

CITY OF ALBUQUERQUE



July 20, 2015

Scott Eddings, P.E.
Huitt-Zollars
6501 Americas Parkway NE
Albuquerque, NM 87110

**Re: Winrock Redevelopment Section 2 and Section 4 Grading and Drainage Plan
Engineer's Stamp Date 7-20-15
Drainage file number (J19D058C)**

Dear Mr. Eddings,

Based upon the information provided in your plan submittal received 7-20-15 and telephone conversation 7-20-15, the above referenced plan is approved for Site Plan for Development action by the DRB, Work Order and for Building Permit with the following comments to be addressed at DRC (Work Order) or prior to releasing Certificate of Occupancy (Building Permit):

1. Storm drain sizes as shown on Sheet C103 should be included in the Work Order, not C100 and C102, for the outfall to the 84" existing storm drain.
2. The narrative states that rooftop basins will be directed to the water feature for treatment. This should be revised to state that the first flush from rooftops will be treated by an underground retention system in the interim condition.
3. Inlet 6 is proposed as a Triple "C" inlet. However, the City does not have a standard drawing for a Triple "C" inlet so a Double "C" inlet with a connector pipe to an "A" inlet may work. This can be addressed on the Work Order plans.
4. Grade a 90% compacted berm (2 feet high?) on the downstream side of the future pad on Sheet C201, to create a sedimentation pond on the future pad.
5. The future pad on Sheet C202 could have a depression in the middle or a berm graded on the southern edge to create a sedimentation pond.
6. Per our conversation, the parking structure deck drains with inlets to the first flush pond next to the ring road.
7. Provide a pipe size for the roof drain pipe on sheet C202. The City understands this pipe is an 18" pipe on the upstream portion and a 24" pipe on the downstream portion.
8. Provide a build note for the plug in the above mentioned roof drain pipe. Per our conversation the plug is to be in a manhole.
9. Per our conversation the pipe leading to the underground retention system is 12" diameter.
10. The first flush depressed area was inadvertently omitted in Sections A, B, and C on Sheet C505.

PO Box 1293

Albuquerque

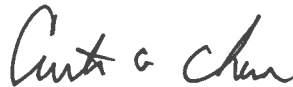
New Mexico 87103

www.cabq.gov

11. As a note for future submittals, the manning's coefficient for streets is 0.017, not 0.013. The street had excess capacity using 0.013, so it should work if 0.017 was used.
12. On Sheet C101, correct the flows on Basins 302-A1 and 302-A2 to 2.8 cfs and 4.2 cfs, respectively.

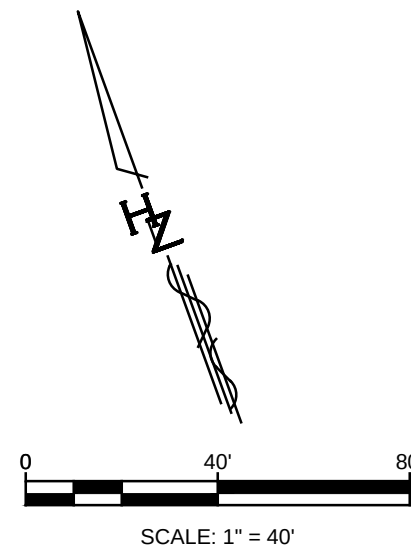
If you have any questions, you can contact me at 924-3420.

Sincerely,

A handwritten signature in black ink, appearing to read "Curtis Cherne". The signature is fluid and cursive, with the first name "Curtis" and last name "Cherne" clearly distinguishable.

Curtis Cherne, P.E.
Principal Engineer, Stormwater Quality for Hydrology
Planning Dept.

C: e-mail



A

DATE: 7/20/15	sheet- X
SCALE: 1"=40'	C201 of- XX

- 1 PROVIDE 12" CURB OPENING
- 2 CONSTRUCT RETAINING WALL: RE SHEET C504
- 3 ADJUST INLET TO GRADE
- 4 4' DIAMETER MANHOLE: RE COA STD DWG 2102
- 5 APPROXIMATE ROOF DRAIN LOCATION
- 6 APPROXIMATE RAMP DRAIN: RE MECHANICAL PLANS
- 7 18"HDPE CORRUGATED STORM
- 8 12" HDPE STORM DRAIN ROOF LEADER
- 9 12" HDPE STORM DRAIN EXTEND TO RAMP INLET
- 10 GRADE 1' BELOW FLOWLINE
- 11 INSTALL ADS STORMWATER CHAMBER: RE SHEETS C501-C504
- 12 24" SIDEWALK CULVERT PER COA STD DWG 2236
- 13 CONSTRUCT 1' BERM AROUND GRADED PAD
- 14 PROVIDE 12" CURB OPENING: RE SHEET C505

SEE SHEET C202

BUILDING PERMIT

HUITT-ZOLIARS
Huitt-Zollars, Inc. Rio Rancho
333 Rio Rancho Drive NE, Suite 101
Rio Rancho, New Mexico 87124
Phone (505) 892-5141 Fax (505) 892-3259

DRAINAGE NARRATIVE

PURPOSE
THE PURPOSE OF THIS DRAINAGE PLAN ADDRESSES STORM WATER RUNOFF AND PROPOSED INFRASTRUCTURE NECESSARY TO CONVEY RUNOFF FROM THE PROPOSED SECTION 2 AND SECTION 4 WINROCK TOWN CENTER SITE PLAN. THESE SECTIONS ARE THE SOUTHEAST AND SOUTHWEST PORTIONS OF THE EXISTING MALL AND ALSO INCLUDE SURFACE PARKING AREAS. THE PLAN WILL EXHIBIT COMPLIANCE WITH THE CITY OF ALBUQUERQUE DPM CHAPTER 22 AND THE DRAINAGE MASTER PLAN (DMP) FOR WINROCK TOWN CENTER PREPARED BY ISAACSON AND ARFMAN, P.A. DATED JUNE 26, 2015.

EXISTING CONDITIONS
THE WINROCK SITE IS A COMPLEX OF BUILDINGS THAT INCLUDES THE MAIN MALL, A NUMBER OF OUTLYING RESTAURANTS, THE TOYS 'R' US, AND A RECENTLY COMPLETED MOVIE THEATER. THE EXISTING MALL BUILDING IS COMPOSED OF A NUMBER OF INDIVIDUAL BUILDINGS THAT WERE ENCLOSED BY AN OVERALL STRUCTURE.

THE SITE IS BOUNDED BY INDIAN SCHOOL ROAD TO THE NORTH, AMERICA'S PARKWAY (AKA UPTOWN LOOP) TO THE NORTHWEST, LOUISIANA BLVD TO THE WEST, I-40 AND THE EMBUDO ARROYO TO THE SOUTH, THE WINROCK VILLAS CONDO COMPLEX TO THE EAST, AND PENNSYLVANIA AVE TO THE NORTHEAST. THE SITE GENERALLY SLOPES FROM THE EAST TOWARDS THE SOUTHWEST CORNER.

EXISTING DRAINAGE PATTERNS DIRECT STORM WATER TOWARDS ONE OF THE EXISTING STORM DRAINS, OR TO THE SURROUNDING ROADS. THE SITE IS COMPLETELY DEVELOPED WITH ABOUT 88% IMPERVIOUS AREA.

- RELATED REPORTS**
- "DRAINAGE MASTER PLAN" FOR WINROCK TOWN CENTER BY ISAACSON AND ARFMAN, P.A. DATED 6/26/2015
 - "PHASE 1 AMENDMENT TO THE FINAL DRAINAGE STUDY FOR WINROCK REDEVELOPMENT" BY HUITT- ZOLLARS, INC. DATED 09/07/2011 (H-Z AMENDMENT)
 - "FINAL DRAINAGE STUDY FOR WINROCK REDEVELOPMENT WINROCK MARKET CENTER" BY HUITT- ZOLLARS, INC. DATED 03/13/2006 (H-Z DRAINAGE STUDY)

IN THE EXISTING CONDITION THE SITE IS FULLY DEVELOPED AND DOESN'T PROVIDE ANY ONSITE DETENTION, RESULTING IN A HISTORIC FREE-DISCHARGE FROM THE OVERALL WINROCK SITE. DOWNSTREAM DRAINAGE INFRASTRUCTURE IS SIZED TO ACCEPT THE EXISTING FLOWS FROM EACH EXISTING DISCHARGE POINT.

- DMP DRAINAGE BASINS & SUB BASINS INCLUDED IN THIS PROJECT:**
- **SUB BASIN 301** BASIN 400 BASIN 400 BASIN 500 ROOF TOP
 - **SUB BASIN 302** BASIN 500 BASIN 610 BASIN 530

- DMP REQUIREMENTS INCLUDE THE FOLLOWING:**
- DESIGN EACH PROJECT USING THE LAND TREATMENTS CALLED OUT FOR EACH BASIN IN THE HYDROLOGY CALCULATIONS IN APPENDIX B.
 - EVERY NEW DEVELOPMENT IS REQUIRED TO BUILD DOWNSTREAM STORM DRAINS THAT ARE SHOWN IN THIS DMP. THE IMPROVEMENTS MUST MEET CITY OF ALBUQUERQUE STANDARDS.
 - THE DEVELOPMENTS ARE ALSO REQUIRED TO DESIGN HOW FLOWS ARE DIRECTED TO THAT INFRASTRUCTURE.
 - EXAMPLES INCLUDE NUMBER AND LOCATION OF STORM INLETS, ROOF DRAIN CONNECTIONS, SIDEWALK CULVERTS, STREET FLOW CAPACITY, ETC.
 - AS PART OF THE INDIVIDUAL GRADING & DRAINAGE PLANS, EVERY NEW DEVELOPMENT WITHIN THE PROJECT IS REQUIRED TO TREAT "FIRST FLUSH" STORM WATER PER CITY OF ALBUQUERQUE DPM REQUIREMENTS.
 - "ROOFTOP" BASINS WILL BE DIRECTED TO THE WATER FEATURE IN BASIN 500P FOR TREATMENT.
 - EXISTING STORM DRAINS THAT ARE UNDER PROPOSED BUILDINGS MUST BE REMOVED. OTHER EXISTINGSTORM DRAINS THAT ARE NOT TO BE USED MAY BE ABANDONED IN-PLACE.

- SUMMARY**
STORM DRAIN 1 - 36" RCP
FIVE BASINS WILL DISCHARGE STORM WATER INTO STORM DRAIN 1.
- **BASINS 500 (ROOFTOP) AND 500 A4**
 - **FIRST FLUSH FOR THE SERVICE AREA WILL BE THE UNDERGROUND STORM CHAMBERS.**

- STORM DRAIN 2 - 36" HPPP**
ONE BASINS PLUS STORM DRAIN 1 WILL DISCHARGE STORM WATER INTO STORM DRAIN 2.
- **BASIN 500 A1** AT INLET NO. 2.

- STORM DRAIN 3 - 24" HPPP**
ONE BASIN DISCHARGES INTO STORM DRAIN 3.
- BASIN 530** DISCHARGES INTO STORM DRAIN 3 IN A BANK OF INLETS AT ANALYSIS POINT 3 (**AP 3**).

- STORM DRAIN 4 - 36" HPPP**
STORM DRAIN 3 DISCHARGES INTO STORM DRAIN 4.
- **BASIN 500 A5**
 - **BASIN 500 A6**

STORM DRAINS 2 AND 4 DISCHARGE INTO THE EXISTING 42" STORM DRAIN WHICH DISCHARGES INTO THE I-40 CHANNEL.

- STORM DRAIN 5 - 24" RCP**
TWO BASINS WILL DISCHARGE INTO STORM DRAIN 5.
- **BASIN 500 ROOFTOP** IS A ROOF TOP BASIN AND THE ROOF DRAINS WILL BE TIED INTO STORM DRAIN 5.
 - **BASIN 500 ROOFTOP** IS A ROOF TOP BASIN AND THE ROOF DRAINS WILL BE TIED INTO STORM DRAIN 5.

- STORM DRAIN 6 - 42" HPPP**
DMP STORM DRAIN FOR BASIN 300. STORM DRAIN DISCHARGES TO EXISTING 84" STORM DRAIN.

- STORM DRAIN 7 - 36" HPPP**
DMP STORM DRAIN FOR BASIN 300. STORM DRAIN DISCHARGES INTO STORM DRAIN 6.

- STORM DRAIN 8 - 24" HPPP**
DMP STORM DRAIN FOR BASIN 300. STORM DRAIN DISCHARGES INTO STORM DRAIN 7.

"FIRST FLUSH" TREATMENT
BASINS WITH PARKING FIELDS HAVE DEPRESSED LANDSCAPE PARKING ISLANDS AND ARE GRADED TO ACCEPT SURFACE FLOWS ON THE HIGH SIDE AND EXCESS WATER WILL SPILL OVER THE HIGH SIDE CURBING IN ORDER TO TREAT THE "FIRST FLUSH" EVENT. SEE SHEET C103 FOR ADDITIONAL FIRST FLUSH INFORMATION.

HYRDOLOGY

Basin	Sub-Basin	Description	Land Treatments (DEVELOPED)				AREA	AREA	10-YR Peak Discharge				10-YR Peak Discharge				10-YR PEAK FLOW		100-YR PEAK FLOW	Drainage Master Plan
			Percentage			D	SF	AC	CFS/ACRE				A	CFS/ACRE			CFS	CFS	CFS	
			A	B	C				A	B	C	D		B	C	D				
301	A1	Road	0	9	0	91	16,365	0.376	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	1.2	1.8		
301	A2	Road	0	9	0	91	15,859	0.364	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	1.2	1.7		
TOTAL								0.740									2.361	3.552	120.1	
302	A1	Road	0	9	0	91	25,502	0.585	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	1.9	2.8		
302	A2	Roads and Parking Field	0	17	0	83	39,398	0.904	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	2.7	4.2		
TOTAL								1.490									4.597	6.980	120.1	
400	A1	Roads and Parking Field	0	9	0	91	140,415	3.223	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	10.3	15.5		
TOTAL								3.223									10.3	15.5	15.2	
500	A1	Road	0	9	0	91	54,006	1.240	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	4.0	6.0		
500	A2	Exposed Parking Structure	0	0	0	100	74,442	1.709	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	5.8	8.6		
500	A3	Road	0	9	0	91	11,021	0.253	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	0.8	1.2		
500	A4	Concrete Service Area	0	0	0	100	43,255	0.993	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	3.4	5.0		
500	A5	Parking Field	0	17	0	83	47,634	1.094	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	3.3	5.0		
500	A6	Parking Field	0	17	0	83	116,179	2.667	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	8.0	12.3		
TOTAL								7.955									25.3	38.1	38.3	
610	A1	Roads	0	3	12	85	11,646	0.267	0.58	1.19	2.00	3.39	1.87	2.60	3.45	5.02	0.8	1.3		
TOTAL								0.267									0.8	1.3	5.5	
SITE TOTAL								13.676									43.358	65.348		

FIRST FLUSH REQUIRED VOLUME

Basin	Sub-Basin	Description	Land Treatments (DEVELOPED)				AREA	AREA	FIRST FLUSH RATES				FIRST FLUSH VOLUME REQUIRED	8" DEEP DEPRESSED LANDSCAPE AREA PROVIDED
			Percentage				AREA	AREA	CF/ACRE				VOLUME	CUBIC FEET
			A	B	C	D	SF	AC	A	B	C	D	CF	
301	A1	Road	0	9	0	91	16,365	0.376	399	545	762	1416	502.52	
301	A2	Road	0	9	0	91	15,859	0.364	399	545	762	1416	486.99	
TOTAL								0.740					989.51	0.00
302	A1	Road	0	9	0	91	25,502	0.585	399	545	762	1416	783.10	
302	A2	Roads and Parking Field	0	17	0	83	39,398	0.904	399	545	762	1416	1,146.78	
TOTAL								1.490					1,929.88	0.00
400	A1	Roads and Parking Field	0	9	0	91	140,415	3.223	399	545	762	1416	4,311.77	5,370.00
TOTAL								3.223					4,311.77	5,370.00
500	A1	Road	0	9	0	91	54,006	1.240	399	545	762	1416	1,658.38	3,800.00
500	A2	Exposed Parking Structure	0	0	0	100	74,442	1.709	399	545	762	1416	2,419.88	0.00
500	A3	Road	0	9	0	91	11,021	0.253	399	545	762	1416	338.43	500.00
500	A4	Concrete Service Area	0	0	0	100	43,255	0.993	399	545	762	1416	1,406.09	0.00
500	A5	Parking Field	0	17	0	83	47,634	1.094	399	545	762	1416	1,386.51	5,390.00
500	A6	Parking Field	0	17	0	83	116,179	2.667	399	545	762	1416	3,381.70	3,100.00
TOTAL								7.955					10,590.98	12,790.00
610	A1	Roads	0	3	12	85	11,646	0.267	399	545	762	1416	350.61	
TOTAL								0.267					350.61	0.00
SITE TOTAL								13.676					18,172.75	18,160.00

*BASIN 530 TO BE DEVELOPED IN THE FUTURE AND WILL BE ALLOWED TO DISCHARGE DIRECTLY TO INLET NO. 3
FIRST FLUSH WILL BE CAPTURED AS PART OF FUTURE DEVELOPMENT.

ANALYSIS POINT

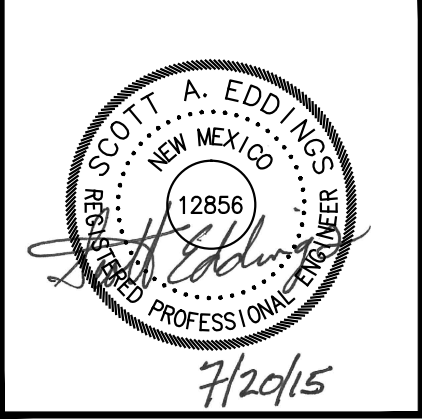
	BASIN		301		302		400		500						530 (DMP)	610
	SUB-BASIN		A1	A2	A1	A2			A1	A2	A3	A4	500 Rooftop (DMP)	A5	A6	A1
ANALYSIS POINT	100-YR PEAK FLOW		1.2	1.2	1.9	2.7	15.5		6	8.6	1.2		5		12.3	1.3
AP1	22											5	17			
AP2	2							2								
AP3	10														10	
AP4	5													5		
AP5	12.3														12.3	
AP6	32					2.7	15.5	4	8.6	1.2						
AP7	1.9				1.9											
AP8	2.4		1.2	1.2												
AP9	1.3															1.3

REV	DATE	BY	REVISION
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△	3/18/15	SAE	FIRST FLUSH PHASING

MODULUS ARCHITECTS

220 COPPER AVE. N.W. SUITE 350
ALBUQUERQUE, NEW MEXICO 87102
PHONE (505) 338-1499 FAX (505) 338-1498

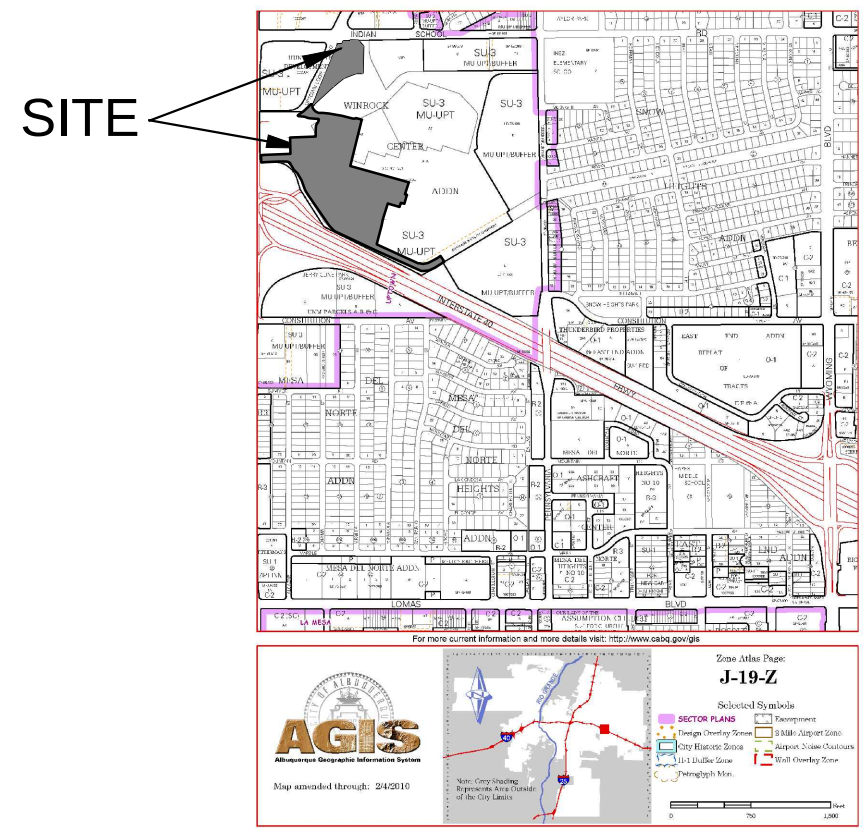
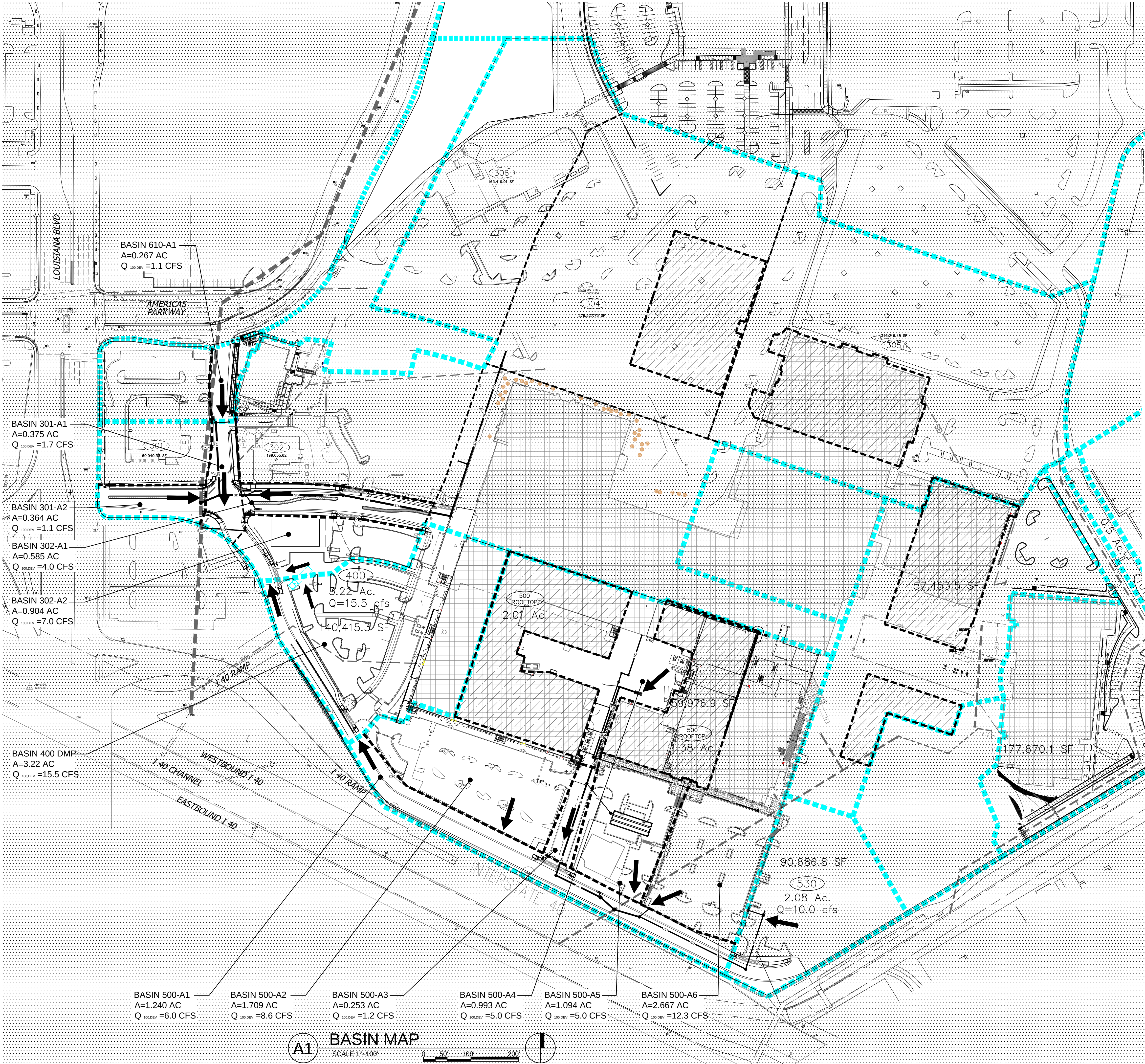




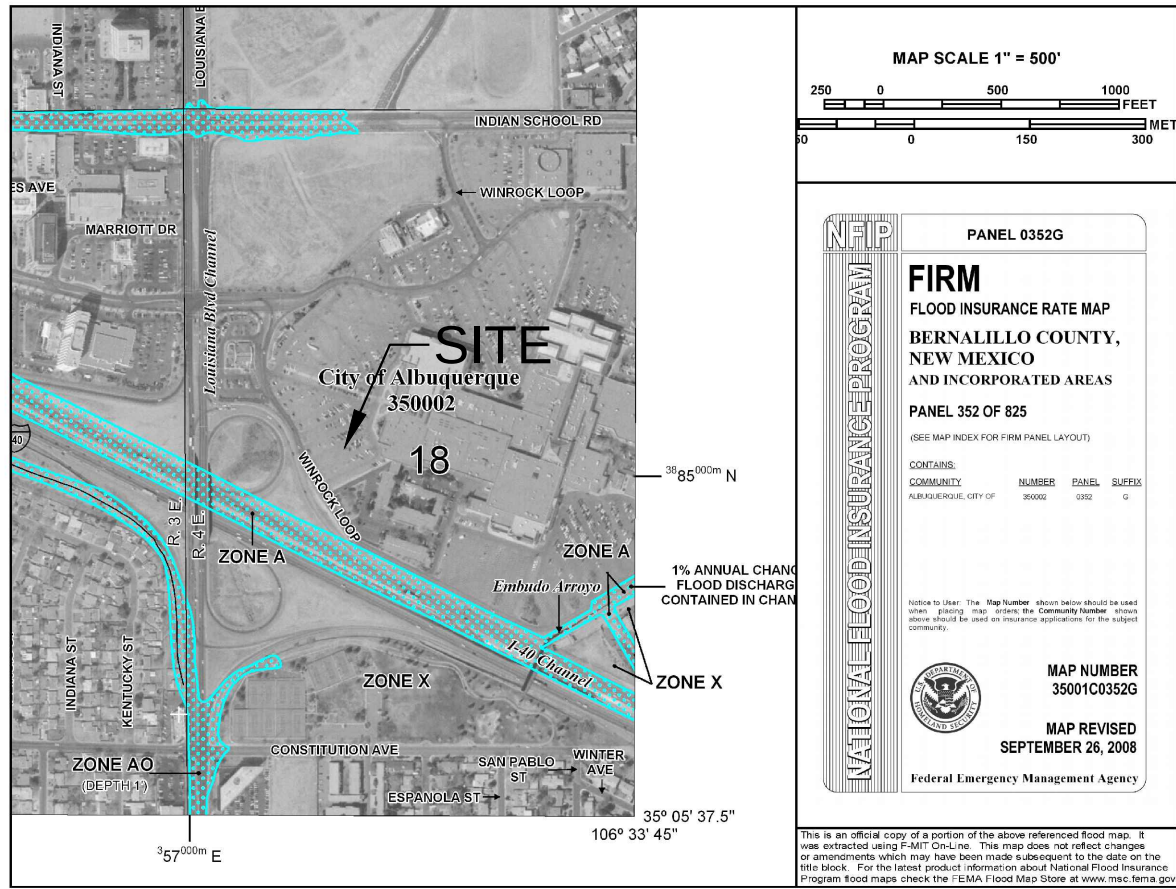
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WINROCK SECTION 2 AND 4		KLS	
PROJECT MANAGER		JOB NO.	
WINROCK TOWN CENTER ALBUQUERQUE, NEW MEXICO		303689.01	
SHEET TITLE		SHEET NO.	
DRAINAGE NARRATIVE / SUMMARY		1	

DATE:	07/14/15	sheet-	X
SCALE:	1"=100'	C100	
		of-	XX

HUITT-ZOLLARS
Huitt-Zollars, Inc. Rio Rancho
333 Rio Rancho Drive NE, Suite 101
Rio Rancho, New Mexico 87124
Phone (505) 892-5141 Fax (505) 892-3259



ZONE ATLAS PAGE J-19-Z



FIRM PANEL 35001C0352G

LEGEND

- OUTSIDE OF CONSTRUCTION LIMITS (NOT INCLUDED)
- BASIN BOUNDARY
- DRAINAGE MASTER PLAN BASIN BOUNDARY
- DISCHARGE LOCATION
- SECTION 2 & 4 DRAINAGE SUB BASIN
- DMP SUB BASIN

FLOOD ZONE

PER THE FEMA MAP NUMBER 35001 C0352G DATED SEPTEMBER 26, 2008 SHOWS THE SITE IS NOT LOCATED WITHIN A FLOOD HAZARD ZONE AREA.

REV	DATE	BY	REVISION
1			
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5			

MODULUS ARCHITECTS
220 COPPER AVE. N.W. SUITE 350
ALBUQUERQUE, NEW MEXICO 87102
PHONE (505) 338-1499 FAX (505) 338-1498

7/22/15

PROJECT TITLE	WINROCK SECTION 2 AND 4
PROJECT LOCATION	WINROCK TOWN CENTER ALBUQUERQUE, NEW MEXICO
PROJECT MANAGER	SCOTT EDDINGS P.E.
JOB NO.	303689.01
DRAWN BY	KLS
SHEET TITLE	BASIN MAP

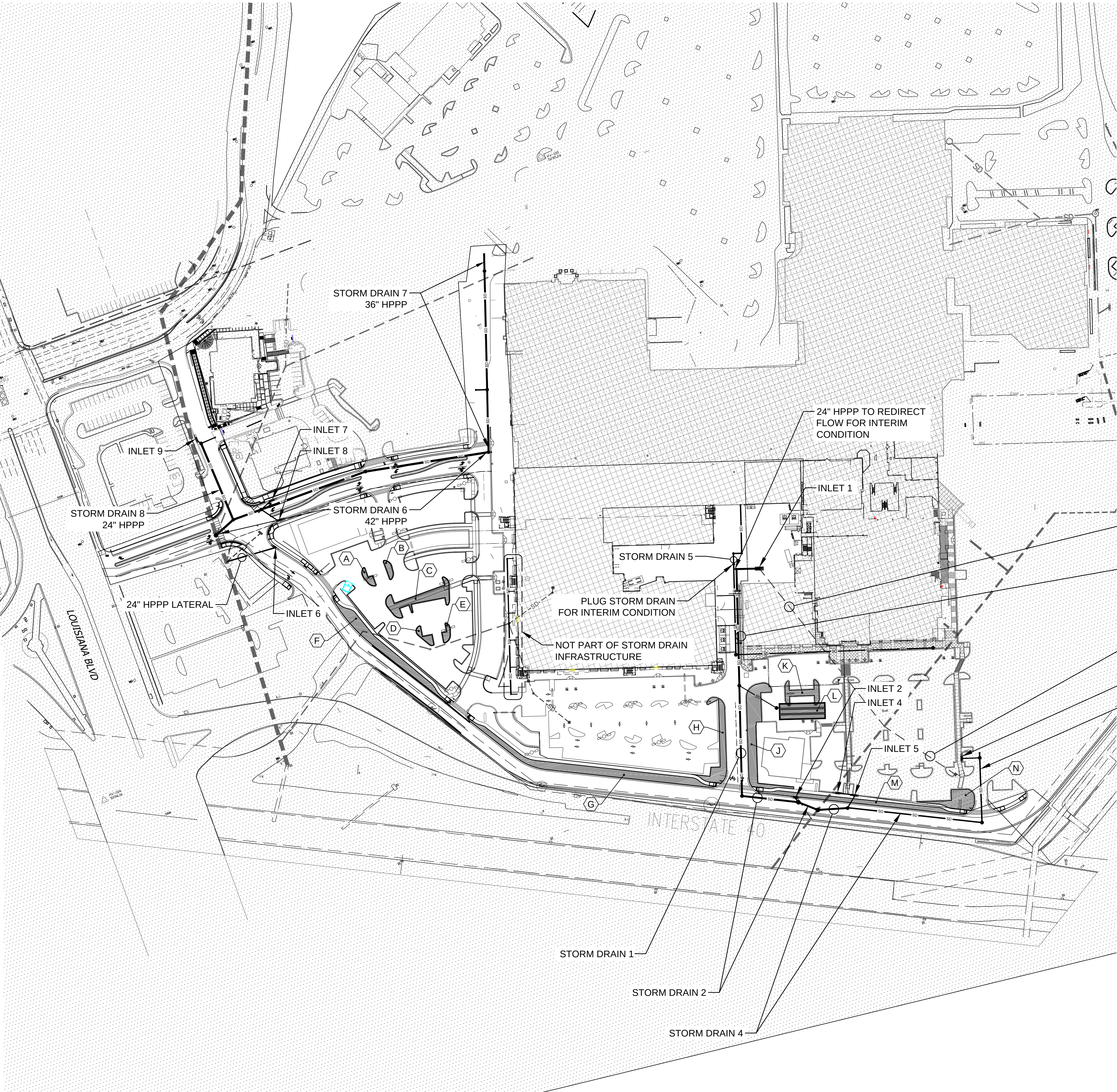
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333 Rio Rancho Drive NE, Suite 101
Rio Rancho, New Mexico 87124
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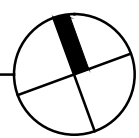
BUILDING PERMIT

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H:\projects\2015\7202015 21631 PM, By: Kacalak-Lybeck, Vera
Last Saved: 7/20/2015 2:15:37 PM, Version: 1

FIRST FLUSH TABLE			
N	AREA SF	VOLUME CF	DESCRIPTION
A	324.78	200	PARKING ISLAND
B	300.48	200	PARKING ISLAND
C	2312.88	1550	PARKING ISLAND
D	385.54	250	PARKING ISLAND
E	360.49	240	PARKING ISLAND
F	3519.62	2300	ROADWAY LANDSCAPE BUFFER
G	5727.95	3800	ROADWAY LANDSCAPE BUFFER
H	2492.34	250	ROADWAY LANDSCAPE BUFFER
J	4296.31	250	ROADWAY LANDSCAPE BUFFER
K	1187.18	790	PARKING ISLAND
L	2550.00	4600	STORM WATER CHAMBER SYSTEM
M	2786.40	1850	ROADWAY LANDSCAPE BUFFER
N	1885.27	1250	ROADWAY LANDSCAPE BUFFER



A1 FIRST FLUSH & STORM DRAIN LAYOUT
SCALE: 1"=100'

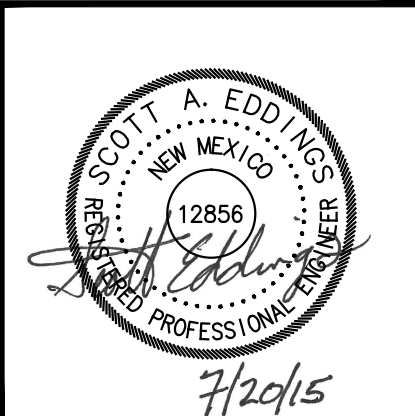


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333 Rio Rancho Drive NE, Suite 101
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BUILDING PERMIT

PROJECT TITLE WINROCK SECTION 2 AND 4			
WINROCK TOWN CENTER ALBUQUERQUE, NEW MEXICO			
PROJECT MANAGER SCOTT EDDINGS P.E.	JOB NO. 303689.01	DRAWN BY KLS	
SHEET TITLE FIRST FLUSH & STORM DRAIN LAYOUT			

DATE 07/20/15	SHEET C103
SCALE 1"=100'	of XX



MODULUS ARCHITECTS
220 COPPER AVE. N.W. SUITE 350
ALBUQUERQUE, NEW MEXICO 87102
PHONE (505) 338-1499 FAX (505) 338-1498

REV	DATE	BY	REVISION
1			
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INLET 3

Worksheet (Sump Condition) for Inlet 3

Objective: Design a Type C Inlet in Sump Condition for a 100-year flow of: 10 cfs

1 Inlet to collect peak flow amount before overtopping headwall.

2 Grate Dimensions

35.5

18.5"

35.5"

9.0 ft

4.6 sf

**Net dimensions of open area of a single grate (Total Area less Area of Bars)

3 Calculate Orifice and Weir Flow into Grate at Design Depth (0.9 ft)

Orifice Equation	Weir Equation
$Q = 0.6 \times A \times (2 \times g \times h)^{1/2}$	$Q = 2.65 \times P \times H^{1/2}$
Where	Where
A = 4.6 sq. ft.	P = 9.0 ft
g = 32.2 ft *2/sec	H = 0.9 ft
h = 0.9 ft	
Therefore	Therefore
Q = 20.8 cfs	Q = 22.6 cfs

Orifice Equation controls

Grate Capacity = 21 cfs

4 Apply 25% Clogging Factor to determine allowable design flow into inlet

21 x 0.75 = 16 cfs

Therefore Capacity of Single C Inlet in Sump Condition = 16 cfs

INLET 5

Worksheet (Sump Condition) for Inlet 5

Objective: Design a Type C Inlet in Sump Condition for a 100-year flow of: 12.3 cfs

1 Inlet to collect peak flow amount before overtopping headwall.

2 Grate Dimensions

35.5

18.5"

35.5"

9.0 ft

4.6 sf

**Net dimensions of open area of a single grate (Total Area less Area of Bars)

3 Calculate Orifice and Weir Flow into Grate at Design Depth (0.9 ft)

Orifice Equation	Weir Equation
$Q = 0.6 \times A \times (2 \times g \times h)^{1/2}$	$Q = 2.65 \times P \times H^{1/2}$
Where	Where
A = 4.6 sq. ft.	P = 9.0 ft
g = 32.2 ft *2/sec	H = 0.9 ft
h = 0.9 ft	
Therefore	Therefore
Q = 20.8 cfs	Q = 22.6 cfs

Orifice Equation controls

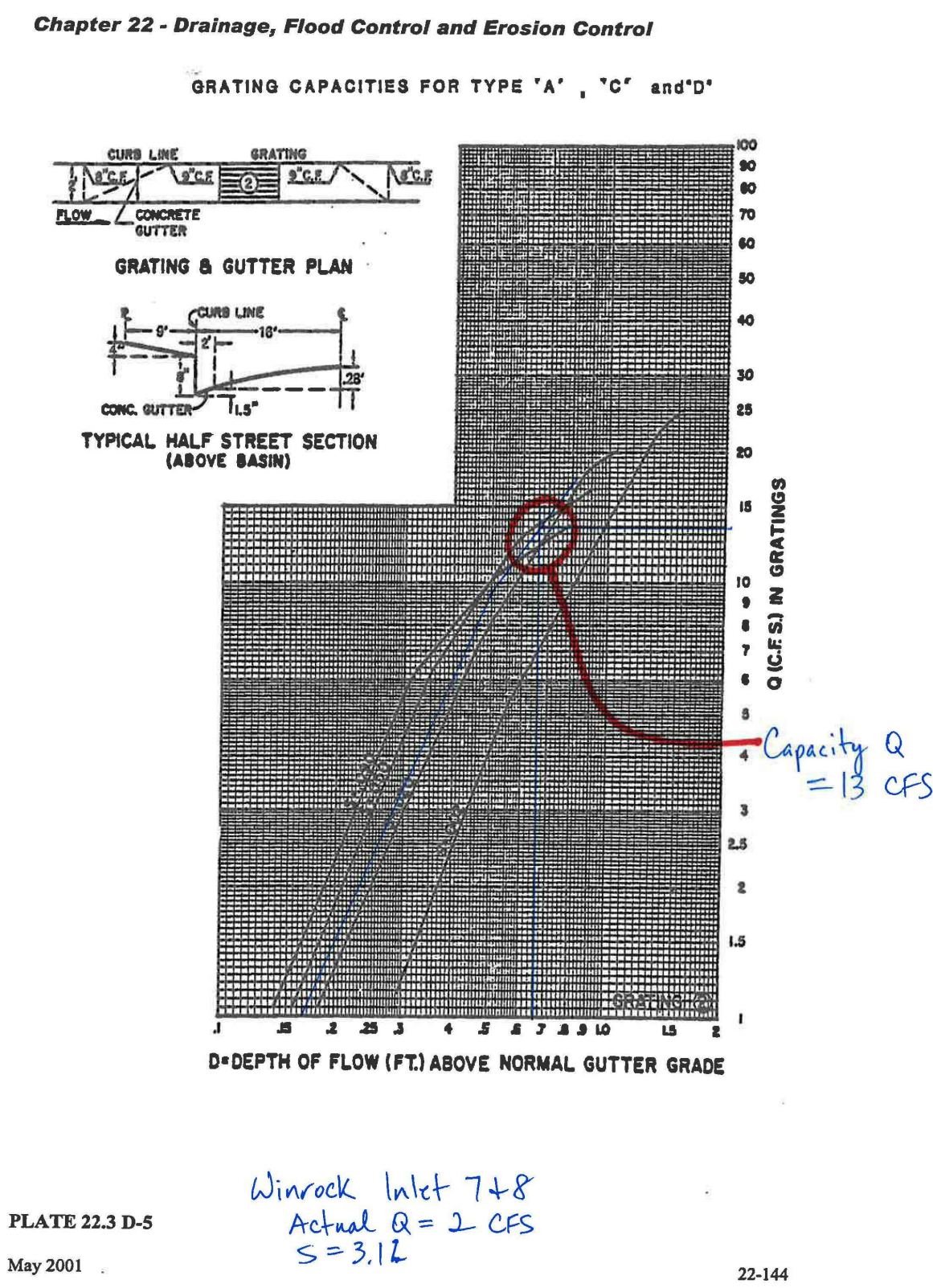
Grate Capacity = 21 cfs

4 Apply 25% Clogging Factor to determine allowable design flow into inlet

21 x 0.75 = 16 cfs

Therefore Capacity of Single C Inlet in Sump Condition = 16 cfs

INLET 7



INLET 4

Worksheet (Sump Condition) for Inlet 4

Objective: Design a Type C Inlet in Sump Condition for a 100-year flow of: 5 cfs

1 Inlet to collect peak flow amount before overtopping headwall.

2 Grate Dimensions

35.5

18.5"

35.5"

9.0 ft

4.6 sf

**Net dimensions of open area of a single grate (Total Area less Area of Bars)

3 Calculate Orifice and Weir Flow into Grate at Design Depth (0.9 ft)

Orifice Equation	Weir Equation
$Q = 0.6 \times A \times (2 \times g \times h)^{1/2}$	$Q = 2.65 \times P \times H^{1/2}$
Where	Where
A = 4.6 sq. ft.	P = 9.0 ft
g = 32.2 ft *2/sec	H = 0.9 ft
h = 0.9 ft	
Therefore	Therefore
Q = 20.8 cfs	Q = 22.6 cfs

Orifice Equation controls

Grate Capacity = 21 cfs

4 Apply 25% Clogging Factor to determine allowable design flow into inlet

21 x 0.75 = 16 cfs

Therefore Capacity of Single C Inlet in Sump Condition = 16 cfs

INLET 6

Worksheet (Sump Condition) for Inlet 6

Objective: Design a Type C Inlet in Sump Condition for a 100-year flow of: 30 cfs

1 Inlet to collect peak flow amount before overtopping headwall.

2 Grate Dimensions

35.5

18.5"

35.5"

20.8 ft

13.7 sf

**Net dimensions of open area of a single grate (Total Area less Area of Bars)

3 Calculate Orifice and Weir Flow into Grate at Design Depth (0.9 ft)

Orifice Equation	Weir Equation
$Q = 0.6 \times A \times (2 \times g \times h)^{1/2}$	$Q = 2.65 \times P \times H^{1/2}$
Where	Where
A = 13.7 sq. ft.	P = 20.8 ft
g = 32.2 ft *2/sec	H = 0.9 ft
h = 0.9 ft	
Therefore	Therefore
Q = 62.5 cfs	Q = 52.4 cfs

Orifice Equation controls

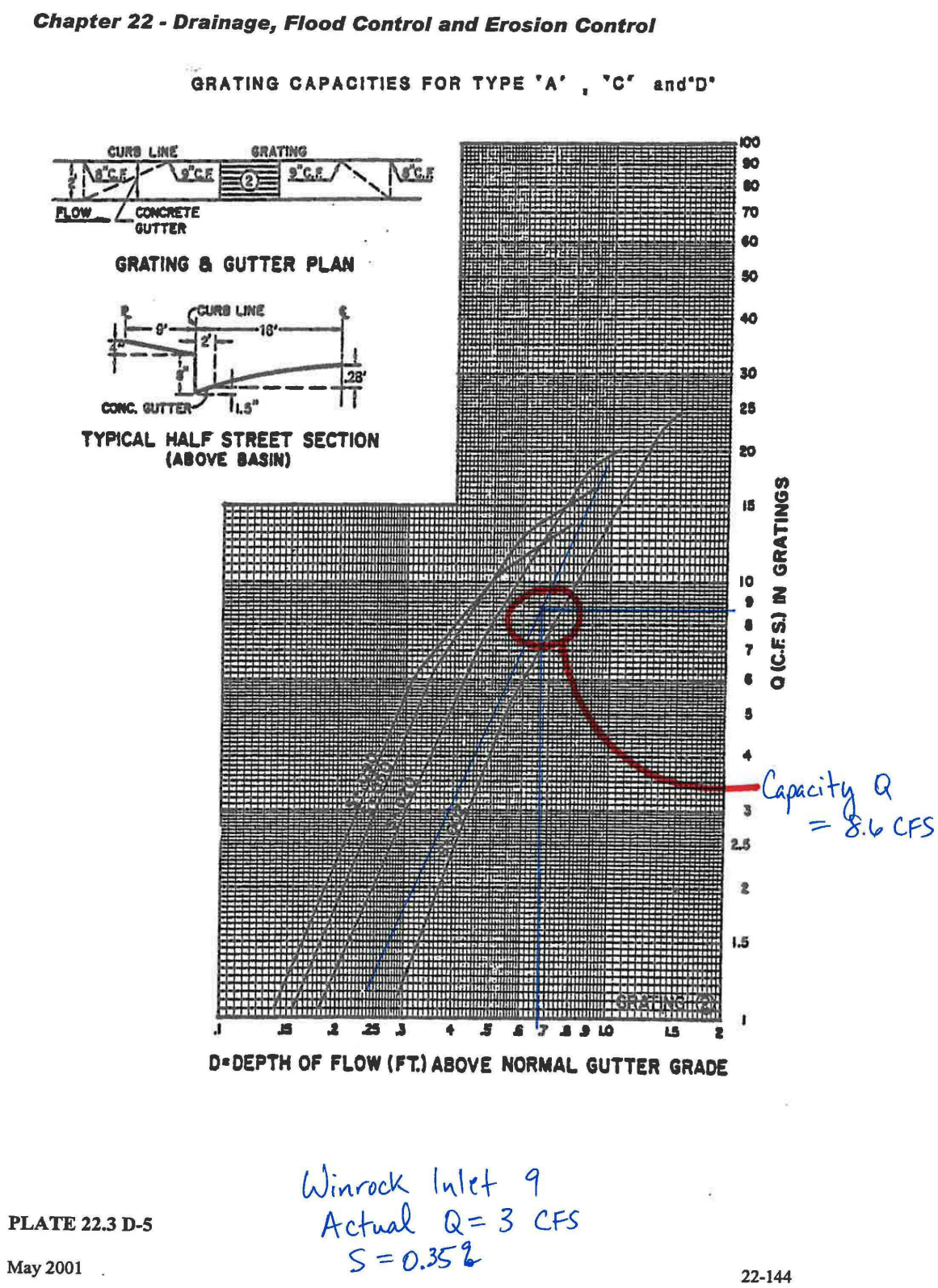
Grate Capacity = 52 cfs

4 Apply 25% Clogging Factor to determine allowable design flow into inlet

52 x 0.75 = 39 cfs

Therefore Capacity of Triple C Inlet in Sump Condition = 39 cfs

INLET 8

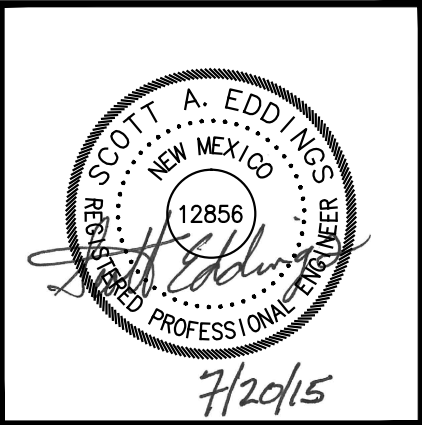


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MODULUS ARCHITECTS

220 COPPER AVE. N.W. SUITE 350
ALBUQUERQUE, NEW MEXICO 87102

PHONE (505) 338-1499 FAX (505) 338-1498



PROJECT TITLE	WINROCK SECTION 2 AND 4
PROJECT MANAGER	WINROCK TOWN CENTER ALBUQUERQUE, NEW MEXICO
JOB NO.	303689.01
DRAWN BY:	KLS
SHEET TITLE	HYDROLOGICS - INLET CAPACITY

DATE:	07/20/15	Sheet:	X
SCALE:	1"=100'		

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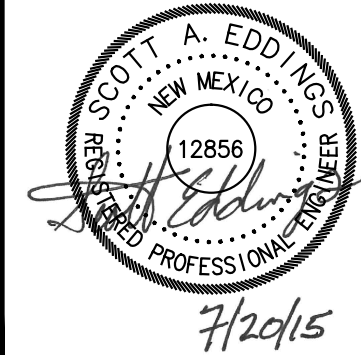
NTS

BUILDING PERMIT

SHEET TITLE

STORM WATER RETENTION PLAN

sheet- X
C501
of- XX

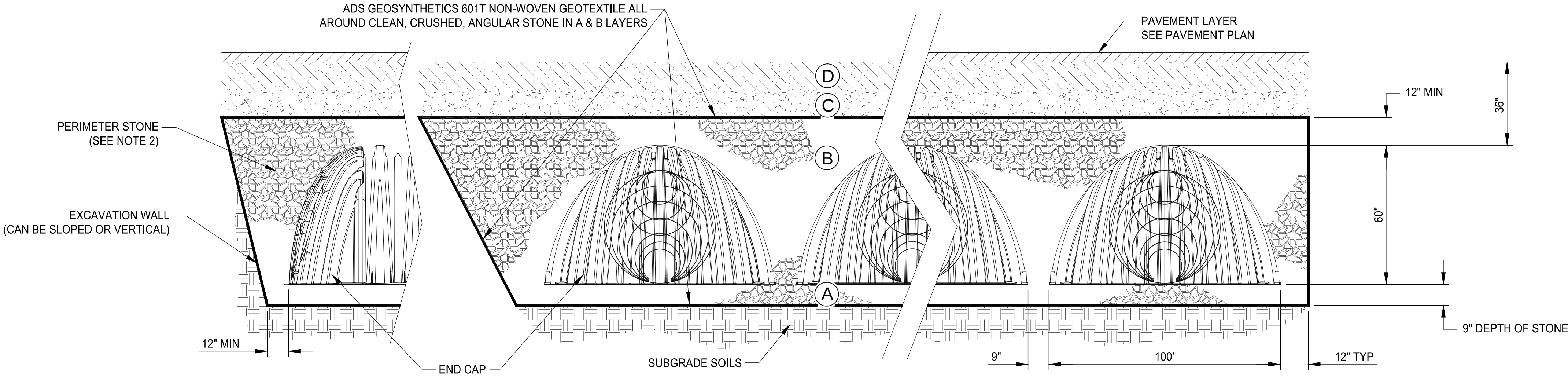


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MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENTS
D	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	ANY SOIL/ ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE RQUIREMENTS	N/ A	PRAPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIALS AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 24" ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145' A-1, A-2-4, A-3 OR AASHTO M43' 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 24" OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH	AASHTO M43' 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH	AASHTO M43' 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ² ³

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 9" (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT.



NOTES:

- "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' .

A1 ACCEPTABLE FILL MATERIALS: STORMTECH MC-4500 CHAMBER SYSTEMS
NTS

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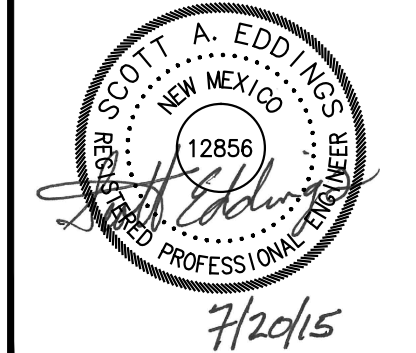
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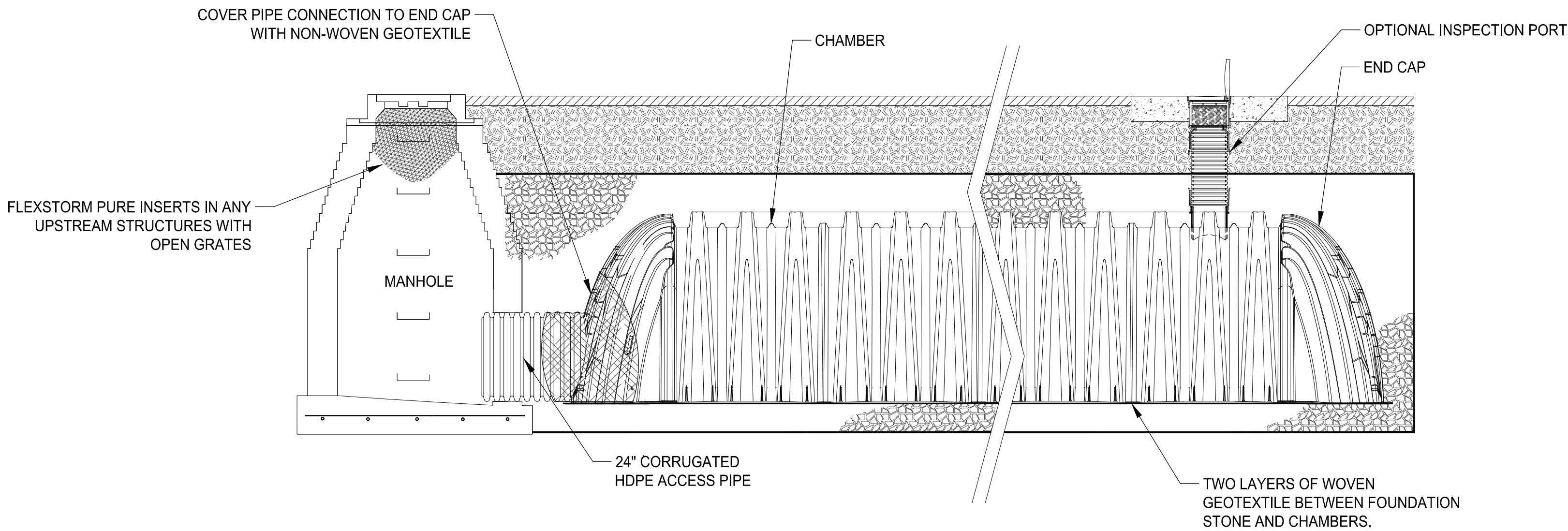
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PROJECT TITLE WINROCK SECTION 2 AND 4	DATE 07/20/15	SHEET C502
PROJECT MANAGER SCOTT EDDINGS P.E.	JOB NO. 303699.01	DRAWN BY VKL
SHEET TITLE STORM WATER RETENTION - SECTION		

DATE 07/20/15	SHEET C502
SCALE N.T.S.	OF XX



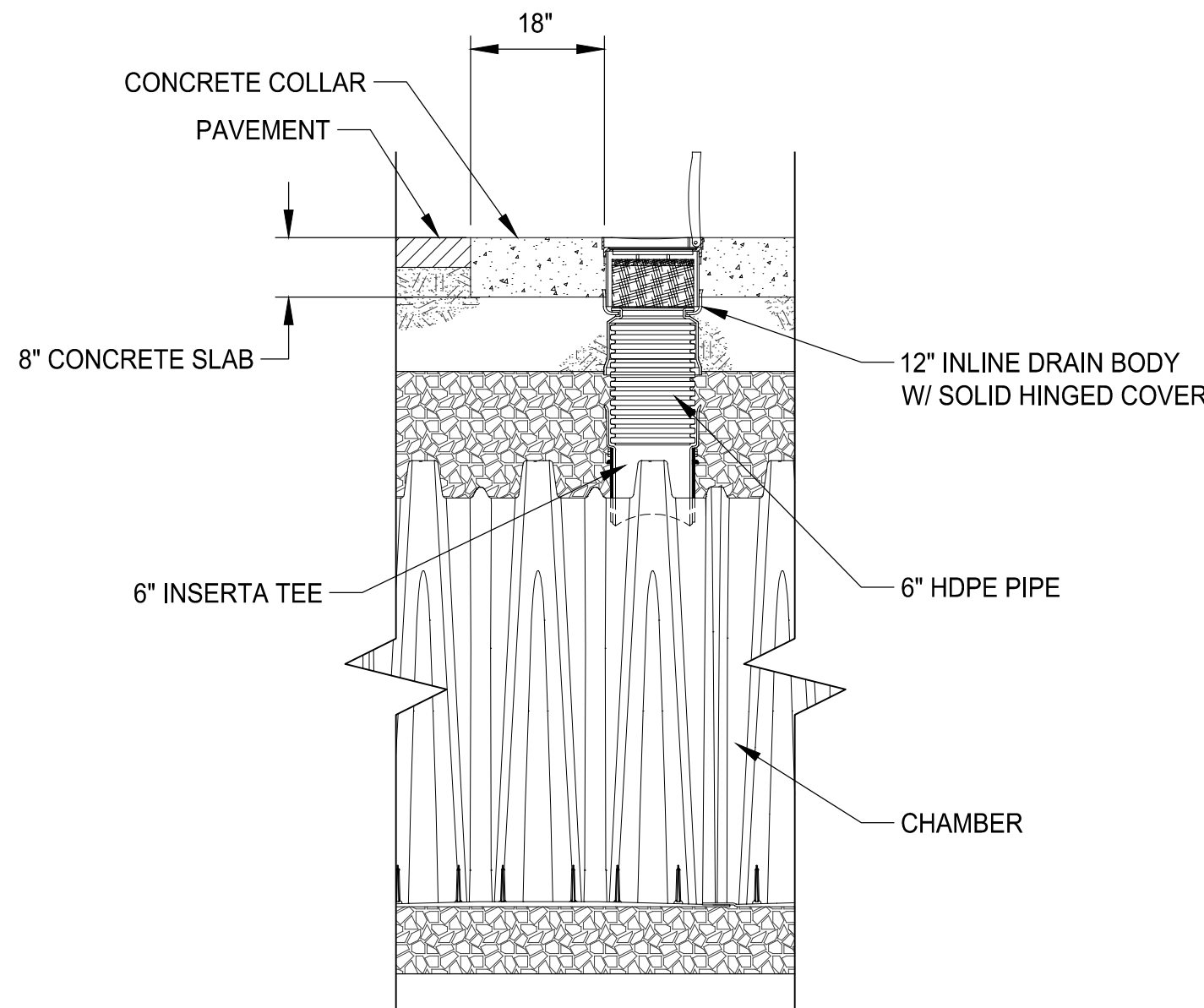
C1 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
 - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - B. ALL ISOLATOR ROWS
 - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
 - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE^ji) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY^jii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
 - B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - C. VACUUM STRUCTURE SUMP AS REQUIRED
- STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.
- STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

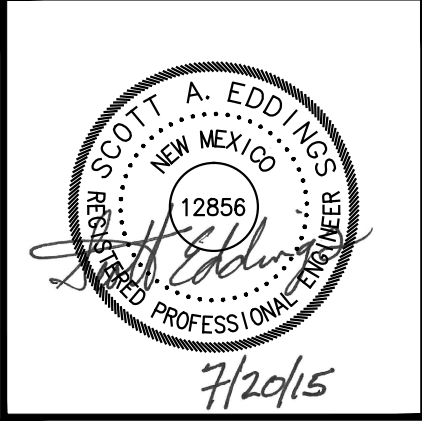
1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS ^j
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



B3 6" INSPECTION PORT DETAIL
NTS

REV	DATE	BY	REVISION
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PROJECT TITLE WINROCK SECTION 2 AND 4	DRAWN BY: VKL
PROJECT MANAGER SCOTT EDDINGS P.E.	JOB NO. 303699.01
SHEET TITLE STORM WATER RETENTION - DETAILS	

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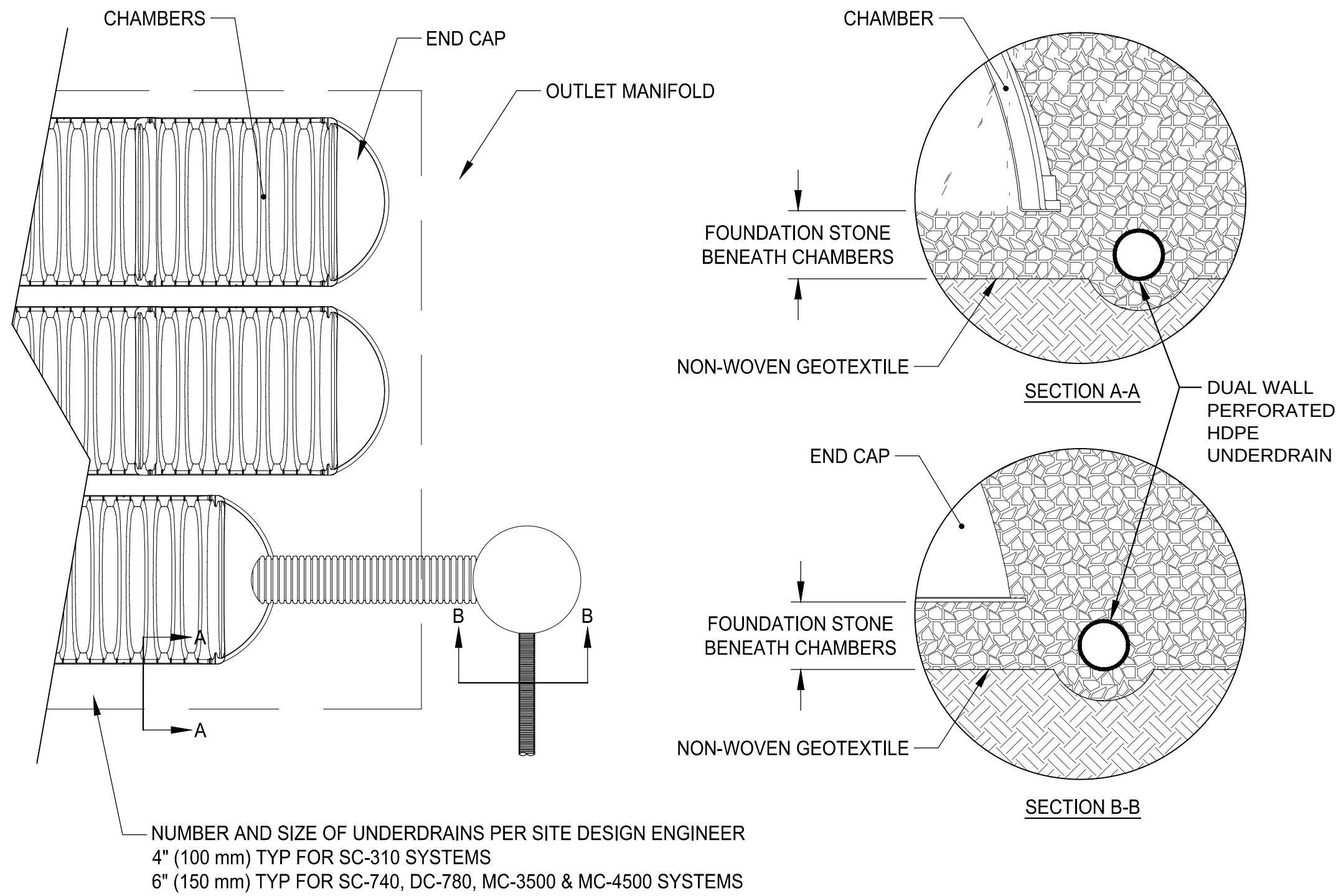
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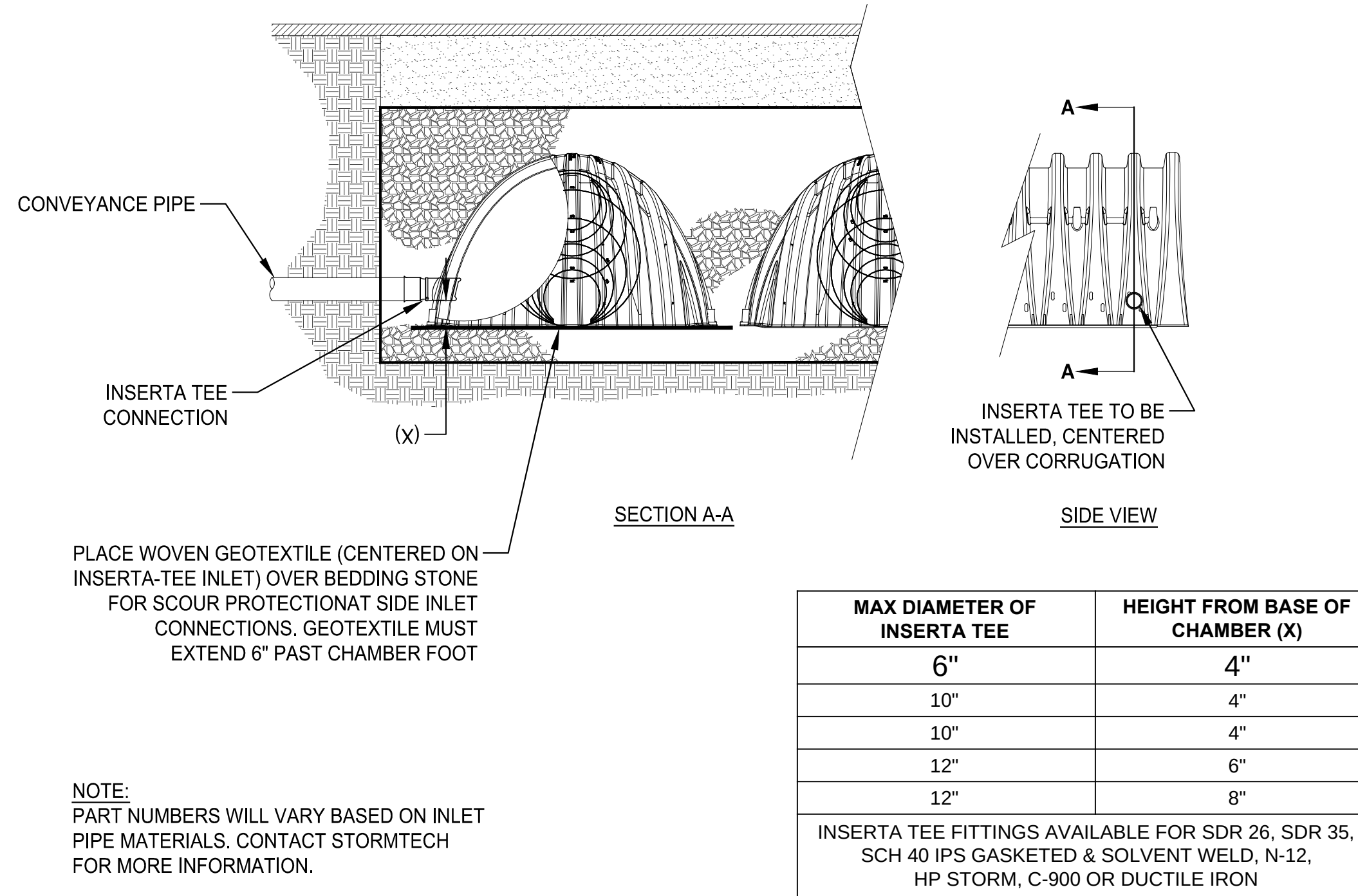
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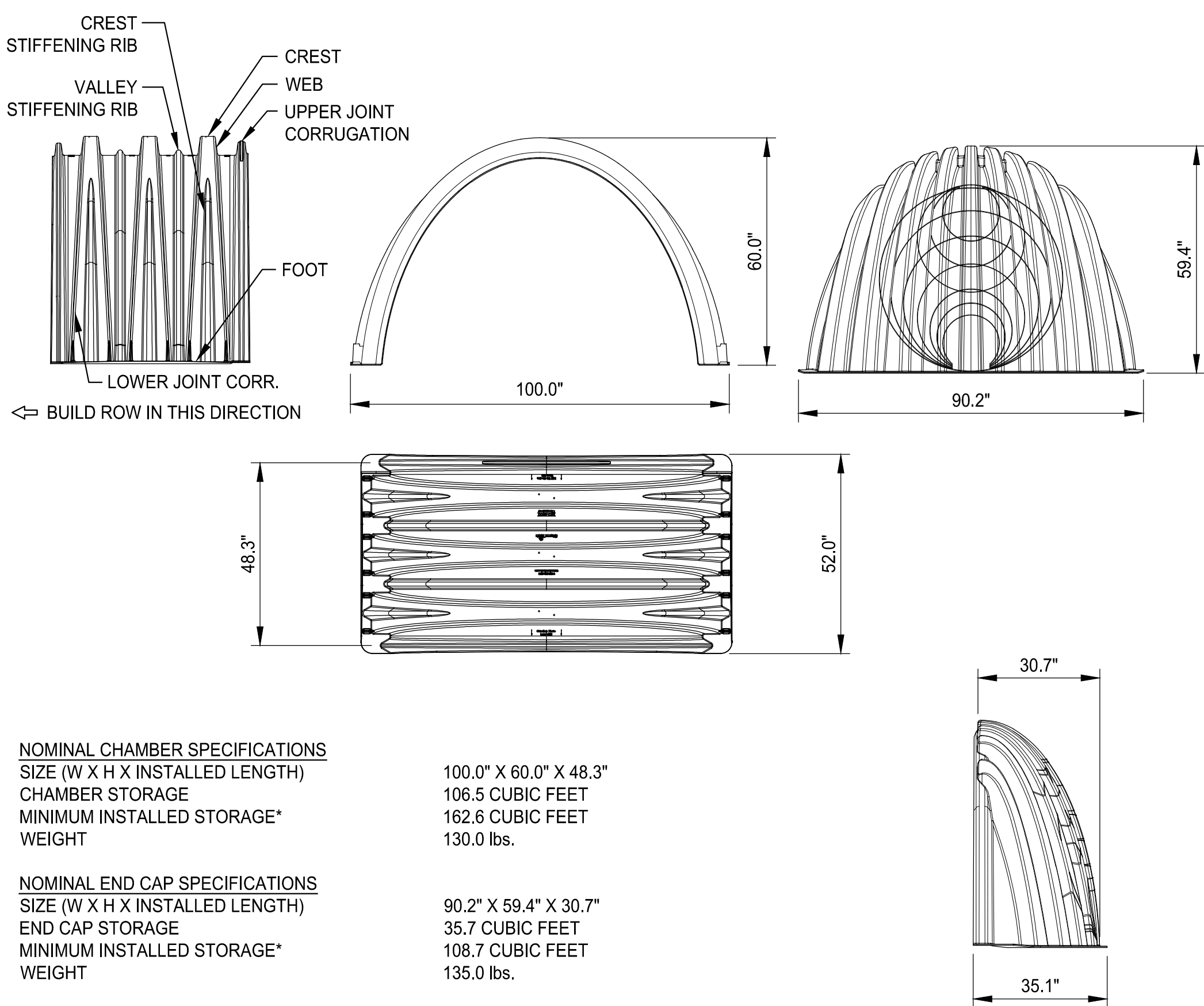
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C1 UNDERDRAIN DETAIL
NTS



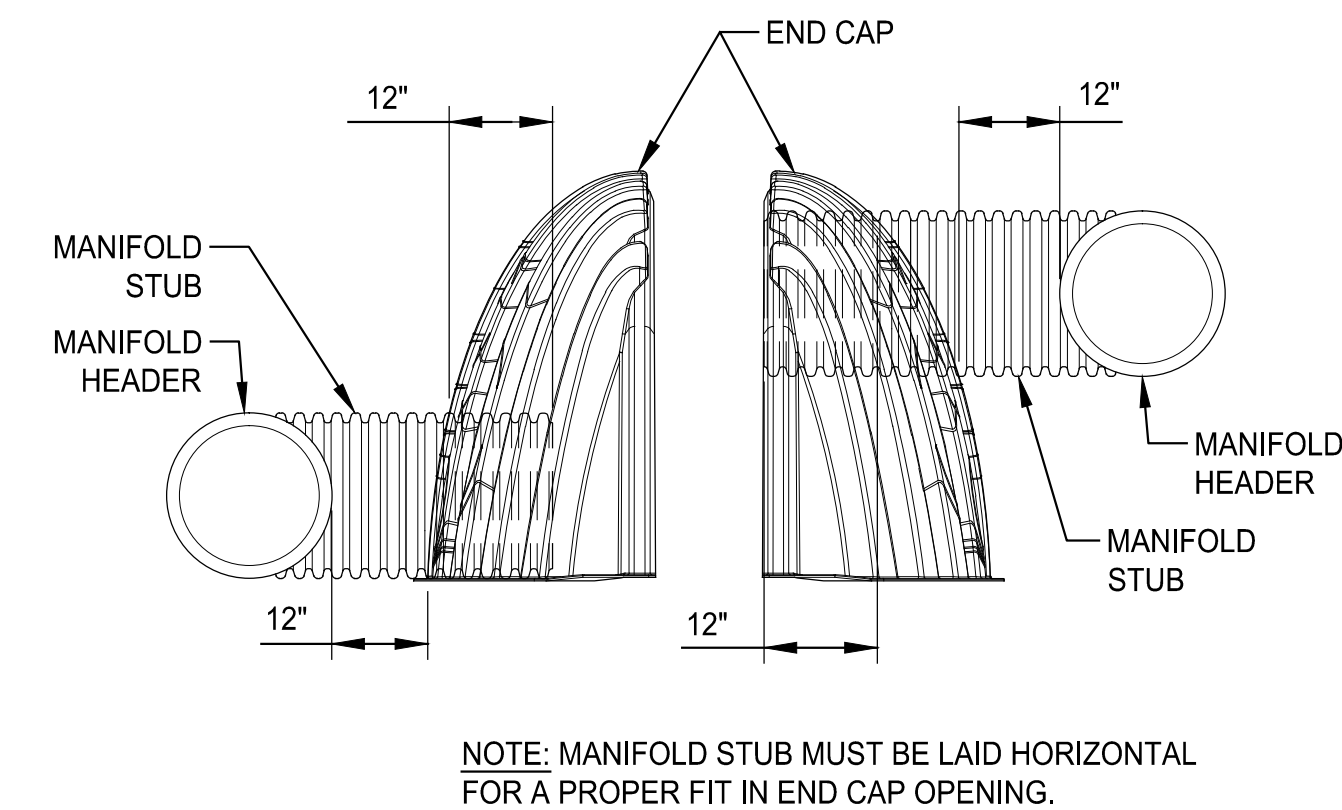
A1 INSERTA TEE DETAIL
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STUB	B	C
6" (150 mm)	42.54" (1.081 m)	---
8"	---	0.86"
10"	---	1.01"
12"	---	1.33"
15"	---	1.55"
18"	---	1.70"
24"	---	1.97"
30"	---	2.26"
36"	---	2.95"
42"	---	3.25"

NOTE: ALL DIMENSIONS ARE NOMINAL

A3 SPECIFICATION
NTS



C5 END CAP INSERTION DETAIL
NTS

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SCOTT A. EDD, M.S.
NEW MEXICO
12856
PROFESSIONAL ENGINEER
7/20/15

PROJECT TITLE
WINROCK SECTION 2 AND 4
WINROCK TOWN CENTER
ALBUQUERQUE, NEW MEXICO

PROJECT MANAGER
SCOTT EDDINGS P.E.

JOB NO.
303699.01

DRAWN BY
VKL

DATE
07/20/15

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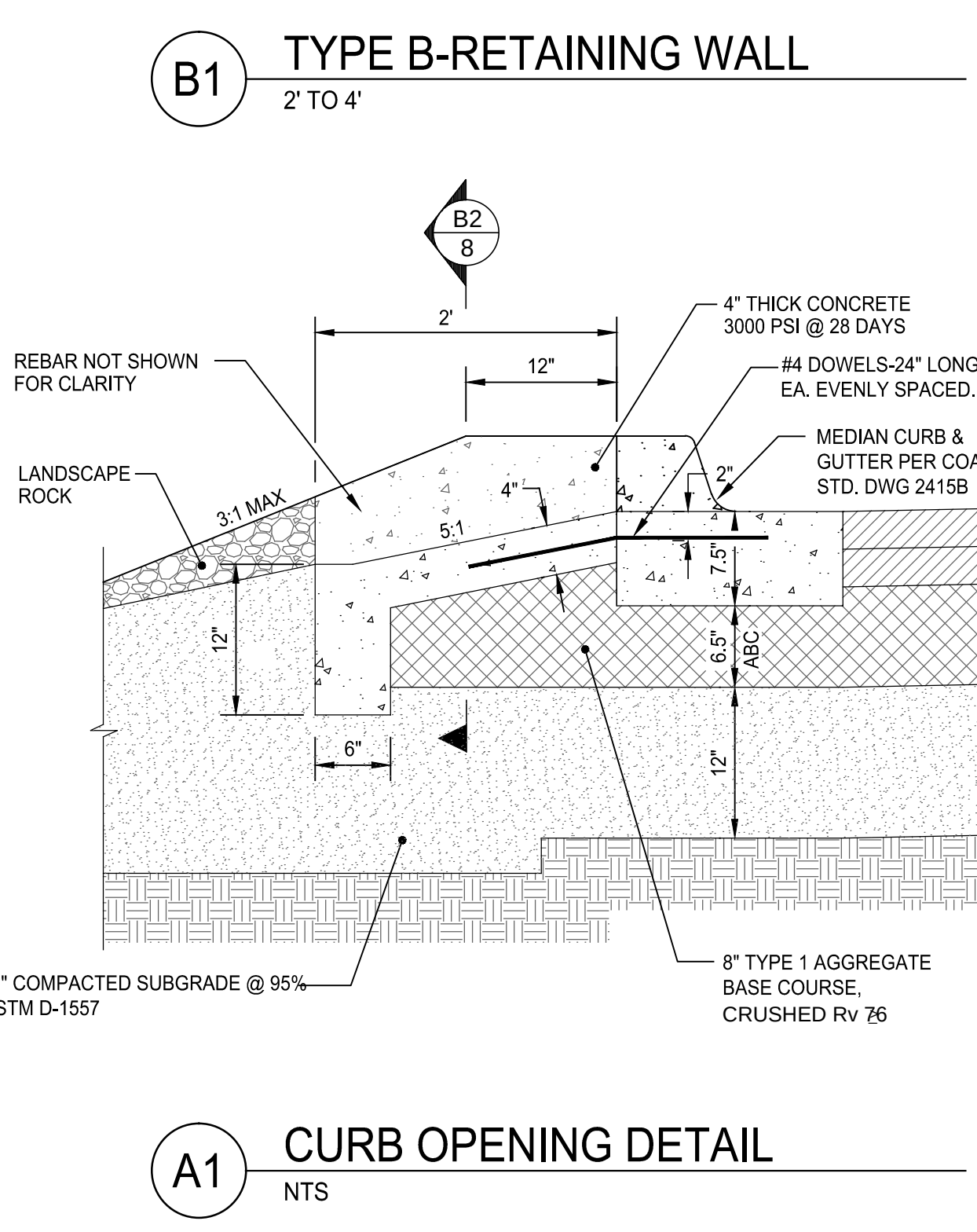
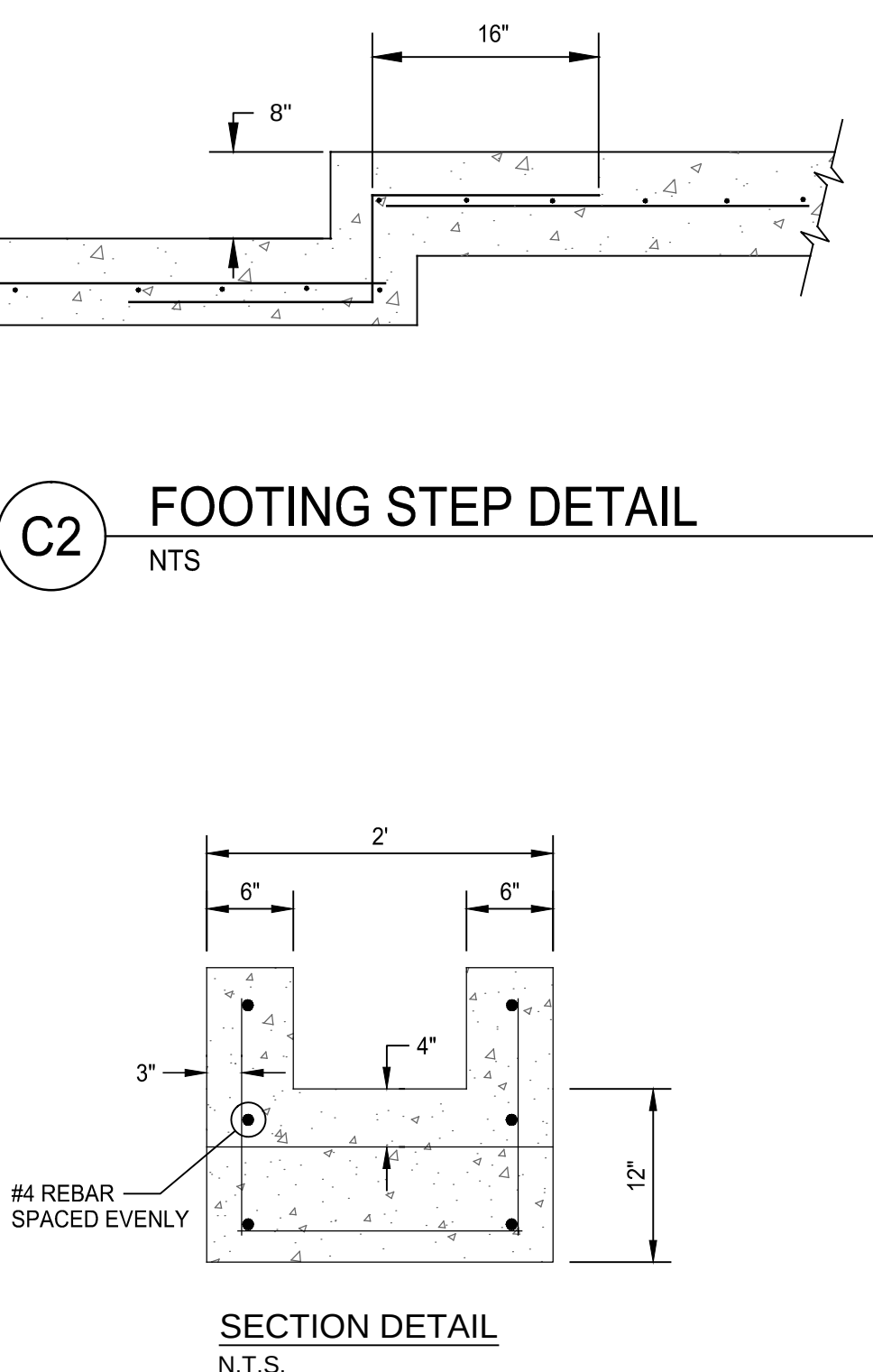
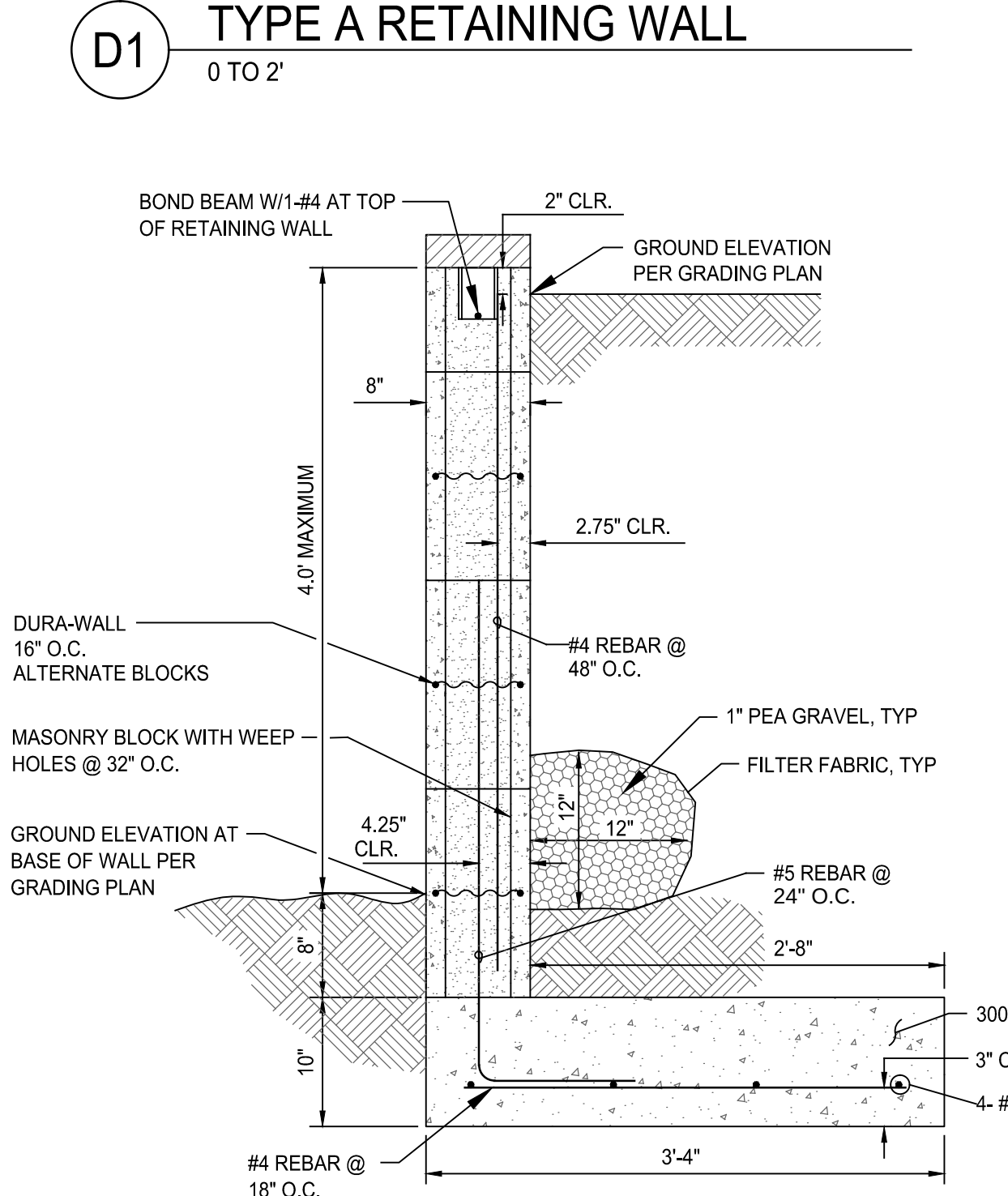
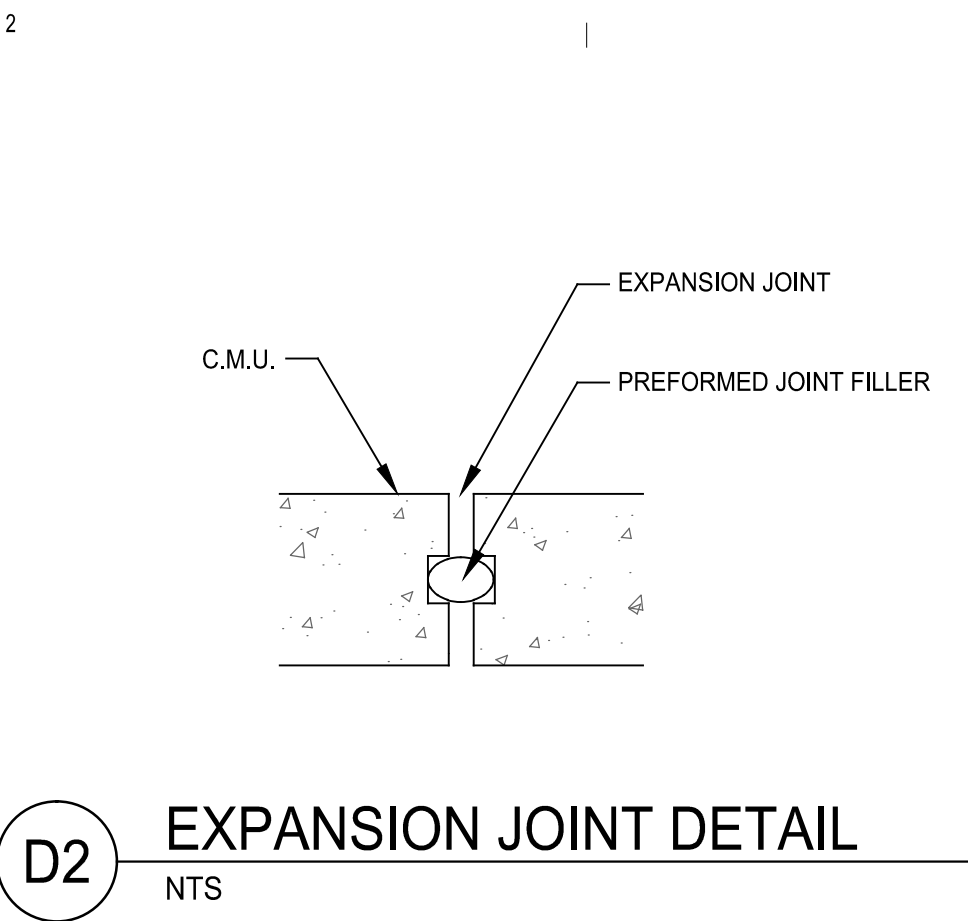
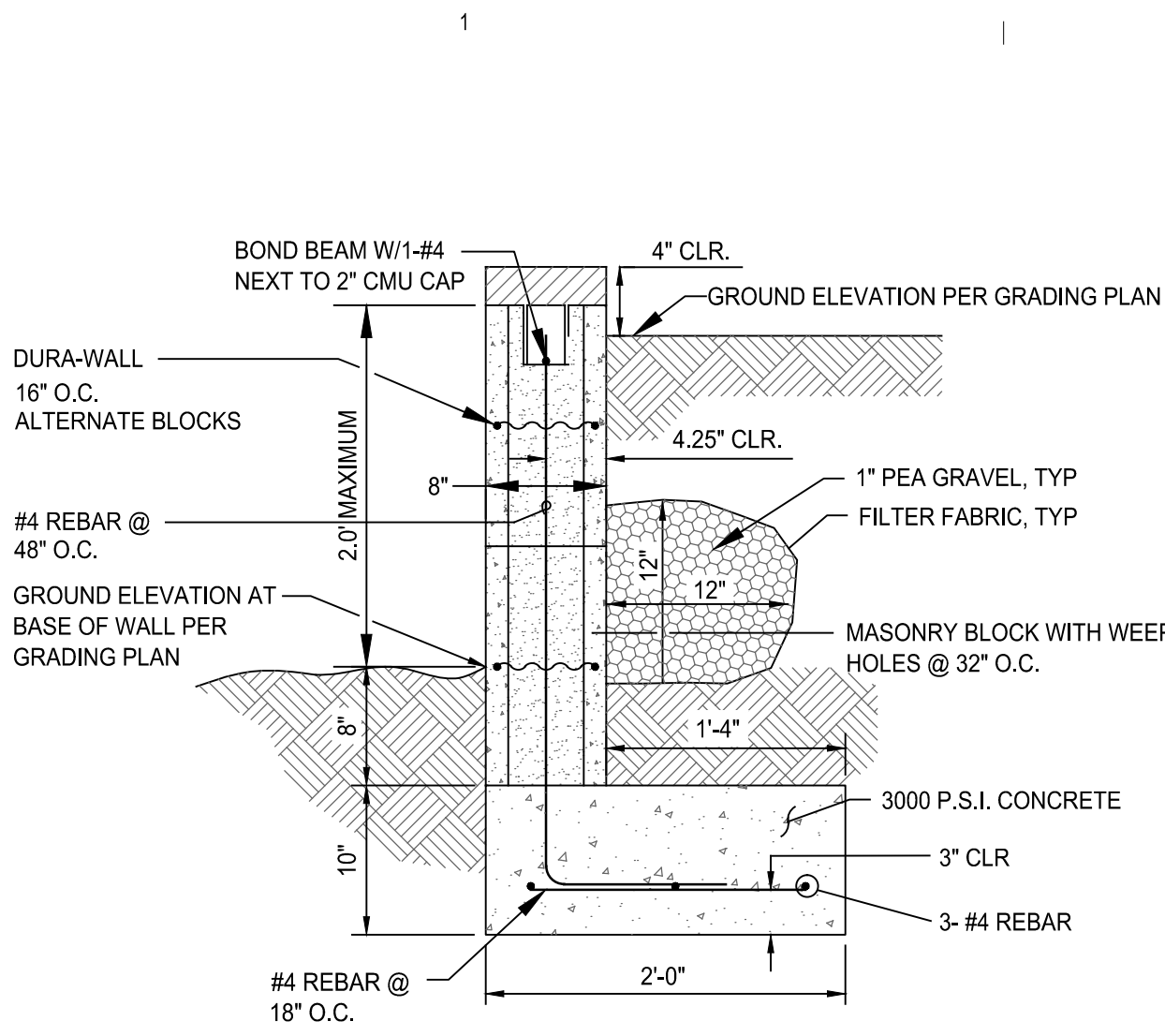
SHEET TITLE
STORM WATER RETENTION - DETAILS

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GENERAL NOTES

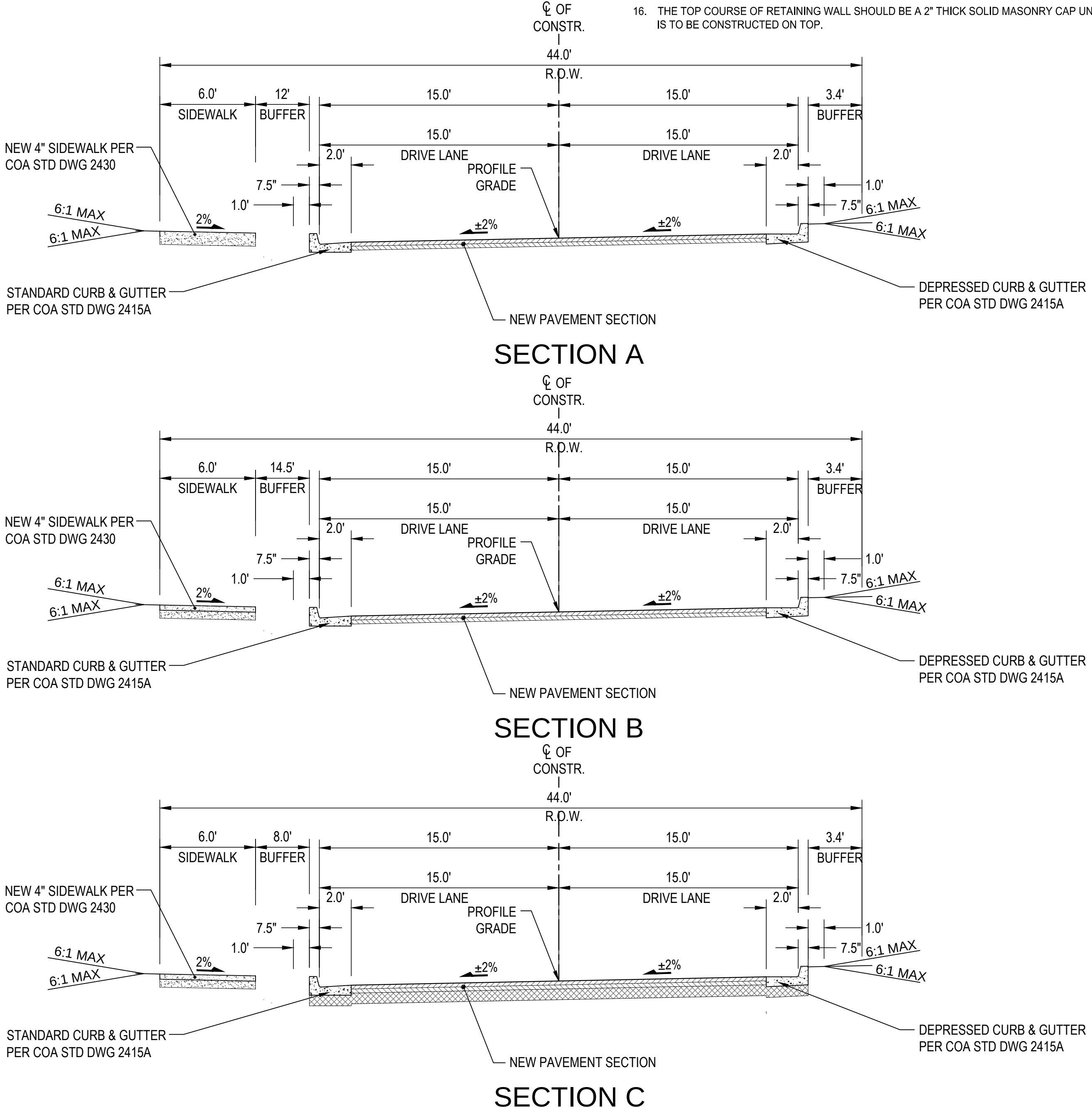
1. THE WALL TYPES ON THIS PLAN INDICATE THE TYPE OF RETAINING WALL TO BE CONSTRUCTED, DETAILED ON SHEET 2-27 & 2-28. TO MATCH SURFACE ELEVATIONS ON THE RETAINING WALL SHEETS. A MINIMUM OF ONE ADDITIONAL COURSE (8\"/>

RETAINING WALL GENERAL NOTES

1. WHERE RETAINING WALLS ARE INSTALLED, WEEP HOLES SHALL BE PROVIDED IN THE PORTION OF THE WALL BELOW GRADE, TO RELIEVE POTENTIAL HYDROSTATIC PRESSURE, BY ELIMINATING THE MORTAR FROM ALTERNATING VERTICAL JOINTS IN EVERY OTHER COURSE OF BLOCK BELOW GRADE. NO TURNED BLOCKS WILL BE ALLOWED.

MASONRY WALL CONSTRUCTION NOTES:

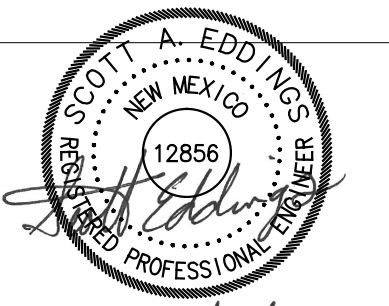
1. RETAINING WALLS ARE REQUIRED WHENEVER THE DIFFERENCE IN SURFACE ELEVATIONS EXCEED 1.50 FEET (2 EXPOSED C.M.U. COURSES)
2. ALL MASONRY UNITS SHALL BE TYPE 1, GRADE N WITH A COMPRESSIVE STRENGTH OF 1900 PSI (NET AREA), FM=1500 PSI
3. MORTAR SHALL BE TYPE S.
4. GROUT - F' =2000 PSI
5. CELLS CONTAINING REBAR SHALL BE GROUTED SOLID FROM THE BOTTOM TO THE TOP OF THE WALL IN ACCORDANCE WITH THE UNIFORM BUILDING CODE.
6. PROVIDE EXPANSION JOINTS AT 20' O.C.
7. THE BACK OF WALLS BELOW GRADE SHALL BE WATERPROOFED PRIOR TO BACKFILLING.
8. ALL CELLS BELOW GRADE SHALL BE GROUTED SOLID.
9. LAP ALL REBAR 40 BAR DIAMETERS, UNLESS OTHERWISE NOTED.
10. ALL HORIZONTAL REINFORCING IN BOND BEAMS SHALL BE CONTINUOUS AROUND CORNERS OR HAVE CORNER BARS OF THE SAME SIZE AND A LAP OF 48 BAR DIAMETERS OR 24\"/>



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7/20/15

BUILDING PERMIT

PROJECT TITLE
WINROCK SECTION 2 AND 4

PROJECT MANAGER
SCOTT EDDINGS P.E.

JOB NO.
303699.01

DRAWN BY
VKL

SHEET TITLE
DETAILS

HUITT-ZOLLARS
Huitt-Zollars, Inc.
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Rio Rancho, New Mexico 87124
Phone (505) 892-5141 Fax (505) 892-3259

DATE:
07/20/15

SCALE:
1"=100'

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DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 12/2005)

PROJECT TITLE: Winrock Redevelopment Sections 2 and 4 ZONE MAP: J-19-Z
DRB#: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: Parcel A-1-A-1-A Winrock Center Addition
CITY ADDRESS: _____

ENGINEERING FIRM: Huitt-Zollars CONTACT: Scott Eddings
ADDRESS: 6501 Americas Parkway NE PHONE: 892-5141
CITY, STATE: ABQ, NM ZIP CODE: 87110

OWNER: Winrock Partners, LLC CONTACT: Fred Gorenz
ADDRESS: 100 South Ave NE, Suite 100 PHONE: 881-0100
CITY, STATE: ABQ, NM ZIP CODE: 87109

ARCHITECT: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

<u>TYPE OF SUBMITTAL:</u>	<u>CHECK TYPE OF APPROVAL SOUGHT:</u>
☐ DRAINAGE REPORT	☐ SIA/FINANCIAL GUARANTEE RELEASE
☐ DRAINAGE PLAN 1 st SUBMITTAL	☐ PRELIMINARY PLAT APPROVAL
☒ DRAINAGE PLAN RESUBMITTAL	☐ S. DEV. PLAN FOR SUB'D APPROVAL
☐ CONCEPTUAL G & D PLAN	☒ S. DEV. FOR BLDG. PERMIT APPROVAL
☒ GRADING PLAN	☐ SECTOR PLAN APPROVAL
☐ EROSION CONTROL PLAN	☐ FINAL PLAT APPROVAL
☐ ENGINEER'S CERT (HYDROLOGY)	☐ FOUNDATION PERMIT APPROVAL
☐ CLOMR/LOMR	☒ BUILDING PERMIT APPROVAL
☐ TRAFFIC CIRCULATION LAYOUT	☐ CERTIFICATE OF OCCUPANCY (PERM)
☐ ENGINEER'S CERT (TCL)	☐ CERTIFICATE OF OCCUPANCY (TEMP)
☐ ENGINEER'S CERT (DRB SITE PLAN)	☐ GRADING PERMIT APPROVAL
☐ OTHER (SPECIFY)	☐ PAVING PERMIT APPROVAL
	☒ WORK ORDER APPROVAL
	☐ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

☒ YES
☐ NO
☐ COPY PROVIDED

DATE SUBMITTED: 7-20-15 BY: Scott Eddings

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location, and scope to the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan:** Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.