

# CITY OF ALBUQUERQUE



May 7, 2015

Fred Arfman, P.E.  
Issacson & Arfman, P.A.  
128 Monroe Street NE  
Albuquerque, NM 87108

RE: **Starbucks, 4407 Lomas Blvd.  
Grading and Drainage Plan  
Engineer's Stamp Date 4-24-2015 (File: J17-D012)**

Dear Mr. Arfman:

Based upon the information provided in your submittal received 4-27-15, the above referenced plan is approved for Building Permit. Please attach a copy of this approved plan in the construction sets when submitting for a building permit.

PO Box 1293 Prior to Certificate of Occupancy release, Engineer Certification per the DPM Checklist will be required.

Albuquerque If you have any questions, you can contact me at 924-3924.

New Mexico 87103

Sincerely,

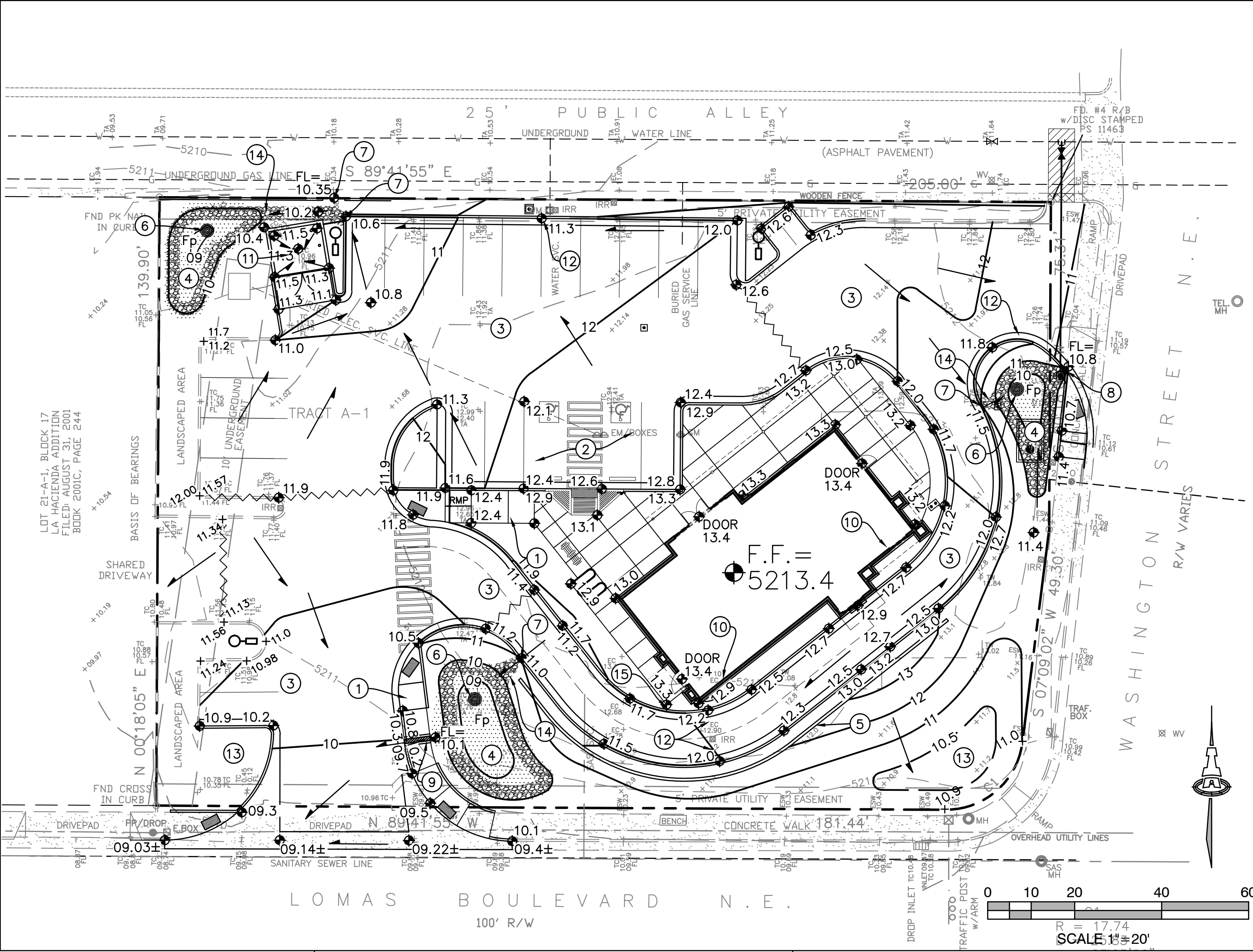
www.cabq.gov

Jeanne Wolfenbarger, P.E.  
Senior Engineer, Planning Dept.  
Development Review Services

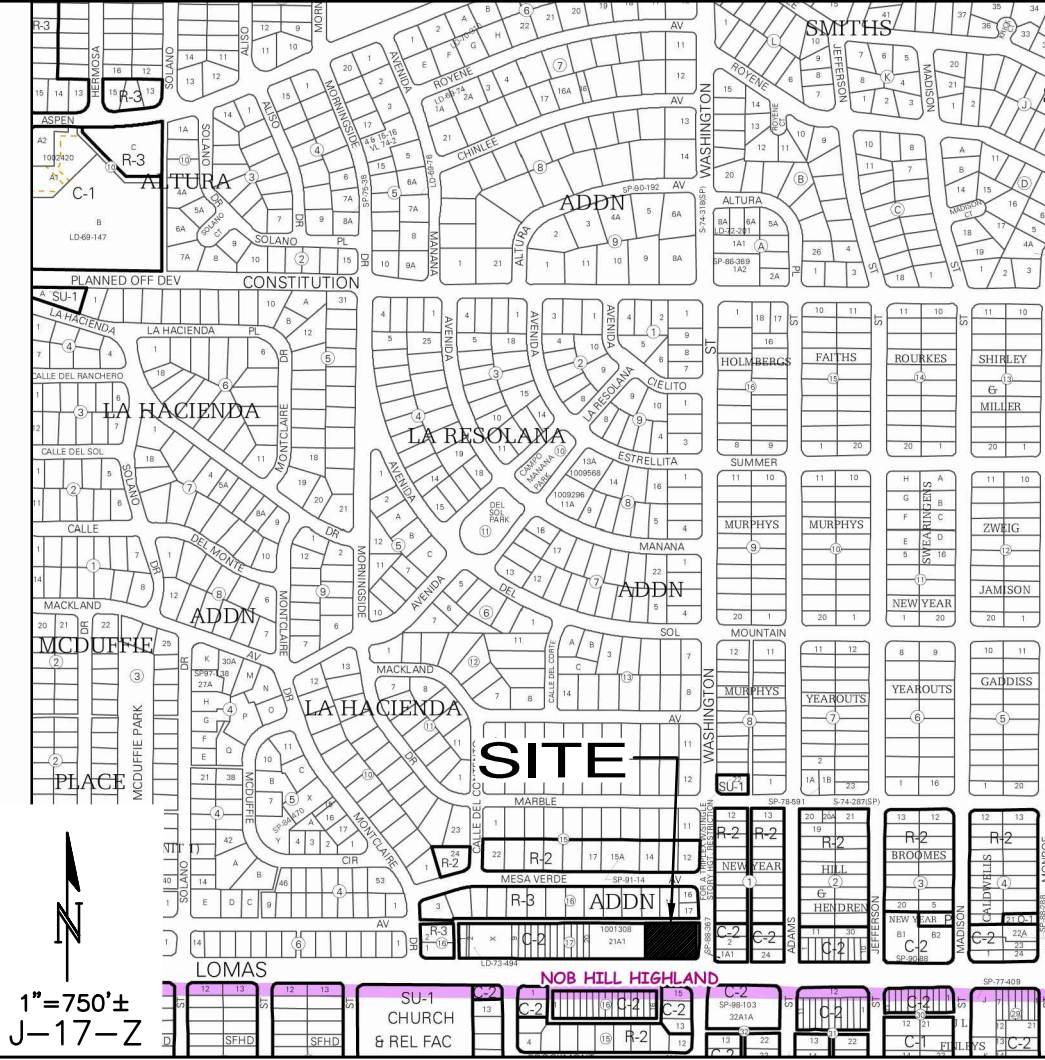
Orig: Drainage file  
c.pdf via Email: Recipient, Monica Ortiz



GRADING AND DRAINAGE PLAN



VICINITY MAP



KEYED NOTES

1. NEW PEDESTRIAN WALK AT ELEVATIONS SHOWN. ALL WALKS TO BE ADA ACCESSIBLE (5% MAX SLOPE, 2% MAX CROSS-SLOPE).
2. SLOPES WITHIN HANDICAP PARKING AREA TO MEET ADA REQUIREMENTS. MAX. SLOPE = 2% IN ANY DIRECTION.
3. PROPOSED PAVING. SEE ARCHITECTURAL FOR PAVEMENT MATERIAL, EXTENTS, JOINT INFORMATION, SECTIONS, PARKING LAYOUT, DIMENSIONS, STRIPING, ETC.
4. CONSTRUCT SHALLOW FIRST FLUSH RETENTION POND AT ELEVATIONS SHOWN. INSTALL ANGULAR ROCK TO DEFINE PERIMETER. HATCHED AREA REPRESENTS EXTENTS OF PONDING. SLOPE AT 3:1.
5. DECORATIVE LANDSCAPE WALL WITH MINOR GRADE TRANSITIONS. SEE ARCHITECTURAL PLANS.
6. INSTALL PERCOLATION PIT THIS AREA. SEE DETAIL SHEET CG-501.
7. CONSTRUCT 12" WIDE BOTTOM WIDTH CURB OPENING AT FLOWLINE (FL=) SHOWN TO PASS 'FIRST FLUSH' DISCHARGE INTO PONDING AREAS. ALL 'FIRST FLUSH' PONDING AND CURB CUTS MUST BE INSTALLED PER PLAN. SEE DETAIL SHEET CG-501.
8. CONSTRUCT 12" WIDE BOTTOM WIDTH CURB OPENING AT FLOWLINE (FL=) SHOWN TO PASS EXCESS FLOW BACK TO PAVEMENT TO FOLLOW HISTORIC FLOWPATH TO STREET / ALLEY. SEE DETAIL SHEET CG-501.
9. CONSTRUCT 12" WIDE COVERED SIDEWALK CULVERT PER C.O.A. STD. DWG. 2236 AT FLOWLINE (FL=) SHOWN TO PASS EXCESS FLOW BACK TO PAVEMENT TO FOLLOW HISTORIC FLOWPATH TO STREET.
10. RELEASE ROOF DISCHARGE TO 'U' SHAPED CONCRETE CHANNEL (2 LOCATIONS). COORDINATE LOCATIONS WITH ARCHITECTURAL AND PLUMBING PLANS.
11. CONSTRUCT NEW CONCRETE DUMPSTER PAD SLOPING TO SANITARY SEWER INLET. SEE UTILITY PLAN.
12. NOTE: TO ENSURE READABILITY, NOT ALL PAVEMENT SPOT ELEVATIONS SHOW ADJACENT TOP OF CURB / TOP OF WALK. TEXT SHOWN WITHIN FLOWLINE REPRESENTS FLOWLINE ELEVATION. ADD 0.5' TYPICAL FOR TOP OF ADJACENT CURB OR WALK ELEVATIONS.
13. DEPRESS LANDSCAPING FOR WATER HARVESTING (THESE ARE SEPARATE FROM FIRST FLUSH PONDING). TYPICAL NOTE: NO WATER HARVESTING SHALL OCCUR WITHIN 10' OF BUILDING.
14. CONSTRUCT 2' WIDE FRACTURED FACE ROCK SWALE (SEE GENERAL NOTE AA) AT ELEVATIONS SHOWN. SEE DETAIL SHEET CG-501.
15. 1:1 MAX. ARMORED SLOPE BETWEEN WALK AND TOP OF CURB.

PROJECT DATA

PROPERTY: THE SITE IS A FULLY DEVELOPED COMMERCIAL PROPERTY LOCATED WITHIN C.O.A. VICINITY MAP J-17. THE SITE IS BOUND TO THE EAST BY WASHINGTON STREET, TO THE SOUTH BY LOMAS BLVD., TO THE WEST BY DEVELOPED COMMERCIAL AND TO THE NORTH BY A PUBLIC ALLEY AND FULLY DEVELOPED RESIDENTIAL PROPERTY.

SITE AREA: 0.6515 ACRES

PROPOSED IMPROVEMENTS: THE PROPOSED IMPROVEMENTS INCLUDE DEMOLITION OF THE EXISTING BUILDING / PARKING AND THE CONSTRUCTION OF A NEW COMMERCIAL BUILDING WITH DRIVE-THRU, UPDATED ASPHALT PAVED ACCESS AND PARKING, PEDESTRIAN WALKS, DRAINAGE IMPROVEMENTS, AND LANDSCAPING.

LEGAL: TRACT A-1, JOSEPH L. DAILEY'S SUBDIVISION OF BLOCK 17, LA HACIENDA SUBDIVISION, ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO,

ADDRESS: 4407 LOMAS BLVD. N.E., ALBUQUERQUE NM

BENCHMARK: MONUMENT 9-J17 : ELEVATION (88) 5210.959 IS A 3-1/4 INCH ALUMINUM DISC STAMPED "ACS 9-J17 1990", SET FLUSH IN THE TOP OF THE CONCRETE CURB OF THE NOSE OF THE MEDIAN LOCATED AT THE INTERSECTION OF LOMAS BOULEVARD AND WASHINGTON STREET NE.

OFF-SITE: NO OFF-SITE DRAINAGE AFFECTS THIS PROPERTY.

FLOOD HAZARD: PER BERNALILLO COUNTY FIRM MAP #35002C0353H DateD, AUGUST 16, 2012, THE SITE IS LOCATED WITHIN FLOODZONE 'X' DESIGNATED AS AREAS DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN.

SURVEYOR: ANTHONY L. HARRIS NMPS 11463  
HARRIS SURVEYING, INC.  
2412-D MONROE ST. NE, 87111  
TELEPHONE: (505) 889-8056

ENGINEER: FRED C. ARFMAN, P.E., NMPE 7322  
ISAACSON & ARFMAN, PA  
128 MONROE NE, 87111  
TELEPHONE: (505) 268-8828

DRAINAGE CONCEPT

THIS SITE IS AN INFILL PROPERTY LOCATED IN A FULLY DEVELOPED PART OF THE CITY. THE PROPERTY WILL CONTINUE TO FREE DISCHARGE TO THE ADJACENT PUBLIC STREETS AND ALLEY WITH THE MAJORITY EXITING THE SITE TO LOMAS BLVD. SEE BASIN EXHIBIT THIS SHEET.

STORMWATER CONTROL MEASURES ARE REQUIRED TO PROVIDE MANAGEMENT OF 'FIRST FLUSH' (DEFINED AS THE 90TH PERCENTILE STORM EVENT OR 0.34" [0.44" LESS 0.1" FOR INITIAL ABSTRACTION] OF STORMWATER WHICH DISCHARGES DIRECTLY TO A PUBLIC STORM DRAINAGE SYSTEM).

THERE ARE 'FIRST FLUSH' RETENTION PONDS AREAS LOCATED IN THREE OF THE FOUR DRAINAGE BASINS. STORM WATER FROM THE IMPERVIOUS AREAS SHALL BE DIRECTED TO THESE BASINS VIA CURB OPENINGS (KEYED NOTE 7). ONCE THE BASINS FILL, EXCESS STORMWATER WILL BE PASSED BACK TO PAVEMENT TO CONTINUE ALONG HISTORIC FLOWPATHS. SEE CHART THIS SHEET FOR FIRST FLUSH RETENTION VOLUMES.

LEGEND

- 78 PROPOSED CONTOUR
- 78.3 PROPOSED SPOT ELEVATION
- FLOW ARROW
- FF = 5328.05 FINISH FLOOR ELEVATION
- PROPOSED GRADE BREAK
- PROPOSED FIRST FLUSH RETENTION PONDING AREA.
- PROPOSED PERCOLATION PIT

ENGINEER'S CERTIFICATION

PER C.O.A. HYDROLOGY BUILDING PERMIT APPROVAL, PRIOR TO CERTIFICATE OF OCCUPANCY RELEASE, ENGINEER'S CERTIFICATION PER THE DPM CHECKLIST IS REQUIRED.

CONTRACTOR SHALL PROVIDE AN AUTOCAD FORMAT AS-BUILT SURVEY PREPARED, STAMPED AND DATED BY A LICENSED SURVEYOR WHICH INCLUDES:

- AS-BUILT SPOT ELEVATIONS AT EACH DESIGN SPOT ELEVATION SHOWN ON THE APPROVED PLAN;
- TOP AND BOTTOM ELEVATIONS DEFINING ALL FIRST FLUSH RETENTION PONDING, AND OTHER SITE PONDING;
- NOTE ANY ITEMS NOT CONSTRUCTED;
- SHOW LINWORK FOR ANYTHING CONSTRUCTED DIFFERENT FROM THE APPROVED PLAN.

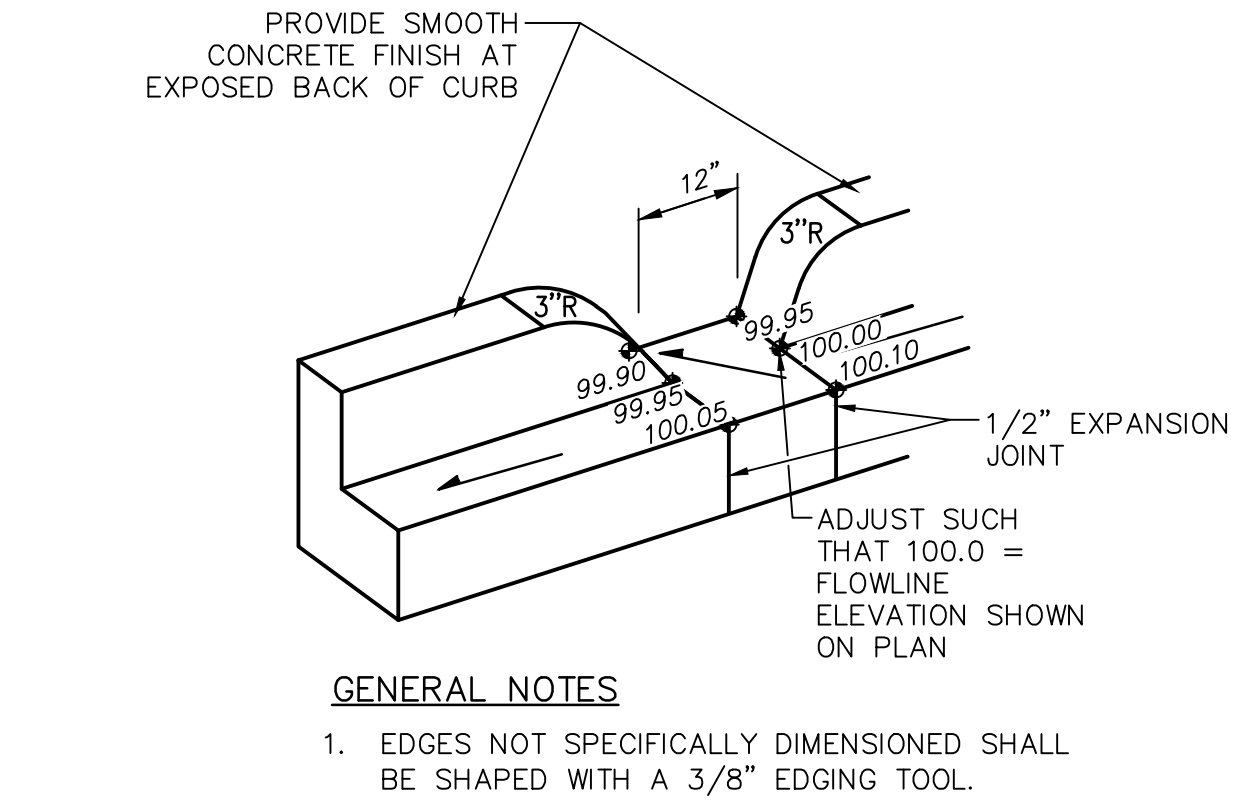
ISAACSON & ARFMAN, P.A.  
Consulting Engineering Associates  
128 Monroe Street N.E.  
Albuquerque, New Mexico 87108  
Ph. 505-268-8828 www.isaacson.com

2115 CG-101.dwg Apr 24, 2015

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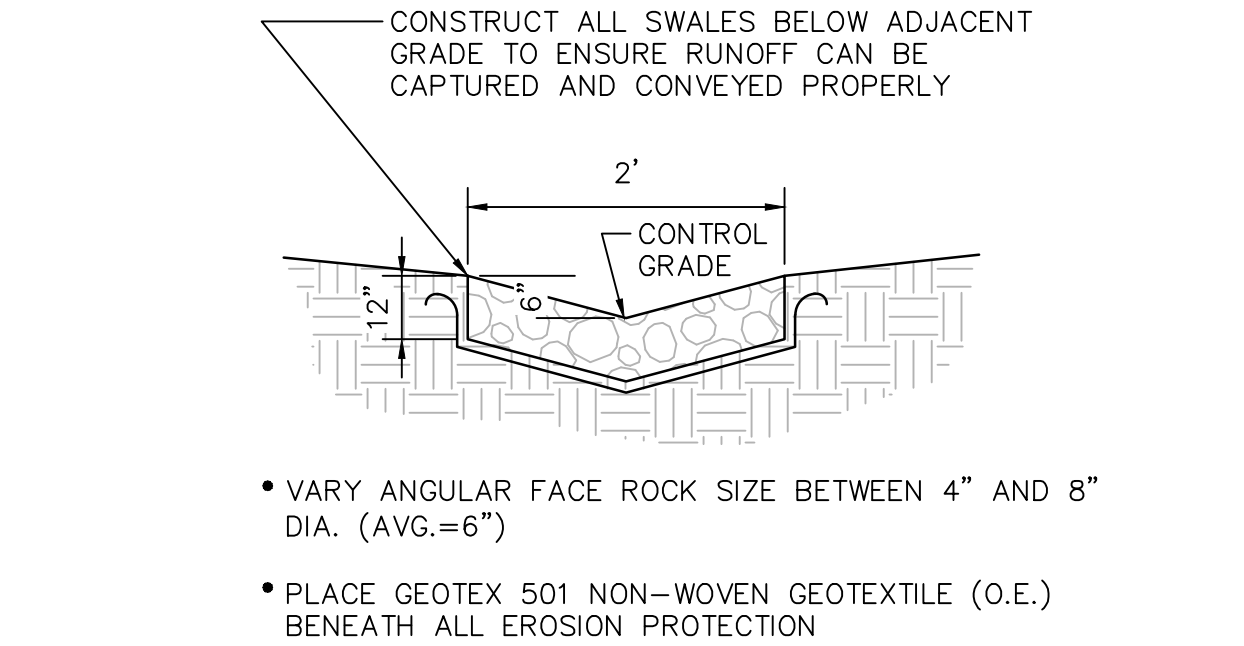
STARBUCKS LOMAS & WASHINGTON MODULUS ARCHITECTS			
GRADING & DRAINAGE PLAN			
Date: 04/24/15	No. Revision:	Date:	Job No. 2115
Drawn By: DEC/BJB			CG-101
Ckd By: FCA			SH. OF





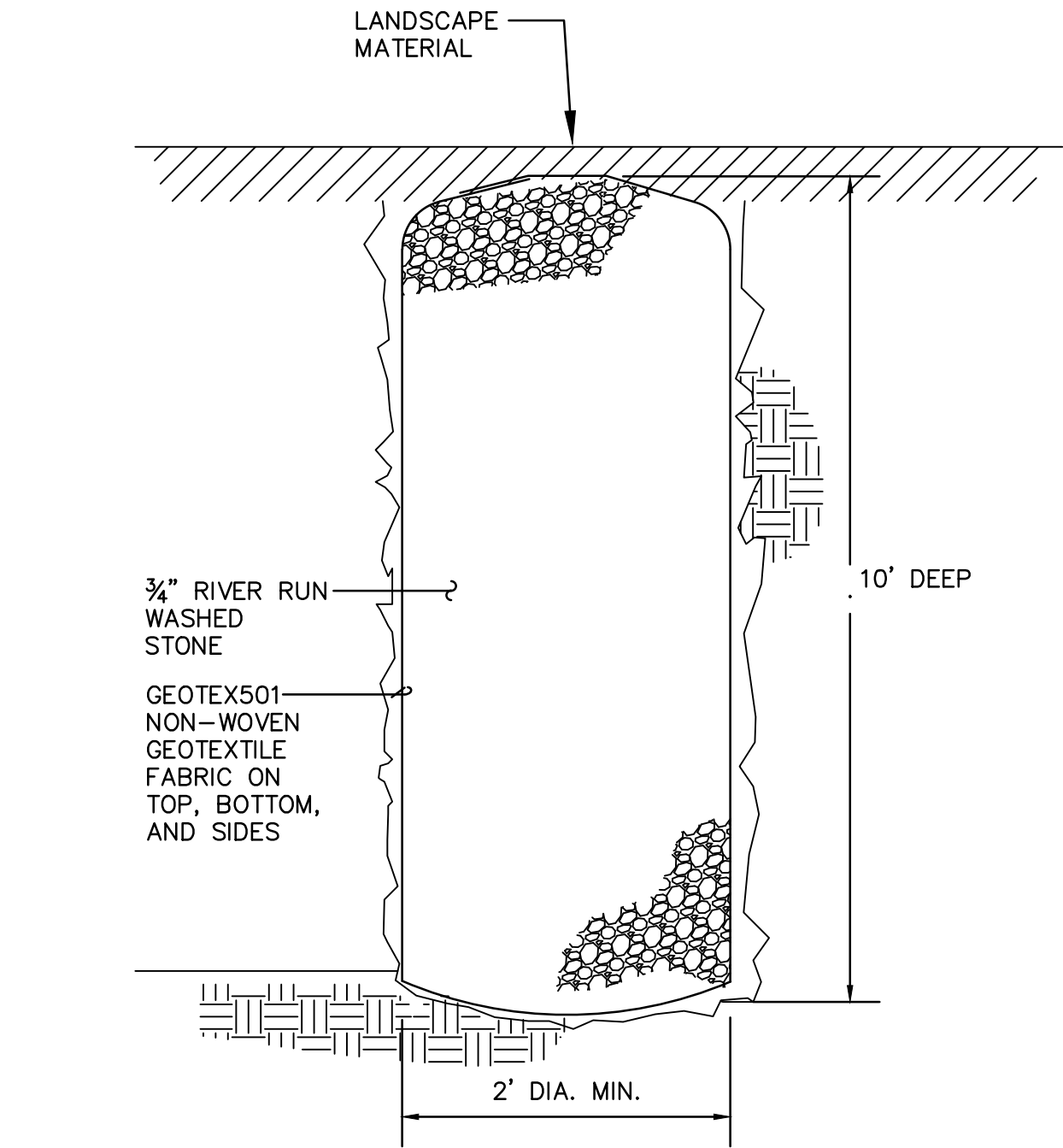
## CURB OPENING

SCALE: N.T.S.



## ROCK SWALE

SCALE: N.T.S.



## PERCOLATION PIT

LOCATE CLAY LAYER BELOW SURFACE GRADE. MAY VARY AT EACH LOCATION

SCALE: N.T.S.

- A. ALL WORK DETAILED ON THESE PLANS AND PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT.
- B. THE CONTRACTOR SHALL ABIDE BY ALL STATE, LOCAL, AND FEDERAL LAWS, CODES, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS, INCLUDING EPA AND ADA REQUIREMENTS.
- C. THE CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FOR THE PROJECT PRIOR TO COMMENCING CONSTRUCTION, OR PRIOR TO OCCUPANCY, AS APPROPRIATE. IF PERMITS ARE DELAYED OR ISSUED WITH CONDITIONS, THE CONTRACTOR SHALL NOTIFY THE OWNER AND ARCHITECT IMMEDIATELY.
- D. COORDINATE WORK WITH SITE PLAN, UTILITY PLAN, DEMOLITION PLAN, AND LANDSCAPE PLAN.
- E. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY HORIZONTAL AND VERTICAL LOCATIONS OF ALL EXISTING OBSTRUCTIONS, AND CONDITION OF ALL EXISTING INFRASTRUCTURE PRIOR TO CONSTRUCTION. REPORT ALL DISCREPANCIES TO THE ARCHITECT AND VERIFY THE ARCHITECT'S INTENT BEFORE PROCEEDING.
- F. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SAFETY.
- G. THE CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS ON SITE AT ALL TIMES. THE CONTRACTOR SHALL NOT SCALE DRAWINGS. ONLY WRITTEN DIMENSIONS OR KEYED NOTES SHALL BE USED.
- H. CONTRACTOR SHALL OBTAIN ALL REQUIRED INSPECTIONS OF THE WORK. CONTRACTOR SHALL REGULARLY UPDATE OWNER AND ARCHITECT REGARDING THE STATUS OF THE INSPECTIONS.
- I. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THE PROPERTY AND/OR PROJECT LIMITS. ANY DAMAGE TO ADJACENT STRUCTURES RESULTING FROM THE CONSTRUCTION PROCESS SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL BE RESPONSIBLE FOR DOCUMENTING EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
- J. CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS. EQUIPMENT SHALL ONLY OBSTRUCT DESIGNATED TRAFFIC LANES IF APPROPRIATE BARRICADING PERMITS HAVE BEEN OBTAINED. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL IN THE RIGHT-OF-WAY.
- K. THE CONTRACTOR SHALL PROVIDE A CONSTRUCTION TRAFFIC CONTROL AND SIGNING PLAN THAT CONFORMS TO THE LATEST EDITION OF THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND LOCAL REQUIREMENTS. THE CONTRACTOR SHALL OBTAIN BARRICADING PERMITS FROM THE APPROPRIATE AUTHORITIES PRIOR TO ANY CONSTRUCTION WORK ON OR ADJACENT TO EXISTING STREETS.
- L. THE CONTRACTOR SHALL MAINTAIN ALL BARRICADING AND CONSTRUCTION SIGNING AT ALL TIMES. THE CONTRACTOR SHALL VERIFY THE PROPER LOCATION OF ALL BARRICADING AT THE END AND BEGINNING OF EACH DAY.
- M. PAVEMENT GRADES IN MARKED HANDICAPPED PARKING AREAS SHALL NOT EXCEED 2.0% IN ANY DIRECTION. FOR ALL ACCESSIBLE ROUTES, MAXIMUM ALLOWABLE CROSS SLOPE IS 2.0% AND MAXIMUM LONGITUDINAL SLOPE WITHOUT RAMP IS 5.0%. FOLLOW ALL ADA ACCESSIBILITY GUIDELINES OR CITY CODES, WHICHEVER IS MORE STRINGENT.
- N. ALL TRASH, DEBRIS, & SURFACE VEGETATION SHALL BE CLEARED AND LEGALLY DISPOSED OF OFFSITE.

- O. PROPOSED SPOT AND CONTOUR ELEVATIONS SHOWN REPRESENT TOP OF FINISH MATERIAL (I.E. TOP OF CONCRETE, TOP OF CONCRETE BUILDING PAD, TOP OF PAVEMENT MATERIAL, TOP OF LANDSCAPING MATERIAL, ETC.). CONTRACTOR SHALL GRADE, COMPACT SUBGRADE AND DETERMINE EARTHWORK ESTIMATES BASED ON ELEVATIONS SHOWN MINUS FINISH MATERIAL THICKNESSES.
- P. IF FIELD GRADE ADJUSTMENTS ARE REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT.
- Q. EXISTING UTILITY LINES ARE SHOWN IN AN APPROXIMATE MANNER ONLY AND MAY BE INCOMPLETE OR OBSOLETE. SUCH LINES MAY OR MAY NOT EXIST WHERE SHOWN OR NOT SHOWN. CONTRACTOR SHALL CONTACT NM-811 FOR UTILITY LINE SPOTS TWO WORKING DAYS PRIOR TO CONDUCTING SITE FIELD WORK. CONTRACTOR SHALL FIELD VERIFY AND LOCATE ALL UTILITIES PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION. CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE CAUSED BY ITS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING UTILITIES, PIPELINES, AND UNDERGROUND UTILITY LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF NECESSARY DRY UTILITY ADJUSTMENTS.
- R. SOIL TESTING AND INSPECTION SERVICES DURING EARTHWORK OPERATIONS ARE REQUIRED. CONTRACTOR SHALL ALLOW TESTING LABS TO INSPECT AND APPROVE COMPACTED SUBGRADES, BACKFILL, AND FILL LAYERS BEFORE FURTHER CONSTRUCTION WORK IS DONE. SHOULD COMPACTION TESTS INDICATE INADEQUATE DENSITY, CONTRACTOR SHALL PROVIDE ADDITIONAL COMPACTION AND TESTING AT THE CONTRACTOR'S SOLE EXPENSE.
- S. CONTRACTOR SHALL PROVIDE ALL OTHER CONSTRUCTION STAKING. CONTRACTOR SHALL LOCATE AND PRESERVE ALL BOUNDARY CORNERS AND REPLACE ANY LOST OR DISTURBED CORNERS AT CONTRACTOR'S SOLE EXPENSE. PROPERTY CORNERS SHALL ONLY BE RESET BY A REGISTERED LAND SURVEYOR.
- T. A CURRENT STORMWATER CONTROL PERMIT, INCLUDING AN EROSION SEDIMENT CONTROL PLAN (E.S.C.)FOR EROSION AND SEDIMENT CONTROL IS REQUIRED FOR ALL CONSTRUCTION, DEMOLITION CLEARING, AND GRADING OPERATIONS THAT DISTURB THE SOIL ON ONE ACRE OR MORE OF LAND. OWNER WILL COORDINATE.
- U. IF THE SITE IS SMALL ENOUGH NOT TO REQUIRE A SWPPP/NPDES PERMIT (LESS THAN ONE ACRE), THE CONTRACTOR SHALL STILL BE RESPONSIBLE FOR USING EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES (BMP'S) TO ENSURE THAT NO SOIL ERODES FROM THE SITE ONTO ADJACENT PUBLIC RIGHT-OF-WAY.
- V. POST-CONSTRUCTION MAINTENANCE FOR PRIVATE STORMWATER FACILITIES WILL BE THE RESPONSIBILITY OF THE FACILITIES OWNER. PERIODIC INSPECTION AND CERTIFICATIONS OF THE FACILITIES MAY BE REQUIRED BY THE CITY ENGINEER.
- W. STORMWATER CONTROL MEASURES SHOWN ON THIS PLAN ARE REQUIRED TO PROVIDE MANAGEMENT OF 'FIRST FLUSH' (DEFINED AS THE 90TH PERCENTILE STORM EVENT OR 0.44" OF STORMWATER WHICH DISCHARGES DIRECTLY TO A PUBLIC STORM DRAINAGE SYSTEM).
- X. ADJUST ANY RIMS OF EXISTING UTILITY FEATURES AS NECESSARY TO MATCH NEW GRADES. UTILITIES IN PAVED AREAS SHALL BE HS-25 TRAFFIC RATED.
- Y. ALL NEW PAVEMENT SURFACES SHALL BE CONSTRUCTED WITH POSITIVE SLOPE AWAY FROM BUILDINGS AND POSITIVE SLOPE TOWARD EXISTING

- AND/OR PROPOSED DRAINAGE PATHS. PAVING AND ROADWAY GRADES SHALL BE ±0.1' FROM PLAN ELEVATIONS. BUILDING PAD ELEVATION SHALL BE ±0.05' FROM PLAN ELEVATION.
- Z. WHERE GRADES BETWEEN NEW AND EXISTING ARE SHOWN AS 'MATCH' OR '±', TRANSITIONS SHALL BE SMOOTH.
- AA. ALL EROSION PROTECTION TO BE FRACTURED FACE ROCK (F.F. ROCK) = 6" AVG. DIA. ANGULAR FACED ROCK PLACED OVER GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.).
- AB. CONTRACTOR SHALL COMPLY WITH LOCAL REGULATIONS FOR RESEEDING OF DISTURBED AREAS.
- AC. ENGINEER RECOMMENDS THAT OWNER MAINTAIN EROSION PROTECTION ELEMENTS. ENGINEER RECOMMENDS THAT OWNER INSPECT SITE YEARLY AND AFTER EACH RAINFALL TO IDENTIFY NEW AREAS OF EROSION AND INSTALL ADDITIONAL EROSION PROTECTION AS NEEDED BASED ON ACTUAL OCCURRENCES.
- AD. MEASURES REQUIRED FOR EROSION AND SEDIMENT CONTROL SHALL BE INCIDENTAL TO THE PROJECT COST.

## BASIN CALCULATIONS

Based on Drainage Design Criteria for City of Albuquerque Section 22.2, DPM, Vol 2, dated Jan., 1993

ON-SITE					
AREA OF SITE:	28380	SF	=	0.7	
100-year, 6-hour					
EXISTING DEVELOPED FLOWS:			PROPOSED DEVELOPED FLOWS:		
	Treatment SF	%		Treatment SF	%
Area A	0	0%	Area A	0	0%
Area B	2838	10%	Area B	4285	15%
Area C	1986.6	7%	Area C	4229	15%
Area D	23555.4	83%	Area D	19866	70%
Total Area	28380	100%	Total Area	28380	100%

On-Site Weighted Excess Precipitation (100-Year, 6-Hour Storm)

$$\text{Weighted E} = \frac{E_A A_A + E_B A_B + E_C A_C + E_D A_D}{A_A + A_B + A_C + A_D}$$

Historic E	=	1.92 in.	Developed E	=	1.77 in.
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On-Site Volume of Runoff:  $V_{360} = \frac{E^* A}{12}$

Historic $V_{360}$	=	4533 CF	Developed $V_{360}$	=	4186 CF
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On-Site Peak Discharge Rate:  $Q_p = Q_{pA} A_A + Q_{pB} A_B + Q_{pC} A_C + Q_{pD} A_D / 43,560$

For Precipitation Zone 2

$Q_{pA}$	=	1.56	$Q_{pC}$	=	3.14
$Q_{pB}$	=	2.28	$Q_{pD}$	=	4.70

Historic $Q_p$	=	2.8 CFS	Developed $Q_p$	=	2.7 CFS
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THE PROPOSED DEVELOPMENT IS EXPECTED TO GENERATE SLIGHTLY LESS PEAK DISCHARGE RATE AND VOLUME AS THE PREVIOUS DEVELOPMENT.

## BASIN SUMMARY

Basin No.	Description	Total Area (SF)	% Impervious	Area Impervious	First Flush Volume Required
SITE	OVERALL PROPERTY	28380	70%	19866.0	563
1	DISCHARGING TO WASHINGTON ST.	835	81%	676	19
2	LANDSCAPE AREA	2358	0%	0	0
3	DISCHARGING TO LOMAS BLVD.	4939	79%	3902	111
4	DISCHARGING TO WEST PROPERTY	363	100%	363	10
A	TO FIRST FLUSH POND / LOMAS BLVD.	5040	72%	3629	103
B	TO FIRST FLUSH POND / WASHINGTON ST.	4607	72%	3317	94
C	TO FIRST FLUSH POND / NORTH ALLEY	10237	78%	7985	226
TOTAL				19872	563

## GENERAL NOTES

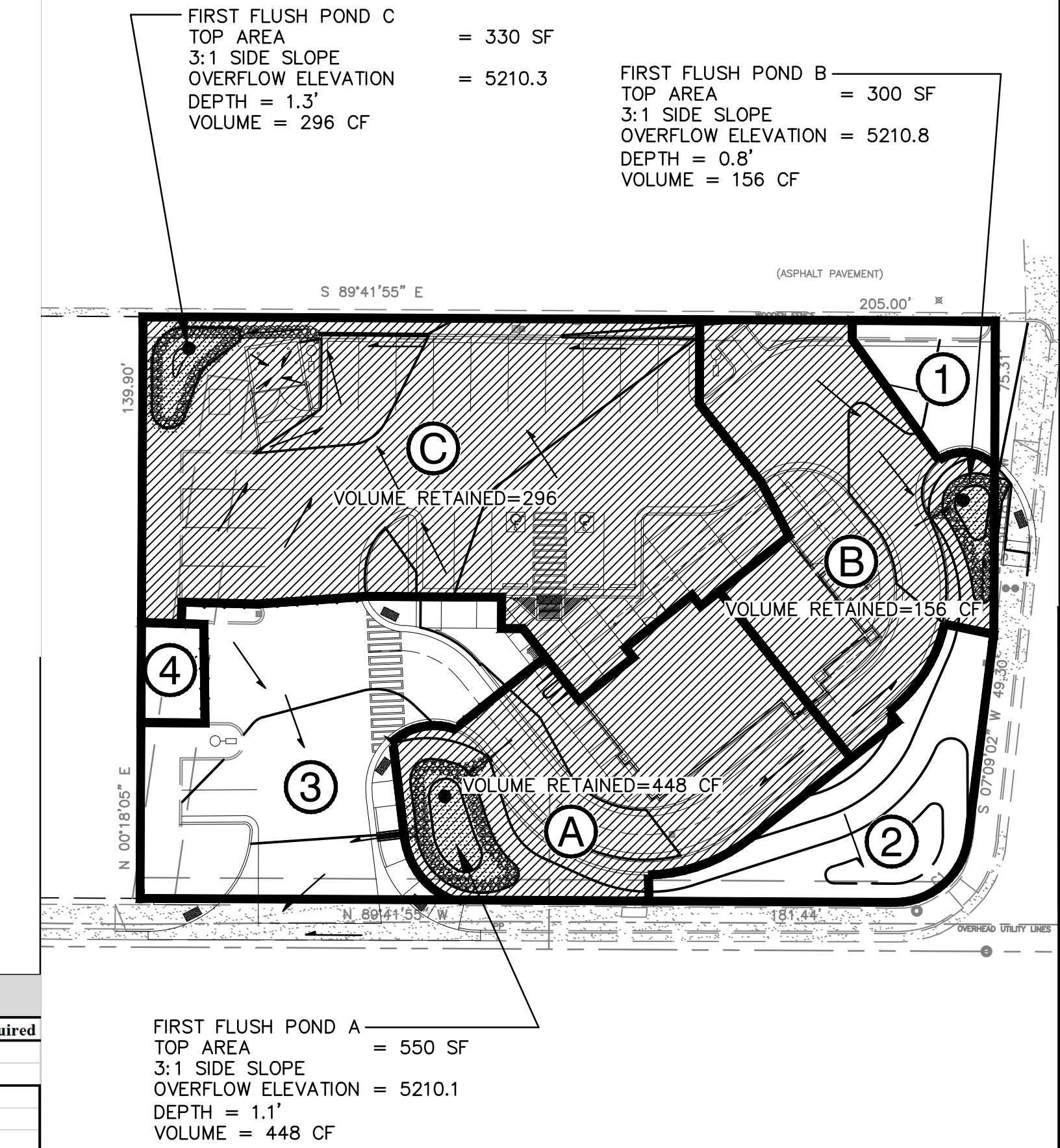
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- AD. MEASURES REQUIRED FOR EROSION AND SEDIMENT CONTROL SHALL BE INCIDENTAL TO THE PROJECT COST.

## FIRST FLUSH BASINS

SCALE: 1"=30'

HATCHED AREAS ARE DIRECTED TO FIRST FLUSH PONDS



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Consulting Engineering Associates  
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## STARBUCKS LOMAS & WASHINGTON MODULUS ARCHITECTS

## GRADING & DRAINAGE DETAILS

Date:	04/24/15	No. Revision:	Date:	Job No.	2115
Drawn By:	DEC/BJB				CG-501
Chd By:	FCA				SH. OF



APRIL 24, 2015

# SUPPLEMENTAL INFORMATION

FOR

## STARBUCKS LOMAS & WASHINGTON N.E.

by



**ISAACSON & ARFMAN, P.A.**  
*Consulting Engineering Associates*

*Thomas O. Isaacson, PE(RET.) & LS(RET.)  
Fred C. Arfman, PE  
Åsa Nilsson-Weber, PE*



Site plan showing property boundaries and features. The plan includes a large rectangular area with diagonal hatching, labeled "ASPHALT PAVEMENT". A smaller rectangular area within the hatched area is labeled "WM BOXES". The plan also shows a "WOODEN FENCE" along the top boundary, a "DRAIN" along the bottom boundary, and a "TRAF. BOX" (Traffic Box) near the bottom right corner. Dimensions are provided for the boundaries: Top boundary is 205.00' W, Right boundary is 75.31' W, Bottom boundary is 181.44' W, and Left boundary is 139.90' W. The plan also shows a "WOODEN FENCE" along the top boundary, a "DRAIN" along the bottom boundary, and a "TRAF. BOX" (Traffic Box) near the bottom right corner. Dimensions are provided for the boundaries: Top boundary is 205.00' W, Right boundary is 75.31' W, Bottom boundary is 181.44' W, and Left boundary is 139.90' W. The plan also shows a "WOODEN FENCE" along the top boundary, a "DRAIN" along the bottom boundary, and a "TRAF. BOX" (Traffic Box) near the bottom right corner.

**Total Lot Size = 28,378 SF**

**Total Impervious Area = 20365 SF**

**= 71.8% Impervious**

S 89°41'55" E

205.00' W<sub>3</sub>

139.90'

N 00°18'05" E

N 89°41'55" W

181.44

7531

IRR 2.42% ST-SJ004805" W

07:09:02" W 49:30:20" N

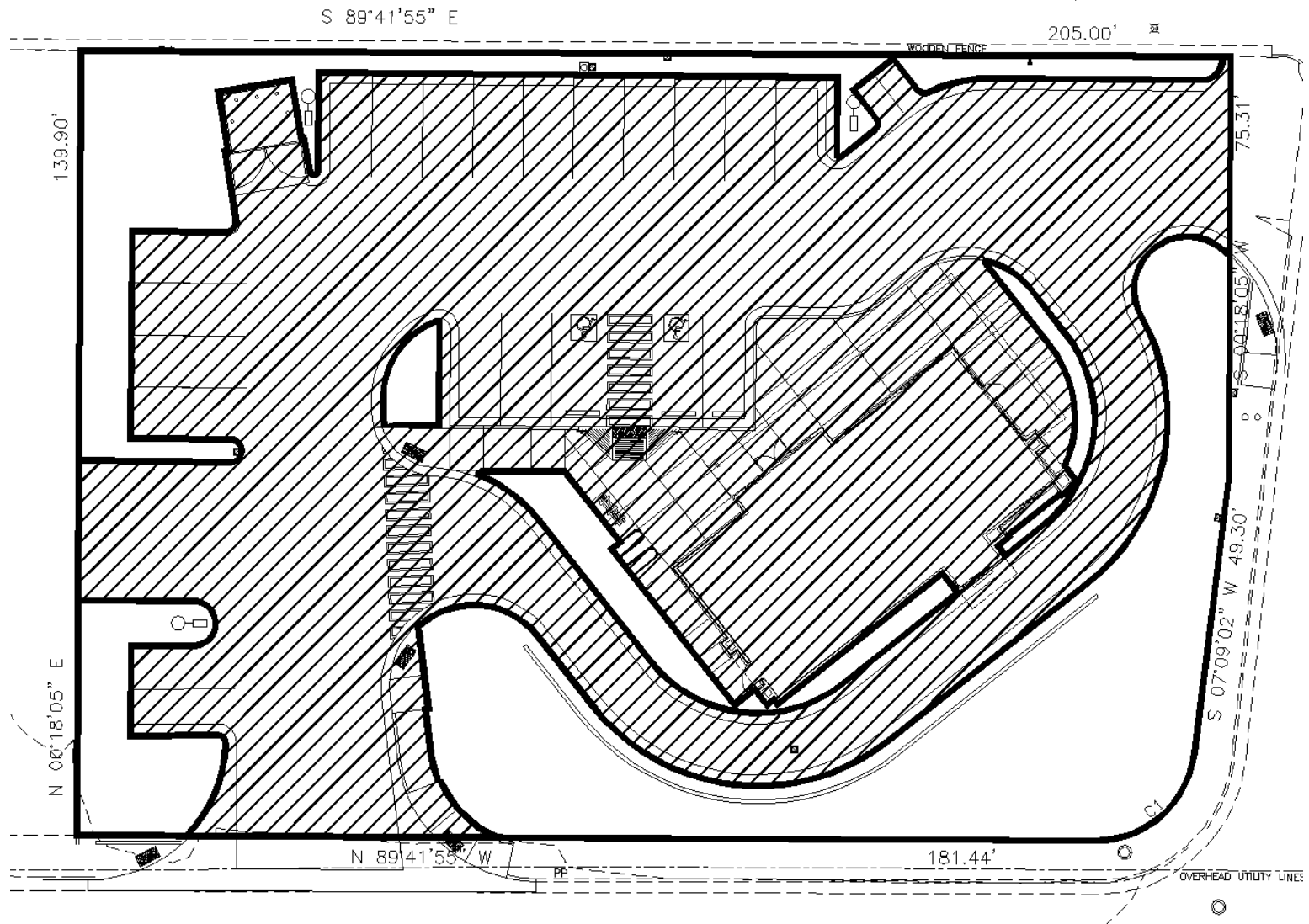
44

OVERHEAD UTILITY LINES

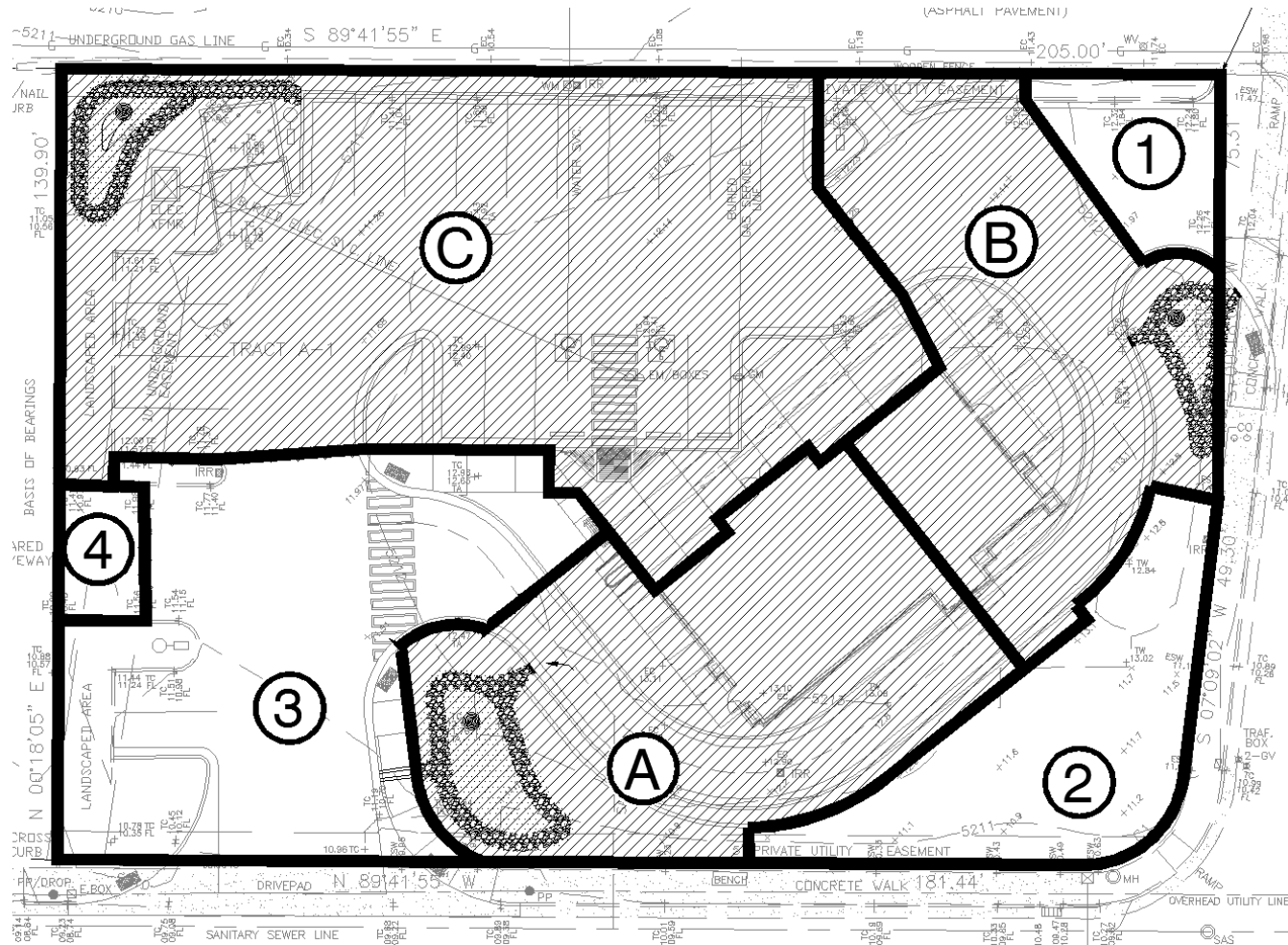
S4.9  
MH

## IMPERVIOUS AREA – PROPOSED CONDITION

Total Lot Size = 28,378 SF      Total Impervious Area = 19963 SF      =      70% Impervious



## IMPERVIOUS AREA – ON-SITE DRAINAGE BASINS - PROPOSED CONDITION





<b>BASIN NO.</b>	<b>1</b>	<b>DESCRIPTION</b>	DISCHARGING TO WASHINGTON ST.
Area of basin flows =	835	SF	= 0.0 Ac.
The following calculations are based on Treatment areas as shown in table to the right		LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)		A = 0%	
Weighted E = 1.90 in.		B = 10%	
Sub-basin Volume of Runoff (see formula above)		C = 9%	
V <sub>360</sub> = 132 CF		D = 81%	
Sub-basin Peak Discharge Rate: (see formula above)		FIRST FLUSH VOL.	
Q <sub>P</sub> = 0.1 cfs		19 CF	
<b>BASIN NO.</b>	<b>2</b>	<b>DESCRIPTION</b>	LANDSCAPE AREA
Area of basin flows =	2358	SF	= 0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right		LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)		A = 0%	
Weighted E = 0.96 in.		B = 50%	
Sub-basin Volume of Runoff (see formula above)		C = 50%	
V <sub>360</sub> = 188 CF		D = 0%	
Sub-basin Peak Discharge Rate: (see formula above)		FIRST FLUSH VOL.	
Q <sub>P</sub> = 0.1 cfs		0 CF	
<b>BASIN NO.</b>	<b>3</b>	<b>DESCRIPTION</b>	DISCHARGING TO LOMAS BLVD.
Area of basin flows =	4939	SF	= 0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right		LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)		A = 0%	
Weighted E = 1.87 in.		B = 11%	
Sub-basin Volume of Runoff (see formula above)		C = 10%	
V <sub>360</sub> = 771 CF		D = 79%	
Sub-basin Peak Discharge Rate: (see formula above)		FIRST FLUSH VOL.	
Q <sub>P</sub> = 0.5 cfs		111 CF	
<b>BASIN NO.</b>	<b>4</b>	<b>DESCRIPTION</b>	DISCHARGING TO WEST PROPERTY
Area of basin flows =	363	SF	= 0.0 Ac.
The following calculations are based on Treatment areas as shown in table to the right		LAND TREATMENT	
Sub-basin Weighted Excess Precipitation (see formula above)		A = 0%	
Weighted E = 2.12 in.		B = 0%	
Sub-basin Volume of Runoff (see formula above)		C = 0%	
V <sub>360</sub> = 64 CF		D = 100%	
Sub-basin Peak Discharge Rate: (see formula above)		FIRST FLUSH VOL.	
Q <sub>P</sub> = 0.0 cfs		10 CF	

<b>BASIN NO. A</b>	<b>DESCRIPTION</b>		<b>TO FIRST FLUSH POND / LOMAS BLVD.</b>
Area of basin flows =	5040	SF	= 0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right			<b>LAND TREATMENT</b>
Sub-basin Weighted Excess Precipitation (see formula above)			A = 0%
Weighted E = 1.79 in.			B = 14%
Sub-basin Volume of Runoff (see formula above)			C = 14%
V <sub>360</sub> = 753 CF			D = 72%
Sub-basin Peak Discharge Rate: (see formula above)			<b>FIRST FLUSH VOL.</b>
Q <sub>P</sub> = 0.5 cfs			103 CF
<b>BASIN NO. B</b>	<b>DESCRIPTION</b>		<b>TO FIRST FLUSH POND / WASHINGTON ST.</b>
Area of basin flows =	4607	SF	= 0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right			<b>LAND TREATMENT</b>
Sub-basin Weighted Excess Precipitation (see formula above)			A = 0%
Weighted E = 1.79 in.			B = 14%
Sub-basin Volume of Runoff (see formula above)			C = 14%
V <sub>360</sub> = 689 CF			D = 72%
Sub-basin Peak Discharge Rate: (see formula above)			<b>FIRST FLUSH VOL.</b>
Q <sub>P</sub> = 0.4 cfs			94 CF
<b>BASIN NO. C</b>	<b>DESCRIPTION</b>		<b>TO FIRST FLUSH POND / NORTH ALLEY</b>
Area of basin flows =	10237	SF	= 0.2 Ac.
The following calculations are based on Treatment areas as shown in table to the right			<b>LAND TREATMENT</b>
Sub-basin Weighted Excess Precipitation (see formula above)			A = 0%
Weighted E = 1.86 in.			B = 11%
Sub-basin Volume of Runoff (see formula above)			C = 11%
V <sub>360</sub> = 1590 CF			D = 78%
Sub-basin Peak Discharge Rate: (see formula above)			<b>FIRST FLUSH VOL.</b>
Q <sub>P</sub> = 1.0 cfs			226 CF



# Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Friday, Apr 24 2015

## Starbucks Covered Sidewalk Culvert

### Rectangular

Bottom Width (ft) = 1.00  
Total Depth (ft) = 0.50

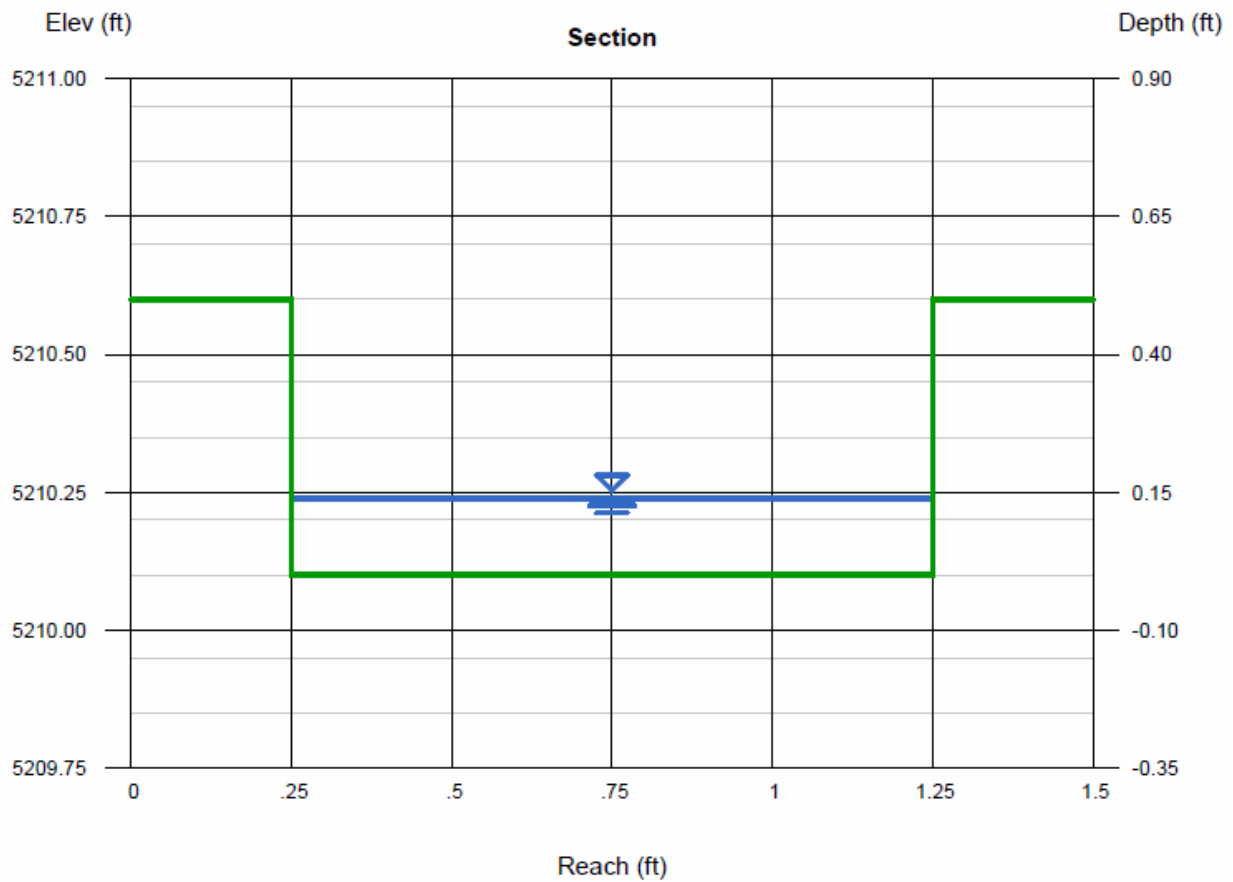
Invert Elev (ft) = 5210.10  
Slope (%) = 2.00  
N-Value = 0.013

### Calculations

Compute by: Known Q  
Known Q (cfs) = 0.50

### Highlighted

Depth (ft) = 0.14  
Q (cfs) = 0.500  
Area (sqft) = 0.14  
Velocity (ft/s) = 3.57  
Wetted Perim (ft) = 1.28  
Crit Depth, Yc (ft) = 0.20  
Top Width (ft) = 1.00  
EGL (ft) = 0.34



## Orifice Equation:

12" wide x 6" high opening (either curb cut or covered sidewalk culvert) can accept 1.4 cfs max.

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### ORIFICE EQUATION - SIDEWALK CULVERT / CURB CUT 1' WIDE X 6" HIGH

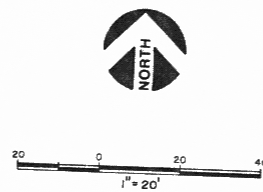
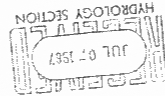
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The Orifice Equation is used to calculate the Flow at the opening of a Channel

$$Q = C * A * (2 * g * h)^{0.5}$$

Where	Q	=	1.4	cfs	
	C	=	0.6		(indicating that the opening will function at 60% capacity)
	A	=	0.5	sq.ft.	
	g	=	32.2	ft/sec <sup>2</sup>	
	h	=	0.333	ft	depth of flow at opening from the center of culvert





VICINITY MAP J-17-Z  
FLOOD HAZARD BOY MAP PANEL No. 29

NOTICE TO CONTRACTOR

- ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE INTERIM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985.
- TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 165-1214, FOR LOCATION OF EXISTING UTILITIES.
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
- BACKFILL COMPACTION SHALL BE ACCORDING TO ARTERIAL STREET USE.
- MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
- CONTRACTOR IS RESPONSIBLE FOR EROSION CONTROL DURING THE CONSTRUCTION PHASE, INCLUDING ANY PROVISIONS THAT NEED TO BE TAKEN TO DIVERT ANY SEDIMENT FROM ENTERING THE CITY RIGHT-OF-WAY, I.E., WINDROWS, SILT FENCING, OR APPROVED EQUAL.
- CURB AND GUTTER SHOWN AS EXISTING AND NOT TO BE REMOVED UNDER THE CONTRACT WHICH IS DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
- WHEN CONSTRUCTION UNDER THIS PROJECT CONNECTS TO EXISTING IMPROVEMENTS, THE CONTRACTOR SHALL PROVIDE AN EASY RIDING CONNECTION.

LEGEND

PROPERTY LINE	---
CONTOUR (NEW)	---
CONTOUR (EXISTING)	---
SPOT ELEVATION (NEW)	---
SPOT ELEVATION (EXISTING)	---

LEGAL DESCRIPTION:

LOTS 30 THRU 37 OF JOSEPH L. DAILEY'S SUBDIVISION OF BLOCK 17-LA HACIENDA, ALBUQUERQUE, NEW MEXICO.

BENCH MARK DATA - TBM & ACS

THE STATION STAMPED "2-317A" A \* + \* CUT ON THE TOP OF CURB 6 FEET SOUTH OF THE SSW CURB RETURN LOCATED IN THE SOUTHWEST QUADRANT OF WASHINGTON STREET, N.E. AND LOMAS BLVD., N.E. ELEVATION = 5,208.26' MSL.

SURVEY DATA:

SURVEY DATA PROVIDED BY FRED SANCHEZ N.M.L.S. NO. 4078, ALBUQUERQUE, NEW MEXICO, SEPTEMBER, 1986.

GENERAL NOTES:

- OWNER OF PROPERTY AT THE NORTHWEST CORNER OF LOMAS AND WASHINGTON IS THE SAME OWNER AS THE PROPERTY TO THE WEST.

REVISED DRAINAGE PLAN

LOMAS & WASHINGTON

ADDITIONAL CONSTRUCTION:

During construction, the Owner increased the size of the building by 734 square feet. Revisions to the grading and drainage plan were made on April 9, 1987. Due to the expansion, the Q(100) increased from 1.8796 cfs to 1.9162 cfs, an increase of 1.91%.

REVISED CALCULATIONS:

Area = 0.7515 acres  
1 = 2.2 in./hr. Plate 22.2 D-2  
6-hour, 100-year rainfall = 2.3 in. Plate 22.2 D-1  
i = (2.2)(2.3) = 5.06 in./hr.

EXISTING ON-SITE CONDITIONS:

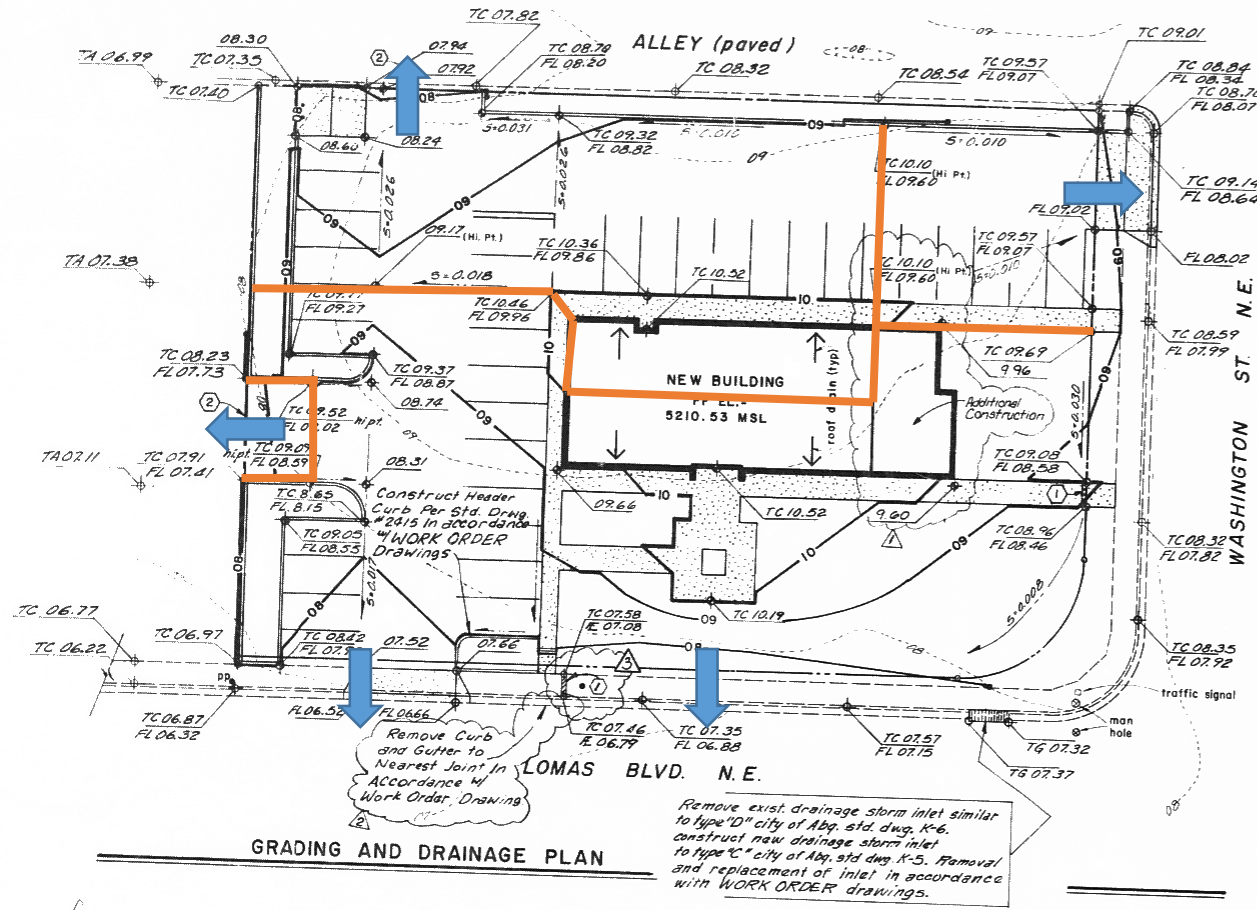
SURFACE TYPE	"C" VALUE	A (ACRES)	"C" X A	COMPOSITE "C" X A/A
Streets, Drives, Walks	0.95	0.4560	0.4332	
Roofs	0.90	0.0898	0.0808	
Lawns & Landscaping	0.25	0.2057	0.0514	
Undeveloped	0.40	-	-	
TOTAL		0.7515	0.5654	0.7524

Q(100) = (0.7524)(5.06)(0.7515) = 2.8611 cfs  
Q(10) = (0.657)(2.8611) = 1.8796 cfs  
CN = 75 Plate 22.2 C-2  
Direct Runoff = .85 in. Plate 22.2 C-4  
V(100) = (0.85)(0.7515)(43560)/12 = 2318.75 cu. ft.  
V(10) = (0.657)(2318.75) = 1523.42 cu. ft.

PROPOSED ON-SITE CONDITIONS:

SURFACE TYPE	"C" VALUE	A (ACRES)	"C" X A	COMPOSITE "C" X A/A
Streets, Drives, Walks	0.95	0.4560	0.4332	
Roofs	0.90	0.1067	0.0960	
Lawns & Landscaping	0.25	0.1888	0.0472	
Undeveloped	0.40	-	-	
TOTAL		0.7515	0.5764	0.7670

Q(100) = (0.7670)(5.06)(0.7515) = 2.9166 cfs  
Q(10) = (0.657)(2.9166) = 1.9162 cfs  
CN = 75 Plate 22.2 C-3  
Direct Runoff = .85 in. Plate 22.2 C-4  
V(100) = (0.85)(0.7515)(43560)/12 = 2318.75 cu. ft.  
V(10) = (0.657)(2318.75) = 1523.42 cu. ft.



GRADING AND DRAINAGE PLAN

OFFICE BLDG AT WASHINGTON AND LOMAS

LOCATION AND EXISTING CONDITION:

THE SITE IS LOCATED ON THE NORTHWEST CORNER OF WASHINGTON AND LOMAS IN ALBUQUERQUE, NEW MEXICO CONTAINING APPROXIMATELY 0.7515 ACRES. THE SITE IS PRESENTLY DEVELOPED, FAIRLY LEVEL AND SLOPES FROM THE CENTER OF THE SITE IN ALL DIRECTIONS.

NO OFF-SITE RUNOFF ENTERS THE SITE DUE TO EXISTING ELEVATIONS. EXISTING RUNOFF ENTERS WASHINGTON AND LOMAS AND IS INTERCEPTED BY LOMAS UNTIL IT ENTERS THE NORTH DIVERSION CHANNEL. THE AREA OF THE SITE IS COMPLETELY DEVELOPED, THEREFORE RUNOFF IN THIS AREA WILL NOT INCREASE.

PROPOSED CONDITION:

PROPOSED DEVELOPMENT OF THE SITE INCLUDES A BUILDING WITH RELATED PARKING AND LANDSCAPING. RUNOFF FROM THE SITE WILL BE ALLOWED TO CONTINUE TO FREE DIVERSION TO THE EAST AND SOUTH BOUNDING STREETS BECAUSE THE PROPOSED RUNOFF WILL BE LESS THAN THE EXISTING.

CALCULATION:

Area = 0.7515 acres  
1 = 2.2 in./hr. Plate 22.2 D-2  
6-hour, 100-year rainfall = 2.3 in. Plate 22.2 D-1  
i = (2.2)(2.3) = 5.06 in./hr.

EXISTING ON-SITE CONDITIONS:

SURFACE TYPE	"C" VALUE	A (ACRES)	"C" X A	COMPOSITE "C" X A/A
Streets, Drives, Walks	0.95	0.6146	0.5819	
Roofs	0.90	0.1208	0.1087	
Lawns & Landscaping	0.25	0.0161	0.004	
Undeveloped	0.40	-	-	
TOTAL		0.7515	0.6966	0.9269

Q(100) = (0.9269)(5.06)(0.7515) = 3.5248 cfs  
Q(10) = (0.657)(3.5248) = 2.3158 cfs  
CN = 85 Plate 22.2 C-2  
Direct Runoff = 1.0 in. Plate 22.2 C-4  
V(100) = (1.0)(0.7515)(43560)/12 = 2727.95 cu. ft.  
V(10) = (0.657)(2727.95) = 1792.3 cu. ft.

PROPOSED ON-SITE CONDITIONS:

SURFACE TYPE	"C" VALUE	A (ACRES)	"C" X A	COMPOSITE "C" X A/A
Streets, Drives, Walks	0.95	0.4560	0.4332	
Roofs	0.90	0.0898	0.0808	
Lawns & Landscaping	0.25	0.2057	0.0514	
Undeveloped	0.40	-	-	
TOTAL		0.7515	0.5654	0.7524

Q(100) = (0.7524)(5.06)(0.7515) = 2.8611 cfs  
Q(10) = (0.657)(2.8609) = 1.8796 cfs  
CN = 75 Plate 22.2 C-3  
Direct Runoff = .85 in. Plate 22.2 C-4  
V(100) = (0.85)(0.7515)(43560)/12 = 2318.75 cu. ft.  
V(10) = (0.657)(2318.75) = 1523.42 cu. ft.

DEAN/  
HUNT/  
KRUEGER  
and  
ASSOCIATES Inc.  
ARCHITECTS/PLANNERS/INTERIORS  
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87108  
505-265-4884

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drawn by: C44  
checked: C44  
date: 11/6/86

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1 4/9/87  
2 4/28/87  
3 7/7/87



AN INSURANCE OFFICE  
at Lomas & Washington N.E.  
Albuquerque, New Mexico

sheet no:

C-2