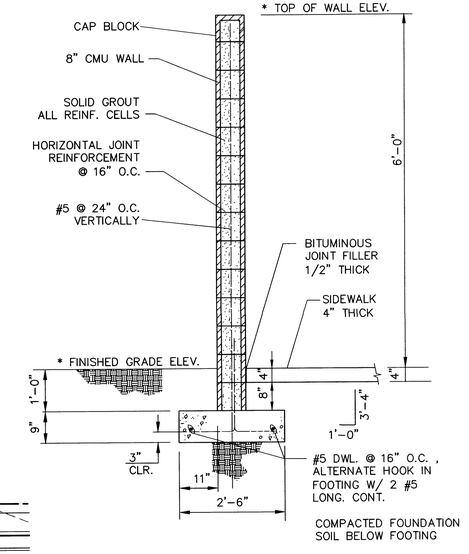
Worksheet for Triangular Channel - 1

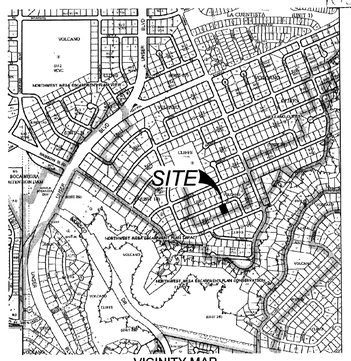
Project Description		
Friction Method	Manning Formula	
Solve For	Discharge	
Input Data		
Roughness Coefficient	0.035	
Channel Slope	0.00500	ft/ft
Normal Depth	1.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Results		
Discharge	5.48	ft³/s
Flow Area	3.00	ft²
Wetted Perimeter	6.32	ft
Hydraulic Radius	0.47	ft
Top Width	6.00	ft
Critical Depth	0.73	ft
Critical Slope	0.02679	ft/ft
Velocity	1.83	ft/s
Velocity Head	0.05	ft
Specific Energy	1.05	ft
Froude Number	0.46	
Flow Type	Subcritical	
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	
GVF Output Data		
Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.00	ft
Critical Depth	0.73	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.02679	ft/ft

Worksheet for Rectangular Orifice - 1

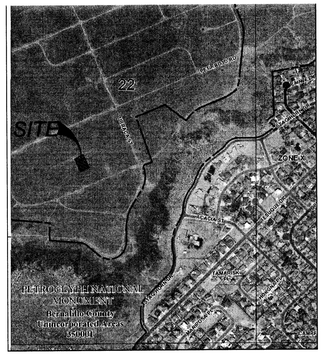
Project Description		
Solve For	Discharge	
Input Data		
Headwater Elevation	0.50	ft
Centroid Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Discharge Coefficient	0.62	
Opening Width	0.50	ft
Opening Height	0.40	ft
Results		
Discharge	0.70	ft³/s
Headwater Height Above Centroid	0.50	ft
Tailwater Height Above Centroid	0.00	ft
Flow Area	0.20	ft²
Velocity	3.52	ft/s



CMU GARDEN WALL
NOT TO SCALE

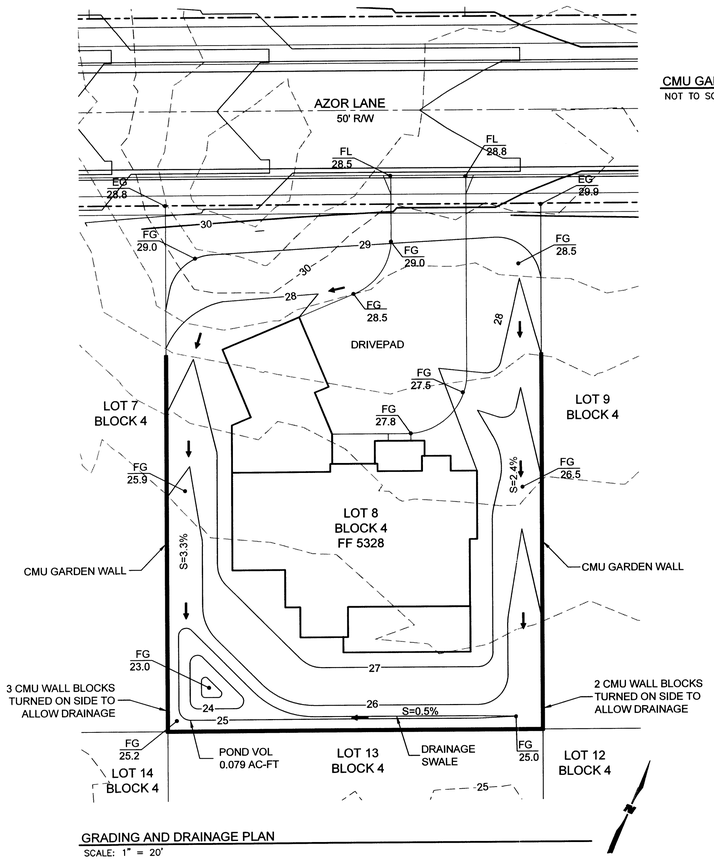


VICINITY MAP
ZONE ATLAS MAP: D-10-Z



FEMA FLOODPLAIN
FIRM #35001C0112G

SOILS MAP
NRCS SOIL SURVEY, BERNALILLO COUNTY

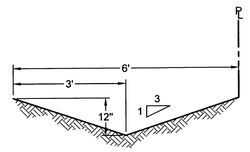


GRADING AND DRAINAGE PLAN
SCALE: 1" = 20'

GRADING NOTES:
1. GRADING ACTIVITIES ON ADJACENT PROPERTIES OR RIGHT-OF-WAY WITHOUT WRITTEN PERMISSION FROM THE OWNER IS NOT PERMITTED.
2. UNPROTECTED SLOPES SHALL BE NO STEEPER THAN 4H:1V PER CORR CODE. IF THERE IS SUFFICIENT SLOPE PROTECTION (I.E. PLANTINGS, ROCK COVER, SHOTCRETE/CONCRETE) SLOPES MAY BE NO STEEPER THAN 3H:1V.
3. IF ROCK IS ENCOUNTERED WITHIN THE BUILDING FOOTPRINT OR DRIVEWAY AREA AT THE FRONT OF THE LOT, THE BUILDING WILL BE MOVED TOWARD THE REAR LOT LINE, AND SHALL REMAIN OUTSIDE OF THE 15 FOOT SETBACK AREA.

LEGEND:

→	FLOW ARROW
30	EXIST CONT MJR
30	EXIST CONT MNR
30	PROP CONT MNR
	PROP CONT MNR
	R/W LINE
FG 25.0	SPOT ELEVATION



DRAINAGE SWALE
NOT TO SCALE

DRAINAGE REPORT

INTRODUCTION
LOT 8 SHOWN HEREON IS A RESIDENTIAL LOT LOCATED ON AZOR LANE WITHIN THE SPECIAL ASSESSMENT DISTRICT 228 (SAD 228) IN ALBUQUERQUE, NM. THE LOT IS WITHIN THE VOLCANO CLIFFS SECTOR DEVELOPMENT PLAN AREA. THE DRAINAGE REPORT HAS BEEN PREPARED IN ACCORDANCE WITH THE LATEST REVISION TO VOLUME 2 SECTION 22.2 OF THE CITY OF ALBUQUERQUE DEVELOPMENT PROCESS MANUAL. THE DEVELOPMENT OF THIS LOT MUST COMPLY WITH THE SAD NO. 228 DRAINAGE REPORT DATED JANUARY, 2012 AND THE DRAINAGE PLANS DATED JUNE 30TH, 2014.

EXISTING CONDITIONS
THE SITE IS AN UNDEVELOPED 0.32 ACRE LOT. THE SITE IS BOUND TO THE WEST, SOUTH AND EAST BY RESIDENTIAL LOTS, WHILE THE NORTH SIDE IS AZOR LANE RIGHT-OF-WAY. THE SITE IS CURRENTLY UNDISTURBED WITH NATIVE VEGETATIVE COVERING. THE SITE IS NOT LOCATED WITHIN A FLOODPLAIN (SEE FIRM MAP #35001C0112G). THE LOT CURRENTLY DRAINS TO THE SOUTH WITH MINIMAL OFFSITE RUNOFF.

PROPOSED CONDITIONS
IMPROVEMENTS TO THE LOT INCLUDE A NEW RESIDENCE WITH A HEATED AREA OF APPROXIMATELY 2,336 SQUARE FEET. ONSITE FLOWS WILL CONTINUE TO FLOW TO THE SOUTH AND WEST. RUNOFF WILL DISCHARGE TO THE ADJACENT PROPERTIES AS IT CURRENTLY DOES IN THE EXISTING CONDITIONS. A WATER QUALITY RETENTION POND AT THE SOUTHWEST CORNER OF THE PROPERTY WILL RETAIN RUNOFF OF 0.44 INCHES OVER THE LOT AREA. THIS RESULTS IN A VOLUME OF APPROXIMATELY 0.14 ACRE-FEET. BASED ON NRCS SOIL SURVEY DATA, THE MADUREZ-WINK SANDY LOAM SOILS AT THE SITE ARE WELL DRAINED WITH A HYDROLOGIC SOIL GROUP OF 'B', WHICH WILL INCREASE INFILTRATION AND REDUCE PONDING TIME.

ACCORDING TO THE SAD 228 DRAINAGE REPORT, THIS LOT IS LOCATED WITHIN BASIN 205-B WHICH ULTIMATELY DRAINS TO POND 6 LOCATED NEAR THE INTERSECTION OF URRACCA STREET AND COMPASS COURT. RUNOFF FROM THE LOT WILL BE CONVEYED ALONG A BACKYARD SWALE TO THE WEST THROUGH LOT 7, THEN SOUTH BETWEEN LOTS 14 AND 15 OF BLOCK 4 TO VISTA DEL PRADO. RUNOFF SURFACE FLOWS ALONG THE ROADWAY AND IS COLLECTED BY STORM DRAIN INLETS LOCATED ON CAMINO DEL OESTE AND CONVYED VIA STORM DRAIN TO POND 6. THE PERCENTAGE OF IMPERVIOUS FOR THE PROPOSED RESIDENCE IS 40%, INCLUDING THE RESIDENTIAL BUILDING AND CONCRETE DRIVEWAY. THE PERCENTAGE OF IMPERVIOUS AREA FOR DRAINAGE BASIN 205-B IS 50% PER THE SAD 228 DRAINAGE REPORT, SO THE PROPOSED IMPROVEMENTS WILL GENERATE LESS RUNOFF THAN IS ALLOWED.

IN THE PROPOSED CONDITIONS, OFFSITE RUNOFF FROM LOTS 9 AND 10 WILL DRAIN WEST ALONG THE REAR LOT LINE THROUGH LOT 8 ACCORDING TO THE DRAINAGE PLAN FOR THE SAD 228. THIS OFFSITE DRAINAGE AREA IS APPROXIMATELY 0.7 ACRES, WITH A 100-YR FLOWRATE OF 1.9 CFS (BASED ON 2.73 CFS/ACRE ACCORDING TO THE SAD 228 DRAINAGE REPORT). THE BACKYARD SWALE HAS BEEN DESIGNED 1 FOOT DEEP WITH 4 TO 1 SIDESLOPES TO CONVEY THIS OFFSITE RUNOFF. SEE ATTACHED FLOWMASTER CALCULATION. IN ADDITION, THE MASONRY WALL WILL BE BUILT WITH OPENINGS TO ALLOW OFFSITE RUNOFF TO DRAIN THROUGH LOT 8 AND TO LOT 7. THE CMU BLOCKS WILL BE TURNED ON THE SIDES IN ORDER TO ALLOW STORMWATER TO DRAIN THROUGH. THESE CMU BLOCK OPENINGS ARE APPROXIMATELY 0.5 FEET WIDE BY 0.4 FEET HIGH, WITH 2 OPENINGS PER UNIT. WITH 0.5 FEET OF HEAD, EACH OPENING IS CAPABLE OF CONVEYING 0.7 CFS, SO EACH BLOCK CAN CONVEY 1.4 CFS. SEE ATTACHED CULVERTMASTER SUMMARY. 2 CMU BLOCKS WILL BE INSTALLED WITH OPENINGS AT THE SOUTHEASTERN CORNER OF THE LOT (FOR A CAPACITY OF 2.8 CFS) AND 3 CMU BLOCKS WILL BE INSTALLED WITH OPENINGS AT THE SOUTHWESTERN CORNER OF THE LOT (FOR A CAPACITY OF 4.2 CFS) TO ALLOW ACCUMULATED RUNOFF TO DRAIN ALONG THE REAR LOT LINE.

WILSON & COMPANY
2600 THE AMERICAN RD. SE SUITE 100
RIO RANCHO, NM 87124
PHONE: 505-898-8021
FAX: 505-898-8501
www.wilsonco.com

CONSULTANTS

SEAL
DONALD M. DUNEMAN NEW MEXICO 17616 PROFESSIONAL ENGINEER LICENSED
9/16/14

PROJECT NAME
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
SAD 228
DRAINAGE PLAN UNIT 19

REV.	DATE	DESCRIPTION	BY

PROJECT NO:	0840010400
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
DATE:	SEPTEMBER 2014

SHEET TITLE
LEGAL DESCRIPTION
LOT 8, BLOCK 4
VOLCANO CLIFFS
SUBDIVISION
UNIT 19

SHEET NO:
01

9/16/2014 M:\RR\08-400-104-00\CADD\SAD 228 DRAINAGE REPORT\Exhibits\Unit-19_Block-4_Lot-8\UNIT19_BLK4_LOT8.dwg

Worksheet for Triangular Channel - 1

Project Description		
Friction Method	Manning Formula	
Solve For	Discharge	
Input Data		
Roughness Coefficient	0.035	
Channel Slope	0.00500	ft/ft
Normal Depth	1.00	ft
Left Side Slope	3.00	ft/ft (H:V)
Right Side Slope	3.00	ft/ft (H:V)
Results		
Discharge	5.48	ft³/s
Flow Area	3.00	ft²
Wetted Perimeter	6.32	ft
Hydraulic Radius	0.47	ft
Top Width	6.00	ft
Critical Depth	0.73	ft
Critical Slope	0.02679	ft/ft
Velocity	1.83	ft/s
Velocity Head	0.05	ft
Specific Energy	1.05	ft
Froude Number	0.46	
Flow Type	Subcritical	
GVF Input Data		
Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	
GVF Output Data		
Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	1.00	ft
Critical Depth	0.73	ft
Channel Slope	0.00500	ft/ft
Critical Slope	0.02679	ft/ft

Worksheet for Rectangular Orifice - 1

Project Description		
Solve For	Discharge	
Input Data		
Headwater Elevation	0.50	ft
Centroid Elevation	0.00	ft
Tailwater Elevation	0.00	ft
Discharge Coefficient	0.62	
Opening Width	0.50	ft
Opening Height	0.40	ft
Results		
Discharge	0.70	ft³/s
Headwater Height Above Centroid	0.50	ft
Tailwater Height Above Centroid	0.00	ft
Flow Area	0.20	ft²
Velocity	3.52	ft/s

DRAINAGE CERT W/SURVEY WORK BY OTHERS
11/23/2015
"DRAINAGE CERTIFICATION"

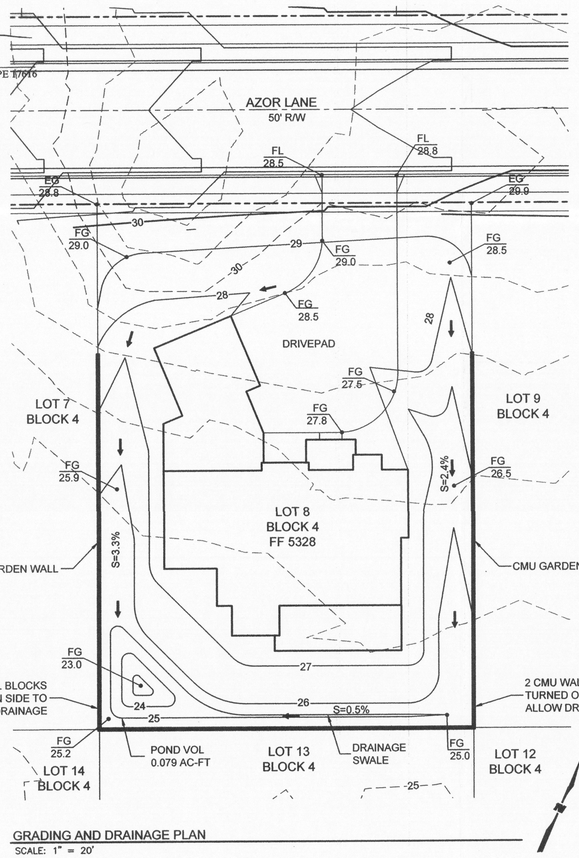
I, DONALD M. DUNEMAN, NMPE 17616, OF THE FIRM WILSON & COMPANY, HEREBY CERTIFY THAT THIS PROJECT HAS BEEN GRADED AND WILL DRAIN IN SUBSTANTIAL COMPLIANCE WITH AND IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 09/16/14. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY RUSS HUGG OF THE FIRM SURV-TEK, INC. I FURTHER CERTIFY THAT I PERSONALLY VISITED THE PROJECT SITE ON NOVEMBER 23, 2015 AND HAVE DETERMINED BY VISUAL INSPECTION THAT THE SURVEY DATA PROVIDED IS REPRESENTATIVE OF ACTUAL SITE CONDITIONS AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A REQUEST FOR CERTIFICATE OF OCCUPANCY.

NO SEPARATE CORRECTIONS OR DEFFECIENCES DETERMINED.

DONALD M. DUNEMAN, NMPE 17616

November 24, 2015
DATE

DONALD M. DUNEMAN NEW MEXICO 17616 LICENSED PROFESSIONAL ENGINEER



GRADING AND DRAINAGE PLAN
SCALE: 1" = 20'

DRAINAGE REPORT

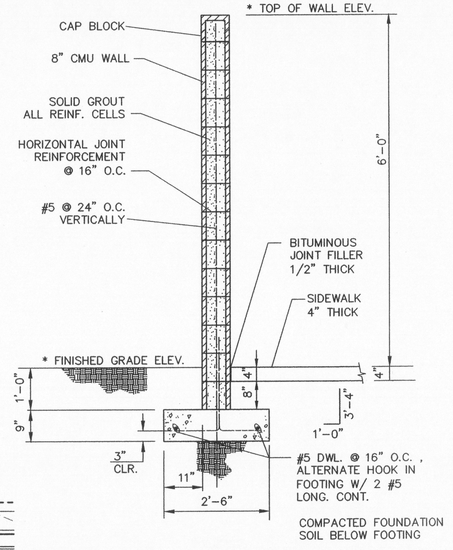
INTRODUCTION
LOT 8 SHOWN HEREON IS A RESIDENTIAL LOT LOCATED ON AZOR LANE WITHIN THE SPECIAL ASSESSMENT DISTRICT 228 (SAD 228) IN ALBUQUERQUE, NM. THE LOT IS WITHIN THE VOLCANO CLIFFS SECTOR DEVELOPMENT PLAN AREA. THE DRAINAGE REPORT HAS BEEN PREPARED IN ACCORDANCE WITH THE LATEST REVISION TO VOLUME 2 SECTION 22.2 OF THE CITY OF ALBUQUERQUE DEVELOPMENT PROCESS MANUAL. THE DEVELOPMENT OF THIS LOT MUST COMPLY WITH THE SAD NO. 228 DRAINAGE REPORT DATED JANUARY, 2012 AND THE DRAINAGE PLANS DATED JUNE 30TH, 2014.

EXISTING CONDITIONS
THE SITE IS AN UNDEVELOPED 0.32 ACRE LOT. THE SITE IS BOUND TO THE WEST, SOUTH AND EAST BY RESIDENTIAL LOTS, WHILE THE NORTH SIDE IS AZOR LANE RIGHT-OF-WAY. THE SITE IS CURRENTLY UNDISTURBED WITH NATIVE VEGETATIVE COVERING. THE SITE IS NOT LOCATED WITHIN A FLOODPLAIN (SEE FIRM MAP #35001C0112G). THE LOT CURRENTLY DRAINS TO THE SOUTH WITH MINIMAL OFFSITE RUNOFF.

PROPOSED CONDITIONS
IMPROVEMENTS TO THE LOT INCLUDE A NEW RESIDENCE WITH A HEATED AREA OF APPROXIMATELY 2,336 SQUARE FEET. ONSITE FLOWS WILL CONTINUE TO FLOW TO THE SOUTH AND WEST. RUNOFF WILL DISCHARGE TO THE ADJACENT PROPERTIES AS IT CURRENTLY DOES IN THE EXISTING CONDITIONS. A WATER QUALITY RETENTION POND AT THE SOUTHWEST CORNER OF THE PROPERTY WILL RETAIN RUNOFF OF 0.44 INCHES OVER THE LOT AREA. THIS RESULTS IN A VOLUME OF APPROXIMATELY 0.14 ACRE-FEET. BASED ON NRCS SOIL SURVEY DATA, THE MADUREZ-WINK SANDY LOAM SOILS AT THE SITE ARE WELL DRAINED WITH A HYDROLOGIC SOIL GROUP OF 'B', WHICH WILL INCREASE INFILTRATION AND REDUCE PONDING TIME.

ACCORDING TO THE SAD 228 DRAINAGE REPORT, THIS LOT IS LOCATED WITHIN BASIN 205-B WHICH ULTIMATELY DRAINS TO POND 6 LOCATED NEAR THE INTERSECTION OF URRACCA STREET AND COMPASS COURT. RUNOFF FROM THE LOT WILL BE CONVEYED ALONG A BACKYARD SWALE TO THE WEST THROUGH LOT 7, THEN SOUTH BETWEEN LOTS 14 AND 15 OF BLOCK 4 TO VISTA DEL PRADO. RUNOFF SURFACE FLOWS ALONG THE ROADWAY AND IS COLLECTED BY STORM DRAIN INLETS LOCATED ON CAMINO DEL OESTE AND CONVYED VIA STORM DRAIN TO POND 6. THE PERCENTAGE OF IMPERVIOUS FOR THE PROPOSED RESIDENCE IS 40%, INCLUDING THE RESIDENTIAL BUILDING AND CONCRETE DRIVEWAY. THE PERCENTAGE OF IMPERVIOUS AREA FOR DRAINAGE BASIN 205-B IS 50% PER THE SAD 228 DRAINAGE REPORT, SO THE PROPOSED IMPROVEMENTS WILL GENERATE LESS RUNOFF THAN IS ALLOWED.

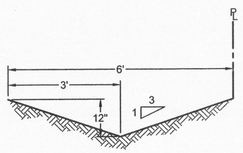
IN THE PROPOSED CONDITIONS, OFFSITE RUNOFF FROM LOTS 9 AND 10 WILL DRAIN WEST ALONG THE REAR LOT LINE THROUGH LOT 8 ACCORDING TO THE DRAINAGE PLAN FOR THE SAD 228. THIS OFFSITE DRAINAGE AREA IS APPROXIMATELY 0.7 ACRES, WITH A 100-YR FLOWRATE OF 1.9 CFS (BASED ON 2.73 CFS/ACRE ACCORDING TO THE SAD 228 DRAINAGE REPORT). THE BACKYARD SWALE HAS BEEN DESIGNED 1 FOOT DEEP WITH 4 TO 1 SIDESLOPES TO CONVEY THIS OFFSITE RUNOFF. SEE ATTACHED FLOWMASTER CALCULATION. IN ADDITION, THE MASONRY WALL WILL BE BUILT WITH OPENINGS TO ALLOW OFFSITE RUNOFF TO DRAIN THROUGH LOT 8 AND TO LOT 7. THE CMU BLOCKS WILL BE TURNED ON THE SIDES IN ORDER TO ALLOW STORMWATER TO DRAIN THROUGH. THESE CMU BLOCK OPENINGS ARE APPROXIMATELY 0.5 FEET WIDE BY 0.4 FEET HIGH, WITH 2 OPENINGS PER UNIT. WITH 0.5 FEET OF HEAD, EACH OPENING IS CAPABLE OF CONVEYING 0.7 CFS, SO EACH BLOCK CAN CONVEY 1.4 CFS. SEE ATTACHED CULVERTMASTER SUMMARY. 2 CMU BLOCKS WILL BE INSTALLED WITH OPENINGS AT THE SOUTHEASTERN CORNER OF THE LOT (FOR A CAPACITY OF 2.8 CFS) AND 3 CMU BLOCKS WILL BE INSTALLED WITH OPENINGS AT THE SOUTHWESTERN CORNER OF THE LOT (FOR A CAPACITY OF 4.2 CFS) TO ALLOW ACCUMULATED RUNOFF TO DRAIN ALONG THE REAR LOT LINE.



CMU GARDEN WALL
NOT TO SCALE

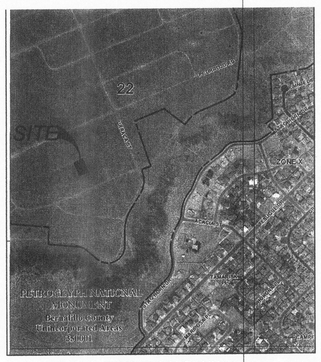
GRADING NOTES:
1. GRADING ACTIVITIES ON ADJACENT PROPERTIES OR RIGHT-OF-WAY WITHOUT WRITTEN PERMISSION FROM THE OWNER IS NOT PERMITTED.
2. UNPROTECTED SLOPES SHALL BE NO STEEPER THAN 4H:1V PER CORR CODE. IF THERE IS SUFFICIENT SLOPE PROTECTION (I.E. PLANTINGS, ROCK COVER, SHOTCRETE/CONCRETE) SLOPES MAY BE NO STEEPER THAN 3H:1V.
3. IF ROCK IS ENCOUNTERED WITHIN THE BUILDING FOOTPRINT OR DRIVEWAY AREA AT THE FRONT OF THE LOT, THE BUILDING WILL BE MOVED TOWARD THE REAR LOT LINE, AND SHALL REMAIN OUTSIDE OF THE 15 FOOT SETBACK AREA.

LEGEND:
- FLOW ARROW
- 30 EXIST CONT MJR
- EXIST CONT MNR
- 30 PROP CONT MNR
- PROP CONT MNR
- R/W LINE
- FG 25.0 SPOT ELEVATION



DRAINAGE SWALE
NOT TO SCALE

VICINITY MAP
ZONE ATLAS MAP: D-10-Z



FEMA FLOODPLAIN
FIRM #35001C0112G

SOILS MAP
NRCS SOIL SURVEY, BERNALILLO COUNTY

RECEIVED
NOV 23 2015
LAND DEVELOPMENT SECTION

WILSON & COMPANY
2600 THE AMERICAN RD. SE SUITE 100
RIO RANCHO, NM 87124
PHONE: 505-898-8021
FAX: 505-898-8501
www.wilsonco.com

CONSULTANTS

SEAL
DONALD M. DUNEMAN NEW MEXICO (17616) LICENSED PROFESSIONAL ENGINEER
9/16/14

PROJECT NAME
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP
SAD 228
DRAINAGE PLAN UNIT 19

REV.	DATE	DESCRIPTION	BY

PROJECT NO: 0840010400
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE: SEPTEMBER 2014

SHEET TITLE
LEGAL DESCRIPTION
LOT 8, BLOCK 4
VOLCANO CLIFFS
SUBDIVISION
UNIT 19

SHEET NO:
01

9/16/2014 M:\RR\08-400-104-00\CADD\SAD 228 DRAINAGE REPORT\Exhibits\Unit-19_Block-4_Lot-8\UNIT19_BLK4_LOT8.dwg