

NOTES:

- REFER TO VOLUME 2 HYDROLOGY STANDARDS OF THE CITY/COUNTY DRAINAGE MANUAL FOR ASSUMPTIONS MADE IN DERIVING THIS FIGURE.

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

**10-YEAR PEAK FLOW
SACRAMENTO METHOD
RAINFALL ZONE 2, <80 ACRES**

APPROVED BY:

Paul Murock

CITY ENGINEER

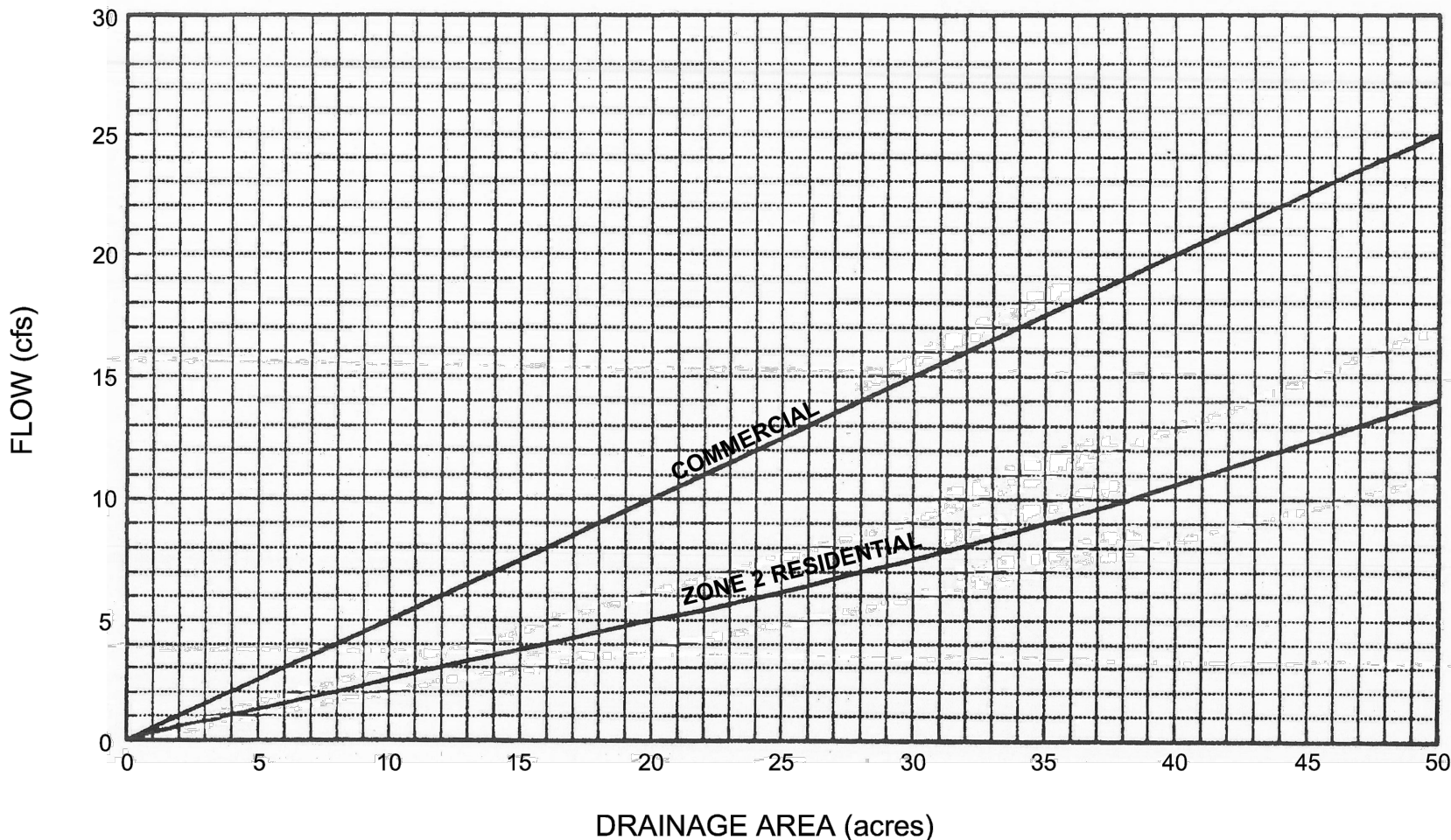
10/24/2018

DATE



DRAWING NUMBER

SD - 1



NOTES:

- Design runoff for multiple family development shall be based on the following formula:

$$Q_m = Q_r + (Q_c - Q_r)(I - 50) / 40$$

Where:

- RD-7 I = 60
- RD-10 I = 70
- RD-20 I = 80
- RD-30 I = 90

Source: County of Sacramento Master Drainage Plan, Part 1, County-wide Hydrology, Nolte and Assoc.

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

**DESIGN RUNOFF
NOLTE METHOD
DRAINAGE AREAS, <50 ACRES**

APPROVED BY:

Paul Murock

CITY ENGINEER

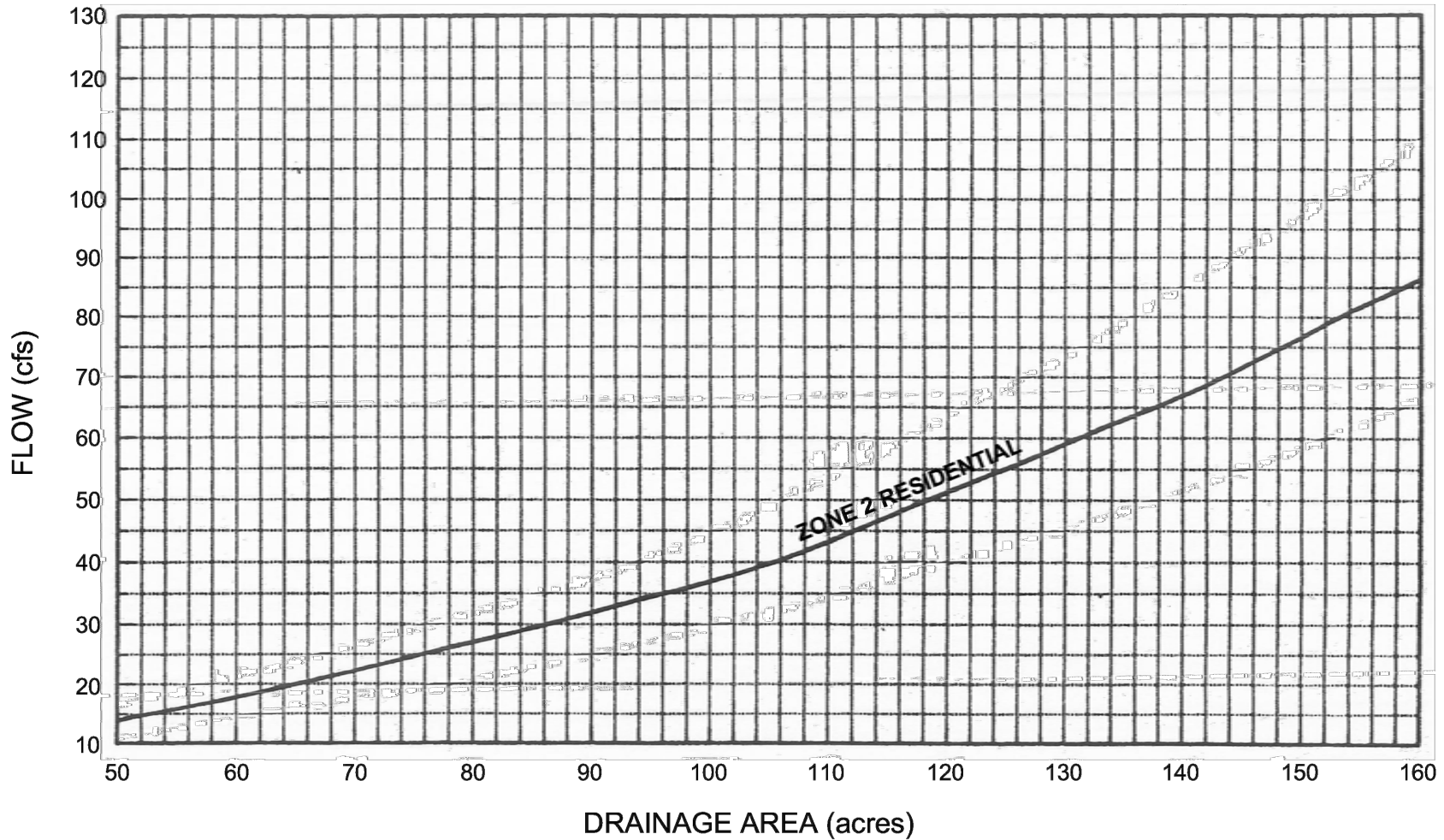
10/24/2018

DATE



DRAWING NUMBER

SD - 1A



NOTES:

- Design runoff for multiple family development shall be based on the following formula:

$$Q_m = Q_r + (Q_c - Q_r)(I - 50)/40$$

Where:

- RD-7 I = 60
- RD-10 I = 70
- RD-20 I = 80
- RD-30 I = 90

Source: County of Sacramento Master Drainage Plan, Part 1, County-wide Hydrology, Nolte and Assoc.

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

**DESIGN RUNOFF
NOLTE METHOD
RESIDENTIAL AREAS, 50-160 ACRES**

APPROVED BY:

Paul Murock

CITY ENGINEER

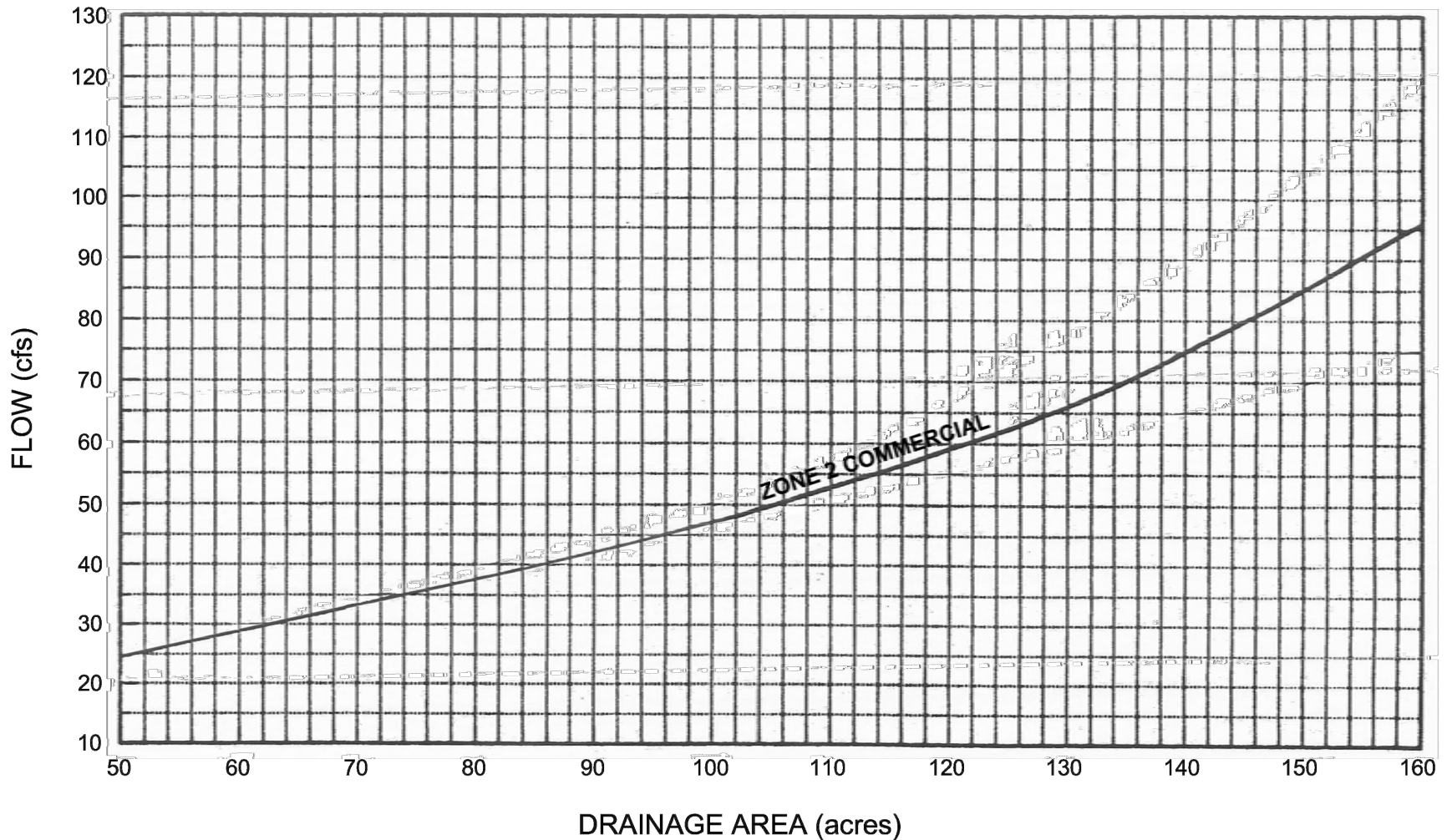
10/24/2018

DATE



DRAWING NUMBER

SD - 1B



Source: County of Sacramento Master Drainage Plan, Part 1, County-wide Hydrology, Nolte and Assoc.

DATE: 09/22/2007		NOT TO SCALE	
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CITY OF ELK GROVE - PUBLIC WORKS

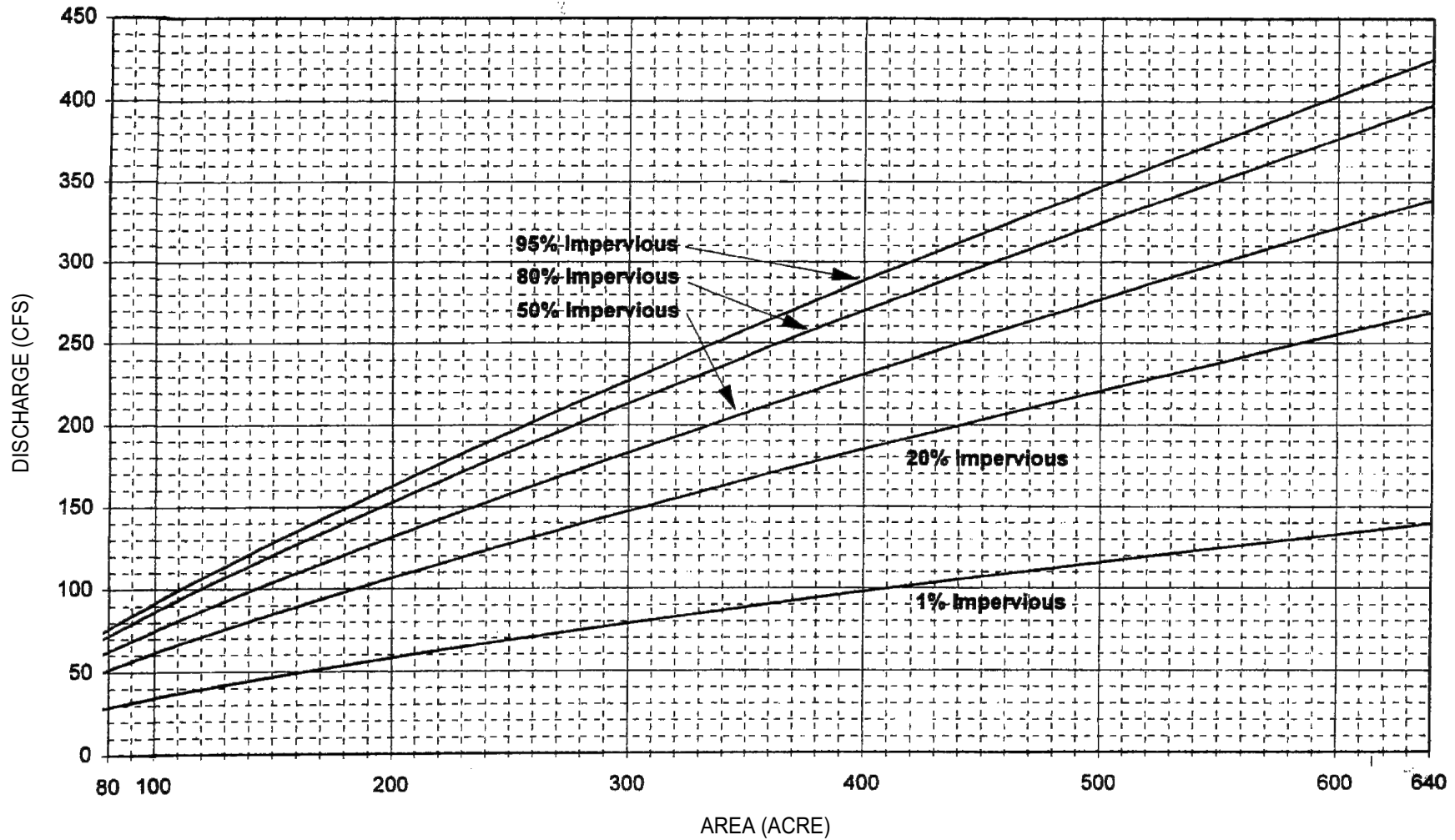
**DESIGN RUNOFF
NOLTE METHOD
COMMERCIAL AREAS, 50-160 ACRES**

APPROVED BY:
Paul M. Muddoch
CITY ENGINEER

10/24/2018
DATE

DRAWING NUMBER
SD - 1C





NOTES:

- REFER TO VOLUME 2 HYDROLOGY STANDARDS OF THE CITY/COUNTY DRAINAGE MANUAL FOR ASSUMPTIONS MADE IN DERIVING THIS FIGURE.

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CITY OF ELK GROVE - PUBLIC WORKS

**10-YEAR PEAK FLOW
SACRAMENTO METHOD
RAINFALL ZONE 2, 80-640 ACRES**

APPROVED BY:

Paul Murock

CITY ENGINEER

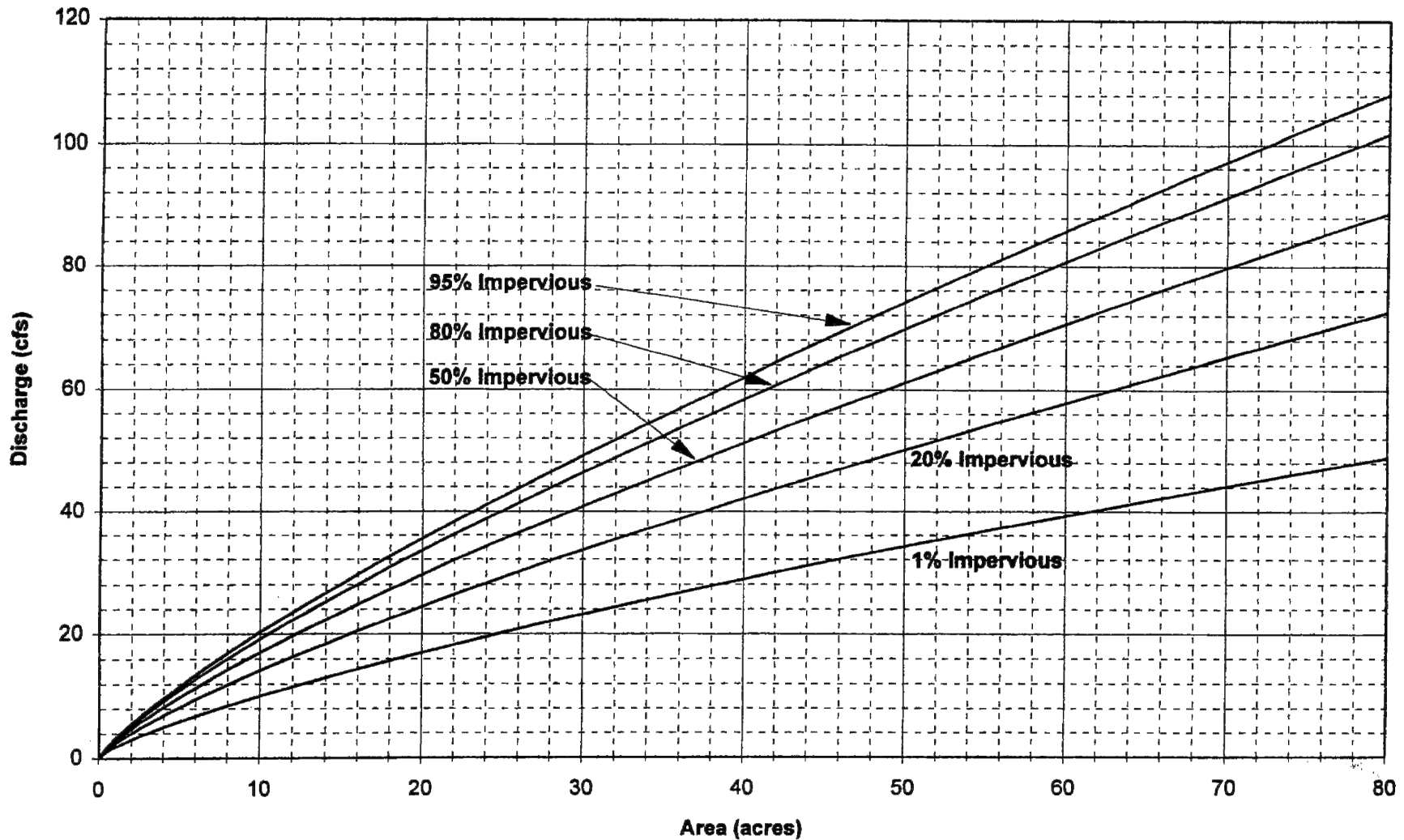
10/24/2018

DATE



DRAWING NUMBER

SD - 2



NOTES:

- REFER TO VOLUME 2 HYDROLOGY STANDARDS OF THE CITY/COUNTY DRAINAGE MANUAL FOR ASSUMPTIONS MADE IN DERIVING THIS FIGURE.

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

**100-YEAR PEAK FLOW
SACRAMENTO METHOD
RAINFALL ZONE 2, <80 ACRES**

APPROVED BY:

Paul M. Muddock

CITY ENGINEER

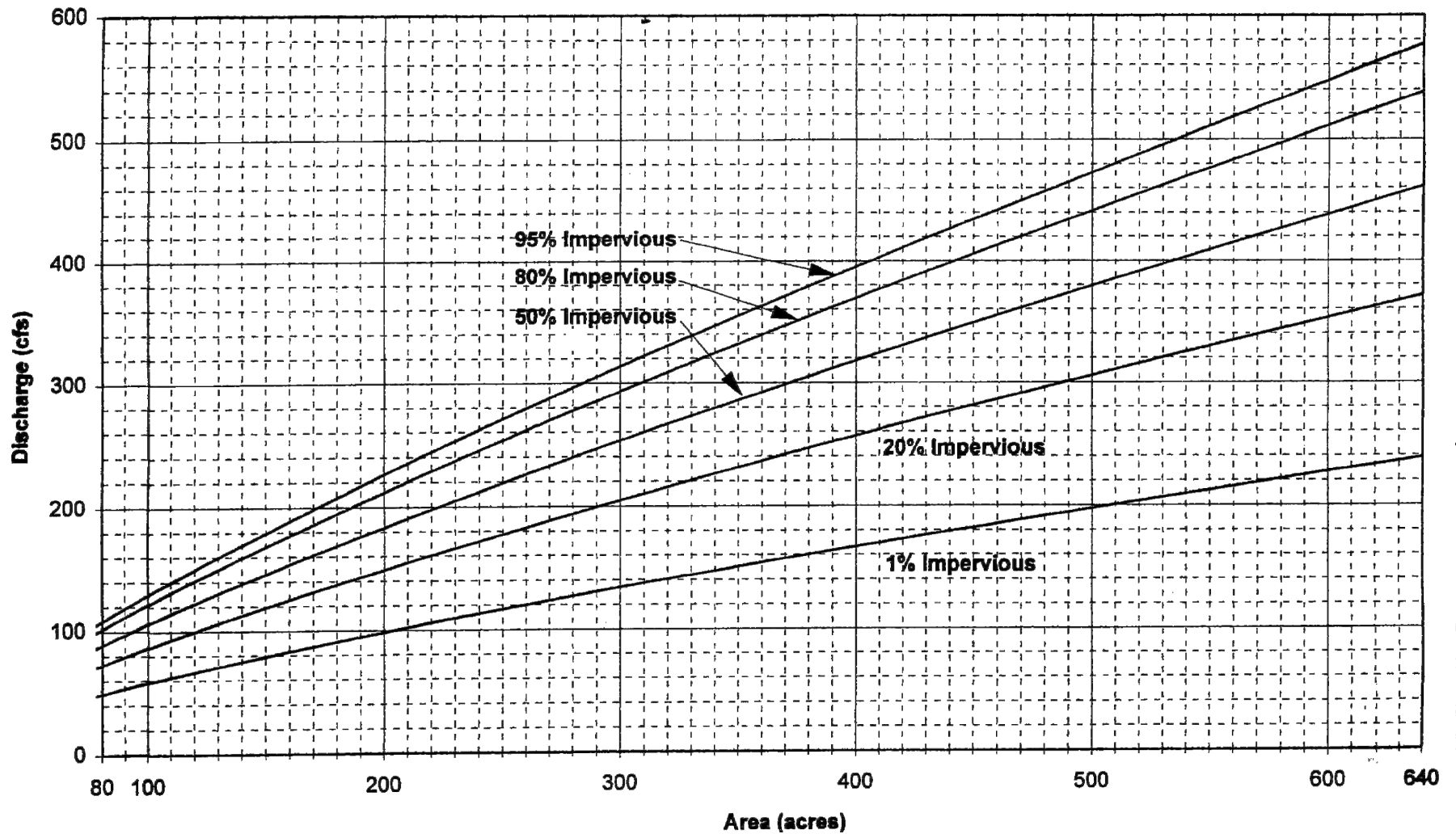
10/24/2018

DATE



DRAWING NUMBER

SD - 3



NOTES:

- REFER TO VOLUME 2 HYDROLOGY STANDARDS OF THE CITY/COUNTY DRAINAGE MANUAL FOR ASSUMPTIONS MADE IN DERIVING THIS FIGURE.

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

**100-YEAR PEAK FLOW
SACRAMENTO METHOD
RAINFALL ZONE 2, 80-640 ACRES**

APPROVED BY:

Paul M. Muddock

CITY ENGINEER

10/24/2018

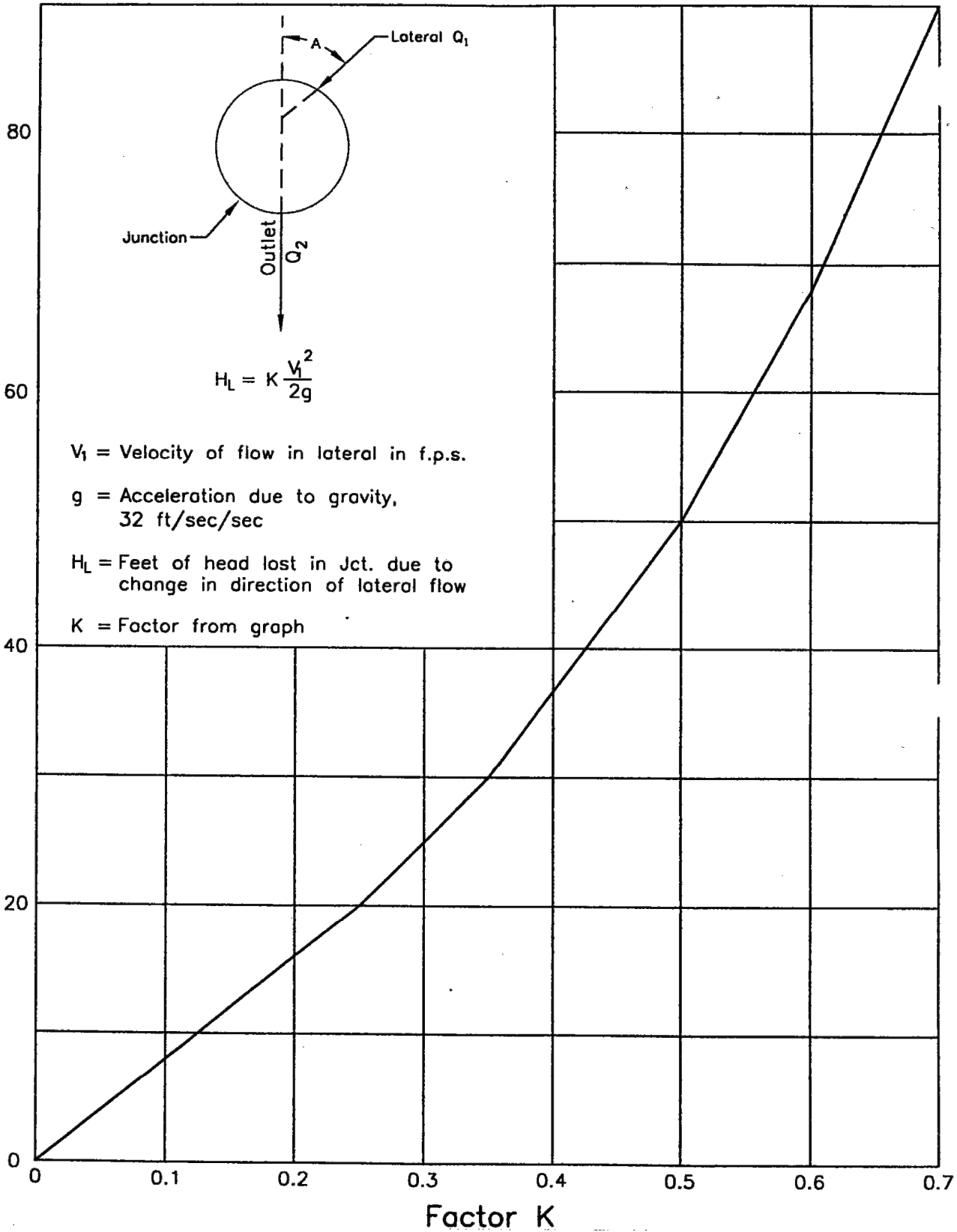
DATE



DRAWING NUMBER

SD - 4


Degree of Angle "A" Between Lateral & Outlet



DATE: 09/22/2017		NOT TO SCALE	
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CITY OF ELK GROVE - PUBLIC WORKS

**LOSS IN JUNCTION DUE TO CHANGE
IN DIRECTION OF FLOW IN LATERAL**

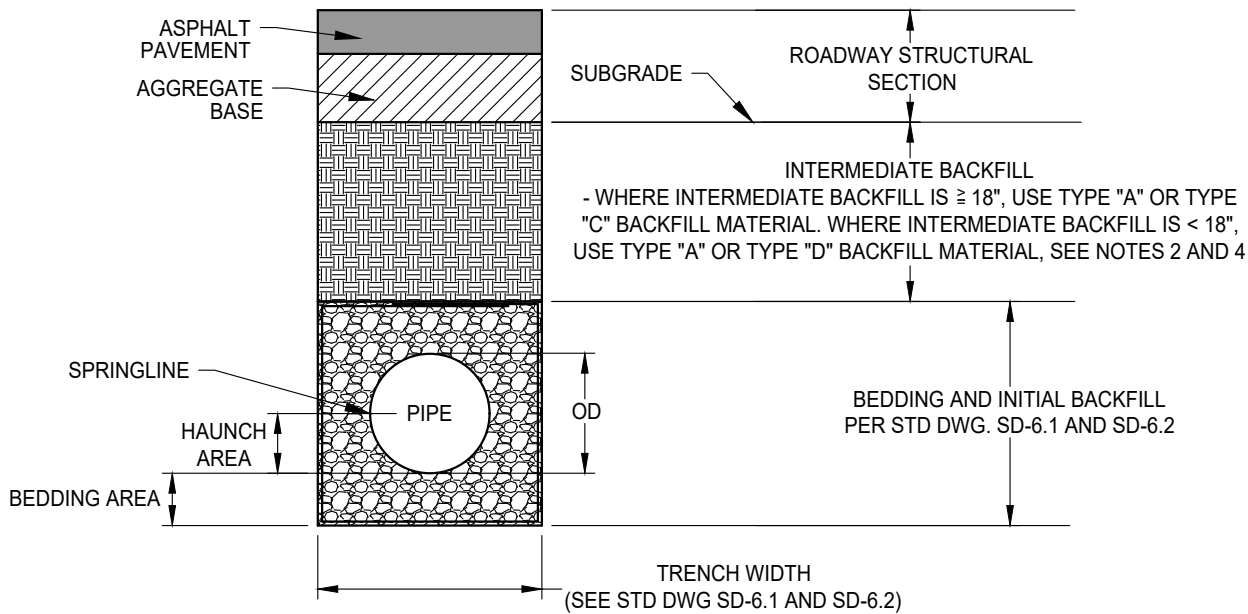
APPROVED BY:

 CITY ENGINEER

10/24/2018
 DATE

DRAWING NUMBER
SD - 5



**STORM DRAIN
TRENCH DETAIL**



BACKFILL MATERIALS

TYPE "A" BACKFILL MATERIAL: 3/4" CLASS II AB AS PER SECTION 50 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.

TYPE "B" BACKFILL MATERIAL: 3/4" CLEAN CRUSHED ROCK AS PER SECTION 50 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.

TYPE "C" BACKFILL MATERIAL: JOB EXCAVATED NATIVE MATERIAL FREE OF ORGANIC OR UNSUITABLE MATERIALS THAT CAN CAUSE VOIDS OR DEPRESSIONS TO DEVELOP DURING OR AFTER PLACEMENT OF THE BACKFILL. ROCKS, STONES, AND SOLID EARTH CHUNKS EXCEEDING 3-INCHES IN GREATEST DIMENSION ARE NOT ALLOWED.

TYPE "D" BACKFILL MATERIAL: CONTROLLED DENSITY FILL AS PER SECTION 50 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.

TYPE "E" BACKFILL MATERIAL: CLASS "C" CONCRETE AS PER SECTION 50 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.

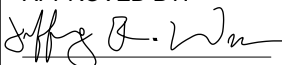
NOTES:

1. GEOTEXTILE SHALL BE INSTALLED AS PER STD DWG SD-6.1, SD-6.2, AND AS PER SECTION 50 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.
2. INTERMEDIATE BACKFILL TO BE PLACED IN 8" MAXIMUM LOOSE LIFTS AS PER SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.
3. CUTOFF COLLARS TO BE INSTALLED EVERY MANHOLE RUN AS PER STD DWG SD-6.3 AND AS PER SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.
4. IF ROADWAY SUBGRADE IS WITHIN 24" OF TOP OF PIPE, RCP PIPE IS REQUIRED & BEDDING AND INITIAL BACKFILL SHALL CONFORM TO SHALLOW PIPE DETAILS AS PER STD DWG SD-6.1.


DATE 02-16-2022		NOT TO SCALE	
REVISION	BY	APPROVED	DATE
01	STN	SA	02-16-2022

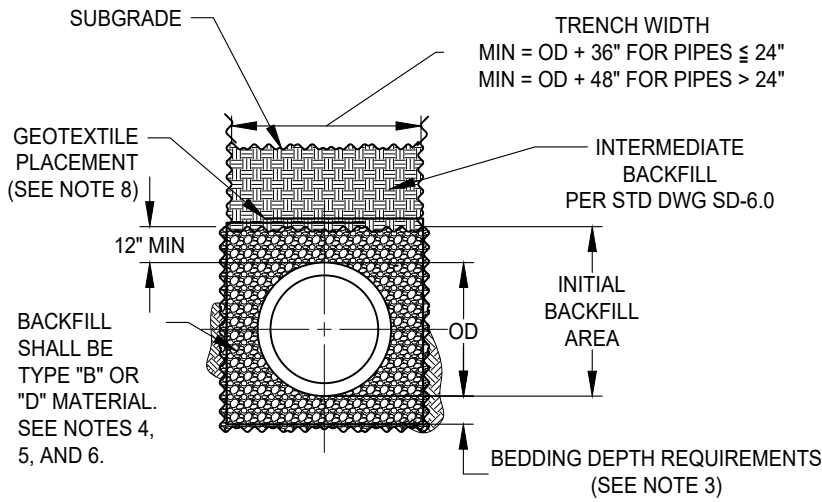
CITY OF ELK GROVE - PUBLIC WORKS

STORM DRAIN TRENCH DETAIL

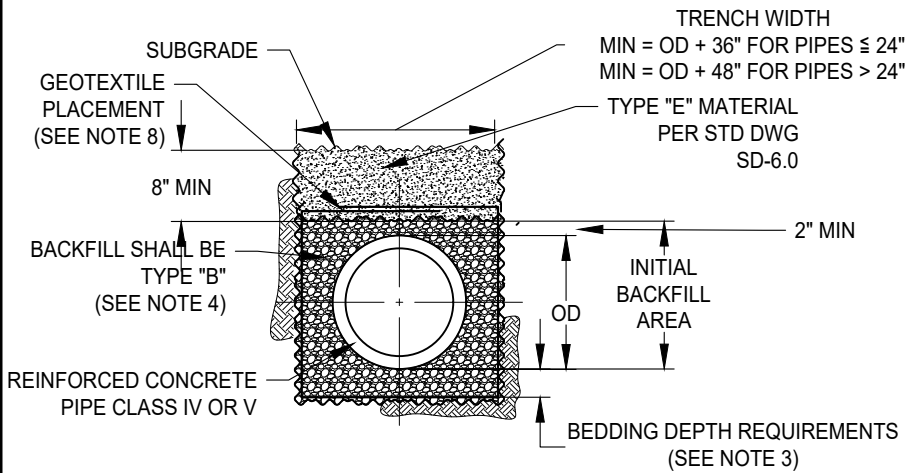
APPROVED BY:

 CITY ENGINEER DATE: 04-29-2024

DRAWING NUMBER
SD - 6.0

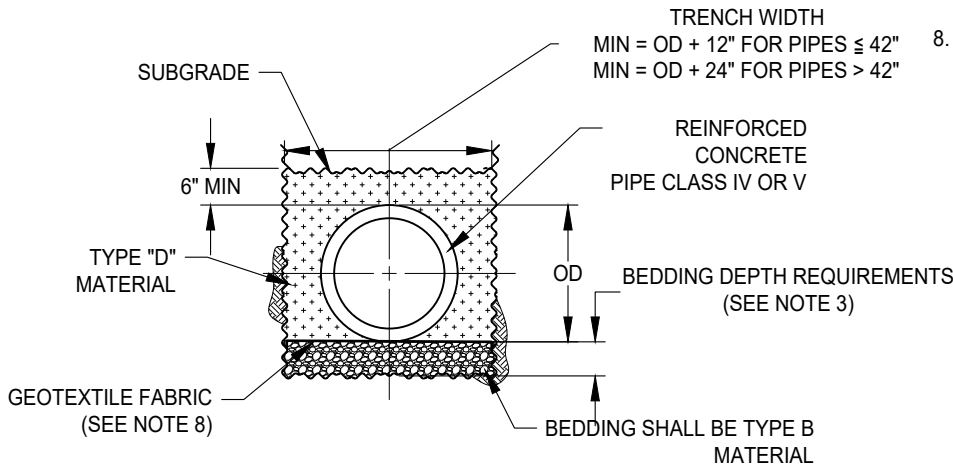




BACKFILL REQUIREMENTS



**BACKFILL REQUIREMENTS FOR SHALLOW PIPE -
OPTION 1**



**BACKFILL REQUIREMENTS FOR SHALLOW PIPE -
OPTION 2**

NOTES:

1. INITIAL BACKFILL MATERIAL SHALL BE THOROUGHLY COMPACTED AROUND PIPE AS PER SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.
2. "TRENCH EXCAVATION, BEDDING AND BACKFILL" AS PER SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.
3. MINIMUM DEPTH OF BEDDING SHALL BE THE GREATER OF:
4" MIN FOR PIPES WITH ID ≤ 48"
6" MIN FOR PIPES WITH ID > 48"
OR
THE DIFFERENCE BETWEEN THE OD OF THE PIPE BARREL AND THE BELL PLUS 1.5".

FOR ROCKY OR UNSUITABLE BEDDING CONDITIONS, SEE SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS FOR TYP. BEDDING REQUIREMENTS.

4. IF MINIMUM TRENCH WIDTH CANNOT BE ACHIEVED, TYPE "D" MATERIAL SHALL BE USED IN LIEU OF TYPE "B" MATERIAL AT NO EXTRA COST.
5. IF BOTTOM OF ROADWAY STRUCTURAL SECTION (SUBGRADE) IS WITHIN 12" OF TOP OF PIPE, BEDDING AND INITIAL BACKFILL SHALL BE PER ONE OF THE TWO SHALLOW PIPE DETAILS ON THIS SHEET.
6. FOR ADDITIONAL INITIAL BACKFILL MATERIAL OPTIONS FOR 48" AND LARGER RCP, SEE SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS.
7. SEE STD DWG SD-6.0 AND SECTION 19 OF THE CITY STANDARD CONSTRUCTION SPECIFICATIONS FOR BACKFILL MATERIAL DEFINITIONS AND ADDITIONAL REQUIREMENTS.
8. GEOTEXTILE FABRIC SHALL BE INSTALLED AS FOLLOWS FOR RCP & PLASTIC PIPE:

- PER SECTION 19 OF CITY STANDARD CONSTRUCTION SPECIFICATIONS.
- FOR DRY TRENCH CONDITIONS - PLACE ON TOP OF INITIAL BACKFILL MATERIAL OR BETWEEN THE BEDDING AND THE TYPE D MATERIAL. EXTENDING A 2" EDGE FACING DOWN ON THE TRENCH SIDES.
- FOR SATURATED TRENCH CONDITIONS - WRAP TYPE B MATERIALS WITH GEOTEXTILE FABRIC. OVERLAP THE FABRIC EDGES AT LEAST TWO FEET (2') ON TOP OF INITIAL BACKFILL MATERIAL OR BEDDING MATERIAL.


DATE 02-16-2022		NOT TO SCALE	
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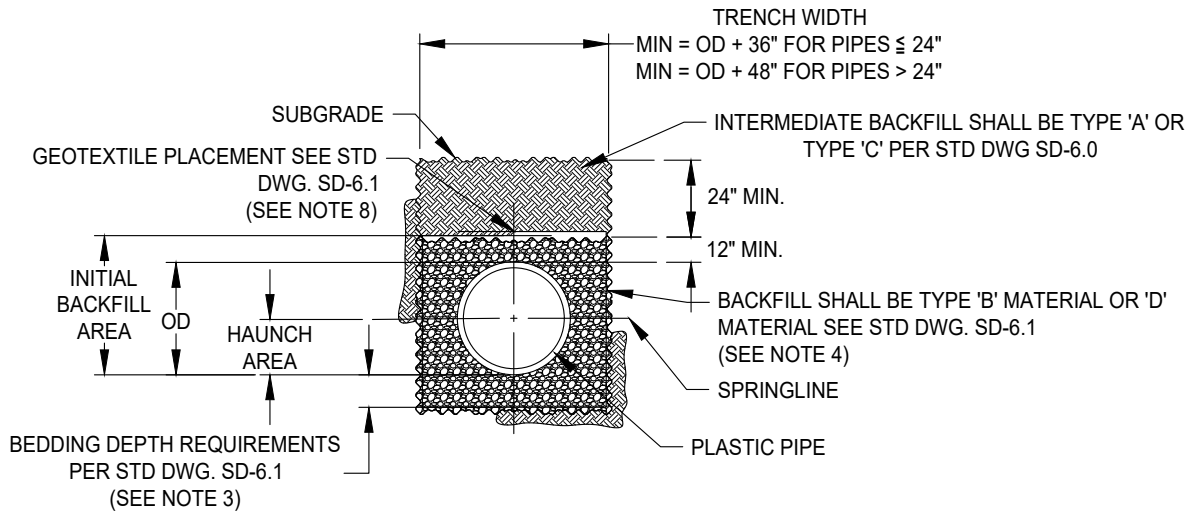
CITY OF ELK GROVE - PUBLIC WORKS

**STORM DRAIN REINFORCED
CONCRETE PIPE BEDDING AND
INITIAL BACKFILL**

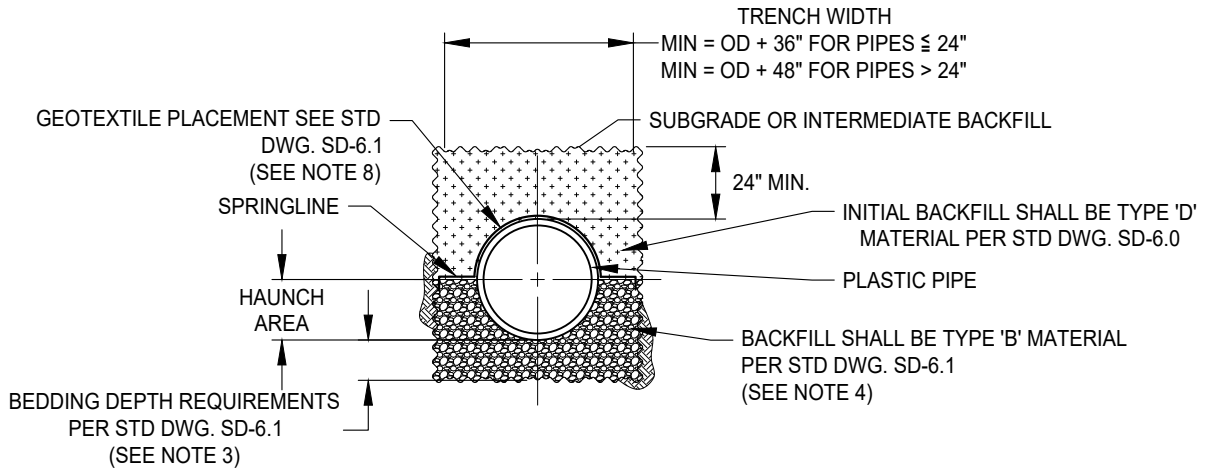
APPROVED BY:
Jeffrey B. Wan 04-29-2024
CITY ENGINEER DATE

DRAWING NUMBER
SD - 6.1

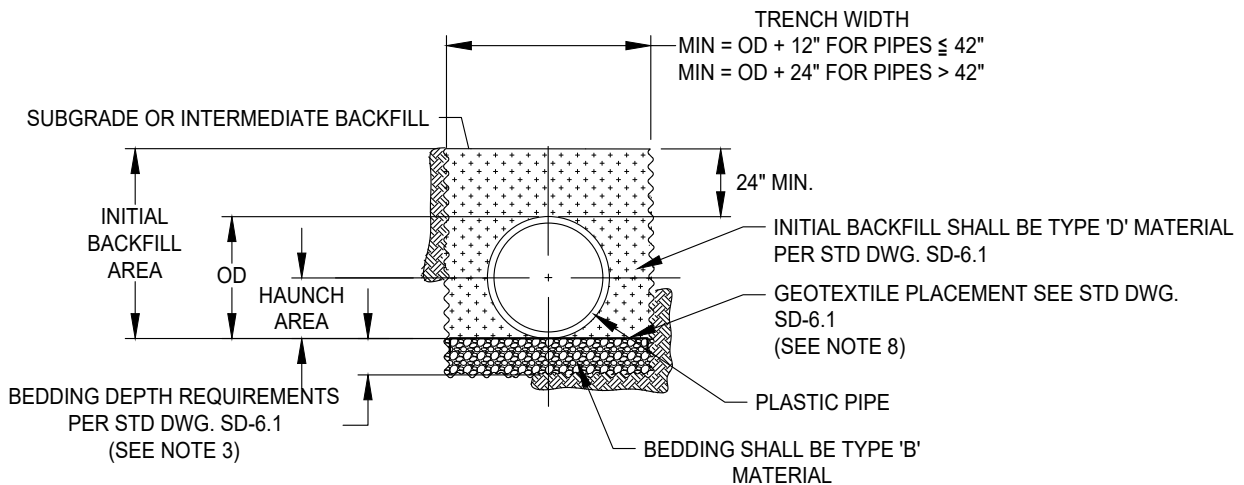




BACKFILL REQUIREMENTS FOR PLASTIC PIPE 12" TO 42" DIAMETER ONLY



INITIAL BACKFILL REQUIREMENTS FOR PLASTIC PIPE (12" TO 60" DIAMETER) - OPTION 1



INITIAL BACKFILL REQUIREMENTS FOR PLASTIC PIPE (12" TO 60" DIAMETER) - OPTION 2


DATE 02-16-2022		NOT TO SCALE	
REVISION	BY	APPROVED	DATE
1	STN	SA	02-16-2022

CITY OF ELK GROVE - PUBLIC WORKS

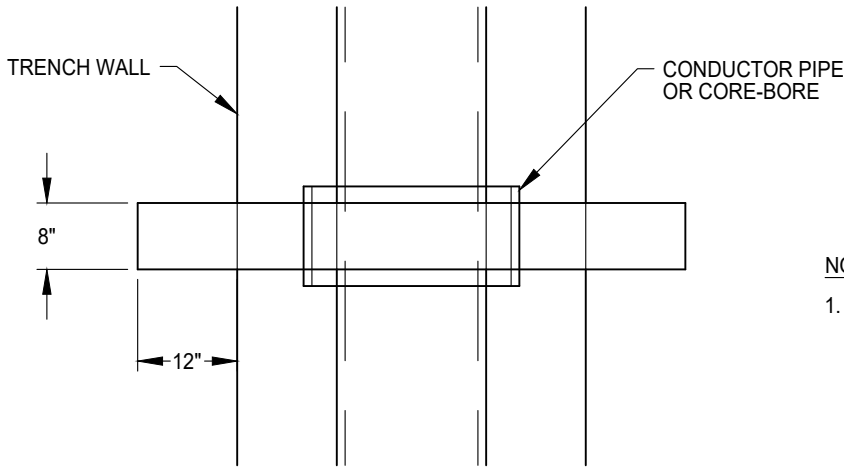
**STORM DRAIN PLASTIC PIPE
BEDDING AND INITIAL BACKFILL**

APPROVED BY:
Jeffrey B. Wan 04-29-2024
CITY ENGINEER DATE

DRAWING NUMBER
SD - 6.2

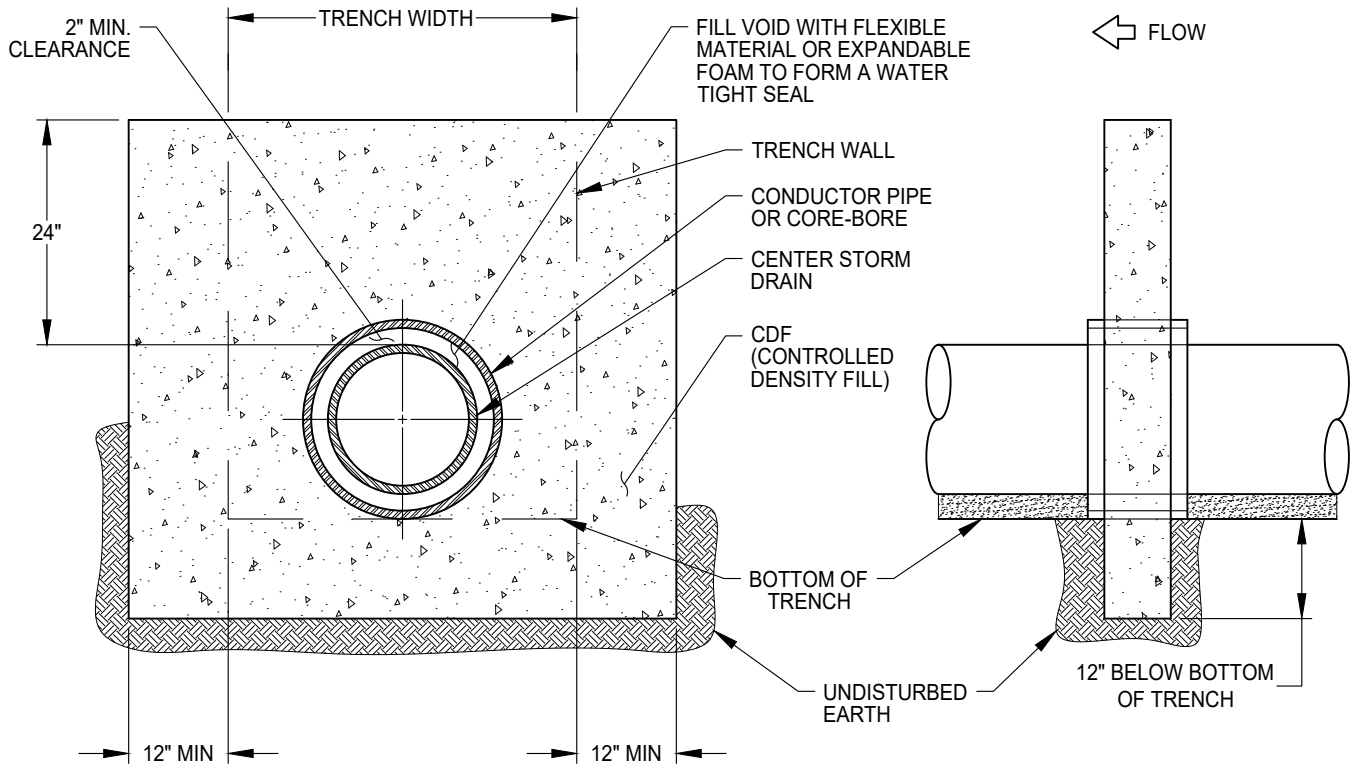


FLOW
↓



NOTES:

1. TOP OF COLLAR TO EXTEND INTO INTERMEDIATE BACKFILL 12" MINIMUM OR TOP OF GROUND WATER HGL.



DATE 02-16-2022		NOT TO SCALE	
REVISION	BY	APPROVED	DATE
01	STN	SA	02-16-2022

CITY OF ELK GROVE - PUBLIC WORKS

APPROVED BY:
Jeffrey B. Wan 04-29-2024
CITY ENGINEER DATE

CUTOFF COLLAR



DRAWING NUMBER

SD - 6.3

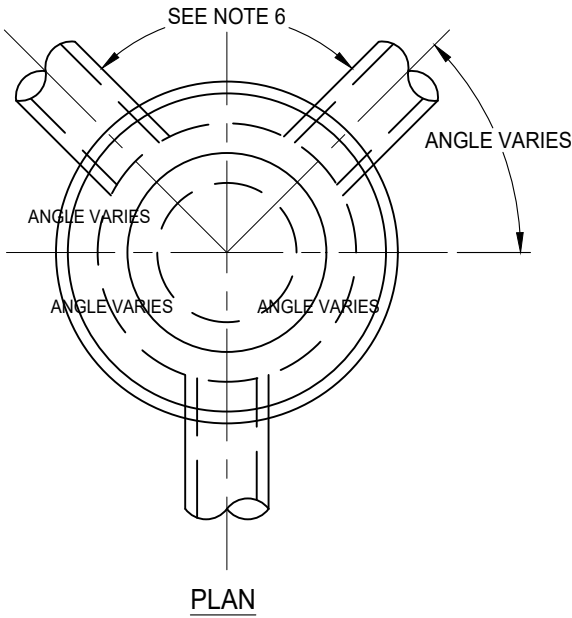
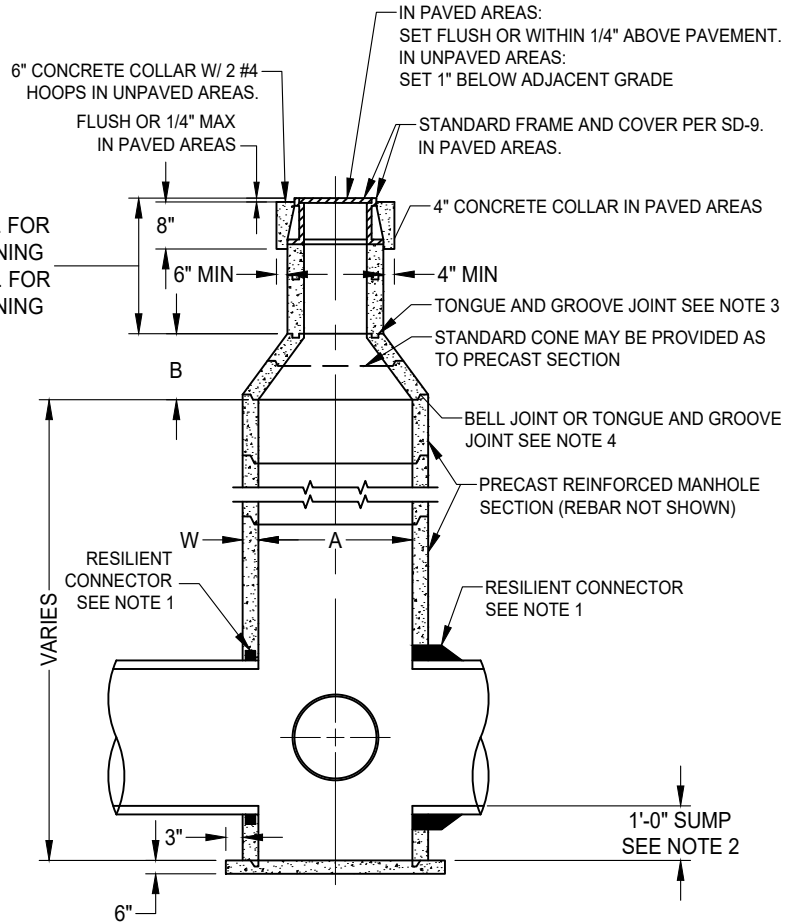


TABLE OF MINIMUM DIMENSIONS

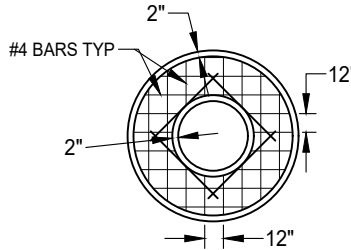
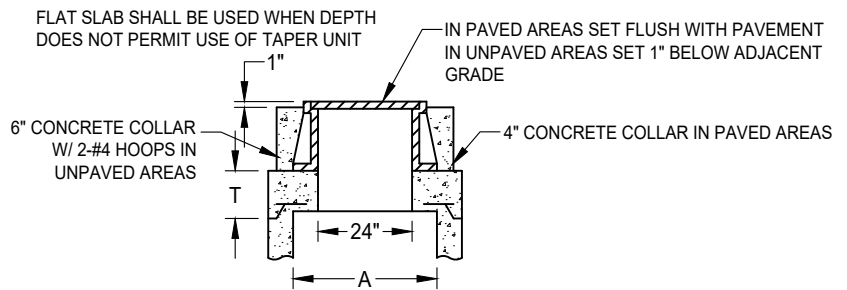
M.H.	A	B	T*	W
48"	48"	18"	8"	4'
60"	60"	28"	9"	6'
72"	72"	SEE NOTE 8	10"	7'

NOTES:

- ON ALL PIPES UP TO 30" I.D. USE FLEXIBLE COMPRESSION GASKET OR BOOT CONNECTOR CONFORMING TO ASTM C-923. CONNECTION SHALL BE WATER AND SOIL TIGHT. FOR PIPES GREATER THAN 30" I.D., BASE MAY BE CAST-IN-PLACE AND A WATER STOP CONFORMING TO ASTM C-923 SHALL BE USED.
- SUMP SHALL BE 1'-0" DEEP, MEASURED FROM INVERT OF OUTFALL PIPE. SUMP NOT REQUIRED IF OUTFALL PIPE IS 24" I.D. OR LARGER.
- RISER SECTIONS, CONES, AND ADJUSTING RINGS SHALL CONFORM TO ASTM C-478.
- ALL JOINTS SHALL BE MADE WITH PREFORMED PLASTIC JOINT SEALING COMPOUND. FOLLOWING INSTALLATION GROUT ALL INTERIOR AND EXTERIOR JOINTS.
- CONCENTRIC COMPONENTS SHALL BE USED UNLESS OTHERWISE SPECIFIED ON THE PLANS.
- PRECAST MANHOLES SHALL BE SIZED TO PROVIDE THE FOLLOWING: THE ANNULAR SPACE ON THE INSIDE OF THE MANHOLE BARREL BETWEEN CORED PIPE CONNECTION HOLES SHALL BE A MINIMUM OF 10 INCHES, IF THE CONNECTION HOLE IS CAST MONOLITHICALLY WITH THE MANHOLE BARREL THE MEASUREMENT SHALL BE TAKEN FORM THE FINISHED CONCRETE CONNECTION.
- SEE SECTION 39, CONSTRUCTION SPECIFICATIONS, "MANHOLES"
- CONE FOR MANHOLES GREATER THAN 60" DIAMETER SHALL BE INDIVIDUALLY DESIGNED.



PROFILE




FLAT SLAB TOP

DATE: 09/22/2017		NOT TO SCALE	
REVISION	BY	APPROVED	DATE
1	SJB	SMA	04-12-2024


CITY OF ELK GROVE - PUBLIC WORKS

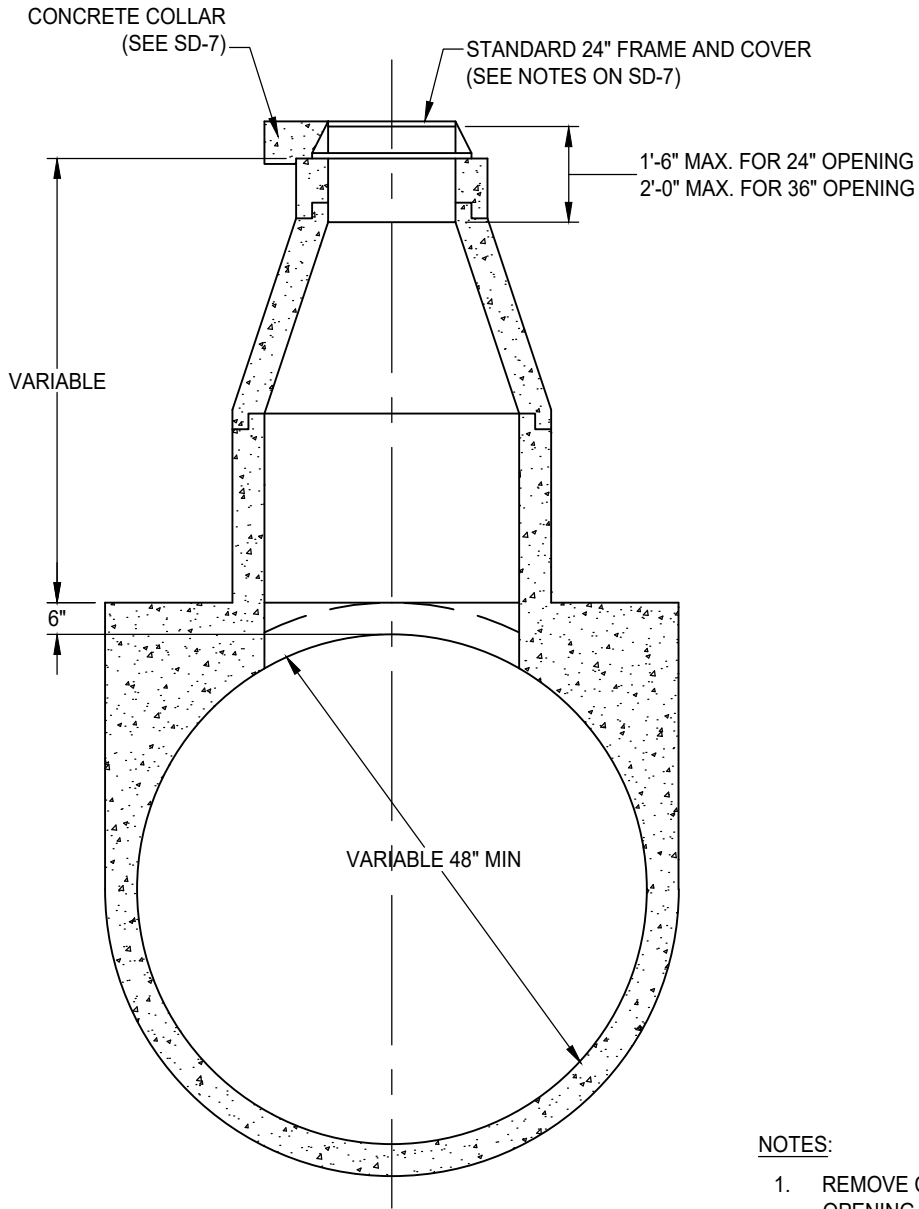
STANDARD PRECAST CONCRETE DRAINAGE MANHOLE

APPROVED BY:  05-28-2024
DATE

CITY ENGINEER DATE

DRAWING NUMBER
SD - 7





TYPE A
CAST-IN-PLACE PIPE ONLY

NOTES:

1. REMOVE CONCRETE IN MANHOLE OPENING AND CONSTRUCT RISER BASE WHILE CONCRETE IS STILL WORKABLE.
2. PLACE RISER SECTION AFTER CONCRETE HAS SET.
3. SEE SECTION 39, "MANHOLES," AND SECTION 36, CAST-IN-PLACE CONCRETE PIPE.

DATE: 09/22/2017		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

APPROVED BY:

Paul Murock

10/24/2018

CITY ENGINEER

DATE

TYPE A
SADDLE MANHOLE

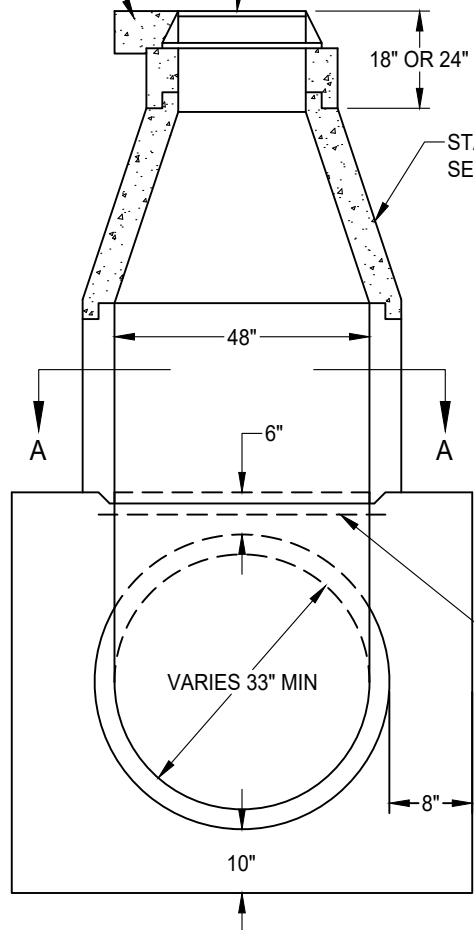


DRAWING NUMBER

SD - 8A

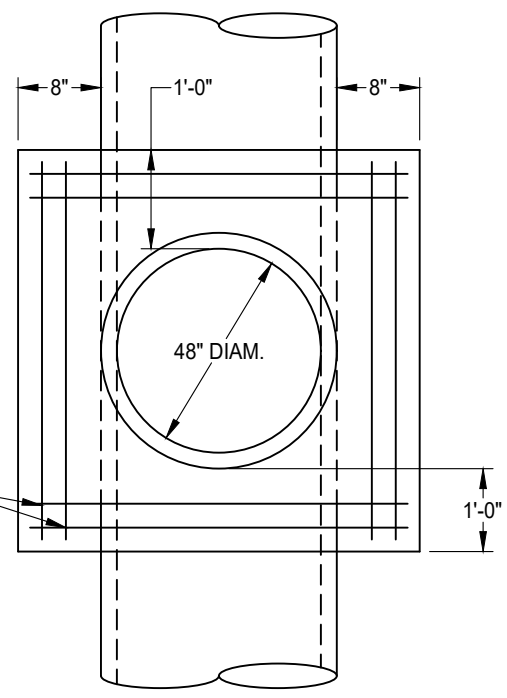
CONCRETE COLLAR
(SEE STD DWG SD-7)

STANDARD 24" FRAME AND COVER
(SEE NOTES ON STD DWG SD-7)



TYPE B

STANDARD MANHOLE SECTION



SECTION A-A

2 #5 BARS
EACH WAY


NOTES:

1. CONCRETE SHALL BE CLASS "A" IN CONFORMANCE WITH ARTICLE 50-5 "PORTLAND CEMENT CONCRETE."
2. SEE SECTION 39, "MANHOLES."

DATE: 09/22/2017		NOT TO SCALE	
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1	SJB	SMA	04-12-2024


CITY OF ELK GROVE - PUBLIC WORKS

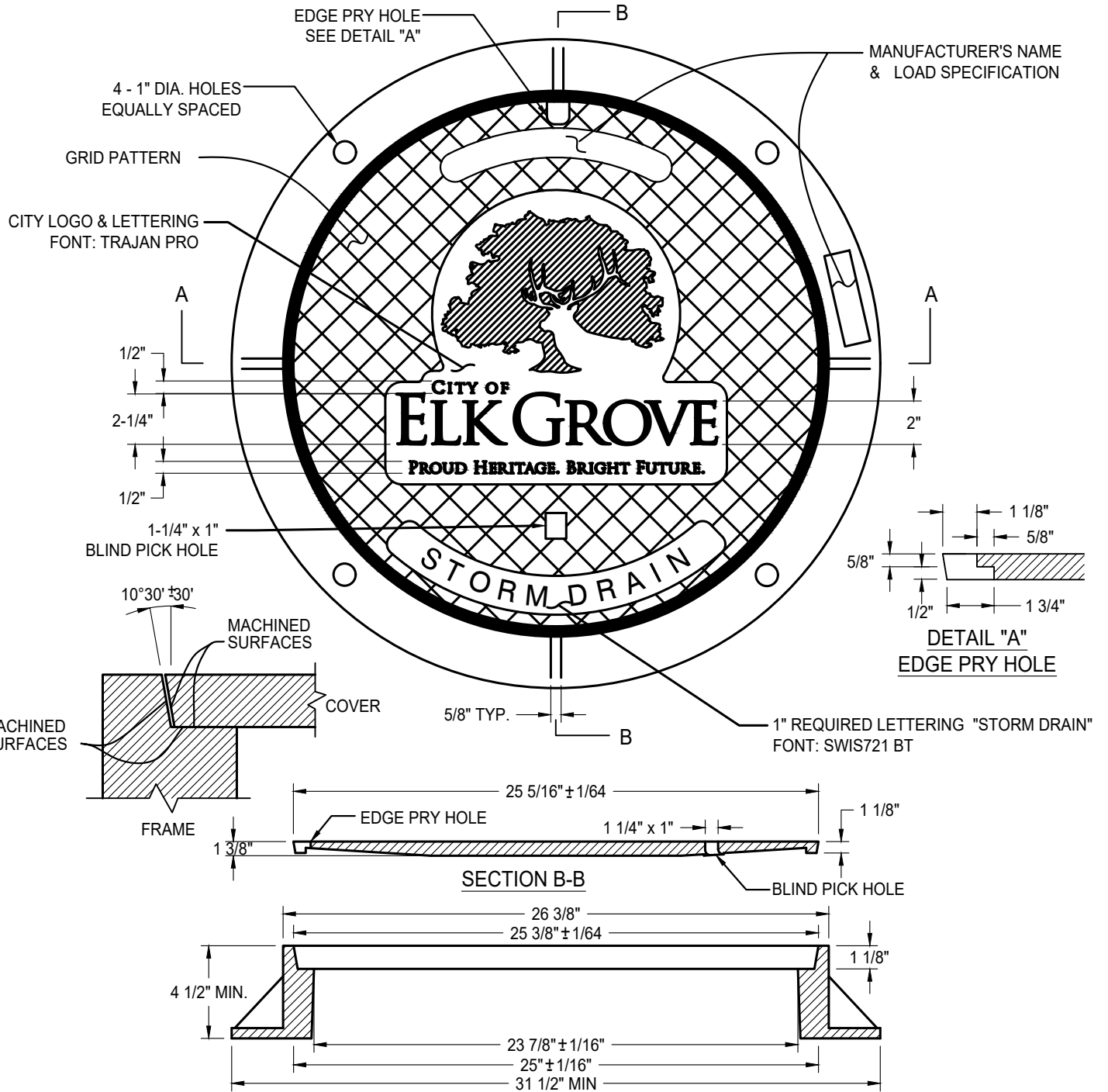
**TYPE B
SADDLE MANHOLE**

APPROVED BY:

CITY ENGINEER

05-28-2024
DATE

DRAWING NUMBER
SD - 8B





NOTES:

1. ALL CASTINGS TO CONFORM TO ASTM A48, CLASS 35B. CONTACT CITY OF ELK GROVE FOR IMAGE FILE.
2. FRAME AND COVER TO MEET AASHTO M-306-10 LOAD SPECIFICATIONS & MANUFACTURER'S PERFORMANCE REQUIREMENTS FOR POSITION & FIT.
3. FRAME AND COVER SHALL HAVE A COATING OF BLACK BITUMINOUS MATERIAL.
4. A TAMPER RESISTANT BOLTED TYPE FRAME & COVER SHALL BE USED IN EASEMENT AREAS UNLESS OTHERWISE APPROVED.

APPROX. SET WEIGHT	
FRAME	163 LBS
COVER	135 LBS
TOTAL	298 LBS


DATE 12/26/2018		NOT TO SCALE	
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CITY OF ELK GROVE - PUBLIC WORKS

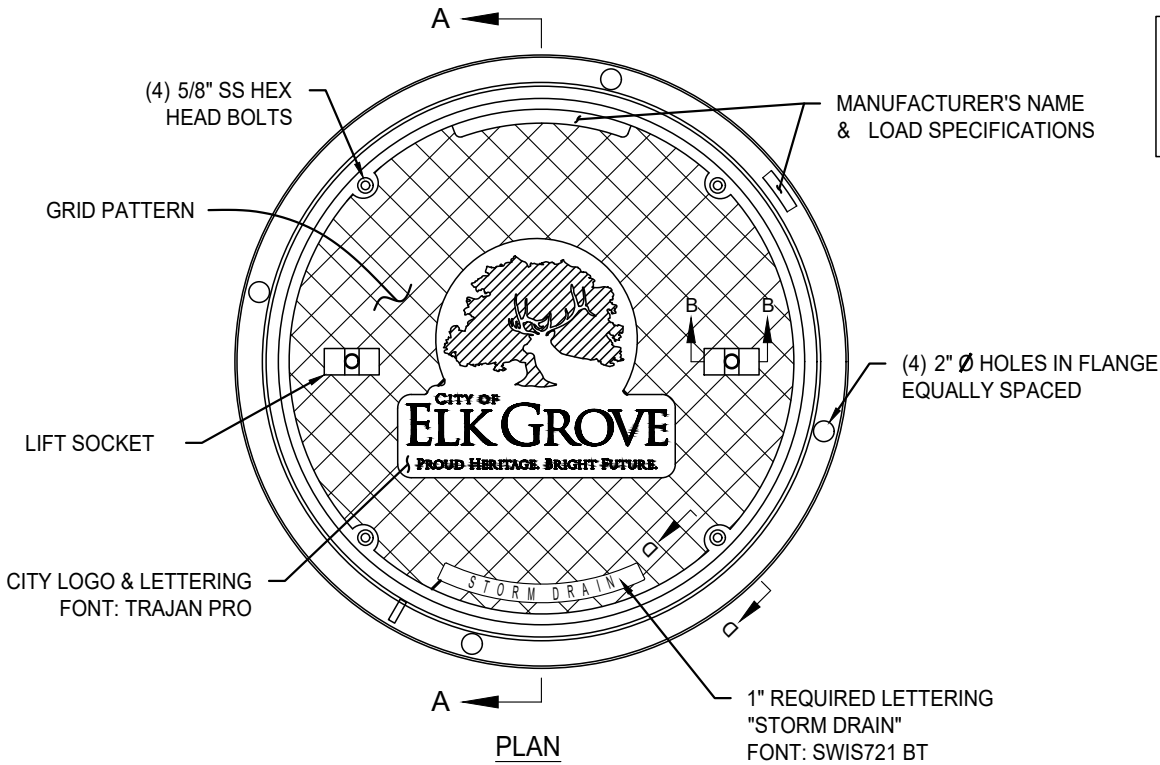
**GREY CAST IRON
STANDARD 24" MANHOLE
FRAME & COVER WITH CITY LOGO**

APPROVED BY:
Paul Muddock 02/26/2021
CITY ENGINEER DATE

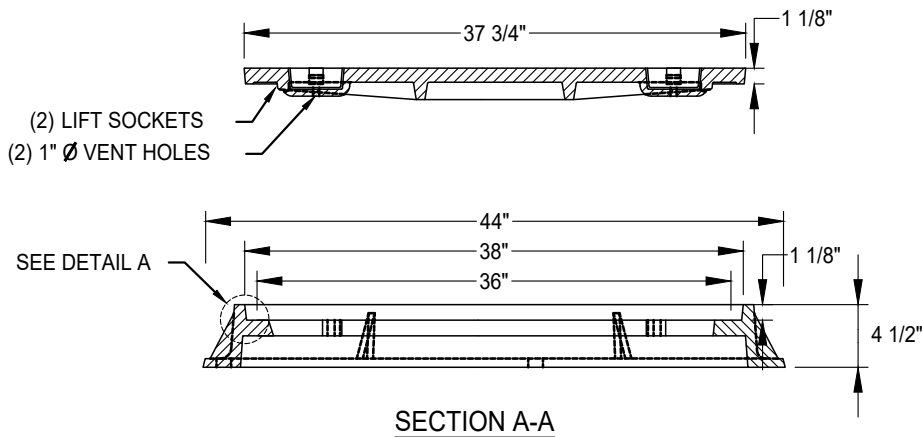
DRAWING NUMBER
SD - 9



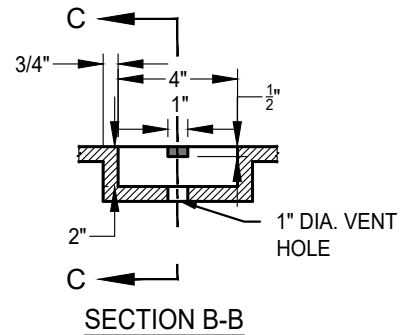
SET WEIGHT	
FRAME	334 LBS
COVER	197 LBS
TOTAL	531 LBS



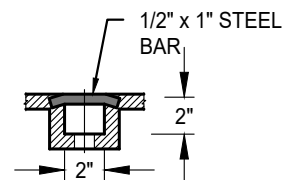
PLAN



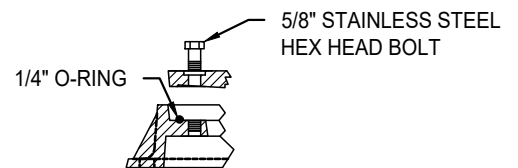
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

NOTES:

1. ALL CASTINGS TO CONFORM TO ASTM A48, CLASS 35B.
2. FRAME AND COVER TO MEET H-20 LOAD SPECIFICATIONS.
3. MACHINED HORIZONTAL AND VERTICAL BEARING SURFACES NOT TO EXCEED 1/64" TOLERANCE.
4. FRAME AND COVER SHALL HAVE A COATING OF BLACK BITUMINOUS PAINT.
5. LOCKING COVER TYPE FRAME AND COVERS SHALL BE USED WHEN SPECIFIED IN CONTRACT DOCUMENTS.
6. H20 RATED SLOTTED GRATE OR GRATE TYPE MANHOLE COVER MAY BE SUBSTITUTE FOR COVER WHEN SPECIFIED IN CONTRACT DOCUMENTS OR UPON APPROVAL OF DIRECTOR.
7. COVER SHALL BE "STORM DRAIN" STAMPED.

DATE XXXX		NOT TO SCALE	
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01	STN	SA	3/27/24

CITY OF ELK GROVE - PUBLIC WORKS

**GREY CAST IRON
STANDARD 36" MANHOLE
FRAME & COVER**

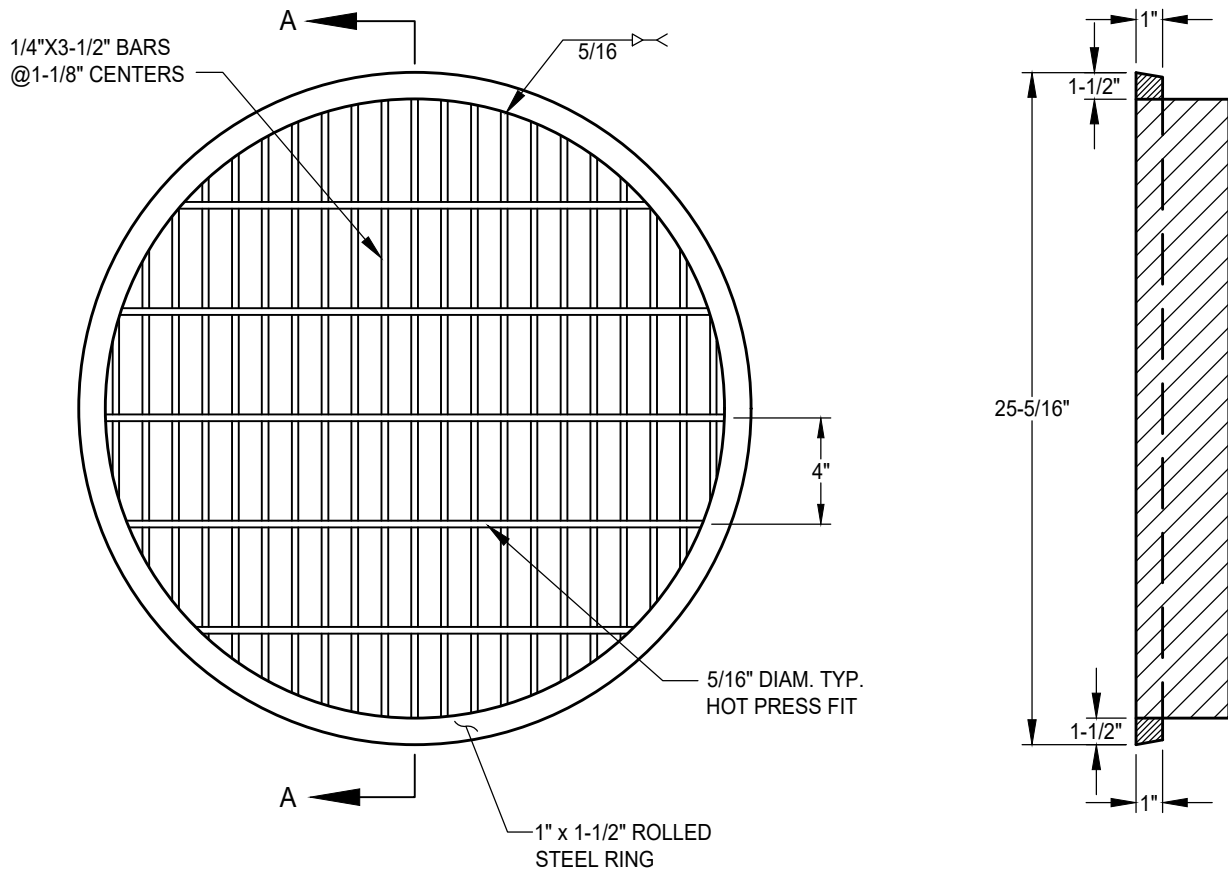
APPROVED BY:

Jeffrey B. Wan 04-19-2024
CITY ENGINEER DATE



DRAWING NUMBER

SD - 10



SECTION A-A

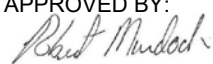
NOTES:

1. MANHOLE COVER SHALL FIT FRAME SHOWN ON STANDARD DRAWING SD-9.
2. SEATING SURFACES SHALL BE MACHINED AS SHOWN IN DETAIL ON STANDARD DRAWING SD-9.
3. THIS COVER MAY BE USED ONLY WITH APPROVAL OF THE CITY ENGINEER.
4. GALVANIZE AFTER FABRICATION.


DATE: 09/22/2017		NOT TO SCALE	
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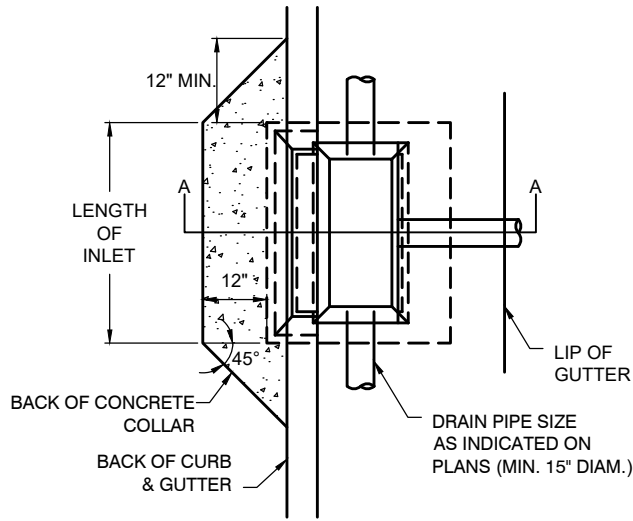
CITY OF ELK GROVE - PUBLIC WORKS

GRATE TYPE MANHOLE COVER

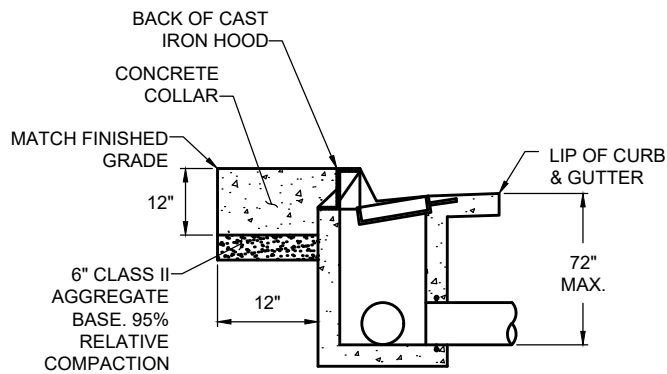
APPROVED BY:

 10/24/2018
 CITY ENGINEER DATE

DRAWING NUMBER
SD - 11





PLAN



SECTION A-A

NOTES:

1. TO BE USED ON TYPE 1A AND TYPE 2 CURB AND GUTTER WHERE INLETS ARE AT DETACHED SIDEWALKS.

DATE: 09/22/2017		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

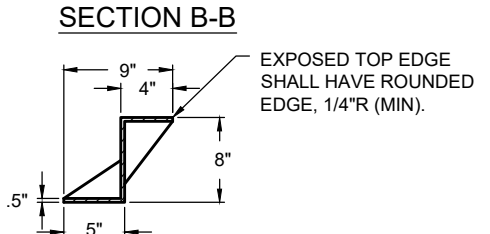
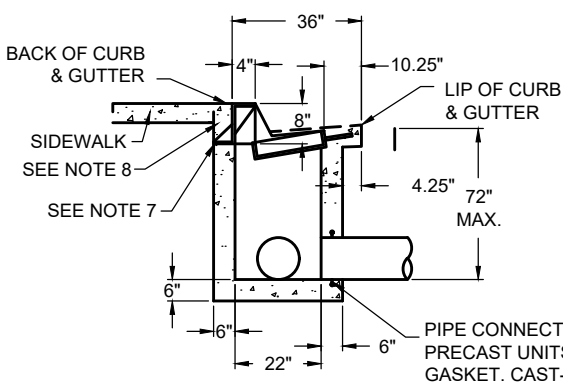
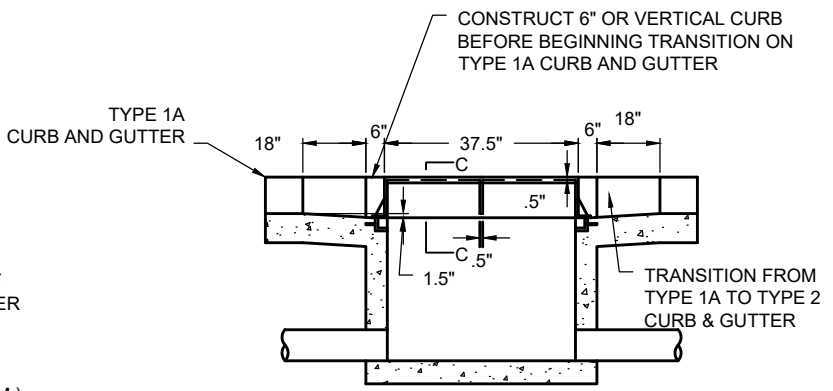
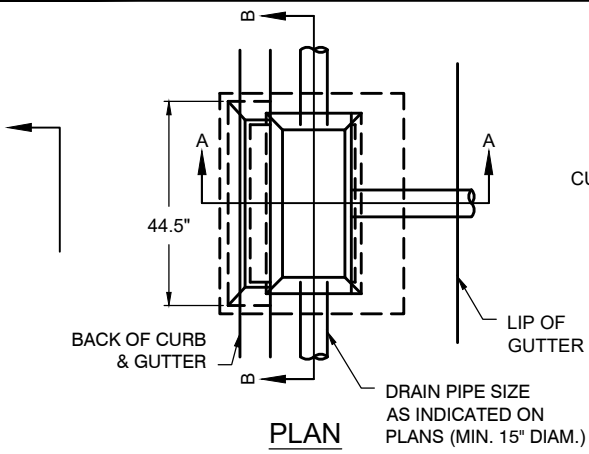
CITY OF ELK GROVE - PUBLIC WORKS

**DROP INLET
TYPE B
AT DETACHED SIDEWALK**

APPROVED BY:
Paul Murbach
CITY ENGINEER 10/24/2018
DATE



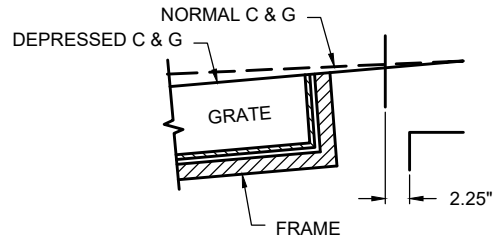
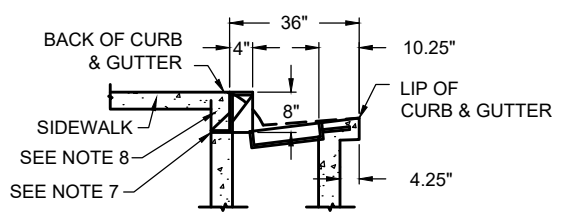
DRAWING NUMBER
SD - 12.1



**SECTION A-A
TYPE 2-VERTICAL C&G**

**SECTION C-C
OPEN-BACK HOOD (CAST IRON)**

PIPE CONNECTIONS SHALL CONFORM TO ASTM C-923. PRECAST UNITS SHALL BE BOOT TYPE OR COMPRESSION GASKET. CAST-IN-PLACE UNITS SHALL INCLUDE A WATER STOP.



**SECTION A-A
TYPE 1A - ROLLED C&G**

**CURB AND GUTTER
WITH FRAME DETAIL**

NOTES:

1. STANDARD DEPRESSION FOR INLET IS 1-1/2" AND LIP OF GUTTER MUST BE SET BACK 3" FROM GUTTER FLOW LINE.
2. FRAME AND GRATE SHALL CONFORM TO STANDARD DRAWINGS SD-14 AND SD-15.
3. OPEN-BACK HOOD SHALL BE H-20 RATED.
4. EXPOSED EDGES SHALL HAVE A 1/8" R (MINIMUM).
5. AN EDGING TOOL SHALL BE USED ON ALL EDGES WHERE THE CONCRETE SIDEWALK AND CURB MEET THE TOP OF THE HOOD.
6. ALL EXPOSED PARTS TO BE HOT DIP GALVANIZED PER ASTM A123, AFTER FABRICATION.
7. SEE SD-12.1 FOR INSTALLATION OF INLETS AT DETACHED SIDEWALKS.
8. INCREASE SIDEWALK THICKNESS TO 8" IN ORDER TO ANCHOR CAST IRON HOOD AND INLET WALL. WIDTH TO BE 6" MINIMUM.
9. WHEN MORE THAN ONE GRATE IS PROPOSED, STD DWG SD-16 FOR SUPPORT ASSEMBLY.

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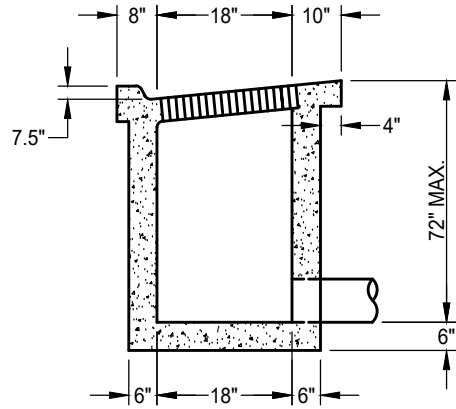
**DROP INLET
TYPE B**

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Paul Murbach
CITY ENGINEER

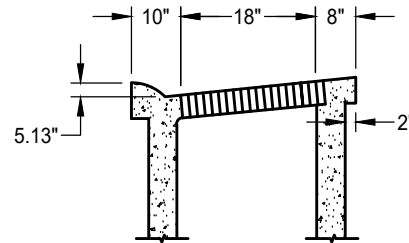
10/24/2018
DATE

DRAWING NUMBER
SD - 12

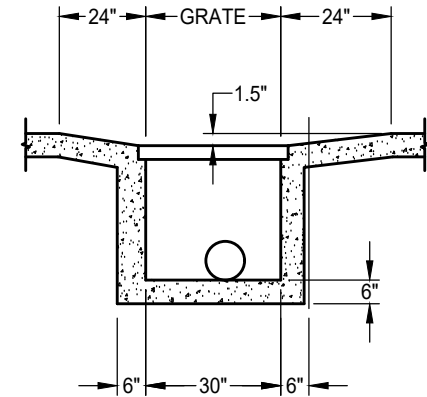




TYPE 2 CURB

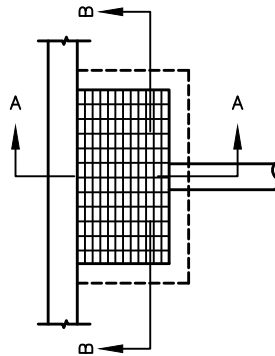


TYPE 1A CURB



SECTION B-B

SECTION A-A



NOTES:

1. STANDARD DEPRESSION FOR INLET IS 1-1/2".
2. FRAME AND GRATE SHALL CONFORM TO STANDARD DRAWINGS SD-14 AND SD-15.
3. OPEN-BACK HOOD SHALL BE H-20 RATED.
4. ALL EXPOSED EDGES SHALL HAVE A 1/8" R (MINIMUM).
5. AN EDGING TOOL SHALL BE USED ON ALL EDGES WHERE THE CONCRETE SIDEWALK AND CURB MEET THE TOP OF THE HOOD.
6. ALL EXPOSED PARTS TO BE HOT DIP GALVANIZED PER ASTM A123, AFTER FABRICATION.

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**DROP INLET
TYPE C**

APPROVED BY:

Paul Murock

02/17/2021

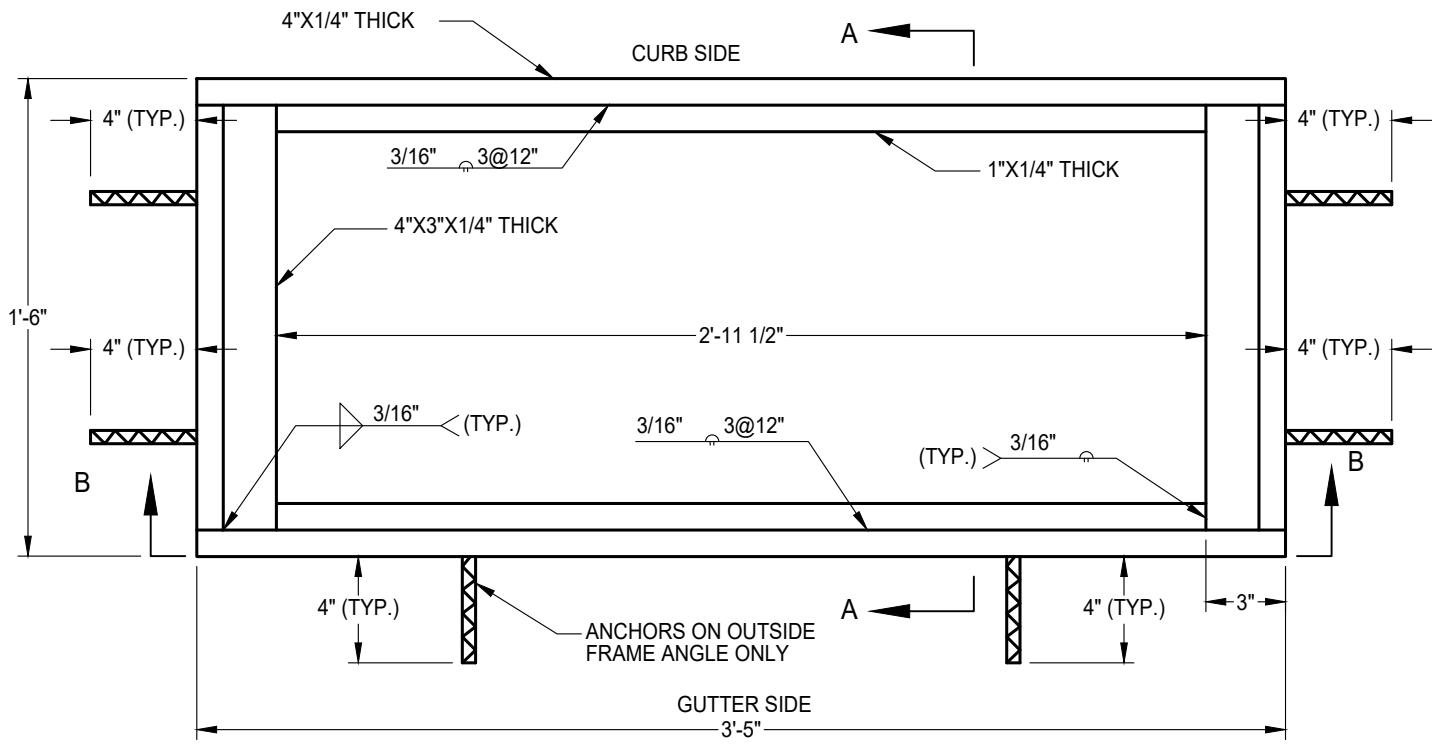
CITY ENGINEER

DATE

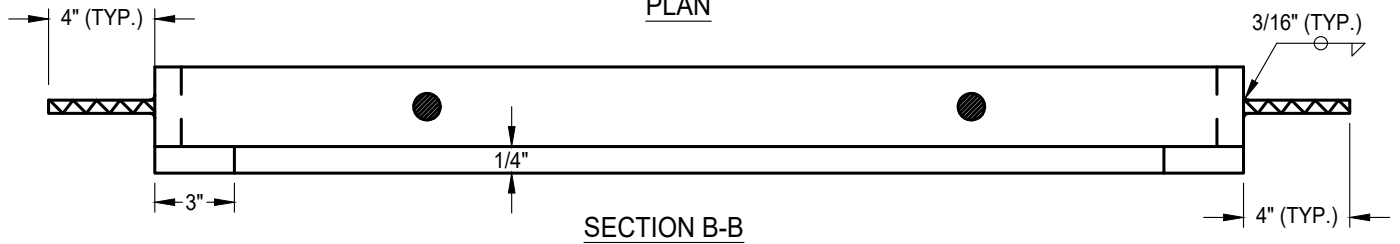


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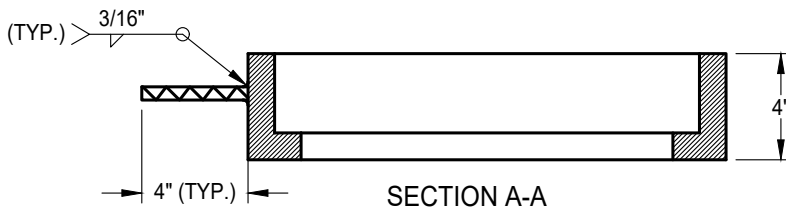
SD - 13



PLAN



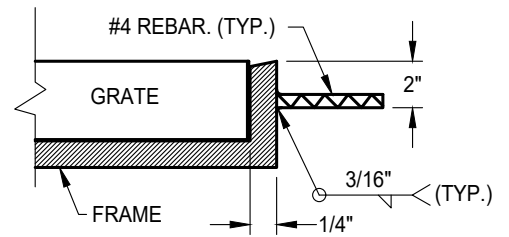
SECTION B-B



SECTION A-A

NOTES:

1. OMIT 1/2" FRAME ANCHORS OVER CENTER SUPPORT ASSEMBLY WHEN MULTIPLE FRAMES ARE USED.
2. MATERIAL: ASTM A36 MILD STEEL
3. SEE ARTICLE 50-31, "SEWER AND STORM DRAIN CASTINGS," OF SECTION 50.
4. ALL EXPOSED PARTS TO BE HOT DIP GALVANIZED PER ASTM A123, AFTER FABRICATION.



FRAME ANCHOR DETAIL

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APPROVED BY:

Paul Murbach

10/24/2018

CITY ENGINEER

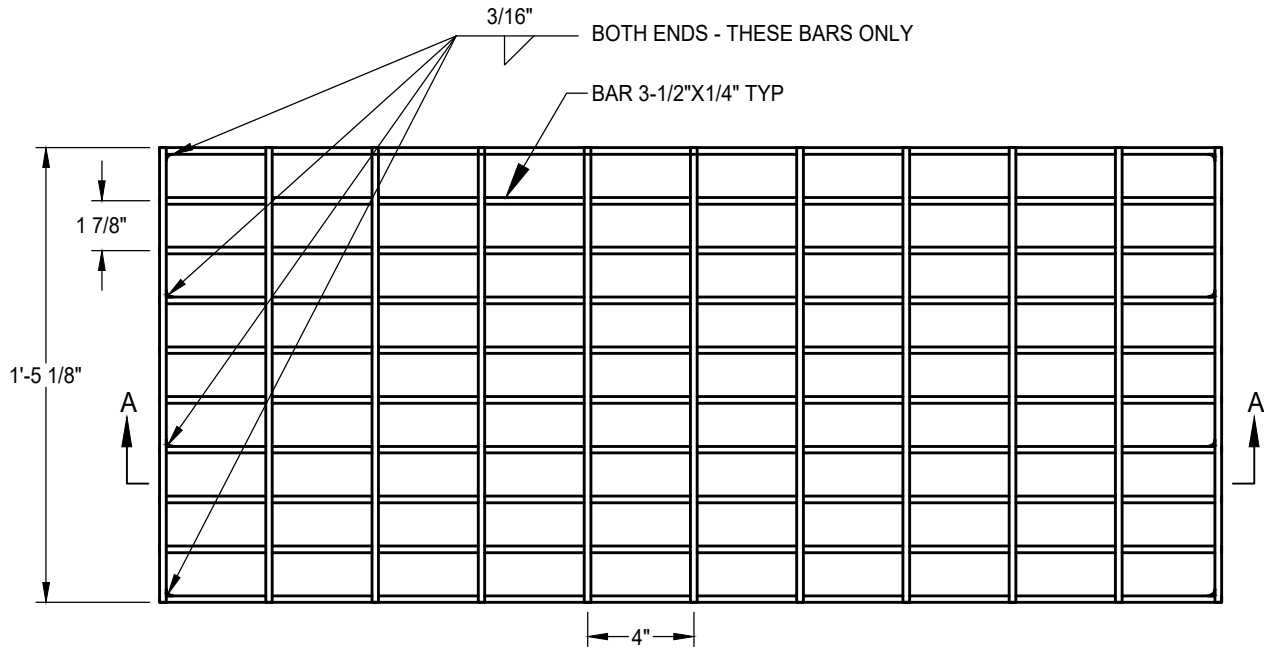
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WELDED STEEL GRATE FRAME

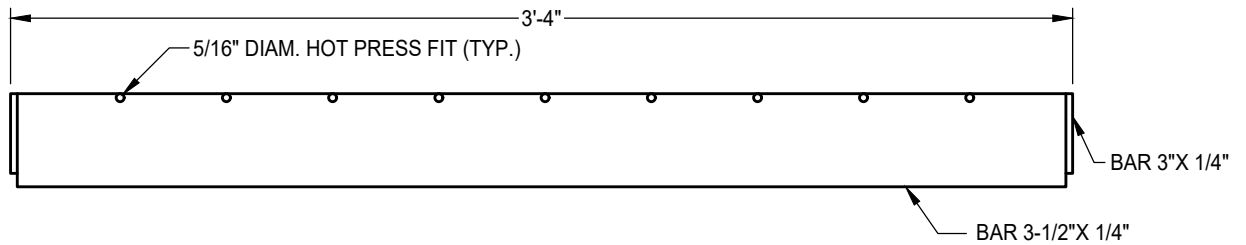


DRAWING NUMBER

SD - 14



PLAN



SECTION A-A

NOTES:

1. DIMENSIONS TO CENTERLINE OF BARS UNLESS OTHERWISE NOTED.
2. ALL EXPOSED PARTS TO BE HOT DIP GALVANIZED PER ASTM A123, AFTER FABRICATION.

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REVISION	BY	APPROVED	DATE

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APPROVED BY:

Paul Murbach

10/24/2018

CITY ENGINEER

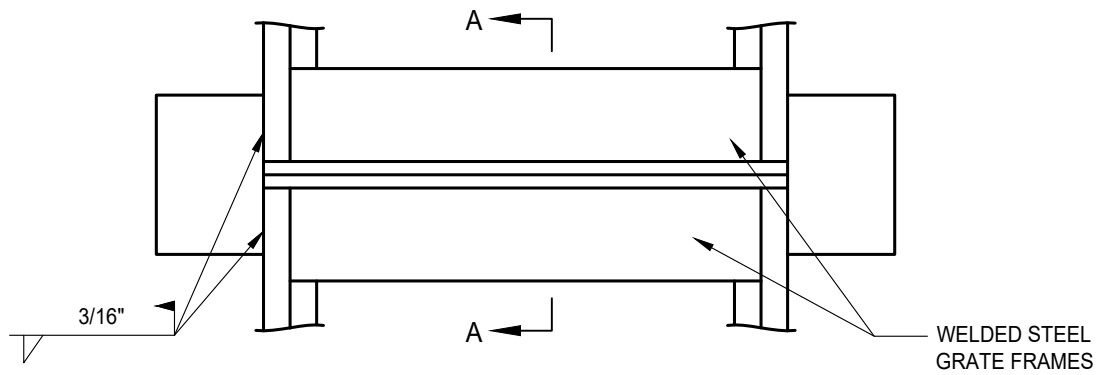
DATE

WELDED STEEL GRATE

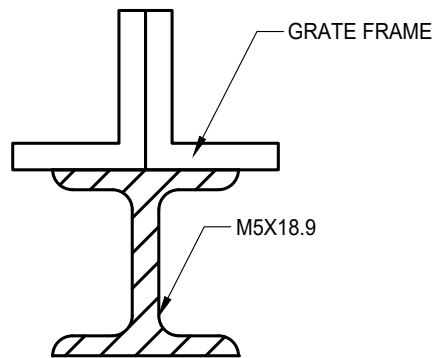


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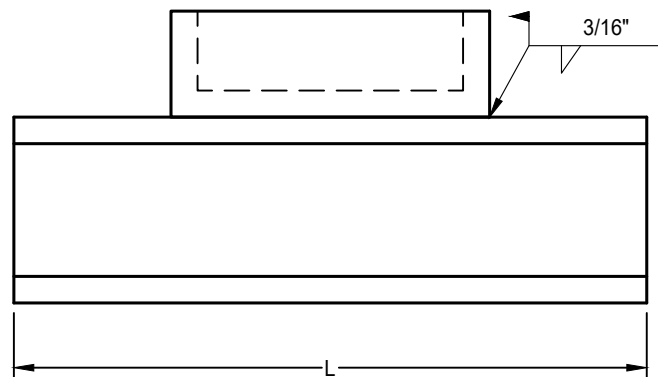
SD - 15



PLAN



SECTION A-A



ELEVATION

NOTES:

1. OMIT 1/2" FRAME ANCHORS OVER CENTER SUPPORT.
2. L=57 INCHES FOR CURB OPENING CATCH BASIN WITH GRATING(S) AND DEBRIS SKIMMER.
3. ALL EXPOSED PARTS TO BE HOT DIP GALVANIZED PER ASTM A123, AFTER FABRICATION.

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REVISION	BY	APPROVED	DATE
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CITY OF ELK GROVE - PUBLIC WORKS

**CENTER SUPPORT ASSEMBLY
FOR MULTIPLE GRATES**

APPROVED BY:

Paul Murook

CITY ENGINEER

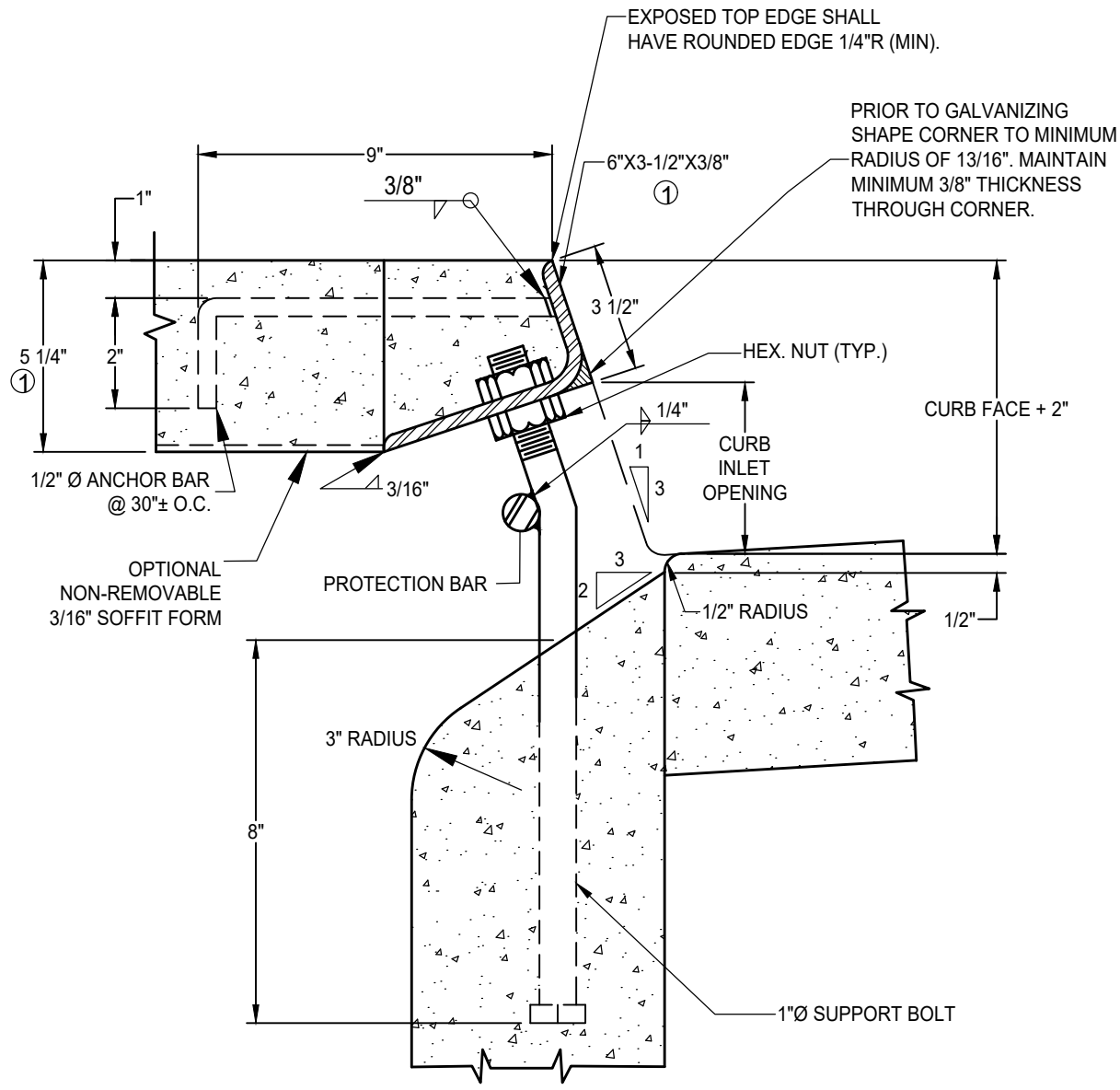
02/17/2021

DATE



DRAWING NUMBER

SD - 16



NOTES:

1. TO BE USED ONLY IN TYPE 2 CURB AND GUTTER WITH 2" DEPRESSION. USE IN TYPE 1A CURB AND GUTTER ONLY UPON APPROVAL OF THE CITY ENGINEER. SEE KEYNOTE 1.
2. FACE ANGLE SHALL BE CAST INTO STRUCTURE CONTINUOUS FOR THE FULL LENGTH "W".
3. ALL EXPOSED METAL PARTS TO BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
4. WHEN CURB INLET OPENING HEIGHT (H) EXCEEDS 6" INSTALL 1" Ø STEEL PROTECTION BAR.
5. INSTALL ADDITIONAL BARS AT 3-1/2" CLEAR SPACING ABOVE FIRST BAR WHEN OPENING EXCEEDS 13".
6. WHEN CURB INLET OPENING LENGTH EXCEEDS 8' INSTALL 1" Ø STEEL SUPPORT BOLTS, SPACED AT NOT MORE THAN 5' O.C.

KEYNOTES:

1. ALTERNATE ANGLE IRON SIZE, DEPRESSION DEPTH, AND SLAB THICKNESS MAY BE USED UPON APPROVAL OF THE CITY ENGINEER.

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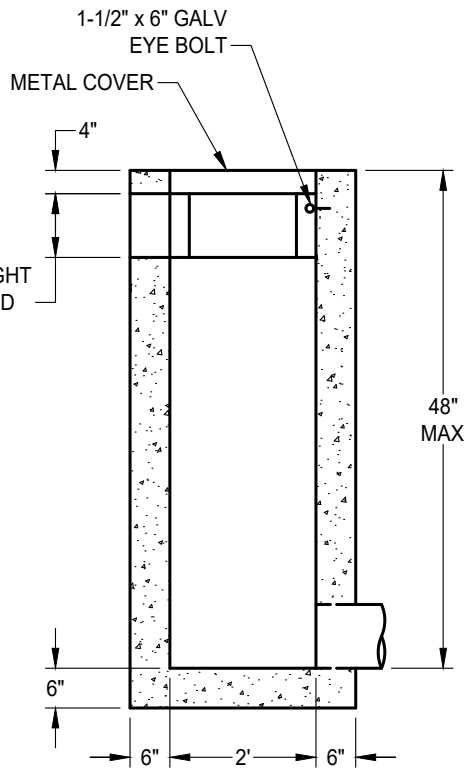
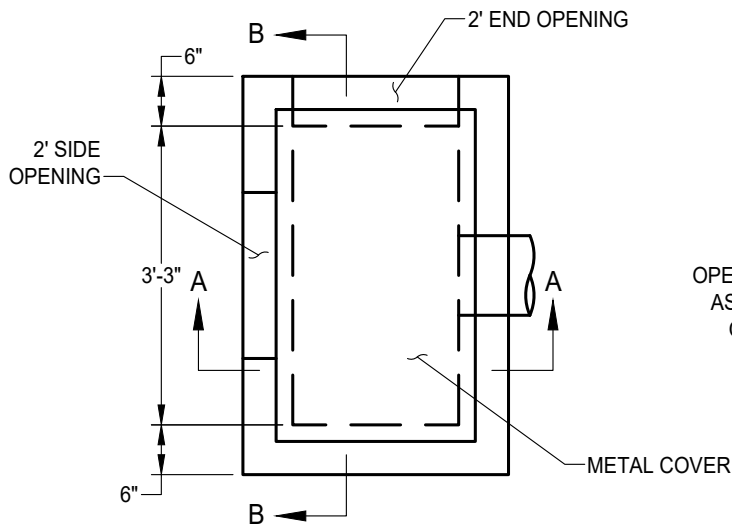
**CATCH BASIN FACE PLATE
ASSEMBLY AND PROTECTION BAR**

APPROVED BY:
Paul Murock
CITY ENGINEER

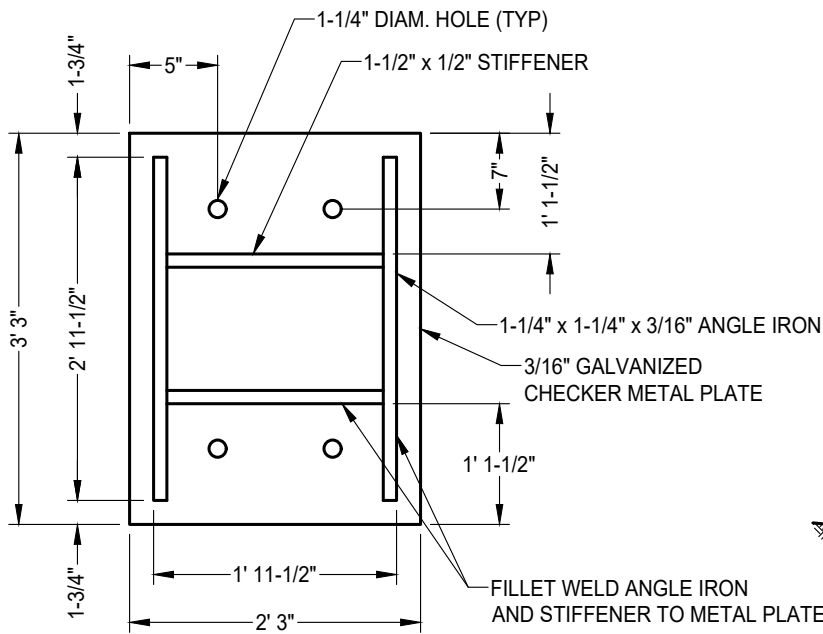
10/24/2018
DATE

DRAWING NUMBER
SD - 17



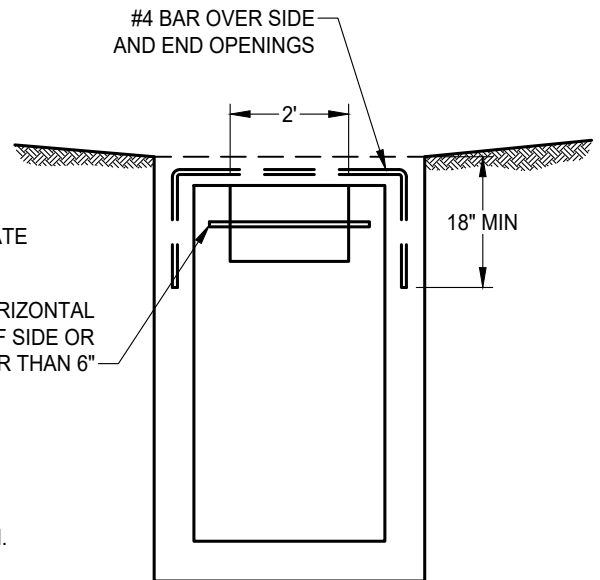


SECTION A-A



METAL COVER (UNDERSIDE)

PLACE 1/2" DIAM. HORIZONTAL BAR IN CENTER OF SIDE OR END OPENING GREATER THAN 6"



SECTION B-B

NOTES:

1. PROVIDE 1/4" x 18" GALVANIZED CHAIN WELD TO COVER AND EYE BOLT.
2. PROVIDE END OR SIDE OPENINGS AS SHOWN ON PLANS OR CROSS SECTION.
3. TOP OF WALLS TO BE FINISHED TO A FLAT PLANE TO PROVIDE EVEN BEARING FOR PLATE COVER.
4. ALL METALS SHALL BE HOT DIP GALVANIZED PER ASTM A123.

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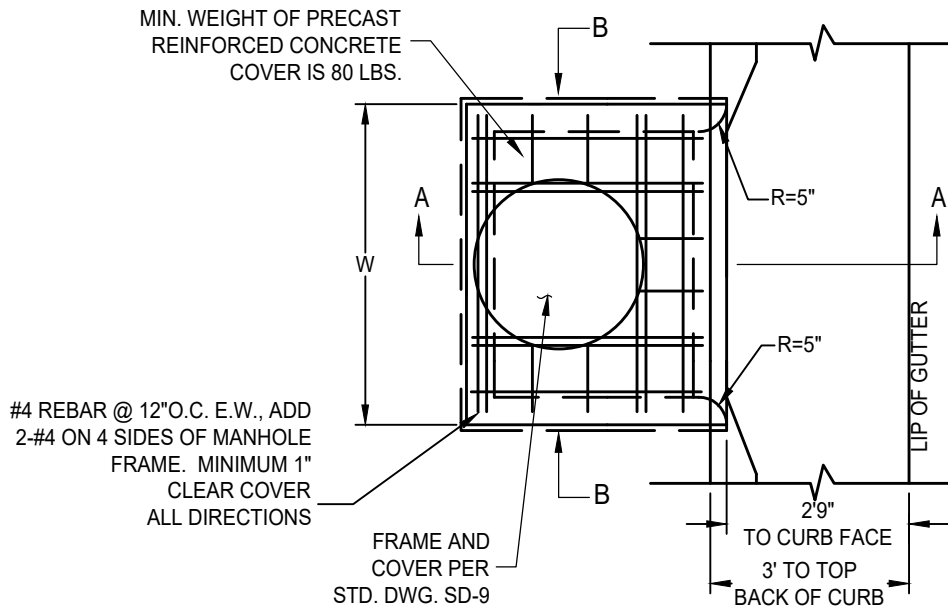
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Paul Murbach
CITY ENGINEER
10/24/2018
DATE

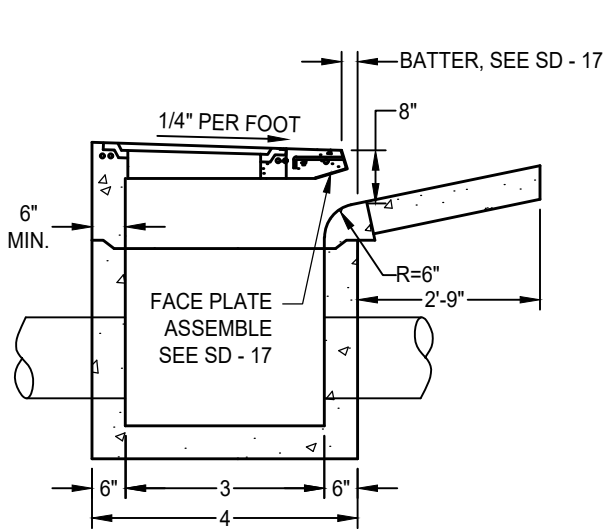
**DROP INLET
TYPE F**



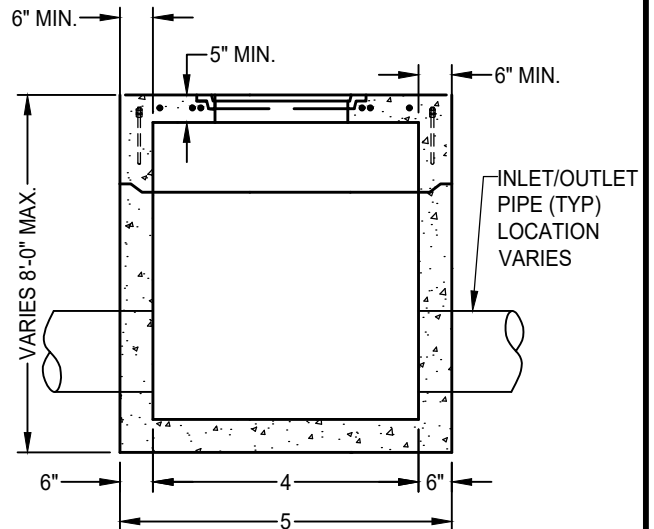
DRAWING NUMBER
SD - 18



PLAN



SECTION A-A



SECTION B-B

NOTES:

1. CURB INLET ASSEMBLY MAY BE PRECAST CONCRETE OR FORMED AND CAST-IN-PLACE P.C.C.
2. ALL METAL SHALL BE HOT DIP GALVANIZED PER ASTM A123.
3. SEE STANDARD DRAWING SD - 17 FOR FACE PLATE ASSEMBLY.

DATE: 09/22/2017		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

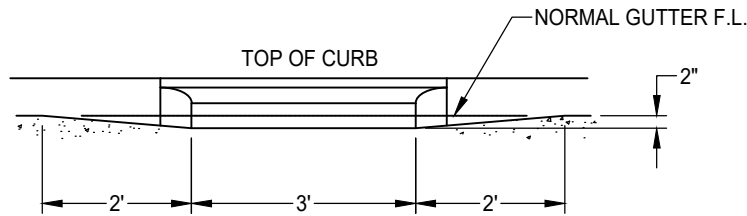
CITY OF ELK GROVE - PUBLIC WORKS

**DROP INLET TYPE G
TYPE 2 C&G ONLY
(PG 1 OF 2)**

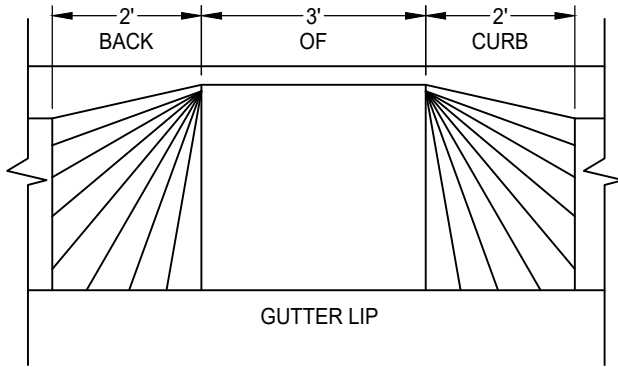
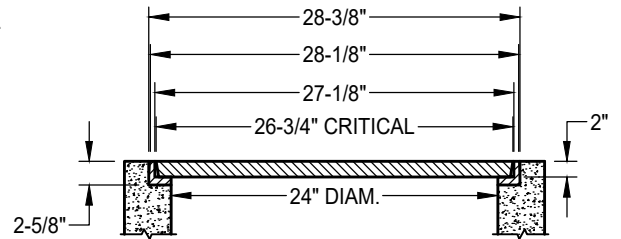
APPROVED BY:
Paul Murock
CITY ENGINEER
10/24/2018
DATE



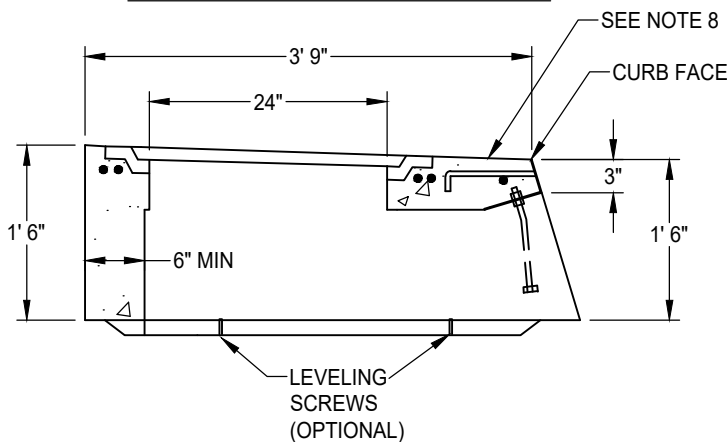
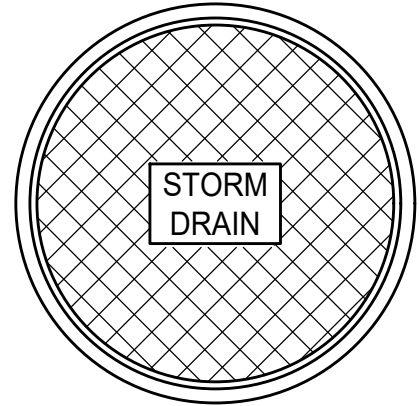
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SD - 19.1



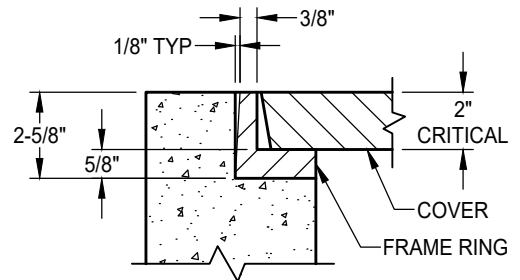
GUTTER TRANSITION ELEVATION



GUTTER TRANSITION PLAN



CURB INLET DETAIL



FRAME AND LID DETAIL

WEIGHT	
CAST IRON COVER	91 LBS
CAST IRON FRAME RING	52 LBS

NOTES:

1. CURB INLET ASSEMBLY MAY BE PRECAST CONCRETE, OR FORMED AND CAST-IN-PLACE P.C.C.
2. ALL METAL SHALL BE HOT DIPPED GALVANIZED ASTM A123.
3. ALL CASTINGS TO CONFORM TO ASTM A48, CLASS 35B
4. FRAME AND COVER TO MEET H-20 LOAD SPECIFICATIONS.
5. BEARING SURFACES ARE MACHINE BEVELED TO ASSURE A CLOSE, NON ROCKING SURFACE.
6. FRAME AND COVER SHALL HAVE A COATING OF BLACK BITUMINOUS MATERIAL CONFORMING TO ASTM 48-30.
7. SEE ARTICLE 50-31 "SEWER AND STORM DRAIN CASTINGS" OF SECTION 50, CONSTRUCTION SPECIFICATIONS.
8. INSTALL "NO DUMPING, DRAINS TO CREEK" PLACARD ON TOP OF CURB.

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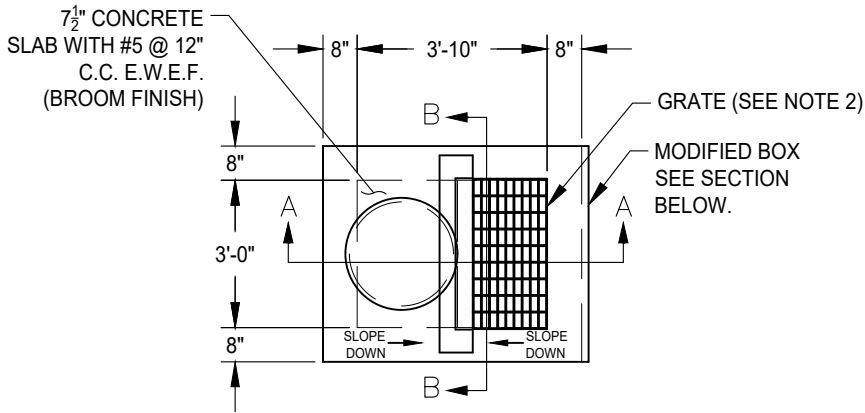
CITY OF ELK GROVE - PUBLIC WORKS

**DROP INLET TYPE G
TYPE 2 C&G ONLY
(SHEET 2 OF 2)**

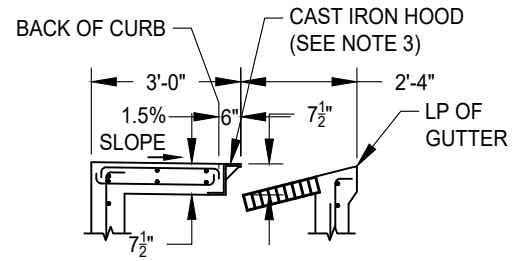
APPROVED BY:
Paul Murock
CITY ENGINEER
10/24/2018
DATE



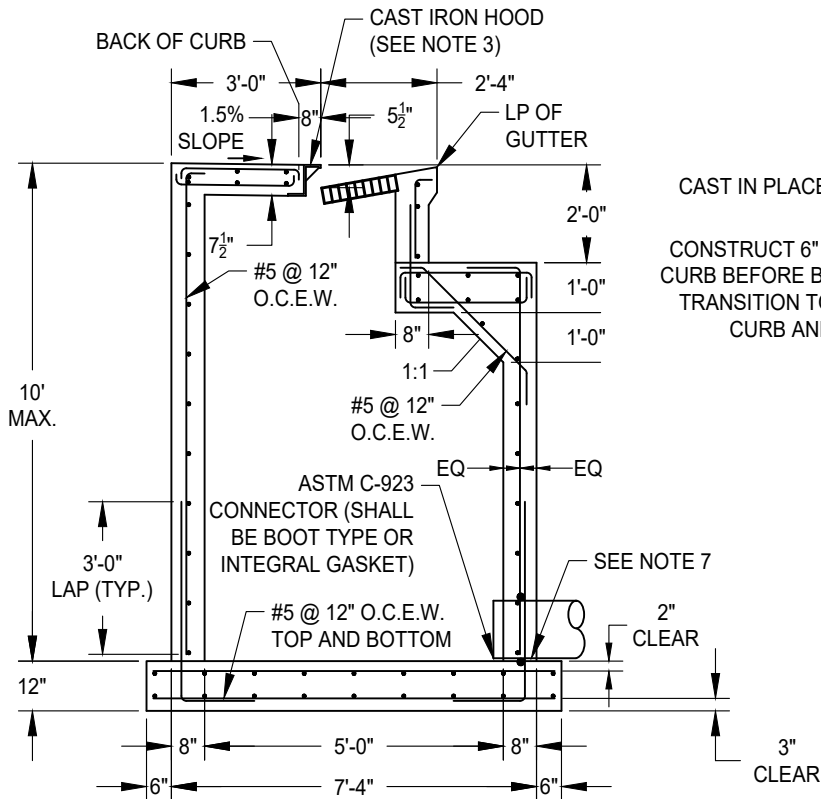
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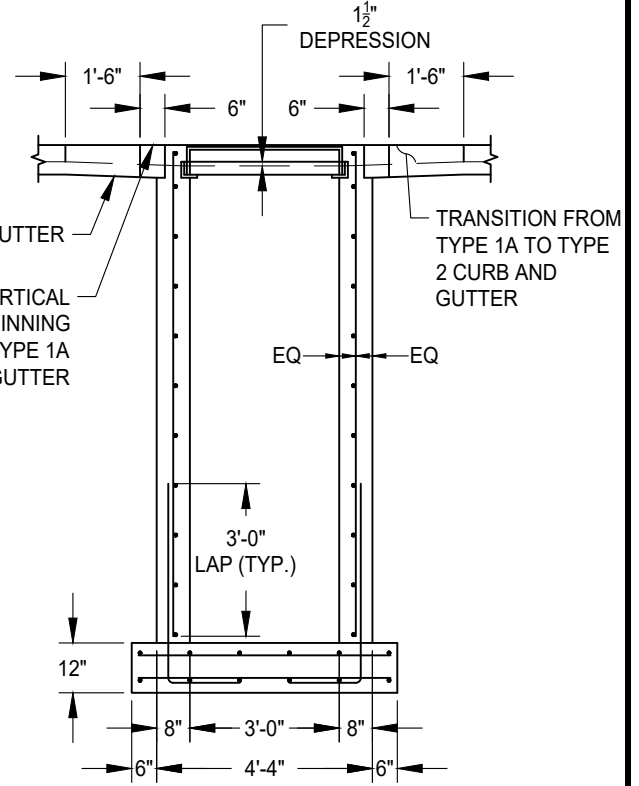
PLAN VIEW



SECTION A-A
TYPE 2 CURB AND GUTTER
(FOR INFORMATION NOT SHOWN OR NOTED REFER TO SECTION A-A TYPE 1A CURB AND GUTTER)



SECTION A-A
TYPE 1A CURB AND GUTTER



SECTION B-B

NOTES:

- STANDARD DEPRESSION FOR INLET IS 1 1/2".
- FRAME AND GRATE SHALL CONFORM TO STANDARD DRAWINGS SD-14 AND SD-15.
- OPEN BACK CAST IRON HOOD SHALL BE H-20 RATED, 3/4" THICK AND CONFORM TO STANDARD DRAWING SD-12.
- ALL EXPOSED EDGES SHALL HAVE A 1/8" RADIUS (MINIMUM).
- AN EDGING TOOL SHALL BE USED ON ALL EDGES WHERE THE CONCRETE SIDEWALK AND CURB MEET THE TOP OF THE HOOD.
- EXPOSED SURFACES OF THE GRATES, FRAMES, AND HOODS WITH THE PARTS ASSEMBLED DISASSEMBLED SHALL BE PAINTED WITH COMMERCIAL QUALITY ASPHALTUM PAINT AFTER TESTING AND ASSEMBLY.
- THE MINIMUM PIPE SIZE IS 12". IF THE INLET DEPTH IS GREATER THAN 4', THE MINIMUM PIPE SIZE SHALL BE 15".
- THE MANHOLE FRAME AND COVER SHALL BE PER STANDARD DRAWING SD-9.

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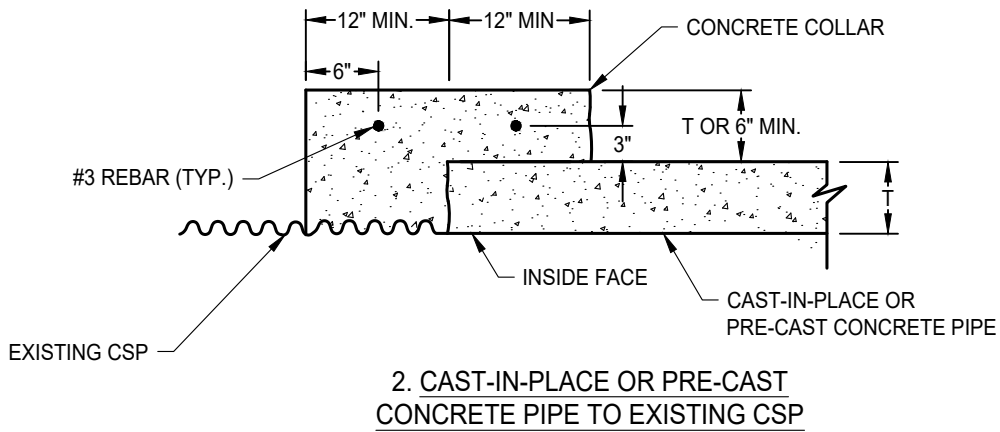
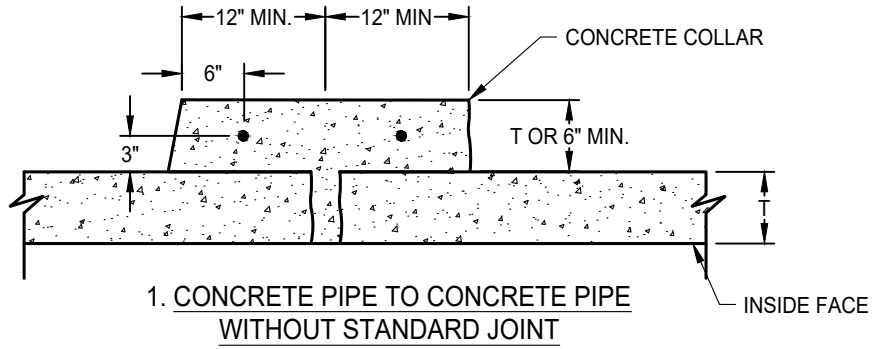
MODIFIED TYPE J INLET

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 10/24/2018
 CITY ENGINEER DATE

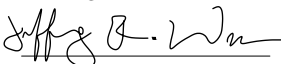


DRAWING NUMBER
SD - 19.3



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1	SJB	SMA	02-28-2024

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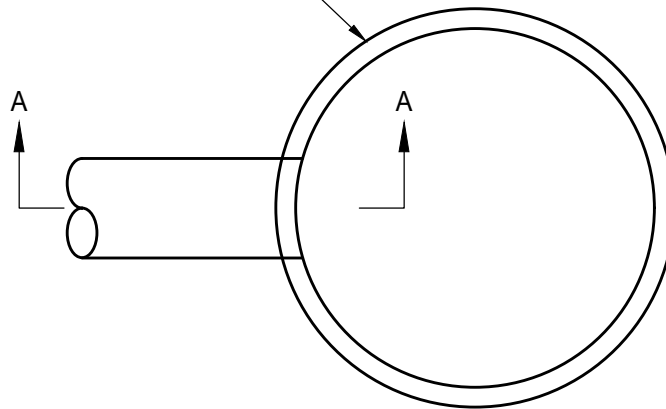
APPROVED BY:

 CITY ENGINEER DATE: 04-29-2024

PIPE CONNECTIONS

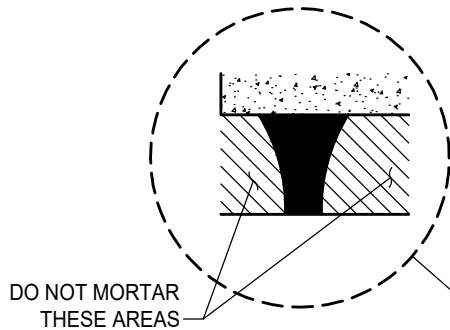


DRAWING NUMBER
SD - 23

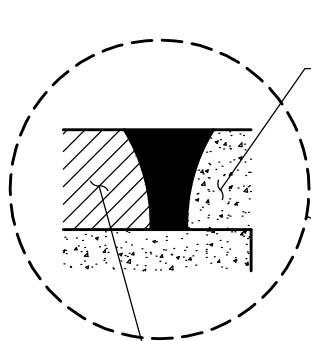
MANHOLE BASE AND BARREL SECTION. MANHOLE CONE, FRAME, AND COVER OMITTED FOR CLARITY.



PLAN



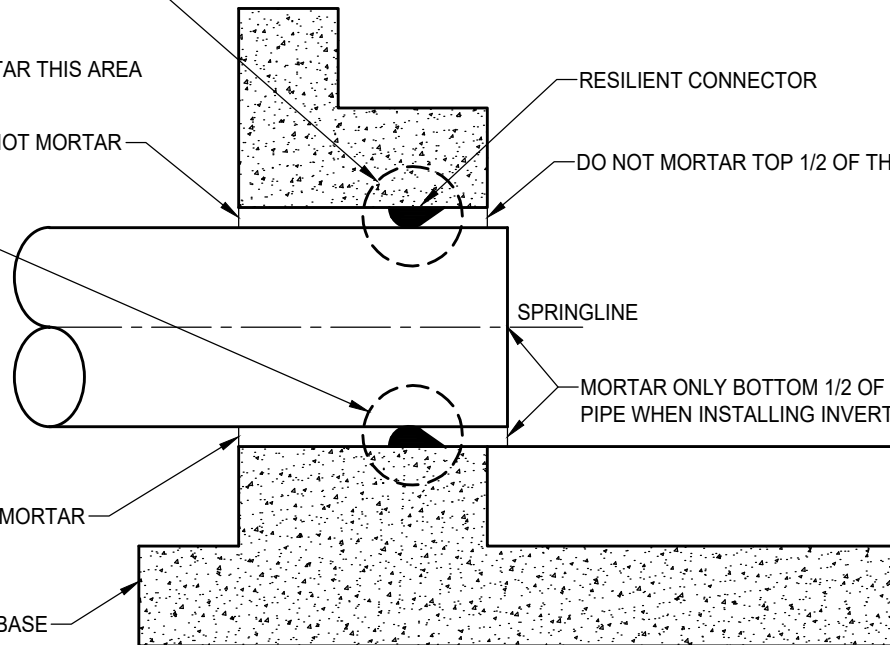
DO NOT MORTAR THESE AREAS



DO NOT MORTAR THIS AREA

MORTAR THIS AREA

DO NOT MORTAR



RESILIENT CONNECTOR

DO NOT MORTAR TOP 1/2 OF THE PIPE

SPRINGLINE

MORTAR ONLY BOTTOM 1/2 OF PIPE WHEN INSTALLING INVERT

DO NOT MORTAR

MANHOLE BASE

SECTION A-A

NOTES:

1. TO HELP CREATE A FLEXIBLE, WATERTIGHT JOINT, DO NOT PLACE MORTAR AROUND THE CONNECTOR ON THE OUTSIDE OF THE STRUCTURE OR AROUND THE TOP HALF OF THE CONNECTOR ON THE INSIDE WHEN COMPLETING THE INVERT WORK.
2. RESILIENT CONNECTORS SHALL BE A FLEXIBLE COMPRESSION GASKET OR BOOT CONNECTOR PER SECTION 39-2.01 "PRECAST CONCRETE STORM DRAIN MANHOLES" OF THE CITY OF ELK GROVE STANDARD CONSTRUCTION SPECIFICATIONS.
3. ALL CONNECTORS SHALL MEET OR EXCEED THE REQUIREMENTS OF A.S.T.M. C-923.

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CITY OF ELK GROVE - PUBLIC WORKS

FLEXIBLE PIPE TO MANHOLE CONNECTION

APPROVED BY:

Paul Murock

10/24/2018

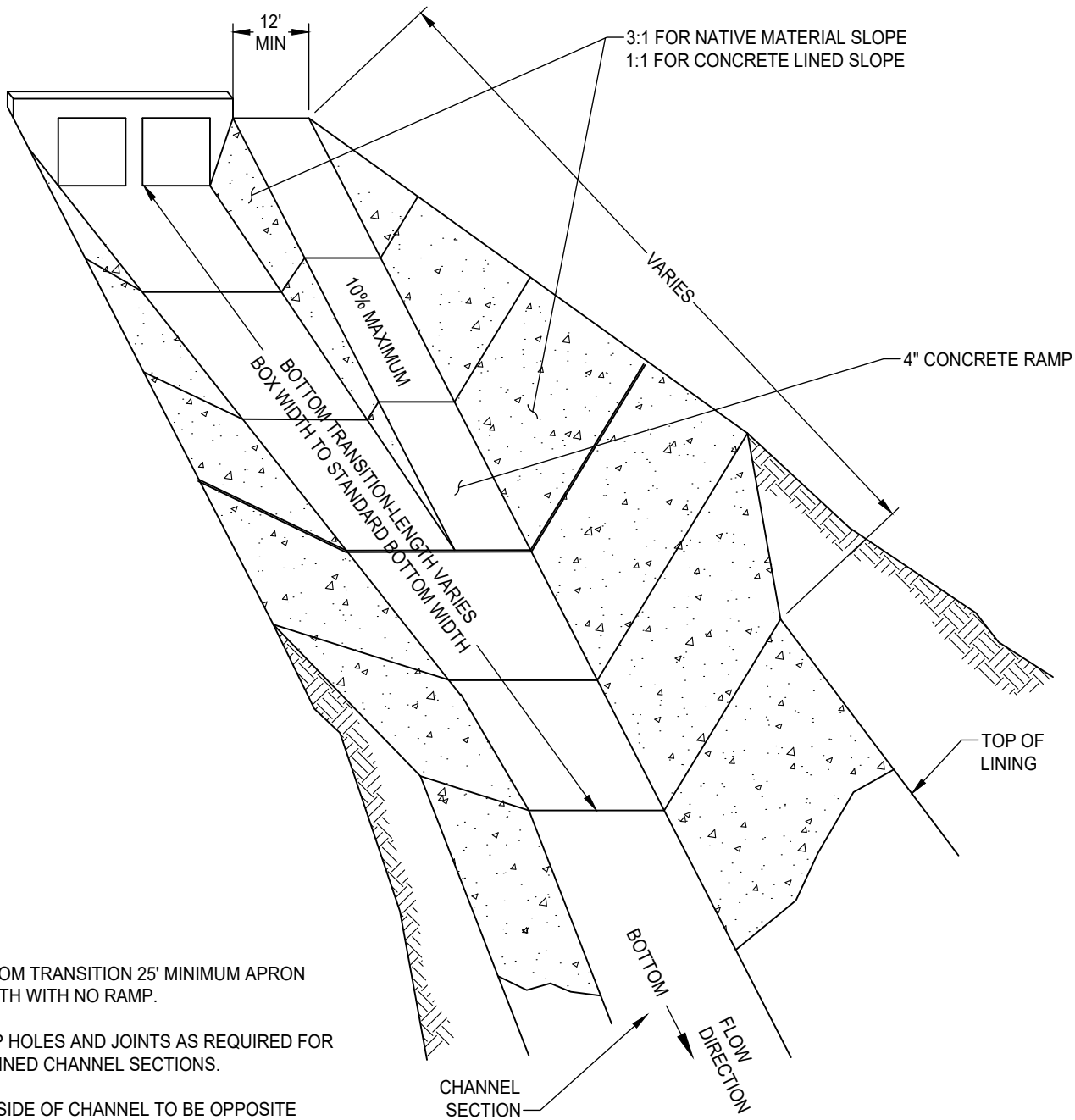
CITY ENGINEER

DATE



DRAWING NUMBER

SD - 24



NOTES:

1. BOTTOM TRANSITION 25' MINIMUM APRON LENGTH WITH NO RAMP.
2. WEEP HOLES AND JOINTS AS REQUIRED FOR ALL LINED CHANNEL SECTIONS.
3. LOW SIDE OF CHANNEL TO BE OPPOSITE RAMP.
4. SIDE SLOPE LINING MAY BE USED AT RAMP LOCATIONS TO INCREASE SLOPE TO MAXIMUM 1:1. TOP OF SLOPE GREATER THAN 3:1 MUST BE FENCED.

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CITY OF ELK GROVE - PUBLIC WORKS

**TYPICAL RAMP AND TRANSITION
DETAIL**

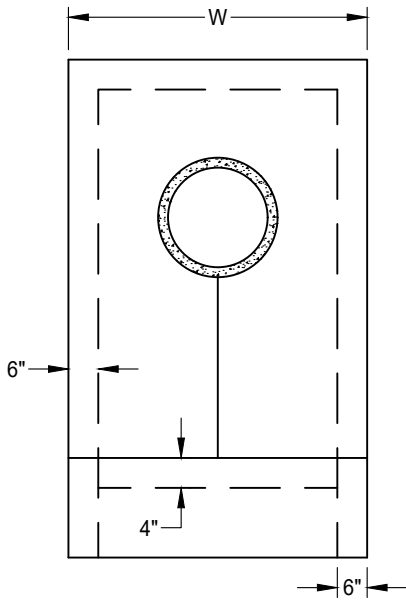
APPROVED BY:
Paul Murbach
CITY ENGINEER

10/24/2018
DATE

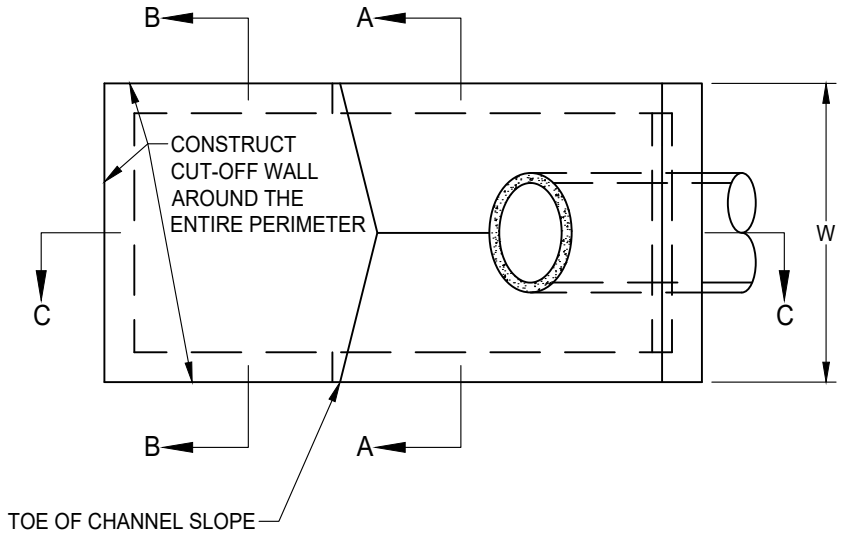
DRAWING NUMBER
SD - 25



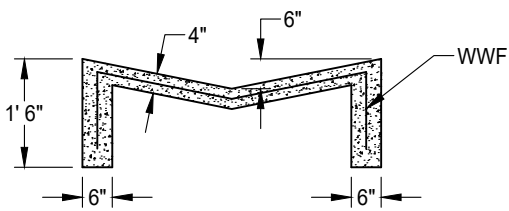
W = 6' 0" MINIMUM
W = 2 x PIPE DIAM. (3'+)



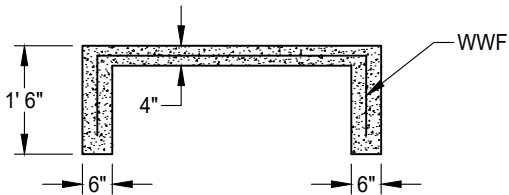
FRONT VIEW



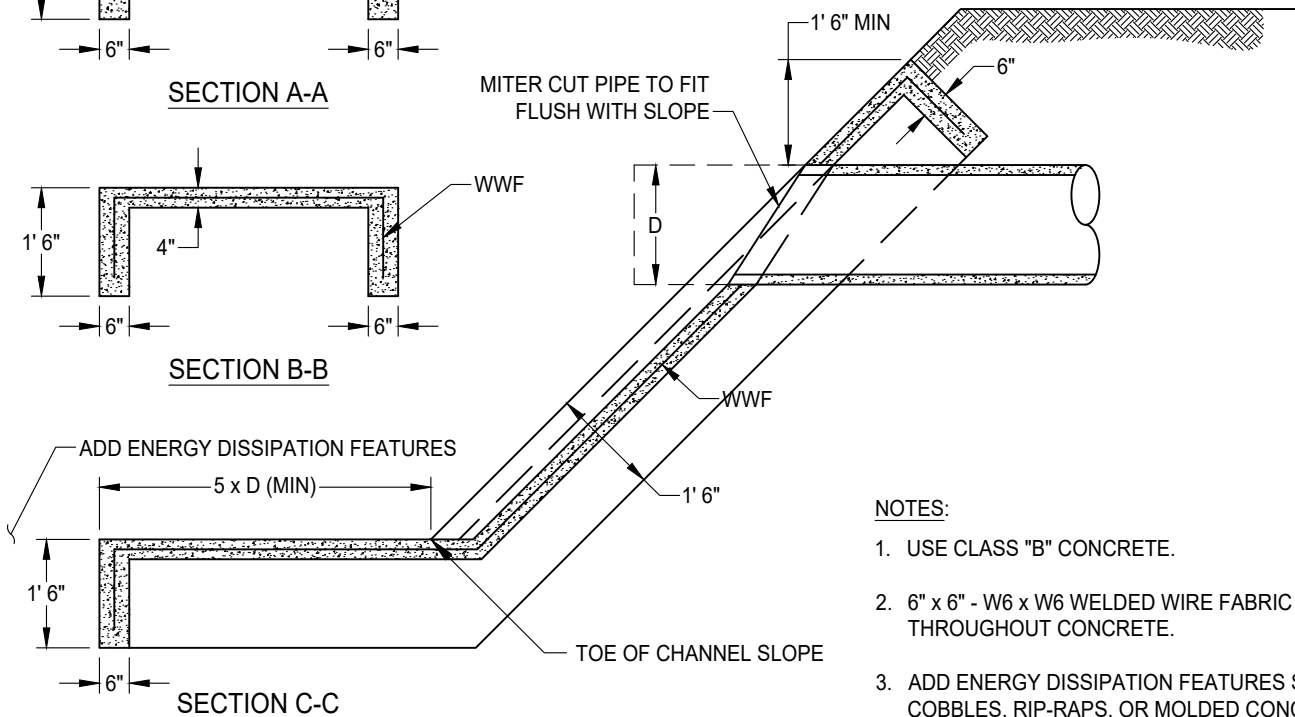
TOP VIEW



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:

1. USE CLASS "B" CONCRETE.
2. 6" x 6" - W6 x W6 WELDED WIRE FABRIC (WWF) THROUGHOUT CONCRETE.
3. ADD ENERGY DISSIPATION FEATURES SUCH AS COBBLES, RIP-RAPS, OR MOLDED CONCRETE AT END OF APRON.

DATE: 09/22/2017		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

OUTLET PIPE HEADWALL AND APRON

APPROVED BY:

Paul Murbach

10/24/2018

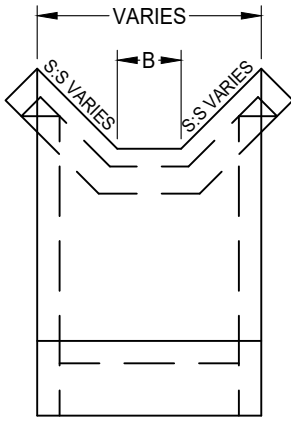
CITY ENGINEER

DATE

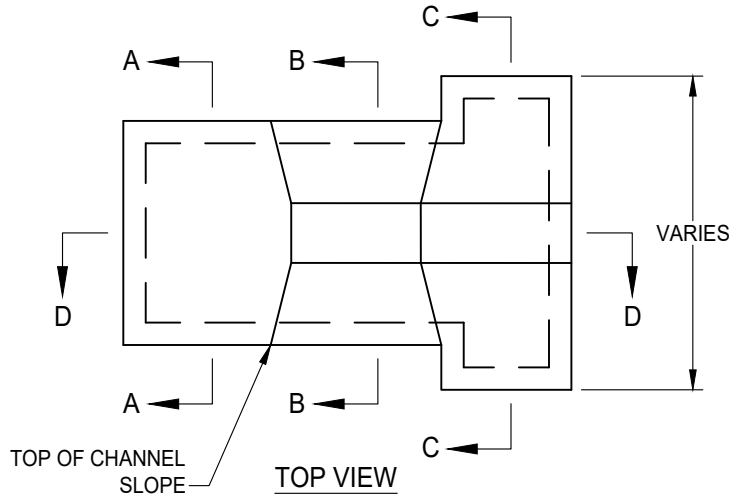


DRAWING NUMBER

SD - 26



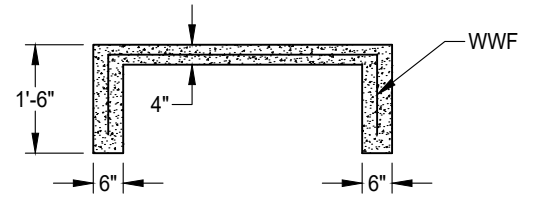
FRONT VIEW



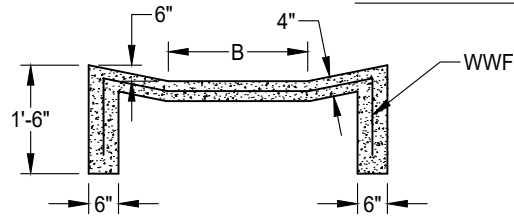
TOP VIEW

NOTES:

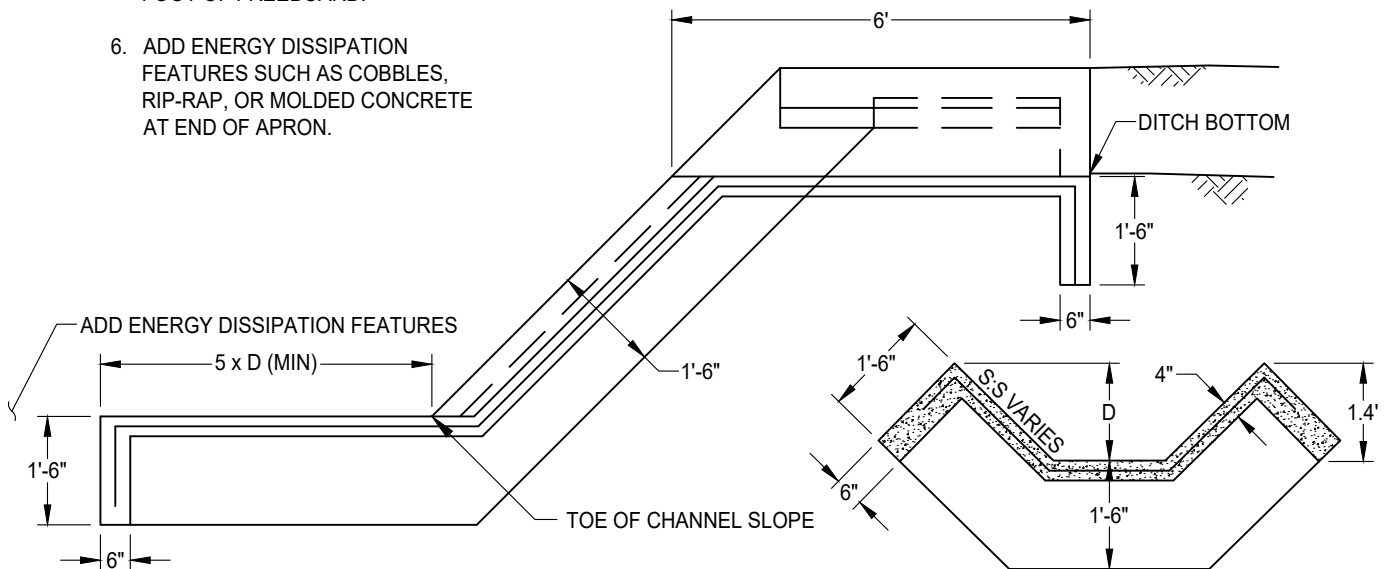
1. USE CLASS "B" CONCRETE OR GROUTED COBBLES AS SPECIFIED.
2. 6" x 6" -W6 x W6 WWF THROUGHOUT CONCRETE.
3. ON LINED CHANNELS APRON SHALL CONNECT TO SIDE LINING.
4. B = DITCH BOTTOM WIDTH OR AS SHOWN ON PLANS.
5. D = DITCH WATER DEPTH PLUS ONE FOOT OF FREEBOARD.
6. ADD ENERGY DISSIPATION FEATURES SUCH AS COBBLES, RIP-RAP, OR MOLDED CONCRETE AT END OF APRON.



SECTION A-A



SECTION B-B



SECTION D-D

SECTION C-C


DATE: 09/22/2017		NOT TO SCALE	
REVISION	BY	APPROVED	DATE
1	SJB	SMA	04-12-2024

CITY OF ELK GROVE - PUBLIC WORKS

DITCH DISCHARGE CONTROL AND APRON

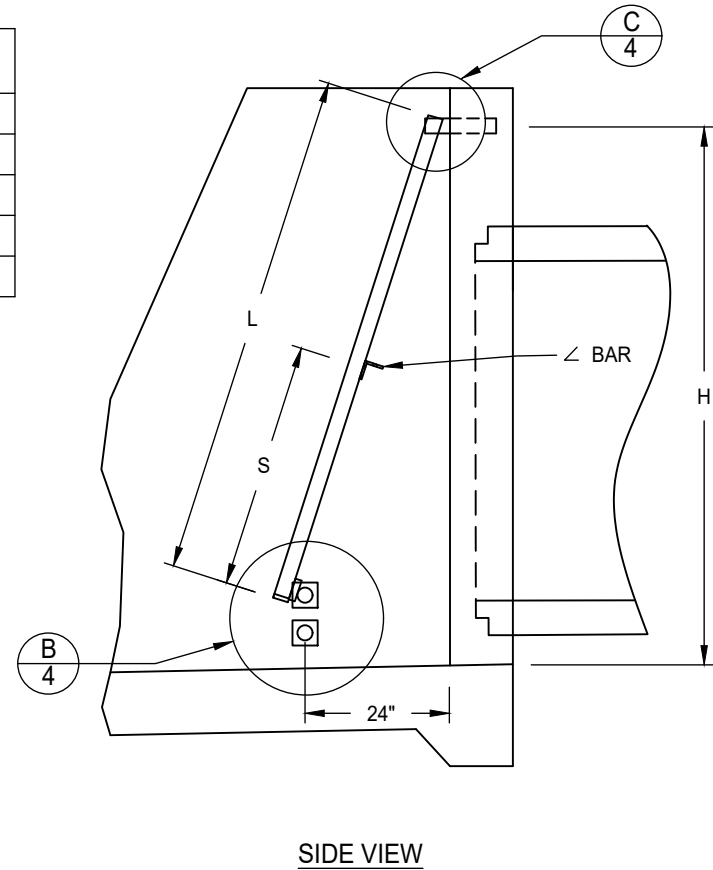
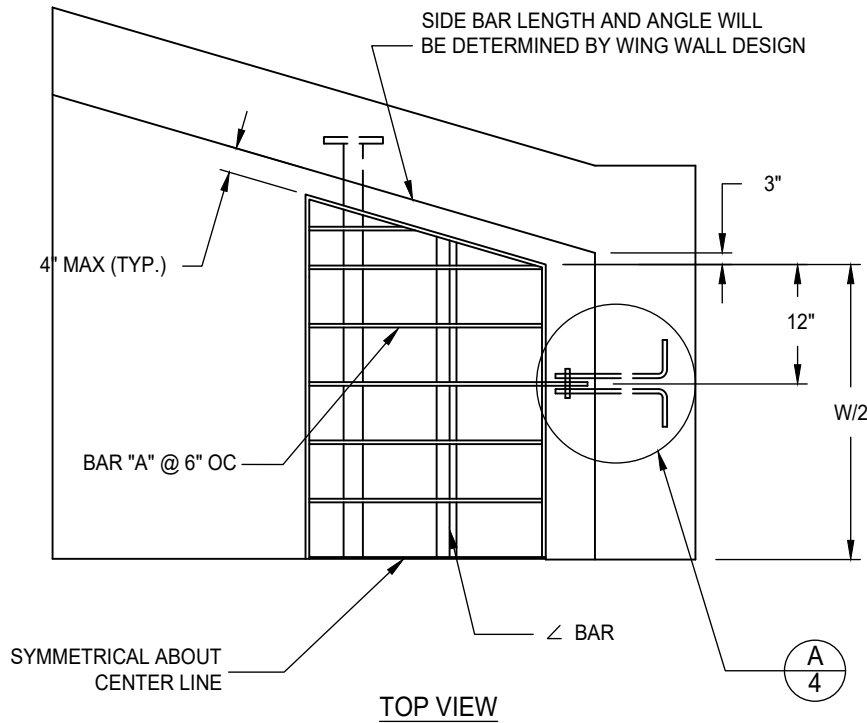
APPROVED BY: _____ 05-28-2024
CITY ENGINEER DATE

DRAWING NUMBER
SD - 27



PIPE DIA. (IN)	PIPE OD (IN)	QUANTITY* BAR "A"	BAR "A" SIZE (IN)	H (IN)	W (IN)	L (IN)	S (IN)
24	30	11	3/8x2 1/2	46	48	40	18
27	33.5	11	3/8x2 1/2	50	48	42	19
30	37	11	3/8x2 1/2	53	48	46	21
33	40.5	11	3/8x2 1/2	57	48	52	24
36	44	13	3/8x2 1/2	60	60	52	24

*INCLUDES OUTSIDE FRAME



DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

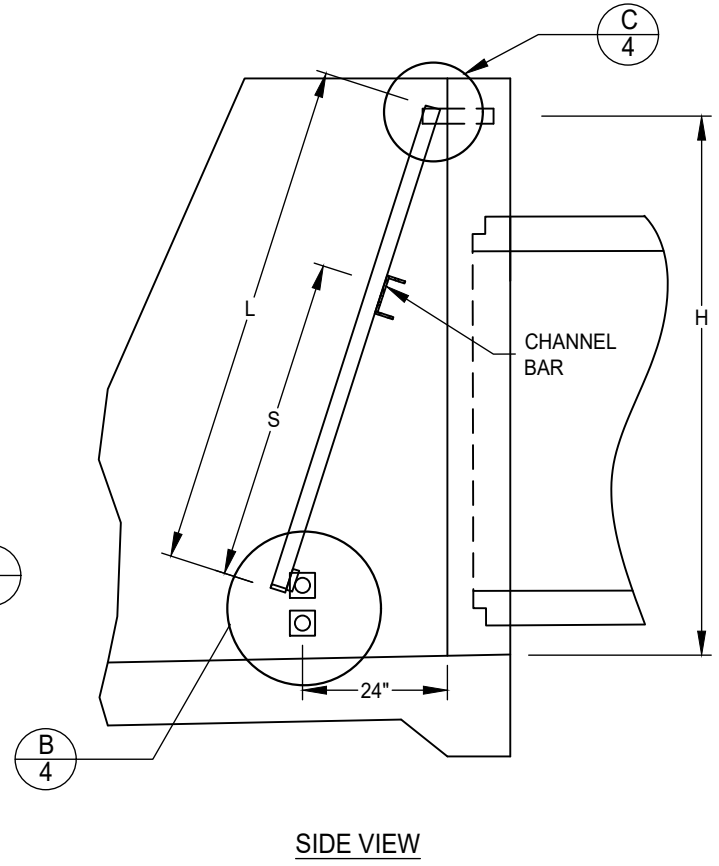
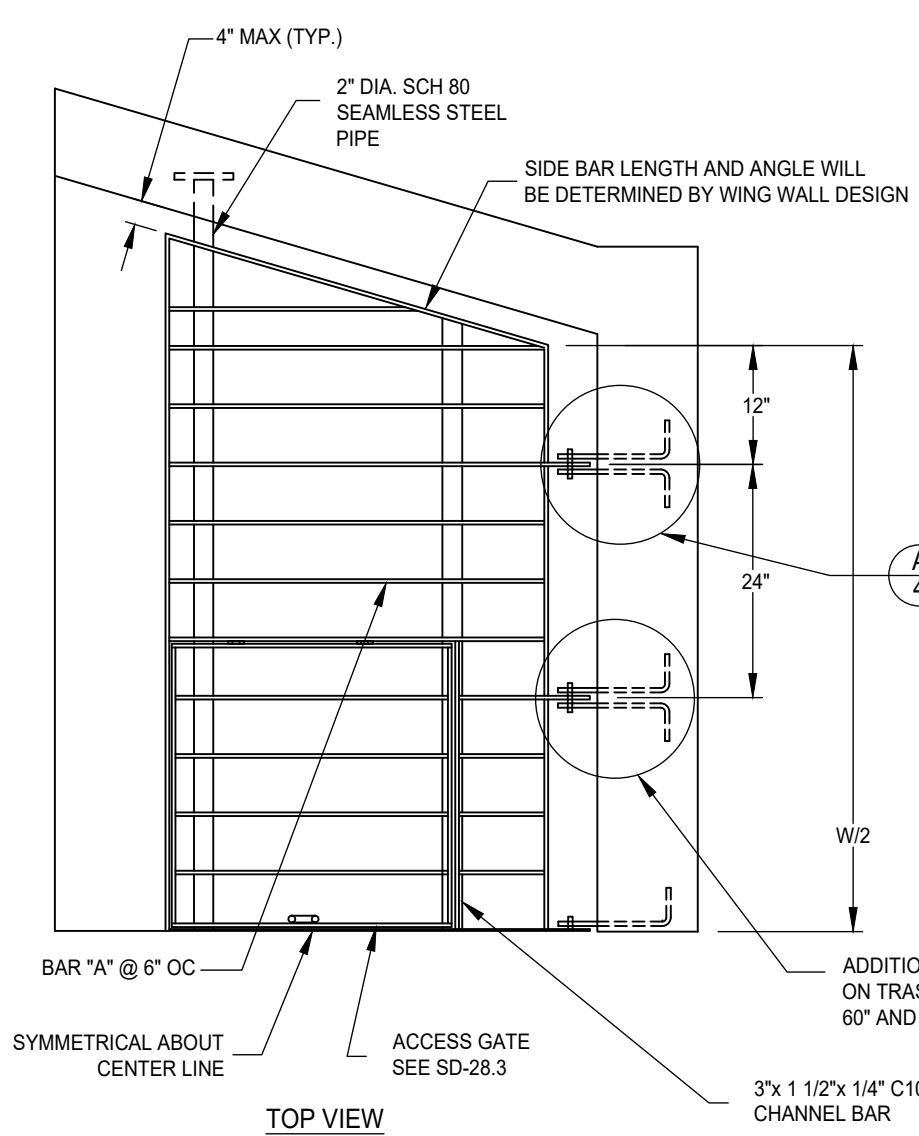
TRASH RACK
24"-36" PIPE
(SHEET 1 OF 4)

APPROVED BY:
Paul Murock
 CITY ENGINEER
 DATE: 10/24/2018



DRAWING NUMBER

SD - 28.1



SIDE VIEW

NOTES:

1. SEE IMPROVEMENT STANDARDS SECTION 9-17 FOR DESIGN REQUIREMENTS

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

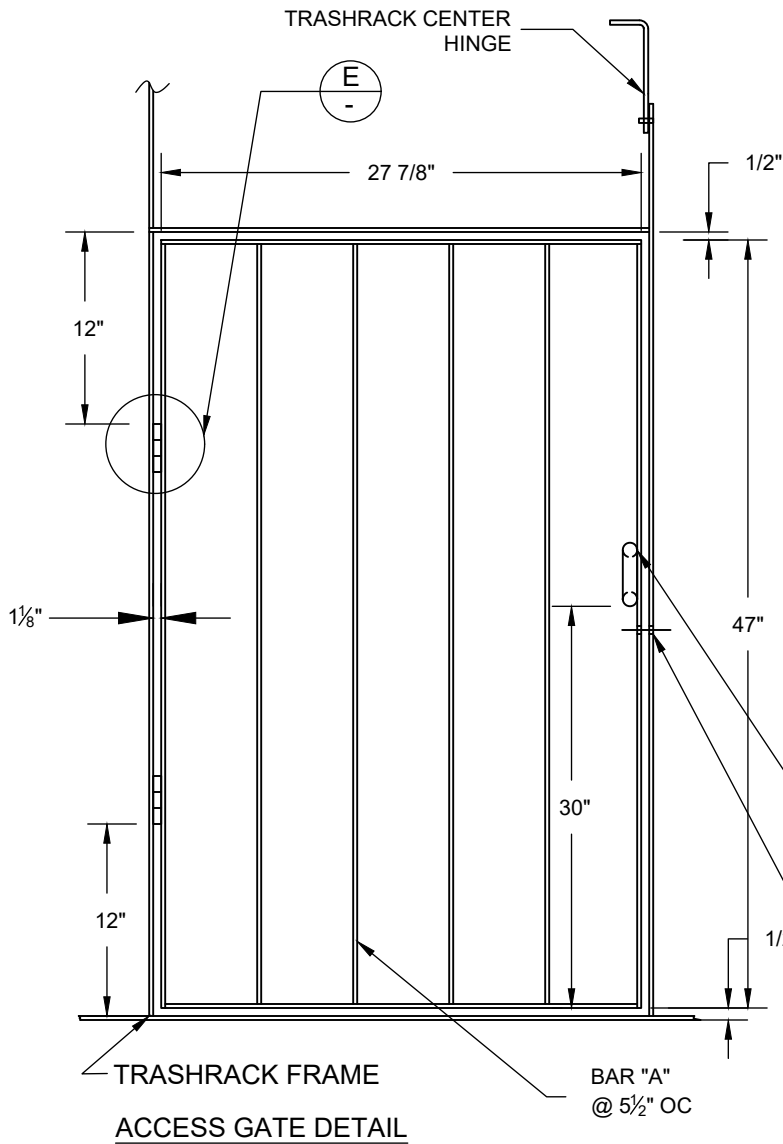
CITY OF ELK GROVE - PUBLIC WORKS

**TRASH RACK
42" PIPE AND LARGER
(SHEET 2 OF 4)**

APPROVED BY:
Paul Murock
CITY ENGINEER
10/24/2018
DATE

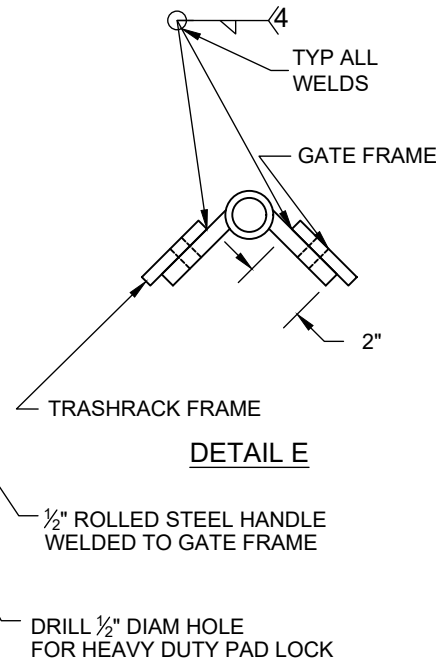


DRAWING NUMBER
SD - 28.2



PIPE DIAM (IN)	PIPE OD (IN)	QUANTITY* BAR "A"	BAR "A" SIZE (IN)	H (IN)	W (IN)	L (IN)	S (IN)
42	51	15	3/8x2 1/2	67	72	60	47-3/4
48	58	17	3/8x2 1/2	74	84	70	47-3/4
54	65	21	3/8x2 1/2	81	108	72	47-3/4
60	72	23	3/8x2 1/2	88	120	80	47-3/4
72	86	27	3/8x2 1/2	102	144	96	47-3/4

*INCLUDES OUTSIDE FRAME



NOTES:

1. SEE STANDARD DRAWINGS SD-29.1 AND SD-29.2 FOR PIPE HEADWALL DETAILS.
2. MATERIAL TO CONFORM TO ASTM DESIGNATION A-36. GALVANIZE ALL EXPOSED FERROUS PARTS AFTER FABRICATION.
3. ALL FILLET WELDS TO BE 3/16".
4. ALL STEEL SHALL CONFORM TO SECTION 75 OF THE STATE SPECIFICATIONS AND ASTM A36, A575 AND A576.
5. GATE HINGES TO BE COATED TO RESIST CORROSION.

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

APPROVED BY:

Paul Murock

10/24/2018

CITY ENGINEER

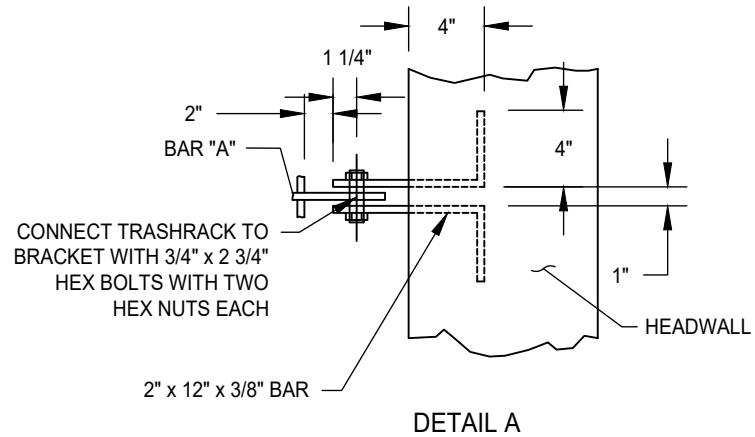
DATE

**TRASH RACK
42" PIPE AND LARGER
(SHEET 3 OF 4)**

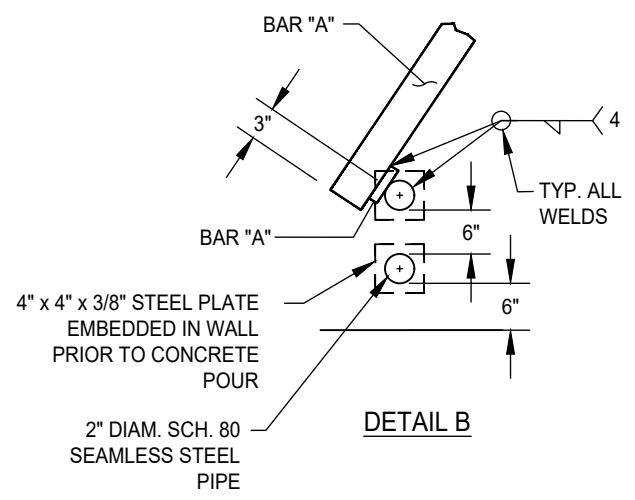
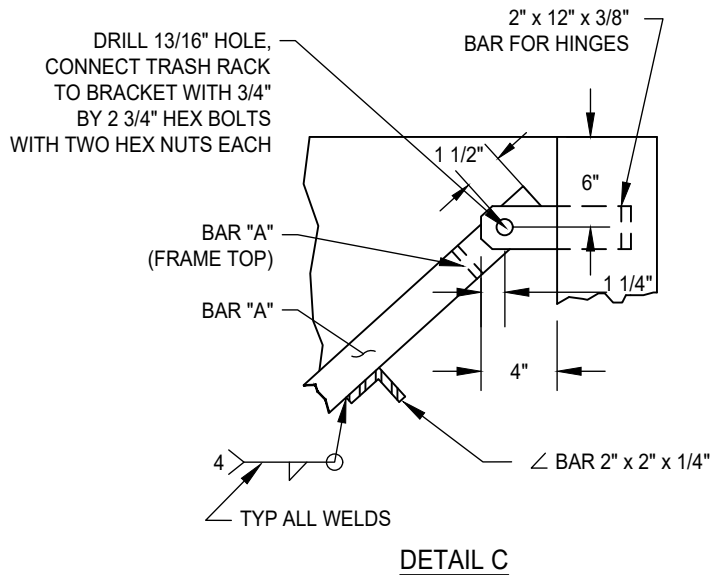


DRAWING NUMBER

SD - 28.3



- NOTES:**
1. SEE STANDARD DRAWINGS SD-29.1 AND SD-29.2 FOR PIPE HEADWALL DETAILS.
 2. MATERIAL TO CONFORM TO ASTM DESIGNATION A-36. GALVANIZE ALL EXPOSED FERROUS PARTS AFTER FABRICATION.
 3. ALL FILLET WELDS TO BE 3/16".
 4. ALL STEEL SHALL CONFORM TO SECTION 75 OF THE STATE SPECIFICATIONS AND ASTM A36, A575 AND A576.



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REVISION	BY	APPROVED	DATE


CITY OF ELK GROVE - PUBLIC WORKS

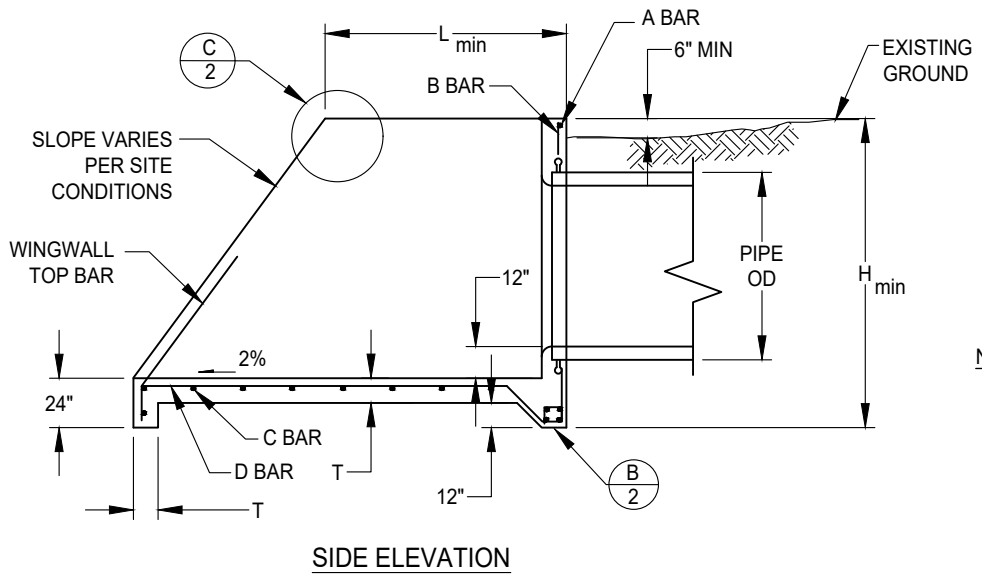
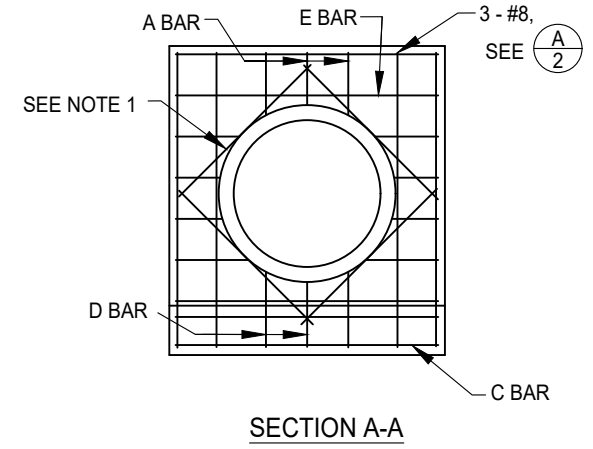
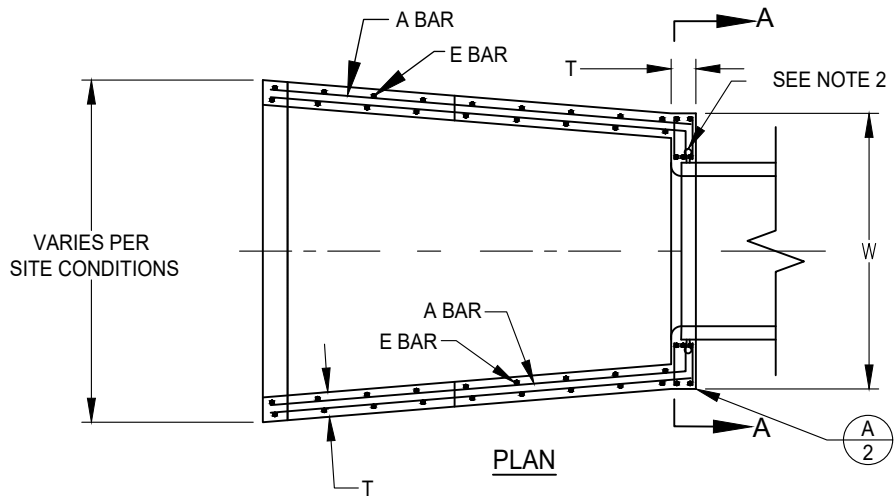
**TRASH RACK
DETAILS
(SHEET 4 OF 4)**

APPROVED BY:
Paul Murock
CITY ENGINEER

10/24/2018
DATE

DRAWING NUMBER
SD - 28.4





- NOTES:**
- SEE DWG SD-28 FOR EMBEDMENT OF TRASH RACK COMPONENTS PRIOR TO POURING CONCRETE

DATE: 09/22/2007		NOT TO SCALE	
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CITY OF ELK GROVE - PUBLIC WORKS

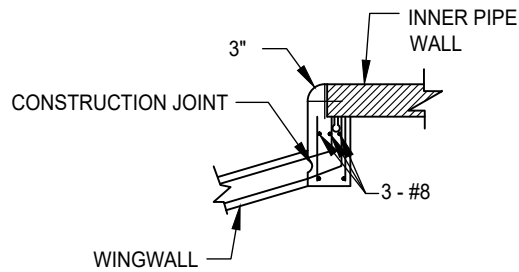
**INLET PIPE HEADWALL
WINGWALL STRUCTURE
(SHEET 1 OF 2)**

APPROVED BY:
Paul Murock
CITY ENGINEER

10/24/2018
DATE

DRAWING NUMBER
SD - 29.1





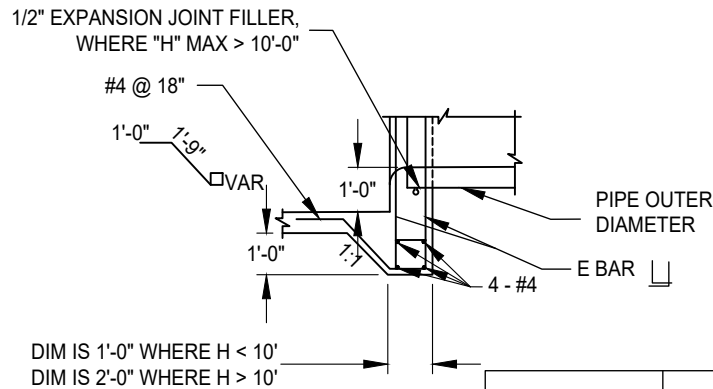
DETAIL A

NOTES:

1. PLACE #5 REBAR ON DIAGONALS @ 4" FROM PIPE OD.
2. PIPE CONNECTIONS SHALL CONFORM TO ASTM C-923. UNITS SHALL INCLUDE A WATER STOP.
3. CHAMFER ALL EXPOSED EDGES 3/4".
4. ALL STEEL MINIMUM 2" FROM CONCRETE EDGES.
5. ALL LAP SPLICES MINIMUM 12".

HEADWALL DIMENSIONS

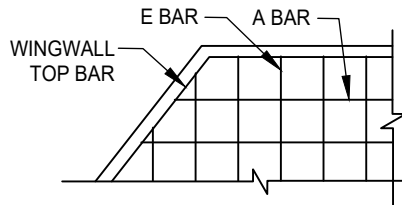
PIPE DIA	PIPE OD	W	H _{min}	T	L _{min}
24"	30"	4'-6"	4'-8"	8"	2'-9"
27"	33.5"	4'-6"	4'-10"	8"	3'-0"
30"	37"	4'-6"	5'-3"	8"	3'-3"
33"	40.5"	4'-6"	5'-9"	8"	3'-6"
36"	44"	5'-6"	5'-9"	8"	3'-9"
42"	51"	6'-6"	6'-6"	8"	4'-3"
48"	58"	7'-6"	7'-5"	10"	5'-3"
54"	65"	9'-6"	7'-7"	10"	5'-9"
60"	72"	10'-6"	8'-3"	10"	6'-0"
72"	86"	12'-6"	9'-8"	10"	7'-3"



DETAIL B

REINFORCING STEEL DIMENSIONS AND DATA

	A BAR	B BAR	C BAR	D BAR	E BAR	WINGWALL TOP BAR
H ≤ 7'	#4 @ 12"OC	#4 @ 12"OC	#4 @ 12"OC	#4 @ 12"OC	#4 @ 12"OC	#4
7' < H ≤ 8'	#4 @ 12"OC EF	#4 @ 12"OC EF	#4 @ 12"OC EF	#4 @ 12"OC EF	#4 @ 12"OC EF	#4
8' < H ≤ 10'	#5 @ 12"OC EF	#5 @ 6"OC EF	#5 @ 12"OC EF	#5 @ 12"OC EF	#5 @ 12"OC EF	#5



DETAIL C

DATE: 09/22/2007		NOT TO SCALE	
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CITY OF ELK GROVE - PUBLIC WORKS

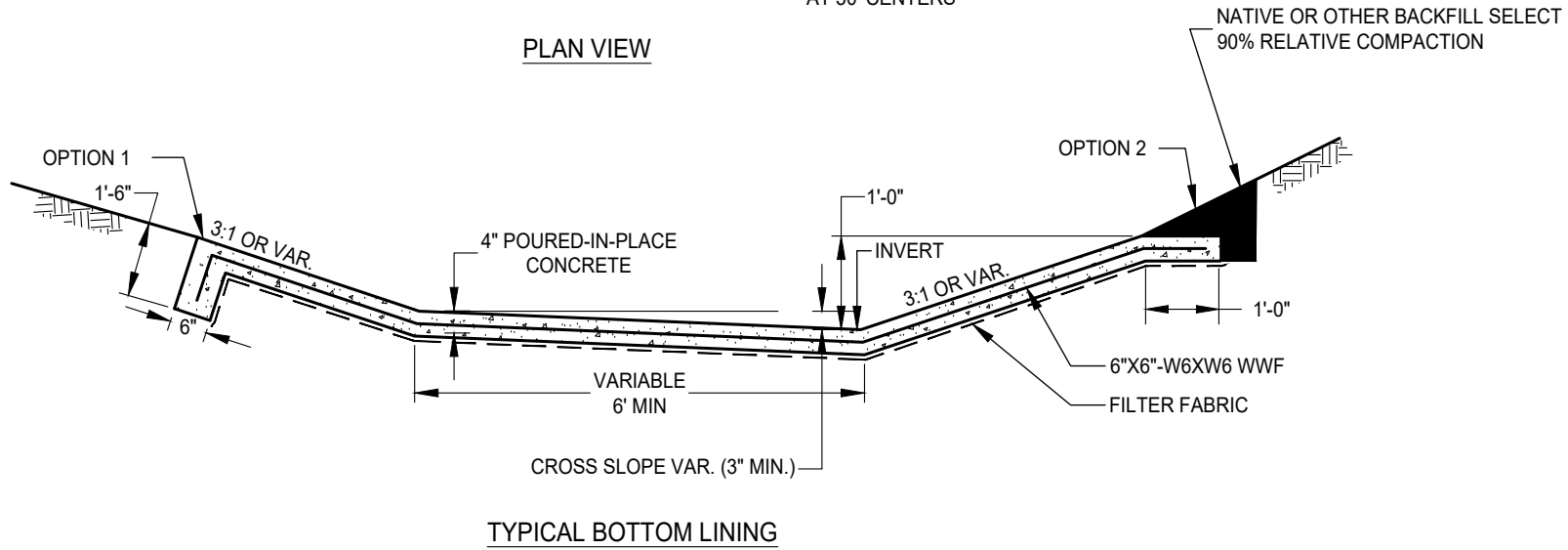
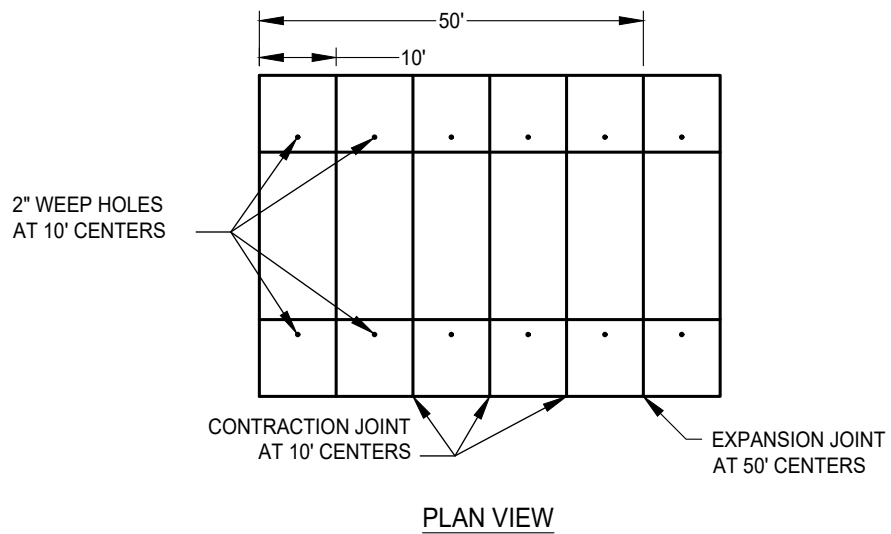
**INLET PIPE HEADWALL
WINGWALL STRUCTURE
(SHEET 2 OF 2)**

APPROVED BY:
Paul Murock
CITY ENGINEER

10/24/2018
DATE

DRAWING NUMBER
SD - 29.2





DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE


CITY OF ELK GROVE - PUBLIC WORKS

**LINED CHANNEL SECTION
(SHEET 1 OF 2)**

APPROVED BY:
Paul Murock
CITY ENGINEER

10/24/2018
DATE

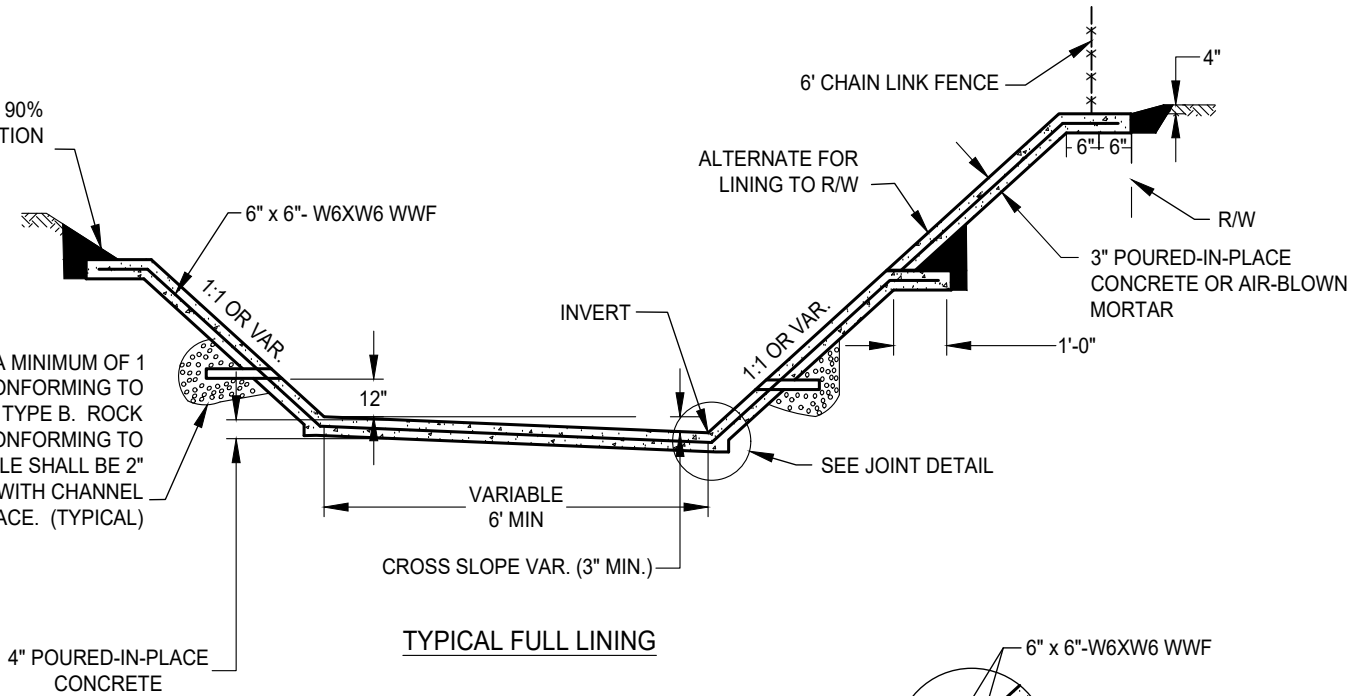
DRAWING NUMBER
SD - 30.1



OPTION 2

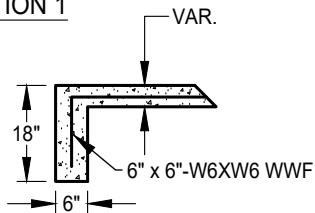
NATIVE OR OTHER SELECT BACKFILL 90%
RELATIVE COMPACTION

WEEP HOLE SHALL BE CENTERED IN A MINIMUM OF 1
C.F. OF 3/4" CRUSHED ROCK CONFORMING TO
SECTION 50 "CLEAN CRUSHED ROCK", TYPE B. ROCK
SHALL BE WRAPPED IN FABRIC CONFORMING TO
SECTION 50 "GEOTEXTILE FABRIC". HOLE SHALL BE 2"
DIAMETER PIPE CUT TO FIT FLUSH WITH CHANNEL
FACE. (TYPICAL)



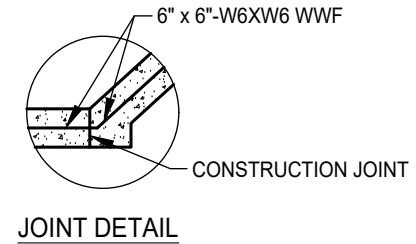
TYPICAL FULL LINING

OPTION 1



CUTOFF WALL

TO BE PLACED ALONG ENTIRE END OF LINED
SECTION AT BEGINNING AND AT END OF
LINING



JOINT DETAIL

DATE: 09/22/2007		NOT TO SCALE	
REVISION	BY	APPROVED	DATE

CITY OF ELK GROVE - PUBLIC WORKS

**LINED CHANNEL SECTION
(SHEET 2 OF 2)**

APPROVED BY:

Paul Murock

CITY ENGINEER

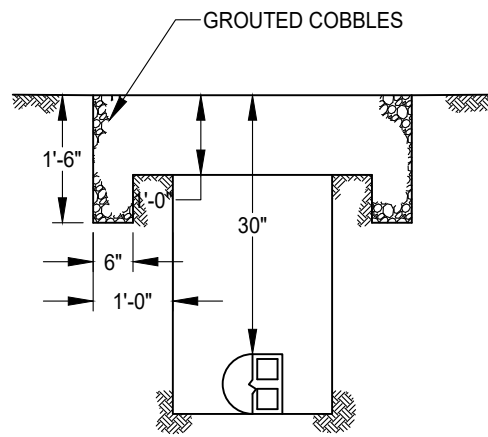
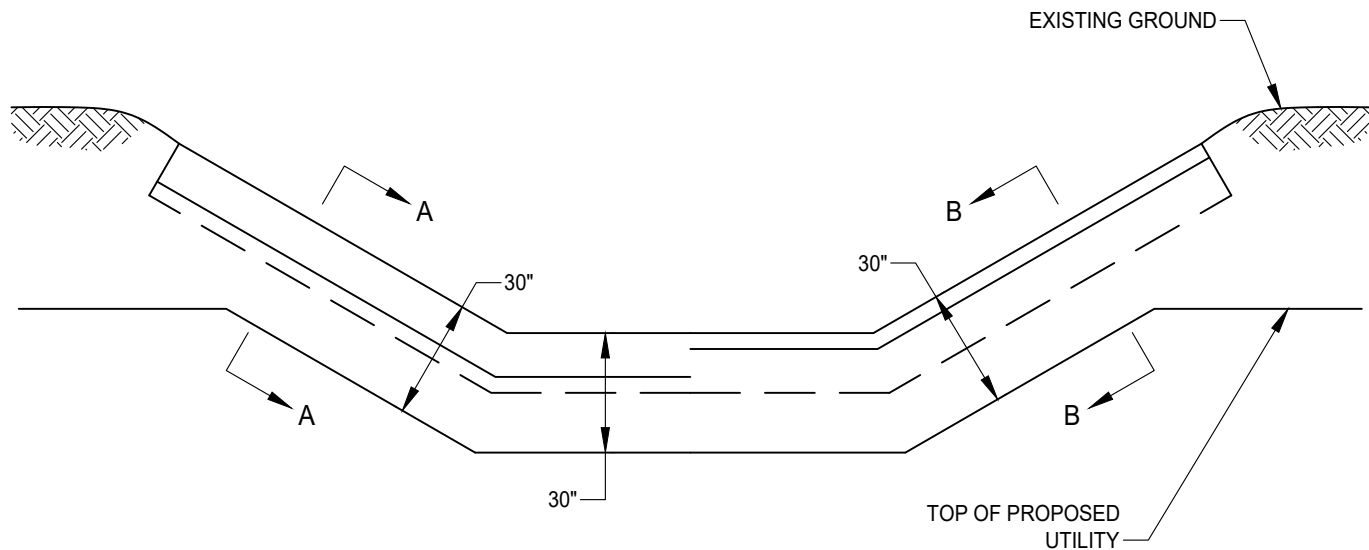
10/24/2018

DATE

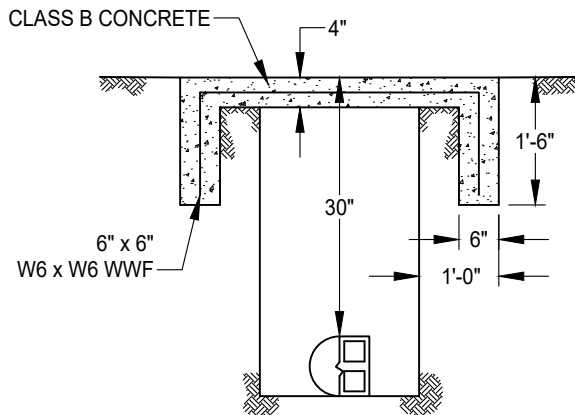
DRAWING NUMBER

SD - 30.2





SECTION A-A



SECTION B-B

NOTES:

1. ALL UTILITY CROSSINGS OF EXISTING STREAMS SHALL BE AT LEAST 30" BELOW EXISTING CHANNEL SIDES AND BOTTOMS. DEEPER PLACEMENT MAY BE REQUIRED IF FUTURE CHANNEL IMPROVEMENTS ARE ANTICIPATED.
2. THE CUT SHALL BE SEALED AS SHOWN WITH GROUTED COBBLES OR CLASS B CONCRETE TO A WIDTH OF 1 FOOT EACH SIDE OF THE UTILITY TRENCH. ALL NATURAL STREAMS, AS SHOWN ON THE NATURAL STREAMS PLAN, SHALL UTILIZED GROUTED COBBLES.
3. CONSTRUCTION IS TO CONFORM TO SECTION 44-2.07 OF THE CITY OF ELK GROVE STANDARD CONSTRUCTION SPECIFICATIONS WITH CUT OFF WALLS CONFORMING TO STANDARD DRAWING SD-30.2 (OPTION 1).

DATE: 09/22/2017		NOT TO SCALE	
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1	SJB	SMA	04-12-2024

CITY OF ELK GROVE - PUBLIC WORKS

UTILITY STREAM CROSSING

APPROVED BY:

[Signature] 05-28-2024
DATE

CITY ENGINEER

DRAWING NUMBER

SD - 31

