

# CITY OF ALBUQUERQUE

Planning Department  
Brennon Williams, Director



Mayor Timothy M. Keller

March 18, 2020

J. Graeme Means, P.E.  
High Mesa Consulting Group  
6010 B Midway Park Blvd NE  
Albuquerque, NM 87109

**RE: Sunset Memorial Park  
924 Menaul Blvd NE  
Revised Master Drainage Plan  
Engineer's Stamp Date: 03/09/20  
Hydrology File: H15D016**

Dear Mr. Means:

PO Box 1293

Based upon the information provided in your submittal received 03/11/2020, the Revised Master Drainage Plan is approved. Once the future projects are ready for Building Permit processing, please submit the Grading & Drainage Plan to the Hydrology Section for review.

Albuquerque

If you have any questions, please contact me at 924-3995 or [rbrissette@cabq.gov](mailto:rbrissette@cabq.gov).

NM 87103

Sincerely,

www.cabq.gov

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 6/2018)

**Project Title:** \_\_\_\_\_ **Building Permit #:** \_\_\_\_\_ **Hydrology File #:** \_\_\_\_\_

**DRB#:** \_\_\_\_\_ **EPC#:** \_\_\_\_\_ **Work Order#:** \_\_\_\_\_

**Legal Description:** \_\_\_\_\_

**City Address:** \_\_\_\_\_

**Applicant:** \_\_\_\_\_ **Contact:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone#:** \_\_\_\_\_ **Fax#:** \_\_\_\_\_ **E-mail:** \_\_\_\_\_

**Other Contact:** \_\_\_\_\_ **Contact:** \_\_\_\_\_

**Address:** \_\_\_\_\_

**Phone#:** \_\_\_\_\_ **Fax#:** \_\_\_\_\_ **E-mail:** \_\_\_\_\_

**TYPE OF DEVELOPMENT:** \_\_\_\_\_ PLAT (# of lots) \_\_\_\_\_ RESIDENCE \_\_\_\_\_ DRB SITE \_\_\_\_\_ ADMIN SITE

IS THIS A RESUBMITTAL? \_\_\_\_\_ Yes \_\_\_\_\_ No

**DEPARTMENT** \_\_\_\_\_ TRANSPORTATION \_\_\_\_\_ HYDROLOGY/DRAINAGE

Check all that Apply:

**TYPE OF SUBMITTAL:**

- \_\_\_\_\_ ENGINEER/ARCHITECT CERTIFICATION
- \_\_\_\_\_ PAD CERTIFICATION
- \_\_\_\_\_ CONCEPTUAL G & D PLAN
- \_\_\_\_\_ GRADING PLAN
- \_\_\_\_\_ DRAINAGE REPORT
- \_\_\_\_\_ DRAINAGE MASTER PLAN
- \_\_\_\_\_ FLOODPLAIN DEVELOPMENT PERMIT APPLIC
- \_\_\_\_\_ ELEVATION CERTIFICATE
- \_\_\_\_\_ CLOMR/LOMR
- \_\_\_\_\_ TRAFFIC CIRCULATION LAYOUT (TCL)
- \_\_\_\_\_ TRAFFIC IMPACT STUDY (TIS)
- \_\_\_\_\_ STREET LIGHT LAYOUT
- \_\_\_\_\_ OTHER (SPECIFY) \_\_\_\_\_
- \_\_\_\_\_ PRE-DESIGN MEETING?

**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
- \_\_\_\_\_ FLOODPLAIN DEVELOPMENT PERMIT
- \_\_\_\_\_ OTHER (SPECIFY) \_\_\_\_\_

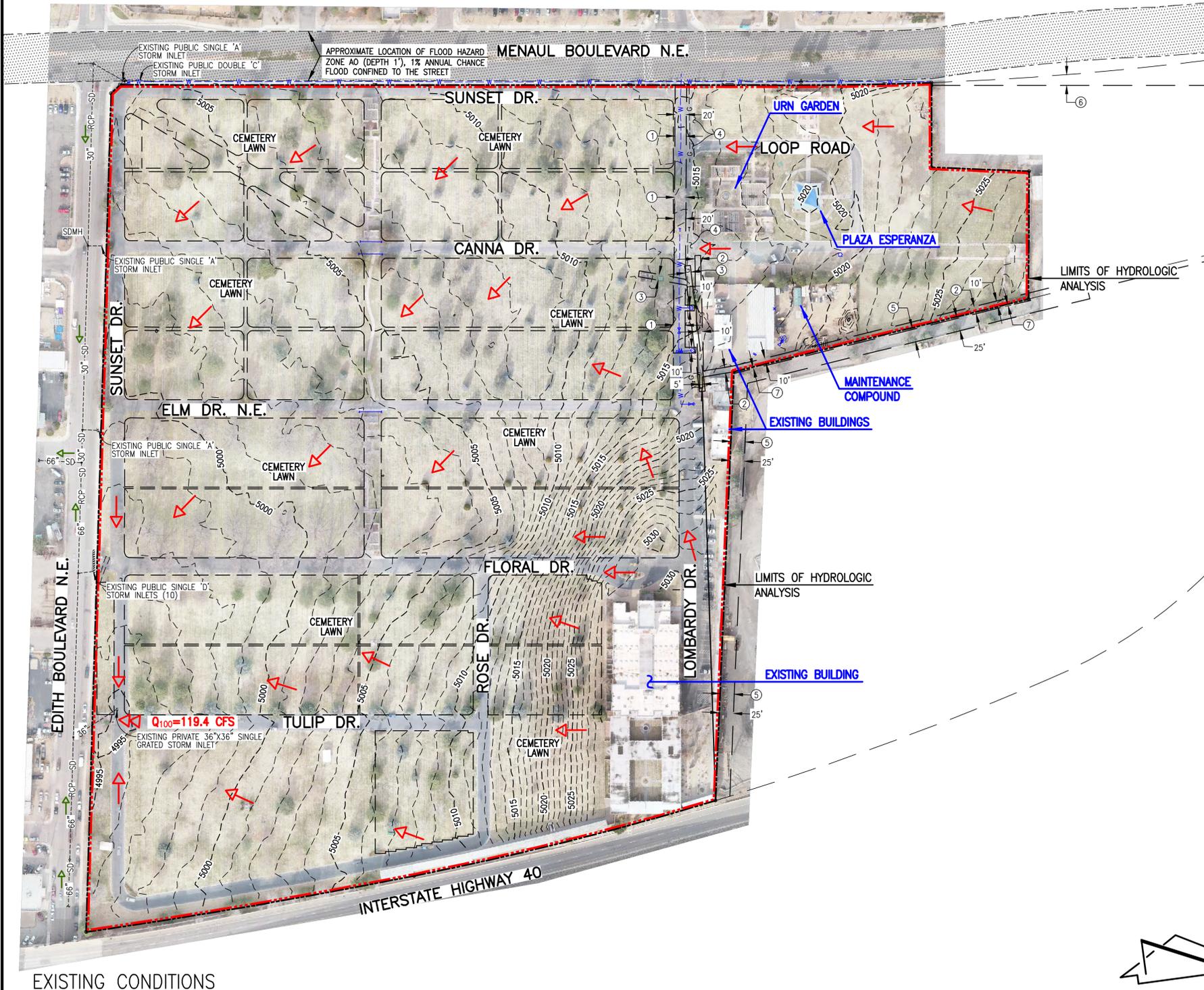
**DATE SUBMITTED:** \_\_\_\_\_ **By:** \_\_\_\_\_

COA STAFF:

ELECTRONIC SUBMITTAL RECEIVED: \_\_\_\_\_

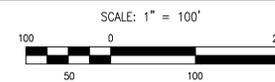
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File Name: P:\data\2019\2019.0572\ENGIN\20190572\_Dbaec.dwg - SHEET 1 Plot Date: 3/9/20 Plot Time: 14:39



EXISTING CONDITIONS

**SURVEY NOTE:**  
 THE BOUNDARY INFORMATION DEPICTED BY THIS PLAN BASED UPON THE SURVEY EFFORT PREPARED BY HIGH MESA CONSULTING GROUP DATED 11/06/2013.  
 THE DIGITAL ORTHOPHOTO, CONTOUR AND UTILITY INFORMATION DEPICTED HEREON IS BASED UPON THE CONTROL AND UNCLASSIFIED SURVEY PREPARED BY HIGH MESA CONSULTING GROUP, NMPS NO. 11184. (2019.057.1)

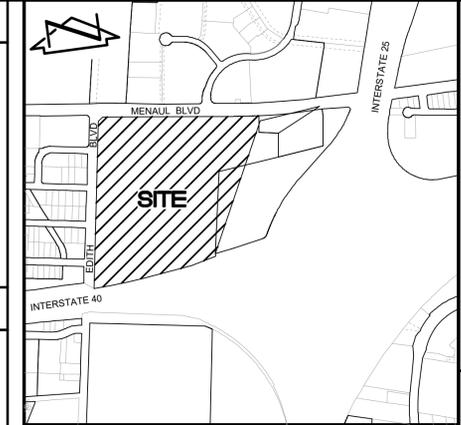


**EASEMENTS**

- ① PUBLIC WATERLINE EASEMENT AS DEPICTED ON PLAT 91C-8
- ② PNM AND MST&T EASEMENT GRANTED BY DOCUMENT FILED 12-22-1986, BOOK MISC. 432A, PAGE 995, DOC. #1986126348. THE NORTHERN 130' OF SAID EASEMENT BEING QUITCLAIMED BY DOCUMENT FILED 04-07-2006, BOOK A114, PAGE 9608, DOC. #2006049769 (PNM ELECTRIC) AND BY DOCUMENT FILED 04-07-2006, BOOK A114, PAGE 9609, DOC. #2006049770 (US WEST COMMUNICATIONS, INC.).
- ③ 10' PNM AND US WEST COMMUNICATIONS, INC. EASEMENT GRANTED BY DOCUMENT FILED 06-02-2000, BOOK A6, PAGE 3753, DOC. #2000053972
- ④ 5' PNM GAS SERVICES EASEMENT GRANTED BY DOCUMENT FILED 07-03-2002, BOOK A38, PAGE 5096, DOC. #2002085333, AS INSTALLED LOCATION

**EASEMENTS - OFFSITE**

- ⑤ 25' PLANTING SCREEN EASEMENT GRANTED BY PLAT B19-86
- ⑥ PUBLIC UTILITY EASEMENTS RESERVED BY V-78-4, PER PLAT 91C-9
- ⑦ 3' PRIVATE RETAINING WALL EASEMENT GRANTED BY DOCUMENT FILED 08-13-2003, BOOK A62, PAGE 2550, DOC. #2003142855



**VICINITY MAP**  
 SCALE: 1"=750'

H-15



**F.I.R.M.**  
 SCALE: 1"=750'

**PANEL 332 OF 825**  
 DATE 09-26-2008

**BENCHMARKS**

- PROJECT BENCHMARK - DESTROYED**  
 AN A.G.R.S. 1 3/4" ALUMINUM DISK STAMPED "ACS BM, 11-H15" EPOXYED ON TOP OF CONCRETE CURB RETURN, AT THE ENE QUADRANT OF THE INTERSECTION OF MENAUL BOULEVARD AND BROADBENT PARKWAY N.E.  
 ELEVATION = 5015.50 FEET (NAVD 1988)
- TEMPORARY BENCHMARK #1 (T.B.M.) - DESTROYED**  
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 ELEVATION = 5003.84 FEET (NAVD 1988)
- TEMPORARY BENCHMARK #2 (T.B.M.)**  
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 A MAG NAIL WITH WASHER SET IN ASPHALT, AS SHOWN ON THIS SHEET.  
 ELEVATION = 5002.64 FEET (NAVD 1988)

**LEGEND**

- EXISTING BASIN BOUNDARY
- - - 5020 - - - EXISTING CONTOUR
- EXISTING FLOWLINE
- EXISTING FLOW DIRECTION
- EXISTING GRAPHIC POINT OF DISCHARGE

**INDEX OF DRAWINGS**

- 1 EXISTING CONDITIONS, NOTES, VICINITY MAP, FLOODPLAIN MAP, KEYED NOTES
- 2 DEVELOPED CONDITIONS
- 3 DRAINAGE PLAN AND CALCULATIONS

**HIGH MESA Consulting Group**  
 6010-B Midway Park Blvd, NE - Albuquerque, New Mexico 87109  
 Phone: 505.346.4250 • Fax: 505.346.4254 • www.highmesagroup.com

**J. GRAEME MEANS**  
 (13676)  
 REGISTERED PROFESSIONAL ENGINEER  
 03-09-2020

**SUNSET MEMORIAL PARK  
 MASTER DRAINAGE PLAN**

NO.	DATE	BY	REVISIONS

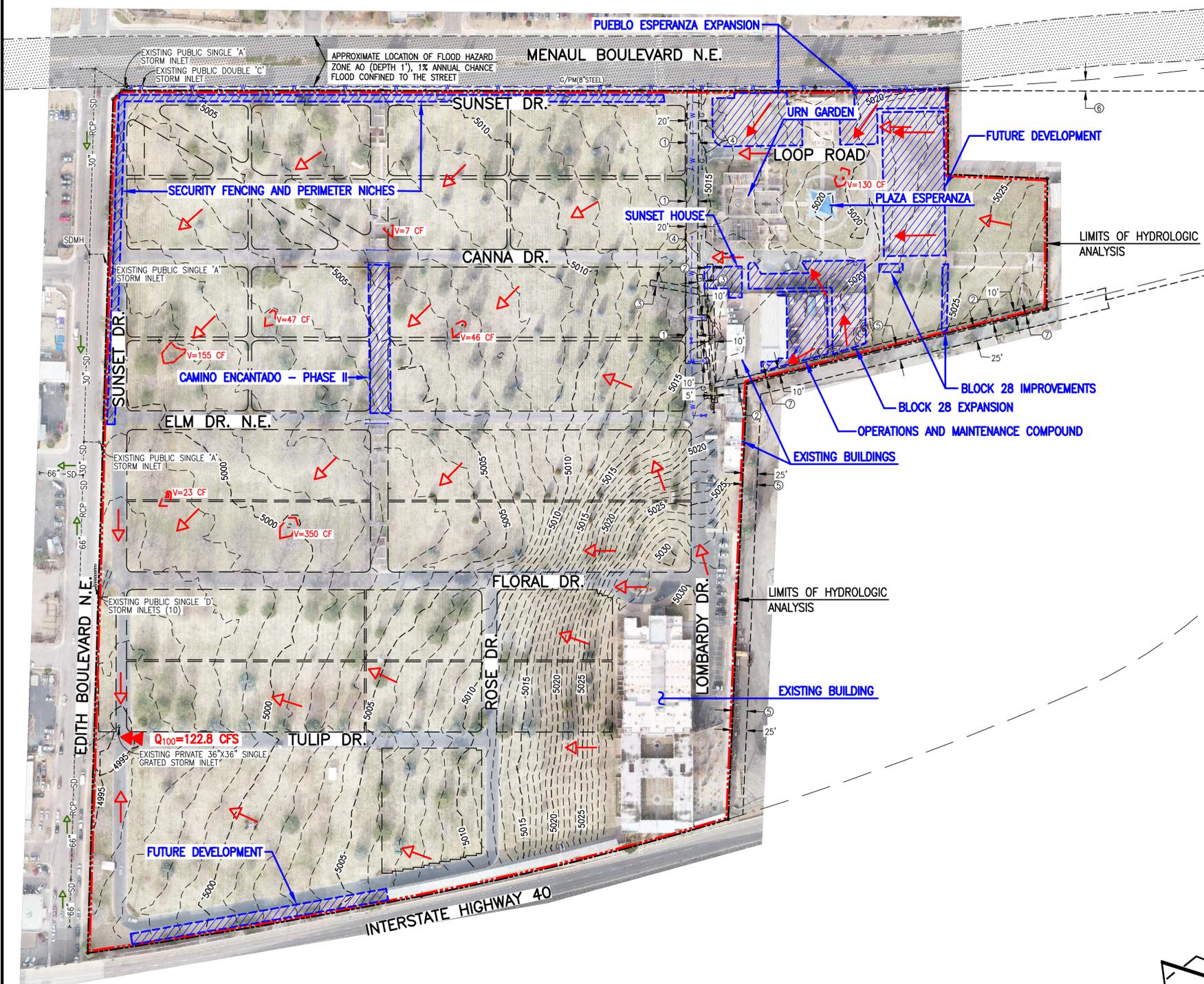
PROJECT No. 2019.057.2  
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 APPROVED BY G.M.  
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**EXISTING CONDITIONS**

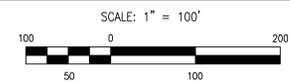
SHEET 1 OF 3

2019.057.2

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DEVELOPED CONDITIONS



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**PROPOSED IMPROVEMENTS**

**CAMINO ENCANTADO PHASE II** - PROPOSED DEVELOPMENT WILL CLOSELY MATCH THE PREVIOUS PHASE OF CAMINO ESPERANZA DEVELOPMENT AND COULD INCLUDE STUCCO-WALLED COURTS WITH CREMATION NICHES AND CASKET CRYPTS, AND ASSOCIATED CREMATION PLANTERS AND GARDEN BED CREMATION INVENTORY.

**SECURITY FENCING AND PERIMETER NICHES** - PROPOSED DEVELOPMENT COULD INCLUDE ALTERNATING SECTIONS OF STUCCO WALL NICHE CABINETS AND METAL SECURITY FENCING ALONG PORTIONS OF MENAUL BLVD. AND EDITH BLVD. PROPOSED DEVELOPMENT WOULD REPLACE AN EXISTING WALL AND FENCE.

**OPERATIONS AND MAINTENANCE COMPOUND** - PROPOSED DEVELOPMENT COULD INCLUDE A CONSOLIDATION OF VEHICLE MANEUVERING AND OUTDOOR EQUIPMENT/MATERIAL STORAGE SPACE AND A CONSOLIDATION OF EXISTING SMALL OUTBUILDINGS AND COVERED STORAGE AREAS INTO FEWER BUILDINGS.

**BLOCK 28 IMPROVEMENTS** - PROPOSED DEVELOPMENT COULD INCLUDE MORE GRAVES ADDED IN THE AREA RECLAIMED BY OPERATIONS AND MAINTENANCE COMPOUND CONSOLIDATION (REFER TO DESCRIPTION ABOVE).

**BLOCK 28 IMPROVEMENT S-** PROPOSED DEVELOPMENTS COULD INCLUDE STUCCO WALL ENTRY FEATURE AT FRONT AND STUCCO WALL NICHE CABINETS ALONG THE EAST SIDE.

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**FUTURE DEVELOPMENT AREAS** - TWO AREAS OF FUTURE, LONG RANGE DEVELOPMENT WILL REMAIN ON PROPERTY.

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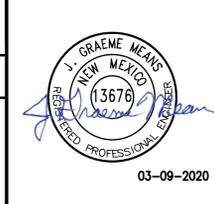
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**LEGEND**

- EXISTING BASIN BOUNDARY
- EXISTING CONTOUR
- EXISTING FLOWLINE
- EXISTING DIRECTION OF FLOW
- EXISTING GRAPHIC POINT OF DISCHARGE
- PROPOSED BASIN BOUNDARY
- PROPOSED FLOWLINE
- PROPOSED DIRECTION OF FLOW
- PROPOSED GRAPHIC POINT OF DISCHARGE

**HIGH MESA Consulting Group**  
 6010-B Midway Park Blvd. NE • Albuquerque, New Mexico 87109  
 Phone: 505.345.4250 • Fax: 505.345.4254 • www.highmesagroup.com



**SUNSET MEMORIAL PARK MASTER DRAINAGE PLAN**

NO.	DATE	BY	REVISIONS

PROJECT No. 2019.057.2  
 DESIGNED BY R.J.C.  
 DRAWN BY J.Y.R.  
 APPROVED BY G.M.  
 SHEET TITLE

**DEVELOPED CONDITIONS**

DRAINAGE PLAN:

I. INTRODUCTION AND EXECUTIVE SUMMARY

THE SITE IS LOCATED AT THE SOUTHEAST CORNER OF THE INTERSECTION OF MENAUL BLVD. NE AND EDITH BLVD. NE. AT PRESENT, THE SITE IS DEVELOPED AS A CEMETERY PARK AND RELATED USES.

THE PROPOSED DRAINAGE CONCEPT WILL BE THE CONTINUED FREE DISCHARGE OF RUNOFF VIA A COMBINATION OF EXISTING SHEET AND SHALLOW CONCENTRATED FLOW ACROSS EXISTING CEMETERY LAWN AREAS AND INTERNAL PAVED ROADS TO EDITH BLVD. NE.

THIS SUBMITTAL IS MADE FOR MASTER SITE DEVELOPMENT PLAN APPROVAL (DRB). INDIVIDUAL PROJECTS TO CONSTRUCTED IN ACCORDANCE WITH THIS MASTER DRAINAGE PLAN WILL INCLUDE DETAILED SITE-SPECIFIC GRADING AND DRAINAGE PLANS AS THEY COME IN AND WILL BE REVIEWED AND APPROVED THROUGH THE ADMINISTRATIVE AMENDMENT PROCESS.

II. PROJECT DESCRIPTION

AS SHOWN BY THE EXISTING AND DEVELOPED CONDITIONS PLANS, THE PROJECT SITE GENERALLY SLOPES FROM NORTHEAST TO SOUTHWEST AND CONSISTS OF SEVERAL DISTINCT AREAS WITH CEMETERY-RELATED USES INCLUDING LARGE EXPANSES OF LAWN BURIAL AREAS WITH ACCESS ROADS DIVIDING THE AREA INTO BLOCKS.

THE CURRENT LEGAL DESCRIPTION OF THE SITE IS TRACT 1, SUNSET MEMORIAL PARK. AS SHOWN BY PANEL 332 OF 825 OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE RATE MAPS PUBLISHED BY FEMA FOR BERNALILLO COUNTY, NEW MEXICO, SEPTEMBER 26, 2008, THIS SITE DOES NOT LIE WITHIN A DESIGNATED FLOOD HAZARD ZONE.

III. BACKGROUND DOCUMENTS & RESEARCH

THE FOLLOWING BACKGROUND DOCUMENTS WERE REVIEWED IN THE PREPARATION OF THIS SUBMITTAL:

A. MASTER DRAINAGE PLAN UPDATE FOR SUNSET MEMORIAL PARK (H-15/D16), DATED 04-09-2015, PREPARED BY HIGH MESA CONSULTING GROUP THE 2014 MASTER DRAINAGE PLAN WAS AN UPDATE TO A PREVIOUSLY APPROVED 1987 MASTER DRAINAGE PLAN AND MAINTAINED EXISTING DRAINAGE PATTERNS AND FREE DISCHARGE OF RUNOFF FROM THE SITE IS ALLOWABLE TO EDITH BLVD. NE

B. A CONTROL AND UNCLASSIFIED SURVEY PREPARED BY HIGH MESA CONSULTING GROUP, NMPS NO. 11184 (2019.057.1) THIS REFERENCED DOCUMENTS PROVIDES A DIGITAL ORTHOPHOTO, CONTOUR, UTILITY INFORMATION AND THE BASIS FOR THE EXISTING CONDITIONS OF THE SITE TO BE DEVELOPED IN THE PHASES LISTED BELOW.

IV. EXISTING CONDITIONS

THE EXISTING SITE IS DEVELOPED AS A CEMETERY WITH RELATED USES. AT PRESENT, THE SITE CONSISTS PRIMARILY OF TURF GRASS BURIAL PLOTS WITH INTERNAL PAVED ACCESS ROADS MAKING UP THE WESTERN AND CENTRAL PORTIONS OF THE SITE. THE EASTERN EDGE OF THE SITE CONTAINS THE EXISTING ADMINISTRATION BUILDING, RETORT, SEVERAL CRYPT BUILDINGS, MAUSOLEUM, ROSE DRIVE IMPROVEMENTS AND ROSE GARDEN.

AS ESTABLISHED BY PREVIOUS MDP UPDATE, THERE ARE NO OFFSITE FLOWS AFFECTING THIS SITE (H-15/D16).

V. DEVELOPED CONDITIONS AND PHASING

DEVELOPMENT IS PROPOSED IN SEVERAL SITE AREAS. THESE AREAS ARE LABELED IN THE DEVELOPED CONDITIONS SITE PLAN. THE DEVELOPED CONDITIONS FOR EACH AREA ARE AS FOLLOWS:

CAMINO ENCANTADO PHASE II - PROPOSED DEVELOPMENT WILL CLOSELY MATCH THE PREVIOUS PHASE OF CAMINO ESPERANZA DEVELOPMENT AND COULD INCLUDE STUCCO-WALLED COURTS WITH CREMATION NICHEs AND CASKET CRYPTS, AND ASSOCIATED CREMATION PLANTERS AND GARDEN BED CREMATION INVENTORY.

SECURITY FENCING AND PERIMETER NICHEs - PROPOSED DEVELOPMENT COULD INCLUDE ALTERNATING SECTIONS OF STUCCO WALL NICHE CABINETS AND METAL SECURITY FENCING ALONG PORTIONS OF MENAUL BLVD. AND EDITH BLVD.

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FUTURE DEVELOPMENT AREAS - TWO AREAS OF FUTURE, LONG RANGE DEVELOPMENT WILL REMAIN ON PROPERTY.

V. DEVELOPED CONDITIONS AND PHASING (CONTINUED)

EACH IMPROVEMENT DESCRIBED ABOVE MAY BE BUILT-OUT IN ITS ENTIRETY AS A SINGLE PROJECT, HOWEVER, IT IS RECOGNIZED THAT MARKET DEMANDS CHANGE WITH TIME THEREBY NECESSITATING RE-VISITING THE SCOPE OF IMPROVEMENTS OFFERED AND HENCE CONSTRUCTED WITHIN EACH ANTICIPATED PHASE AND ASSOCIATED PROJECT.

EACH INDIVIDUAL PROJECT WILL BE ADDRESSED BY PROJECT-SPECIFIC SUBMITTALS FOR PERMIT. THERE WILL BE NO CONSTRUCTION BASED UPON THE CONCEPTS AND THIS MASTER PLAN.

VI. EXISTING AND DEVELOPED CONDITIONS PLANS

THE EXISTING AND DEVELOPED CONDITIONS PLANS SHOW 1) EXISTING GRADES INDICATED BY FLOW ARROWS AND CONTOURS AT 1'-0" INTERVALS AS TAKEN FROM THE ABOVE REFERENCED 2019 SURVEY, 2) PROPOSED DEVELOPMENT AREAS WITH RELATED GENERAL FLOW ARROWS, 3) THE LIMIT AND CHARACTER OF THE EXISTING IMPROVEMENTS AS TAKEN FROM THE ABOVE REFERENCED 2019 SURVEY, AND 4) THE LIMITS OF THE PROPOSED IMPROVEMENTS AS GENERALLY DESCRIBED BY THE PRECEDING DEVELOPED CONDITIONS SECTION.

VII. CALCULATIONS

THE CALCULATIONS CONTAINED HEREON ANALYZE THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6-HOUR RAINFALL EVENT FOR THE PROJECT SITE. THE PROCEDURE FOR 40 ACRE AND SMALLER BASINS, AS SET FORTH IN THE REVISION OF SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED JANUARY 1993, HAS BEEN USED TO QUANTIFY THE PEAK RATE OF DISCHARGE AND VOLUME OF RUNOFF GENERATED.

VIII. FIRST FLUSH

THE PROPOSED NEW DEVELOPMENT AREA WILL GENERATE A FIRST FLUSH VOLUME OF 1,490 CF. THIS RUNOFF WILL BE INHERENTLY TREATED BY FLOWING ACROSS EXISTING TURF AREAS THAT DISCONNECT UPSTREAM IMPERVIOUS AREAS FROM THE EXISTING DOWNSTREAM DISCHARGE LOCATIONS.

AS PREVIOUSLY DESCRIBED, THE MAJORITY OF THE SITE RUNOFF WILL CROSS LONG EXPANSES OF TURF AREAS AS IF FLOWS ACROSS THE SITE. THIS DISCONNECTED IMPERVIOUSNESS WILL CONTINUE TO PROVIDE WATER QUALITY BENEFITS FOR THE ENTIRE SITE.

THERE ARE A TOTAL OF 9 LARGE TURF AREAS WEST OF LOMBARDY DRIVE THAT RECEIVE UPSTREAM RUNOFF FROM IMPERVIOUS AREAS. THE AVERAGE SLOPE OF THESE LARGE AREAS IS 2.7%. ASSUMING THAT THE INITIAL 100 FEET OF DISTANCE TRAVELLED IS SHEET FLOW IN NATURE, THE RESULTANT TRAVEL TIME IS 0.34 HOURS OVER AN AREA OF 260,000 SQUARE FEET.

AS SHOWN BY THE CALCULATION ON THIS SHEET, THE INFILTRATION RATE FROM THE SEVERAL TURF AREAS GREATLY EXCEEDS THE FIRST FLUSH RUNOFF GENERATED FROM THESE DEVELOPED IMPROVEMENTS WHILE THE EXISTING DEPRESSIONS MANAGE THE FIRST FLUSH FROM APPROXIMATELY HALF OF THE NEW IMPERVIOUS AREAS.

IX. CONCLUSIONS

THE FOLLOWING CONCLUSIONS HAVE BEEN ESTABLISHED AS A RESULT OF THE EVALUATIONS AND ANALYSES CONTAINED HEREIN:

- 1. THE PROPOSED IMPROVEMENTS REPRESENT MODIFICATIONS TO AN EXISTING SITE WITHIN AN INFILL AREA
2. THE SITE DOES NOT LIE WITHIN A DESIGNATED FLOOD HAZARD ZONE, OR DISCHARGE TO A DESIGNATED FLOOD HAZARD ZONE.
3. THERE IS NO ADVERSE IMPACT ON ADJACENT OR DOWNSTREAM FLOOD ZONES.
4. THERE WILL BE A MINOR INCREASE IN DEVELOPED RUNOFF GENERATED BY THE PROPOSED PHASED IMPROVEMENTS
5. THE EXISTING DRAINAGE PATTERN (STATUS QUO) WILL NOT BE ALTERED AND HENCE MAINTAINED
6. THE PROPOSED DEVELOPMENT IS IN CONFORMANCE WITH THE PREVIOUSLY APPROVED MASTER DRAINAGE PLAN, MAINTAINING FREE DISCHARGE TO EDITH BLVD. NE
7. THE FIRST FLUSH RUNOFF GENERATED BY THE PROPOSED DEVELOPMENT AREAS SHOWN IN THIS PLAN WILL EFFECTIVELY BE TREATED BY THE EXISTING TURF AREAS THAT DISCONNECT IMPERVIOUS AREAS ONSITE BY EXISTING STORAGE AND INFILTRATION.
8. DEVELOPMENT OF THE PARK WILL PROCEED IN PHASES. THE PHASING PLAN PRESENTED HEREIN IS THE MOST RELIABLE TOOL AVAILABLE TO THE OWNER, PLANNERS, AND ENGINEER AT THIS TIME. CHANGES IN SCOPE, SEQUENCE AND PHASING TO THAT PRESENTED HEREIN WILL BE ADDRESSED BY INDIVIDUAL SITE-SPECIFIC DRAINAGE SUBMITTALS.
11. THIS PLAN SUPPORTS DRB MASTER SITE PLAN APPROVAL.
12. PHASED PROJECTS IDENTIFIED BY THIS PLAN WILL REQUIRE INDIVIDUAL SUBMITTALS TO SUPPORT ADMINISTRATIVE AMENDMENTS AND BUILDING AND/OR GRADING AND PAVING PERMIT APPROVAL.

CALCULATIONS:

I. SITE CHARACTERISTICS

A. PRECIPITATION ZONE = 2

B. P6,100 = P360 = 2.35

C. TOTAL PROJECT AREA (A\_T) = 1,702.574 SF / 39.09 AC

D. LAND TREATMENTS

1. EXISTING LAND TREATMENT

Table with 3 columns: TREATMENT, AREA (SF/AC), %

2. DEVELOPED LAND TREATMENT

Table with 3 columns: TREATMENT, AREA (SF/AC), %

II. HYDROLOGY

A. EXISTING CONDITION

a. VOLUME
E\_W = (E\_A\_A + E\_B\_A + E\_C\_A + E\_D\_A) A\_T
E\_W = ((0.00\*0.53) + (25.94\*0.78) + (0.98\*1.13) + (12.16\*2.12))/39.09 = 1.21 IN
V\_100 = (E\_W/12) A\_T = (1.21/12) 39.09 = 3.9276 AC-FT = 171.088 CF

b. PEAK DISCHARGE
Q\_p = Q\_p\_A\_A + Q\_p\_A\_B + Q\_p\_A\_C + Q\_p\_A\_D
Q\_p = Q\_100 = ((0.00\*1.56) + (25.94\*2.28) + (0.98\*3.14) + (12.16\*4.7)) = 119.4 CFS

B. DEVELOPED CONDITION

a. VOLUME
E\_W = (E\_A\_A + E\_B\_A + E\_C\_A + E\_D\_A) A\_T
E\_W = ((0.00\*0.53) + (25.12\*0.78) + (0.98\*1.13) + (12.98\*2.12))/39.09 = 1.23 IN
V\_100 = (E\_W/12) A\_T = (1.23/12) 39.09 = 4.0192 AC-FT = 175.076 CF

b. PEAK DISCHARGE
Q\_p = Q\_p\_A\_A + Q\_p\_A\_B + Q\_p\_A\_C + Q\_p\_A\_D
Q\_p = Q\_100 = ((0.00\*1.56) + (25.12\*2.28) + (0.98\*3.14) + (12.98\*4.7)) = 121.4 CFS

c. FIRST FLUSH VOLUME: NEW DEVELOPMENT AREAS ONLY FOR 0.6 EVENT OVER 6 HRS
V\_FF = ((P\_FF - I\_A\_C) \* A\_D)
V\_FF = ((0.60 - 0.10)/12) \* (0.82) = 0.0342 AC-FT = 1.490 CF

TURF AREA INFILTRATION AND STORAGE

THERE ARE 9 EXISTING PERVIOUS LAWN AREAS (TREATMENT B WITH AN ASSOCIATED INFILTRATION RATE OF 1.25 IN/HR) THAT WILL DISCONNECT IMPERVIOUS AREAS FROM THE EXISTING OUTFALL AND INFILTRATE RUNOFF FROM THE UPSTREAM IMPROVEMENTS. IN ORDER TO BE CONSERVATIVE, WE ONLY APPLIED THE INFILTRATION RATE TO THE FIRST (UPSTREAM) 100 FEET OF SHEET FLOW CONDITION.

TRAVEL TIME (NRCS CH.15 PART 630.1502 PART B) SHEET FLOW:
TRAVEL TIME = (0.007(N x L)^0.8) / ((P\_2)^0.5 x S^0.4) IN HRS

L LENGTH = 100 FT (MAX LENGTH FOR SHEET FLOW)
N, MANNINGS ROUGHNESS COEFFICIENT= 0.24 (DENSE GRASS)
P\_2, 2 YR 24 HR RAINFALL (IN) = 1.22 (NOAA ATLAS)
S, AVG. SLOPE OF LAND SURFACE (FT/FT) = 0.027

TRAVEL TIME = (0.007(0.24 x 100)^0.8) / ((1.22)^0.5 x 2.77^0.4)
TRAVEL TIME = 0.34 HRS

TOTAL AREA OF 1ST 100' OF LAWN AREAS= 260,000 SF
TOTAL INFILTRATION = 260,000 SF X (1.25 IN/HR)/12 X 0.34 HRS = 9,208 CF

TOTAL EXISTING STORAGE OF DEPRESSED VOLUMES= 758 CF
TOTAL REDUCTION/TREATMENT = 9,208 CF + 758 CF = 9,966 CF >> 1,490 CF

C. COMPARISON

a. VOLUME
Delta V\_100 = 175076 - 171088 = 3,988 CF (INCREASE)

b. PEAK DISCHARGE
Delta Q\_100 = 121.4 - 119.4 = 2.0 CFS (INCREASE)

File Name: P:\data\2019\2019.0572\ENGN\20190572\_Dbase.dwg - SHEET 3 Plot Date: 3/9/20 Plot Time: 16:50

HIGH MESA Consulting Group logo and contact information: 6010-B Midway Park Blvd, NE Albuquerque, New Mexico 87109

Professional Engineer seal for J. GRAEME MEANS, NEW MEXICO, No. 13676, dated 03-09-2020

SUNSET MEMORIAL PARK MASTER DRAINAGE PLAN title block

Table with 2 columns: NO., DATE, BY, REVISIONS

PROJECT No. 2019.057.2
DESIGNED BY R.J.C.
DRAWN BY J.Y.R.
APPROVED BY G.M.
SHEET TITLE

DRAINAGE PLAN AND CALCULATIONS