

CITY OF ALBUQUERQUE



December 22, 2017

Fred Arfman, P.E.
Isaacson & Arfman, P.A.
128 Monroe St. N.E
Albuquerque, NM 87108

**RE: Industrial Water Engineering
Grading and Drainage Plan
Engineer's Stamp Date 12/13/17
Hydrology File: C16D006LL**

Dear Mr. Arfman:

Based on the information provided in the submittal received on 12/15/17 the above-referenced submittal is approved for Building Permit.

PO Box 1293

Prior to Hydrology approval for Certificate of Occupancy:

Albuquerque

1. The Private Facility Drainage Covenant must be recorded with Bernalillo County and a copy included with the drainage certification.
2. Payment of Fee-in-Lieu will be required for any ponding areas not constructed and certified.

NM 87103

If you have any questions, please contact me at 924-3695 or dpeterson@cabq.gov.

www.cabq.gov

Sincerely,

Dana Peterson, P.E.
Senior Engineer, Planning Dept.
Development Review Services



December 13, 2017

Mr. Dana Peterson, P.E.
Senior Engineer, Planning Dept.
City of Albuquerque

RE: Industrial Water Engineering G&D Plan Resubmittal (C16D006LL)

Dear Mr. Peterson,

Attached with this letter is the revised Grading & Drainage Plan for Building Permit.

Revisions in response to your numbered comments dated October 31, 2017 are as follows:

1. Pertinent text has been adjusted to 0.1'..
2. Top of pond, bottom of pond and volumes are called out on sheet CG-101.
3. ESC plan is completed and approved.
4. Draft of Private Facility Drainage Covenant for first flush ponds is provided for review.
5. Hydraulic capacity calculations for the existing sidewalk culvert and existing drainage channel downstream of the overflow from Pond P3 is provided.

We have also added a 0.1' high raised curb on the east edge of the west drainage easement to keep on-site first flush and off-site discharge separated. The off-site discharge passing through the property (6.72 cfs) is handled at a depth of 0.3' along the west curb (see channel calculations attached). The maximum capacity at a depth of 0.4' is 14.5 cfs.

We understand that, per your comments, the following items will be required prior to approval for Certificate of Occupancy:

1. Private Facility Drainage Covenant for first flush ponds will be recorded with Bernalillo County and a copy included with drainage certification.
2. Payment of Fee-in-Lieu for any ponding areas not constructed and certified.

Please contact me at bryanb@iacivil.com or at (505) 268-8828 if you have any questions or need any additional information.

Sincerely,
Isaacson & Arfman, PA

Bryan J. Bobrick

Bryan J. Bobrick
Project Manager

Channel Report

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

Thursday, Dec 14 2017

Drainage Easement Capacity

User-defined

Invert Elev (ft) = 99.50
Slope (%) = 2.00
N-Value = Composite

Calculations

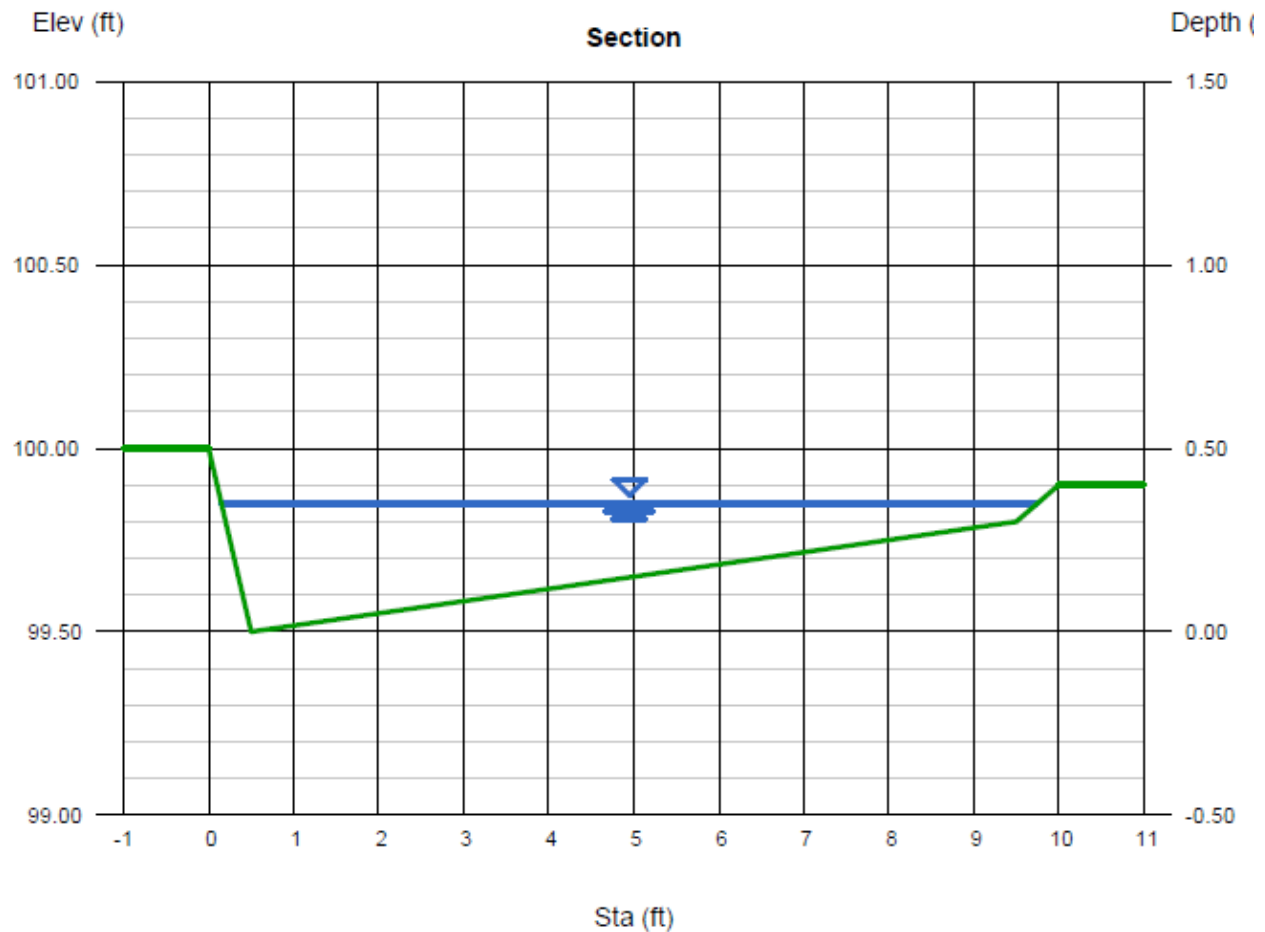
Compute by: Q vs Depth
No. Increments = 10

Highlighted

Depth (ft) = 0.35
Q (cfs) = 10.04
Area (sqft) = 1.87
Velocity (ft/s) = 5.38
Wetted Perim (ft) = 9.75
Crit Depth, Yc (ft) = 0.49
Top Width (ft) = 9.60
EGL (ft) = 0.80

(Sta, El, n)-(Sta, El, n)...

(0.00, 100.00)-(0.50, 99.50, 0.013)-(9.50, 99.80, 0.013)-(10.00, 99.90, 0.013)



**PRIVATE FACILITY
DRAINAGE COVENANT**

This Drainage Covenant ("Covenant"), between _____ ("Owner"), whose address is _____ and whose telephone number is (____) _____ and the City of Albuquerque, New Mexico, a municipal corporation whose address is P.O. Box 1293, Albuquerque, New Mexico 87103, is made in Albuquerque, Bernalillo County, New Mexico and is entered into as of the date Owner signs this Covenant.

1. Recital. The Owner is the current owner of the following described real property located at [give legal description, and street address]
 8701 Alameda Park Drive, NE - Albuquerque, New Mexico - 87113

 Lots numbered two (2) and three (3) of Alameda Business Park

recorded on June 29, 1999 - Book 99C pages 167 through _____, as Document No. 19990085494 in the records of the Bernalillo County Clerk, State of New Mexico (the "Property").

Pursuant to City ordinances, regulations and other applicable laws, the Owner is required to construct and maintain certain drainage facilities on the Property, and the parties wish to enter into this Covenant to establish the obligations and responsibilities of the parties.

2. Description and Construction of Drainage Facility. The Owner shall construct the following "Drainage Facility" within the Property at the at the Owner's sole expense in accordance with the standards, plans and specifications approved by the City:
 First flush ponds as shown on the approved Grading and Drainage Plan dated 12-11-2017

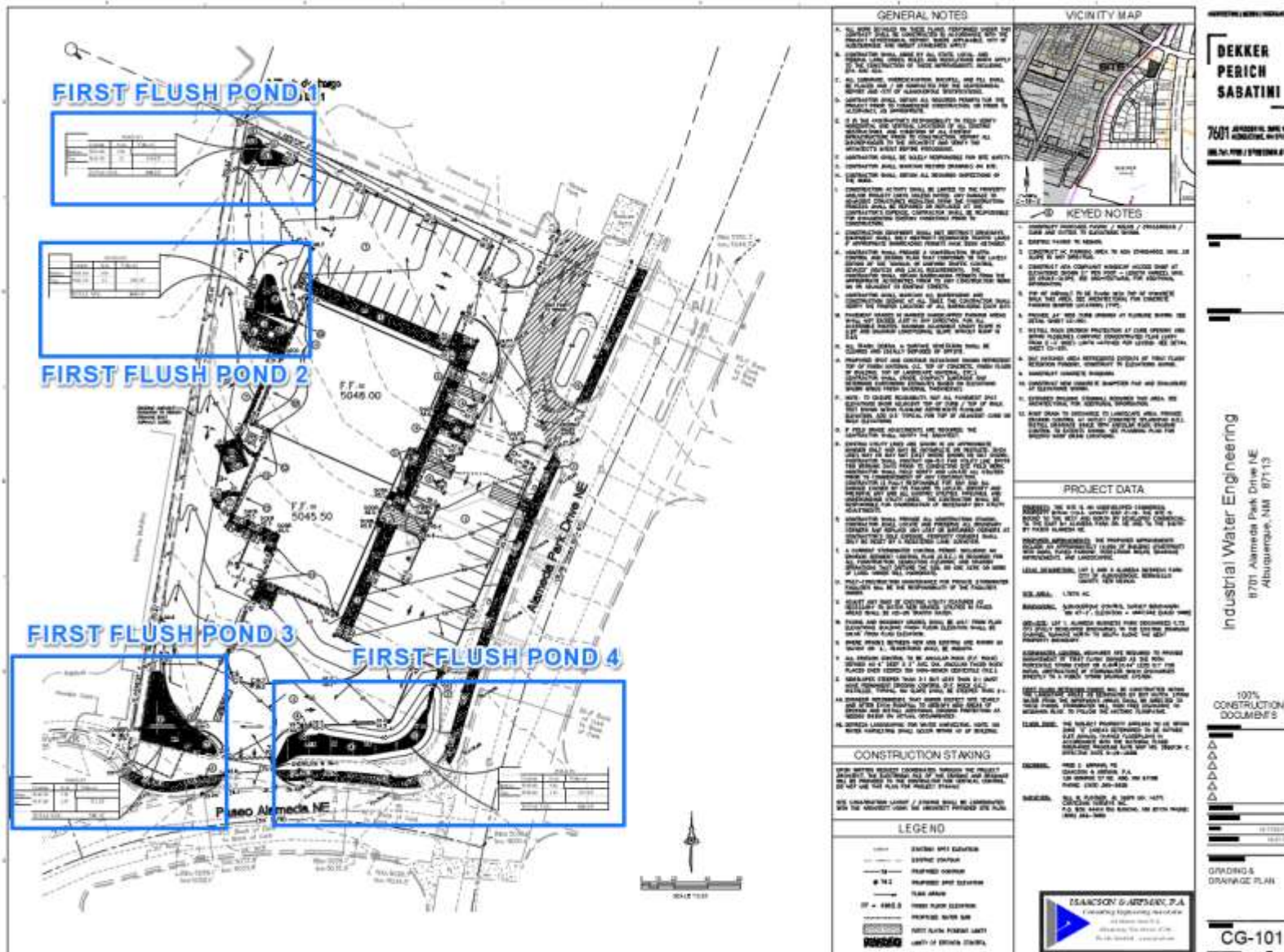
The Drainage Facility is more particularly described in Exhibit A attached hereto and made a part hereof.

3. Maintenance of Drainage Facility. The Owner shall maintain the Drainage Facility at Owner's sole cost in accordance with the approved Drainage Report and plans.

4. Benefit to Property. The Owner acknowledges and understands that the Drainage Facility required herein to be constructed on the Owner's property is for the private benefit and protection of the Owner's property and that failure to maintain such facility could result in damage or loss to the Property.

5. Inspection of Drainage Facility. The City shall have no duty or obligation whatsoever to perform any inspection, maintenance or repair of the Drainage Facility, it being the duty of the Owner, its heirs, successors and assigns to construct and maintain the facility in accordance with approved plans and specifications.

PRIVATE FACILITY DRAINAGE COVENANT EXHIBIT





City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: _____ **Building Permit #:** _____ **City Drainage #:** _____

DRB#: _____ **EPC#:** _____ **Work Order#:** _____

Legal Description: _____

City Address: _____

Engineering Firm: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

bryanb@iacivil.com

Owner: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

Architect: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

Other Contact: _____ **Contact:** _____

Address: _____

Phone#: _____ **Fax#:** _____ **E-mail:** _____

Check all that Apply:

DEPARTMENT:

- ☒ HYDROLOGY/ DRAINAGE
☐ TRAFFIC/ TRANSPORTATION
☐ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

- ☒ ENGINEER ARCHITECT CERTIFICATION
☐ CONCEPTUAL G & D PLAN
☒ GRADING PLAN
☐ DRAINAGE MASTER PLAN
☐ DRAINAGE REPORT
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ TRAFFIC IMPACT STUDY (TIS)
☐ EROSION & SEDIMENT CONTROL PLAN (ESC)
☐ OTHER (SPECIFY) _____

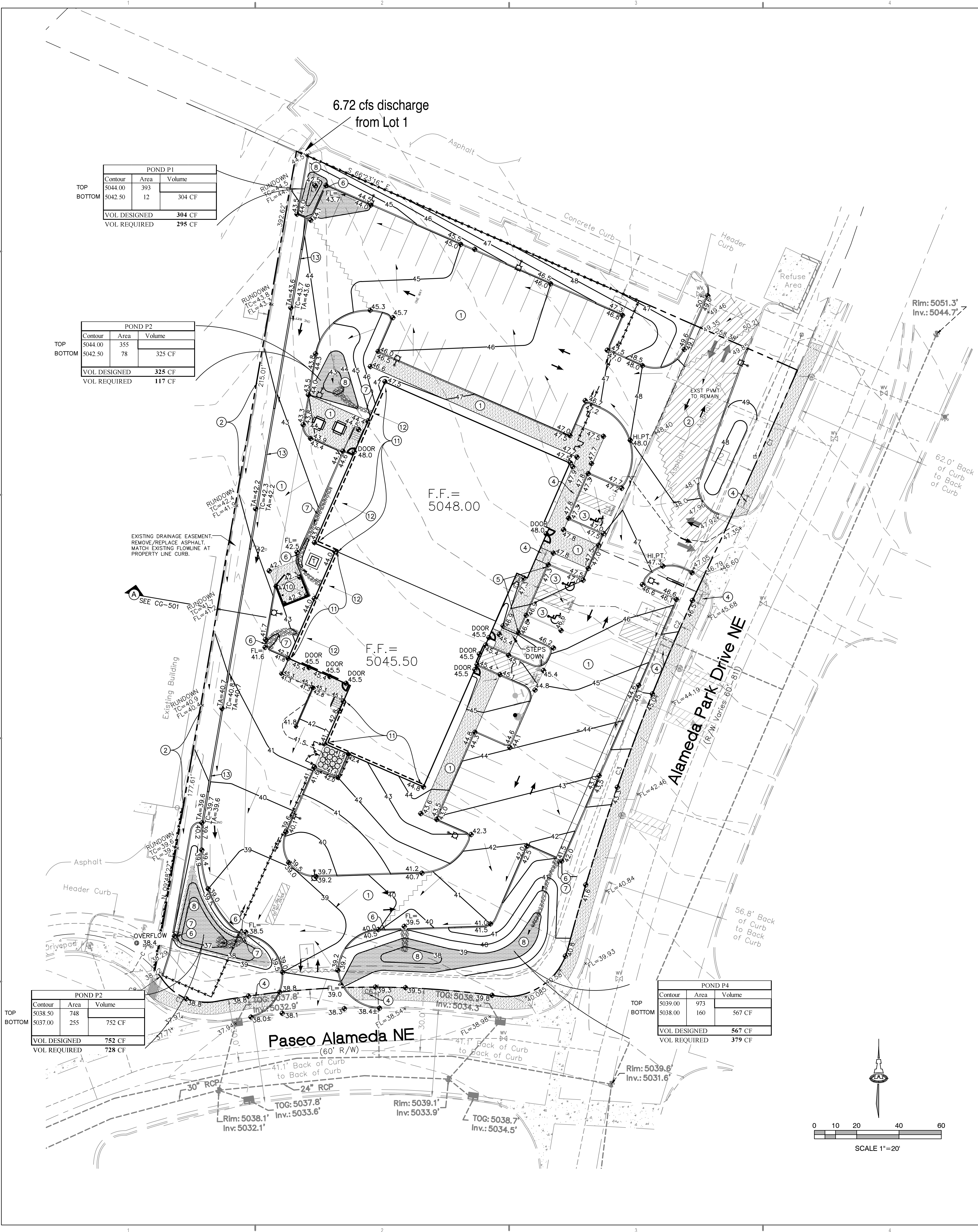
CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- ☒ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY
☐ PRELIMINARY PLAT APPROVAL
☐ SITE PLAN FOR SUB'D APPROVAL
☐ SITE PLAN FOR BLDG. PERMIT APPROVAL
☐ FINAL PLAT APPROVAL
☐ SIA/ RELEASE OF FINANCIAL GUARANTEE
☐ FOUNDATION PERMIT APPROVAL
☐ GRADING PERMIT APPROVAL
☐ SO-19 APPROVAL
☐ PAVING PERMIT APPROVAL
☐ GRADING/ PAD CERTIFICATION
☐ WORK ORDER APPROVAL
☐ CLOMR/LOMR
☐ PRE-DESIGN MEETING
☐ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: ☒ Yes ☐ No

DATE SUBMITTED: December 15, 2017 By: Fred C. Arfman

COA STAFF: _____ ELECTRONIC SUBMITTAL RECEIVED: _____



POND P1		
Contour	Area	Volume
5044.00	393	304 CF
5042.50	12	
VOL. DESIGNED		304 CF
VOL. REQUIRED		295 CF

POND P2		
Contour	Area	Volume
5044.00	355	325 CF
5042.50	78	
VOL. DESIGNED		325 CF
VOL. REQUIRED		117 CF

POND P4		
Contour	Area	Volume
5039.00	973	567 CF
5038.00	160	
VOL. DESIGNED		567 CF
VOL. REQUIRED		379 CF

POND P2		
Contour	Area	Volume
5038.50	748	752 CF
5037.00	255	
VOL. DESIGNED		752 CF
VOL. REQUIRED		728 CF

GENERAL NOTES

- A. ALL WORK DETAILED ON THESE PLANS, PERFORMED UNDER THIS CONTRACT SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT, WHERE APPLICABLE, CITY OF ALBUQUERQUE AND NMDOT STANDARDS APPLY.
- B. 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.
- C. ALL SUBGRADE, OVEREXCAVATION, BACKFILL, AND FILL SHALL BE PLACED AND / OR COMPACTED PER THE GEOTECHNICAL REPORT AND CITY OF ALBUQUERQUE SPECIFICATIONS.
- D. CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS FOR THE PROJECT PRIOR TO COMMENCING CONSTRUCTION, OR PRIOR TO OCCUPANCY, AS APPROPRIATE.
- 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. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR SITE SAFETY.
- G. CONTRACTOR SHALL MAINTAIN RECORD DRAWINGS ON SITE.
- H. CONTRACTOR SHALL OBTAIN ALL REQUIRED INSPECTIONS OF THE WORK.
- I. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THE PROPERTY AND/OR PROJECT LIMITS UNLESS NOTED. 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.
- K. 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. CONTRACTOR SHALL MAINTAIN ALL BARRICADING AND CONSTRUCTION SIGNING AT ALL TIMES. THE CONTRACTOR SHALL VERIFY THE PROPER LOCATION OF ALL BARRICADING 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%.
- 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, FINISH FLOOR OF BUILDING, TOP OF LANDSCAPE MATERIAL, ETC.). CONTRACTOR SHALL GRADE, COMPACT SUBGRADE AND DETERMINE EARTHWORK ESTIMATES BASED ON ELEVATIONS SHOWN MINUS FINISH MATERIAL THICKNESSES.
- P. 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.
- Q. IF FIELD GRADE ADJUSTMENTS ARE REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT.
- R. 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.
- S. CONTRACTOR SHALL PROVIDE ALL 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.P.) 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. POST-CONSTRUCTION MAINTENANCE FOR PRIVATE STORMWATER FACILITIES WILL BE THE RESPONSIBILITY OF THE FACILITIES OWNER.
- V. ADJUST ANY RIMS OF EXISTING UTILITY FEATURES AS NECESSARY TO MATCH NEW GRADES. UTILITIES IN PAVED AREAS SHALL BE HS-25 TRAFFIC RATED.
- W. PAVING AND ROADWAY GRADES SHALL BE $\pm 0.1'$ FROM PLAN ELEVATIONS. BUILDING FINISH FLOOR ELEVATION SHALL BE $\pm 0.05'$ FROM PLAN ELEVATION.
- X. WHERE GRADES BETWEEN NEW AND EXISTING ARE SHOWN AS 'MATCH' OR '±', TRANSITIONS SHALL BE SMOOTH.
- Y. ALL EROSION CONTROL TO BE ANGULAR ROCK (F.F. ROCK) DEFINED AS 6" DEEP X 3" AVG. DIA. ANGULAR FACED ROCK PLACED OVER GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.).
- Z. SIDESLOPES STEEPER THAN 3:1 BUT LESS THAN 2:1 MUST HAVE PERMANENT EROSION CONTROL (F.F. ROCK O.E.) INSTALLED. TYPICAL NO SLOPE SHALL BE STEEPER THAN 2:1.
- AA. 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.
- AB. DEPRESS LANDSCAPING FOR WATER HARVESTING. NOTE: NO WATER HARVESTING SHALL OCCUR WITHIN 10' OF BUILDING.

CONSTRUCTION STAKING

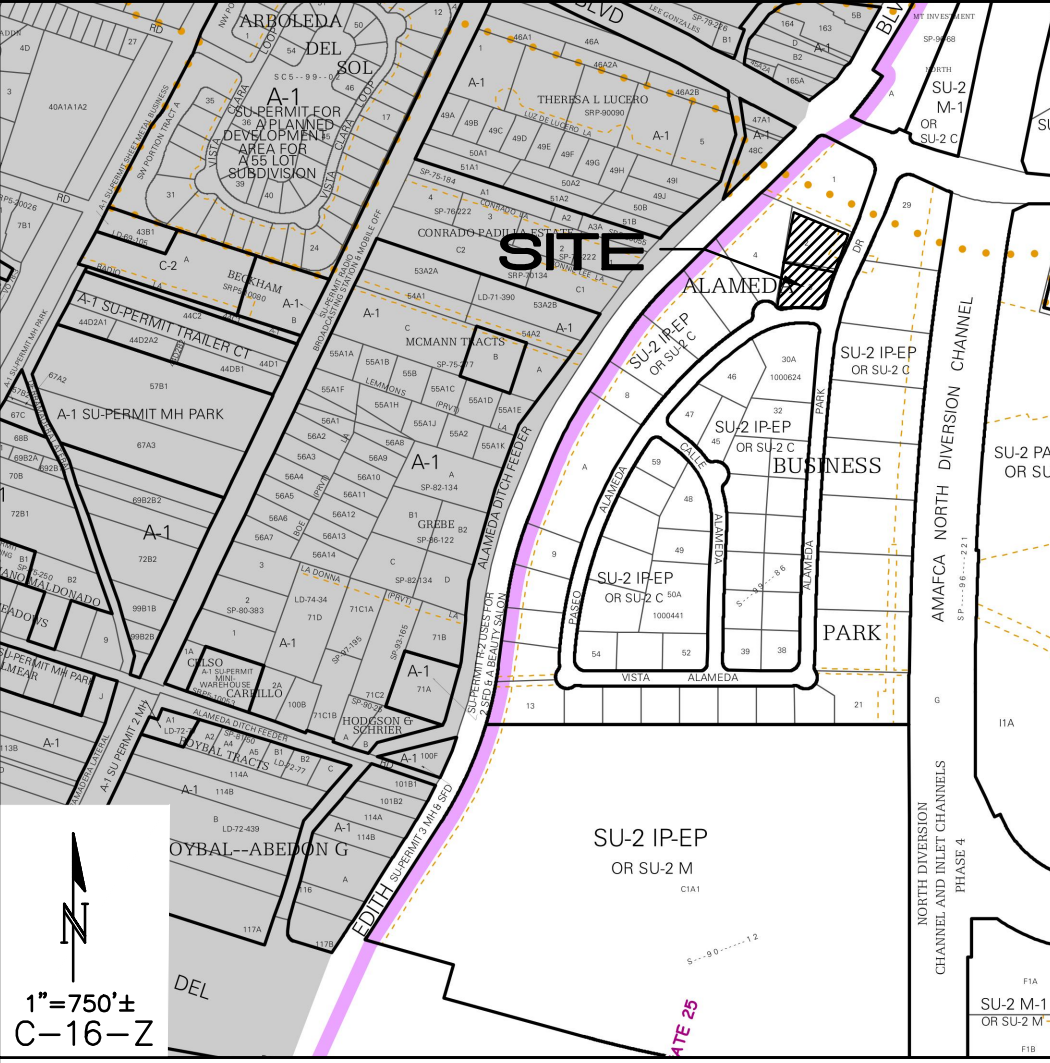
UPON WRITTEN REQUEST COORDINATED THROUGH THE PROJECT ARCHITECT, THE ELECTRONIC FILE OF THE GRADING AND DRAINAGE WILL BE PROVIDED TO THE CONTRACTOR FOR VERTICAL CONTROL. DO NOT USE THIS PLAN FOR PROJECT STAKING.

SITE CONSTRUCTION LAYOUT / STAKING SHALL BE COORDINATED WITH THE ARCHITECT USING THE ARCHITECT PROVIDED SITE PLAN.

LEGEND

- EXISTING SPOT ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- FLOW ARROW
- FINISH FLOOR ELEVATION
- PROPOSED WATER BAR
- FIRST FLUSH PONDING LIMITS
- LIMITS OF EROSION CONTROL

VICINITY MAP



KEYED NOTES

1. CONSTRUCT PROPOSED PAVING / WALKS / CROSSWALKS / CURB AND GUTTER TO ELEVATIONS SHOWN.
2. EXISTING PAVING TO REMAIN.
3. CONSTRUCT HC PARKING AREA TO ADA STANDARDS. MAX. 2% SLOPE IN ANY DIRECTION.
4. CONSTRUCT ADA COMPLIANT HANDICAP ACCESS RAMP AT ELEVATIONS SHOWN (1" PER FOOT - LENGTH VARIES). MAX. 2% CROSS-SLOPE. SEE ARCHITECTURAL FOR ADDITIONAL INFORMATION.
5. TOP OF ASPHALT TO BE FLUSH WITH TOP OF CONCRETE WALK THIS AREA. SEE ARCHITECTURAL FOR CONCRETE PARKING BUMPER LOCATIONS (TYP).
6. PROVIDE 3.0' WIDE CURB OPENING AT FLOWLINE SHOWN. SEE DETAIL SHEET CG-501.
7. INSTALL ROCK EROSION PROTECTION AT CURB OPENING AND WITHIN FLOWLINES CARRYING CONCENTRATED FLOW (VARY FROM 2'-3' WIDE). LIMITS HATCHED PER LEGEND. SEE DETAIL SHEET CG-501.
8. DOT HATCHED AREA REPRESENTS EXTENTS OF 'FIRST FLUSH' RETENTION PONDING. CONSTRUCT TO ELEVATIONS SHOWN.
9. NOT USED.
10. CONSTRUCT NEW CONCRETE DUMPSTER PAD AND ENCLOSURE AT ELEVATIONS SHOWN.
11. EXTENDED BUILDING STEMWALL REQUIRED THIS AREA. SEE ARCHITECTURAL FOR ADDITIONAL INFORMATION.
12. ROOF DRAIN TO DISCHARGE TO LANDSCAPE AREA. PROVIDE EROSION CONTROL AT OUTLET (CONCRETE SPLASHPAD O.E.). INSTALL DRAINAGE SWALE WITH ANGULAR ROCK EROSION CONTROL TO EXTENTS SHOWN. SEE PLUMBING PLAN FOR SPECIFIC ROOF DRAIN LOCATIONS.
13. CONSTRUCT 8"x8" CHAMFERED RIBBON CURB ALONG EAST DRAINAGE EASEMENT. CURB TO BE PROTRUDING 1" ABOVE ADJACENT ASPHALT (BOTH SIDES). SEE SECTION A ON SHEET CG-501.

PROJECT DATA

PROPERTY: THE SITE IS AN UNDEVELOPED COMMERCIAL PROPERTY WITHIN C.O.A. VICINITY MAP C-16. THE SITE IS BOUND TO THE WEST AND NORTH BY DEVELOPED COMMERCIAL, TO THE EAST BY ALAMEDA PARK DR. NE AND TO THE SOUTH BY PASEO ALAMEDA NE.

PROPOSED IMPROVEMENTS: THE PROPOSED IMPROVEMENTS INCLUDE AN APPROXIMATELY 14,000 SF BUILDING (FOOTPRINT) WITH DOCK, PAVED PARKING, PEDESTRIAN WALKS, DRAINAGE IMPROVEMENTS, AND LANDSCAPING.

LEGAL DESCRIPTION: LOT 2 AND 3 ALAMEDA BUSINESS PARK CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO.

SITE AREA: 1.7676 AC.

BENCHMARK: ALBUQUERQUE CONTROL SURVEY BENCHMARK "NM 47-2", ELEVATION = 4997.592 (NAD 1988)

OFF-SITE: LOT 1, ALAMEDA BUSINESS PARK DISCHARGES 6.72 CFS (FULLY DEVELOPED DISCHARGE) TO THE EXISTING DRAINAGE CHANNEL RUNNING NORTH TO SOUTH ALONG THE WEST PROPERTY BOUNDARY.

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.

FIRST FLUSH RETENTION PONDS WILL BE CONSTRUCTED WITHIN THE LANDSCAPE AREAS AS DESIGNATED BY DOT HATCH. STORM WATER FROM THE IMPERVIOUS AREAS SHALL BE DIRECTED TO THESE PONDS. STORMWATER WILL THEN FREE DISCHARGE TO MCMAHON BLVD. TO FOLLOW THE HISTORIC FLOWPATHS.

FLOOD ZONE: THE SUBJECT PROPERTY APPEARS TO LIE WITHIN ZONE "X" (AREAS DETERMINED TO BE OUTSIDE 0.2% ANNUAL CHANCE FLOODPLAIN) IN ACCORDANCE WITH THE NATIONAL FLOOD INSURANCE PROGRAM RATE MAP NO. 3500136 G, EFFECTIVE DATE 9-26-2008.

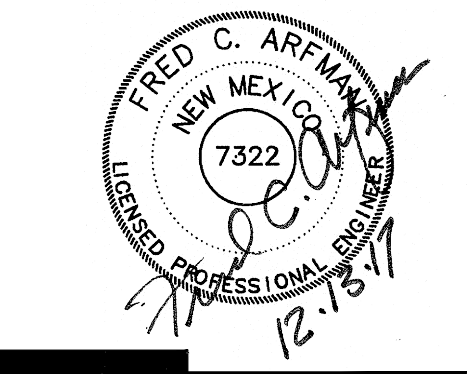
ENGINEER: FRED C. ARFMAN, PE
ISAACSON & ARFMAN, P.A.
128 MONROE ST. NE, ALBU. NM 87108
PHONE: (505) 268-8828

SURVEYOR: WILL W. PLOTNER, JR., NMPS NO. 14271
CARTESIAN SURVEYS INC.
P.O. BOX 44414 RIO RANCHO, NM 87174 PHONE: (505) 896-3050

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

**DEKKER
PERICH
SABATINI**

7601 JEFFERSON NE, SUITE 101
ALBUQUERQUE, NM 87109
505.761.9700 / DPSDESIGN.ORG



SEAL

PROJECT

Industrial Water Engineering
8701 Alameda Park Drive NE
Albuquerque, NM 87113

100%
CONSTRUCTION
DOCUMENTS

REVISIONS



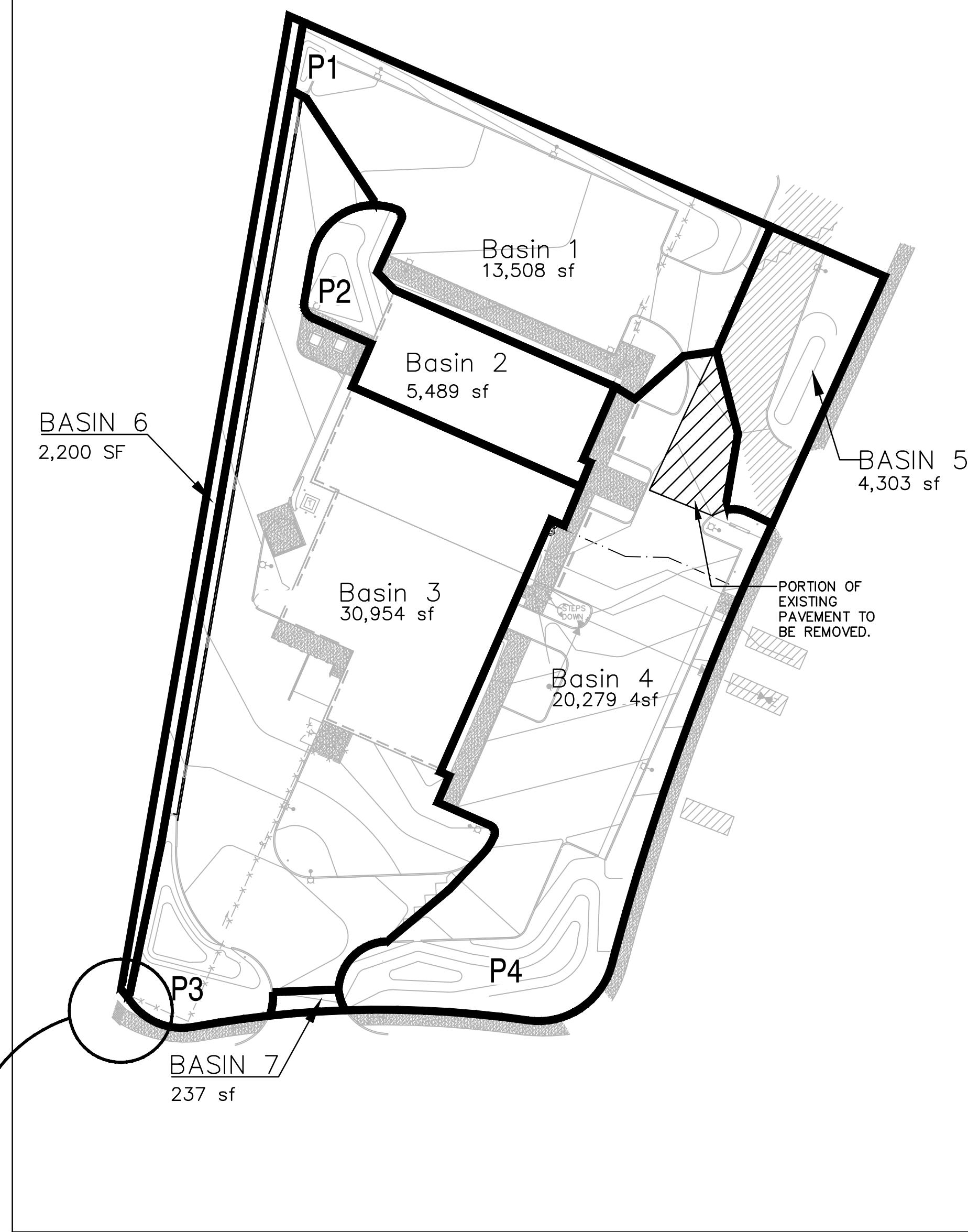
DRAWN BY
REVIEWED BY
DATE 12/14/2017
PROJECT NO. 16-0113

DRAWING NAME
**GRADING &
DRAINAGE PLAN**

SHEET NO.

CG-101

DRAINAGE SUB-BASINS FOR FIRST FLUSH RETENTION



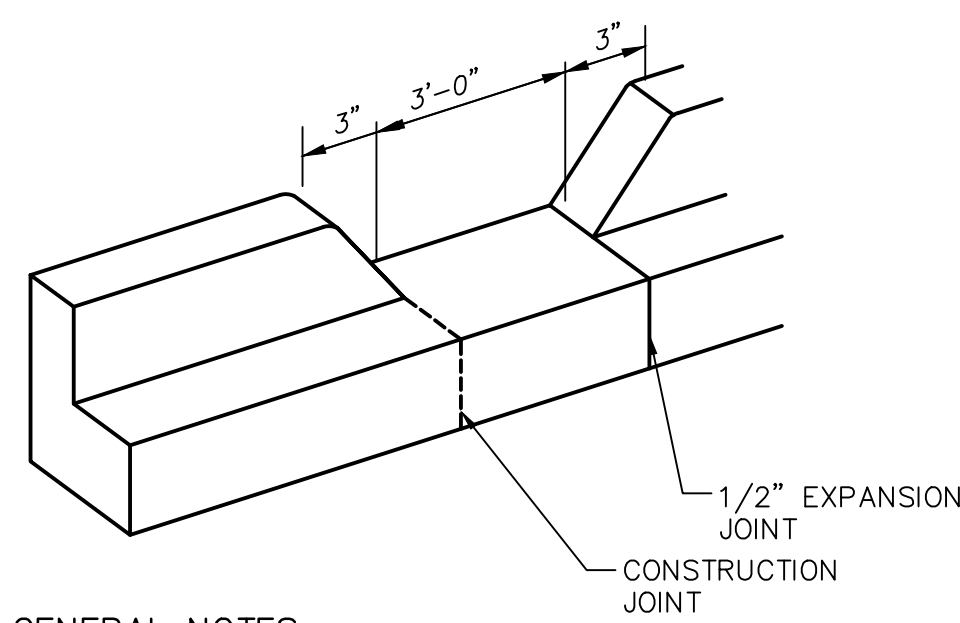
EXISTING 4'+ CHANNEL AND COVERED CULVERT TO PASS 100-YEAR 6-HOUR LOT 1 OFFSITE FLOW (6.32 CFS) + ON-SITE BASINS B1, B2, B3 AND B6 (5.1 CFS) = 11.42 CFS.

Rectangular
Bottom Width (ft) = 4.00
Total Depth (ft) = 0.67

Invert Elev (ft) = 100.00
Slope (%) = 1.60
N-Value = 0.013

Calculations
Compute by: Known Q
Known Q (cfs) = 11.50

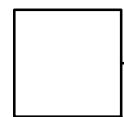
Highlighted
Depth (ft) = 0.41
Q (cfs) = 11.50
Area (sqft) = 1.64
Velocity (ft/s) = 7.01
Wetted Perim (ft) = 4.82
Crit Depth, Yc (ft) = 0.64
Top Width (ft) = 4.00
EGL (ft) = 1.17



GENERAL NOTES

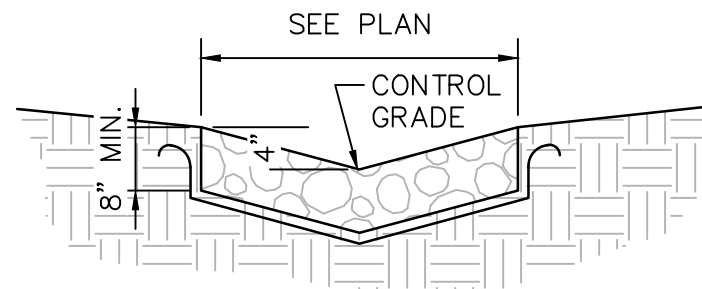
- EDGES NOT SPECIFICALLY DIMENSIONED SHALL BE SHAPED WITH A 3/8" EDGING TOOL.

CURB OPENING

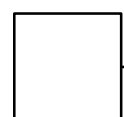


SCALE: N.T.S.

- VARY ANGULAR FACE ROCK SIZE BETWEEN 2" AND 6" DIA. (AVG.=4")
- PLACE GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.) BENEATH ALL EROSION PROTECTION
- CONSTRUCT ALL EROSION PROTECTION INSET INTO (NOT ON TOP OF) GRADE TO ENSURE RUNOFF CAN BE CAPTURED AND CONVEYED PROPERLY

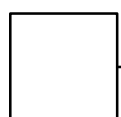


ROCK EROSION PROTECTION



SCALE: N.T.S.

SECTION A



SCALE: N.T.S.

BASIN NO.	1	DESCRIPTION	Draining to Pond P1
Area of basin flows =	13508 SF	=	0.3 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	1.86 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	8%
V ₅₀₀ =	2099 CF	C =	15%
Sub-basin Peak Discharge Rate: (see formula above)		D =	77%
Q _p =	1.3 cfs	FIRST FLUSH VOL.	
		295 CF	

BASIN NO.	2	DESCRIPTION	Draining to Pond P2
Area of basin flows =	5489 SF	=	0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	1.84 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	10%
V ₅₀₀ =	841 CF	C =	15%
Sub-basin Peak Discharge Rate: (see formula above)		D =	75%
Q _p =	0.5 cfs	FIRST FLUSH VOL.	
		117 CF	

BASIN NO.	3	DESCRIPTION	Draining to Pond P3
Area of basin flows =	30954 SF	=	0.7 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	1.92 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	8%
V ₅₀₀ =	4962 CF	C =	9%
Sub-basin Peak Discharge Rate: (see formula above)		D =	83%
Q _p =	3.1 cfs	FIRST FLUSH VOL.	
		728 CF	

BASIN NO.	4	DESCRIPTION	Draining to Pond P4
Area of basin flows =	20279 SF	=	0.5 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	1.72 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	17%
V ₅₀₀ =	2913 CF	C =	17%
Sub-basin Peak Discharge Rate: (see formula above)		D =	66%
Q _p =	1.9 cfs	FIRST FLUSH VOL.	
		379 CF	

PRIOR TO HYDROLOGY APPROVAL FOR CERTIFICATE OF OCCUPANCY, ENGINEER'S CERTIFICATION OF SUBSTANTIAL COMPLIANCE OF THE OVERALL GRADING AND DRAINAGE PLAN, INCLUDING FIRST FLUSH POND VOLUMES, IS REQUIRED. CONTRACTOR SHALL COORDINATE WITH OWNER TO PROVIDE COMPLETE AS-BUILT INFORMATION (PROVIDED BY A PROFESSIONAL SURVEYOR).

ON-SITE DRAINAGE SUB-BASIN CALCULATIONS

POND P1		
Contour	Area	Volume
\$044.00	393	
\$042.50	12	304 CF
VOL DESIGNED		304 CF
VOL REQUIRED		295 CF

POND P2		
Contour	Area	Volume
\$044.00	355	
\$042.50	78	325 CF
VOL DESIGNED		325 CF
VOL REQUIRED		117 CF

POND P2		
Contour	Area	Volume
\$038.50	748	
\$037.00	255	752 CF
VOL DESIGNED		752 CF
VOL REQUIRED		728 CF

POND P4		
Contour	Area	Volume
\$039.00	973	
\$038.00	160	567 CF
VOL DESIGNED		567 CF
VOL REQUIRED		379 CF

BASIN NO.	5	DESCRIPTION	Existing Entry Drive - Free Discharge
Area of basin flows =	4303 SF	=	0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	1.67 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	15%
V ₅₀₀ =	599 CF	C =	25%
Sub-basin Peak Discharge Rate: (see formula above)		D =	60%
Q _p =	0.4 cfs	FIRST FLUSH VOL.	
		73 CF	

BASIN NO.	6	DESCRIPTION	Existing Asphalt Rundown - Free Discharge
Area of basin flows =	2200 SF	=	0.1 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	2.12 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	0%
V ₅₀₀ =	389 CF	C =	0%
Sub-basin Peak Discharge Rate: (see formula above)		D =	100%
Q _p =	0.2 cfs	FIRST FLUSH VOL.	
		62 CF	

BASIN NO.	7	DESCRIPTION	New Entry Drive - Free Discharge
Area of basin flows =	237 SF	=	0.0 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)			
Weighted E =	2.12 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	0%
V ₅₀₀ =	42 CF	C =	0%
Sub-basin Peak Discharge Rate: (see formula above)		D =	100%
Q _p =	0.0 cfs	FIRST FLUSH VOL.	
		7 CF	

THE FIRST FLUSH VOLUME FOR BASINS 1 THRU 4 ARE CAPTURED WITHIN THE ASSOCIATED PONDS (P1 THRU P4).

BASIN 5 IS A PORTION OF AN EXISTING ASPHALT DRIVE THAT WILL CONTINUE TO FREE DISCHARGE TO ALAMEDA PARK DRIVE NE (APPROX. 1200 SF OF THIS ENTRY DRIVE IS BEING DEMOLISHED AS PART OF THE PROPOSED CONSTRUCTION). BASIN 6 IS AN EXISTING ASPHALT RUNDOWN THAT WILL CONTINUE TO FREE DISCHARGE TO PASEO ALAMEDA NE. BASIN 7, CONSISTING OF THE NEW SOUTH ENTRY DRIVE (237 SF OF IMPERVIOUS AREA) IS OFF-SET BY THE 1200 SF OF EXISTING ASPHALT PAVEMENT THAT IS BEING REMOVED AT THE NORTHEAST DRIVE.

BASED ON THIS ANALYSIS, THERE IS NO FIRST FLUSH VOLUME THAT WILL BYPASS OTHER THAN THE EXISTING PAVEMENT AND THE SOUTH ENTRY DRIVE THAT WILL BE OFF-SET BY THE EXISTING PAVEMENT BEING REMOVED.

OVERALL CALCULATIONS - 100-YEAR 6-HOUR STORM

CALCULATIONS: 2214 - Industrial Water Engineering (Alameda Office/Warehouse) : 09-11-17

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

ON-SITE			
AREA OF SITE:	76978 SF	=	1.8
100-year, 6-hour			
DEVELOPED FLOW	FREE DISCHARGE MAX.	EXCESS PRECIP:	
Treatment SF	%	Treatment SF	%
Area A =	0 0%	Area A =	0 0%
Area B =	9237.36 12%	Area B =	8199 11%
Area C =	8467.58 11%	Area C =	10159 13%
Area D =	59273.06 77%	Area D =	58620 76%
Total Area =	76978 100%	Total Area =	76978 100%

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

Weighted E = $E_A A_A + E_B A_B + E_C A_C + E_D A_D$

$A_A + A_B + A_C + A_D$

Historic E = 1.85 in. Developed E = 1.85 in.

On-Site Volume of Runoff: V₅₀₀ = $E^* A / 12$

Historic V₅₀₀ = 11869 CF Developed V₅₀₀ = 11846 CF

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 = 7.5 CFS Developed Q_p = 7.5 CFS

THE FULLY DEVELOPED PROPERTY WILL DISCHARGE 7.5 CFS (MAXIMUM) DURING THE 100-YEAR 6-HOUR STORM.

THIS SITE IS LOCATED WITHIN THE ALAMEDA BUSINESS PARK (MASTER DRAINAGE PLAN MDP' C16-D08).

EXISTING CONDITION: THE SITE IS AN UNDEVELOPED TRACT THAT WAS MASS GRADED AS PART OF THE ALAMEDA BUSINESS PARK DEVELOPMENT. THE SITE SLOPES FROM THE NORTHEAST TO THE SOUTHWEST. PER THE MDP, THIS PROPERTY IS PERMITTED FREE DISCHARGE. RETENTION / DETENTION IS PROVIDED WITHIN A POND LOCATED AT THE EASTERN BOUNDARY OF THE OVERALL BUSINESS PARK DEVELOPMENT.

WEST EXISTING DRAINAGE CHANNEL: PER THE DRAINAGE REPORT FOR LOT 1 - ALAMEDA BUSINESS PARK, PREPARED BY RIO GRANDE ENGINEERING, DATED APRIL 2008, (C16/D6U1), LOT 1 FREE DISCHARGES 6.72 CFS TO THE EXISTING DRAINAGE CHANNEL LOCATED ALONG THE WEST PROPERTY LINE. THE EXISTING CHANNEL AT 4' WIDE X 6' HIGH, HAS A CAPACITY

PROPOSED CONDITION: THE PROPOSED IMPROVEMENTS INCLUDE A 14,000± SF BUILDING WITH DOCK, PAVED PARKING, PEDESTRIAN ACCESS AND ASSOCIATED LANDSCAPING. THE SITE WILL BE GRADED TO DISCHARGE DEVELOPED FLOW FROM IMPERVIOUS AREAS TO FIRST FLUSH RETENTION BASINS LOCATED THROUGHOUT THE SITE. ONCE THESE FILL, EXCESS WILL FREE DISCHARGE.

THE DEVELOPED SITE CONSISTS OF A SINGLE DRAINAGE BASIN WITH ALL FLOW DISCHARGE SOUTH TO PASEO ALAMEDA NE. THE INTERIOR OF THE PROPERTY HAS BEEN DIVIDED INTO 10 DRAINAGE SUB-BASINS FOR FIRST FLUSH CALCULATIONS (SEE DRAINAGE SUB-BASINS AND ASSOCIATED CALCULATIONS THIS SHEET.)

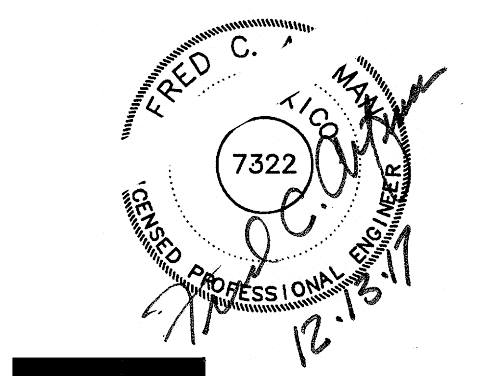
ISAACSON & ARFMAN, P.A.
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque, New Mexico 87108
Ph. 505-268-8828 www.isacil.com

ARCHITECTURE / DESIGN / INSPIRATION

DEKKER
PERICH
SABATINI

7601 JEFFERSON NE, SUITE 101
ALBUQUERQUE, NM 87109

505.761.9700 / DPSDESIGN.ORG



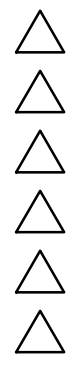
SEAL

PROJECT

Industrial Water Engineering
8701 Alameda Park Drive NE
Albuquerque, NM 87113

100%
CONSTRUCTION
DOCUMENTS

REVISIONS



DRAWN BY

REVIEWED BY

DATE 12/14/2017

PROJECT NO. 16-0113

DRAWING NAME

GRADING AND
DRAINAGE CALCS
AND DETAILS

SHEET NO.

CG-501

OF