

CITY OF ALBUQUERQUE



Timothy M. Keller, Mayor

February 23, 2018

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

**RE: Ladera Crossing Self Storage
Grading and Drainage Plan
Engineer's Stamp Date: 02/15/18
Hydrology File: H09D028**

Dear Mr. Arfman:

PO Box 1293

Based upon the information provided in your resubmittal received 02/20/2018, the revised Grading and Drainage Plan is approved for Building Permit and Grading Permit.

Albuquerque

Please attach a copy of this approved plan in the construction sets for Building Permit processing. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

NM 87103

If you have any questions, please contact me at 924-3995 or rbrissette@cabq.gov.

www.cabq.gov

Sincerely,

Renée C. Brissette

Renée C. Brissette, P.E. CFM
Senior Engineer, Hydrology
Planning Department



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: February 16, 2018 By: Fred C. Arfman

COA STAFF: _____ ELECTRONIC SUBMITTAL RECEIVED: _____



February 6, 2018

Renée C. Brissette, P.E., CFM
City of Albuquerque
Hydrology – Planning Department

RE: Ladera Crossing Self-Storage – Hydrology File J09D026
Drainage and Grading Plan Resubmittal

Dear Ms. Brissette,

Enclosed with this letter is a revised Drainage and Grading Plan submittal for the above referenced project. Revisions provided are in response to your review comments dated January 29, 2018. The numbered responses below correspond to your numbered comments.

1. The sheets have been reformatted to 24" x 36".
2. An ESC Plan is in process, coordinated through the owner and will be submitted to Curtis Cherne, PE separately. Our client is aware that Hydrology's approval for Grading or Building Permit will not be given until the submittal has been made.
3. The drainage study reference has been added to the G&D plan.
4. Road name (Ladera Drive) has been added to the G&D plan.
5. A note has been added stating that the emergency spillway from AMAFCA's Ladera Dam System is directed at Tract 5-A-1C1 and Tract 5-A-1C2.
6. A Private Facility Drainage Covenant per Chapter 17 of the DPM for each tracts retention pond is attached. These will be filed following your review.
7. A written agreement from Tract 5-A-C2 Owner stating that grading can be conducted on their property for the benefit of Tract 5-A-1C1 is attached.
8. The upstream off-site basin has been added to Basin #1. See Exhibit A.
9. Existing / Proposed 100-year 6-hour calculations have been added to the plan.
10. Pipe calculations are attached. See Exhibit B.

Please let me or Fred Arfman, PE know if you have any questions or comments.

Thank you,

Isaacson & Arfman, PA

Bryan J Bobrick

Bryan Bobrick
Project Manager

EXHIBIT A – Off-site Basin contributing to Basin #1

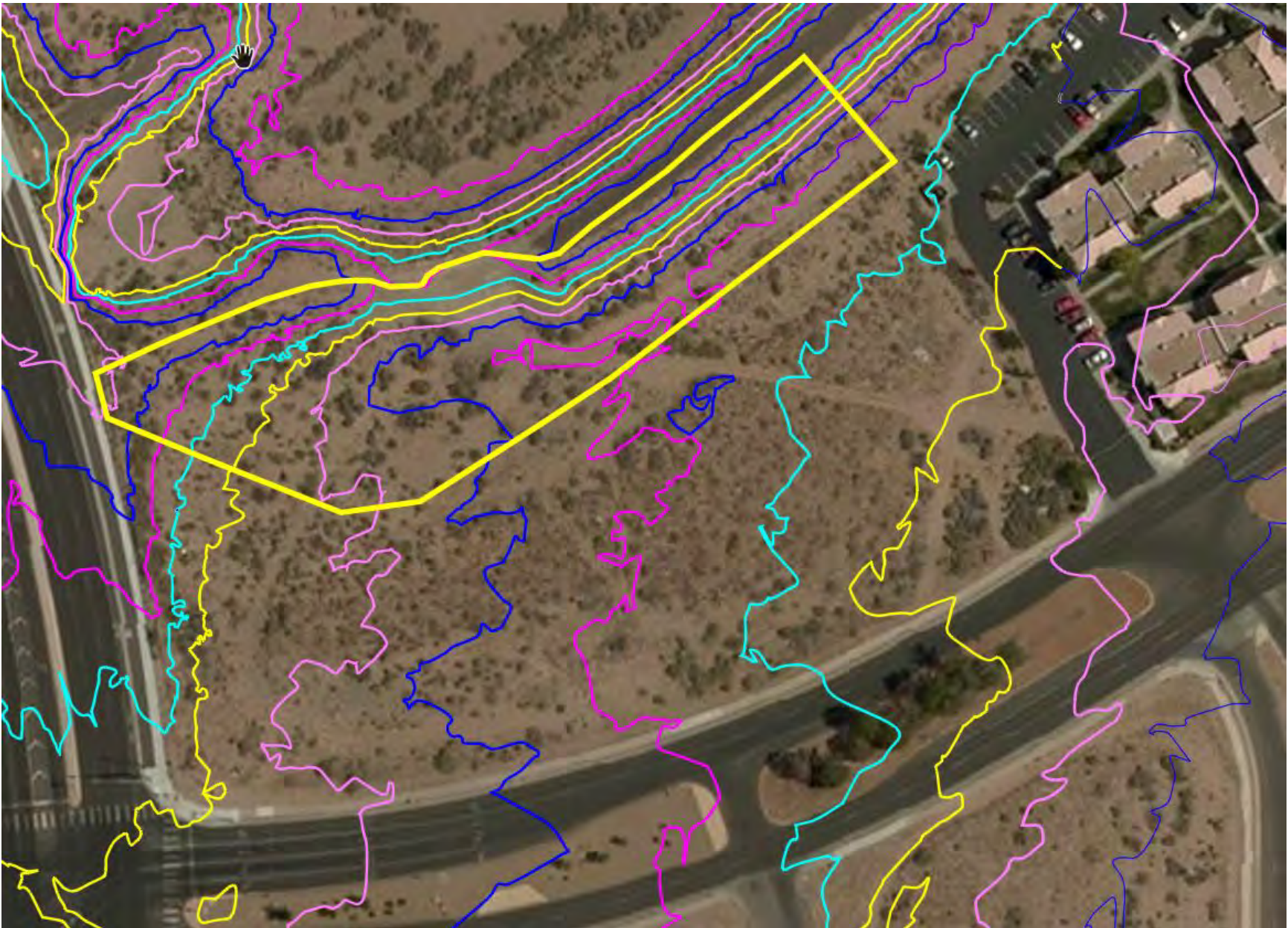


EXHIBIT B – Storm Drain Calculations – Basin #1

The proposed storm drain will collect discharge from Basin 1 + off-site Basin O1 at the Pond P1 inlet and route to Pond P4 and then to Ladera Drive to follow historic flowpaths.

Basin 1: 100-year 6-hour = 2.3 cfs

Basin O1: 100-year 6-hour = 3.1 cfs

Total Q100-year 6-hour = 5.4 cfs

Circular Culvert

Invert Elev Dn (ft) = 5179.70
 Pipe Length (ft) = 200.00
 Slope (%) = 1.15
 Invert Elev Up (ft) = 5182.00
 Rise (in) = 15.0
 Shape = Circular
 Span (in) = 15.0
 No. Barrels = 1
 n-Value = 0.012
 Culvert Type = Circular Culvert
 Culvert Entrance = Smooth tapered inlet throat
 Coeff. K,M,c,Y,k = 0.534, 0.555, 0.0196, 0.9, 0.2

Embankment

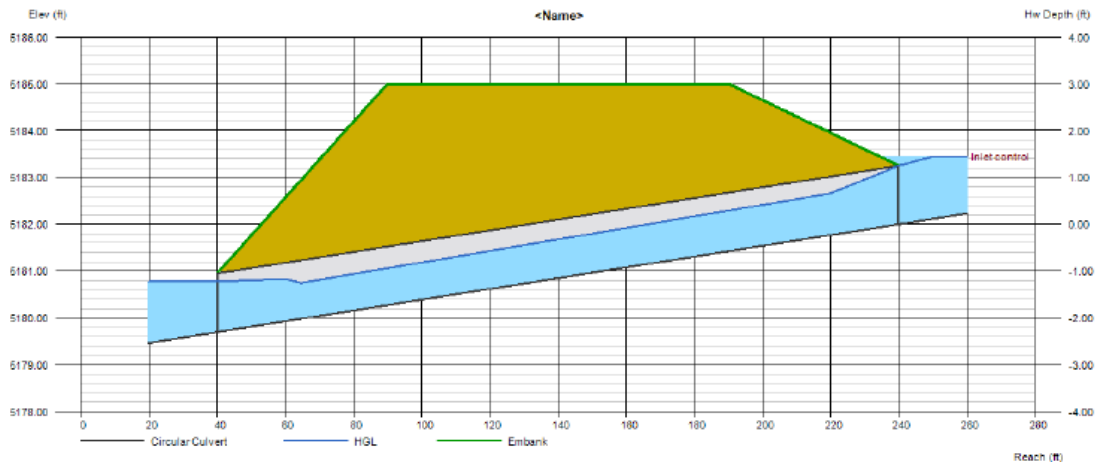
Top Elevation (ft) = 5185.00
 Top Width (ft) = 100.00
 Crest Width (ft) = 0.00

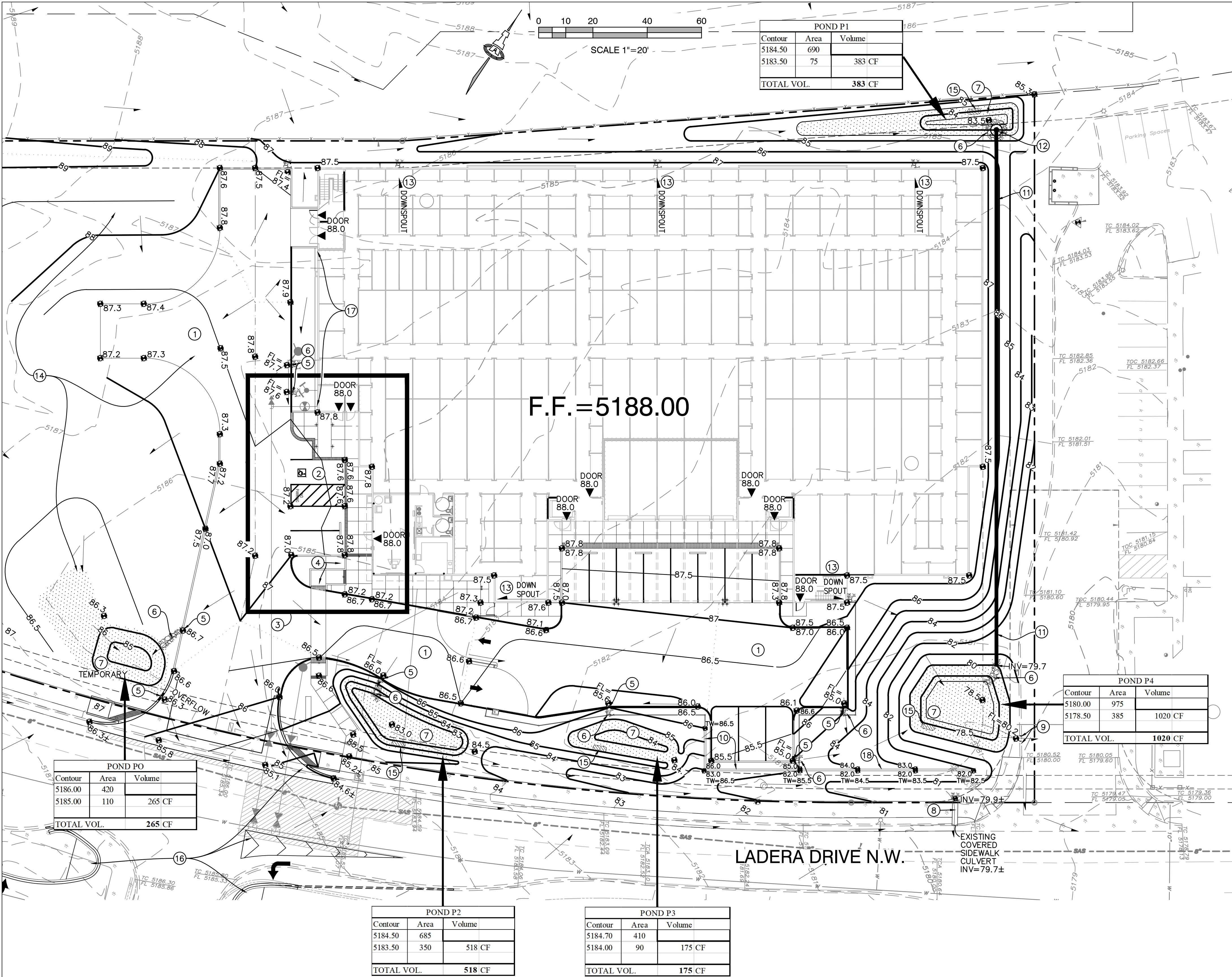
Calculations

Qmin (cfs) = 0.00
 Qmax (cfs) = 5.10
 Tailwater Elev (ft) = (dc+D)/2

Highlighted

Qtotal (cfs) = 5.00
 Qpipe (cfs) = 5.00
 Qovertop (cfs) = 0.00
 Veloc Dn (ft/s) = 4.44
 Veloc Up (ft/s) = 5.25
 HGL Dn (ft) = 5180.78
 HGL Up (ft) = 5182.91
 Hw Elev (ft) = 5183.44
 Hw/D (ft) = 1.15
 Flow Regime = Inlet Control





PROJECT DATA

PROPERTY: THE SITE IS AN UNDEVELOPED COMMERCIAL PROPERTY WITHIN C.O.A. VICINITY MAP H-9. THE SITE IS BOUND TO THE WEST BY UNDEVELOPED COMMERCIAL PROPERTY, TO THE EAST BY DEVELOPED MULTI-FAMILY, TO THE NORTH BY AMAFCA REGIONAL PONDS AND TO THE SOUTH BY LADERA DRIVE.

SITE AREA: 1.6 ACRES.

PROPOSED IMPROVEMENTS: THE PROPOSED IMPROVEMENTS INCLUDE A MULTI-STORY SELF STORAGE FACILITY WITH ASSOCIATED PAVED PARKING, PEDESTRIAN WALKS, DRAINAGE IMPROVEMENTS AND LANDSCAPING.

LEGAL: EAST PORTION OF TRACT 5-A-1C1, EL RANCHO ATRISCO PHASE III CITY OF ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO.

BENCHMARK: VERTICAL DATUM IS BASED UPON THE ALBUQUERQUE CONTROL SURVEY BENCHMARK "3-H10", ELEVATION = 5196.15 (NAVD 1988)

OFF-SITE: A PORTION OF OPEN SPACE TO THE NORTH WILL CONTINUE TO DRAIN INTO THIS PROPERTY. THIS FLOW IS ADDED TO ON-SITE BASIN 1 AND WILL BE ROUTED THROUGH THE PROPOSED STORM DRAIN AND DISCHARGED TO LADERA DRIVE TO FOLLOW THE HISTORIC FLOWPATH. IN ADDITION, OWNER IS AWARE THAT THERE IS AN EMERGENCY SPILLWAY FROM AMAFCA'S LADERA DAM SYSTEM WHICH WOULD DIRECT STORMWATER INTO TRACTS 5-A-1C1 AND 5-A-1C2.

FLOOD HAZARD: 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. 35001C0326 J, EFFECTIVE DATE 11-04-2016.

DRAINAGE PLAN CONCEPT: THIS SITE IS INCLUDED IN THE 'LADERA DRIVE IMPROVEMENTS - GAVIN ROAD TO COORS BLVD - DRAINAGE ANALYSIS MEMO' BY PERSONS BRINCKERHOFF, DATED AUGUST 10, 2015. FLOW FROM THE ADJACENT PROPERTY TO THE WEST (INCLUDING THE WEST HALF OF THE SHARED ACCESS DRIVE) WILL BE DIRECTED TO AN OFF-SITE TEMPORARY FIRST FLUSH / SEDIMENT CONTROL POND. EXCESS WILL OVERFLOW AT THE WEST ENTRANCE DRIVE TO LADERA DRIVE.

THE PROPOSED IMPERVIOUS AREA WILL DRAIN TO FIRST FLUSH RETENTION PONDS AS REQUIRED. EXCESS WILL DISCHARGE TO LADERA DRIVE. TO FOLLOW HISTORIC FLOWPATHS.

FIRST FLUSH: 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 SHOWN. STORM WATER FROM THE IMPERVIOUS AREAS SHALL BE DIRECTED TO THESE PONDS.

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

SURVEYOR: RUSS P. HUGG, NMPS NO. 9750
SURV-TEK, INC.
9384 VALLEY VIEW DR. NW, 87114
TELEPHONE: (505) 897-3366

EROSION CONTROL

THE PROPOSED LANDSCAPING OF THIS PROPERTY IS TO INCLUDE 3/4" TO 7/8" DECORATIVE GRAVEL OVER FILTER MATERIAL. LARGER DIAMETER EROSION CONTROL ROCK (3" AVG.) IS TO BE PROVIDED AT ROOF DISCHARGE POINTS AND AS NOTED PER KEYED NOTE #6. ENGINEER RECOMMENDS OWNER INSPECT PROPERTY YEARLY AND AFTER STORM EVENTS TO DETERMINE WHERE ADDITIONAL EROSION PROTECTION IS REQUIRED.

CONSTRUCTION STAKING

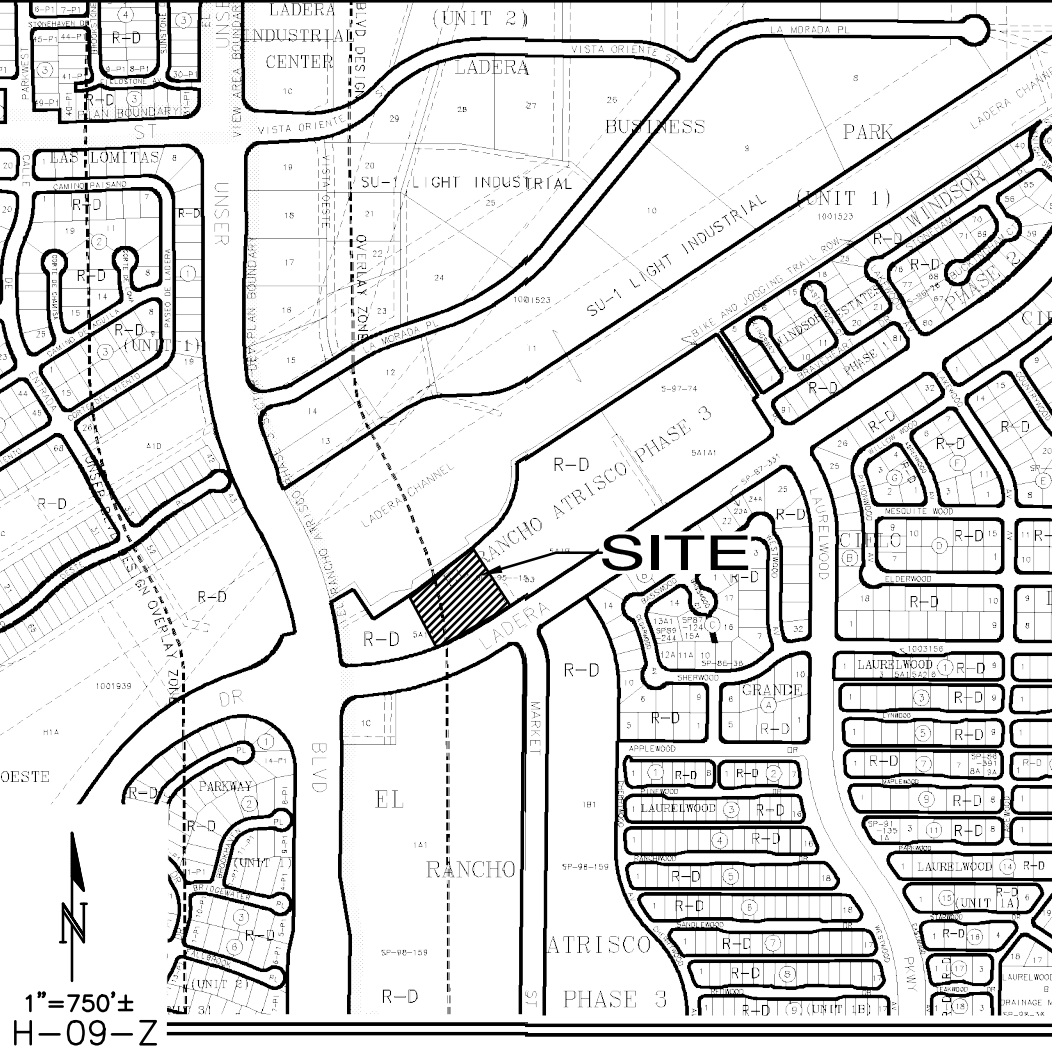
UPON WRITTEN REQUEST COORDINATED THROUGH THE PROJECT ARCHITECT, THE ELECTRONIC FILE OF THE GRADING AND DRAINAGE WILL BE PROVIDED TO THE CONTRACTOR FOR VERTICAL CONTROL. DO NOT USE THIS PLAN FOR PROJECT STAKING.

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

LEGEND

- 5303.01 — — — — — EXISTING SPOT ELEVATION
- 5303.5 — — — — — EXISTING CONTOUR
- 02 — — — — — PROPOSED CONTOUR (1' INCREMENT)
- ◆ 02.3 PROPOSED SPOT ELEVATION
- TW, FL, INV TOP OF WALL, FLOWLINE, INVERT
- FLOW ARROW
- F.F.= FINISH FLOOR ELEVATION
- — — — — GRADE BREAK
- PROPOSED FIRST FLUSH RETENTION PONDING AREA
- PERCOLATION TRENCH
- LIMITS OF EROSION CONTROL

VICINITY MAP



KEYED NOTES

- CONSTRUCT PROPOSED PAVING / WALKS / CURB AND GUTTER TO ELEVATIONS SHOWN. SEE PAVING PLAN FOR PAVEMENT MATERIAL, EXTENTS, SECTIONS, PARKING LAYOUT, DIMENSIONS, STRIPING, ETC. PROVIDE SMOOTH TRANSITION TO EXISTING.
- CONSTRUCT HC PARKING AREA TO ADA STANDARDS. MAX. 2% SLOPE IN ANY DIRECTION.
- SEE ENLARGED ENTRY GRADES THIS SHEET FOR 0.1' CONTOUR INFORMATION TO CLARIFY GRADING CONCEPT.
- CONSTRUCT ADA COMPLIANT HANDICAP ACCESS RAMP AT ELEVATIONS SHOWN. MAX. 2% CROSS-SLOPE.
- PROVIDE 2.0' WIDE CURB OPENING AT FLOWLINE SHOWN. SEE CG5.1.
- INSTALL 6" THICK ROCK EROSION PROTECTION AT CURB OPENINGS AND TO LIMITS SHOWN. SEE CG5.1.
- DOT HATCHED AREA REPRESENTS EXTENTS OF 'FIRST FLUSH' RETENTION PONDING. CONSTRUCT TO ELEVATIONS SHOWN.
- EXISTING COVERED SIDEWALK CULVERT. CONTRACTOR TO CLEAN AND REMOVE ANY MATERIAL BLOCKING ACCESS TO FLOW.
- SAWCUT TWO 24" WIDE (BOTTOM WIDTH) OPENINGS IN EXISTING CONCRETE CURB.
- CONSTRUCT RETAINING WALL (MAXIMUM 3' RETAINING) TO ACHIEVE GRADE TRANSITIONS SHOWN. GRADES PROVIDED EACH SIDE REFLECT FINISH GRADES. SEE ARCHITECTURAL FOR INFORMATION RE: STRUCTURAL DESIGN, ADDITIONAL WALL HEIGHT, CONSTRUCTION DETAILS, WEEPHOLES, ETC.
- INSTALL 200 LF 15" ADS N-12WT STORM DRAIN PIPE AT INVERT ELEVATIONS SHOWN. SLOPE = 1.1%±
 - RIM = 5184.5
 - INV = 5182.0 (15"Ø)
 - SUMP = 5180.0
- ROOF DISCHARGE LOCATION. INSTALL 3'X3'X12" THICK ROCK EROSION PROTECTION AT OUTLET.
- GRADE AND CONSTRUCT WEST SIDE OF PAVED DRIVE TO ELEVATIONS SHOWN. (OUTSIDE OF PROPERTY LIMITS - WRITTEN AGREEMENT ON FILE).
- CONSTRUCT PERCOLATION TRENCH WITHIN EACH ON-SITE FIRST FLUSH POND. SEE SHEET CG5.1.
- CONSTRUCTION IN THE PUBLIC R.O.W. TO BE DONE BY PUBLIC WORK ORDER. GRADES PROVIDED ARE FOR GENERAL INFORMATION.
- CONSTRUCT 4" THICK X 18" WIDE CONCRETE MOW STRIP. TOP OF CONCRETE = 87.9 TYPICAL.
- CONSTRUCT GRADE TRANSITION (OWNER'S OPTION: BLOCK, BOULDERS, KEYSTONE) TO DIRECT DRAINAGE FROM ADJACENT PAVEMENT CURB OPENINGS IS DIRECTED TO POND P4.

FRED C. ARFMAN
NEW MEXICO
7322
Professional Engineer
February 15, 2018

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

2228 CG-101.dwg Feb 15, 2018

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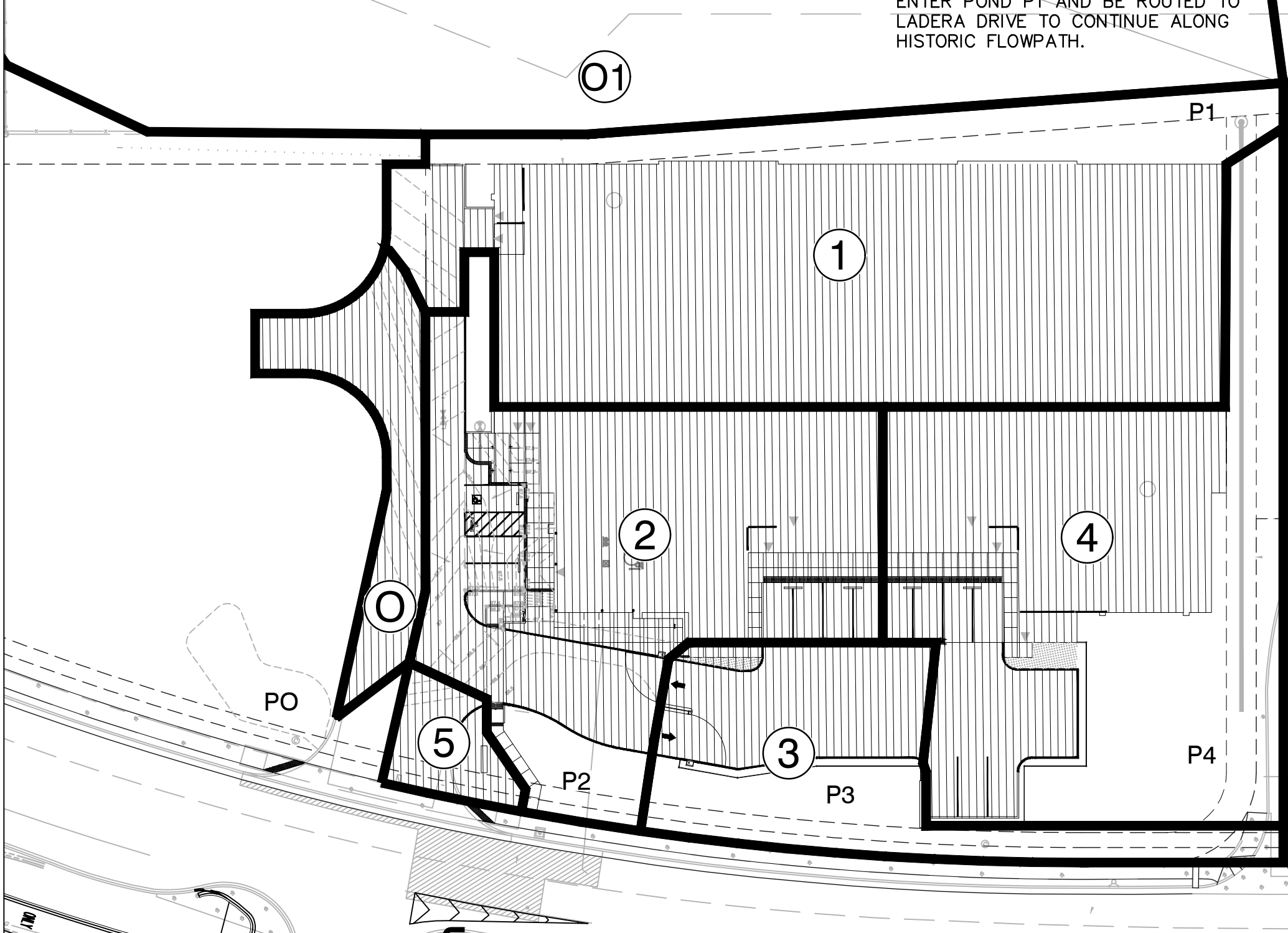
LADERA CROSSING SELF-STORAGE LADERA DR. & UNSER BLVD. NW TITAL DEVELOPMENT

GRADING & DRAINAGE PLAN

Date: 02/15/18	No. Revision:	Date:	Job No. 2228
Drawn By: BJB			CG1.1
Ckd By: FCA			SH. OF

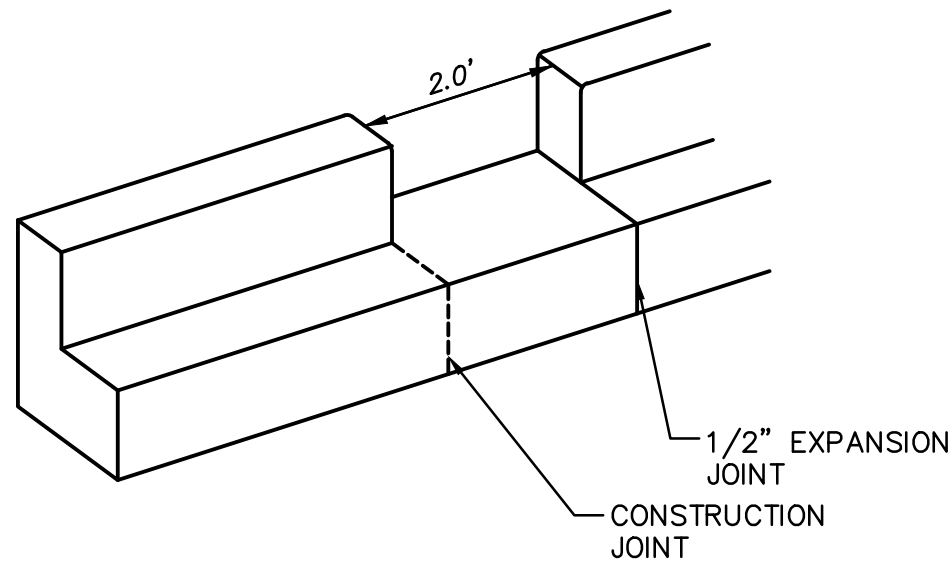
BASIN NO.	01	DESCRIPTION	Off-site basin impacting along the north property boundary.
Area of basin flows =	54607 SF	1.3 Ac.	
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)		LAND TREATMENT	
Weighted E =	0.83 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	50%
V ₆₀₀ =	3777 CF	C =	50%
Sub-basin Peak Discharge Rate: (see formula above)		D =	0%
Q _p =	3.1 cfs		

BASIN 01 IS AN HISTORIC OFF-SITE BASIN WHICH WILL CONTINUE TO DRAIN EAST ALONG THE NORTH SIDE OF THE PROPERTY. THIS BASIN (APPROXIMATELY 1.3 ACRES) WILL GENERATE 3.1 CFS. FLOW AND WILL ENTER POND P1 AND BE ROUTED TO LADERA DRIVE TO CONTINUE ALONG HISTORIC FLOWPATH.



= IMPERVIOUS AREA

0 20 40 80 120
SCALE 1"=40'



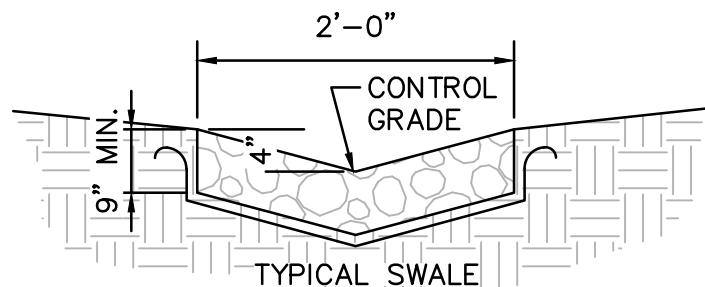
GENERAL NOTES

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

CURB OPENING

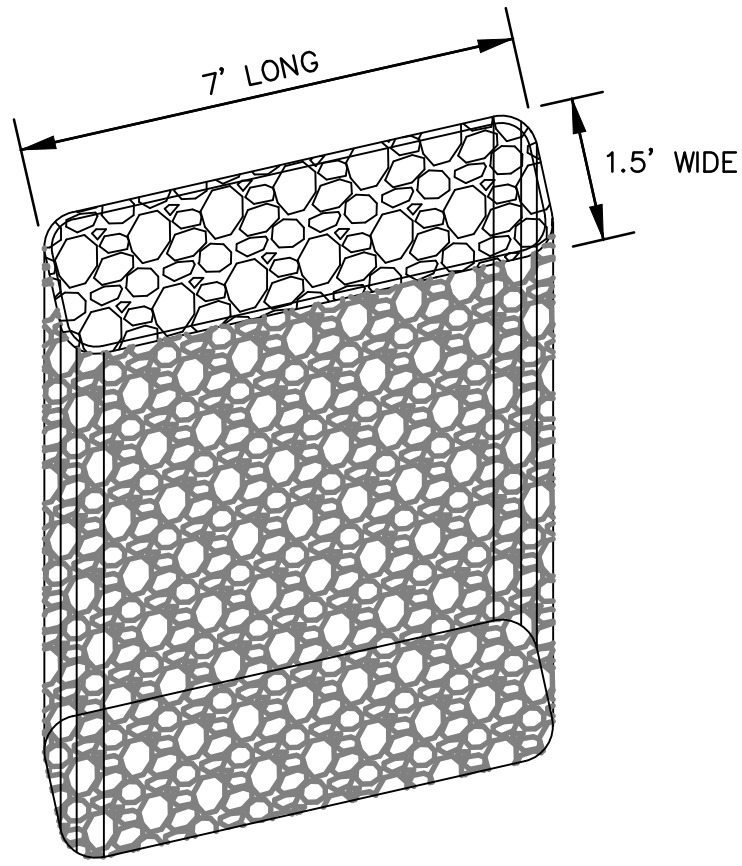
SCALE: N.T.S.

- VARY ANGULAR FACE ROCK SIZE BETWEEN 2" AND 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.



TYPICAL DIMENSIONS

PERCOLATION TRENCH

1.5" WIDE X 7.0' LONG X DEPTH (TYPICAL)
EXTEND 6" MIN. OR TO 18" BELOW BOTTOM OF CLAY LAYER IF ENCOUNTERED WITHIN 6' DEPTH. MAY VARY BASED ON LOCATION.

SCALE: N.T.S.

BASIN NO.	1	DESCRIPTION	To First Flush Pond #1
Area of basin flows =	26042 SF		0.6 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)		LAND TREATMENT	
Weighted E =	1.69 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	15%
V ₆₀₀ =	3661 CF	C =	9%
Sub-basin Peak Discharge Rate: (see formula above)		D =	76%
Q _p =	2.3 cfs	FF=	561 CF
BASIN NO.	2	DESCRIPTION	To First Flush Pond #2
Area of basin flows =	16507 SF		0.4 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)		LAND TREATMENT	
Weighted E =	1.82 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	10%
V ₆₀₀ =	2504 CF	C =	2%
Sub-basin Peak Discharge Rate: (see formula above)		D =	88%
Q _p =	1.6 cfs	FF=	412 CF
BASIN NO.	3	DESCRIPTION	To First Flush Pond #3
Area of basin flows =	7703 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)		LAND TREATMENT	
Weighted E =	1.34 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	30%
V ₆₀₀ =	863 CF	C =	24%
Sub-basin Peak Discharge Rate: (see formula above)		D =	46%
Q _p =	0.6 cfs	FF=	100 CF
BASIN NO.	4	DESCRIPTION	To First Flush Pond #4
Area of basin flows =	19512 SF		0.4 Ac.
The following calculations are based on Treatment areas as shown in table to the right			
Sub-basin Weighted Excess Precipitation (see formula above)		LAND TREATMENT	
Weighted E =	1.50 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	37%
V ₆₀₀ =	2438 CF	C =	15%
Sub-basin Peak Discharge Rate: (see formula above)		D =	56%
Q _p =	1.6 cfs	FF=	310 CF
BASIN NO.	5	DESCRIPTION	Discharge to Unser Blvd. (no First Flush)
Area of basin flows =	1408 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)		LAND TREATMENT	
Weighted E =	1.97 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	0%
V ₆₀₀ =	231 CF	C =	0%
Sub-basin Peak Discharge Rate: (see formula above)		D =	100%
Q _p =	0.1 cfs	FF=	40 CF
BASIN NO.	0	DESCRIPTION	To Off-site First Flush Pond
Area of basin flows =	3388 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)		LAND TREATMENT	
Weighted E =	1.97 in.	A =	0%
Sub-basin Volume of Runoff (see formula above)		B =	0%
V ₆₀₀ =	556 CF	C =	0%
Sub-basin Peak Discharge Rate: (see formula above)		D =	100%
Q _p =	0.3 cfs	FF=	96 CF

383 CF PROVIDED IN POND P1. REMAINDER (178 CF) ROUTED TO POND P4

518 CF PROVIDED

175 CF PROVIDED IN POND P3

+178 CF FROM BASIN 1 = 488 CF 1020 CF PROVIDED IN POND P4

0 CF PROVIDED - DISCHARGE TO LADERA DRIVE

265 CF PROVIDED

FIRST FLUSH NOTES

THE FIRST FLUSH VOLUME FOR BASINS 1 THRU 4 AND THE OFF-SITE PAVED DRIVE (BASIN 0) ARE CAPTURED WITHIN THE ASSOCIATED PONDS (P1 THRU P4 AND PO).

BASIN 5 IS A PAVED ENTRY DRIVE THAT CANNOT BE DIRECTED TO AN ON-SITE FIRST FLUSH POND.

BASED ON THIS ANALYSIS, THERE IS NO FIRST FLUSH VOLUME THAT WILL BYPASS OTHER THAN THE BASIN 5 ENTRY DRIVE.

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 (ON-SITE PONDS P1, P2, P3 AND P4; OFF-SITE POND PO), IS REQUIRED. CONTRACTOR SHALL COORDINATE WITH OWNER TO PROVIDE COMPLETE AS-BUILT INFORMATION (PROVIDED BY A PROFESSIONAL SURVEYOR).

DISCHARGE TO LADERA DR. NW

THE FULLY DEVELOPED PROPERTY 100-YEAR 6-HOUR STORM DISCHARGE RATE = 6.2 CFS.

EXISTING CONDITION: THE SITE IS AN UNDEVELOPED TRACT THAT SLOPES FROM THE NORTHWEST TO THE SOUTHEAST DISCHARGING 3.3 (Q100-6HR) CFS TO LADERA DR. VIA A 2' WIDE COVERED SIDEWALK CULVERT.

PROPOSED CONDITION: THE PROPOSED IMPROVEMENTS INCLUDE A 34,050± SF BUILDING (FOOTPRINT) WITH PAVED DRIVES, PARKING, PEDESTRIAN ACCESS AND ASSOCIATED LANDSCAPING. THE SITE WILL BE GRADED TO PASS FLOW FROM IMPERVIOUS AREAS TO FIRST FLUSH RETENTION BASINS LOCATED THROUGHOUT THE SITE.

THE DEVELOPED SITE CONSISTS OF FIVE DRAINAGE SUB-BASINS RELATING TO FIRST FLUSH (SEE BASIN EXHIBIT AT LEFT).

SUB-BASINS 1 (2.2 CFS) AND 4 (1.6 CFS) = 3.8 CFS TO DISCHARGE TO THE EAST PROPERTY ACCESS DRIVE VIA TWO 2' WIDE CURB OPENINGS.

SUB-BASINS 2 (1.6 CFS) AND 3 (0.6 CFS) = 2.2 CFS TO DISCHARGE TO LADERA DR. VIA THE EXISTING COVERED SIDEWALK CULVERT.

SUB-BASIN 5 TO RELEASE TO LADERA DR. VIA THE PROPOSED WEST ACCESS DRIVE.

NOTE: PER THE WEIR CALCULATION, EACH 2' WIDE X 8" HIGH OPENING HAS A MAX. 2.8 CFS CAPACITY.

2" WIDE X 8" HIGH BROAD CRESTED WEIR

Rectangular Weir
Crest = Broad
Bottom Length (ft) = 2.00
Total Depth (ft) = 0.67

Calculations
Weir Coeff. C_w = 2.60

Highlighted
Depth (ft) = 0.67
Q (cfs) = 2.852
Area (sqft) = 1.34
Velocity (ft/s) = 2.13
Top Width (ft) = 2.00

OFF-SITE BASIN 0 IS THE PORTION OF THE ADJACENT PROPERTY THAT WILL BE PAVED. FIRST FLUSH VOLUME IS PROVIDED IN POND PO.

OFF-SITE BASIN 01 IS AN HISTORIC OFF-SITE BASIN WHICH WILL GENERATE 3.1 CFS. FLOW AND WILL ENTER POND P1 AND BE ROUTED TO LADERA DRIVE TO CONTINUE ALONG HISTORIC FLOWPATH.

100-YEAR 6-HOUR CALCULATIONS

AREA OF SITE:		70685	SF	=	1.6		
		100-year, 6-hour					
ALLOWABLE DISCHARGE:		DEVELOPED FLOWS:					
	Treatment SF	%		Treatment SF	%		
Area A	=	0	0%	Area A	=	0	0%
Area B	=	70685	100%	Area B	=	10603	15%
Area C	=			Area C	=	10603	15%
Area D	=	0	0%	Area D	=	49480	70%
Total Area	=	70685	100%	Total Area	=	70685	100%

On-Site Volume of Runoff: V ₃₆₀ =	E*A / 12
Allowable V ₃₆₀ =	3947 CF
Developed V ₃₆₀ =	9590 CF

On-Site Peak Discharge Rate: Q _P =	Q _{BA} A _A + Q _{PB} A _B + Q _{PC} A _C + Q _{PD} A _D / 43,560
For Precipitation Zone 1	
Q _{BA} =	1.29
Q _{PB} =	2.03
Q _{BC} =	2.87
Q _{PD} =	4.37
Allowable Q _P =	3.3 CFS
Developed Q _P =	6.2 CFS

GENERAL NOTES: CIVIL

- 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.
- IF FIELD GRADE ADJUSTMENTS ARE REQUIRED, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT FOR INSTRUCTIONS.
- THE ENVIRONMENTAL PROTECTION AGENCY (EPA) AND THE CITY OF ALBUQUERQUE REQUIRE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP), AN NPDES PERMIT, AND AN EROSION AND SEDIMENT CONTROL (ESC) PERMIT FOR PROJECTS WHERE CONSTRUCTION ACTIVITIES MEET THE EPA THRESHOLD. (SWPPP, NPDES PERMIT, AND ESC PLAN BY OTHERS.) A CURRENT CITY-APPROVED ESC PERMIT MUST BE INCLUDED WITH THE CONTRACTOR'S SUBMITTAL FOR A ROUGH GRADING, GRADING, PAVING, BUILDING, OR WORK ORDER PERMIT. CONTRACTOR SHALL COORDINATE WITH OWNER TO DETERMINE WHO WILL PREPARE SWPPP AND INSPECT REQUIRED ELEMENTS.
- 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.
- MEASURES REQUIRED FOR EROSION AND SEDIMENT CONTROL SHALL BE INCIDENTAL TO THE PROJECT COST.
- WHERE GRADES BETWEEN NEW AND EXISTING ARE SHOWN AS 'MATCH' OR '±', TRANSITIONS SHALL BE SMOOTH.
- 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.
- ALL EROSION PROTECTION TO BE INSTALLED AS 3" AVG. DIA. ANGULAR FACED ROCK (F.F. ROCK) PLACED OVER GEOTEX 501 NON-WOVEN GEOTEXTILE (O.E.).
- SIDESLOPES STEEPER THAN 3:1 BUT LESS THAN 2:1 MUST HAVE PERMANENT EROSION PROTECTION INSTALLED, TYPICAL. NO SLOPE SHALL BE STEEPER THAN 2:1.
- FIRST FLUSH BASIN DESIGN PARAMETERS AND STORMWATER CONTROL MEASURES SHOWN ON THIS PLAN TO BE STRICTLY ADHERED TO FOR CERTIFICATION PURPOSES.
- 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. 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.
- FOR ENGINEER'S CERTIFICATION OF SUBSTANTIAL COMPLIANCE (FOR CERTIFICATE OF OCCUPANCY) CONTRACTOR SHALL PROVIDE AN AUTOCAD FORMAT AS-BUILT SURVEY PREPARED BY A LICENSED SURVEYOR WHICH INCLUDES:
 - AS-BUILT SPOT ELEVATIONS AT EACH DESIGN SPOT ELEVATION SHOWN ON THE APPROVED PLAN;
 - TOP AND BOTTOM ELEVATIONS AS REQUIRED TO DEFINE THE PERIMETER OF PONDS (TO BE USED BY ENGINEER TO CALCULATE AS-BUILT VOLUME PROVIDED);
 - ALL CONSTRUCTION, INCLUDING DRAIN INLETS, PIPES AND PONDS SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED PLAN IN ORDER TO RECEIVE ENGINEER'S CERTIFICATION.
- GRADING OF FIRST FLUSH BASINS WILL BE INSPECTED AS PART OF ENGINEER'S CERTIFICATION FOR CERTIFICATE OF OCCUPANCY. DURING LANDSCAPING, FIRST FLUSH BASINS WILL BE SMOOTHLY INTEGRATED INTO LANDSCAPING WHILE MAINTAINING REQUIRED TOP AND BOTTOM ELEVATION, VOLUME AND INLET / OVERFLOW ELEVATIONS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE INSTALLATION OF ALL WORK RELATED TO PROPOSED STORM DRAINS SHOWN ON THIS PLAN INCLUDING: TRENCHING, BACKFILL, SUPPORTS, INLETS, WATER QUALITY FEATURES, EROSION CONTROL FEATURES, TESTING AND CLEANING. ANY WORK NOT ACCEPTED BY THE ARCHITECT OR ENGINEER DUE TO IMPROPER WORKMANSHIP OR LACK OF PROPER COORDINATION SHALL BE REMOVED AND CORRECTLY INSTALLED AT THE CONTRACTOR'S EXPENSE, AS DIRECTED.
- MINIMUM COVER FOR STORM DRAIN PIPES SHALL BE 12", UNLESS OTHERWISE NOTED.
- STORM DRAINS SHALL BE INSTALLED PRIOR TO SURFACE IMPROVEMENTS SUCH AS PAVEMENT, SIDEWALKS, AND LANDSCAPING.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CONNECTIONS TO ROOF DOWNSPOUTS AND ALL NECESSARY FITTINGS. FITTING COSTS SHALL BE INCIDENTAL.
- TRENCHING, BORING, AND JACKING SHALL BE CONSTRUCTED IN ACCORDANCE WITH COA SPEC. SECT. 700. ALL BACKFILL SHALL BE COMPACTED TO A MINIMUM 95% DENSITY PER ASTM D-1557.
- ALL INLET AND AREA DRAIN RINGS & GRATES, MANHOLE RINGS & COVERS, AND OTHER SURFACE FEATURES SHALL BE ADJUSTED TO FINISHED GRADE, UNLESS OTHERWISE NOTED ON THE PLANS.
- ALL STORM DRAIN CROSSINGS OF WATER AND SEWER LINES SHALL HAVE 18" MIN CLEARANCE. IF 18" CLEARANCE IS NOT POSSIBLE, CONTACT THE ENGINEER AND / OR ARCHITECT IMMEDIATELY.
- HDPE PIPE SHALL BE ADS N-12 (WATERTIGHT) OR ENGINEER APPROVED EQUIVALENT. HDPE PIPE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- PVC PIPES SHALL BE PVC SDR-35, INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- STORM DRAINS SHALL BE INSTALLED AT INVERTS AND SLOPES SPECIFIED ON THE PLANS. THE PIPE SHALL DRAIN AT A CONSTANT SLOPE BETWEEN FITTINGS AND MANHOLES. THE PIPE SHALL DRAIN TOWARD THE OUTLET AT ALL LOCATIONS.

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

2228 CG-101.dwg Feb 15, 2018

LADERA CROSSING SELF-STORAGE
LADERA DR. & UNSER BLVD. NW
TITAL DEVELOPMENT

GRADING & DRAINAGE DETAILS

Date:	No. Revision:	Date:	Job No.
02/15/18			2228
Drawn By:			CG5.1
BUB			
Ckd By:			SH. OF
FCA			

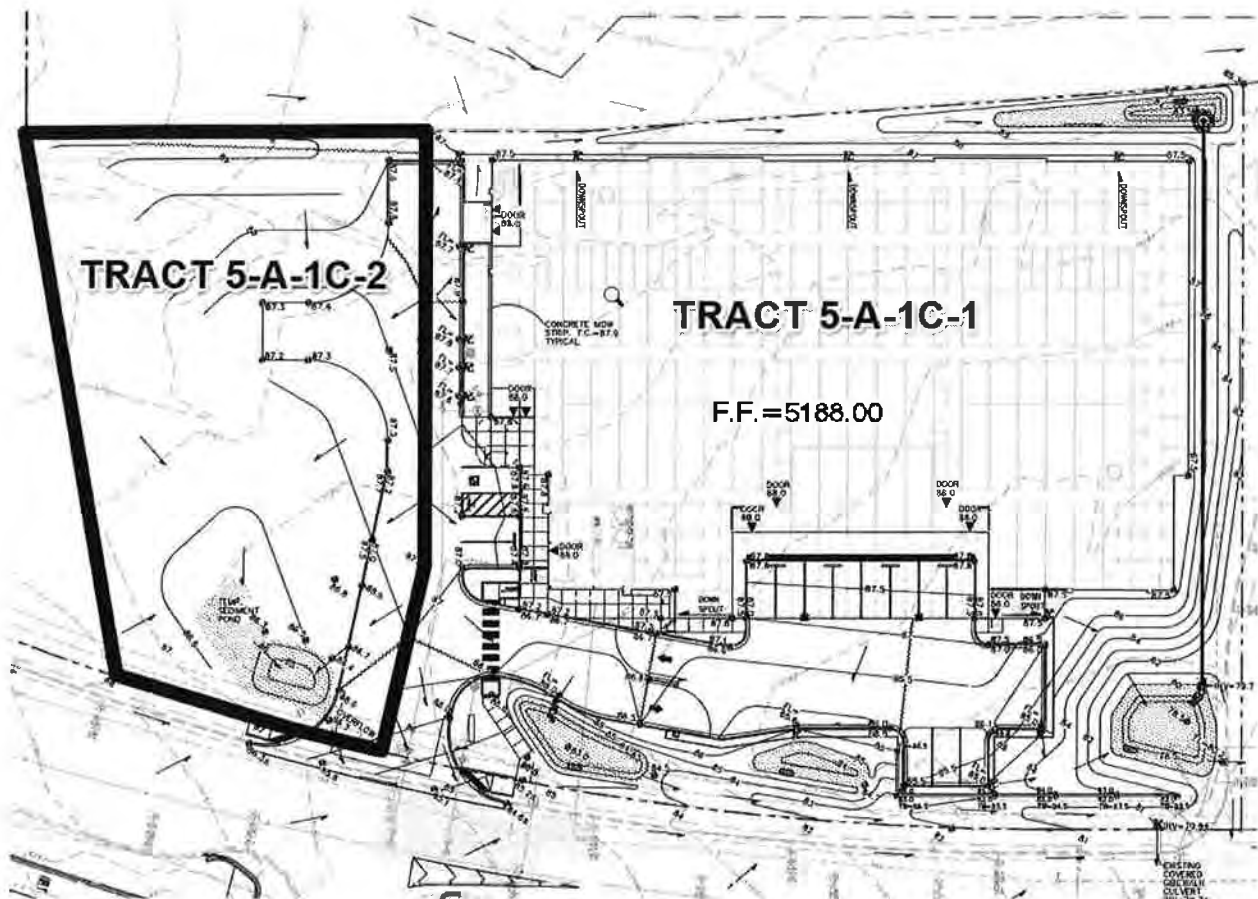
February 14, 2018

Titan Ladera SS, LLC, Owner of **Tract 5-A-1C-2, El Rancho Atrisco Phase III**, hereby grants permission to the owner of **Tract 5-A-1C-1, El Rancho Atrisco Phase III** for interim grading, paving and first flush pond construction in conjunction with the proposed development of **Tract 5-A-1C-1, El Rancho Atrisco Phase III**.

The attached exhibit shows the approximate limits of the construction. This permission will remain in effect until the Certificate of Occupancy the Tract 5-A-1C-1 has been approved.



Signature of Property Owner of Tract 5-A-1C-2



**PRIVATE FACILITY
DRAINAGE COVENANT**

This Drainage Covenant ("Covenant"), between **Titan Ladera SS, LLC** ("Owner"), whose address is **6300 Riverside Plaza Lane #200 Albuquerque, NM 87120** and whose telephone number is **(505) 998-0163** 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]

Tract 5-A-1C-1 of the El Rancho Atrisco Phase III

recorded on **2/15/18**, pages **1** through **3**, as Document No. **2018010646**
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:

Four (4) First Flush retention ponds as per Isaacson and Arfman's Grading and Drainage Plan dated December 22, 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.

6. Liability of City. The Owner understands and agrees that the City shall not be liable to the Owner, its heirs, successors or assigns, or to any third parties for any damages resulting from the Owner's failure to construct, maintain or repair the Drainage Facility.

7. Indemnification. The Owner owns and controls the Drainage Facility and shall not permit the Drainage Facility to constitute a hazard to the health or safety of the general public. The Owner agrees to indemnify, defend and hold harmless the City, its officials, agents and employees, from any claims, actions, suits or other proceedings arising from or out of the negligent acts or omissions of the Owner, its agents, representatives, contractors or subcontractors or arising from the failure of the Owner, its agents, representatives, contractors or subcontractors to perform any act or duty required of the Developer or Owner herein; provided, however, to the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Covenant, this Covenant to indemnify will not extend to liability, claims, damages, losses or expenses, including attorneys' fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the respective indemnitee, or the agents or employees of the respective indemnitee; or (2) the giving of or the failure to give direction or instructions by the respective indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

8. Assessment. Nothing in this Covenant shall be construed to relieve the Owner, its heirs, assigns and successors from an assessment against the Owner's property for improvements to the property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Drainage Facility will not reduce the amount assessed by the City.

9. Binding on Owner's Property. The covenants and obligations of the Owner set forth herein shall be binding on the Owner, its heirs, assigns and successors and on the Owner's property and constitute covenants running with the Owner's property until released by the City. This Covenant can only be released by the City's Chief Administrative Officer with concurrence of the City Engineer.

10. Entire Covenant. This Covenant contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

11. Changes to Covenant. Changes to this Covenant are not binding unless made in writing, signed by both parties.

12. Effective Date of Covenant. This Covenant shall be effective as of the date of signature of the Owner.

OWNER:

CITY OF ALBUQUERQUE:

By [signature]:

By: Shahab Biazar, P.E., City engineer

Name [print]: KURT BROWNING

Dated: _____

Title: MANAGER

Dated: 2/15/18

OWNER'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
)ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on this 15th day of February,
2018, by Kurt Browning (name of person signing permit),
Manager (title of person signing permit) of
Titan Ladera SS. LLC (Owner).



(SEAL)
OFFICIAL SEAL
SUSAN S YULO
NOTARY PUBLIC-State of New Mexico
My Commission Expires 3.21.2020

Susan S Yulo
Notary Public
My Commission Expires: 3.21.2020

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
)ss
COUNTY OF BERNALILLO)

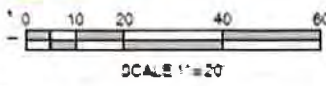
This instrument was acknowledged before me on this _____ day of _____
20__, by Shahab Biazar, P.E., City Engineer, of the City of Albuquerque,
a municipal corporation, on behalf of said corporation.

(SEAL)

Notary Public
My Commission Expires: _____

(EXHIBIT A ATTACHED)

EXHIBIT 'A'



POND P1		
Contour	Area	Volume
5184.50	100	183 CF
5183.50	75	
TOTAL VOL		383 CF

F.F.=5188.00

LADERA DRIVE N.W.

POND P2		
Contour	Area	Volume
5184.50	685	518 CF
5183.50	350	
TOTAL VOL		518 CF

POND P3		
Contour	Area	Volume
5184.50	410	175 CF
5184.00	90	
TOTAL VOL		175 CF

EXISTING COVERED SIDEWALK
INVERT = 79.7±

PRIVATE FACILITY
DRAINAGE COVENANT

This Drainage Covenant ("Covenant"), between **Titan Ladera SS, LLC** ("Owner"), whose address is **6300 Riverside Plaza Lane #200 Albuquerque, NM 87120** and whose telephone number is **(505) 998-0163** 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]

Tract 5-A-1C-2 of the El Rancho Atrisco Phase III

recorded on **2/15/18**, pages **1** through **3**, as Document No. **2018010646**
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:

One (1) temporary pond as per Isaacson and Arfman's Grading and Drainage Plan dated December 22, 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.

6. Liability of City. The Owner understands and agrees that the City shall not be liable to the Owner, its heirs, successors or assigns, or to any third parties for any damages resulting from the Owner's failure to construct, maintain or repair the Drainage Facility.

7. Indemnification. The Owner owns and controls the Drainage Facility and shall not permit the Drainage Facility to constitute a hazard to the health or safety of the general public. The Owner agrees to indemnify, defend and hold harmless the City, its officials, agents and employees, from any claims, actions, suits or other proceedings arising from or out of the negligent acts or omissions of the Owner, its agents, representatives, contractors or subcontractors or arising from the failure of the Owner, its agents, representatives, contractors or subcontractors to perform any act or duty required of the Developer or Owner herein; provided, however, to the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Covenant, this Covenant to indemnify will not extend to liability, claims, damages, losses or expenses, including attorneys' fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the respective indemnitee, or the agents or employees of the respective indemnitee; or (2) the giving of or the failure to give direction or instructions by the respective indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

8. Assessment. Nothing in this Covenant shall be construed to relieve the Owner, its heirs, assigns and successors from an assessment against the Owner's property for improvements to the property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Drainage Facility will not reduce the amount assessed by the City.

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11. Changes to Covenant. Changes to this Covenant are not binding unless made in writing, signed by both parties.

12. Effective Date of Covenant. This Covenant shall be effective as of the date of signature of the Owner.

OWNER:

By [signature]:

Name [print]:

Title:

Dated:

CITY OF ALBUQUERQUE:

By: Shahab Biazar, P.E., City engineer

Dated:

OWNER'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)

)ss

COUNTY OF BERNALILLO)

This instrument was acknowledged before me on this 15th day of February,
2018, by Kurt Browning (name of person signing permit),
Manager (title of person signing permit) of
Titan Ladera SS. LLC (Owner).



(SEAL)
OFFICIAL SEAL
SUSAN S YULO

NOTARY PUBLIC-State of New Mexico
My Commission Expires 3-21-2020

[Signature]
Notary Public
My Commission Expires: 3.21.2020

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)

)ss

COUNTY OF BERNALILLO)

This instrument was acknowledged before me on this _____ day of _____
20__, by Shahab Biazar, P.E., City Engineer, of the City of Albuquerque,
a municipal corporation, on behalf of said corporation.

(SEAL)

Notary Public

My Commission Expires: _____

(EXHIBIT A ATTACHED)

EXHIBIT 'A'

