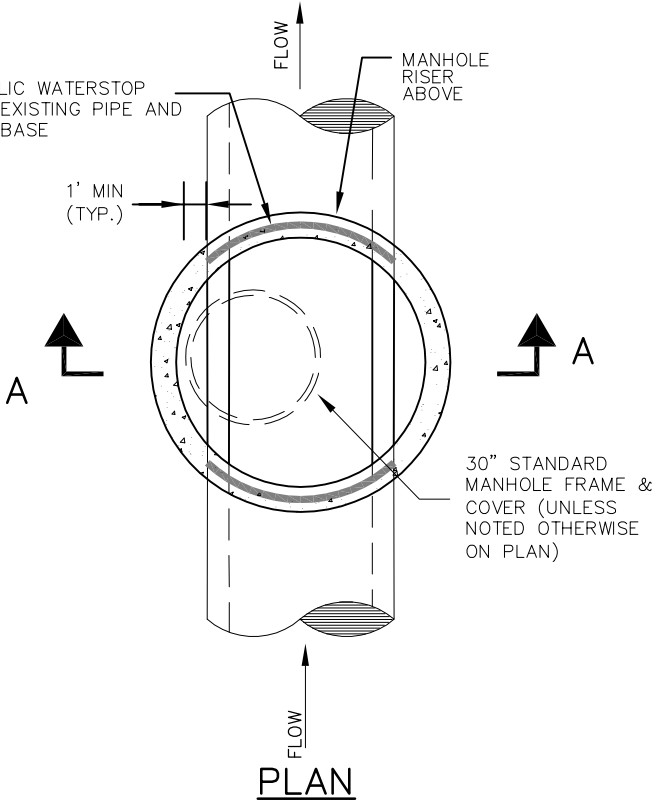
PRECAST BASE INSIDE DIMENSION TABLE

WIDTH (W)	I.D. (C)
8" TO 24"	4' $\phi$
27" TO 36"	5' $\phi$
48" TO 66"	6' $\phi$
66" TO 72"	8' $\phi$
> 72"	10' $\phi$

I.D. = INSIDE DIMENSION



SECTION A-A



PLAN

NOTES:  
 1. REMOVE EXISTING BRICK PIPE TO SPRING LINE WITHIN THE INSIDE OF THE PRECAST MANHOLE BASE AND CONSTRUCT THE INVERT TO THE SPRING LINE AS SHOWN.

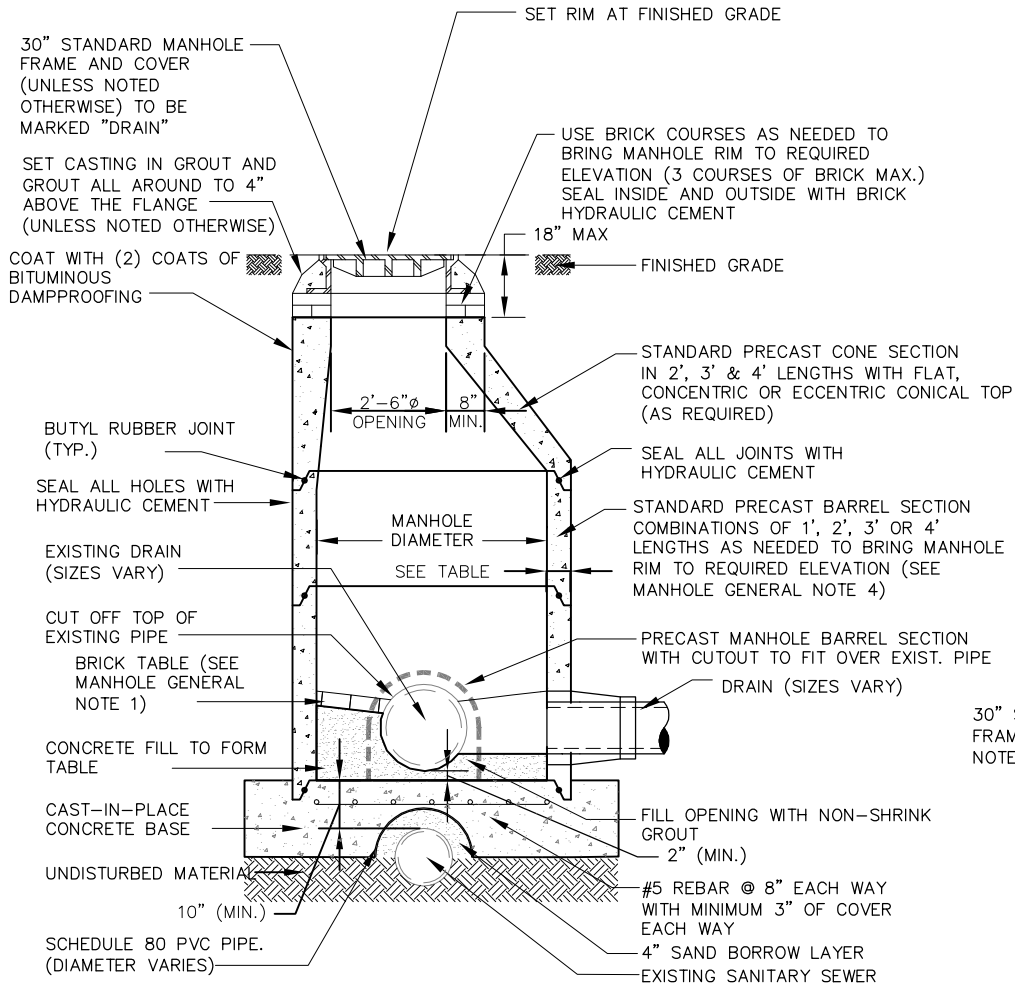
95% DETAILS  
 NOT FOR CONSTRUCTION



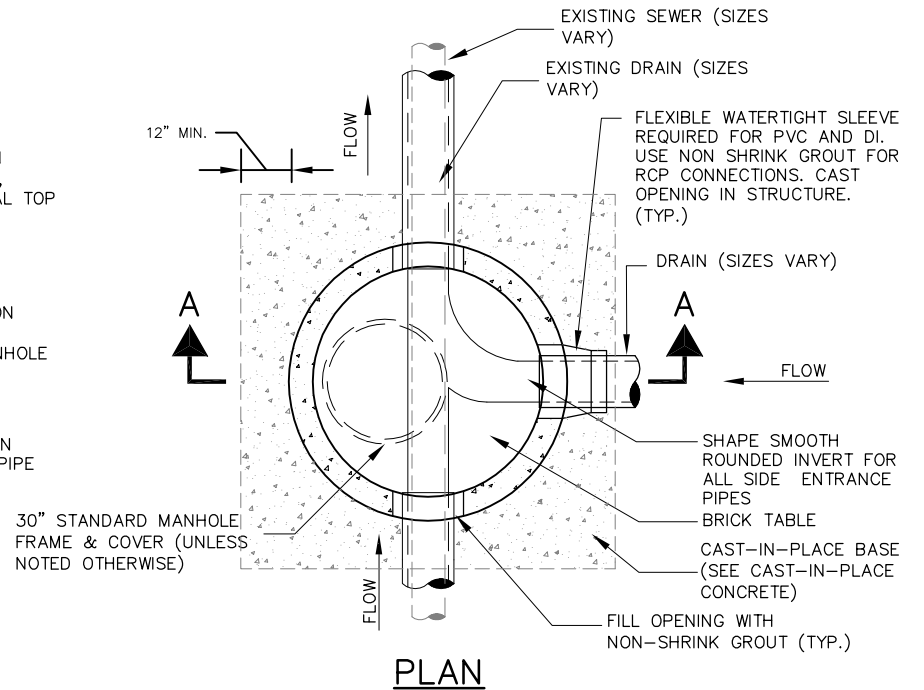
TYPE 2 - PRECAST DROP OVER MANHOLE DETAIL

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	2252.3
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**SECTION A-A**



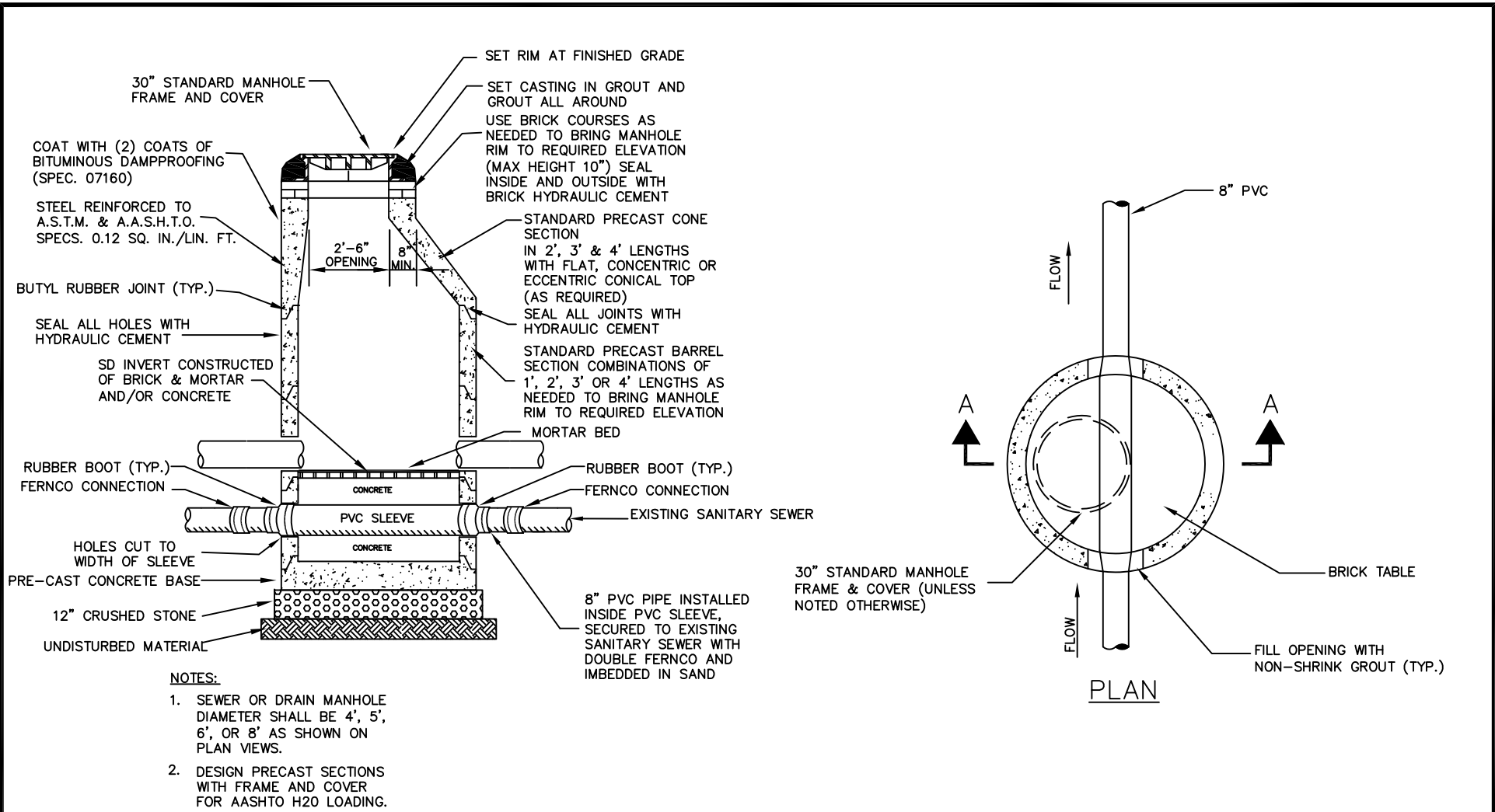
95% DETAILS  
NOT FOR CONSTRUCTION



**TYPE 5 - MANHOLE CONSTRUCTED OVER EXISTING SEWER DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.6</b>
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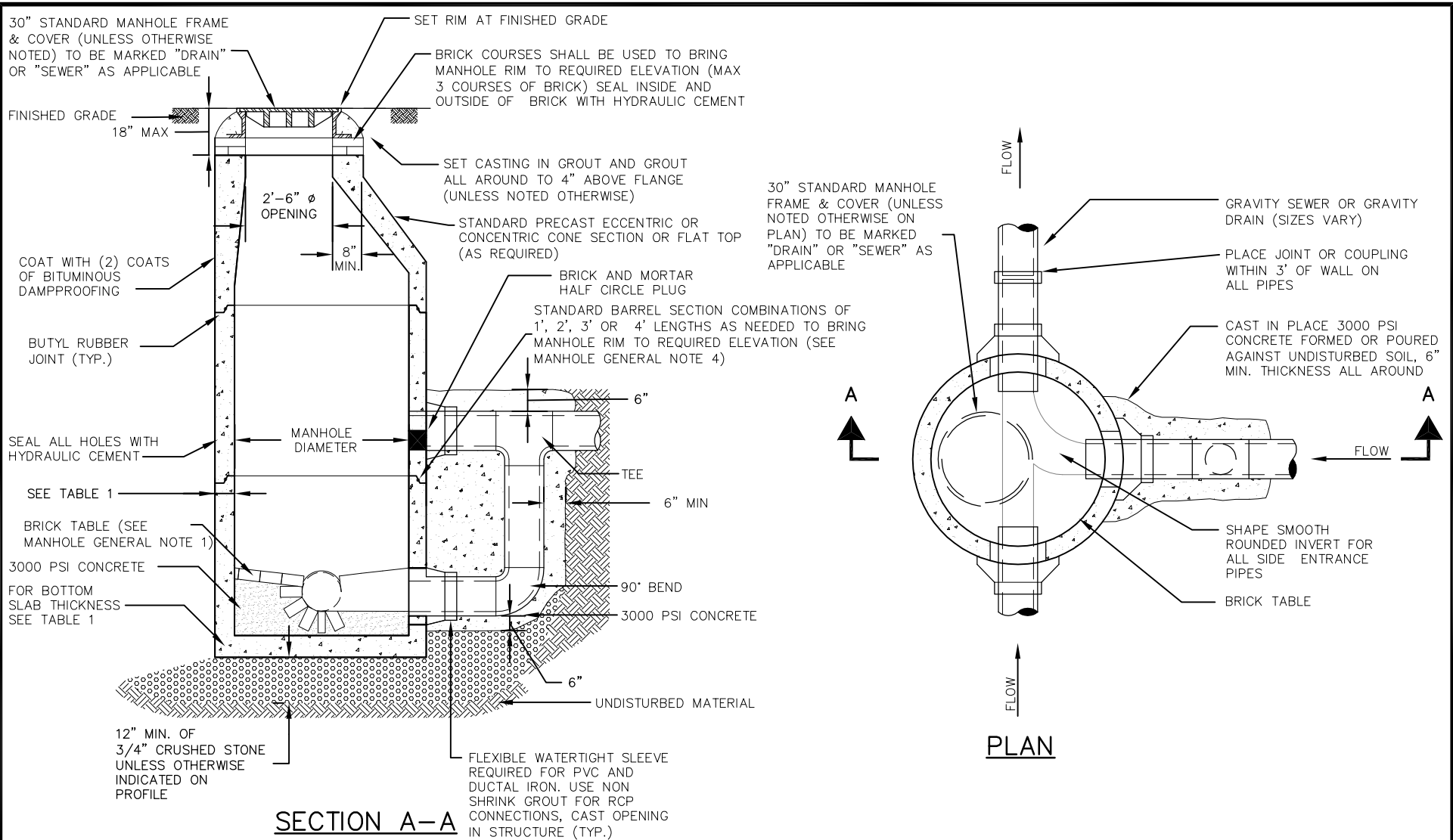


- NOTES:**
1. SEWER OR DRAIN MANHOLE DIAMETER SHALL BE 4', 5', 6', OR 8' AS SHOWN ON PLAN VIEWS.
  2. DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H20 LOADING.

SECTION A-A



<b>TYPE 6 - MANHOLE CONSTRUCTED OVER EXISTING UTILITY - WITH BASE</b>			
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS			
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.7</b>



95% DETAILS  
NOT FOR CONSTRUCTION



**TYPE 3 - DROP MANHOLE**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.4</b>
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30" STANDARD MANHOLE FRAME & COVER (UNLESS NOTED OTHERWISE) TO BE MARKED "DRAIN" OR "SEWER"

SET CASTING IN GROUT AND GROUT ALL AROUND TO 4" ABOVE FLANGE (UNLESS NOTED OTHERWISE)

SET RIM AT FINISHED GRADE

USE BRICK COURSES AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (MAX 3 COURSES OF BRICK) SEAL INSIDE AND OUTSIDE OF BRICK WITH HYDRAULIC CEMENT

COAT WITH (2) COATS OF BITUMINOUS DAMPPROOFING

BUTYL RUBBER JOINT (TYP.)

SEAL ALL HOLES WITH HYDRAULIC CEMENT

WALL THICKNESS PER PRECAST CONCRETE MANHOLE DETAIL

STANDARD PRECAST BASE IN 3' LENGTHS (MIN)

BOTTOM SLAB THICKNESS PER PRECAST CONCRETE MANHOLE DETAIL

18" MAX

FINISH GRADE

STANDARD PRECAST FLAT TOP

2'-6" Ø OPENING

STANDARD PRECAST BARREL SECTION COMBINATIONS OF 1', 2', 3' OR 4' LENGTHS AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (SEE PRECAST CONCRETE MANHOLE DETAIL GENERAL NOTE 4)

SEAL ALL INTERIOR AND EXTERIOR JOINTS WITH HYDRAULIC CEMENT

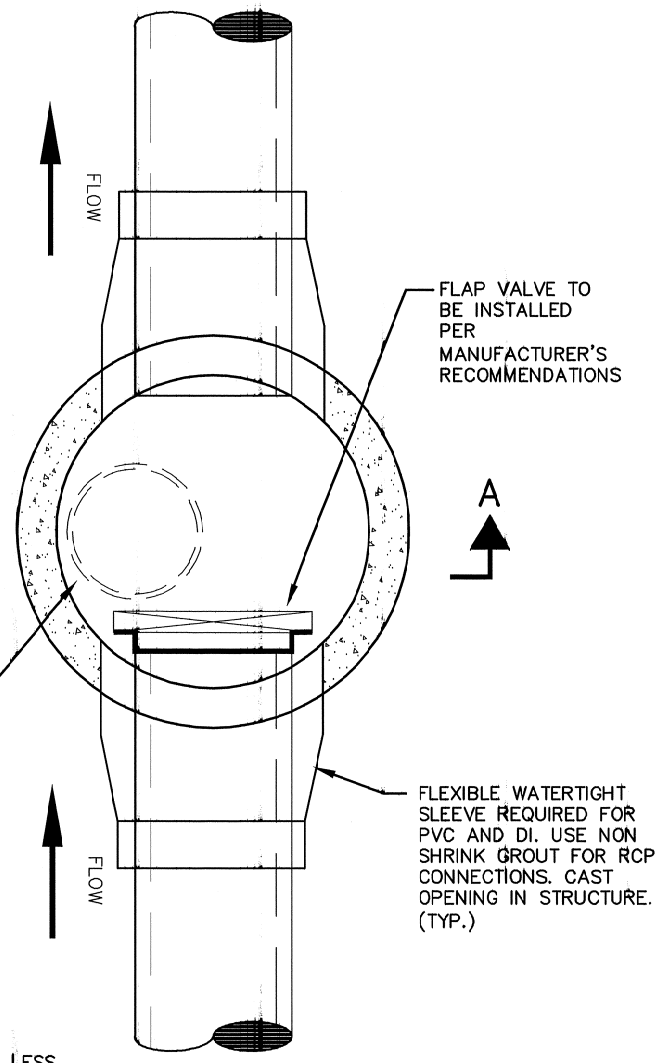
FLAP VALVE

12" (MIN.) OF 3/4" CRUSHED STONE UNLESS OTHERWISE INDICATED ON PROFILE

UNDISTURBED MATERIAL

**SECTION A-A**

NOTES:  
1. SIZE MANHOLE PER PRECAST CONCRETE MANHOLE DETAIL BUT NOT LESS THAN 5' DIAMETER



**PLAN**



**TYPE 7 - FLAP VALVE MANHOLE DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.1</b>
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TABLE 1				
MANHOLE DIAMETER	SIDE WALL MIN. THICKNESS	BOTTOM SLAB MIN. THICKNESS	MAX PIPE DIAMETER *	
			RCP	DI/PVC
4'	5"	6"	24"	30"
5'	6"	8"	36"	42"
6'	6"	8"	48"	54"
8'	8"	8"	66"	72"
10'	10"	10"	72"	84"

\* MAY VARY DEPENDING ON SIZE AND LOCATION OF ADDITIONAL PENETRATIONS OR RELATIONSHIP OF PENETRATIONS IN MANHOLE

MANHOLE GENERAL NOTES:

- HIGHEST POINT OF BRICK TABLE AT MANHOLE WALL, TO BE AT ELEV OF CROWN OF PIPE. TABLE TO SLOPE AT 8.3%.
- SEWER OR DRAIN MANHOLE DIAMETER SHALL BE 4', 5', 6', 8' OR 10' AS SHOWN ON PLAN/PROFILE VIEWS.
- DESIGN PRECAST SECTIONS WITH FRAME AND COVER FOR AASHTO H20 LOADINGS. UNLESS OTHERWISE NOTED
- MANHOLES LARGER THAN 4' IN DIAMETER AT THE BASE SHALL BE REDUCED IN DIAMETER TO 4' AT THE NEXT RISER SECTION UNLESS NOTED OTHERWISE ON PLANS.

TRENCH PAY LIMIT TABLE FOR MANHOLES

WALL THICKNESS	MAX TRENCH WIDTH
LESS THAN 6"	I.D. + 5'-0"
6" TO 12"	I.D. + 6'-0"
13" TO 18"	I.D. + 7'-0"
19" & GREATER	O.D. + 6'-0"

I.D. = INSIDE DIMENSION  
O.D. = OUTSIDE DIMENSION

FOR TRENCHES GREATER THAN 5' DEEP ADD 3' FOR TEMPORARY SUPPORT OF EXCAVATION

95% DETAILS  
NOT FOR CONSTRUCTION



MANHOLES - GENERAL NOTES AND DIMENSIONS

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	2252.1
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30" STANDARD MANHOLE FRAME & COVER (UNLESS NOTED OTHERWISE) TO BE MARKED "DRAIN"

SET CASTING IN GROUT AND GROUT ALL AROUND TO 4" ABOVE FLANGE (UNLESS NOTED OTHERWISE)

SET RIM AT FINISHED GRADE

USE BRICK COURSES AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (MAX 3 COURSES OF BRICK) SEAL INSIDE AND OUTSIDE OF BRICK WITH HYDRAULIC CEMENT

COAT WITH (2) COATS OF BITUMINOUS DAMPPROOFING

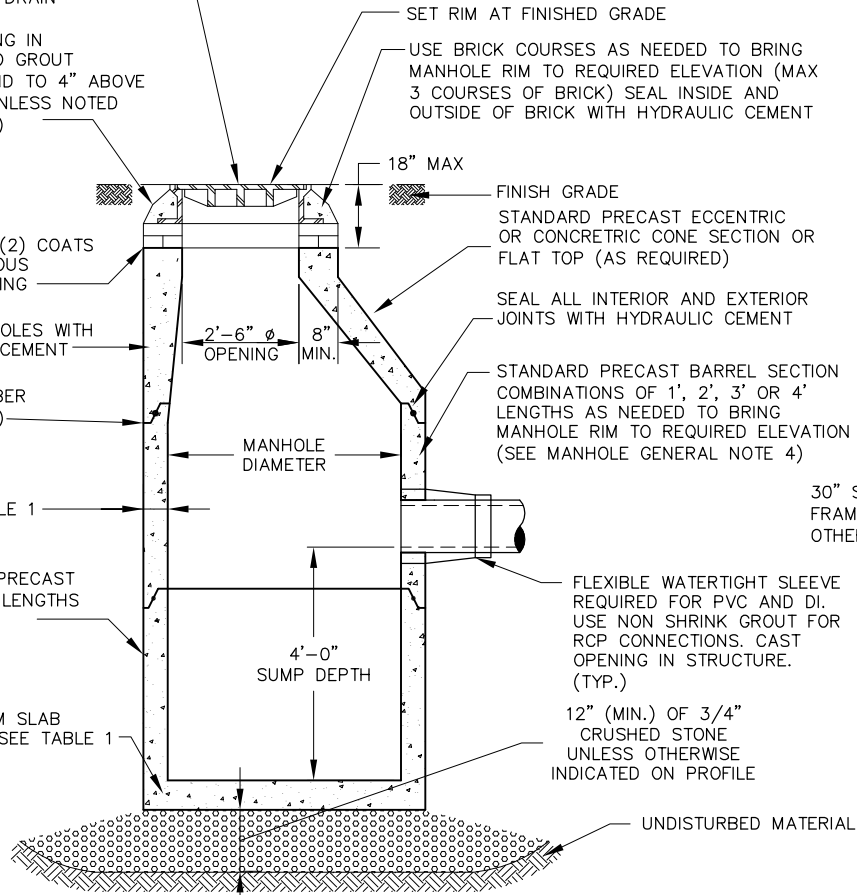
SEAL ALL HOLES WITH HYDRAULIC CEMENT

BUTYL RUBBER JOINT (TYP.)

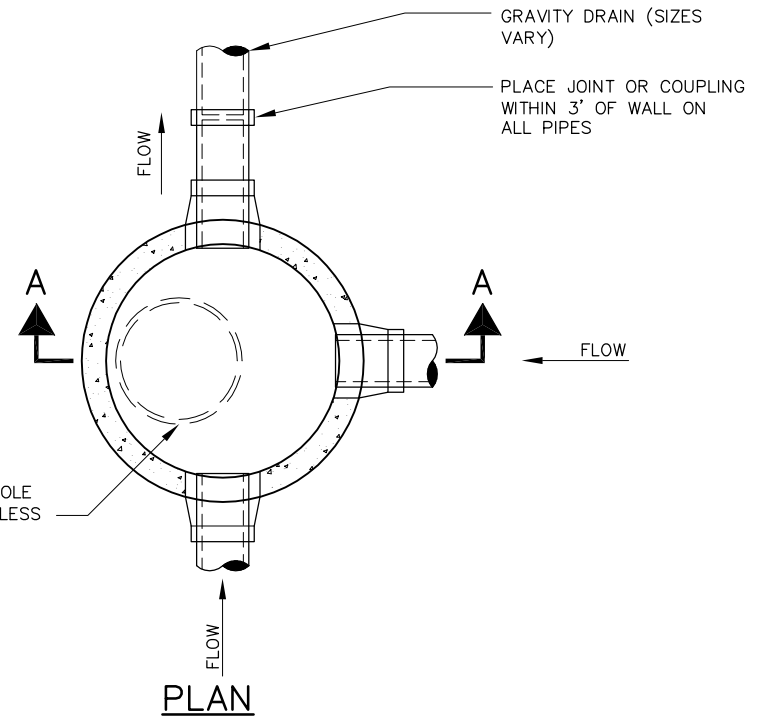
SEE TABLE 1

STANDARD PRECAST BASE IN 3' LENGTHS (MIN)

FOR BOTTOM SLAB THICKNESS SEE TABLE 1



**SECTION A-A**



**PLAN**

95% DETAILS  
NOT FOR CONSTRUCTION



**TYPE 4 - SUMP MANHOLE DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	<b>2252.5</b>
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30" STANDARD MANHOLE FRAME & COVER (UNLESS NOTED OTHERWISE) TO BE MARKED "DRAIN" OR "SEWER" AS APPLICABLE

SET CASTING IN GROUT AND GROUT ALL AROUND TO 4" ABOVE THE FLANGE (UNLESS NOTED OTHERWISE)

COAT WITH (2) COATS OF BITUMINOUS DAMPPROOFING

BUTYL RUBBER JOINT (TYP.)

SEAL ALL HOLES WITH HYDRAULIC CEMENT

SEE TABLE 1

BRICK TABLE (SEE MANHOLE GENERAL NOTE 1)

FOR BOTTOM SLAB THICKNESS SEE TABLE 1

UNDISTURBED MATERIAL

SET RIM AT FINISHED GRADE

USE BRICK COURSES AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (MAX 3 COURSES OF BRICKS) SEAL INSIDE AND OUTSIDE OF BRICK WITH HYDRAULIC CEMENT

FINISH GRADE

STANDARD PRECAST ECCENTRIC OR CONCENTRIC CONE SECTION, OR FLAT TOP (AS REQUIRED)

SEAL ALL INTERIOR AND EXTERIOR JOINTS WITH HYDRAULIC CEMENT

STANDARD PRECAST BARREL SECTION COMBINATIONS OF 1', 2', 3' OR 4' LENGTHS AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (SEE MANHOLE GENERAL NOTE 4)

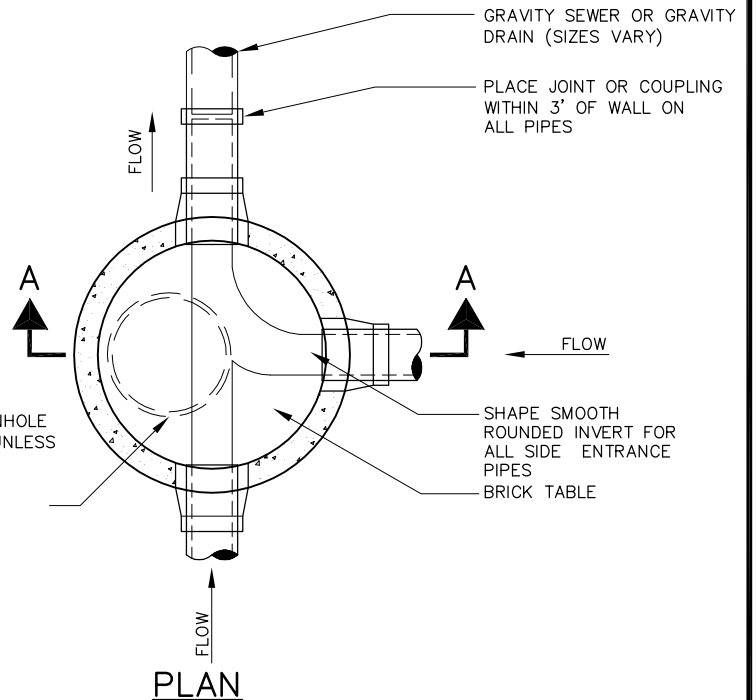
STANDARD PRECAST BASE IN 3' LENGTHS (MIN.)

3000 PSI CONCRETE

FLEXIBLE WATERTIGHT SLEEVE REQUIRED FOR PVC AND DI. USE NON SHRINK GROUT FOR RCP CONNECTIONS. CAST OPENING IN STRUCTURE. (TYP.)

12" (MIN.) OF 3/4" CRUSHED STONE UNLESS OTHERWISE INDICATED ON PROFILE

SECTION A-A



95% DETAILS  
NOT FOR CONSTRUCTION



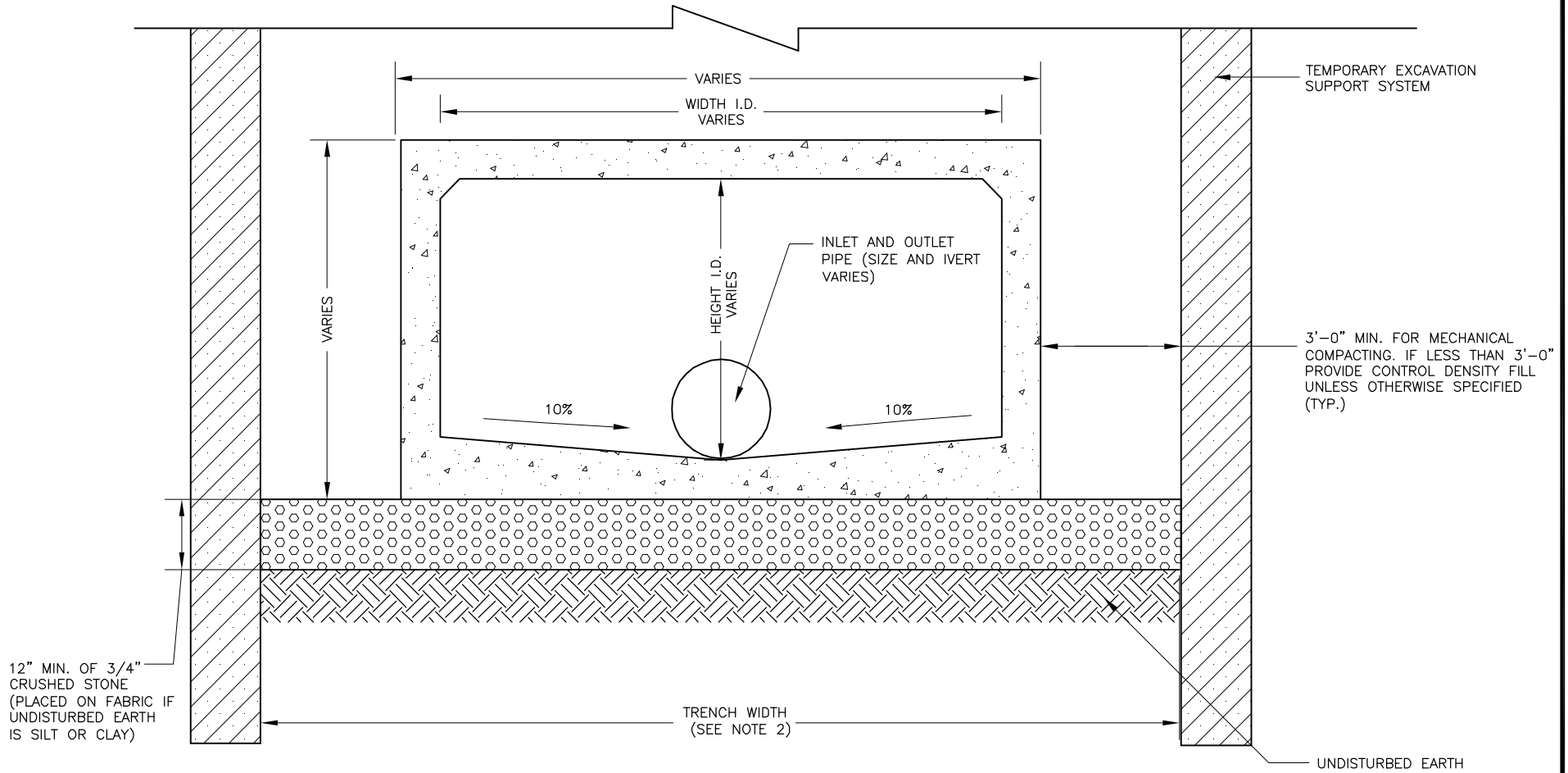
TYPE 1 - MANHOLE DETAIL

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 02252	2252.2
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NOTES:

1. PRECAST REINFORCED CONCRETE BOX SECTIONS MANUFACTURED IN ACCORDANCE WITH PRECAST REINFORCED STORAGE TANK. WATERTIGHT GASKET JOINTS TO BE PROVIDED AS SPECIFIED.
2. TRENCH PAY LIMIT FOR STORAGE TANK IS OUTSIDE DIMENSION (WIDTH) PLUS 3' FOR TEMPORARY SUPPORT OF EXCAVATION PLUS SPACE BETWEEN CULVERT AND TEMPORARY SUPPORT OF EXCAVATION TO A MAXIMUM OF 6' TOTAL.
3. STORAGE TANK WALL, ROOF AND SLAB THICKNESS TO BE DESIGNED BY THE MANUFACTURER
4. FLOATATION SLABS TO BE DESIGNED AND SPECIFIED BY THE MANUFACTURER



STORAGE TANK DETAIL - SECTION

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 02720

2720.2

30" VENTED MANHOLE FRAME & COVER (UNLESS OTHERWISE NOTED) TO BE MARKED "DRAIN"

SET CASTING IN GROUT AND GROUT ALL AROUND TO 4" ABOVE THE FLANGE (UNLESS OTHERWISE NOTED)

COAT WITH (2) COATS OF BITUMINOUS DAMPPROOFING

SEAL ALL HOLES WITH HYDRAULIC CEMENT

BUTYL RUBBER JOINT (TYP.)

5"

INLET PIPE (INVERT ELEVATIONS VARY)

SET RIM AT FINISHED GRADE

USE BRICK COURSES AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (MAX 3 COURSES OF BRICKS) SEAL INSIDE AND OUTSIDE OF BRICK WITH HYDRAULIC CEMENT

FINISH GRADE

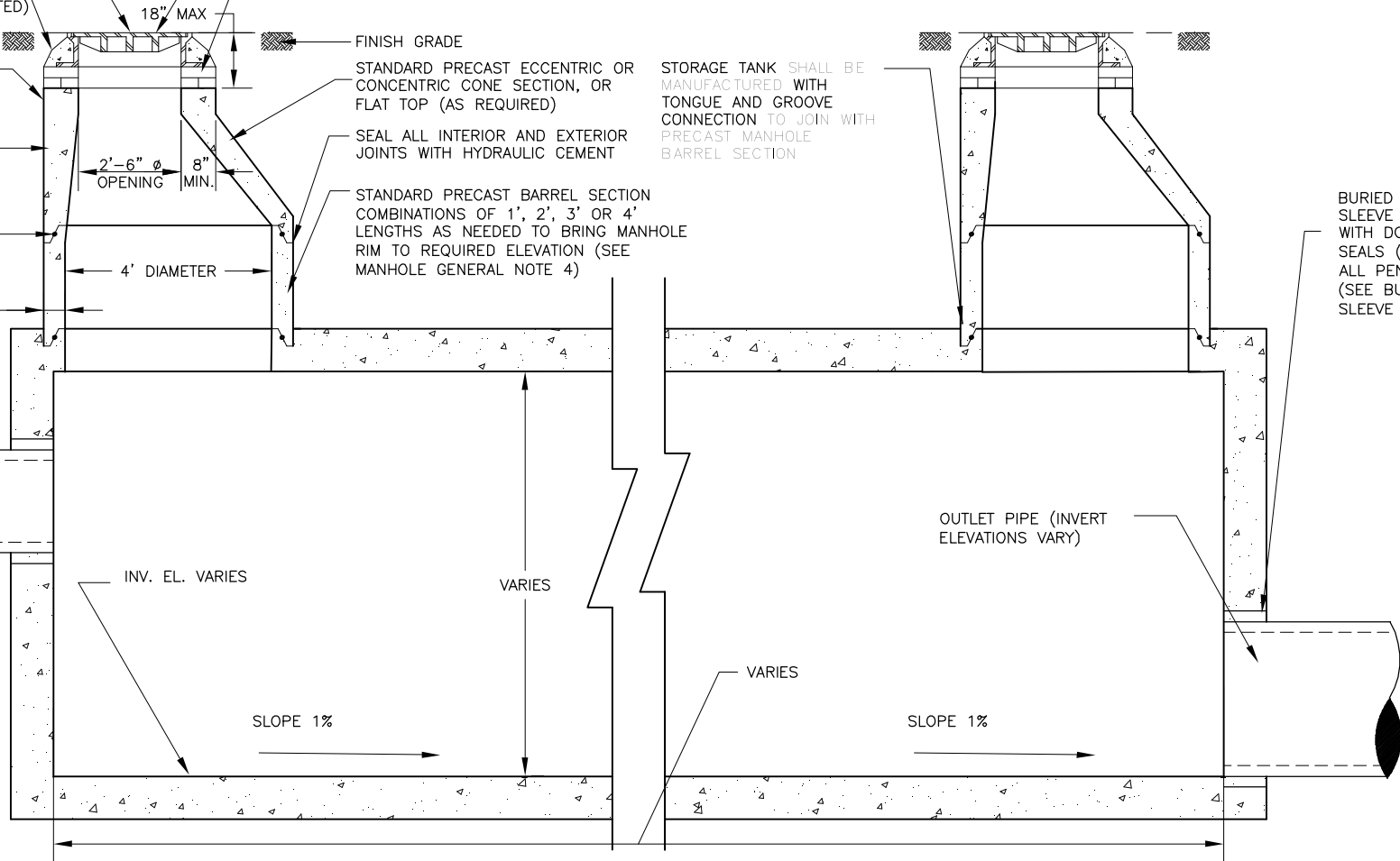
STANDARD PRECAST ECCENTRIC OR CONCENTRIC CONE SECTION, OR FLAT TOP (AS REQUIRED)

SEAL ALL INTERIOR AND EXTERIOR JOINTS WITH HYDRAULIC CEMENT

STANDARD PRECAST BARREL SECTION COMBINATIONS OF 1', 2', 3' OR 4' LENGTHS AS NEEDED TO BRING MANHOLE RIM TO REQUIRED ELEVATION (SEE MANHOLE GENERAL NOTE 4)

STORAGE TANK SHALL BE MANUFACTURED WITH TONGUE AND GROOVE CONNECTION TO JOIN WITH PRECAST MANHOLE BARREL SECTION

BURIED WALL PIPE SLEEVE CLOSURES WITH DOUBLE LINK SEALS (TYPICAL OF ALL PENETRATIONS) (SEE BURIED WALL SLEEVE DETAIL)



### STORAGE TANK DETAIL - PLAN

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

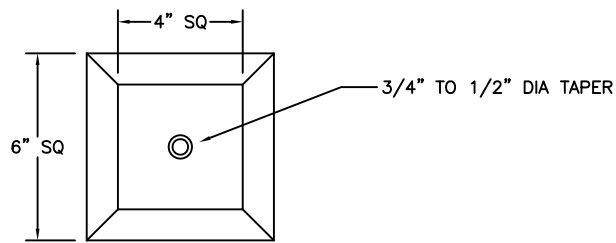
SCALE: N.T.S.

DATE OF ISSUE: 02/05

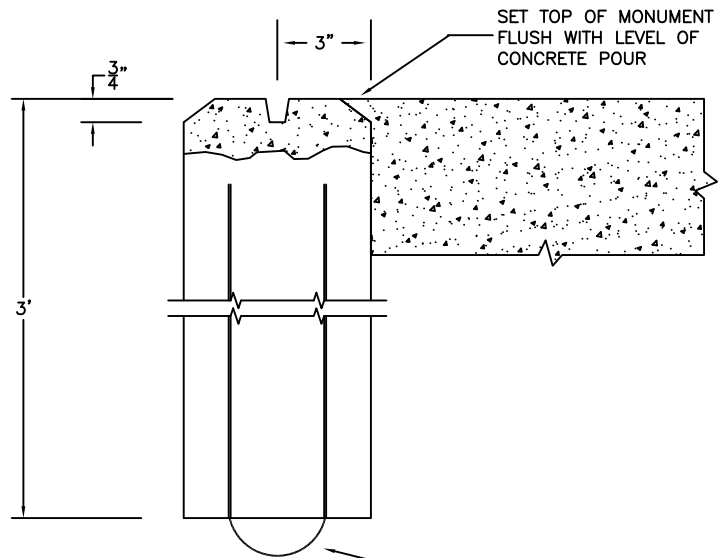
SPEC. SECTION REF#: 02720

2720.1

CITY OF CAMBRIDGE D.P.W.  
 ENGINEERING DEPARTMENT  
 SURVEY MONUMENT SPECIFICATION — 2008



PLAN VIEW



SIDE VIEW

NOTES:





1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS

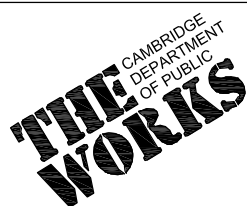
E.F. SHEA ITEM NO. B-BM2	WT=110#
E.F. SHEA ITEM NO. B-BM3	WT=147#

E.F. SHEA, AMESBURY MA (978) 388-1509  
 E.F. SHEA, WILMINGTON MA (978) 658-2645  
 E.F. SHEA, NOTTINGHAM, NH (603) 942-5668

TRAFFIC MANAGEMENT GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (M.U.T.C.D)
2. ALL SIGN LOCATIONS ON DETAILS ARE SHOWN SCHEMATICALLY. FINAL LOCATIONS SHALL BE DETERMINED BASED ON ACTUAL FIELD CONDITIONS AND CITY APPROVAL
3. ADDITIONAL TRAFFIC CONTROL DEVICES SHALL BE PROVIDED UPON THE CITY'S REQUEST
4. ALL TEMPORARY SIGNAGE AND TRAFFIC CONTROL DEVICES SHALL BE PROPERLY SECURED
5. ALL DRUMS NOT OTHERWISE SPECIFIED SHALL BE EQUIPPED WITH TYPE "C" –STEADY BURN WARNING LIGHTS
6. TEMPORARY TRAFFIC LANES WITHIN THE WORK ZONE SHALL BE A MINIMUM OF 11 FEET
7. ADVISORY SPEED LIMITS SHALL BE POSTED AS DIRECTED BY THE CITY
8. FLASHING ARROW BOARDS SHALL BE UTILIZED FOR LANE SHIFTS WHERE THE EXISTING SPEED LIMIT IS 35 M.P.H. OR GREATER
9. NON-ESSENTIAL TRAFFIC CONTROL DEVICES SHALL BE COVERED OR REMOVED DURING NON-WORK HOURS
10. ALL TRAVEL WAYS SHALL BE PROTECTED FROM DUST AND CONSTRUCTION DEBRIS AT ALL TIMES
11. TRAFFIC CONTROL INCLUDES NECESSARY STREET SWEEPING AND SNOW REMOVAL WITHIN THE WORK ZONE
12. VEHICULAR AND PEDESTRIAN SHALL BE ALLOWED ACCESS TO PRIVATE PROPERTY AT ALL TIMES DURING CONSTRUCTION
13. ALL TRAFFIC CONTROL DEVICES SHALL BE PLACED AND MOVED AS NECESSARY TO MAINTAIN ADEQUATE ABUTTER ACCESS AT ALL TIMES. WORK MAY REQUIRE ADDITIONAL SIGNAGE AND OTHER TRAFFIC CONTROL DEVICES, GRADING AND TEMPORARY PAVEMENT FOR PASSAGE OF PEDESTRIAN, VEHICULAR AND EMERGENCY TRAFFIC THROUGH WORK AREAS BOTH DURING AND AFTER WORK HOURS
14. EACH ABUTTER SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 24 HOURS IN ADVANCE OF THE START OF ANY WORK THAT WILL REQUIRE THE TEMPORARY CLOSURE OF ACCESS
15. CONSTRUCTION WORK ZONE SHALL BE STAGED AS TO ALLOW FOR CONTINUOUS ACCESS AT DRIVE ENTRANCES AND TO MINIMIZE DETOURS TO CAMBRIDGE ROADS
16. EXCAVATIONS SHALL BE PROTECTED BY STEEL PLATES OR BARRICADES DURING NON-WORK HOURS
17. GRADE SEPARATIONS IN EXCESS OF 2" DURING NON WORKING HOURS WILL REQUIRE DELINEATION BY DRUMS
18. EXCAVATION EDGES IN EXCESS OF 4" DEEP SHALL BE PROTECTED DURING NON-WORKING HOURS BY BACKFILLING WITH A WEDGE OF GRAVEL COMPACTED TO A 4:1 SLOPE
19. SAFE PEDESTRIAN WALKWAYS SHALL BE PROVIDED AND ACCESS TO LOCAL BUSINESSES AND RESIDENCES. PUBLIC WALKWAYS SHALL REMAIN OPEN AND ACCESSIBLE UNLESS OTHERWISE DIRECTED BY CITY.
20. ALL EXISTING PEDESTRIAN CROSSINGS SHALL BE MAINTAINED. ALTERNATIVE CROSSING SHALL BE PROVIDED WHEN EXISTING CROSSINGS ARE DISRUPTED BY CONSTRUCTION ACTIVITY. TEMPORARY LOCATIONS, SAFETY SIGNAGE AND SAFETY CONTROLS SHALL BE APPROVED BY THE CITY PRIOR TO IMPLEMENTATION
21. PEDESTRIAN WALKWAYS SHALL BE PROTECTED ALONG WORK ZONE WITH CONCRETE BARRIERS AND FENCING
22. POLICE DETAILS SHALL BE SCHEDULED AND COORDINATED BY THE CONTRACTOR TO MAINTAIN THE SAFETY OF PEDESTRIAN AND VEHICULAR TRAFFIC
23. DETOURS TO SHALL ONLY BE ALLOWED AS INDICATED OR AS APPROVED BY THE CITY OF CAMBRIDGE TRAFFIC AND PARKING DEPARTMENT

<u>LEGEND</u>	
EXISTING DIRECTION TRAFFIC FLOW ARROW	
28" (MIN) PLASTIC DRUM (REFLECTORIZED) WITH FLASHER	
TRAFFIC MANAGEMENT SIGN DURING CONSTRUCTION	
WORK ZONE	



## TRAFFIC MANAGEMENT GENERAL NOTES AND LEGEND

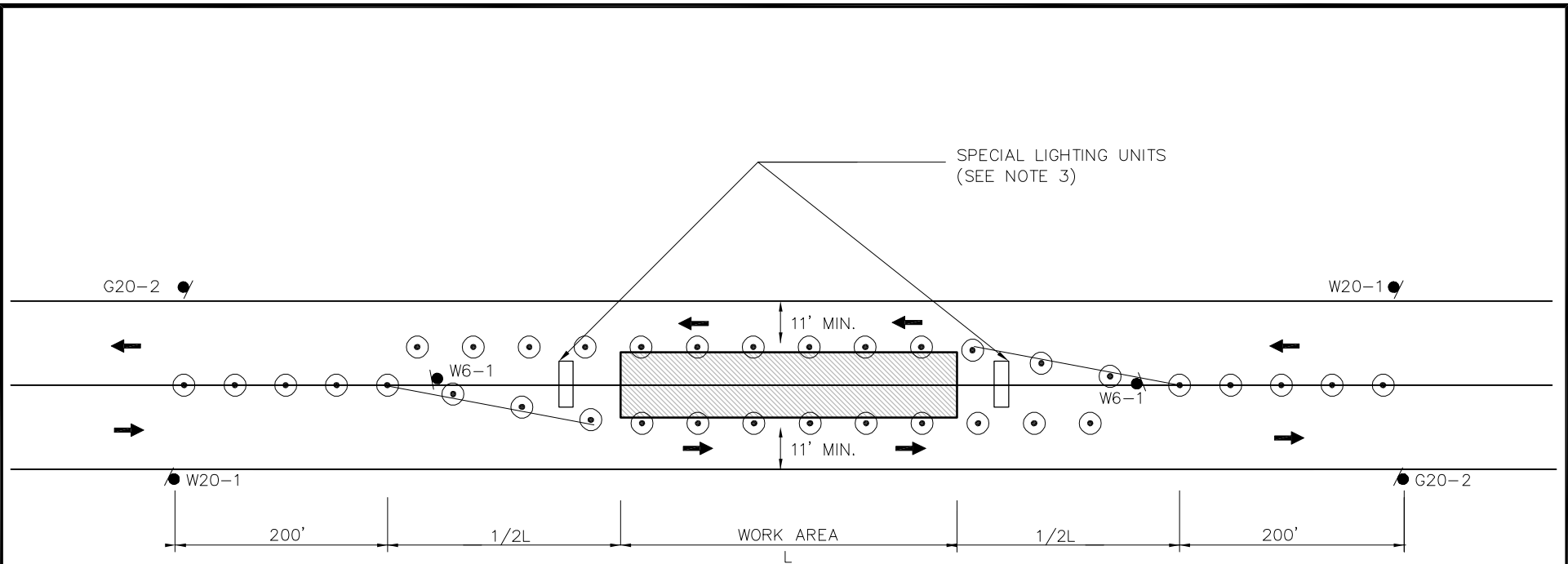
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

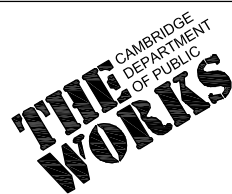
DATE OF ISSUE: 02/05

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**1570.1**



- NOTES:
1. ALL CONES AND DRUMS TO BE SPACED @ 20' O.C.
  2. L=AREA OF 1/2 DAY OF WORK (PER MUTCD MANUAL)
  3. SPECIAL LIGHTING UNITS (ARROW BOARDS) TO BE ADDED ON BOTH SIDES OF WORKZONE WHERE SPEED LIMIT MEETS OR EXCEEDS 35 M.P.H.



## TYPICAL INTERIOR LANE CLOSURE

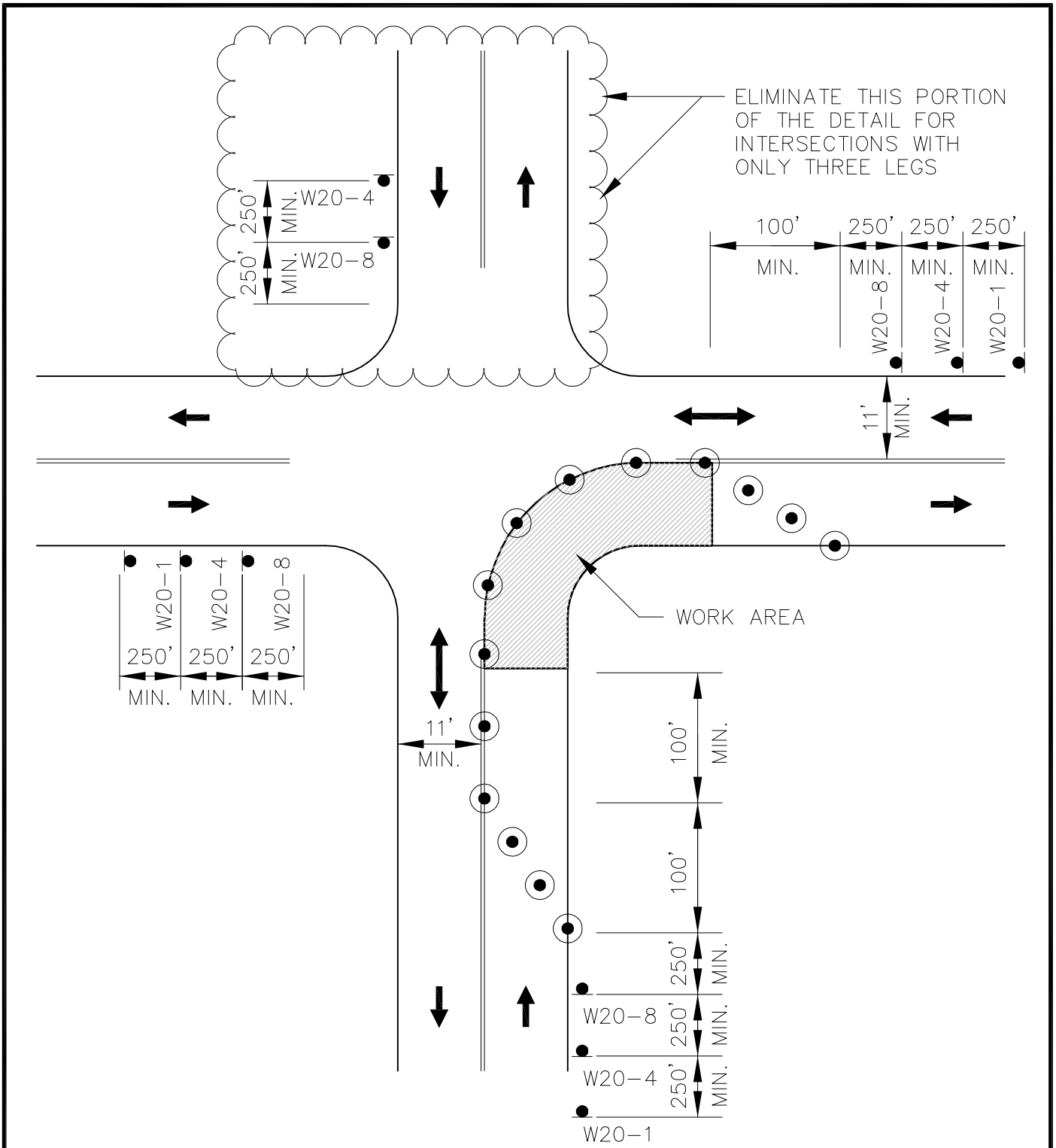
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

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**1570.5**



- NOTES:
1. ADVANCE WARNING SIGN PLACEMENT TO BE ADJUSTED AS NECESSARY AND APPROVED BY THE CITY.
  2. ALL DRUMS AND CONES TO BE SPACED @ 20' O.C.



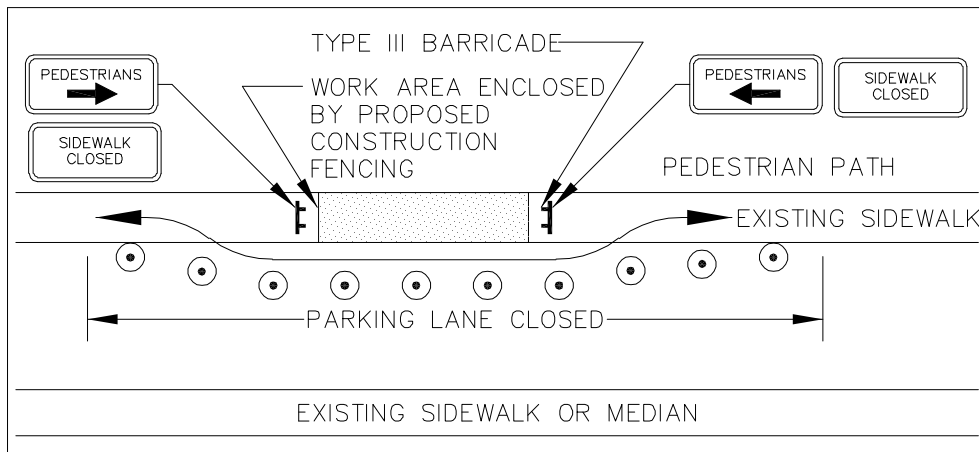
**ONE LANE BI-DIRECTIONAL TRAFFIC AT INTERSECTIONS**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

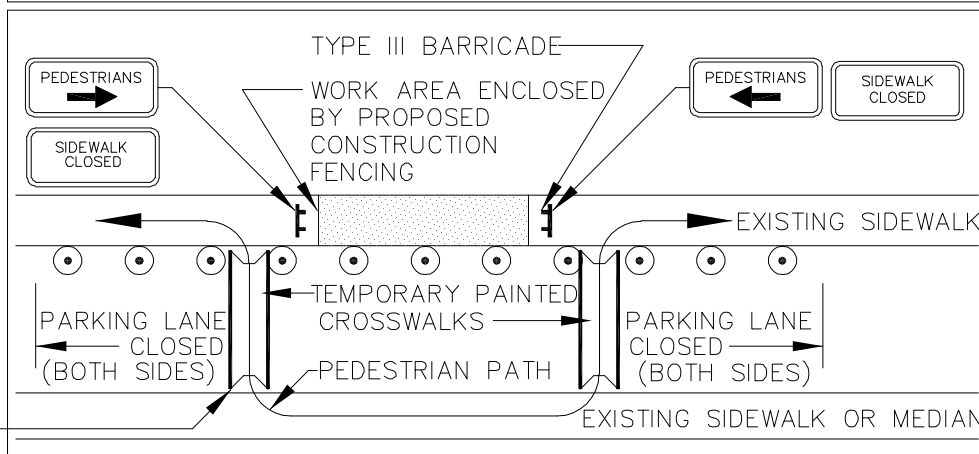
SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 01570	<b>1570.7</b>
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TO BE USED IN CONJUNCTION WITH THE PROPOSED LANE CLOSURE DETAILS AND DURING CONSTRUCTION STAGING AND AS DIRECTED BY THE CITY.

TYPE I  
N.T.S.




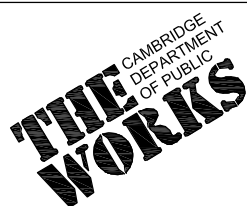
TYPE II  
N.T.S.



TEMPORARY BITUMINOUS CONCRETE WHEEL CHAIR RAMP. WIDTH AND LENGTH PER ADA REQUIREMENTS BUT SHALL NOT INTRUDE INTO TRAVEL WAY

PEDESTRIAN BYPASS NOTES:

1. ADDITIONAL ADVANCE WARNING MAY BE REQUIRED BY THE CITY.
2. CONTROLS FOR PEDESTRIAN TRAFFIC ONLY, ARE SHOWN. VEHICULAR TRAFFIC SHALL BE MAINTAINED AS DETAILED ELSEWHERE.
3. STREET LIGHTING SHALL BE CONSIDERED WHEN LOCATING CONTROL DEVICES.
4. EXISTING WHEELCHAIR RAMPS SHALL BE CONSIDERED WHEN LOCATING TEMPORARY PAINTED CROSSWALKS.
5.  DIRECTION OF PEDESTRIAN TRAVEL.
6. IF THE WORK ZONE DOES NOT PERMIT PEDESTRIANS TO TRAVEL ADJACENT TO IT AS SHOWN IN PEDESTRIAN BYPASS TYPE I, TEMPORARY CROSSWALKS WITH APPROPRIATE SIGNS SHALL BE INSTALLED TO CROSS PEDESTRIANS TO THE OPPOSITE SIDE OF THE STREET AS SHOWN IN PEDESTRIAN BYPASS TYPE II, AND AS DIRECTED BY THE ENGINEER.



**PEDSTRIAN BYPASS DETAIL**

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

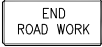












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**1570.8**

## CONSTRUCTION SIGN LEGEND

IDENTIFICATION NUMBER	SIZE OF SIGN		TEXT	TEXT DIMENSIONS			COLOR		
	WIDTH	HEIGHT		LETTER HEIGHT	VERTICAL SPACING	ARROW	BACK-GROUND	LEGEND	BORDER
G20-2	36"	24"		MUTCD STANDARD DETAIL			MUTCD STANDARD DETAIL		
W1-4L	30"	30"							
W1-4R	30"	30"							
W4-2L	48"	48"							
W4-2R	48"	48"							
W5-1	48"	48"							
W6-1	48"	48"							
W20-1	36"	36"							
W20-4	48"	48"							
W20-5L	48"	48"							
W20-5R	48"	48"							
W20-7b	36"	36"							
W20-8	36"	36"							



### CONSTRUCTION SIGN LEGEND

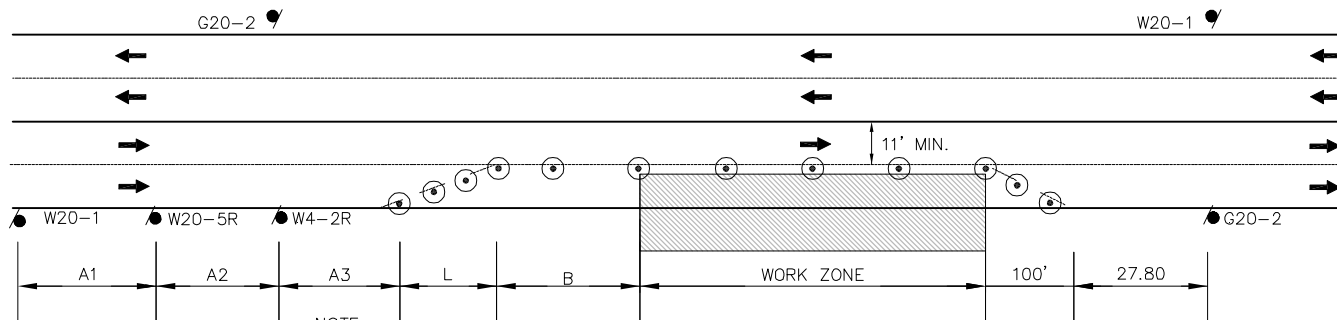
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

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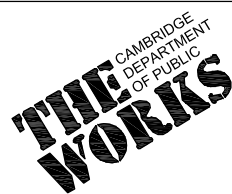
SPEC. SECTION REF#: 01570

**1570.2**



NOTE:  
 1. THIS DETAIL SHOWS A RIGHT LANE CLOSURE DETAIL. THIS DETAIL SHALL ALSO BE USED FOR LEFT LANE CLOSURES WITH THE SIGN PLACEMENT AND TYPE AS APPROPRIATE

SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (A1/A2/A3)	CHANNELIZING DEVICES			
		TRANSITION LENGTH (L)	BUFFER LENGTH (B)	DEVICE SPACING	MIN. #
25-40	500/500/500	320	160	20	30
45-55	500/1000/1000	680	360	40	30



## TYPICAL ONE LANE CLOSURE

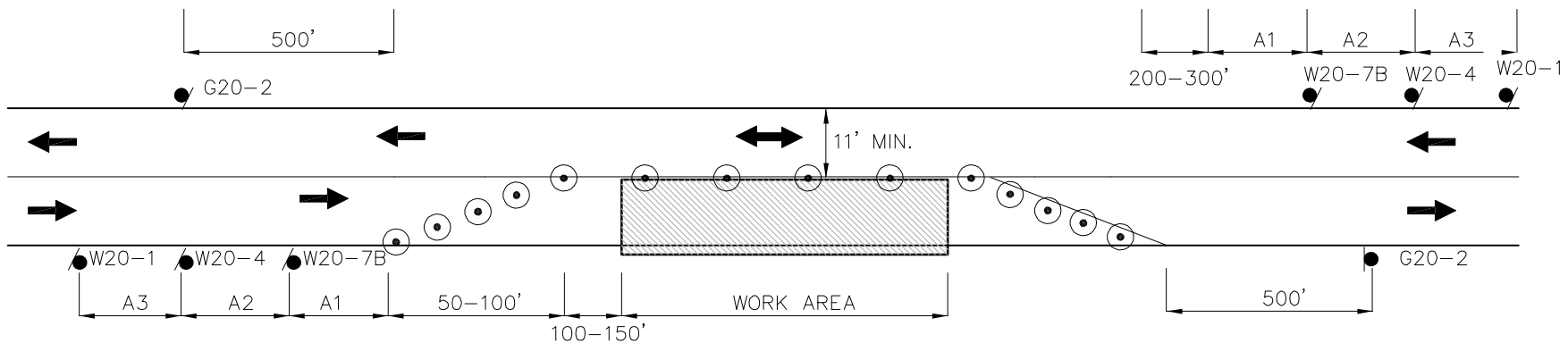
CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 01570

**1570.3**



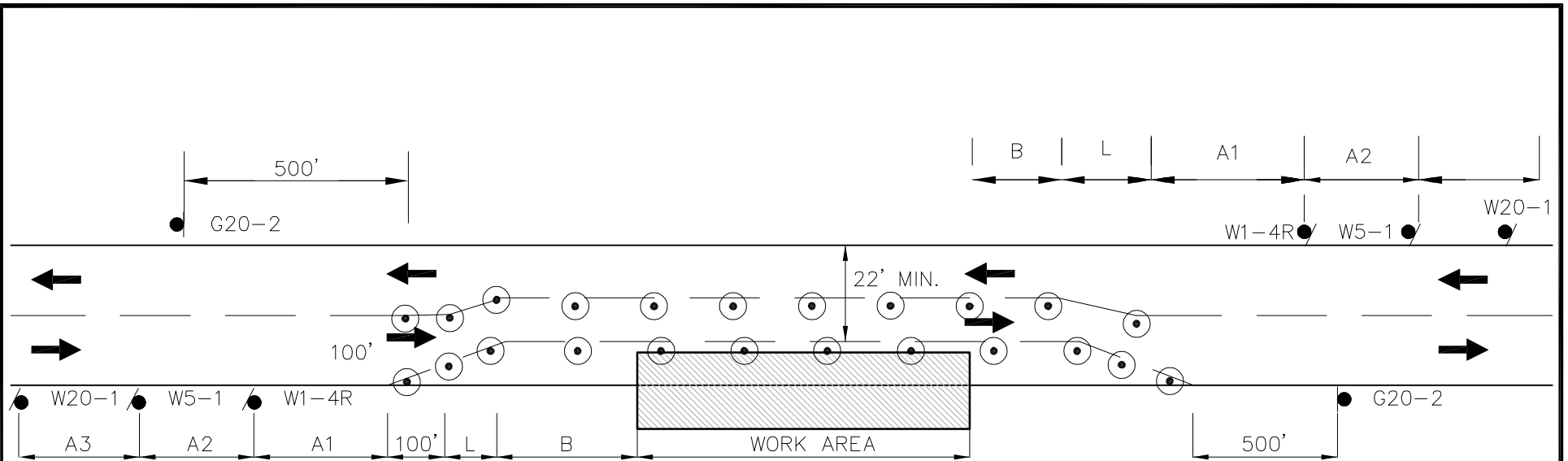
SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (A1/A2/A3)	CHANNELIZING DEVICES	
		DEVICE SPACING	MIN. #
25-40	500/500/500	20	20
45-55	500/1000/1000	40	20



### TYPICAL TWO WAY ALTERNATING TRAFFIC

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.	DATE OF ISSUE: 02/05	SPEC. SECTION REF#: 01570	<b>1570.6</b>
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NOTES:

1. THIS DETAIL SHOWS A RIGHT LANE CLOSURE DETAIL. THIS DETAIL CAN ALSO BE USED FOR LEFT LANE CLOSURES, WITH SIGN PLACEMENT AND TYPE AS APPROPRIATE.

SPEED LIMIT (MPH)	SPACING FOR ADVANCE WARNING SIGNS (A1/A2/A3)	CHANNELIZING DEVICES			
		TRANSITION LENGTH (L)	BUFFER LENGTH (B)	DEVICE SPACING	MIN. #
25-40	500/500/500	320	160	20	90
45-55	500/1000/1000	680	360	40	90



TYPICAL TWO-WAY STREET LANE SHIFT

CITY OF CAMBRIDGE STANDARD SPECIFICATIONS AND DETAILS

SCALE: N.T.S.

DATE OF ISSUE: 02/05

SPEC. SECTION REF#: 01570

1570.4