

# CITY OF ALBUQUERQUE

Hydrology Section Planning Department  
David S. Campbell, Director



Timothy M. Keller, Mayor

December 10, 2018

Richard Stevenson  
Tierra West, LLC  
5571 Midway Park Place NE  
Albuquerque, NM, 87109

**RE: 1401 Wyoming Blvd NE - Maverick**  
**Grading Plan Engineer's Stamp Date: 12/06/2018**  
**Hydrology File: J19D034**

Based upon the information provided in your submittal received 12/07/2018, the Grading and Drainage Plan cannot be approved for SO-19, Building Permit, or Grading Permit until the following conditions are addressed.

1. Note 8 on sheet C-2 does not apply to this site. Add standard SO-19 notes available on the hydrology web page unless a work order is required.
2. The sidewalk culvert may be eliminated if the 100 year overflow from the BMPs is directed through the parking lot to the west driveway.
3. The oil/water separator may not discharge into the sanitary sewer. The oil/water separator maintenance should be addressed in the maintenance plan to include routine Vactor cleaning and a manifest of Vactor service with inspection notes.
4. Add vector control to the maintenance notes. "Allowing conditions such as the accumulation of standing water that can contribute to the breeding of mosquitoes is a violation of the City of Albuquerque's Insect and Rodent Control Ordinance. Maintenance of retention ponds is the responsibility of the property owner. In order to prevent mosquito breeding, vegetation should regularly be cleared from the basin and edges of ponds. The site should be maintained throughout the year in this manner. Removal of vegetation creates a less desirable site for mosquito breeding. This will also aid in the reduction of rodent harborage. When standing water does exist it should be treated with publicly available mosquito products (e.g. mosquito dunks) at the treatment rate designated by the product label. Should a site maintain permanent standing water, mosquito fish (*Gambusia*) can be obtained from the City of Albuquerque's Environmental Health Department free of charge."
5. Pond #1 is located on the high side of the site, so it is difficult to get the new impervious area to drain to it. BMP ponds are only credited with serving the SWQV of the area draining into them so Pond #1 only provides 180 cf of the required SWQV for this site. Oversizing the pond does not gain any extra credit. This is a poor location for a pond, so please consider relocating it. If it is to remain in its current location then calculations and details are needed to size the "drainage swale"

PO Box 1293

Albuquerque

NM 87103

[www.cabq.gov](http://www.cabq.gov)

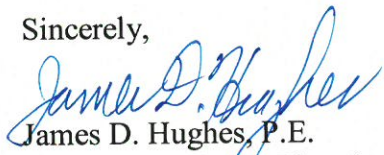


and "curb cut" being used to get the runoff into the pond (1.5 cfs/imp-acre is the SWQV flow rate).

6. Pond #1 grades are problematic because the adjacent grade changes elevation by more than 4' from the low west end to the high east end. Retaining walls will likely be required, and must be shown in more detail. Section A-A shows a 2.5' elevation difference from top of slope to bottom of slope which makes the side slopes 1:1 instead of the 2.5:1 that is shown on the section. The pond is may be in a PUE so there may be franchise utilities in the way.
7. Please identify all easements on the G&D Plan.
8. Please consider using gravel or porous pavers west of the new building and just resurface the existing asphalt alley and the driveway at the southwest corner of the site. Please differentiate between gravel, resurfacing, and pavement to be removed and replaced. Resurfacing is not considered redevelopment and does not require any SWQV. Some of the hatching patterns already used needs to be added to the legend.
9. Also consider replacing the two ponds with an underground BMP Infiltration Trench located just east of the southwest driveway. A 6' x 6' x 60' trench lined with filter fabric and filled with coarse aggregate (0.40 porosity) provides 864 cf SWQV and would probably cost about \$3,000. It could be located in a depressed landscape strip between the sidewalk and parking lot. Payment-in-Lieu may be reduced to Zero if any impervious area not draining into the trench could be repaved instead of removal and replacement.
10. Since all of the new impervious surfaces can drain through BMPs, the statement in the SWQV BMP NOTES on sheet D1 should say "is not being captured" instead of saying "cannot be captured".
11. As a reminder, if the project total area of disturbance (including the staging area and any work within the adjacent Right-of-Way) is 1 acre or more, then an Erosion and Sediment Control (ESC) Plan and Owner's certified Notice of Intent (NOI) is required to be submitted to the Stormwater Quality Engineer (Curtis Cherne, PE, ccherne@cabq.gov, 924-3420) 14 days prior to any earth disturbance.
12. Please provide a Drainage Covenant for onsite inlets, storm drains, oil/water separator, and BMPs prior to Certificate of Occupancy. Please submit this on the 4th floor of Plaza de Sol with a \$25 check payable to Bernalillo County.
13. Standard review fees will be required at the time of resubmittal. Verify with Transportation whether or not this will have to go to DRB.

If you have any questions, please contact me at 924-3986 or e-mail [jhughes@cabq.gov](mailto:jhughes@cabq.gov).

Sincerely,

  
James D. Hughes, P.E.  
Principal Engineer, Planning Dept.  
Development and Review Services

**DRAINAGE REPORT  
For**



**Maverik Fuel Center**

**1401 Wyoming Blvd. NE  
Albuquerque, NM 87112**

Prepared for:

Maverik, Inc.  
185 South State Street,  
Salt Lake City, Utah 84111

Prepared by:

Tierra West, LLC  
5571 Midway Park Place NE  
Albuquerque, New Mexico 87109

December, 2018

I certify that this report was prepared under my supervision, and I am a registered Professional Engineer in the State of New Mexico in good standing.

Ronald R. Bohannon  
PE # 7868

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**Appendices**

Drainage Basin Maps & Hydrology Tables/Calculations.....	APPENDIX A
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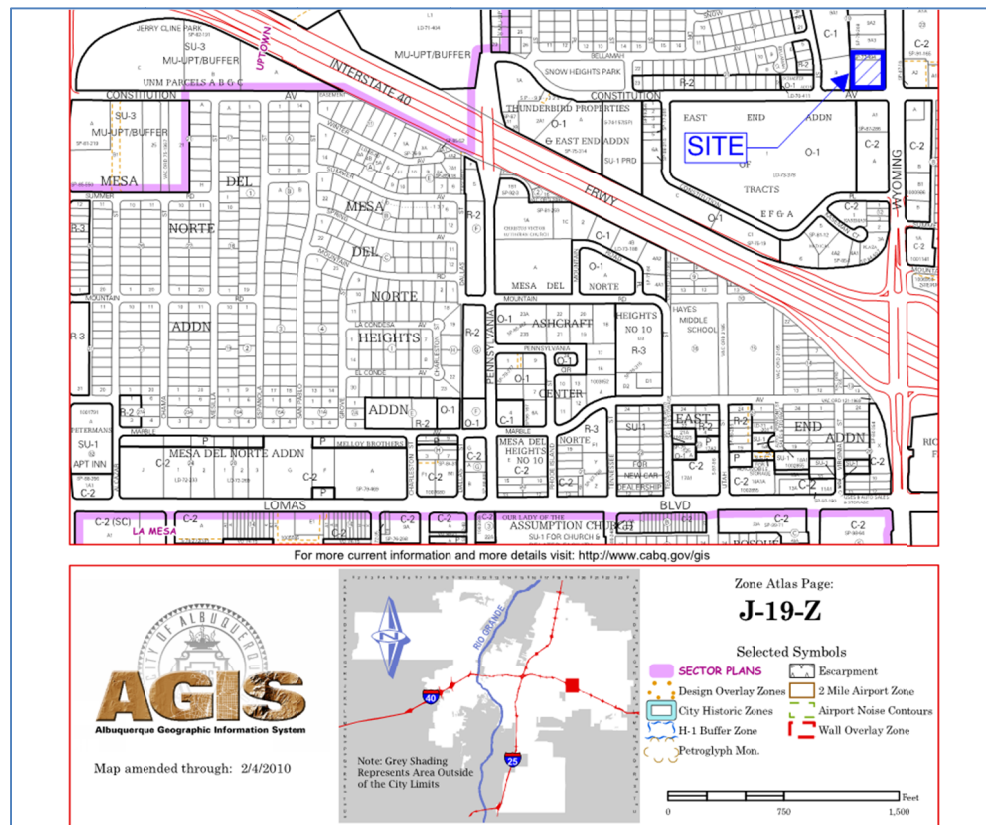
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## Purpose

The purpose of this report is to outline the Drainage Plan and present a solution for the re-development of two parcels to be a Maverik Gas Station and Convenience Store. The site will consist of a single-story 4,300 square foot c-store with ten gasoline refueling pumps for passenger vehicles users. The parcels will not be consolidated and therefore a cross access and drainage easement for the benefit of both tracts will be granted for each tract by the Plat. No truck refueling is proposed.

This report outlines the developed flows associated in redeveloping the 0.969 acre site and describes the on-site surface improvements needed to safely convey the developed flows. As the site is a gas station with fueling activities, the design is required to demonstrate control of oil from vehicle refueling areas and will be addressing the 80<sup>th</sup> percentile flows from the site. These provisions are included in the proposed drainage solution.

In the pre-submittal meeting with Hydrology, the City indicated that adequate downstream capacity and will not be required to be verified.



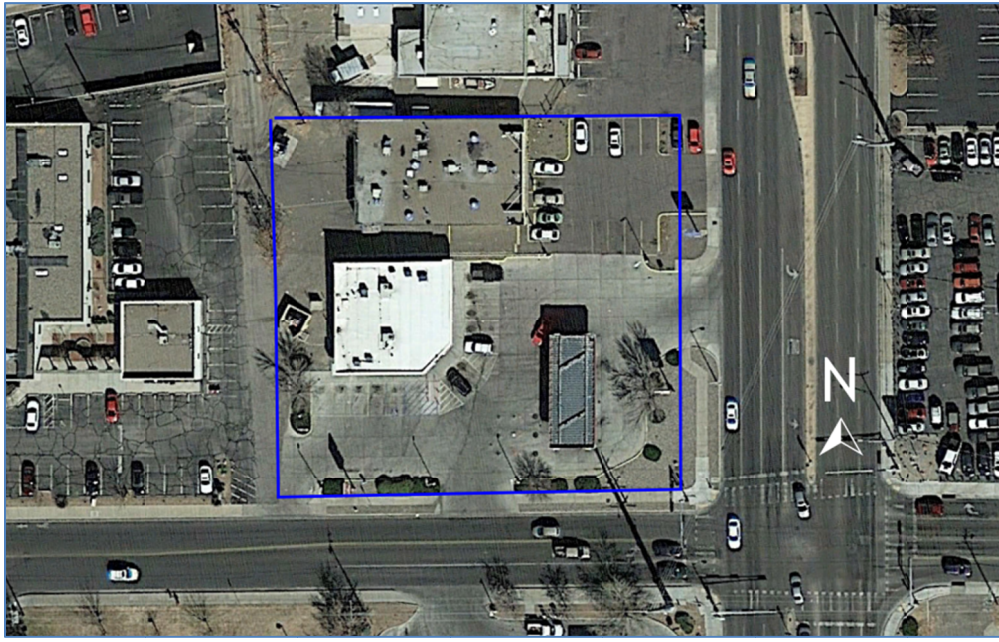
**Exhibit A – Vicinity Map**



## Location and Background

The site is located on the northwest corner of Constitution Ave. and Wyoming Blvd. The address of the parcels is 1401 and 1415 Wyoming Blvd. NE, Albuquerque, NM 87112. The proposed redevelopment will occur across two lots legally described as being a portion of Lot 9, Block 18 of the Snow Heights Addition to the City of Albuquerque, New Mexico. Both parcels are developed with a 3,000 sq-ft single story abandoned (Circle K) gas & c-store on the southern lot, and a 4,800 sq-ft commercial building (Café Istanbul) on the northern lot. The site Hydronium number is J19D049. The site is bordered to the south by Constitution Ave, Wyoming Blvd to the east, commercial buildings to the north and mixed use office & commercial to the west.

Both parcels in their current developed condition do not have any storm water facilities or water quality features and are 95 percent impervious. The sites redesign calls for a similar drainage route to the current drainage flow. Approximately 60% of the current site is drained by sheet flow discharging into Constitution Ave. through the easterly most driveway entrance. The balance of the site either sheet flows through the second driveway entrance at the alleyway ingress/egress location on Constitution Ave. or flows to the west into the adjacent commercial lot paved parking area. There is no storm drain in Constitution Ave. along the street frontage of the site.

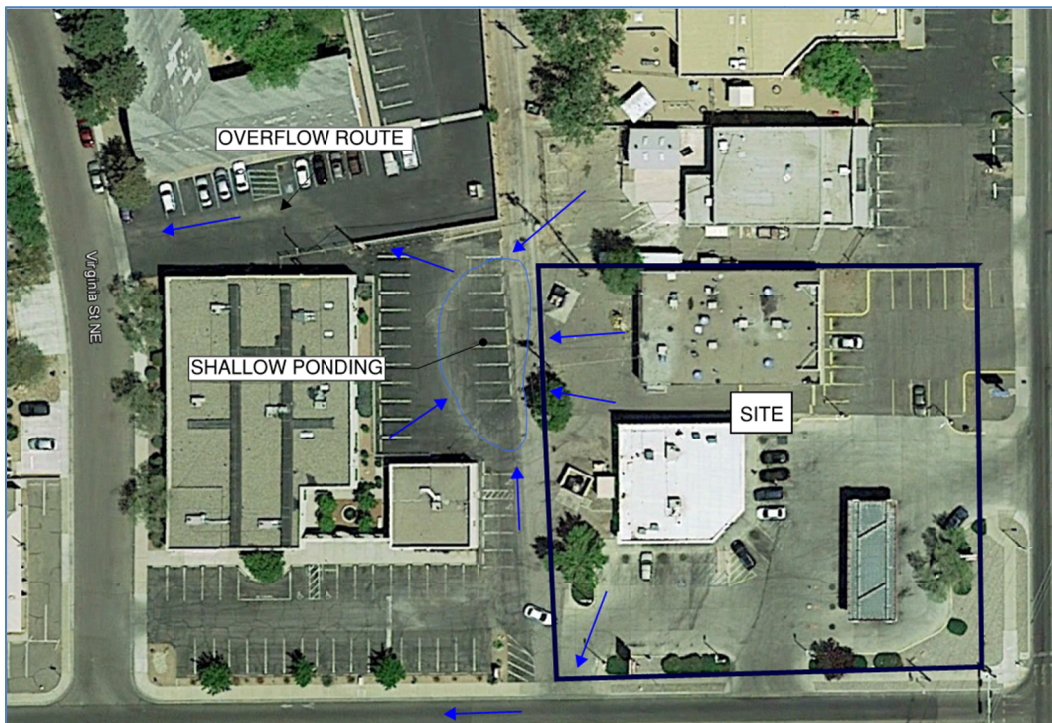


**Exhibit B – Site Aerial Image**

Runoff which sheet flows into Constitution Ave. are conveyed via the gutter system for approximately 2,200 lineal feet west to an existing stack of grate inlets at the intersection of Constitution Ave. and Bellamah Ave.

The approved drainage design on record at the City with reference J19-DO49, prepared by Isaacson & Arfman, P.A is dated May 25, 1988 and outlines the drainage calculations for the gas & convenience store site using the rational method outlined in the DPM current at the time of submittal.

There is no grading or drainage plan on file for the commercial lot to the north. From site inspection the alley drains to the west and ponds in the parking lot of the commercial building directly west of the site as shown in Exhibit C. At a certain elevation additional runoff can surface flow from this low area into the Virginia Apartment parking lot to the north. Although it is not reference on the grading and drainage plan for this site, from a site inspection the topography permits the flow of runoff into the driveway for the apartments at which point the runoff sheet flows to Virginia St. Historically this is the direction of flow for the commercial lot based on existing topography.



**Exhibit C – Historical Flows**

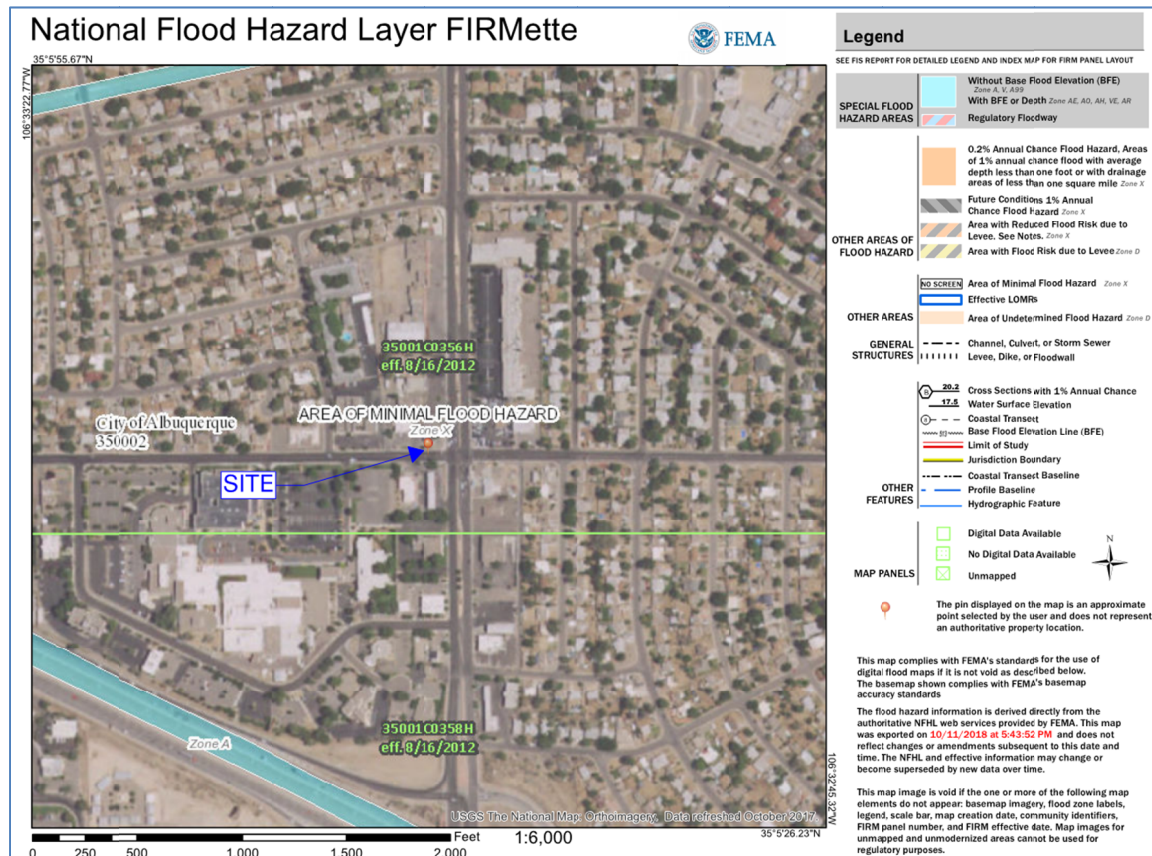


The approved paving permit which includes drainage and grading elevations for the Virginia St. Apartment Complex on record at the City has the reference J19-D63 prepared by Jeff Mortensen & Assoc., is dated October 25, 1988 and outlines the drainage calculations for the paving improvements. It does not reference any acceptance of offsite flows.

## Flood Plain

The floodplain information is published for the site by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Bernalillo County, New Mexico and Incorporated Areas. The subject site is detailed on Community Panel Number 35001C0356H dated August 16, 2012 and is shown below.

The subject site is located within Flood Zone X, which is defined as, "Areas determined to be outside the 0.2% annual chance floodplain". The site does not lie within a Flood Hazard Area as shown on the FEMA map requiring no further flood-proofing or other flood mitigation.



**Exhibit D – FIRM Map**



## Calculations

The site is located within Precipitation Zone 3, between San Mateo Blvd. and Eubank Blvd. as specified in Chapter 22, Section A.1 of the City of Albuquerque Development Process Manual Volume I – Design Criteria, 2006 Revision (DPM). The principal design storm is the 100-year 6 hour event. No detention basins or retention basins are proposed and therefore longer duration design storms are not considered in the calculations. As stated in the DPM in Chapter 22 Section A.2, the 100-year 6 hour event is 2.60 inches.

The appropriate land treatments A through D, as defined in the DPM Chapter 22 Section A.3, will be applied to the various pervious and impervious areas for the proposed re-developed site.

Excess precipitation is the depth of runoff remaining after the initial volume of rainfall retained on the surface and infiltration has been subtracted from the design storm hydrograph. The DPM defines the excess precipitation for the 100-year 6 hour event in Chapter 22 Table A-8 for Zone 2 with the corresponding land treatments.

A weighted excess precipitation rate is used to calculate the volume runoff as defined in the DPM Chapter 22 (a-5, a-6). The calculation requires the sum of excess precipitation multiplied by the corresponding treatment areas divided by the total area, multiplied by the weighted excess precipitation of the watershed area.

To determine the peak discharge for the re-development the corresponding treatment areas are multiplied by the peak rate for each treatment and sum to compute the total flow. The peak rates for the treatment areas are defined in the DPM Chapter 22 Table A-9 for the 100 year event.

As this site is a re-development the storm water quality volume is calculated based on the 0.48 inch storm. To calculate the required storm water quality volume to be captured and retained onsite, the impervious areas are multiplied by 0.26 inches for the 80th percentile storm.

## Existing Developed Conditions

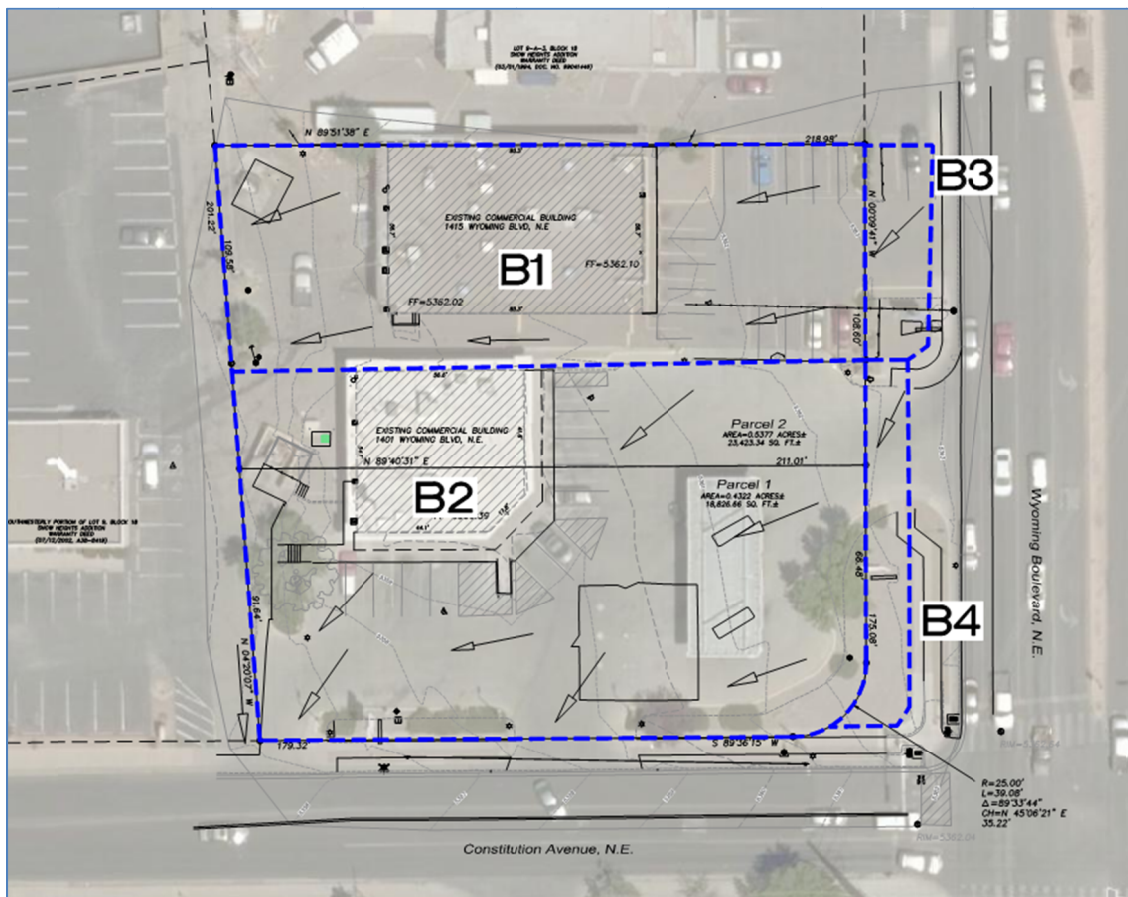
The entire site is divided into four drainage basins; two onsite (B1 and B2) and two offsite basins (B3 and B4), consisting of Treatment B for the landscape areas and Treatment D for the impervious areas for the existing buildings and pavement areas.

The runoff and volume for the existing commercial lot north of the gas station (Basin B1) was calculated with all sheet flow entering the existing alley way and draining directly to the lot to the west, with a total runoff of 1.86 cfs. There is no drainage report for this parcel recorded with the

City. There is no landscaping across the parcel with Treatment D assigned for 100% of the area. Historically the runoff sheet flows to the alley way and ponds in the parking lot of the commercial site to the west of the parcel as discussed previously.

The peak discharge calculated for the gas station site (Basin B2) matches the approved peak discharge presented in the 1988 drainage plan for the parcel of ~2.7 cfs for the 100-year 6 hour event, as to be expected as the calculation methods listed in the DPM have not significantly changed over this time.

The only offsite flows that enter the site are generated from a 15-ft strip of pavement within the public ROW along Wyoming Blvd at the driveway entrance to the commercial site and a 15-ft landscape strip of public right-of-way between the property's east boundary and the back of the westerly curb (Basins B3 and B4 respectively). This flow amounts to 0.25 cfs and is added to the existing onsite flows. The runoff and volume calculations for the existing condition, based on the drainage criteria detailed in the DPM is included in appendix A.



**Exhibit E – FIRM Map**

## Proposed Conditions

The developed site is divided into seven basins, with the offsite flows (Basins 6 and 7) included in the total developed discharge. There is one BMP surface Stormwater Quality volume pond proposed to capture a portion of the required volume, with the remaining volume allowed to freely discharge with a payment in lieu made for this volume. Included in the appendix are the calculations for the proposed site conditions. The expected total runoff from the site for the 100-year 6 hour event is 5.01 cfs with a volume of 0.194 ac-ft.

Roof drains are planned for the fuel center canopy with runoff collected and conveyed to an 8-inch diameter drain that will discharge flows directly to the water quality basin #1. Roof drains will collect runoff from the c-store and discharge directly to the second SWQP located in a landscape island before discharging into basin B2.

Per DPM Chapter 22.9.E, Table 1 all fueling stations must demonstrate control of oil from vehicle fueling areas. Basin B3 is the area covering the fueling bays. A trench drain is proposed on the west side of the fueling apron to capture all runoff generated from fuel spills or cleaning and maintenance, and flows south to the concrete oil water separator box chamber with a capacity for 300 gallons. Any additional flow shall flow through the chamber into the sanitary sewer service lateral. Due to the grades there is no opportunity to discharge this outlet to a landscape feature. . The sump box chamber is adequate to capture any major fuel spill/s that may occur during operations at the site. Included in the appendix is the detail for the oil water separator chamber. During regular site maintenance the sump box chamber shall be cleaned of debris and sediment that accumulates over time as detailed on the Maintenance of BMP Schedule on the drainage plan.

Basins B3 – B7 sheet flow to the SWQV pond in the south east corner of the site via a 2-foot curb cut. The landscape area surrounding the pond will be xeriscaped to blend with the existing right-of-way landscaping. The water quality pond #1 will retain a volume of 336 cubic feet before releasing the additional flow to Constitution Ave. right-of-way through a concrete weir and a 2-foot concrete rundown / sidewalk culvert conforming to the SO19 Permit. The concrete rundown sidewalk channel has the capacity to pass the 100-year 6 hour event combined flows that enter into the pond which is a total of 1.4 cfs. At the proposed 2% grade the sidewalk culvert has a capacity of 6.97 cfs.

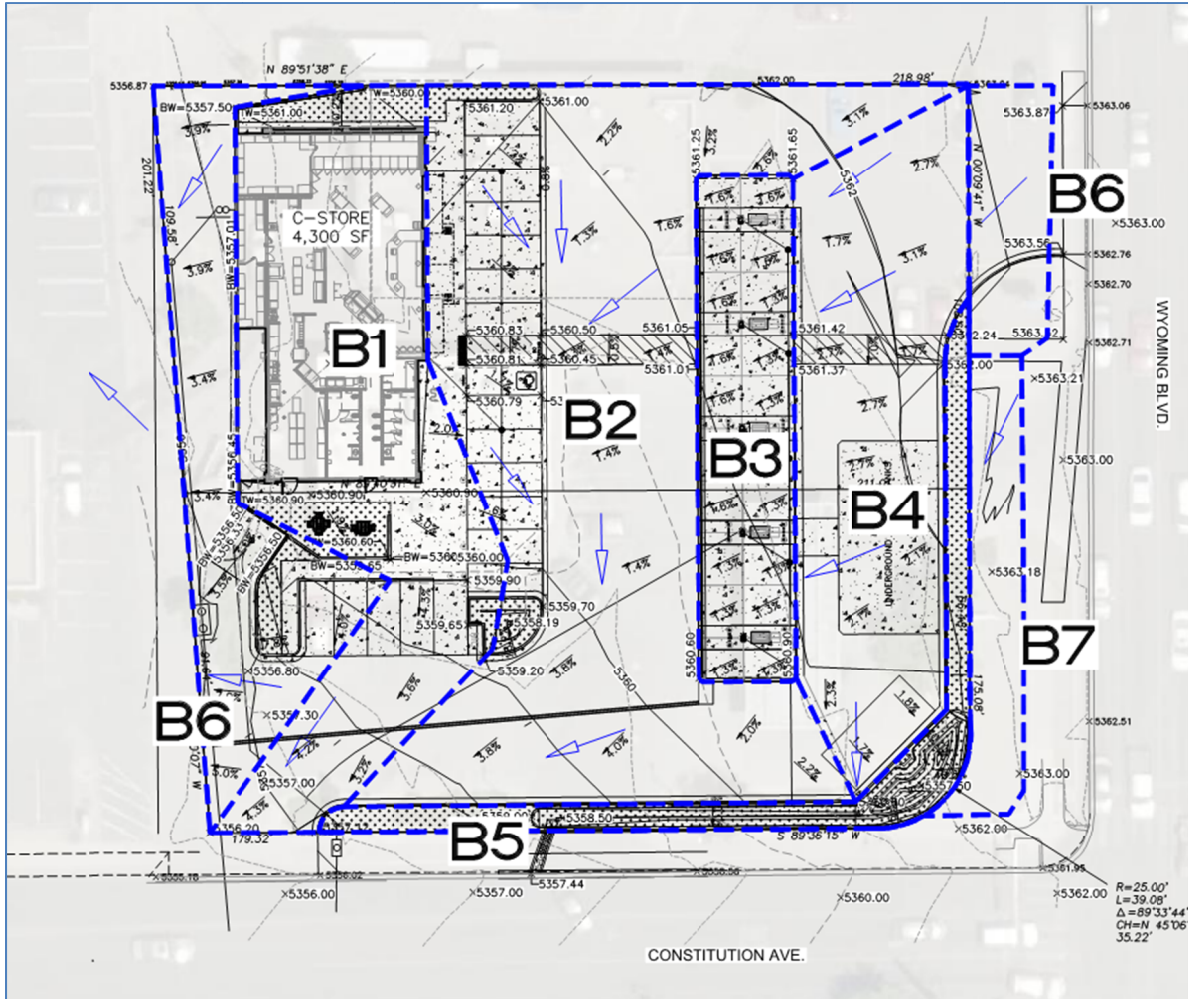
For Basins B1 and B2, which covers the majority of the parking lot area, the drive isle and the building, the runoff sheet flows to the south west corner of the parcel similar to the historic



drainage flows. This sheet flow discharges directly to Constitution Ave. and the combined total for B1 and B2 is 2.86 cfs for the 100-year 6 hour event. The roof drains associated with the c-store in B1 discharge into SWQV pond #2 which has a capacity of 120 cubic feet. Additional flow is released into the drive isle and discharges to Constitution Ave. The SWQP will be landscaped with a xeriscape theme.

The existing topography and the proposed design grading results in Basin B8 sheet flow to the west into the commercial parking lot. Historically the majority of the commercial site drained to this area. With the redevelopment, it is expected to result in a decrease of flows to this area of 2,280 cubic feet (Historic Basin B1 minus Developed Basin B8). This will not rectify the historical ponding issues which occur on the property to the west but will decrease the flow directed to this area.

The required SWQV generated for the impervious areas that cannot be met with onsite storage is 436 cubic feet, and therefore generates a payment in lieu fee of \$3,488.



**Exhibit F – Drainage Basin Map**

## Stormwater Quality Volume Management

As this site is a re-development, the water quality volume is calculated based on the 0.48 inch storm. To calculate the Stormwater Quality Volume the impervious area is multiplied by 0.26 inches. The formula used is  $SWQV = 0.26 \times I \times 43,560 \times (1/12)$  where  $I$  is the impervious area in acres.

The total impervious area is 0.94 acres and requires a total water quality volume of 892 cubic feet for the impervious basin areas. All developed flows from impervious areas B4 – B7 are routed through SWQV pond #1. Impervious areas from B1 is routed through SWQV pond #2. The total volume of the SWQV ponds is 456 cubic feet. The delta 436 cubic feet of SWQV could be managed onsite, but the developer is choosing Payment in Lieu which totals \$3,488. The water quality volume calculations are detailed on the hydrology table in the appendix.

## Post Construction Maintenance Responsibility

As part of the City of Albuquerque's endeavor to uphold best management practices (BMPs) and ensure compliance with the City's Drainage Ordinance, Stormwater Quality Ordinance and the EPA MS4 Permit, a drainage and landscape maintenance plan is proposed for this site. The stormwater features proposed have been designed for easy maintenance that comprises of periodic tasks and inspections to ensure the features operate and perform to the design criteria to which it was designed. The maintenance of the BMPs shall be the responsibility of the owner of the property. The maintenance plan detailed below and listed on the grading and drainage plan shall be recorded in the Bernalillo County Records Room.

The maintenance comprises of the following:

**Responsible Party:** Property Owner.

**Access to surface and sub-surface stormwater quality elements:** All access to the stormwater quality elements shall be accessible from Constitution Ave. and from the paved areas within the site. There is no restricted access to the location of both the surface and sub-surface elements.

REGULAR MAINTENANCE	FREQUENCY
LITTER MANAGEMENT	
Pick up all litter at site and in Landscape areas and remove from site	Daily
INLETS AND OUTLETS	
Visual inspection for function. Remove silt from slab aprons and debris in pavement areas. Remove all fallen vegetation around inlet and outlet structures.	Monthly
HARD SURFACES	
Sweep all paving regularly. Maintain pavement in autumn after leaf fall. Coordinate with Landscape Contractor if additional maintenance is required.	As required

OCCASIONAL TASKS	FREQUENCY
INSPECTION AND INLETS, OUTLETS AND CONTROL CHAMBERS	
Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage. For below ground control chambers, remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.	Yearly
POND VEGETATION	
Ensure Pond vegetation is maintained by Landscape Contractor. All weeds and all cuttings removed from site.	As required
SILT MANAGEMENT	

Inspect swales and water quality pond for silt accumulation. Excavate silt, stack and dry within 2-feet of the water quality feature, but outside the design profile where water flows, spread, rake and overseed. Protect surface from siltation and manage main area of basin for design function or appearance.	Yearly
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<b>REMEDIAL WORK</b>	<b>FREQUENCY</b>
Inspect storm all water quality structures regularly to check for damage or failure. Undertake remedial work as required.	Yearly

## Summary

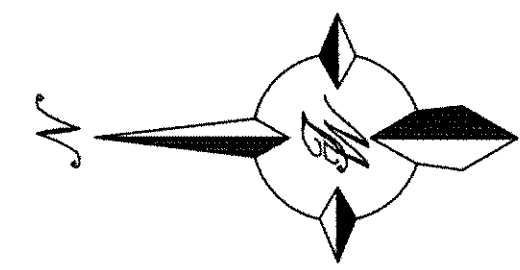
This report outlines the Drainage Plan and presents the on-site BMP SWQV ponding and drainage improvements needed to safely convey the developed flows for the re-development of the site to a Maverik Gas Station and Convenience Store.

The solution improves the existing drainage issue where the commercial parcel drains to the west and ponds, after which additional sheet flow overflows to the Virginia St. Apartment complex and drains out to the street. This runoff is now re-routed through the developed site, a portion through a SWQV pond and allowed to discharge into Constitution Ave.

Per the DPM the design is required to control the oil wash-off from vehicle refueling areas and is achieved with the 300 gallon oil-water sump box chamber. The SWQV retains a total of 456 cubic feet in surface ponds, with the remaining 436 cubic feet required to be paid in Lieu which totals \$3,488. The site does not increase the historic flow released from the site and the solution adheres to best practices for stormwater quality management.

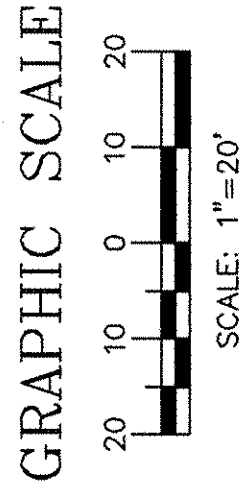
## APPENDIX A





## LEGEND

CURB & GUTTER  
 BOUNDARY LINE  
 EASEMENT  
 SIDEWALK  
 CONTOUR MAJOR  
 CONTOUR MINOR  
 SPOT ELEVATION  
 FLOW ARROW  
 EXISTING CURB & GUTTER  
 EXISTING CONTOUR MAJOR  
 EXISTING CONTOUR MINOR  
 EXISTING SPOT ELEVATION



# NOTICE TO CONTRACTORS

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.
2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE INTERIM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985.
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND REMOVE ALL EXISTING UTILITIES AND STRUCTURES. ALL EXISTING CONNECTIONS SHOULD BE CONFLICT EXISTING. THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.
8. PRIOR TO WORK WITHIN THE PASEO DEL NORTE RIGHT-OF-WAY, A NDOT PERMIT WILL BE REQUIRED.

### EROSION CONTROL NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL (CITY) ACCEPTANCE OF ANY PROJECT.

**LEGAL DESCRIPTION:**

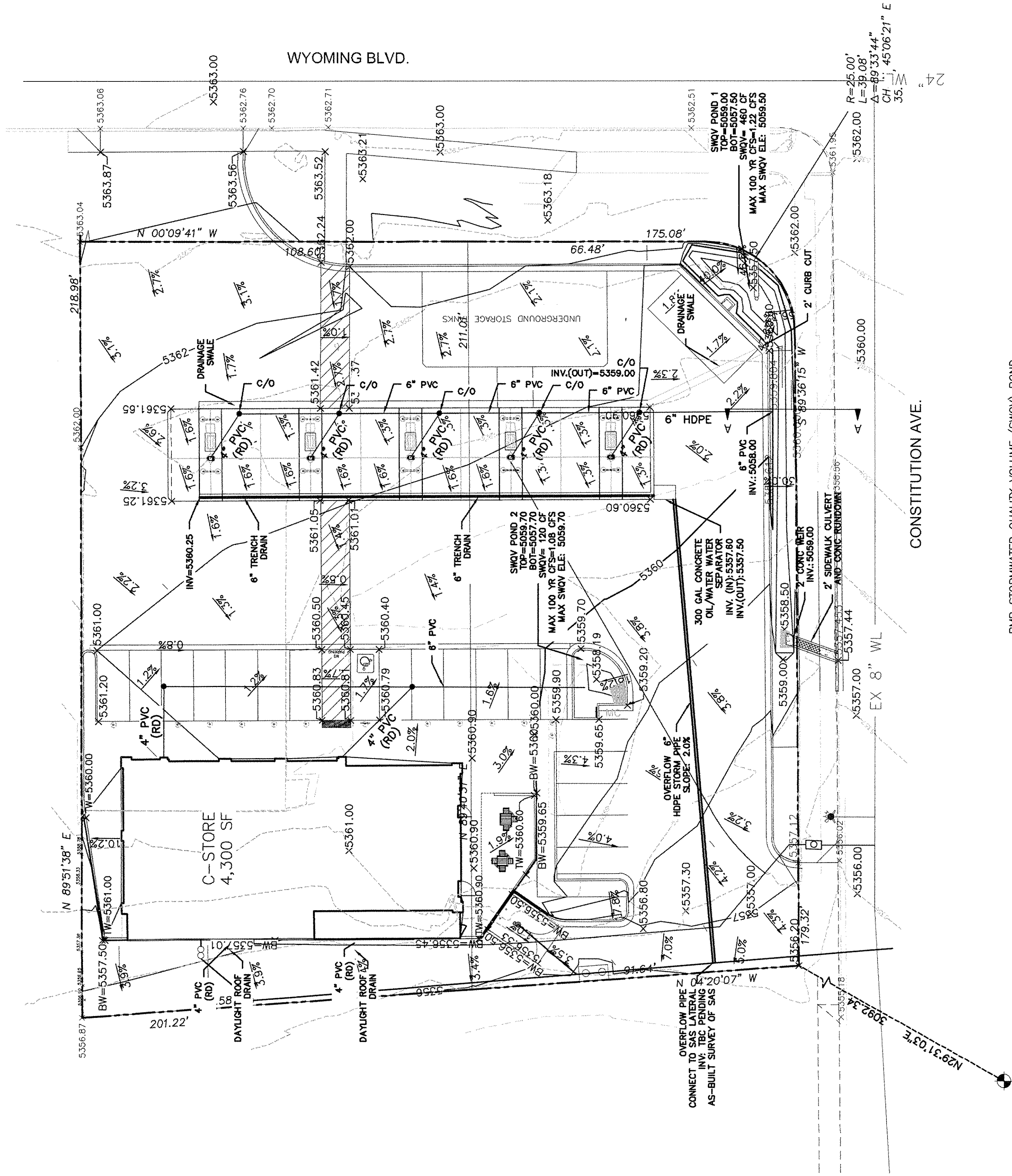
A PORTION OF LOT 9, BLOCK 18 SNOW HEIGHTS

## NOTES

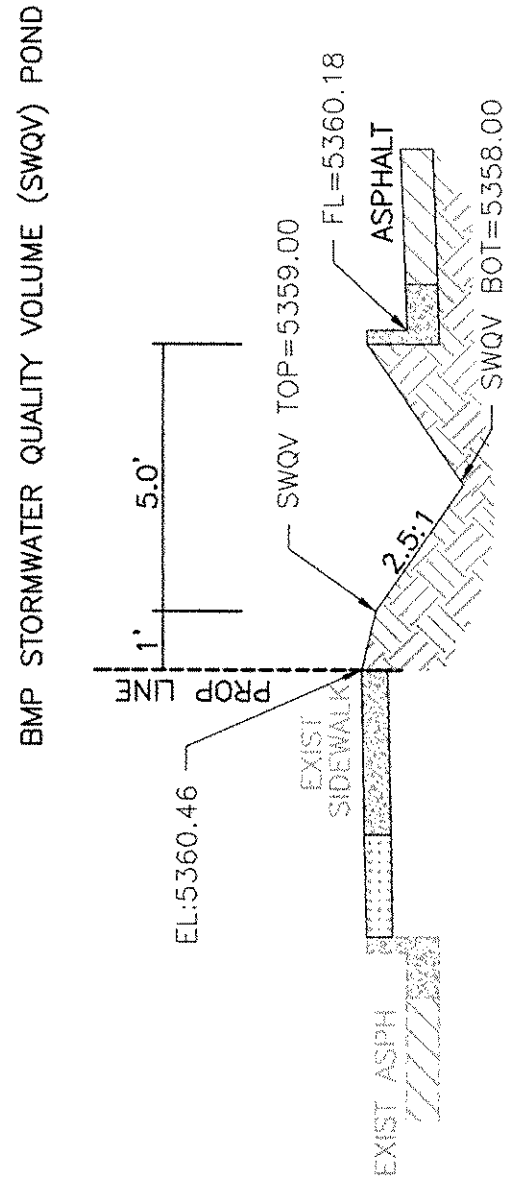
THE PARCELS 1401 AND 1415 WYOMING BLVD. NE. WILL NOT BE CONSOLIDATED AND THEREFORE A CROSS ACCESS AND DRAINAGE EASEMENT FOR THE BENEFIT OF BOTH TRACTS WILL BE GRANTED FOR EACH TRACT BY THE PLAT. NO TRUCK REFUELING IS PROPOSED.

## BMP SWQV NOTES

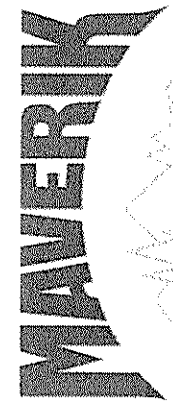
THE SWQV COULD BE MANAGED ONSITE HOWEVER THE DEVELOPER IS CHOOSING PAYMENT IN LIEU. A TOTAL OF 436 CF VOLUME CAN NOT BE CAPTURED AND THEREFORE GENERATES A FEE IN LIEU OF \$3,488.



## SECTION A-A





A.C.R.S. MONUMENT \*47\_K19\*  
STANDARD C.O.A. ALUMINUM DISC  
(FOUND IN PLACE)  
NEW MEXICO, STATE PLANE COORDINATES  
(CENTRAL ZONE-N.A.D. 1983)  
N=1,487,200.514 US SURVEY FEET  
E=1,548,658.688 US SURVEY FEET  
PUBLISHED EI=5344.399 US SURVEY FT (NAVD 1988)  
GROUND TO GRID FACTOR=0.999657877  
DELTA ALPHA ANGLE=0°10'34.73"

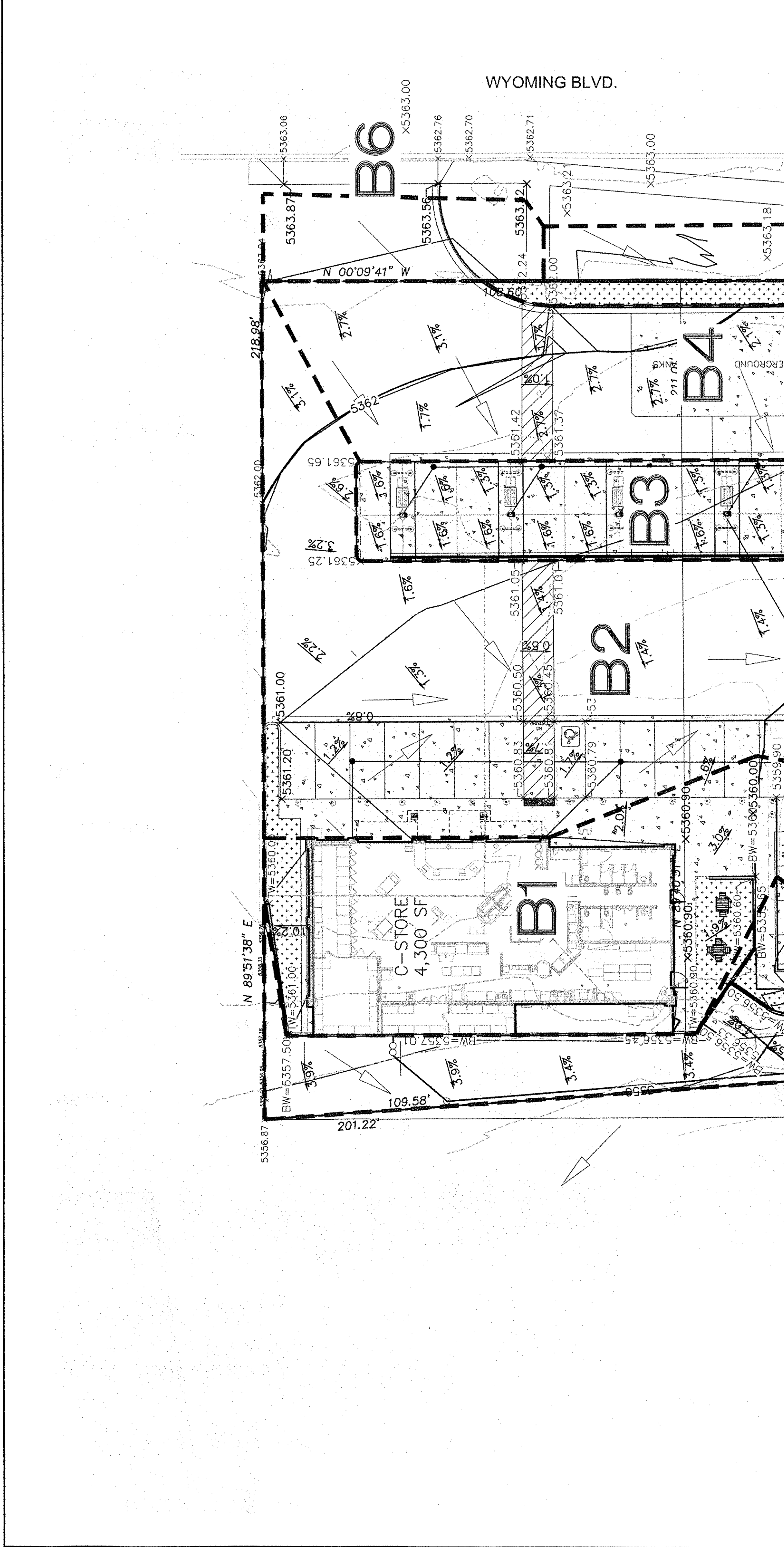
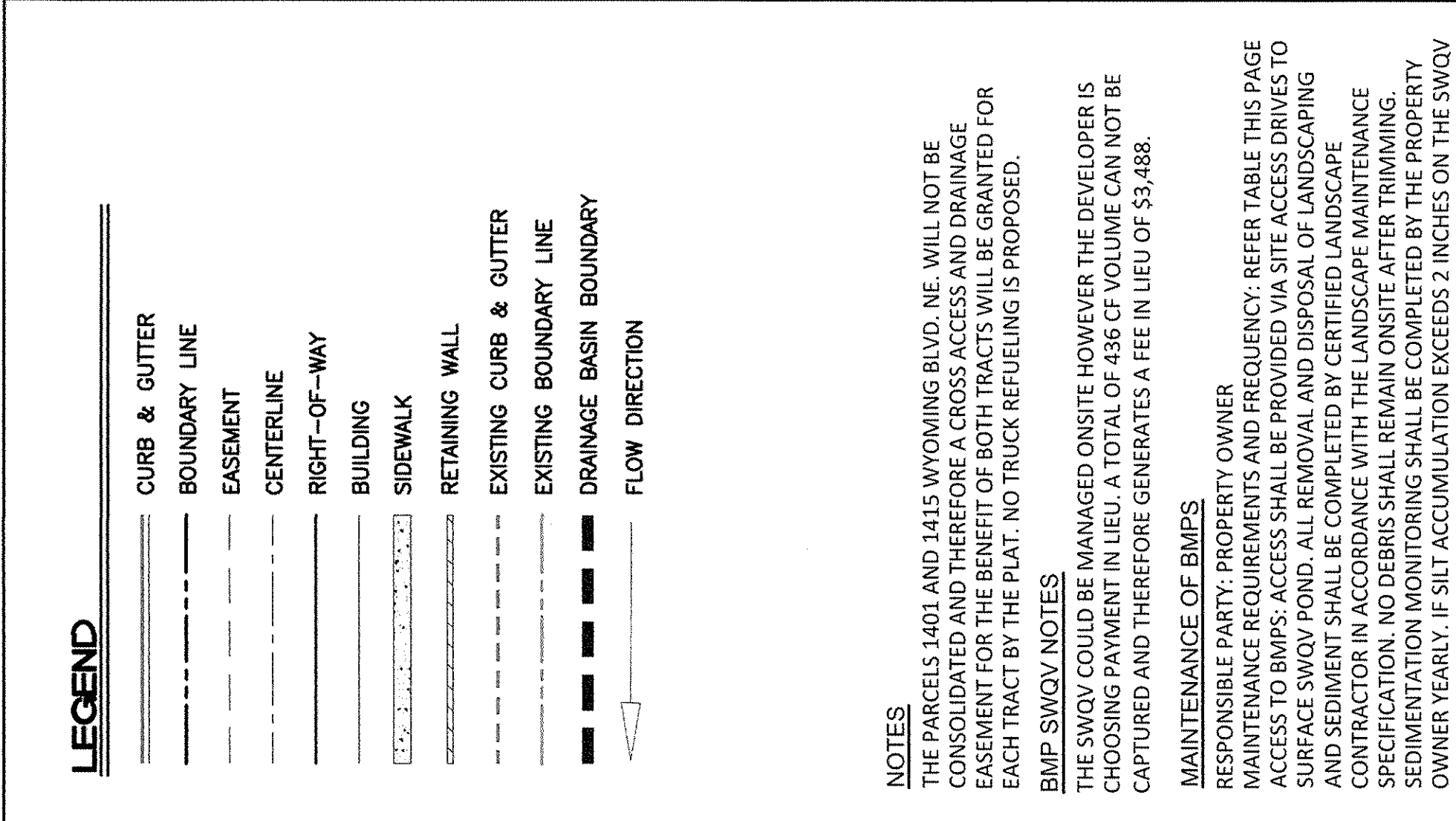
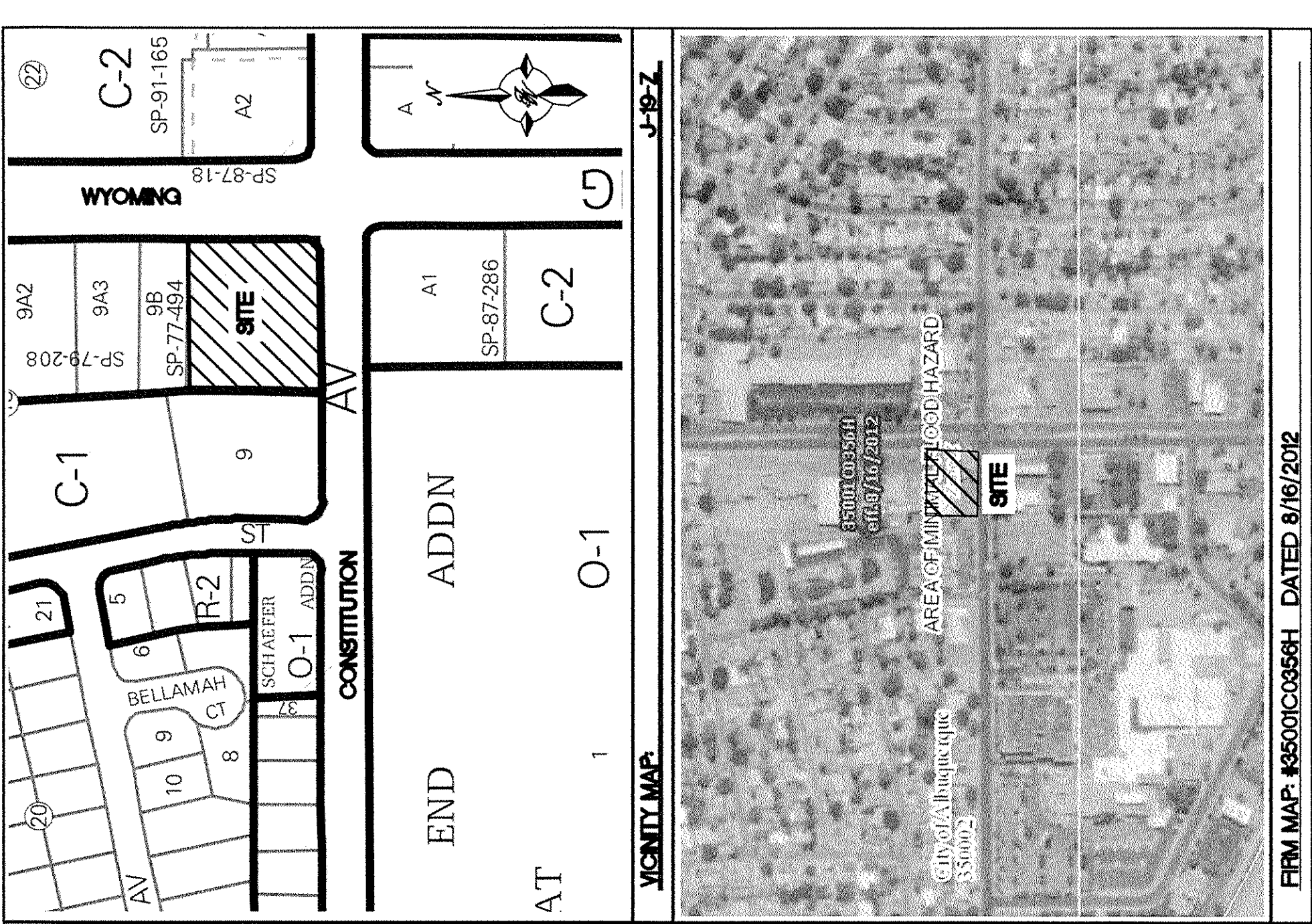


## CAUTION

ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATIONS PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

ENGINEER'S SEAL		<b>MAYERIK</b> <b>1401 WYOMING BLVD. NE</b>  <b>GRADING AND</b> <b>DRAINAGE PLAN</b>	DRAWN BY RS	DATE 12/5/2018	SHEET #  <b>C2</b>	JOB # 2018055
			TERRA WEST LLC 5571 DOWDY PARKWAY, SUITE NE ALBUQUERQUE, NM 87105 (505) 858-3100 www.tierawestllc.com			
						
			RONALD R. BOHANNAN PROFESSIONAL ENGINEER STATE OF NEW YORK No. 12345 Mechanical Engineering			





LEGAL DESCRIPTION	
A PORTION OF LOT 9, BLOCK 18 SNOW HEIGHTS	

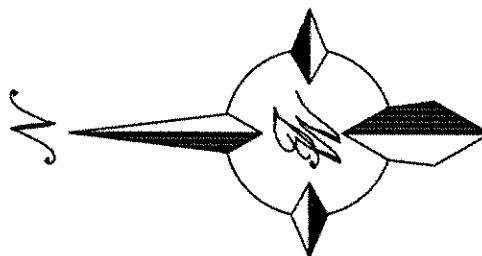
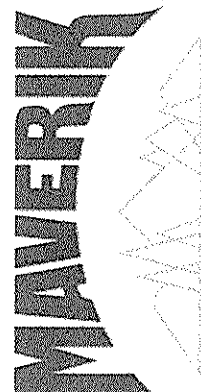

VISUAL INSPECT WITHIN 24 HOURS OF THE SWQV POND BERM.	
VISUAL INSPECT FOLLOWING STORM EVENTS SHALL BE COMPLETED AS REQUIRED TO ENSURE THE INFILTRATION OF THE SWQV IS ACHIEVED AT ACCEPTABLE RATES. THE SWQV, AT THE MAXIMUM 24" DEPTH, SHOULD INFILTRATE WITHIN 24 HOURS.	

REGULAR MAINTENANCE	FREQUENCY
LITTER MANAGEMENT	As required
Pick up all litter at site and in Landscape areas and remove from site.	Daily
INLETS AND OUTLETS	
Visual inspection for function. Remove silt from silt aprons and debris in pavement areas. Remove all fallen vegetation around inlet and outlet structures.	Monthly
HARD SURFACES	
Sweep all paving regularly. Maintain pavement in autumn after leaf fall. Coordinate with Landscape Contractor if additional maintenance is required.	As required

OCCASIONAL TASKS	FREQUENCY
INSPECTION AND INLETS, OUTLETS AND CONTROL CHAMBERS	
Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage. For below ground control chambers, remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.	Yearly
POND VEGETATION	
Ensure Pond vegetation is maintained by Landscape Contractor. All weeds and all cuttings removed from site.	As required
SILT MANAGEMENT	
Inspect swales and water quality pond for silt accumulation. Excavate silt, stack and dry within 2 feet of the water quality feature, but outside the design profile where water flows, spread, rake and overseed. Protect surface from siltation and manage main area of basin for design function or appearance.	Yearly

REMEDIAL WORK	FREQUENCY
Inspect storm all water quality structures regularly to check for damage or failure. Undertake remedial work as required.	Yearly

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			ENGINEER'S SEAL	MAVERIK 1401 WYOMING BLVD. NE DEVELOPED DRAINAGE PLAN			DRAWN BY RS
			5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87709 (505) 858-3100 www.terrawestllc.com			SHEET #  D1	DATE 12/5/2018 2018055--DRAINAGE DEVELOPED

Basin Descriptions				100 Year, 6-Hr				10 Year, 6-Hr				FF Pond Required CF	FF Pond Provided				
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A	Treatment B	Treatment C	Treatment D	Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs				
1	9,360	0.215	0.00034	0%	0.000	0%	0.000	100%	0.215	2,360	0.042	1.08	1.500	0.027	0.73	203	120
2	15,488	0.354	0.00055	0%	0.000	0%	0.000	100%	0.354	2,360	0.070	1.78	1.500	0.044	1.20	334	-
3	3,535	0.081	0.00013	0%	0.000	0%	0.000	100%	0.081	2,360	0.016	0.41	1.500	0.010	0.28	77	-
4	7,043	0.162	0.00025	0%	0.000	0%	0.000	100%	0.162	2,360	0.032	0.81	1,500	0.020	0.55	153	-
5	2,214	0.051	0.00008	0%	0.000	100%	0%	0%	0.000	0.920	0.004	0.13	0.360	0.002	0.06	0	336
6	1,575	0.036	0.00006	0%	0.000	20%	0.007	0%	0.000	0.029	2,072	0.006	1.272	0.004	0.11	27	-
7	1,848	0.042	0.00007	0%	0.000	100%	0.042	0%	0.000	0.920	0.003	0.11	0.360	0.001	0.05	0	-
8	4,631	0.106	0.00017	0%	0.000	2%	0.002	0%	0.000	98%	0.104	2,331	1,477	0.013	0.36	98	-
Total	45,644	1.048	0.00164	0.000	0.103	0.000	0.000	0.945	0.194	5,012		0.121	3,326		892	456	

Equations:

Weighted E = Ea \* Aa + Eb \* Ab + Ec \* Ac + Ed \* Ad / (Total Area)

Volume = Weighted E \* Total Area

Flow = Qa \* Aa + Qb \* Ab + Qc \* Ac + Qd \* Ad

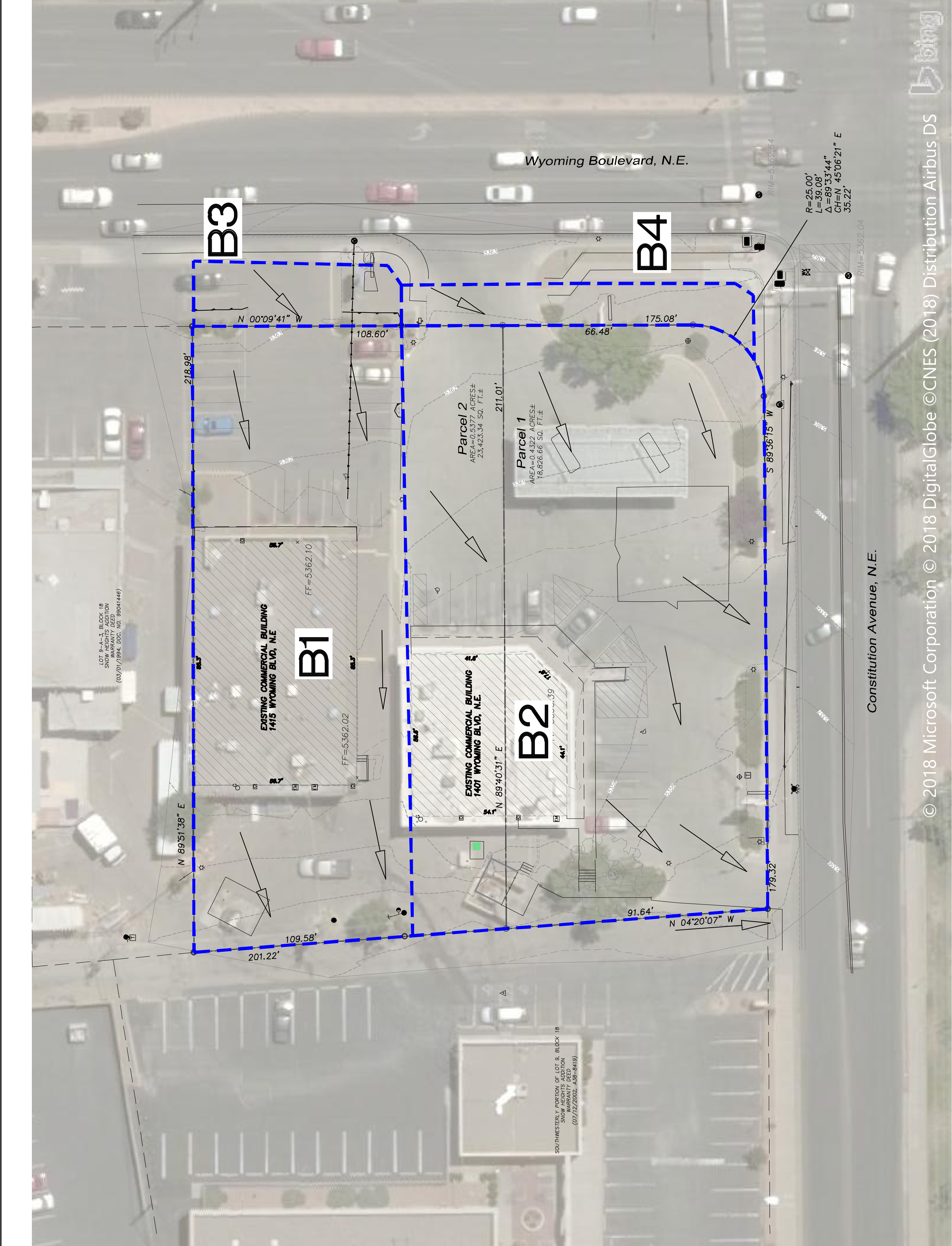
WQV<sub>required</sub> = 0.26 \* A \* 43560 \* (1/12)

Peak Discharge (cfs/acre)

Zone 3	100-Year	10-Year
Ca	1.87	0.58
Cb	2.6	1.19
Cc	3.45	2.00
Cd	5.02	3.39

Basin Descriptions				100 Year, 6 Hr				10 Year, 6 Hr				Water Quality Volume							
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A	%	Treatment B	%	Treatment C	%	Treatment D	%	Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs	FF Pond Required CF	FF Pond Provided
1	9,360	0.215	0.00034	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2	15,488	0.354	0.00055	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
3	3,535	0.081	0.00013	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4	7,043	0.162	0.00025	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
5	2,214	0.051	0.00008	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	1,575	0.036	0.00006	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
7	1,848	0.042	0.00007	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
8	4,631	0.106	0.00017	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	45,644	1.048	0.00164	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0%	0.000	0.000	0.000	0.000	0.000	0.000	0.000





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Existing Conditions - Free Discharge

Basin		Basin Descriptions										100-Year, 6-Hr			10-Year, 6-Hr		
		Area (sf)	Area (acres)	Area (sq miles)	Treatment A	Treatment B	Treatment C	Treatment D	Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs			
B1	16,168.25	0.371	0.00058	0%	0.000	0%	0.000	100%	0.371	2.360	0.073	1.86	1.500	0.046	1.26		
B2	26,052.80	0.598	0.00093	0%	0.000	8%	0.000	0%	0.000	92%	0.550	2.171	1.018	0.069	1.87		
B3	1,575.00	0.036	0.00006	0%	0.000	20%	0.000	0%	0.000	80%	0.029	1.888	0.006	0.15	0.10		
B4	1,848.00	0.042	0.00007	0%	0.000	50%	0.000	0%	0.000	50%	0.021	1.180	0.004	0.11	0.07		
Total	45,644.05	1.048	0.00164		0.000	0.000	0.000	0.972	0.750	0.121	4.88	0.003	0.029	3.29			

Equations:

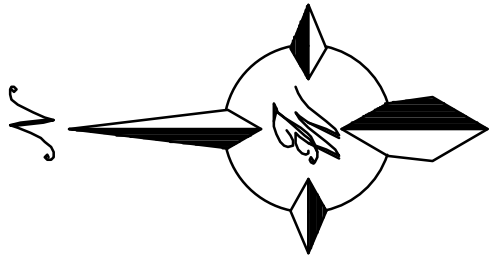
Weighted E = Eb\*Aa + Eb\*Ab + Ec\*Ac + Ed\*Ad / (Total Area)

Volume = Weighted E \* Total Area

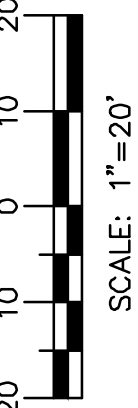
Flow = Qa\*Aa + Qb\*Ab + Qc\*Ac + Qd\*Ad

Excess Precipitation, E (in.)			
Zone 3			
Ea	0.66	0.19	
Eb	0.92	0.36	
Ec	1.29	0.62	
Ed	2.36	1.50	

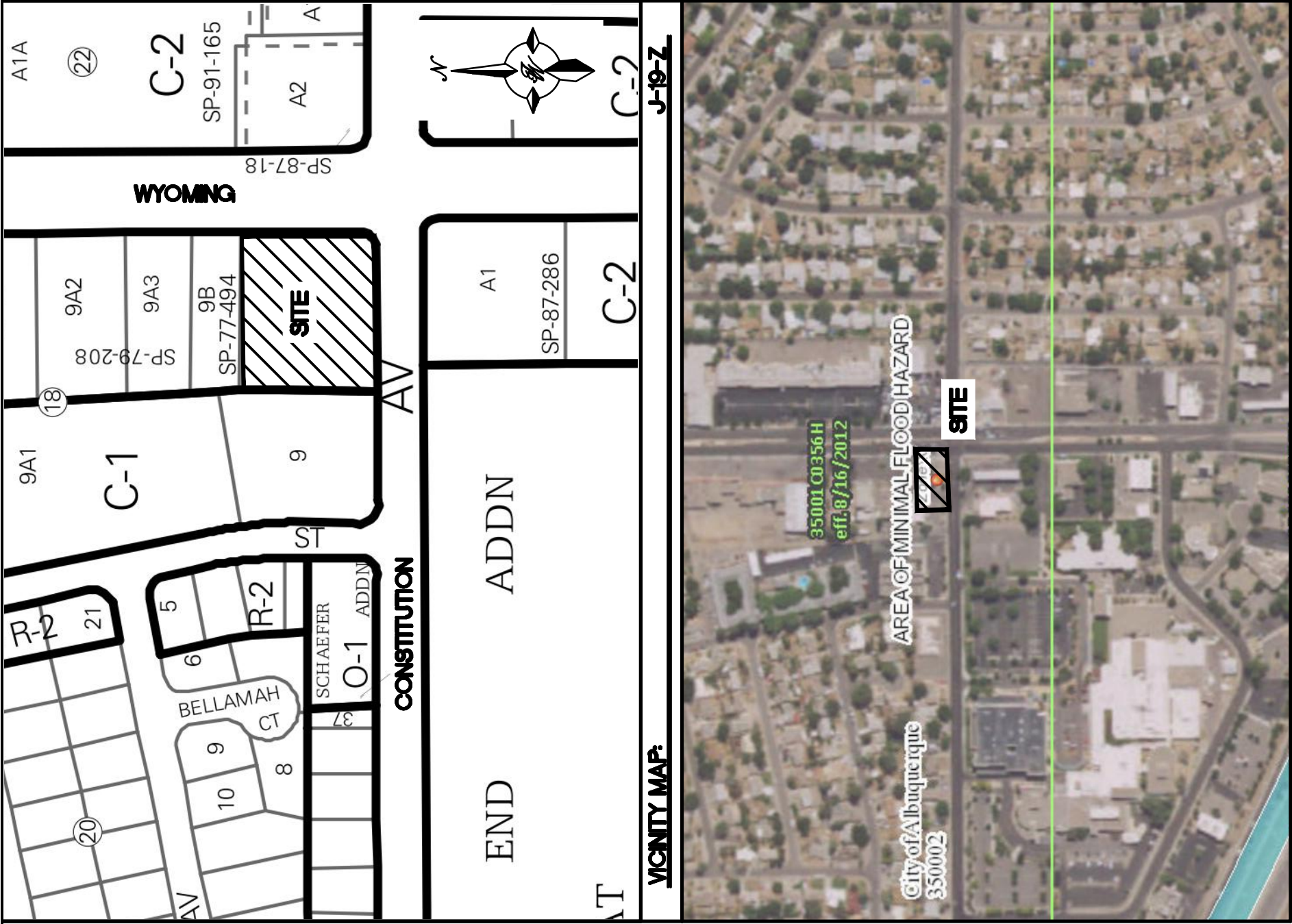
Peak Discharge (cfs/acre)			
Zone 3			
Qa	1.87	0.58	
Qb	2.6	1.19	
Qc	3.45	2.00	
Qd	5.02	3.39	



GRAPHIC SCALE



ENGINEER'S SEAL	MAVERIK		DRAWN BY RS
	1401 WYOMING BLVD. NE		DATE 12/5/2018
	HISTORIC DRAINAGE PLAN		2018055-DRAINAGE HISTORIC
	SHEET # <b>C1</b>		
ROMALO R. BOHANNAN P.E. #7868	TERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.terrawestllc.com		JOB # 2018055



FIRM MAP: #35001C0958H DATED 8/16/2012

LEGAL DESCRIPTION

A PORTION OF LOT 9, BLOCK 18 SNOW HEIGHTS

LEGEND

- CURB & GUTTER
- BOUNDARY LINE
- EASEMENT
- CENTERLINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- RETAINING WALL
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- DRAINAGE BASIN BOUNDARY
- FLOW DIRECTION



DPM Weighted E Method

Precipitation Zone 3

Maverik @ 1401 Wyoming Blvd

TWLLC Date 12/5/2018

Existing Conditions - Free Discharge

Basin Descriptions																	100-Year, 6-Hr				10-Year, 6-Hr		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs						
				%	(acres)	%	(acres)	%	(acres)	%	(acres)												
B1	16,168	0.371	0.00058	0%	0.000	0%	0.000	0%	0.000	100%	0.371	2.360	0.073	1.86	1.500	0.046	1.26						
B2	26,053	0.598	0.00093	0%	0.000	8%	0.000	0%	0.000	92%	0.550	2.171	0.108	2.76	1.380	0.069	1.87						
B3	1,575	0.036	0.00006	0%	0.000	20%	0.000	0%	0.000	80%	0.029	1.888	0.006	0.15	1.200	0.004	0.10						
B4	1,848	0.042	0.00007	0%	0.000	50%	0.000	0%	0.000	50%	0.021	1.180	0.004	0.11	0.750	0.003	0.07						
Total	45,644	1.048	0.00164		0.000		0.000		0.000		0.972		0.191	4.88		0.121	3.29						

Proposed Conditions - Free Discharge

Basin Descriptions																	100-Year, 6-Hr				10-Year, 6-Hr				Water Quality Volume			
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs	FF Pond Required CF	FF Pond Provided									
				%	(acres)	%	(acres)	%	(acres)	%	(acres)																	
1	9,360	0.215	0.00034	0%	0.000	0%	0.000	0%	0.000	100%	0.215	2.360	0.042	1.08	1.500	0.027	0.73	203	120									
2	15,438	0.354	0.00055	0%	0.000	0%	0.000	0%	0.000	100%	0.354	2.360	0.070	1.78	1.500	0.044	1.20	334	-									
3	3,535	0.081	0.00013	0%	0.000	0%	0.000	0%	0.000	100%	0.081	2.360	0.016	0.41	1.500	0.010	0.28	77	-									
4	7,043	0.162	0.00025	0%	0.000	0%	0.000	0%	0.000	100%	0.162	2.360	0.032	0.81	1.500	0.020	0.55	153										
5	2,214	0.051	0.00008	0%	0.000	100%	0.051	0%	0.000	0%	0.000	0.920	0.004	0.13	0.360	0.002	0.06	0	336									
6	1,575	0.036	0.00006	0%	0.000	20%	0.007	0%	0.000	80%	0.029	2.072	0.006	0.16	1.272	0.004	0.11	27										
7	1,848	0.042	0.00007	0%	0.000	100%	0.042	0%	0.000	0%	0.000	0.920	0.003	0.11	0.360	0.001	0.05	0										
8	4,631	0.106	0.00017	0%	0.000	2%	0.002	0%	0.000	98%	0.104	2.331	0.021	0.53	1.477	0.013	0.36	98	-									
Total	45,644	1.048	0.00164		0.000		0.103		0.000		0.945		0.194	5.012		0.121	3.326	892	456									

Equations:

Weighted E = Ea\*Aa + Eb\*Ab + Ec\*Ac + Ed\*Ad / (Total Area)

Volume = Weighted E \* Total Area

Flow = Qa\*Aa + Qb\*Ab + Qc\*Ac + Qd\*Ad

WQV<sub>required</sub> = 0.26\*A^43560\*(1/12)

Excess Precipitation, E (in.)			
Zone 3	100-Year	10-Year	
Ea	0.66	0.19	
Eb	0.92	0.36	
Ec	1.29	0.62	
Ed	2.36	1.50	

Peak Discharge (cfs/acre)			
Zone 3	100-Year	10-Year	
Qa	1.87	0.58	
Qb	2.6	1.19	
Qc	3.45	2.00	
Qd	5.02	3.39	

# OIL SEPARATOR 300 GALLON CAPACITY

MODEL: GI 300/184

## PRODUCT INFORMATION

300 GALLON  
OIL WATER SEPARATOR

TANK= 7,100 #      BAFFLE= 550 #  
LID= 2,100 #  
DESIGN MAY VARY

## SPECIFICATIONS

MEETS ASTM C 1613

RATING: A-16 (H-20), ASSUME  
4" MAX EARTH COVER WITH 3"  
WATER TABLE BELOW GRADE

CONCRETE: 5,000 PSI @ 28 DAYS

STEEL REINFORCEMENT: MEETS  
ASTM A 615, PLACEMENT AS  
REQUIRED BY DESIGN

INLET & OUTLET BOOT MEETS  
ASTM C 923, ACCEPTS 4" & 6" PVC

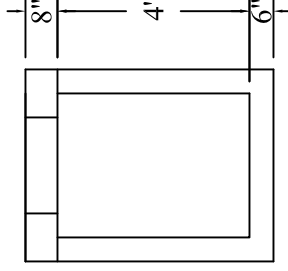
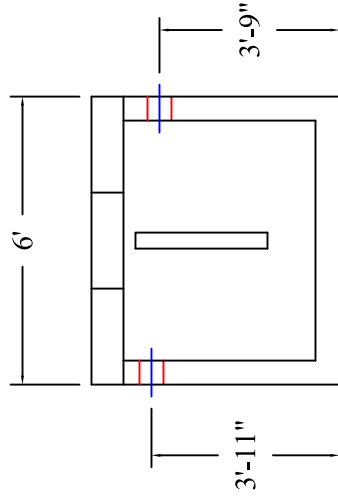
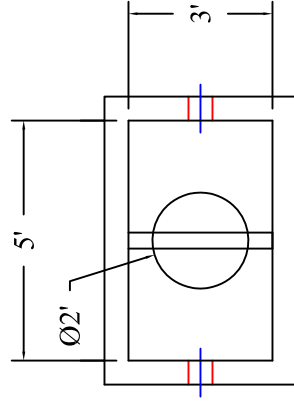
BUTYL SEALANT: MEETS ASTM  
C 900, USED ON JOINTS

ACCESS OPENING SUITABLE FOR  
24" RISER AND/OR RING & COVER

INTERNAL PIPING BY OTHERS  
PER MUNICIPAL SPECS

MODIFICATION TO THIS DESIGN  
AVAILABLE UPON REQUEST

CALL FOR ADDITIONAL SPECS



## DRAWING INFORMATION

Drawn By: CBC  
Checked By: \_\_\_\_\_  
Revision: 1  
Date: 2/6/17

APPROVED BY: \_\_\_\_\_

print: \_\_\_\_\_

sign: \_\_\_\_\_

\*actual dimensions may vary slightly

Scale: 1/4" = 1'



**BARTOW  
PRECAST**

770.382.4462  
sales@bartowprecast.com  
WWW.BARTOWPRECAST.COM



Pipe Capacity

Pipe	D (in)	Slope (%)	Area (ft^2)	R	Q Provided (cfs)	Velocity (ft/s)
PVC	4	1.00	0.09	0.083	0.23	2.58
PVC	6	1.00	0.20	0.125	0.66	3.39
HDPE	8	1.50	0.35	0.167	1.48	4.25
HDPE	24	1.40	3.14	0.500	26.84	8.54

## Worksheet for 2' Concrete Sidewalk Culvert at 2% Slope

### Project Description

Friction Method                      Manning Formula  
Solve For                              Discharge

### Input Data

Channel Slope    0.02000    ft/ft  
Normal Depth    0.50       ft  
Section Definitions

Station (ft)	Elevation (ft)
0+00	0.58
0+00	0.08
0+01	0.00
0+02	0.08
0+02	0.58

### Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 0.58)	(0+02, 0.58)	0.013

### Options

Current Roughness weighted Method              Pavlovskii's Method  
Open Channel Weighting Method                  Pavlovskii's Method  
Closed Channel Weighting Method                Pavlovskii's Method

### Results

Discharge    6.97    ft<sup>3</sup>/s  
Elevation Range                                      0.00 to 0.58 ft  
Flow Area    0.92    ft<sup>2</sup>  
Wetted Perimeter                                      2.84    ft  
Hydraulic Radius                                      0.32    ft  
Top Width    2.00    ft  
Normal Depth    0.50    ft  
Critical Depth    0.76    ft

---

## Worksheet for 2' Concrete Sidewalk Culvert at 2% Slope

---

### Results

Critical Slope	0.00550	ft/ft
Velocity	7.61	ft/s
Velocity Head	0.90	ft
Specific Energy	1.40	ft
Froude Number	1.98	
Flow Type	Supercritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.76	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.00550	ft/ft

# Cross Section for 2% Slope

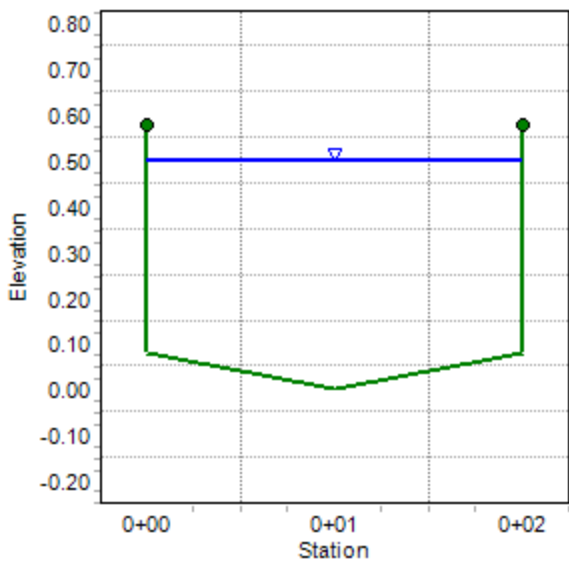
## Project Description

Friction Method	Manning Formula
Solve For	Discharge

## Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.50	ft
Discharge	6.97	ft³/s

## Cross Section Image



## Overflow Weir

### Project Description

Friction Method                      Manning Formula  
Solve For                              Discharge

### Input Data

Channel Slope    0.02000    ft/ft  
Normal Depth    0.50       ft  
Section Definitions

Station (ft)	Elevation (ft)
0+00	2.00
0+02	1.50
0+04	1.50
0+06	2.00

### Roughness Segment Definitions

Start Station	Ending Station	Roughness Coefficient
(0+00, 2.00)	(0+06, 2.00)	0.069

### Options

Current Roughness Weighted Method              Pavlovskii's Method  
Open Channel Weighting Method                  Pavlovskii's Method  
Closed Channel Weighting Method                Pavlovskii's Method

### Results

Discharge    3.04    ft<sup>3</sup>/s  
Elevation Range                                      1.50 to 2.00 ft  
Flow Area    2.00    ft<sup>2</sup>  
Wetted Perimeter                                      5.66    ft  
Hydraulic Radius                                      0.35    ft  
Top Width    5.50    ft  
Normal Depth    0.50    ft  
Critical Depth    0.31    ft  
Critical Slope    0.11408    ft/ft



---

## Overflow Weir

---

### Results

Velocity	1.52	ft/s
Velocity Head	0.04	ft
Specific Energy	0.54	ft
Froude Number	0.44	
Flow Type	Subcritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Downstream Velocity	Infinity	ft/s
Upstream Velocity	Infinity	ft/s
Normal Depth	0.50	ft
Critical Depth	0.31	ft
Channel Slope	0.02000	ft/ft
Critical Slope	0.11408	ft/ft

## Cross Section for Irregular Section - 1

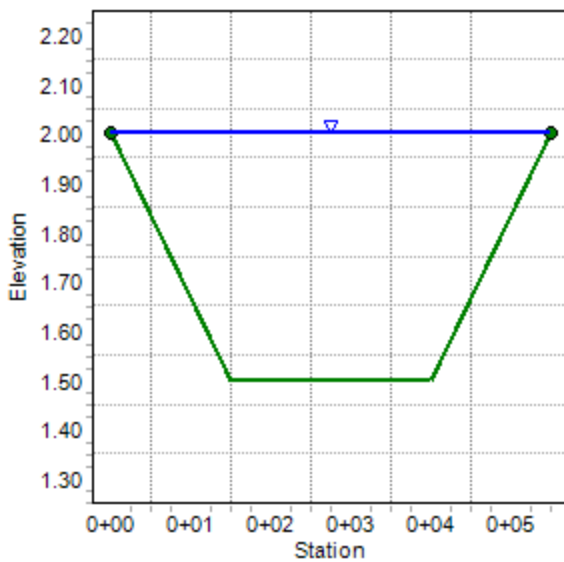
### Project Description

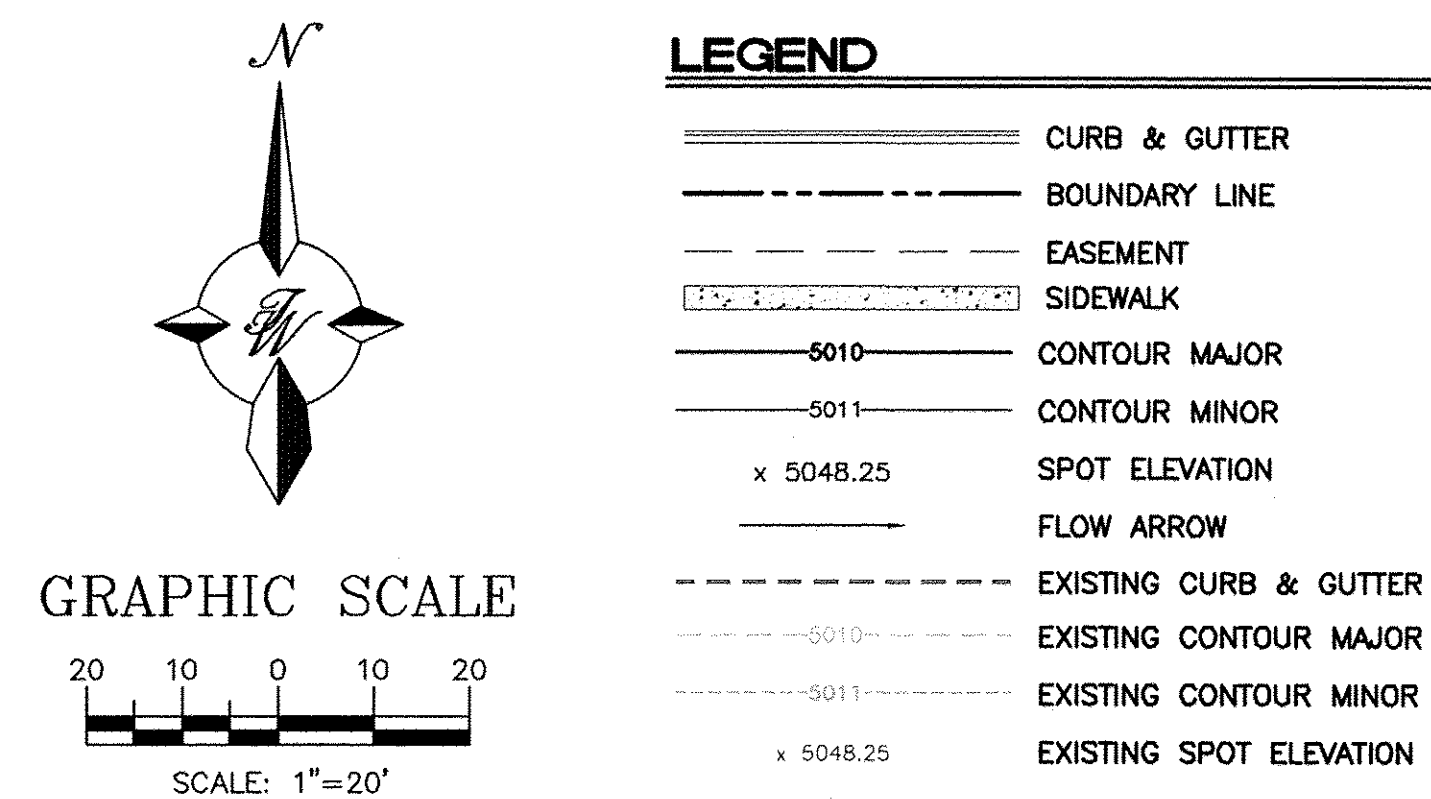
Friction Method	Manning Formula
Solve For	Discharge

### Input Data

Channel Slope	0.02000	ft/ft
Normal Depth	0.50	ft
Discharge	3.04	ft <sup>3</sup> /s

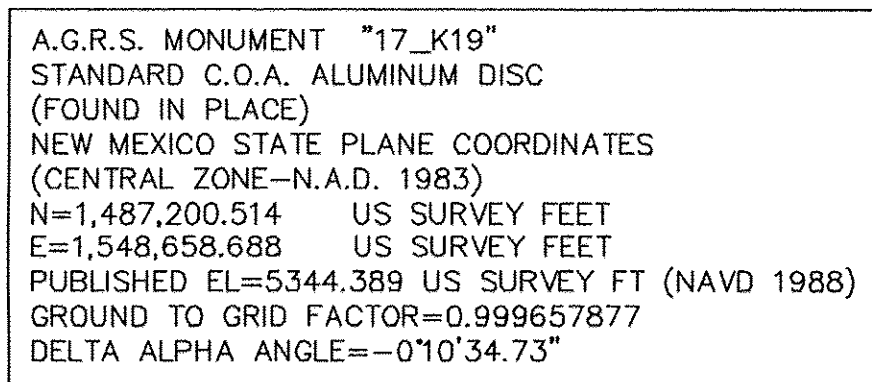
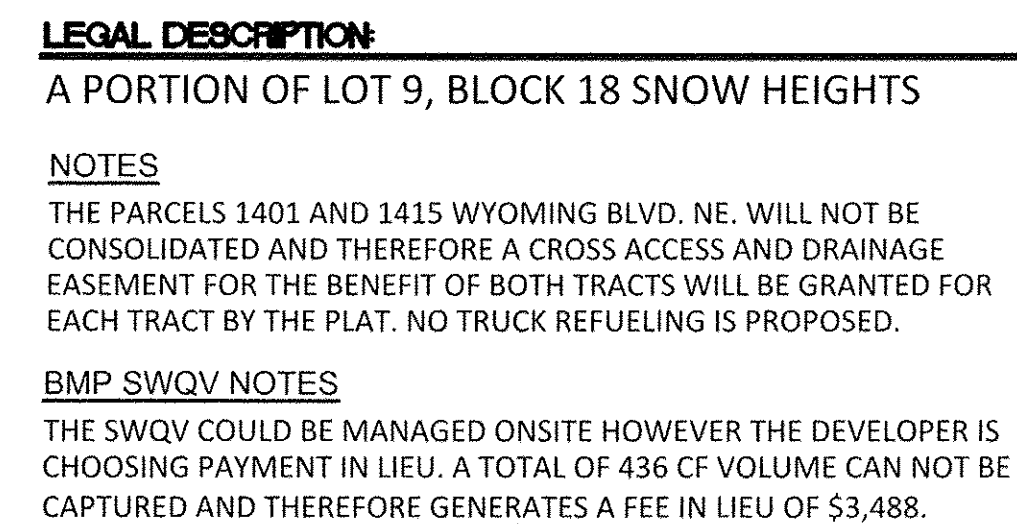
### Cross Section Image





1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.
2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE INTERIM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985.
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONNECTIONS. SHOULD CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACKFILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.
8. PRIOR TO WORK WITHIN THE PASEO DEL NORTE RIGHT-OF-WAY, A NMDOT PERMIT WILL BE REQUIRED

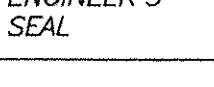

1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR.
5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL (CITY) ACCEPTANCE OF ANY PROJECT.



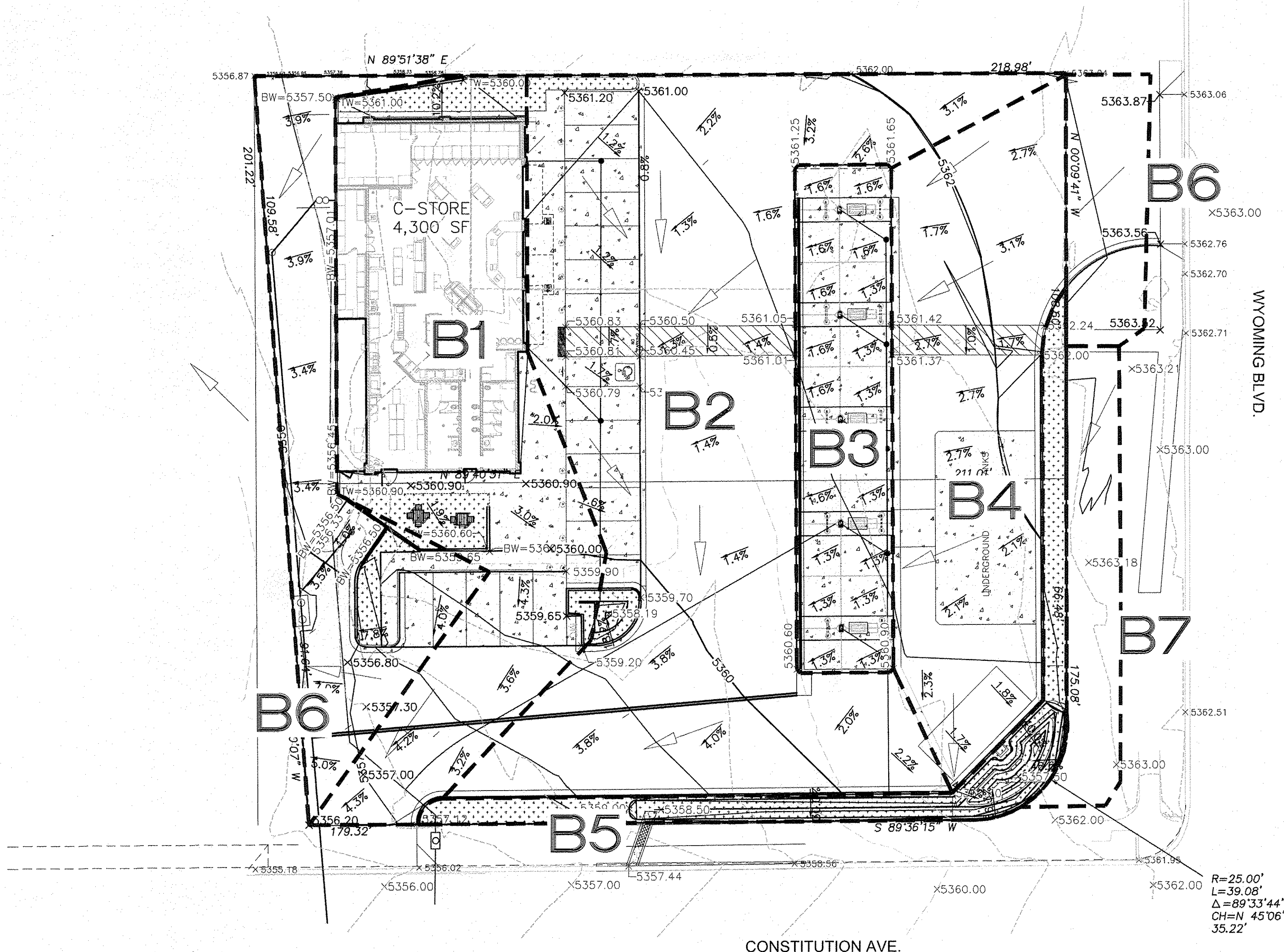
**CAUTION:**

ALL EXISTING UTILITIES SHOWN WERE OBTAINED FROM RESEARCH, AS-BUILTS, SURVEYS OR INFORMATION PROVIDED BY OTHERS. IT SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT ALL NECESSARY FIELD INVESTIGATION PRIOR TO AND INCLUDING ANY EXCAVATION, TO DETERMINE THE ACTUAL LOCATION OF UTILITIES AND OTHER IMPROVEMENTS, PRIOR TO STARTING THE WORK. ANY CHANGES FROM THIS PLAN SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.



	<b>ENGINEER'S SEAL</b>	<b>MAVERIK</b> <b>1401 WYOMING BLVD. NE</b>	<b>DRAWN BY</b> <b>RS</b>
		<b>GRADING AND DRAINAGE PLAN</b>	<b>DATE</b> <b>12/5/2018</b>
		 <b>TIERRA WEST, LLC</b> 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 <a href="http://www.terrawestllc.com">www.terrawestllc.com</a>	<b>2018055-GR</b>
	<b>RONALD R. BOHANNAN</b> <b>P.E. #78968</b>		<b>SHEET #</b>  <b>C2</b>  <b>JOB #</b> <b>2018055</b>





LEGEND

- CURB & GUTTER
- BOUNDARY LINE
- EASEMENT
- CENTERLINE
- RIGHT-OF-WAY
- BUILDING
- SIDEWALK
- RETAINING WALL
- EXISTING CURB & GUTTER
- EXISTING BOUNDARY LINE
- DRAINAGE BASIN BOUNDARY
- FLOW DIRECTION

NOTES

THE PARCELS 1401 AND 1415 WYOMING BLVD. NE. WILL NOT BE CONSOLIDATED AND THEREFORE A CROSS ACCESS AND DRAINAGE EASEMENT FOR THE BENEFIT OF BOTH TRACTS WILL BE GRANTED FOR EACH TRACT BY THE PLAT. NO TRUCK REFUELING IS PROPOSED.

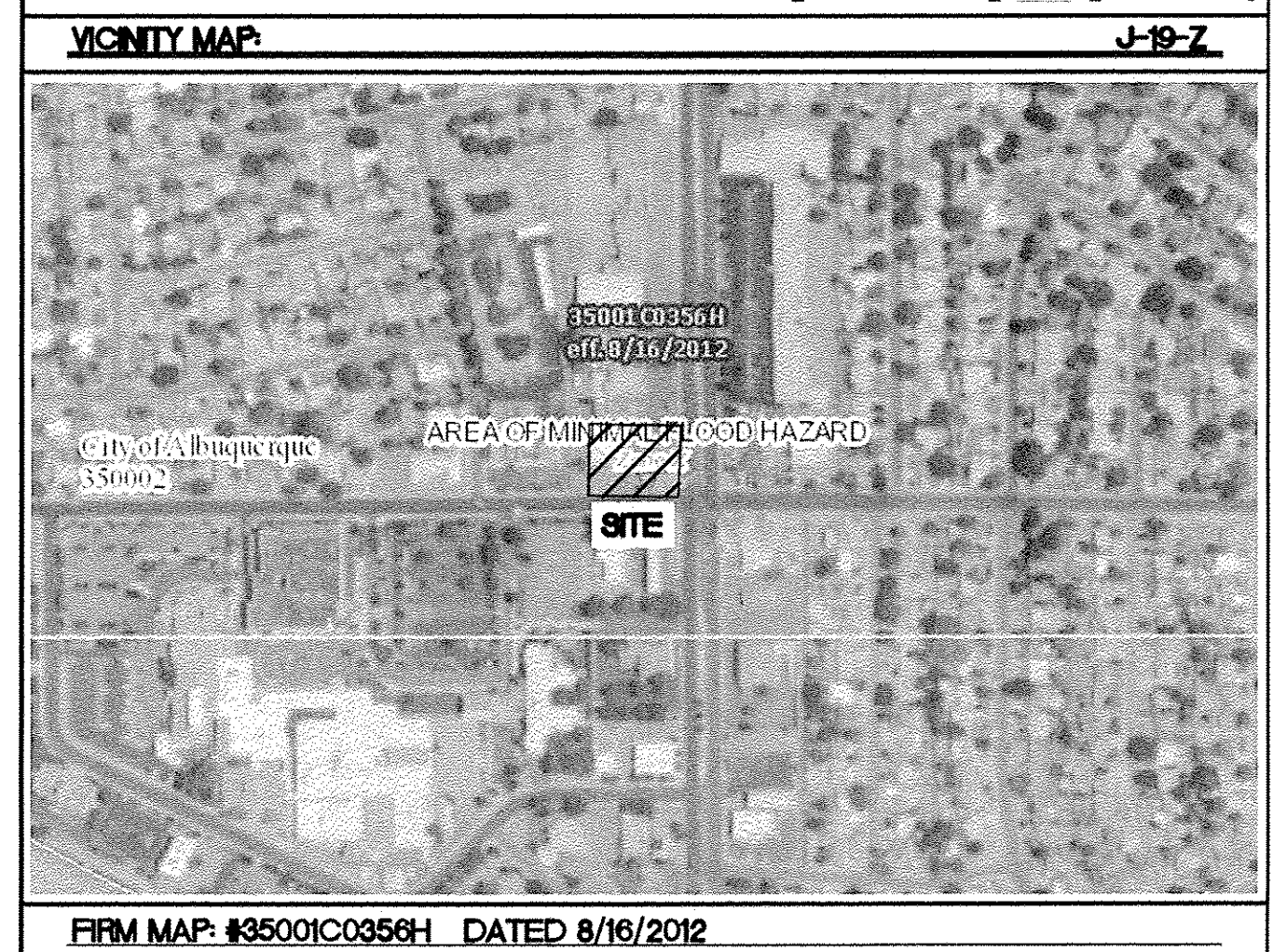
BMP SWQV NOTES

THE SWQV COULD BE MANAGED ONSITE HOWEVER THE DEVELOPER IS CHOOSING PAYMENT IN LIEU. A TOTAL OF 436 CF VOLUME CAN NOT BE CAPTURED AND THEREFORE GENERATES A FEE IN LIEU OF \$3,488.

MAINTENANCE OF BMPS

RESPONSIBLE PARTY: PROPERTY OWNER  
MAINTENANCE REQUIREMENTS AND FREQUENCY: REFER TABLE THIS PAGE  
ACCESS TO BMPS: ACCESS SHALL BE PROVIDED VIA SITE ACCESS DRIVES TO SURFACE SWQV POND. ALL REMOVAL AND DISPOSAL OF LANDSCAPING AND SEDIMENT SHALL BE COMPLETED BY CERTIFIED LANDSCAPE CONTRACTOR IN ACCORDANCE WITH THE LANDSCAPE MAINTENANCE SPECIFICATION. NO DEBRIS SHALL REMAIN ONSITE AFTER TRIMMING. SEDIMENTATION MONITORING SHALL BE COMPLETED BY THE PROPERTY OWNER YEARLY. IF SILT ACCUMULATION EXCEEDS 2 INCHES ON THE SWQV POND GAUGE THEN THE POND BOTTOM SHALL BE EXCAVATED AND STACKED WITHIN 2-FEET OF THE SWQV POND BERM. VISUAL INSPECT FOLLOWING STORM EVENTS SHALL BE COMPLETED AS REQUIRED TO ENSURE THE INFILTRATION OF THE SWQV IS ACHIEVED AT ACCEPTABLE RATES. THE SWQV, AT THE MAXIMUM 24" DEPTH, SHOULD INFILTRATE WITHIN 24 HOURS.

REGULAR MAINTENANCE	FREQUENCY
LITTER MANAGEMENT	
Pick up all litter at site and in Landscape areas and remove from site	Daily
INLETS AND OUTLETS	
Visual inspection for function. Remove silt from slab aprons and debris in pavement areas. Remove all fallen vegetation around inlet and outlet structures.	Monthly
HARD SURFACES	
Sweep all paving regularly. Maintain pavement in autumn after leaf fall. Coordinate with Landscape Contractor if additional maintenance is required.	As required
OCCASIONAL TASKS	FREQUENCY
INSPECTION AND INLETS, OUTLETS AND CONTROL CHAMBERS	
Inspect surface structures removing obstructions and silt as necessary. Check there is no physical damage. For below ground control chambers, remove cover and inspect ensuring water is flowing freely and that the exit route for water is unobstructed. Remove debris and silt.	Yearly
POND VEGETATION	
Ensure Pond vegetation is maintained by Landscape Contractor. All weeds and all cuttings removed from site.	As required
SILT MANAGEMENT	
Inspect swales and water quality pond for silt accumulation. Excavate silt, stack and dry within 2-feet of the water quality feature, but outside the design profile where water flows, spread, rake and overseed. Protect surface from siltation and manage main area of basin for design function or appearance.	Yearly
REMEDIAL WORK	FREQUENCY
Inspect storm all water quality structures regularly to check for damage or failure. Undertake remedial work as required.	Yearly



LEGAL DESCRIPTION

A PORTION OF LOT 9, BLOCK 18 SNOW HEIGHTS

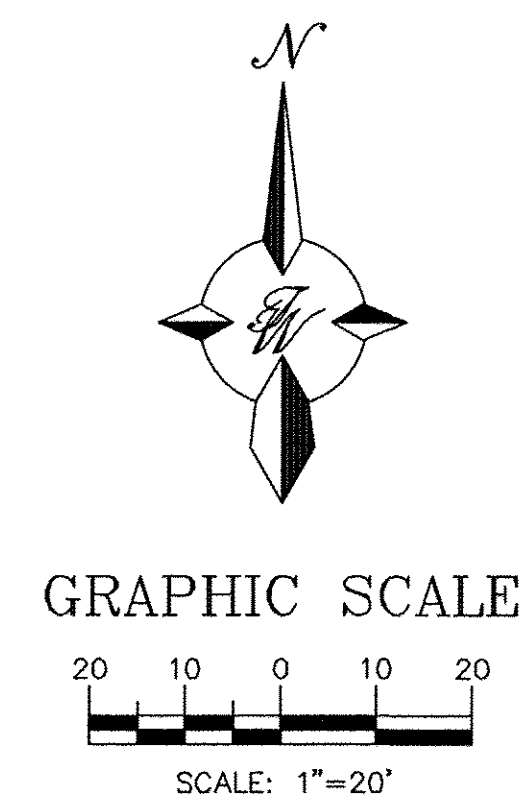
Basin Descriptions											100-Year, 6-Hr			10-Year, 6-Hr			Water Quality Volume		
Basin ID	Area (sf)	Area (acres)	Area (sq miles)	Treatment A		Treatment B		Treatment C		Treatment D		Weighted E (in)	Volume (ac-ft)	Flow cfs	Weighted E (in)	Volume (ac-ft)	Flow cfs	FF Pond Required CF	FF Pond Provided
				%	(acres)	%	(acres)	%	(acres)	%	(acres)								
1	9,360	0.215	0.00034	0%	0.000	0%	0.000	0%	0.000	100%	0.215	2.360	0.042	1.08	1.500	0.027	0.73	203	120
2	15,438	0.354	0.00055	0%	0.000	0%	0.000	0%	0.000	100%	0.354	2.360	0.070	1.78	1.500	0.044	1.20	334	-
3	3,535	0.081	0.00013	0%	0.000	0%	0.000	0%	0.000	100%	0.081	2.360	0.016	0.41	1.500	0.010	0.28	77	-
4	7,043	0.162	0.00025	0%	0.000	0%	0.000	0%	0.000	100%	0.162	2.360	0.032	0.81	1.500	0.020	0.55	153	-
5	2,214	0.051	0.00008	0%	0.000	100%	0.051	0%	0.000	0%	0.000	0.920	0.004	0.13	0.360	0.002	0.06	0	336
6	1,575	0.036	0.00006	0%	0.000	20%	0.007	0%	0.000	80%	0.029	2.072	0.006	0.16	1.272	0.004	0.11	27	-
7	1,848	0.042	0.00007	0%	0.000	100%	0.042	0%	0.000	0%	0.000	0.920	0.003	0.11	0.360	0.001	0.05	0	-
8	4,631	0.106	0.00017	0%	0.000	2%	0.002	0%	0.000	98%	0.104	2.331	0.021	0.53	1.477	0.013	0.36	98	-
Total	45,644	1.048	0.00164	0.000	0.000	2%	0.103	0%	0.000	99.45	0.945	0.194	5.012	0.121	0.121	3.326	892	456	-

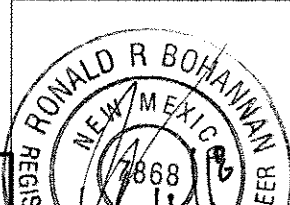

Equations:

Weighted E =  $E_a \cdot A_a + E_b \cdot A_b + E_c \cdot A_c + E_d \cdot A_d$  / (Total Area)  
Volume = Weighted E \* Total Area  
Flow =  $Q_a \cdot A_a + Q_b \cdot A_b + Q_c \cdot A_c + Q_d \cdot A_d$   
 $WQV_{required} = 0.26 \cdot A \cdot 43560 \cdot (1/12)$

Excess Precipitation, E (in.)			
Zone	3	100-Year	10-Year
Ea	0.66	0.19	
Eb	0.92	0.36	
Ec	1.29	0.62	
Ed	2.36	1.50	

Peak Discharge (cfs/acre)			
Zone	3	100-Year	10-Year
Qa	1.87	0.58	
Qb	2.6	1.19	
Qc	3.45	2.00	
Qd	5.02	3.39	



<div>ENGINEER'S SEAL</div> <div></div> <div>RONALD R. BOHANNAN P.E. #7868</div>	<div>MAVERIK</div> <div>1401 WYOMING BLVD. NE</div> <div>DEVELOPED DRAINAGE PLAN</div> <div> <i>TERRA WEST, LLC</i></div> <div>5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 858-3100 www.terrawestllc.com</div>	DRAWN BY RS
		DATE 12/5/2018
		2018055--DRAINAGE DEVELOPED
		SHEET # D1
		JOB # 2018055