AMAFCA On-call Engineering Services – Task 6

Re-evaluation of the Proposed Eastern/Alvarado Pond on Campus Wash

December 6, 2018

Prepared for:

AMAFCA

Prepared by:

wsp

Introduction

In July of 2018, a technical memorandum entitled "Campus Wash Feasibility Study - Eastern/Alvarado Pond" was prepared by WSP. The memorandum presented the findings of a hydraulic analysis to evaluate the effect of the proposed Eastern/Alvarado Detention Pond on removing/minimizing the existing mapped floodplains in the vicinity. The layout of the proposed Eastern/Alvarado Detention Pond extended from south to north, between Eastern Avenue (Eastern) and Ross Avenue (Ross) and from east to west, between Alvarado Drive (Alvarado) and Palomas Drive. The proposed pond had a surface area of 4 acres, a 15' wide maintenance road around its perimeter, 3:1 side slopes, and a maximum storage volume of 32 acre-feet. AMAFCA and the City of Albuquerque are considering moving forward with a detention pond that would have a smaller footprint, and have asked WSP to re-evaluate the effect of the revised Eastern/Alvarado Detention Pond on the Overall Campus Wash System.

Proposed Conceptual Drainage Improvements

Recommendations contained in this Memo are conceptual. They address the size and configuration of the Revised Eastern/Alvarado Detention Pond ("Revised Pond"), modifications to the existing storm drains, and the effect of the improvements on the existing mapped floodplains.

Revised Eastern/Alvarado Detention Pond

The footprint of the Revised Pond should only occupy ½ the space of the original pond and should have a surface area of approximately 2 acres. The extent of the Revised Pond should be limited to the northern ½ of the property at the northwest corner of Eastern and Alvarado. The Revised Pond would still be approximately 15' deep and should have vertical walls. The minimum top of pond elevation should be at 5292.0 and the bottom of the pond should be set at elevation 5278.0. The access for the pond should be from Ross and it should consist of a 12' wide ramp on a 10:1 longitudinal slope, with 3:1 embankment slopes. A 5' wide buffer around the parameter of the Revised Pond was assumed for the construction of the retaining walls. This Revised Pond provides a maximum storage volume of 22 acre-feet at elevation 5292.0. The conceptual layout of the proposed Revised Pond can be found as an attachment to this Memo.

WSP recommends that a 16" diameter orifice (or a ported riser structure with similar discharge characteristics) outlet structure be considered for this pond. The outlet structure should connect to the proposed 30" diameter trunk line under Ross, as previously recommended in the original report.

WSP's analysis shows that the water surface elevation in the proposed Revised Pond with the referenced outlet structure would reach 5290.9 during the 100-year storm; this would provide approximately 1' of freeboard for the 100-year storm. At this stage, the storage behind the pond would be 20.7 acre-feet with a discharge out of the outlet structure of 23.5 cfs. **Table 1**, on the following page, shows the stage-storage-discharge for the proposed Revised Pond.

Storm Drain Systems

As indicated in the original technical memorandum, WSP's analysis shows that both existing Campus Wash and San Mateo North storm drain systems are undersized for the 100-year storm, and efforts should be made to divert, to the extent possible, flows from these systems to the Eastern/Alvarado Detention Pond.

Table 1: Stage-Storage-Discharge (South Detention Pond)

Stage (feet)	Storage (acre-feet)	Discharge (cfs)
5278	0.00	0.0
5279	1.51	3.38
5281	4.59	10.26
5283	7.75	13.99
5285	10.97	16.91
5287	14.24	19.4
5289	17.55	21.6
5291	20.89	23.6

The existing Campus Wash storm drain system under the intersection of Eastern and Alvarado carries a 100-year discharge of 120 cfs. This flow should be diverted to the Revised Pond via a new 60" diameter pipe; approximately 380' of 60" diameter trunk line would be required to carry the flow from the existing trunk line north along Alvarado to the southeast corner of the Revised Pond. See the attached "StromCAD Plan and Profiles – Proposed Conditions" drawings for the layout of this system; the StormCAD drawings show that the diversion occurs at MH-5C through a new 60" diameter pipe designated as P-04aC.

As recommended in the original report, a portion of the flow in the San Mateo North storm drain system should also be carried to the proposed pond. The existing San Mateo North system carries a 100-year discharge of 125 cfs at the intersection of Ross and Arizona Street (Arizona). The construction of a new by-pass trunk line carrying this flow to the Revised Pond should still be considered. As shown on the attached "StromCAD Plan and Profiles – Proposed Conditions" drawings, the construction of a 48" diameter pipe to carry the by-pass flow is recommended; the StormCAD drawings show that the diversion occurs at MH-9S through a new 48" diameter pipe designated as P-01SC.

WSP's hydraulic analysis shows that the 100-year hydraulic grade line (HGL) in the trunk lines carrying flow to the Revised Pond are slightly higher than the ones presented in the original report. This is mainly due to the higher 100-year water surface elevation in the Revised Pond. The estimated 100-year water surface elevation for the original pond was at 5289.6 while the one for the Revised Pond reaches to elevation 5290.9. The revised 100-year HGL information for the systems upstream of the Revised Pond are shown on the attached "StromCAD Profiles – Proposed Conditions" drawings.

The 100-year peak discharge out of the Revised Pond is also slightly higher than the one for the original pond since the available storage in the Revised Pond was reduced. The estimated 100-year peak discharge out of the original pond was 17.6 cfs while the one for the Revised Pond has increased to 23.5 cfs. This increase does not affect the originally estimated 100-year peak flow and/or HGL in the trunk lines downstream of the Revised Pond because the time of peak discharge out of the Revised Pond is considerably longer than the time of peak discharge in the storm drain trunk lines.

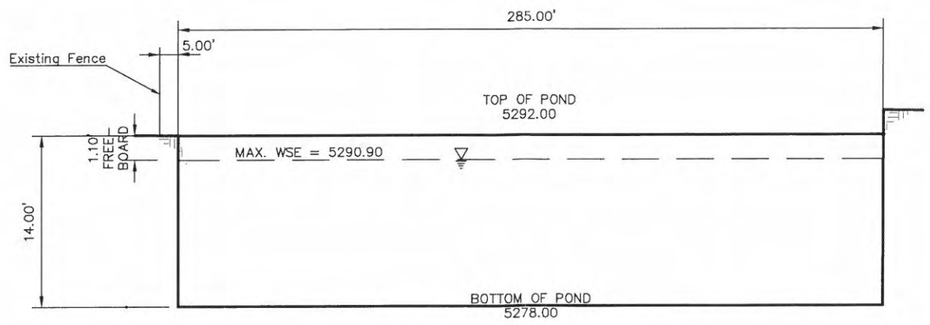
Mapped Floodplains

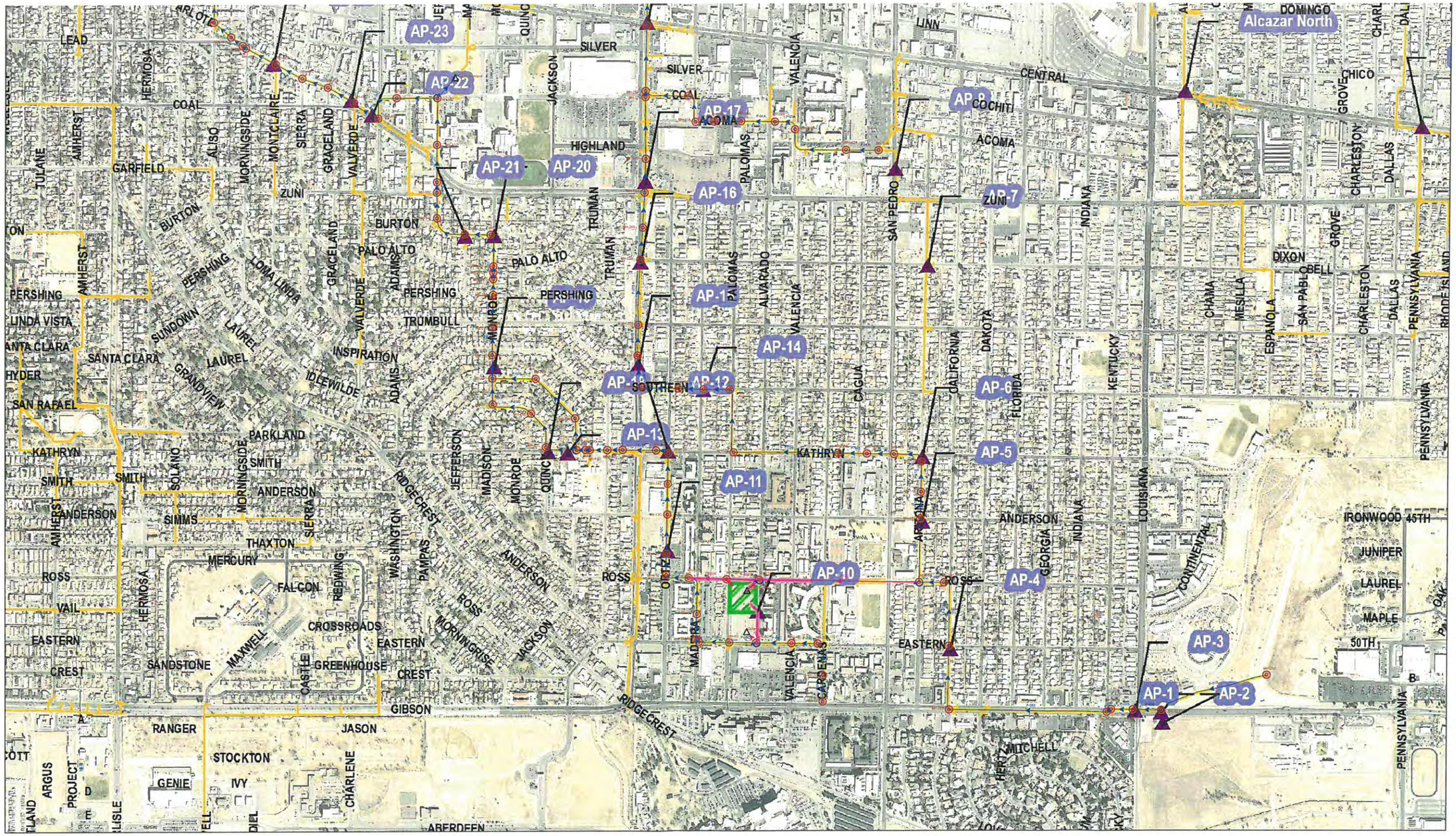
The analysis shows that the implementation of the Revised Pond in lieu of the original one will still provide the same effect on the limits of the mapped floodplains. As indicated in the original report, the floodplains along the San Mateo North system can be removed from Gibson to Trumbull Ave (Trumbull). The floodplains from Trumbull to Central on San Mateo would remain in place; however, the magnitude of the flooding would be less. For the Campus Wash system, the floodplains can be removed from Gibson to approximately the intersection of Kathryn Avenue and Quincy Street; the existing floodplains north of this point would remain in place; however, the magnitude of flooding would be reduced.

Conceptual Cost Estimate

COA's estimated unit prices for contract bid items in 2009 were used to develop a conceptual cost estimate for the proposed drainage improvements. The total estimated construction cost, not including any right-of-way costs, is $3,500,000. Details of this cost estimate can be found as an attachment to this Memo.

SCALE (HORIZ): 1"=60'
SCALE (VERT): 1":6'





REVISED PROPOSED
ALVARADO/EASTERN POND

AMAFCA

0 1000 2000 Feet

LEGEND

EXISTING STORM DRAIN

PROPOSED STORM DRAIN

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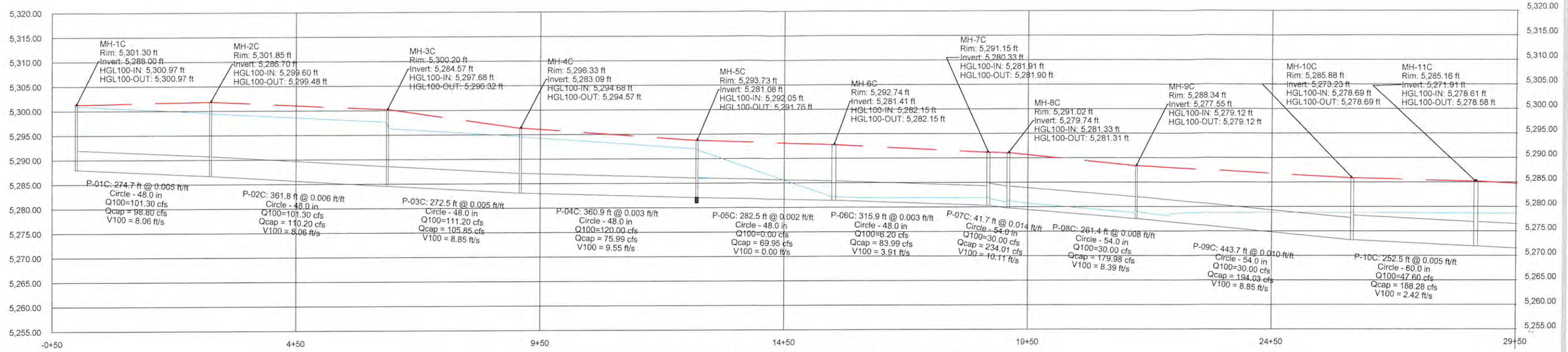
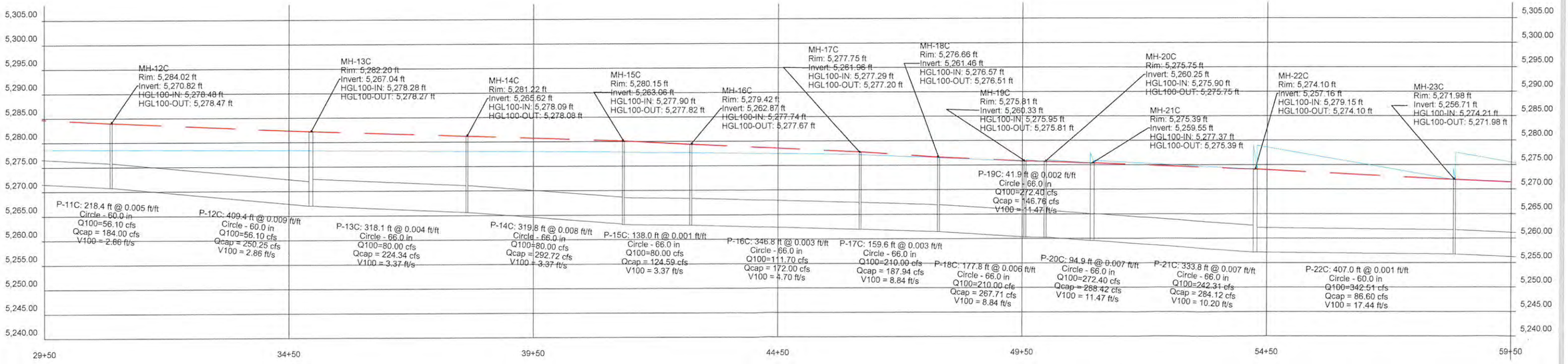
EXISTING AND PROPOSED
STORM DRAINS
STORMCAD LAYOUT



CAMPUS WASH - FROM GIBSON & CARDENAS TO ORTIZ & ROSS



CAMPUS WASH - FROM ORTIZ & ROSS TO QUINCY & MONROE

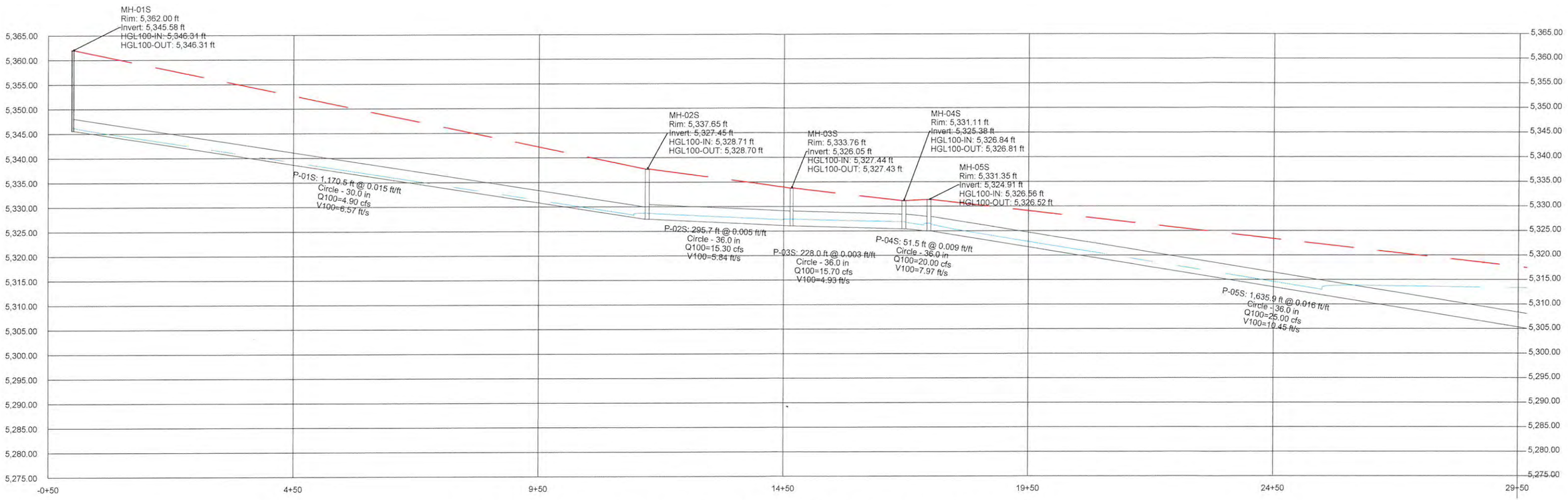
ALVARADO/EASTERN PROPOSED POND
FEASIBILITY STUDY

AMAFCA

0 100 200 400 Feet
1:200

LEGEND
EXISTING GROUND
HGL (Revised Pond)

STORM DRAIN PROFILES
PROPOSED CONDITIONS
(Revised Pond)



SAN MATEO NORTH SYSTEM - FROM GIBSON & LOUISIANA TO GIBSON & CALIFORNIA

ALVARADO/EASTERN PROPOSED POND
FEASIBILITY STUDY

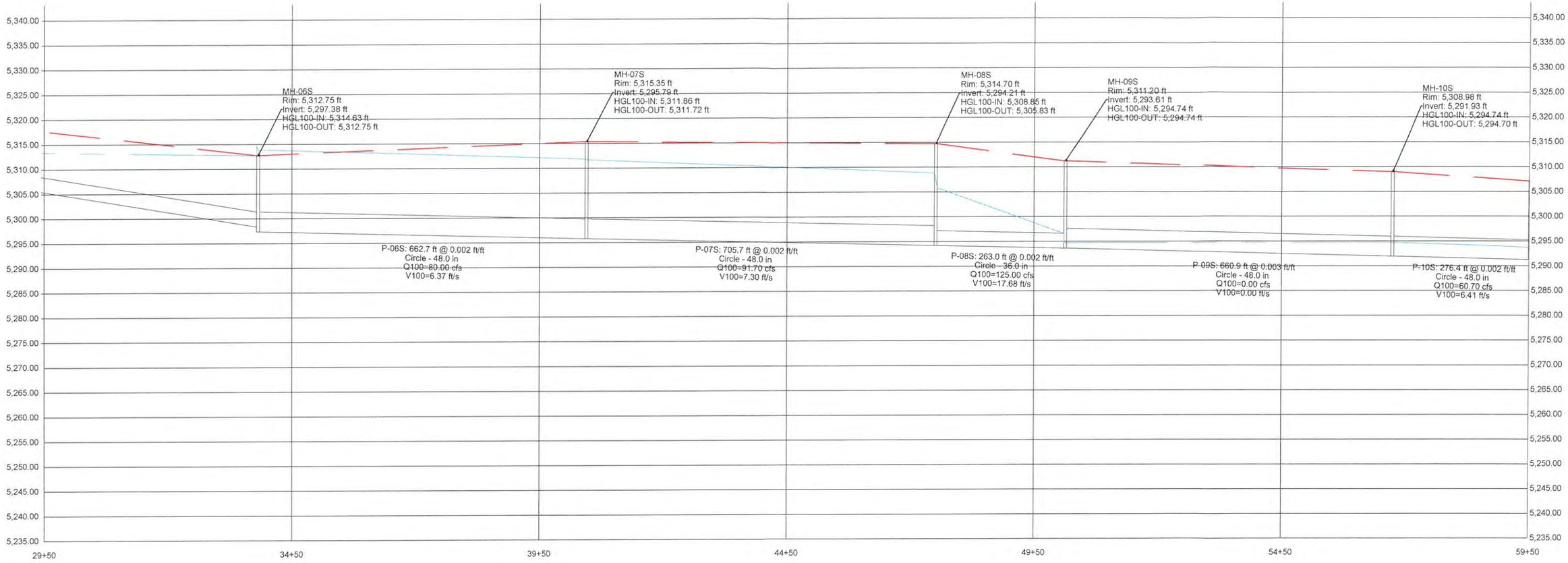
AMAFCA

0 100 200 400 Feet
1:200

LEGEND
EXISTING GROUND
HGL (Revised Pond)

wsp

STORM DRAIN PROFILES
PROPOSED CONDITIONS
(Revised Pond)



SAN MATEO NORTH SYSTEM - FROM GIBSON & CALIFORNIA TO ARIZONA & ANDERSON

ALVARADO/EASTERN PROPOSED POND
FEASIBILITY STUDY

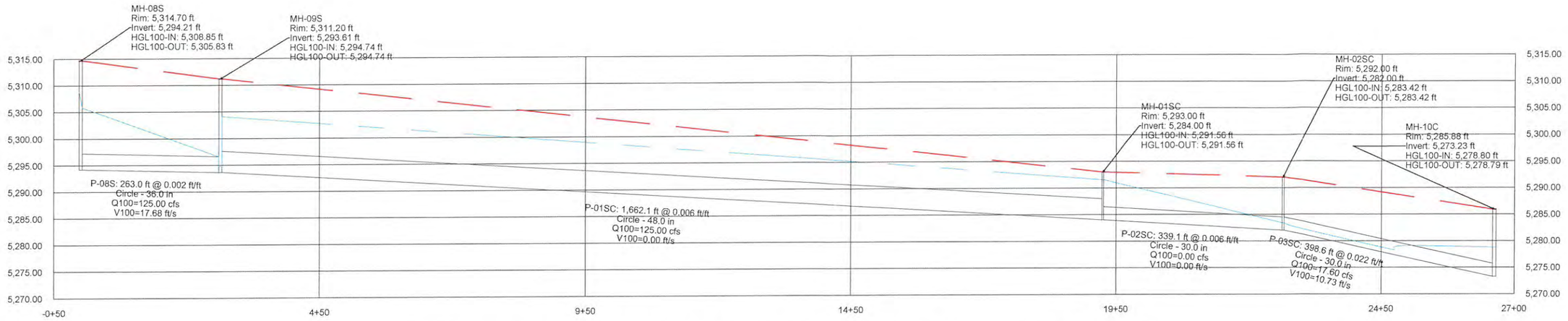
AMAFCA

0 100 200 400 Feet
1:200

LEGEND
EXISTING GROUND
HGL (Revised Pond)

wsp

STORM DRAIN PROFILES
PROPOSED CONDITIONS
(Revised Pond)



PROPOSED BYPASS SYSTEM - FROM ARIZONA & ROSS TO PROPOSED POND AT EASTERN AND ALVARADO

ALVARADO/EASTERN PROPOSED POND
FEASIBILITY STUDY

AMAFCA

0 100 200 400 Feet
1:200

LEGEND
EXISTING GROUND
HGL (Revised Pond)

wsp

STORM DRAIN PROFILES
PROPOSED CONDITIONS
(Revised Pond)