

STORM DRAIN DESIGN CRITERIA

1. MINIMUM GUTTER SLOPE SHALL BE 0.0035 AND A MAXIMUM OF 0.3 FOOT FALL AROUND CURB RADIUS
2. MAXIMUM GUTTER LENGTH PER CATCH BASIN SHALL BE 900 FEET
3. THE RATIONAL METHOD USED IN DETERMINING THE PEAK RUNOFF SHALL BE EXPRESSED BY THE EQUATION, $Q = C \times I \times A$, WHERE:

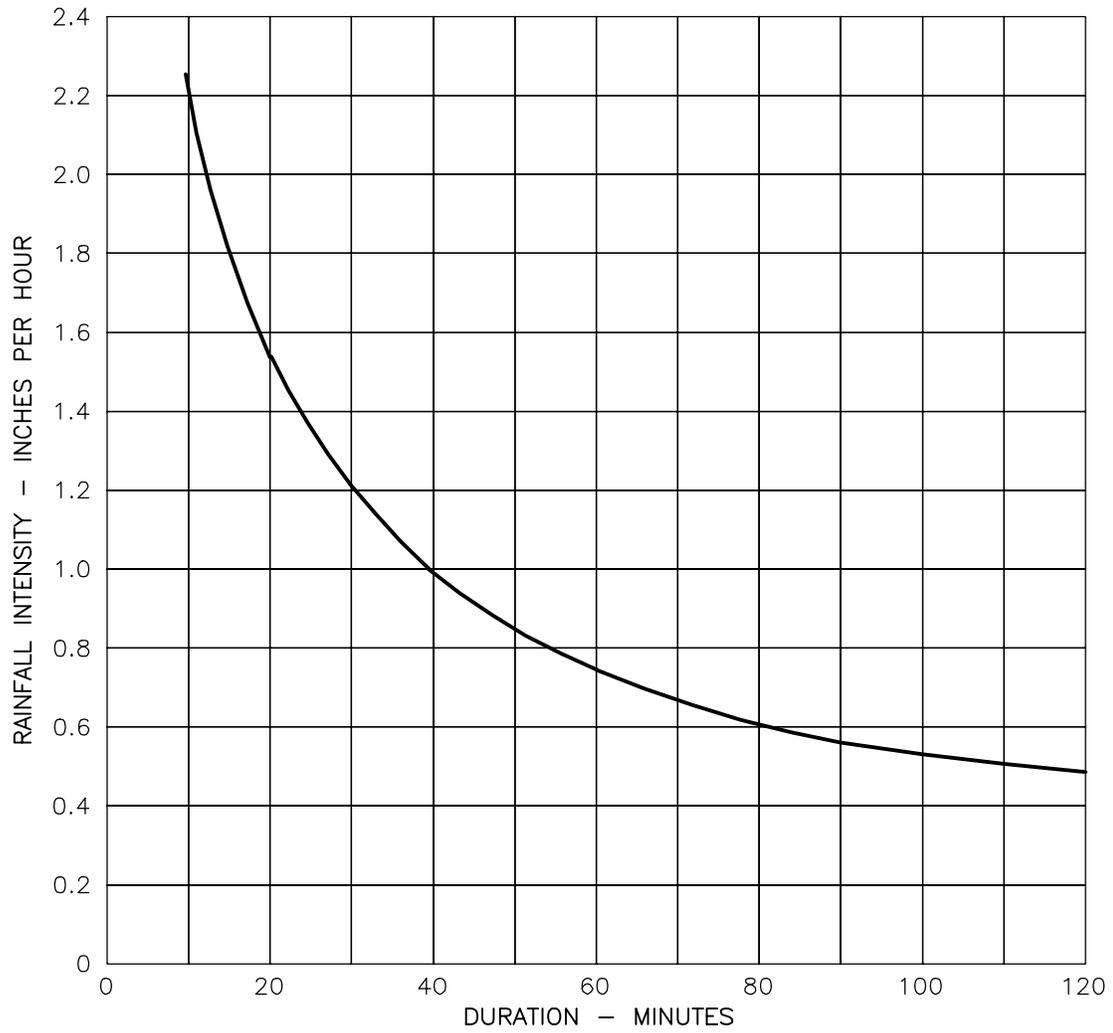
Q = RUNOFF, IN CUBIC FEET PER SECOND
 C = RUNOFF COEFFICIENT (SEE ITEM 4 BELOW)
 I = AVERAGE RAINFALL INTENSITY, IN INCHES PER HOUR, FOR A DURATION EQUAL TO THE TIME OF CONCENTRATION
 A = TRIBUTARY DRAINAGE AREA, IN ACRES

4. RUNOFF COEFFICIENTS FOR THE CITY OF ESCALON:

	C	MAXIMUM INLET TIME (MINUTES)
SINGLE FAMILY RESIDENTIAL	0.35	25
MULTI-FAMILY RESIDENTIAL	0.50	20
APARTMENTS	0.65	15
COMMERCIAL	0.90	10
INDUSTRIAL	0.85	10
PARKS	0.25	28
SCHOOLS	0.40	24

5. RAINFALL INTENSITY SHALL BE DETERMINED USING THE 10 YEAR RAINFALL INTENSITY CURVE (SEE CITY OF ESCALON STANDARD D2)
6. MINIMUM SIZE FOR LATERALS FROM CATCH BASIN TO MANHOLE SHALL BE 12" DIAMETER
7. MINIMUM SIZE FOR STROM DRAIN TRUNK LINES SHALL BE 12" DIAMETER
8. THE MINIMUM VALUE OF MANNINGS "n" USED IN FLOW CALCULATIONS SHALL BE 0.013
9. MAIN STORM DRAIN TRUNK LINES SHALL BE DESIGNED FOR A MINIMUM VELOCITY OF 2.5 FEET PER SECOND, FLOWING FULL
10. MANHOLES SHALL BE PROVIDED AT ALL JUNCTIONS, CHANGES OF ALIGNMENT, GRADE, OR PIPE SIZE
11. LATERALS FROM CATCH BASINS SHALL BE CONNECTED TO MAIN STORM DRAIN TRUNK LINE AT MANHOLES ONLY
12. ACCESS TO MAIN STORM TRUNK LINE SHALL BE PROVIDED BY MANHOLES AT MAXIMUM INTERVALS OF 400 FEET ON LINES 21 INCHES IN DIAMETER OR SMALLER, AND AT INTERVALS OF 700 FEET ON LINES GREATER THAN 21 INCHES IN DIAMETER
13. STORM DRAIN PIPE MAY BE REINFORCED CONCRETE PIPE, ASTM DESIGNATION C-76, WITH RUBBER GASKET JOINT

REVISION	DATE	<h1 style="margin: 0;">CITY OF ESCALON</h1>	APPROVED BY:
DATE: APR. 2003	DRAWN BY: DBR		<h2 style="margin: 0;">STORM DRAIN DESIGN CRITERIA</h2>
CHECKED BY: AJA	SCALE: NONE		IMPROVEMENT STANDARD NO. D1



REVISION	DATE
DATE:	APR. 2003
DRAWN BY:	DBR
CHECKED BY:	AJA
SCALE:	NONE

CITY OF ESCALON
 INTENSITY-DURATION CURVE
 10-YEAR RAINFALL

APPROVED BY:

 CITY ENGINEER
 IMPROVEMENT STANDARD NO. D2

DESIGN CRITERIA FOR STORM DRAINAGE BASINS AND PUMP STATIONS

THE DESIGN OF STORM DRAINAGE FACILITIES SHALL CONFORM TO CITY STANDARDS, THE STORM DRAINAGE MASTER PLAN, AND ANY CONDITIONS OR RESTRICTIONS CONTAINED THEREIN.

STORM DRAINAGE RETENTION POND

1. REQUIRED BASIN SIZING: $V = 2CAR / 12$

WHERE: C = RUNOFF COEFFICIENT (SEE ITEM 4, ESCALON CITY STANDARD D1)
 A = AREA SERVED BY BASIN, IN ACRES
 R = 3.12", TOTAL RAINFALL FOR STORM
 V = BASIN VOLUME, IN ACRE-FEET

FREEBOARD: 2 FEET MINIMUM

STORM DRAINAGE DETENTION BASIN

1. REQUIRED BASIN SIZING: $V = CAR / 12$

WHERE: C = RUNOFF COEFFICIENT (SEE ITEM 4, ESCALON CITY STANDARD D1)
 A = AREA SERVED BY BASIN, IN ACRES
 R = 3.12", TOTAL RAINFALL FOR STORM
 V = BASIN VOLUME, IN ACRE-FEET

FREEBOARD: 2 FEET MINIMUM

2. ALL DETENTION BASINS SHALL HAVE OUTLET FACILITIES PROVIDING TERMINAL DRAINAGE CAPABLE OF EMPTYING A FULL BASIN WITHIN 24 HOURS

STORM PUMP STATION

1. REQUIRED PUMP WELL VOLUME: $V_w = 8.02 Q_p / St$

WHERE: Q_p = PUMPING RATE IN gpm FOR A SINGLE PUMP
 St = STARTS PER HOUR, 3 FOR ALL PUMPS
 V_w = MINIMUM PIT VOLUME, IN CUBIC FEET

2. REQUIRED OUTLET PUMP FACILITIES: $Q_p = 5430.8 V / T$

WHERE: V = BASIN VOLUME, IN ACRE-FEET
 T = TIME TO EMPTY THE BASIN, 24 HOURS OR NUMBER PER CITY ENGINEER'S EXCEPTION
 Q_p = PUMPING RATE IN gpm FOR A SINGLE PUMP

3. REQUIRED PUMP STATION FEATURES:

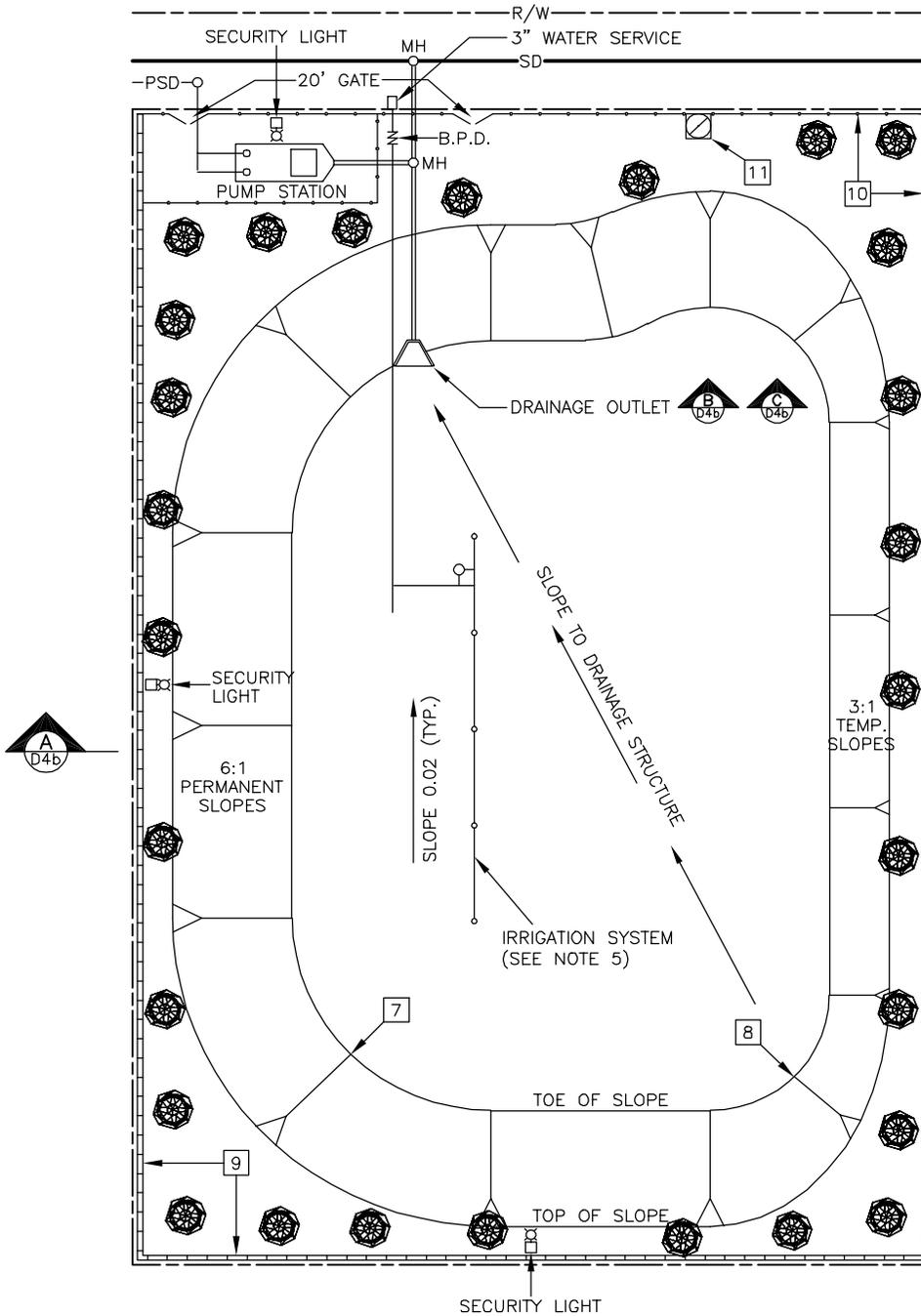
PUMP CONFIGURATION: DUPLEX PUMPS OF EQUAL CAPACITY, EQUAL OR GREATER THAN Q_p

PUMP CONTROLS: DUPLEX CONTROLS WITH ALTERATION, TELEMETRY, ETC. PER CITY OF ESCALON STANDARDS

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DATE: APR. 2003			 CITY ENGINEER
DRAWN BY: DBR		<h2>DRAINAGE BASIN AND PUMP STATION CRITERIA</h2>	IMPROVEMENT STANDARD NO. D3
CHECKED BY: AJA			
SCALE: NONE			

NOTES:

1. THE BASIN SHALL BE LAID OUT TO BE AESTHETICALLY PLEASING AND SHALL PROVIDE AREAS ABOVE THE HIGH WATER MARK FOR THE INSTALLATION OF PERMANENT FEATURES SUCH AS BENCHES, PICNIC TABLES, ETC.
2. TREES SHALL BE PLANTED AROUND THE EXTERIOR OF THE BASIN AT A RATE OF 1 FOR EACH 50' OF BOUNDARY PERIMETER. DECIDUOUS TREES SHALL BE PLANTED ALONG STREET FRONTAGE. ALL OTHERS SHALL BE EVERGREEN
3. TREES TO BE PLANTED SHALL BE OF 15 GALLON SIZE AND CONFORM TO THE CITY OF ESCALON APPROVED STREET TREE LIST
4. SECURITY LIGHTING SHALL BE INSTALLED ON ALL PERMANENT BOUNDARIES NOT ADJACENT TO STREETS AT A SPACING OF 800' O.C. MAXIMUM, IN ACCORDANCE TO CITY OF ESCALON STANDARD LIGHTING DETAIL
5. A PERMANENT AUTOMATIC IRRIGATION SYSTEM, USING TURF ROTORS, SHALL BE INSTALLED IN THE BASIN
6. THE ENTIRE BASIN, INCLUDING SLOPES, SHALL BE SEEDED WITH "PLAY"-TYPE SEED MIX
- 7 100' MINIMUM RADIUS FOR PERMANENT CONSTRUCTION
- 8 60' MINIMUM RADIUS FOR TEMPORARY SLOPES
- 9 8' SPLIT FACE CONCRETE BLOCK WALL WHERE PROPERTY LINES ABUT OTHER PROPERTIES
- 10 6' CHAIN LINK FENCE ON PROPERTY LINES ADJOINING STREET, OR WHERE FUTURE EXPANSION IS PLANNED
- 11 LOCKABLE TURNSTILE: 1 REQUIRED FOR EACH 500' OF STREET FRONTAGE



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CITY OF ESCALON

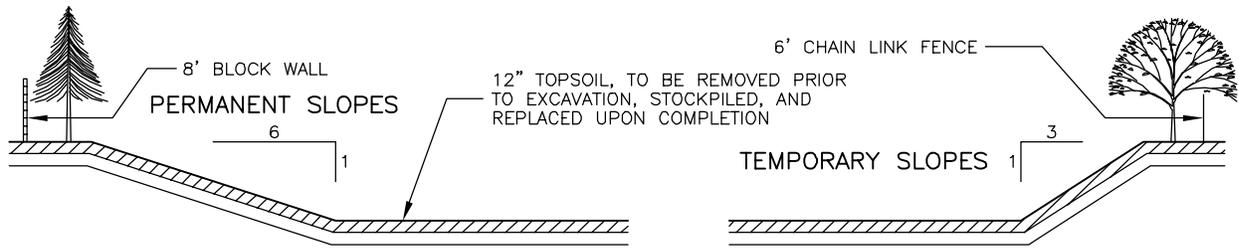
STORM DRAINAGE BASIN

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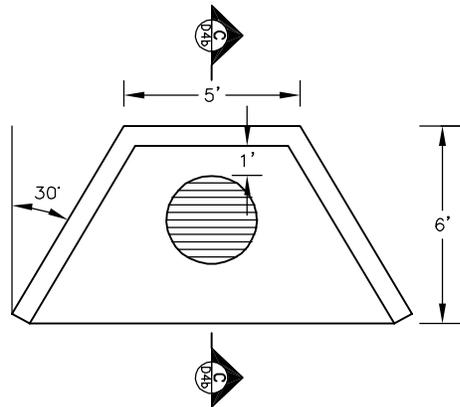
Doug Trilham

CITY ENGINEER

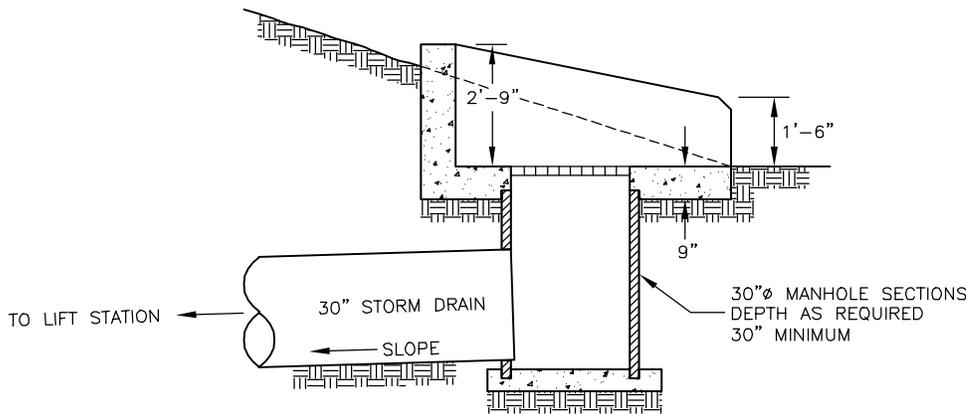
IMPROVEMENT STANDARD NO. D4a



A
D4a
BASIN SECTION



B
D4b
DRAINAGE OUTLET/INLET STRUCTURE



C
D4b
DRAINAGE STRUCTURE SECTION

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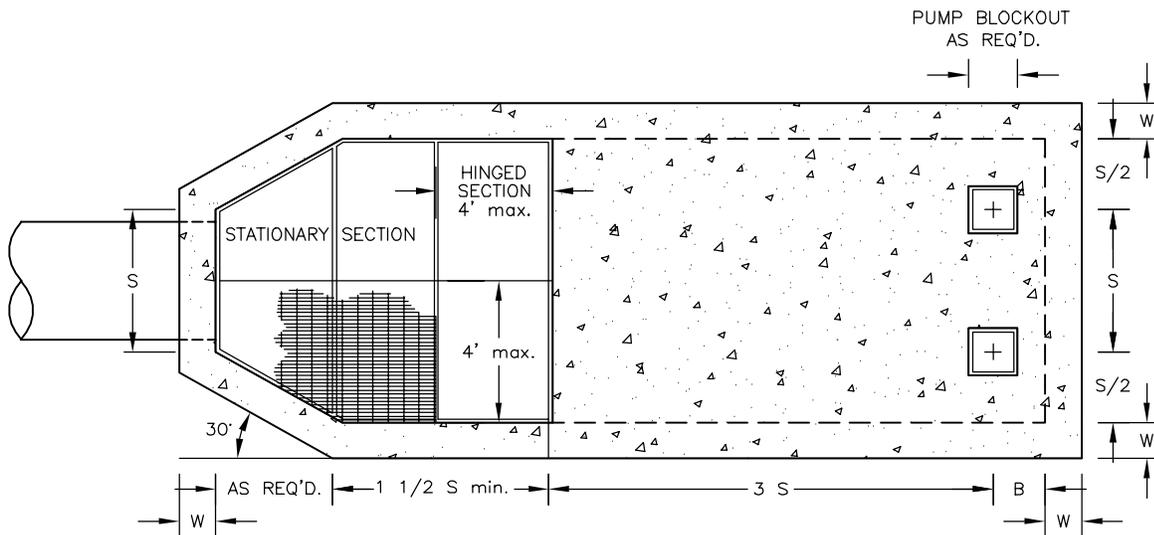
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STORM DRAINAGE BASIN

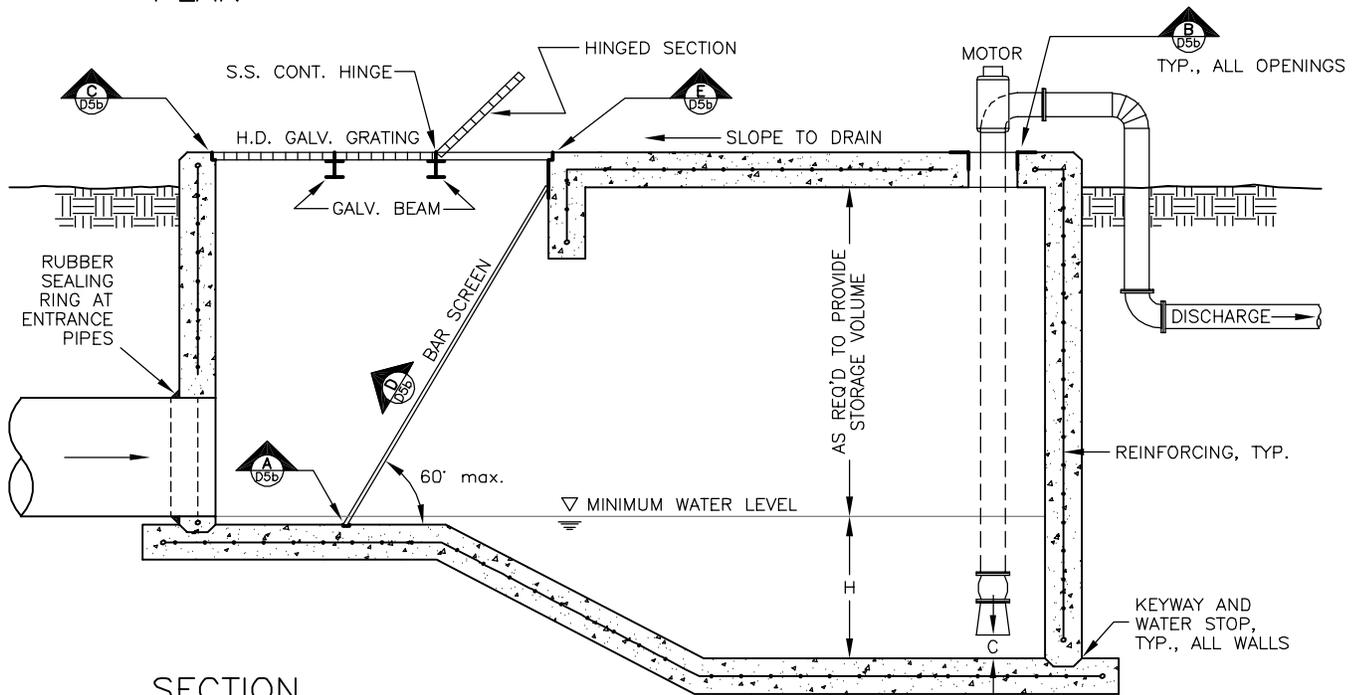
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Doug Strilham
CITY ENGINEER

IMPROVEMENT STANDARD NO. D4b



PLAN



SECTION

DIMENSIONS

PUMP GPH	0-1500	1501-3000
PUMP SIZE	10"	12"
B	12 3/4"	14"
C	6"	7"
H min.	36"	62"
S	36"	42"
W	9"	9"

NOTE:
DIMENSIONS GIVEN ARE APPROXIMATE.
ACTUAL DIMENSIONS SHALL BE AS
REQUIRED BY PUMP MANUFACTURER
AND STANDARD SPECS

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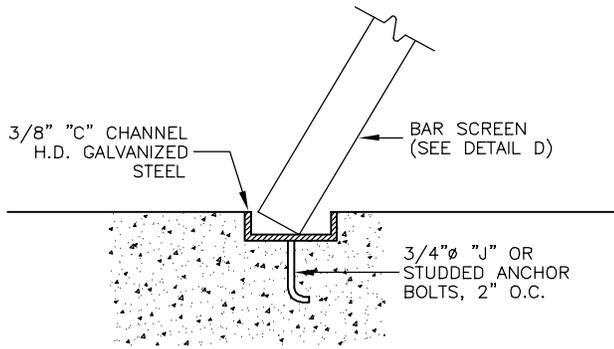
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STORMWATER PUMP STATION

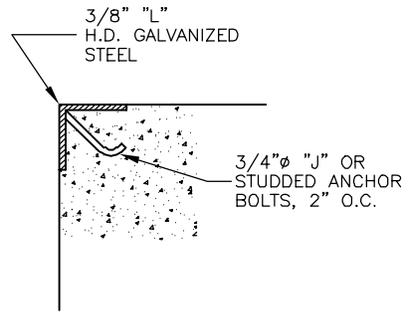
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CITY ENGINEER

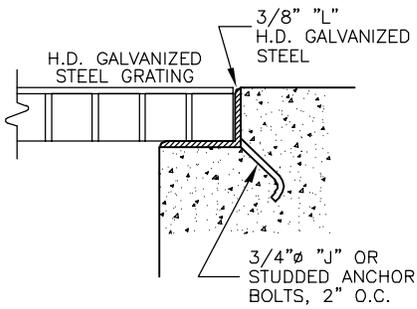
IMPROVEMENT STANDARD NO. D5a



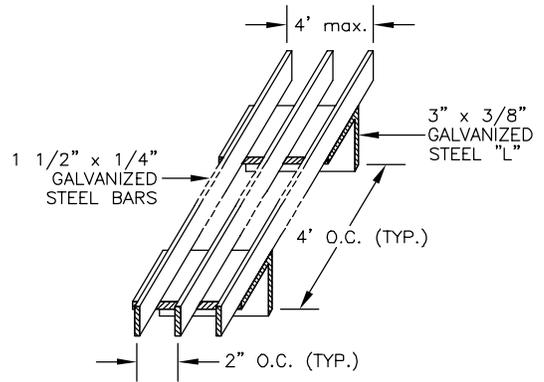
A
D5a FOOTING DETAIL



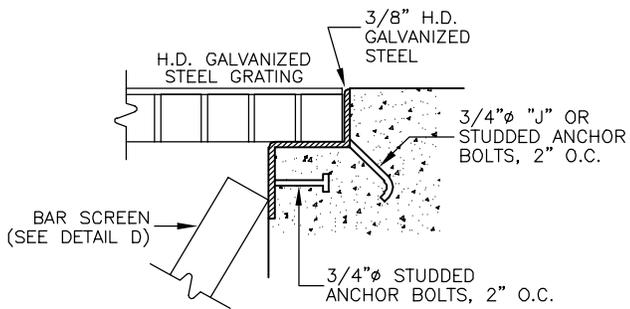
B
D5a NOSING DETAIL



C
D5a EDGE DETAIL



D
D5a BAR SCREEN DETAIL



E
D5a EDGE-NOSING DETAIL

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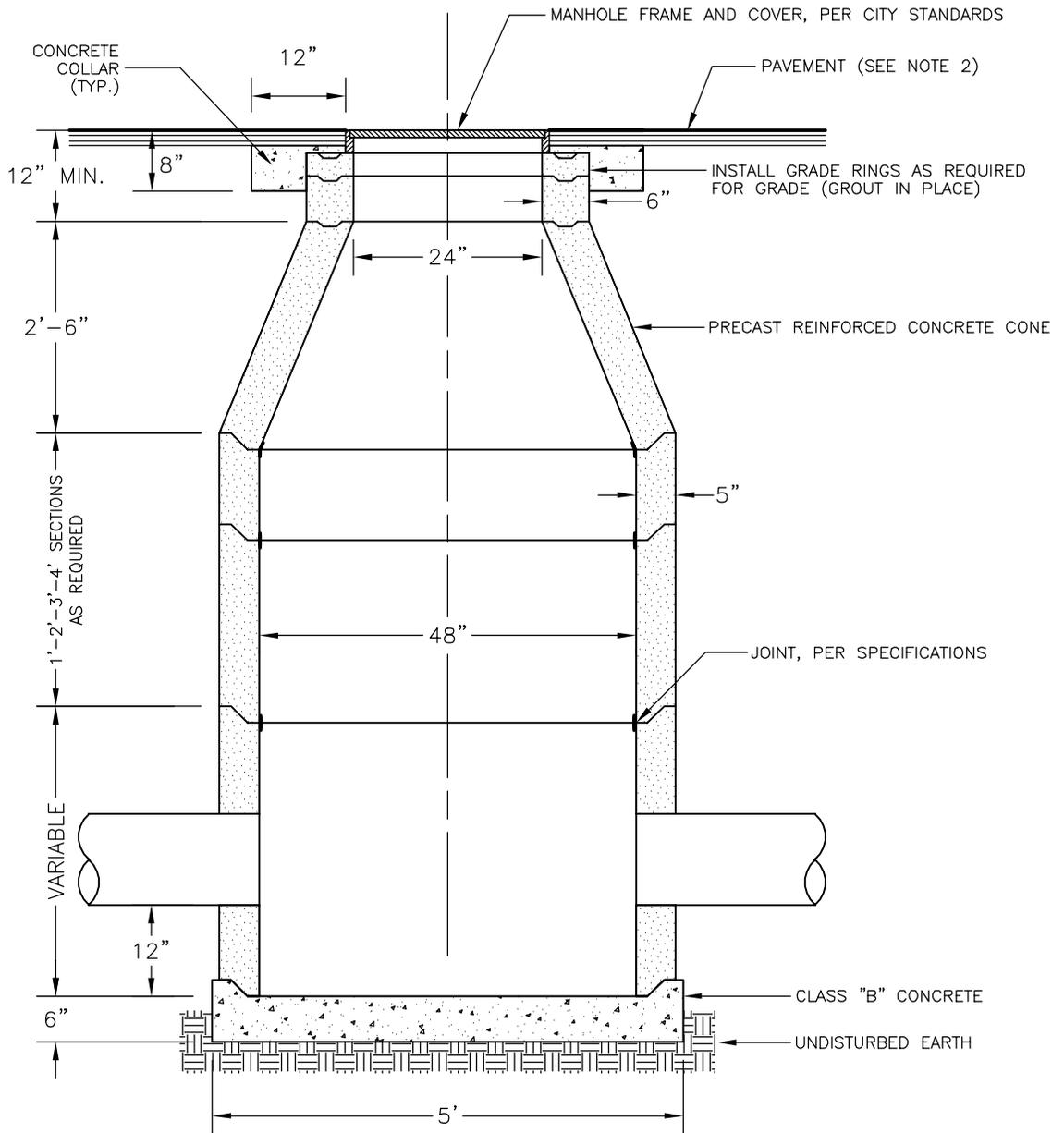
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STORMWATER PUMP STATION

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Doug Strilham
CITY ENGINEER

IMPROVEMENT STANDARD NO. D5b



NOTES:

1. TYPE II STORM DRAIN MAINTENANCE HOLE TO BE USED ONLY WHERE APPROVED BY THE CITY ENGINEER
2. WHEN NOT IN TRAVELLED WAY, SET ELEVATION OF MANHOLE COVER 6" ABOVE GRADE

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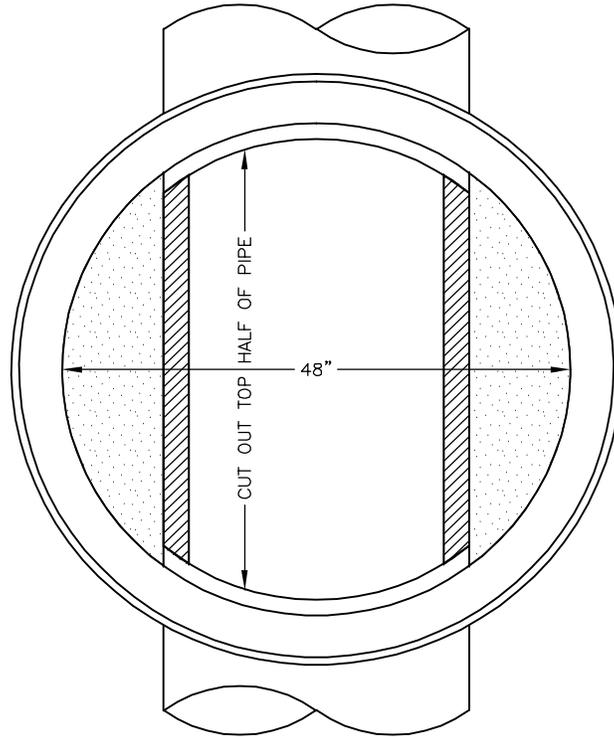
CITY OF ESCALON

TYPE II STORM DRAIN
MAINTENANCE HOLE

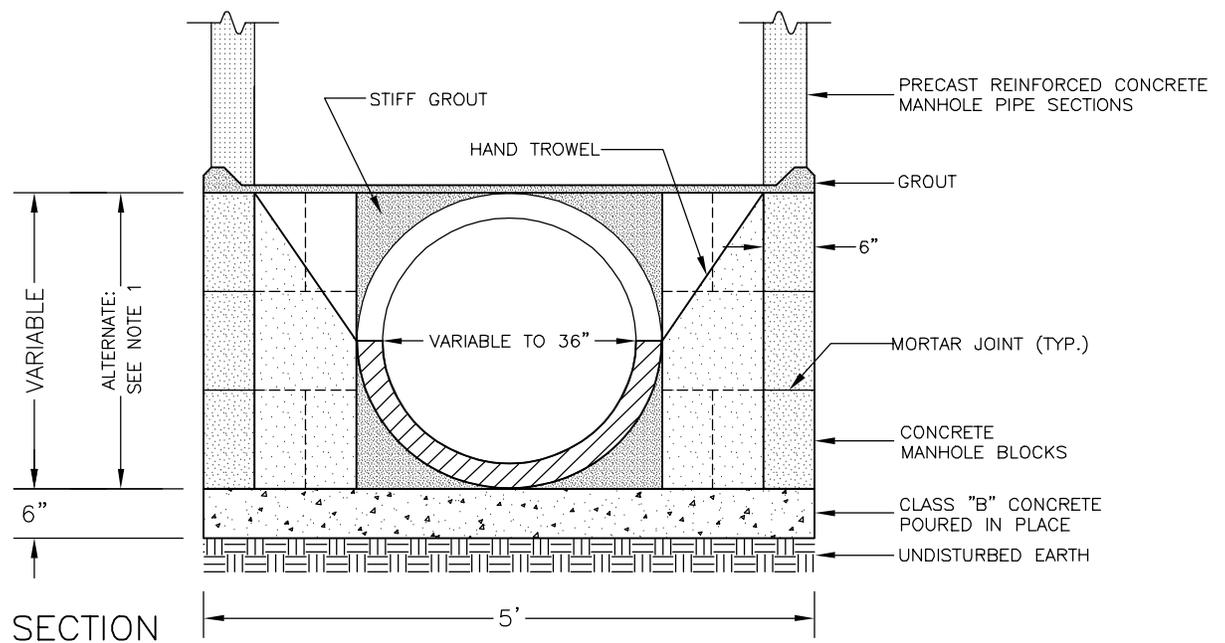
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STANDARD NO. D10



PLAN



SECTION

NOTE:

1. MAY BE CAST IN PLACE. CONCRETE DETAILS SUBJECT TO APPROVAL OF CITY ENGINEER

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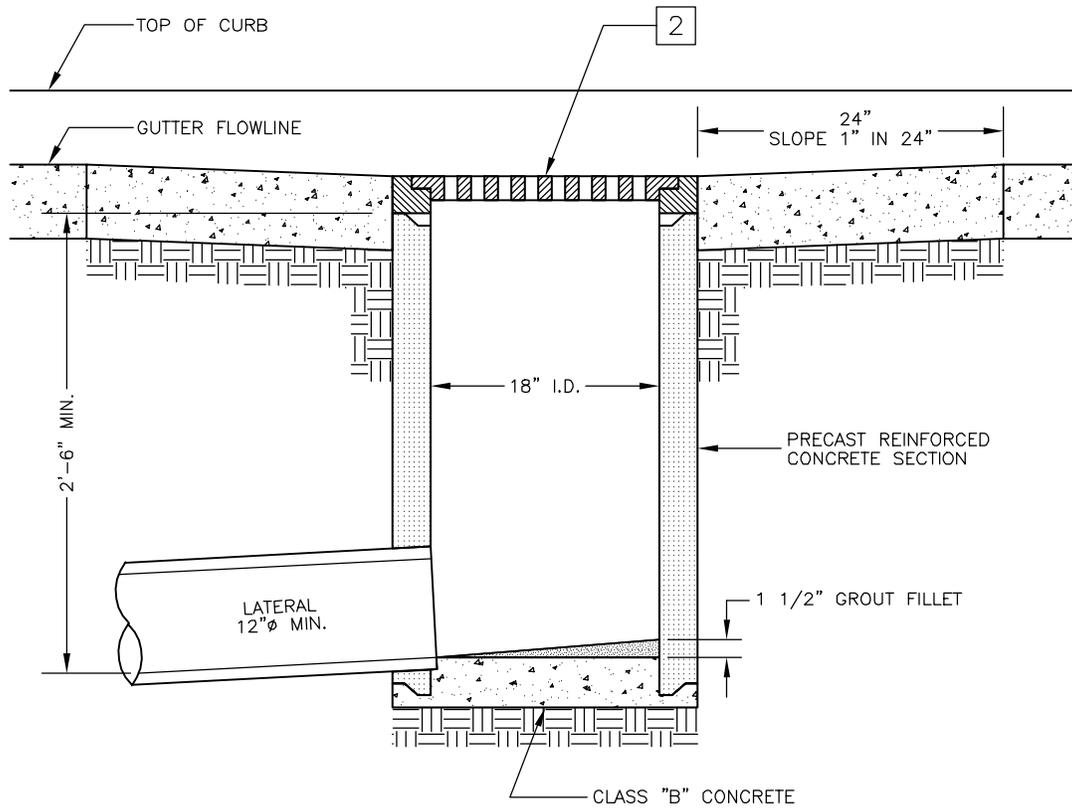
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ALTERNATE BASE FOR
STORM MAINTENANCE HOLE

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CITY ENGINEER

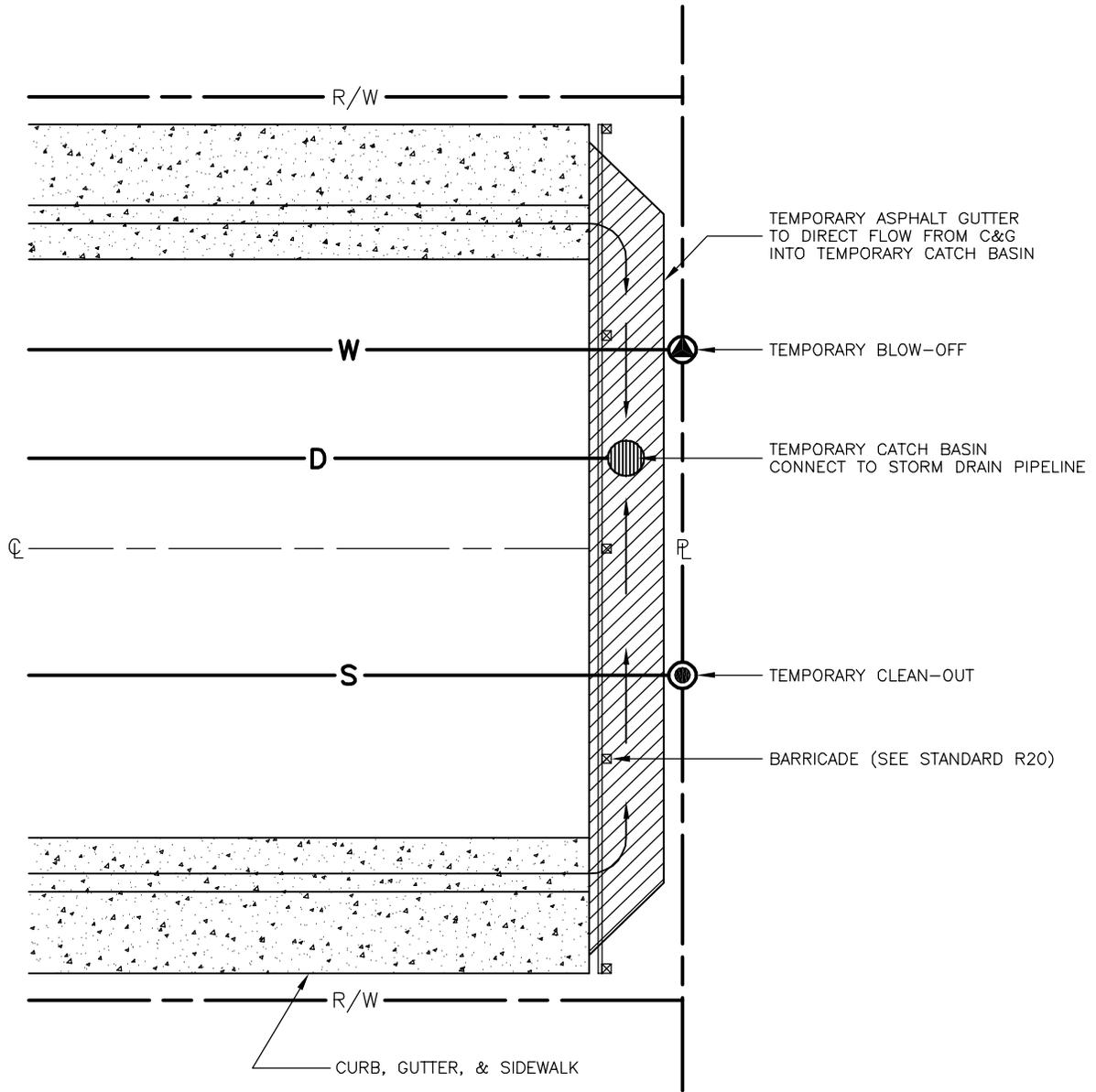
IMPROVEMENT
STANDARD NO. D11



NOTES:

1. APPROVAL OF CITY ENGINEER REQUIRED FOR INSTALLATIONS OTHER THAN IN CURB AND GUTTER
2. GRATE AND FRAME SHALL CONFORM TO COUNTYWIDE STANDARD CW-M7
3. 18" PIPE BARREL SHALL BE CLASS 1 RCP, OR CLASS 2 NON-RCP
4. CATCH BASIN ASEMBLY TO BE SET $\frac{1}{2}$ " BELOW FLOW LINE OF GUTTER

REVISION	DATE	<h1 style="margin: 0;">CITY OF ESCALON</h1>	APPROVED BY:
DATE:	APR. 2003		<h2 style="margin: 0;">18" STORM DRAIN CATCH BASIN</h2>
DRAWN BY:	DBR		IMPROVEMENT STANDARD NO. D12
CHECKED BY:	AJA		
SCALE:	NONE		



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SCALE: NONE	

CITY OF ESCALON

TEMPORARY CATCH BASIN

APPROVED BY:

Doug Strickham

CITY ENGINEER

IMPROVEMENT STANDARD NO. D13