

CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Director



Mayor Timothy M. Keller

August 22, 2023

Edward C. Naidu, P.E.
Respec
5971 Jefferson St. NE
Albuquerque, NM 8710

RE: Task 5 – Marble Arno
LOMR Request Engineer's Stamp Date: 07/06/2023
Hydrology File: J14D206

Dear Mr. Naidu:

Based upon the information provided in your submittal received 07/25/2023, the LOMR Request **is not** approved by the City of Albuquerque. The following comments need to be addressed for approval of the above referenced project:

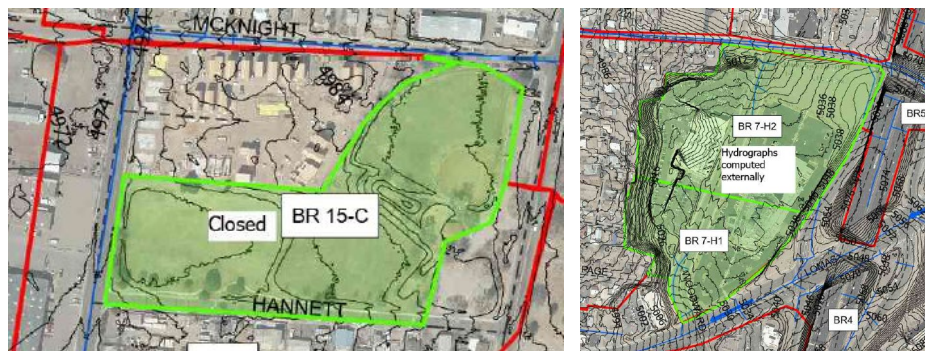
PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

1. Please address Albuquerque Metropolitan Arroyo and Flood Control Authority's comments sent July 24, 2023.
2. The existing SWMM model was not included. Please include the model in the resubmittal.
3. Please provide a Revised FIRM Panel or Annotated FIRM Panel that shows the removed floodplain.
4. Please include what version of SWMM model that you are using throughout the report.
5. In Figure 4 & 5, what are the two green areas? Please add to the Legend if necessary.



CITY OF ALBUQUERQUE

Planning Department
Alan Varela, Director



Mayor Timothy M. Keller

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

Sincerely,

Renée C. Brissette

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

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City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

Project Title: Task 5 - Marble Arno LOMR **Building Permit #** _____ **Hydrology File #** _____

DRB# _____ **Project #:** 6097-003 **EPC#** _____

Legal Description: UPC: 101405840113842925 **City Address OR Parcel** Broadway Blvd NE and Lomas Blvd NE Intersection

Applicant/Agent: RESPEC **Contact:** Cassy McClintock

Address: 7770 Jefferson Street NE, Suite 200, Albuquerque, NM 87120 **Phone:** (505) 253-9730

Email: cassy.mcclintock@respec.com

Applicant/Owner: _____ **Contact:** _____

Address: _____ **Phone:** _____

Email: _____

TYPE OF DEVELOPMENT: PLAT (#of lots) RESIDENCE DRB SITE ADMIN SITE: _____

RE-SUBMITTAL: YES X NO

DEPARTMENT: TRANSPORTATION X 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
- FLOOD PLAN DEVELOPMENT PERMIT APP.
- ELEVATION CERTIFICATE
- X CLOMR/LOMR
- TRAFFIC CIRCULATION LAYOUT (TCL)
- ADMINISTRATIVE
- TRAFFIC CIRCULATION LAYOUT FOR DRB APPROVAL
- TRAFFIC IMPACT STUDY (TIS)
- STREET LIGHT LAYOUT
- OTHER (SPECIFY)
- PRE-DESIGN MEETING?

TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

- BUILDING PERMIT APPROVAL
- CERTIFICATE OF OCCUPANCY
- CONCEPTUAL TCL DRB APPROVAL
- 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
- X CLOMR/LOMR
- FLOOD PLAN DEVELOPMENT PERMIT
- OTHER (SPECIFY) _____

DATE SUBMITTED: July 25, 2023



MARBLE ARNO LETTER OF MAP REVISION



PREPARED BY

RESPEC, Inc.
7770 Jefferson St. NE,
Suite 200
Albuquerque, NM 87109

PREPARED FOR



JULY 2023

RESPEC Project Number 04270.0005



CERTIFICATION

I, Edward C. Naidu, do hereby certify that this report was duly prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the state of New Mexico.



Edward C. Naidu, P.E.
NMPE No. 22997

July 06, 2023

Date



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DEFINITION OF ACRONYMS

- CFS – Cubic Feet per Second
- LOMR – Letter of Map Revision
- DAR – Drainage Analysis Report
- DEM – Digital Elevation Model
- FEMA – Federal Emergency Management Agency
- FIS – Flood Insurance Study
- MRCOG – Mid-region Council of Governments
- MVDMP – Mid-Valley Drainage Management Plan
- SBSDMP – South Broadway Sector Drainage Management Plan
- SWMM – Storm Water Management Model

1.0 GENERAL PROJECT INFORMATION

1.1 PROJECT DESCRIPTION AND PURPOSE

The purpose of this report is to document the analysis procedures implemented in support of an application for a Letter of Map Revision (LOMR) for the existing Zone AH in the area surrounding the Broadway and Lomas intersection in downtown Albuquerque as shown in **Figure 1**. This area has been historically prone to flooding due to the lack of capacity in the storm drains and the old age of the original Broadway Pump station, which was built in 1956 and had malfunctioned several times causing flooding in the area. The basis of this application is the construction of the Marble-Arno stormwater pump station, outlined in red, and associated storm drainage improvements.



Figure 1: Vicinity Map

1.2 PREVIOUS STUDIES

The hydrologic, hydraulic analysis, and SWMM model development used for this LOMR is based on the Mid Valley Drainage Master Plan, 2012, and subsequent design analysis reports. Minor basin boundary modifications were made to improve the homogeneity of the basins and to account for post construction. All referenced reports are included in **Appendix 2**.

These reports include:

- » *Mid-Valley Drainage Management Plan (MVDMP)*, completed by Smith Engineering Company in 2012, is the master plan study in which the original hydrologic and hydraulic analysis for the watershed was developed. The MVDMP's proposed conditions model had to be modified with an addendum to account for surface runoff hydrograph that was predicted by the South Broadway Drainage Master Plan. This hydrograph was expected to impact the Broadway Lomas intersection with an estimated flow of 239 cfs and approximately 11-acre feet of volume. Because this result was made available after the MVDMP was completed, an amendment to the MVDMP proposed conditions model was made so that any ponding/pump station facility at Marble-Arno would have to accommodate this hydrograph referred to as the North Flow Hydrograph. No changes were made to the existing conditions model at that time.
- » *South Broadway Drainage Management Plan (SBDMP)*: This study was completed by URS in 2013 in conjunction with the Mid-Valley Drainage Management Plan in 2013 for the adjacent southern watershed to the Mid-Valley Drainage Master Plan. This study developed the North Flow Hydrograph that would affect any future project at the Marble Arno location. After the study was completed, there were concerns about the accuracy of the magnitude of the North Flow Hydrograph predicted in this study, however, no further studies were conducted to verify the data after its immediate completion.
- » *Marble-Arno Storm Drainage Design Conceptual Design Study* completed in July 2018 that documents the alternatives considered, selection of the pumps, and final site layout. The construction plans were based on the recommendations of this report and form the primary basis for the LOMR. The original design assumed that the pond, pump station and associated storm drainage system would have to be phased. North Flow Hydrograph created the need for a large ponding and pumps station facility of approximately 33 acre-feet. Additionally, a successive phase would require construction of large diameter storm drains south of Lomas to capture and convey the large flow. However, during the design phase, Smith conducted an impact analysis that performed a detailed review of the source of the North Flow Hydrograph. The study discovered several errors in the SBDMP and the size of the North Flow Hydrograph and the final entry points in the Broadway- Lomas system were refined and much reduced. The final design for the facility was refined based on the findings of the South Broadway Impact Analysis Report to the current configuration as constructed.
- » *The South Broadway Impact Analysis Report*, conducted by Smith Engineering Company in 2018, was an analysis that was developed during the design of Marble Arno Storm Water Pump station. This study assessed the validity of the North Flow Hydrograph from the SBDMP. This study recognized the fact that there were significant errors made in the development of the North Flow Hydrograph and in the SBDMP model development in general. The SBDMP study had not accounted for the capture capacity of inlets and storm drains in the study area, major obstructions to flow paths formed by urbanization, buildings and roads and incorrect hydrologic modeling assumptions within SWMM. This led to a very large and improbable overland flow that was predicted. Consequently, the South Broadway Impact Analysis factored in the capture capacity of inlets in the tributary area and the conveyance capacity of existing storm drains that was overlooked in the 2013 study.

Based on the excess overland flows, a 2D surface water model was developed to evaluate potential flow paths and flow splits along Broadway Blvd. This refined the locations that the overland flows would drain based on the topography of Broadway between Martin Luther King Jnr Blvd and Lomas. The study concluded that the original overland flows were inaccurate and the design parameters for the Marble-Arno Pump station were modified as reflected in the Marble-Arno Storm Drainage Design Conceptual Design Study. While the study's findings were determined in parallel with the design analysis report for the pump station, the report was finalized and submitted much later in 2019. This was because the funding constraints on the Marble-Arno pumps station project required prioritization of the design analysis report and construction plans.

All reports are included in **Appendix 2**.

1.3 DATUM CONVERSIONS

The design limits are in an older part of the city and as such all elevations are reported in the NGVD 29 datum. As such the National Oceanic and Atmospheric Administration (NOAA) NGS Coordinate Conversion and Transformation Tool (NCAT) was used to convert elevations in the old vertical datum of North Geodetic Vertical Datum (NGVD) 29 to the new datum of NAVD 88. After comparing the differences, an average conversion factor of 2.66 feet was applied to all NGVD 29 data points. See Appendix 2 for the datum conversion obtained from the Mid-Valley Drainage Management Plan.

1.4 EXISTING FEMA FLOODPLAINS

According to the flood insurance study (FIS) from Federal Emergency Management Agency (FEMA), there is an existing flood zone AH in the Marble-Arno Area. The flood zone was obtained from the FIS numbers:

- » 35001C0332G
- » 35001C0334G

See effective Flood Insurance Rate Map (FIRM), in **Appendix 2**. An overview of the existing floodplains is provided in **Figure 2**. The FIRMS are included in **Appendix 2**.

1.5 FIELD OBSERVATIONS

RESPEC conducted field observations around the Marble Arno Pump Station and the contributing area. This field work consisted of verifying storm drain inlet locations and types, basin boundaries, and the old Post Office Pond.

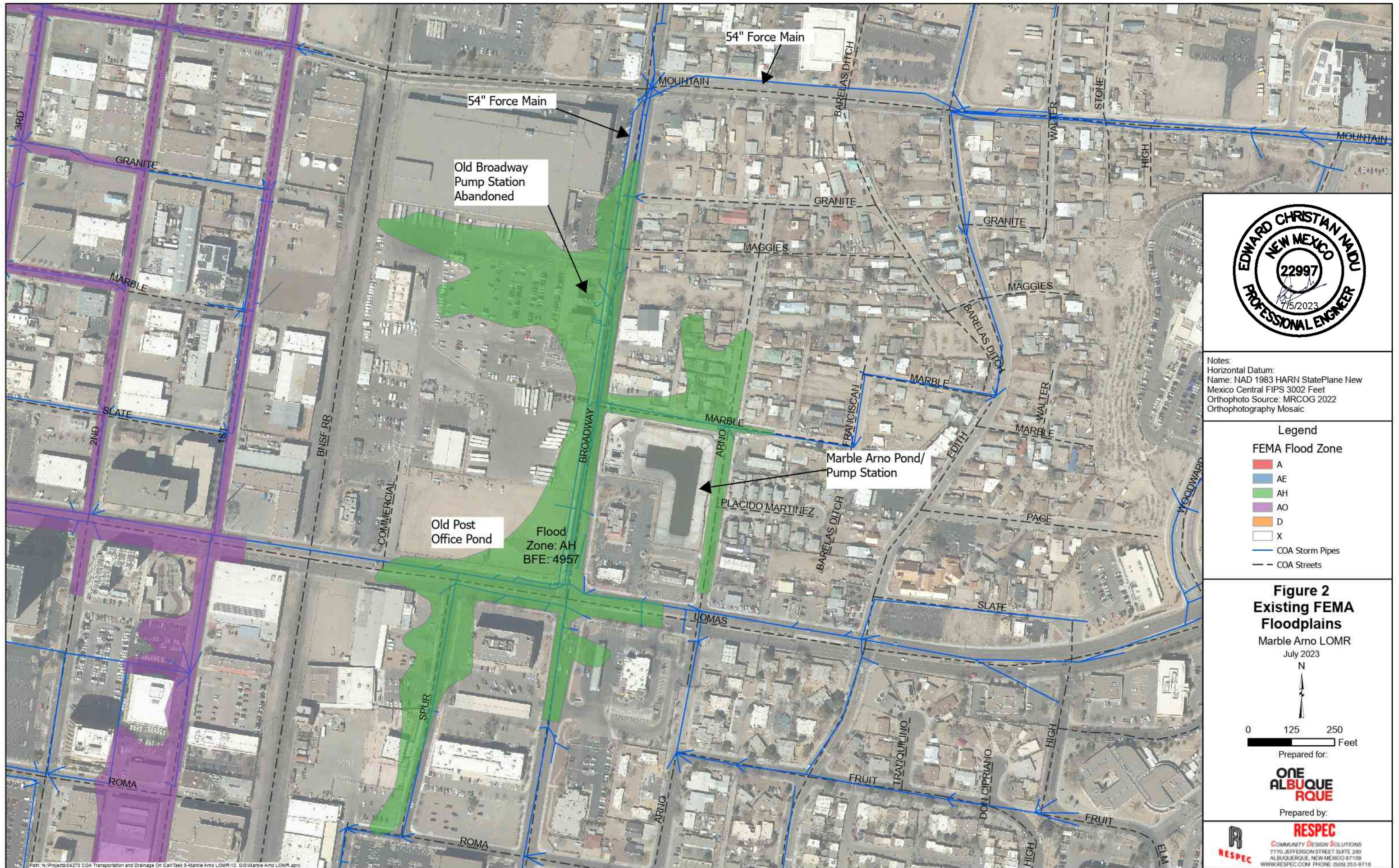
Observed in the field were standard COA type inlets, and curb heights for the intersection of Broadway and Lomas, which are provided as a reference in **Appendix 2**. The documentation of the fieldwork and photos are provided in **Appendix 2**.

1.6 OVERVIEW OF CONSTRUCTION PROJECT

Construction for the Marble – Arno Storm Pump Station and Pond project (COA Project # 5958.92) was completed, and record drawings were provided on February 24th, 2023. The key components of the project were the construction of a 21 acre-ft pond that would act as a wet well for a brand new 47,628 gallons per minute capacity pump station. Large diameter storms were also constructed in Broadway Blvd, Marble Ave,

Arno St, and Lomas Blvd. A new array of inlets on both the north and south side of Lomas Blvd. A full street width transverse inlet was installed on Marble Ave just west of Arno St.

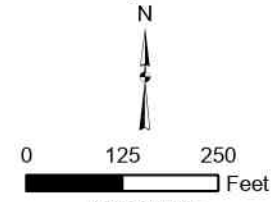
The original Broadway Pump Station was demolished and abandoned, and the Post Office Pond was backfilled as well. The scope of construction is shown in **Figure 3**.



Notes:
Horizontal Datum:
Name: NAD 1983 HARN StatePlane New
Mexico Central FIPS 3002 Feet
Orthophoto Source: MRCOG 2022
Orthophotography Mosaic

- Legend
- FEMA Flood Zone
- A
 - AE
 - AH
 - AO
 - D
 - X
- COA Storm Pipes
- COA Streets

Figure 2
Existing FEMA
Floodplains
Marble Arno LOMR
July 2023



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Notes:
Horizontal Datum:
Name: NAD 1983 HARN StatePlane New Mexico Central FIPS 3002 Feet
Orthophoto Source: MRCOG 2022
Orthophotography Mosaic

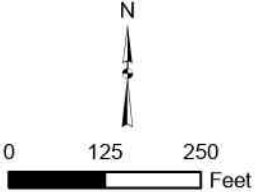
Legend

- COA Storm Pipes
- COA Streets
- New Storm Drain

Figure 3 Scope of Construction

Marble Arno LOMR

July 2023



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2.0 HYDROLOGIC PARAMETERS

2.1 HYDROLOGIC CONDITIONS

The overall watershed delineation, and input parameters for SWMM were computed in the MVDMP in 2013 and were adopted completely for this LOMR. There was no georeferenced digital vector data available for the subbasin boundaries. RESPEC reproduced the subbasins shapes by digitizing data available only in PDF format from the 2013 report. The procedures for input parameter computations are documented in that report which is included in **Appendix 2**. The tributary area has remained the same and most of the subbasin boundaries delineated remained unchanged for the design of the Marble-Arno Pump Station and storm drains with minor exceptions. **Figure 4** shows the preconstruction subbasins affecting the Marble – Arno Pumpstation and Pond as delineated in the MVDMP.

Because of the storm drain construction, a few changes were made to the subbasins which are described below. Post construction modifications are also documented in **Figure 5**.

The modifications to subbasins BR6 and BR19 were largely to account for the construction of the pond, pump station and storm drains. The area for subbasin BR21 was reduced from 23.8 acres to 5.5 acres to account for the transverse grate inlet and storm drain that diverts 40 cfs from the subbasin at the intersection of Medical Arts and Lomas Blvd. Record drawings for the design of the cattle grate inlet is provided in **Appendix 2**. Subbasin BR2 used be the old Post Office Pond along with some commercial development to the west. This was subdivided to make the subbasins more homogenous. There are slight area differences between the MVDMP, and the modifications made in this study. This is because the original boundaries were drawn in AutoCAD and the modifications were drawn in ArcGIS. CAD drawings, once scaled for line weights can change the areas slightly.

Table 1: Summary of Hydrologic Parameters

Original Mid Valley DMP Conditions						Post Construction Conditions					
Basin Name	Area (ac)	Curve Number	Percent Impervious (%)	Peak Discharge (cfs)	Runoff Volume* (ac-ft)	Basin Name	Area (ac)	Curve Number	Percent Impervious (%)	Peak Discharge (cfs)	Runoff Volume* (ac-ft)
BR2	5.67	73	50	13.3	0.8	BR2.1	3	73	0	0.54	0.18
						BR2.2	2.71	73	82	10.91	0.49
BR6	28.6	71	82	42.9	5.2	BR6.1	9.9	71	82	26.9	1.8
						BR6.2	6.1	71	82	19.7	1.1
						BR6.3	11.5	71	82	29.22	2.1
BR21	23.8	79	80	64.21	4.5	BR21	6.2	79	80	24.3	1.2
BR19	26.2	71	75	42.7	4.6	BR19.1	13.1	71	75	31.1	2.36
						BR19.2	13.4	71	75	31.1	2.36

*SWMM reports in MG (million gallons) which equals to ~3.07 ac-ft/1MG.



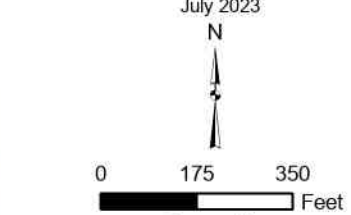
NAME	AREA	CURVENO	IMPERV
BR1	28.93	74	75
BR10	36.43	73	31
BR11	9.74	73	65
BR12	22.29	73	10
BR13	29.14	73	70
BR14	19.8	73	89
BR16	25.89	70	13
BR17	49.17	73	59
BR18	33.13	73	75
BR19	26.21	71	75
BR2	5.67	73	90
BR20	24.15	73	90
BR21	12	77	70
BR3	37.23	73	66
BR4	39.56	77	75
BR5	10.73	83	59
BR6	28.63	71	82
BR9	55.23	73	86



Notes:
Horizontal Datum:
Name: NAD 1983 HARN StatePlane New Mexico Central FIPS 3002 Feet
Orthophoto Source: MRCOG 2022
Orthophotography Mosaic

- Legend
- BR Basin Boundaries
 - Non-Tributary Basins
 - COA Streets
 - COA Storm Pipes
 - Existing Flow Arrows
 - Post Office Detention Pond
 - Contour

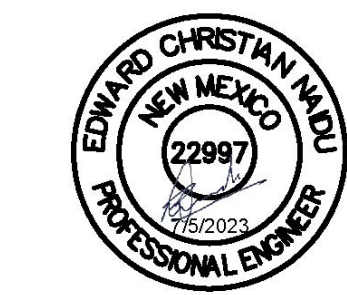
Figure 4
Pre-Construction
Basin Map
Marble Armo LOMR
July 2023



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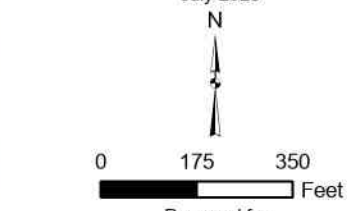
NAME	AREA	CURVENO	IMPERV
BR1	31.58	74	75
BR10	36.95	73	31
BR11	9.41	73	65
BR12	21.27	73	10
BR13	27.74	73	70
BR14	18.64	73	89
BR16	25.57	70	13
BR17	51.22	73	59
BR18	32.28	73	75
BR19.1	13.42	71	75
BR2.1	3.04	73	90
BR20	22.75	73	90
BR21	5.5	77	70
BR3	37.4	73	66
BR4	40.31	77	75
BR5	12.16	83	59
BR6.1	9.95	71	82
BR9	54.97	73	86
BR2.2	2.72	73	90
BR6.3	11.51	71	82
BR6.2	6.14	71	82
BR19.2	13.42	71	75



Notes:
Horizontal Datum:
Name: NAD 1983 HARN StatePlane New Mexico Central FIPS 3002 Feet
Orthophoto Source: NRCOG 2022
Orthophotography Mosaic

- Legend
- BR Basin Post Const
 - Non-Tributary Basins
 - Post Office Detention Pond
 - Marble Arno Pump Station
 - COA Streets
 - Contour
 - New Flow Arrows
 - New Storm Drain

Figure 5
Post-Construction
Basin Map
Marble Arno LOMR
July 2023



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3.0 HYDRAULIC ANALYSIS

3.1 MARBLE — ARNO PUMP STATION

RESPEC updated the SWMM model from Smith Engineering Company to match all parameters in the model to the record drawing information provided after construction was completed. RESPEC acquired the post construction surveyed pond surface to extract contours for a depth-area curve to input into the model. The pump rating curve was determined from record drawings for the design flow for each pump. The pumps station has 5 pumps in total including a low flow pump. The pumps will turn on at different water surface elevations in the pond. The summary of pumps start up elevations from as-builts are shown in **Figure 6**.

There is 1 low flow pump for the smaller storms which has a design flow of 1.53 cfs. In addition, there are 4 main pumps and have a design flow of 26.75 cfs each, a combined peak flow rate of all 5 pumps operating is 108.53 cfs. The pump equipment schedule from as-builts is shown in **Figure 7**. The pump station discharges into a 54-inch force main that discharges into the existing AMAFCA North Diversion Channel.

INITIAL (ELEVATION) SETTINGS		
	ON	OFF
PUMP #1	28.00	27.25
PUMP #2	35.00	34.50
PUMP #3	36.00	35.50
PUMP #4	36.75	36.25
PUMP #5	37.50	37.00
BARSCREEN	34.25	34.00

Figure 6: Pump Elevation Settings

PUMP EQUIPMENT SCHEDULE				
ID	DESIGN TDH	DESIGN FLOW	DISCHARGE Ø	TYPE
PUMP #1	18.6 FT.	1.53 CFS	6"	SUBMERSIBLE
PUMP #2	200 FT.	26.75 CFS	14"	SUBMERSIBLE
PUMP #3	200 FT.	26.75 CFS	14"	SUBMERSIBLE
PUMP #4	200 FT.	26.75 CFS	14"	SUBMERSIBLE
PUMP #5	200 FT.	26.75 CFS	14"	SUBMERSIBLE

Figure 7: Pump Elevation Settings

3.2 STORM DRAIN HYDRAULICS

The storm drain network was modified to reflect final construction. Record drawings were used as the basis for all elevations, pipe slopes and diameters. The construction of the Marble Arno Pump Station included new high-capacity inlets and storm drain infrastructure in the surrounding areas to the pump station on Broadway Boulevard, Lomas Boulevard, Marble Avenue and Arno Street as shown in **Figure 8**. The goal was

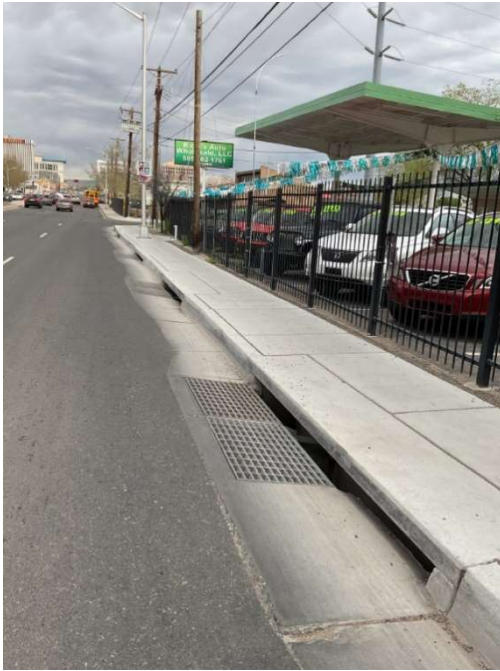


Figure 8: High-Capacity Inlets in Broadway

to capture and divert all the runoff from the subbasins from east into the pond/pump station so that the intersection of Broadway and Lomas does not get inundated. The preconstruction storm drainage system is shown in **Figure 9**. The post construction storm drainage infrastructure is shown in **Figure 10**.

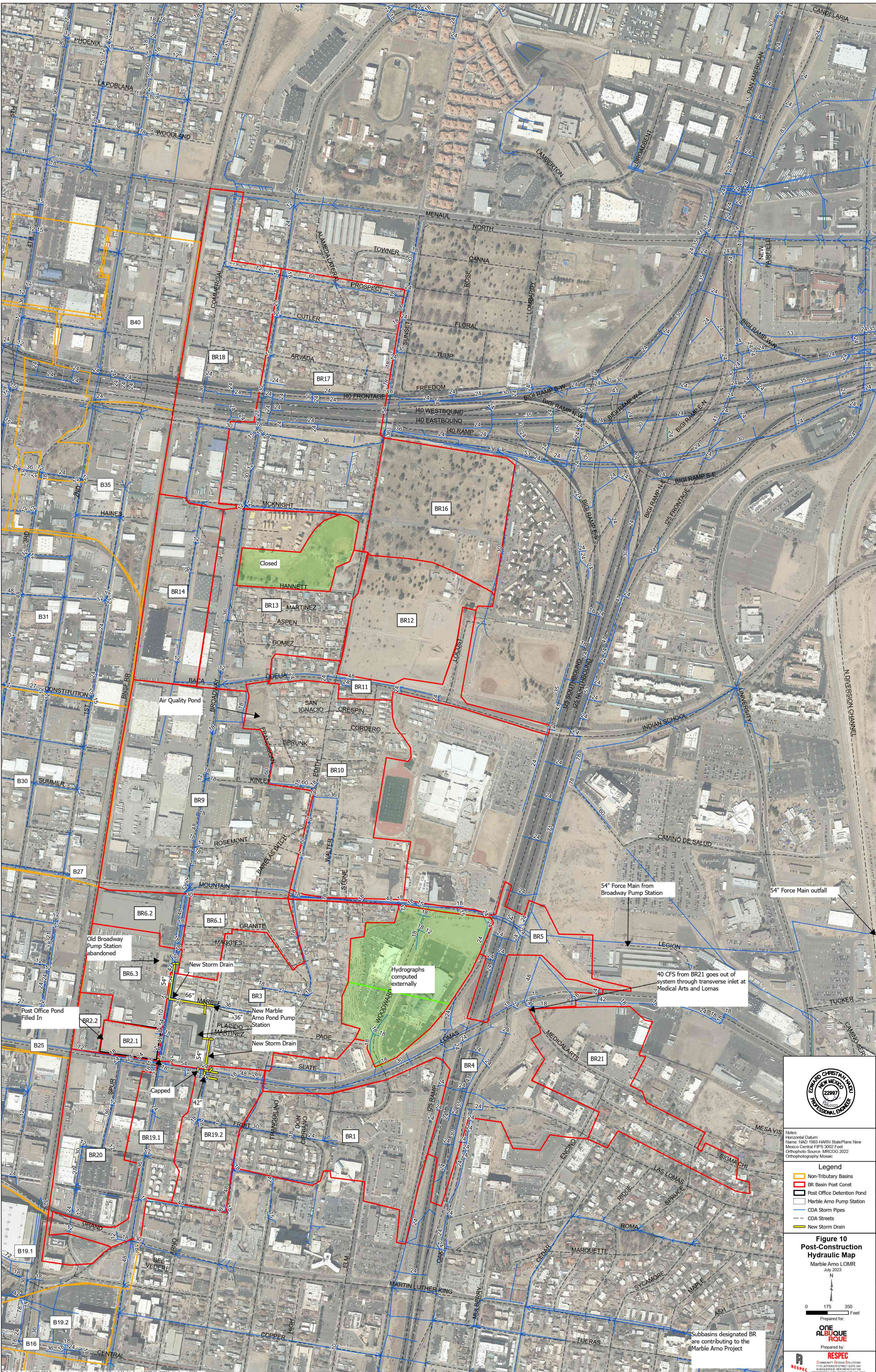
Hydrographs were introduced from the subcatchments in SWMM into the hydraulic network as a point discharge through junctions that represent manholes. For junctions where inflow hydrographs are introduced into the system, a surcharge depth was assigned to ensure that there was no volume loss due to large flowrates entering the system. A modeling schematic is shown in **Figure 11**. Apart from the subbasin changes due to post construction effects, all modeling assumptions for hydraulics analysis in SWMM were adopted from the MVDMP study. The MVDMP existing conditions model did not simulate the parallel 36-inch storm drain on the south side of Lomas, nor the 36-inch storm drain in John St. These

were added in the South Broadway Impact Analysis, and in this LOMR to add a higher level of detail with regards to the existing infrastructure in the area. As-builts for these storm drains are provided in.


Inlet capacities were computed to validate if there is sufficient interception capacity to capture the surface runoff effectively. The inlet capacities were computed using COA standard nominal graphs provided in the design process manual (DPM 2020). These graphs use a curb height with an average street slope to calculate the approximate flow rate for the grate. A 15% clogging factor was applied to the grate capacity of the new inlets since trash, weeds and other debris can build up in the grates. The DPM indicates that the clogging factor may be reduced for banks of inlets as the first inlet usually sweeps most of the trash and debris, however, to be conservative, all inlets were assumed to be 15% clogged. The total capacity of the new inlets installed on Lomas is 154 cfs including the 15% clogging factor. Upstream on Lomas, east of the new construction, there are a total of 48 inlets. The maximum flow in the 54-inch storm drain at the Lomas and Arno intersection is 186 cfs indicating that there are more than adequate inlets to capture all the surface runoff from the basins to the east and south of Lomas. To deal with surges in the system, the MVDMP discusses the usage of ponding areas assigned to manholes in flat areas that allows the storm drains to surge and recede in and out of the hydraulic network and onto the roads. This allows the roads to provide excess storage during the peak of the storm. The junctions with ponded areas then use the excess surge volume to determine flooding depth. All assumptions and storage areas from the MVDMP were used for this study.

As part of this analysis, storm drain hydraulic grade lines were checked to make sure they were contained in the system and were not flooding. The design and analysis of the Marble Arno Pump Station and Pond was based on existing conditions in the tributary watershed. The master plan does propose facilities at Sunset Park and a small pond at Medical Arts however for the design of Marble – Arno Pump station and pond, these were assumed to be not in place.





Path: N:\Projects\04270 COA Transportation and Drainage On Call Task 5-Marble Arno LOMR\12 GIS\Marble Arno LOMR.aprx



Notes:
Horizontal Datum: Name: NAD 1983 HARN StatePlane New Mexico Central FIPS 3002 Feet
Orthophoto Source: MRCOG 2022
Orthophotography Mosaic

Legend

- Non-Tributary Basins
- BR Basin Post Const
- Post Office Detention Pond
- Marble Arno Pump Station
- COA Storm Pipes
- COA Streets
- New Storm Drain

Figure 10
Post-Construction
Hydraulic Map
Marble Arno LOMR
July 2023

0 175 350 Feet

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4.0 CONCLUSION

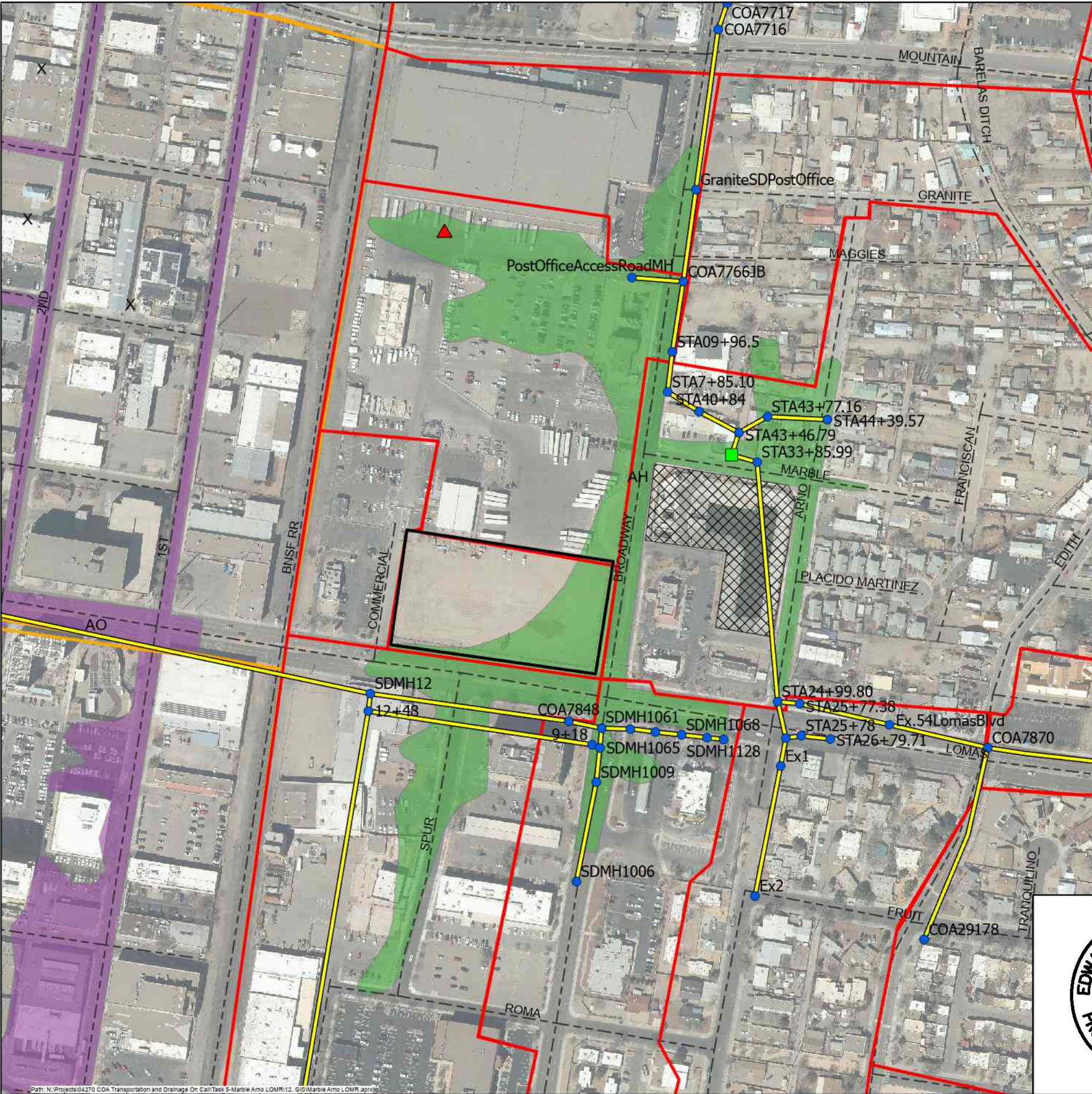
The construction of Marble – Arno Pump station and pond diverts 89.3 acres of heavily impervious drainage area east of the Broadway - Lomas intersection north into the new pond/pump station facility through the new storm drains in Arno St. This dramatically reduces the stress on the hydraulic network at the intersection of Broadway and Lomas. The construction of the storm drainage system at the intersection of Broadway and Lomas is old with some storm drains having adverse slopes to account for the original configuration of inline weirs that were built with the original Post Office Pond. As such, the manholes in this area show minor flooding but all nodes have flooding depths less than 1 ft. The same is true for the 30-inch storm drain that collects runoff from Broadway and Marquette. This storm drain was deemed to be under capacity in the MVDMP. The storm drains north of the original abandoned Broadway Pump station show some flooding but the depths are below 1 ft. This is due to the lack of system capacity going north on Broadway towards I-40.

In the MVDMP, another future pond was proposed at Sunset Park, along with storm drain improvements in to address the capacity issues demonstrated in this model. However, since the depths are below 1 ft, making the LOMR request feasible.

Figure 12 provides a summary of the junctions (manholes) in the vicinity of the floodplain being analyzed along with the maximum computed hydraulic grade line (HGL).

The intersection of Broadway and Lomas is constructed with standard City of Albuquerque 8-inch-tall curb and gutter. The surcharge depths will be below 1 ft in depth and will be completely contained in the streets by the 8-inch curb and gutter until the system (HGL) recedes once the peak of the storm has passed. The excess flows will then drain back into the system through the inlets.

The analysis confirms that the current flood plains delineated in the project area can be safely removed.



HGL Summary for Critical Junctions In the Existing Zone AH								
Junction ID	Rim Elevation (ft)	HGL Elevation (ft)	Max Pondered Depth ¹ (ft)	Max Pondered Depth ¹ (inches)	Depth Above Rim (ft)	Pondered Area Assigned	Curb Height (ft)	Is Depth > 1 ft
3	4957	4957.03	0.025	0.30	0.03	Yes	0.66	No
2	4957	4957	0.003	0.04	0	Yes	0.66	No
12+48	4957.4	4957.4	0	0.00	0	No	0.66	No
SDMH 12	4957.4	4957.43	0	0.00	0.03	No	0.66	No
SDMH 1006	4958.4	4958.42	0.025	0.30	0.02	Yes	0.66	No
SDMH 1009	4957.4	4957.37	0	0.00	-0.03	Yes	0.66	No
SDMH 1065	4956.1	4956.08	0	0.00	-0.02	Yes	0.66	No
9+18	4956	4956.05	0.052	0.62	0.05	Yes	0.66	No
SDMH 1062	4955.9	4955.99	0.14	1.68	0.09	Yes	0.66	No
COA 7848	4955.8	4955.99	0.16	1.92	0.19	Yes	0.66	No
SDMH 1061	4955.9	4955.98	0.064	0.77	0.08	No	0.66	No
SDMH 1064	4955.9	4955.93	0	0.00	0.03	No	0.66	No
SDMH 1068	4956.5	4956.38	0	0.00	-0.12	No	0.66	No
SDMH 1134	4957.2	4957.2	0	0.00	0	No	0.66	No
Sta24+99.80	4958.5	4957.02	0	0.00	-1.48	No	0.66	No
Sta33+85.99	4956.8	4953.26	0	0.00	-3.54	No	0.66	No
Sta44+39.57	4955.7	4954	0	0.00	-1.7	Yes	0.66	No
Sta43+77.16	4955.2	4953.92	0	0.00	-1.28	Yes	0.66	No
Sta43+46.79	4955.5	4953.84	0	0.00	-1.66	Yes	0.66	No
Sta40+84	4956.3	4954.42	0	0.00	-1.88	yes	0.66	No
Sta17+85.10	4956.6	4954.88	0	0.00	-1.72	Yes	0.66	No
Sta09+96.5	4956.3	4956.11	0	0.00	-0.19	Yes	0.66	No
COA7766JB	4956.3	4957.23	0.93	11.16	0.93	Yes	0.66	No
GraniteSD Post Office	4957	4957.76	0.79	9.48	0.76	Yes	0.66	No

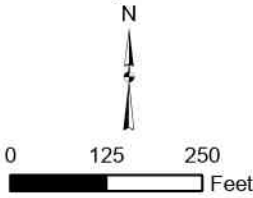
1 SWMM uses a combination of the maximum HGL, surge volume and the allocated ponded area to compute the flood depth above each junction

Subbasins designated BR are contributing to the Marble Arno Project

Figure 12
Hydraulic Grade Line
Summary of Junctions

Marble Arno LOMR

July 2023



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Legend	
BR Basin Post Const	Conduits
Non-Tributary Basins	FLD_ZONE
Post Office Detention Pond	A
Marble Arno Pump Station	AE
COA Streets	AH
Junctions	AO
Storages	D
Outfalls	X

Notes:
Horizontal Datum:
Name: NAD 1983 HARN StatePlane New Mexico Central FIPS 3002 Feet
Orthophoto Source: MRCOG 2022
Orthophotography Mosaic

5.0 REFERENCES

- / *Flood Insurance Rate Map* Numbers 35001C0332G & 35001C0334G, Federal Emergency Management Agency Floodplain Data, September 26, 2008.
- / *Flood Insurance Study*, Bernalillo County, New Mexico, Federal Emergency Management Agency, 2008.
- / *Mid-Valley Drainage Management Plan*, Smith Engineering Company, April 2012.
- / *South Broadway Impact Analysis Report*, Smith Engineering Company, March 2019.



APPENDIX 1

MT 2 FORMS



APPENDIX 2

BACKGROUND INFORMATION





APPENDIX 3

MODELS





APPENDIX 4

MAPS

