

CITY OF ALBUQUERQUE



Richard J. Berry, Mayor

June 23, 2017

Genny Donart
Isaacson & Arfman, P.A.
128 Monroe St NE
Albuquerque, NM 87108

RE: **Bridgestone Northpoint Apartments – South La Cueva Arroyo Phase 1**
Engineer's Stamp Date: 6/21/17
Hydrology File: B18D001C

Dear Ms. Donart:

Based on the information provided in the submittal received on 6-21-2017 the above-referenced Supplemental Information to the Drainage Report(s) is approved for Work Order Number 786480.

PO Box 1293

Please coordinate construction plan changes Jeanne Wolfenbarger in Design Review and Construction.

Albuquerque

Subsequent phases of the I-25 Northpoint project will require revised calculations and FEMA approval prior to hydrology approval. Interim transitions should be designed to public standards if public maintenance is expected, or they may be designed as temporary structures if privately maintained.

New Mexico 87103

If you have any questions, please contact me at 924-3986 or jhughes@cabq.gov.

www.cabq.gov

Sincerely,

James D. Hughes
Principal Engineer, Planning Dept.
Development Review Services

SUPPLEMENTAL INFORMATION

FOR

THE SOUTH LA CUEVA ARROYO, PHASE 1

AT

BROADSTONE NORTHPOINT

ALBUQUERQUE, NEW MEXICO

JUNE, 2017

PREPARED FOR:
TITAN DEVELOPMENT, LLC

BY



Genevieve L. Donart, PE

Date



ISAACSON & ARFMAN, P.A.

Consulting Engineering Associates

Thomas O. Isaacson, PE(RET.) & LS(RET.)

Fred C. Arfman, PE

Åsa Nilsson-Weber, PE

I&A Project No. 2132

M:\PROJECT DOCUMENTS\2100-2199\2132\REPORTS

Broadstone Northpoint is a 9.9 acre Townhome/Apartment complex on the southwest corner of the Northpoint 25 master planned site that encompasses a portion of the South La Cueva Arroyo just upstream of the San Mateo Blvd crossing. The site is part of the “Amended Drainage Master Plan for North I-25 Corporate Center (aka Northpoint 25)” (Northpoint DMP) by Isaacson & Arfman, P.A. dated July 21, 2016.

As designated in the Northpoint DMP, Broadstone Northpoint must build 2-72” storm drain pipes to contain the South La Cueva Arroyo where it is within the site to carry 979.5 cfs in the 100-year storm.

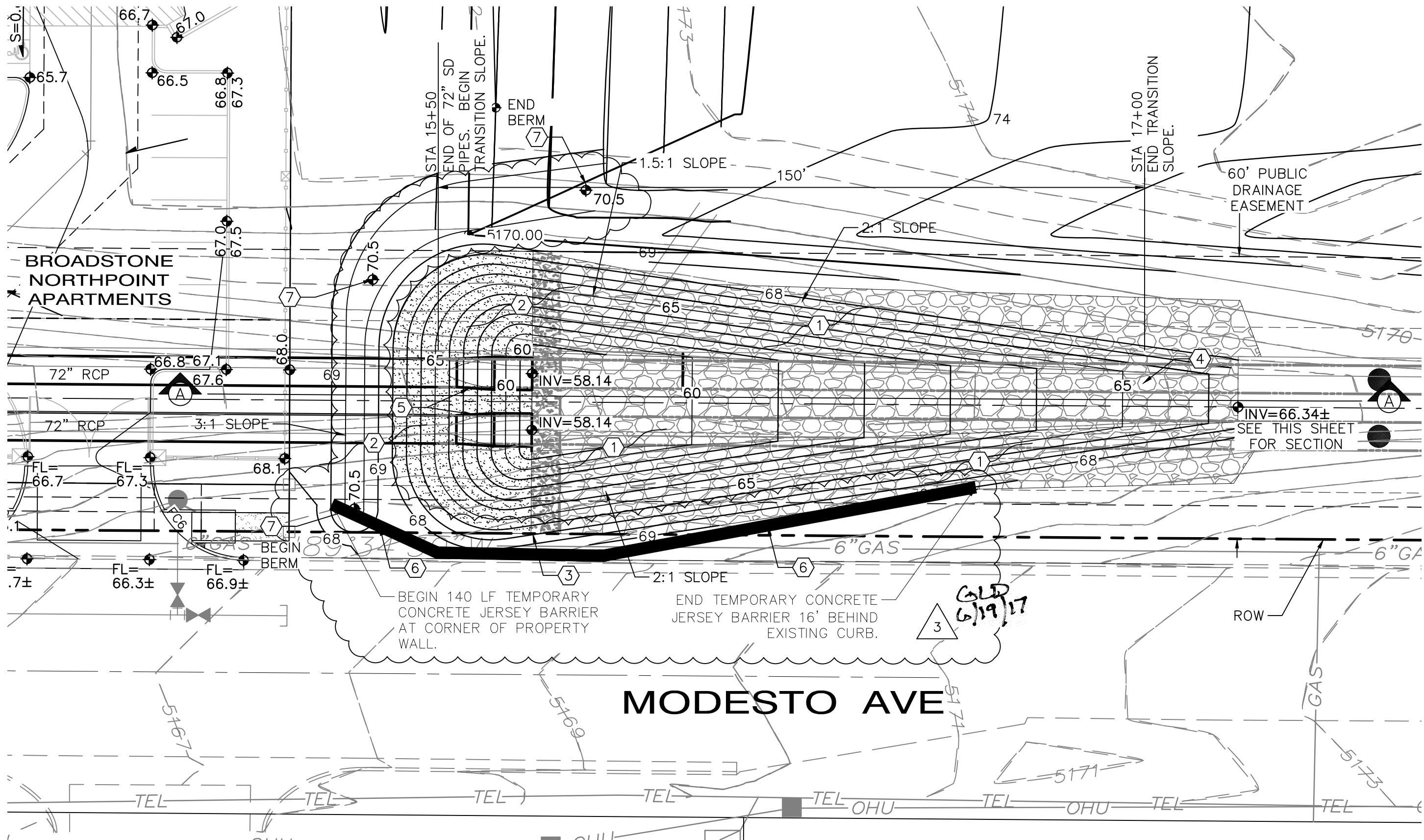
Because this project is building the first phase of the storm drain, a temporary transition is required from the existing channel to direct storm water into the pipes. This temporary transition structure will be removed when the storm drain is extended in the future.

While the 72” pipes are sufficient to carry the 100-year storm, they are under-sized for inlet control at the headwater depth available. Orifice calculations show that 84” inlet pipes allow the storm water to transition into the pipes. A stick of 84” pipe and an eccentric cone reducer from 84” to 72” are included at the upstream end of each storm drain.

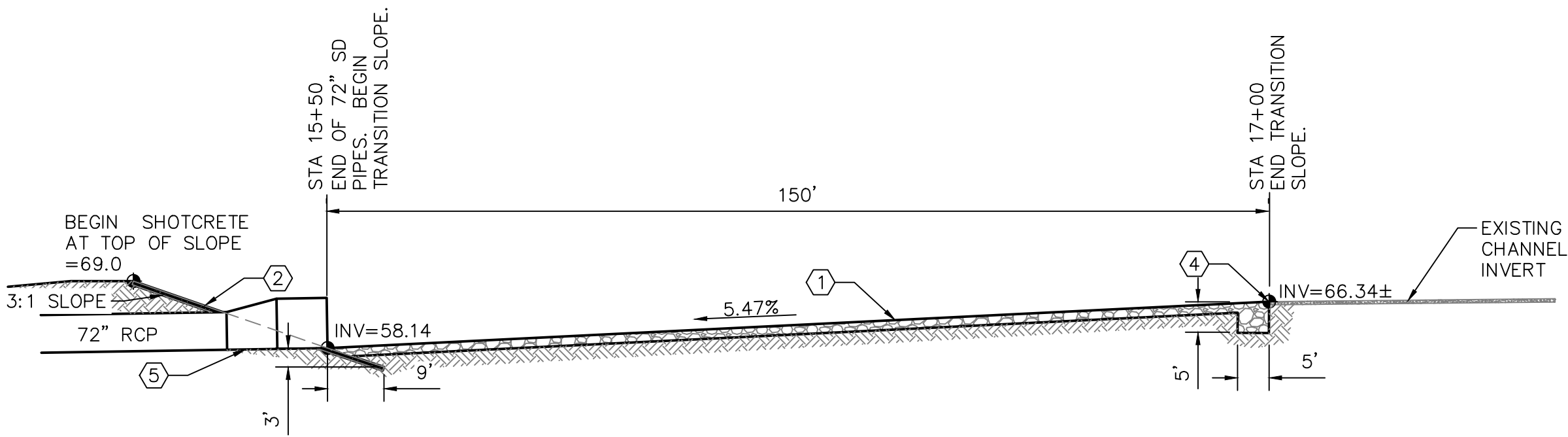
Hydraflow Storm Sewer calculations were used to model this reducer on the upstream end of the pipes. They confirm that the headwater will be 5” below the elevation of the lowest adjacent grades. (5168.8-5168.4) In order to provide 2’ of freeboard for the transition structure the berm between the temporary transition structure and the apartments will be raised to 5170.4 minimum, and a temporary concrete jersey barrier will be added along the south side between the structure and Modesto Ave.

See following pages for calculations.





TEMPORARY TRANSITION STRUCTURE DETAIL
PLAN VIEW



TEMPORARY TRANSITION STRUCTURE DETAIL
SECTION A-A

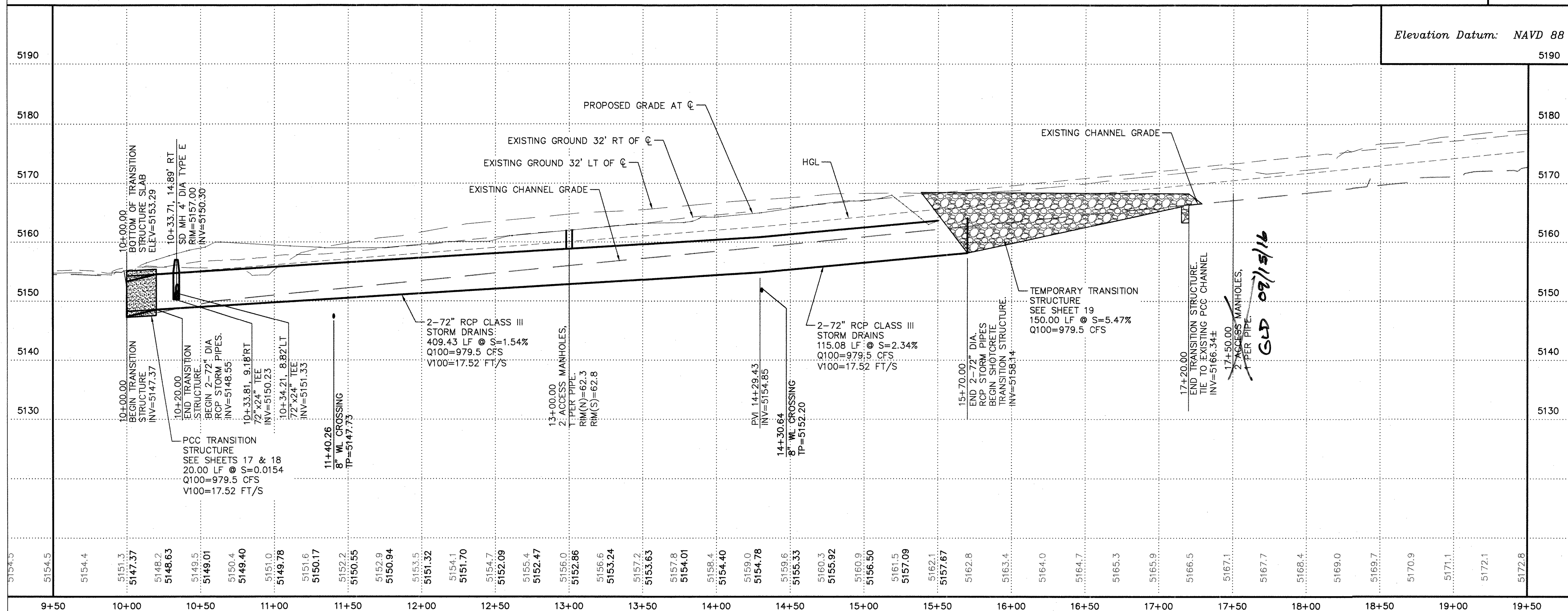
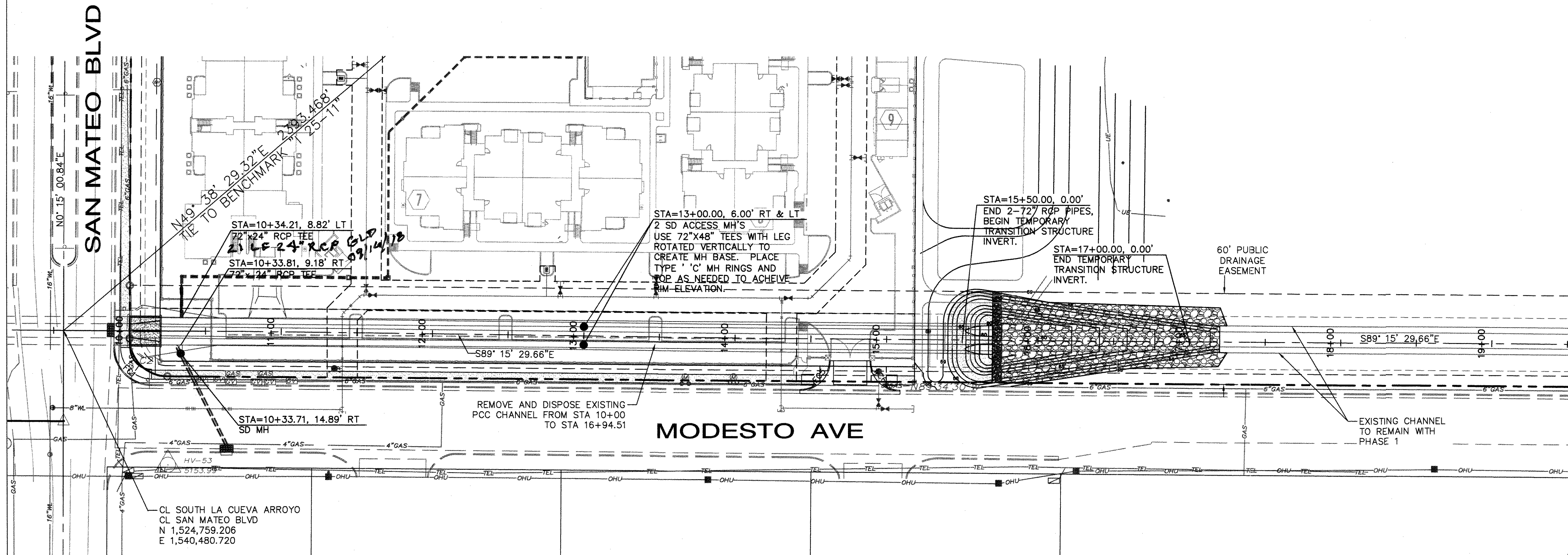
KEYED CONSTRUCTION NOTES

- 3' THICK, 15" MEAN DIA. BROKEN CONCRETE OR RIPRAP OVER 12" TYPE 2 GRAVEL FILTER MATERIAL, OR 12" THICK MINIMUM SIZE 3 SQ. FT. SLABS OF OVERLAPPING BROKEN CONCRETE PLACED TO KEEP THE OVERLAP ON THE DOWNSTREAM END, THEREBY PREVENTING STORM WATER FROM RELOCATING THE SLABS. EITHER OPTION TO BE PLACED OVER 12" TYPE 2 GRAVEL FILTER MATERIAL AND 12" SUBGRADE COMPACTED TO 95% MIN.
- 7" THICK SHOTCRETE (OPTION #1), OR 18" THICK GROUTED RIPRAP (OPTION #2), OR 18" THICK GROUTED BROKEN CONCRETE (OPTION #3)
- NOT USED.
- SAWCUT EXISTING CONCRETE CHANNEL. REMOVE & DISPOSE OF CONCRETE DOWNSTREAM.
- 84" TO 72" RCP TRANSITION WITH AN ECCENTRIC CONE & 8 LF OF 84" RCP SD. TO BE REMOVED WHEN FUTURE PHASES EXTEND THE 72" SD UPSTREAM.
- INSTALL 140 LF OF TEMPORARY CONCRETE JERSEY BARRIERS BETWEEN CURB AND TEMPORARY TRANSITION STRUCTURE AS SHOWN IN PLAN VIEW.
- 18" HIGH BERM FOR FREEBOARD.

AS-BUILT INFORMATION				BENCH MARKS				SURVEY INFORMATION				ENGINEER'S SEAL				REVISIONS			
CONTRACTOR	WORK STATED BY	DATE	DATE	CONTRACTOR	WORK STATED BY	DATE	DATE	FIELD NOTES	FIELD NOTES	FIELD NOTES	FIELD NOTES	ENGINEER'S SEAL	ENGINEER'S SEAL	ENGINEER'S SEAL	ENGINEER'S SEAL	NO.	DATE	REVISIONS	REVISIONS
Albuquerque Central Survey Monument "125-11"	New Mexico State Plane Coordinates, Central Zone (NAD83) as published:			Albuquerque Central Survey Monument "125-11"	New Mexico State Plane Coordinates, Central Zone (NAD83) as published:											1	11/07/16	CLARIFY BROKEN CONCRETE NOTE	CLARIFY BROKEN CONCRETE NOTE
	Y= 1,526,309.141				Y= 1,526,309.141											2	3/4/17	CLARIFY BROKEN CONCRETE NOTE	CLARIFY BROKEN CONCRETE NOTE
	X= 1,542,232.560				X= 1,542,232.560											3	6/19/17	AUD FREEBOARD & JERSEY BARRIERS	AUD FREEBOARD & JERSEY BARRIERS
	Ground to grid factor= 0.999665711				Ground to grid factor= 0.999665711														
	Delta Alpha= -00°11'21.89"				Delta Alpha= -00°11'21.89"														
	Elevation= 5209.617 (NAVD88)				Elevation= 5209.617 (NAVD88)														

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2129 CP-502.dwg Jun 20, 2017

CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT ENGINEERING DEVELOPMENT GROUP			
BROADSTONE NORTHPOINTE APARTMENTS CHANNEL DETAILS			
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	LAST DESIGN UPDATE	Mo./DAY/YR.
City Project No.	Zone Map No.	Sheet	Of
786480	B-18	19	26



STORM DRAIN GENERAL NOTES

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE INSTALLATION OF ALL WORK RELATED TO PROPOSED STORM DRAINS SHOWN ON THIS PLAN INCLUDING: TRENCHING, BACKFILL, SUPPORTS, INLET AND MANHOLE COLLARS, MANHOLES, WATER QUALITY FEATURES, EROSION CONTROL FEATURES, TESTING, CLEANING, AND STERILIZING. ANY WORK NOT ACCEPTED BY THE ARCHITECT OR ENGINEER DUE TO IMPROPER WORKMANSHIP OR LACK OF PROPER COORDINATION SHALL BE REMOVED AND CORRECTLY INSTALLED AT THE CONTRACTOR'S EXPENSE, AS DIRECTED.
- MINIMUM COVER FOR STORM DRAIN PIPES SHALL BE 12", UNLESS OTHERWISE NOTED.
- STORM DRAINS SHALL BE INSTALLED AFTER COMPLETION OF THE SITE ROUGH GRADING.
- STORM DRAINS SHALL BE INSTALLED PRIOR TO SURFACE IMPROVEMENTS SUCH AS PAVEMENT, SIDEWALKS, AND LANDSCAPING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CONNECTIONS TO ROOF DOWNSPOUTS AND ALL NECESSARY FITTINGS. FITTING COSTS SHALL BE INCIDENTAL.
- TRENCHING, BORING, AND JACKING SHALL BE CONSTRUCTED IN ACCORDANCE WITH COA SPEC. SECT. 700 / NMAPWA SPEC. SECT. 700 / LOCAL UTILITY COMPANY SPECIFICATIONS. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY PER ASTM D-1557.
- ALL INLET AND AREA DRAIN RINGS & GRATES, MANHOLE RINGS & COVERS, AND OTHER SURFACE ITEMS FOR THE STORM DRAINS SHALL BE ADJUSTED TO FINISHED GRADE, UNLESS OTHERWISE NOTED ON THE PLANS.
- ALL STORM DRAIN CROSSINGS OF WATER AND SEWER LINES SHALL HAVE 18" MIN CLEARANCE. IF 18" CLEARANCE IS NOT POSSIBLE, CONTACT THE ENGINEER AND / OR ARCHITECT IMMEDIATELY.
- RCP PIPES, PP PIPES, CONCRETE INLETS, MANHOLES, AND CLEANOUTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH COA SPEC. SECT. 900.
- HDPE PIPE SHALL BE ADS N-12 (WATERTIGHT) OR ENGINEER APPROVED EQUIVALENT. HDPE PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- PVC PIPES SHALL BE PVC SDR-35, INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- STORM DRAINS SHALL BE INSTALLED AT INVERTS AND SLOPES SPECIFIED ON THE PLANS. THE PIPE SHALL DRAIN AT A CONSTANT SLOPE BETWEEN FITTINGS AND MANHOLES. THE PIPE SHALL DRAIN TOWARD THE OUTLET AT ALL LOCATIONS.

SCALES:
1"=40' HOR.
1"=10' VERT.

Elevation Datum: NAVD 88

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2128 CP-301.dwg Sep 09,2016

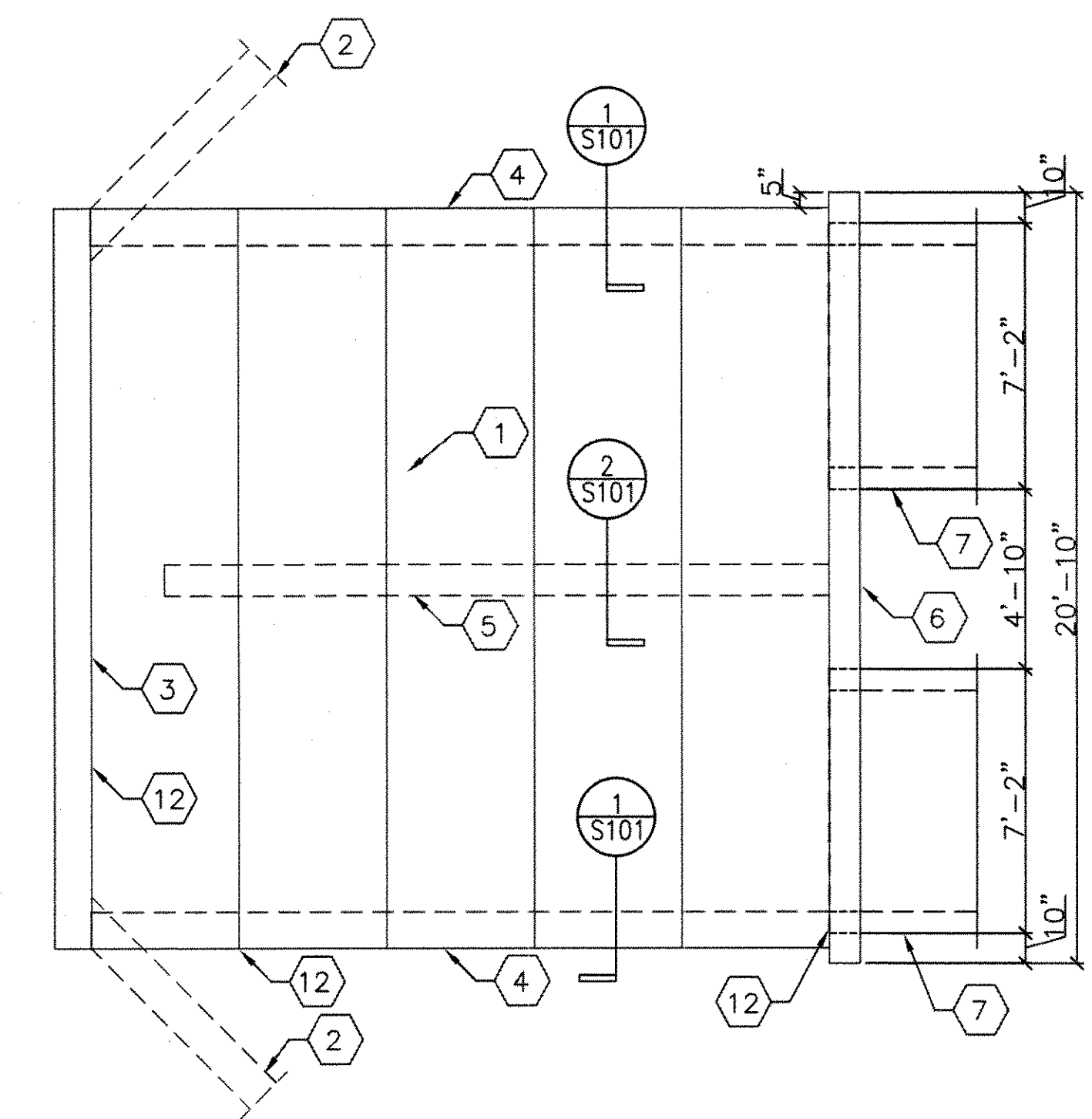
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

**BROADSTONE NORTHPOINTE APARTMENTS
SOUTH LA CUEVA ARROYO
STORM DRAIN PLAN & PROFILE**

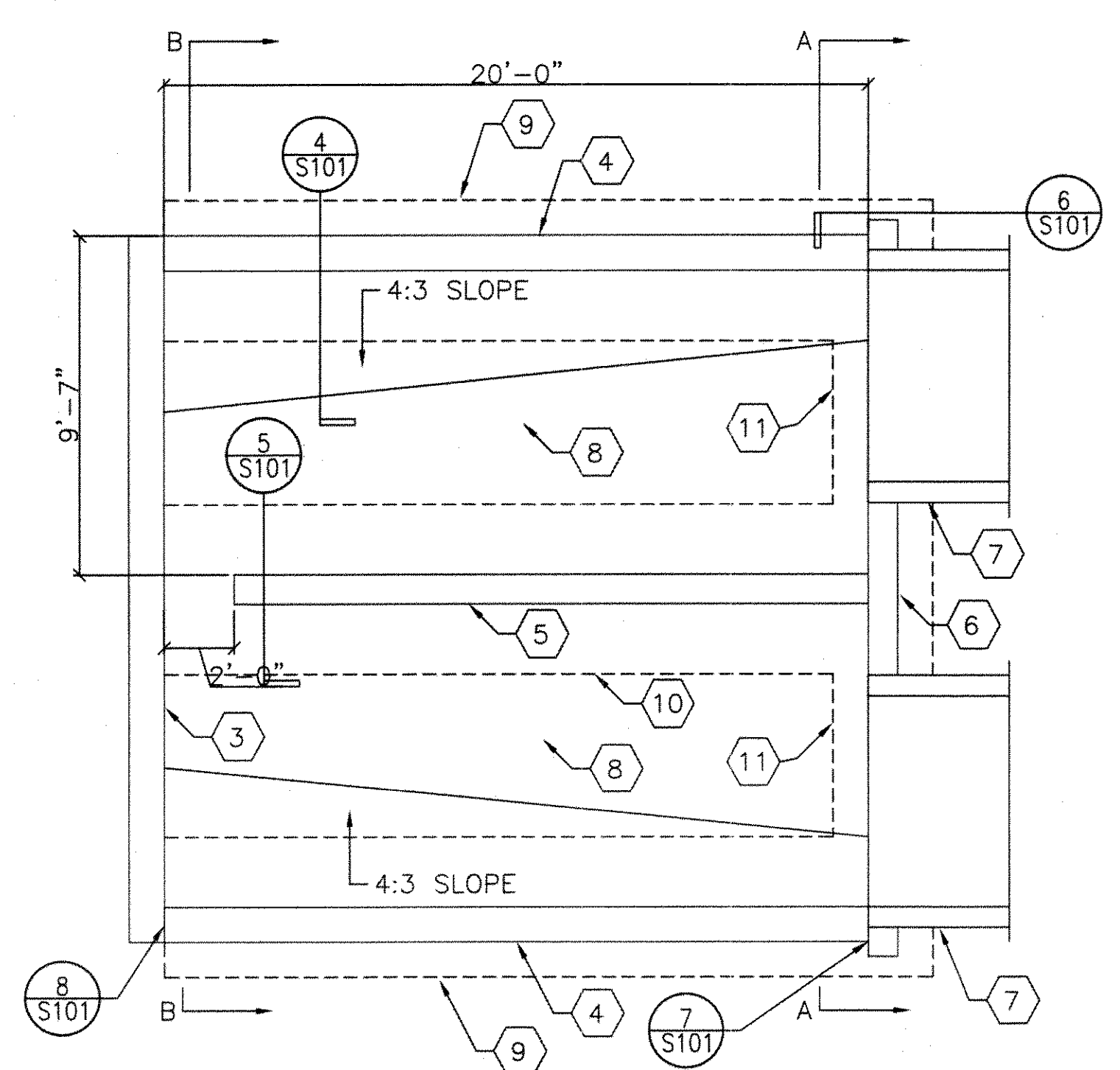
DESIGN REVIEW COMMITTEE	CITY ENGINEER APPROVAL	Mo./DAY/YR.	Mo./DAY/YR.
APPROVED DESIGN REVIEW COMMITTEE			
City Project No. 786480	Zone Map No. B-18	Sheet 16	Of 26

AS-BUILT INFORMATION		BENCH MARKS		SURVEY INFORMATION		ENGINEER'S SEAL		REVISIONS	
CONTRACTOR	DATE	Albuquerque Control Survey Monument "125-11"	Zone (NAD83) as published:	FIELD NOTES		Professional Engineer Seal		NO.	DATE
INSPECTED BY	DATE	New Mexico State Plane Coordinates, Central	Y= 1,526,309.141					DESIGNED BY	DATE
REVISIONS BY	DATE		X= 1,542,232.560					DRAWN BY	DATE
REVISIONS BY	DATE		Ground to grid factor= 0.999665711					CHECKED BY	DATE
REVISIONS BY	DATE		Delta Alpha= -0011'21.89"						
REVISIONS BY	DATE		Elevation= 5209.617 (NAVD88)						

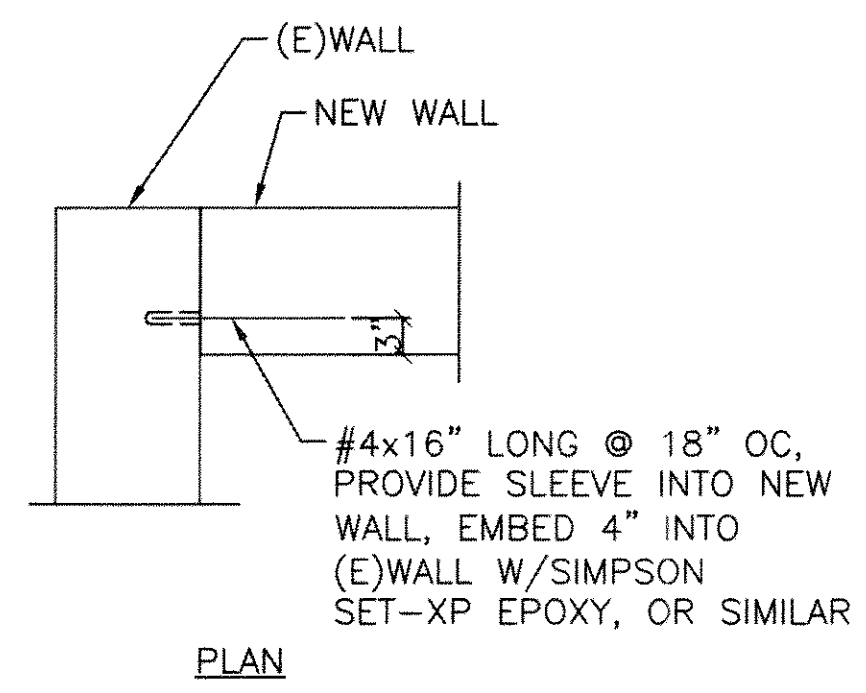
- KEYED NOTES**
- 8" DEEP x 48" WIDE PRECAST HOLLOW CORE PANELS WITH 2" CONCRETE TOPPING.
 - EXISTING WING WALLS TO BE REMOVED.
 - EXISTING BOX CULVERT TO REMAIN.
 - 12" CONCRETE WALL WITH #4@18" OC VERTICAL AND #4@16" OC HORIZONTAL, EACH FACE.
 - 10" CONCRETE WALL WITH #4@18" OC VERTICAL AND #4@18" OC HORIZONTAL, EACH FACE.
 - 10" CONCRETE HEAD WALL WITH #4@18" OC VERTICAL AND #4@18" OC HORIZONTAL, EACH FACE
 - 6" DIAMETER RCP.
 - 10" THICK CONCRETE SLAB ON GRADE WITH #4@18" OC EACH WAY, TOP AND BOTTOM.
 - 4'-0" WIDE x 12" THICK CONTINUOUS FOOTING WITH BOTTOM REINFORCING; #4@18" OC TRANSVERSE AND 4-#4 LONGITUDINAL, TOP REINFORCING; #4@18" OC TRANSVERSE AND 2-#4 LONGITUDINAL.
 - 4'-9" WIDE x 12" THICK CONTINUOUS FOOTING WITH #4@18" TRANSVERS AND 4-#4 LONGITUDINAL.
 - 4'-0" WIDE x 12" THICK CONTINUOUS FOOTING WITH #4@18" OC TRANSVERSE AND 4-#4 LONGITUDINAL.
 - PROVIDE NP-1 SEALANT, OR EQUIVALENT, AT ALL JOINTS, TYPICAL.



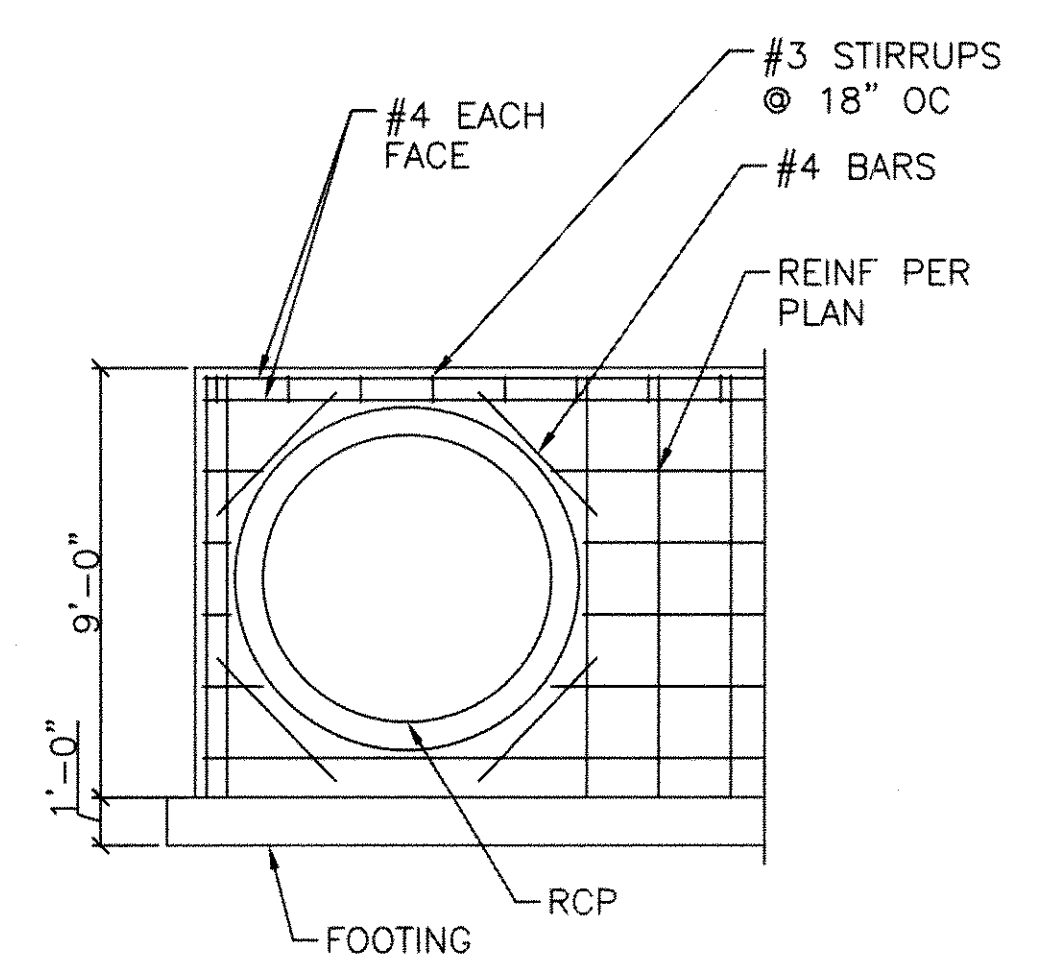
2 ROOF PLAN
 S101 SCALE: 1/4" = 1'-0"



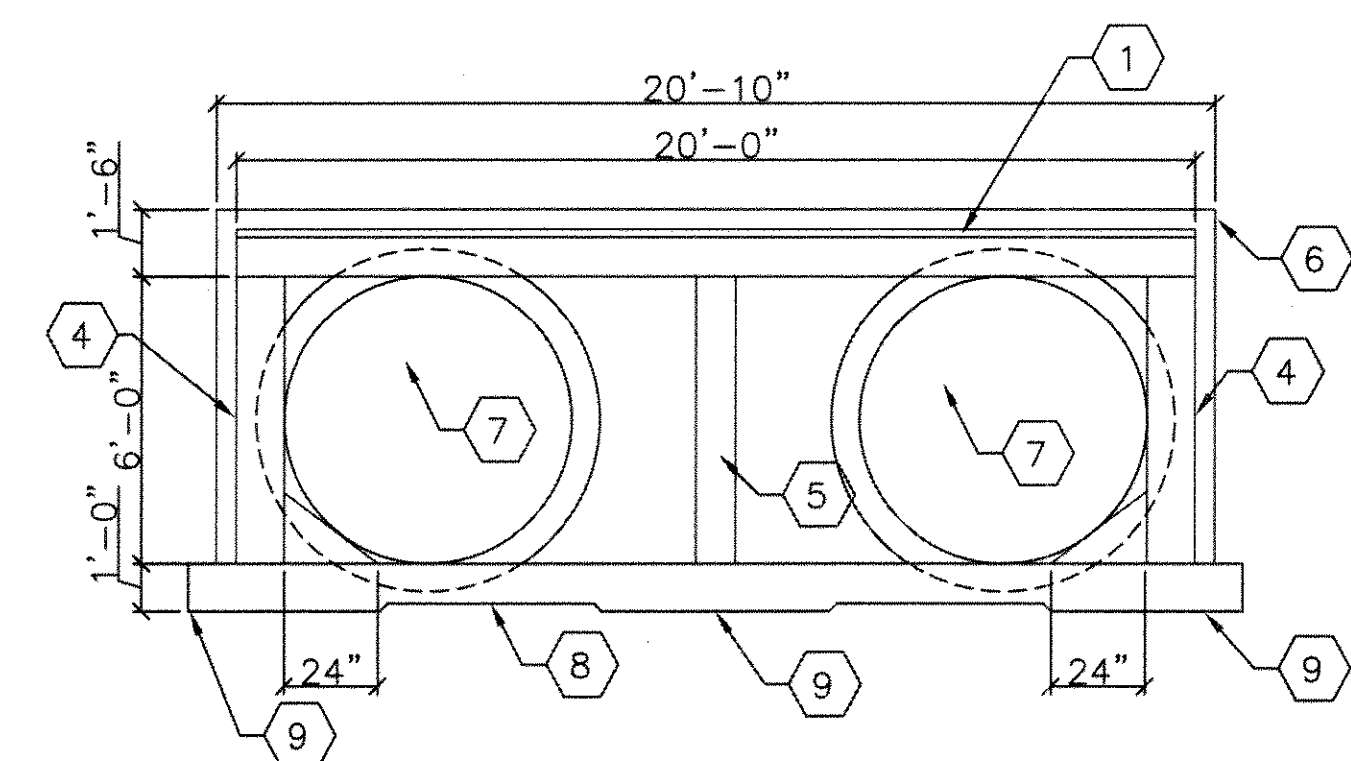
1 FOUNDATION PLAN
 S101 SCALE: 1/4" = 1'-0"



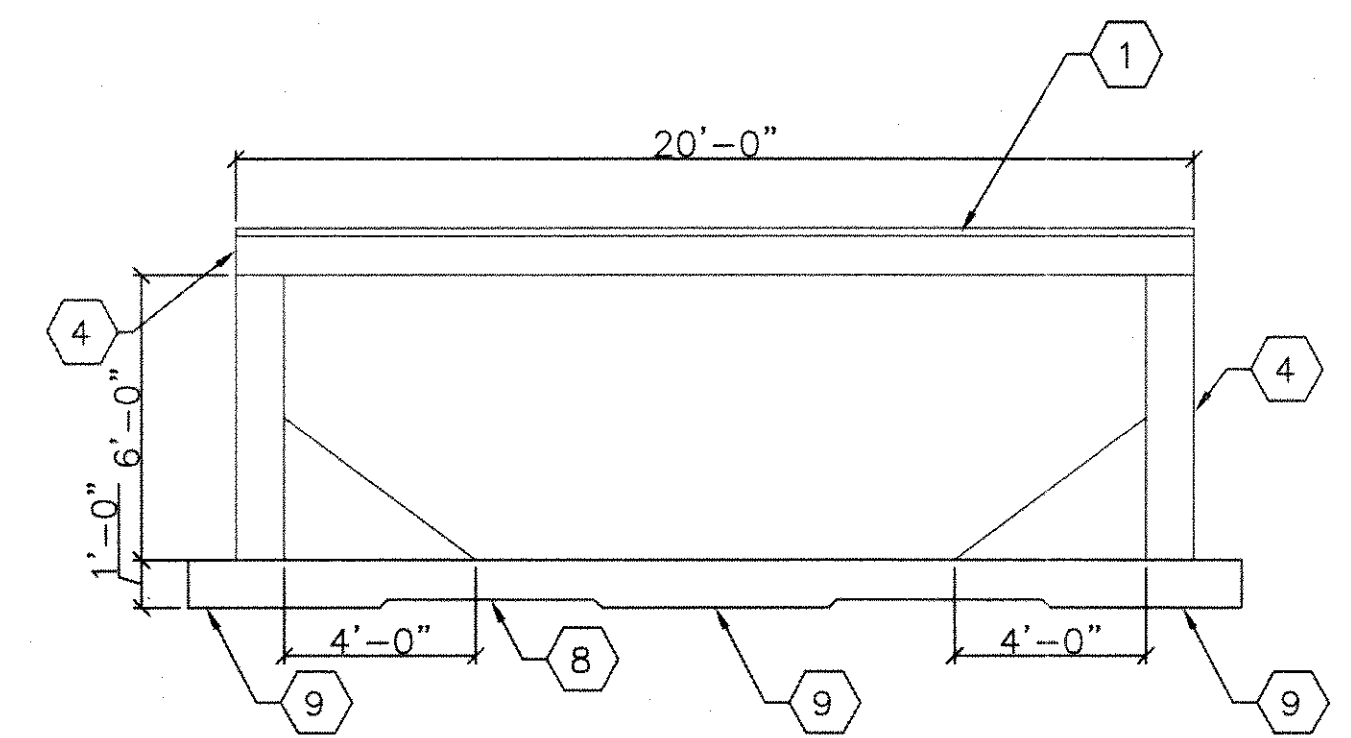
8 CORNER CONNECTION
 S101 SCALE: 3/4" = 1'-0"



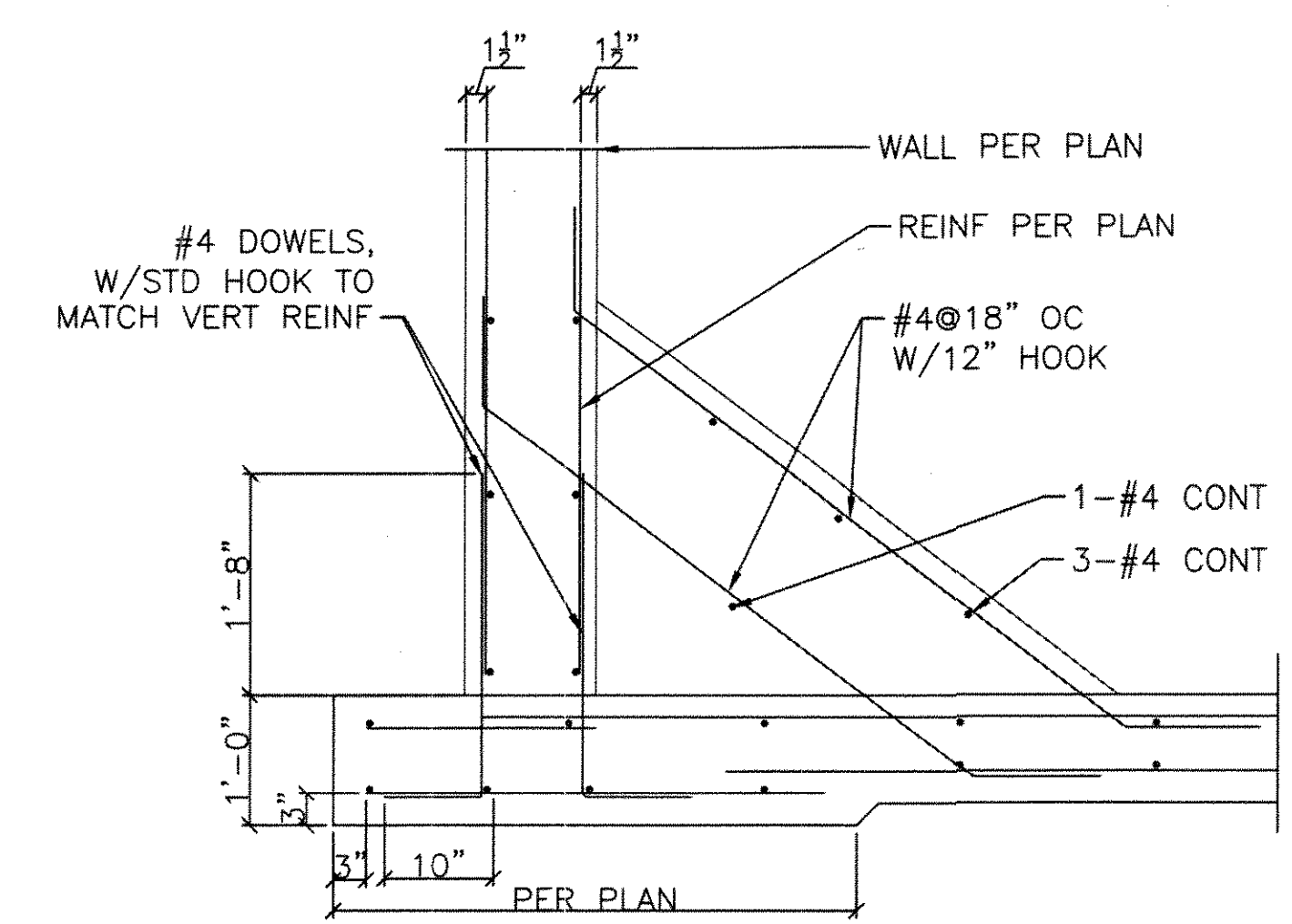
9 HEAD WALL REINFORCEMENT
 S101 SCALE: 3/4" = 1'-0"



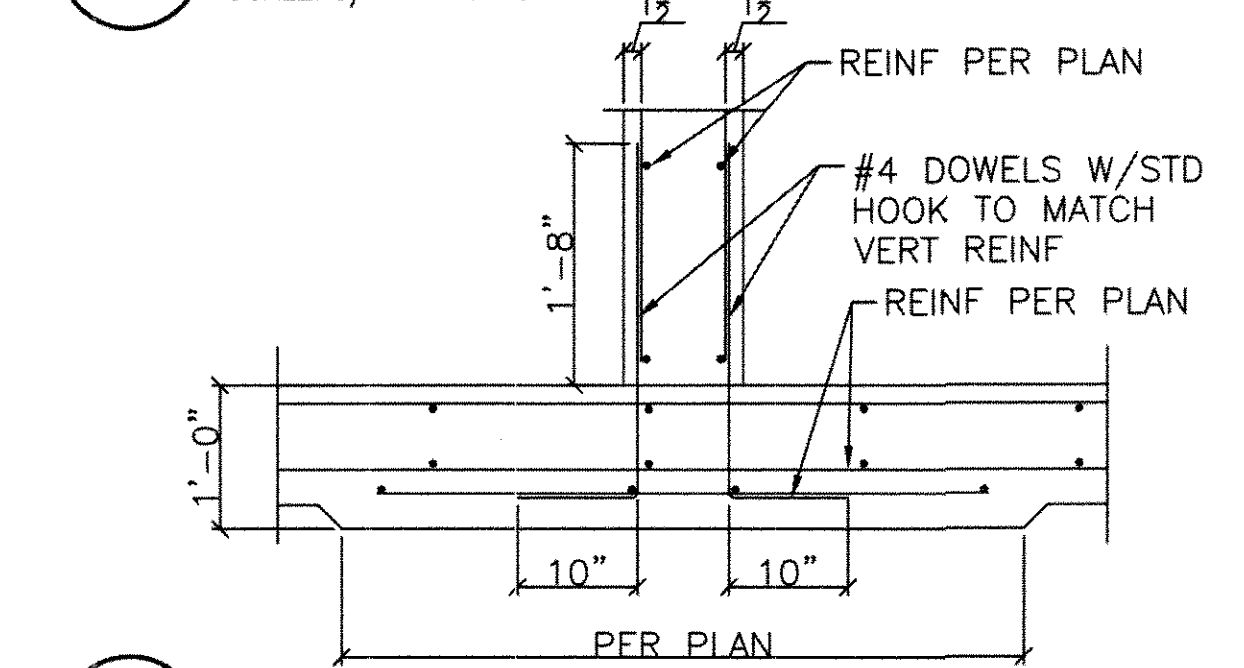
SECTION A-A



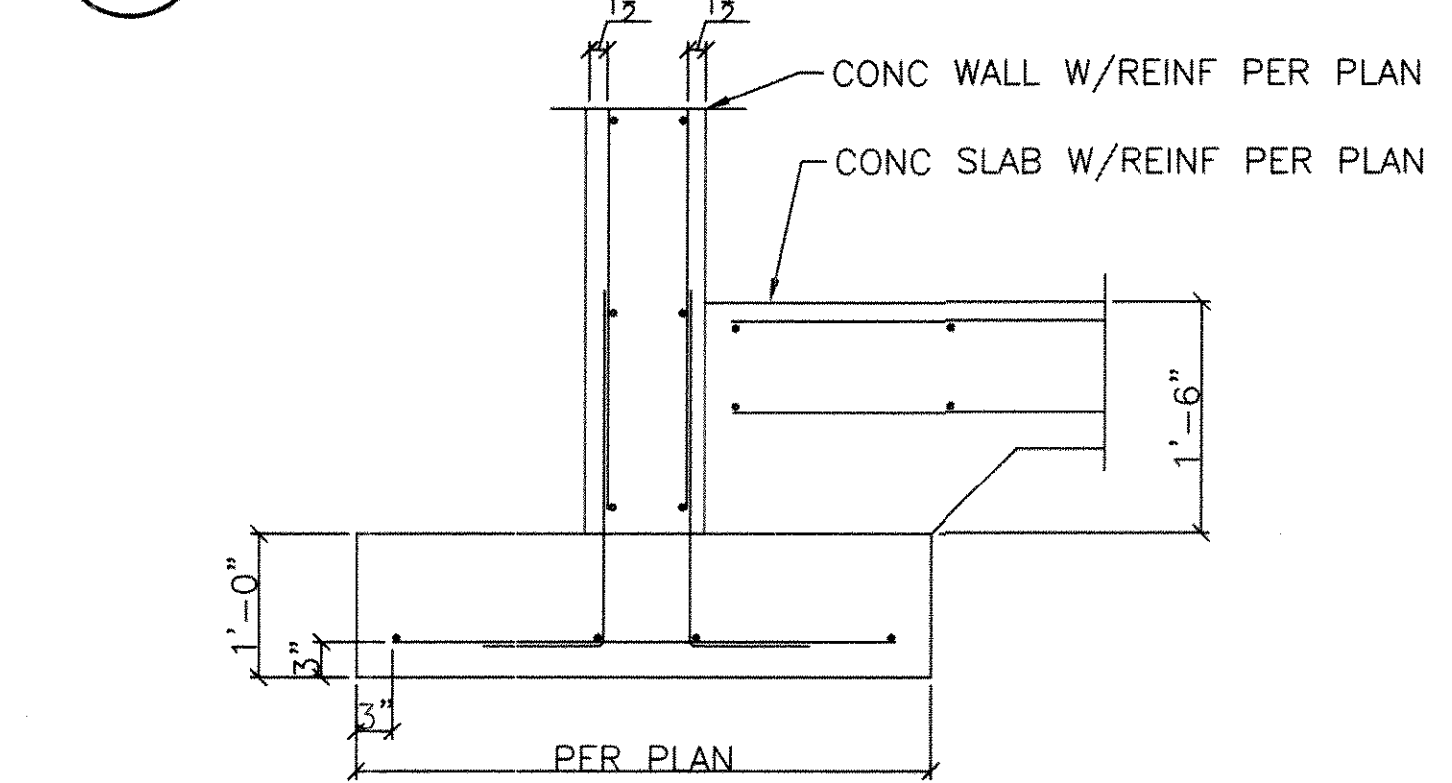
SECTION B-B



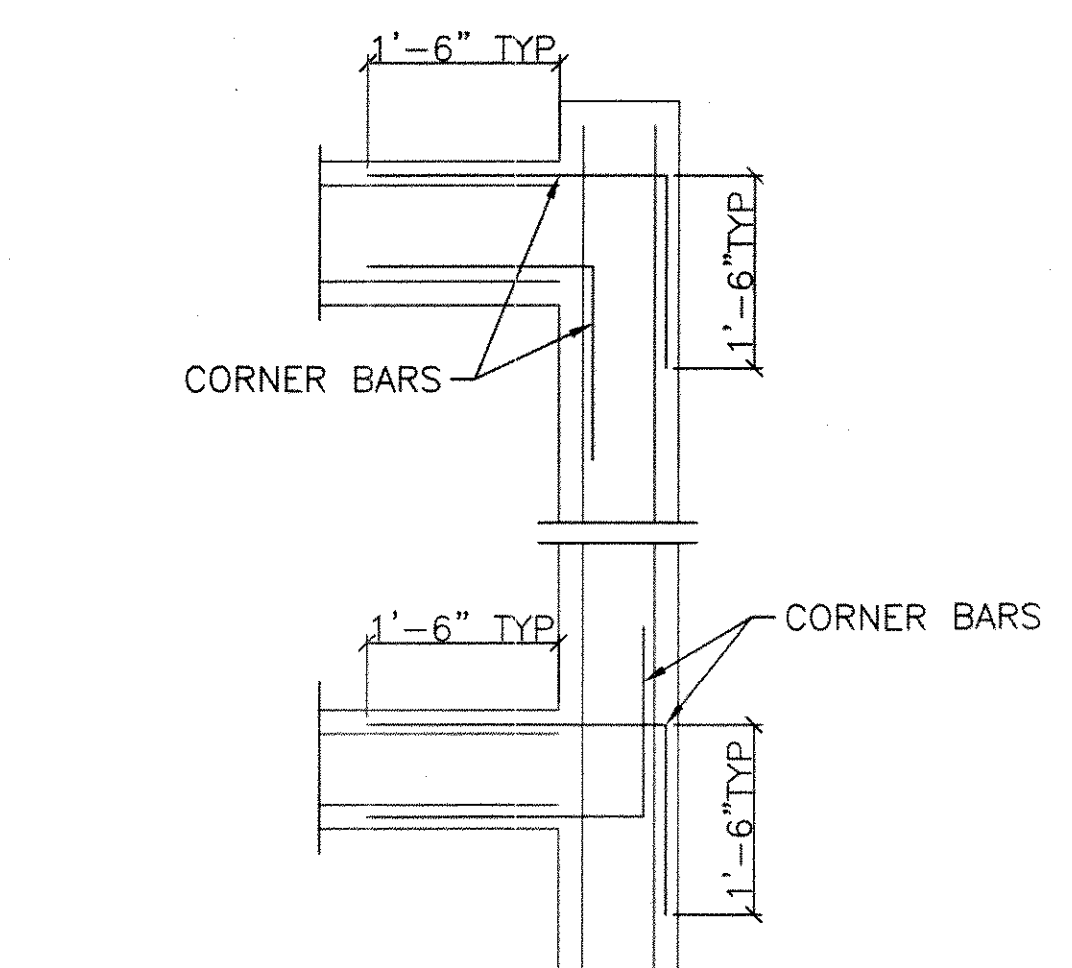
4 EXTERIOR FOOTING
 S101 SCALE: 3/4" = 1'-0"



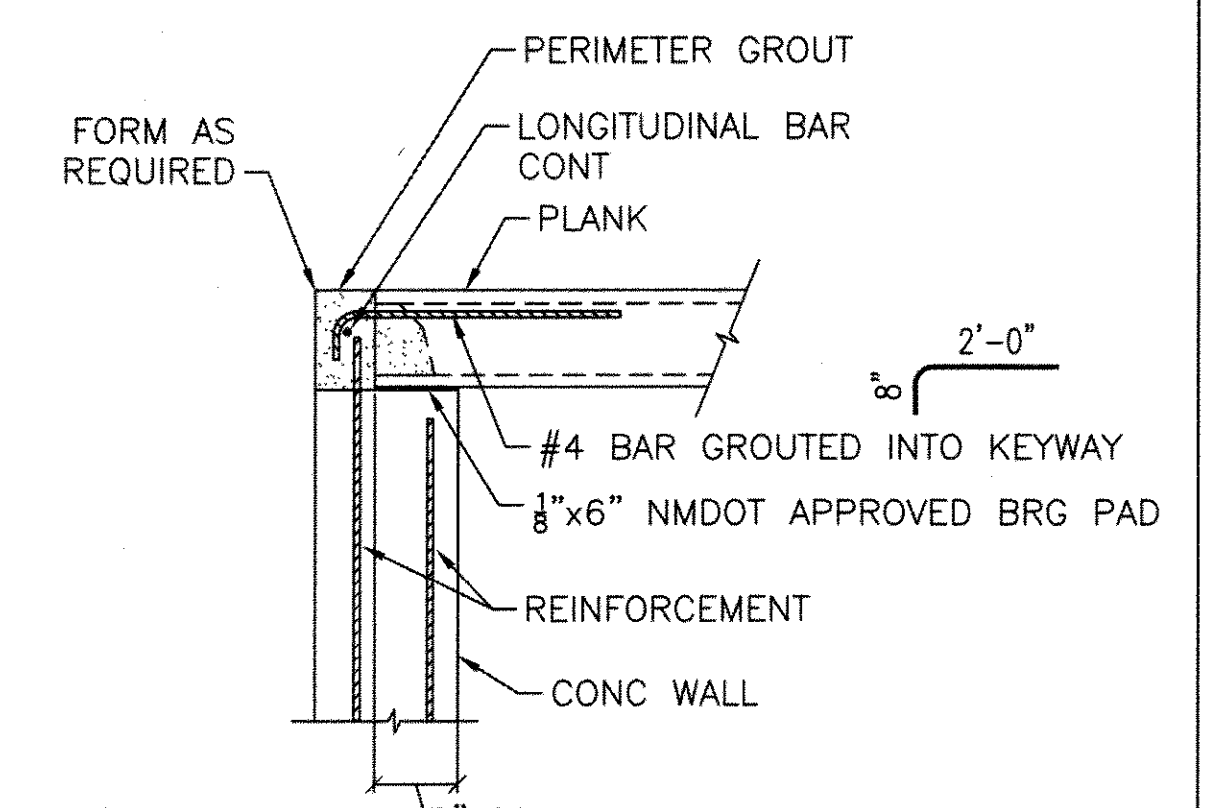
5 INTERIOR FOOTING
 S101 SCALE: 3/4" = 1'-0"



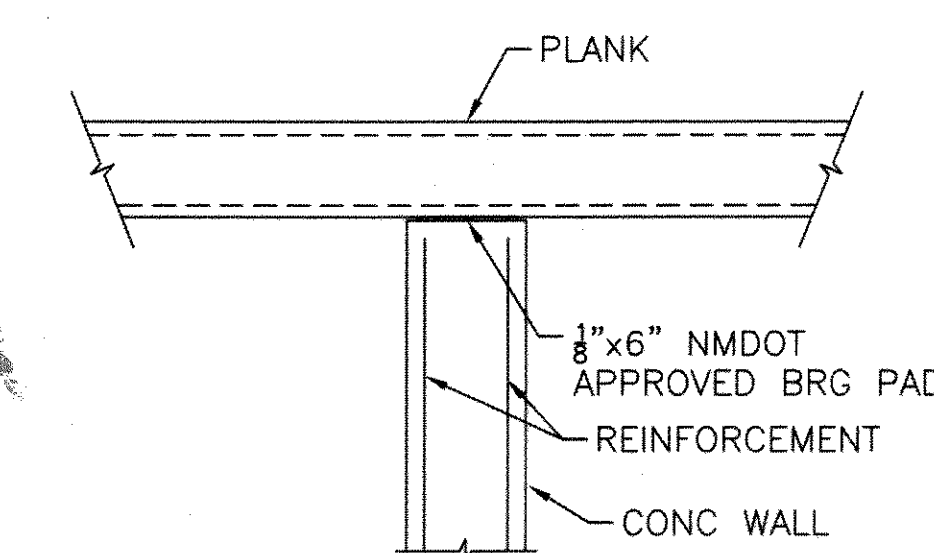
6 HEAD WALL FOOTING
 S101 SCALE: 3/4" = 1'-0"



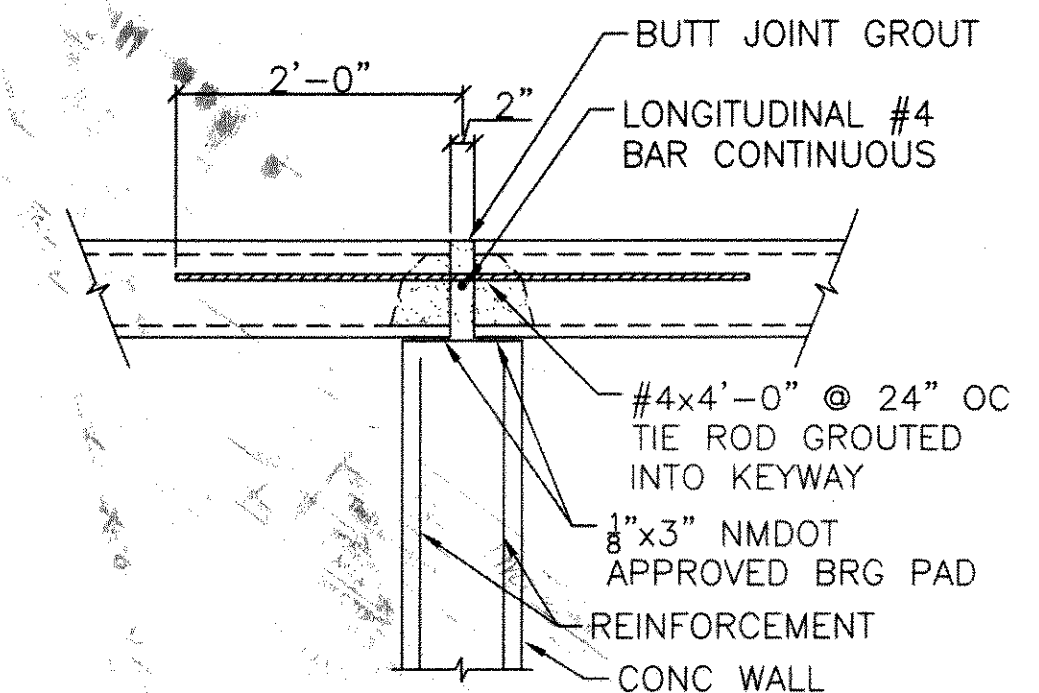
7 CONCRETE CONER REINFORCING
 S101 SCALE: 3/4" = 1'-0"



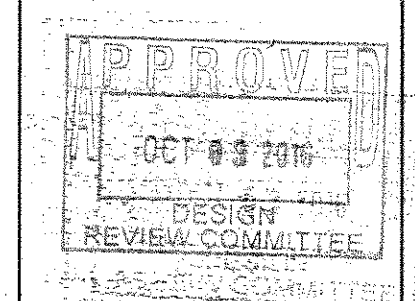
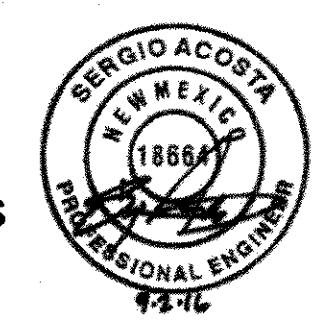
1 EXTERIOR BEARING (ROOF)
 S101 SCALE: 3/4" = 1'-0"



2 INTERIOR BEARING (ROOF)
 S101 SCALE: 3/4" = 1'-0"



3 ALTERNATE INTERIOR BEARING
 S101 SCALE: 3/4" = 1'-0"



MARK	DATE	DESCRIPTION
ISSUE DATE:	6/10/16	
PROJECT NO:	1612	
DRAWN BY:	SA	
CHK'D BY:	SA	
SHEET TITLE		
SHEET NO.		

CULVERT PLAN AND DETAILS

1. CODES
 - A. 2012 INTERNATIONAL BUILDING CODE
 - B. ASCE 7-10, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
 - C. ACI 318-11, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
2. OCCUPANCY CATEGORY PER IBC TABLE 1604.5: I (ONE)
3. DEAD LOADS
 - A. ACTUAL WEIGHT OF COMPONENTS
4. LIVE LOADS
 - ROOF: 500 PSF, SOIL & TRAFFIC
5. SNOW LOADS
 - GROUND SNOW LOAD $P_g = 20$ PSF
 - EXPOSURE FACTOR $C_e = 1.0$
 - THERMAL FACTOR $C_t = 1.0$
 - IMPORTANCE FACTOR $I = 1.0$
 - FLAT ROOF SNOW LOAD $P_f = 20$ PSF
 - SLOPED ROOF SNOW LOAD $P_s = NA$
 - RAIN ON SNOW SURCHARGE = NA
6. WIND LOADS
 - BASIC WIND SPEED = 90 MPH
 - EXPOSURE C
 - IMPORTANCE FACTOR $I = 1.0$
 - INTERNAL PRESSURE COEFFICIENT $G_{Cpi} = +/-0.18$
7. SEISMIC LOADS
 - IMPORTANCE FACTOR $I = 1.0$
 - MAPPED SPECTRAL ACCELERATION PARAMETERS
 - $S_s = 0.45$
 - $S_1 = 0.13$
 - SOIL SITE CLASS = C
 - DESIGN SPECTRAL ACCELERATION PARAMETERS
 - $S_{ds} = 0.36$
 - $S_{d1} = 0.15$
 - SEISMIC DESIGN CATEGORY = C
 - BASIC SEISMIC FORCE RESISTING SYSTEM: BEARING WALLS, ORDINARY CONCRETE REINFORCED SHEAR WALLS
 - RESPONSE MODIFICATION FACTOR $R = 4.0$
 - SEISMIC RESPONSE COEFFICIENT $C_s = 0.09$
 - ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE

1. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS: 4000 PSI
2. FORM SIDES OF FOOTINGS, WALLS AND GRADE BEAMS. NEAT FORMING IS NOT PERMITTED.
4. CHAMFER EXPOSED EDGES OF CONCRETE 3/4" UNLESS NOTED OTHERWISE.
5. EMBEDDED PIPES, CONDUITS AND SLEEVES: SEE TYPICAL DETAILS FOR PERMITTED EMBEDS IN CONCRETE MEMBERS. SUBMIT ANY PROPOSED EMBEDS NOT CONFORMING TO TYPICAL DETAILS FOR REVIEW BY THE ENGINEER. PROPOSED EMBEDS MAY REQUIRE ADDITIONAL REINFORCING AS SPECIFIED BY THE ENGINEER. PROVIDE ANY ADDITIONAL REINFORCING AT NO COST TO OWNER.

1. FABRICATE AND PLACE REINFORCING IN ACCORDANCE WITH ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE, AND ACI 315, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT.
2. MATERIAL
 - A. REINFORCING SHOWN ON THE DRAWINGS TO BE WELDED: ASTM A706 GRADE 60 WELDABLE REINFORCING.
 - B. ALL OTHER REINFORCING: ASTM A615 GRADE 60.
3. DO NOT TACK WELD OR WELD REINFORCING UNLESS SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS.
4. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR ALL REINFORCING TO THE ENGINEER AND THE CITY OF ALBUQUERQUE, DESIGN/REVIEW SECTION CONSTRUCTION ENGINEER, ATTN: MOHAMMAD ABADI.

1. GEOTECHNICAL REPORT: THE PROJECT GEOTECHNICAL REPORT WAS PREPARED BY X8e/VINYARD, INC., PROJECT NUMBER 15-1-065, DATED NOVEMBER 23, 2015.
2. DESIGN ALLOWABLE BEARING PRESSURE: 3000 PSF.
3. MINIMUM BEARING DEPTH BELOW FINISH GRADE FOR FROST FOR EXTERIOR FOOTINGS: 18".
4. ENGINEERED FILL:
 - A. IMPORTED FILL SHALL CONFORM TO THE FOLLOWING:

(1) GRADATION (ASTM C136)	PERCENT PASSING BY WEIGHT
4"	100
1"	90-100
NO. 4 SIEVE	70-100
NO. 200 SIEVE	10-100
 - (2) PLASTICITY INDEX OF 10 OR LESS.
 - (3) IMPORTED FILL SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.

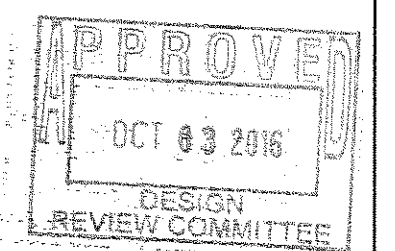
GENERAL

- CONTRACTOR SHALL:
- 1. IF THERE ARE DISCREPANCIES BETWEEN PLANS, DETAILS, GENERAL NOTES AND SPECIFICATIONS, USE THE MOST STRINGENT REQUIREMENTS.
- 2. SPECIFIC NOTES AND DETAILS TAKE PRECEDENCE OVER GENERAL NOTES AND TYPICAL DETAILS.
- 3. DETAILS DESIGNATED "TYPICAL" APPLY IN ALL SIMILAR CONDITIONS UNLESS SPECIFIC DETAILS ARE SHOWN.
- 4. WHERE NO SPECIFIC DETAILS ARE SHOWN, PROVIDE CONSTRUCTION TO MATCH CONSTRUCTION DETAILED FOR SIMILAR CONDITIONS ON THE PROJECT. CONFIRM DETAILS WITH ENGINEER BEFORE CONSTRUCTION.
- 2. DIMENSIONS
 - A. DO NOT SCALE DRAWINGS FOR CONSTRUCTION DIMENSIONS.
 - B. VERIFY ALL DIMENSIONS IN THE FIELD. NOTIFY ENGINEER OF ANY DISCREPANCIES.
- 3. PROJECT COORDINATION
 - A. COORDINATE STRUCTURAL WORK WITH REQUIREMENTS SHOWN ON ARCHITECTURAL, MECHANICAL, ELECTRICAL, CIVIL AND OTHER PROJECT DRAWINGS.
 - B. NOT ALL STRUCTURAL WORK IS SHOWN ON STRUCTURAL DRAWINGS. PROVIDE WORK SHOWN ON ALL PROJECT DRAWINGS.
- 4. SUBMITTALS
 - A. ANY WORK THAT IS FABRICATED OR INSTALLED BEFORE REQUIRED SUBMITTALS FOR THAT WORK ARE SUBMITTED AND REVIEWED IS AT CONTRACTOR'S RISK AND MAY BE REQUIRED TO BE MODIFIED OR REMOVED AND REPLACED AT CONTRACTOR'S EXPENSE.
 - B. POORLY EXECUTED SUBMITTALS WILL NOT BE REVIEWED BUT WILL BE REJECTED.
 - C. REVIEW OF SUBMITTALS IS FOR GENERAL CONFORMANCE WITH DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. SUBMITTAL REVIEW DOES NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
 - D. DEVIATIONS FROM THE CONTRACT DOCUMENTS SHOWN ON SUBMITTALS
 - (1) ON AN ATTACHED SEPARATE SHEET, PREPARED ON CONTRACTOR'S LETTERHEAD, SPECIFICALLY NOTE ON SUBMITTALS ANY ITEMS DEVIATING FROM THE CONTRACT DOCUMENTS OR PREVIOUSLY REVIEWED SUBMITTALS, AND REQUEST APPROVAL.
 - (2) ONLY DEVIATIONS THAT ARE SPECIFICALLY NOTED AS APPROVED IN THE ENGINEER'S REVIEW ARE APPROVED FOR INCORPORATION INTO THE WORK. DEVIATIONS THAT ARE NOTED AS "NOT APPROVED", AND DEVIATIONS THAT ARE NOT COMMENTED ON, ARE NOT APPROVED FOR INCORPORATION INTO THE WORK.

- A. CHANGES TO THE CONTRACT DOCUMENTS THAT DO NOT AFFECT THE PROJECT COST OR SCHEDULE MAY BE ISSUED BY THE ENGINEER OF RECORD BY ARCHITECT'S SUPPLEMENTAL INSTRUCTIONS (ASI), RESPONSES TO REQUESTS FOR INFORMATION (RFI), COMMENTS ON SUBMITTALS, OR BY OTHER WRITTEN DOCUMENT.
- B. CHANGES TO THE CONTRACT DOCUMENTS WILL NOT BE ISSUED VERBALLY, BY PHONE OR IN PERSON. DO NOT INCORPORATE ANY CHANGES TO THE CONTRACT DOCUMENTS THAT HAVE BEEN ISSUED VERBALLY WITHOUT WRITTEN DOCUMENTATION.
- C. CHANGES TO THE CONTRACT DOCUMENTS THAT AFFECT THE PROJECT COST OR SCHEDULE CAN ONLY BE ISSUED IN WRITING BY THE OWNER. THE ENGINEER DOES NOT HAVE AUTHORITY TO ISSUE CHANGES THAT AFFECT PROJECT COST OR SCHEDULE.
- D. IF ENGINEER ISSUES ANY CHANGE TO THE CONTRACT DOCUMENTS THAT THE CONTRACTOR BELIEVES AFFECTS THE PROJECT COST OR SCHEDULE, DO NOT PROCEED WITH THE CHANGE. NOTIFY THE OWNER AND ENGINEER OF THE PROPOSED CHANGE AND IMPACT ON COST AND SCHEDULE.
- E. ANY WORK DONE ON A CHANGE THAT IMPACTS PROJECT COST OR SCHEDULE, THAT HAS NOT BEEN ISSUED IN WRITING BY THE OWNER, IS AT CONTRACTOR'S RISK. CONTRACTOR MAY NOT BE PAID FOR THIS WORK, AND THE WORK MAY BE REQUIRED TO BE MODIFIED OR REMOVED AND REPLACED AT CONTRACTOR'S EXPENSE.

- A. THE STRUCTURE SHOWN ON THE DRAWINGS IS DESIGNED TO BE STABLE IN THE FINAL CONFIGURATION. DESIGN AND PROVIDE TEMPORARY BRACING, SHORING AND OTHER SUPPORTS AS REQUIRED FOR STABILITY DURING CONSTRUCTION. DO NOT DAMAGE OR OVERSTRESS PERMANENT ELEMENTS WITH TEMPORARY BRACING, SHORING OR OTHER SUPPORTS.
- B. USE CONSTRUCTION SEQUENCES THAT WILL NOT RESULT IN DAMAGE TO PERMANENT COMPONENTS FROM THERMAL STRESSES DURING CONSTRUCTION.
- C. DO NOT CUT, NOTCH OR MODIFY SHOP-FABRICATED STRUCTURAL MEMBERS IN THE FIELD UNLESS SHOWN ON DRAWINGS OR SUBMITTED AND APPROVED BY ENGINEER.

NHSE
nob hill structural engineering, llc
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REVISONS		
MARK	DATE	DESCRIPTION

ISSUE DATE: 6/10/16	
PROJECT NO:	1612
DRAWN BY:	SA
CHK'D BY:	SA
SHEET TITLE	

GENERAL NOTES

SHEET NO.

CHANNEL GENERAL NOTES
GENERAL NOTES

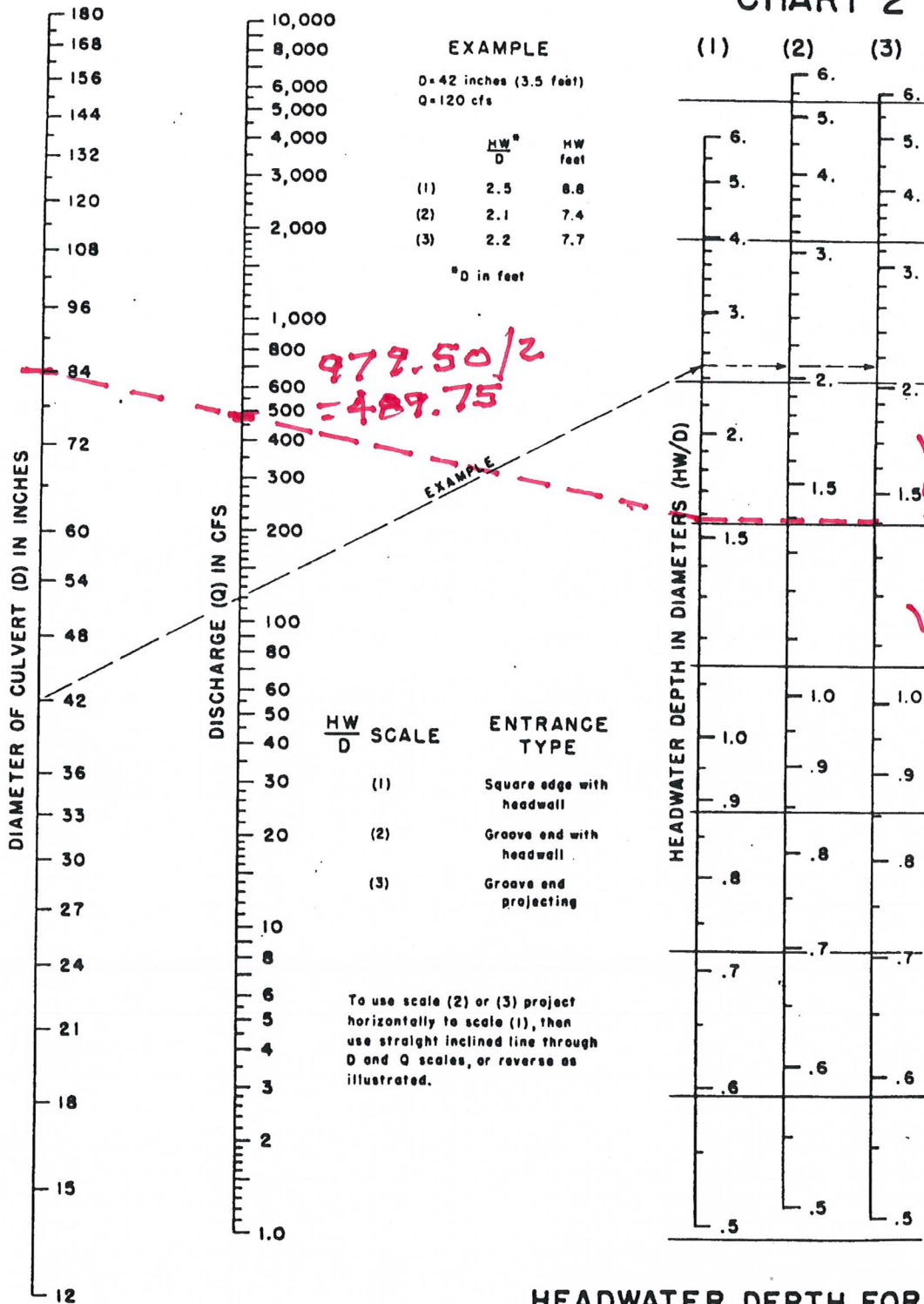
Sheet **18** Of **26**

S-001

CHART 2



2-Ø4"
INLETS



HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

HEADWATER SCALES 2 & 3
REVISED MAY 1964

BUREAU OF PUBLIC ROADS JAN. 1963

Culvert Report

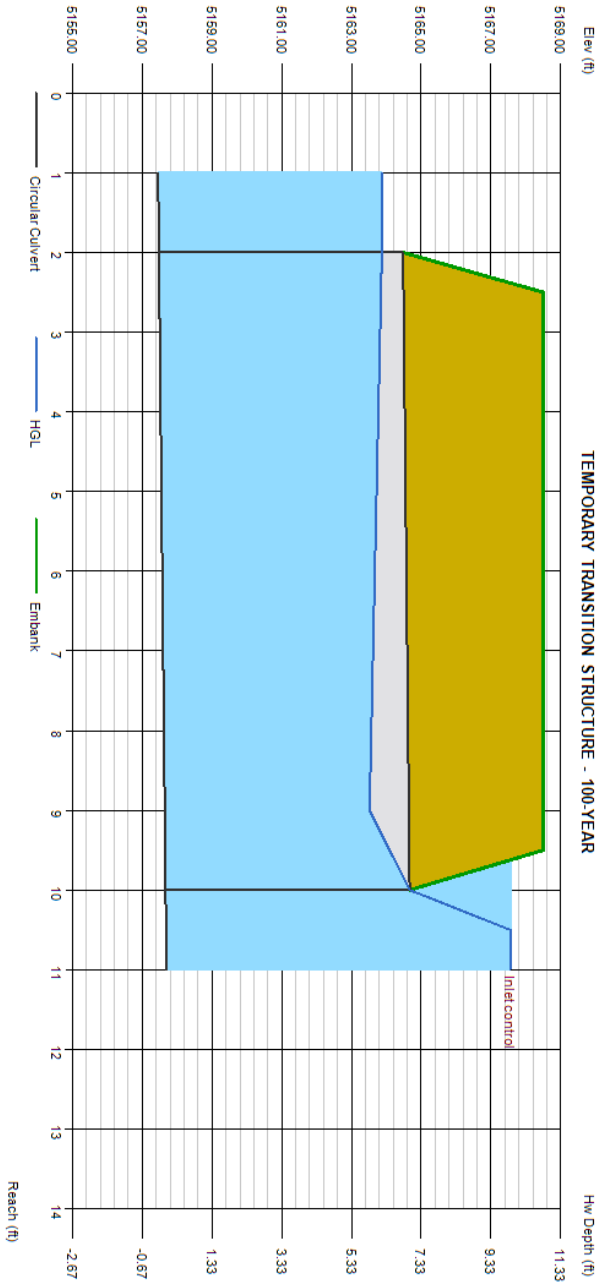
TEMPORARY TRANSITION STRUCTURE - 100-YEAR

Invert Elev Dn (ft)	= 5157.48
Pipe Length (ft)	= 8.00
Slope (%)	= 2.37
Invert Elev Up (ft)	= 5157.67
Rise (in)	= 84.0
Shape	= Circular
Span (in)	= 84.0
No. Barrels	= 2
n-Value	= 0.017
Culvert Type	= Circular Concrete
Culvert Entrance	= Groove end projecting (C)
Coeff. K,M,c,Y,k	= 0.0045, 2, 0.0317, 0.69, 0.2

Embankment	
Top Elevation (ft)	= 5168.50
Top Width (ft)	= 7.00
Crest Width (ft)	= 10.00

Calculations	
Qmin (cfs)	= 979.50
Qmax (cfs)	= 979.60
Tailwater Elev (ft)	= (dc+D)/2

Highlighted	
Qtotal (cfs)	= 979.50
Qpipe (cfs)	= 979.50
Qovertop (cfs)	= 0.00
Veloc Dn (ft/s)	= 13.29
Veloc Up (ft/s)	= 14.37
HGL Dn (ft)	= 5163.87
HGL Up (ft)	= 5163.47
Hw Elev (ft)	= 5167.55
Hw/D (ft)	= 1.41
Flow Regime	= Inlet Control



Hydraflow Storm Sewers Extension for Autodesk® AutoCAD® Civil 3D® Plan



Line No.	DnStm Ln No	Line Length	Known Q	Flow Rate	Capac Full	Vel Ave	Line Size	Line Slope	Invert Dn	Invert Up	HGL Dn	HGL Up	HGL Jnct	Gnd/Rim El Dn	Gnd/Rim El Up	
		(ft)	(cfs)	(cfs)	(cfs)	(ft/s)	(in)	(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	
1	Outfall	409.43	0.00	979.50	1050.88	21.11	72(2b)	1.54	5148.55	5154.85	5153.14	5159.44	5159.44	5155.00	5162.30	
2	1	140.57	0.00	979.50	1296.03	18.32	72(2b)	2.34	5154.85	5158.14	5161.70	5163.18	5163.18	5162.30	5168.80	
3	2	8.00	979.50	979.50	1969.13	12.73	84(2b)	2.37	5158.14	5158.33	5166.46	5166.51	5168.38 i	5168.80	5168.80	
Project File: 2129 S LA CUEVA PH1.stm												Number of lines: 3			Date: 6/14/2017	
NOTES: i Inlet control; ** Critical depth																

Storm Sewer Profile

