

Part Three

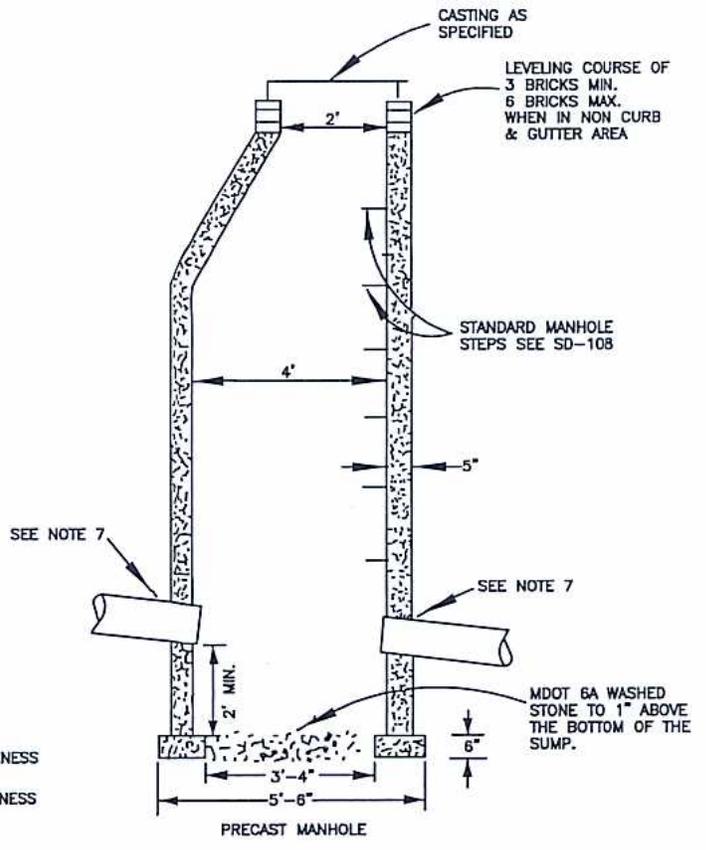
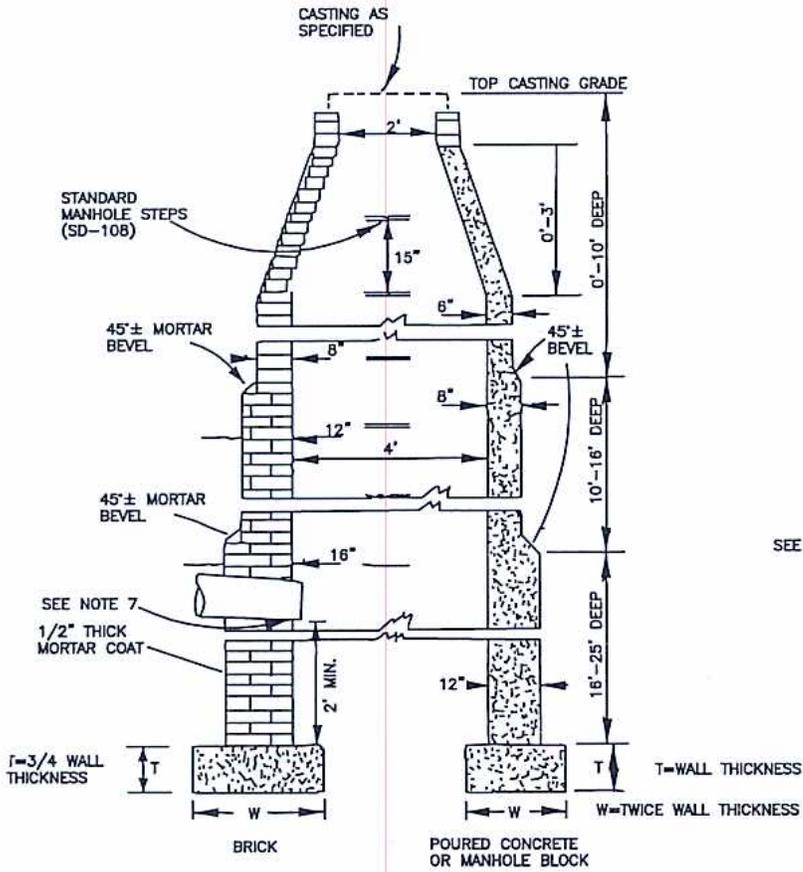
STANDARD DETAILS

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STANDARD DETAILS

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<u>Standard Detail Number</u>	<u>Description</u>
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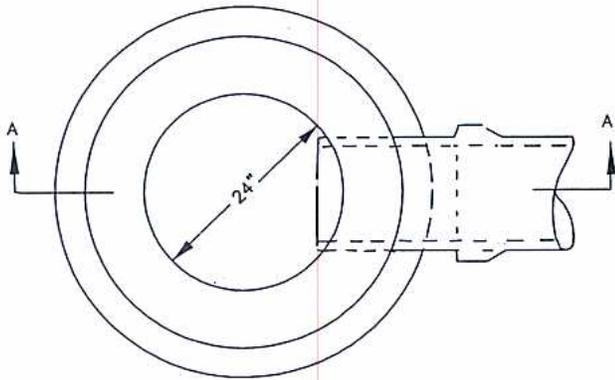


1. CONCRETE FOR BASES AND POURED STRUCTURES SHALL HAVE A COMPRESSIVE STRENGTH OF 3500 P.S.I. IN 28 DAYS AND A MINIMUM OF 5.5 SACKS OF CEMENT PER CYD, SLUMP SHALL NOT EXCEED FOUR INCHES (4").
2. BRICK SHALL BE GRADE MA, CONFORMING TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR SEWER BRICK, A.S.T.M. C-32.
3. MORTAR BLOCK SHALL MEET A.S.T.M. REQUIREMENTS FOR LOAD BEARING CONCRETE MASONRY UNITS C-90-52.
4. MORTAR FOR LAYING BRICK OR BLOCK AND PLASTERING OUTSIDE OF STRUCTURES SHALL BE COMPOSED OF 1 PART PATENTED MORTAR AND 2-1/2 PARTS OF MASONRY SAND (M.D.O.T. SPECIFICATIONS).
5. PRECAST MANHOLES SHALL BE OF THE ECCENTRIC CONE TYPE CONFORMING TO ASTM C-478.
6. MANHOLE STEPS SHALL BE SPACED 15" APART. STEPS REQUIRED IF DEPTH IS OVER FIVE FEET (5'). STEPS SHALL BE EJIW 8501 (PRECAST) OR EJIW 8503 (BLOCK) OR APPROVED EQUAL.
7. RESILIENT CONNECTIONS (ASTM C-923) WILL BE REQUIRED FOR PIPE INSERTIONS.

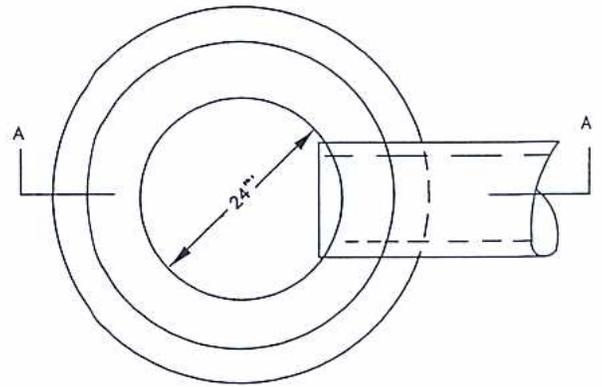
NOTE: CATCH BASINS SHALL HAVE SOLID BOTTOMS, LEACHING BASINS SHALL HAVE AN OPEN BOTTOM AS DETAILED ABOVE.

STORM SEWER LESS THAN 24" SHALL HAVE A RESILIENT CONNECTION

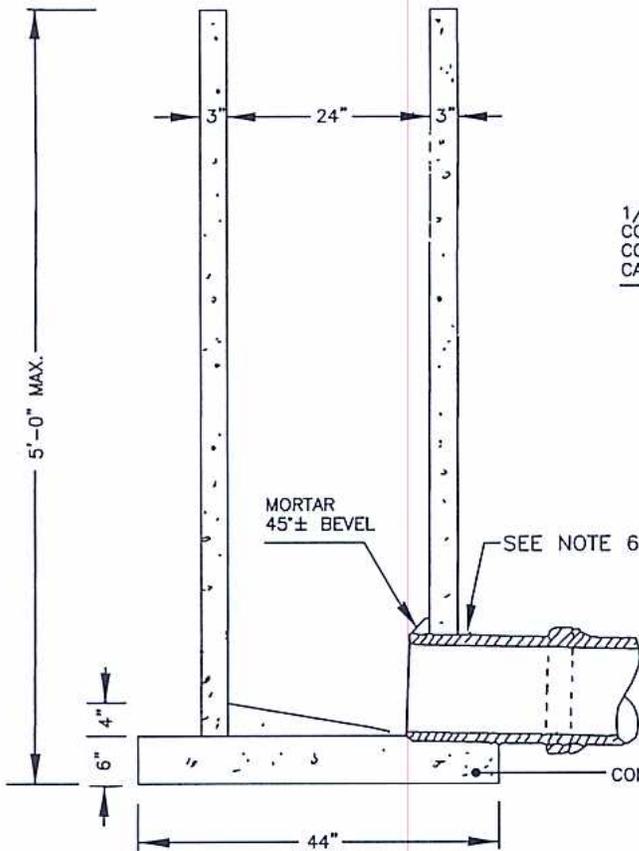
CITY OF PORTAGE	
STANDARD 48" DRAINAGE STRUCTURE	
STANDARD DESIGN SD-101	AUG.17.93 L.G.N. AUG.07.95 drw(cad) NOV. 97 drw(cad) NOV.24.97 drw(cad) MARCH,1999 drw(cad)
APPROVED BY <i>wcb</i>	AUG'05 J&H



PAVED INVERT

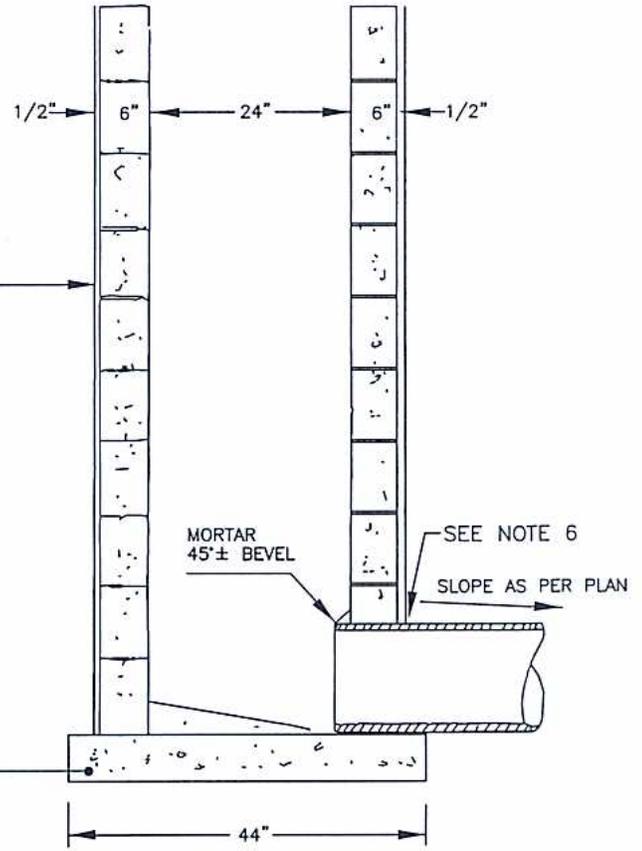


PLAN VIEW



PRE-CAST CONCRETE

1/2" CEMENT PLASTER
COAT OUTSIDE OF ALL
CONCRETE BLOCK
CATCH BASINS

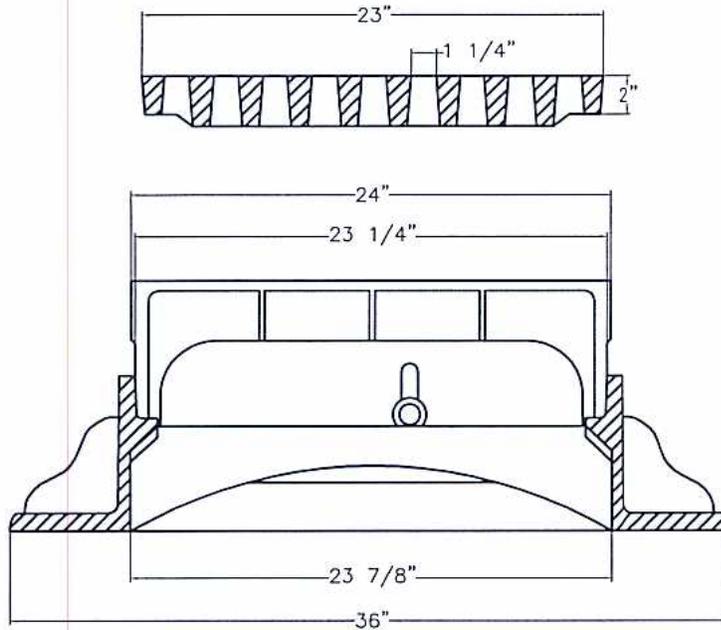


CONCRETE BLOCK

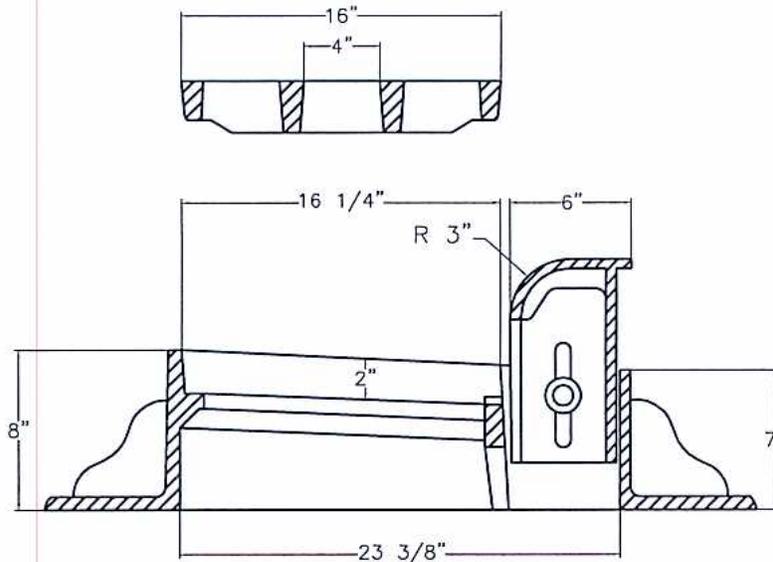
SECTION A-A

1. CONCRETE FOR BASES AND POURED STRUCTURES SHALL HAVE A COMPRESSIVE STRENGTH OF 3500 P.S.I. IN 28 DAYS AND A MINIMUM OF 5.5 SACKS OF CEMENT PER CYD SLUMP NOT TO EXCEED 4".
2. CEMENT BLOCK SHALL MEET A.S.T.M. REQUIREMENTS FOR LOAD BEARING CEMENT MASONRY UNITS C-90-52.
3. MORTAR FOR LAYING BRICK OR BLOCK AND PLASTERING OUTSIDE OF STRUCTURES SHALL BE COMPOSED OF 1 PART PATENTED MORTAR AND 2.5 PARTS MASONRY SAND (2MS, MDOT SPECIFICATIONS).
4. PRECAST MANHOLES SHALL BE OF THE ECCENTRIC CONE TYPE CONFORMING TO ASTM C-478.
5. MANHOLE STEPS SHALL BE SPACED 15" APART. STEPS REQUIRED IF DEPTH IS OVER FIVE FEET (5'). STEPS SHALL BE EJIW 8501 (PRECAST) OR EJIW 8503 (BLOCK) OR APPROVED EQUAL.
6. RESILIENT CONNECTORS SHALL BE REQUIRED FOR ALL PIPE INSERTIONS AS PER ASTM C-923.

CITY OF PORTAGE	
24" CATCH BASIN	
STANDARD DESIGN SD-102 APPROVED BY <i>wcb</i>	AUG. 17, 93 L.G.N. NOV. '97 D.R.W. NOV. 24, 97 D.R.W. DEC. 2, 97 D.R.W. MARCH, 99 D.R.W. JULY '05 J&H



SIDE VIEW



CROSS SECTION

NOTES:

THE SEATING FACE OF THE GRATE AND THE SEAT FOR SAME ON THE FRAME SHALL BE GROUND SO THAT THE GRATE SHALL HAVE AN EVEN BEARING ON ITS SEAT TO PREVENT ROCKING OR TILTING.

THE CASTINGS SHALL BE FREE OF POURING FAULTS, BLOWHOLES, CRACKS, AND OTHER IMPERFECTIONS.

THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN AND NEATLY FINISHED, AND SHALL BE COATED WITH COAL TAR PITCH VARNISH.

CASTING:

EAST JORDAN "7010 WITH M4 GRATE & T1 BACK"
OR APPROVED EQUIVALENT
HAVING A TOTAL WEIGHT OF 325 LBS.

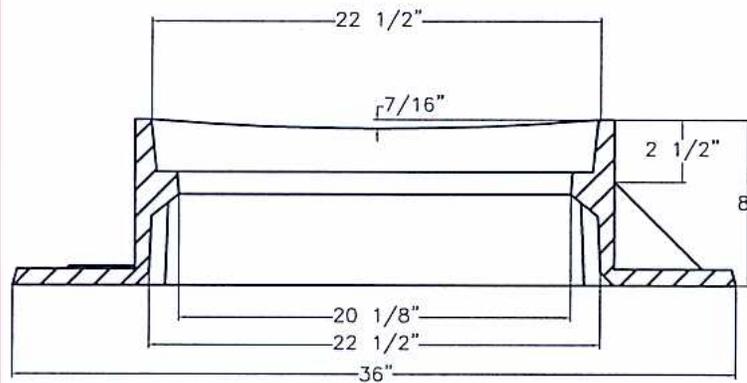
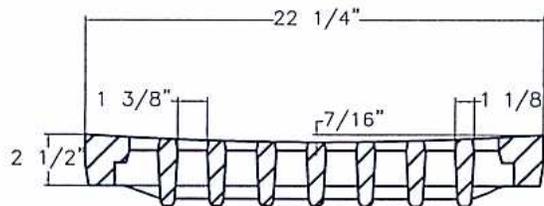
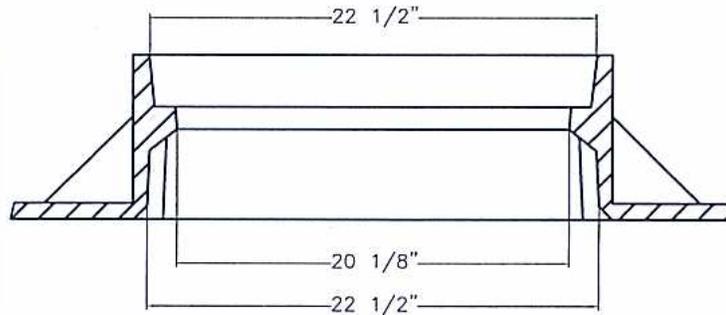
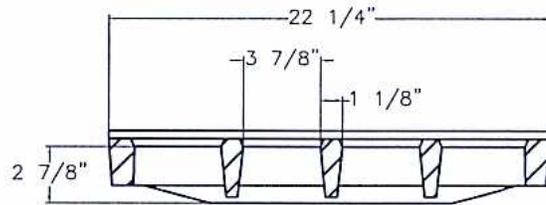
CITY OF PORTAGE

STANDARD CURB
INLET CASTING

STANDARD DESIGN SD-103

APPROVED BY *wcb*

AUG. 17, 93
L.G.N.
AUG. 07, 95
drw(cad)
NOV. 97
drw(cad)
JULY 05
J&H
DEC 06
jma (cad)



NOTES:

THE SEATING FACE OF THE GRATE AND THE SEAT FOR SAME ON THE FRAME SHALL BE GROUND SO THAT THE GRATE SHALL HAVE AN EVEN BEARING ON ITS SEAT TO PREVENT ROCKING OR TILTING

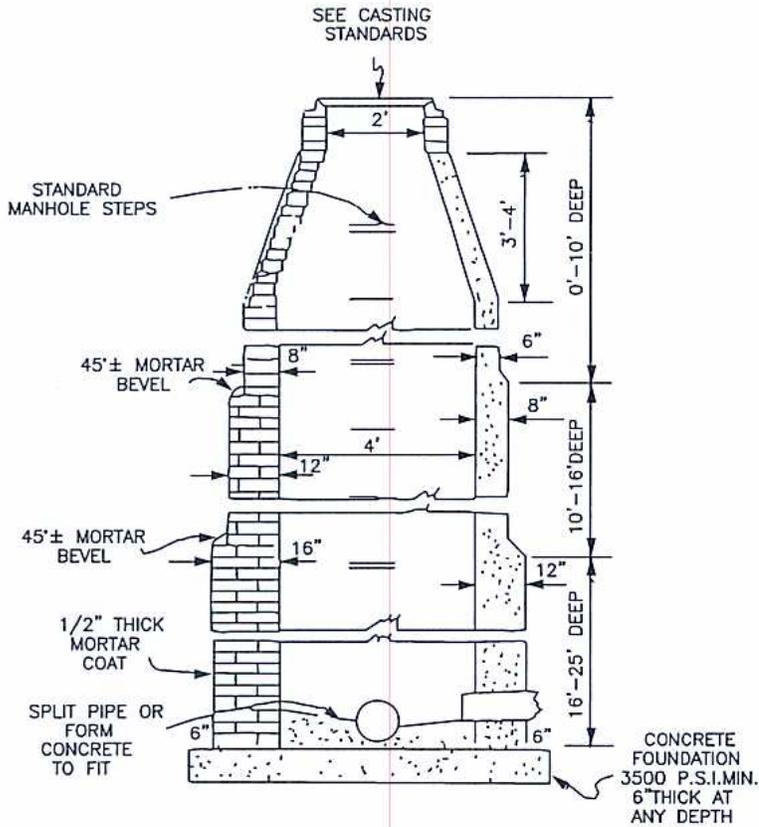
THE CASTING SHALL BE FREE OF POURING FAULTS, BLOWHOLES, CRACKS, AND OTHER IMPERFECTIONS. THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN AND NEATLY FINISHED, AND SHALL BE COATED WITH COAL TAR PITCH VARNISH.

CASTING:

EAST JORDAN "5100 CASTING WITH M1 GRATE"
HAVING A TOTAL WEIGHT OF 490 LBS.

CITY OF PORTAGE	
STANDARD DROP CURB INLET CASTING	
STANDARD DESIGN SD-104 APPROVED <u>wcb</u>	AUG.17.93 L.G.N. AUG.07.95 drw(cad) NOV. '97 drw(cad) JULY'05 J&H DEC'06 jma (cad)

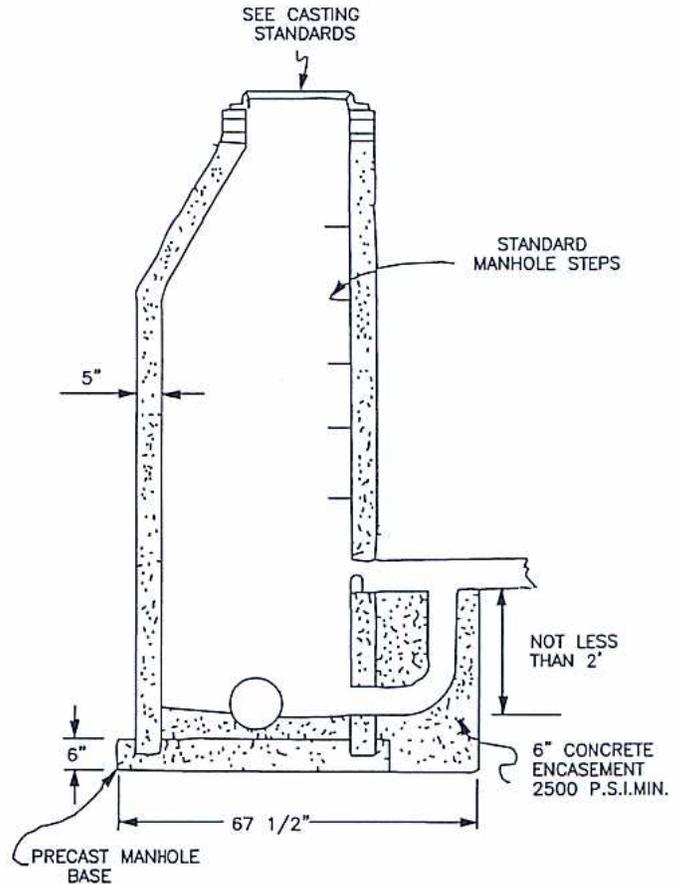
MANHOLE



BRICK

POURED CONCRETE OR MANHOLE BLOCK

DROP MANHOLE



PRECAST MANHOLE

1. BRICK SHALL BE GRADE MA. CONFORMING TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR SEWER BRICK, A.S.T.M. C-32
2. MORTAR BLOCK SHALL MEET A.S.T.M. REQUIREMENTS FOR LOAD BEARING CONCRETE MASONRY UNITS C-90-52
3. MORTAR FOR LAYING BRICK OR BLOCK AND PLASTERING OUTSIDE OF STRUCTURES SHALL BE COMPOSED OF ONE PART PATENTED MORTAR AND 2-1/2 PARTS MDOT 2NS.
4. PRECAST MANHOLES SHALL BE OF THE ECCENTRIC CONE TYPE CONFORMING TO ASTM C-478 WITH GASKETS CONFORMING TO ASTM C-443 AND BUTYL RUBBER JOINT SEALANT CONFORMING TO FEDERAL SPECIFICATION SS-S-210A.
5. RESILIENT CONNECTIONS (ASTM C-923) WILL BE REQUIRED FOR PIPE INSERTIONS.

TABLE "A"

SEWER SIZE INCOMING	DROP SIZE
8" THRU 12"	8"
15" THRU 18"	10"
21" THRU 27"	12"
30" THRU 36"	15"

CITY OF PORTAGE

STANDARD MANHOLE

AUG.17,93
L.G.N.
AUG.07,95
drw(cad)
NOV. '97
drw(cad)

JULY'05
J&H

STANDARD DESIGN SD-105

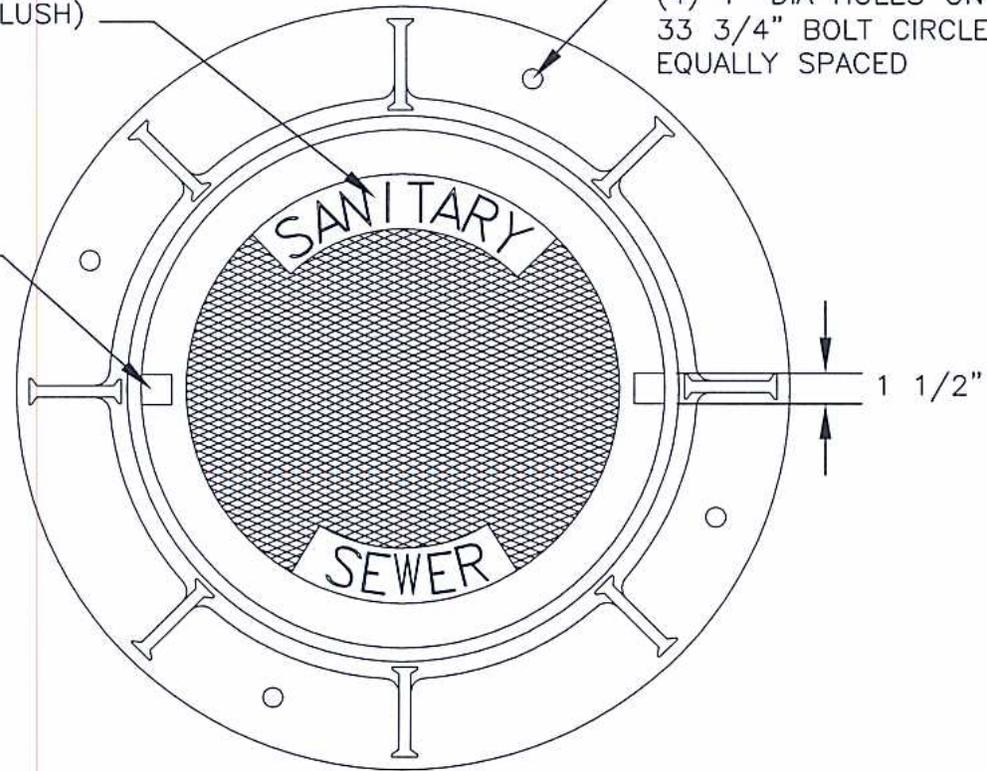
APPROVED

wcb

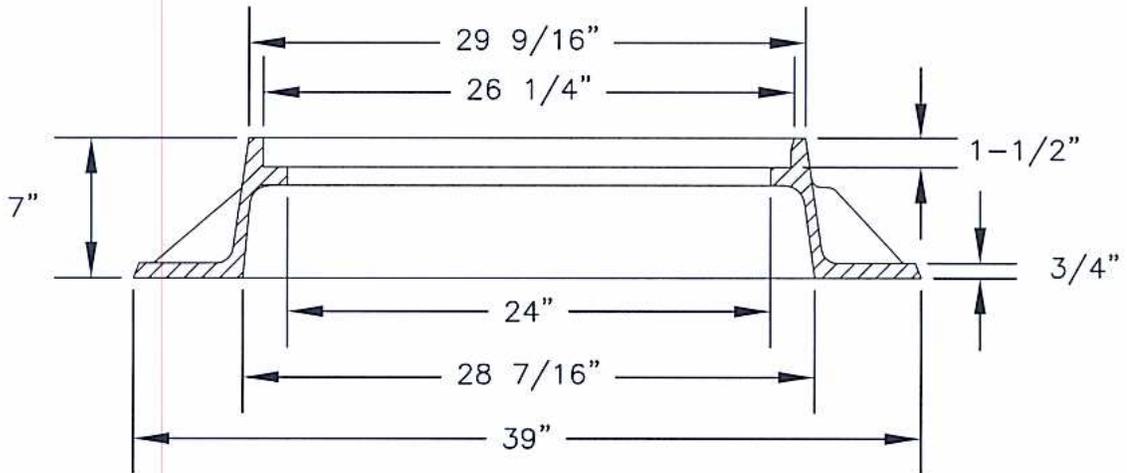
2" LETTERS
(RECESSED FLUSH)

(4) 1" DIA HOLES ON
33 3/4" BOLT CIRCLE.
EQUALLY SPACED

(2) CLOSED PICKHOLES



TOP VIEW OF FRAME



CROSS SECTION OF FRAME
EAST JORDAN FRAME CASTING "1040Z" OR EQUIVALENT

NOTES:

THE SEATING FACE OF THE LID AND THE SEAT FOR SAME ON THE FRAME SHALL BE GROUND OR MACHINED SO THAT THE LID SHALL HAVE AN EVEN BEARING ON ITS SEAT TO PREVENT ROCKING OR TILTING.

THE CASTING SHALL BE FREE OF POURING FAULTS, BLOWHOLES, CRACKS AND OTHER IMPERFECTIONS. THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN, AND NEATLY FINISHED, AND SHALL BE COATED WITH COAL TAR PITCH VARNISH.

MANHOLE COVER:

EAST JORDAN TYPE "A" 1040A
W/ 2" "SANITARY SEWER" LETTERING
HEAVY DUTY SOLID COVER OR APPROVED EQUIVALENT

TOTAL WEIGHT
350 LB.

CITY OF PORTAGE

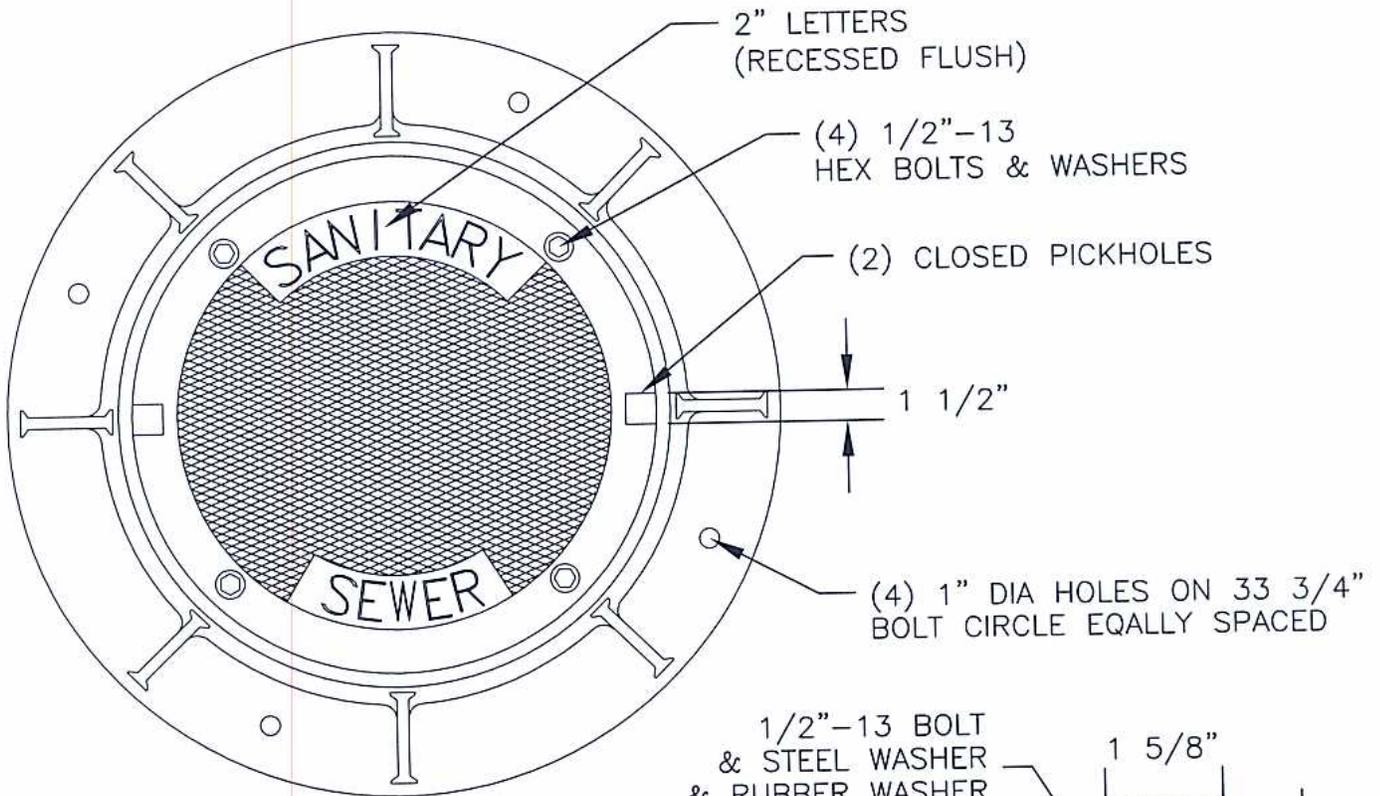
SANITARY SEWER
STANDARD
MANHOLE CASTING

AUG. 17, 93
L.G.N.
NOV. '97
D.R.W.
JULY '05
J&H
JAN '07
JMA

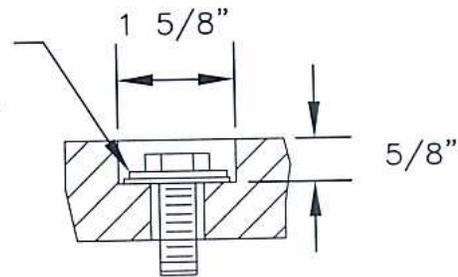
STANDARD DESIGN SD-106

APPROVED wcb

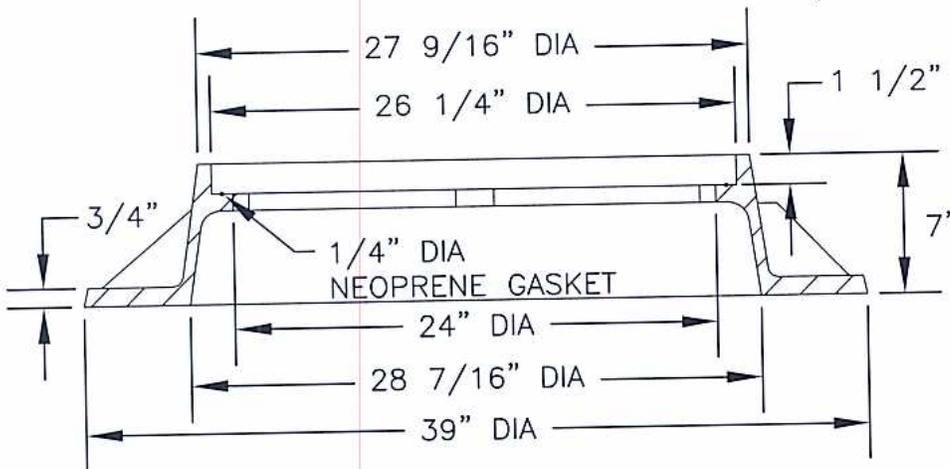
TOP VIEW OF FRAME



1/2"-13 BOLT
& STEEL WASHER
& RUBBER WASHER
(TYP 4 PLACES)



BOLT DETAIL



CROSS SECTION OF FRAME
EAST JORDAN FRAME CASTING "1040 ZPT" OR EQUIVALENT

NOTES:

THE SEATING FACE OF THE LID SHALL BE GROUND OR MACHINED TO FORM A TIGHT SEAL WITH THE NEOPRENE GASKET IN THE MACHINED GROOVE IN THE BASE.

THE CASTING SHALL BE FREE OF POURING FAULTS, BLOW HOLES, CRACKS AND ANY OTHER IMPERFECTIONS. THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN AND NEATLY FINISHED, AND SHALL BE COATED WITH COAL TAR PITCH VARNISH.

MANHOLE COVER:

EAST JORDAN TYPE "APT". HEAVY DUTY SOLID COVER OR APPROVED EQUIVALENT, EQUIPPED WITH 1/2" BRONZE CAP SCREWS AND 2" "SANITARY SEWER" LETTERING.

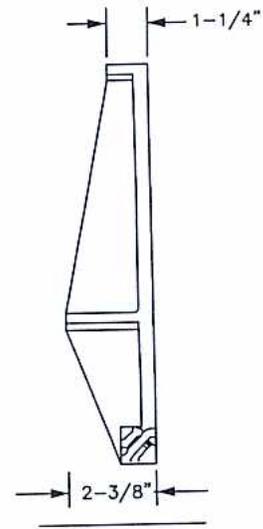
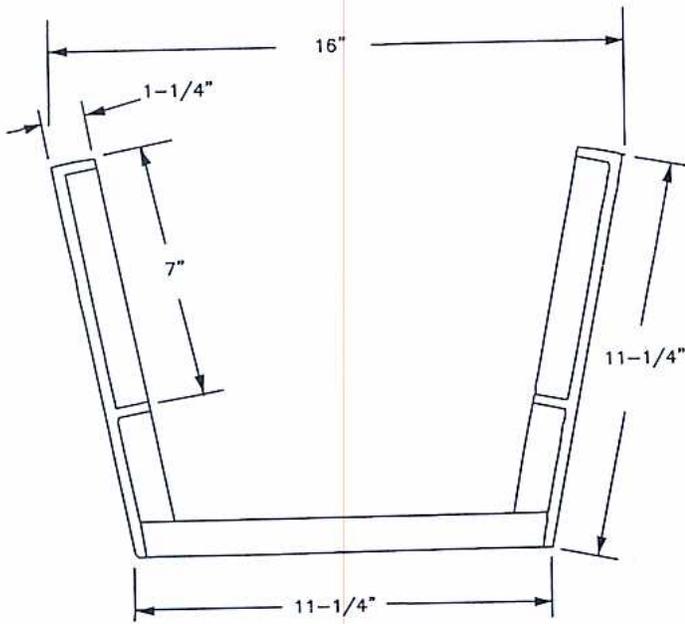
TOTAL WEIGHT
380 LBS.

CITY OF PORTAGE

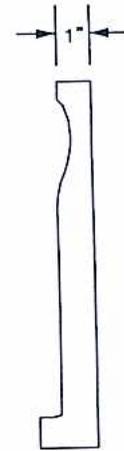
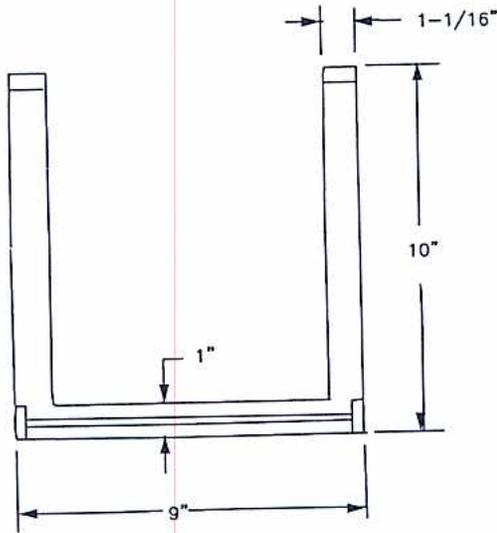
SANITARY SEWER
PRESSURE-TIGHT
MANHOLE CASTING

STANDARD DESIGN SD-107
APPROVED wcb

AUG. 17, '99
L.G.N.
AUG. 07, '99
drw(cad)
NOV. '99
drw(cad)
JULY '00
J&H
JAN '00
JMA



TYPICAL STEP
FOR BLOCK CONSTRUCTION



TYPICAL STEP
FOR PRECAST CONSTRUCTION

NOTES:

MANHOLE STEPS SHALL BE ONE INCH (1") CAST IRON OR HIGH GRADE ALUMINUM WITH FOOT RECESS AND SUITABLY SCORED SO AS TO PROVIDE A NON-SLIP SURFACE.

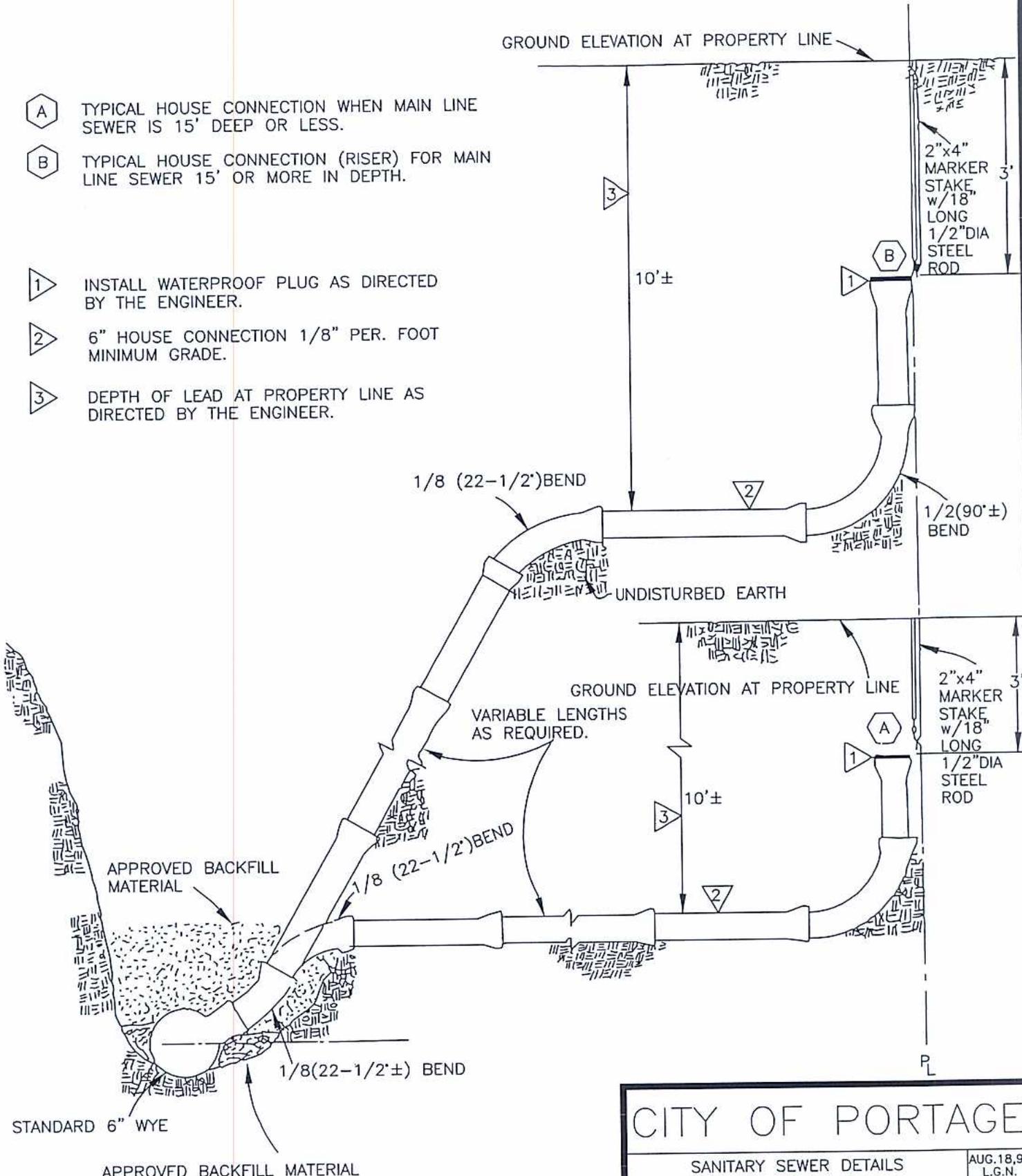
EAST JORDAN MANHOLE STEP "8501"
FOR PRECAST CONSTRUCTION, OR APPROVED EQUIVALENT

EAST JORDAN MANHOLE STEP "8503"
FOR BLOCK CONSTRUCTION, OR APPROVED EQUIVALENT

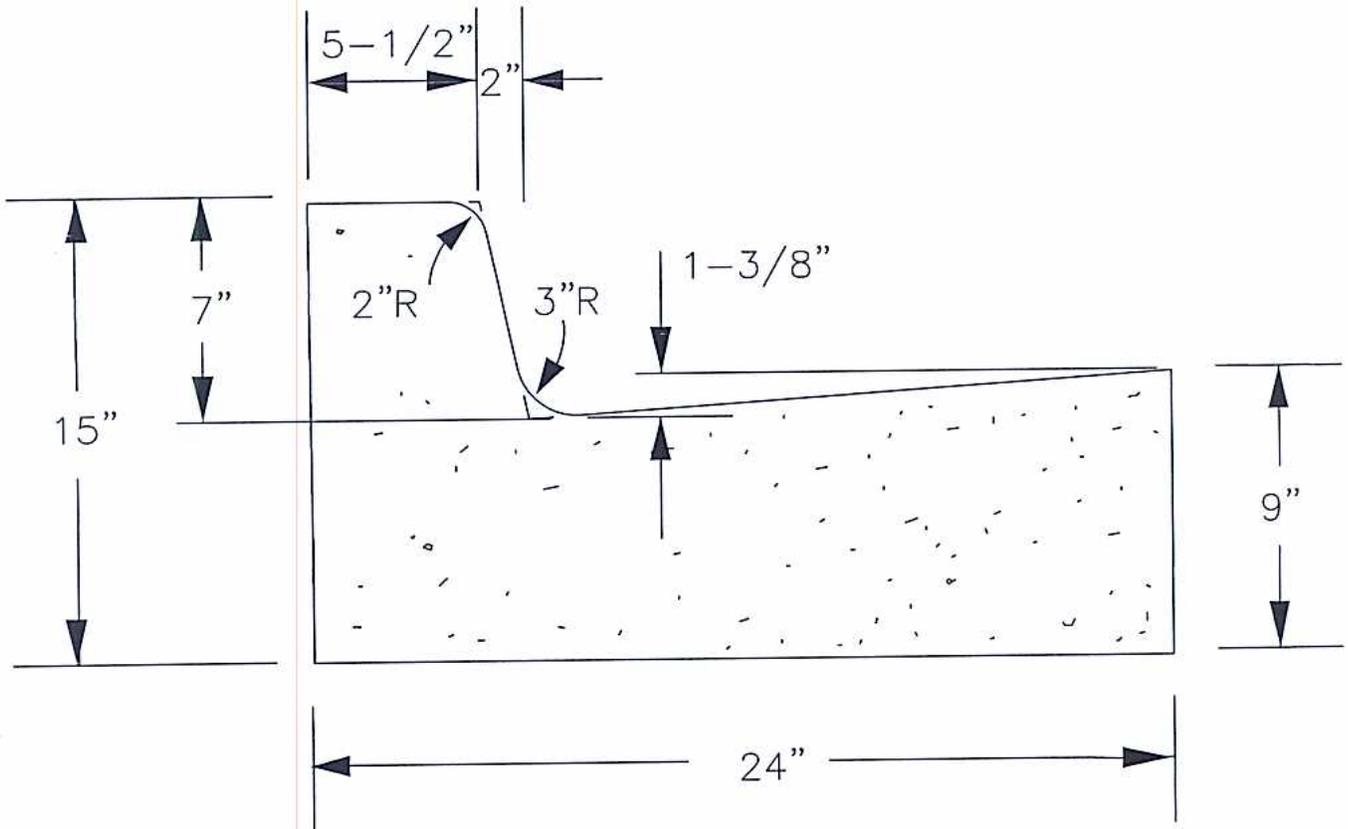
CITY OF PORTAGE	
STANDARD MANHOLE STEP	
STANDARD DESIGN	SD-108
APPROVED	<i>wcb</i>
<small> AUG.17.9 L.G.N. AUG.07.9 drw(cad) NOV. '97 drw(cad) JULY'05 J&H </small>	

- A** TYPICAL HOUSE CONNECTION WHEN MAIN LINE SEWER IS 15' DEEP OR LESS.
- B** TYPICAL HOUSE CONNECTION (RISER) FOR MAIN LINE SEWER 15' OR MORE IN DEPTH.

- 1** INSTALL WATERPROOF PLUG AS DIRECTED BY THE ENGINEER.
- 2** 6" HOUSE CONNECTION 1/8" PER. FOOT MINIMUM GRADE.
- 3** DEPTH OF LEAD AT PROPERTY LINE AS DIRECTED BY THE ENGINEER.



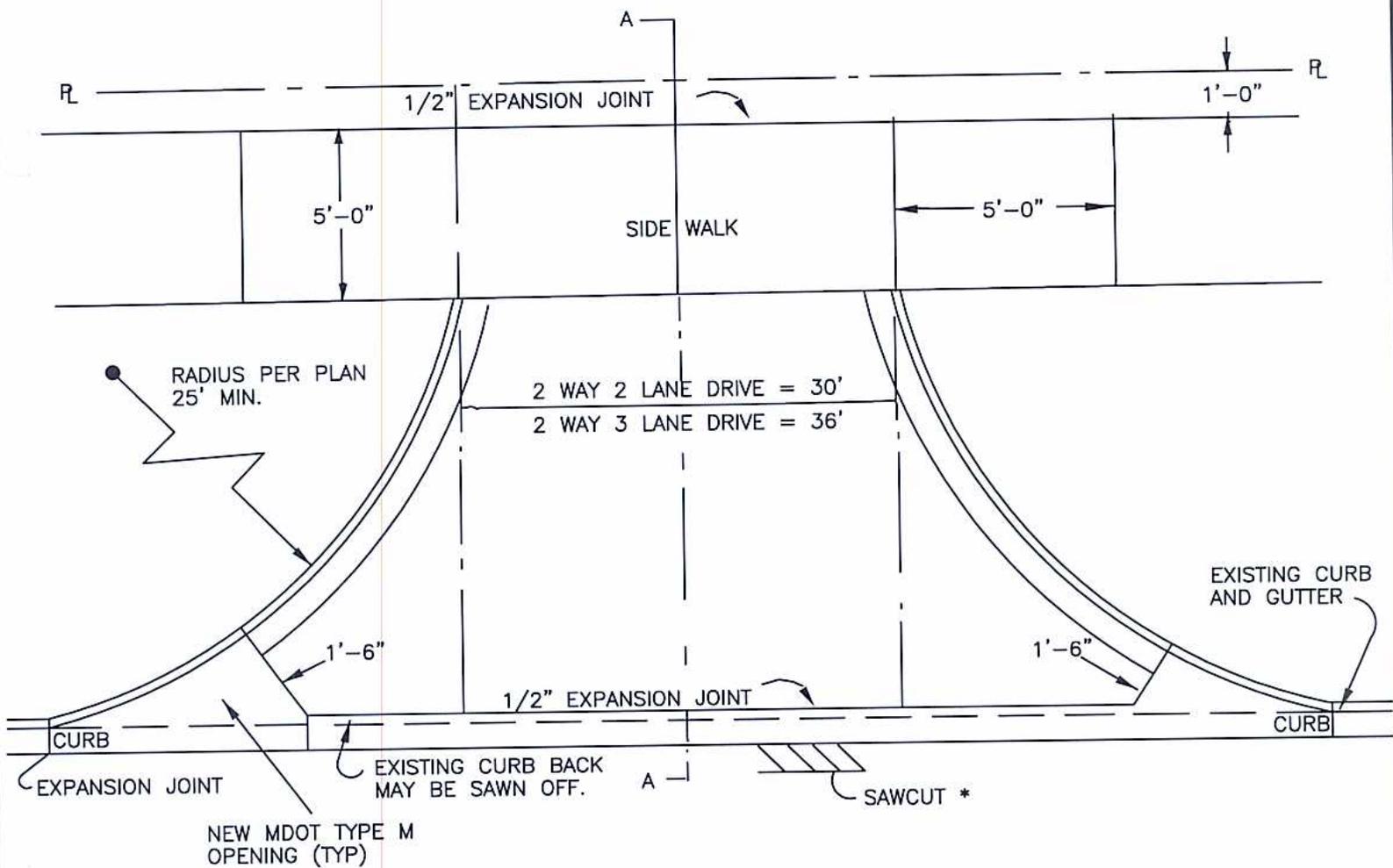
CITY OF PORTAGE	
SANITARY SEWER DETAILS STANDARD HOUSE CONNECTIONS (PROPERTY LINE RISER)	AUG.18.93 L.G.N. AUG.08.95 drw(cad) NOV.25.97 drw(cad) DEC.'97 drw(cad) FEB.'98 drw(cad) JULY'05 J&H
STANDARD DESIGN	SD-110
APPROVED	<i>wcb</i>



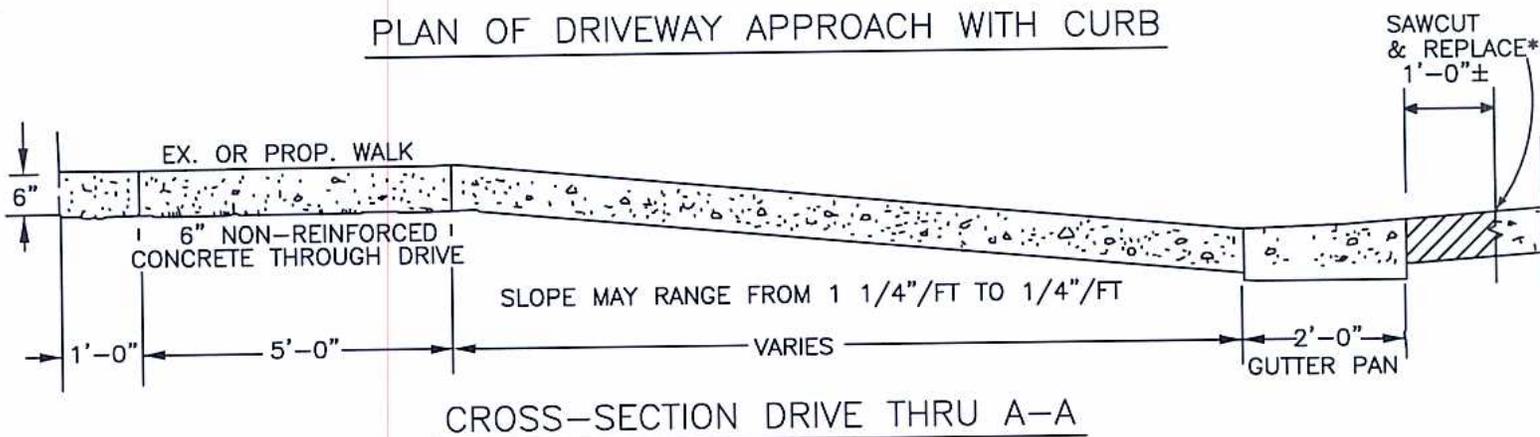
CURB DETAIL

STANDARD MDOT C-4 CURB WITHOUT REBAR

CITY OF PORTAGE	
STANDARD CURB	AUG. 17, 93 L.G.N. JULY '05 J&H
STANDARD DESIGN SD-113	
APPROVED <i>wcb</i>	



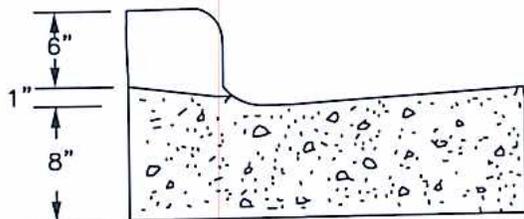
PLAN OF DRIVEWAY APPROACH WITH CURB



CROSS-SECTION DRIVE THRU A-A

- IF BITUMINOUS PAV'T IS USED FOR APPROACH, MIN. THICKNESS SHALL BE 4" BIT. & 8" 22A AGGREGATE.

* SAWCUT AND REPLACE WITH EQUAL DEPTH OF PAVEMENT. ANNULUS SHALL NOT BE FILLED WITH CONCRETE.



IF CURB INLET IS PRESENT, REPLACE CASTING PER SD-104 AND ADJUST CURB FLOWLINE ACCORDINGLY

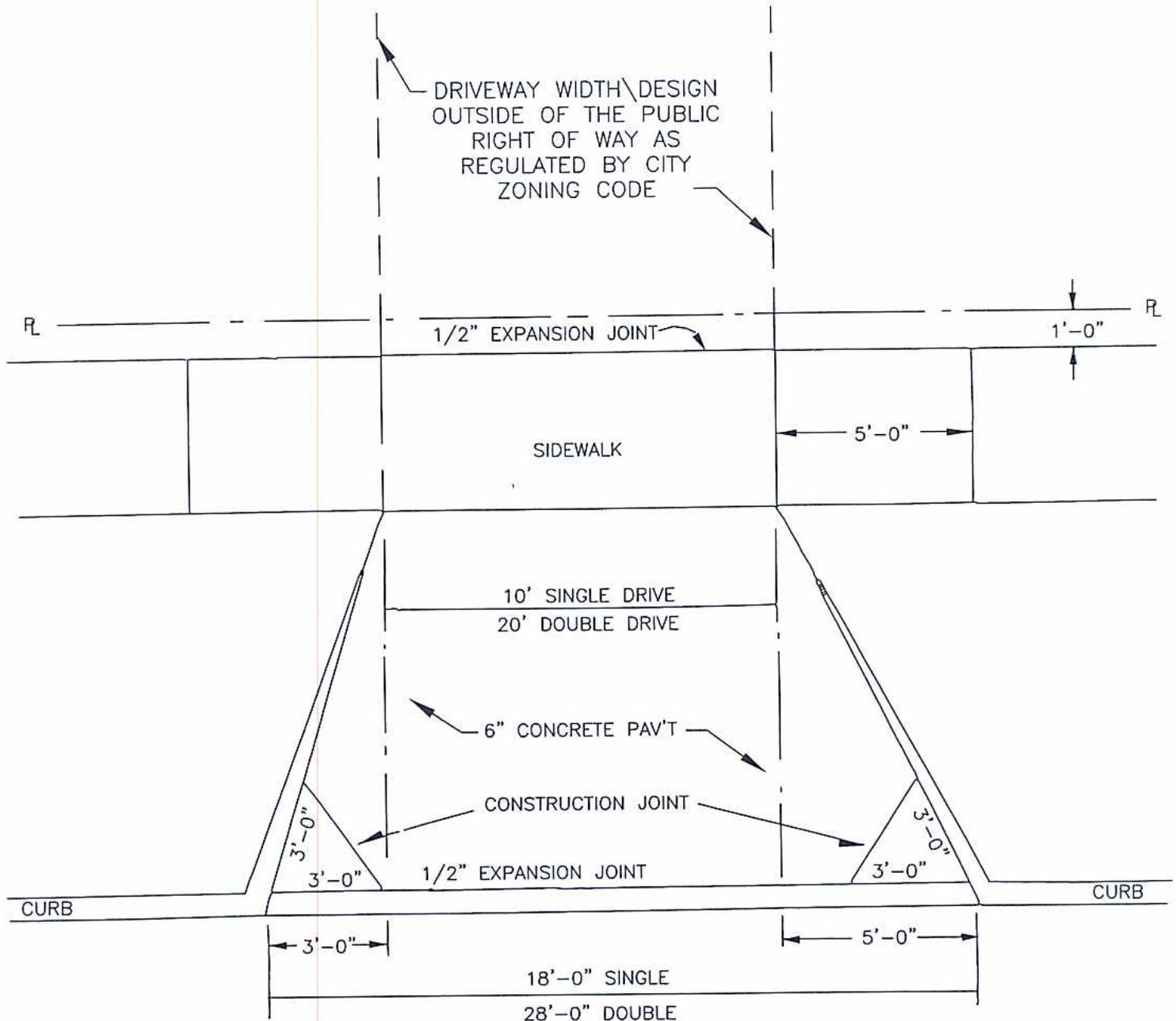
CURB DETAIL

CITY OF PORTAGE

COMMERCIAL & INDUSTRIAL
DRIVEWAY APPROACH WITH
CURBED STREET

STANDARD DESIGN SD-116
APPROVED *wcb*

FEB. 99
D.R.W.
MARCH 99
D.R.W.
JULY 05
J&H



PLAN OF DRIVEWAY APPROACH WITH CURB

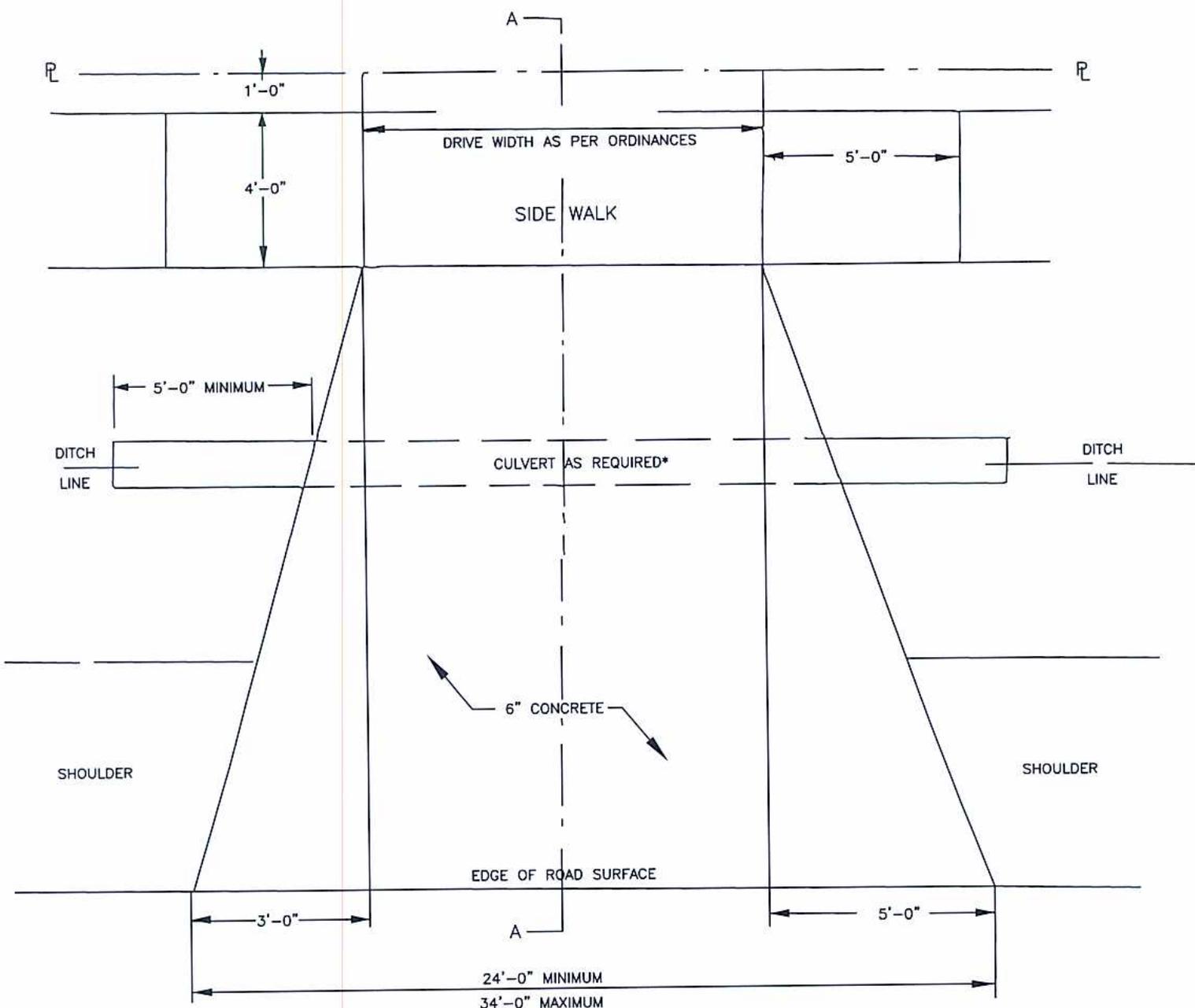
CITY OF PORTAGE

RESIDENTIAL DRIVEWAY
APPROACH WITH CURBED
STREET

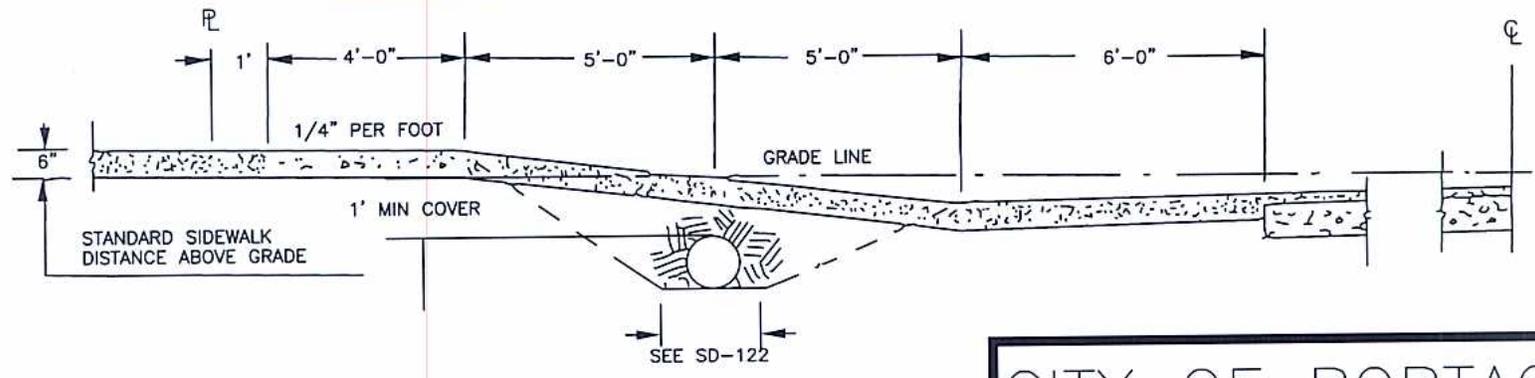
STANDARD DESIGN SD-117

APPROVED WCB

AUG. 17, 93	L.G.N.
NOV. '97	D.R.W.
NOV. 25, 97	D.R.W.
JULY '05	J&H
FEB '07	JMA



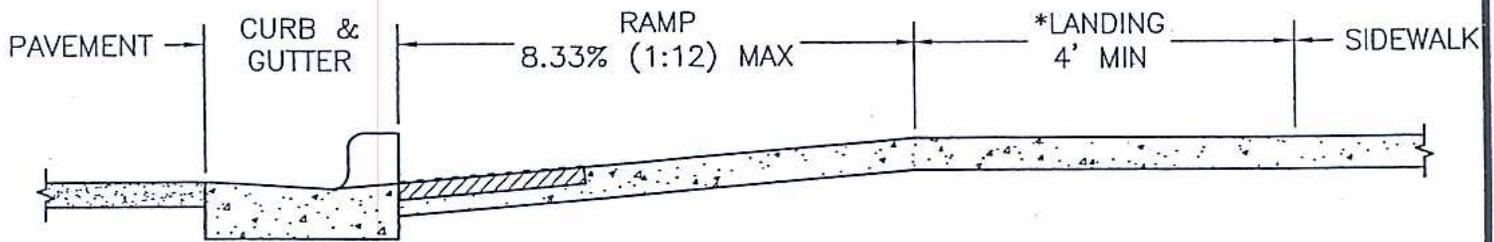
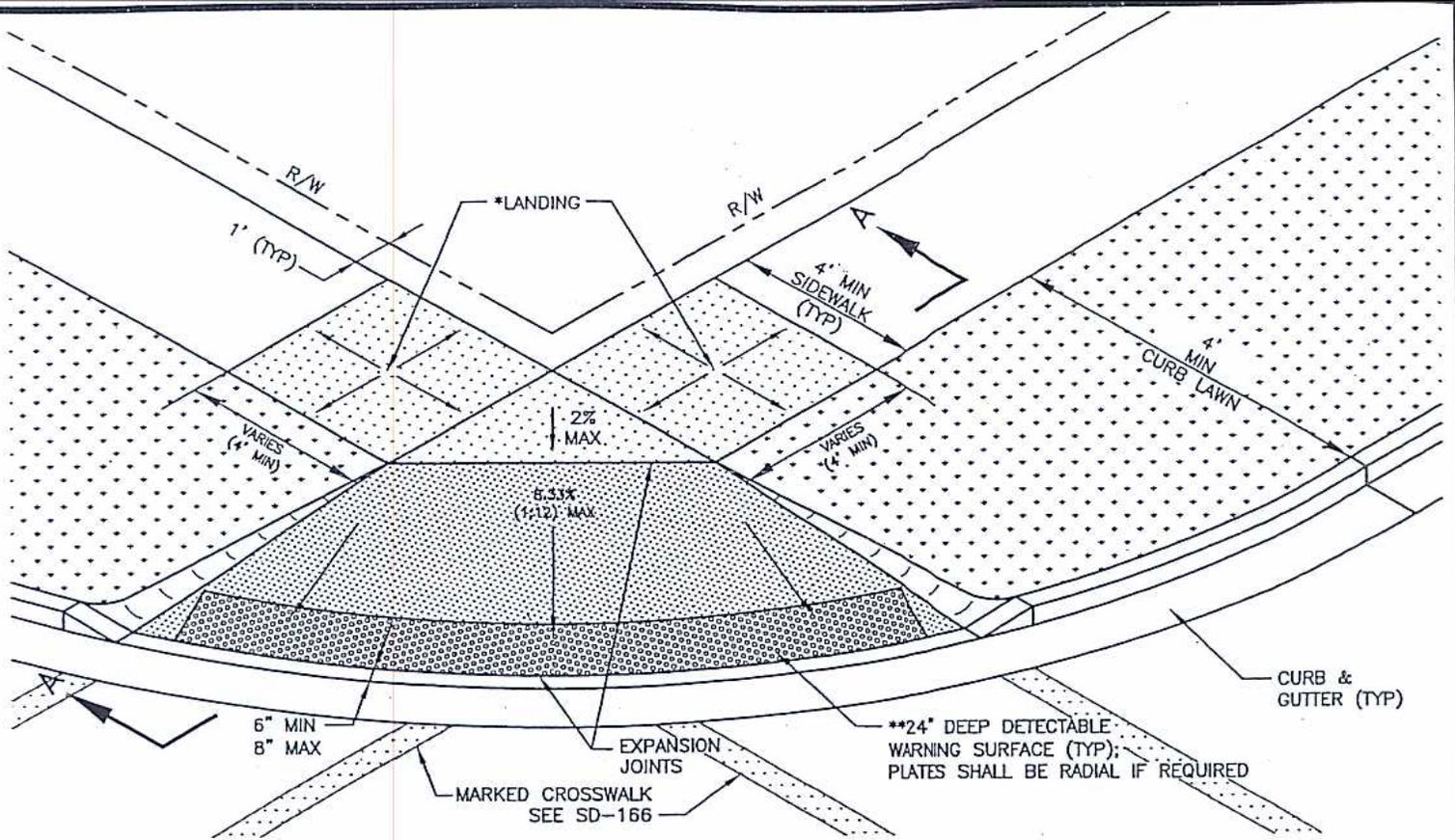
PLAN OF DRIVEWAY APPROACH WITHOUT CURB



CROSS SECTION DRIVE THRU A-A

- * SIZE AND NECESSITY OF CULVERT TO BE DETERMINED BY THE ENGINEER
- * IF BITUMINOUS PVMT IS USED MIN THICKNESS SHALL BE 3" BIT & 6" 22A AGGREGATE

CITY OF PORTAGE		AUG.17.9 L.G.N.
RESIDENTIAL DRIVEWAY APPROACH WITHOUT CURBED STREET		AUG.07.9 drw(cad)
STANDARD DESIGN SD-118		NOV. '97 drw(cad)
APPROVED <i>wcb</i>		JULY'05 J&H
		FEB '07 JMA



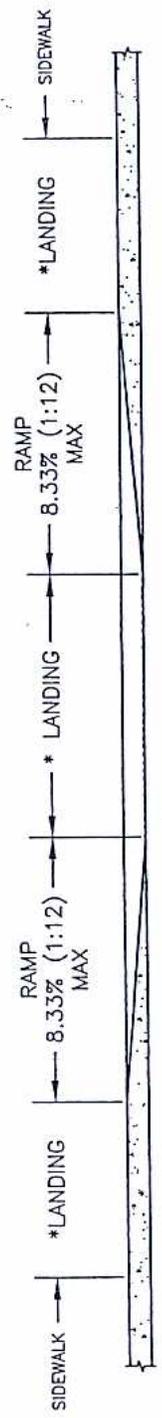
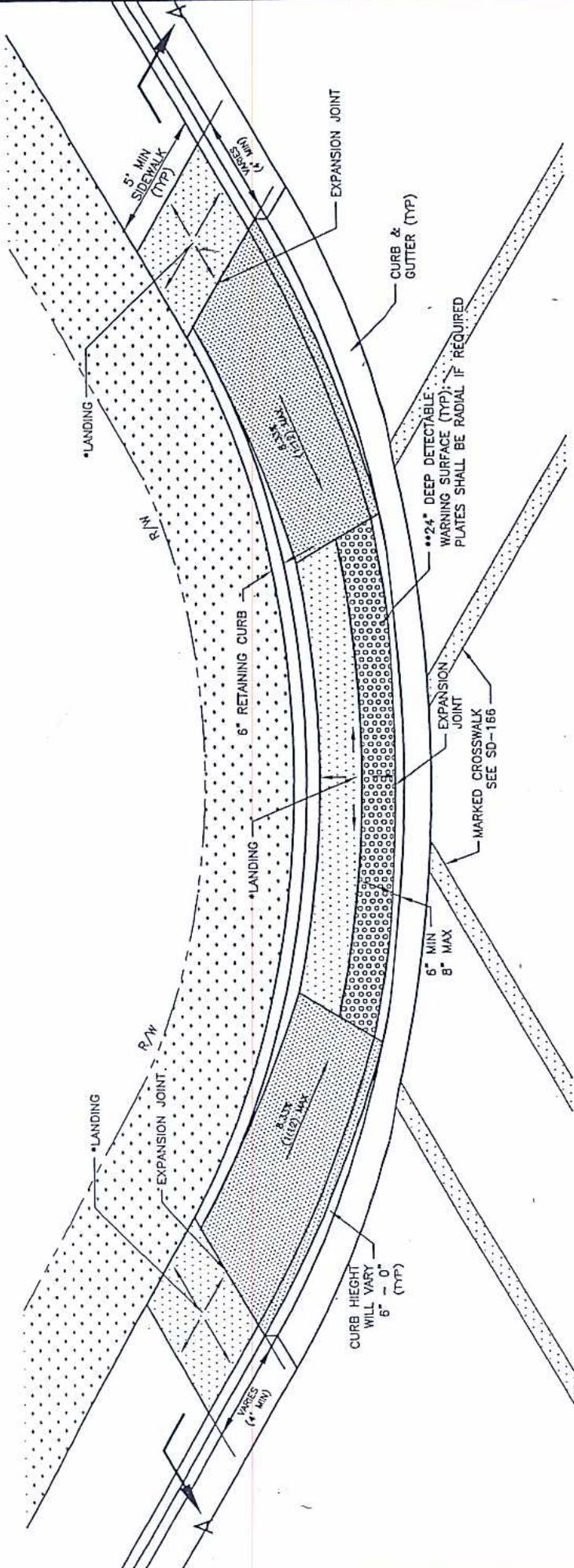
SECTION A-A
NTS

* MAXIMUM LANDING SLOPE IN ANY DIRECTION IS 2% (1:50). LANDING SHALL BE A MINIMUM OF 4'-0" IN ALL DIRECTIONS.

** DETECTABLE WARNING SURFACE SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP. THEY SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF 8" FROM THE FACE OF THE CURB.

DETECTABLE WARNING PLATES SHALL HAVE A BLACK ASPHALT COATING AND SHALL BE CAST IRON. PLATES SHALL BE EJIW 7005 OR NEENAH FOUNDRY SERIES 4213.

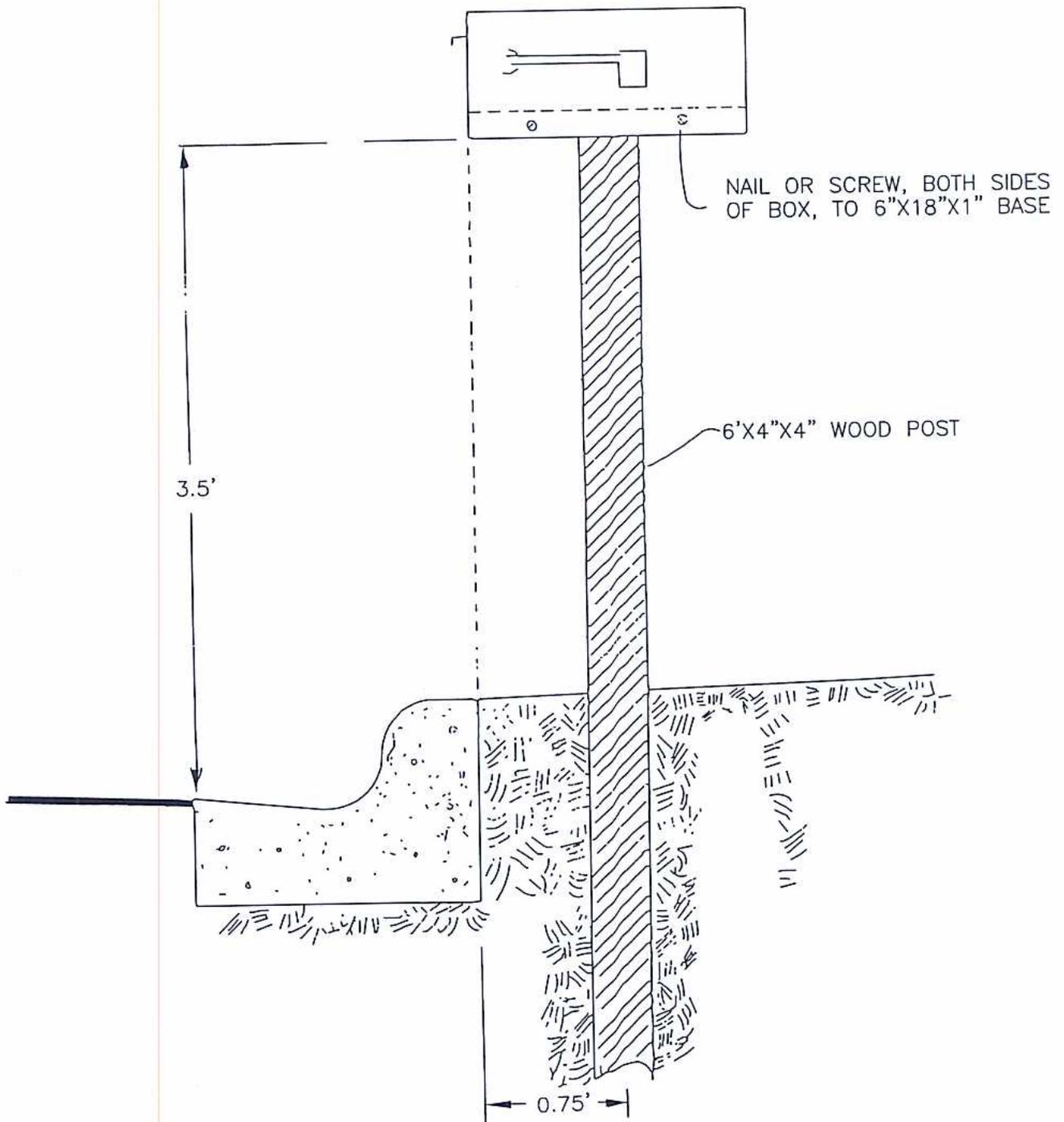
CITY OF PORTAGE		AUG.17.93 L.G.N.
RAMPED SIDEWALK DETAIL		AUG.07.95 drw(cad)
		NOV.07.97 drw(cad)
		NOV.25.97 drw(cad)
STANDARD DESIGN	SD-119A	JAN'07 JMA
APPROVED	<i>wcb</i>	



SECTION A-A
NTS

- * MAXIMUM LANDING SLOPE IN ANY DIRECTION IS 2% (1:50). LANDING SHALL BE A MINIMUM OF 4'-0" IN ALL DIRECTIONS.
- ** DETECTABLE WARNING SURFACE SHALL EXTEND THE FULL WIDTH OF THE CURB RAMP. THEY SHALL BE LOCATED SO THAT THE EDGE NEAREST THE CURB LINE IS A MINIMUM OF 6" AND A MAXIMUM OF 8" FROM THE FACE OF THE CURB.
- DETECTABLE WARNING PLATES SHALL HAVE A BLACK ASPHALT COATING AND SHALL BE CAST IRON. PLATES SHALL BE EJIW 7005 OR NEENAH FOUNDRY SERIES 4213.

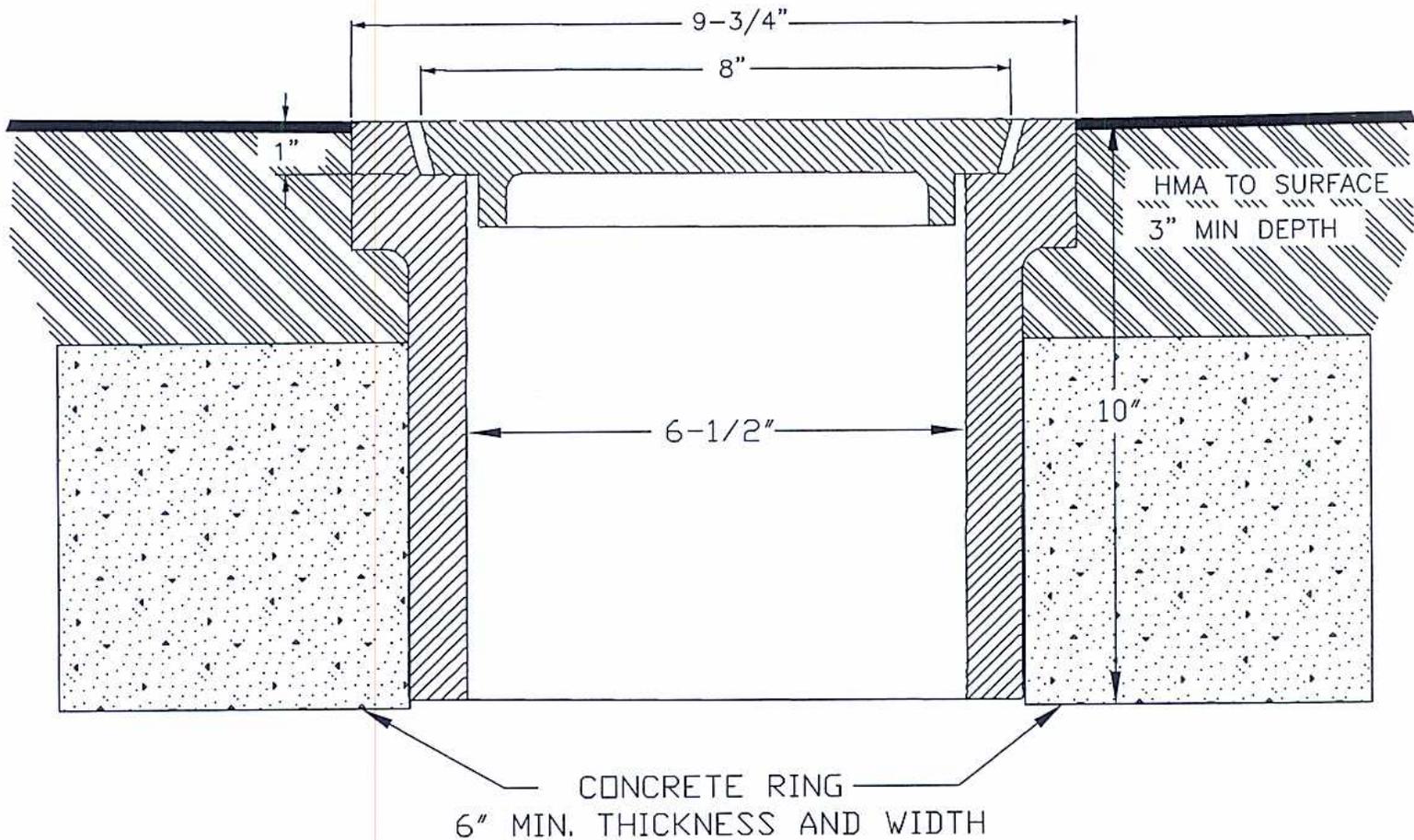
CITY OF PORTAGE	
RAMPED SIDEWALK ADJACENT TO CURB & GUTTER DETAIL	
STANDARD DESIGN SD-119B	AUG.17.93 L.G.N. AUG.07.93 drw(cad) NOV.07.97 drw(cad) NOV.25.97 drw(cad)
APPROVED <i>wcb</i>	JAN'07 JMA



NOTES:

MAIL BOX TO BE POSTMASTER APPROVED
 POST TO BE 6'X4"X4" WOOD WITH 6"X18"X1" WOOD BASE
 BOARD FIRMLY ATTACHED
 POST TO BE PLACED SO AS TO STAND STRAIGHT
 IN AREAS WITHOUT CURB AND GUTTER, PLACE CENTER OF
 POST 1.75' OFF EXISTING SHOULDER

CITY OF PORTAGE		AUG.17.95 L.G.N. AUG.07.95 drw(cad) NOV. '97 drw(cad) JULY'05 J&H
TYPICAL MAIL BOX		
STANDARD DESIGN	SD-120	
APPROVED	<i>WCB</i>	



CROSS SECTION OF MONUMENT BOX AND COVER

NOTES:

THE SEATING FACE OF THE LID AND THE SEAT FOR SAME ON FRAME SHALL BE GROUND OR MACHINED SO THAT THE LID SHALL HAVE AN EVEN BEARING ON ITS SEAT TO PREVENT ROCKING OR TILTING.

THE CASTING SHALL BE FREE OF POURING FAULTS, BLOW HOLES, CRACKS AND OTHER IMPERFECTIONS, THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN AND NEATLY FINISHED, AND SHALL BE COATED WITH TAR PITCH VARNISH.

CASTING:

EAST JORDAN FLANGE TYPE "2965"

OR APPROVED EQUIVALENT

TOTAL WEIGHT 60 LB.

CITY OF PORTAGE

STANDARD
MONUMENT BOX

STANDARD
DESIGN SD-121

APPROVED *wcb*

AUG.17,93
L.G.N.

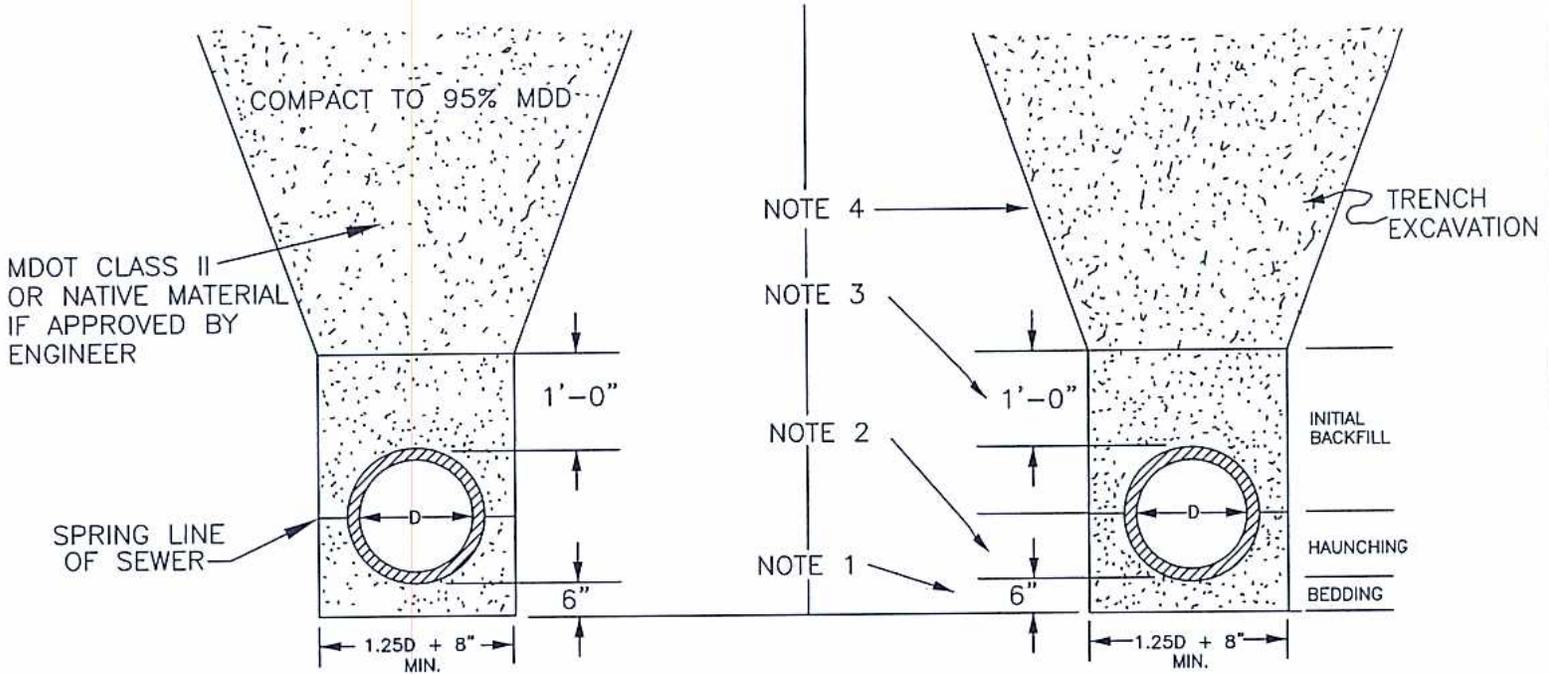
AUG.07,95
drw(cad)

NOV. '97
drw(cad)

JULY'05
J&H

TYPICAL SECTION OF SEWER IN OPEN CUT UNDER ROADBED

TYPICAL SECTION OF SEWER IN OPEN CUT NOT UNDER ROADBED



GRADING REQUIREMENTS FOR GRANULAR MATERIALS AND MDOT 17A

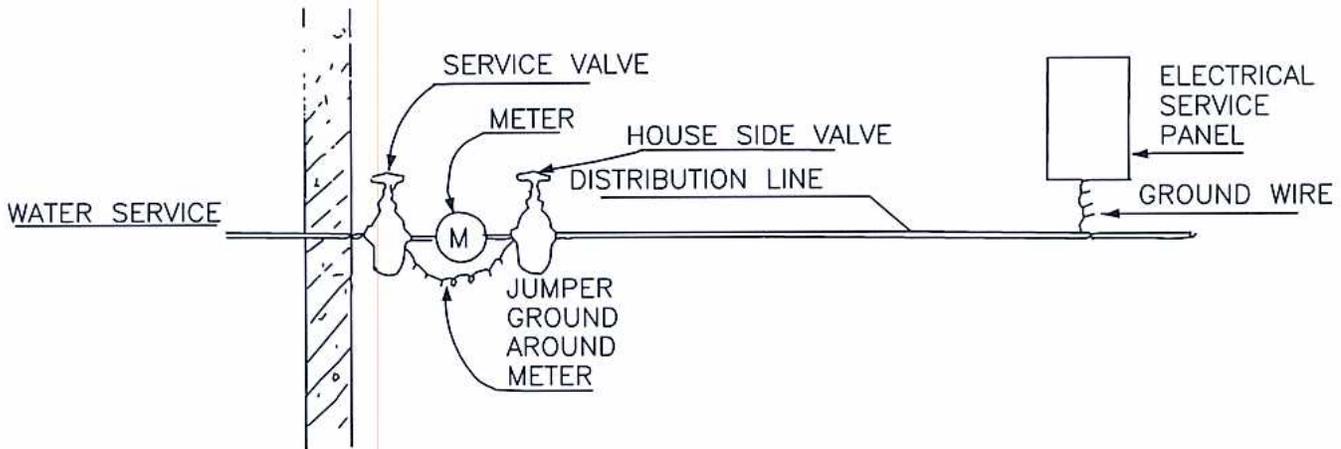
MATERIAL	TOTAL PERCENT PASSING (SIEVE SIZE - U.S. STANDARD SIEVE SERIES)										LOSS BY WASHING PERCENT
	6"	3"	2"	1"	3/4"	1/2"	3/8"	No. 4	No. 30	No. 100	
CLASS I			100			40-85		20-85	5-30		0-5
CLASS II		100		60-100						0-30	0-7
CLASS III	100	95-100									0-15
17A				100	90-100	50-75		0-8			1.0 MAX

PER MDOT 2003 STANDARD SPECIFICATIONS FOR CONSTRUCTION, FOR ADDITIONAL INFORMATION, SEE TABLES 902-2 AND 902-3

NOTES:

- BEDDING:** CLASS "A" BEDDING SHALL CONSIST OF A CONTINUOUS CONCRETE CRADLE CONFORMING TO PLAN DETAIL.
CLASS "B" BEDDING SHALL CONSIST OF A BED OF GRANULAR MATERIAL HAVING A THICKNESS OF AT LEAST SIX INCHES (6") BELOW THE BOTTOM OF THE PIPE TO THE SPRINGLINE OF THE PIPE, AND SHALL HAVE RECESSES SHAPED TO RECEIVE THE BELL.
CLASS "C" BEDDING SHALL CONSIST OF BEDDING THE CONDUIT IN ITS NATURAL FOUNDATION TO A DEPTH OF THE SPRING LINE OF THE CONDUIT. THE BED SHALL BE SHAPED TO RECEIVE THE BELL.
- HAUNCHING:** FROM THE BOTTOM OF THE PIPE TO THE SPRING LINE, HAUNCHING OF THE PIPE BEDDING MATERIAL CLASS B OR C SHALL BE PERFORMED. HAUNCHING SHALL CONSIST OF PLACING LIFTS OF CLASS B OR C MATERIAL IN FOUR INCH (4") TO SIX INCH (6") LIFTS ON EITHER SIDE OF THE PIPE, AND COMPACTING IN PLACE.
- INITIAL BACKFILL:** FROM THE SPRING LINE OF THE PIPE TO ONE FOOT (1') ABOVE THE PIPE, THE PIPE SHALL BE BACKFILLED WITH GRANULAR MATERIAL, CLASS B OR C, IN SIX INCH (6") LIFTS AND COMPACTED TO 95% OF MAXIMUM DRY DENSITY (MDD), AS DETERMINED BY THE MODIFIED PROCTOR METHOD.
- FINAL BACKFILL:** WHERE EXCAVATION IS MADE THROUGH PAVEMENT AREAS OR WHERE STRUCTURES ARE UNDERCUT BY THE EXCAVATION, THE BACKFILL FROM ONE FOOT (1') ABOVE THE PIPE TO THE SUBGRADE SHALL BE MADE WITH GRANULAR MATERIAL COMPACTED TO 95% OF MAXIMUM DRY DENSITY, AS DETERMINED BY THE MODIFIED PROCTOR METHOD.
WHERE EXCAVATION IS NOT MADE THROUGH PAVEMENT AREAS OR OTHERWISE SPECIFIED, THE BACKFILL SHALL BE COMPACTED IN FOUR FOOT (4') MAXIMUM LIFTS BY MACHINE METHODS.

CITY OF PORTAGE		AUG. 17, 93 L.G.N.
STANDARD TRENCH DETAIL		AUG. 07, 95 drw(cad) NOV. 7, 97 drw(cad) JULY 99 drw(cad)
STANDARD DESIGN	SD-122	JULY '05 J&H
APPROVED	<u>wcb</u>	



- 1 PERMIT REQUIRED EITHER BY PLUMBER OR HOMEOWNER, FOR CONNECTION FROM METER DISCHARGE TO DISTRIBUTION PIPING IN BUILDING.
- 2 OLD PUMP AND WELL MUST BE COMPLETELY DISCONNECTED FROM POTABLE WATER SUPPLY (GROUNDING MAY BE DISRUPTED.)
- 3 APPROVED METALLIC PIPE (COPPER or GALVINIZED IRON) MUST BE USED TO ASSURE PROPER GROUNDING CONTINUITY.
- 4 FULL SIZE GATE VALVE MUST BE USED ON HOUSE SIDE.
- 5 MINIMUM SIZE GROUND WIRE AUTHORIZED No.6 BRAIDED COPPER.
- 6 APPROVED GROUND CLAMP MUST BE USED.
- 7 AN INSPECTION FOR CROSS CONNECTIONS SHALL BE MADE PRIOR COMPLETING THE CONNECTION TO THE SERVICE.
- 8 CALL 329-4477 COMMUNITY DEV. DEPT. FOR INSPECTION OF INSTALLATION.
- 9 THE WATER METER SHALL BE INSTALLED IMMEDIATELY ADJACENT TO THE INTERIOR WALL.

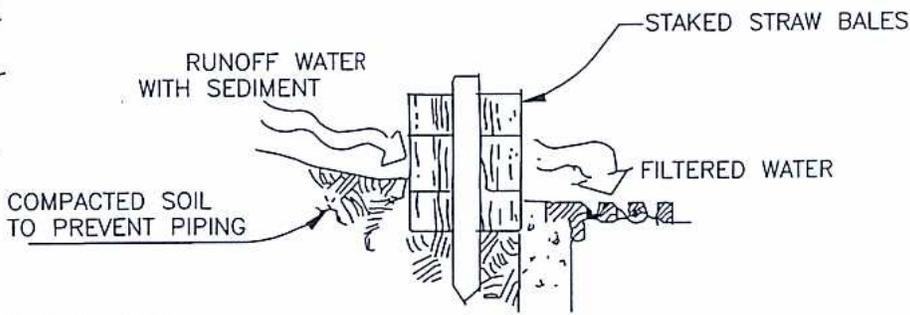
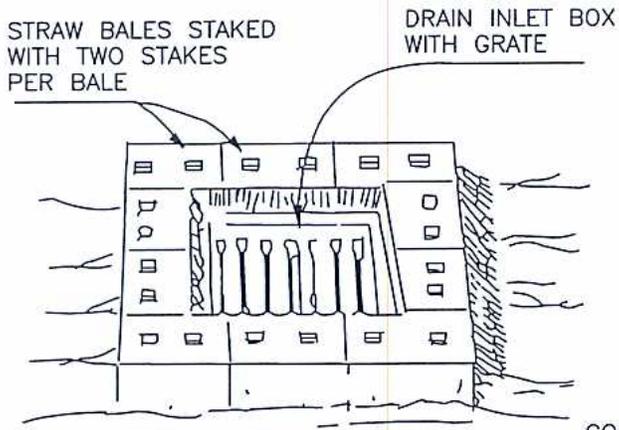
CITY OF PORTAGE

TYPICAL CITY
WATER CONNECTION

STANDARD
DESIGN SD-124

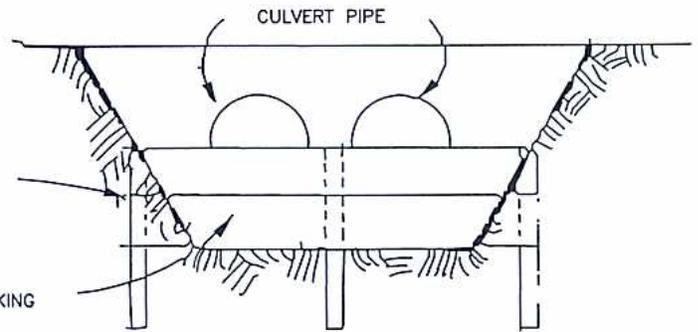
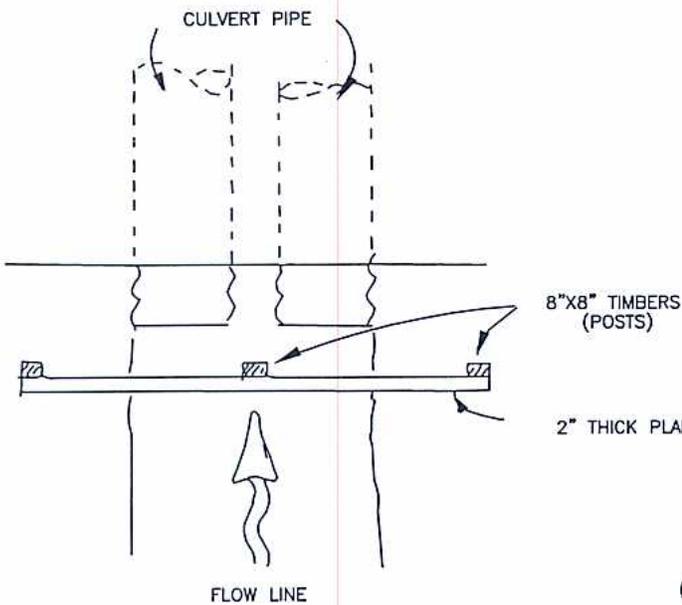
APPROVED BY J.B.

AUG. 18, 93
L.G.N.
NOV. '97
D.R.W.
JULY '99
D.R.W.
FEB '07
JMA

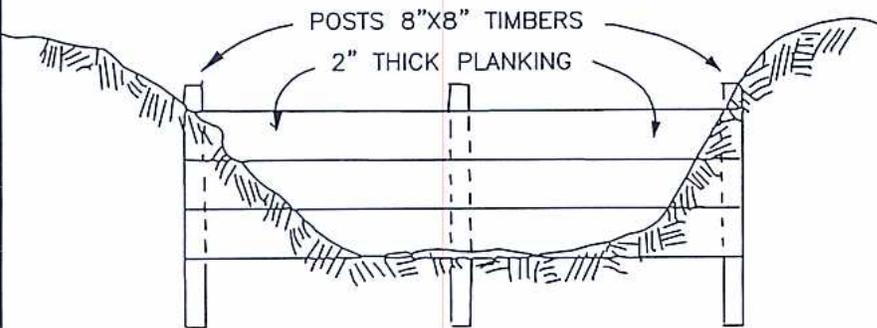


DETAIL "A" SD-125
STRAW BALE/DRAIN INLET SEDIMENT FILTER

CROSS SECTION



DETAIL "B" SD-125
CULVERT SEDIMENT TRAP



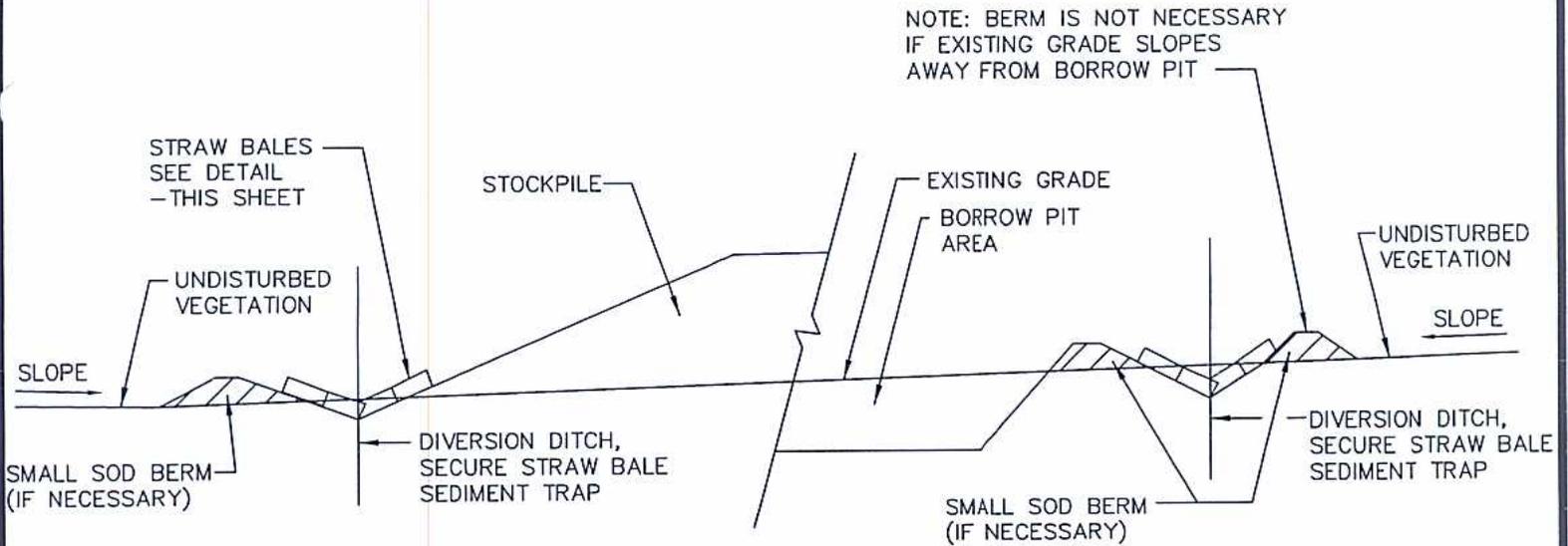
DETAIL "C" SD-125
STREAM SEDIMENT TRAP

CITY OF PORTAGE

SEDIMENT
TRAPS

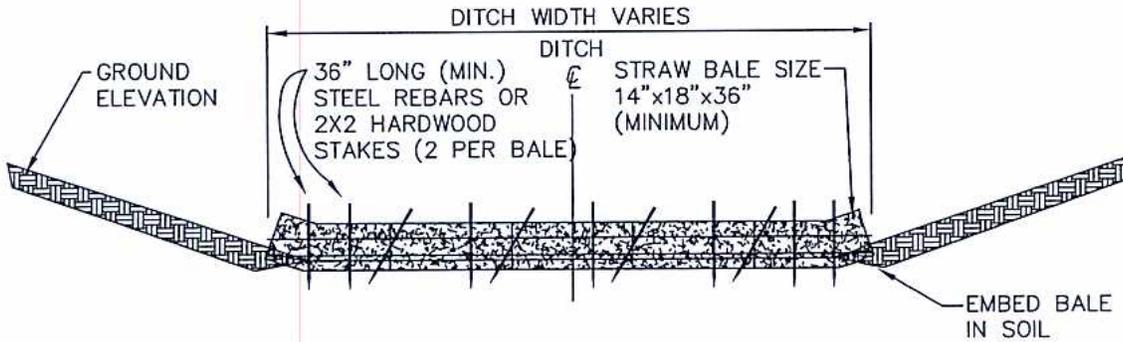
STANDARD DESIGN SD-125
APPROVED *wcb*

AUG.18.93
L.G.N.
AUG.08.95
drw(cad)
NOV. '97
drw(cad)
AUG'05
J&H



TEMPORARY DIVERSION DITCH DETAIL

N.T.S.



SEDIMENT TRAP DITCH DETAIL

NTS

NOTES:

1. EXACT NUMBER OF BALES TO BE DETERMINED.
2. STRAW BALES SHOULD BE EMBEDDED 4" INTO THE DITCH.
3. END BALES SHOULD BE SLIGHTLY SLOPED UPHILL.
4. DETAIL TYPICAL OF BOTH TRAP LOCATIONS.
5. OTHER SEDIMENT TRAP LOCATIONS TO BE DETERMINED AS NEEDED.
6. DRIVE FIRST STAKE AT AN ANGLE TOWARDS PREVIOUS BALE TO FORCE BALES TOGETHER.

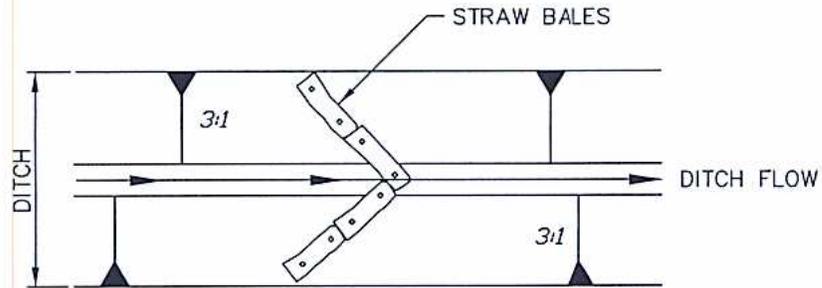
CITY OF PORTAGE

SEDIMENTATION CONTROLS
 DIVERSION DITCH
 AND SEDIMENT TRAP

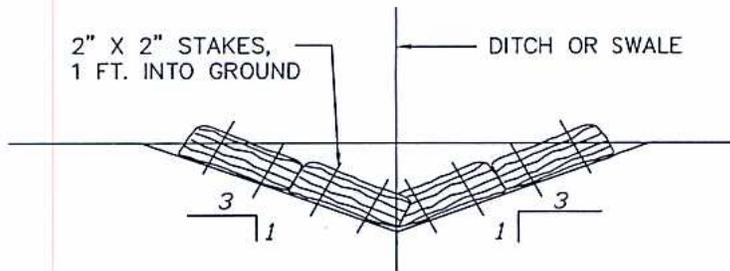
AUG'05
 J&H

STANDARD DESIGN SD-125A

APPROVED BY *wcb*



PLAN VIEW



NOTE: INSTALL STRAW BALES EVERY 200 FT. IN DITCHES AROUND BORROW AREAS, STOCKPILES, OR OTHER AREAS WHERE SEDIMENT TRAP IS NEEDED DURING CONSTRUCTION.

SECTION

STRAW BALE SEDIMENT TRAP DETAIL

N.T.S.

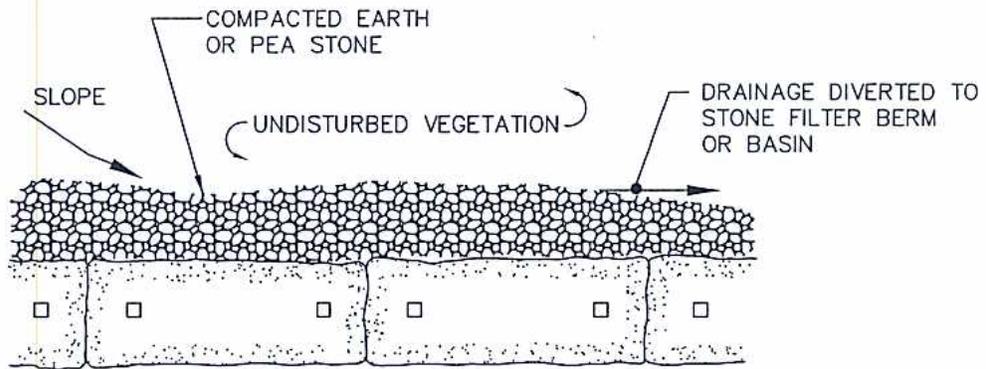
CITY OF PORTAGE

SEDIMENTATION CONTROLS
STRAW BALE
SEDIMENT TRAP

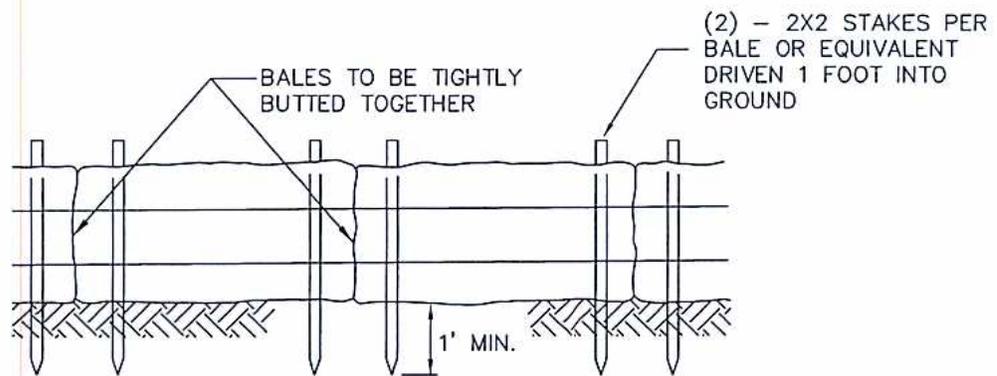
AUG'05
J&H

STANDARD DESIGN SD-125B

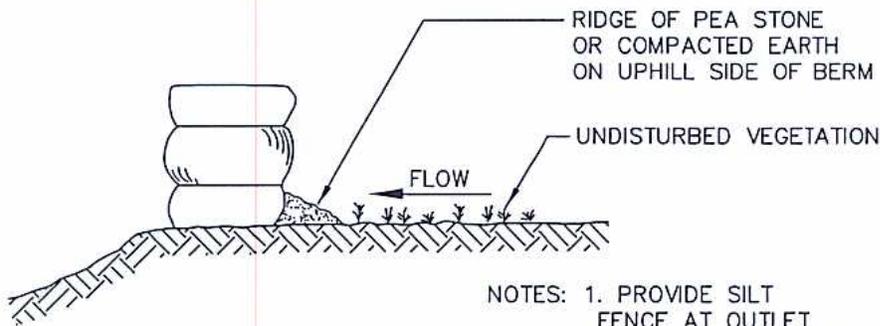
APPROVED BY WOB



PLAN



ELEVATION



SECTION

- NOTES: 1. PROVIDE SILT FENCE AT OUTLET
 2. SMALL EARTH BERM MAY BE CONSTRUCTED INSTEAD.

STRAW BALE DIVERSION BERM

N.T.S.

CITY OF PORTAGE

SEDIMENTATION CONTROLS
 STRAW BALE
 DIVERSION BERM

AUG'05
 J&H

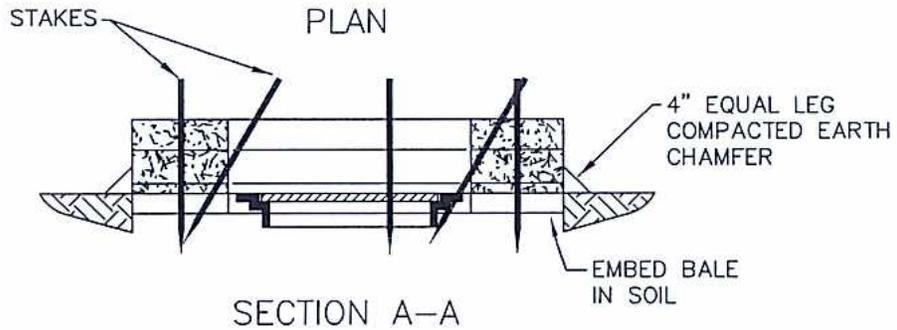
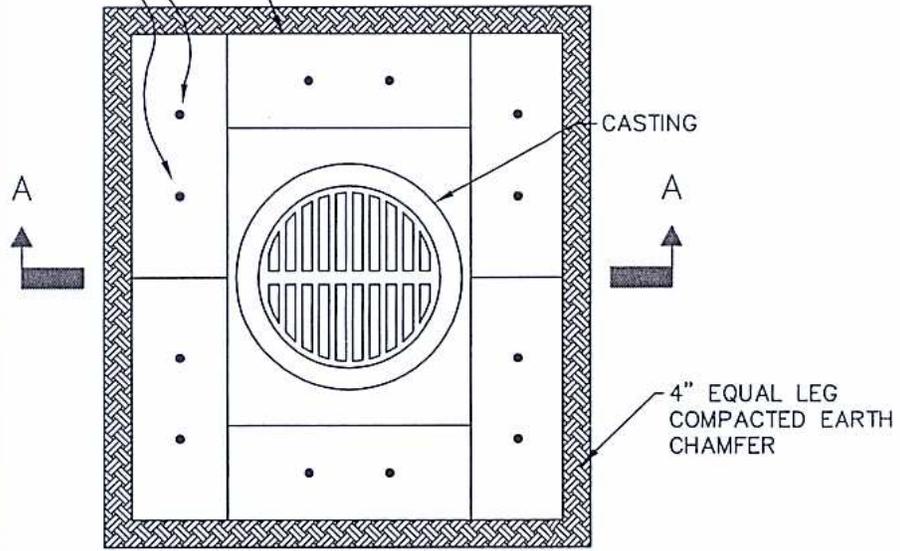
STANDARD
 DESIGN

SD-125C

APPROVED BY WCB

36" LONG (MIN.)
STEEL REBARS OR
2X2 HARDWOOD
STAKES (2 PER BALE)

STRAW BALE SIZE
14"X18"X36"
(MINIMUM)



NOTES:

1. BUILD INLET UP TO GROUND ELEVATION.
2. STRAW BALES SHOULD BE EMBEDDED 4" INTO THE DITCH.
3. TOPS OF BALES SHOULD BE 14" ABOVE INLET, EMBEDDED AS IN NOTE 2.
4. DRIVE FIRST STAKE AT AN ANGLE TOWARDS PREVIOUS BALE TO FORCE BALES TOGETHER.

SEDIMENT TRAP
AROUND CATCH BASINS, MANHOLES, & INLETS

(TO BE PLACED WHERE SHOWN ON THE DRAWINGS AND AS THE CONTRACTOR'S WORK REQUIRES TO FILTER SEDIMENT FROM THE STORM WATER RUN OFF).

NTS

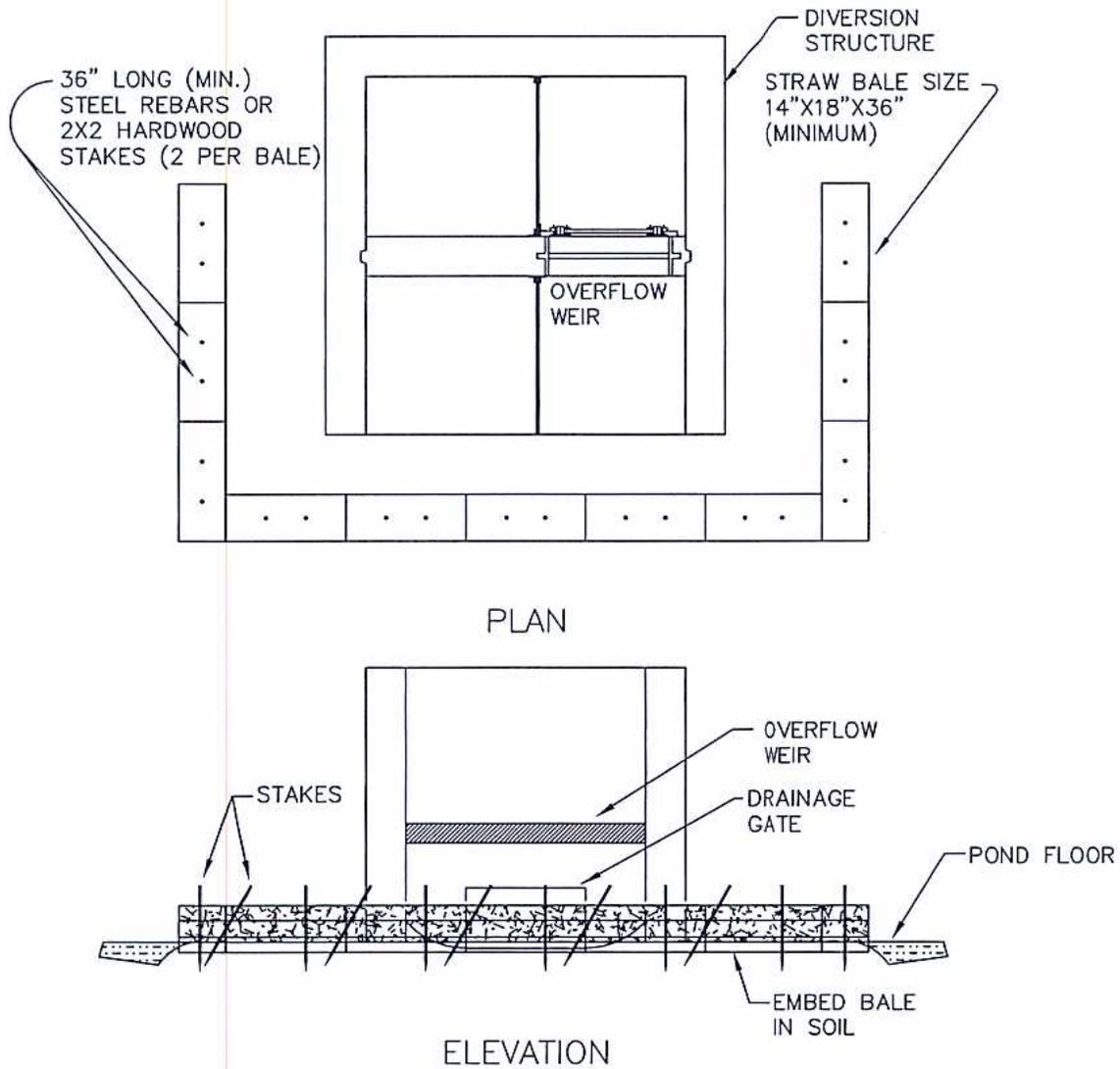
CITY OF PORTAGE

SEDIMENTATION CONTROLS
SEDIMENT TRAP
AROUND INLETS

AUG'05
J&H

STANDARD DESIGN SD-125D

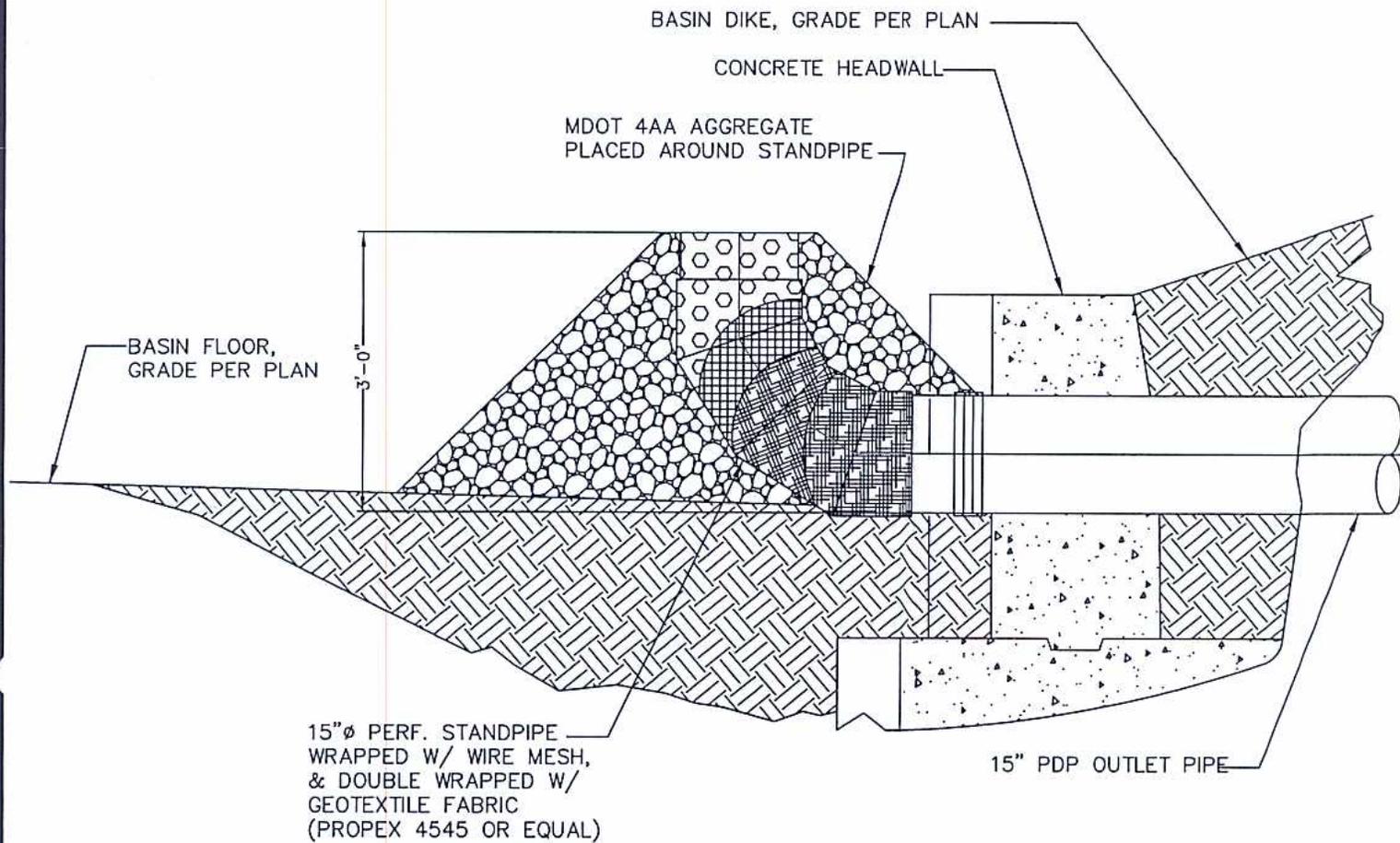
APPROVED BY *wcb*



SEDIMENT TRAP AT DIVERSION STRUCTURE

NTS

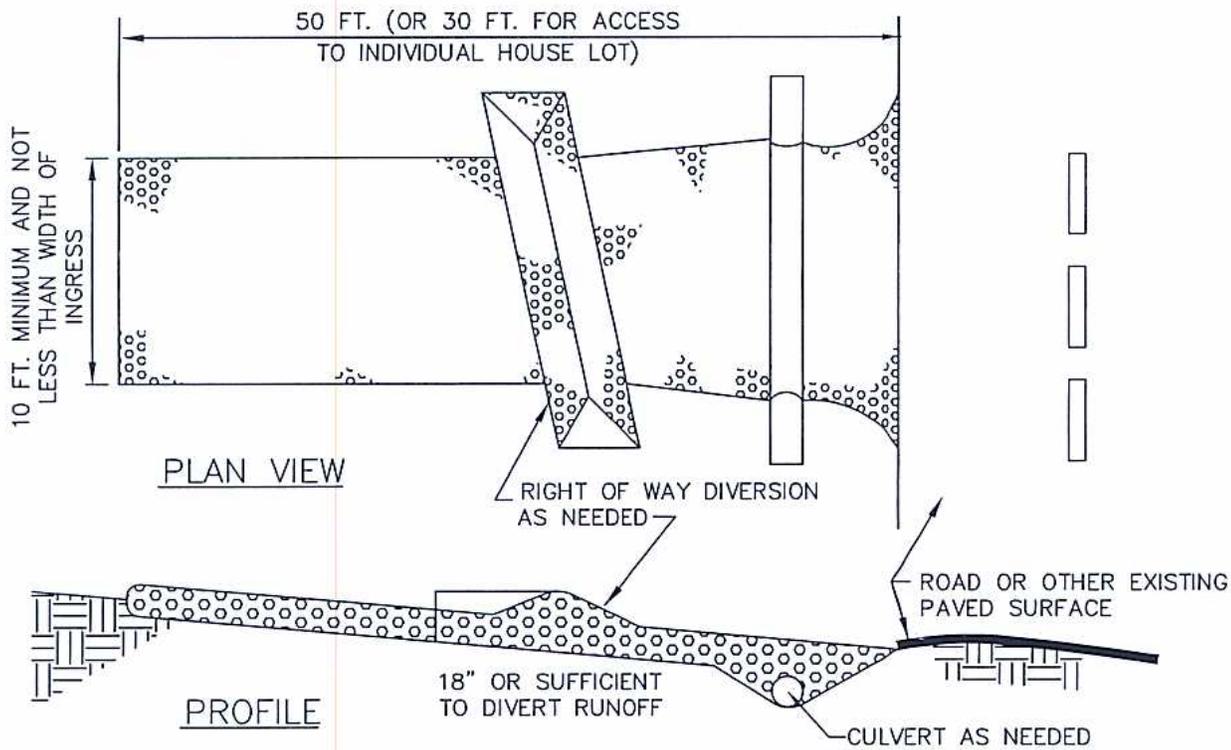
CITY OF PORTAGE	
SEDIMENTATION CONTROLS SEDIMENT TRAP AT DIVERSION STRUCTURE	
STANDARD DESIGN	SD-125E
APPROVED BY: <u>WCB</u>	
AUG'05 J&H	



TEMPORARY SEDIMENT BASIN OUTLET STRUCTURE DETAIL

NTS

CITY OF PORTAGE	
SEDIMENTATION CONTROLS TEMPORARY SEDIMENT BASIN OUTLET STRUCTURE	AUG'05 J&H
STANDARD DESIGN	SD-125F
APPROVED BY <i>wcb</i>	



1. STONE - MDOT 4AA STONE OR RECYCLED CONCRETE OF EQUIVALENT GRADATION SHALL BE USED.
2. LENGTH - THE CONSTRUCTION ENTRANCE SHALL BE AS LONG AS REQUIRED TO STABILIZE HIGH TRAFFIC AREAS BUT NOT LESS THAN 50 FT. (EXCEPT ON SINGLE RESIDENCE LOT WHERE A 30-FT. MINIMUM LENGTH APPLIES).
3. THICKNESS - THE STONE LAYER SHALL BE AT LEAST 6 IN. THICK.
4. WIDTH - THE ENTRANCE SHALL BE AT LEAST 10 FT. WIDE, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. BEDDING - A GEOTEXTILE SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE. IT SHALL HAVE A GRAB TENSILE STRENGTH OF AT LEAST 200 LB. AND A MULLEN BURST STRENGTH OF AT LEAST 190 LB (PROPEX 4553 OR EQUAL).
6. CULVERT - A CULVERT SHALL BE CONSTRUCTED UNDER THE ENTRANCE IF NEEDED TO PREVENT SURFACE WATER FLOWING ACROSS THE ENTRANCE FROM BEING DIRECTED OUT ONTO PAVED SURFACES.
7. TEMPORARY DIVERSION - A TEMPORARY DIVERSION (SD-125I) SHALL BE CONSTRUCTED AS PART OF THE CONSTRUCTION ENTRANCE IF NEEDED TO PREVENT SURFACE RUNOFF FROM FLOWING THE LENGTH OF THE CONSTRUCTION ENTRANCE AND OUT ONTO PAVED SURFACES.
8. MAINTENANCE - TOP DRESSING OF ADDITIONAL STONE WALL SHALL BE APPLIED AS CONDITIONS DEMAND. MUD SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADS, OR ANY SURFACE WHERE RUNOFF IS NOT CHECKED BY SEDIMENT CONTROLS, SHALL BE REMOVED IMMEDIATELY. REMOVAL SHALL BE ACCOMPLISHED BY SCRAPING OR SWEEPING.
9. CONSTRUCTION ENTRANCES SHALL NOT BE RELIED UPON TO REMOVE MUD FROM VEHICLES AND PREVENT OFF SITE TRACKING. VEHICLES THAT ENTER AND LEAVE THE CONSTRUCTION SITE SHALL BE RESTRICTED FROM MUDDY AREAS.

CONSTRUCTION ENTRANCE

NTS

CITY OF PORTAGE

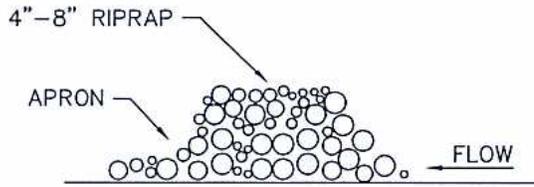
SEDIMENTATION CONTROLS
CONSTRUCTION
ENTRANCE

AUG'05
J&H

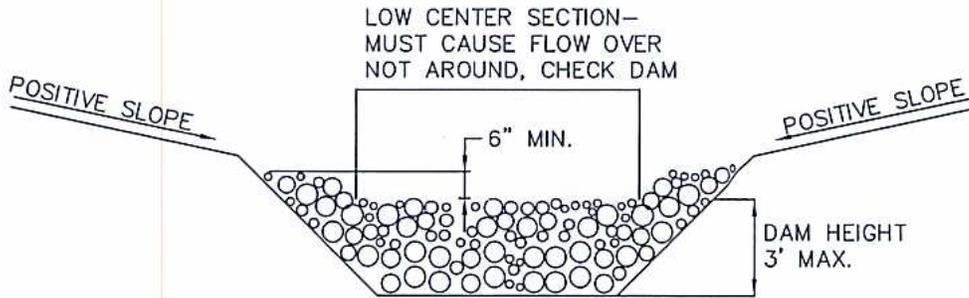
STANDARD
DESIGN

SD-125G

APPROVED BY *WCB*



PROFILE



CROSS SECTION

1. THE CHECK DAM SHALL BE CONSTRUCTED OF 4 IN. TO 8 IN. DIAMETER RIPRAP, PLACED SO THAT IT COMPLETELY COVERS THE WIDTH OF THE CHANNEL.
2. THE TOP OF THE CHECK DAM SHALL BE CONSTRUCTED SO THAT THE CENTER IS APPROXIMATELY 6 IN. LOWER THAN THE OUTER EDGES, SO WATER WILL FLOW ACROSS THE CENTER AND NOT AROUND THE ENDS.
3. THE MAXIMUM HEIGHT OF THE CHECK DAM AT THE CENTER OF THE WEIR SHALL NOT EXCEED 3 FT.
4. SPACING BETWEEN DAMS SHALL BE AS SHOWN IN THE PLANS OR BY THE FOLLOWING TABLE:

CHECK DAM SPACING				
DAM HEIGHT (FT.)	CHANNEL SLOPE			
	< 5%	5-10%	10-15%	15-20%
1	65 FT.	30 FT.	20 FT.	15 FT.
2	130 FT.	65 FT.	40 FT.	30 FT.
3	200 FT.	100 FT.	65 FT.	50 FT.

CHECK DAM

CITY OF PORTAGE

SEDIMENTATION CONTROLS

AUG'05
J&H

CHECK DAM

STANDARD DESIGN

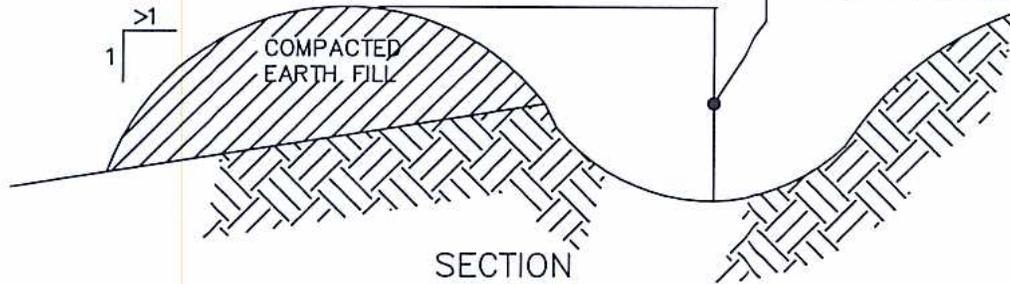
SD-125H

APPROVED BY wcb

DIVERSION SLOPES SHALL NOT BE STEEPER THAN 1:1

SEED AND MULCH ENTIRE DIVERSION

18" MIN. FOR DRAINAGE AREA < 5 ACRES
24" MIN. FOR DRAINAGE AREA > 5 ACRES



1. DIVERSION SHALL BE COMPACTED BY TRAVERSING WITH TRACKED EARTH MOVING EQUIPMENT.
2. DIVERSIONS SHALL NOT BE BREACHED OR LOWERED TO ALLOW CONSTRUCTION TRAFFIC TO CROSS; INSTEAD THE TOP WIDTH MAY BE MADE WIDER AND SIDE SLOPES MADE FLATTER THAN SPECIFIED ABOVE.
3. DIVERSIONS SHALL BE STABILIZED WITH VEGETATION AND CHECK DAMS OR THE FOLLOWING TREATMENTS.

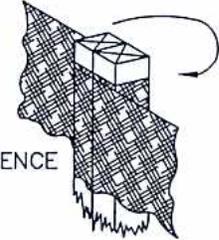
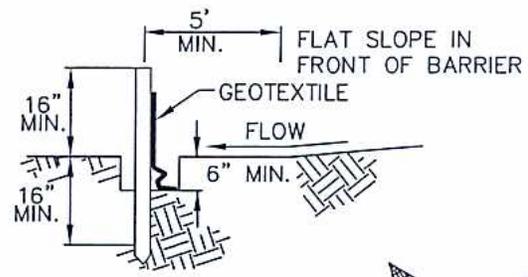
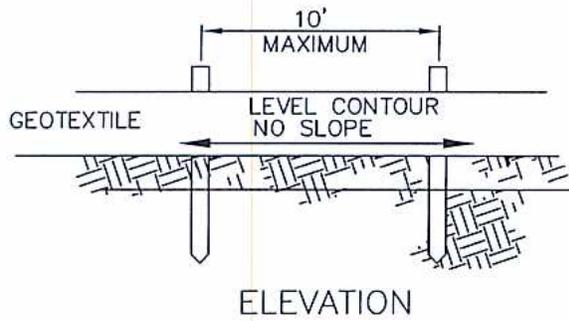
TEMPORARY DIVERSION STABILIZATION TREATMENT			
DIVERSION SLOPE	< 2 ACRES	2-5 ACRES	5-10 ACRES
0-3%	SEED AND STRAW	SEED AND STRAW	SEED AND STRAW
3-5%	SEED AND STRAW	SEED AND STRAW	MATTING
5-8%	SEED AND STRAW	MATTING	MATTING
8-20%	SEED AND STRAW	MATTING	ENGINEERED

NOTE: DIVERSIONS WITH STEEPER SLOPES OR GREATER DRAINAGE AREAS ARE BEYOND THE SCOPE OF THIS STANDARD AND MUST BE DESIGNED FOR STABILITY, SEED, STRAW AND MATTING USED SHALL MEET THE MDOT SPECIFICATIONS FOR TEMPORARY SEEDING (TSM 24+), MULCHING AND MATTING.

TEMPORARY DIVERSION

N.T.S.

<h1>CITY OF PORTAGE</h1>	
SEDIMENTATION CONTROLS TEMPORARY DIVERSION	AUG'05 J&H
STANDARD DESIGN	SD-125I
APPROVED BY <u>WCB</u>	



DETAILS:

NOTES:

1. SILT FENCE SHALL BE CONSTRUCTED BEFORE UPSLOPE LAND DISTURBANCE BEGINS.
2. ALL SILT FENCE SHALL BE PLACED AS CLOSE TO THE CONTOUR AS POSSIBLE SO THAT WATER WILL NOT CONCENTRATE AT LOW POINTS IN THE FENCE AND SO THAT SMALL SWALES OR DEPRESSIONS WHICH MAY CARRY SMALL CONCENTRATED FLOWS TO THE SILT FENCE ARE DISSIPATED ALONG ITS LENGTH.
3. TO PREVENT WATER PONDED BY THE SILT FENCE FROM FLOWING AROUND THE ENDS, EACH END SHALL BE CONSTRUCTED UPSLOPE SO THAT THE ENDS ARE AT A HIGHER ELEVATION.
4. WHERE POSSIBLE, SILT FENCE SHALL BE PLACED ON THE FLATTEST AREA AVAILABLE.
5. WHERE POSSIBLE, VEGETATION SHALL BE PRESERVED FOR 5 FT. (OR AS MUCH AS POSSIBLE) UPSLOPE FROM THE SILT FENCE. IF VEGETATION IS REMOVED, IT SHALL BE REESTABLISHED WITHIN 7 DAYS FROM THE INSTALLATION OF THE FENCE.
6. SOIL STOCKPILES OR OTHER SOURCES OF SEDIMENT SHALL HAVE SILT FENCE PROTECTION.
7. THE SILT FENCE SHALL BE PLACED IN A TRENCH CUT A MINIMUM OF 6" DEEP. THE TRENCH SHALL BE CUT WITH A TRENCHER, CABLE LAYING MACHINE, OR OTHER SUITABLE DEVICE WHICH WILL ENSURE AN ADEQUATELY UNIFORM TRENCH DEPTH.
8. THE SILT FENCE SHALL BE PLACED WITH THE STAKES ON THE DOWN SLOPE SIDE OF THE GEOTEXTILE AND SO THAT 8" OF CLOTH ARE BELOW THE GROUND SURFACE. EXCESS MATERIAL SHALL LAY ON THE BOTTOM OF THE 6" DEEP TRENCH. THE TRENCH SHALL BE BACK FILLED AND COMPACTED.
9. SEAMS BETWEEN SECTION OF SILT FENCE SHALL BE OVERLAPPED WITH THE END STAKES OF EACH SECTION WRAPPED TOGETHER BEFORE DRIVING INTO THE GROUND.
10. MAINTENANCE – SILT FENCE SHALL ALLOW RUNOFF TO PASS ONLY AS DIFFUSED FLOW THROUGH THE GEOTEXTILE. IF RUNOFF OVER TOPS THE SILT FENCE, FLOWS UNDER OR AROUND THE ENDS, OR IN ANY OTHER WAY BECOMES A CONCENTRATED FLOW, ONE OF THE FOLLOWING SHALL BE PERFORMED, AS APPROPRIATE:
 - 1) THE LAYOUT OF THE SILT FENCE SHALL BE CHANGED,
 - 2) ACCUMULATED SEDIMENT SHALL BE REMOVED,
 - 3) OTHER PRACTICES SHALL BE INSTALLED.

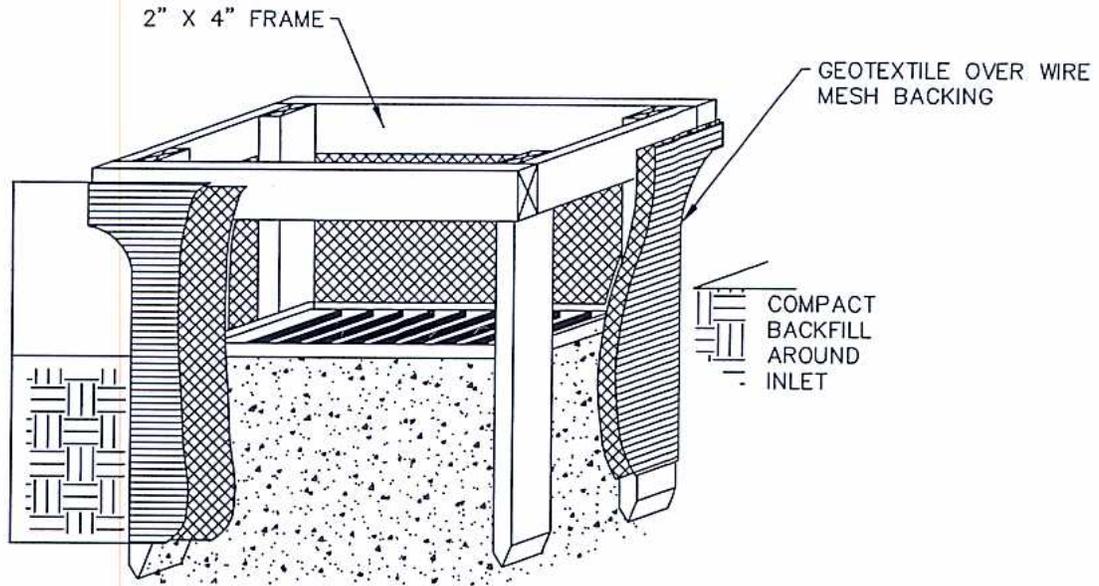
CRITERIA FOR SILT FENCE MATERIALS:

1. FENCE POSTS – THE LENGTH SHALL BE A MINIMUM OF 32" LONG. WOOD POST WILL BE 2" X 2" HARDWOOD OF SOUND QUALITY. THE MAXIMUM SPACING BETWEEN POSTS SHALL BE 10 FT.
2. SILT FENCE FABRIC ECOLOFENCE 24/11 OR EQUAL (SEE TABLE BELOW):

SILT FENCE
N.T.S.

FABRIC PROPERTIES	VALUES	TEST METHOD
GRAB TENSILE STRENGTH	100 LB. MINIMUM	ASTM D 4632
TRAPEZOID TEAR STRENGTH	65 LB. MINIMUM	ASTM D 4533
PERMITTIVITY	0.1/SEC MINIMUM	ASTM D 4491
APPARENT OPENING SIZE (MAX)	0.60 MILLIMETERS	ASTM D 4751

CITY OF PORTAGE	
SEDIMENTATION CONTROLS	AUG'05 J&H
SILT FENCE	
STANDARD DESIGN	SD-125J
APPROVED BY	<u>web</u>



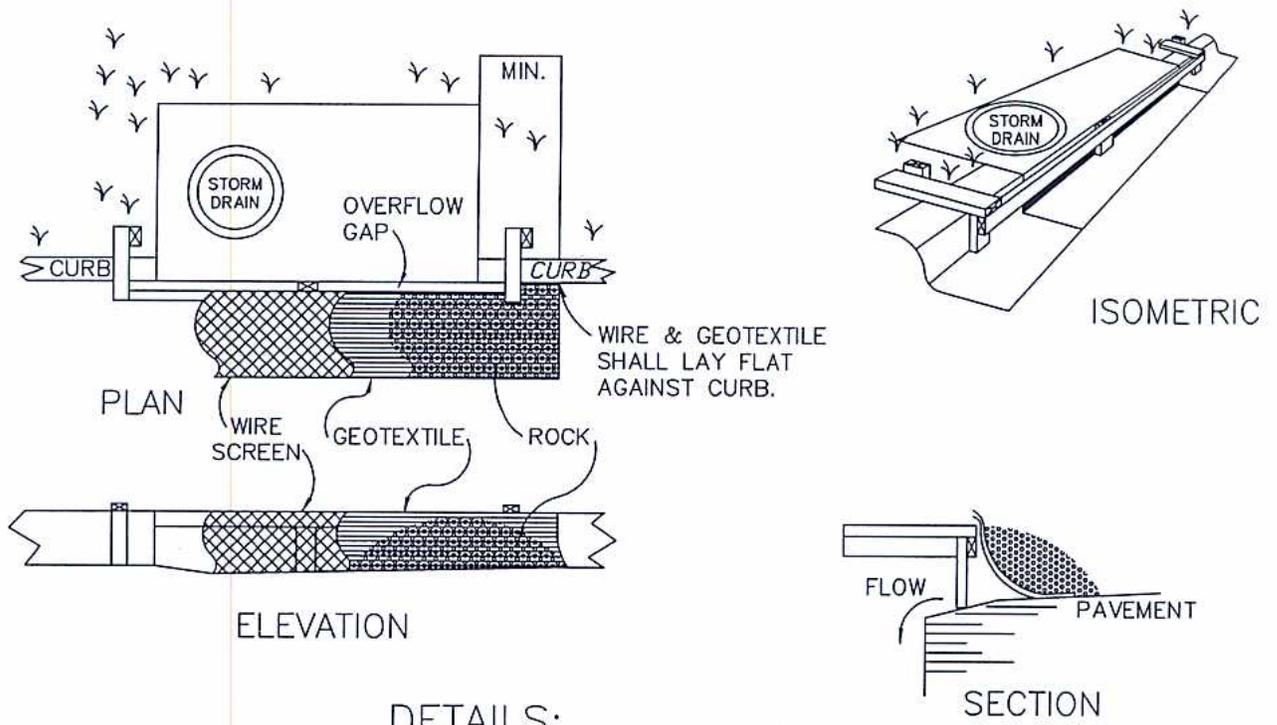
NOTES:

1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.
2. THE EARTH AROUND THE INLET SHALL BE EXCAVATED COMPLETELY TO A DEPTH AT LEAST 18 IN.
3. THE WOODEN FRAME SHALL BE CONSTRUCTED OF 2 IN BY 4 IN. CONSTRUCTION GRADE LUMBER. THE 2 IN. BY 4 IN. POSTS SHALL BE DRIVEN 18 IN. INTO THE GROUND AT FOUR CORNERS OF THE INLET AND THE TOP PORTION OF 2 IN. BY 4 IN. FRAME ASSEMBLED USING THE OVERLAP JOINT SHOWN. THE TOP OF THE FRAME SHALL BE AT LEAST 6 IN. BELOW ADJACENT ROADS IF PONDED WATER WOULD POSE A SAFETY HAZARD TO TRAFFIC.
4. WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC WITH WATER FULLY IMPOUNDED AGAINST IT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY TO THE FRAME.
5. GEOTEXTILE SHALL HAVE A PERMITTIVITY OF 0.1 PER SECOND (ASTM D 4491) AND BE RESISTANT TO SUNLIGHT. IT SHALL BE STRETCHED TIGHTLY AROUND THE FRAME AND FASTENED SECURELY. IT SHALL EXTEND FROM THE TOP OF THE FRAME TO 18 IN. BELOW THE INLET NOTCH ELEVATION. THE GEOTEXTILE SHALL OVERLAP ACROSS ON THE SIDE OF THE INLET SO THE ENDS OF THE CLOTH ARE NOT FASTENED TO THE SAME POST.
6. BACKFILL SHALL BE PLACED AROUND THE INLET IN COMPACTED 6 IN. LAYERS UNTIL THE EARTH IS EVEN WITH NOTCH ELEVATION ON ENDS AND TOP ELEVATION ON SIDES.
7. A COMPACTED EARTH DIKE OR A CHECK DAM SHALL BE CONSTRUCTED IN THE DITCH LINE BELOW THE INLET IF THE INLET IS NOT IN A DEPRESSION AND IF RUNOFF BYPASSING THE INLET WILL NOT FLOW TO A SETTLING POND. THE TOP OF EARTH DIKES SHALL BE AT LEAST 6 IN. HIGHER THAN THE TOP OF THE FRAME.

INLET PROTECTION IN SWALES, DITCH LINES OR YARD INLETS

N.T.S.

CITY OF PORTAGE	
SEDIMENTATION CONTROLS TEMPORARY INLET PROTECTION	
STANDARD DESIGN	SD-125K
APPROVED BY	<i>wcb</i>
AUG'05 J&H	



1. INLET PROTECTION SHALL BE CONSTRUCTED EITHER BEFORE UPSLOPE LAND DISTURBANCE BEGINS OR BEFORE THE STORM DRAIN BECOMES OPERATIONAL.
2. THE WOODEN FRAME IS TO BE CONSTRUCTED OF 2-BY-4 IN. CONSTRUCTION-GRADE LUMBER. THE END SPACERS SHALL BE A MINIMUM OF 1 FT. BEYOND BOTH ENDS OF THE THROAT OPENING. THE ANCHORS SHALL BE NAILED TO 2-BY-4 IN. STAKES DRIVEN ON THE OPPOSITE SIDE OF THE CURB.
3. THE WIRE MESH SHALL BE OF SUFFICIENT STRENGTH TO SUPPORT FABRIC AND STONE. IT SHALL BE A CONTINUOUS PIECE WITH A MINIMUM WIDTH OF 30 IN. AND 4 FT. LONGER THAN THE THROAT LENGTH OF THE INLET, 2 FT. ON EACH SIDE.
4. GEOTEXTILE SHALL HAVE A PERMITTIVITY OF 0.1 PER SECOND (ASTM D 4491) AND BE RESISTANT TO SUNLIGHT.
5. THE WIRE MESH AND GEOTEXTILE CLOTH SHALL BE FORMED TO THE CONCRETE GUTTER AND AGAINST THE FACE OF THE CURB ON BOTH SIDES OF THE INLET AND SECURELY FASTENED TO THE 2-BY-4 IN. FRAME.
6. MDOT 4AA STONE SHALL BE PLACED OVER THE WIRE MESH AND GEOTEXTILE IN SUCH A MANNER AS TO PREVENT WATER FROM ENTERING THE INLET UNDER OR AROUND THE GEOTEXTILE CLOTH.

CURB INLET PROTECTION

CITY OF PORTAGE

SEDIMENTATION CONTROLS
TEMPORARY
CURB INLET PROTECTION

AUG'05
J&H

STANDARD
DESIGN

SD-125L

APPROVED BY

wcb

8'-0"



CITY OF PORTAGE SANITARY SEWER IMPROVEMENT PROJECT

CITY SHARE FUNDS	\$ _____
SPECIAL ASSESSMENT FUNDS	\$ _____
TOTAL PROJECT COST	\$ _____

CONTRACTOR: A.B.C CONST. INC. ENGINEER: D.E.F. ENGINEERING CO.

COMPLETION DATE: _____

INFORMATION AVAILABLE AT THE CITY OF PORTAGE DEPT. OF
TRANSPORTATION AND UTILITIES 329-4422

4'-0"

3/4" WATERPROOF PLYWOOD
(PAINT BACKSIDE WHITE)

WHITE BACKGROUND

BLACK LETTERS

RED 1.25" BORDER

4'-0"

4"x4" POST
(PAINT BLUE)

GROUND

36" MIN

NOTE: IF SPACE OR PROJECT TIME IS LIMITED FOR DRIVING POSTS INTO THE GROUND (SUCH AS THE STRIP PAVING PROJECT), THE PROJECT MANAGER MAY USE METAL POSTS AND A BASE SO THAT SIGNS CAN BE MOVED.

NOTE :

LETTER SIZE

TEXT FONT :

5"	ARIAL
3.5"	ARIAL
2.5"	ARIAL
1.75"	ARIAL

CITY OF PORTAGE

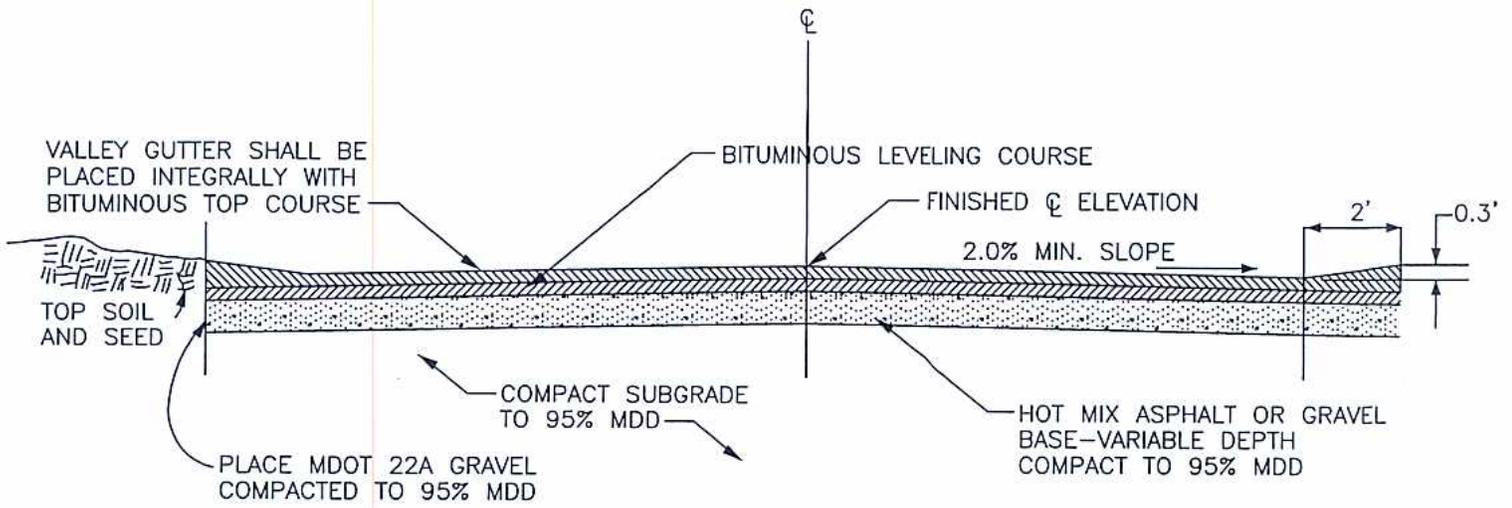
PROJECT
SIGN

JULY 8, 04
M.Z.
AUG '05
J&H

STANDARD
DESIGN
APPROVED BY

SD-127

WCB



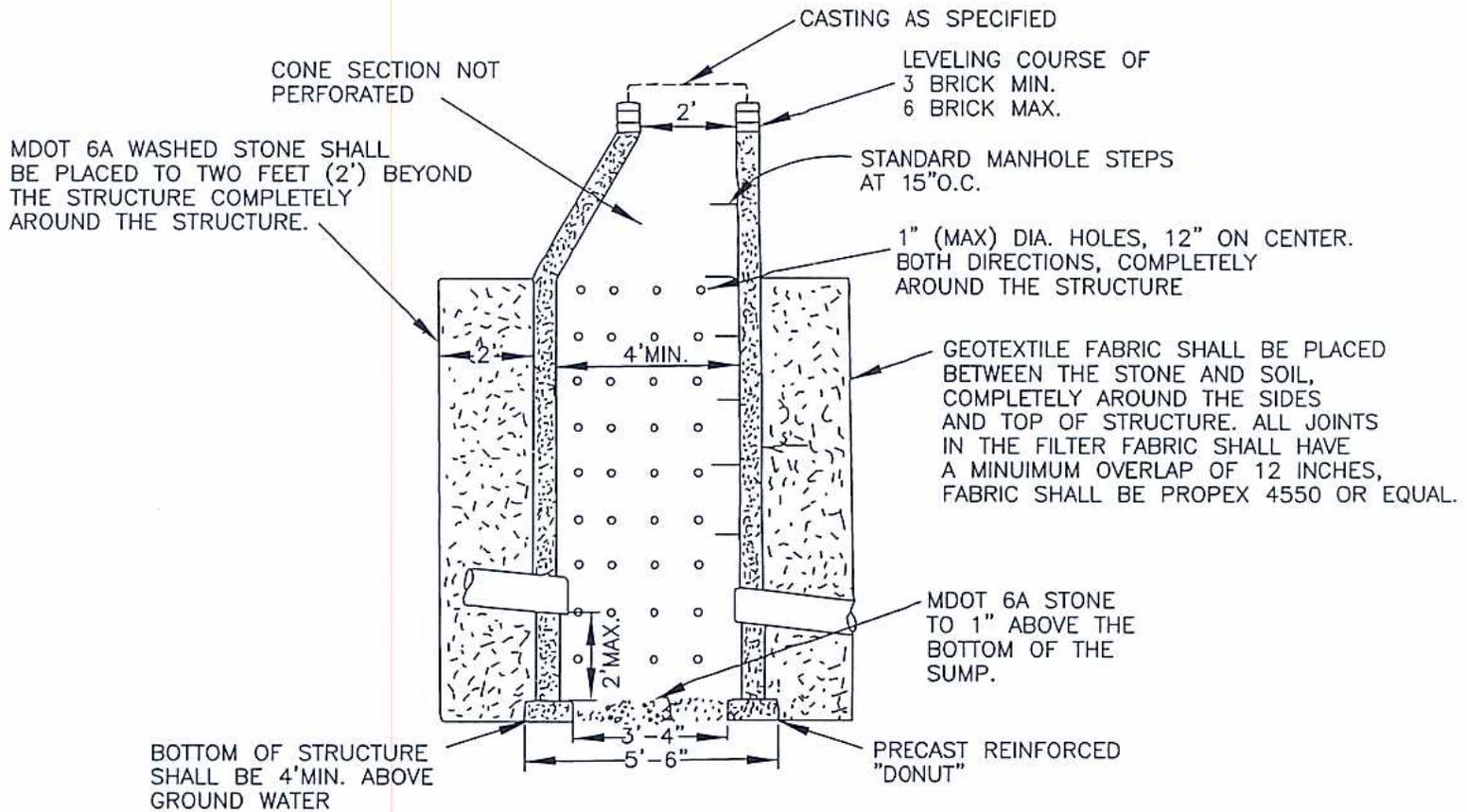
CITY OF PORTAGE

INTEGRAL VALLEY
GUTTER SECTION
TYPICAL CROSS-SECTIONAL VIEW
NOT TO SCALE

AUG.18,93
L.G.N.
AUG.08,95
drw(cad)
AUG'05
J&H

STANDARD DESIGN SD-131

APPROVED WCB



PRECAST LEACHING BASIN

1. CONCRETE FOR BASES AND POURED STRUCTURES SHALL HAVE A COMPRESSIVE STRENGTH OF 3500 P.S.I. IN 28 DAYS AND A MINIMUM OF 5.5 SACKS OF CEMENT PER. CU. YD. SLUMP SHALL NOT EXCEED (4").
2. PRECAST MANHOLES SHALL BE OF THE ECCENTRIC CONE TYPE WITH STEEL REINFORCEMENT CONFORMING TO THE ASTM SPECIFICATIONS FOR C-478.
3. STEPS SHALL NOT BE INSTALLED UNTIL AFTER ALIGNMENT OF CASTING IS APPROVED

NOTE: CATCH BASINS SHALL HAVE SOLID BOTTOM AND SIDES, LEACHING BASINS SHALL HAVE AN OPEN BOTTOM AS DETAILED ABOVE.

CITY OF PORTAGE

STANDARD
48" DRAINAGE STRUCTURE
(PERFORATED)

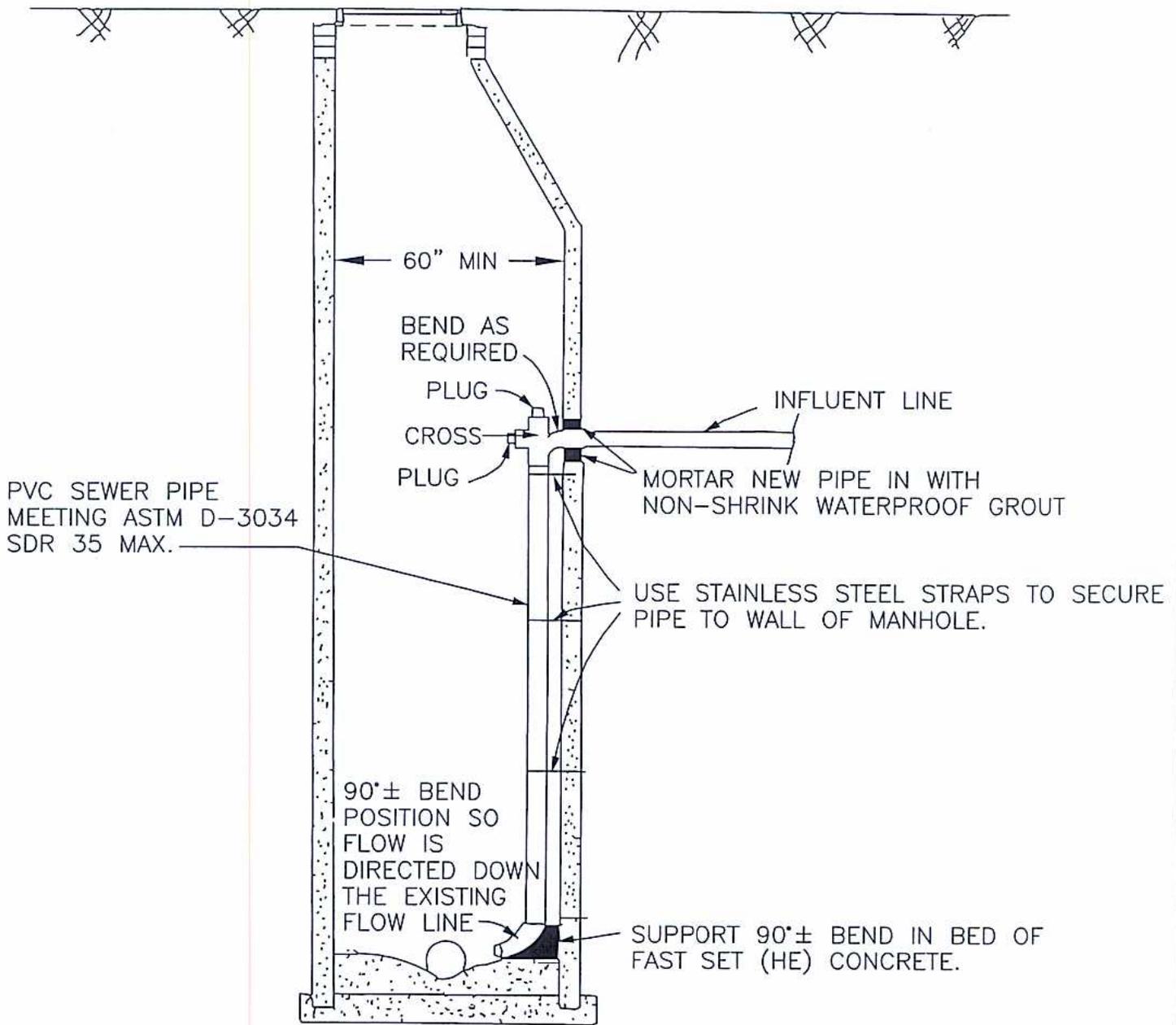
AUG.18.93
L.G.N.

AUG.08.95
drw(cad)

AUG'05
J&H

STANDARD
DESIGN SD-133

APPROVED BY WOB



PVC SEWER PIPE
MEETING ASTM D-3034
SDR 35 MAX.

NOTE: FOR MANHOLE DIMENSIONS SEE SD-105
THIS CONNETION WILL ONLY BE ALLOWED
FOR MANHOLES 60" DIA. OR GREATER

CITY OF PORTAGE	
SANITARY SERVICE DROP CONNECTION 4" or 6" ONLY	
STANDARD DESIGN	SD-134
APPROVED BY	<u>wcb</u>
AUG.18,93 L.G.N. MAR.3,94 J.B. AUG.08,95 drw(cad) NOV.25,97 drw(cad)	AUG'05 J&H

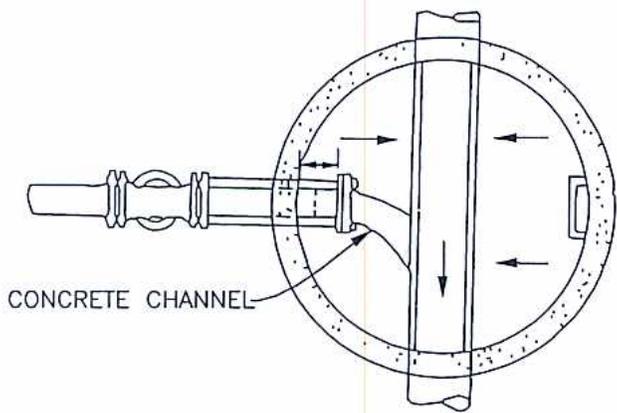
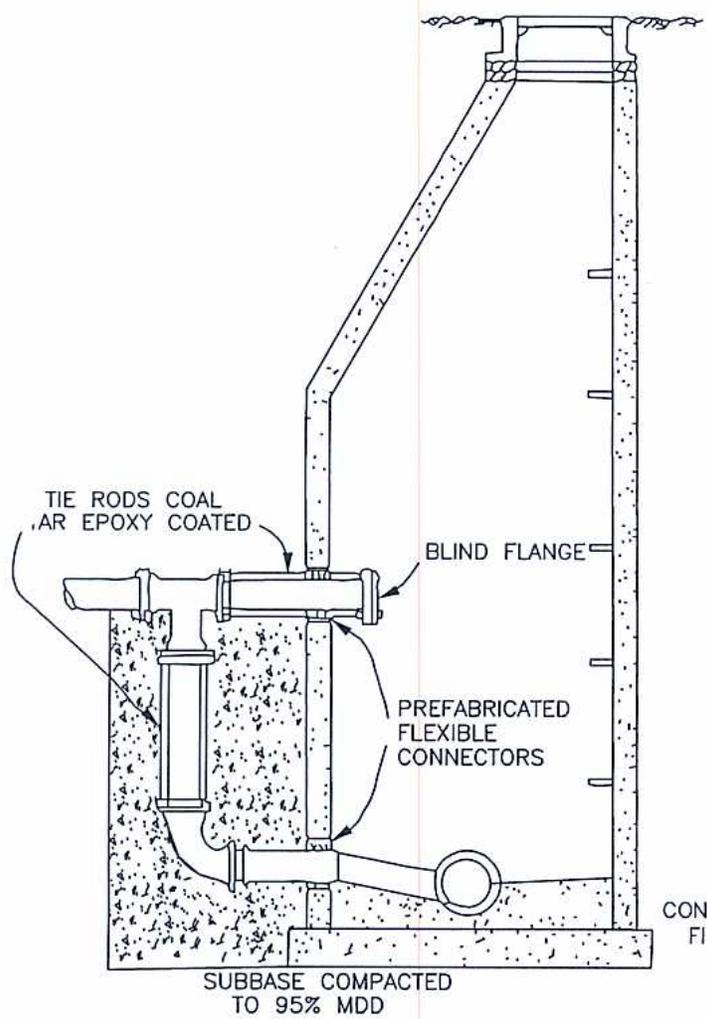
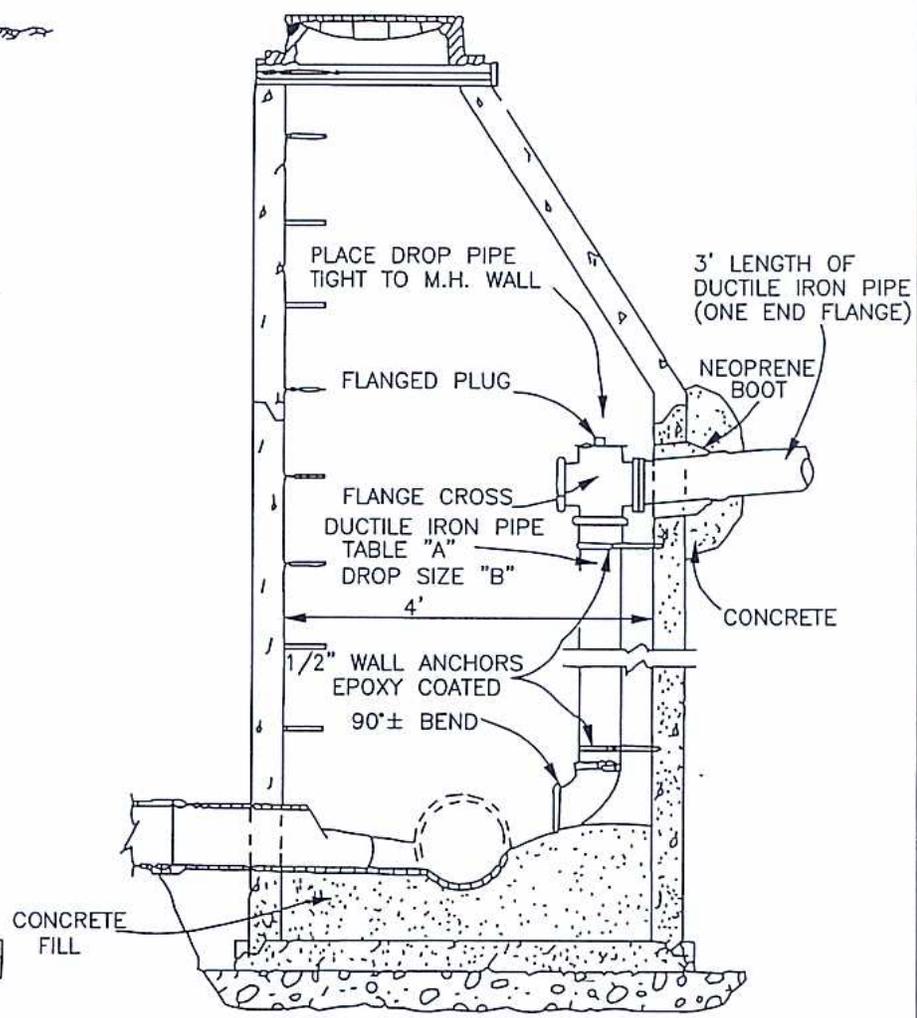


TABLE "A"

PIPE SIZE (INCOMING)	DROP "B"
2"	2"
4"	4"
6"	6"
8" THRU 12"	8"
15" THRU 18"	10"
21" THRU 24"	12"



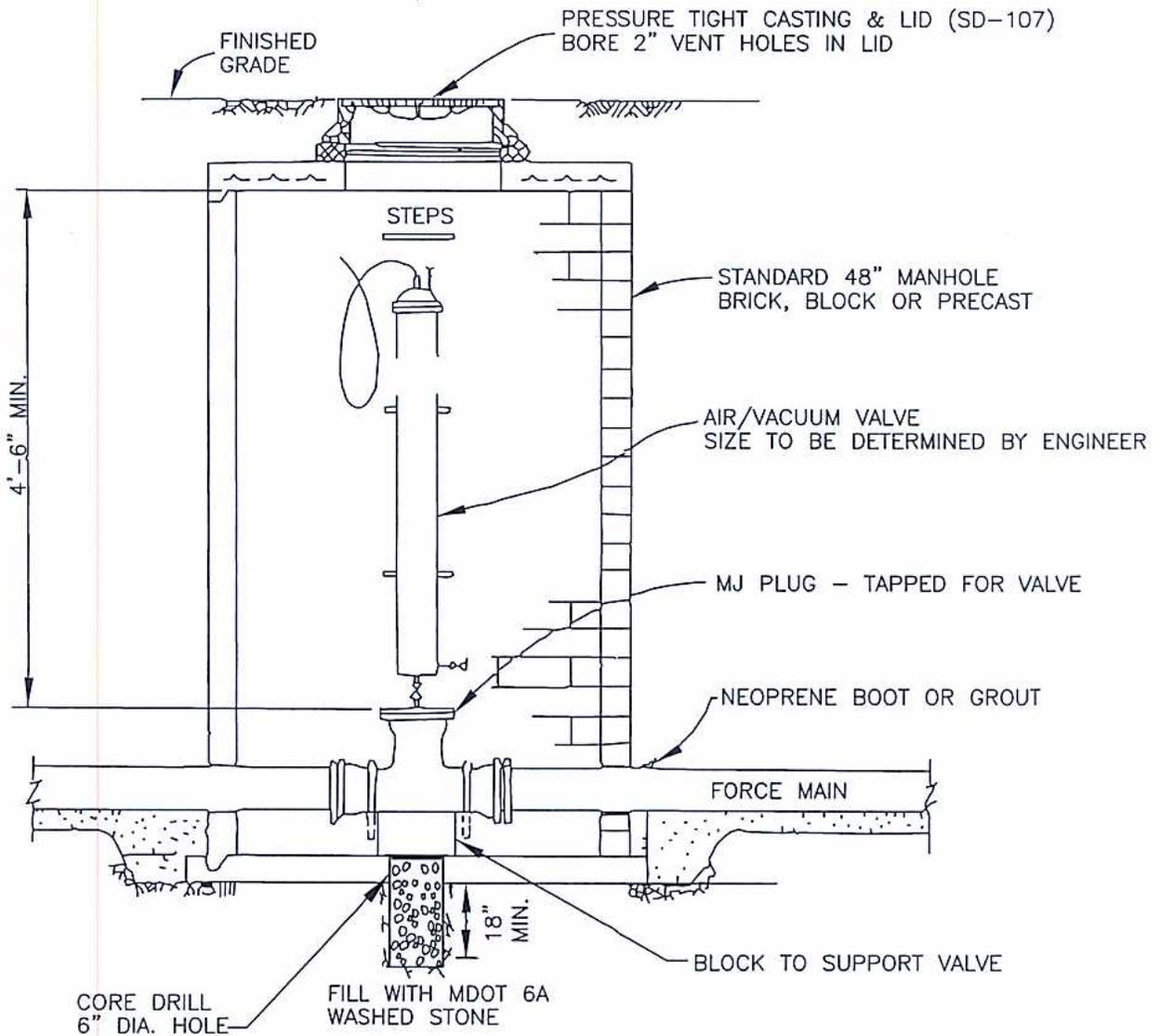
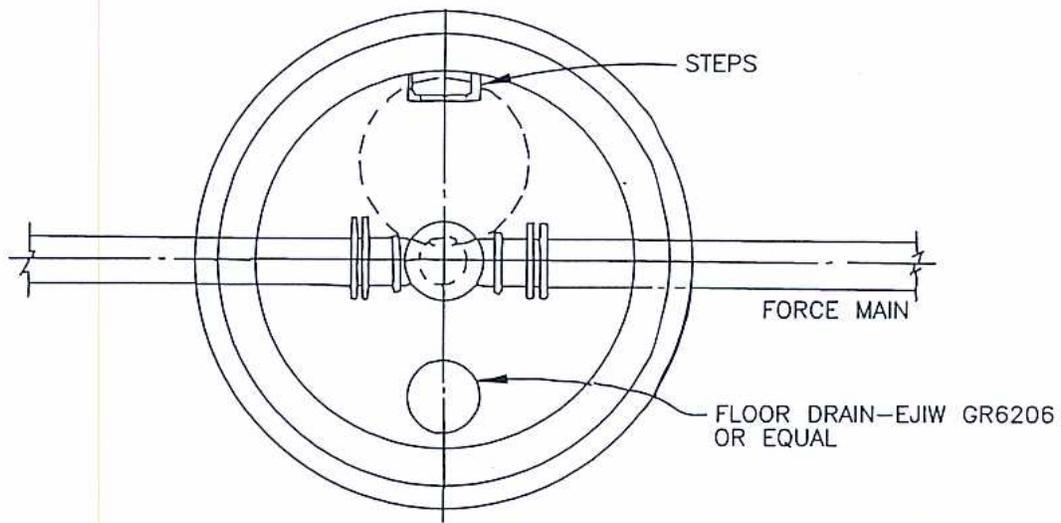
OUTSIDE DROP



INSIDE DROP

NOTES:
 FITTINGS SHALL BE MECHANICAL JOINT
 PIPE SHALL BE DUCTILE IRON CLASS 52 INCLUDING FIRST LENGTH OF PIPE OUTSIDE OF MANHOLE DROP CONNECTION.
 CONCRETE AROUND OUTSIDE DROP SHALL BE TYPE 1 PORTLAND CEMENT WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI AT 28 DAYS.

CITY OF PORTAGE	
FORCE MAIN DROP CONNECTION	AUG.18.93 L.G.N AUG.08.95 drw(cad) NOV.25.87 drw(cad) AUG'05 J&H
STANDARD DESIGN	SD-135
APPROVED BY	<u>WCB</u>



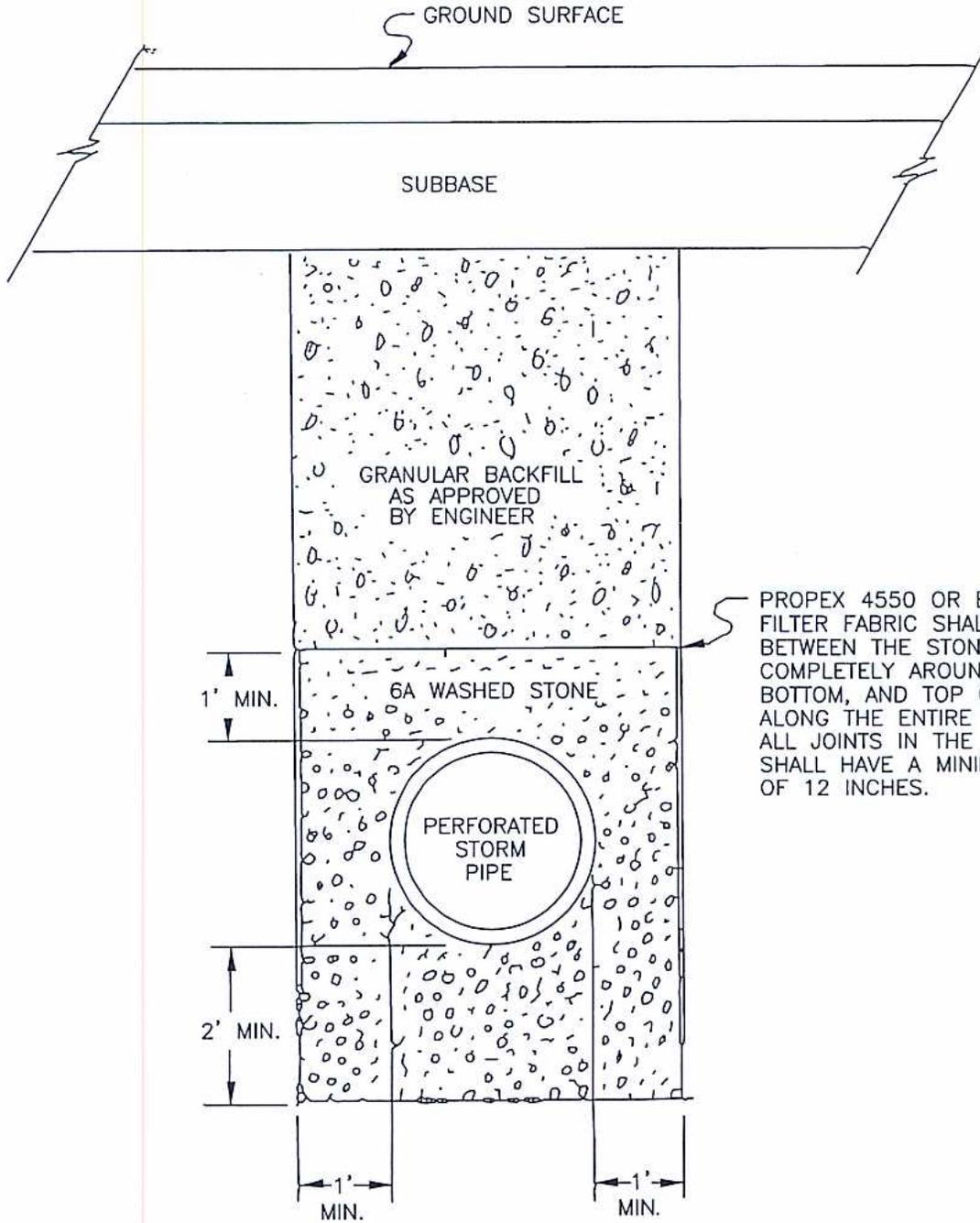
CITY OF PORTAGE

SAN. SEWER FORCE MAIN
AIR RELEASE VALVE
AND CHAMBER

STANDARD DESIGN SD-136

APPROVED BY WCB

AUG.18.93
L.G.N.
SEPT 7, 95
drw (CAD)
NOV.25.97
drw (CAD)
AUG'05
J&H



PROPEX 4550 OR EQUIVALENT
FILTER FABRIC SHALL BE PLACED
BETWEEN THE STONE AND SOIL,
COMPLETELY AROUND THE SIDES,
BOTTOM, AND TOP OF THE STONE
ALONG THE ENTIRE TRENCH.
ALL JOINTS IN THE FILTER FABRIC
SHALL HAVE A MINIMUM OVERLAP
OF 12 INCHES.

CITY OF PORTAGE

STORM WATER
TRENCH DETAIL

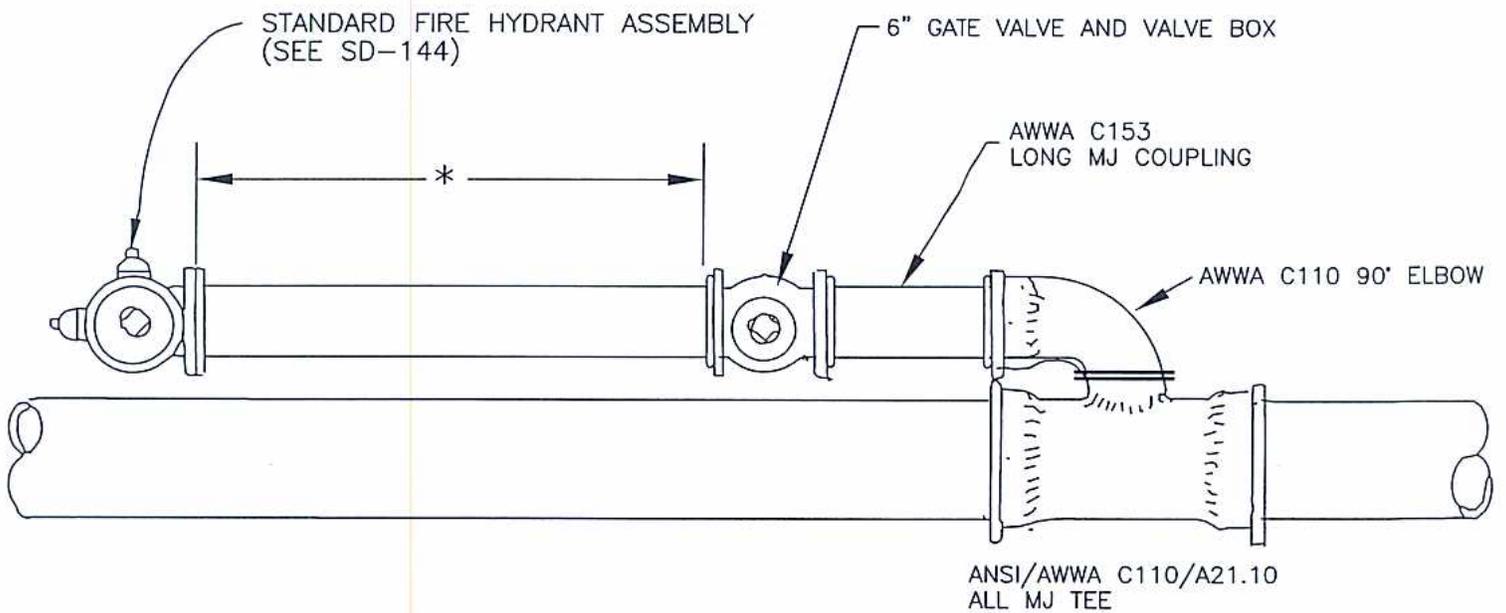
AUG.18,93
L.G.N

SEPT. 7,95
drw (CAD)

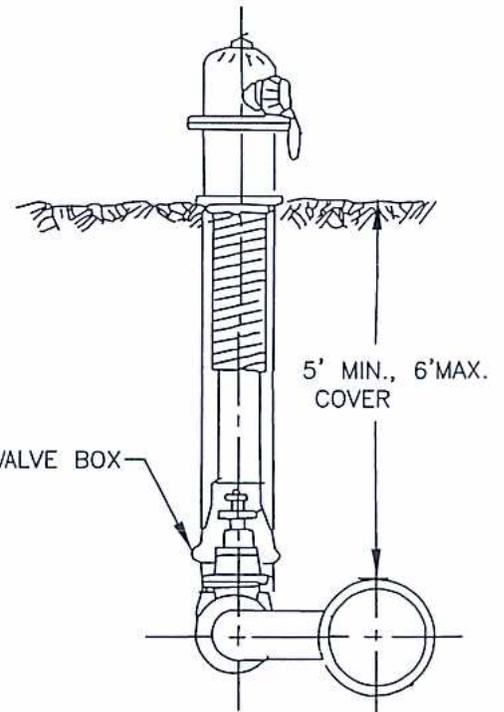
AUG'05
J&H

STANDARD
DESIGN SD-137

APPROVED BY wcb



*DISTANCE MAY VARY. HYDRANT SHALL HAVE A MECHANICAL JOINT INLET AND BE RESTRAINED, TIED OR HARNESSSED TO THE AUXILIARY VALVE IN A MANNER ACCEPTABLE TO THE ENGINEER (E.G. TWO 3/4-INCH THREADED CONTINUOUS RODS) MECHANICAL JOINT RETAINER GLAND, CLOW F-1216 ANCHORING PIPE WITH ROTO-RING GLAND, ETC.



4" PUMPER CONNECTION TO FACE CURB.
DIRECTION OF TEE AS SHOWN ON PLANS.

CITY OF PORTAGE

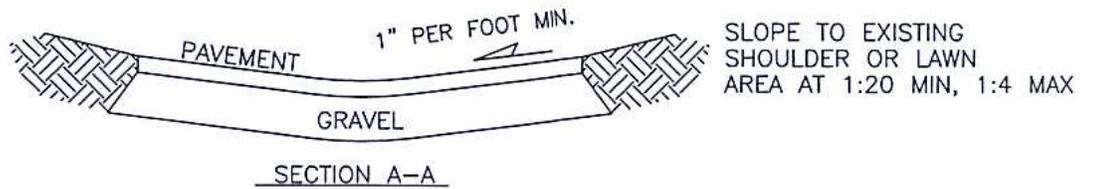
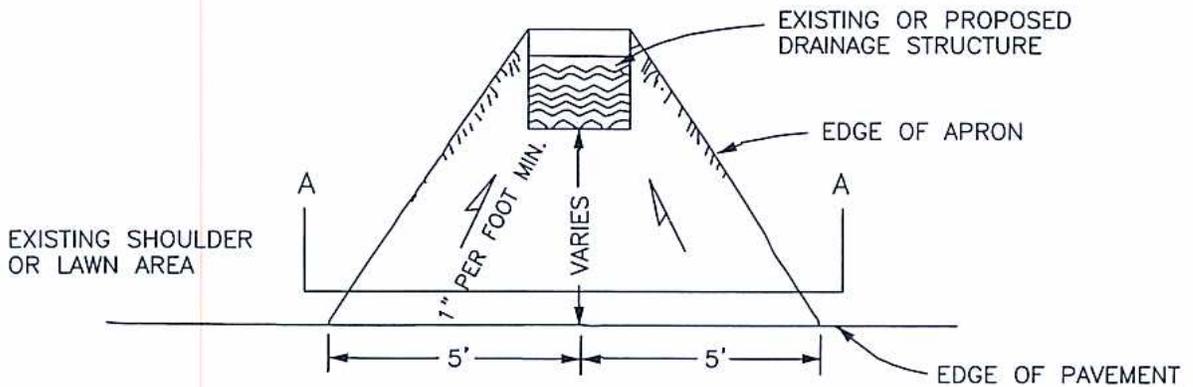
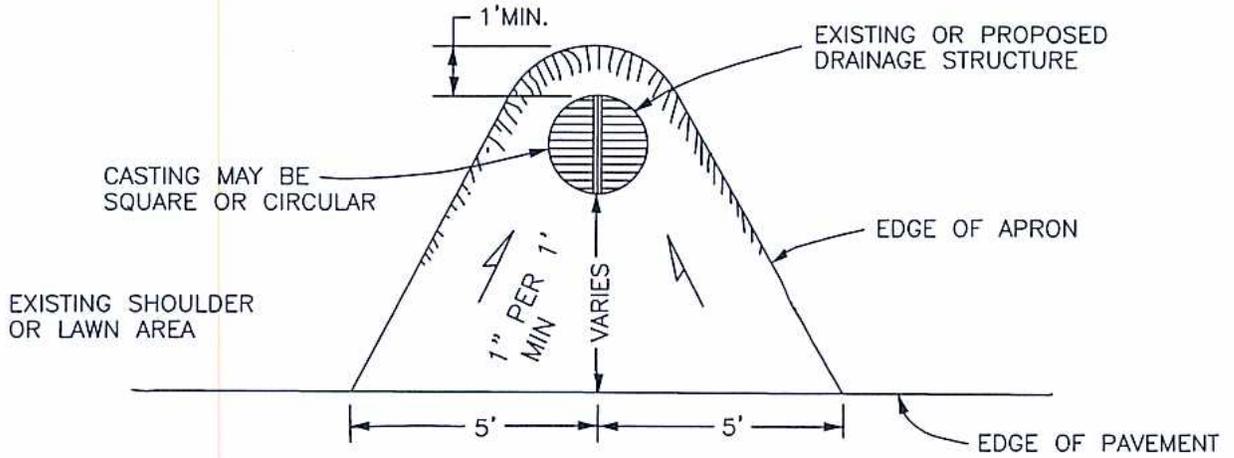
CLOSE COUPLE
HYDRANT ASSEMBLY

AUG. 18, 93
L.G.N.
JULY '99
d.r.w.
AUG. '99
d.r.w.

STANDARD
DESIGN SD-138

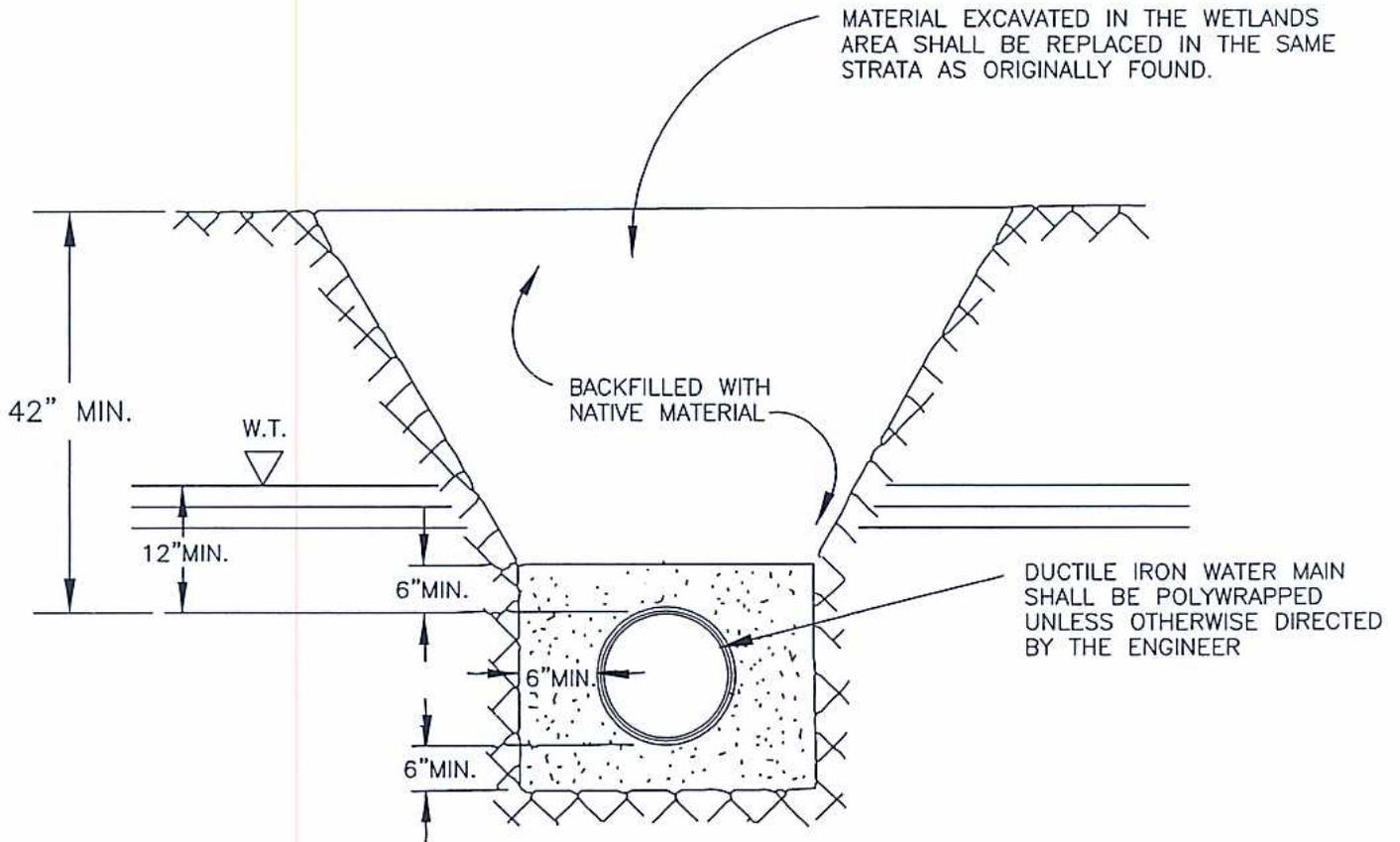
AUG'05
J&H

APPROVED BY wcb



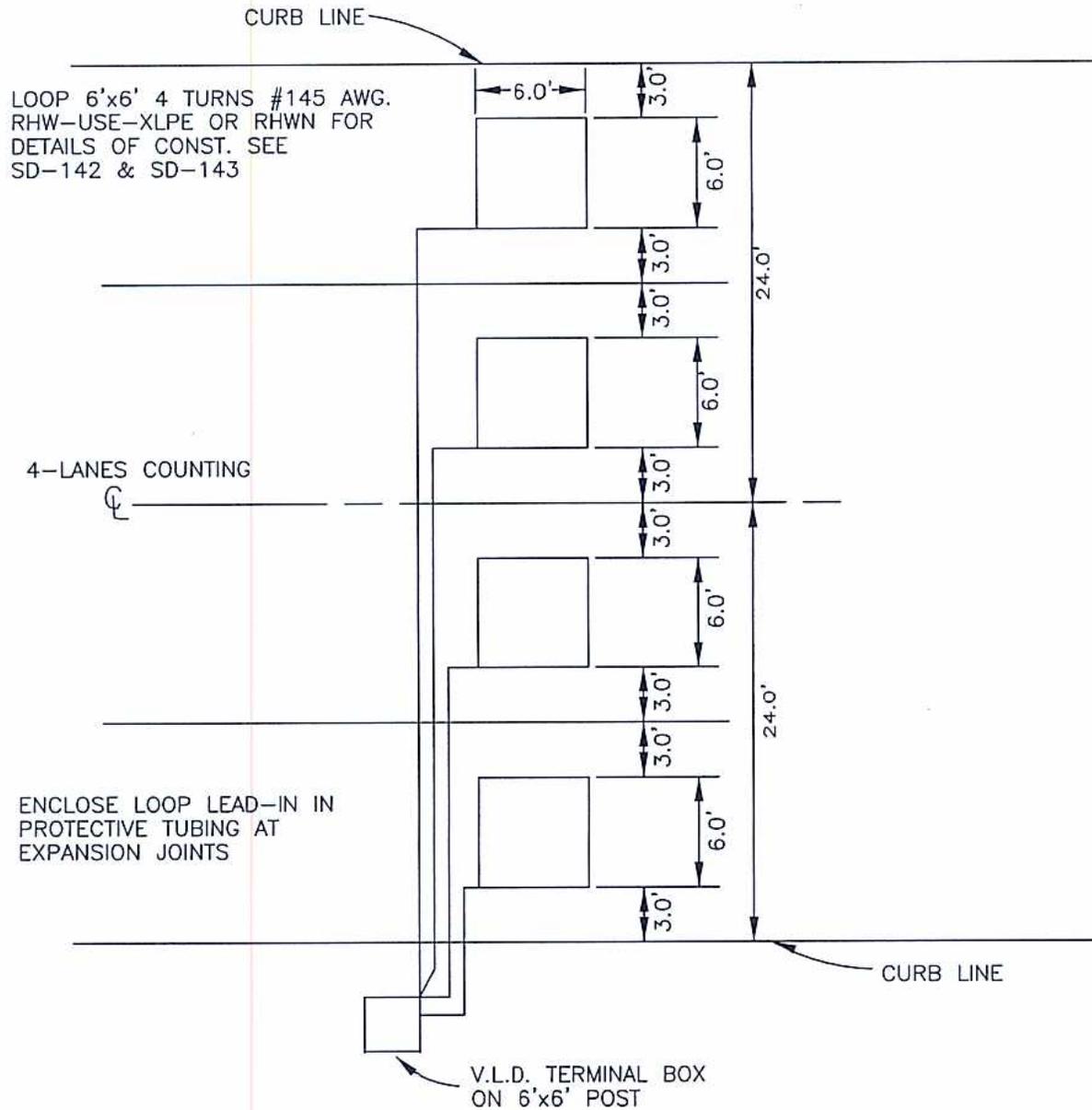
THE BITUMINOUS APRON SHALL BE CONSTRUCTED OVER 6" MIN. (CIP) OF MDOT 22A. PAVEMENT SHALL BE 2" MIN. OF TOP COURSE MATERIAL

CITY OF PORTAGE	
BITUMINOUS SPILLWAY AT STORM BASIN	
AUG. 18, 93 L.G.N.	AUG. 09, 95 drw(cod)
AUG. 05 J&H	
STANDARD DESIGN	SD-139
APPROVED BY	<u>WCB</u>



TRENCH SHALL BE EXCAVATED TO STABLE MATERIAL AND BACKFILLED TO GRADE WITH COMPACTED MDOT CLASS II OR NATIVE GRANULAR MATERIAL IF APPROVED BY THE ENGINEER.

CITY OF PORTAGE	
WETLAND TRENCH DETAIL FOR WATER MAIN	
STANDARD DESIGN	SD-140
APPROVED BY	<u>WCB</u>
AUG. 18, 93 L.G.N. AUG. 09, 95 drw(cad) JULY '99 drw(cad) AUG '05 J&H	



CITY OF PORTAGE

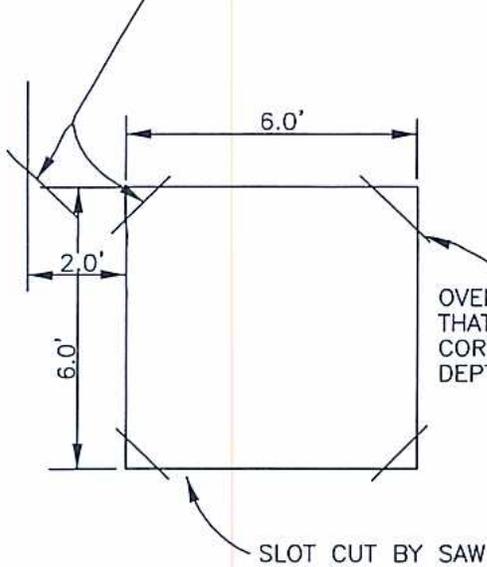
MULTI-LANE LOOP
LAYOUT

STANDARD DESIGN SD-141

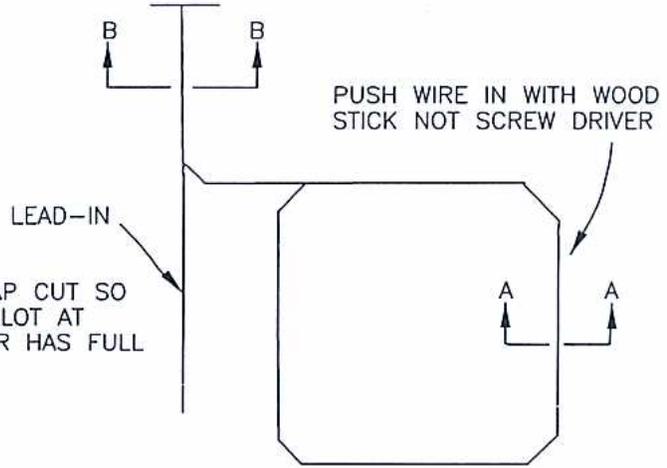
APPROVED BY WCB

AUG.18,93
L.G.N.
AUG.09,95
drw(cad)
NOV.07,97
drw(cad)
AUG'05
J&H

CUT DIAGONALS TO PREVENT SHARP BENDS OF WIRE

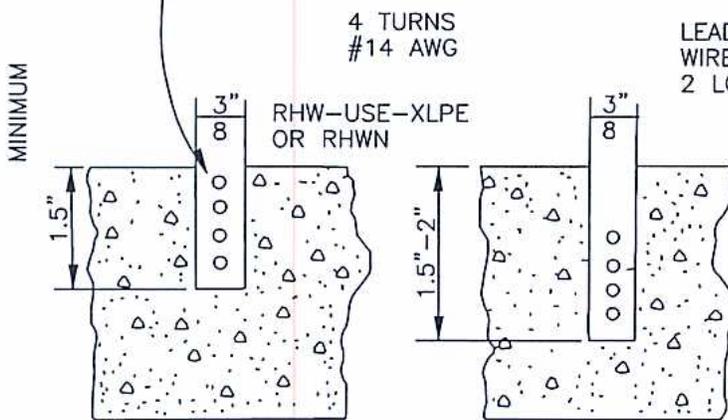


SLOT PLAN



LOOP IN SLOT PLAN

FILL SLOTS WITH 2-COMPONENT SEALER OR EQUAL

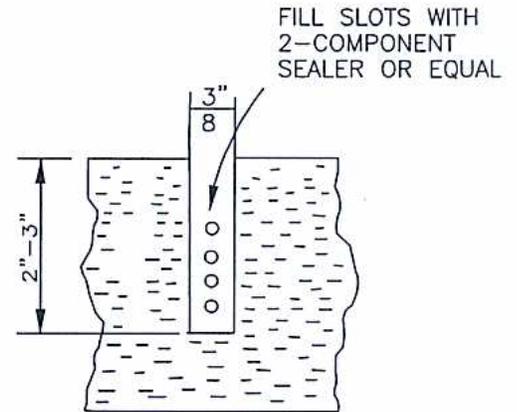


SECTION A-A

SECTION B-B

LOOP IN CONCRETE

LEAD-IN WIRES OF 2 LOOPS



SECTION A-A
SECTION B-B

LOOP IN CONCRETE

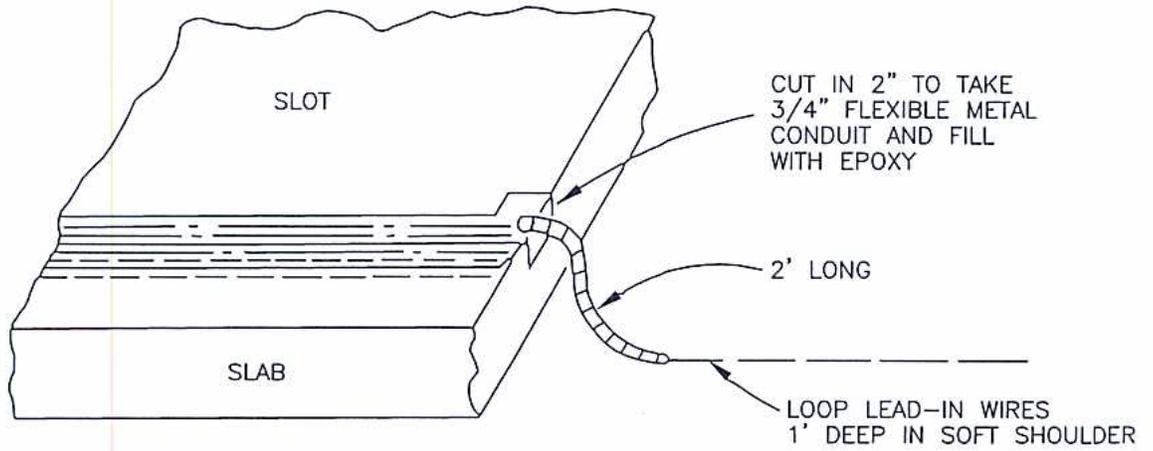
CITY OF PORTAGE

DETECTION LOOP
CONSTRUCTION DETAIL

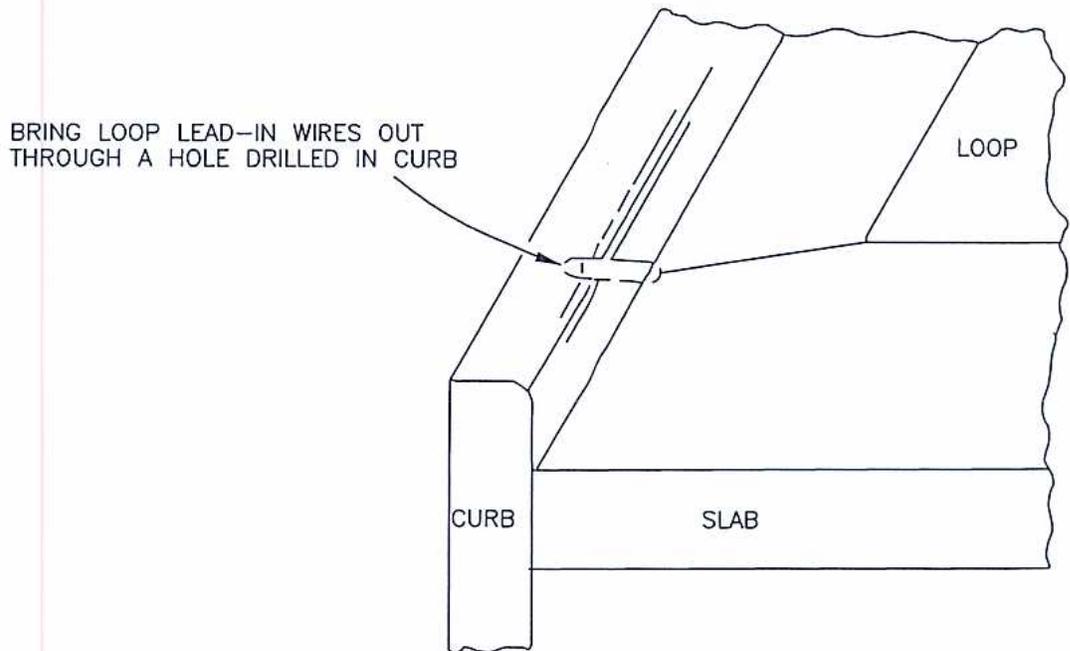
AUG.18.93
L.G.N.
AUG.09.95
drw(cad)
NOV.07.97
drw(cad)

STANDARD DESIGN SD-142

APPROVED BY wcb



LOOP LEAD-IN WIRES IN SOFT SHOULDER



LOOP LEAD-IN WIRES IN CURB

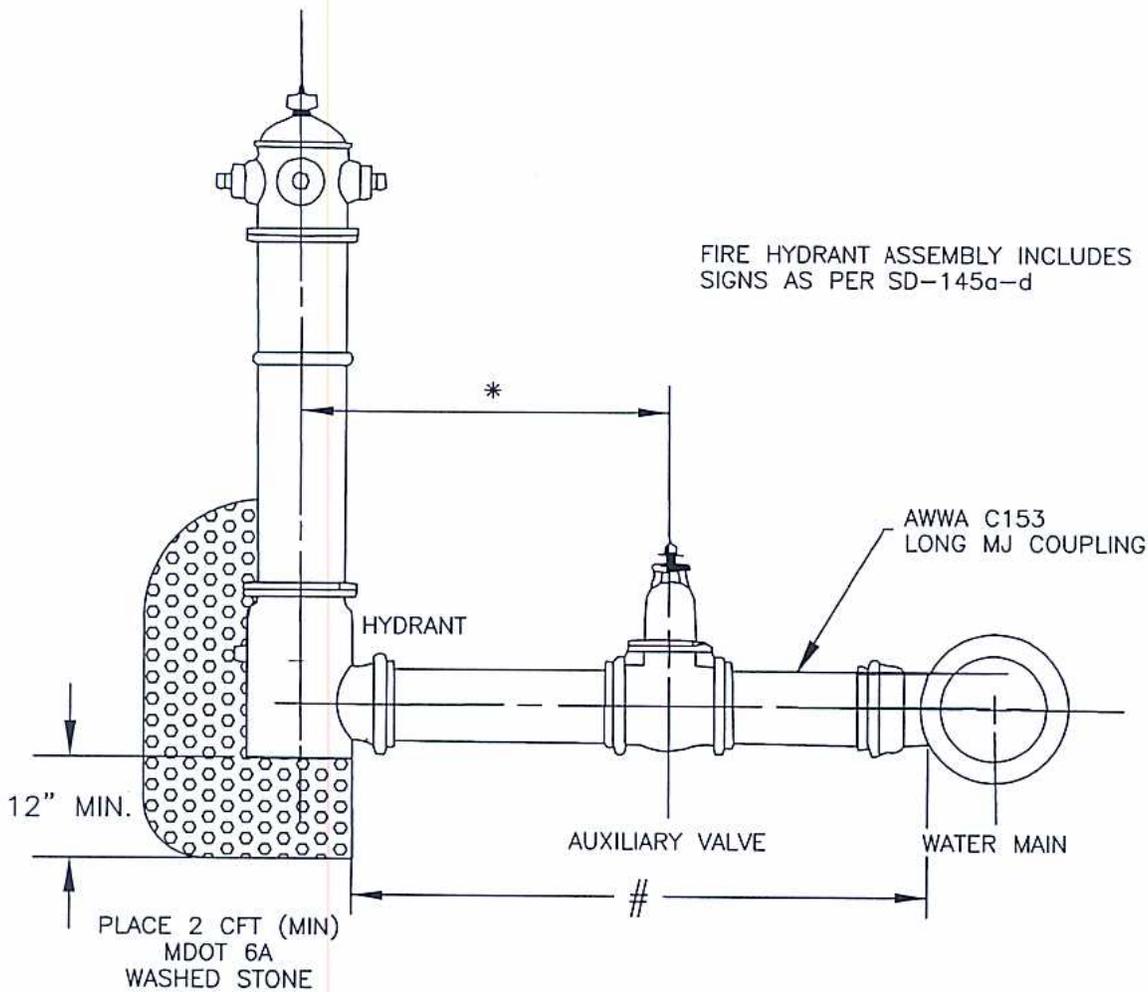
CITY OF PORTAGE

DETECTION LOOP
LEAD-IN CONSTRUCTION
DETAIL

AUG. 18, 93
L.G.N.
NOV. 07, 97
D.R.W.

STANDARD DESIGN SD-143

APPROVED BY JB



FIRE HYDRANT ASSEMBLY INCLUDES
SIGNS AS PER SD-145a-d

*DISTANCE MAY VARY. HYDRANT SHALL HAVE A MECHANICAL JOINT INLET AND BE RESTRAINED, TIED OR HARNESSSED TO THE AUXILIARY VALVE IN A MANNER ACCEPTABLE TO THE ENGINEER (E.G. TWO 3/4-INCH THREADED CONTINUOUS RODS) MECHANICAL JOINT RETAINER GLAND, CLOW F-1216 ANCHORING PIPE WITH ROTO-RING GLAND, ETC. CONCRETE THRUST BLOCKS WILL NOT BE PERMITTED.

IF DISTANCE BETWEEN WM AND FH IS GREATER THAN 20FT, 8" DIWM SHALL BE USED.

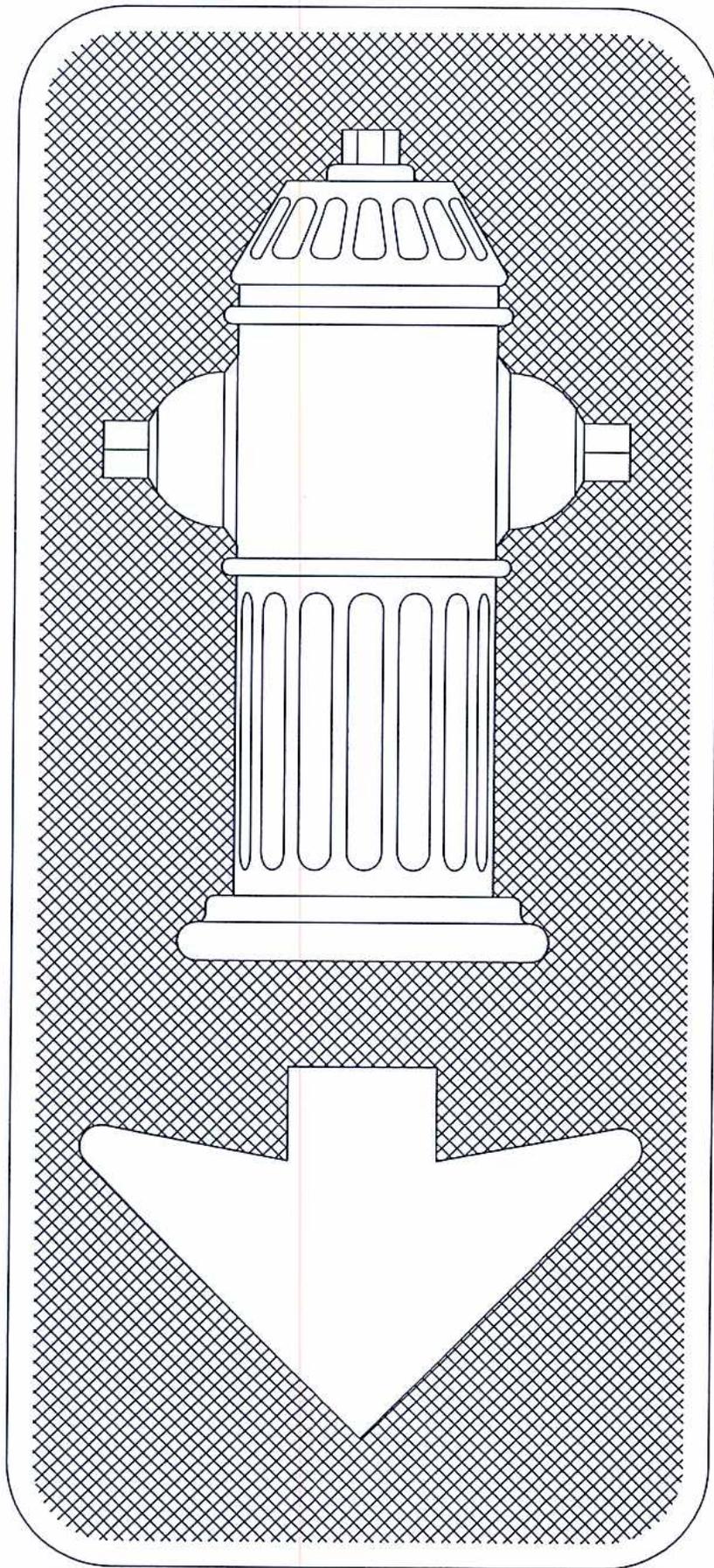
CITY OF PORTAGE

TYPICAL FIRE
HYDRANT
ASSEMBLY

AUG.18,93
L.G.N.
AUG.09,95
drw(cad)
JULY '99
drw(cad)
AUG'05
J&H

STANDARD
DETAIL SD-144

APPROVED BY WCB



FIRE HYDRANT SIGN

SIZE: 18"x8"
COLOR: RED w/WHITE
SYMBOLS
SPECIFICATIONS:
M.D.O.T. TYPE 3A
BOTTOM HEIGHT OF SIGN:
5 FEET
POST: 2 lb U-CHANNEL,
9 FEET IN LENGTH

TWO REQUIRED ON
EACH POST

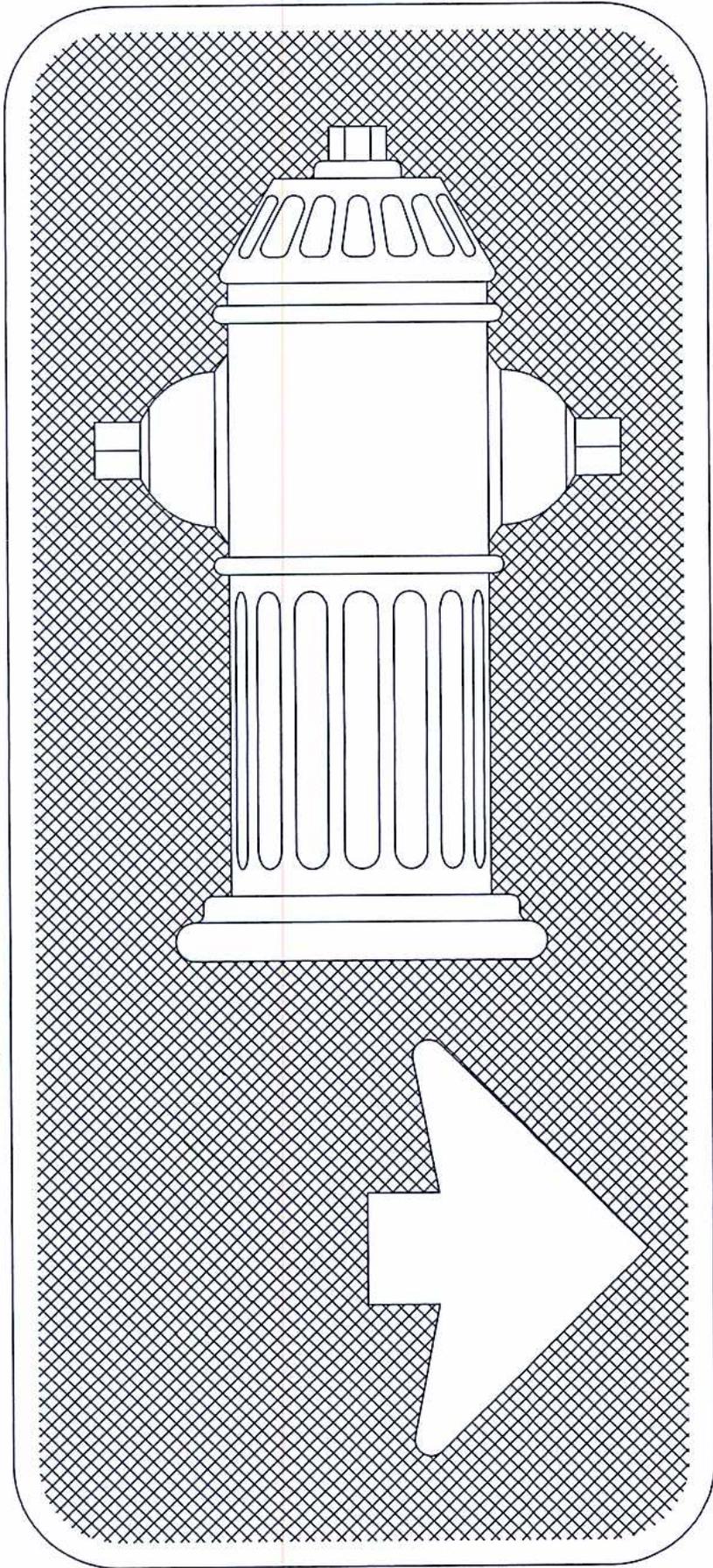
CITY OF PORTAGE

STANDARD
HYDRANT SIGN

AUG.18,93
L.G.N.
AUG.09,95
drw(cad)

STANDARD
DESIGN SD-145A

APPROVED _____ J.B. _____



CITY OF PORTAGE

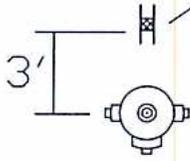
STANDARD
HYDRANT SIGN

AUG.18,93
L.G.N.
AUG.09,95
drw(cad)

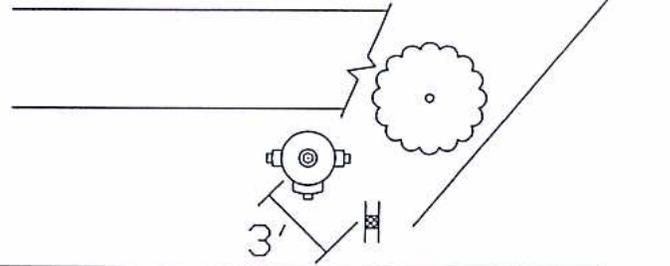
STANDARD DESIGN SD-145B

APPROVED J.B. _____

PREFERRED
HYDRANT SIGN
LOCATION



ALTERNATE
HYDRANT SIGN
LOCATION



DIRECTION
OF TRAVEL

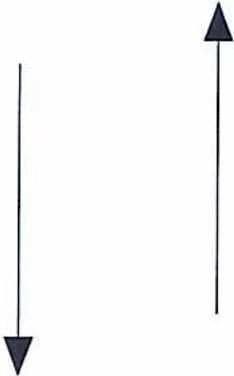


DIRECTION
OF TRAVEL

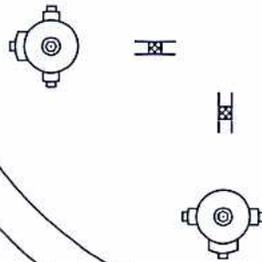


FIGURE 1

DIRECTIONS
OF TRAVEL,
MINOR STREET



ON STREET CORNER, SIGNS
TO FACE DIRECTIONS OF
TRAVEL OF STREET WHICH
STEAMER PORT FACES



DIRECTION
OF TRAVEL,
MAJOR STREET



CITY OF PORTAGE

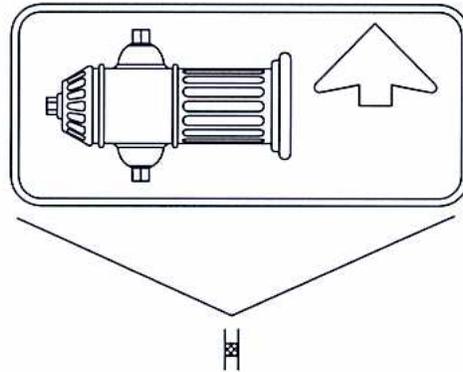
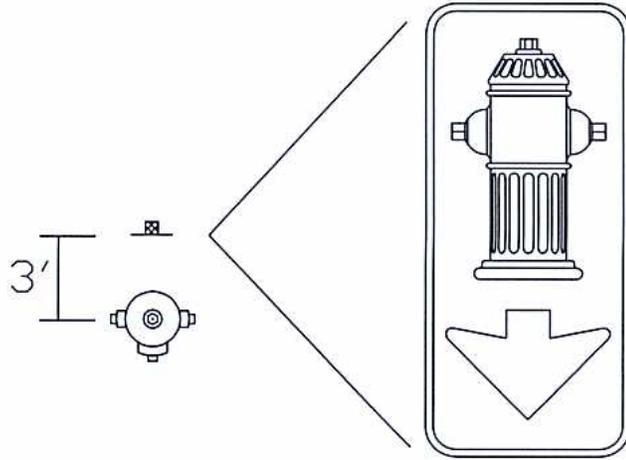
STANDARD
HYDRANT SIGN

AUG.19,93
L.G.N.
AUG.09,95
drw(cad)

STANDARD
DESIGN SD-145C

APPROVED J.B.

ARRANGEMENT OF
SIGNS FOR HYDRANTS
NOT CLEARLY
VISIBLE FROM ROAD



SIGN GIVES
DIRECTION TO
HYDRANT



DIRECTION
OF TRAVEL

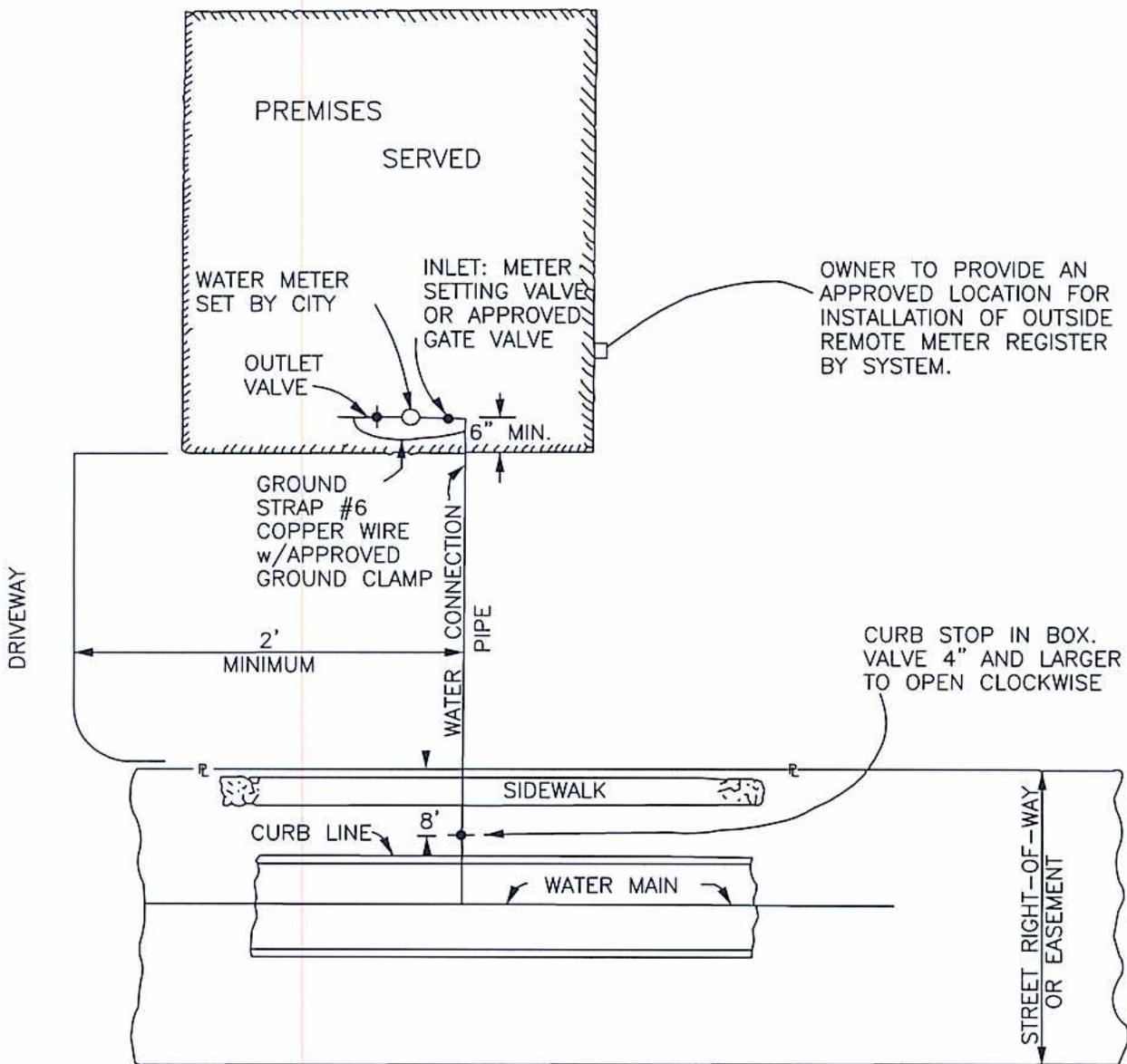
CITY OF PORTAGE

STANDARD
HYDRANT SIGN

AUG.19,93
L.G.N.
AUG.09,95
drw(cad)

STANDARD
DESIGN SD-145D

APPROVED J.B.



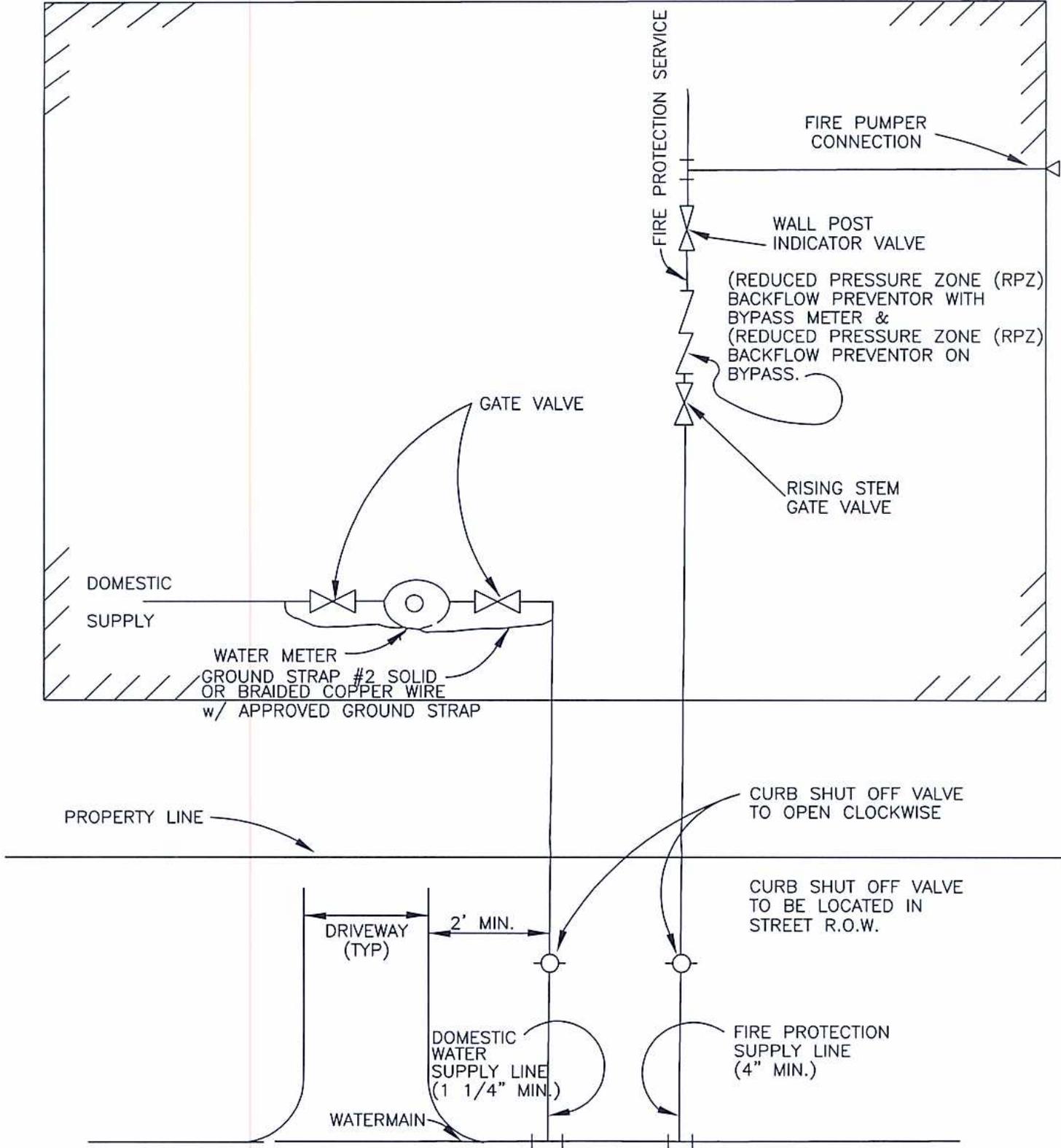
OWNER TO PROVIDE AN APPROVED LOCATION FOR INSTALLATION OF OUTSIDE REMOTE METER REGISTER BY SYSTEM.

CURB STOP IN BOX. VALVE 4" AND LARGER TO OPEN CLOCKWISE

NOTE:

- 1) FOR 2" OR LARGER WATER CONNECTION PIPE, SEE OTHER DRAWINGS FOR METER SETTING.
- 2) ALL WATER SERVICE PIPE, VALVES & APPURTENANCES, SHALL BE THE SAME SIZE FROM THE WATER MAIN TO THE METER INLET VALVE.
- 3) WHEN A TAPPING SLEEVE AND VALVE IS INSTALLED NO ADDITIONAL CURB STOP IS REQUIRED.
- 4) THE WATER SERVICE SHALL BE A MINIMUM OF 2' FROM THE EDGE OF THE DRIVEWAY.
- 5) WHERE A BASEMENT METER SETTING IS NOT FEASIBLE, A METER PIT INSTALLATION WILL BE REQUIRED.

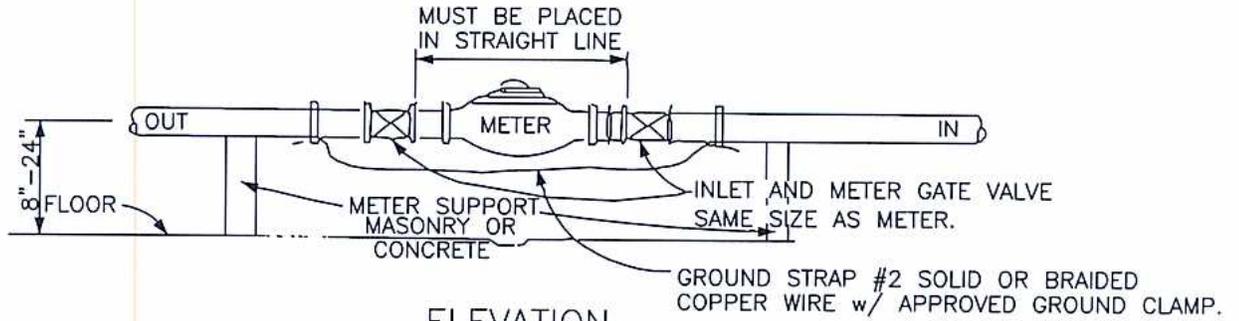
<h1>CITY OF PORTAGE</h1>	
<h2>TYPICAL WATER CONNECTION PIPE</h2>	
STANDARD DESIGN	SD-146
APPROVED BY <u> J.B. </u>	
<small>AUG.19,93 L.G.N. APR. 1995 drw 4-25-95 drw 4-26-95 drw FEB '07 JMA</small>	



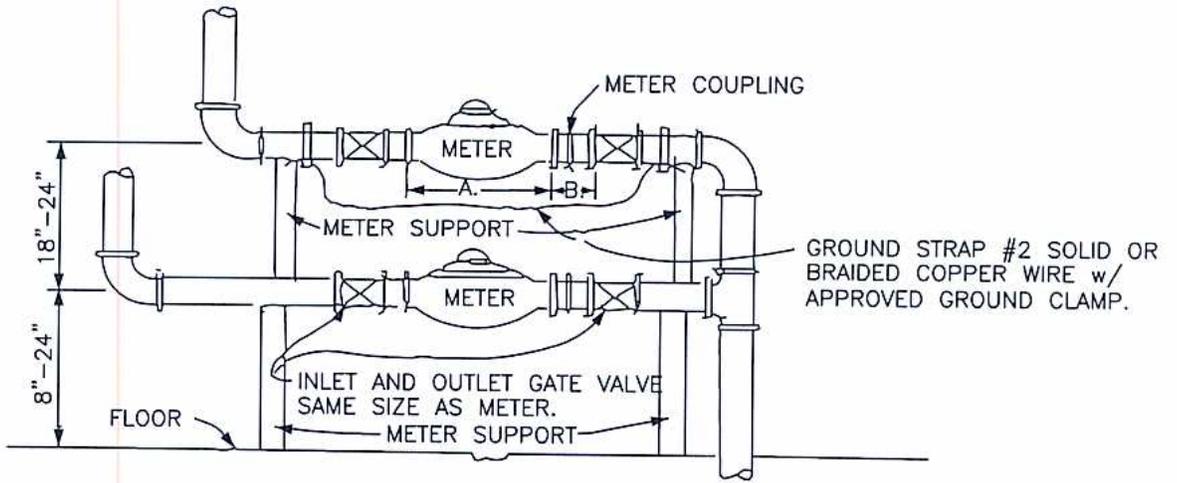
NOTE:

1. WATER SERVICE LOCATION. THE WATER SERVICE LINES ARE NOT TO BE LOCATED OVER OTHER UNDERGROUND UTILITIES, TOWARD LARGE TREES, IN LINE WITH SANITARY SEWER LINES, SEPTIC TANKS, DRAIN FIELDS, DRY WELLS, OR UNDER DRIVEWAYS. WATER SERVICES ARE TO BE A MINIMUM OF 2' FROM THE EDGE OF THE DRIVEWAY.
2. ALL POST INDICATOR VALVES (WALL &/or YARD) SHALL BE LOCATED DOWN STREAM OF THE BACKFLOW PREVENTION DEVICE. THE CURB SHUTOFF VALVE CANNOT BE USED FOR A POST INDICATOR VALVE.

<h1>CITY OF PORTAGE</h1>	
<h2>STANDARD WATER SERVICE LOCATION</h2>	AUG. 30, 94 L.G.N.
STANDARD DESIGN	SD-148
APPROVED BY <u>wcb</u>	APR. 1995 drw 4-25-95 drw NOV. 1997 drw DEC. 1997 drw FEB. '07 JMA



ELEVATION
SINGLE METER
1 1/2", 2", or 3"

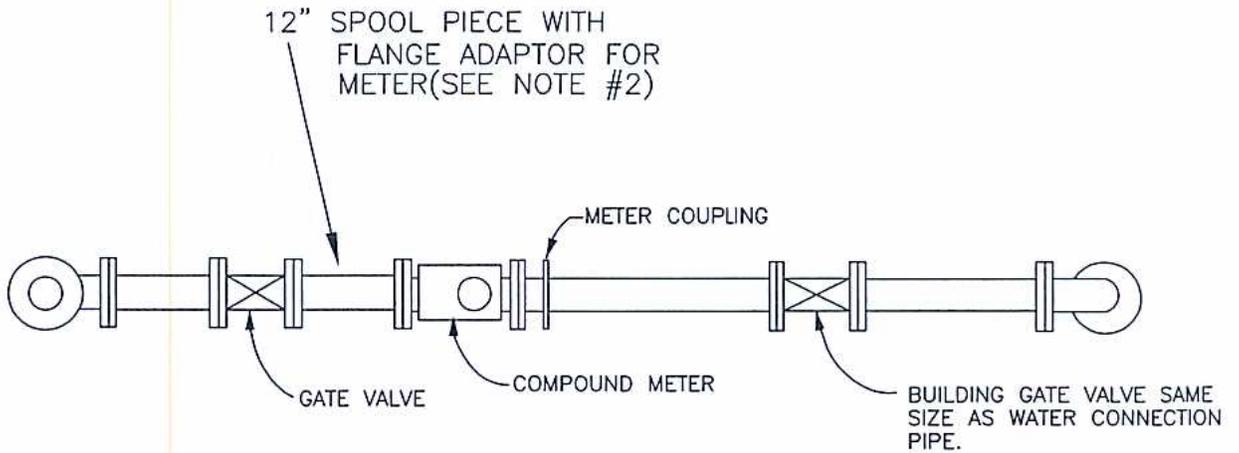


ELEVATION
METER BATTERY
1 1/2", 2", or 3"

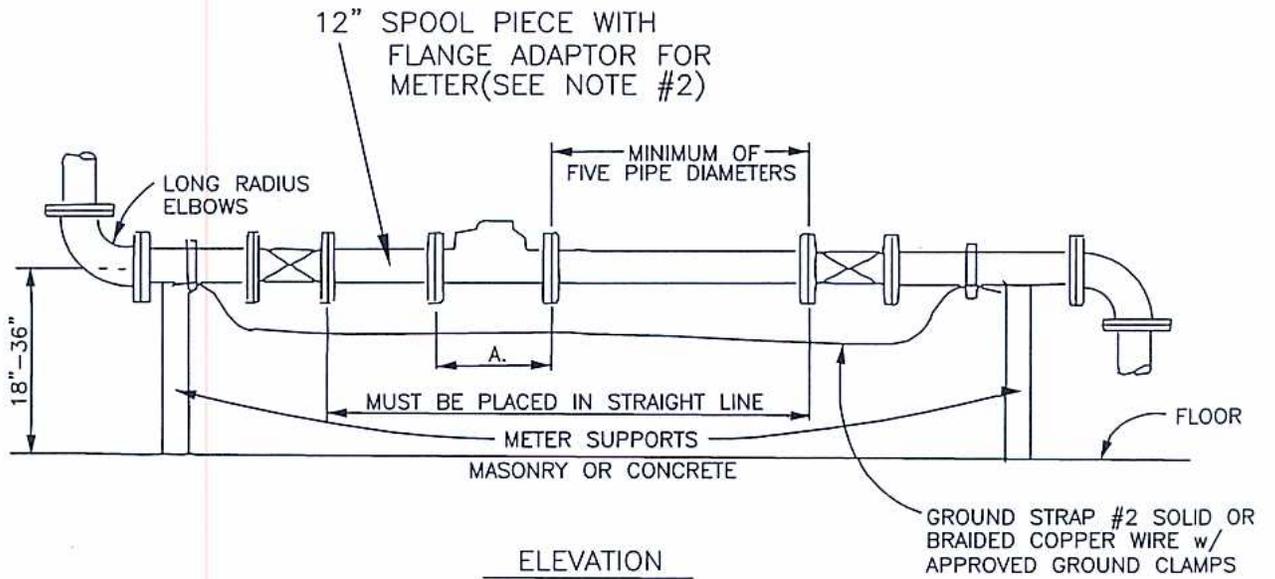
NOTE:
ALL PIPE IN THE METER SETTING
MUST BE BRASS WITH THREADED
ENDS OR CAST IRON.

METER SIZE	A.	B.
1 1/2	13"	6"
2" SR	17"	8"
2" COMPOUND	15 1/4"	8"
3" COMPOUND	17"	12"

CITY OF PORTAGE	
METER SETTING 1 1/2" or 3" WATER CONNECTION PIPE	
STANDARD DESIGN	SD-149
APPROVED BY	J.B.
AUG. 19, 93 L.G.N. AUG '05 J&H	



PLAN VIEW



ELEVATION

.NOTE:

#1 METER DIMENSIONS

A.	
3"	17"
4"	20 3/8"
6"	27 3/8"

#2	METER SIZE	FLANGE ADAPTOR MODEL #
	3"	SMITH BLAIR 912
	4"	SMITH BLAIR 912
	6"	SMITH BLAIR 912

ALL PIPE AND VALVES IN THE METER SETTING MUST BE THE SAME SIZE AS THE METER. BLACK IRON PIPE MAY NOT BE USED.

CITY OF PORTAGE

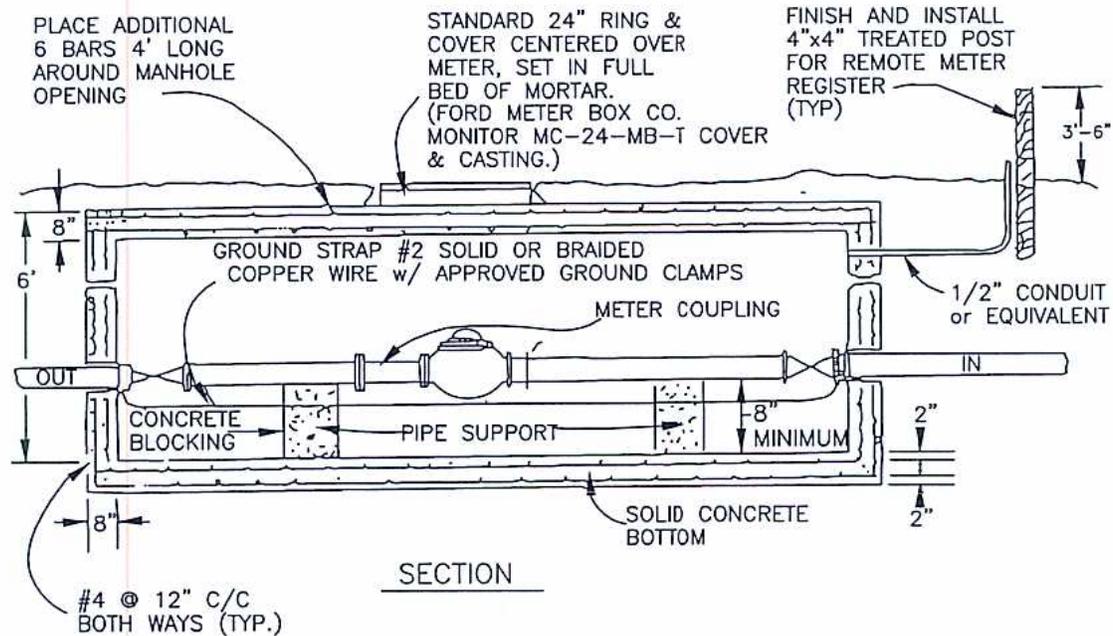
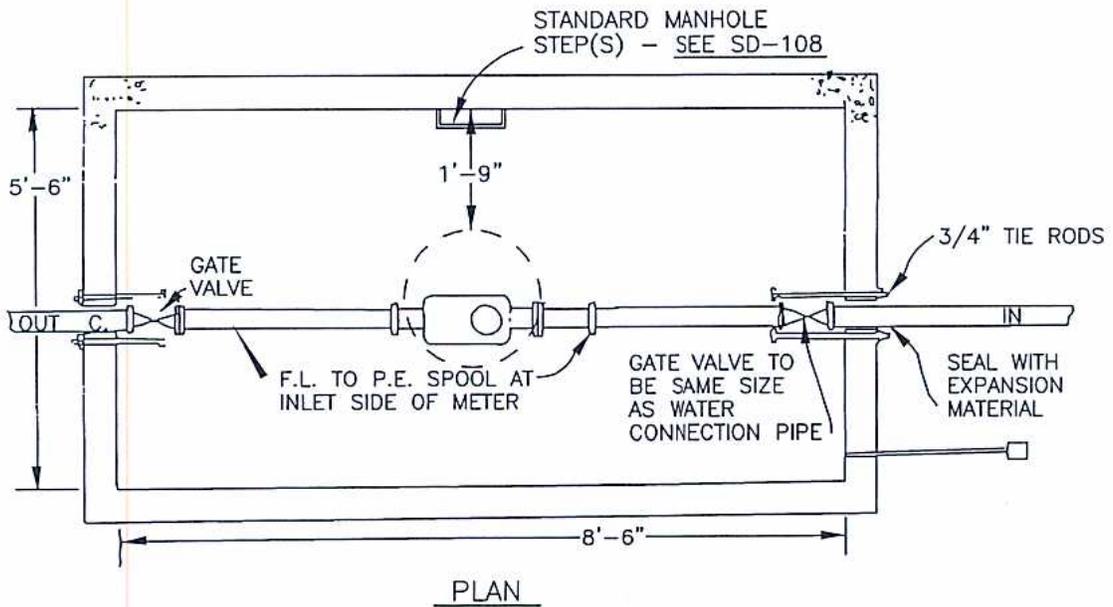
METER SETTING FOR
3", 4" or 6" METERS

AUG.19,93
L.G.N.

APR. 1995
drw
4-25-95
drw

STANDARD DESIGN SD-150

APPROVED BY J.B.



NOTE:

- 3" METER LENGTH 17"
- 4" METER LENGTH 20 5/8"
- 6" METER LENGTH 24 3/4"

METER SIZE	FLANGE ADAPTOR MODEL #
3"	SMITH BLAIR 912
4"	SMITH BLAIR 912
6"	SMITH BLAIR 912

NOTE:

ALIGN STEPS WITH ACCESS OPENING TO FACILITATE EASY INGRESS & EGRESS SEE SD-108

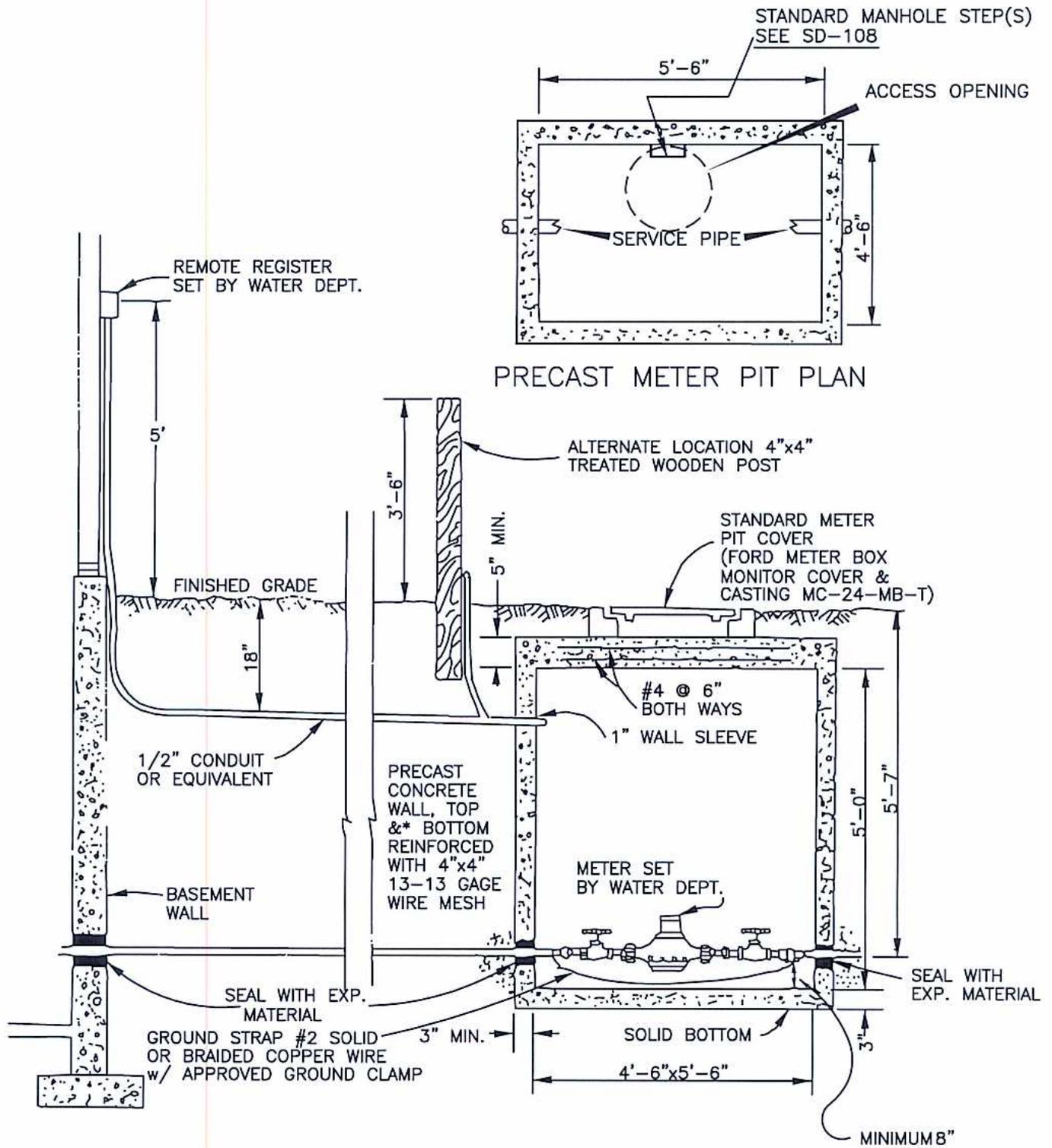
CITY OF PORTAGE

PRECAST METER PIT AND METER SETTING ARRANGEMENT FOR 3", 4" or 6" COMPOUND METER AND TYPICAL PIT LAYOUT

STANDARD DESIGN SD-151

APPROVED BY WCB

AUG. 19, 93
L.G.N.
APR. 1995
d.r.w.
4-25-95
d.r.w.
DEC. '97
d.r.w.
JULY '99
d.r.w.
AUG '05
J&H



NOTE:

CONTRACTOR MUST FURNISH AND INSTALL A 1/2" CONDUIT FROM THE METER PIT TO THE APPROVED LOCATION EITHER ON A BUILDING WALL OR MOUNTED ON A POST NEAR THE PIT.

ALIGN STEPS WITH ACCESS OPENING.

CITY OF PORTAGE

PRECAST METER
PIT FOR
1 1/2" or 2" METER

AUG. 19, 93
L.G.N.
APR. 1995
d.r.w.
4-25-95
d.r.w.
DEC. 2, 97
d.r.w.

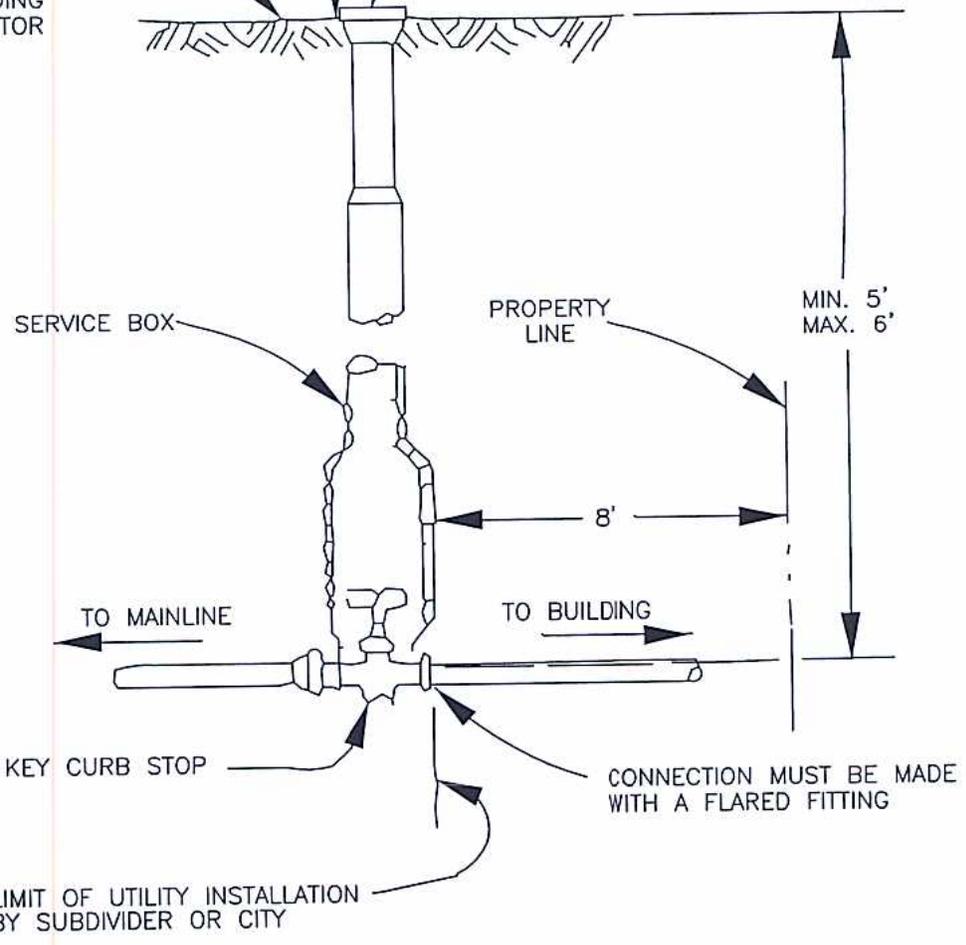
STANDARD
DESIGN SD-152

APPROVED BY *WCB*

CURB BOX MUST BE PLUMB,
CONTINUOUS, (SAME MATERIAL)
FROM TOP TO BOTTOM, &
ADJUSTED TO FINISH GROUND
LEVEL

GROUND LEVEL
AS ESTABLISHED
BY BUILDING
CONTRACTOR

CURB BOX CAP IN
GOOD CONDITION
AND VISIBLE

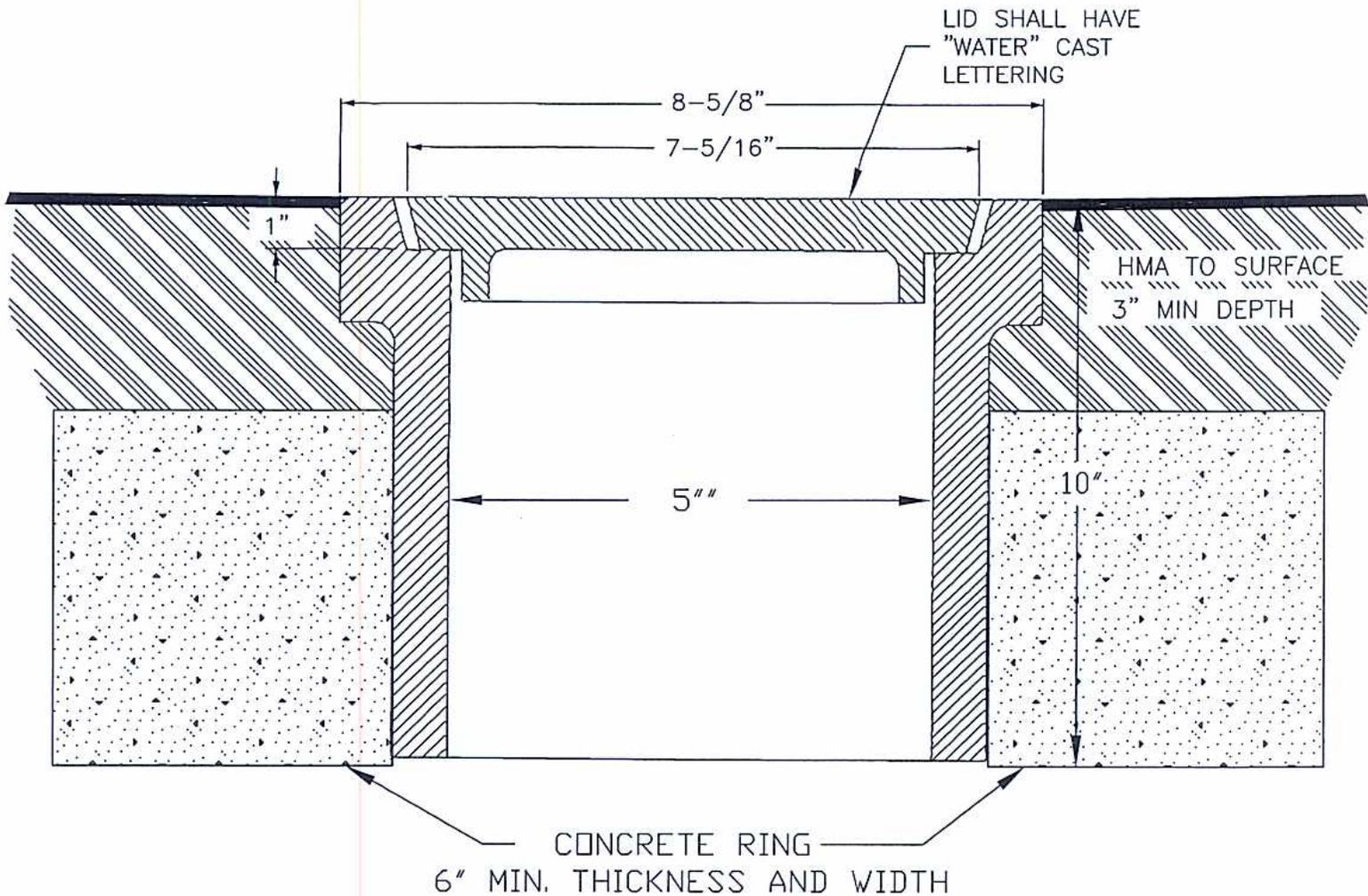


NOTE:
FAILURE TO COMPLY WITH THIS DETAIL SHALL BE SUFFICIENT
CAUSE TO REJECT SETTING OF WATER METER

<p>CITY OF PORTAGE ENGINEERING DEPARTMENT</p>	
<p>CURB STOP CONNECTION & FINAL SETTING OF CURB BOX</p>	
<p>STANDARD DESIGN</p>	<p>SD-153A</p>
<p>APPROVED BY <u>J.B.</u></p>	

APR. 13, 94
L.G.N.

WS-7A



CROSS SECTION OF VALVE BOX AND COVER

NOTES:

THE SEATING FACE OF THE LID AND THE SEAT FOR SAME ON FRAME SHALL BE GROUND OR MACHINED SO THAT THE LID SHALL HAVE AN EVEN BEARING ON ITS SEAT TO PREVENT ROCKING OR TILTING.

THE CASTING SHALL BE FREE OF POURING FAULTS, BLOW HOLES, CRACKS AND OTHER IMPERFECTIONS, THEY SHALL BE SOUND, TRUE TO FORM AND THICKNESS, CLEAN AND NEATLY FINISHED, AND SHALL BE COATED WITH TAR PITCH VARNISH.

LID SHALL BE NON LOCKING TYPE EJIW 6800

CASTING:

EAST JORDAN SCREW TYPE "8550"
OR APPROVED EQUIVALENT

TOTAL WEIGHT 148 LB.

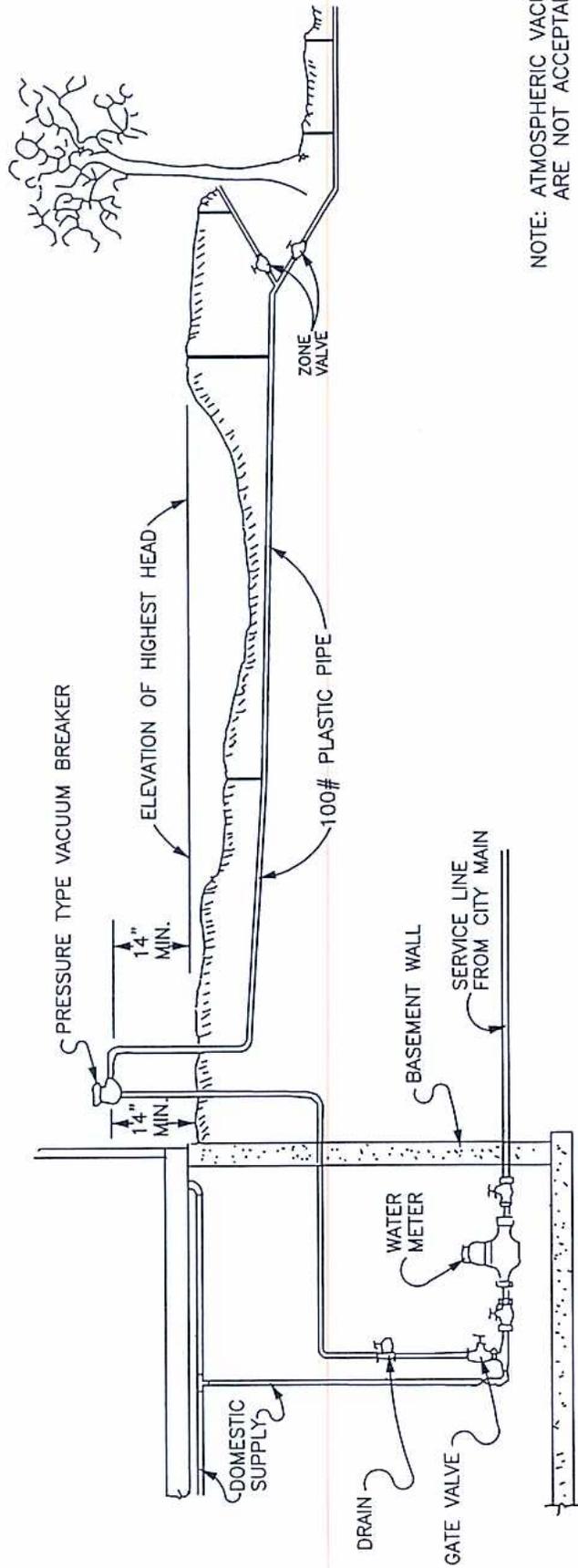
CITY OF PORTAGE

STANDARD
VALVE BOX

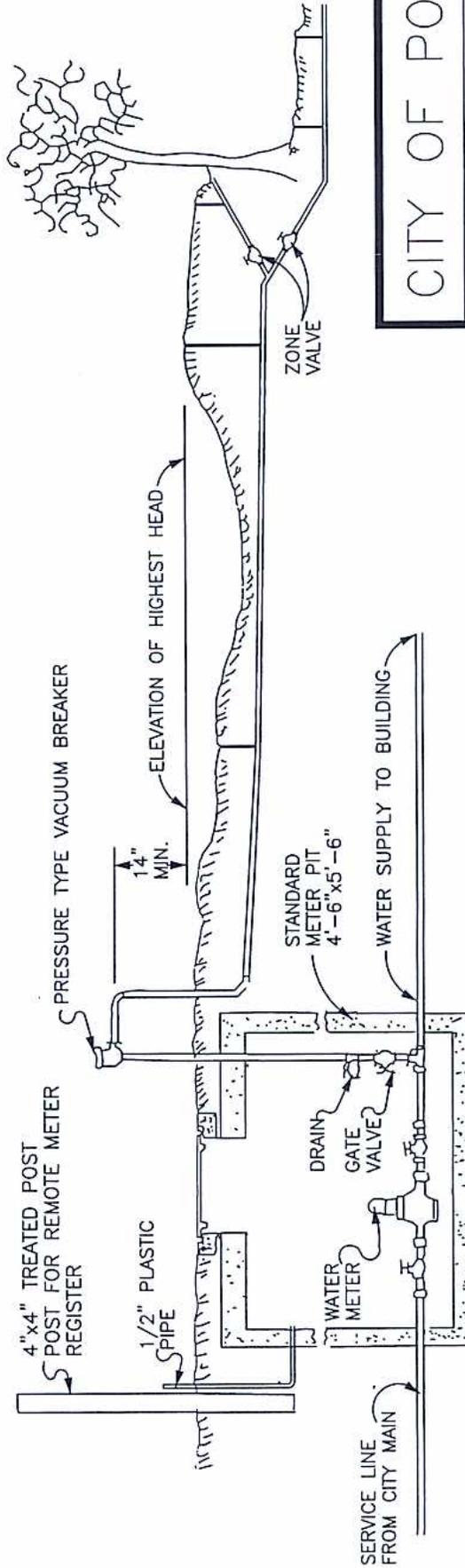
DEC 2006
JMA

STANDARD
DESIGN SD-154

APPROVED WCB



NOTE: ATMOSPHERIC VACUUM BREAKERS ARE NOT ACCEPTABLE



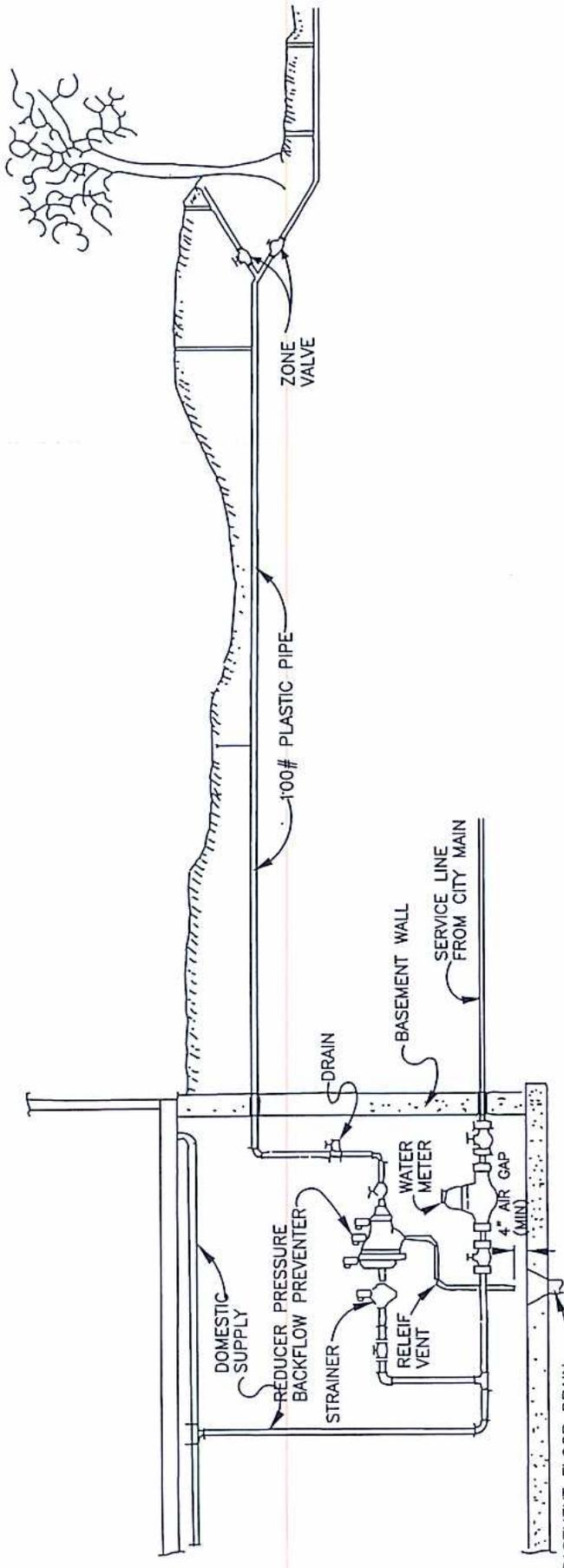
NOTE: SEE METER PIT DETAIL FOR DIMENSIONS.

CITY OF PORTAGE

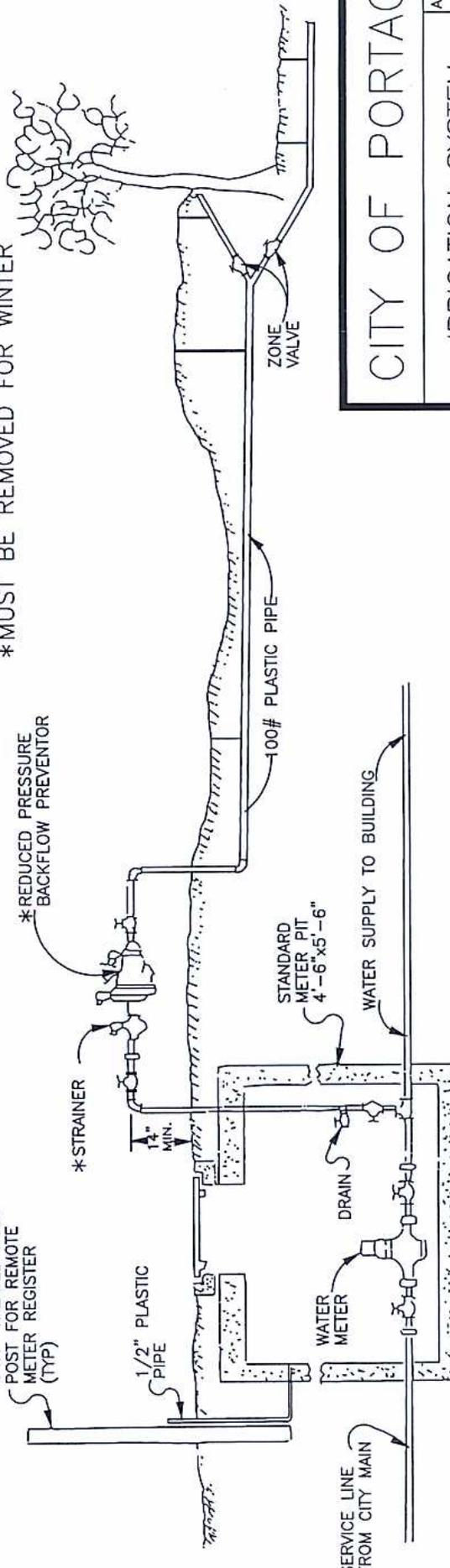
AUG. 1993 LGN
 APR. 1995 d.r.w.
 4-25-95 d.r.w.

IRRIGATION SYSTEM
 PRESSURE TYPE
 VACUUM BREAKER

STANDARD DESIGN SD-155
 APPROVED BY J.B.



* MUST BE REMOVED FOR WINTER



NOTE: SEE METER PIT DETAIL FOR DIMENSIONS

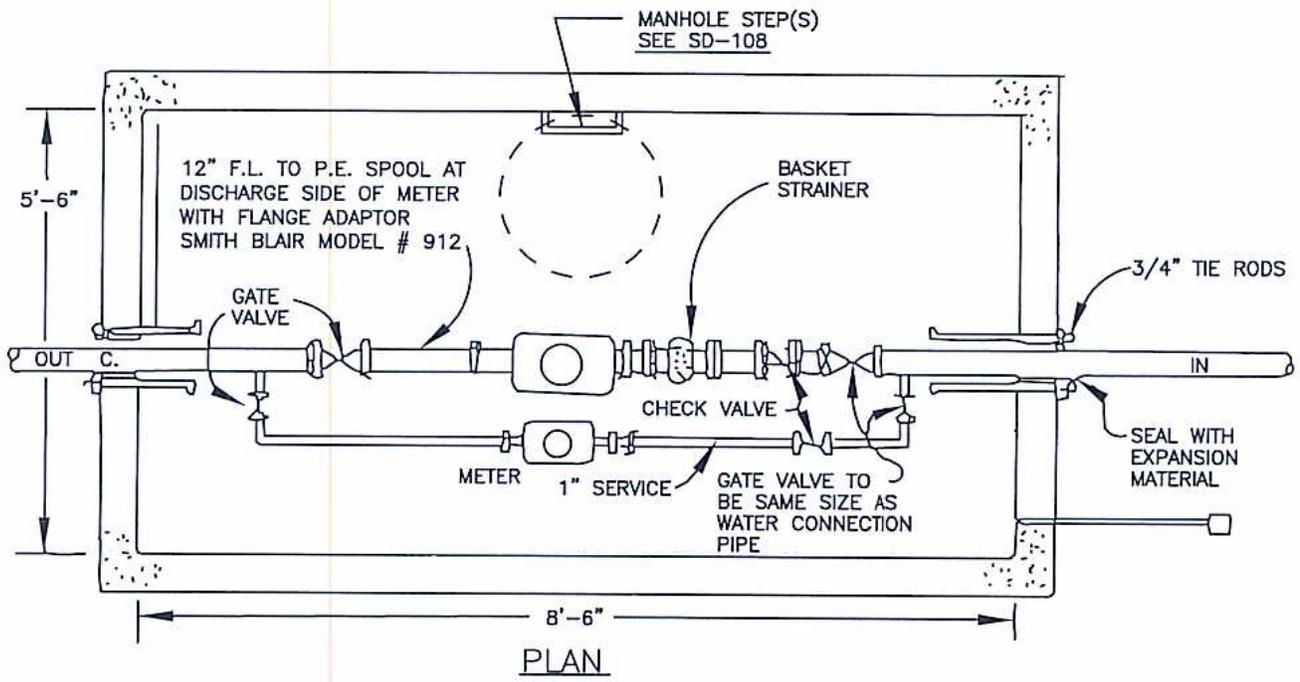
CITY OF PORTAGE

AUG. 19, 93
L.G.N.
APR. 1, 1995
d.r.w.
4-25-95
d.r.w.

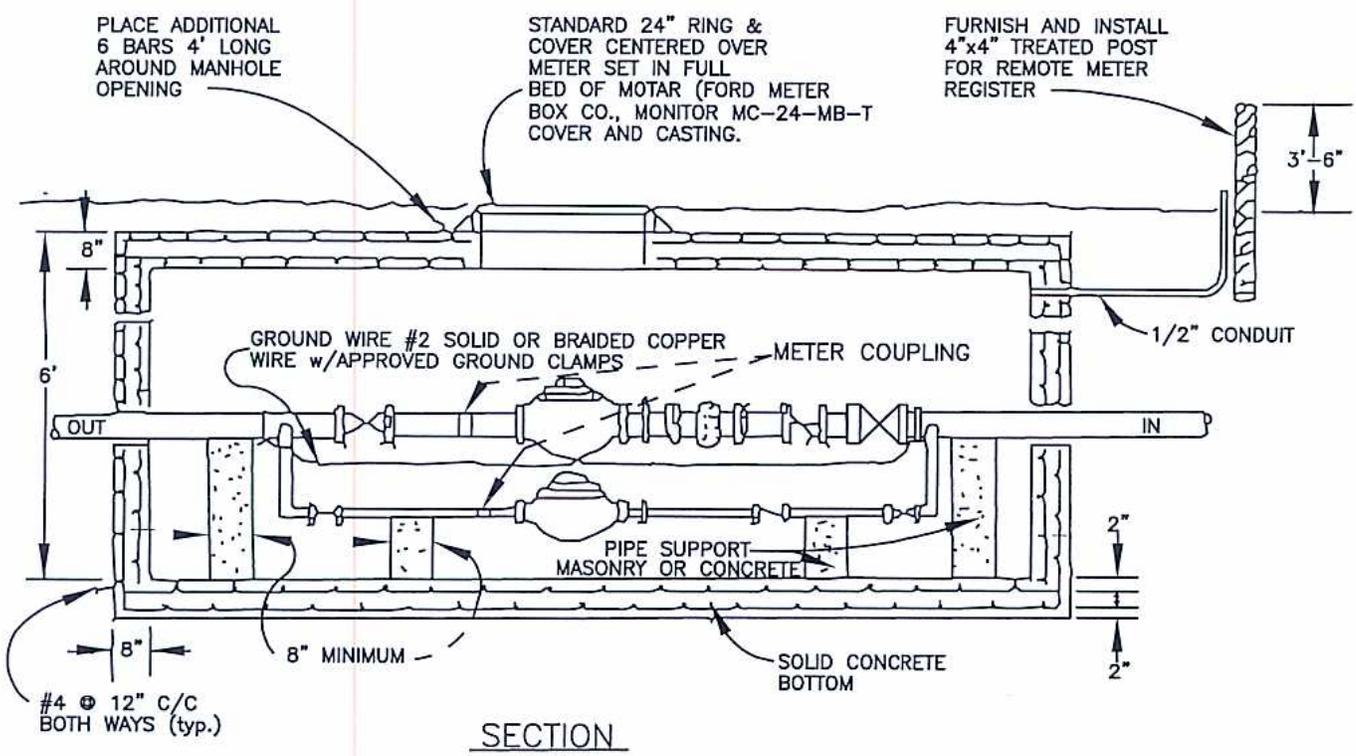
IRRIGATION SYSTEM
REDUCED PRESSURE
BACKFLOW PREVENTOR

STANDARD DESIGN SD-156

APPROVED BY J.B.



PLAN



SECTION

NOTE: ALIGN STEPS WITH ACCESS OPENING TO FACILITATE EASY INGRESS & EGRESS

#1 METER DIMENSIONS

	A.	B.
3"	3'17"	12
4"	4'20-3/8"	20
6"	6'27-3/8"	36

#2	METER SIZE	FLANGE ADAPTOR MODEL #
	3"	SMITH BLAIR 912
	4"	SMITH BLAIR 912
	6"	SMITH BLAIR 912

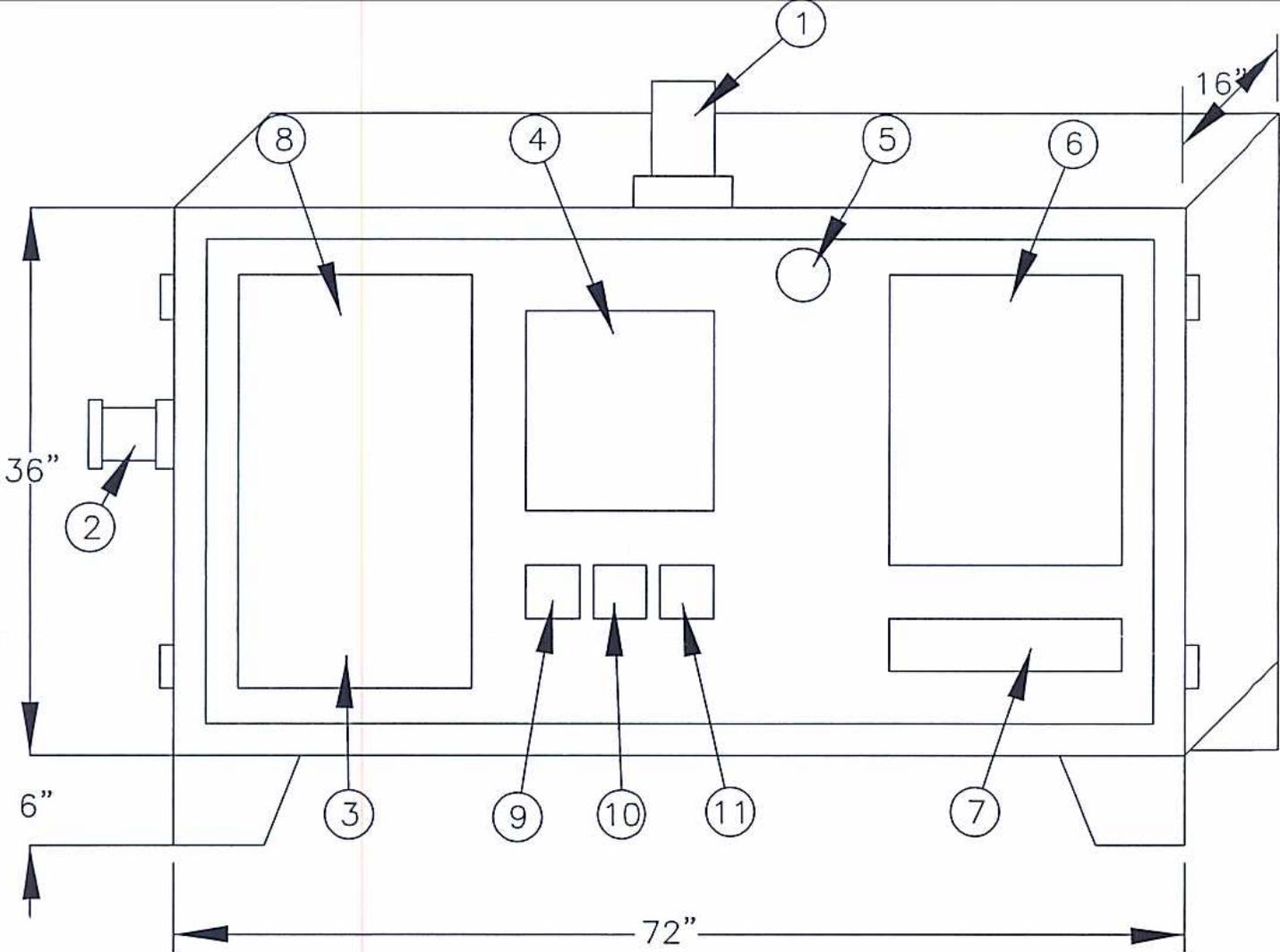
CITY OF PORTAGE

METER SETTING ARRANGEMENT FOR 3", 4" OR 6" TURBINE METER WITH 1" BYPASS METER AND TYPICAL PIT LAYOUT

STANDARD DESIGN SD-157

APPROVED BY *WCB*

AUG.19,93
L.G.N.
APR. 1995
d.r.w.
4-25-95
d.r.w.
4-26-95
d.r.w.
DEC. 97
d.r.w.
JULY '99
d.r.w.



1. ALARM LIGHT
2. EMERGENCY GENERATOR RECEPTACLE
3. PUMP PANEL
4. CIRCUIT BREAKER PANEL
5. LIGHT
6. REMOTE TERMINAL
7. WIREWAY
8. ENCLOSURE
9. DUPLEX OUTLET
10. WET WELL LIGHT SWITCH
11. PANEL LIGHT SWITCH

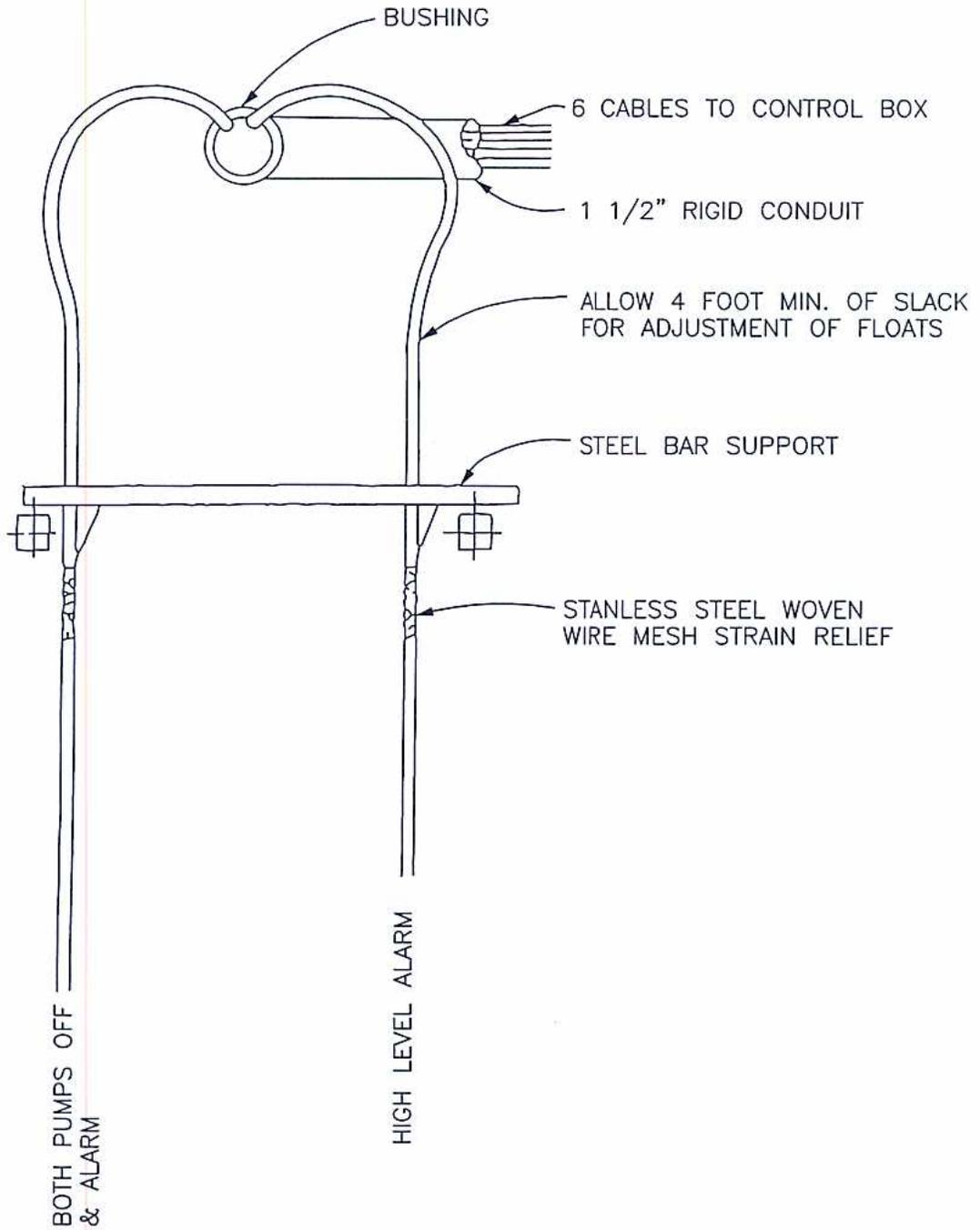
CITY OF PORTAGE

TYPICAL
LOW PROFILE
LIFT STATION
CONTROL PANEL

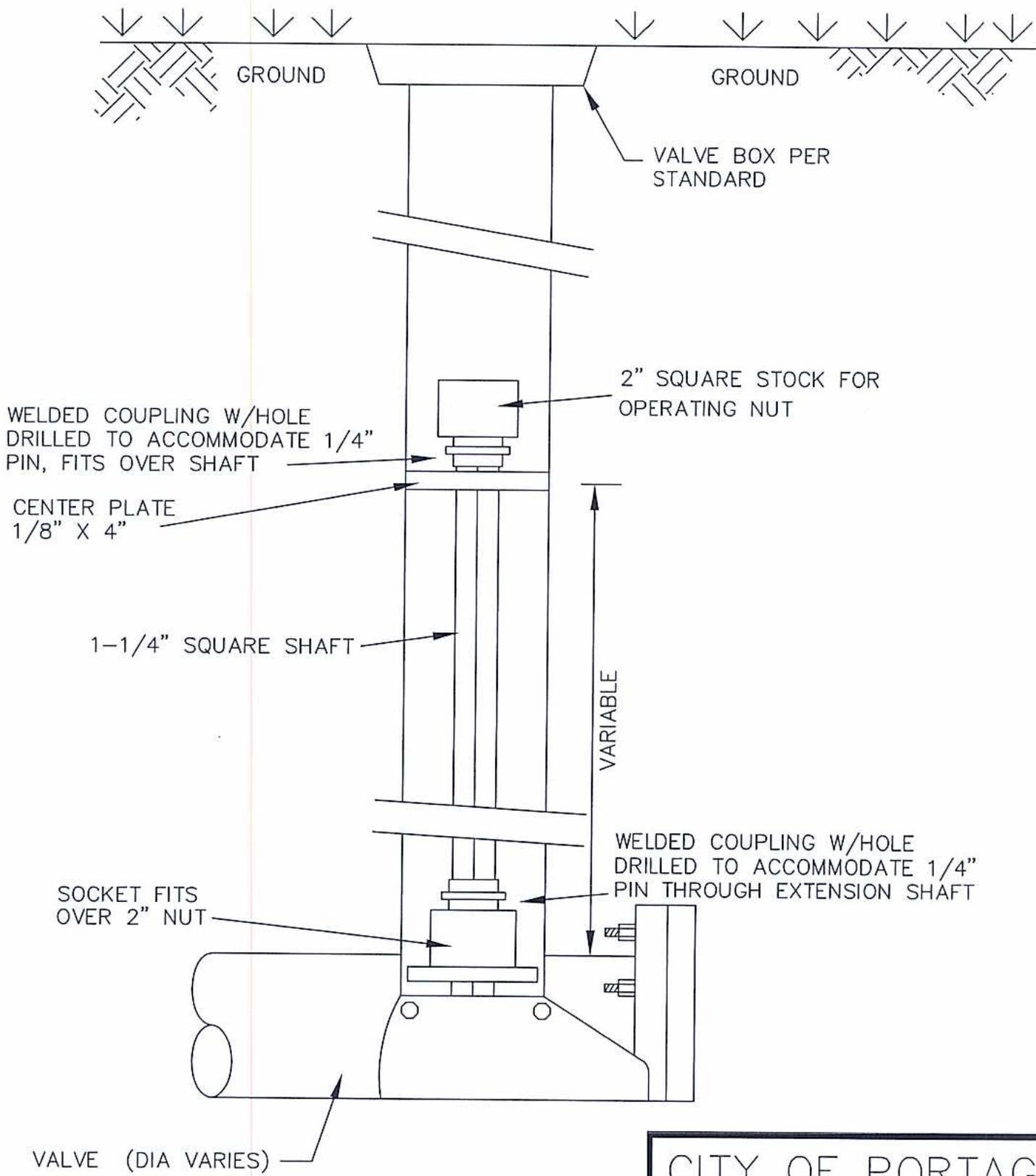
AUG.20,93
L.G.N.
AUG.10,95
drw(cad)
DEC.97
drw(cad)

STANDARD
DESIGN SD-160

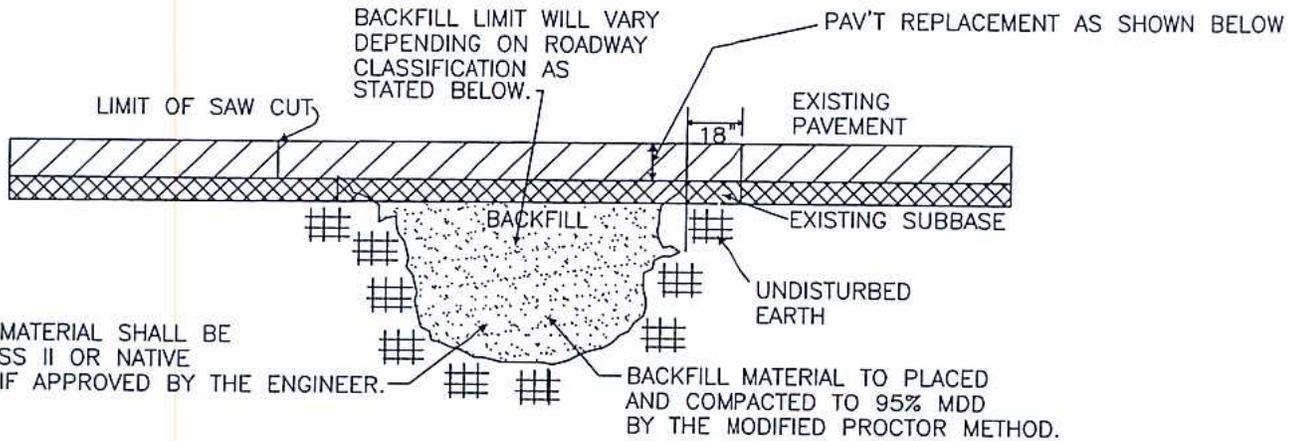
APPROVED BY *wcb*



CITY OF PORTAGE	
FLOAT TERMINATION DETAIL FOR SUBMERSIBLE LIFT STATION	AUG.20,93 L.G.N. AUG.10,95 drw(cad)
STANDARD DESIGN SD-161	
APPROVED BY <u> J.B. </u>	



CITY OF PORTAGE	
VALVE EXTENSION STEM (VARIABLE)	
STANDARD DESIGN	SD-164
APPROVED BY <u>J.B.</u>	
4-13-94 D.W. NOV. 97 d.r.w. DEC. 06 JMA	



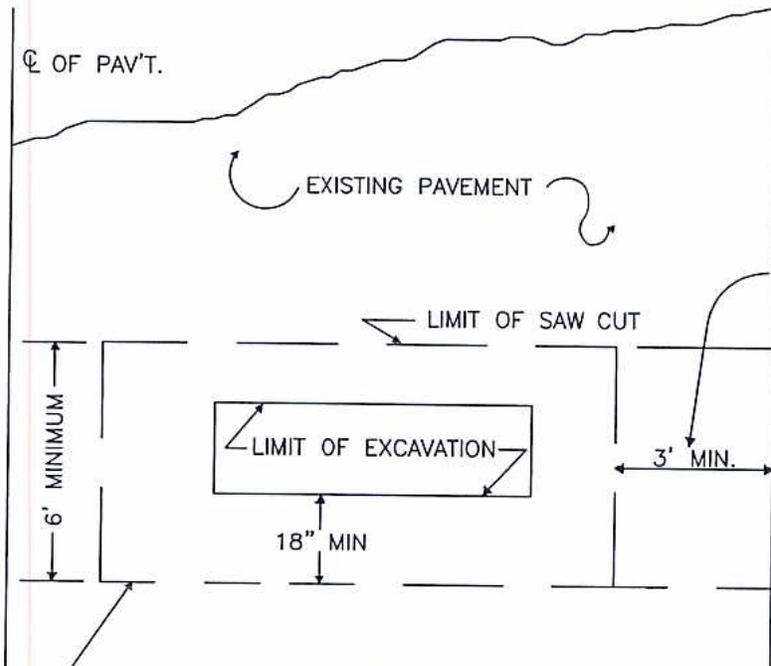
CROSS SECTION
NO SCALE

• PAVEMENT REPLACEMENT:

MAJOR ROAD (ADT > 2000): 4" (COMPACTED) MDOT 22A, 5" MDOT 13A HMA BASE COURSE (TWO LIFTS MIN.) AND 3" OF MDOT 13A HMA - LEVELING AND TOP COURSES.

LOCAL ROAD (ADT < 2000): 6" (COMPACTED) MDOT 22A, 2" MDOT 13A HMA & 1-1/2" OF MDOT 36A HMA.

NOTE: LENGTH AND WIDTH OF THE PATCH VARY DEPENDING ON THE DEPTH OF THE EXCAVATION.



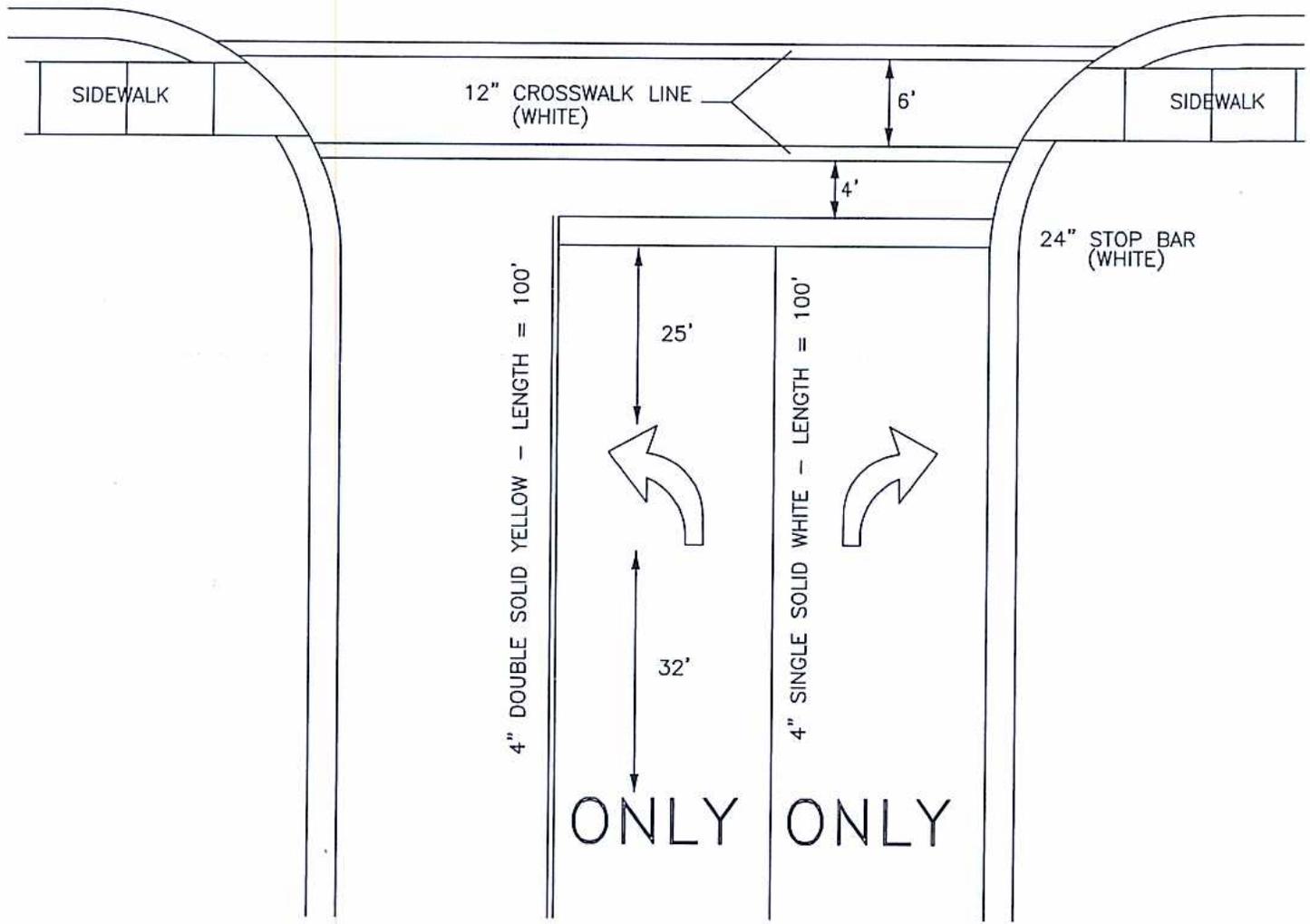
PLAN VIEW

NO SCALE

FINISH NEAT SAWCUT AS DETAILED HEREIN ONLY WHEN EXCAVATION IS COMPLETE AND PREPARATION FOR FINISH REPAIR IS BEING IMPLEMENTED.

1. ALL NON UTILITY PAVEMENT REPLACEMENT REQUESTS WILL REQUIRE A PERMIT ISSUED BY THE TRANSPORTATION AND UTILITIES DEPARTMENT.
2. 48 HOURS NOTICE IS TO BE GIVEN TO THE CITY OF PORTAGE TRANSPORTATION & UTILITIES DEPT. PRIOR TO ANY LANE RESTRICTION, CLOSURE OR DETOUR IMPLEMENTATION.
3. EXISTING PAVEMENT SHALL BE SAW CUT A MINIMUM OF 18" FROM THE EDGE OF THE EXCAVATION.
4. A MIN. PATCH WIDTH OF 6' IS REQUIRED SO AS TO FACILITATE A STEEL WHEELED ROLLER WHEN RUNNING PERPENDICULAR TO CENTERLINE OF ROADWAY.
5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF PORTAGE CONTRACT CONDITIONS AND SPECIFICATIONS.

CITY OF PORTAGE	
PAVEMENT REPLACEMENT DETAIL	
STANDARD DESIGN	SD-165
APPROVED BY <i>wcb</i>	
4-96 D.R.W.	12-97 D.R.W.
JAN'98 DRW	FEB'98 DRW
AUG'05 J&H	



NOTE:

- 1) ALL STOP BARS, CROSSWALK LINES, ARROWS, & "ONLY" SYMBOLS SHALL BE WHITE.
- 2) INLAY OR OVERLAY PLASTIC OR THERMOPLASTIC MATERIALS SHALL BE USED FOR ALL STOP BARS, CROSSWALK LINES, ARROWS, AND "ONLY" SYMBOLS.
- 3) THERMOPLASTIC MATERIALS SHALL BE USED FOR ALL 4" CENTERLINE AND LANE LINE MARKINGS.
- 4) ARROWS AND "ONLY" SYMBOL DIMENSIONS SHALL BE PER THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, CURRENT ED.
- 5) THE STOP BAR SHALL BE PLACED A MINIMUM OF 4 FEET IN ADVANCE OF THE NEAREST CROSSWALK LINE.
- 6) IF NO CROSSWALK EXISTS, THE STOP BAR SHALL BE PLACED AT THE DESIRED STOPPING POINT, BUT NO MORE THAN 30 FEET OR LESS THAN 4 FEET FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY.
- 7) ARROWS AND "ONLY" SYMBOLS SHALL BE USED AT ALL MAJOR STREET INTERSECTIONS, OR AS DIRECTED BY THE ENGINEER.

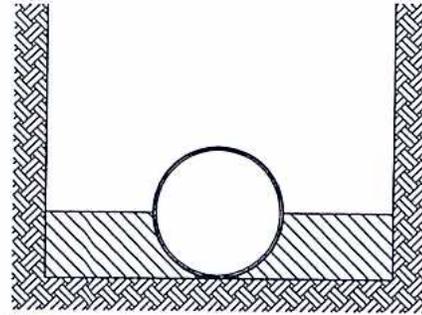
NO SCALE

<h1>CITY OF PORTAGE</h1>	
<h2>TYPICAL INTERSECTION MARKING DETAIL</h2>	
STANDARD DESIGN	SD-166
APPROVED BY: <i>wcb</i>	
MAR. 1999 T.R.D.	

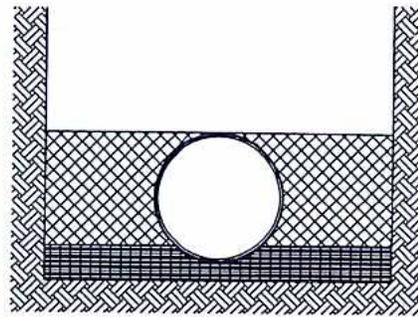
LAYING CONDITIONS FOR DUCTILE IRON PIPE.



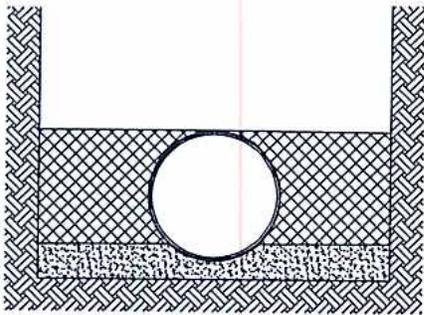
TYPE 1:*
FLAT BOTTOM TRENCH.** LOOSE BACKFILL



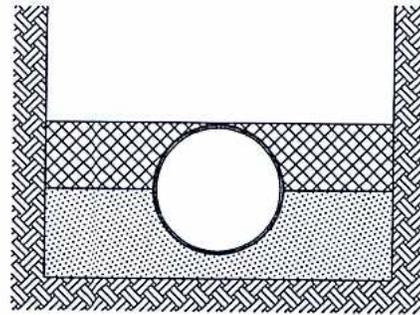
TYPE 2:
FLAT BOTTOM TRENCH.** BACKFILL LIGHTLY
CONSOLIDATED TO CENTERLINE OF PIPE.



TYPE 3:
PIPE BEDDED IN 4 IN. MINIMUM OF LOOSE SOIL.***
BACKFILL LIGHTLY CONSOLIDATED TO TOP OF PIPE.



TYPE 4:
PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO
DEPTH OF 1/8 PIPE DIAMETER, 4IN. MINIMUM.
BACKFILL COMPACTED TO TOP OF PIPE.
(APPROXIMATELY 80% STANDARD PROCTOR, AASHTO T-99.)



TYPE 5:
PIPE BEDDED IN COMPACTED GRANULAR MATERIAL TO
CENTERLINE OF PIPE. COMPACTED GRANULAR OR
SELECT MATERIAL++ TO TOP OF PIPE. (APPROXIMATELY
90% STANDARD PROCTOR, AASHTO T-99.)

NOTES:

1. MINIMUM DEPTH 5'
2. MAXIMUM DEPTH 6'
3. *FOR 14 IN. AND LARGER PIPE, CONSIDERATION SHOULD BE GIVEN TO THE USE OF LAYING CONDITIONS OTHER THAN TYPE 1.
4. **"FLAT BOTTOM" IS DEFINED AS UNDISTURBED EARTH.
5. ++ "LOOSE SOIL" OR "SELECT MATERIAL" IS DEFINED AS NATIVE SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, FOREIGN MATERIALS AND FROZEN EARTH.

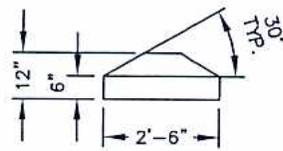
CITY OF PORTAGE

STANDARD TRENCH DETAIL
FOR DUCTILE IRON
WATER MAIN

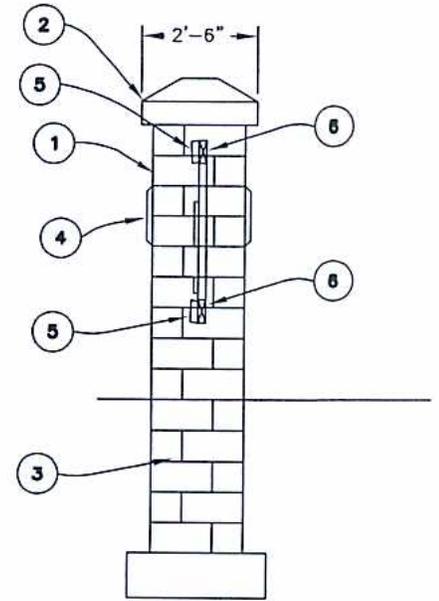
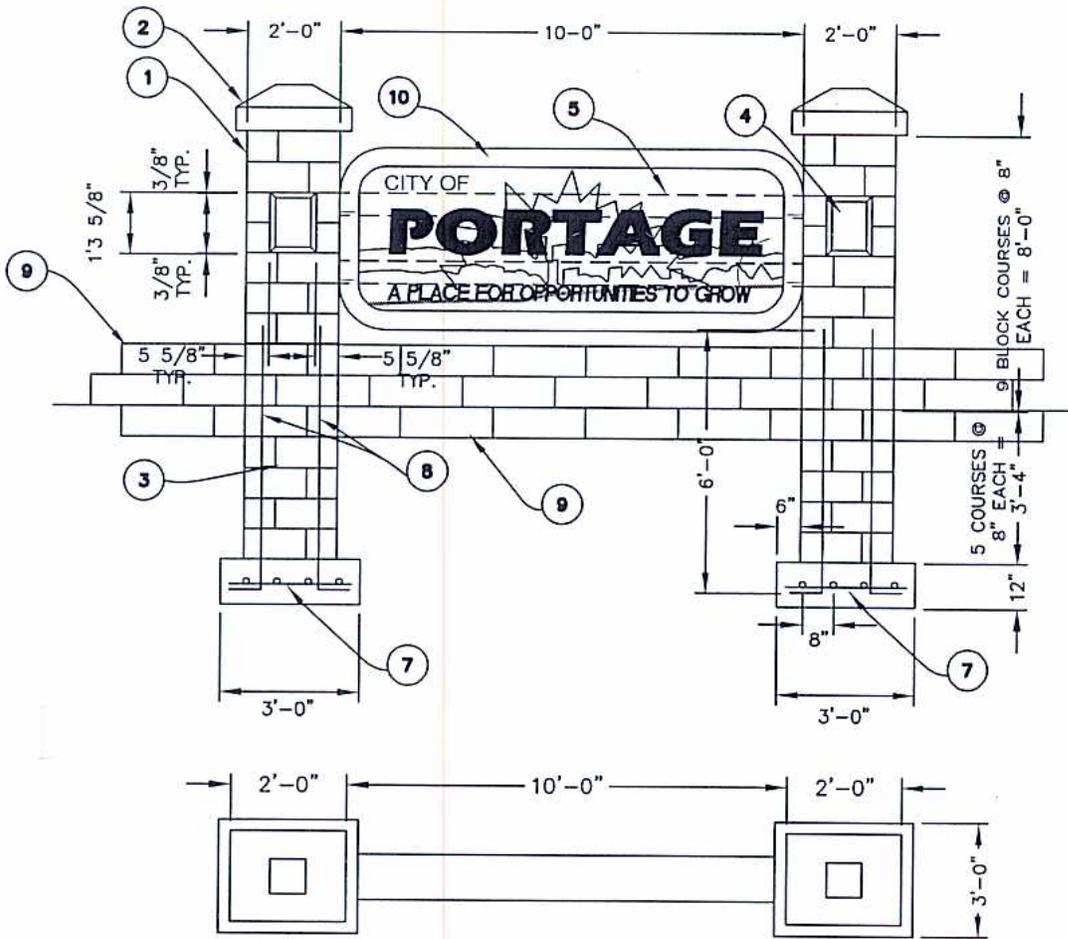
AUG'05
J&H

STANDARD
DESIGN SD-168

APPROVED BY *WCB*



TYP. COLUMN CAP
SCALE: 1/4" = 1'-0"



SIGN KEYNOTES

1. SPLIT FACE CONCRETE BLOCK, COLOR BLEND TO BE MIXTURE OF COLOR NO. 1 NATURAL AND NO W10 (LIGHT GREY). BLOCK AS MANUFACTURED BY 4D INC. MIDLAND, MICHIGAN, OR APPROVED EQUIVALENT.
2. CUT SMOOTH FINISH MANUFACTURED STONE.
3. STANDARD WEIGHT CONCRETE BLOCK.
4. MANUFACTURED STONE INSERTS - FRONT & REAR ONLY (TOTAL THICKNESS 5 1/8")
5. 2"x6"x10' PRESSURE TREATED WOOD MEMBER
6. 4"x4"x1/4" STEEL ANGLE 1 1/2" LENGTH. BOLT TO WOOD NAILER WITH 2 LAG SCREWS AND TO STONE END WALLS WITH (2) 1/2" BOLTS.
7. #5 RODS 8" O.C. EACH WAY.
8. (4) - #5 DOWEL RODS.
9. NEW CONCRETE BLOCK LANDSCAPE WALL INSTALL AS PER MANUFACTURERS RECOMMENDATIONS. (2 COURSES SHOWING ABOVE GRADE, 1 COURSE BURIED). COLOR TO BE SELECTED BY OWNER.
10. HIGH DENSITY CLEAR CEDAR (2" THICKNESS) W/WOOD SANDBLAST.
COLORS TO BE PANTONE AS FOLLOWS:
PORTAGE = RED 186
SUN = PROCESS YELLOW
BORDER = BLUE 300
STREAM = BLUE 300 (50% SCREENED DOWN)
BACKGROUND STRUCTURES = LIGHT GREEN 3252
FOREGROUND STRUCTURES = DARK GREEN 329

CITY OF PORTAGE

WELCOME TO PORTAGE
CITY SIGN

AUG'05
J&H

STANDARD
DETAIL

SD-169

APPROVED BY

WCB

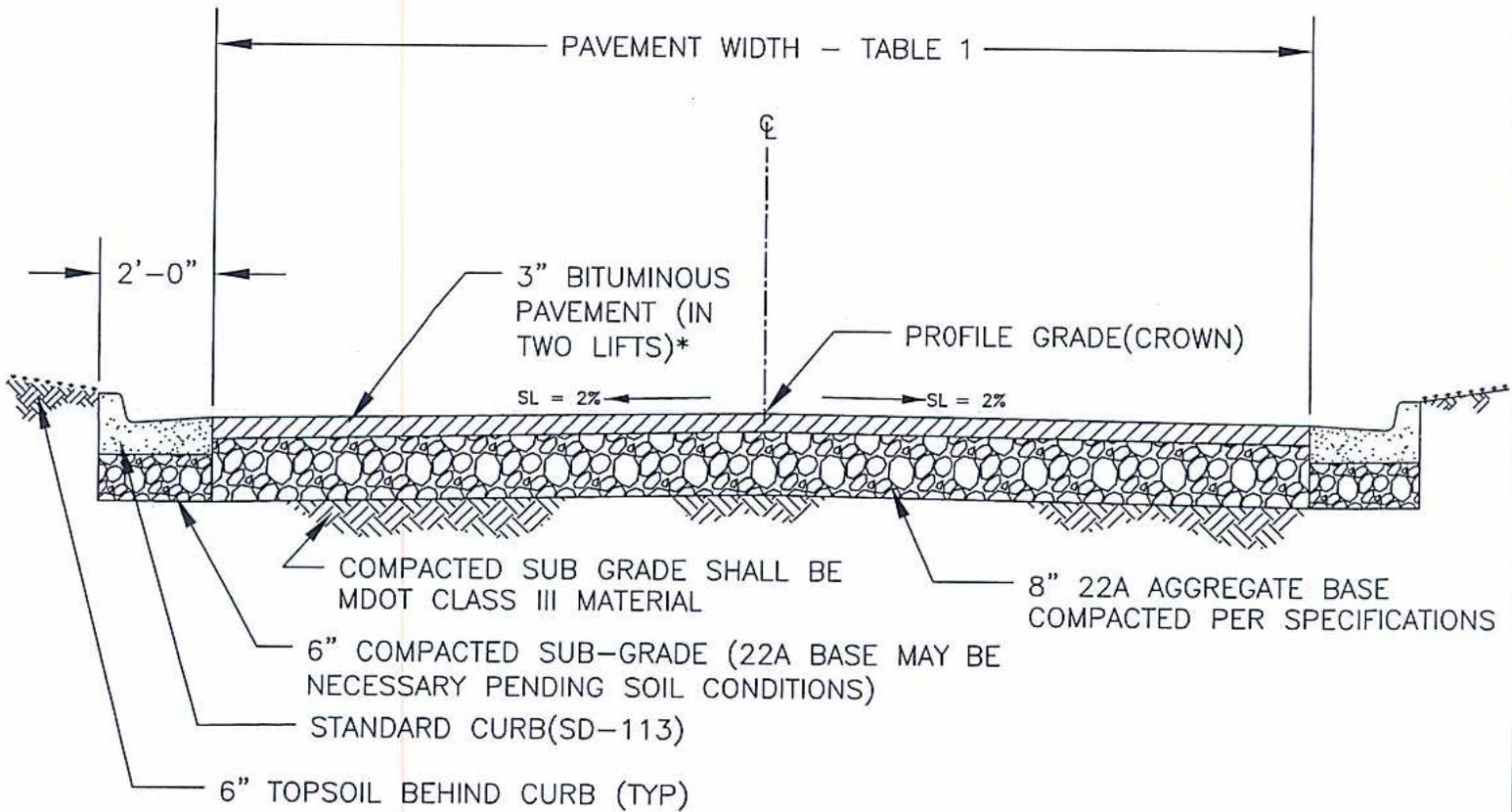


TABLE 1

LOT WIDTH (FRONTAGE ON A PUBLIC STREET)	PAVEMENT WIDTH
79' OR LESS	32'-0"
80' TO 99'	26'-0"
100' OR MORE	24'-0"

* BITUMINOUS PAVEMENT SHALL BE MDOT 36AA SURFACE COURSE AND MDOT 13A LEVELING COURSE

CITY OF PORTAGE

LOCAL ROADWAY
STANDARD SECTION

AUG.17.93
L.G.N.
AUG.07.95
drw(cad)
NOV. '97
drw(cad)

STANDARD DESIGN SD-170

JULY'05
J&H
JAN'07
JMA

APPROVED wcb