CITY OF ALBUQUERQUE

September 26, 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 9/12/17
Hydrology File: C16D006LL

Dear Mr. Arfman:

Based on the information provided in the submittal received on 9/14/17 the above-referenced submittal cannot be approved for Site Plan for Building Permit until the following are corrected:

1. Label the plan as "Conceptual, Not For Construction." If this is intended as the building permit plan, then all building permit comments will need to be addressed prior to SPBP.

2. It is unclear what sub-basins drain to which ponds and if the ponds are large enough for their contributing drainage areas. Clearly show where each sub-basin drains to and what the required vs. provided first flush volume is at each pond.

3. Payment of cash-in-lieu for the first flush volume not captured is required [$8.00/CF x (CF of bypass flows)].

Prior to Building Permit the following will need to be addressed:

1. Correct text size on callouts to be 0.10" or larger; this applies mostly to the survey info for the water valves, drop inlets, and storm drain.

2. Call-out top of pond, bottom of pond, and volume on sheet CG-101.

3. Clarify the drainage rundown along the west side of the lots. If the Asphalt curb is removed, how will flows route to pond P5? If the intent is to convey new flows in the rundown, it will need to get routed through the pond before discharging to the street.

4. This project will require an ESC plan, submitted to the Storm Water Quality Engineer (Curtis Cherne, PE ccherne@cabq.gov, 924-3420).

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Orig: Drainage file

CITY OF ALBUQUERQUE

5. A Private Facility Drainage Covenant is required for the first flush ponds. The original notarized form, pond exhibit, and recording fee ($25 payable to City of Albuquerque) must be turned into DRC (4th, Plaza del Sol) for routing. Please contact Charlotte LaBadie (clabadie@cabq.gov, 924-3996) or Madeline Carruthers (mtafoya@cabq.gov, 924-3997) regarding the routing and recording process for covenants.

6. Additional comments may be provided at Building Permit, based on the outcome of the above remarks.

Prior to Hydrology approval for Certificate of Occupancy, the Private Facility Drainage Covenant must be recorded with Bernalillo County and a copy included with the drainage certification.

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

Sincerely,

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

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

Orig: Drainage file

City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Industrial Water Engineering Building Permit #: _____ City Drainage #: C16

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

Legal Description: Lots 2 & 3, Alameda Business Park

City Address: 8701 Alameda Park Drive NE - Albuquerque, NM 87113

Engineering Firm: Isaacson & Arfman, P.A. Contact: Fred C. Arfman or Bryan J. Bobrick

Address: 128 Monroe Street NE - Albuquerque, NM 87108

Phone#: (505) 268-8828 Fax#: _____ E-mail: freda@iacivil.com
bryanb@iacivil.com

Owner: _____ Contact: _____

Address: _____

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

Architect: Dekker Perich Sabatini Contact: _____

Address: 7601 Jefferson Street NE, Suite 100 - Albuquerque, NM 87109

Phone#: (505) 761-9700 Fax#: _____ E-mail: _____

Other Contact: Cartesian Surveys, Inc. Contact: Will W. Plotner, Jr.

Address: P.O. Box 44414 - Rio Rancho, NM 87174

Phone#: (505) 896-3050 Fax#: _____ E-mail: _____

Check all that Apply:

DEPARTMENT:

X HYDROLOGY/ DRAINAGE
_____ TRAFFIC/ TRANSPORTATION
_____ MS4/ EROSION & SEDIMENT CONTROL

TYPE OF SUBMITTAL:

_____ ENGINEER/ ARCHITECT CERTIFICATION

_____ CONCEPTUAL G & D PLAN
X GRADING PLAN
_____ DRAINAGE MASTER PLAN
_____ DRAINAGE REPORT
_____ CLOMR/LOMR

_____ TRAFFIC CIRCULATION LAYOUT (TCL)
_____ TRAFFIC IMPACT STUDY (TIS)
_____ EROSION & SEDIMENT CONTROL PLAN (ESC)

_____ OTHER (SPECIFY) _____

IS THIS A RESUBMITTAL?: _____ Yes X No

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

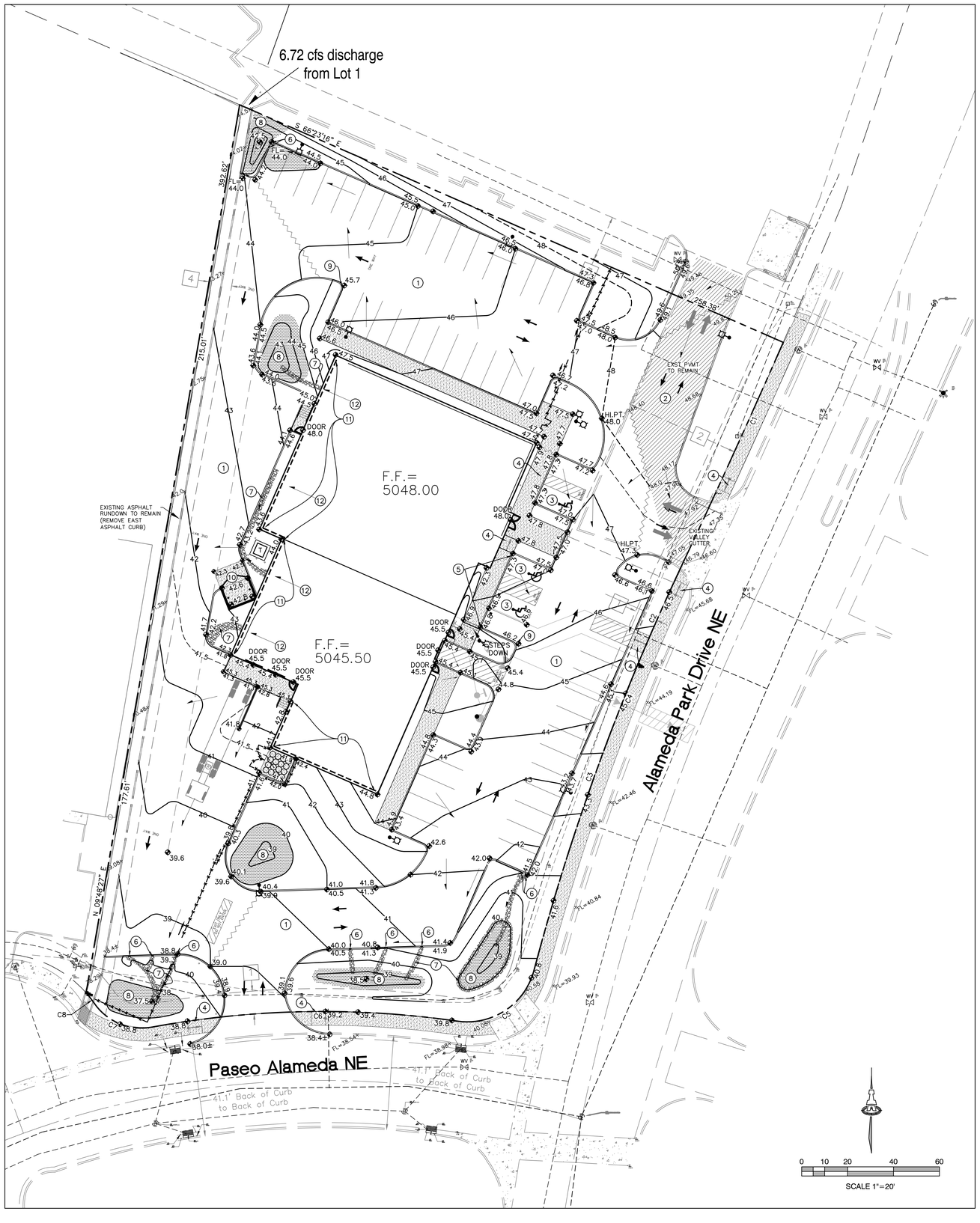
X BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY

_____ PRELIMINARY PLAT APPROVAL
_____ SITE PLAN FOR SUB'D APPROVAL
X SITE PLAN FOR BLDG. PERMIT APPROVAL
_____ FINAL PLAT APPROVAL
_____ SIA/ RELEASE OF FINANCIAL GUARANTEE
_____ FOUNDATION PERMIT APPROVAL
X GRADING PERMIT APPROVAL
_____ SO-19 APPROVAL
_____ PAVING PERMIT APPROVAL
_____ GRADING/ PAD CERTIFICATION
_____ WORK ORDER APPROVAL
_____ CLOMR/LOMR

_____ PRE-DESIGN MEETING
_____ OTHER (SPECIFY) _____

DATE SUBMITTED: September 14, 2017 By: Fred C. Arfman

COA STAFF: ELECTRONIC SUBMITTAL RECEIVED: ___



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 NOT 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. 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. 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.

S. A CURRENT STORMWATER CONTROL PERMIT, INCLUDING AN EROSION SEDIMENT CONTROL PLAN (E.S.C.) IS REQUIRED FOR ALL CONSTRUCTION, DEMOLITION CLEARING, AND GRADING OPERATIONS THAT DISTURB THE SOIL ON ONE ACRE OR MORE OF LAND. OWNER WILL COORDINATE.

T. POST-CONSTRUCTION MAINTENANCE FOR PRIVATE STORMWATER FACILITIES WILL BE THE RESPONSIBILITY OF THE FACILITIES OWNER.

U. ADJUST ANY RIMS OF EXISTING UTILITY FEATURES AS NECESSARY TO MATCH NEW GRADES. UTILITIES IN PAVED AREAS SHALL BE HS-25 TRAFFIC RATED.

V. PAVING AND ROADWAY GRADES SHALL BE ±0.1' FROM PLAN ELEVATIONS. BUILDING FINISH FLOOR ELEVATION SHALL BE ±0.05' FROM PLAN ELEVATION.

W. WHERE GRADES BETWEEN NEW AND EXISTING ARE SHOWN AS 'MATCH' OR '±', TRANSITIONS SHALL BE SMOOTH.

X. 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.).

Y. 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.

Z. 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.

AA. DEPRESS LANDSCAPING FOR WATER HARVESTING. NOTE: NO WATER HARVESTING SHALL OCCUR WITHIN 10' OF BUILDING.

CONSTRUCTION STAKING

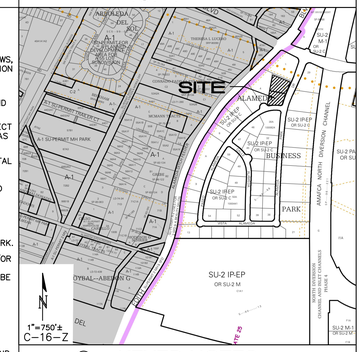
UPON WRITTEN REQUEST COORDINATED THROUGH THE PROJECT ARCHITECT, THE ELECTRONIC FILE OF THE GRADING AND DRAINAGE WILL BE PROVIDED TO THE CONTRACTOR FOR VERTICAL CONTROL. DO NOT USE THIS PLAN FOR PROJECT STAKING.

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

LEGEND

×4958.63	EXISTING SPOT ELEVATION
4958	EXISTING CONTOUR
78	PROPOSED CONTOUR
78.3	PROPOSED SPOT ELEVATION
	FLOW ARROW
FF = 4965.8	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 12" 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. 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.
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.

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 (NAVD 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. 35001C 136 G, EFFECTIVE DATE 9-26-2008.

ENGINEER: FRED C. ARFMAN, PE
ISAACSON & ARFMAN, P.A.
128 MONROE ST NE, ABQ. 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.iacivil.com

ARCHITECTURE / DESIGN / INSPIRATION

DEKKER PERICH SABATINI

7601 JEFFERSON NE, SUITE 100
ALBUQUERQUE, NM 87109

505.761.9700 / DPSDESIGN.ORG

FRED C. ARFMAN NEW MEXICO 7322 REGISTERED PROFESSIONAL ENGINEER 05-12-17

SEAL

PROJECT

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

PROGRESS SET
08/23/2017

REVISIONS

DRAWN BY	
REVIEWED BY	
DATE	07/11/2017
PROJECT NO.	16-0113

DRAWING NAME

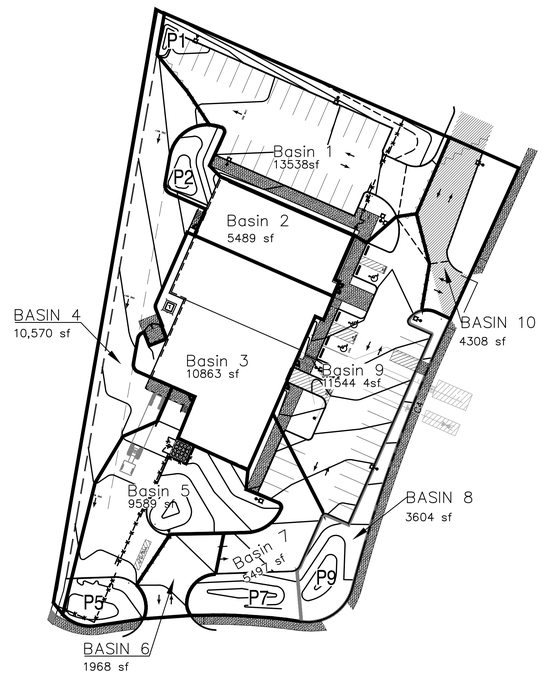
GRADING & DRAINAGE PLAN

SHEET NO.

CG-101

OF

DRAINAGE SUB-BASINS FOR FIRST FLUSH RETENTION



POND P1		
Contour	Area	Volume
5044.00	440	
5042.50	12	339 CF
TOTAL VOL.		**339** CF

POND P2		
Contour	Area	Volume
5044.00	468	
5043.00	81	275 CF
TOTAL VOL.		**275** CF

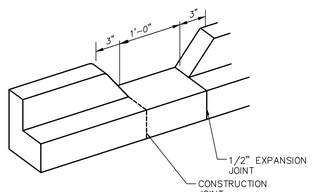
POND P5		
Contour	Area	Volume
5038.00	395	
5037.50	23	105 CF
TOTAL VOL.		**105** CF

POND P7		
Contour	Area	Volume
5039.50	379	
5038.50	20.3	200 CF
TOTAL VOL.		**200** CF

POND P9		
Contour	Area	Volume
5040.50	295	
5039.00	45	255 CF
TOTAL VOL.		**255** CF

FIRST FLUSH BASINS ARE PROVIDED THROUGHOUT THE SITE TO ACCOMMODATE THE FIRST FLUSH FROM THE MAJORITY OF THE ON-SITE DRAINAGE SUB-BASINS.

Drainage Sub-basin	Impervious Area	First Flush Calculation	
1	11778 SF	334 CF	FIRST FLUSH POND P1
2	4940 SF	140 CF	FIRST FLUSH POND P2
3	10646 SF	302 CF	DISCHARGE PASSES THROUGH LANDSCAPE SWALE
4	10570 SF	299 CF	COMBINES WITH LOT 1 DISCHARGE
5	3836 SF	109 CF	FIRST FLUSH POND P5
6	1968 SF	56 CF	DIRECT DISCHARGE TO STREET
7	2199 SF	62 CF	FIRST FLUSH POND P7
8	0 SF	0 CF	NO IMPERVIOUS AREA
9	10505 SF	298 CF	FIRST FLUSH POND P9
10	2671 SF	76 CF	DIRECT DISCHARGE TO STREET



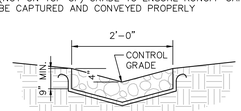
GENERAL NOTES

1. 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 4" DIA. (AVG.=3")
- 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.

ON-SITE DRAINAGE SUB-BASIN CALCULATIONS

BASIN NO. 1 — **DESCRIPTION** Draining to West Pond
Area of basin flows = 13538 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 = 1.96 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 2215 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 1.4 cfs
LAND TREATMENT: A = 0%; B = 8%; C = 5%; D = 87%
FIRST FLUSH VOL. 334 CF

BASIN NO. 2 — **DESCRIPTION** Draining to East Parking
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 = 2.00 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 916 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 0.6 cfs
LAND TREATMENT: A = 0%; B = 5%; C = 5%; D = 90%
FIRST FLUSH VOL. 140 CF

BASIN NO. 3 — **DESCRIPTION** Self Ponding with Landscaping
Area of basin flows = 10863 SF = 0.2 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 = 2.10 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 1901 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 1.2 cfs
LAND TREATMENT: A = 0%; B = 0%; C = 2%; D = 98%
FIRST FLUSH VOL. 302 CF

BASIN NO. 4 — **DESCRIPTION**
Area of basin flows = 10570 SF = 0.2 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.
Sub-basin Volume of Runoff (see formula above): V_{360} = 1867 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 1.1 cfs
LAND TREATMENT: A = 0%; B = 0%; C = 0%; D = 100%
FIRST FLUSH VOL. 299 CF

BASIN NO. 5 — **DESCRIPTION**
Area of basin flows = 9589 SF = 0.2 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 = 1.40 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 1122 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 0.8 cfs
LAND TREATMENT: A = 0%; B = 35%; C = 25%; D = 40%
FIRST FLUSH VOL. 109 CF

BASIN NO. 6 — **DESCRIPTION**
Area of basin flows = 1968 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.
Sub-basin Volume of Runoff (see formula above): V_{360} = 348 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 0.2 cfs
LAND TREATMENT: A = 0%; B = 0%; C = 0%; D = 100%
FIRST FLUSH VOL. 56 CF

BASIN NO. 7 — **DESCRIPTION**
Area of basin flows = 5497 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 = 1.44 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 659 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 0.4 cfs
LAND TREATMENT: A = 0%; B = 25%; C = 35%; D = 40%
FIRST FLUSH VOL. 62 CF

BASIN NO. 8 — **DESCRIPTION**
Area of basin flows = 3604 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 = 0.99 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 297 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 0.2 cfs
LAND TREATMENT: A = 0%; B = 40%; C = 60%; D = 0%
FIRST FLUSH VOL. 0 CF

BASIN NO. 9 — **DESCRIPTION**
Area of basin flows = 11544 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 = 2.01 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 1937 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 1.2 cfs
LAND TREATMENT: A = 0%; B = 5%; C = 4%; D = 91%
FIRST FLUSH VOL. 298 CF

BASIN NO. 10 — **DESCRIPTION**
Area of basin flows = 4308 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 = 1.66 in.
Sub-basin Volume of Runoff (see formula above): V_{360} = 596 CF
Sub-basin Peak Discharge Rate: (see formula above): Q_P = 0.4 cfs
LAND TREATMENT: A = 0%; B = 24%; C = 14%; D = 62%
FIRST FLUSH VOL. 76 CF

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

	Treatment SF	%
Area A =	0	0%
Area B =	9237.36	12%
Area C =	8467.58	11%
Area D =	59273.06	77%
Total Area =	76978	100%

FREE DISCHARGE MAX.

	Treatment SF	%
Area A =	0	0%
Area B =	3849	5%
Area C =	7698	10%
Area D =	65431	85%
Total Area =	76978	100%

EXCESS PRECIP: Precip. Zone 2
E_A = 0.53
E_B = 0.78
E_C = 1.13
E_D = 2.12

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 =	1.85 in.	Developed E =	1.95 in.

On-Site Volume of Runoff: V360 = E*A / 12

Historic V_{360} =	11869 CF	Developed V_{360} =	12535 CF

On-Site Peak Discharge Rate: $Qp = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D / 43{,}560$

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 =	7.8 CFS

THE FULLY DEVELOPED PROPERTY WILL DISCHARGE 7.8 CFS (MAXIMUM) DURING THE 100-YEAR 6-HOUR STORM.

THIS SITE IS LOCATED WITHIN THE ALAMEDA BUSINESS PARK (MASTER DRAINAGE PLAN 'MDP' C16-D06).

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.)

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PROGRESS SET
08/23/2017

REVISIONS
1
2
3
4
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DRAWN BY
REVIEWED BY
DATE 07/11/2017
PROJECT NO. 16-0113

DRAWING NAME
GRADING AND DRAINAGE CALCS AND DETAILS

SHEET NO.
CG-501
OF