Engineering Report

NMSU Main Campus
Storm Drainage Masterplan

New Mexico State University
April 2024

Prepared for:

Prepared by:

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New Mexico State University

Main Campus Storm Drainage Master Plan

Draft Report

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New Mexico State University

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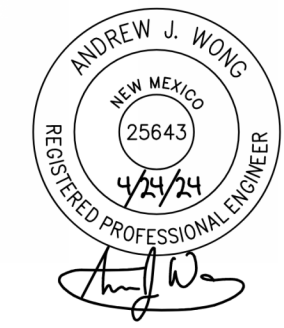
The technical material and data contained in the specifications were prepared under the supervision and direction of the undersigned, whose seal as a Professional Engineer, licensed to practice in the State of New Mexico, is affixed below.



4/24/2024 N.M.P.E. No. 25643

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All questions about the meaning or intent of these documents shall be submitted only to the Engineer of Record, stated above, in writing.

Table of Contents

List of Tables

List of Figures

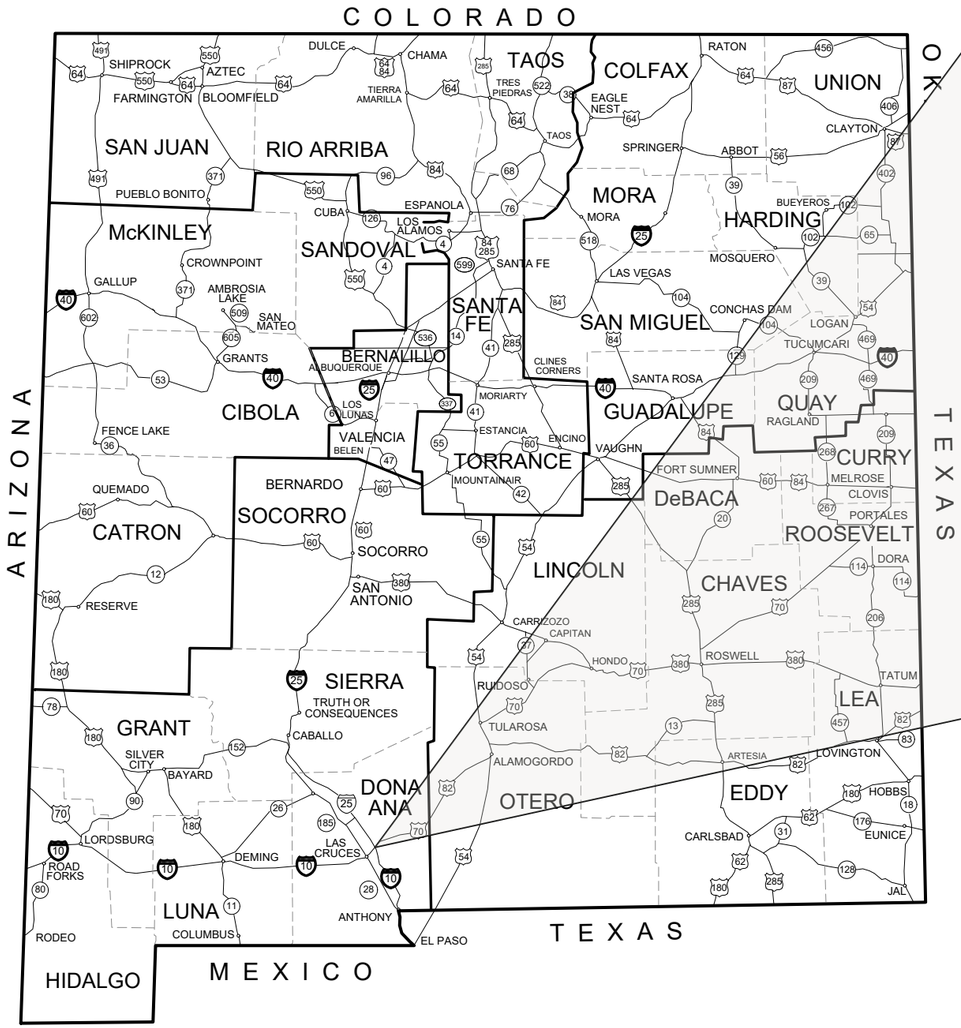
1.0 INTRODUCTION

Since its founding, the infrastructure of New Mexico State University (NMSU) has undergone significant development. As the campus continues to grow, so does the framework needed to support it. With the construction of new buildings, roads, parking lots and various other impervious surfaces, additional drainage infrastructure is required to maintain safe and effective drainage patterns throughout the campus.

Due to aging infrastructure and the campus being within several significant flow paths, there have been several drainage issues that warrant concern. Some of these problems have resulted in significant property damage, limitation of access by vehicles due to road flooding, as well as nuisance flows and ponding in various locations. NMSU has conducted Drainage Masterplans in the past, which have addressed these issues; however, as the campus continues to change and expand, a new study is warranted to maintain the integrity of NMSU's current drainage infrastructure and to ensure that the addition of new infrastructure will not significantly alter these drainage patterns.

1.1. Location

New Mexico State University lies between the crossroads of interstate highways I-25 and I-10, as seen in Figure 1-1 below.



Location Map

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NEW MEXICO STATE UNIVERSITY DRAINAGE MASTERPLAN

Figure 1-1

2.0 GOALS

The goals set forth in this drainage masterplan are as follows:

1. Analyze existing drainage patterns and structures throughout the main campus (excluding Arrowhead Park) using hydrologic analysis and a comprehensive computer model to replicate various storms.
2. Identify existing drainage issues within the main campus, both visually observed by NMSU's Facilities and Services Team and/or exhibited in the model. Included in this is an assessment of NMSU's current Storm Water Management Program.
3. Provide direction and recommendations for improving the existing areas identified as having drainage issues.
4. Provide overall guidance to aid in the planning of future storm drainage actions and improvements for the next 30 years. Included in this is a prioritization list for short-term and long-term planning.
5. Provide a Capitol Improvements Program (CIP) for storm drainage projects and corresponding cost estimates

3.0 PREVIOUS REPORTS

To accurately provide a comprehensive study of the current drainage conditions at NMSU, previous studies were analyzed and used as references for this report. This is done for numerous reasons, for example: the review of these documents may highlight previously identified problems which may otherwise be overlooked. Naturally, these reports utilize programs that may be considered outdated by todays drainage standards, but the general methodology remains relatively similar and can be used as a reference for this study and for future studies.

3.1. NMSU Main Campus Storm Drainage Master Plan

The most significant of these past reports is the Drainage Masterplan (DMP) done for NMSU by Molzen Corbin in 1995. While there are more recent drainage reports that focus on specific sites or issues within NMSU, the 1995 report is the most recent DMP done for the entire campus. This DMP utilized the SCS Type II rainfall storm, with the rainfall amounts for this storm taken from the NOAA Atlas for New Mexico. Two modeling techniques were considered for the 1995 DMP, including HEC-1 and AHYMO. HEC-1, a Flood Hydrograph Package developed by the Army Corps of Engineers Hydrologic Engineering Center, developed hydrology based on SCS methods using SCS curve numbers, drainage areas, and lag times as input for hydrograph development. “AHYMO” is another computer model developed by SCS based off of the program HYMO. AHYMO had been enhanced by engineers in Albuquerque to specifically reflect the conditions of northern New Mexico. It was also used to prepare the 1981 Albuquerque DMP (referenced in the 1995 NMSU DMP). AHYMO was exclusively for projects done under the jurisdiction of the Albuquerque Metropolitan Arroyo Flood Control Authority (AMAFCA).

For the 1995 MP, both HEC-1 and AHYMO were used to model NMSU and their respective results compared to determine the best approach. Ultimately, AHYMO was chosen as the ideal model for the master plan due to its superior routing techniques but adjusted to so that peak rates of discharge would represent those from HEC-1 (the peak rates produced by HEC-1 were thought to have reflected the drainage conditions on campus for that time). This allowed for the best parts of both programs to be used.

As the 1995 DMP is the most recent masterplan done for NMSU, it will be referenced in this 2023 master plan for comparison purposes only. While the general methodology of the previous report is consistent with some of the methodology used today, the modeling techniques used are considered outdated for today's standards. For various reasons, including the different modeling programs used and changes in weather patterns, it is expected that the results and conclusions presented in this report will differ from those in the 1995 report.

3.2. NMSU Storm Water Management Program for NPDES General Permit

In 2009 Martich Professional Services prepared at Storm Water Management Program (SWMP) for NPDES General Permit (NO. NMR040000). This document was provided in compliance with Small Municipal Separate Storm Water Systems (MS4s) standards set forth by the Environmental Protection Agency (EPA) in order to effectively reduce the discharge of pollutants to the maximum extent practicable. As NMSU is classified as an MS4 for its main campus (bordered by University Avenue, Interstate Highway 25 and Interstate Highway 10), NMSU must provide a SWMP in order to fulfill the requirements set forth to obtain the permit. The requirements of the SWMP include:

1. Determination that its discharges do not cause or have a reasonable potential to cause or contribute to water quality standards not being met in the waters receiving the discharges;
2. Determination that its discharges do not exceed any Total Maximum Daily Loads of pollutants established for waters receiving the discharges;
3. Determination that its discharges and discharge-related activities do not jeopardize a species listed as endangered or threatened under the Federal Endangered Species Act; and
4. Determination that its discharges and discharge-related activities do not affect a property that is listed or is eligible for listing on the National Register of Historic Places as maintained by the U.S. Secretary of the Interior.

This report serves as documentation that NMSU complies with these requirements and provides details of major aspects of the existing storm water management taking place. These aspects include the water quality standards in place, the control measures taken, the construction site storm water runoff controls, storm water management for future development, and pollution

prevention for municipal operations. Also detailed in the document are the expected communications with the public to ensure transparency of the discharges taking place and to provide plans for storm water pollution prevention.

As this report provides detailed inventory of the discharge points, as well as the standards for discharge within campus, it will be used in this report as reference for proposed drainage conditions to ensure the criteria of the 2009 SWMP is met.

3.3. NMSU Auxiliary Services Drainage Concerns

An engineering report detailing the auxiliary drainage concerns for the NMSU campus was developed in 2013 by Parkhill Smith & Cooper Inc. (now Parkhill Inc.). This report evaluated causes of flooding and water damage, provided solutions to alleviate the drainage problems, and provided a cost estimate for the solutions recommended. The calculations used for analysis within this report were done using the Runoff Analysis Method (per Section 32-103 (B) of the City of Las Cruces Design Standards: Urban Drainage Criteria (2005)). There are 22 sections in this report that coincide with the 22 areas of concern around campus. Some of the drainage issued documented within this report have since been addressed. For example, the issues around Monagle hall are obsolete considering it has since been demolished and replaced by Juniper Hall which retains its own discharge onsite. Though some issues were eradicated, other drainage issues mentioned are still existing today, such as the ponding that occurs within Cervantes Village.

The 2013 report provides a detailed inventory of the more localized drainage issues occurring at NMSU. While this 2023 masterplan analyzes the larger drainage patterns through campus, there are some outstanding issues detailed in the 2013 report that coincide with some of the larger scale problems occurring today. For this reason, the 2013 report will be used as a reference for those specific issues.

3.4. Arrowhead Park Drainage Study (2020)

The Arrowhead Park Drainage Study was completed by Molzen Corbin for NMSU and the Arrowhead Park development in 2020. It studied the existing and proposed drainage conditions

for most of the major flowpaths for the Arrowhead Park portion of the NMSU campus. This included analysis and alternatives for most of the Tortugas Arroyo. An amendment to the report was completed in 2023 by Molzen Corbin for some additional planned development along Arrowhead Dr next to the Burrell College of Osteopathic Medicine. Given the recent nature of the Arrowhead Study, additional analysis and recommendations for that portion of NMSU was not included in this Masterplan.

4.0 EXISTING CONDITIONS

Establishing and analyzing the existing conditions is the first part of any drainage analysis. The results of this research and analysis effort is presented in the following sections.

4.1. FEMA Floodmaps

There are four FEMA floodmaps covering the NMSU main campus area: 35013C1092G, 35013C1094G, 35013C1111G, and 35013C1113G. These can be found in Appendix B. Within the main campus area, there are two areas identified as being inundated by the 1% change storm due to offsite flows moving through. The first, coming from the east as shown in Figure 4-1 below, is the flowpath associated with the Tortugas Arroyo. This flowpath was analyzed as part of the 2020 Arrowhead Drainage report with alternatives for maintaining the conveyance capacity as the area develops. There are currently no structures located within this floodplain.

FIGURE 4-1: FEMA FLOOD ZONES

The second flood zone is associated with the regional floodplain which passes through the western end of the campus. There are several structures located within the floodplain including

the Las Cruces Convention Center, the NMSU police department, Skeen Hall, and Wooten Hall. Addressing the impacts of this floodplain may not be feasible and would require a large multi-agency coordination effort beyond the scope of this report.

4.2. Existing Basins

Consistent with the City of Las Cruces area, runoff generated from NMSU's campus generally flows from the East to the West side of campus towards the Rio Grande. Water is conveyed through campus by drainage structures of varying type and size, including culverts, arroyos, and drop inlets.

There is a total of 36 basins analyzed for this report. The basins analyzed are either within or near the main campus and their respective reaches generally contribute to the main flow paths throughout NMSU. These basins can be seen in Figure 4-2 below. Certain basins, specifically those with recent development, have onsite retainage for their generated flows. The runoff from remaining basins contribute to the larger flow paths mentioned in the next section.

LAST MODIFIED: Dec 15, 2023 - 8:59am BY USER: LMarquez
DWG. LOCATION: L:\nmsu\MS\20-13_NMSU Drainage Master Plan\DWGS\
DWG. NAME: BASIN MAP2.dwg

SCALE: 1"=600'

UNION STORM DRAIN

E UNIVERSITY AVE

E COLLEGE AVE

UNION AVE

COLLEGE POND

NMSU HORSESHOE

FRENGER ST

STEWART ST

NMSU REGIONAL POND

WELLS ST

SAM STEEL WAY

COLLEGE ARROYO

TORTUGAS ARROYO

BASIN : 6
7.69 ACRES

BASIN : 15
6.17 ACRES

BASIN : 16
13.08 ACRES

BASIN : 17
10.94 ACRES

BASIN : 21
1.90 ACRES

BASIN : 22
16.04 ACRES

BASIN : 20
20.50 ACRES

BASIN : 7
3.33 ACRES

BASIN : 5
46.21 ACRES

BASIN : 36
3.33 ACRES

BASIN : 4
6.63 ACRES

BASIN : 8
10.29 ACRES

BASIN : 18
29.50 ACRES

BASIN : 23
9.33 ACRES

BASIN : 25
4.53 ACRES

BASIN : 26
22.96 ACRES

BASIN : 27
25.78 ACRES

BASIN 2
2.84 ACRES

BASIN : 3
3.89 ACRES

BASIN : 9
4.43 ACRES

BASIN : 14
1.35 ACRES

BASIN : 11
4.20 ACRES

BASIN : 29
23.41 ACRES

BASIN : 13
4.68 ACRES

BASIN : 10
172.13 ACRES

BASIN : 28
4.88 ACRES

BASIN : 24
21.78 ACRES

BASIN : 12
38.71 ACRES

BASIN : 19
92.52 ACRES

LEGEND

FLOW PATH
EXISTING STORM DRAIN
BASIN BOUNDARY

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NMSU DRAINAGE MASTER PLAN

FIGURE 4-2
EXISTING DRAINAGE CONDITIONS

4.3. Major Flow Paths

As previously mentioned, the runoff from the basins within or around NMSU main campus flow to one of the major flow paths, these flow paths have been determined through topographic mapping, physical investigation, aerial imagery, and historical flow data.

The most notable flow paths within the main campus are listed as follows:

- The Tortugas Arroyo, which conveys the outfall from the Tortugas Arroyo Dam and runs from northeast to southwest through the southeast quadrant of campus.
- College Arroyo, which runs along the east side of campus and conveys water from north of the University Interchange to the Tortugas Arroyo.
- Stewart Street conveys a significant amount of flow from surrounding basins. This has been visually observed and is evident within basin mapping.
- College Drive, which receives runoff directly from Espina Street, International Mall (I-Mall).
- Sam Steel Way receives flow from multiple basins, including some runoff from I-10. This flow moves from the street to a channel along its south side and back to the street at various points before finally entering a short channel on its north side where it eventually discharges into the NMSU Regional Pond.
- University also receives discharge from multiple basins within campus. From University, this flow discharges into the storm drain system that runs from El Paseo, under Union, and eventually discharges into the EBID Park Drain.

Most of the major flow paths listed (and additional smaller flow paths) are exhibited in the model and were used to determine the capacity of various structures throughout campus. Though the Tortugas Arroyo is one of the most notable flow paths, it has already been thoroughly analyzed as a part of the Arrowhead Final Drainage Report done in 2020 by Molzen Corbin (amended for Arrowhead Park in 2023). The arroyo also does not directly run through the urbanized portion of campus; therefore, it was not further analyzed within this report.

4.4. Major Drainage Structures and Conveyances

There are various structures throughout campus that transport the major flows listed in section 2.1, however; there are many flow path conveyances that are not considered drainage structures but were analyzed in order to identify any issues that may be occurring.

The most notable conveyances analyzed within this report are listed as follows:

- The basin for Stewart Street is one of the largest basins within campus. Stewart picks up water from various surrounding streets such as Locust Street and Williams Avenue before discharging into the NMSU Regional Pond.
- Wells Street picks up flow from the Cole Village housing development and discharges it onto Sam Steel Way.
- As previously mentioned, College Arroyo runs through campus and conveys a significant amount of flow through various channels. There are multiple structures within the arroyo, most significant being the two concrete culverts that carry the flow under Stewart Street, the channel that runs along the east side of the football practice field, and the storm drain along the westbound lane of Wells Street which discharges to a small reinforces concrete pipe on the other side.
- Frenger Street, between Espina Street and Zhul Library has been reported to convey significant flow in storm events. Frenger discharges flow onto Espina Street.
- As mentioned, Espina Street receives flow from Frenger Street, the International Mall area and from around the Horseshoe. The flow from Espina eventually discharges into the system along College Drive.
- There are multiple drainage structures along College Drive. There is a small pond at the corner of College Drive and Knox Street that has an outfall structure that discharges into a storm drainage system that conveys the flow westward towards Union Avenue.

5.0 DRAINAGE ISSUES AND CONCERNS

The NMSU Facilities and Services department has expressed concern over various drainage issues through campus. These issues are generally on a larger scale (differing from the localized issues outlined in the Auxiliary Services Drainage Concerns document) and come from the larger flow paths mentioned in the previous section. This master plan will provide analysis and recommendations based on the following issues:

- The NMSU Regional Pond is located at the corner of Stewart Street and Union Drive (shown in Figure 5-1 below). This pond receives a substantial amount of flow from campus and is a major discharge point for many basins. In severe weather events the pond has been observed to overflow and release water onto Union Drive. While the pond does have an 18-inch outfall pipe, it has a gate that must be manually opened meaning there is no outfall structure releasing flow during most storm events.

FIGURE 5-1: NMSU REGIONAL POND

- As mentioned, Stewart Street conveys water from one of the largest basins within NMSU. While most of the basin is developed, there are a number of large grass areas including the intramural field and Preciado Park. There is no inlet system along Stewart and it has been observed that the amount of surface flow on Stewart is a potential safety concern for the students and staff and NMSU, specifically within the intersection of Stewart and Espina Street.

FIGURE 5-2: STEWART ST

- College Drive receives flow from Espina Street and International Mall. This flow runs into the small pond at the intersection of Knox Street and College Dr before spilling onto the road and then into the storm drain system along College where it eventually flows into the storm drain system along Union Drive. Currently NMSU has observed that the pond and storm drain along College Dr is not functioning effectively, and large amounts of water are flowing on the surface of the road and various points of ponding along the street in the vicinity of the Police Station.

FIGURE 5-3: FLOODING ON COLLEGE DR (2007)

- There are various points along Arrowhead drive that warrant concern. At the intersection of Arrowhead and Stewart (exhibited below) there is a low water crossing where runoff from the parking lot east of Arrowhead, this crossing is a safety concern for students and staff. In addition to this, there is low point in the road near the intersection of Arrowhead and Wells where significant ponding can result in the road closure.

FIGURE 5-4: PONDING AT ARROWHEAD AND WELLS

- The drop inlet that conveys College Arroyo across Wells Street has been observed to experience capacity issues. As this is a low point in the road, large amounts of water cross on the street instead of flowing into the drop inlet.

FIGURE 5-5: COLLEGE ARROYO AT WELLS

- Espina Road picks up surface flow from Frenger Street, International Mall and around the NMSU "Horseshoe". Due to limited longitudinal slope in Espina's profile, there are several places where nuisance ponding often occurs.
- Wells St generally has a fairly consistent slope along its length that helps facilitate effective conveyance of water toward Sam Steel Way. However, just before the intersection with Sam Steel the roadway profile experiences a slight dip that results in water ponding across especially the westbound lanes. Figure 5-6 shows this location, although the flooding was not present at the time the photograph was taken.

FIGURE 5-6: WELLS ST NEAR SAM STEEL

- Sam Steel Way conveys flows that originate from Wells St, Williams St, and I-10 to the NMSU Regional Pond. These flows can accumulate to be quite significant and, due to the bare slopes on I-10, can include a heavy sediment load as well. The roadway itself is a NMDOT facility. But the adjacent channel, shown in Figure 5-7, is within NMSU property. Therefore, any improvements would need to be coordinated with the State.

FIGURE 5-7: SAM STEEL WAY CHANNEL

- The intersection at Locust St and Sam Steel Way is another location that has been identified as suffering from nuisance flooding. As show in Figure 5-8, Locust St meets Sam Steel and forms a low point where ponding occurs. This has resulted in significant deterioration of the pavement, sediment deposits, and flooding issues for vehicles.

FIGURE 5-8: LOCUST ST AND SAM STEEL WAY

6.0 HYDROLOGIC ANALYSIS

The methodology used for this MP for the hydrologic and hydraulic analysis was heavily influenced by the methods suggested in the New Mexico Department of Transportation (NMDOT) Drainage Design Manual (DDM). The NMDOT manual provides a comprehensive guide on how to execute a detailed analysis of drainage conditions, typically for roadway improvements. This method is considered to be fairly reliable and widely accepted by engineering entities within the State of New Mexico. The methods described in the DDM are also consistent with those used in the 1995 MP, the major differences being the modeling programs used.

6.1. HEC-HMS

The National Resources Conservation Service Unit Hydrograph Method in HEC-HMS was used to model the existing drainage conditions across campus. This was the preferred method as it allows the complicated routing that occurs between the NMSU watersheds to be exhibited. HEC-HMS requires the input of the following parameters for each basin: drainage basin area, rainfall depth and distribution, time of concentration, lag time, and runoff curve numbers. The model was run using the 50-year and 100-year as the design and check storm. The components for the model were gathered using the methods listed below.

6.2. Watershed Mapping

The drainage basin areas for campus were mapped using topography from 2021 provided by NMSU. The overall basin map can be seen in Figure 4-2.

6.3. Rainfall Data

The rainfall intensity and frequency storm were modeled using rainfall data from the National Oceanic and Atmospheric Administration (NOAA) for the 24-hour duration. This information can be found in Appendix C. The design and the check floods chosen for this analysis were the 50-year and 100-year.

6.4. Time of Concentration

The Time of Concentration (Tc) is the time required for runoff to travel along the longest flow path within the watershed. Generally, the time of concentration equation is chosen based on the characteristics of the watershed. Since most of the basins for NMSU are developed, the Kirpich Method was used to calculate the time of concentrations for most watersheds. This is due to the fact the Kirpich Method is primarily used for basins where channelized flow occurs. Since the area is so heavily developed, it is expected and observed that most of the flow occurring is gullied.

The basic equation for the Kirpich Formula method is as follows:

$$T_c = 0.0078 \times L^{0.77} \times S^{-0.385} \quad (minutes)$$

where L is the length of the flow path (ft) and S is the average slope (ft/ft) of the flow path.

Although most basins could be analyzed using the Kirpich Method, some of the basins required the use of the Upland Method. The Upland method was used for the basins in which significant gullying was not apparent.

The equation for the Upland Method is as follows:

$$T_t = \frac{L}{3600 * V}$$

In which T_t is the travel time (hr), L is the flow length (ft), V is the average velocity (ft/s), and 3600 is the conversion factor from seconds to hours.

For this method, Tc is the sum of the travel time T_t values for the various consecutive flow segments.

Complete Time of Concentration calculations can be found in Appendix D.

6.5. Lag Time

The Lag Time for a basin is the time between the centroid of the runoff and the peak of the runoff hydrograph. Lag Time can be derived from the Time of Concentration with the following formula:

$$Lag = .6 * T_C \ (minutes)$$

6.6. Soil Data and Curve Numbers

The hydrologic soil group classifications of the watersheds within the project area were collected from the NRCS Web Soil Survey online. This soil data, as well as the United States Department of Agriculture (USDA) Urban Hydrology for Small Watersheds Manual, was used to determine the Curve Number (CN) for each individual basin. The Unit Hydrograph Methods Curve numbers are dependent on soil type and ground cover for the drainage area.

The Curve Number for each basin that can found in Appendix E

6.7. Hydrologic Analysis Results

The HEC-HMS model was ran using the components mentioned. The model then provided a peak flow and volume for each basin. The hydraulic elements of interest were modeled as individual reaches, with a peak flow rate given for each reach. The results of the analysis for the hydraulic elements of interest can be seen in Table 6-1 below. The data for each basin and reach can be found in Appendix F.

Table 6-1: Hydrologic Analysis Results

Drainage Structure Name	Description	Total Drainage Area	Q10	Q100	V10	V100
		ac	cfs	cfs	ac-ft	ac-ft
Arrowhead Stewart to Wells	Street Flow	23.41	15	28	0.8	2.0
College Arroyo	Arroyo	81.27	117	203	12.0	26.0
College Arroyo Inlet	Drop Inlet	81.27	123	222	12.8	28.6
College Dr	Street Flow	46.21	80	158	6.9	155.8
Espina Street	Street Flow	38.77	29	65	2.4	5.9
Frenger	Street Flow	35.69	35	75	2.4	6.0
I-Mall	Street Flow	38.51	53	102	4.5	9.9
NMSU Regional Pond	Pond	411.622	273	606	26.4	65.3
Stewart Street	Street Flow	172.13	56	169	6.4	20.3
Sam Steel Way	Street Flow	134.23	130	260	11.8	26.6
Union Storm Drain	48" RCP	52.84	88	177	8.3	18.3
Wells Street	Street Flow	38.71	45	86	3.8	8.3

7.0 HYDRAULIC ANALYSIS

There are many runoff conveyances within campus, the most notable being the street flow that occurs on various streets and the flow through inlets and culverts. For the major flow paths listed in section 2.3, hydraulic analyses were done on the significant structures within the path. The methods used for the hydraulic analyses of this project are described below.

7.1. Hydraulic Methodology

Various methods were used to analyze the capacities of the critical flowpaths for this report. For street flows, the Federal Highway Administration's Hydraulic Toolbox was used to determine the conveyance capacity before the water overtops the curb or the street becomes unnavigable, whichever is less.

For culvert crossings, the FHWA's HY-8 culvert analysis software was used to determine the capacity before the headwater overtops the roadway crest.

Storage capacity was determined using the existing topography and Civil 3D if necessary.

7.2. Hydraulic Results

For the street flow that occurs on campus, the Federal Highway Administration Hydraulic Toolbox was used to analyze the capacity before water overtops the curb. For street flows, the estimated roadway cross section was used with the capacity being limited by the depth at the curb or the depth at which the street cannot be navigated safely, whichever was less. The results from Hydraulic Toolbox for the conveyances being analyzed can be seen in Table 7-1.

Table 7-1: Hydraulic Analysis Results

Drainage Structure Name	Description	Estimated Capacity	10-yr*	100-yr*
College Arroyo Inlet Across Wells St	Low Water Crossing	None	117 cfs	203 cfs
Espina Street	Street Flow	74 cfs	31 cfs	65 cfs
Frenger	Street Flow	85 cfs	35 cfs	75 cfs
Stewart Street	Street Flow	66 cfs	56 cfs	169 cfs
Wells Street	Street Flow	154 cfs	45 cfs	86 cfs
College Dr	12" Culvert	7 cfs	80 cfs	158 cfs
Sam Steel Way	Channel + Street Flow	138 cfs	130 cfs	260 cfs
Sam Steel Driveway Culvert	(2) 18" Culverts	21	130 cfs	260 cfs
NMSU Police Station Pond	Pond	4 ac-ft	0.27 ac-ft	0.64 ac-ft
Frenger St Pond	Pond	4 ac-ft	1.6 ac-ft	2.9 ac-ft
NMSU Regional Pond	Pond	18 ac-ft	26 ac-ft	65 ac-ft

*yellow indicates demand beyond the available capacity

As shown in the table, there are several street conveyances that are deemed insufficient for handling both the design (50-year) and the check flood (100-year). This can be attributed to several factors including the lack of drainage infrastructure along the roadways and a general increase of impervious area since the design of these roadways. The following points discuss the areas shown as lacking sufficient capacity.

- The results for the College Arroyo crossing Wells St show that the inlet at that location (see Figure 5-5) is likely intended for the adjacent parking lot rather than the arroyo flows. Therefore, this is functionally a low-water crossing for the Arroyo over Wells.
- Stewart St has capacity for the 10-yr storm, but the 100-yr is expected to overtop the curb at certain locations.
- College Drive's existing storm drain is significantly undersized for the expected demand. This results in the ponding and flooding that has often been reported in the vicinity of the NMSU Police Station.
- The results for Sam Steel Way include the capacity of the street plus the capacity of the adjacent channel since both elements convey flows. Both together meet the demand for the 10-yr storm, but fail the 100-yr. This computed capacity is for the eastern half of the

channel where the cross section is about 18-ft wide compared to the western half where it is nearly 30-ft wide.

- There are two driveway culverts crossing the Sam Steel Way channel. Both appear to be significantly undersized. As a result, water may be pushed from the channel into the roadway creating a point where the road experiences more flooded conditions prior to water being able to reenter the channel.
- The NMSU Regional Pond does not have the required storage capacity given its current condition and operation to contain either the 10-yr or 100-yr storm. Note that this analysis considers the pond to be functionally without an outfall since current policy requires the outfall to be opened by hand following permission from the City of Las Cruces.

8.0 DRAINAGE IMPROVEMENTS

The proposed drainage improvements outlined in this masterplan will focus on the issues identified in Section 4.3 relating the major flowpaths through the campus. Minor drainage improvements identified in the 2013 Parkhill Report will not be duplicated in this section.

8.1. Maintenance Recommendations

There are several existing drainage systems that, over the course of the site visits performed for this study, were observed to be in need of maintenance. Generally, it is expected that all drainage infrastructure requires maintenance over time to ensure the systems efficiency. It is recommended that a complete inventory and maintenance plan for the campus's drainage infrastructure be completed. Critical elements related to the major flowpaths would benefit from an annual inspection prior to the summer monsoon season to ensure they can operate effectively. These include:

Table 8-1: Maintenance Recommendations

Drainage Structure Name	Observed Condition	Recommendation
Tortugas Arroyo	No issues observed	Annual inspection of roadway crossings to ensure culverts are not obstructed
College Arroyo	No issues observed	Annual inspection of roadway crossings to ensure culverts are not obstructed
College Dr	Pond, inlets, culverts found to be clogged	Annual inspection of pond, inlets, and culverts to remove sediment and obstructions. Elevation rod in pond to establish normal design bottom.
NMSU Police Station Pond	No issues observed	Annual inspection of pond, to remove sediment and obstructions. Elevation rod in pond to establish normal design bottom.
Frenger St Pond	No issues observed	Annual inspection of pond, to remove sediment and obstructions. Elevation rod in pond to establish normal design bottom.
Stewart Street	No issues observed	Annual inspection of inlet and culvert leading to the regional pond to remove sediment and obstructions.
Sam Steel Way Channel	Sediment and debris in channel	Annual inspection of channel leading to the regional pond to remove sediment and obstructions.
NMSU Regional Pond	Significant sedimentation reducing capacity.	Annual inspection of pond, to remove sediment and obstructions. Elevation rod in pond to establish normal design bottom.

8.2. Storage Capacity Recommendations

The most significant storage capacity issue facing the NMSU Main Campus is the lack of capacity at the NMSU Regional Pond. Currently, the pond has an estimated capacity of 18 ac-ft. However, according to the hydrologic analysis the total volume entering the pond for a 100-yr storm is approximately 65 ac-ft. Therefore, the demand is over three times the current capacity. These results are validated by reports of Stewart St and Wells St flooding during large storm events.

While the total volume reaching the pond is 65 ac-ft, NMSU is permitted to discharge a certain amount of historical flow. For the purposes of this report, it is assumed that the runoff volume exceeding the originally designed capacity of the NMSU Regional Pond is considered the historic discharge volume. As-built drawings and reports from NMSU Facility Staff indicate that the original storage capacity of the pond was 30 ac-ft.

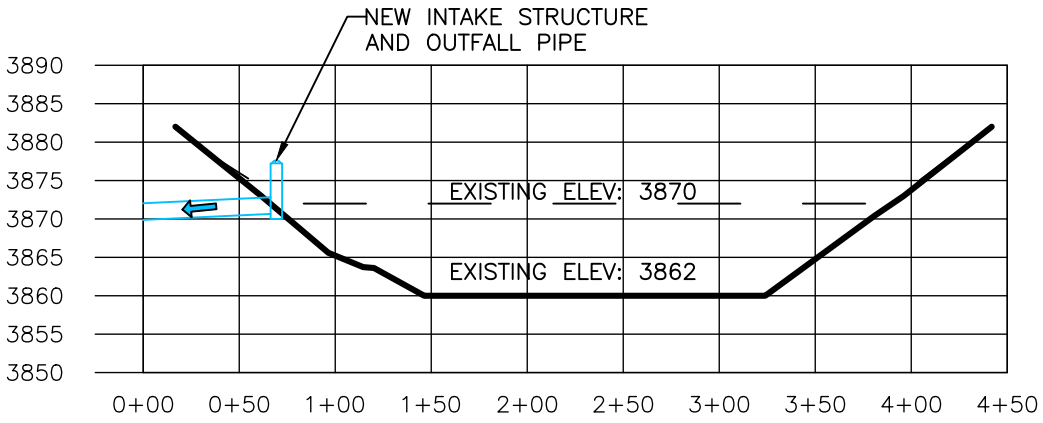
If it is possible to expand the storage capacity beyond the 30 ac-ft demand, any additional storage could be used to account for runoff generated by future impervious services such as new buildings or parking areas. The following recommendations will explore several options for reaching or exceeding the 30 ac-ft benchmark.

8.2.1. Storage Alternative 1: Restore the NMSU Regional Pond

The first and most easily achievable recommendation is to excavate the sedimentation in the NMSU Regional Pond. Record Drawings indicate that the original storage volume was approximately 30 ac-ft. By simply re-excavating the pond to restore the original intended capacity, the existing pond has the capacity to meet the 10-year storm demand. Additionally, there is the potential for collaboration with the City of Las Cruces and/or the New Mexico Department of Transportation in these maintenance efforts since the pond receives water and sediment from their facilities as well. Figure 8-1 shows a plan and profile view of how this alternative may look.

Estimated Construction Cost: $763,357.50

1 NMSU REGIONAL POND IMPROVEMENTS PLAN



A NMSU REGIONAL POND IMPROVEMENTS SECTION

NMSU DRAINAGE MASTERPLAN

MOLZENCORBIN

FIGURE 8-1
REGIONAL POND IMPROVEMENTS

8.2.2. Storage Alternative 2: Construct Automatic Outfall for the NMSU Regional Pond

The existing outfall for the NMSU Regional Pond is an 18" pipe with a valve that must be manually opened with permission from the City of Las Cruces so that it can discharge into the City's 78" culvert in Union. As a result, during large storms the pond can fill quickly due to the lack of an automatic outfall.

According to preliminary conversations with City of Las Cruces Public Works engineers, if it could be demonstrated that having an automatic outfall structure does not negatively impact the operations of the 78" Union storm drain, it is possible that NMSU could be allowed to install such a structure at the NMSU Regional Pond.

This automatic outfall would have to be designed with an elevated outfall structure to ensure that the pond would not be able to release water until the peak for the 78" Union storm drain has dissipated. Figure 8-1 shows a plan and profile view of how this alternative may look.

Estimated Construction Cost: $128,573.39

8.2.3. Storage Alternative 3: Cole Village Pond

According to NMSU Facilities Staff, Cole Village, located at the intersection of Wells St and Espina St, is to be demolished. While there are several other potential plans for the newly available real estate, this would also be an excellent location for a new regional pond to supplement the NMSU Regional Pond at Sam Steel. There is currently approximately 8 ac-ft of water volume on Wells and Sam Steel for the 100-yr storm that could be intercepted at this location. A one acre pond approximately 8-ft deep (8 ac-ft) would capture the entirety of these flows and reduce that demand on the NMSU Regional Pond. Figure 8-2 shows how a pond at Cole Village may look.

Estimated Construction Cost: $867,140.95

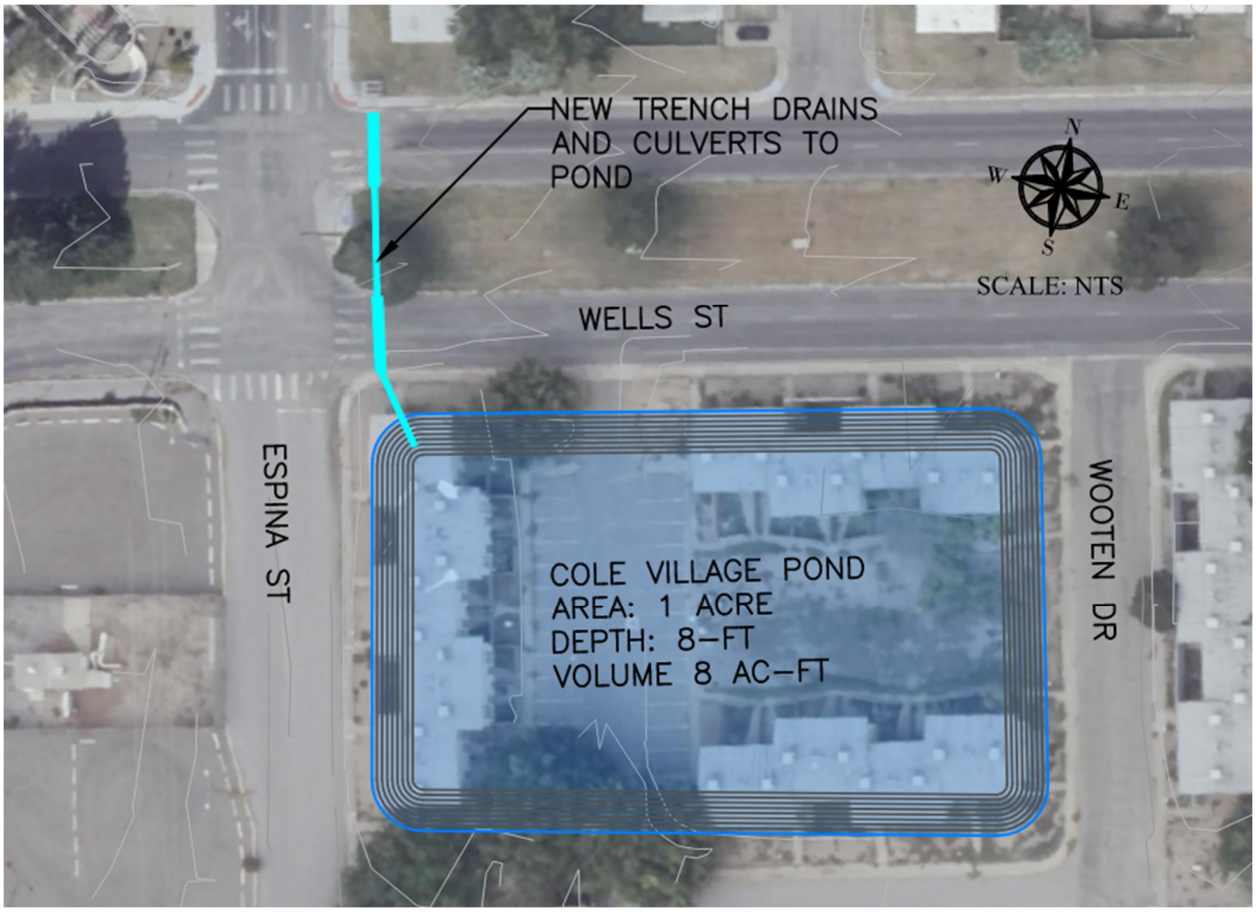


FIGURE 8-2: COLE VILLIAGE POND

8.2.4. Storage Alternative 4: Central Heating Plant Underground Storage

According to NMSU Operations Staff, the 3 million gallon underground water storage facility at the Central Heating Plan is no longer needed for its original purpose and could potentially be converted into a storm water storage facility. This would equate to approximately 8 ac-ft of storage. Further investigations will be needed to determine the feasibility of this alternative.

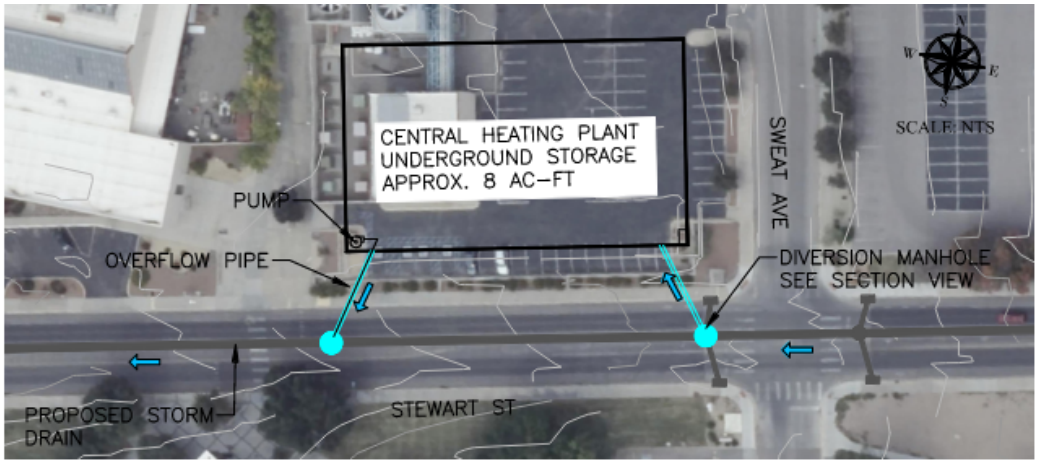
The alternative would depend on the installation of storm drain in Stewart Street. The storm drain would divert into the Central Heating Plan Underground Storage. Once the underground storage reaches capacity, the water would automatically continue discharging down the Stewart St storm drain. Naturally, several modifications to the facility would be needed to accommodate this new purpose. Figure 8-3 shows a layout of this alternative.

Given the greater depth of the underground storage facility relative to the proposed storm drain in Stewart, the water in the underground storage facility would not be able to drain by gravity. Several options could be explored for draining the stored water. The simplest option would be to install sump pumps to pump the water back into the Stewart storm drain once the storm peak has passed. This option would enable the facility to provide the temporary storage needed, but it would not directly gain any advantage from the stored water.

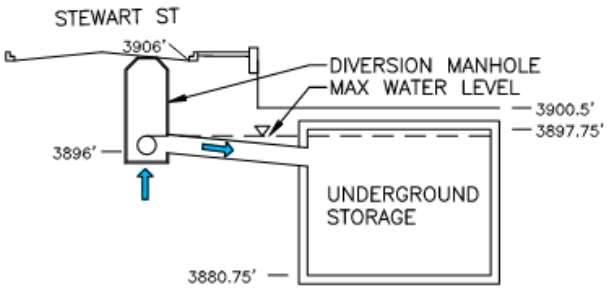
A second alternative, if the soil conditions are conducive to percolation, would be to drill drainage wells in the bottom of the storage facility to allow the water to slowly infiltrate over time, recharging the aquifer. This would enable NMSU, who's water supply is dependent on the aquifer below, to extend the viability of this crucial natural resource. Additionally, this option would not require electricity consumption to remove the water from the storage facility.

Another sustainable option would be to install pumps that could be connected to the irrigation systems in nearby green spaces such as Preciado Park or the Horseshoe Park. This would require some sort of treatment process within the storage facility to ensure sediment and debris do not enter the system, as well as measures to prevent contamination of the potable water system currently feeding the irrigation systems. The benefit of this option would be to utilize the stored stormwater to reduce the water demand. One large storm in July could have the potential to fully irrigate one of the nearby parks for the remainder of the summer months.

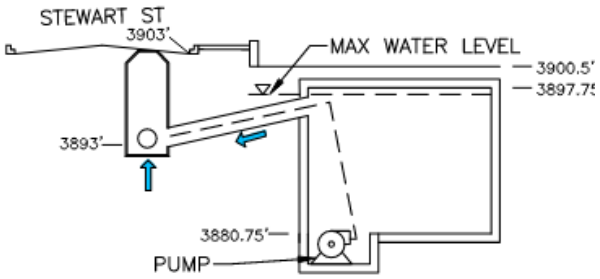
Estimated Construction Cost (pump option): $849,056.05



1 CENTRAL HEATING PLANT UNDERGROUND STORAGE - PLAN



A UPSTREAM PROFILE VIEW



B DOWNSTREAM PROFILE VIEW

FIGURE 8-3: CENTRAL HEATING PLANT UNDERGROUND STORAGE

8.2.5. Storage Alternative 5: Dispersed Green Stormwater Infrastructure

This alternative is a little more general. There are numerous areas around campus where shallow ponds, curb cuts, and landscaping modifications would provide rainwater harvesting, address local flooding issues, and provide additional storage, relieving the demand on the NMSU Regional Pond. It is recommended that any time a roadway resurfacing or modification project is planned, an analysis be done regarding the potential for green stormwater infrastructure. Several areas particularly suited for such improvements are identified in Figure 8-4 and in the list below:

- College Dr near Zuhl Museum (approximately 2.4 ac-ft) ($130,000)
- College Dr and Knox St near Skeen Hall (approximately 0.26 ac-ft) ($15,000)
- Wells St median (approximately 0.3 ac-ft) ($17,000)
- Horseshoe Perimeter (approximately 0.4 ac-ft) ($22,500)
- Intermural Fields along Locust St (Sidewalk culverts toward athletic fields) ($10,000)
- Preciado Park (Sidewalk culverts along Gregg St and Williams St) ($15,000)
- Hardman Residence tree grove (Sidewalk culvert on Espina St) ($5,000)
- Bioswale near University and Jordan Rd to direct flowpath through trees and address erosion ($9,000)
- Bioswales in pine tree grove west of duck pond ($9,000)

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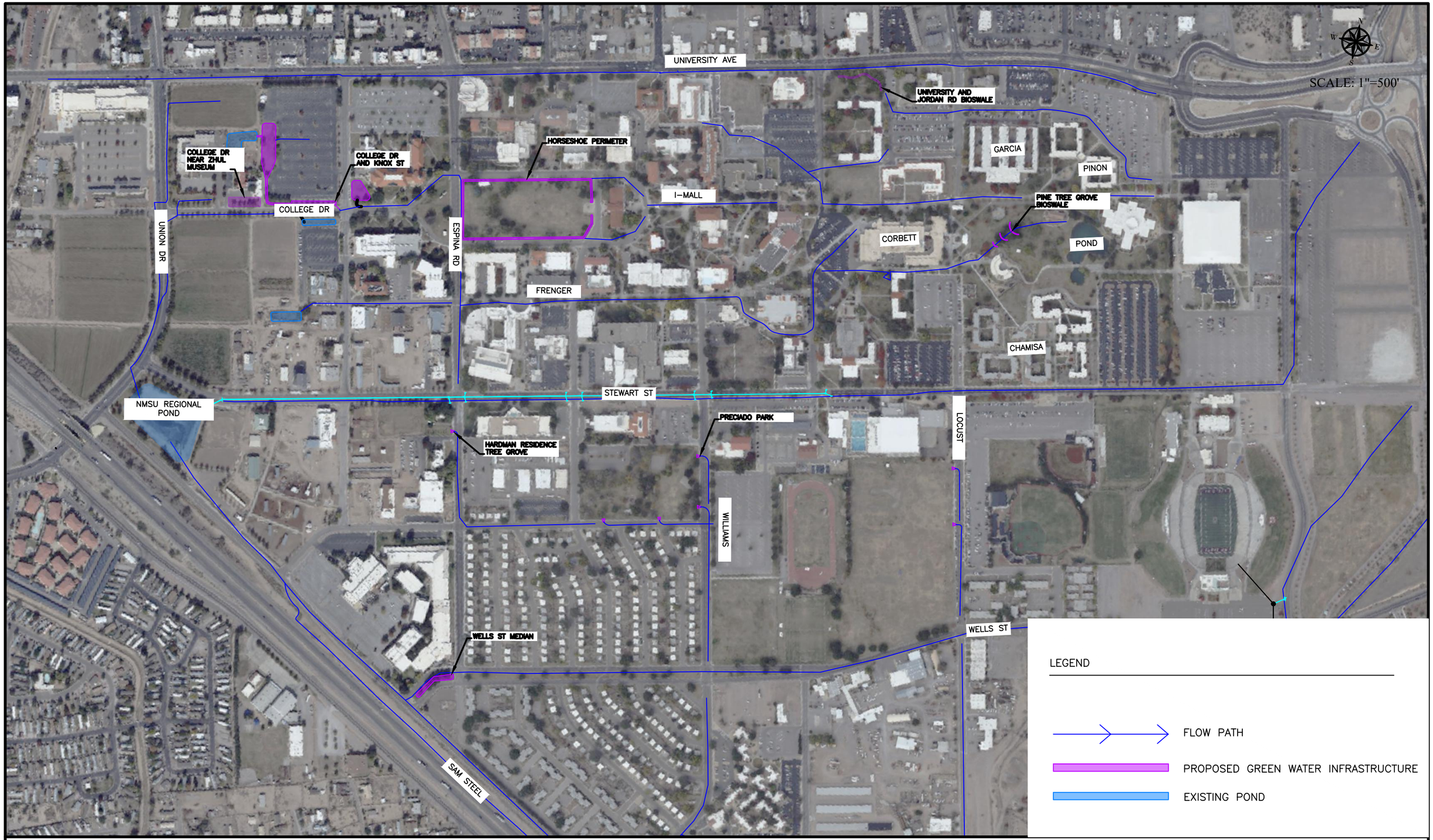


MOLZENCORBIN

NMSU DRAINAGE MASTER PLAN

FIGURE 8-4

DISPERSED GREEN STORMWATER INFRASTRUCTURE

8.3. Conveyance Capacity Recommendations

The conveyance capacity recommendations will focus on the issues highlighted in Table 7-2 as well as the issues highlighted in Section 5.0.

8.3.1. Conveyance Alternative 1: Stewart Street Storm Drain

The most significant conveyance issue facing the NMSU main campus is the large peak flows on Stewart St compared to its limited conveyance capacity. Stewart St begins conveying water westward at the crossing of the College Arroyo near the Aggie Memorial Stadium. It collects runoff from much of the adjacent areas via Locus St, Williams Ave, Sweet Ave, and Espina St. Naturally, the peak flows are highest toward the western end of the street. It is near the Stewart and Espina intersection, where the slope of Stewart is only 1.5%, that the road has an estimated carrying capacity of approximately 66 cfs. While this should be sufficient for the 10-yr storm, the 100-yr storm may be expected to exceed the depth of the 6-inch curb causing flooding at adjacent properties, not to mention the impact to traffic due to such deep and fast flowing water.

Conveyance Alternative 1, as shown in Figure 8-5, would be to install a storm drain system from Breland Dr to the NMSU Regional Pond outfall. This would likely need to be at least a 4-ft diameter trunk line at the western end tapering off to an approximately 3-ft diameter line at the eastern end. Water would be captured at each of the intersections using curb drop inlets and 24-in connecting pipes. *Estimated Construction Cost: $2,378,654.55*

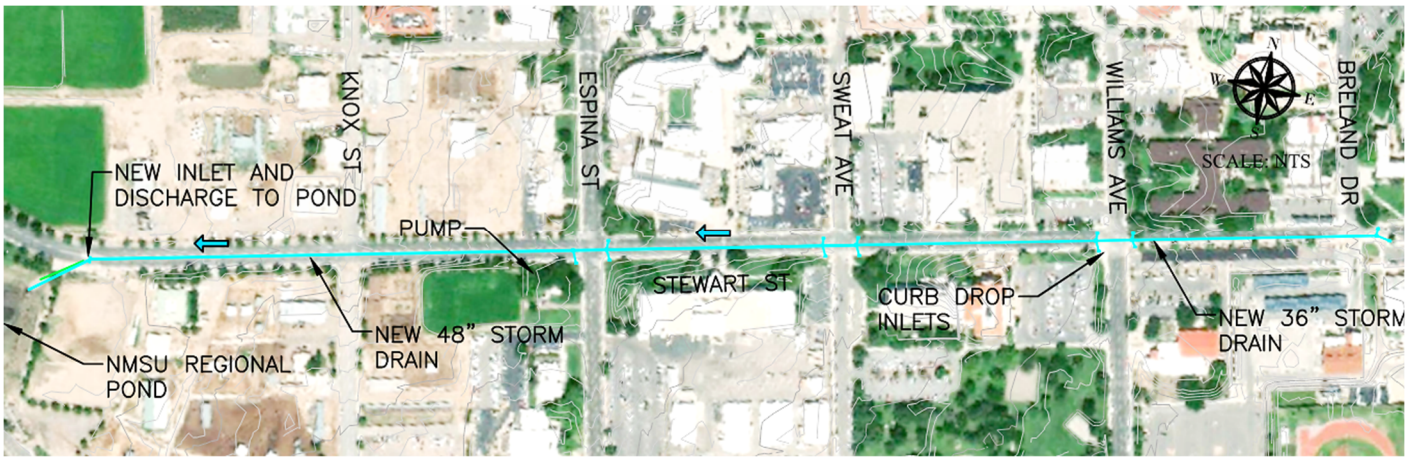


FIGURE 8-5: STEWART ST STORM DRAIN

8.3.2. Conveyance Alternative 2: Stewart St Channel and Pedestrian Corridor

The NMSU Planning Department has discussed the possibility of closing Stewart St to vehicular traffic and turning it into a pedestrian corridor. If this project was to be completed, there would be significant opportunities for green stormwater infrastructure. As shown in Figure 8-6, the existing roadway width would provide be ample space for a 20-ft pedestrian path, a 10-ft sidewalk, and a 24-ft wide by 3-ft deep channel capable of conveying the peak flows while capturing rainwater for landscaping. Many other layouts are possible as well with dedicated bicycle paths, bus-lanes, or park ponding areas all genuine options depending on the needs of the corridor users and the aesthetic vision of the NMSU architects.

Estimated Construction Cost: $4,086,941.10 including channel and pedestrian improvements from Locust St to Espina St and new storm drain from Espina to NMSU Regional Pond.

It should be mentioned that, while this alternative may be more expensive that installing storm drain in Stewart St, it provides transportation and quality of life benefits beyond drainage improvements alone. Therefore it may align better with the sustainability and design goals of the NMSU campus masterplan.

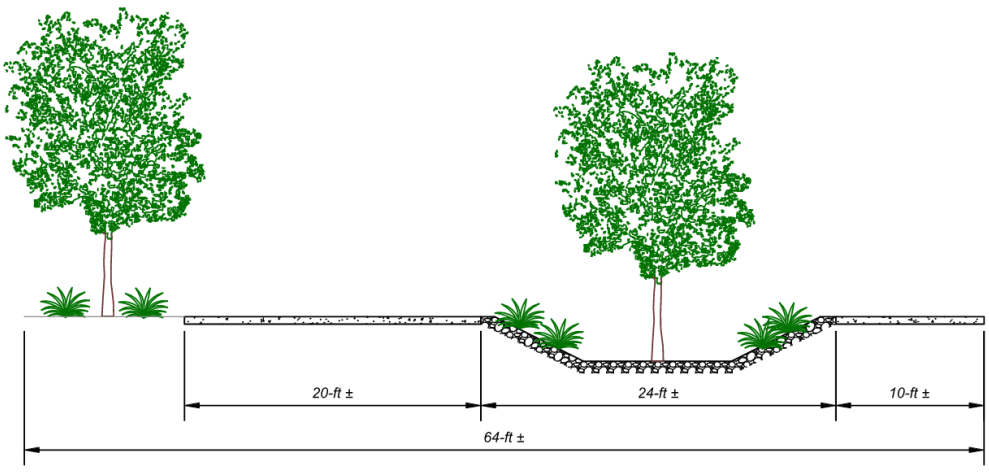


FIGURE 8-6: STEWART ST CHANNEL AND PEDESTRIAN CORRIDOR

8.3.3. Conveyance Alternative 3: College Drive Storm Drain Improvements

The existing storm drain in College Dr is approximately 12-in in diameter which only has the capacity to convey less than 10 cfs compared to the 158 cfs 100-yr peak expected. Additionally, this is one of the areas reported to have experienced significant flooding in the past.

While the Green Stormwater Infrastructure recommendations relating to the area would help alleviate some of these flooding concerns, it is also recommended to expand the existing storm drain system. The existing storm drain at the intersection of Union and College is 48-in diameter reinforced concrete pipe. It is recommended to replace the existing inlets and culverts in College Dr with 42in diameter pipe and standard curb drop inlets that are less susceptible to clogging. Additionally, sediment control structures, in the form of mulch socks, rock check dams, or landscaping should be installed along the south side of College Dr because it appears that significant amounts of sediment currently run off the adjacent dirt shoulder and into the storm drain system. Figure 8-7 below shows this Alternative.

Estimated Construction Cost: $489,793.67

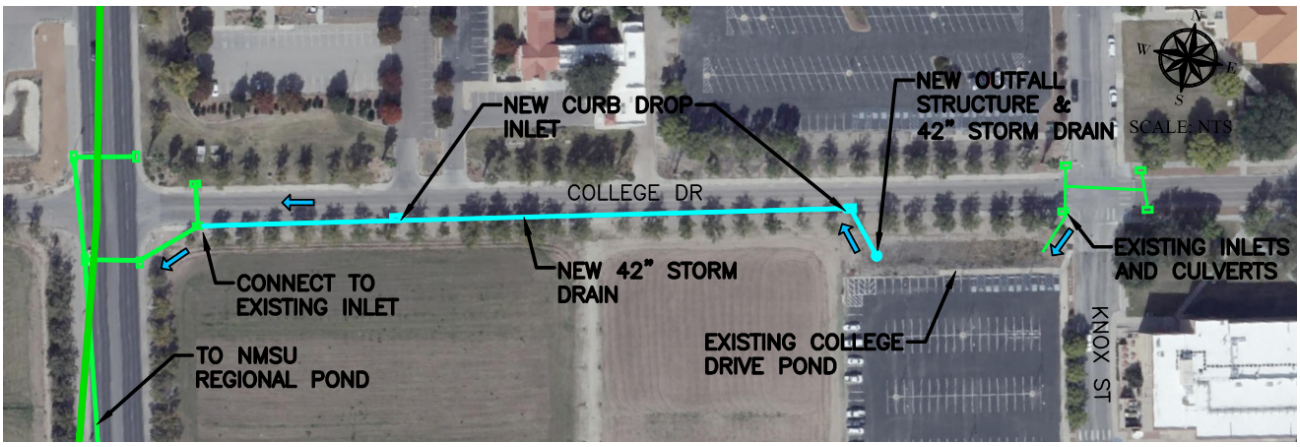


FIGURE 8-7: COLLEGE DR STORM DRAIN IMPROVEMENTS

8.3.4. Conveyance Alternative 4: College Arroyo at Wells St

The College Arroyo, which crosses campus from the University/Triviz intersection south to the Tortugas Arroyo, has a crossing at Wells St just south of the Aggie Memorial Stadium that is insufficient. While there is an inlet and small culvert conveying water across Wells, it appears to be sized more for the adjacent parking lot rather than the high flows coming from the College Arroyo. It is recommended, at this location, to add a new culvert crossing under Wells St. It may be difficult to construct a crossing with the capacity for the full 100-yr peak flow of 203 cfs given the topography. However, as shown in Figure 8-8, three 30-in culverts seem feasible and should be able meet the 10-yr storm and mitigate the worst impacts of larger storms.

Estimated Construction Cost: $246,882.48

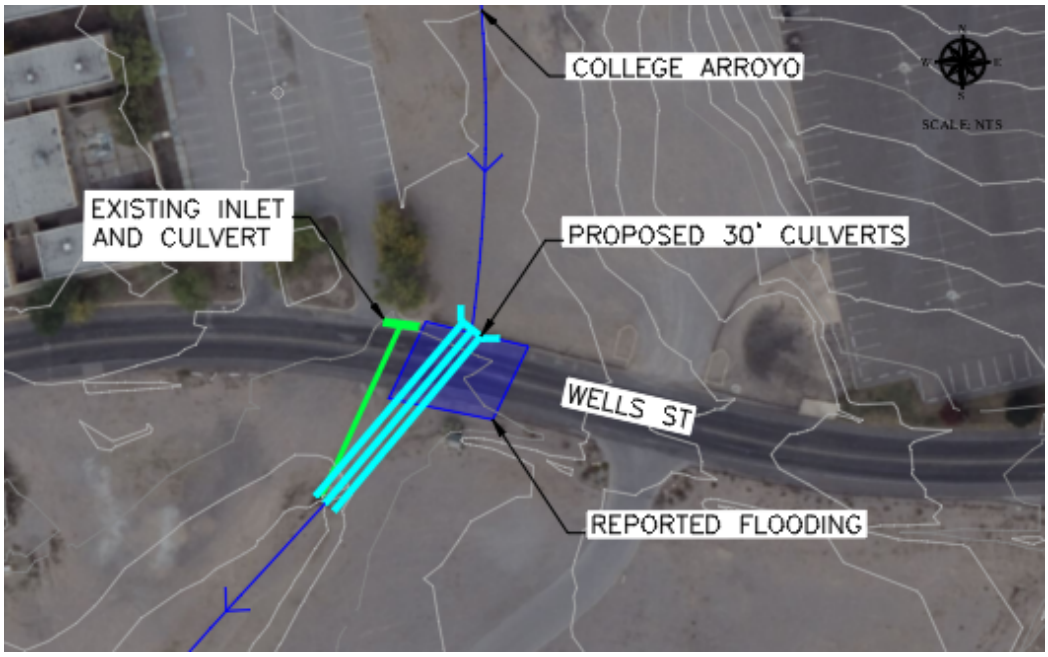


FIGURE 8-8: COLLEGE ARROYO CROSSING AT WELLS ST

8.3.5. Conveyance Alternative 5: Arrowhead Drive Curb and Gutter

One of the areas repeatedly mentioned as a flooding concern is Arrowhead Dr between Triviz and Wells. This section of Arrowhead does not include curb and gutter, and therefore has difficulty conveying water effectively. Additionally, the intersection of Arrowhead and Wells, there is a depression in the roadway profile that results in fairly deep standing water across the entire road necessitating closures at times.

The recommendation for Arrowhead is to reconstruct the roadway with curb and gutter, as seen in the Figure 8-9. With increasing foot, vehicular, and bicycle traffic in this portion of campus, a redesign of the road may be justified for numerous reasons. As discussed previously, this reconstruction could include rainwater harvesting swales along the roadway as well to help address local flooding and improve sustainability, as shown in Figure 8-10.

Estimated Construction Cost: $1,281,206.20. While this cost is relatively high compared to other projects in this report, it is important to note that it includes roadway and pedestrian improvements beyond simply the drainage improvements.

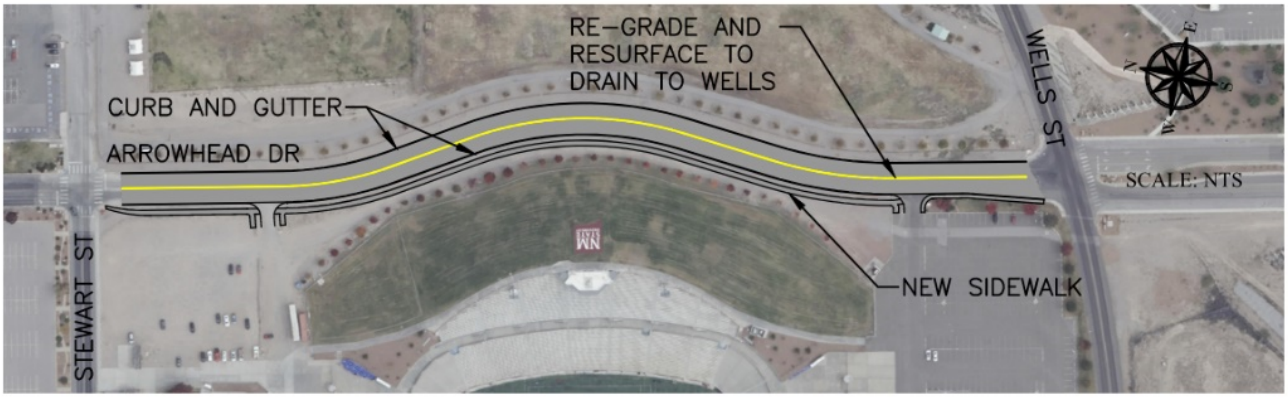


FIGURE 8-9 ARROWHEAD DR CURB AND GUTTER -PLAN

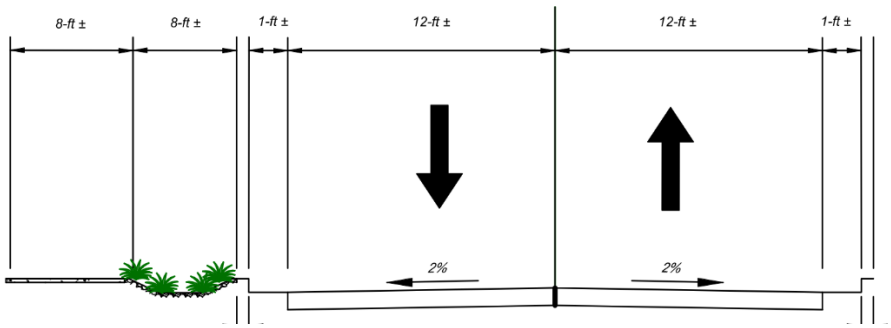


FIGURE 8-10 ARROWHEAD DR CURB & GUTTER - SECTION

8.3.6. Conveyance Alternative 6: Arrowhead and Wells St Inlet

Regarding the flooding at Arrowhead and Wells, the roadway reconstruction would create the opportunity to modify the roadway profile and enable the curb and gutter to convey water to the Tortugas Arroyo. In the short term, however, there is an existing drainage culvert for the Aggie Memorial Stadium's internal drainage system that passes immediately adjacent to the low spot on its way to the Tortugas Arroyo. Installing a drop inlet at this location and connecting it to the culvert, as shown in Figure 8-11 would be a cost-effective and quick way to address much of the flooding concerns.

Estimated Construction Cost: $71,990.65

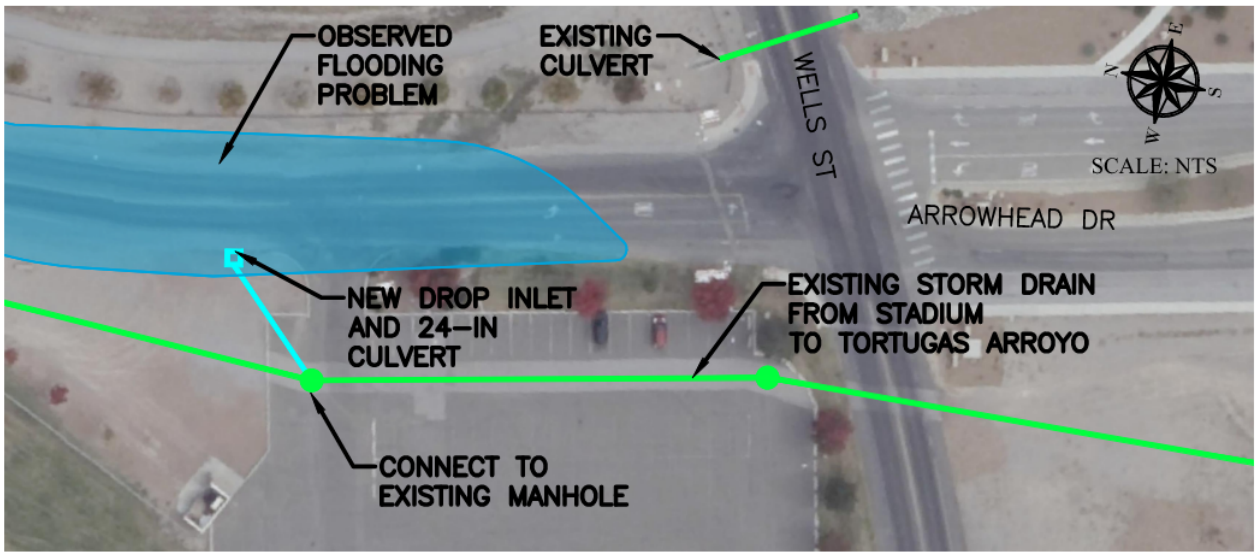


FIGURE 8-11: ARROWHEAD AND WELLS INTERSECTION IMPROVEMENTS

8.3.7. Conveyance Alternative 7: Wells St at Sam Steel Way

As described in Section 7.2, Wells St generally has sufficient conveyance to meet the required demand. However, as water reaches the intersection with Sam Steel Way, there is a flat area that often experiences ponding. There are several options for alleviating this problem depending on whether or not the Cole Village Pond previously described is implemented.

- Option 7A: Cole Village Pond and Median Pond in Wells St. If the Cole Village Pond is constructed, the flows reaching the end of Wells St will be greatly reduced. This option would address what would then be a relatively minimal amount of water by excavating storage volume in the median of Wells St. While there are several mature pine trees currently in the median, it's possible that several of these could be saved and may even benefit from the rainwater harvesting occurring in the depressed median.

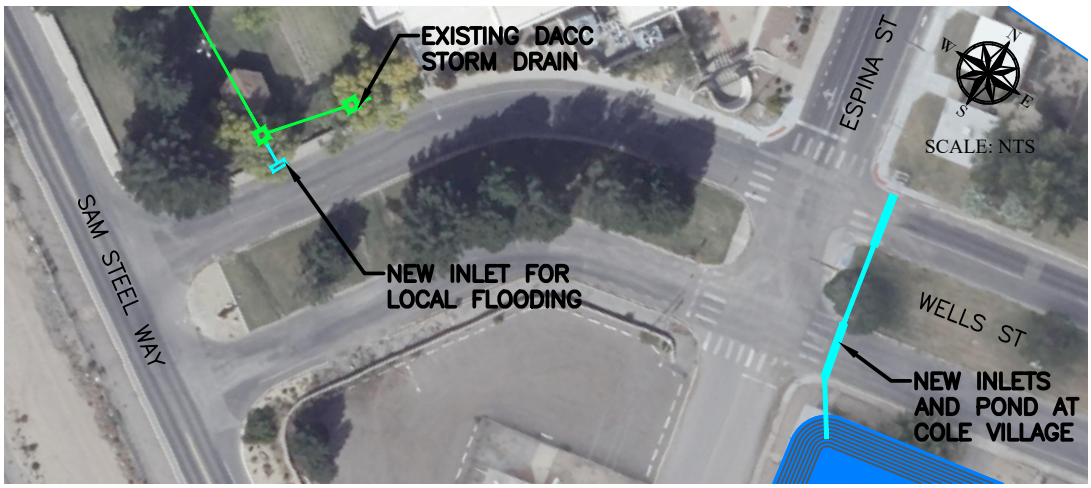
  Estimated Construction Cost: $15,000.00
- Option 7B: Cole Village Pond and New Inlet to 12-in Storm Drain to DACC. There is an existing 12-in diameter storm drain through the adjacent DACC parking lot that should be able to be connected to by a new inlet in the westbound lanes of Wells St. Given the limited capacity of this existing culvert, this connection would also depend on the construction of the Cole Village Pond to be effective.

  Estimated Construction Cost: $25,000.00
- Option 7C: If the Cole Village Pond is not to be considered, addressing the flooding at this location becomes more challenging. The most comprehensive option would be to construct new inlets at the eastbound and westbound lanes and construct a new 3-ft diameter culvert through the DACC parking lot to beginning of the Sam Steel Channel at Gregg St. The DACC parking lot is currently scheduled for resurfacing so this project could be included combined with that effort.

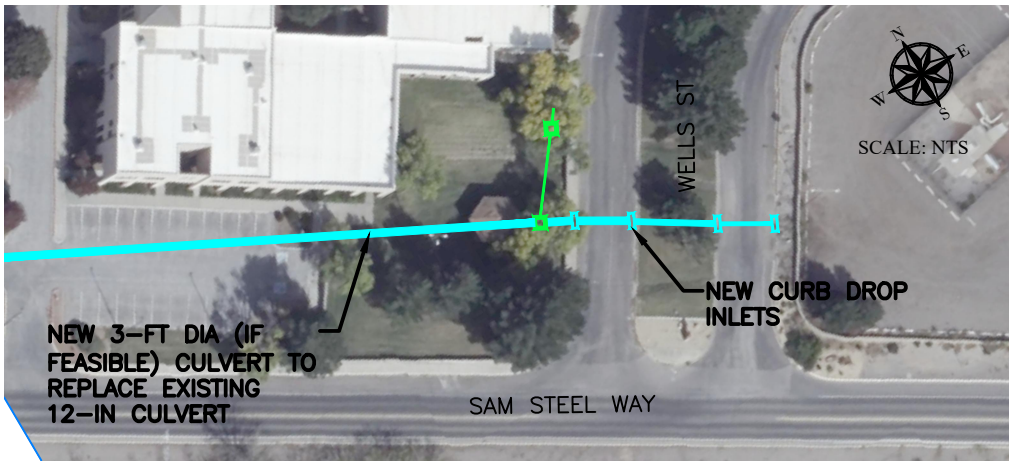
  Estimated Construction Cost: $648,971.01

The total cost of Alternative 7C reveals how much more difficult this issue will be to address if the Cole Village Pond is not constructed.

A WELLS STREET AT SAM STEEL ALTERNATIVE A



B WELLS STREET AT SAM STEEL ALTERNATIVE B



C WELLS STREET AT SAM STEEL ALTERNATIVE C

NMSU DRAINAGE MASTERPLAN

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FIGURE 8-12

WELLS ST AT SAM STEEL ALTERNATIVES

8.3.8. Conveyance Alternative 8: Sam Steel Way Channel Improvements

The current conveyance capacity of Sam Steel Way (118 cfs channel + 18 cfs street flow) is below the required demand. If the Cole Village Pond is constructed, this demand will decrease, but the 100-yr storm may still exceed the estimated capacity. Additionally, the driveway culverts for the both driveways significantly limit the capacity of the channel at those locations. The recommendations for improving the carrying capacity for Sam Steel Way are as follows:

- Widen the eastern half of the channel to at least 20-ft wide at the top.
- Replace the two 18-in culverts at the eastern driveway culvert crossing with two 36-in culverts
- Modify to western driveway crossing with concrete or rock cladding to allow flows to overtop and run down in the channel while mitigating erosion.

Sam Steel Way is a NMDOT facility, so these improvements would require coordination. There is also the potential for funding assistance since these improvements would benefit the the NMDOT as well.

Estimated Construction Cost: $95,197.23

FIGURE 8-13: SAM STEEL WAY IMPROVEMENTS

8.3.9. Conveyance Alternative 9: Locus St at Sam Steel Way Intersection Improvements

The final location identified as needing conveyance capacity improvements is the Locust St and Sam Steel Way intersection. The issue here is the sag at the intersection which makes it difficult for water flowing south on Locust St to navigate the curve to flow east on Sam Steel Way toward the Tortugas Arroyo. Molzen Corbin recommends that the intersection be regraded and the curb be reconstructed as shown in Figure 8-14 to allow water to flow east. In addition, the pavement on Locust St as it approaches Sam Steel would benefit from replacement due to its deteriorated condition.

Considering Sam Steel Way is owned by the NMDOT, improvements to the intersection would require coordination and may be eligible for some funding collaboration.

Estimated Construction Cost: $66,482.02

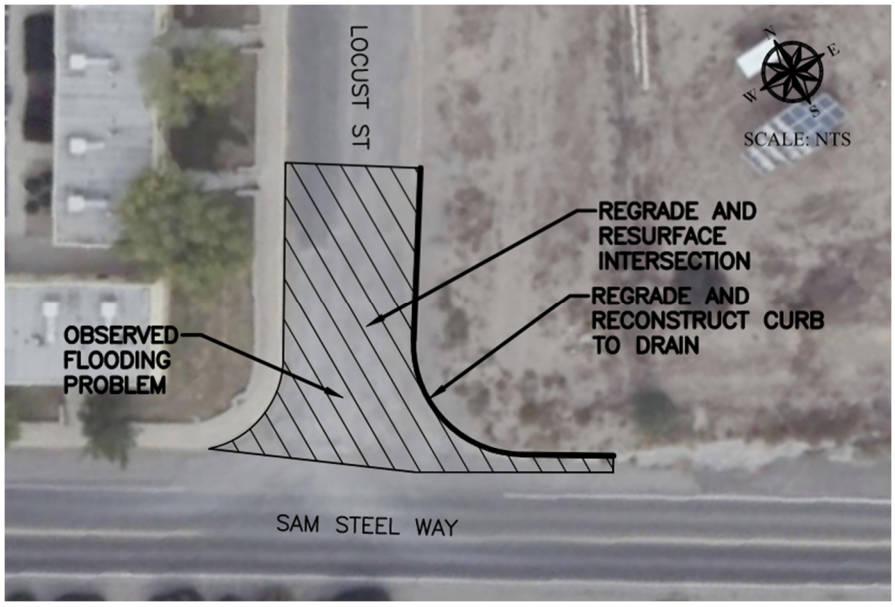

FIGURE 8-14: LOCUST ST AND SAM STEEL WAY INTERSECTION

8.4. Water Quality Recommendations

One issue brought up during discussions with NMSU Facilities Staff was the issue of runoff from the livestock corrals flowing into the NMSU Regional Pond and causing potential water quality concerns. A student-lead study completed in 2013 proposed a conceptual design involving the use of swales and filter strips to limit the amount of contaminants flowing off the corrals and into the NMSU Regional Pond. This concept seems valid and as an effective, low-cost, low-maintenance solution. There is already a row of pecan trees along the perimeter of the corrals. It is recommended to deepen and connect the tree wells to create a continuous swale. This will capture much of the runoff and reuse it for the existing trees. On the outer edge of a swale, it is recommended to install a 4-ft wide by 1-ft tall berm to further ensure water does not escape.

Estimated Construction Cost: $45,872.56

See Figure 8-15 and Figure 8-16 below:

FIGURE 8-15: CORRALS RUNOFF MITIGATION

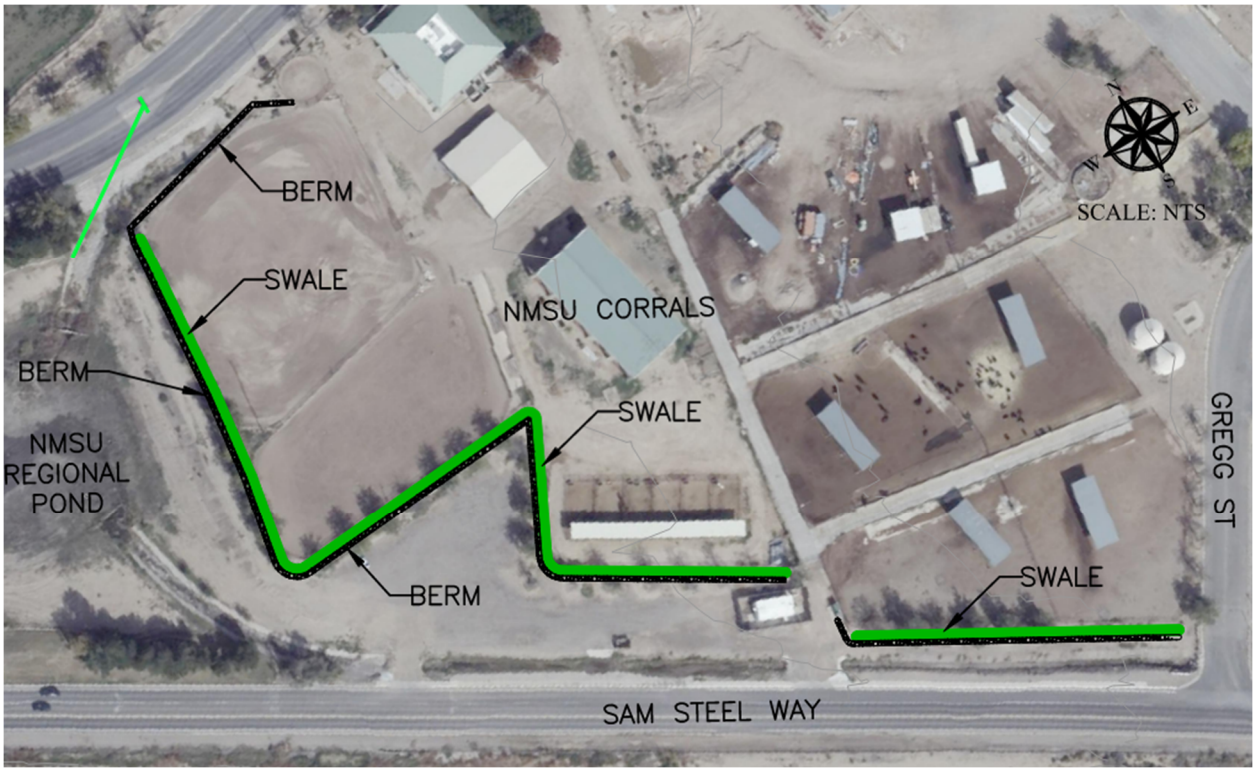

FIGURE 8-16: CORRALS RUNOFF MITIGATION – PLAN

9.0 RECOMMENDATIONS SUMMARY

The alternatives presented in the previous section were developed to address the most significant drainage issues facing the NMSU Main Campus. As described in Section 7, the NMSU Regional Pond currently lacks the storage capacity to manage the high volume of water expected for the 10-yr and 100-yr storms. Storage Alternative 1, Restoring the NMSU Regional Pond, would bring the capacity up to meet the 10-yr storm event as well as meeting the benchmark for what can be considered the historic expected storage volume.

The Cole Village Pond, which would intercept up to 8 ac-ft on Wells St, would improve the operations of the NMSU Regional Pond to the point where it could be expected to meet the demand of the 50-yr storm. And the subsequent addition of the Central Heating Plan Underground Storage would bring the cumulative storage capacity to the level of the 100-yr storm.

Regarding conveyance capacity, one of the most impactful projects is the College Dr Storm Drain Project which would address the major flooding that has been reported to occur in the vicinity of the NMSU Police Department. The current 12-in pipe and inlets are simply unable to convey the high demand and are very susceptible to clogging. Replacing them with standard curb drop inlets and new 42-in diameter culverts would significantly improve the operations.

The most expensive conveyance project is the Stewart St Storm Drain due to the total length and size of the culverts proposed. However, such improvements would remove the majority of the water that can be a frequent obstruction to the users of Stewart St and reduce the flooding concerns that have also been reported. An alternative to storm drain at this location would be the Stewart St Channel and Pedestrian Corridor. While this alternative would be significantly more expensive, much of the additional cost is due to the fact that the entire corridor would be redesigned for pedestrians, water harvesting, and landscaping and would provide benefits beyond just drainage.

10.0 CAPITAL IMPROVEMENT PLAN

The prioritization of the recommended improvements depends on several factors. Naturally, due to budgetary limitations, cost must be one of the most significant considerations. Based on the cost estimates generated for each alternative, the projects vary in cost from test of thousands to several million dollars. It is expected that there will be a need to space out the large cost projects over a longer period of time if possible.

Another consideration is the positive impact of the project. In this evaluation, a high impact rating was assigned to projects that have the potential to mitigate drainage issues that impact people and property in a serious or long-term sort of way. An example of a high impact project would be the College Drive Storm Drain project because flooding in that location has been observed to be extensive, damage adjacent properties, completely blocks traffic and takes a while to dissipate.

A medium impact rating was assigned to projects that address issues that are somewhat less severe or more limited in their potential to impact people or property. An example of a medium impact project would be the College Arroyo crossing at Wells St. This crossing has the potential to make Wells St temporarily impassible and to cause some damage over time to the roadway. However, the worst effects of the drainage crossing will dissipate quickly as the storm passes, and the associated flooding is not expected to damage any neighboring properties.

A low impact rating was assigned to projects that still have value but that address a more localized issue or provide long-term type benefits. An example of a low impact project could be the Corrals Runoff Mitigation which provide water quality benefits and localized erosion control benefits. Another example is the Cole Village Pond which provides benefits for the largest storm events and could be used as additional water storage “credit” for future developments on campus.

The final prioritization consideration is that certain projects have other projects as prerequisites. For example, the Central Heating Plant Storage project cannot be implemented unless the Stewart St storm drain is constructed.

Using these factors, a project prioritization list was developed to conceptualize the budgetary requirements and phasing of all the proposed improvements as shown in Table 10-1. All costs are in 2024 dollars and must be inflated as necessary for future years.

Table 10-1: Project Prioritization List

Project	Cost	Impact
Phase I		
NMSU Pond Restoration	$763,357.50	High
NMSU Pond Outfall	$128,573.39	Medium
College Dr Storm Drain	$489,793.67	High
Arrowhead Dr Inlet at Wells St	$71,990.65	Medium
Corrals Runoff Mitigation	$45,872.56	High
Locust St and Sam Steel	$66,482.02	Low
Total Phase I	***$1,566,069.78***	
Phase II		
Stewart St Storm Drain*	$2,378,654.55	High
College Arroyo at Wells St	$246,882.48	Medium
Total Phase II	***$2,625,537.04***	
Phase III		
Central Heating Plant Storage	$849,056.05	Low
Cole Village Pond	$867,140.95	Low
Dispersed GSI	$237,688.80	Low
Arrowhead Dr Curb & Gutter**	$1,281,206.20	Medium
Wells St at Sam Steel Way***	$25,000.00	Medium
Sam Steel Way Improvements	$95,197.23	Low
Total Phase III	$***3,355,289.24***	

*Could be exchanged for the Stewart St Channel and Pedestrian Corridor ($4.1M)
**Includes Roadway and Pedestrian Improvements
***Dependent on Cole Village Pond

10.1. Phase I

Three out of the four High Impact projects, namely the NMSU Pond Restoration, the College Dr Storm Drain, and the Corrals Runoff Mitigation were prioritized for Phase I. Upon completion of the NMSU Pond Restoration project, it is expected that the stormwater retention requirements for the NMSU Main Campus will be fulfilled. This means any additional storage projects can accommodate new runoff resulting from future developments. The inclusion of the NMSU Pond Outfall in Phase I is logical since it can be most effectively integrated with the NMSU Pond Restoration project.

The Corrals Runoff Mitigation is included in Phase I in order to prioritize reducing the water quality benefits of reducing the pollutant discharge from the Corrals. Additionally, Phase I includes the Arrowhead Dr Inlet at Wells St and the Locust St/Sam Steel Intersection projects, both of which are lower-cost initiatives offering immediate benefits to the University.

10.2. Phase II

The primary Phase II project is the Stewart St Storm Drain, which presents an option to be exchanged with the Stewart St Channel and Pedestrian Corridor project, albeit at a higher cost of $4,086,941.10. The only additional Phase II project is the crossing of the College Arroyo at Wells St.

10.3. Phase III

Most of the cost of Phase III is comprised of the Cole Village Pond, the Central Heating Plant's Underground Storage, and the Arrowhead Dr Curb & Gutter improvements. The Arrowhead Dr Curb & Gutter is priced as a full roadway reconstruction from Stewart St to Wells St including new sidewalk on the westside of the road. Therefore, much of the cost of those improvements are related to non-drainage elements such as the roadway improvements and landscaping.

Another notable aspect of Phase III is that the Wells St at Sam Steel Intersection Improvements are dependent on the construction of the Cole Village Pond. If the Cole Village Pond is not constructed, then the improvements at the Wells St/Sam Steel intersection become much more expensive in order to manage the much higher peak flows.

10.4. Conclusion

Naturally, outside circumstances such as funding availability and other development on the NMSU campus may accelerate or delay various projects on this prioritization list. However, the completion of these projects should be able to position NMSU to be able to manage storm water, provide a more functional and beautiful environment, and facilitate future development well into the future.

11.0 APPENDICES

Appendix A – Referenced Drawings & Agreements

Appendix B – FEMA Floodmaps

Appendix C – Rainfall Data

Appendix D – Time of Concentration Calculations

Appendix E – Curve Number Calculations

Appendix F – Hydrological Results

Appendix G – Hydraulic Results

Appendix H – Cost Estimates

APPENDIX A

Referenced Drawings

F.H.W.A. Region No.	State		Sheet No.	Total Sheets
6	NEW MEXICO	M-4509(1)	3-5	103

SOUTH MAIN STREET

OAK DRIVE

PARK DRAIN

LAS CRUCES LATERAL

TURQUOISE AVE. (PVT.)

4+51.79LT. BUILD TYPE III D.I. FOR TYPE B CURB. FL=3876.20 INV.=3872.32 IN INV.=3872.32 OUT

BUILD RETENTION POND IN LCCATION SHOWN SEE DETAIL SHT 3-9

BUILD 60 L.F. OF 18" RCP AS DETAILED ON SHEET 3-9

30" RCP OUTLET INV.=3871.00

24" RCP

EXIST. MH INV.=3869.15

EXIST. MH INV.=3870.39

EXIST. 12" CONC. PIPE EXIST. OUTLET INV.=3871.22

0+61LT. ST. LIGHT

3+81LT. ST. LIGHT

5+00RT. ST. LIGHT

2+70RT. ST. LIGHT

6+51LT. ST. LIGHT

12+50LT. ST. LIGHT

11+00RT. ST. LIGHT

5+00LT. ST. LIGHT

E.P.E. MESILLA SUB-STATION

0+68.40LT. BUILD 5' WIDE RUNDOWN

0+68.40LT. BUILD 5' WIDE RUNDOWN

LEGEND

WATER VALVE (EXIST.)	⑩ 24" RCP — PIPE NO. – SIZE – MATERIAL
10" WATER — WATER LINE (EXIST.)	CURB DROP INLET (NEW)
FIRE HYDRANT (EXIST.)	⑨ INLET NO. DESIGNATION
GAS VALVE (EXIST.)	
4" GAS — GAS LINE (EXIST.)	
MH SEWER MANHOLE (EXIST.)	
8" SEWER — SEWER LINE (EXIST.)	
POWER POLE (EXIST.)	
TELEPHONE — TELEPHONE LINE (UNDERGROUND OR AERIAL) (EXIST.)	
O.E. — ELECTRIC LINE (EXIST.)	
utility box — UTILITY BOX (EXIST.)	
RAIL ROAD	
18" SS — STORM SEWER (NEW)	

GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PROFILE SCALE
1"=50' HORIZONTAL
1"=5' VERTICAL

PROJECT BENCHMARK:
CITY OF LAS CRUCES BM NO. 154. LOCATED APPROXIMATELY 2' NORTH OF BRIDGE COLUMN AT STATION 16+83.46 44.14 FT. LEFT. ELEVATION = 3883.09 USGS DATUM MSL.

LOW POINT ELEVATION = 3876.80
LOW POINT STATION = 4+51.79

250 VC
PVI STA = 5+50
PVI ELEV = 3876.46
A.D. = 2.80
K = 89.29

250 VC
PVI STA = 9+00
PVI ELEV = 3885.21
A.D. = 2.80
K = 89.29
HIGH POINT ELEVATION = 3884.88
HIGH POINT STATION = 9+98.21

BVC STA = 4+25
BVC ELEV = 3876.84
EVC STA = 6+75
EVC ELEV = 3879.59
BVC STA = 7+75
BVC ELEV = 3882.09
EVC STA = 10+25
EVC ELEV = 3884.84

-0.30%
+2.50%
-0.30%
0.200%
5.474%

INSTALL 38 L.F. 30" RCP

STA. 4+51.79 RT. BUILD TYPE III D.I. FOR TYPE "B" CURB. FL = 3873.20 INV. = 3872.43 EXIST. 8" PVC SEWER INV.=3869.39 ⑨

STA. 4+51.79 RT. BUILD TYPE III D.I. FOR TYPE "B" CURB. FL = 3873.20 INV. = 3872.32 IN INV. = 3872.32 OUT OUTLET INV. = 3871.00 ⑩

INSTALL 56 L.F. 24" RCP ⑪

6+06 60" CONDUIT

8+36 60" CONDUIT

DATUM ELEV 3860.00

3884 3882 3880 3878 3876 3874 3872 3870 3868 3866 3864 3862

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00

City of Las Cruces

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TED G. SCANLON NEW MEXICO

SHEET TITLE:
STORM SEWER P & P STA. 0+00 TO 13+00

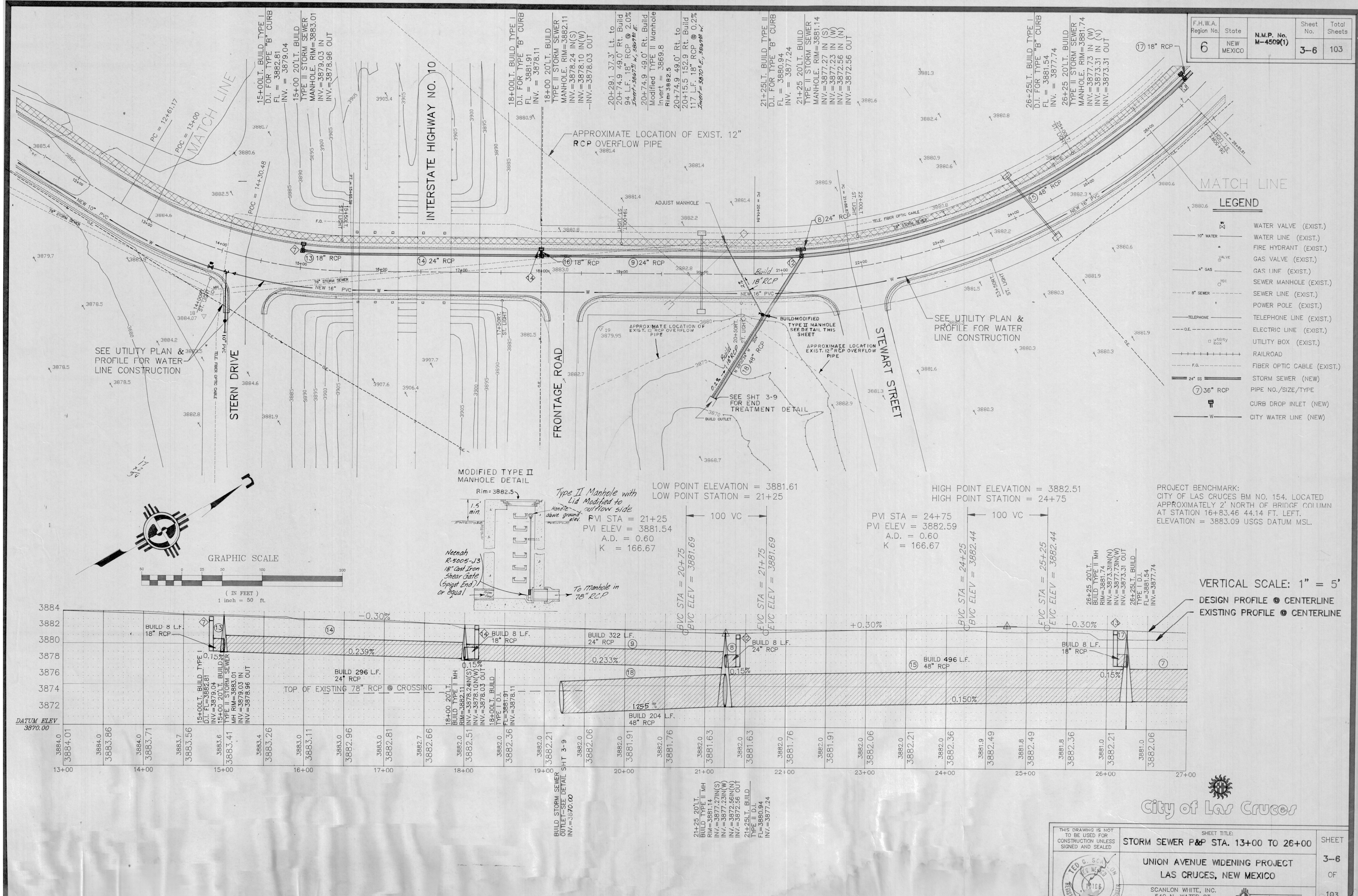
UNION AVENUE WIDENING PROJECT
LAS CRUCES, NEW MEXICO

SCANLON WHITE, INC.
540 N. WATER ST.
LAS CRUCES, N.M.

scanlon white inc

SHEET 3-5 OF 103

ADD BY:	CHECKED BY:	DRAWING FILE:	DATE:	PROJECT NO.	SCALE:
T. SCANLON		UNSS1.DWG		M-4509 (1)	1" = 50'


F.H.W.A. Region No. 6
State NEW MEXICO
N.M.P. No. M-4509(1)
Sheet No. 3-6
Total Sheets 103
INTERSTATE HIGHWAY NO. 10
MATCH LINE
STERN DRIVE
FRONTAGE ROAD
STEWART STREET
APPROXIMATE LOCATION OF EXIST. 12" RCP OVERFLOW PIPE
SEE UTILITY PLAN & PROFILE FOR WATER LINE CONSTRUCTION
SEE SHT 3-9 FOR END TREATMENT DETAIL
ADJUST MANHOLE
BUILD MODIFIED TYPE II MANHOLE SEE DETAIL THIS SHEET
15+00LT. BUILD TYPE I D.I. FOR TYPE "B" CURB FL = 3882.81 INV. = 3879.04
15+00 20'LT. BUILD TYPE II STORM SEWER MANHOLE, RIM=3883.01 INV.=3879.03 IN INV.=3878.96 OUT
18+00LT. BUILD TYPE I D.I. FOR TYPE "B" CURB FL = 3881.91 INV. = 3878.11
18+00 20'LT. BUILD TYPE II STORM SEWER MANHOLE, RIM=3882.11 INV.=3878.24 IN(S) INV.=3878.10 IN(W) INV.=3878.03 OUT
21+25LT. BUILD TYPE II D.I. FOR TYPE "B" CURB FL = 3880.94 INV. = 3877.24
21+25 20'LT. BUILD TYPE II STORM SEWER MANHOLE, RIM=3881.14 INV.=3877.27 IN (S) INV.=3877.23 IN (W) INV.=3872.56 IN (N) INV.=3872.56 OUT
26+25LT. BUILD TYPE I D.I. FOR TYPE "B" CURB FL = 3881.54 INV. = 3877.74
26+25 20'LT. BUILD TYPE II STORM SEWER MANHOLE, RIM=3881.74 INV.=3877.73 IN (W) INV.=3873.31 IN (N) INV.=3873.31 OUT
LEGEND
WATER VALVE (EXIST.)
WATER LINE (EXIST.)
FIRE HYDRANT (EXIST.)
GAS VALVE (EXIST.)
GAS LINE (EXIST.)
SEWER MANHOLE (EXIST.)
SEWER LINE (EXIST.)
POWER POLE (EXIST.)
TELEPHONE LINE (EXIST.)
ELECTRIC LINE (EXIST.)
UTILITY BOX (EXIST.)
RAILROAD
FIBER OPTIC CABLE (EXIST.)
STORM SEWER (NEW)
PIPE NO./SIZE/TYPE
CURB DROP INLET (NEW)
CITY WATER LINE (NEW)
MODIFIED TYPE II MANHOLE DETAIL
Type II Manhole with Lid Modified to outflow side
Neenah R-5005-J3 18" Cast Iron Shear Gate (Spigot End) or equal
To Manhole in 78" RCP
GRAPHIC SCALE
(IN FEET)
1 inch = 50 ft.
LOW POINT ELEVATION = 3881.61
LOW POINT STATION = 21+25
PVI STA = 21+25
PVI ELEV = 3881.54
A.D. = 0.60
K = 166.67
HIGH POINT ELEVATION = 3882.51
HIGH POINT STATION = 24+75
PVI STA = 24+75
PVI ELEV = 3882.59
A.D. = 0.60
K = 166.67
100 VC
PROJECT BENCHMARK:
CITY OF LAS CRUCES BM NO. 154, LOCATED APPROXIMATELY 2' NORTH OF BRIDGE COLUMN AT STATION 16+83.46 44.14 FT. LEFT.
ELEVATION = 3883.09 USGS DATUM MSL.
VERTICAL SCALE: 1" = 5'
DESIGN PROFILE @ CENTERLINE
EXISTING PROFILE @ CENTERLINE
TOP OF EXISTING 78" RCP @ CROSSING
BUILD 8 L.F. 18" RCP
BUILD 296 L.F. 24" RCP
BUILD 322 L.F. 24" RCP
BUILD 8 L.F. 24" RCP
BUILD 496 L.F. 48" RCP
BUILD 204 L.F. 48" RCP
DATUM ELEV 3870.00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
24+00
25+00
26+00
27+00
City of Las Cruces
THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED AND SEALED
SHEET TITLE: STORM SEWER P&P STA. 13+00 TO 26+00
UNION AVENUE WIDENING PROJECT
LAS CRUCES, NEW MEXICO
SCANLON WHITE, INC.
540 N. WATER ST.
LAS CRUCES, N.M.
SHEET 3-6 OF 103
CADD BY:
CHECKED BY:
DRAWING FILE:
DATE:
PROJECT NO.

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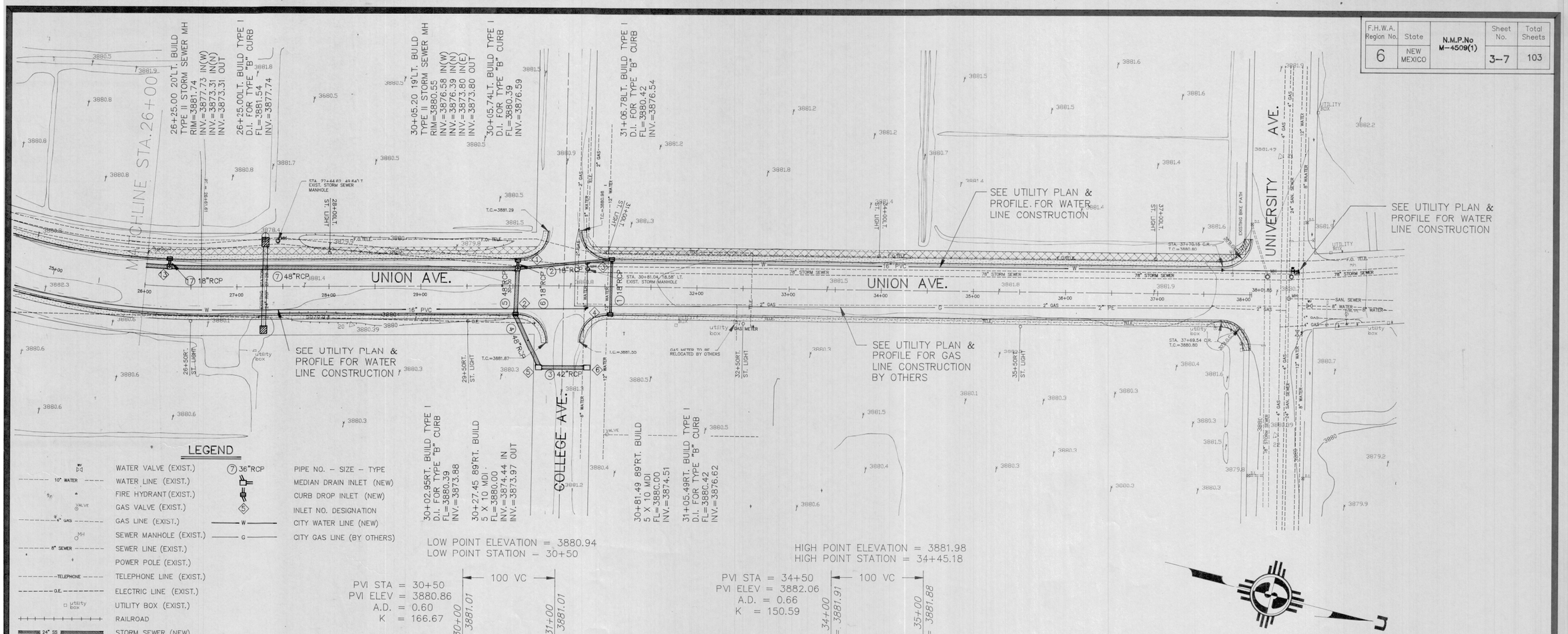
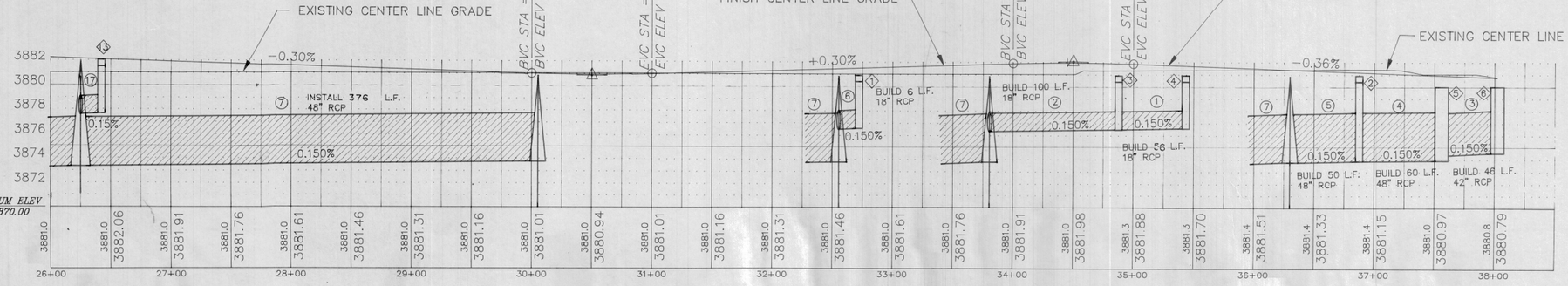


LEGEND

- WATER VALVE (EXIST.)
- WATER LINE (EXIST.)
- FIRE HYDRANT (EXIST.)
- GAS VALVE (EXIST.)
- GAS LINE (EXIST.)
- SEWER MANHOLE (EXIST.)
- SEWER LINE (EXIST.)
- POWER POLE (EXIST.)
- TELEPHONE LINE (EXIST.)
- ELECTRIC LINE (EXIST.)
- UTILITY BOX (EXIST.)
- RAILROAD
- STORM SEWER (NEW)
- PIPE NO. – SIZE – TYPE
- MEDIAN DRAIN INLET (NEW)
- CURB DROP INLET (NEW)
- INLET NO. DESIGNATION
- CITY WATER LINE (NEW)
- CITY GAS LINE (BY OTHERS)



GRAPHIC SCALE

50 0 25 50 100 200

(IN FEET)
1 inch = 50 ft.

PROFILE SCALE

1"=50' HORIZONTAL
1"=5' VERTICAL

PROJECT BENCHMARK:
CITY OF LAS CRUCES BM NO. 154. LOCATED APPROXIMATELY 2' NORTH OF BRIDGE COLUMN AT STATION 16+83.46 44.14 FT. LEFT.
ELEVATION = 3883.09 USGS DATUM MSL.

City of Las Cruces

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SHEET TITLE: STORM SEWER P&P STA. 26+00 TO 38+02

UNION AVENUE WIDENING PROJECT
LAS CRUCES, NEW MEXICO

SCANLON WHITE, INC.
540 N. WATER ST.
LAS CRUCES, N.M.

scanlon white

SHEET 3–7 OF 103

CAD BY:	CHECKED BY:	DRAWING FILE:	DATE:	PROJECT NO.	SCALE
GLON		UNSEQC.DWG			

F.H.W.A. Region No.	State		Sheet No.	Total Sheets
6	NEW MEXICO	NMP NO. M-4509(1)	3-8	103

STORM SEWER PIPE TABLE – 10 YR. STORM

PIPE NO..	FROM	TO	Q(10)	SIZE	MATERIAL	LENGTH	SLOPE	INVERT U/S	CROWN U/S	HGLE U/S	GROUND U/S	INVERT D/S	CROWN D/S	HGLE D/S	GROUND D/S
1	INLET NO. 4	INLET NO. 3	1 CFS	18"	RCP	56 L.F.	0.150%	3876.62	3878.12	3877.27	3880.42	3876.54	3878.04	3877.99	3880.42
2	INLET NO. 3	MH 30+05.20 19' LT.	3 CFS	18"	RCP	100 L.F.	0.150%	3876.54	3878.04	3877.99	3880.42	3876.39	3877.89	3877.81	3880.55
3	INLET NO. 6	INLET NO. 5	26 CFS	42"	RCP	46 L.F.	0.150%	3874.51	3878.01	3879.31	3880.00	3874.44	3877.94	3878.83	3880.00
4	INLET NO. 5	INLET NO. 2	53 CFS	48"	RCP	60 L.F.	0.150%	3873.97	3877.97	3878.83	3880.00	3873.88	3877.88	3878.62	3880.39
5	INLET NO. 2	MH 30+05.20 19' LT.	53 CFS	48"	RCP	50 L.F.	0.150%	3873.88	3877.88	3878.62	3880.39	3873.80	3877.80	3878.04	3880.55
6	INLET NO. 1	MH 30+05.20 19' LT.	1 CFS	18"	RCP	6 L.F.	0.150%	3876.59	3878.09	3877.22	3880.39	3876.58	3878.08	3877.77	3880.55
7	MH 30+05.20 19' LT.	MH 26+25.00 20' LT.	53 CFS	48"	RCP	376 L.F.	0.150%	3873.80	3877.80	3878.04	3880.55	3873.31	3877.31	3877.25	3881.88
8	INLET NO. 12	MH 21+25.00 20' LT.	5 CFS	24"	RCP	8 L.F.	0.150%	3877.24	3879.24	3878.50	3881.11	3877.23	3879.23	3878.29	3881.14
9	MH 18+00.00 20' LT.	MH 21+25.00 20' LT.	5 CFS	24"	RCP	322 L.F.	0.233%	3878.03	3880.03	3876.49	3881.14	3877.27	3879.27	3878.23	3881.14
10	INLET NO. 10	INLET NO. 9	8 CFS	24"	RCP	56 L.F.	0.200%	3872.43	3874.43	3875.10	3876.30	3872.32	3874.32	3874.74	3876.30
11	INLET NO. 9	RETENTION POND	14 CFS	30"	RCP	38 L.F.	3.474%	3872.32	3874.82	3874.74	3876.30	3871.00	3873.50	3873.78	DAYLIGHT
~~12~~	~~INLET NO. 11~~	~~OUTLET TO PARK DRAIN~~	~~17 CFS~~	~~30"~~	~~RCP~~	~~45 L.F.~~	~~0.600%~~	~~3871.50~~	~~3874.00~~	~~3874.28~~	~~3875.92~~	~~3871.23~~	~~3873.73~~	~~3872.54~~	~~3871.23~~
13	INLET NO. 7	MH 15+00.00 20' LT.	3 CFS	18"	RCP	8 L.F.	0.150%	3879.04	3880.54	3880.15	3882.84	3879.03	3880.53	3880.38	3883.01
14	MH 15+00.00 20' LT.	MH 18+00.00 20' LT.	3 CFS	24"	RCP	296 L.F.	0.239%	3878.96	3880.96	3880.38	3883.01	3878.24	3880.24	3879.45	3882.11
15	MH 26+25.00 20' LT.	MH 21+25.00 20' LT.	53 CFS	48"	RCP	496 L.F.	0.150%	3873.31	3877.31	3877.25	3881.88	3872.56	3876.56	3876.49	3881.14
16	INLET NO. 14	MH 18+00.00 20' LT.	2 CFS	18"	RCP	8 L.F.	0.150%	3878.11	3879.61	3879.06	3881.91	3878.10	3879.60	3879.48	3882.11
17	INLET NO. 13	MH 26+25.00 20' LT.	1 CFS	18"	RCP	8 L.F.	0.150%	3877.74	3879.24	3878.33	3881.54	3877.73	3879.23	3878.24	3881.88
18	MH 21+25.00 20' LT.	RETENTION POND	53 CFS	48"	RCP	204 L.F.	0.420%	3872.56	3876.56	3876.49	3881.14	3871.70	3875.70	3873.87	3871.70

STORM SEWER PIPE TABLE – 100 YR. STORM

PIPE NO..	FROM	TO	Q(100)	SIZE	MATERIAL	LENGTH	SLOPE	INVERT U/S	CROWN U/S	HGLE U/S	GROUND U/S	INVERT D/S	CROWN D/S	HGLE D/S	GROUND D/S
1	INLET NO. 4	INLET NO. 3	2 CFS	18"	RCP	56 L.F.	0.150%	3876.62	3878.12	3880.10	3880.42	3876.54	3878.04	3879.95	3880.42
2	INLET NO. 3	MH 30+05.20 19' LT.	4 CFS	18"	RCP	100 L.F.	0.150%	3876.54	3878.04	3879.95	3880.42	3876.39	3877.89	3879.73	3880.55
3	INLET NO. 6	INLET NO. 5	40 CFS	42"	RCP	46 L.F.	0.150%	3874.51	3878.01	3881.89	3880.00	3874.44	3877.94	3881.41	3880.00
4	INLET NO. 5	INLET NO. 2	80 CFS	48"	RCP	60 L.F.	0.150%	3873.97	3877.97	3881.41	3880.00	3873.88	3877.88	3880.94	3880.39
5	INLET NO. 2	MH 30+05.20 19' LT.	80 CFS	48"	RCP	50 L.F.	0.150%	3873.88	3877.88	3880.94	3880.39	3873.80	3877.80	3880.20	3880.55
6	INLET NO. 1	MH 30+05.20 19' LT.	2 CFS	18"	RCP	6 L.F.	0.150%	3876.59	3878.09	3879.80	3880.39	3876.58	3878.08	3879.64	3880.55
7	MH 30+05.20 19' LT.	MH 26+25.00 20' LT.	81 CFS	48"	RCP	376 L.F.	0.150%	3873.80	3877.80	3880.20	3880.55	3873.31	3877.31	3878.58	3881.88
8	INLET NO. 12	MH 21+25.00 20' LT.	9 CFS	24"	RCP	8 L.F.	0.150%	3877.24	3879.24	3879.43	3881.11	3877.23	3879.23	3879.23	3881.14
9	MH 18+00.00 20' LT.	MH 21+25.00 20' LT.	9 CFS	24"	RCP	322 L.F.	0.233%	3878.03	3880.03	3879.85	3881.14	3877.27	3879.27	3878.69	3881.14
10	INLET NO. 10	INLET NO. 9	14 CFS	24"	RCP	56 L.F.	0.200%	3872.43	3874.43	3876.06	3876.30	3872.32	3874.32	3875.36	3876.30
11	INLET NO. 9	RETENTION POND	26 CFS	30"	RCP	38 L.F.	3.474%	3872.32	3874.82	3875.36	3876.30	3871.00	3873.50	3873.98	DAYLIGHT
~~12~~	~~INLET NO. 11~~	~~OUTLET TO PARK DRAIN~~	~~32 CFS~~	~~30"~~	~~RCP~~	~~45 L.F.~~	~~0.600%~~	~~3871.50~~	~~3874.00~~	~~3874.48~~	~~3875.92~~	~~3871.23~~	~~3873.73~~	~~3873.73~~	~~3871.23~~
13	INLET NO. 7	MH 15+00.00 20' LT.	6 CFS	18"	RCP	8 L.F.	0.150%	3879.04	3880.54	3880.79	3882.84	3879.03	3880.53	3880.54	3883.01
14	MH 15+00.00 20' LT.	MH 18+00.00 20' LT.	6 CFS	24"	RCP	296 L.F.	0.239%	3878.96	3880.96	3880.54	3883.01	3878.24	3880.24	3879.85	3882.11
15	MH 26+25.00 20' LT.	MH 21+25.00 20' LT.	80 CFS	48"	RCP	496 L.F.	0.150%	3873.31	3877.31	3878.58	3881.88	3872.56	3876.56	3876.99	3881.14
16	INLET NO. 14	MH 18+00.00 20' LT.	4 CFS	18"	RCP	8 L.F.	0.150%	3878.11	3879.61	3880.04	3881.91	3878.10	3879.60	3879.88	3882.11
17	INLET NO. 13	MH 26+25.00 20' LT.	2 CFS	18"	RCP	8 L.F.	0.150%	3877.74	3879.24	3878.60	3881.54	3877.73	3879.23	3878.54	3881.88
18	MH 21+25.00 20' LT.	RETENTION POND	81 CFS	48"	RCP	204 L.F.	0.420%	3872.56	3876.56	3876.99	3881.14	3871.70	3875.70	3874.56	3871.70

STORM SEWER INLET TABLE – 10 YR. STORM

INLET NO.	LOCATION	Q(10)	TYPE	SIZE	FLOWLINE	INVERT	DEPTH
1	30+05.74 LT.	2 CFS	I–B	4'–6" X 2'–6"	3880.39	3876.59	3.80'
2	30+02.95 RT.	1 CFS	I–B	4'–6" X 2'–6"	3880.39	3873.88	6.51'
3	31+06.78 LT.	2 CFS	I–B	4'–6" X 2'–6"	3880.42	3876.54	3.93'
4	31+05.49 RT.	1 CFS	I–B	4'–6" X 2'–6"	3880.42	3876.62	3.88'
5	30+27.45 89'RT.	26 CFS	MDI	10'–0" X 5'–0"	3880.00	3873.97	6.03'
6	30+81.49 89'RT.	26 CFS	MDI	10'–0" X 5'–0"	3880.00	3874.51	5.49'
7	15+00.00 LT.	3 CFS	I–B	4'–6" X 2'–6"	3882.81	3879.04	3.77'
9	4+51.79 LT.	8 CFS	III–B	13'–6" X 2'–6"	3876.20	3872.43	3.77'
10	4+51.79 RT.	5 CFS	III–B	13'–6" X 2'–6"	3876.20	3872.32	3.88'
~~11~~	~~5+04.53 45.18'RT.~~	~~3 CFS~~	~~MDI~~	~~4'–0" X 3'–0"~~	~~3875.92~~	~~3871.50~~	~~4.42'~~
12	21+25.00 LT.	7 CFS	II–B	9'–0" X 2'–6"	3880.94	3877.24	3.70'
13	26+25.00 LT.	1 CFS	I–B	4'–6" X 2'–6"	3881.54	3877.74	3.80'
14	18+00.00 LT.	2 CFS	I–B	4'–6" X 2'–6"	3881.91	3878.11	3.80'

STORM SEWER INLET TABLE – 100 YR. STORM

INLET NO.	LOCATION	Q(100)	TYPE	SIZE	FLOWLINE	INVERT	DEPTH
1	30+05.74 LT.	2 CFS	I–B	4'–6" X 2'–6"	3880.39	3876.59	3.80'
2	30+02.95 RT.	2 CFS	I–B	4'–6" X 2'–6"	3880.39	3873.88	6.51'
3	31+06.78 LT.	2 CFS	I–B	4'–6" X 2'–6"	3880.42	3876.54	3.93'
4	31+05.49 RT.	2 CFS	I–B	4'–6" X 2'–6"	3880.42	3876.62	3.88'
5	30+27.45 89'RT.	40 CFS	MDI	10'–0" X 5'–0"	3880.00	3873.97	6.03'
6	30+81.49 89'RT.	40 CFS	MDI	10'–0" X 5'–0"	3880.00	3874.51	5.49'
7	15+00.00 LT.	6 CFS	I–B	4'–6" X 2'–6"	3882.81	3879.04	3.77'
9	4+51.79 LT.	14 CFS	III–B	13'–6" X 2'–6"	3876.20	3872.43	3.77'
10	4+51.79 RT.	12 CFS	III–B	13'–6" X 2'–6"	3876.20	3872.32	3.88'
~~11~~	~~5+04.53 45.18'RT.~~	~~3 CFS~~	~~MDI~~	~~4'–0" X 3'–0"~~	~~3875.92~~	~~3871.50~~	~~4.42'~~
12	21+25.00 LT.	12 CFS	II–B	9'–0" X 2'–6"	3880.94	3877.24	3.70'
13	26+25.00 LT.	2 CFS	I–B	4'–6" X 2'–6"	3881.54	3877.74	3.80'
14	18+00.00 LT.	4 CFS	I–B	4'–6" X 2'–6"	3881.91	3878.11	3.80'

GUTTER FLOW TABLE – 10 YR. STORM

LOCATION	Q(10)	FLOW WIDTH	FLOW DEPTH
WEST OF INLET NO. 9	6 CFS	14.4'	0.29'
EAST OF INLET NO. 9	8 CFS	13.3'	0.27'
WEST OF INLET NO. 10	5 CFS	13.7'	0.27'
EAST OF INLET NO. 10	6 CFS	12.4'	0.25'
WEST OF INLET NO. 7	3 CFS	11.9'	0.24'
SOUTH OF INLET NO. 14	2 CFS	11.4'	0.23'
SOUTH OF INLET NO. 2	1 CFS	6.9'	0.14'
NORTH OF INLET NO. 4	1 CFS	8.2'	0.16'
NORTH OF INLET NO. 3	1 CFS	8.2'	0.16'
SOUTH OF INLET NO. 1	1 CFS	8.7'	0.17'
SOUTH OF INLET NO. 13	1 CFS	8.7'	0.17'
NORTH OF INLET NO. 12	2 CFS	9.1'	0.18'
SOUTH OF INLET NO. 12	5 CFS	15.1'	0.30'

GUTTER FLOW TABLE – 100 YR. STORM

LOCATION	Q(100)	FLOW WIDTH	FLOW DEPTH
WEST OF INLET NO. 9	11 CFS	18.1'	0.36'
EAST OF INLET NO. 9	14 CFS	16.8'	0.34'
WEST OF INLET NO. 10	9 CFS	17.2'	0.34'
EAST OF INLET NO. 10	12 CFS	15.6'	0.31'
WEST OF INLET NO. 7	6 CFS	15.0'	0.30'
SOUTH OF INLET NO. 14	4 CFS	14.4'	0.29'
SOUTH OF INLET NO. 2	2 CFS	8.7'	0.17'
NORTH OF INLET NO. 4	2 CFS	10.3'	0.21'
NORTH OF INLET NO. 3	2 CFS	10.3'	0.22'
SOUTH OF INLET NO. 1	2 CFS	11.0'	[illegible]
SOUTH OF INLET NO. 13	2 CFS	[illegible]	[illegible]
[illegible] NO. 12	3 CFS	[illegible]	[illegible]
[illegible]	9 CFS	[illegible]	[illegible]

PROJECT BENCHMARK:
CITY OF LAS CRUCES BM NO. 154. LOCATED APPROXIMATELY 2' NORTH OF BRIDGE COLUMN AT STATION 16+83.46 44.14 FT. LEFT.
ELEVATION = 3883.09 USGS DATUM MSL.

City of Las Cruces

THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS SIGNED AND SEALED

TED G. SCANLON NEW MEXICO 10466 REGISTERED ENGINEER

SHEET TITLE:
STORM SEWER DATA TABLES

UNION AVENUE WIDENING PROJECT
LAS CRUCES, NEW MEXICO

SCANLON WHITE, INC.
540 N. WATER ST.
LAS CRUCES, N.M.

scanlon white inc.

SHEET 3-8 OF 103

CADD BY:	CHECKED BY:	DRAWING FILE:	DATE:	PROJECT NO.	SCALE
[illegible]ANLON		UNSSTC.dwg			

NEW MEXICO STATE UNIVERSITY

GENERAL CONSTRUCTION FOR THE IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

LAS CRUCES, NEW MEXICO

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.

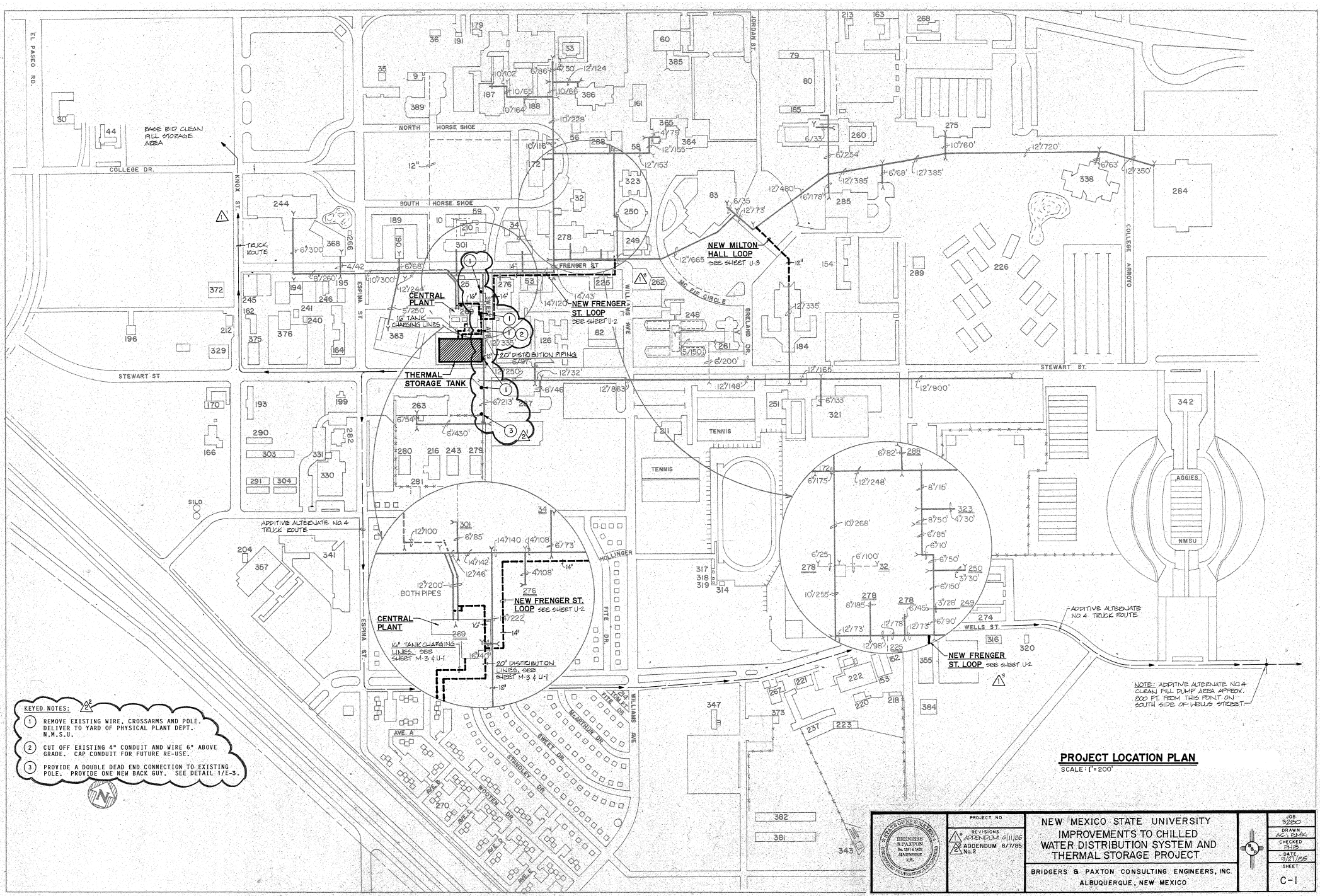
213 TRUMAN, NE ALBUQUERQUE, NEW MEXICO 87108 265-8577

CONSULTANTS:

BRIDGERS & PAXTON INC.	MECHANICAL	ALBUQUERQUE, NEW MEXICO
RUEHLE ENGINEERING	ELECTRICAL	ALBUQUERQUE, NEW MEXICO
R. D. KRAUSE ENGINEERING CO.	STRUCTURAL	SANTA FE, NEW MEXICO

DRAWING INDEX

U-A4



KEYED NOTES: 2

1. REMOVE EXISTING WIRE, CROSSARMS AND POLE. DELIVER TO YARD OF PHYSICAL PLANT DEPT. N.M.S.U.
2. CUT OFF EXISTING 4" CONDUIT AND WIRE 6" ABOVE GRADE. CAP CONDUIT FOR FUTURE RE-USE.
3. PROVIDE A DOUBLE DEAD END CONNECTION TO EXISTING POLE. PROVIDE ONE NEW BACK GUY. SEE DETAIL 1/E-3.

NOTE: ADDITIVE ALTERNATE NO.4 CLEAN FILL DUMP AREA APPROX. 800 FT. FROM THIS POINT ON SOUTH SIDE OF WELLS STREET.

PROJECT LOCATION PLAN
SCALE: 1"=200'

PROJECT NO.
REVISIONS
1 ADDENDUM 6-11-85
2 ADDENDUM 8/7/85 No. 2

NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

JOB 3280
DRAWN ACL/BMK
CHECKED SHB
DATE 5/21/85
SHEET C-1

LEGEND

DESCRIPTION	NEW	EXISTING	ABANDON/REMOVE
CONSTRUCTION			
CURB AND GUTTER			
CONCRETE	AS NOTED	AS NOTED	AS NOTED
ASPHALTIC PAVEMENT			
CHAIN LINK FENCE			
GRADE CONTOUR	3900	3900	
SPOT ELEVATION	80.75	80.75	

GENERAL NOTES:

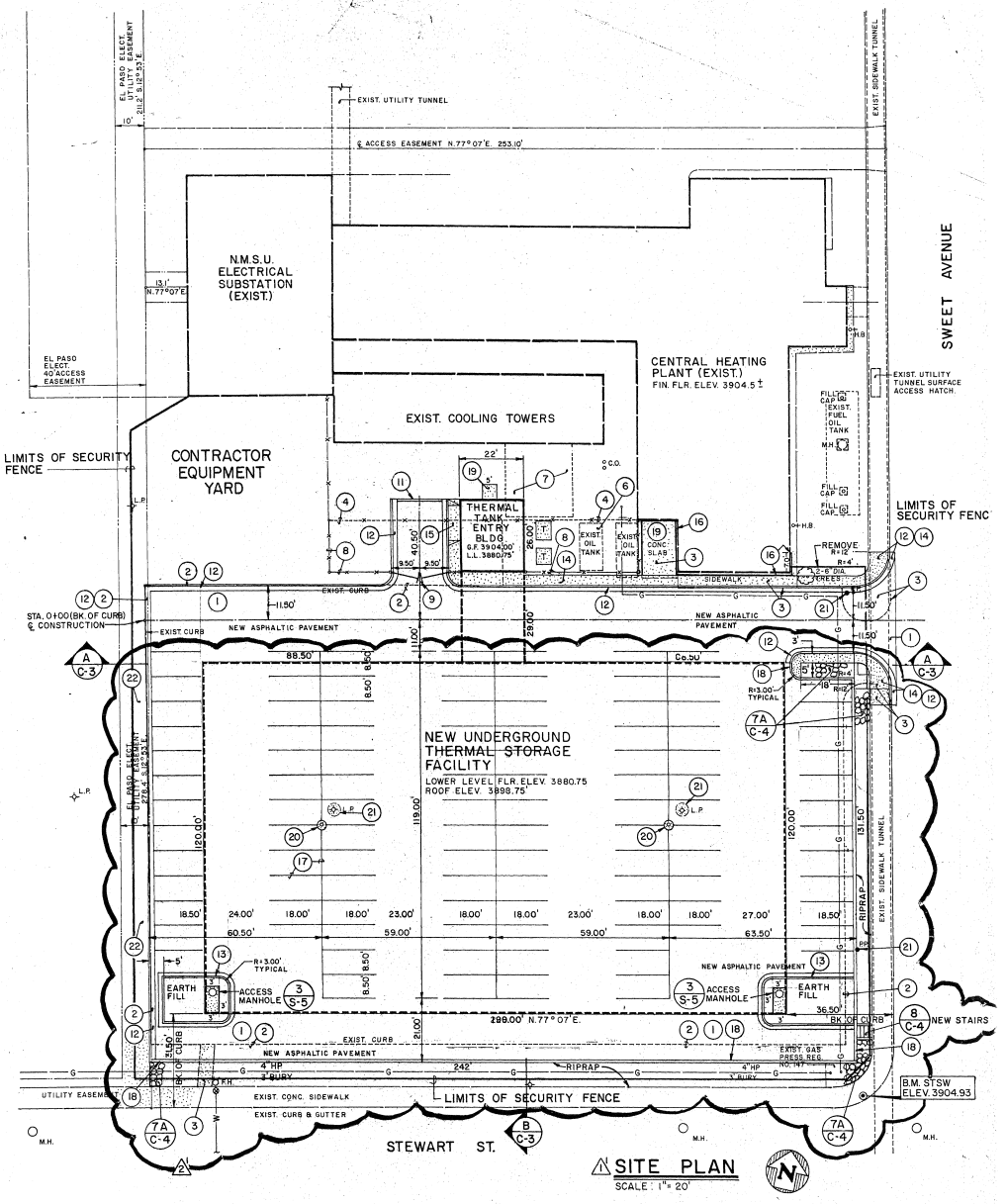
1. ALL RADIUS DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS WITH REFERENCE TO CURB OR CURB AND GUTTER ARE TO THE BACK OF CURB.

KEYED NOTES: (DEMOLITION)

1. REMOVE EXISTING ASPHALTIC PAVEMENT
2. REMOVE EXISTING CONCRETE CURB AND GUTTER.
3. REMOVE EXISTING CONCRETE SIDEWALK AND CURB AND GUTTER.
4. REMOVE EXISTING CHAIN LINK FENCE. SALVAGE MATERIAL TO BE USED FOR "NEW" CHAIN LINK FENCE INSTALLATION.
5. REMOVE AND RELOCATE EXISTING LIGHT POLE WITH CONCRETE BASE AS PER ELECTRICAL SITE PLAN AND SPECIFICATIONS.
6. EXISTING OIL STORAGE TANKS (ABOVE GRADE) TO BE REMOVED BY THE "OWNER".
7. EXISTING CHEMICAL FACILITY INCLUDING SHED, FOUNDATION, AND TANKS TO BE REMOVED BY THE "OWNER".

KEYED NOTES: (NEW CONSTRUCTION)

8. NEW CHAIN LINK FENCE: REUSE SALVAGE MATERIAL FROM EXISTING FENCE DEMOLITION. SEE NOTE 4.
9. NEW CHAIN LINK FENCE DOUBLE GATE, 19' CLEAR WIDTH, HEIGHT TO MATCH EXISTING FENCE (6'±)
10. INSTALL NEW CORNER POST ADJACENT TO NEW BUILDING AND CONNECT EXISTING CHAIN LINK FENCING.
11. NEW HEADER CURB AS PER DETAIL 4/C-4.
12. NEW STANDARD CURB AND GUTTER AS PER DETAIL 5/C-4.
13. NEW MEDIAN CURB AND GUTTER AS PER DETAIL 2/C-4.
14. NEW CONCRETE SIDEWALK AS PER DETAIL 3/C-4.
15. NEW DRIVE PAD AS PER DETAIL 1/C-4.
16. NEW CONCRETE RETAINING WALL AS PER DETAIL 6/C-4.
17. NEW PARKING STRIPE SHALL BE 4" WIDE.
18. NEW STRAIGHT CURB AS PER DETAIL 4A/C-4.
19. 4" THICK CONCRETE PAD WITH 6 X 6-10/10 WWF. COMPACT 6" OF SUBGRADE TO 90% DENSITY.
20. RELOCATED LIGHT POLE. PROVIDE CONCRETE BASE EQUAL TO THAT REMOVED. SEE NOTE 5.
21. EXISTING POWER POLE TO BE REMOVED AND RELOCATED. REFER TO ADDENDUM NOTES.
22. EXISTING CONCRETE SIDEWALK TO BE REMOVED AND REPLACED, SUBJECT TO DISPLACEMENT BY THERMAL TANK EXCAVATION.



SITE PLAN
SCALE: 1" = 20'

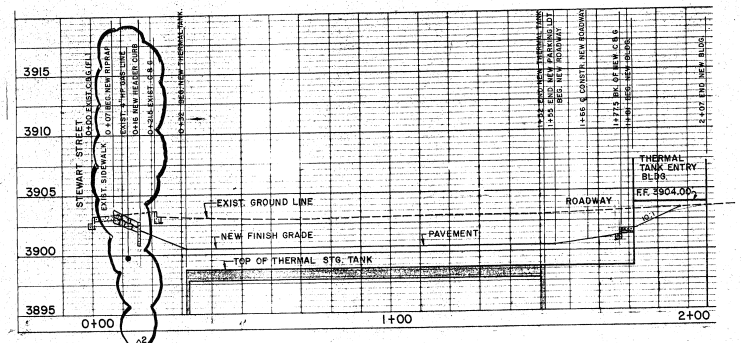
BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO

PROJECT NO.

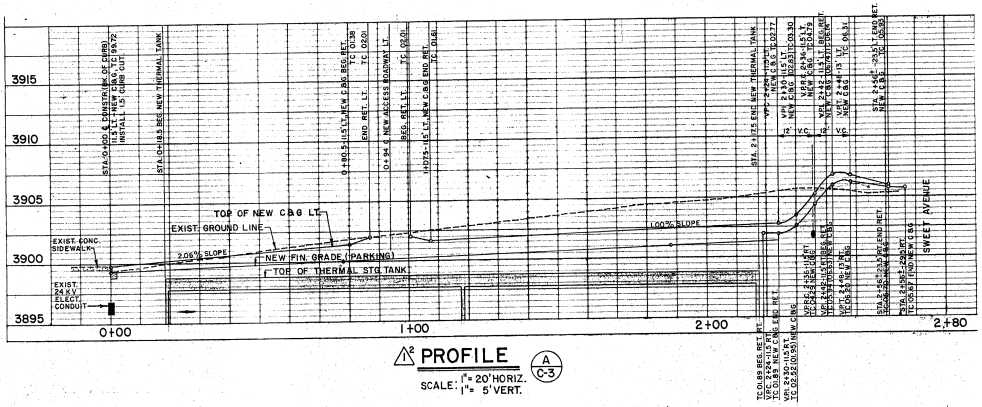
REVISIONS
1 JUNE 27, 1985 ADDENDUM
2 AUG. 2, 1985 ADDENDA & C.O.

NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

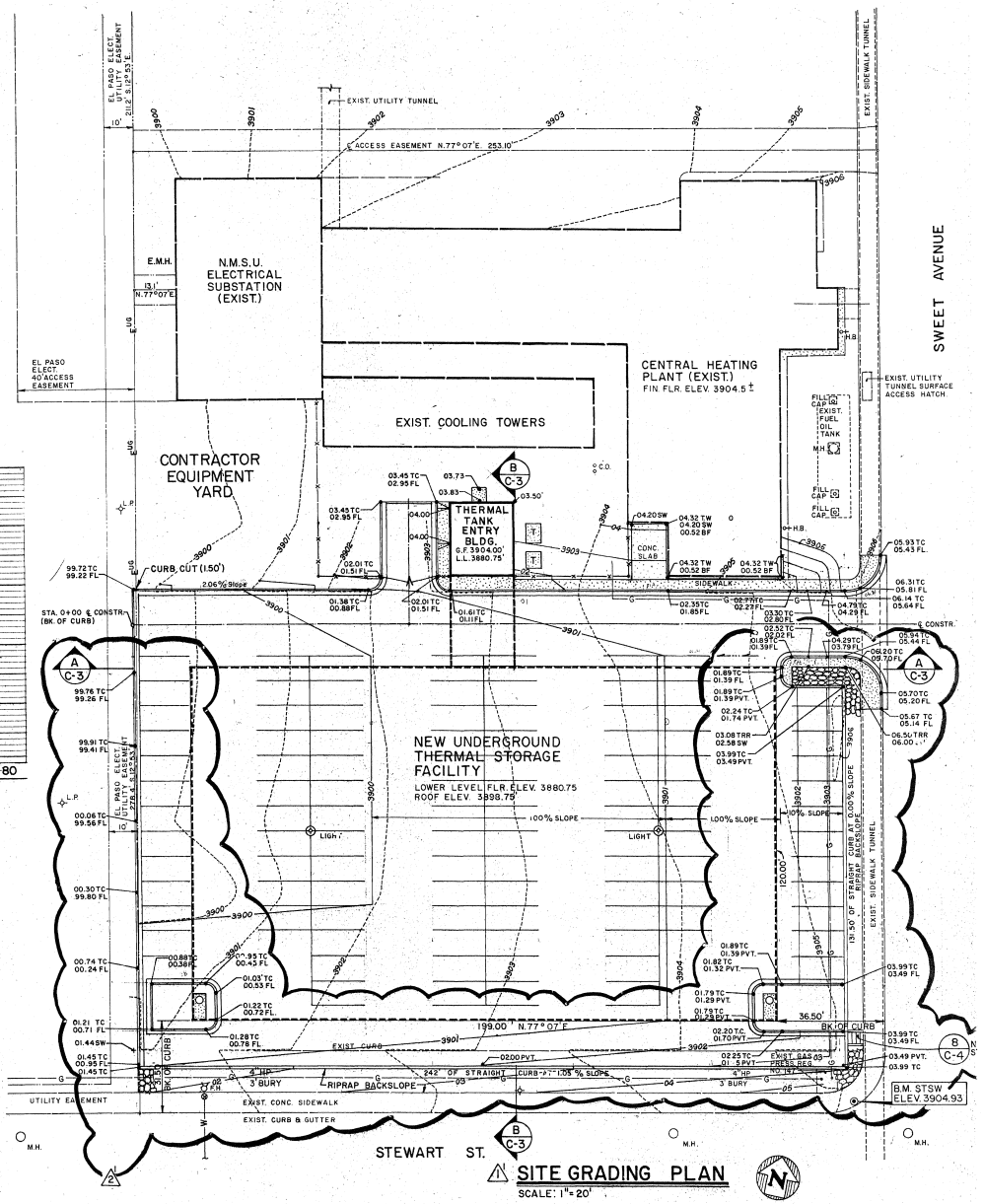
JOB 3280
DRAWN R.G.G.
CHECKED F.H.B.
DATE JUNE 1985
SHEET C-2



⚠3 PROFILE (B C-3)
SCALE: 1"= 20' HORIZ. 1"= 5' VERT.

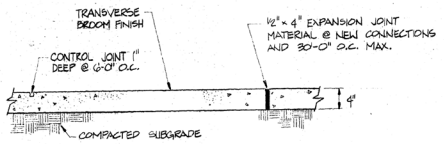


⚠2 PROFILE (A C-3)
SCALE: 1"= 20' HORIZ. 1"= 5' VERT.



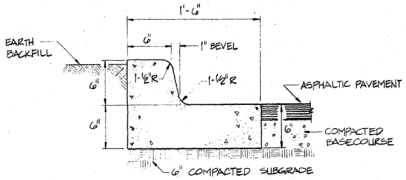
⚠1 SITE GRADING PLAN
SCALE: 1"= 20'

PROJECT NO	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	JOB 3280 DRAWN R.G.G. CHECKED F.H.B. DATE JUNE 1985 SHEET C-3
REVISIONS ⚠3 JUNE 27, 1985 ADDENDUM ⚠2 AUG. 2, 1985 ADDENDA & C.O.		



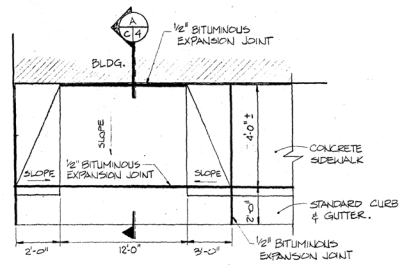
CONCRETE SIDEWALK DETAIL 3 C-4

SCALE: NONE



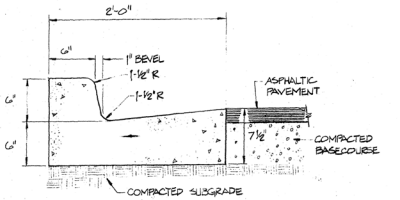
MEDIAN CURB DETAIL 2 C-4

SCALE: NONE



DRIVEPAD DETAILS 1 C-4

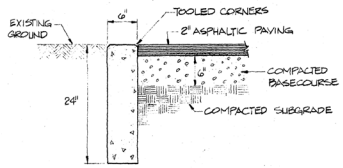
SCALE: NONE



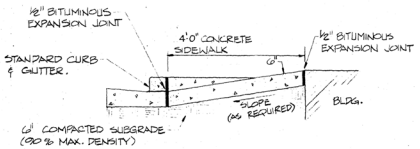
STANDARD CURB & GUTTER DETAIL 5 C-4

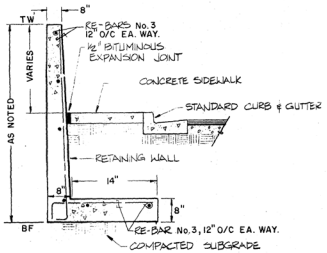
SCALE: NONE

NOTE: PROVIDE CONTROL JOINTS 6'-0" O.C., PROVIDE EXPANSION JOINTS AT NEW CONNECTION AND 30'-0" O.C. (MAX).



HEADER CURB DETAIL 4 C-4



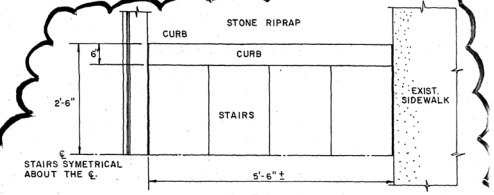


RETAINING WALL DETAIL 6 C-4

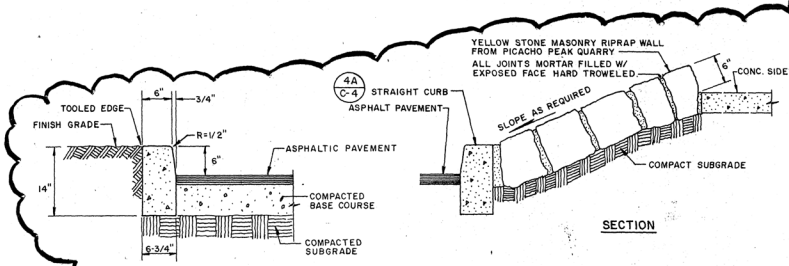
SCALE: NONE

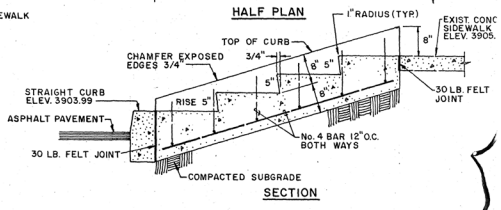
SECTION A C-4

SCALE: NONE



HALF PLAN





⚠1 ⚠2 **STRAIGHT CURB DETAIL** 4A C-4

MASONRY RIPRAP STONE WALL 7A C-4

PARKING LOT STAIR DETAILS 8 C-4

CONSTRUCTION DETAILS

PROJECT NO.	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	JOB 3280 DRAWN R.G.G. CHECKED F.H.B. DATE JUNE 1985 SHEET C-4
REVISIONS ⚠3 JUNE 28,1985 ADDENDUM ⚠1 AUG. 2 ,1985 ADDENDA ⚠2	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	

LEGEND (UTILITIES)

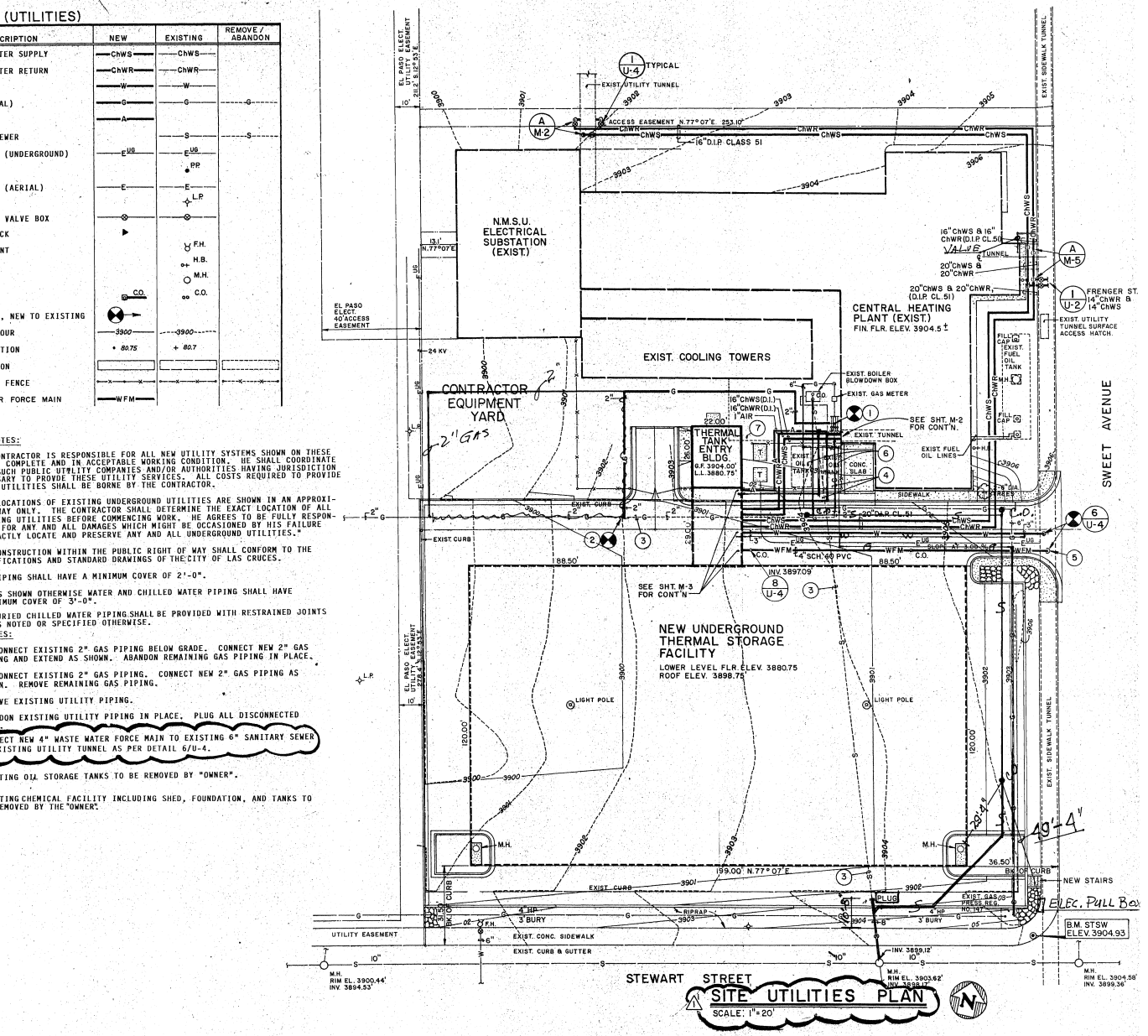
DESCRIPTION	NEW	EXISTING	REMOVE/ ABANDON
CHILLED WATER SUPPLY	ChWS	ChWS	
CHILLED WATER RETURN	ChWR	ChWR	
WATER	W	W	
GAS (NATURAL)	G	G	G
AIR	A		
SANITARY SEWER		S	S
ELECTRICAL (UNDERGROUND)	E UG	E UG	
POWER POLE		PP	
ELECTRICAL (AERIAL)	E	E	
LIGHT POLE		L.P.	
VALVE WITH VALVE BOX			
THRUST BLOCK			
FIRE HYDRANT		F.H.	
HOSE BIBB		H.B.	
MANHOLE		M.H.	
CLEANOUT	CO.	C.O.	
CONNECTION, NEW TO EXISTING			
GRADE CONTOUR	3900	3900	
SPOT ELEVATION	+ 80.75	+ 80.7	
CONSTRUCTION			
CHAIN LINK FENCE			
WASTEWATER FORCE MAIN	WFM		

GENERAL NOTES:

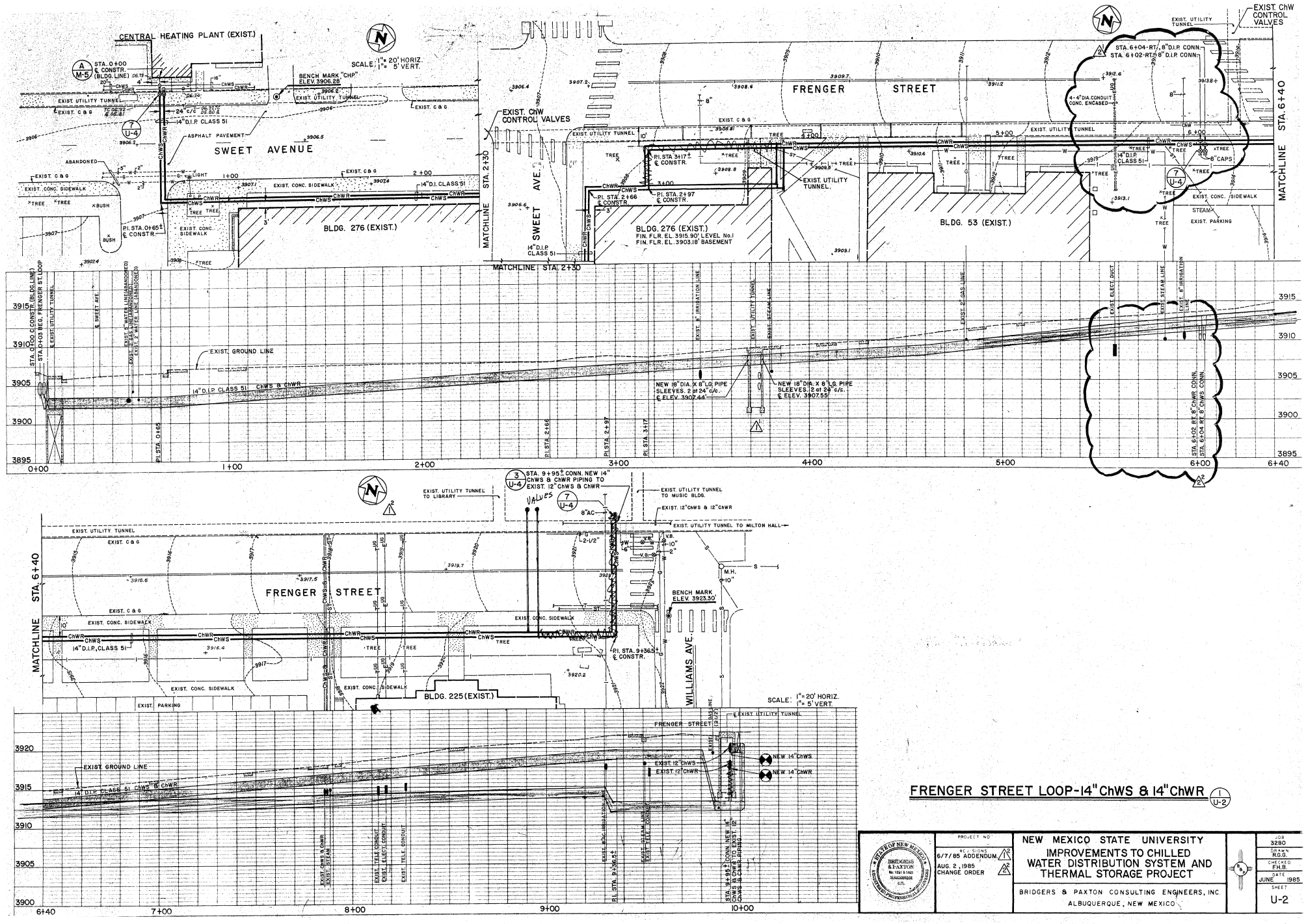
1. THE CONTRACTOR IS RESPONSIBLE FOR ALL NEW UTILITY SYSTEMS SHOWN ON THESE PLANS, COMPLETE AND IN ACCEPTABLE WORKING CONDITION. HE SHALL COORDINATE WITH SUCH PUBLIC UTILITY COMPANIES AND/OR AUTHORITIES HAVING JURISDICTION NECESSARY TO PROVDE THESE UTILITY SERVICES. ALL COSTS REQUIRED TO PROVIDE THESE UTILITIES SHALL BE BORNE BY THE CONTRACTOR.
2. "THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. HE AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES."
3. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT OF WAY SHALL CONFORM TO THE SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF LAS CRUCES.
4. GAS PIPING SHALL HAVE A MINIMUM COVER OF 2'-0".
5. UNLESS SHOWN OTHERWISE WATER AND CHILLED WATER PIPING SHALL HAVE A MINIMUM COVER OF 3'-0".
6. NEW BURIED CHILLED WATER PIPING SHALL BE PROVIDED WITH RESTRAINED JOINTS UNLESS NOTED OR SPECIFIED OTHERWISE.

KEYED NOTES:

1. DISCONNECT EXISTING 2" GAS PIPING BELOW GRADE. CONNECT NEW 2" GAS PIPING AND EXTEND AS SHOWN. ABANDON REMAINING GAS PIPING IN PLACE.
2. DISCONNECT EXISTING 2" GAS PIPING. CONNECT NEW 2" GAS PIPING AS SHOWN. REMOVE REMAINING GAS PIPING.
3. REMOVE EXISTING UTILITY PIPING.
4. ABANDON EXISTING UTILITY PIPING IN PLACE. PLUG ALL DISCONNECTED ENDS.
5. CONNECT NEW 4" WASTE WATER FORCE MAIN TO EXISTING 6" SANITARY SEWER IN EXISTING UTILITY TUNNEL AS PER DETAIL 6/U-4.
6. EXISTING OIL STORAGE TANKS TO BE REMOVED BY "OWNER".
7. EXISTING CHEMICAL FACILITY INCLUDING SHED, FOUNDATION, AND TANKS TO BE REMOVED BY THE "OWNER".

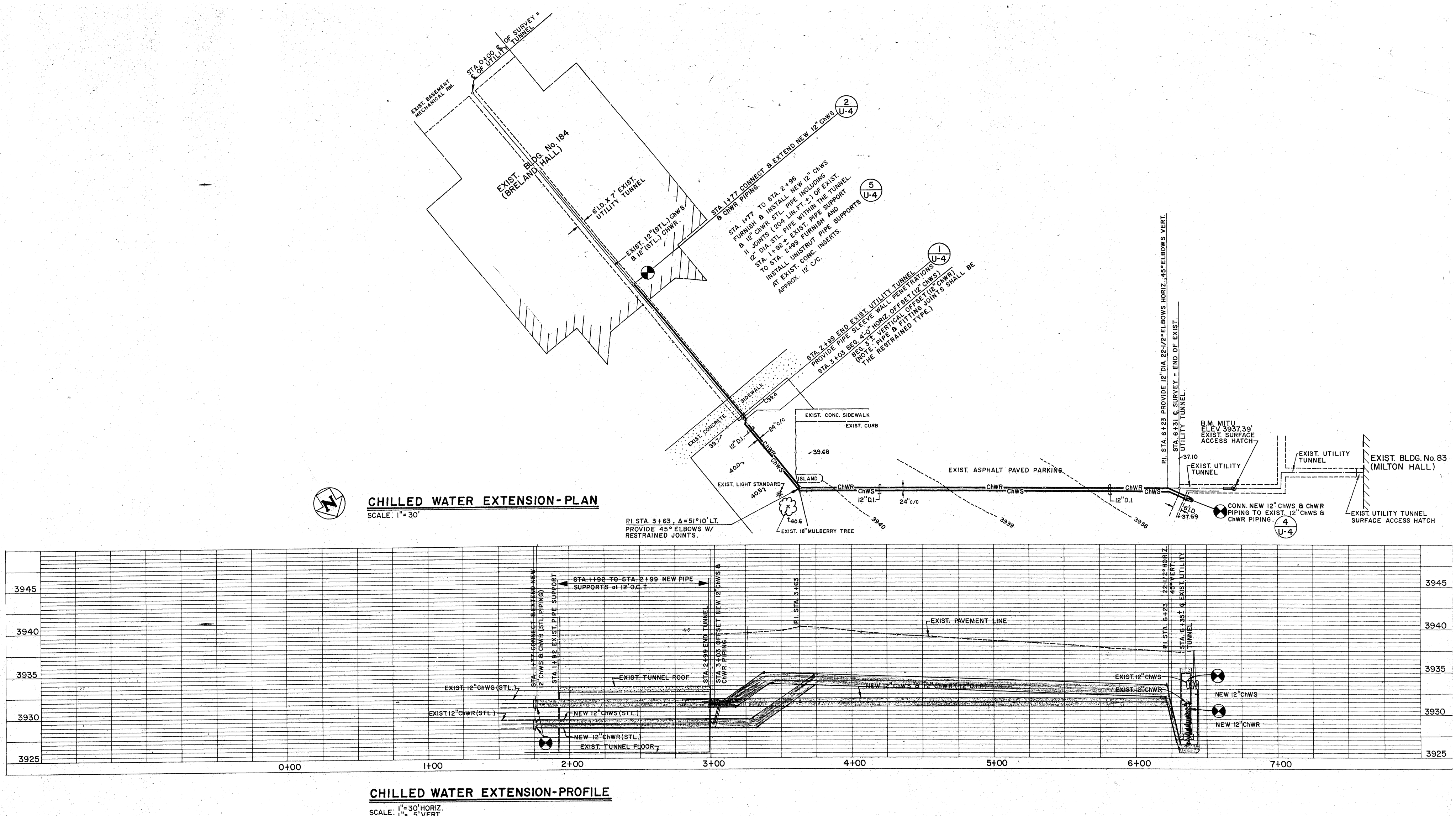


PROJECT NO	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	JOB 3280
REVISIONS 2 AUG. 2, 1985 ADDENDA & C.O.	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	DRAWN R.G.G. CHECKED F.H.B. DATE JUNE 1985 SHEET U-1



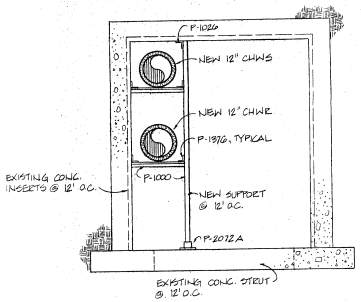
FRENGER STREET LOOP-14"ChWS & 14"ChWR (1/U-2)

PROJECT NO.	NEW MEXICO STATE UNIVERSITY	JOB	3280
REVISIONS 6/7/85 ADDENDUM 1/2	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	DRAWN	R.G.G.
AUG. 2, 1985 CHANGE ORDER 2/2	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	CHECKED	F.H.B.
		DATE	JUNE 1985
		SHEET	U-2



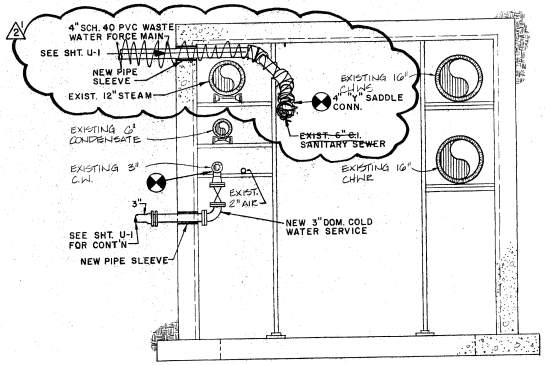
MILTON HALL LOOP - 12" ChWS & 12" ChWR (1/U-3)

PROJECT NO. / REVISIONS	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	JOB 3280 DRAWN R.G.G. CHECKED F.H.B. DATE JUNE 1985 SHEET U-3



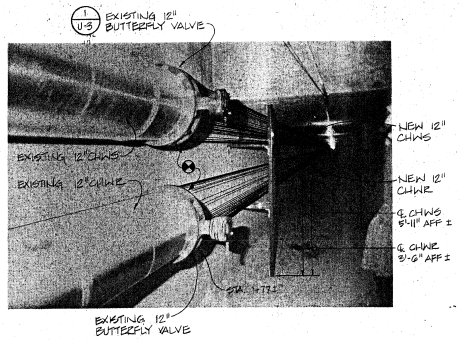
UTILITY TUNNEL PIPE SUPPORT DETAIL (5 / U-4)

SCALE : 1/2" = 1'-0"



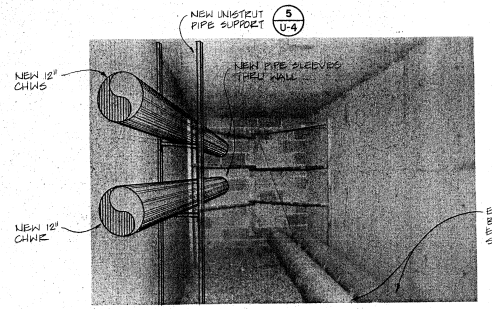
EXISTING UTILITY TUNNEL DETAIL (6 / U-4)

SCALE : 1/2" = 1'-0"



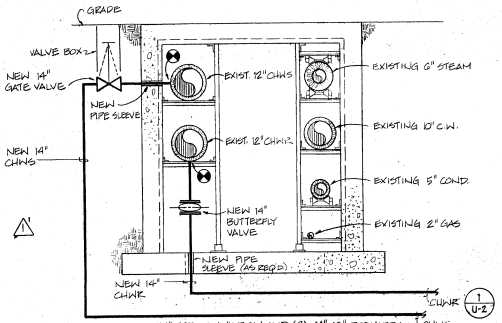
NEW 14" CHWS & CHWR EXTENSION (2 / U-4)

SCALE : NONE



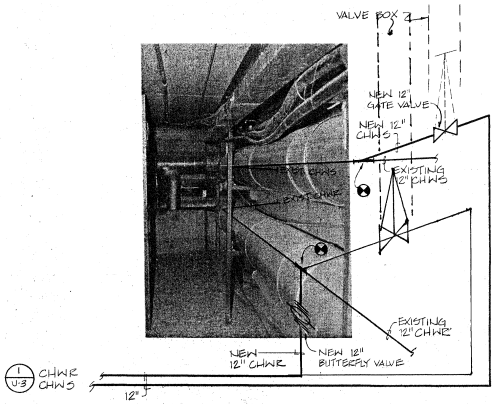
NEW 14" CHWS & CHWR EXTENSION (1 / U-4)

SCALE : NONE



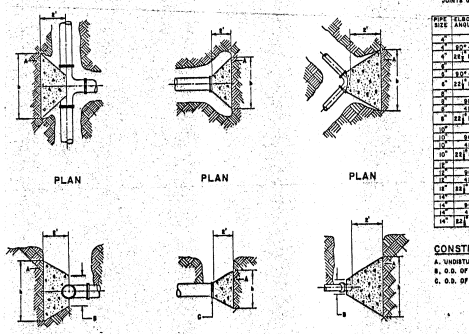
NEW 14" CHWS & CHWR CONNECTION (3 / U-4)

SCALE : 1/2" = 1'-0"



NEW 12" CHWS & CHWR CONNECTION (4 / U-4)

SCALE : NONE



GENERAL NOTES:

1. THE ENGINEER SHALL PROVIDE DESIGN FOR ALL JOINTS GREATER THAN 14°.

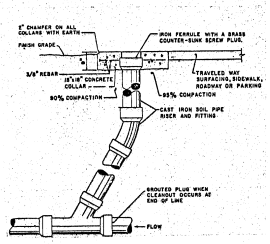
PIPE SIZE	ELBOW ANGLE	ELBOW (A) DIM.	ELBOW (B) DIM.	TEE OR PLUG (A) DIM.	TEE OR PLUG (B) DIM.
4"					
4"	90° 45° 22½° 11¼°				
6"					
6"	90° 45° 22½° 11¼°				
8"					
8"	90° 45° 22½° 11¼°				
10"					
10"	90° 45° 22½° 11¼°				
12"					
12"	90° 45° 22½° 11¼°				
14"					
14"	90° 45° 22½° 11¼°				
16"					
16"	90° 45° 22½° 11¼°				
18"					
18"	90° 45° 22½° 11¼°				
20"					
20"	90° 45° 22½° 11¼°				
24"					
24"	90° 45° 22½° 11¼°				

CONSTRUCTION NOTES:

A. UNDISTURBED EARTH.
B. O.D. OF PIPE + 6".
C. O.D. OF CAP OR PLUG, MIN. 12" X 12".

THRUST BLOCK DETAILS (9 / U-4)

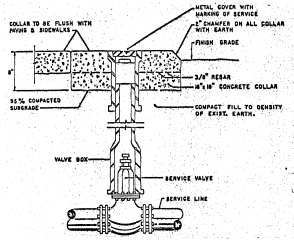
SCALE : NONE



CLEANOUT DETAIL (8 / U-4)

SCALE : NONE

NOTE : CLEANOUT FOR 4" WASTEWATER FORCE MAIN SHALL BE SCH. 40 PVC PIPE & FITTINGS W/ SOLVENT CEMENT JOINTS.



VALVE BOX DETAIL (7 / U-4)

SCALE : NONE

REFERENCE IDENTIFICATION PLANE
2' 1' 0 2'
1/2" = 1'0"

	PROJECT NO.	NEW MEXICO STATE UNIVERSITY
	REVISIONS 6/7/85 ADDENDUM 1 AUG. 2, 1985 CHANGE ORDER 2	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT
		BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO

JOB 3280 | DRAWN R.G.G. | CHECKED F.H.B. | DATE JUNE 1985 | SHEET U-4

EQUIPMENT SCHEDULE

SYMBOL LEGEND

SYMBOL	DESCRIPTION
	ABBREVIATIONS
BHP	BRAKE HORSEPOWER
BI	BACKWARD INCLINED
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
CO	CLEANOUT
CW	COLD WATER
D	DRAIN
DIA.	DIAMETER
EWT	ENTERING WATER TEMPERATURE
°F	DEGREES FAHRENHEIT
FPM	FEET PER MINUTE
FT.	FEET
GPM	GALLONS PER MINUTE
HB	HOSE BIBB
HP	HORSEPOWER
IN.	INCHES
KW	KILOWATT
LWT	LEAVING WATER TEMPERATURE
MAX.	MAXIMUM
MBH	THOUSANDS BRITISH THERMAL UNITS PER HOUR
MIN.	MINIMUM
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
NOM.	NOMINAL
OA	OUTSIDE AIR
PD	PRESSURE DROP
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
RA	REVERSE ACTING
RPM	REVOLUTIONS PER MINUTE
SF	SQUARE FEET
WG	WATER GAUGE
	PIPING SYMBOLS
—CWS—	CONDENSING WATER SUPPLY
—CWR—	CONDENSING WATER RETURN
—CHWS—	CHILLED WATER SUPPLY
—CHWR—	CHILLED WATER RETURN
—CW—·—·	COLD WATER (DOMESTIC)
—D— — —	DRAIN
—V— — —	VENT
—HIGH—	HIGH TANK DISTRIBUTION HEADER PIPING
—LOW—	LOW TANK DISTRIBUTION HEADER PIPING
	VALVE SYMBOLS
	GATE VALVE
	BUTTERFLY VALVE
	CONTROL VALVE (REFER TO CONTROLS FOR TYPE)
	CHECK VALVE
	BALANCING VALVE (PLUG COCK)
	SOLENOID VALVE
	GENERAL SYMBOLS
	ECCENTRIC REDUCER
	CONCENTRIC REDUCER
	THERMOMETER 0-100°
	GAUGE WITH GAUGE COCK 0-120 PSI
	VALVE IN PIPING RISE OR DROP
	ORIFICE FLANGE
	EXHAUST DUCT
	SUPPLY DUCT
	ELECTRIC THERMOSTAT

(11) VENTILATION FAN: SINGLE INLET- UTILITY SET AS SCHEDULED. AMCA RATED IN ARRANGEMENT AS SCHEDULED WITH BACKWARD INCLINED WHEEL TYPE SCHEDULED, VARIABLE PITCH V-BELT DRIVE SIZED FOR 150 PERCENT OF THE MOTOR HORSEPOWER. FURNISH SPRING ISOLATORS FOR THE COMBINED WEIGHT OF THE FAN, MOTOR, DRIVE, AND BASE WITH A MINIMUM ISOLATION EFFICIENCY OF 90 PERCENT. THE ALLOWABLE PEAK TO PEAK VIBRATION AMPLITUDE SHALL NOT EXCEED 3 MILS IN ANY PLANE. FURNISH OPEN BALL BEARING MOTOR WITH GREASE FITTINGS AND SUITABLE FOR CONTINUOUS OPERATION AT JOB SITE ELEVATION WITH PROVED TORQUE CHARACTERISTICS SUFFICIENT TO BRING THE FAN AND DRIVE UP TO SPEED WITHIN 10 SECONDS. TRANE 20" BI OR APPROVED EQUAL.

SYMBOL	CFM	STATIC PRESSURE, "	OUTLET VELOCITY	RPM	BHP	MOTOR HP	CLASS	ELEC. POWER	MOTOR SPEED (RPM)
11	4,000	0.64	1,724	1,050	1.0	1-1/2	1	480/3/60	1,750

(12) EXHAUST FAN: POWER ROOF VENTILATOR, V-BELT DRIVEN CENTRIFUGAL BLOWER TYPE. CURB BASE MOUNTED, MOTOR OPERATED 115V, BACKDRAFT DAMPER, BACKWARD INCLINED CENTRIFUGAL WHEEL, SPUN ALUMINUM INLET SHROUD, BIRD SCREEN, AND CAPABLE OF EXHAUSTING THE CAPACITY SCHEDULED BELOW. GREENHECK OR APPROVED EQUAL.

SYMBOL	CFM	S.P. IN. W.G.	TIP SPEED	MOTOR HP	RPM	VOLTAGE	GREENHECK MODEL
12	4,000	0.22	3,367	1/2	525	115/1/60	GB 24-5

(13) WATER METER: SEALED REGISTER METER, 2" FLANGED ENDS, 160 GPM CAPACITY. ROCKWELL SR-2" OR APPROVED EQUAL.

DIFFUSER SCHEDULE

(A) SIDEWALL SUPPLY REGISTER: FOR EXPOSED DUCT MOUNTING, DOUBLE DEFLECTION, VERTICAL FACE BARS, HORIZONTAL REAR BARS, 2" ALUMINUM AIRFOIL LOUVERS, STEEL FRAME, BAKED WHITE ENAMEL FINISH, OPPOSED BLADE DAMPER. SIZE AS SHOWN ON THE DRAWINGS. TITUS MODEL 122-RS5, OR APPROVED EQUAL.

FLOOR DRAINS AND FLOOR SINK:

FD-1 FLOOR DRAIN: ZURN MODEL Z-541.

FS-1 FLOOR SINK: ZURN MODEL Z-1921 WITHOUT GRATE.

(1) AND **(2)** ADDITIVE ALTERNATE NO. 1

PLATE AND FRAME HEAT EXCHANGERS: ASME CONSTRUCTED AND STAMPED FOR 150 PSIG OPERATION, AND TO CONSIST OF CORREGATED 304 STAINLESS STEEL PLATES WITH PORTS FOR THE PASSAGE OF FLUIDS BETWEEN WHICH HEAT IS TRANSFERED. PLATES SHALL BE FITTED WITH GASKETS OF THE APPROPRIATE MATERIAL FOR THE TYPE OF FLUID HANDLED TO SEAL THE CHANNEL AND DIRECT FLUIDS INTO THE ALTERNATE CHANNEL. FURNISH FLANGED NIPPLES, STAINLESS STEEL RUNNERS, AND EPOXY PAINT THE ASSEMBLY. ALL EXCHANGERS ARE COUNTER CURRENT FLOW. TWO UNITS IN SERIES. PRESSURE DROPS SHALL NOT BE EXCEEDED BY MORE THAN 10% OF THOSE SCHEDULED. ALFA-LAVAL OR APPROVED EQUAL.

SYMBOL	HOT SIDE PORT NO. GPM	IN	OUT	INITIAL EWT. DEG. F	FINAL LWT. DEG. F	PD. PSI
1	3,200	1	2	55.0	41.0	17.0
2	3,200	1	2			17.0

SYMBOL	COLD SIDE PORT NO. GPM	IN	OUT	INITIAL EWT. DEG. F	FINAL LWT. DEG. F	PD. PSI
1	4,500	3	4	39.0	49.0	20.0
2	4,500	3	4			20.0

SYMBOL	TRANSFER AREA EFFECTIVE SQ. FT.	HOT MEDIUM	COLD MEDIUM	TOTAL HEAT EXCHANGED BTUH	ALFA-LAVAL MODEL NO.
1	6003.1	CHILLED WATER	COOLING TOWER WATER	22,500,000	AX30B-HAS
2	6003.1	CHILLED WATER	COOLING TOWER WATER		AX30B-HAS

(3) AND **(4)** DISTRIBUTION PUMP/TURBINE: THE PUMP/TURBINE SYSTEMS SHALL CONSIST OF ONE (1) CLOSE COUPLED PUMP ASSEMBLY INTERPIPED INTO A COMBINATION PUMP/TURBINE. PUMP/TURBINE SHALL CONSIST OF PUMP, MOTOR WITH DOUBLE EXTENDED SHAFT, AND TURBINE. TWO (2) PUMPS, TWO (2) MOTORS, AND ONE (1) TURBINE; ALL TO BE COMPLETELY ASSEMBLED AND MOUNTED ON A COMMON BEDPLATE MOUNTED TO A CONCRETE HOUSEKEEPING PAD. MOTOR MUST BE SIZED TO OPERATE THE PUMPS WITHOUT THE ASSISTANCE OF THE TURBINE. TURBINE MUST BE ABLE TO RUN-DRY WITHOUT DAMAGE OR EXCESSIVE WEAR. SPEED CONTROL WILL BE BY THE 3-PHASE INDUCTION MOTOR; DIRECT CONNECTED TO THE TURBINE.

SYMBOL	QUANTITY	PUMP GPM	PUMP TOTAL HEAD, FT.	MAX. PUMP RPM	MINIMUM PUMP EFFICIENCY	PUMP MOTOR HP	PUMP MOTOR EFFICIENCY
3	2	3,300	210	1,785	88%	200	96%
4	2	3,300	210	1,785	88%	200	96%

SYMBOL	QUANTITY	TURBINE GPM	TURBINE DESIGN HD. FT.	MAX. TURBINE RPM	MIN. TURBINE EFFICIENCY AT DESIGN POINT	TURBINE OUTPUT AT DESIGN POINT
3	1	6,600	78	1,785	80%	78 KW
4	1	6,600	78	1,785	80%	78 KW

SYMBOL	PUMP CORNELL MODEL	TURBINE CORNELL MODEL	ELECTRICAL
3	(2) 8H	(1) 10TR1Y	480/3/60
4	(2) 8H	(1) 10TR1Y	480/3/60

(5) CHARGING PUMP/TURBINE: THE PUMP/TURBINE SYSTEM SHALL CONSIST OF TWO (2) CLOSE COUPLED PUMP/TURBINE ASSEMBLIES WITH ONE COMMON PUMP DISCHRAGE AND ONE COMMON TURBINE INLET. PUMP/TURBINES SHALL CONSIST OF PUMP, MOTOR WITH DOUBLE EXTENDED SHAFT, AND TURBINE. TWO (2) PUMPS, TWO (2) MOTORS, AND TWO (2) TURBINES; ALL TO BE COMPLETELY ASSEMBLED AND MOUNTED ON A COMMON BEDPLATE MOUNTED TO A 4" CONCRETE HOUSEKEEPING PAD. MOTORS MUST BE SIZED TO OPERATE THE PUMPS WITHOUT THE ASSISTANCE OF THE TURBINES. TURBINES MUST BE ABLE TO RUN-DRY WITHOUT DAMAGE OR EXCESSIVE WEAR. SPEED CONTROL WILL BE BY THE 3-PHASE INDUCTION MOTOR; DIRECT CONNECTED TO THE TURBINE. CORNELL OR APPROVED EQUAL.

SYMBOL	QUANTITY	PUMP GPM	PUMP TOTAL HEAD, FT.	MAX. PUMP RPM	MINIMUM PUMP EFFICIENCY	PUMP MOTOR HP	PUMP MOTOR EFFICIENCY
5	2	4,000	80	1,800	80%	125	95%

SYMBOL	QUANTITY	TURBINE GPM	TURBINE DESIGN HD. FT.	MAX. TURBINE RPM	MIN. TURBINE EFFICIENCY AT DESIGN POINT	TURBINE OUTPUT AT DESIGN POINT
5 (T-1)	1	6,110	104	1,800	83%	99 KW
5 (T-2)	1	1,890	104	1,800	84%	31 KW

SYMBOL	PUMP CORNELL MODEL	TURBINE CORNELL MODEL	ELECTRICAL
5	(2) 10RB	(T-1) 10TR1Y	480/3/60
		(T-2) 5TR1A	480/3/60

(6) END SUCTION PUMP: HORIZONTAL, CLOSE COUPLED, END SUCTION, CAST IRON BRONZE FITTED WITH CASING RINGS, SHAFT SLEEVES AND MECHANICAL SEAL. CASING SHALL BE VERTICALLY SPLIT WITH A MINIMUM WORKING PRESSURE OF 125 PSIG. IMPELLER SHALL BE SINGLE SUCTION ENCLOSED TYPE OF BRONZE CONSTRUCTION. SHAFT SHALL BE HIGH STRENGTH SAE 1045 CARBON STEEL. BEARING FRAME SHALL BE CAST IRON CONSTRUCTION PROVIDED WITH CATCH BASIN RESERVOIR WITH TAPPED DRAIN HOLE TO COLLECT AND PIPE AWAY MECHANICAL SEAL LEAKAGE. FURNISH ONE SPARE MECHANICAL SEAL. MOTOR SHALL BE 480 VOLT, 3 PHASE, 60 HERTZ. AURORA OR APPROVED EQUAL.

SYMBOL	GPM	HEAD, FT.	MOTOR HP	RPM	EFFICIENCY	AURORA SERIES 340	SERVICE
6	140	30	2	1,750	63%	2-1/2x3x7A	FILTER PUMP

(7) FILTER: MULTI-MEDIA SIDESTREAM FILTER, MANUAL BACKWASH AND RINSE, GRADED FILTER MEDIA SELECTED TO MATCH PROJECT REQUIREMENTS. CARBON STEEL TANK 42" DIAMETER X 66" HIGH WITH EPOXY COATING, BOLTED STEEL SKID BASE, ON 4" CONCRETE HOUSEKEEPING PAD, ACCESS MANHOLE, 100 PSI WORKING PRESSURE NON-CODE, DESIGN FLOW RATE 140 GPM. TEN MICRON PARTICLE REMOVAL. HYDRO-MAX MODEL NM-42 OR APPROVED EQUAL.

(8) CARTRIDGE FILTER: GLASS REINFORCED POLYMER CYLINDER WITH PVC HEAD AND BASE, STAINLESS STEEL COVER BOLTS, O-RING SEALS, FILTER CARTRIDGE - CONTINUOUS STRAND POLY-PROPYLENE MATERIAL, 1 MICRON PARTICLE REMOVAL, 28 GPM. EDEN MODEL EXCEL 12-EFC2-2C150 OR APPROVED EQUAL.

(9) TANK WATER TREATMENT SYSTEM: SINGLE TANK DESIGN FOR SINGLE CHEMICAL PREVENTION OF CORROSION AND SCALE IN TANK WATER WITHOUT THE USE OF ACIDS OR CHROMATE COMPOUNDS. SYSTEM SHALL INCLUDE ONE INHIBITOR CHEMICAL FEED PUMP AND TANK ASSEMBLY, POSITIVE DISPLACEMENT DIAPHRAGM, AND PRECISION FEED PUMP WITH PVC LIQUID HANDLING PARTS FOR USE WITH 115 VOLT POWER AND MOUNTED ON TOP OF A 50 GALLON POLYETHYLENE TANK ASSEMBLY (MOUNTED ON A 4" CONCRETE HOUSEKEEPING PAD). PROVIDE AN INJECTION SYSTEM ASSEMBLY FOR FEEDING TREATMENT INTO THE TANK WATER CIRCULATING LINE. FURNISH SOLENOID VALVE 1" SIZE. PROVIDE A TEST SET IN WALL MOUNTED CABINET WITH ALL NECESSARY COMPONENTS TO TEST FOR CHLORIDE, HARDNESS, AND INHIBITOR RESIDUAL, AND A TEST METER TO MEASURE TOTAL DISSOLVED SOLIDS.

(10) SUMP PUMP: SUBMERSIBLE DUPLEX ARRANGEMENT WITH SUMP SIZED AS SCHEDULED BELOW, FABRICATED OF FIBERGLASS WITH STEEL SUMP COVER WITH (2) 20" ACCESS OPENINGS, (1) INSPECTION OPENING, SIDE INLET, 4" VENT, 6" INLET, 3" DISCHARGE FLANGES, HIGH WATER ALARM WITH CONTACTS FOR REMOTE ALARM LOCATED IN CENTRAL PLANT, FLOAT AND FLOAT SWITCH, MECHANICAL ALTERNATOR, FACTORY WIRED MAGNETIC STARTERS AND SAFETY SWITCHES. CAPACITIES OF EACH PUMP SHALL BE AS SCHEDULED BELOW. KENCO MODEL T-36 OR EQUAL BY YEOMAN, WEINMAN, OR APPROVED EQUAL.

SYMBOL	SUMP DIA., IN.	SUMP DEPTH	PUMP GPM	HEAD, FT.	MOTOR HP	RPM	POWER	SERVICE
10	48	8	125	33	3	1,725	480/3/60	EQUIPMENT GALLERY

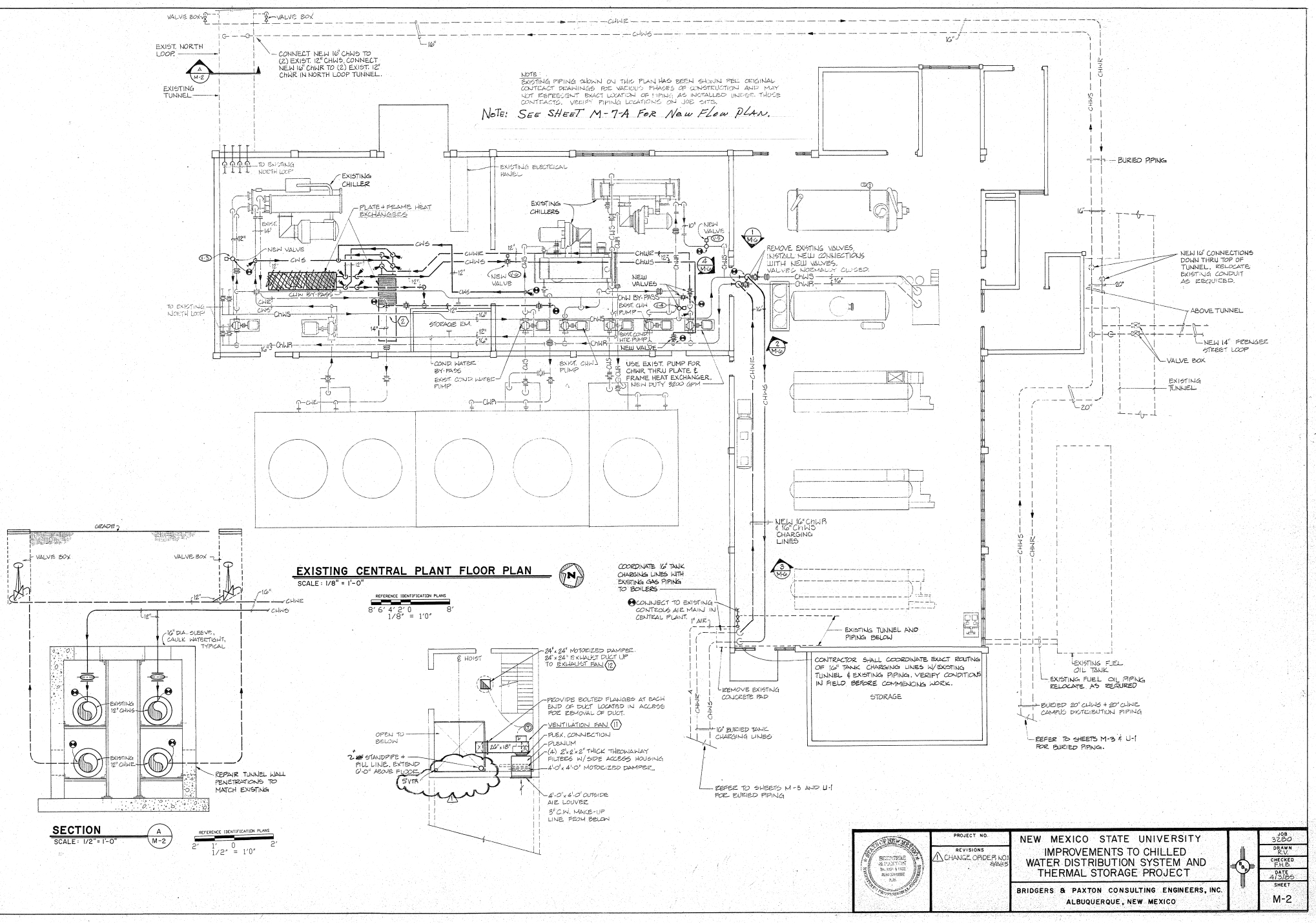
PROJECT NO.

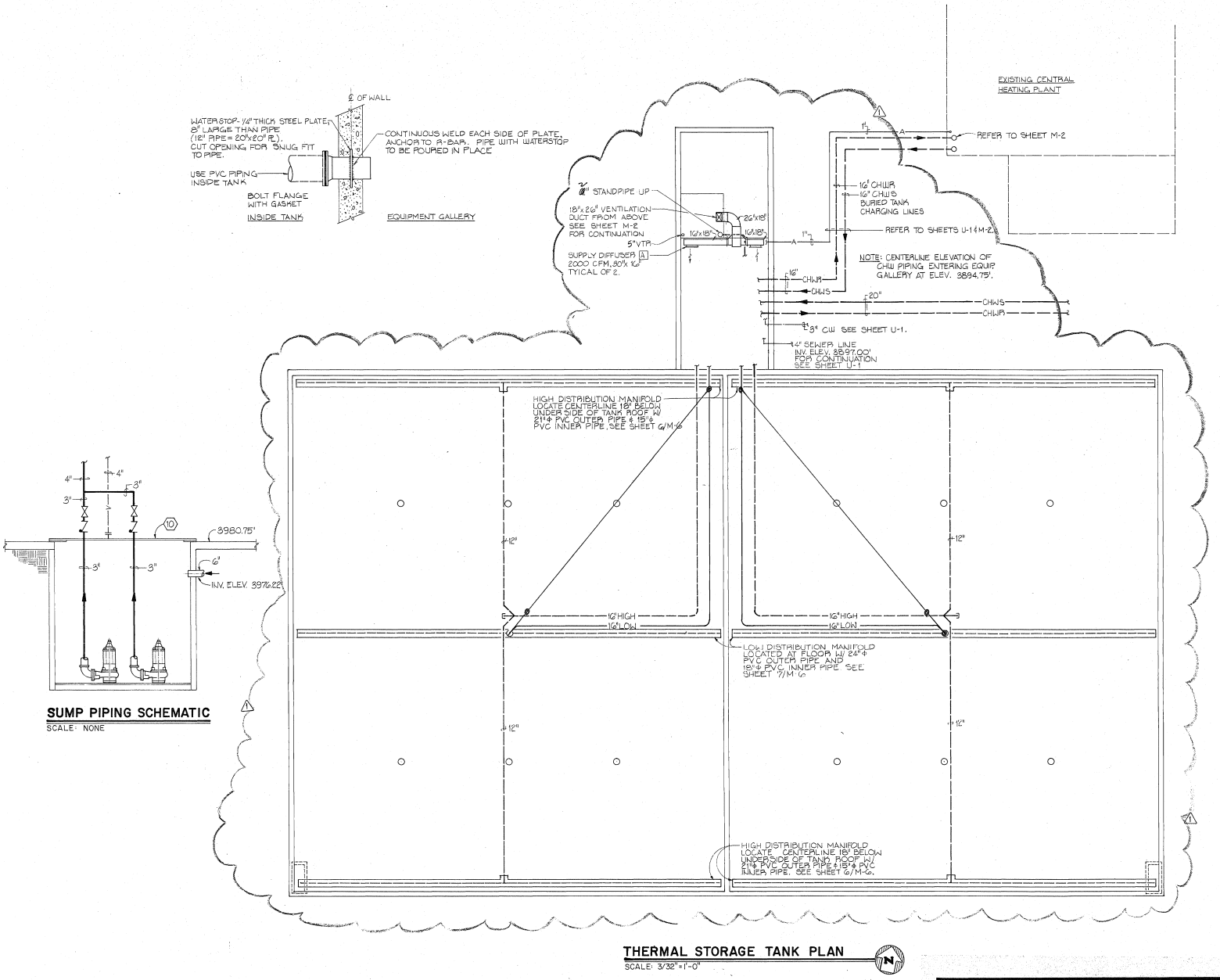
REVISIONS
1 ADDENDUM NO. 2 8/8/85

NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

JOB 3280
DRAWN BHF
CHECKED PHB
DATE 5/8/85
SHEET M-1

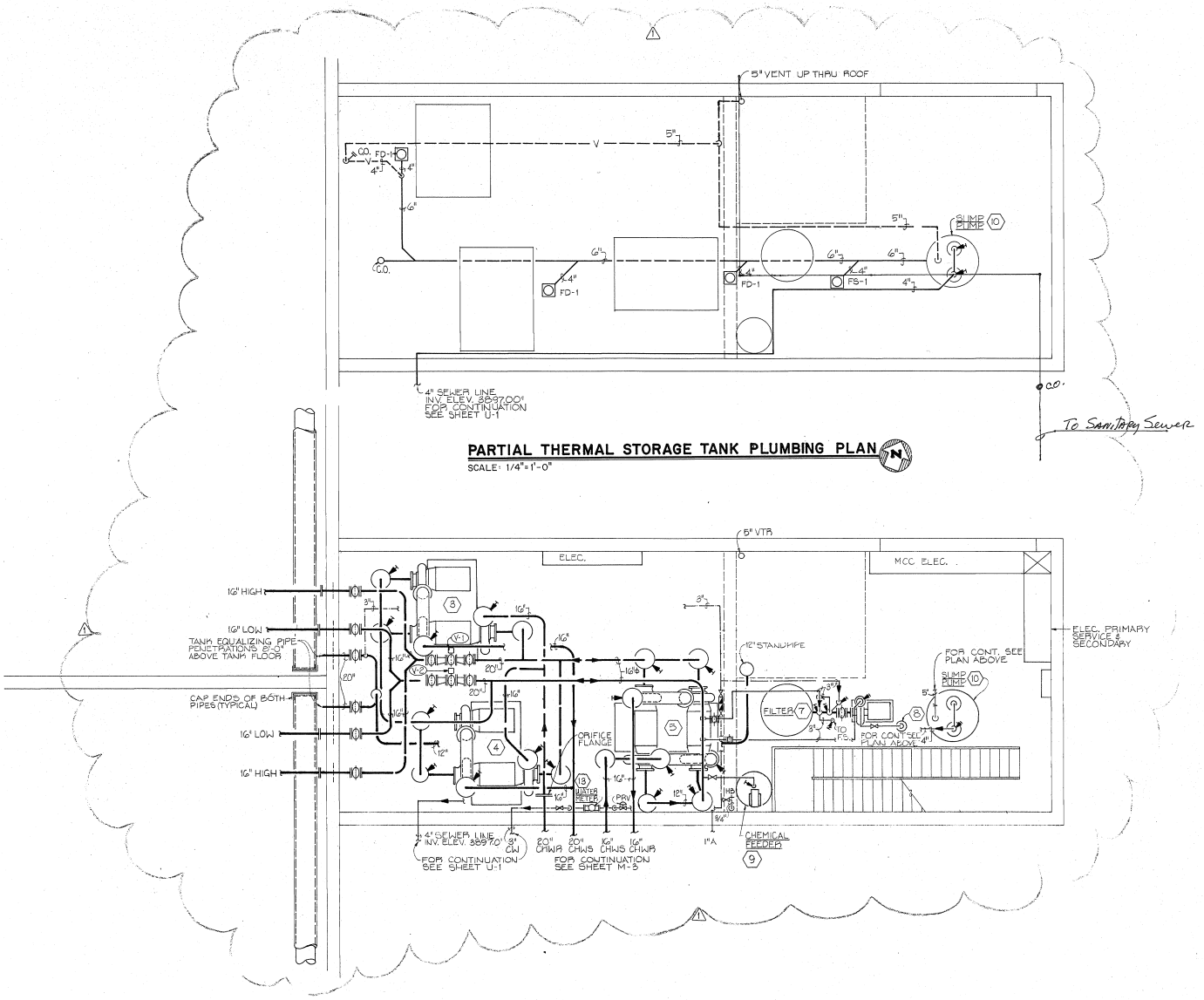

EXISTING CENTRAL PLANT FLOOR PLAN
SCALE: 1/8" = 1'-0"
NOTE: EXISTING PIPING SHOWN ON THIS PLAN HAS BEEN SHOWN PER ORIGINAL CONTRACT DRAWINGS FOR VARIOUS PHASES OF CONSTRUCTION AND MAY NOT REPRESENT EXACT LOCATION OF PIPING AS INSTALLED UNDER THOSE CONTRACTS. VERIFY PIPING LOCATIONS ON JOB SITE.
NOTE: SEE SHEET M-7A FOR NEW FLOW PLAN.
VALVE BOX
EXIST. NORTH LOOP
EXISTING TUNNEL
CONNECT NEW 16" CHWS TO (2) EXIST. 12" CHWS, CONNECT NEW 16" CHWR TO (2) EXIST. 12" CHWR IN NORTH LOOP TUNNEL.
TO EXISTING NORTH LOOP
EXISTING CHILLER
PLATE & FRAME HEAT EXCHANGERS
EXISTING ELECTRICAL PANEL
EXISTING CHILLERS
NEW VALVE
CHW BY-PASS
STORAGE EXT.
COND. WATER BY-PASS
EXIST. COND WATER PUMP
EXIST. CHW PUMP
EXIST. CONDENSATE PUMP
NEW VALVE
USE EXIST. PUMP FOR CHWR THRU PLATE & FRAME HEAT EXCHANGER. NEW DUTY 2200 GPM
REMOVE EXISTING VALVES, INSTALL NEW CONNECTIONS WITH NEW VALVES. VALVES NORMALLY CLOSED.
BURIED PIPING
NEW 16" CONNECTIONS DOWN THRU TOP OF TUNNEL. RELOCATE EXISTING CONDUIT AS REQUIRED.
ABOVE TUNNEL
NEW 14" FRENGER STREET LOOP
VALVE BOX
EXISTING TUNNEL
NEW 16" CHWR & 16" CHWS CHARGING LINES
COORDINATE 16" TANK CHARGING LINES WITH EXISTING GAS PIPING TO BOILERS
CONNECT TO EXISTING CONTROLS AIR MAIN IN CENTRAL PLANT.
EXISTING TUNNEL AND PIPING BELOW
CONTRACTOR SHALL COORDINATE EXACT ROUTING OF 16" TANK CHARGING LINES W/EXISTING TUNNEL & EXISTING PIPING. VERIFY CONDITIONS IN FIELD BEFORE COMMENCING WORK.
STORAGE
REMOVE EXISTING CONCRETE PAD
16' BURIED TANK CHARGING LINES
REFER TO SHEETS M-3 AND U-1 FOR BURIED PIPING
EXISTING FUEL OIL TANK
EXISTING FUEL OIL PIPING RELOCATE AS REQUIRED
BURIED 20" CHWS & 20" CHWR CAMPUS DISTRIBUTION PIPING
REFER TO SHEETS M-3 & U-1 FOR BURIED PIPING.
REFERENCE IDENTIFICATION PLANS
8' 6' 4' 2' 0 8'
1/8" = 1'0"
SECTION
SCALE: 1/2" = 1'-0"
A M-2
GRADE
VALVE BOX
16" DIA. SLEEVE, CAULK WATERTIGHT, TYPICAL
EXISTING 12" CHWS
EXISTING 12" CHWR
REPAIR TUNNEL WALL PENETRATIONS TO MATCH EXISTING
6" HOIST
24"x24" MOTORIZED DAMPER. 24"x24" EXHAUST DUCT UP TO EXHAUST FAN (12)
PROVIDE BOLTED FLANGES AT EACH END OF DUCT LOCATED IN ACCESS FOR REMOVAL OF DUCT.
VENTILATION FAN (11)
FLEX. CONNECTION
PLENUM
(4) 2"x2"x2" THICK THROWAWAY FILTERS W/ SIDE ACCESS HOUSING
4'-0"x 4'-0" MOTORIZED DAMPER
OPEN TO BELOW
2" ø STANDPIPE & FILL LINE, EXTEND 0'-0" ABOVE FLOOR
5'VTR
4'-0"x 6'-0" OUTSIDE AIR LOUVER
3" C.W. MAKE-UP LINE FROM BELOW
PROJECT NO.
REVISIONS
CHANGE ORDER NO.1 6/6/85
NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT
BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO
JOB 3280
DRAWN R.V.
CHECKED F.H.B.
DATE 4/3/85
SHEET M-2



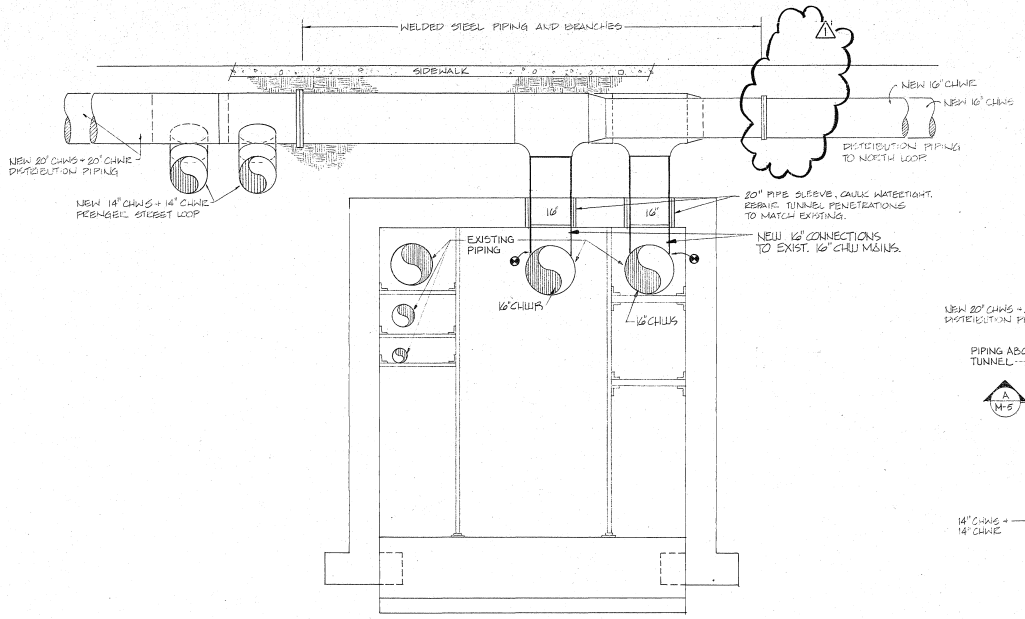
SUMP PIPING SCHEMATIC
SCALE: NONE

THERMAL STORAGE TANK PLAN
SCALE: 3/32"=1'-0"

PROJECT NO.	NEW MEXICO STATE UNIVERSITY	JOB 3280	
REVISIONS ⚠1 CHANGE ORDER NO.1 8/8/85	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	DRAWN PPS	
	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	CHECKED EHB	
		DATE 8/8/85	
		SHEET M-3	



PROJECT NO.	NEW MEXICO STATE UNIVERSITY	JOB 3280
REVISIONS ⚠1 CHANGE ORDER NO.1 8/8/85	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	DRAWN RWB
		CHECKED FHB
	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	DATE 8/8/85
		SHEET M-4



SECTION

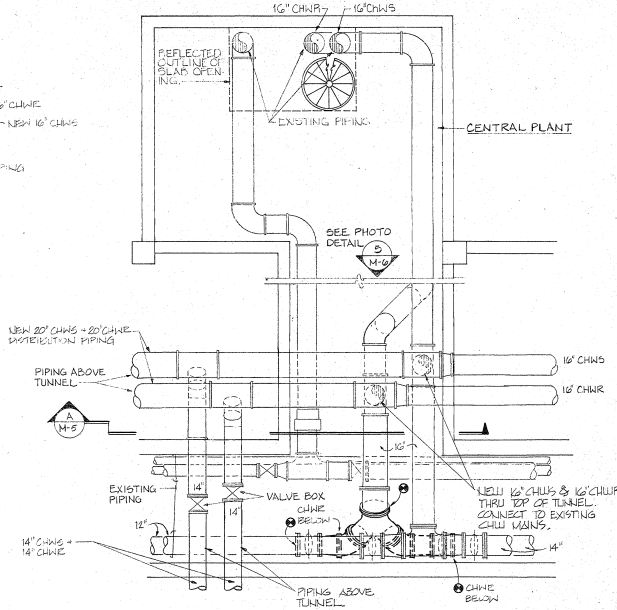
SCALE: 1/2"=1'-0"

A M-6

REFERENCE IDENTIFICATION PLANS

2' 1' 0 2'

1/2" = 1'0"



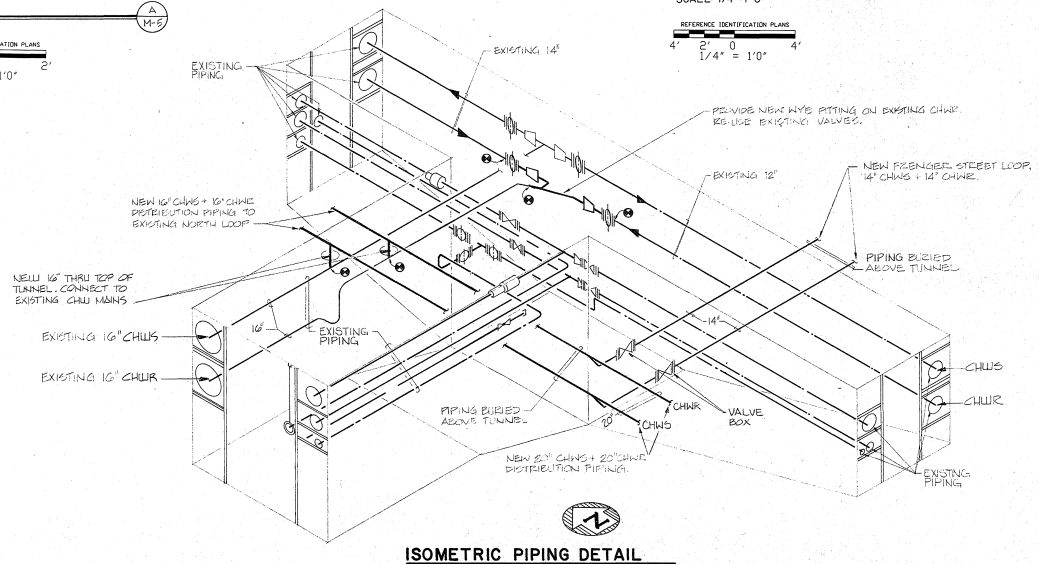
TUNNEL PLAN

SCALE: 1/4"=1'-0"

REFERENCE IDENTIFICATION PLANS

4' 2' 0 4'

1/4" = 1'0"



ISOMETRIC PIPING DETAIL

SCALE: NONE

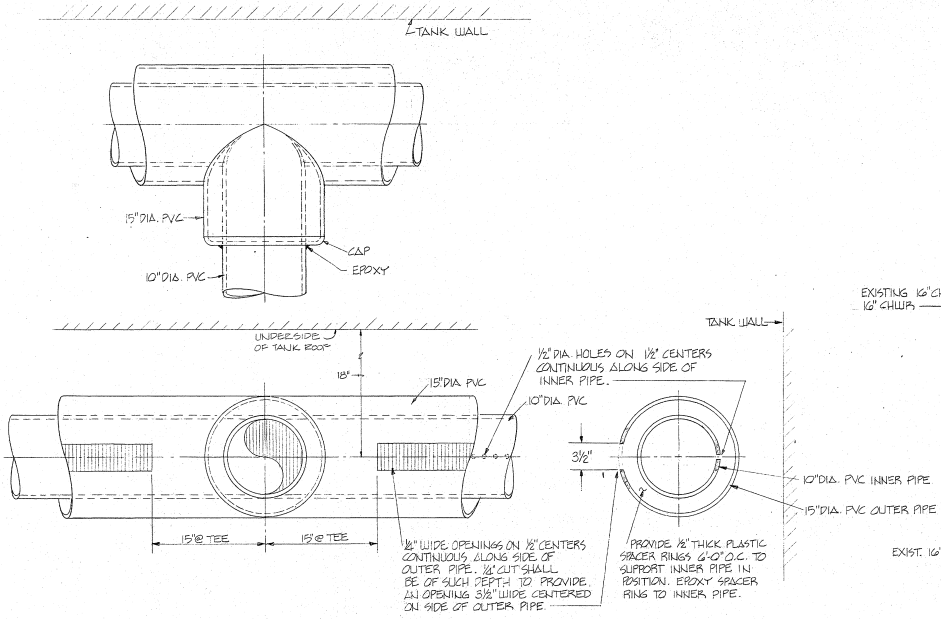
PROJECT NO.

REVISIONS
1 ADDENDUM 6/11/85

NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

JOB 3280
DRAWN RS/RV
CHECKED PHE
DATE 4/3/85
SHEET M-5



HIGH PIPE DISTRIBUTION MANIFOLD DETAILS (6 / M-6)

SCALE : 1-1/2" = 1'-0"

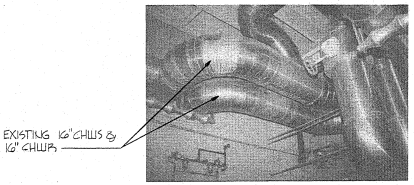


PHOTO DETAIL (4 / M-6)

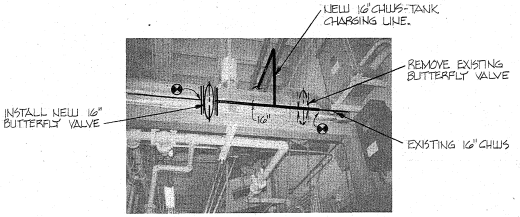


PHOTO DETAIL (1 / M-6)

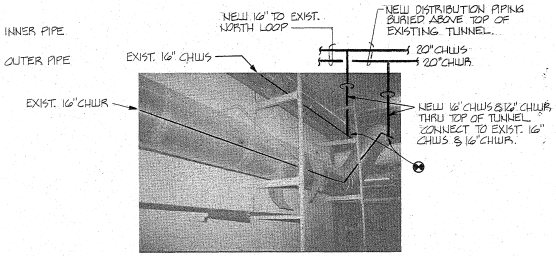


PHOTO DETAIL (5 / M-6)

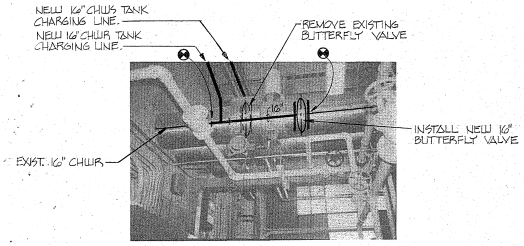


PHOTO DETAIL (2 / M-6)

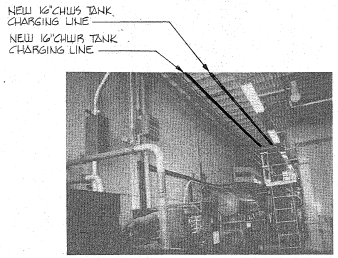
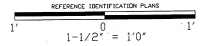
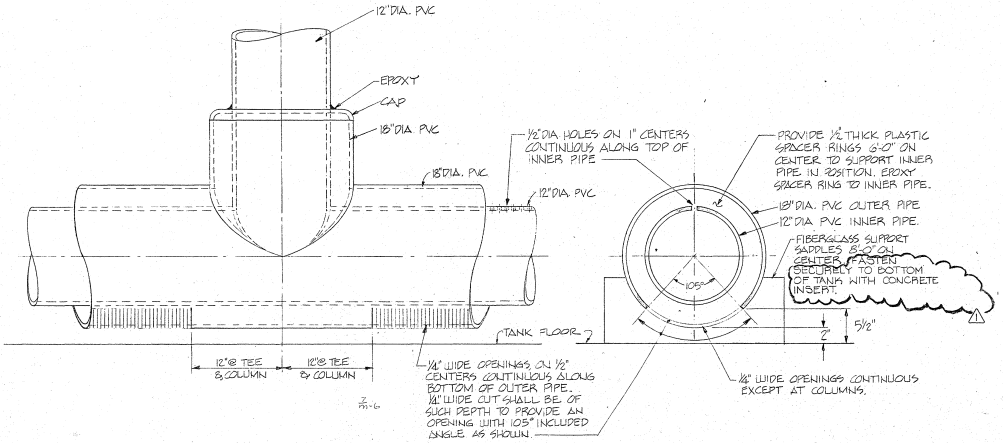


PHOTO DETAIL (3 / M-6)

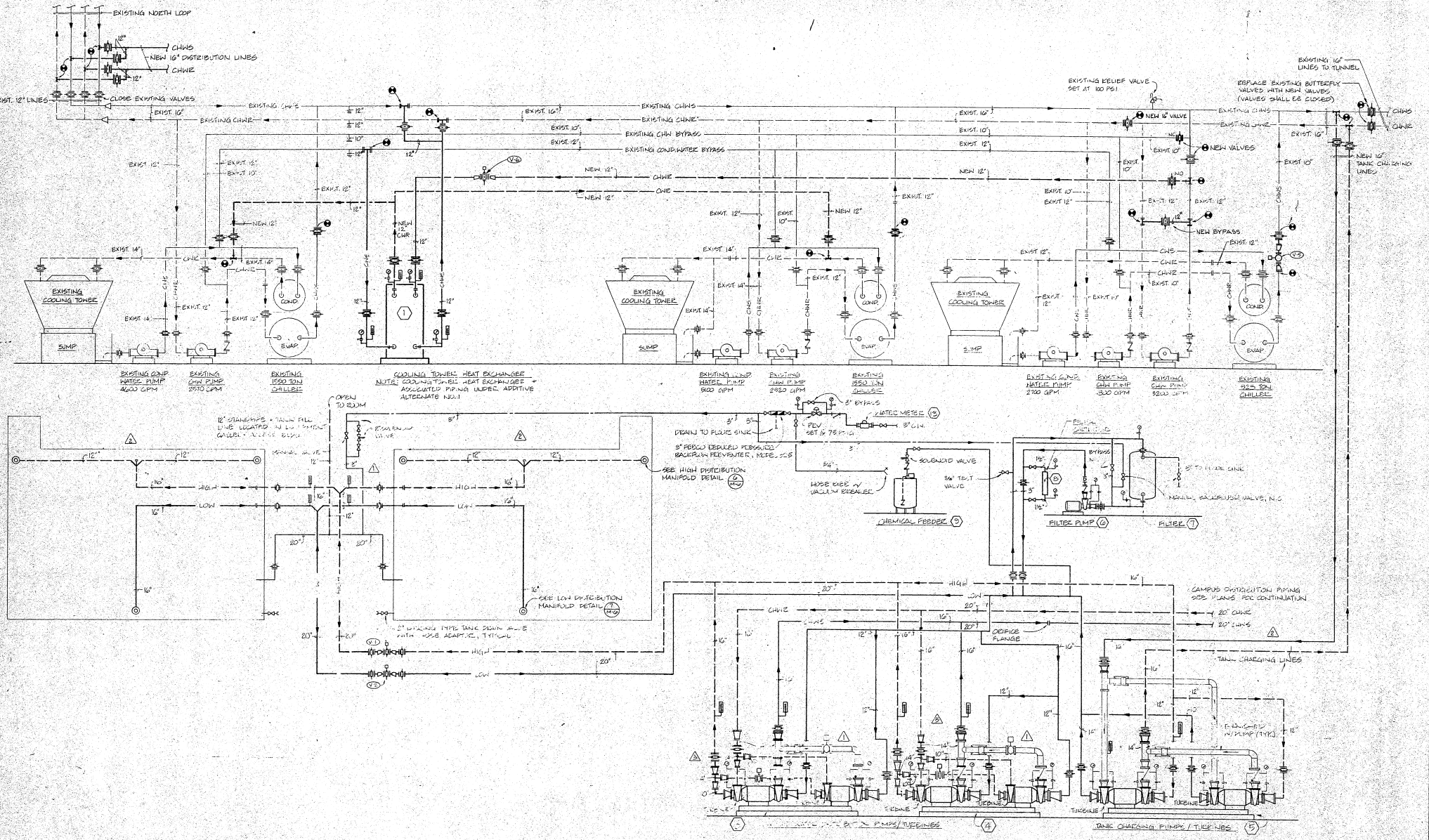




LOW PIPE DISTRIBUTION MANIFOLD DETAIL (7 / M-6)

SCALE : 1-1/2" = 1'-0"

PROJECT NO.	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT		JOB 3280
REVISIONS ⚠1 ADDENDUM NO. 2 8/8/86	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO		DRAWN M.A.S.
			CHECKED F.H.B.
			DATE 6/2/86
			SHEET M-6



CHILLED WATER PIPING SCHEMATIC

SCALE: NONE

PIPING LEGEND

EXISTING PIPING TO BE REMOVED

NEW PIPING TO BE INSTALLED

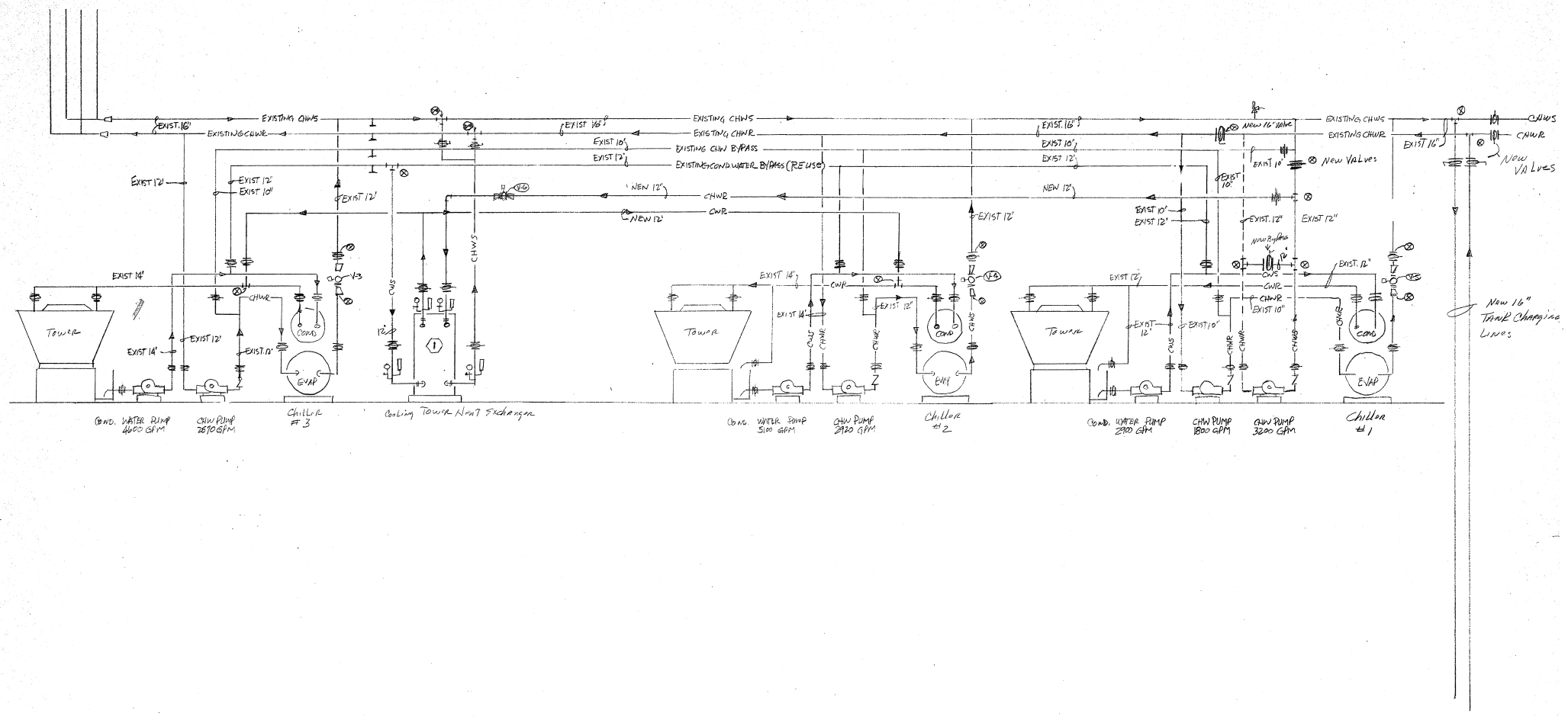
NEW CONNECTION TO EXISTING

PROJECT NO.	
REVISIONS	
1 ADDENDUM NO. 1	8/8/85
2 CHANGE ORDER NO. 1	8/8/85
3 REVISION NO. 3	10/7/85
4 "AS BUILT"	3/12/87

NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

JOB	3280
DRAWN	EMK
CHECKED	FHD
DATE	9/6/85
SHEET	M-7

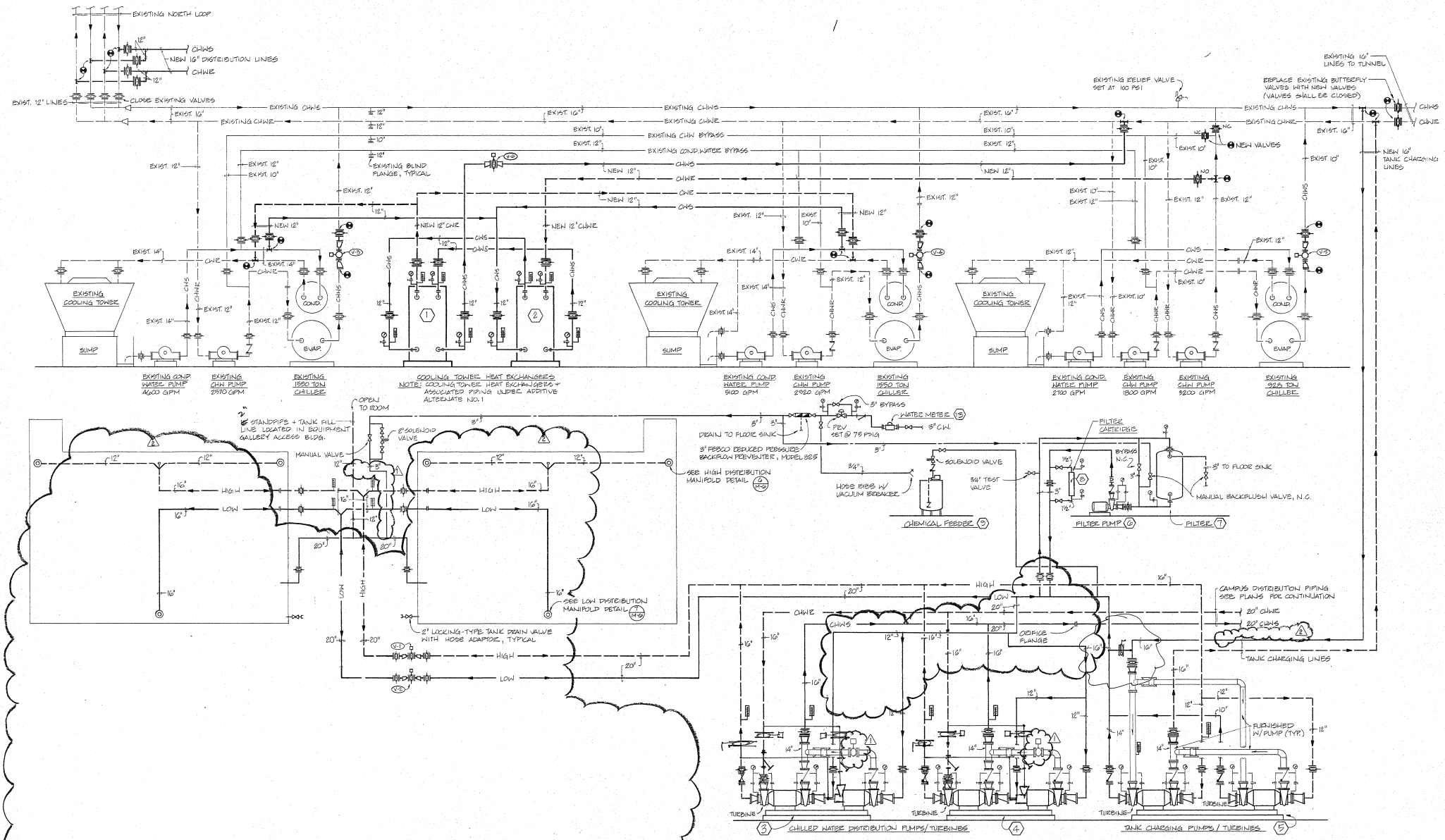


CHILLED WATER PIPING SCHEMATIC
SCALE: NONE

⊗ NEW CONNECTION TO EXISTING

COOL POOL – AS BUILT – 7-1-86

SHEET M-7-A



CHILLED WATER PIPING SCHEMATIC

SCALE: NONE

PIPING LEGEND

- EXISTING PIPING + EQUIPMENT
- NEW PIPING + EQUIPMENT
- NEW CONNECTION TO EXISTING

PROJECT NO.

REVISIONS

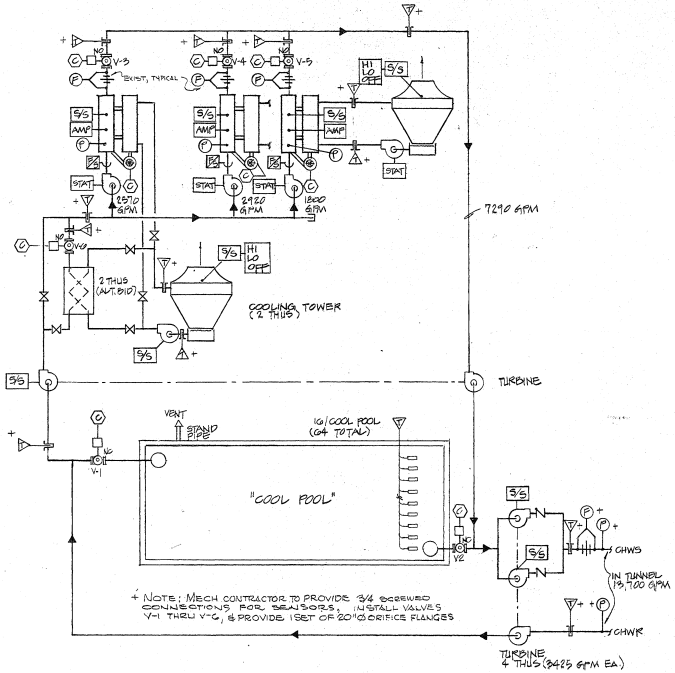
1. ADDENDUM NO. 1 8/5/85
2. CHANGE ORDER NO. 1 8/6/85

NEW MEXICO STATE UNIVERSITY

IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

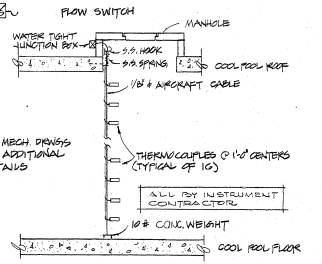
BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

JOB 5280
DRAWN EMK
CHECKED PHB
DATE 5/10/85
SHEET M-7



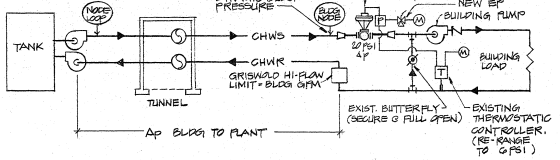
SCHEMATIC OF COOL POOL SENSOR LOCATIONS

SYMBOL	DESCRIPTION TEMPERATURE
	FLOW (GPM)
	MODULATING CONTROL
S/S	START/STOP/STATUS
STAT	STATUS
AMP	AMPS/KW/KWH
	PRESSURE
	FLOW SWITCH



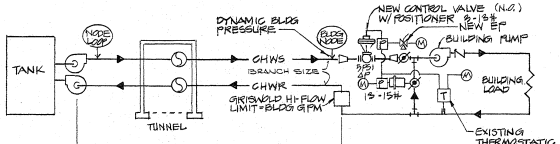
DETAIL OF COOL POOL SENSOR MOUNTING

NO SCALE



SCHEMATIC OF PROPOSED BUILDING MODS (32 THUS)

BUILDINGS: 10, 22, 30, 32, 33, 34, 50, 60, 63, 126, 172, 184, 187, 188, 189, 220, 244, 249, 250, 263, 276, 278, 287, 288, 301, 321, 333, 343, 364, 368, 386, 389 (VALVE INSTALLATION BY MECH. CONTRACTOR.)



SCHEMATIC OF PROPOSED BUILDING MODS (7 THUS)

BUILDINGS: 184, 226, 260, 275, 284, 285, 335
VALVE INSTALLATION BY MECH CONTRACTOR

SYSTEM SUMMARY

SYSTEM	DIGITAL OUT (DO) START/STOP	DIGITAL OUT (DO) S/S, RESTART	DIGITAL IN (DI) STATUS	DIGITAL IN (DI) ALARMS KW	DIGITAL IN (DI) ALARMS CHILLER TEMP	DIGITAL IN (DI) ALARMS LEVEL	ANALOG IN (AI) OSA	ANALOG IN (AI) OS HUMID	ANALOG IN (AI) WATER TEMP	ANALOG IN (AI) FLOW	ANALOG IN (AI) PRESSURE	ANALOG OUT (AO) DDC/SYSPSI	ANALOG OUT (AO) LEVEL	ANALOG OUT (AO) INLET VANES	SOFTWARE TIME	SOFTWARE CONTROL	SOFTWARE DEMAND	SOFTWARE ALARM	SOFTWARE PROGRAM CHANGE
CHILLER NO 1	•		•	•	•	•			•	•		•		•		•		•	
COOLING TOWER	•[2]		•[2]						•[2]							•			
CHILLER NO 2	•		•	•	•	•			•	•		•		•		•	•	•	
COOLING TOWER	•[2]		•[2]						•[2]							•			
CHILLER NO 3	•		•	•	•	•			•	•		•		•		•	•	•	
COOLING TOWER	•[2]		•[2]						•[2]							•			
COOL POOLS	•	•	•			•	•			•[34]			•	•		•		•	•
SYSTEM PUMPS	•[2]		•[2]			•	•	•	•	•[2]	•[2]			•		•		•	
HEAT EXCH.									•							•			
SUB TOTALS	12	1	18	3	3	5	1	1	16	4	2	8	1	3					
SYSTEM TOTAL	13		30				84					12							

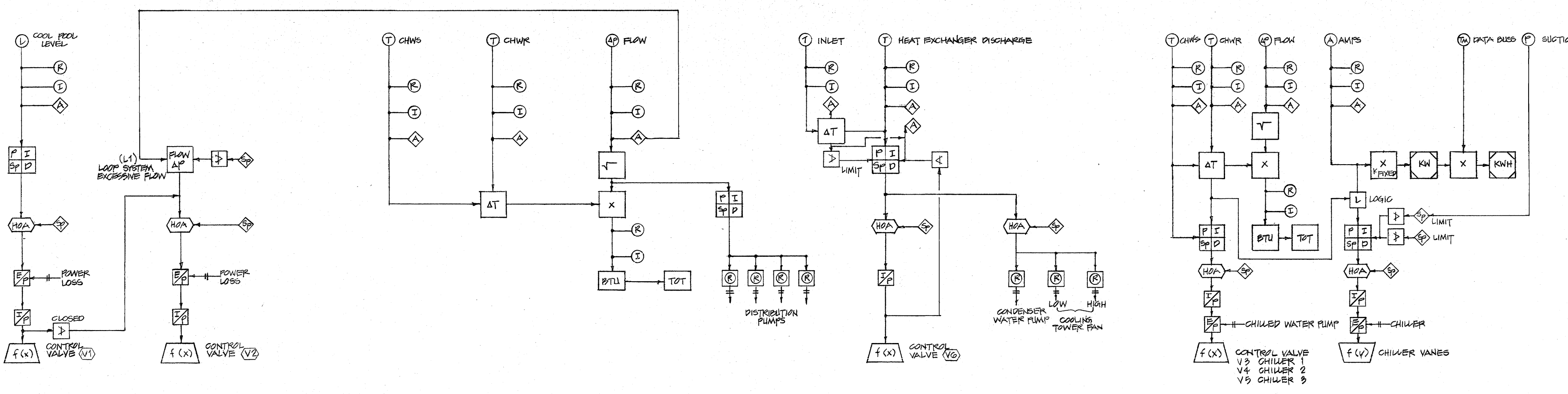
N.M.S.U. "COOL POOL" SCHEDULE

BLDG NO.	BUILDING NAME	FLOW NODE	FLOW GPM	BRANCH SIZE	DESIGN BLDG PRESS.	DESIGN Δp BLDG TO PLANT	DESIGN Δp FOR VALVE	DESIGN Cv	VALVE SIZE	VALVE #	ACTUAL Δp FOR VALVE	ACTUAL Cv
364/65	ENGLISH/STEECH	33	180	4"	94.65	8.85	85.80	19	2"	V283	14.3	46.2
60	WILLIAMS	46	95	4"	98.90	9.60	84.80	11	1¼"	V283	25.0	18.7
33	MILTON	16	455	6"	81.64	21.80	59.78	60	4"	V297	22.0	94
285	CORBETT ADD'N / CORBETT ORIGINAL	17	220 / 370	4" / 6"	58.80	49.09	4.12	100 / 330	4 / 4	—	—	—
154	GARCIA ANNEX	18	100	4"	58.83	44.67	14.16	27	2"	V283	4.4	47
260	W.R.C.	19	415	6"	92.71	35.44	32.62	74	4"	V297	8.5	146
275	GARCIA	21	825	10"	64.63	38.87	25.76	1750	4"	S3200	9.3	415
338	ED. SERVICES	22	180	6"	62.09	41.41	20.68	40	2½"	V297	5.8	74
284	FAN AM	23	1470	12"	60.89	42.61	18.28	340	5"	S3200	6.0	597
263	P.S.L.	24	380	6"	94.87	8.63	86.24	35	2½"	V297	19.0	74
287	O'DONNELL	25	365	6"	93.92	9.58	84.34	89	2½"	V297	23.5	74
126	COMPUTER	43	104	6"	95.61	7.89	87.12	12	1¼"	V283	27.0	18.7
248	REGENTS & HEALTH	26	280	6"	85.23	18.27	66.96	82	2"	V283	33.5	46.8
184	BRELAND	28	400	8"	89.27	18.23	67.04	44	2½"	V 297	28.0	74
321	ACTIVITY CTR	29	415	6"	85.20	18.30	66.90	50	2½"	V297	32.0	74
226	WEST ALUMNI	30/31	182	6"	67.77	35.79	32.04	82	2"	—	—	—
244	AG & AG ADD'N	1	475	6"	98.19	11.31	86.88	61	6"	V297	24.0	94
368	KNOX	40	144	4"	97.99	6.17	91.16	15	1½"	V283	22.0	29.5
189	JETT ADD'N	2	570	6"	96.97	6.19	89.64	60	4"	V297	15.0	146
363	ENG/RG COMP.	41	80	5"	98.35	5.15	93.20	8.3	1¼"	V283	18.0	18.7
301	THOMAS-BROWN	3	304	6"	86.52	16.98	69.54	70	2½"	—	—	—
10	GODDARD	5			89.02	20.48	68.54					
276	WALDEN	34	203	4"	99.20	4.30	94.98	27	2"	V283	50.0	46.8
34	FOSTER ADD'N	6	315	6"	98.05	5.45	92.60	33	2½"	V297	19.0	74
32	YOUNG & LIB ADD'N	47	110	6"	97.81	5.69	92.12	12	1½"	V283	18.8	29.3
172	HADLEY	35	285	6"	97.22	6.28	90.94	25	2"	V283	22.0	46.8
389	NEW MUSIC	44	397	5"	85.15	18.35	66.80	40	4"	V297	19.0	74
187	CHEMISTRY ADD'N	9	530	6"	101.19	49.11	52.08	50	4"	V297	50.0	94
188	ORG. PHY & CHEM	8	417	6"	98.16	46.07	52.09	95	4"	V297	26.0	94
33	KENT	11	50	4"	92.53	42.43	52.10	6	4"	V283	18.5	11.7
386	NEW B.A.	42	150	5"	97.30	45.20	52.10	16	1½"	V283	25.0	29.3
56	DOVE	10	80	3"	92.96	40.87	52.09	9	3"	V283	17.2	18.7
288	GUTHERIE	7	293	6"	95.13	43.04	52.09	20	2"	V283	28.5	46.8
278	BRANSON HALL	SEE BELOW FOR ADDENDUM NO. 1 CHANGE										
225	ASTRONOMY		70	3"				17	1¼"			
249	THEATRE	15	160	3"	76.91	24.85	52.06	17	1½"	V283	29.0	29.3
250	OLD MUSIC	14	160	3"	80.38	28.32	52.06	17	1½"	V283	29.0	29.3
353	HARDMAN	38	190	4"	88.63	36.53	52.10	16	1½"	V283	23.0	29.3
	CENTRAL PLANT	800	13700	20"	103.30	47.75	4.0		12"	S3200		
278	ORIGINAL		1986					44	2"	V-283		
278	ADDITION #1		315					70	2½"	V-297		
278	ADDITION #2		180					40	2"	V-283		

NOTE!!

WORK SHOWN ON THIS DRAWING IS PAID FOR UNDER THE INSTRUMENT & CONTROLS ALLOWANCE, EXCEPT FOR SENSOR OPENINGS IN PIPE LINES & INSTALLATION OF ALL CONTROL VALVES V-1 THRU V-6 & BUILDING CONTROL VALVES SCHEDULED ABOVE.

PROJECT NO.	NEW MEXICO STATE UNIVERSITY		JOB 3280
REVISIONS ⚠ ADDENDUM NO. 1 8/26/85	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT		DRAWN BHP
	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO		CHECKED PHS
			DATE 5/20/85
			SHEET M-8

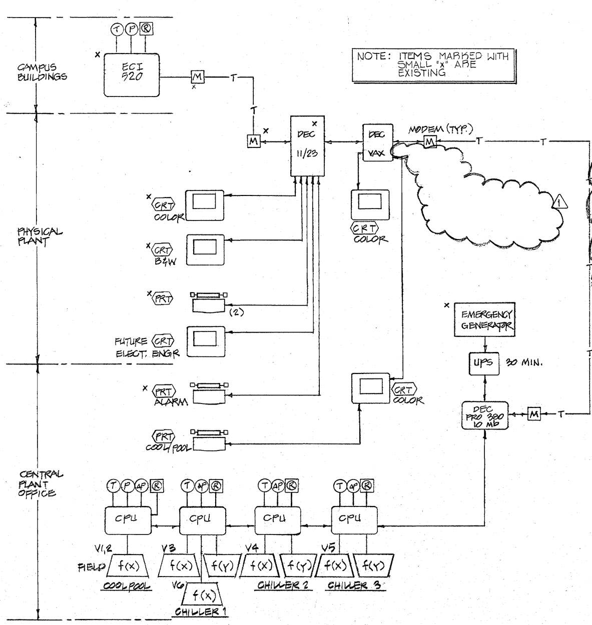


COOL POOL LEVEL/FLOW DIAGRAM
NO SCALE

LOOP SYSTEM
BTU/FLOW DIAGRAM
NO SCALE

HEAT EXCHANGER/FLOW DIAGRAM
NO SCALE

CHILLER/FLOW DIAGRAM
NO SCALE



CONTROL LOOP SYSTEM
NO SCALE

VALVE SCHEDULE					
SYMBOL	LINE SIZE	GPM	LOSS PSI	VALVE SIZE	VALVE TYPE
V-1	20"	13720	2.0	16"	OFFSET BUTTERFLY
V-2	20"	13720	0.60	16"	BUTTERFLY
V-3	12"	2570	4.2	6"	OFFSET BUTTERFLY
V-4	12"	2920	5.5	6"	OFFSET BUTTERFLY
V-5	12"	1800	2.2	6"	OFFSET BUTTERFLY
V-6	12"	3200	1.9	8"	OFFSET BUTTERFLY

SYMBOL LIST

	SYMBOL	DESCRIPTION		SYMBOL	DESCRIPTION
HARDWARE	L	LEVEL	SOFTWARE	TM	TIME
	P	PRESSURE		R	RECORD
	ΔP	DIFFERENTIAL PRESSURE		I	INDICATE
	T	TEMPERATURE		A	ALARM
	A	AMPS		√	SQUARE ROOT
	PF	POWER FACTOR		X	TIMER
	I/P	TRANSDUCER		ΔT	DIFFERENTIAL TEMPERATURE
	E/P	ELECTRIC/PNEUMATIC SWITCH		TOT	TOTALIZE
	f(x)	CONTROL VALVE		BTU	CALCULATE BTU'S
	f(y)	INLET VANE		KW	KILOWATT USAGE & DEMAND
	R	RELAY		KWH	KILOWATT HOUR
	M	MODEM		P I / SP D	PROPORTIONAL, INTEGRAL & DERIVATIVE CONTROL W/SET POINT
	CRT	CATHODE RAY TUBE (TV)			LIMIT CONTROL
	PRT	PRINTER		SP	SET POINT
	HOA	HAND-OFF-AUTO		L	LOGIC

NOTE!!
THE COST OF WORK DESCRIBED ON THIS SHEET OR DRAWINGS IS PAID FOR UNDER THE INSTRUMENT & CONTROLS ALLOWANCE OF THE CONTRACT.

PROJECT NO.
REVISIONS
1 ADDENDUM NO. 1 8/8/85

NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

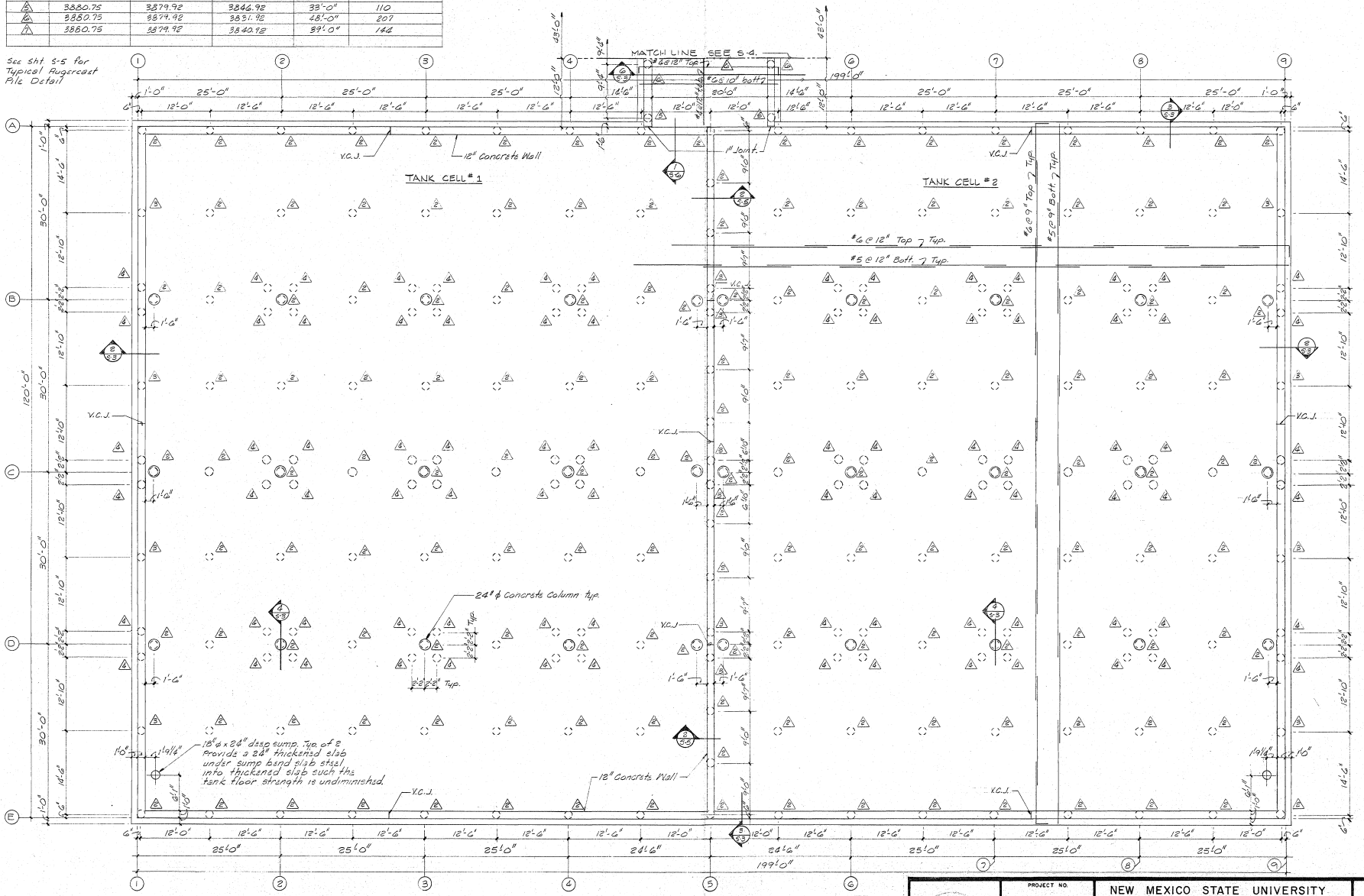
JOB 3250
DRAWN BYP
CHECKED FHE
DATE 5/20/85
SHEET M-9

16" ϕ AUGERCAST PILE SCHEDULE

MARK	TOP OF SLAB ELEV.	TOP OF PILE ELEV.	BOTT. OF PILE ELEV.	LENGTH	PILE CAPACITY (KIPS)
1	3880.75	3878.92	3818.92	60'-0"	320
2	3880.75	3878.92	3826.92	54'-0"	260
3	3880.75	3878.92	3830.92	48'-0"	207
4	3880.75	3878.92	3839.92	39'-0"	144
5	3880.75	3879.92	3846.92	33'-0"	110
6	3880.75	3879.92	3831.92	48'-0"	207
7	3880.75	3879.92	3840.92	39'-0"	144

Specifications for site grading contained in the Geotechnical Investigation Report are a part of the contract documents; and are a supplement to Section 0220 EARTHWORK.

See Sht S-5 for Typical Augercast Pile Detail



REFERENCE IDENTIFICATION PLANS
8' 6' 4' 2' 0 8'
1/8" = 1'0"

STORAGE TANK FOUNDATION & FLOOR PLAN

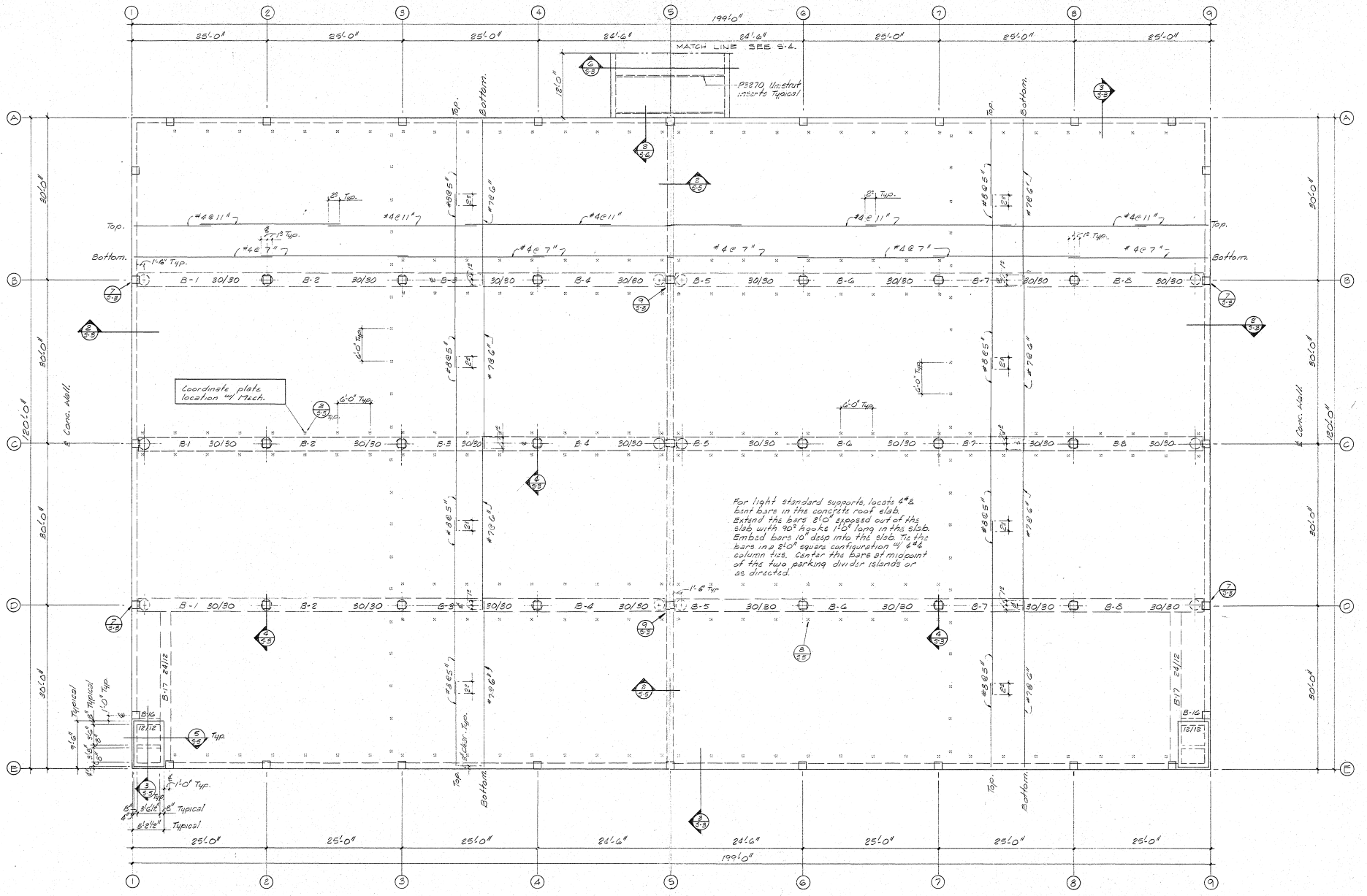
SCALE: 1/8"=1'-0" M.S.L. FIN. FLR. ELEV.=3880.75 REF.=0'0"

NORTH

Note: Contractor to submit locations of vcj's to Structural Engineer for approval

See Sht S-4 for Design Criteria.

PROJECT NO.	
REVISIONS	
NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	
BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	
JOB 3220	
DRAWN G.H.M. & D.A.L.	
CHECKED R.K.	
DATE 4/3/85	
SHEET S-1	



STORAGE TANK FRAMING PLAN

SCALE: 1/8" = 1'-0"

REFERENCE IDENTIFICATION PLANS

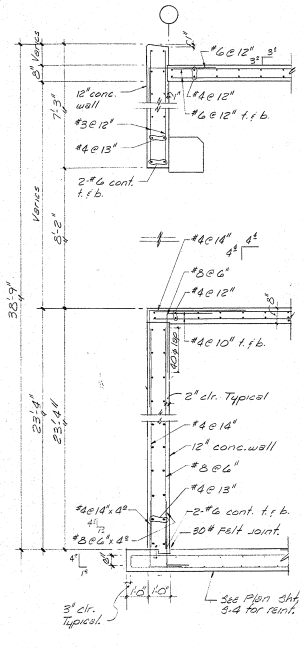
8' 6' 4' 2' 0 8'

1/8" = 1'0"

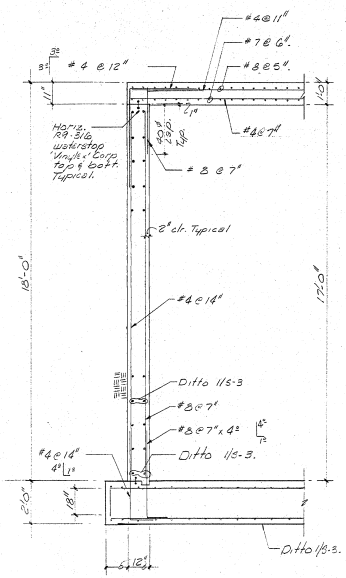
NORTH

REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO 9273

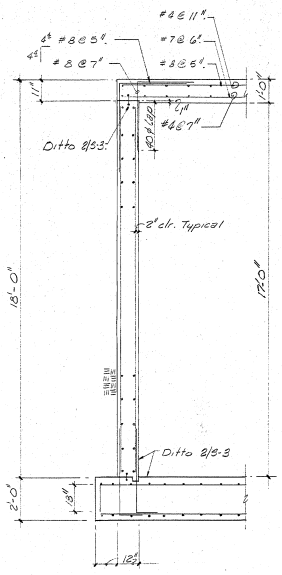
PROJECT NO.	NEW MEXICO STATE UNIVERSITY	JOB 3280
REVISIONS	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	DRAWN G.H.M./D.A.L.
	BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	CHECKED R.D.K.
		DATE 4/3/85
		SHEET S-2



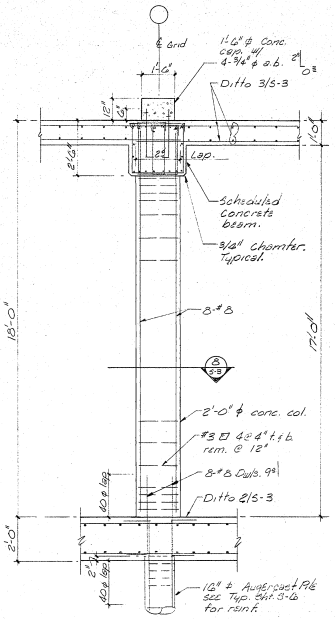
SECTION ① S-3
Scale: 3/8" = 1'-0"



SECTION ② S-3
Scale: 3/8" = 1'-0"



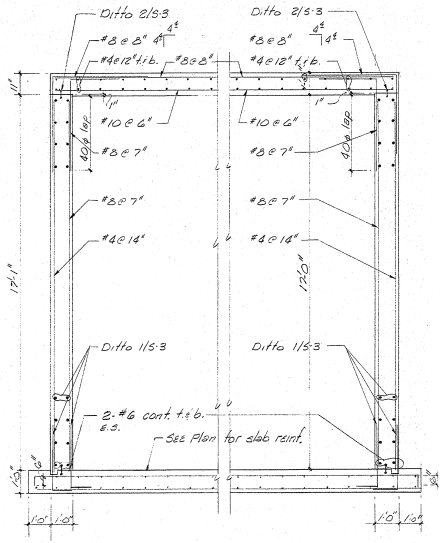
SECTION ③ S-3
Scale: 3/8" = 1'-0"



SECTION ④ S-3
Scale: 3/8" = 1'-0"

NOT USED

SECTION ⑤ S-3
Scale: 3/8" = 1'-0"



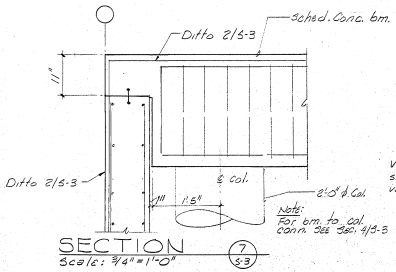
SECTION ⑥ S-3
Scale: 3/8" = 1'-0"

REFERENCE IDENTIFICATION PLANS
3' 2' 1' 0 3'
3/8" = 1'-0"

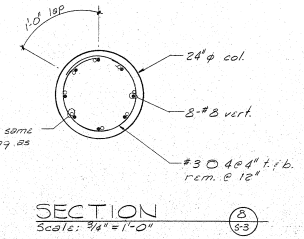
CONCRETE BEAM SCHEDULE

SPAN	① 25'-0"	② 25'-0"	③ 25'-0"	④ 24'-6"	⑤	⑤ 24'-6"	⑥ 25'-0"	⑦ 25'-0"	⑧ 25'-0"	⑨	13'-8"		11'-0"		11'-0"		12'-4"		26'-0"	
DESIG. & SIZE	o.f.	B-1 30/30	B-2 30/30	B-3 30/30	B-4 30/30	o.f.	B-5 30/30	B-6 30/30	B-7 30/30	B-8 30/30	o.f.	o.f.	B-9 12/24	o.f.	o.f.	B-10 12/16	o.f.	o.f.	B-11 12/24	o.f.	o.f.	B-12 12/16	o.f.	o.f.	B-13 16/24	o.f.
TOP		13 Typ.			8-#11					8-#11		2" Typ.	2-#6	2" Typ.	8" Typ.	(8-#6)	8" Typ.	2" Typ.	(8-#6)	2" Typ.	2" Typ.	(2-#6)	2" Typ.	2" Typ.	(#4@7")	
REINF.	2" Typ.	8-#11	12" Typ.	2-#4 cont. each face		13" Typ.	(8-#11) 2" Typ.	2-#4 cont. each face			12" Typ.		#4 cont. e.f.			2"		1" Typ.	#4 cont. e.f.	12" Typ.	1" Typ.			1" Typ.	#4 cont. e.f.	0" Typ.
BOTTOM	13 Typ.	8-#10	1" Typ.		8-#10	13 Typ.	1" Typ.		8-#10		2" Typ.	2-#6		2" Typ.	2-#6		2" Typ.	2-#6		2" Typ.	2-#6		2" Typ.	2-#6	
STIRRUPS	#4	10@6" rem.@13"	do.	do.	do.		10@6" rem.@13"	do.	do.	do.		#3 ☐ @ 6"		#3 ☐ @ 6"		@ 10"		#3 ☐ @ 6"		#3	@ 10"			#3	@ 10"	

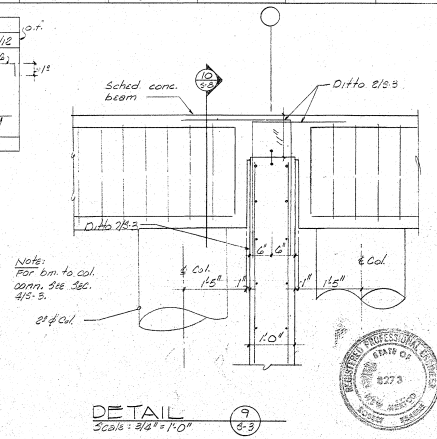
SPAN	22'-0"			6'-0"			6'-6½"		o.f.	31'-3"		o.f.
DESIG. & SIZE	o.f.	B-14 12/57	o.f.	o.f.	B-15 12/24	o.f.	o.f.	B-16 12/12	o.f.	o.f.	B-17 24/12	o.f.
TOP	2" Typ.	3-#9	2" Typ.	2" Typ.	2-#6	2" Typ.	2" Typ.	8-#6			4-#6	
REINF.	1" Typ.	#4 cont. e.f.	1" Typ.	1" Typ.	#4 cont. e.f.	1" Typ.	1" Typ.	2-#6			2-#6	
BOTTOM	8" Typ.	3-#9	8" Typ.	8" Typ.	2-#6	8" Typ.					4-#8	
STIRRUPS	#4	@ 12"		#3 ☐ @10"		#3 ☐	@ 6"		#3 ☐	@ 6"		



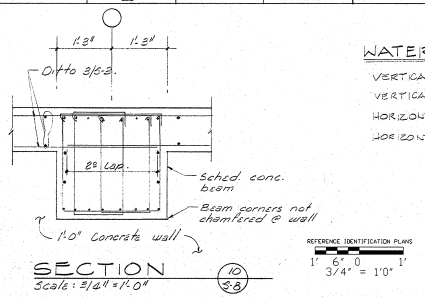
SECTION ⑦ S-3
Scale: 3/4" = 1'-0"



SECTION ⑧ S-3
Scale: 3/4" = 1'-0"



DETAIL ⑨ S-3
Scale: 3/4" = 1'-0"



SECTION ⑩ S-3
Scale: 3/4" = 1'-0"

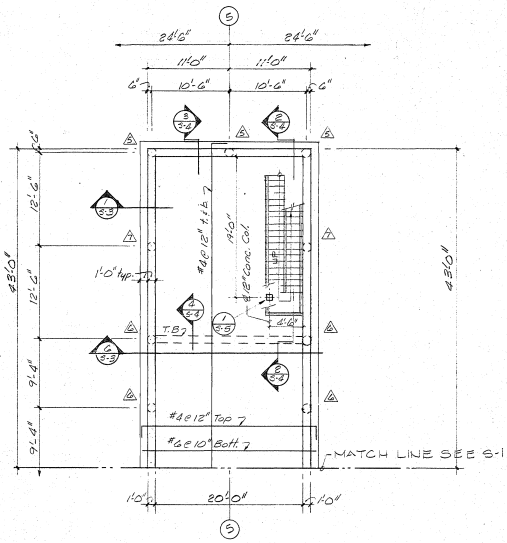
REFERENCE IDENTIFICATION PLANS
1' 6" 0 1'
3/4" = 1'-0"

WATERSTOP (TYPICAL

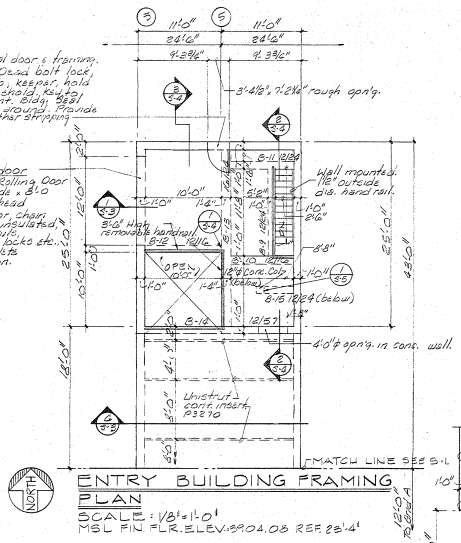
VERTICAL RSBA-12 VINYLEX CORP.	12" WALL
VERTICAL RSBG-12	8" WALL
HORIZONTAL R9-516	12" WALL
HORIZONTAL RG-38	8" WALL

	PROJECT NO.	NEW MEXICO STATE UNIVERSITY
	REVISIONS	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT
		BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO

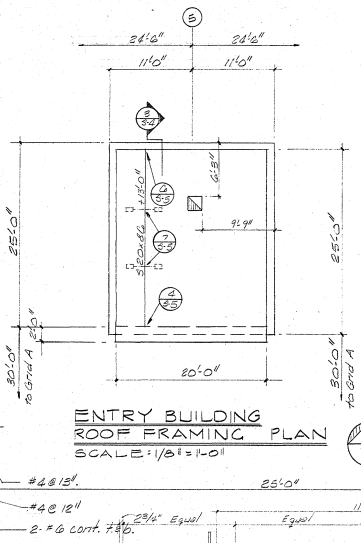
JOB	3280
DRAWN	
CHECKED	R.K.
DATE	4/3/18
SHEET	S-3



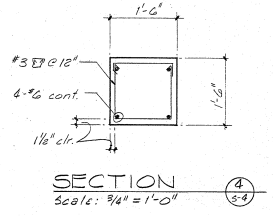
ENTRY BUILDING
FOUNDATION & FLOOR PLAN
SCALE: 1/8"=1'-0" MSL FIN. FLR ELEV=5880.75 REF:0.0'



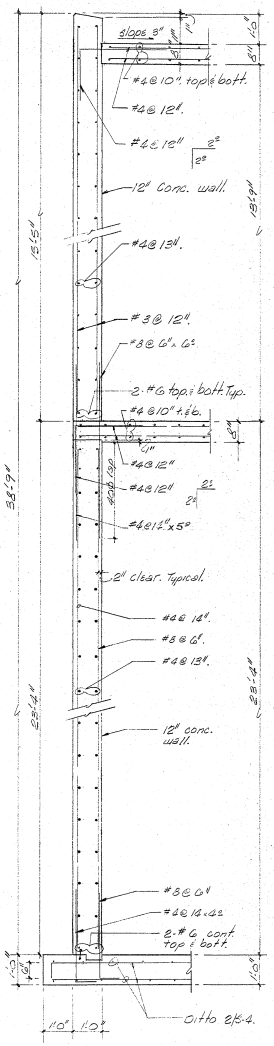
ENTRY BUILDING FRAMING PLAN
SCALE: 1/8"=1'-0"
MSL FIN. FLR. ELEV=5904.08 REF. 22'-4"



ENTRY BUILDING
ROOF FRAMING PLAN
SCALE: 1/8"=1'-0"



SECTION
Scale: 3/4" = 1'-0"

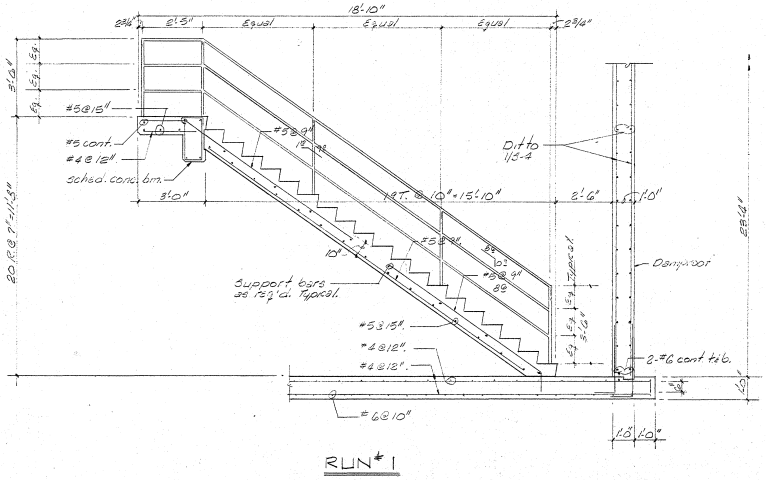


SECTION
Scale: 1/2" = 1'-0"

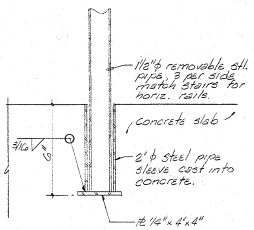
DESIGN CRITERIA	
* ROOF LIVE LOAD (Storage Tank)	323 PSF
* ROOF DEAD LOAD (Storage Tank)	130 PSF
ROOF LIVE LOAD (Stair Tower)	20 PSF
ROOF DEAD LOAD (Stair Tower)	105 PSF
FLOOR LIVE LOAD (Stair Tower)	150 PSF
FLOOR DEAD LOAD (Stair Tower)	105 PSF
WIND	UBC CODE 82
BASIC WIND SPEED	75 MPH
Ce: (0'-20') = 0.7	
PROJECTED AREA METHOD	
Cq: (0'-40') = 1.3 qs: 13 I = 1.00	
P: (0-20') = 14 PSF	

DESIGN CRITERIA CONTINUED	
CONCRETE	4000 PSI
REINF.	60 KSI
STRUCTURAL STEEL	36 KSI
SOIL BRNG. (SPREAD FTGS.)	
ROOF LIVE LOAD (Tunnel)	220 PSF
ROOF DEAD LOAD (Tunnel)	150 PSF

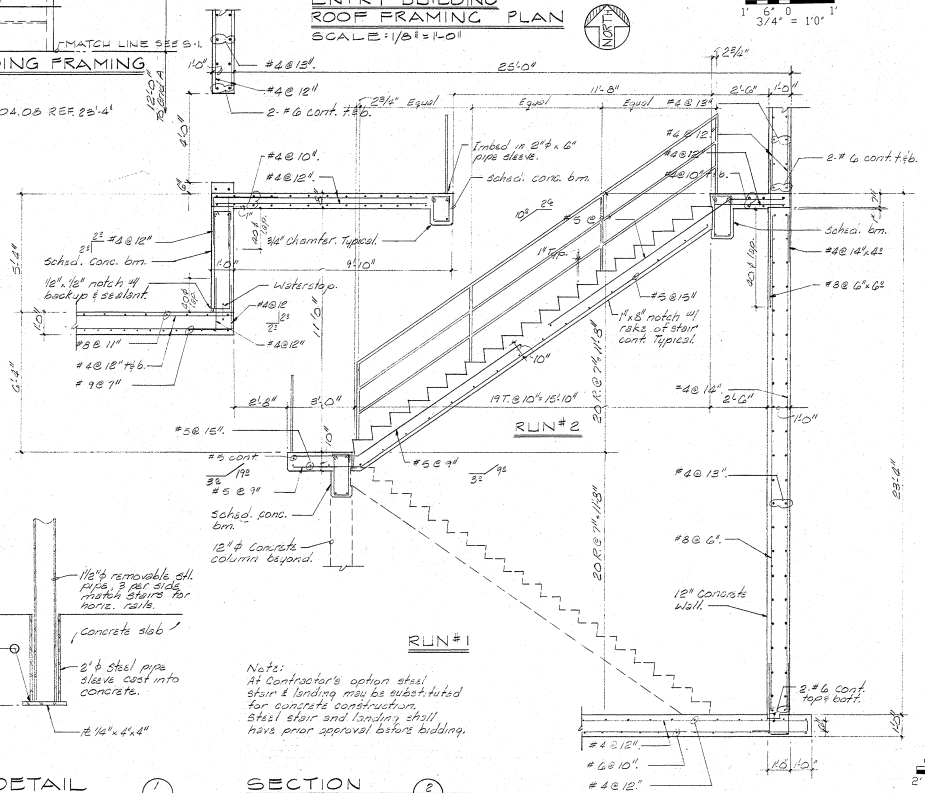
* Tank storage structure designed for future building loads.



RUN #1



DETAIL
Scale: 3/4"=1'-0"



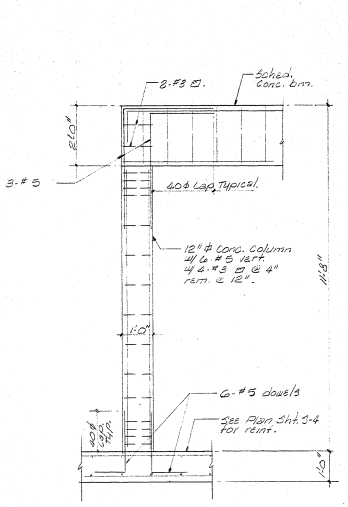
RUN #2

Note:
At Contractor's option steel stair & landing may be substituted for concrete construction. Steel stair and landing shall have prior approval before bidding.

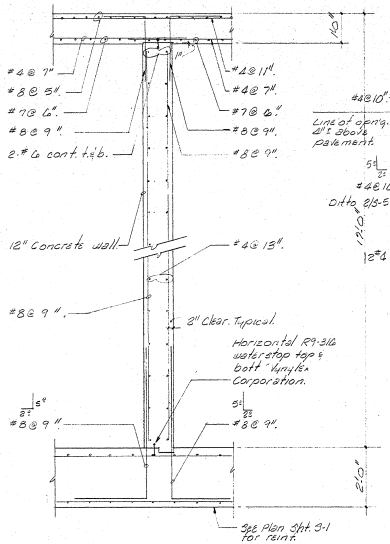
SECTION
Scale: 1/4"=1'-0"

	PROJECT NO.	NEW MEXICO STATE UNIVERSITY
	REVISIONS	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT
		BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO

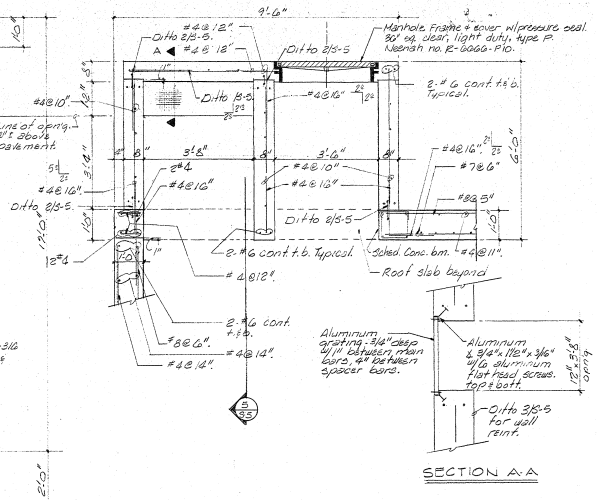
JOB 3280
DRAWN
CHECKED
DATE 4/3/85
SHEET S-4



DETAIL 1 S-5
Scale: 1/2" = 1'-0"

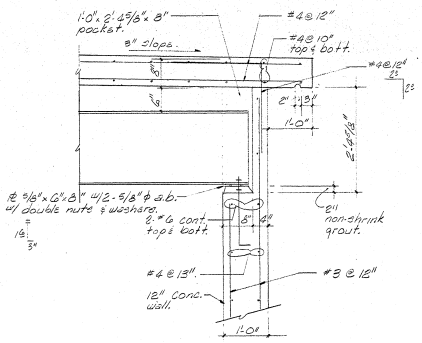


SECTION 2 S-5
Scale: 1/2" = 1'-0"

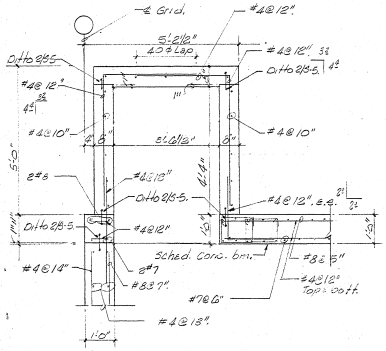


SECTION A-A

SECTION 3 S-5
Scale: 1/2" = 1'-0"

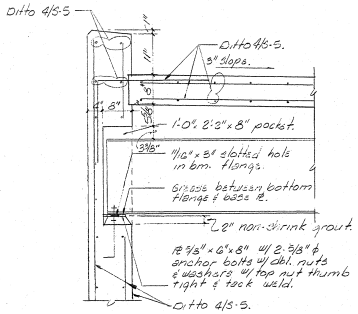


DETAIL 4 S-5
Scale: 3/2" = 1'-0"

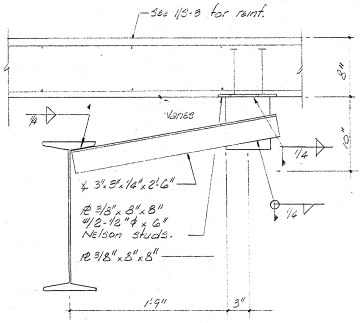


SECTION 5 S-5
Scale: 1/2" = 1'-0"

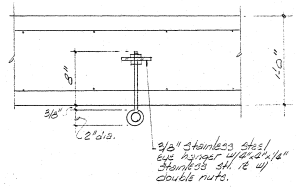
REFERENCE IDENTIFICATION PLANS
2' 1' 0 2'
1/2" = 1'-0"



DETAIL 6 S-5
Scale: 1/4" = 1'-0"



DETAIL 7 S-5
Scale: 1 1/2" = 1'-0"

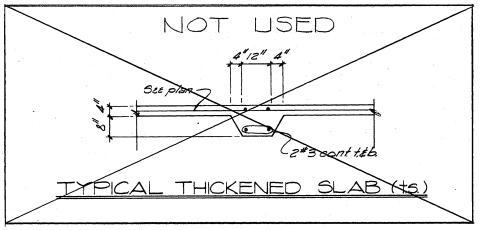


DETAIL 8 S-5
Scale: 1 1/2" = 1'-0"

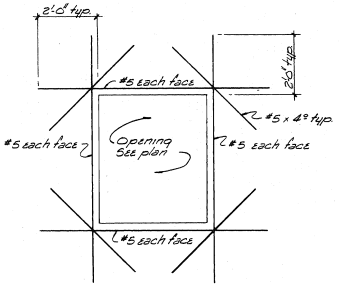
REFERENCE IDENTIFICATION PLANS
1' 0 1'
1-1/2" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO 3273 BRIDGERS & PAXTON

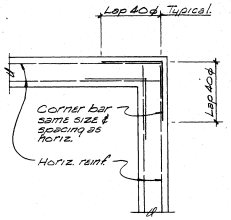
	PROJECT NO.	NEW MEXICO STATE UNIVERSITY	JOB 3280
	REVISIONS	IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	DRAWN G.H., E.A.L.
		BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	CHECKED R.K.
			DATE 4/1985
			SHEET S-5



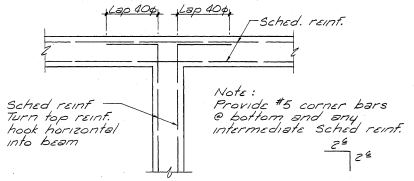
TYPICAL THICKENED SLAB (ts)



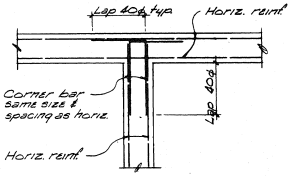
TYPICAL OPENING IN A CONC. WALL OR STRUCTURAL SLAB



TYPICAL CORNER @ CONC. WALLS AND FTGS.



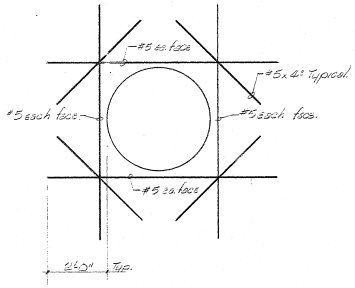
TYP. INTERSECTION @ CONCRETE BEAMS



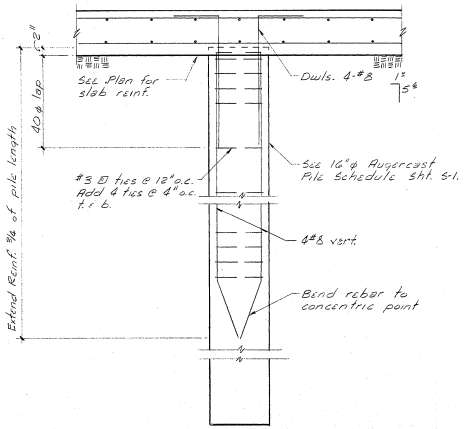
TYP. INTERSECTION @ CONC. WALL

STANDARD CONCRETE WALL REINFORCEMENT SCHEDULE UNLESS OTHERWISE DRAWN OR NOTED

WALL THICKNESS	NO. OF LAYERS & LOCATION	REINFORCING HORIZONTAL	REINFORCING VERTICAL
6"	1 @ center	#4@13"	#3@18"
8"	1 @ center	#4@10"	#4@18"
10"	2-1 ea. face	#4@16"	#3@15"
12"	2-1 ea. face	#4@13"	#3@12"
16"	2-1 ea. face	#4@10"	#4@18"



TYPICAL DETAIL OF 1'-0" DIA. & LARGER OPNGS. IN CONC. WALLS



TYPICAL AUGERCAST PILE DETAIL

GENERAL NOTES

GENERAL:

1. Where conflicts occur between specs, referenced codes, notes and working drawings, the most stringent requirements shall apply.
2. Contractor shall provide support for equipment to the building structure. Contractor shall furnish all necessary structures, inserts, sleeves, and hanging devices for installation of mechanical and plumbing equipment, ductwork and piping, etc. Contractor shall completely coordinate installation of such devices with all trades and Sub-Contractors. Contractor must further verify with the Architect that the devices and supports are adequate as intended and do not overload the building's structural components in any way.
3. Do not backfill against basement walls until first floor is in place.

CONCRETE:

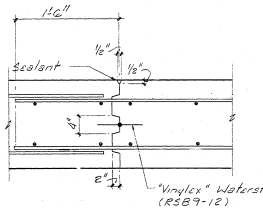
1. All ~~concrete shall be harbinger~~ (150#/Ft^3) f'c 4000 psi at 28 days. Unless noted otherwise.
2. Concrete proportions, mixing, placing, curing, formwork, construction joints, etc., shall comply with all applicable provisions of the ACI code "ACI-301-72" and the ACI Standards.
3. Unless noted or detailed, provide corner bars the same size and spacing as the horizontal reinforcing at the corners and intersection of all walls, beams, bond beams, turndowns and footings.
4. General contractor shall furnish and install all welding inserts, etc., that are cast in place. Steel Fabricator shall provide nail holes in all cast in place items as required.
5. Form all footings, stem walls and other concrete structural elements.
6. Construction joints on structural concrete slabs, beams and grade beams shall occur only at centerline of span between supports. Approval of construction joint location shall be obtained from the structural engineer.
7. At concrete beams, grade beams and structural slabs, splice top bars at mid span, and splice bottom bars at centerline of supports unless otherwise noted.

CONCRETE REINFORCEMENT:

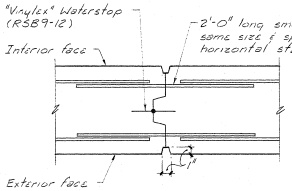
1. No bending or fabrication of rebar will be permitted on the job site.
2. All concrete reinforcing steel details not specifically noted or detailed shall be in accordance with notes and details already shown as applicable.
3. Reinforcing steel shall comply with all applicable provisions of the ACI Code "ACI-318-77", the ACI detailing manual "ACI-315-74" and the C.R.S.I. design handbook.
4. Unless otherwise noted or detailed, the reinforcement of footing and other principal structural members in which the concrete is deposited against the ground shall have not less than 3 inches of concrete between it and the ground contact surfaces. If concrete surfaces after removal of the forms are to be exposed to the weather or be in contact with the ground, the reinforcement shall be protected with not less than 2 inches of concrete for bars larger than #5 and 1½" for #5 bars or smaller.
5. All reinforcing steel shall be "ASTM-A-615-60" except ties, stirrups and lugs welded to plates may be "A-615-40".
7. Provide 2#6 at the top and bottom, above and below all floor and roof bearing points, and above and below all horizontal construction joints in all concrete walls.
8. Where columns are poured monolithically with concrete walls, provide vertical reinforcing and ties as scheduled.
9. Unless noted or detailed, provide around openings in concrete walls 2#5 x 4'-0" diagonal at all corners, 2#5 at each side, top and bottom.

CONCRETE SLABS:

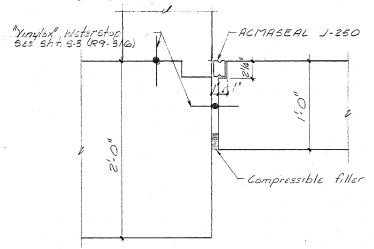
1. Unless noted or detailed, provide around openings in concrete floors and roofs 2#4 x 4'-0" diagonal at all openings and 2#4 at all sides.



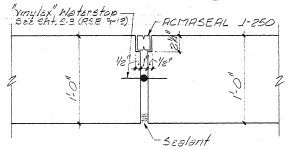
TYPICAL CONSTRUCTION JT. AT FLOOR AND ROOF



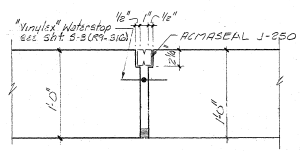
TYPICAL VERTICAL CONTRACTION JT. (V.C.J.)



SECTION Scale: 1½"=1'0" (1 S-6)



TYPICAL JOINT @ WALL



SECTION Scale: 1½"=1'-0" (2 S-6)

BRIDGERS & PAXTON	PROJECT NO. / REVISIONS	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	JOB 3280 DRAWN G.H.M. / D.A.L. CHECKED R.K. DATE 4/3/85 SHEET S-6

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
O_A	CEILING OUTLET, LETTER DENOTES FIXTURE TYPE
O	WALL OUTLET
▭	FLOURESCENT FIXTURE
S_2	WALL SWITCH, SPST 4'-0" TO TOP, UNLESS OTHERWISE NOTED LETTER DENOTES CONTROL
S_3	THREE WAY WALL SWITCH
⊖	DUPLEX CONVIENCE OUTLET, 18" ABOVE FLOOR TO BOTTOM, OTHERWISE NOTED
M_5	MOTOR OUTLET AND SIZE IN HP
T	THERMOSTAT, 4'-0" ABOVE FLOOR TO TOP
J	JUNCTION BOX AS NOTED OR REQUIRED
D	DISCONNECT SWITCH
▬	ELECTRICAL PANELBOARD 208Y/120V 3-PHASE 4-WIRE
▭	ELECTRICAL PANELBOARD 480Y/277V 3-PHASE 4-WIRE
———	RACEWAY EXPOSED OR IN WALLS OR CEILING
- - -	RACEWAY CONCEALED IN WALLS OR FLOOR, OR ROUTED UNDER GROUND
WP	WEATHERPROOF
6	DIVISION 15 EQUIPMENT REFERENCE
(1)	NOTE REFERENCE
(M)	FURNISHED UNDER DIVISION 15
(E)	FURNISHED UNDER DIVISION 16

NOTES (CONT'D)

(42) INSTALL LB'S TO ROUTE EMERGENCY FEEDER OUT OF BUILDING

(43) TRANSITION BETWEEN RIGID CONDUIT

(44) PROVIDE 3" THICK CONCRETE CAP OVER EMERGENCY FEEDER AND 2" COMMUNICATIONS CONDUIT

(45) 4 #4, 1 #8 GND. IN 1-1/4" SCHEDULE 40 PVC

(46) PULL BOX WITH SCREW COVER. SIZE AS REQUIRED

(47) 3 #10, 1 #10 GND. IN 3/4" CONDUIT

(48) 15 KVA DRY TYPE TRANSFORMERS. FLOOR MOUNT ON 4" HIGH CONCRETE HOUSEKEEPING PAD AND ON VIBRATION ISOLATORS

(49) 4 #6, 1 #10 GND. 1-1/4" CONDUIT

(50) EXTEND 2 #12 AND 1 #12 GROUND IN 3/4" CONDUIT TO NEAREST AVAILABLE 120V EMERGENCY PANEL. SUPPLY AND INSTALL 20A, 1P CIRCUIT BREAKER. UPDATE PANEL DIRECTORY

(51) THE PARKING LOT FIXTURES SHALL BE RELOCATED TO APPROXIMATELY THE SAME LOACTION AFTER THE TANK HAS BEEN COMPLETED AND THE PARKING LOT PAVED AND STRIPED. REMOVE POLES FROM EXISTING CONCRETE BUSES. POUR NEW POLE BUSES TO EXTEND 6" ABOVE FINAL GRADE. PROVIDE AND INSTALL MOUNTING PLATE, ANCHOR BOLTS, AND NECESSARY EQUIPMENT TO REINSTALL POLES ON NEW BUSES. SIZE ANCHOR BOLTS TO "BREAK-AWAY" BEFORE DAMAGING WATER TANK STRUCTURE REPLACE EXISTING WIRING WITH NEW TO FEED RELOCATED POLES.

(46) FOR DISPOSITION OF EXISTING POWER POLES, SEE SHEET C-1 AS PER ADDENDA NO. 2.

NOTES

(1) FUTURE 2000 KVA LOOP FEED TRANSFORMER 480Y/277V SECONDARY (N.I.C.)

(2) FUTURE S & C PRIMARY, PAD MOUNTED SWITCH (N.I.C.)

(3) APPROXIMATE ROUTING OF FUTURE PRIMARY SERVICE FROM THE UTILITY TUNNEL. ROUTING WILL BE COORDINATED WITH DIVISION 15 UTILITY LINES IN AREA

(4) REMOVE EXISTING TWO-HEAD PARKING LOT, 20' HIGH, LIGHTING FIXTURES WITH 5'-0" LONG CONCRETE BASE ATTACHED. REMOVE LUMINAIRES BEFORE REMOVING POLES. ~~THE THREE POLES WITH BASES AND LUMINAIRES, UNWARRANTY TO THE PHYSICAL PLANT FOR STORAGE. VERIFY EXACT STORAGE LOCATION WITH OWNER~~

(5) APPROXIMATE LOCATION OF SPACE IN EXISTING EMERGENCY MOTOR CONTROL CENTER. SUPPLY AND INSTALL 60A, 3P. CIRCUIT BREAKER IN SPACE TO SERVE THE EMERGENCY LOADS IN THE NEW EQUIPMENT GALLERY. SEE EMERGENCY RISER DIAGRAM

(6) 4 #4, 1 #8 GND. 1-1/4" CONDUIT, ROUTED SURFACE MOUNTED ON WALL FROM NEW CIRCUIT BREAKER. USE EXISTING WIRING TROUGH IF POSSIBLE

(7) INSTALL NECESSARY LB'S TO ROUTE CONDUITS FROM OUTSIDE OF THE BUILDING INTO THE CENTRAL PLANT

(8) 4 #4, 1 #8 GND. 1-1/4" SCHED. 40 PVC CONDUIT 36" BELOW GRADE (MIN.). PROVIDE 3" THICK CONCRETE CAP ABOVE CONDUIT

(9) EXTEND 2" RIGID CONDUIT, WITH PULL WIRE BETWEEN PULL BOX AND CABINET. ROUTE CONDUIT 36" BELOW GRADE. PROVIDE LB'S AT CENTRAL PLANT TO ENTER BUILDING. USE SCHED. 40 PVC WHERE ROUTED UNDERGROUND. PROVIDE 3" THICK CONCRETE CAP OVER CONDUIT

(10) CABINET, SEE DRAWING E-2

(11) 12" x 12" x 8" DEEP PULL BOX WITH SCREW COVER MOUNTED AT 10'-0" AFF

(12) 8 - 4" RIGID CONDUITS STUBBED OUT 3'-0" FROM BUILDING. ROUTE CONDUITS BELOW WATER PIPING ROUTED INTO THE EQUIPMENT AREA. COORDINATE WITH THE MECHANICAL CONTRACTOR

(13) APPROXIMATE LOCATION OF MOTOR CONTROL CENTER MCC-A. SEE DRAWING E-2

(14) COORDINATE ROUTING AND LOCATION OF ELECTRICAL RACEWAY AND EQUIPMENT WITH EXISTING TUNNEL AND MECHANICAL EQUIPMENT IN AREA

(15) EXTEND 1-1/2" SCHED. 40 PVC CONDUIT FROM J.B. IN OPENING INTO TANKS TO J.B. #1 ON MEZZANINE LEVEL

(16) 12" x 12" x 6" DEEP WATER-TIGHT NEMA 4X ENCLOSURE WITH LOCKABLE WINGED COVER. MOUNT INSIDE OPENING INTO WATER TANKS

(17) 4" x 4" CEILING MOUNTED SQUARE BOX MOUNTED ABOVE EACH EXISTING CHILLER. ROUTE EMPTY CONDUIT (WITH PULL WIRE) AS SHOWN

(18) MOUNT JUNCTION / PULL BOX ON EXISTING INSTUMENT PANEL IN AREA. EXTEND CONDUIT NIPPLE INTO INSTRUMENT PANEL AS INSTRUCTED IN FIELD. 1" FOR (NOTE 19), AND 3/4" FOR (NOTE 20)

(19) 6" x 6" x 4" JUNCTION BOX

(20) 4" x 4" SQUARE BOX

(21) EXTEND EMPTY 3/4" CONDUIT WITH PULL WIRE, TO THE 3 EXISTING CHILLER MOTOR STARTER PANELS. LOOP CONDUIT BETWEEN STARTERS

(22) INSTALL 6" x 6" x 4" JUNCTION BOX IN EXISTING OFFICE. VERIFY EXACT LOCATION IN FIELD

(23) 1" CONDUIT. ROUTE FROM J.B. IN INSTRUMENT PANEL AREA, ALONG CEILING, DOWN INTO THE EXISTING UTILITY TUNNEL AND INTO THE OFFICE. VERIFY EXACT ROUTING IN FIELD

(24) 1" SCHED. 40 PVC CONDUIT 3'-0" BELOW GRADE. PROVIDE 3" THICK CONRETE CAP OVER CONDUIT

(25) INCOMING PULL-BOX ABOVE MCC-A

(26) AMMETER WITH 4 POSITION SWITCH

(27) VOLTMETER WITH 7 POSITION SWITCH

(28) 4 - 20ma WATT TRANSDUCER. OUTPUT WIRING SHALL BE CONNECTED TO TERMINAL BLOCK

(29) 4 #3, 1 #8 GND. 1-1/4" CONDUIT

(30) 3 #6, 1 #6 GND. 1-1/4" CONDUIT

(31) 30 KVA DRY TYPE TRANSFORMER. FLOOR MOUNT ON 4" HIGH CONCRETE HOUSEKEEPING PAD AND ON VIBRATION ISOLATORS

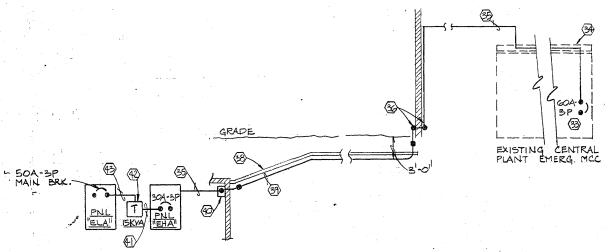
(32) 8 INCOMING 4" RIGID INCOMING CONDUITS SUPPORTED FROM STRUCTURE

(33) SUPPLY AND INSTALL 60A, 3P CIRCUIT BREAKER IN EXISTING CUTLER-HAMMER MCC. I.C. RATING SHALL MATCH EXISTING DEVICES

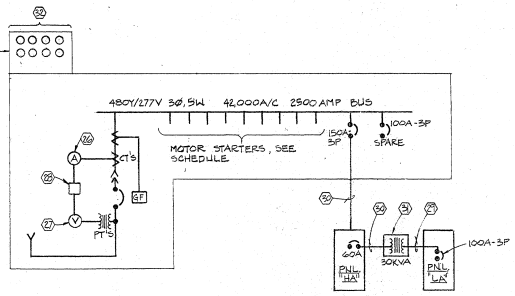
(34) ROUTE NEW WIRING THROUGH EXISTING WIRING TROUGH ABOVE EXISTING MCC.

(35) SURFACE MOUNTED 4 #4, 1 #8 GND. IN 1-1/4" RIGID CONDUIT

GENERAL NOTES



EMERGENCY POWER RISER DIAGRAM
NO SCALE



POWER RISER DIAGRAM
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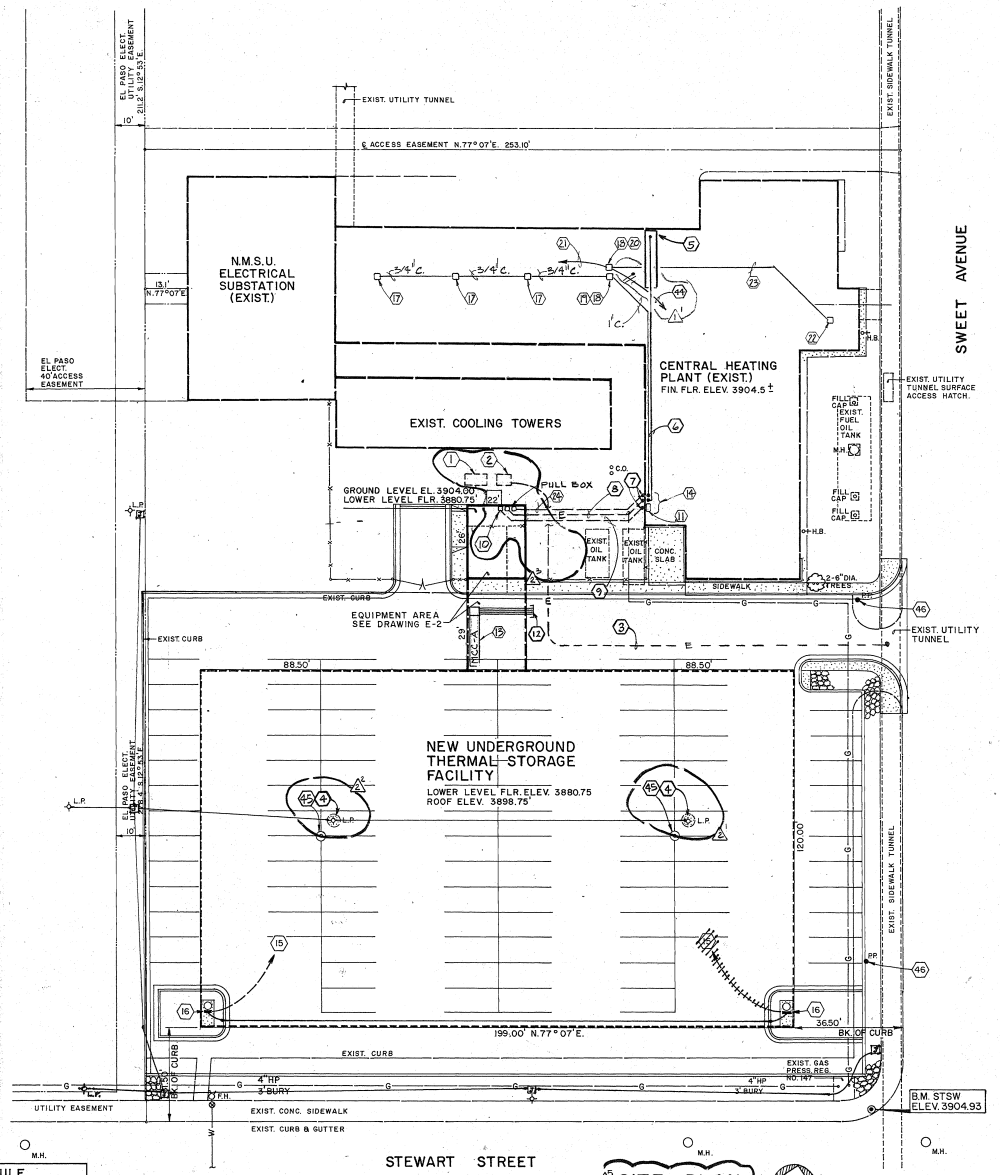


SITE PLAN
SCALE: 1" = 20'

ELECTRICAL SHEET SCHEDULE

SHEET NO.	DESCRIPTION
E-1	SITE PLAN
E-2	FLOOR PLANS — LIGHTING & POWER
E-3	DETAILS & SCHEDULES

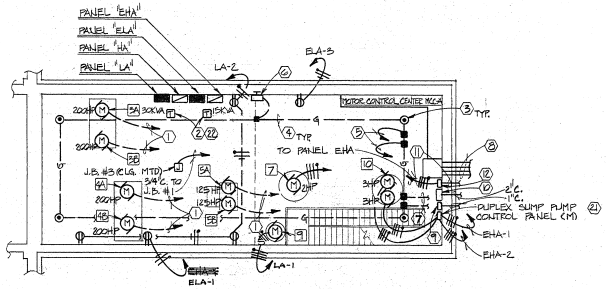
PROJECT NO.

REVISIONS
1 6-11-85 MISC. REV.
2 8-7-85 MISC. REV. & ADDENDUMS 1,2,3 INCORPORATED

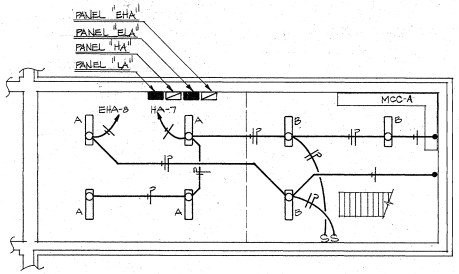
NEW MEXICO STATE UNIVERSITY
IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC.
ALBUQUERQUE, NEW MEXICO

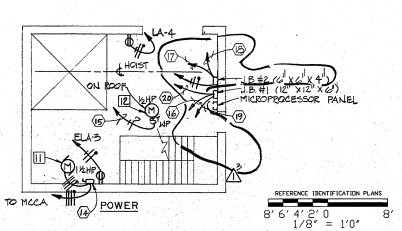
JOB 3280
DRAWN KRC
CHECKED DDR
DATE 5-28-85
SHEET E-1

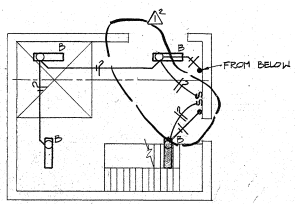


EQUIPMENT ROOM FLOOR PLAN — POWER
SCALE: 1/8" =1'-0"



EQUIPMENT ROOM FLOOR PLAN — LIGHTING
SCALE: 1/8" =1'-0"





MEZZANINE LEVEL FLOOR PLANS
SCALE: 1/8" =1'-0"

NOTES

1. SEE MOTOR STARTER SCHEDULE FOR WIRING REQUIREMENTS
2. SEE POWER RISER DIAGRAM, DRAWING E-1
3. 3/4" x 10'-0" COPPER GROUND ROD 2'-0" BELOW FLOOR. CADWELD TO COUNTERPOISE
4. #500 MCM BARE COPPER COUNTERPOISE CONDUCTOR ROUTED 2'-0" BELOW FLOOR. CADWELD TO GROUND RODS AND TAPS
5. EXTEND 2 #500 MCM INSULATED CONDUCTORS TO GROUND BUS IN MCC-A. CADWELD TO COUNTERPOISE. PROVIDE WATERTIGHT CONDUIT SLEEVE THROUGH FLOOR
6. 3" x 1/4" THICK x 18" LONG COPPER GROUNDING BUS. WALL MOUNT ON ISOLATION BLOCKS FOR FUTURE USE. CLAMP 2 INSULATED #500 MCM TO BUS; EXTEND AND CADWELD TO COUNTERPOISE. PROVIDE WATERTIGHT CONDUIT SLEEVE THROUGH FLOOR
7. CADWELD 2 INSULATED #500 MCM GROUND CONDUCTORS TO COUNTERPOISE. EXTEND OUT ALONG WITH THE EIGHT INCOMING SERVICE CONDUITS FOR FUTURE EXTENSION TO SERVICE EQUIPMENT
8. EIGHT INCOMING 4" RIGID CONDUITS SUPPORTED FROM STRUCTURE ABOVE. ROUTE BELOW WATER PIPING ABOVE THEM. COORDINATE ROUTING WITH WALL MOUNTED AND CEILING HUNG WATER PIPING. SEE SITE PLAN
9. PROVIDE AND INSTALL PULL BOX (6"x6"x6" MINIMUM). EXTEND 1" CONDUIT UP TO BOX #1 ABOVE
10. 18" x 24" x 6" DEEP "TELEPHONE TYPE" CABINET WITH LOCKABLE HINGED COVER AND 3/4" PLYWOOD BACKING
11. 4 #4, 1 #8 GND. 1-1/4" CONDUIT
12. 8" x 8" x 6" DEEP PULL BOX
13. ~~WIRE ELECTRIC HOIST UNIT AND CONTROLS. DETERMINE EXACT REQUIREMENTS FROM EQUIPMENT INFORMATION~~
14. 30A, 3P DISCONNECT
15. TO MCCA, TO INTERLOCK WITH #11 THEN TO CIRCUIT LA-5
16. EXTEND (2) 1-1/2" CONDUITS TO MICROPROCESSOR PANEL
17. EXTEND 1" C TO MCC-A
18. EXTEND 3/4" CONDUIT TO MICROPROCESSOR PANEL
19. TO PULL BOX BELOW
20. 3/4" CONDUIT TO J.B. #3
21. EXTEND NECESSARY CONTROL WIRING TO FLOATAND OTHER CONTROL DEVICES
22. WALL MOUNT TRANSFORMER ABOVE PANELBOARD.

BRIDGERS & PAXTON CONSULTING ENGINEERS, INC. ALBUQUERQUE, NEW MEXICO	PROJECT NO. 8-7395 REVISION: 1 MISC. REV. & ADDENDUMS 1,2,3 INCORPORATED	NEW MEXICO STATE UNIVERSITY IMPROVEMENTS TO CHILLED WATER DISTRIBUTION SYSTEM AND THERMAL STORAGE PROJECT	JOB 3280 DRAWN KRC CHECKED DDR DATE 5-28-85 SHEET E-2

RESOLUTION NO. 93-274

A RESOLUTION UPDATING THE UNION AVENUE WIDENING JOINT POWERS PROJECT AGREEMENT BETWEEN THE CITY OF LAS CRUCES AND THE NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT, PROJECT NO. M-4509(1).

The City Council of the City of Las Cruces is informed that:

The City of Las Cruces and the New Mexico State Highway and Transportation Department are planning to reconstruct Union Avenue, from University Avenue to South Main Street. The purpose of this project is to widen Union Avenue to four lanes, with a center turn lane; and, provide left-turn lanes at the intersections of University Avenue and El Paseo Road, and at South Main Street and Union Avenue. Also included in this project are improved drainage facilities, street lights and a bicycle path.

On October 11, 1990, the City of Las Cruces entered into a Federal Aid Urban System Joint Powers Agreement with the New Mexico State Highway and Transportation Department for the Union Avenue Widening Project. The agreement was amended on April 20, 1992. This updated agreement extends the date, by which the City of Las Cruces must be contractually committed to a contractor for construction of Union Avenue, to July 15, 1993.

NOW, THEREFORE, the City Council of the City of Las Cruces, New Mexico determines, resolves and orders as follows:

(1)

THAT the City of Las Cruces update the Federal Aid Urban System Joint Powers Project Agreement for Project No. M-4509(1) with the New Mexico State Highway and Transportation Department to extend the date, by which the City of Las Cruces must be contractually committed to a contractor for construction of Union Avenue, to July 15, 1993.

(2)

THAT the updated Federal Aid Urban System Joint Powers Project Agreement, Project No. M-4509(1) for the Union Avenue Widening Project between the City of Las Cruces and the New Mexico State Highway and Transportation Department, attached hereto and incorporated herein, is hereby authorized and approved.

Resolution No. 93-274, continued.

(3)

THAT the Mayor execute any and all documents, and that staff do any and all things necessary or desirable to carry out the foregoing Resolution.

DONA AND APPROVED this 21 day of June, 1993.

MAYOR RUBEN A. SMITH

ATTEST:

CITY CLERK

(SEAL)

VOTE:

Mayor Smith: Aye
Councillor Ferralez: Aye
Councillor Kennon: Aye
Councillor Valencia: Aye
Councillor Benavidez: Aye
Councillor Tomlin: Aye
Councillor Haltom: Aye

Moved by: Tomlin

Seconded by: Ferralez

APPROVED AS TO FORM:

CITY ATTORNEY

Contract No. _____

Vendor No. _____

Project No. M-4509(1)

Control No. 1329

JOINT POWERS PROJECT AGREEMENT

THIS AGREEMENT is made and entered into this _____ day of _____, 1993 by and between the NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT, herein referred to as "DEPARTMENT", and the CITY OF LAS CRUCES, herein referred to as "LAS CRUCES".

RECITALS

WHEREAS, both the DEPARTMENT and LAS CRUCES are engaged in a joint and coordinated effort for the upgrading of Union Avenue from a 2-lane to a 4-lane facility with sidewalks, bike path, and installment of poles and luminaries, from its junction with NM 478 (Main Street) to its junction with University Avenue, a distance of approximately 4,075 feet, and

WHEREAS, as a part of this project, both parties wish to fund and continue to provide preliminary engineering and design plans, survey activities, title reports, right-of-way acquisition, utility relocation, lighting improvements, railroad agreements and construction improvements; and

WHEREAS, the funding for this work will continue to be provided through previously authorized Federal Aid Urban System Funds (herein designated as "M Funds"); and

WHEREAS, the DEPARTMENT and LAS CRUCES entered into a Lighting

Agreement (DO5264), Project No. STP-4509(1) on April 29, 1992 to provide and install underground cable, conduit, and bases for twenty-five (25) poles and luminaries and provide all utilities, and maintenance for the project, which agreement is attached as Exhibit "A" and made part of this AGREEMENT;

WHEREAS, the DEPARTMENT and LAS CRUCES entered into a Project Agreement (DO4776) on October 11, 1990 in the amount of One Million One Hundred Thirty Thousand dollars ($1,130,000) to provide funds for the upgrading of Union Avenue from a 2-lane to a 4-lane facility with side walks and a bike path, which agreement is attached as Exhibit "B" and made part of this AGREEMENT;

WHEREAS, the DEPARTMENT and LAS CRUCES entered into a First Amendment (DO4776/1) to the original Project Agreement on April 20, 1992 to increase the Project funding from One Million One Hundred Thirty Thousand dollars ($1,130,000) to One Million Three Hundred Thousand dollars ($1,300,000) to continue development of the project, which agreement is attached as Exhibit "C" and made part of this AGREEMENT;

WHEREAS, some of the work activities to be performed under Project Agreement Contract Number (DO4776), Project Number M-4509(1) were not authorized by the statute cited, Section 67-3-28, N.M.S.A. 1978; and

WHEREAS, the funds allocated for Project Agreement DO4776 and First Amendment to the Project DO4776/1 have not been fully expended and the expenditure of the available remaining funds shall be disbursed and expended under the terms and conditions of this

Joint Powers Agreement;

WHEREAS, the remaining work to be performed under the Project Agreement (D04776), First Amendment to the Project (DO4776/1) and Lighting Agreement (DO5264) shall be performed under this AGREEMENT;

NOW, THEREFORE, in consideration of the covenants contained herein and pursuant to the New Mexico Joint Powers Agreement Act, N.M.S.A. 1978, Sections 11-1-1 to 11-1-7, as amended, THE PARTIES AGREE AS FOLLOWS:

SECTION ONE -- PURPOSE:

The purpose of this AGREEMENT is to specify and delineate the rights and duties of the parties hereto, to incorporate the work remaining to be performed and disburse and expend the remaining available funds under Project Agreement (D04776), First Amendment to Project Agreement (DO4776/1), and Lighting Agreement (DO5264) as part of this AGREEMENT, to upgrade Union Avenue from a 2-lane to a 4-lane facility with sidewalks and a bike path and to install poles and luminaries, from its junction with NM 478 (Main Street) to its junction with University Avenue, a distance of approximately 4,075 feet, within the LAS CRUCES municipal city limits, and hereinafter identified in this document as "the project". The project is a joint and coordinated effort for which DEPARTMENT and LAS CRUCES each have authority or jurisdiction.

SECTION TWO -- LAS CRUCES SHALL:

1. Act in the capacity of lead agency for the project.
2. Participate in the construction cost of the Project Number M-4509(1), Control No. 1329, as follows:

LAS CRUCES shall pay Two Hundred Thirty Four Thousand Three Hundred Ninety dollars ($234,390) or 18.03% of the eligible contract amount of this AGREEMENT, whichever is the lesser amount.

LAS CRUCES shall pay all project costs which exceed the following funding amount: M Funds, One Million Three Hundred Thousand dollars ($1,300,000);

3. Pay all costs, perform all labor and supply all material, except as provided in SECTION THREE of this AGREEMENT, for the purpose as described in SECTION ONE.

4. Provide a representative from its organization who shall serve as the point of contact to the DEPARTMENT.

5. Adopt a written Resolution of support for the project, including acquisition of right-of-way for the project and assumption of ownership, liability and maintenance responsibility for the newly constructed road, utility relocation and lighting improvements. The DEPARTMENT'S Secretary or his designee shall sign this AGREEMENT only if LAS CRUCES has passed a Resolution and the same is attached hereto as Exhibit D and made a part hereof.

6. Initiate the preliminary engineering, survey, right-of-way acquisition and final design activities, coordinate project construction or reconstruction, schedule all inspections and write inspection reports as needed.

7. Perform the following right-of-way activities:

   a. Obtain required right-of-way for the project in accordance with DEPARTMENT'S Right Of Way Handbook, current edition.

b. Submit all appraisals of real property to be acquired in connection with this project to the Department's Right-of-Way facility Review Appraiser for review. The purpose of appraisal review is to assure that the appraisal meets DEPARTMENT requirements prior to the initiation of acquisition. In no event will the appraisal review function be contracted to a consultant.

The satisfactory performance of these activities by LAS CRUCES shall be verified and certified by appropriate DEPARTMENT staff.

8. Maintain all records and documents relating to the right-of-way acquisition for a minimum of three (3) years, and record all transfer of ownership documents with the County Clerk.

9. Acquire the required Right-Of-Way for the project in accordance with the following:

   a. The DEPARTMENT'S Right Of Way Handbook, current edition.

   b. All DEPARTMENT and Federal Highway Administration (FHWA) requirements and procedures.

   c. The DEPARTMENT'S Federal Aid System Procedures, 1987/88 edition, (the "FAUS Manual").

   Any variation to the above must be approved in writing by the DEPARTMENT.

10. Complete the right-of-way acquisition for this project by June 15, 1993.

11. Furnish the DEPARTMENT written "Certification of the Right-Of-Way Phase" of this project (see Appendix C which is hereby

incorporated by reference into this AGREEMENT). Furthermore, this certificate and this AGREEMENT shall both be executed by the MAYOR OF LAS CRUCES or his/her designee. Failure of LAS CRUCES to furnish the above certificate to the DEPARTMENT upon written demand by the DEPARTMENT shall amount to a material breach of this AGREEMENT and shall entitle the DEPARTMENT to cease performance of any obligation set forth in this AGREEMENT at its sole discretion.

12. Be responsible for all design and pre-construction activity, including, but not limited to, the following:

    a. utility relocation,
    b. drainage and storm drain design,
    c. geotechnical design,
    d. pavement design,
    e. environmental and archaeological clearances,
    f. right(s)-of-way maps, and
    g. hazardous substance/waste site(s) contamination investigations.

13. Initiate and cause to be prepared the necessary scoping report, all required inspections and Plans, Specifications, and Estimates (PS&E) for this project.
14. Cause all designs and plans to be performed under the direct supervision of a Registered New Mexico Professional Engineer.
15. Design the project in accordance with the following:
    a. The DEPARTMENT'S Right-Of-Way Handbook, current edition.

b. Guide for the Development of Bicycle Facilities, 1991 edition,

c. A Policy on Geometric Design of Highways and Streets, 1990 edition, (AASHTO'S "Green Book"), and

d. All DEPARTMENT and Federal Highway Administration (FHWA) requirements and procedures, and

d. The DEPARTMENT'S Federal Aid System Procedures, 1987/88 edition, (the "FAUS Manual").

e. The DEPARTMENT'S Standard Specifications for Road Building Bridge Construction, 1984 edition (also known as the DEPARTMENT'S "Green Book").

Any variation or design exception to the above must be approved in writing by the DEPARTMENT.

16. Adhere to Minimum Design Standards and Minimum Survey and Plan Requirements identified in Appendices A and B, which are hereby incorporated into this AGREEMENT.

17. Submit required environmental documents to the DEPARTMENT. The DEPARTMENT will coordinate all related activities through the Federal Highway Administration (FHWA).

18. Obtain DEPARTMENT and FHWA written approval of the project's environmental document prior to the Plans, Specifications, and Estimate (PS&E) review session.

19. Notify the DEPARTMENT'S designated engineer when the plans are sufficiently complete to schedule inspections.

20. Make no changes in design or scope of work after final approval of the plans by the DEPARTMENT without written approval of the Secretary or his authorized representative.

21. Obtain all required written agreements or permits relating to the realignment of LAS CRUCES roads, when applicable, from all public and private entities.

22. Furnish the DEPARTMENT written "Certification of the Pre-Construction Contract Phase" of this project (see Appendix D which is hereby incorporated by reference into this AGREEMENT). This certificate shall certify that the design phase has been performed before the construction contract goes to bid. Furthermore, this certificate and this AGREEMENT shall both be executed by the Mayor of LAS CRUCES. Failure of LAS CRUCES to furnish the above certificate to the DEPARTMENT upon reasonable written demand by the DEPARTMENT shall amount to a material breach of this AGREEMENT and shall entitle the DEPARTMENT to cease performance of any obligation set forth in this AGREEMENT at its sole discretion.

23. Advertise and let Project No. M-4509(1), Control No. 1329.

24. Coordinate with DEPARTMENT District staff to prepare a final detailed estimate of the work, indicating the bid items, the quantity in each item, the unit bid price and cost of the items based on such bid price. Progress estimates shall be submitted to the DEPARTMENT in similar form so that details of quantities allowed on various items of work will be shown for each progress payment.

25. Maintain all records and documents relative to the design and construction of the project for a minimum of three (3) years.

26. Furnish the DEPARTMENT, upon reasonable demand, all records relevant to this AGREEMENT and to allow the DEPARTMENT the

right to audit all records which support the terms of this AGREEMENT.

27. Comply with all applicable federal and state laws, rules, and regulations.

28. Agree that this AGREEMENT automatically terminates if the funds identified in SECTION TWO, Paragraph 2. have not been contractually committed between LAS CRUCES and a contractor by July 15, 1993.

29. Maintain with its own funds all facilities constructed or reconstructed with Control No. 1329 funds.

30. Adhere to Executed Lighting AGREEMENT (DO5264) under Project No. STP-4509(1) for the Union Avenue upgrading from South Main to University.

SECTION THREE -- DEPARTMENT SHALL:

1. Participate in the cost of the following Project No. M-4509(1), Control No. 1329 as follows:
   Federal Aid Urban System (M) One Million Sixty Five Thousand Six Hundred Ten dollars ($1,065,610) or 81.97% of the eligible contract amount for construction and right-of-way acquisition project costs of this AGREEMENT, whichever is the lesser amount.
   The DEPARTMENT shall not pay any project costs which exceed the following amount: M Funds, One Million Sixty Five Thousand Six Hundred Ten dollars ($1,065,610).

2. Assign a Project Development Engineer (PDE) and appropriate District Staff to provide technical assistance in developing, monitoring and inspecting this project.

3. Provide timely reviews of all submittals of plans, specifications, investigations or studies.

4. Acknowledge, in writing, receipt of the completed certificate required under SECTION TWO, Paragraph 22 of this AGREEMENT.

5. Examine materials submitted for review; these items shall be limited to the following:

   a. Basic design concept at scoping stage.

   b. Proper format of plan sets.

   c. Completeness of plan sets.

   d. Incorporation of required basic information.

   e. Incorporation of design recommendations.

   f. Conformance with established design standards.

   g. Use of proper quantity values.

   h. Conformance of the environmental document with the DEPARTMENT'S Action Plan.

   i. Conformance with the New Mexico Health and Environmental Department's requirements, when applicable, in regard to the preliminary and final investigation of hazardous substance/waste site(s); and conformance with the preliminary and final design for the removal plan of contaminates from the affected site(s).

   The DEPARTMENT shall not provide an extensive check of any plans submitted by LAS CRUCES. Acceptance of plans and/or investigations by the DEPARTMENT does not relieve LAS CRUCES or its consultant of their responsibility for errors and omissions.

6. Combine the upgrading and construction of Union Avenue with

the Lighting Agreement on Union Avenue (Project No. STP-4509(1).

7. Perform all construction management activities for Project No. M-4509(1).

SECTION FOUR - BOTH PARTIES AGREE:

1. That the work remaining to be performed under Project Agreement (D04776), First Amendment to Project Agreement (DO4776/1) and Project Agreement (DO5264) shall be performed under the terms and conditions of this Joint Powers Agreement and which are marked " Exhibits A, B, and C ", attached hereto, incorporated herein by this reference, and made a part of this AGREEMENT.

2. LAS CRUCES shall certify compliance with all applicable provisions of the following DEPARTMENT publications:

   a. The DEPARTMENT'S Right-Of-Way Handbook, current edition.

   b. Guide for Development of Bicycle Facilities, current edition.

   c. Standard Specifications for Road Building and Bridge Construction, 1984 edition, (the DEPARTMENT'S "Green Book");

   d. Manual of Uniform Traffic Control Devices for Streets and Highways, current edition;

   e. Action Plan, 1984 edition;

   f. Activity Description Manual, current edition;

   g. Federal Aid Urban Systems Procedures, 1987/88 edition, (the "FAUS Manual");

3. That complete sets of plans, specifications and contract

documents shall be submitted to the design team members, six (6) sets to the Project Development Engineer, and two (2) complete sets to the Highway District Office three (3) weeks prior to any scheduled inspection. LAS CRUCES has the sole responsibility for the accuracy of the plans.

4. Field Design, Grade and Drain, and Plan-In-Hand Inspections must be held, using the latest approved check lists. The DEPARTMENT'S PDE shall provide these lists when requested. After the Plan-In-Hand inspection has been held, LAS CRUCES must submit to the DEPARTMENT'S Verification Unit a complete set of plans which incorporates all comments and recommendations received during the inspection. All inspections shall involve a representative from LAS CRUCES, consultant, District Highway Office, Project Development Bureau and Federal Highway Administration (FWHA). Within ten (10) days following each of these inspections, LAS CRUCES shall submit a report regarding each inspection to the Project Development Engineer. LAS CRUCES shall be responsible for assuring that all revisions resulting from the inspection are included in the plans before LAS CRUCES is permitted to proceed with further development of the project.

5. Once all corrections have been made in response to recommendations made by the DEPARTMENT'S Verifications Unit, LAS CRUCES shall request, through the assigned PDE, that a PS&E review be scheduled by the DEPARTMENT'S Design Bureau. The LAS CRUCES must obtain written authorization from NMSHTD prior to advertising the project for bid.

6. If upon termination of this AGREEMENT there remain any property, materials or equipment belonging to the DEPARTMENT, LAS CRUCES shall account for the same and dispose of them as directed by the DEPARTMENT.

7. Reimbursement to LAS CRUCES shall be made on a monthly basis upon submittal of invoices by LAS CRUCES to the Preliminary Design Bureau for the design phase, when applicable, and to the District 1 Construction Office for the construction phase. Invoices shall have a certification by LAS CRUCES authenticating that the invoices accurately reflect work completed, amount due, remaining contract balance and contract number.

8. The DEPARTMENT must approve, in writing, all plans and contract documents prior to their acceptance or execution.

9. Prior to award of the construction contract, LAS CRUCES will obtain a written authorization to award the construction contract from New Mexico State Highway and Transportation Department.

SECTION FIVE -- CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION:

Funds expended by LAS CRUCES for construction and right-of-way acquisition, including relocation and administrative costs, shall be reimbursed by the DEPARTMENT. This includes all payments for the following right-of-way acquisition activities: appraisal, negotiation, condemnation, relocation assistance, litigation and updating of property description. These expenditures include personnel salaries, fees and associated expenses attributable

to this project.

SECTION SIX -- PROJECT RESPONSIBILITY:

Preliminary engineering and design plans, surveying, title reports, right-of-way acquisition, railroad agreements, utility relocation, lighting improvements, and construction of Union Avenue, ownership and perpetual maintenance of Union Avenue within LAS CRUCES municipal limits is LAS CRUCES'S sole responsibility and nothing herein is intended to give the DEPARTMENT any responsibility for future maintenance of the project in LAS CRUCES.

SECTION SEVEN -- LAS CRUCES SOLE JURISDICTION:

By reason of the DEPARTMENT'S participation in the funding of this project, the DEPARTMENT is not incorporating this project into the State Highway System, nor is the DEPARTMENT assuming any maintenance responsibility or liability for participation in this project.

SECTION EIGHT -- INTENT OF AGREEMENT:

This AGREEMENT is not intended by any of the provisions of any part of the AGREEMENT to create in the public, or any member thereof, a third party beneficiary or to authorize anyone not a party to the AGREEMENT to maintain a suit(s) for wrongful death(s), bodily and/or personal injury(ies) to person(s), damage(s) to property(ties), and/or any other claim(s) whatsoever pursuant to the provisions of this AGREEMENT.

SECTION NINE -- NEW MEXICO TORT CLAIMS ACT:

By entering into this AGREEMENT, LAS CRUCES and its "public

employees" as defined in the New Mexico Tort Claims Act, and the DEPARTMENT and its "public employees" as defined in the New Mexico Tort Claims Act, do not waive sovereign immunity, do not waive any defense(s) and/or do not waive any limitation(s) of liability pursuant to law. No provision in this AGREEMENT modifies and/or waives any provision of the New Mexico Tort Claims Act.

SECTION TEN -- TERMS OF THIS AGREEMENT:

The terms of this AGREEMENT are lawful; performance of all duties and obligations herein shall conform with and do not contravene any state, local, or federal statutes, regulations, rules, or ordinances.

SECTION ELEVEN -- PEDESTRIAN, BICYCLE AND EQUESTRIAN REQUIREMENTS:

In accordance with State Law, SECTION 67-3-62 N.M.S.A. 1978, new alignment and major widening projects must consider provisions for pedestrian, bicycle and equestrian facilities concurrent with the design of the project.

SECTION TWELVE -- ACCOUNTABILITY OF RECEIPTS AND DISBURSEMENTS:

There shall be strict accountability for all receipts and disbursements relating hereto.

SECTION THIRTEEN -- DEPARTMENT'S AUTHORIZATION OF EXPENDITURES:

The DEPARTMENT is expressly not committed to expenditure of any funds until such time as they are budgeted, appropriated by the legislature, and approved for expenditure by the State Highway Commission. The DEPARTMENT'S decision as to whether its funds are sufficient for fulfillment of this AGREEMENT shall be final.

SECTION FOURTEEN -- UNEXPENDED AND UNENCUMBERED PROJECT BALANCES:

Any unexpended or unencumbered balance from the Federal Aid funds appropriated for this project shall revert to the DEPARTMENT.

SECTION FIFTEEN -- EXECUTION OF AGREEMENT:

This AGREEMENT shall not take effect until executed by the parties hereto and approved by the Department of Finance and Administration, pursuant to N.M.S.A. 1978, SECTION 11-1-3, as amended.

SECTION SIXTEEN -- AMENDMENT:

This AGREEMENT shall not be altered, modified, or amended except by an instrument in writing and executed by the parties hereto.

IN WITNESS WHEREOF, the parties have set their hands and seals this day and year set forth below.

NEW MEXICO STATE HIGHWAY AND
TRANSPORTATION DEPARTMENT

By: _____
Secretary

Date: _____

CITY OF LAS CRUCES

By: _____
Mayor

Date: _____

Attest:
By: _____
City Clerk

Date: _____

(Signatures continued on page 17.)

(Signatures continued from page 16.)

Approved By New Mexico Department
Of Finance And Administration

By: _____
Secretary

Date: _____

Approved as to legal form
by the Office of General Counsel

By: Phil R. Lucero
for General Counsel

Date: May 26, 1993

Approved as to legal form
by the City Attorney's Office

By: Robert Kelly
City Attorney

Date: 6-10-93

APPENDIX A

Minimum Design Standards

1. All DEPARTMENT and FHWA standards, requirements and procedures.

2. Roadway and interSECTION geometry shall be designed to provide Level of Service "C" or "D" based upon 20 year projected Average Daily Traffic (lane widths of 12 Ft. are desirable and 11 ft. are a minimum).

3. The design must provide for all facilities as required by law (wheelchair ramps, bicycle paths, etc.)

4. The pavement shall be designed for a 20 year life as a minimum.

5. All traffic control devices shall be designed in accordance with the Manual on Uniform Traffic Control Devices, current edition.

6. The DEPARTMENT'S Standard Specifications for Road Building and Bridge Construction, 1984 edition (the "Green Book"), shall be used.

7. Plans shall be prepared using the specific contents and format used by the DEPARTMENT as applicable.

8. The Guidelines in the DEPARTMENT'S following Manuals shall be used in the design of this project:

   a. DEPARTMENT'S Regulations for Driveway and Median Opening on Non-Access Controlled Highways, June 9, 1989.
   b. DEPARTMENT'S Urban Drainage Design Criteria.
   c. DEPARTMENT'S Geotechnical Manual, September, 1990.
   d. DEPARTMENT'S Check Lists for Field Design, Grade and Drain and Plan-In-Hand Inspections.
   e. DEPARTMENT'S Action Plan.
   f. DEPARTMENT'S Federal-Aid Systems Procedures (FAUS) Manual.

9. All electronic design data to be furnished to the DEPARTMENT, upon the DEPARTMENT'S request, shall be transmitted in a format that is compatible with the DEPARTMENT'S Diginetics format. Survey mapping data shall be submitted to the DEPARTMENT in either a DIGIMAP graph or AUTOCAD DFX Format. If the AUTOCAD DXF Format is to be utilized, then the Engineer/Surveyor must contact the DEPARTMENT'S Survey Section to obtain symbols and layer names which must be used in conjunction with this format. Submittals in either format shall be on 1600 bpi magnetic tape in VAX/VMS backup 9 track open reel format.

10. This project shall be designed in accordance with all applicable provisions of A Policy On Geometric Design Of Highways and Streets, 1990 edition (AASHTO "GREEN BOOK").

APPENDIX B

Minimum Survey And Plan Requirements

1. Establish center line of existing Right-Of-Way or center line (base line) for new alignment.
   a. Permanent points of reference shall be used for all survey control points. The base line shall be tied to at least two points in the LAS CRUCES GPS Network.
   b. Reference points shall be established outside the proposed construction limits for all survey points.

2. Establish and permanently reference stations and monuments.

3. Establish a permanent benchmark network.

4. Determine and record sufficient topography to assure all relevant landmarks are shown. Include items such as buildings, sidewalks, driveways, walls, trees, etc.

5. Obtain and plot existing profile grade and cross-sections where necessary. Plot curb profiles as needed.

6. A drainage map shall be required. It shall show all drainage areas, flow lines, divisions lines, and the existing drainage system.

7. All affected utilities above and below ground and their owners must be shown.

8. The plans shall be drawn to a scale of 1" = 50 feet as a minimum although complex areas should be shown larger (e.g. 1" = 20 feet.)

9. The surveyor shall verify, ascertain, and certify the Right-Of-Way design plans.

10. All surveying and Right-Of-Way mapping is to be performed according to the DEPARTMENT'S Surveying Requirements, edition 1989, and minimum standards for surveying, N.M.S.A. 1978, Sections 61-23-1 to 61-23-32 or as amended.

11. The guidelines in the DEPARTMENT'S Right-Of-Way Handbooks, current edition, shall be used.

12. Survey, control and the photography supplied to the DEPARTMENT shall be submitted on electronic tape in Digimap format with all graphics files, support files and cross section files in this format. The LAS CRUCES shall be responsible for all translations required to assure that the finished product is compatible with DEPARTMENT equipment.

When completed, please send Certificate No. 1 to:

Mr. Luis D. Duffy, Director
Transportation Planning Division
New Mexico State Highway and
Transportation Department
SB-1
P. O. Box 1149
Santa Fe, NM 87504-1149

APPENDIX C

CERTIFICATION of
THE RIGHT OF WAY PHASE
of PROJECT No. M-4509(1), Control No.1329

I, _____, in my capacity

as _____

_____ of _____ do hereby certify with reference to Project No. M-4509(1), Control No. 1329 as follows:

1. LAS CRUCES has complied with the terms and conditions of the right of way phase requirements set forth in Joint Powers Project Agreement Project No. M-4509(1), Control No. 1329.

2. That all necessary right(s)-of-way for the construction or reconstruction of this project has been acquired by LAS CRUCES at its own expense (including, but not limited to, Temporary Construction Permits and Construction Maintenance Easements) in compliance with the DEPARTMENT'S Right-of-Way Procedures Manual (current edition).

IN WITNESS WHEREOF, _____ in his/her capacity as _____ of _____ does hereby certify the aforementioned matters stated herein are true to his/her knowledge and belief and does hereby set his/her hand and seal this day and year specified below:

CITY OF LAS CRUCES

By: _____
Mayor

Date: _____

225

When completed, please send Certificate No. 2 to:

Mr. Luis D. Duffy, Director
Transportation Planning Division
New Mexico State Highway and
Transportation Department
SB-1
P. O. Box 1149
Santa Fe, NM 87504-1149

APPENDIX D

CERTIFICATION OF
THE PRE-CONSTRUCTION CONTRACT PHASE
OF PROJECT CONTROL NUMBERS, M-4509(1), CONTROL No.1329

I, _____, in my capacity

as_____

_____ of _____ do hereby certify with reference to Project Control Number, M-4509(1), Control No. 1329 follows:

1. That LAS CRUCES has complied with the terms and conditions of the pre-construction phase requirements set forth in Joint Powers Agreement (JPA) Control No. 1329.

2. That the design for this project is in compliance with all state laws, rules, regulations, and local ordinances and in the rules and regulations of the DEPARTMENT.

3. That all utilities within the location of this construction project (check one or both of the following conditions):

_____ a. have been relocated
_____ b. are scheduled for relocation prior to or concurrent with construction of this project and have been coordinated with the appropriate utility.

4. That LAS CRUCES has encumbered the necessary funds to complete this project.

5. That LAS CRUCES has fully complied with the requirements of N.M.S.A. 1978, SECTION 67-3-62.

6. That LAS CRUCES has completed all required Environmental Documentation and clearances for this project using guidance contained in the New Mexico State Highway Department Action Plan, June, 1984 edition.

7. That LAS CRUCES has completed all required

Archaeological Documentation and clearances for this project using guidance contained in the New Mexico State Highway Department Action Plan, June, 1984 edition.

8. That the following attached agreement(s) have been executed, when required, for construction or reconstruction of this project (attach copies to this certificate):

a. lighting,
b. signalization,
c. storm sewer and lift station,
d. landscape,
e. road exchange, and
f. any other applicable agreements.

9. That LAS CRUCES has complied with and certifies compliance with all applicable provisions of Guide for the Development of Bicycle Facilities, 1991 edition, A Policy on Geometric Design of Highways and Streets, 1990 edition (AASTHO'S "Green Book"); the DEPARTMENT'S Standard Specifications for Road Building and Bridge Construction, 1984 edition (also known as the DEPARTMENT'S "Green Book"); the Manual of Uniform Traffic Control Devices for Streets and Highways, current edition; and the DEPARTMENT'S Federal Aid Urban Systems Procedures (FAUS) manual, 1987/88 edition.

10. That this certification procedure has been executed prior to advertisements for contract bids or commencement of the project.

IN WITNESS WHEREOF, _____ in his/her

capacity as _____ of _____ does hereby certify the aforementioned matters stated herein are true to his/her knowledge and belief and does hereby set his/her hand and seal this day and year specified below:

LAS CRUCES

By:_____
Mayor

Date:_____

Attest:
By:_____
City Clerk

Date:_____

Contract No. DO4776/1

Vendor No. ~~50945~~ 5057567

Project No. M-4509(1)

Control No. 1329

AMENDMENT TO

FEDERAL AID URBAN SYSTEM

PROJECT AGREEMENT DO4776

PROJECT No. M-4509(1)

This First Amendment to Federal Aid Urban System Project Agreement DO4776, made and entered into this 20th day of April, 1997 by and between the NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT, herein referred to as "DEPARTMENT", and the CITY OF LAS CRUCES located in DONA ANA COUNTY, herein referred to as "LAS CRUCES".

M.E.A.

RECITALS

Whereas, DEPARTMENT and LAS CRUCES entered into Project Agreement DO4776 on October 11, 1990; and

Whereas, Page 6, Section Three, Paragraph 9, of original Project Agreement allows both parties to make alterations or revisions to said AGREEMENT; and

Whereas, it has become necessary to amend original Project Agreement DO4776;

Now, therefore, it is agreed by DEPARTMENT and LAS CRUCES that Project Agreement DO4776 be amended and changed to read and be as follows:

1. Page 2, SECTION 1, Paragraph 4, line 1, after the words "in the amount of", delete the figure "$203,700" and replace it with the figure "$234,390".

2. Page 4, SECTION 2, Paragraph 1, line 1, after the words "in the amount of", delete the figure "$926,300" and replace it with the figure "$1,065,610".

IN WITNESS WHEREOF, the parties have set their hands and seals the day and year first above written.

NEW MEXICO STATE HIGHWAY
& TRANSPORTATION DEPT.

BY: _____
SECRETARY

DATE: 04/20/92

CITY OF LAS CRUCES

BY: _____
Mayor

DATE: _____

Attest:

BY: _____
City Clerk

DATE: _____

Approved as to form by the DEPARTMENT's Office of General Counsel the 18th day of Dec, 1991

By: _____
for General Counsel

BY: _____
City Attorney

DATE: 2-27-92

Contract No. 005264
Vendor No. 5057560

LIGHTING AGREEMENT

UNION AVENUE WIDENING, SOUTH MAIN TO UNIVERSITY
PROJECT NO. STP-4509(1)

THIS AGREEMENT, made and entered into this 21st day of April, 1992, by and between the NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT, acting by and through the Secretary, hereinafter called the Department, and the CITY OF LAS CRUCES by and through its duly appointed City Manager, hereinafter called the PUBLIC ENTITY.

WITNESSETH,

WHEREAS, the Public Entity contemplates the letting of a contract for the construction of a highway project within the boundaries of the Public Entity, said project being identified as Union Avenue Widening Project No. STP-4509(1).

WHEREAS, the Public Entity has requested that the Department administer use of Federal Aid Funds in accordance with the Federal Aid Urban Systems Program for the said project, the exact design to be determined by the Public Entity subject to the approval of the Department, or its delegated representatives, before the actual work begins.

NOW THEREFORE,

1. The Public Entity agrees that it will provide the necessary plans, estimates, and other documents required for the construction of the project.

2. The Public Entity shall indemnify and hold harmless the State, its officers and employees against liability, claims, damages, losses

or expenses arising out of bodily injury to persons or damage to property caused by, or resulting from Public Entity's and/or its employees, own negligent act(s) or omission(s) while Public Entity's employees perform(s) or fails to perform its obligations and duties under the terms and conditions of this Agreement. This save harmless and indemnification clause is subject to the immunities, provisions, and limitations of the Tort Claims Act (41-1-1, et seq., N.M.S.A. 1978 Comp.) and Section 56-7-1, N.M.S.A. 1978 Comp., and any amendments thereto.

3. It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of the Agreement to create the public or any member thereof a third party beneficiary, or to authorize anyone not a party to the Agreement to maintain a suit(s) for wrongful death(s), bodily and/or personal injury(ies) to person(s), damage(s) to property(ies), and/or any other claim(s) whatsoever pursuant to the provisions of this Agreement.

4. By entering into this Agreement, the Public Entity and its "public employees", as defined in the New Mexico Tort Claims Act; and, the Department and its "public employees", as defined in the New Mexico Tort Claims Act, do not waive sovereign immunity, do not waive any defense(s) and/or do not waive any limitation(s) of liability pursuant to law. No provision in this Agreement modifies and/or waives any provision of the New Mexico Tort Claims Act.

5. The Public Entity agrees that for the street lighting system, it will provide and install underground cable, conduit, and bases for

twenty-five (25) street lights, the exact locations to be determined by the Public Entity, subject to the concurrence of the Department, before actual work begins.

6. The Public Entity agrees that the poles and luminaires will be installed within ninety (90) days after the completion of the project.

7. The Public Entity agrees that after installation of the street lighting system, it will provide any and all utilities, maintenance, and such other items as may be necessary for the continued satisfactory operation of said street lighting system.

8. The Public Entity agrees to provide for the cost of maintaining and providing energy to the lighting system as defined in this agreement.

9. The Department agrees to administer the construction of the project in a manner provided by law in accordance with such plans, documents and the Federal Aid Urban Programs.

10. Any alterations or revisions of this Agreement must be in writing and must have the written approval of the Secretary of the State Highway and Transportation Department in order to be effective.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year hereinafter first written.

CITY OF LAS CRUCES

BY: _____
Bruno Zaldo,
City Manager

NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

_____ 04/24/92
Secretary

RECOMMENDED BY:

_____
Traffic Design Engineer

Contract No. 50945
Vendor No.

PROJECT NO. M-4509(1)

CONTROL NO. 1329

FEDERAL AID URBAN SYSTEM PROJECT AGREEMENT

THIS AGREEMENT, made and entered into this 11th day of October, 1990, by and between the NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT, hereinafter "DEPARTMENT" and the CITY OF LAS CRUCES, COUNTY OF DONA ANA, hereinafter "MUNICIPALITY".

In consideration of the convenants contained herein and pursuant to Section 67-3-28, N.M.S.A. 1978, as amended, the parties agree as follows:

GENERAL

That the Department and the Municipality do hereby approve and enter into this Agreement relative to the Federal-Aid Urban System Program to plan, Develop, Construct, and Maintain this project in accordance with the procedures and the requirements of the Department's latest approved FEDERAL AID URBAN SYSTEM PROCEDURES MANUAL (FAUS), which is hereby incorporated by reference into this Agreement.

SECTION 1 - MUNICIPALITY AGREES:

1. To pay all costs, perform all labor and supply all material except as provided in SECTION TWO of this Agreement for the

purpose of planning, developing, designing, acquiring right-of-way, constructing, and maintaining FAUS Project No. M-4509(1).

2. To assume sole responsibility for the preliminary engineering, public hearings, surveying, title reports, appraisals, right-of-way acquisition, railroad agreements, utility relocations, and contract letting necessary for this project.

3. That the design of the project must be developed in accordance with the Department's Federal Aid Urban System (FAUS) Procedures.

4. To participate in the amount of $203,700 or 18.03% (applicable Municipality matching percentage participation) of the total contract price for construction, reimbursable utility relocations and for right-of-way acquisition, whichever is higher.

5. That any right-of-way acquired will comply with Department and Federal Highway Administration Standards and will require prior approval of Department, as outlined in the FAUS Manual. Municipality further agrees to abide by the terms of the Right-of-Way Cooperative Agreement prepared for this project.

6. To stay within the approved Design Work Schedule in conformance with Attachments A & B which are incorporated by reference as part of this Agreement. The Department must approve all Design work schedules.

7. To comply with all applicable provisions of the Department's Standard Specifications for Road and Bridge Construction

(1984 Edition) and any special plans and specifications unless expressly waived in writing by the Department.

8. To furnish to the Department upon reasonable demand all records relevant to this Agreement and to allow Department the right to audit all records which support the terms of this Agreement.

9. To enter into a contract for the construction of this project no later than September 30, 1991. If there construction contract is not executed by this time, this agreement is automatically terminated. Should such automatic termination occur, or if the Municipality fails to complete this project as outlined in FAUS Manual, the Municipality agrees to reimburse the Department and United States Department of Transportation for any and all funds paid the Municipality under this Agreement.

10. To abide by the Lighting Agreement required (if applicable) between the Department and the Municipality if lighting is provided for in the Construction Plans.

11. To maintain traffic signals, signs, and pavement markings installed under this project. To abide by the Traffic Signal, Signs, and Markings Agreement required by the Department (if applicable) for the above items installed under this contract.

12. To coordinate and make proper arrangements for all utility adjustments required by construction.

13. To maintain, at its own cost and expense, all portions of the project that lie within its jurisdiction in a manner

satisfactory to the Department and the Federal Highway Administration (or their authorized representatives).

14. In accordance with State Law, Section 67-3-62 N.M.S.A. 1978, to evaluate provisions for pedestrian, bicycle and equestrian facilities concurrent with the design of the project. To conduct a bicycle public hearing and notify the public and Department accordingly.

15. To coordinate with affected railroad or other agency in obtaining required agreements and/or permits when the project involves a railroad or irrigation system.

SECTION 2 - DEPARTMENT AGREES:

1. To participate in the amount of $926,300 or 81.97% (applicable Federal Aid matching percentage participation of the total contract price for construction and right-of-way acquisition, whichever is less.

2. To assign a Project Development Engineer and appropriate District Staff to provide technical assistance in developing, monitoring, and inspecting this project.

3. To coordinate all aspects of right-of-way acquisition as outlined in the FAUS Manual.

4. To provide for Construction Engineering for subject project, which will include project supervision, surveying (except when a contract item), inspection and testing.

SECTION 3 - BOTH PARTIES AGREE:

1. The Department must approve all plans and contract documents prior to their acceptance or execution.

2. The Department must concur in the selection of the

Consultant, contract scope of work and fee before work is undertaken.

3. The current New Mexico State Highway Department Standard Specifications for Road and Bridge Construction (1984 Edition), will be used for work to be performed by this Contract.

4. That Municipality will select, with concurrence by the Department, Consultant(s), who shall perform all of the required preliminary engineering and design of the project.

5. That this project is for an improvement to a Municipal street under Municipality's sole jurisdiction and control, and that by reason of Department's participation in the planning and construction of this project, the Department is not incorporating these streets into the State Highway System, nor is the Department accepting any of Municipality's full jurisdiction and liability for the maintenance or existence of this Municipal street.

6. Municipality shall indemnify and hold harmless the Department, its officers and employees, against liability, claims, damages, losses or expenses arising out of bodily injury to persons or damage to property caused by, or resulting from Municipality's and/or its employees', own negligent act(s) or omission(s) while Municipality and/or its employees, perform(s) or fails to perform its obligations and duties under the terms and conditions of this agreement. This save harmless and idemnification clause is subject to the immunities, provisions, and limitations of the Tort

Claims Act (41-4-1, et seq., N.M.S.A. 1978 Comp.) and Section 56-7-1 N.M.S.A. 1978 Comp. and any amendments thereto.

7. It is specifically agreed between the parties executing this Agreement that it is not intended by any of the provisions of any part of this Agreement to create in the public or any member thereof a third party beneficiary or to authorize anyone not a party to the Agreement to maintain a suit(s) for wrongful death(s) bodily and/or personal injury(ies) to person(s), damage(s) to property(ies), and/or any other claim(s) whatsoever pursuant to the provisions of this Agreement.

8. By entering into this Agreement, the Municipality and its "public employees" as defined in the New Mexico Tort Claims Act,. and the Department and its "public employees" as defined in the New Mexico Tort Claims Act, do not waive sovereign immunity, do no waive any defense(s) and/or do not waive any limitation(s) of liability pursuant to law. No provision in this Agreement modifies and/or waives any provision of the New Mexico Tort Act.

9. That any alternations or revisions of this Agreement must have the written approval of both parties provided that only a contract executed by the Secretary of the New Mexico State Highway and Transportation Department can bind the Department.

10. That the terms of this Agreement are lawful; that performance of all duties and obligations herein will conform with and not contravene any State or Federal statutes and regulations.

11. That the Department is expressly not committed to expenditure of any funds until such time as they are budgeted, appropriated by the Federal Government, and approved for expenditure. The Department's decision as to whether its funds are sufficient for fulfillment of this Agreement shall be final.

IN WITNESS WHEREOF of the parties have set their hands and seals the day and year first above written.

NEW MEXICO STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

BY: _____
SECRETARY

MUNICIPALITY OF LAS CRUCES

BY: _____
MAYOR

ATTEST:

_____
MUNICIPAL CLERK

APPROVED AS TO FORM:

_____
City Attorney

MINIMUM FIELD SURVEY REQUIREMENTS

1. Establish centerline of existing right of way or centerline (baseline) for new alignment and tie to section corners where possible.

   a. Permanent points will be used for all control.

   b. Reference points will be established outside the proposed construction limits for all survey control points.

2. Establish and permanently reference stationing, considering adjacent roadway section.

3. Establish a permanent bench mark network that is tied to sea level datum by ties at both ends to USGS bench marks.

4. Determine and record existing topography:

   a. Within proposed right-of-way limits.

   b. Adjacent to right-of-way, if it may affect project.

   c. Major features such as buildings, sidewalks, driveways, walls, service station islands, trees, etc. up to 50 feet from the right-of-way line also are to be shown (if photo maps are used, topography need not be shown outside proposed R.O.W.).

   d. Use rectangular coordinate method or angle-distance method.

5. Obtain and plot existing profile grades and cross-sections.

   a. As a minimum profiles shall show centerline and curb lines.

6. Prepare a drainage map that shows:

   a. Areas

   b. Flowlines

   c. Division lines

   d. Existing drainage system

7. Property maps shall be prepared, if additional R.O.W. is needed.

They shall contain:

a. Metes and bounds surveys of properties involved.

b. R.O.W. and property markers.

c. Section lines, grant lines, Indian Lands, and National Forest division applicable.

d. Political subdivision lines

e. Owners addresses and source of survey identified

8. Utilities:

a. All utilities above and below ground shall be located with respect to line and elevation

b. Utility owners shall be identified.

9. Survey maps (of standard sheet size):

a. Plan and profile (separate utility map if needed to prevent congestion).

b. Drainage

c. Property

10. Scales:

a. Scale will depend upon complexity (1"=50' minimum)

b. All maps (except drainage) will have the same scale

c. Scale must be small enough to show necessary details, e.g. intersection 1"=20'.

NOTE: Surveyor shall ascertain and certify the source of the right-of-way establishment.

APPENDIX B

MINIMUM DESIGN CRITERIA

GENERAL

In general, the design of FAUS projects shall be based upon criteria contained in the various applicable AASHTO Design Guides as adopted by the HTD and approved by the FHWA.

SPECIFICATIONS

Current HTD Specifications for Road and Bridge Construction shall be used.

TYPICAL SECTION

The typical roadway section shall be based upon anticipated Average Daily Traffic (ADT) volumes in the 20th year after construction. In general a 4-lane undivided section with curb, gutter and sidewalks shall be the minimum standard. Twelve foot (12') wide driving lanes are desirable, an 11 ft. width is the acceptable minimum.

INTERSECTIONS

Intersection geometry shall be based upon anticipated Design Hourly Volumes (DHV) for the 20th year after construction. Where traffic signals are to be constructed or are anticipated within 20 years, an intersection designed for Level of Service "C" is desirable. Traffic signals must be warranted in accordance with the latest edition of the Manual on Uniform Traffic Control Devices.

All intersections shall provide for the safe and adequate turning of the appropriate design vehicle.

PARKING

Only parallel parking shall be permitted within the roadway section. Vehicle parking behind the curb and sidewalk and within the right-of-way shall not be permitted. Proper restrictions of parking at intersections shall be included in the design.

DRIVEWAYS

The location, spacing and size of driveways and curb cuts, etc., shall either be in accordance with HTD Regulations or Municipal Regulations, using the particular regulation that is more restrictive.

BICYCLE AND PEDESTRIAN FACILITIES

The need for bicycle and pedestrian facilities shall be considered for each project. Bicycle facilities shall be in accordance with the municipalities officially adopted Bike Route Master Plan (or equivalent). If no such plan exists, FAUS funds are not eligible for bicycle facilities. It is anticipated that all projects will include sidewalks with provisions for use by the handicapped at intersections, as required by State Law.

SURFACING

The design of surfacing shall be based upon soil tests and analysis and projected traffic data. A 20-year design shall be used. The design procedure shall be in accordance with current HTD practice. Special conditions may justify the consideration of stage construction.

DRAINAGE

A drainage study and report are required for all projects. This shall include a map indicating tributary drainage areas and critical points of concentration. The drainage analysis shall consider a "10-year" storm as the minimum. A "100-year" storm analysis is required for all major structures.

Culverts and storm drains shall be designed for runoff from the "10-year" storm as a minimum. A higher degree of protection should be considered on each project, with the final choice based upon local conditions, local policy, anticipated flood damage and economy.

When a drainage system is proposed, it will contain inlets designed to intercept gutter flow from a "10-year" storm in a manner that one driving lane in each direction will remain open. This stipulation will only apply to a roadway section containing more than two lanes.

EXCEPTIONS

Exception to the above minimum design criteria will be considered and may be granted, if sufficient jurisdiction is provided by the Municipality. Exception must be approved by both the HTD and FHWA.

rm No. A-[illegible]
v. 8/79

NEW MEXICO STATE HIGHWAY DEPARTMENT

PROJECT AUTHORIZATION

TRANSACTION CODE 8.2

DATE _____

DOC. NO. 82

: Marie Aragon TITLE: Financial Specialist

OU ARE HEREBY AUTHORIZED TO INCUR EXPENDITURES, NOT TO EXCEED THE AMOUNTS SHOWN BELOW UNDER MOUNT-LIFE OF PROJECT", TO BE USED ONLY FOR THE FOLLOWING DESCRIBED PURPOSES. YOU WILL BE HELD ESPONSIBLE FOR THE MANAGEMENT OF THIS "PROJECT AUTHORIZATION" FROM THE APPROVAL DATE UNTIL MPLETION OF THE PROJECT.

PPLEMENT	TOTAL OF SUPPLEMENTS	ORIGINAL AUTHORIZATION	TOTAL AUTHORIZATION
). _____	$ _____	$ _____	$ 926,300.00

OJECT M-450961) COUNTY _____ ROUTE _____ LENGTH _____

RMINI City of Las Cruces

NTRACTOR - STATE FORCES _____ VENDOR NO. _____ CONTR. NO. _____

OP AGREEMENT WITH City of Las Cruces APPROVED BY S.H.C. ON _____

SCRIPTION AND JUSTIFICATION OF WORK TO BE DONE:

Planning, developing, designing, acquiring right-of-way, Constructing, and maintaining FAUS Project No M-450961).

FUNDS REQUESTED		OBJECT CODE	PROJECT NO.		AMOUNT - LIFE OF PROJECT	E.S.N.
DERAL FUNDS		27	W3245091		926,300.00	
ATE FUNDS		29				
BJECT OF EXPENDITURE	ORG. CODE		TOTAL		926,300.00	
RSONAL SERVICES		6000		B		
PLOYEE BENEFITS		6100		B		
AVEL		6200		B		
INT. & REPAIRS		6300		B		
PPLIES		6400		B		
NTRACTUAL SERVICES		6500		B		
	9401	6600	W3245091	B	926,300.00	
OCKPILE PRODUCTION		6700		B		
PITAL OUTLAY		6800		B		
			TOTAL		926,300.00	

THORIZED BY: Ron A. Sosa

By: Phyllis A. Taylor

BUDGET AVAILABLE: Lawrence Tinsley 7/24/90

MISCELLANEOUS ENCUMBRANCE DOCUMENT

☒ ENCUMBRANCE
☐ ENC ADJUSTMENT

ORIGINATING ORGANIZATION 1630

SIGNATURE Marie Arago

Title S-III

DATE 6 12 90

DOCUMENT No. 7000476

For Use with Encumbrance Adj.

ORG.	ACCT.	TASK	ACTIVITY		AMOUNT	E.S.N.
9401	6531				$26,300.00	

UNIT	QUANTITY	DESCRIPTION
		M-4509(1)

EXPLANATION: to encumber funds on an agmt with Las Cruces, City of

SIGNATURE [signature]
Division Head or District Engineer

Legal Sent copy to NMSU Sec 1-30-94

RESOLUTION NO. 94-178

A RESOLUTION AUTHORIZING THE MAYOR TO EXECUTE AN AGREEMENT TO SETTLE DISPUTED UTILITY CLAIM WITH NEW MEXICO STATE UNIVERSITY AND AN AGREEMENT FOR EXTENSION OF UTILITY EASEMENT.

The City Council is informed that:

WHEREAS, the City of Las Cruces ("City") and New Mexico State University ("University") staff have been diligently working to prepare a mutually satisfactory settlement of a disputed utility lien filed by the City on University property for the unpaid natural gas bill of Flores de New Mexico, a defunct commercial greenhouse formerly located on University property;

WHEREAS, the parties have prepared a proposed Agreement to Settle Disputed Utility Claim ("Flores Agreement") which has previously been approved by The Board of Regents of New Mexico State University;

WHEREAS, in the proposed Flores Agreement, the University donates to the City necessary right-of-way for the Union Avenue widening project, and a site for a replacement lift station and related easements in complete settlement of the unpaid natural gas bill of Flores de New Mexico. In exchange for the real property, the City agrees to release its utility lien on University property.

WHEREAS, City and University staff have also been negotiating for the extension of a sewer line from the University horse farm lift station site southerly to Park Drain;

WHEREAS, the parties have prepared a proposed Agreement for Extension of Utility Easement ("Extension Agreement"), which has not yet been reviewed or approved by The Board of Regents of New Mexico State University;

WHEREAS, in the proposed Extension Agreement, the University donates the necessary easement to the City to enable the City to extend municipal sewer service to property located south of Park Drain. In exchange for the easement, the City agrees to place underground the existing irrigation ditch along the south side of Union Avenue adjacent to the horse farm property.

NOW, THEREFORE, the City Council of the City of Las Cruces, New Mexico, hereby resolves as follows:

I. That the Agreement to Settle Disputed Utility Claim with New Mexico State University and the Agreement for Extension of Utility Easement be and hereby are approved and the Mayor is authorized to execute same;

II. That City staff and officials are hereby authorized to do all acts necessary to carry out the intent of this Resolution and the conditions of both Agreements.

DONE AND APPROVED this 18 day of January, 1994.

RUBEN A. SMITH, Mayor

ATTEST:

CITY CLERK
(SEAL)

Mayor Ruben A. Smith: Aye
Councillor Ferralez: Absent
Councillor Kennon: Aye
Councillor Valencia: Aye
Councillor Tomlin: Aye
Councillor Haltom: Aye
Councillor Benavidez: Aye

Moved by: Valencia

Seconded by: Haltom

APPROVED AS TO FORM:

MARCIA B. DRIGGERS
Assistant City Attorney

AGREEMENT TO SETTLE DISPUTED UTILITY CLAIM

This agreement is entered into on this _____ day of _____, 1992, between the City of Las Cruces ("City"), a New Mexico municipal corporation, and the Board of Regents of New Mexico State University ("University").

BACKGROUND FOR UTILITY LIEN

1. The University owns land in what is commonly referred to as Arrowhead Research Park located south of the main University campus.

2. 27.769 acres within said research park was leased to the New Mexico State University Foundation, Inc. ("Foundation"), a non-profit corporation.

3. The Foundation thereafter subleased said property to Flores de New Mexico ("Flores"), a former Delaware corporation, for a greenhouse operation to grow flowers and potted plants to be sold to wholesalers and large retailers.

4. Flores secured City natural gas service to said property and thereafter incurred an unpaid utility bill in the amount of One Hundred Six Thousand Ninety Two Dollars and 88/100 ($106,092.88) owing to the City for utility charges from the January 12, 1989, billing through the March 13, 1989 billing. After offset for Flores' utility deposit, Flores owed the City the net sum of Sixty Thousand Two Hundred Forty Dollars and 77/100 ($60,240.77) plus interest at the rate of 12% per year.

5. Having heard rumors of Flores' intention to file

bankruptcy, the City filed a claim of municipal utility lien on or about April 10, 1989, against the University as the owner of the subject property on which the utility bills were incurred.

6. Flores thereafter filed for relief under the United States Bankruptcy code on April 12, 1989, in cause number 11-89-01033ML, United States Bankruptcy Court, District of New Mexico.

7. The City's municipal utility lien was determined to be an unsecured claim in the bankruptcy proceeding. The City received no payment from the bankruptcy court proceeding towards the utility bill owing to it by Flores.

8. The City maintains that it has a valid lien on the University's property for the unpaid utility bills of its sublessee, which lien the City maintains can be foreclosed in compliance with state statutes.

9. The University maintains that the City's municipal utility lien is invalid and cannot be foreclosed upon because the University is a public body and part of the State, one governmental body cannot place a lien against another governmental body, and because there was no existing natural gas service to the property when the lease with the Foundation was entered into.

10. Both parties recognize the potential detrimental effects of litigating this disputed claim, and wish to avoid the litigation process to solve disputes.

11. Rather than jeopardize the cooperative relationship between the two public entities, the parties have been diligently

working towards a mutually acceptable compromise and settlement of the City's disputed utility claim, which will have benefit for both parties.

GENERAL CONDITIONS

In complete satisfaction of any amount alleged to be owing by the University to the City for the unpaid natural gas bill of Flores and in recognition of the mutual benefits to be derived, the parties agree to the conditions set forth in this agreement.

I.

BACKGROUND FOR UNION AVENUE WIDENING PROJECT

1. In conjunction with the State of New Mexico Highway and Transportation Department, the City needs to acquire necessary right of way from the University to widen and improve Union Avenue/El Paseo from the south right of way of University Avenue to the east right of way of South Main Street.

2. The Union Avenue Widening Project will improve safety and traffic flow in this congested part of Union Avenue, which is also known as El Paseo when it crosses through University property.

3. As part of the project, it is necessary for the City to acquire by Quitclaim Deed four (4) tracts of University property totaling 583 square feet. Legal descriptions and plats are attached as Exhibits "A", "B", "C", and "D" to this agreement.

4. As part of the project, it is necessary for the City to acquire a permanent easement of 2600 square feet for construction and maintenance purposes, primarily for long term access to a storm

sewer clean out. A legal description and plat are attached as Exhibit "E" to this agreement.

5. As part of the project, it is necessary for the City to acquire three (3) temporary construction easements totalling 22,310 square feet for the purpose of project construction, including but not limited to the temporary storage of equipment and materials, excavating dirt, repaving, grooming roadway and shoulder slopes, and removing vegetation and other obstructions interfering with the construction project. Legal descriptions and plats are attached as Exhibit "F", "G" and "H" to this agreement.

6. As part of the project, it is necessary for the City to make provision for the discharge of service water drainage from the completed Union Avenue Widening Project.

UNION AVENUE WIDENING PROJECT CONDITIONS

1. The University will deed to the City by Quitclaim Deed four (4) tracts of property described in Exhibits "A", "B", "C", and "D" to this agreement to be used as right of way for the Union Avenue Widening Project.

2. The University will grant to the City an easement for real property described in Exhibit "E" to this agreement to be used for construction and maintenance purposes, primarily for the long term access to a storm sewer clean out.

3. The University will grant to the City three (3) temporary construction easements for real property described in Exhibits "F", "G", and "H" to this agreement to be used for the purpose of

project construction, including but not limited to the temporary storage of equipment and materials, excavating dirt, repaving, grooming roadway and shoulder slopes, and removing vegetation and other obstructions interfering with the construction project.

4. The University will allow the City to discharge surface water drainage from the completed Union Avenue Widening Project into the University's detention pond located easterly of El Paseo between Stewart Street and the Frontage Road.

5. The City represents that the volume of surface water drainage that will be discharged into the University's detention pond by this completed project will not exceed 0.80 acre feet of drainage generated from a ten (10) year frequency storm as determined by the National Weather Service, National Oceanic and Atmospheric Administration, Precipitaion Frequency Atlas for Western United States. In the future, if either party should ever be required by any state or federal law or regulation to treat water from the detention pond prior to its discharge, then the parties shall equitably share in the treatment cost.

6. As further consideration for the City's use of the University's detention pond, the City agrees to landscape the perimeter of the detention pond in accordance with the landscape design prepared by the City and modified by the University. The landscaping and related services to be provided by each party are set forth below and will be finalized in greater detail in a separate memorandum of understanding to be entered into between the parties.

A. The City will finalize the landscape design and will provide and install the plant materials, the irrigation system, and a three (3) strand clean wire fence which fence will be around the interior perimeter of the pond behind the berm;

B. The University will provide the finalized grading design; the rough grading of the site; landscaping and erosion controls for those areas of the perimeter of the pond where the University discharges surface water drainage along the ground surface; a source for the irrigation water; and if necessary, electricity for the operation of the irrigation system.

7. The Union Avenue Widening Conditions set forth in paragraphs 1 through 6 above are supplemented by an agreement for the acquisition of real property. A copy of that agreement is attached as Exhibit "I" to this agreement.

II.

BACKGROUND FOR LIFT STATION

1. The existing City owned Mesilla Park lift station located on Union Avenue must be enlarged to adequately handle additional liquid waste from the village of Tortugas. The existing facility cannot be enlarged due to its proximity to an existing City well.

2. The City's utility department has diligently explored relocation options presented by its consulting engineer, Gardner, Mason and Associates. Some of the options have generated community

and University opposition.

3. One initial proposed site was along Union Avenue on University property known as the University Horse Farm. Because that location conflicted with the University's master development plan, the consulting engineer studied alternative locations on the horse farm property.

4. A mutually acceptable site for the proposed lift station has been located on the horse farm property away from a main street location.

LIFT STATION CONDITIONS

1. The University will quitclaim with right of reverter to the City a tract of land approximately 40' x 60' on the south side of the horse farm property as more specifically shown on Exhibit "J" attached to this agreement.

2. The City will construct a wastewater lift station on the deeded tract, which facility will be both an above and below ground structure.

3. Because the tract is University owned land within the City limits, it will be necessary for the City to apply for a special use permit to use the property as a wastewater lift station. The University as an adjacent land owner agrees not to protest the City's special use permit so long as the deeded property is to be used for the purposes set forth in this agreement.

4. The City will install and thereafter maintain in good repair a fence with gate around the perimeter of the tract

comparable to existing horse farm fencing.

5. The University will grant to the City a non-exclusive right of way easement from Union Avenue to the tract along a previously existing unpaved roadway as more specifically shown on Exhibit "J" attached to this agreement for vehicular access to the lift station site.

6. The University will grant the City a utility easement from Union Avenue through the tract together with a right of access for construction and maintenance as more specifically shown on Exhibit "J" attached to this agreement.

7. The City will install a gravity feed line along said utility easement to the lift station facility. The City will also install at no cost to the University, stub outs in the design and construction of the gravity feed line to enable the University to connect to the line at a future date. The stub outs will be placed at locations mutually agreed to between the City's consulting engineer and the University's Director of Physical Plant.

8. The City will install a water line along said utility easement to the lift station facility. The City will also install at no cost to the University stub outs in the design and construction of the water line to enable the University to connect to the line at a future date. The stub outs will be placed at locations mutually agreed to between the City's consulting engineer and the University's Director of Physical Plant.

9. The University will pay to the City all applicable

development and connections charges in effect at the time of connection to the gravity feed line and water line.

10. After the installation of the gravity feed and water lines, the City will restore the roadway to its previously existing condition and thereafter will maintain the roadway, which it will use as a service access to the facility, with a gravel surface of a material compatible with the University's use of the adjacent land.

11. The City will extend an electric line along the utility easement to the facility and will have the line placed underground to enable the University to have the least restrictive use of the surface area, if such installation is acceptable to El Paso Electric Company.

12. The University will grant the City a temporary construction easement adjacent to the roadway and utility easement and to the lift station site to allow the City to do all things necessary for the construction of the water and gravity feed lines and lift station facility including, but not limited to, excavating dirt and refilling trenches, storage of equipment and materials, and removing vegetation and other obstructions interfering with the construction project. To the extent that the temporary easement property is altered or damaged as a result of the construction by the City, the property will be re-contoured by the City comparable to the surrounding property, and re-seeded and allowed to return to its previously existing condition, and the gravel roadway and any

existing improvements will be restored as set forth in paragraph 10 above.

EXECUTED in duplicate on this _____ day of _____, 1992.

BOARD OF REGENTS OF NEW MEXICO STATE UNIVERSITY

By_____

_____

CITY OF LAS CRUCES

By_____
RUBEN A. SMITH, Mayor

ATTEST:

_____
CITY CLERK

APPROVED BY:

_____
MARCIA B. DRIGGERS,
Assistant City Attorney

AGREEMENT FOR ACQUISITION OF REAL PROPERTY

THIS AGREEMENT is entered into on this ____ day of _____, 1992, between New Mexico State University ("Seller") and the City of Las Cruces ("City").

For valuable consideration, the Seller agrees to convey in fee simple and the City agrees to acquire four (4) tracts of real property with all improvements thereon, if any, and all rights and easements of record belonging thereto, located in Dona Ana County, New Mexico, more particularly described as Exhibits A, B, C, and D which are attached to and made a part of this agreement and are hereafter called the "properties".

For valuable consideration, the Seller agrees to convey and the City agrees to acquire three (3) temporary easements and one (1) permanent easement which are more particularly described in Exhibits E, F, G and H, which are attached hereto and made a part of this agreement and are hereafter called "easements".

TERMS AND CONDITIONS

1. Property Survey. The City will provide a current survey of the properties and the easements prepared by a surveyor licensed in the State of New Mexico, upon execution of this agreement.

2. Conditional Acquisition Price. The properties easements to be acquired by the City are as follows:

PROPERTY	SIZE	TYPE OF ACQUISITION
3-CME-1	2,600 sq.ft.	Permanent Easement
3-TCP-1	1,246 sq.ft.	Temporary Easement
4-1	384 sq.ft.	Quitclaim Deed
4-1-A	17 sq.ft.	Quitclaim Deed
4-1-B	55 sq.ft.	Quitclaim Deed
4-1-C	127 sq.ft.	Quitclaim Deed
4-TCP-1	10,570 sq.ft.	Temporary Easement
4-TCP-2	10,494 sq.ft.	Temporary Easement

4-TCP-1	10,570 sq.ft.	Temporary Easement
4-TCP-2	10,494 sq.ft.	Temporary Easement

The acquisition of the properties and easements by the City from the Seller will be part of the consideration for the execution by the parties of a separate agreement entitled Agreement to Settle Disputed Utility Claim concerning an unpaid natural gas bill owing to the City by Flores de New Mexico, a former sub-lessee of University property. The seperate agreement must be entered into on or before January 4, 1993, or as otherwise agreed to in writing by the parties, and must include acquisition of the above-referenced properties and easements as part of the settlement consideration. If such an agreement is not entered into by that date, the City will purchase the properties and easements based on appraisals prepared for the project or as otherwise negotiated by the parties, which payment shall be made within thirty (30) days after January 4, 1993.

3. Closing Date. Closing shall occur on a mutually agreeable date, at least ten days after the meeting of the City Council, when the resolution authorizing the purchase is adopted, pursuant to Municipal Code, Section 2-151. The parties may extend the closing date by mutual agreement, not to exceed sixty (60) days following approval by the City Council.

4. Quitclaim Deeds. At closing, the Seller shall execute and deliver a Quitclaim Deeds prepared by the City conveying the properties to the City in fee simple, subject to all patent reservations and to all other existing liens, encumbrances and

other exceptions of record.

5. Risk of Loss. All risk of loss or damage to the properties will pass from the Seller to City at closing. In the event that material loss or damage occurs prior to closing, City may, without liability, refuse to accept the conveyance of title.

6. Temporary and Permanent Easements. At closing, Seller shall also execute three (3) temporary and one (1) permanent easements prepared by the City for the City's use as temporary construction easements and as a permanent construction and maintenance easement.

The temporary construction easement entitles the City to do any and all things necessary for the construction of said Union Avenue Widening Project, including but not limited to temporary storage of equipment and materials; excavating dirt; re-paving; grooming roadway and shoulder slopes; and removing vegetation and other obstructions interfering with the construction. Temporary construction easements shall become effective upon their execution; shall remain in full force and effect for so long as they may be required for the City to fully construct said project; and shall terminate upon completion of construction.

The permanent easement shall be a construction and maintenance easement to provide the City with a long term non-exclusive access, primarily, for maintaining the storm sewer clean-out. The permanent easement shall remain in effect so long as the City maintains the easement in a good state of repair and does not abandon use of the easement. If City discontinues use of this

easement, then Seller shall be entitled to file a Certificate of Abandonment with the Dona Ana County Clerk and the easement shall then terminate.

7. Construction Clean-up. Any areas of the herein described lands and any other University property used by the City for construction and maintenance that are altered or damaged as a result of construction by City, shall be re-contoured comparable to the surrounding terrain, re-seeded and allowed to return to a natural condition; or if paved, to repave to existing specifications when said construction or maintenance is completed.

8. Possession of Easements. Possession of the property for the temporary and permanent easements will be given to the City at closing. The City will relinquish possession of the temporary easements at the end of construction.

9. Costs and Fees. All fees and other closing costs shall be paid by the City.

10. Notice. All notices given pursuant to or in connection with this Agreement shall be made in writing and mailed to the City, ATTN: Joe Dearing, P. O. Drawer CLC, Las Cruces, NM 88004; and to Seller, NEW MEXICO STATE UNIVERSITY, Attn: Board of Regents, P. O. Box 3 Z, University Park, NM 88003, or to such other address as requested by either party. Notice shall be deemed to be received on the fifth day following posting.

11. Counterparts. This agreement may be executed in one or more identical counterparts, and all counterparts so executed shall constitute one agreement which shall be binding on all of the

parties.

12. Governing Law. The City states that it has complied with the requirements of Municipal Code Section 2-151. The City acknowledges that the Seller must submit this transaction to the Commission on Higher Education and the State Board of Finance for approval prior to the conveyance of any real property to the City. Agreement shall be subject to the laws of the State of New Mexico.

13. Access During Construction. The City will insure that Seller and all persons wishing to visit Seller's property will have twenty four (24) hour per day access to University property during the construction period.

EXECUTED on the date first written above.

NEW MEXICO STATE UNIVERSITY

By_____

_____

CITY OF LAS CRUCES

By_____
RUBEN A. SMITH, Mayor

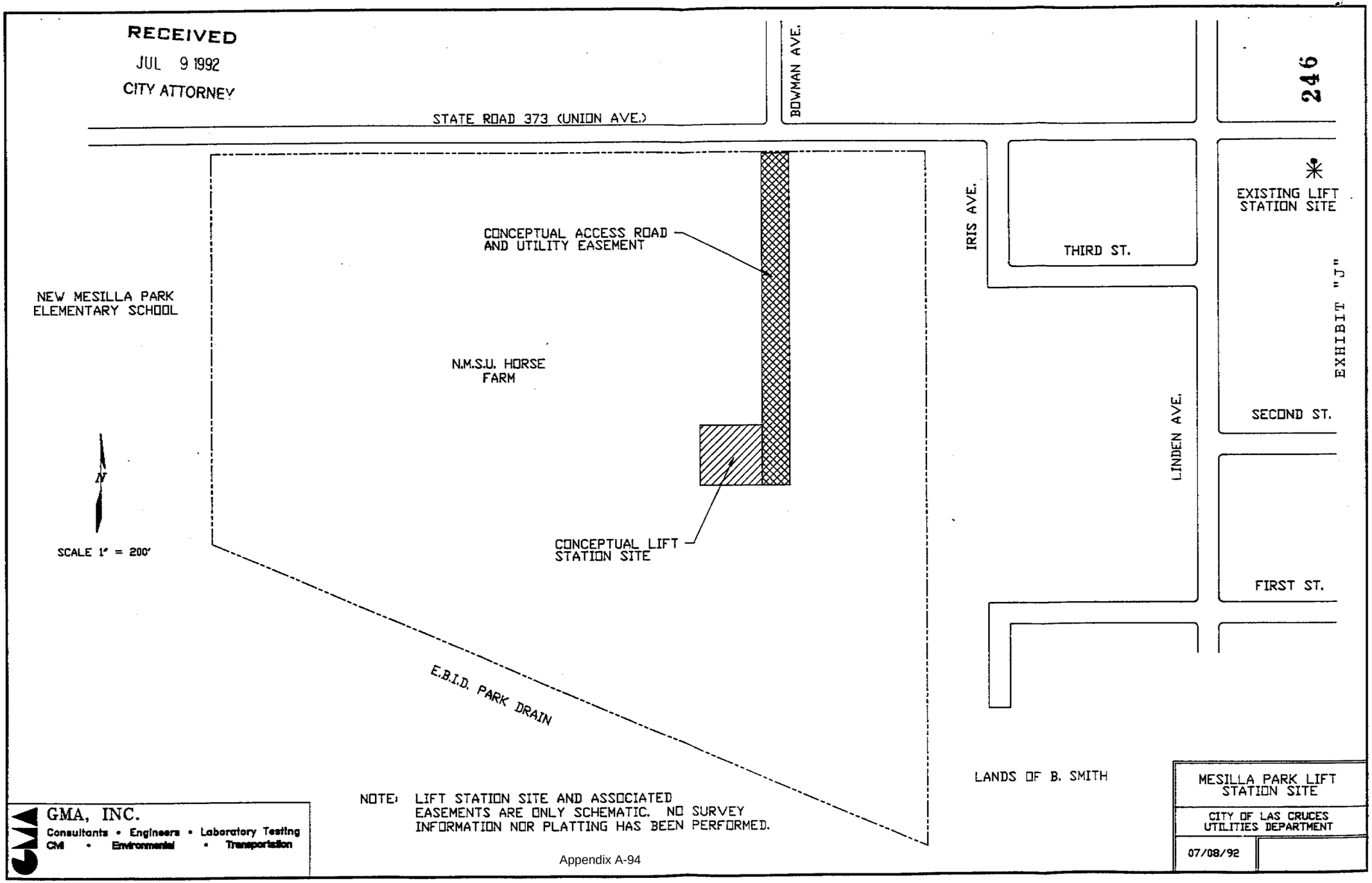
ATTEST:

_____
City Clerk

APPROVED AS TO FORM:

_____
Marcia B. Driggers
Assistant City Attorney

RECEIVED
JUL 9 1992
CITY ATTORNEY



GMA, INC.
Consultants • Engineers • Laboratory Testing
Civil • Environmental • Transportation

NOTE: LIFT STATION SITE AND ASSOCIATED EASEMENTS ARE ONLY SCHEMATIC. NO SURVEY INFORMATION NOR PLATTING HAS BEEN PERFORMED.

MESILLA PARK LIFT STATION SITE
CITY OF LAS CRUCES UTILITIES DEPARTMENT
07/08/92

NOV 06 1992

PHYSICAL PLANT

Box 30001, Dept. 3545
Las Cruces, New Mexico 88003-0001
(505) 646-2101

29 October 1992

Ms. Marcia Driggers
City Attorney
City of Las Cruces
P.O. Drawer CLC
Las Cruces, New Mexico 88004

Re: Flores de New Mexico Lien

Dear Ms. Driggers:

The purpose of this letter is to verify in writing the information which I previously provided to you with regard to the action that was taken by the NMSU Board of Regents at their meeting on September 25, 1992 on this issue.

At that time the Board of Regents took several actions. The first was to approve the draft agreement to settle the Flores de New Mexico lien dispute between New Mexico State University (NMSU) and the City of Las Cruces. In addition, the Board of Regents directed the University Administration to inform the City of the intent to accept the proposed settlement. At such time as the City Council has considered and approved the settlement, the two entities shall meet to execute the said agreement.

In addition, the Board of Regents directed the University Administration to, subsequent to execution, submit for approval to the applicable State agencies the proposed land actions along Union Avenue. As the action will require the disposal of State-owned property it will require approval by not only the Board of Regents but also the Commission on Higher Education and the State Board of Finance.

The Board also approved the development of a memorandum of understanding between the University and the City of Las Cruces concerning the landscaping of the retention pond located at Union Avenue and Frontage Road in exchange for accepting storm water runoff from Union Avenue.

The Board also approved action that it had previously taken to grant to the City of Las Cruces authority to enter University property in order for the City to proceed with the Union Avenue widening project.

The Board also directed the University Administration to continue cooperative efforts with the City of Las Cruces in the design development of the Mesilla Park Lift Station and to bring any proposed land action back to the Board of Regents for their approval at a later date.

Subsequent to the Board of Regents meetings there have been several meetings between representatives of the University and the City to work together to bring this issue to a close. Allow me to express our appreciation for your personal involvement in working on this most tedious issue.

Sincerely,

Benjamin E. Woods
Director

/gu
cc: Dr. James E. Halligan, President, NMSU
Mrs. Christina Chavez Kelley, Assistant to the President
Mr. Jim McDonough, Vice President for Business Affairs

AGREEMENT FOR EXTENSION OF UTILITY EASEMENT

THIS AGREEMENT is entered into on this ____ day of _____, 1994, between the **CITY OF LAS CRUCES** ("City"), a New Mexico municipal corporation, and **THE BOARD OF REGENTS OF NEW MEXICO STATE UNIVERSITY** ("University").

BACKGROUND

1. The University approved a draft Agreement to Settle Disputed Utility Claim ("Flores Agreement") at its September 25, 1992, meeting.

2. The Flores Agreement was intended to fully settle any amount alleged to be owing by the University to the City for the unpaid natural gas bill of Flores de New Mexico, a defunct greenhouse operation formerly located on University property.

3. As partial consideration for the Flores Agreement, the University will grant to the City a utility easement from Union Avenue to the proposed lift station tract on the south side of the University's horse farm property.

4. At a work session in October, 1992, the City Council agreed to allow property owners south of Park Drain and the University's horse farm property to connect to the City's sewer system if the property owners paid for the expenses. The least expensive and most feasible location to connect to the City's sewer system would be at the lift station to be located on the horse farm property pursuant to the Flores Agreement.

5. In order to use the lift station to serve property to the south, the easement from Union Avenue to the lift station would have to be extended southerly to Park Drain. The draft Flores Agreement, that was approved by the University in September 1992, was rejected by the City Council at its December 7, 1992, meeting. City staff was directed to continue negotiating with the University regarding the southerly extension of sewer service.

6. City and University staff have been working toward a mutually acceptable agreement for the southerly extension of the sewer line and have considered various options. City and

University staff would prefer to have the sewer lines and the lift station constructed in one project to minimize the disruption to the horse farm.

7. City Utility Department staff presented other options, including relocating the lift station to adjacent private property, to the City Council at a work session on November 8, 1993. The Council rejected these other options and directed staff to pursue the horse farm location with the University.

CONDITIONS

1. The University will grant the City a utility easement from the proposed lift station tract on the south side of the horse farm property southerly to Park Drain.

2. The University will grant the City a temporary construction easement to allow the City to do all things necessary for the construction of the sewer line, including but not limited to, excavating dirt and refilling trenches, storing equipment and materials, and removing vegetation and other obstructions interfering with the construction project.

3. To the extent that the utility easement and the temporary construction easement properties are altered or damaged as a result of the construction by the City, the property will be re-contoured by the City comparable to the surrounding property, and re-seeded and allowed to return to its previously existing condition. Any existing facilities, which are impacted by the construction, including surface structures and the underground water system, will be restored to their previously existing condition or as otherwise approved by the University.

4. The City will not begin construction until the summer of 1994 because of heavy class loads on the horse farm property during the spring 1994 semester.

5. The existing underground irrigation pipe, which is buried in the present horse farm roadway, will be extended to the south and the City will provide a water valve in the large arena at the south side of the horse farm property.

6. The City will replace the open irrigation ditch along the south side of Union Avenue adjacent to the horse farm property with appropriate underground piping including turnout structures and valves. This new underground irrigation system will be covered with an earth berm of sufficient size to restrict vehicles from driving across it. This construction work will be coordinated so that it is done after the Elephant Butte Irrigation District irrigation season is completed.

7. City and University staff will work closely together during the design phase of the entire project, and will schedule and coordinate the construction of the irrigation ditch, lift station and sewer lines to minimize the disruption to the horse farm property and to the irrigation system.

Executed in duplicate on this ____ day of _____, 1994.

THE BOARD OF REGENTS OF
NEW MEXICO STATE UNIVERSITY

By_____

CITY OF LAS CRUCES

By_____
RUBEN A. SMITH, Mayor

ATTEST:

_____
CITY CLERK

APPROVED BY:

_____
MARCIA B. DRIGGERS
Assistant City Attorney

PHYSICAL PLANT

Box 30001/Dept. 3545
Las Cruces, New Mexico 88003-0001
(505) 646-2101

NEW MEXICO STATE UNIVERSITY

September 7, 1993

Ms. Marcia Driggers
City Attorney's Office
P.O. Drawer CLC
200 N. Church Street
Las Cruces, NM 88004

RE: Mesilla Park Lift Station/NMSU Horse Farm

Dear Marcia:

The purpose of this letter is to inform you of New Mexico State University's desire to finalize the overall settlement of the Flores de New Mexico lien. Prior action was taken by the New Mexico State University Board of Regents approving an initial settlement agreement. It is our understanding that the City of Las Cruces wishes to supplement this agreement.

Acceptance of this supplemental agreement will require action by the Board of Regents. As soon as this agreement has been worked out at staff level and then approved by the City Council, we will carry it forward to the Board of Regents for their consent.

We would request the following conditions to be made a part of the supplemental agreement between New Mexico State University and the City of Las Cruces on this issue:

1. The construction must not be initiated until the summer of 1994. Our heavy class loads in the spring semester mandate that we have full access to our horse farm during this time period.

2. The existing facilities which are impacted by the construction must be restored to their original condition or to the approval of the University. This includes the underground water system as well as all surface structures.

3. The existing underground irrigation pipe, which is buried in the present roadway, will be extended to the south and provide a water valve in the large arena at the south side of the property.

4. The irrigation ditch along Union Avenue will be replace with appropriate underground piping including turnout structures and valves. This new irrigation system along Union Avenue will be covered by an earth berm of sufficient size to restrict automobiles from driving across it. This work should be coordinated so that it is done after EBID irrigation seasons.

5. It would be important to us that there be provisions made within the eventual construction contract for damages that may be incurred by the University should a contractor fail to perform, i.e., should the contractor fail to complete the job within the agreed to performance period. There would be damages borne by New Mexico State University as it would not have access to certain of its land and assets. Delay of regaining acquisition of the rights to these assets would bring a burden about, which we would hope to be reimbursed for accordingly.

6. Included in our recovery of the existing facilities is a special interest with regards to the reseeding of our pasture land. Should that land be kept dormant for too long a period of time it may require extensive effort to regain the pasture capability which currently exists. We would expect that it would be a responsibility of the contractor to ensure that we recover this pasture capability to match existing capability.

Obviously, it will be necessary for the City and University to work closely in the coordination of the construction documents during the design phase and the actual construction itself. It is imperative that the University be represented during the design phase and we would ask for assurances in the supplemental agreement to that effect. Specifically, that the Physical Plant Department and the College of Agriculture and Home Economics have an opportunity to review and comment. We have a great many questions with regards to the scheduling and coordination of this and feel like those can probably best be answered in a meeting as opposed to trying to address each of them at this point in time and would ask that that meeting be scheduled as soon as is appropriate.

In closing, we would request that you take these issues into consideration and prepare a draft supplemental agreement, which could be forwarded to the University for our review prior to action by the City Council. If you have any further questions on this, please do not hesitate to call either myself or Christina Chavez Kelley.

Sincerely,

Benjamin E. Woods
Director

cc: Mrs. Christina Chavez Kelley, Assistant to the President
Dean John Owens, College of Agriculture and Home Economics
Dr. Bobby Rankin, Academic Department Head, Animal and Range Sciences
Mr. Owen Lockwood, Assistant Director for Utilities, PPD

AGREEMENT FOR EXTENSION OF UTILITY EASEMENT

THIS AGREEMENT is entered into on this 21st day of Jan, 1994, between the **CITY OF LAS CRUCES** ("City"), a New Mexico municipal corporation, and **THE BOARD OF REGENTS OF NEW MEXICO STATE UNIVERSITY** ("University").

BACKGROUND

1. The University approved the Agreement to Settle Disputed Utility Claim ("Flores Agreement") at its September 25, 1992, meeting.

2. The Flores Agreement was intended to fully settle any amount alleged to be owing by the University to the City for the unpaid natural gas bill of Flores de New Mexico, a defunct greenhouse operation formerly located on University property.

3. As partial consideration for the Flores Agreement, the University will grant to the City a utility easement from Union Avenue to the proposed lift station tract on the University's horse farm property.

4. At a work session in October, 1992, the City Council agreed to allow property owners south of Park Drain and the University's horse farm property to connect to the City's sewer system if the property owners paid for the expenses. The least expensive and most feasible location to connect to the City's sewer system would be at the lift station to be located on the horse farm property pursuant to the Flores Agreement.

5. In order to use the lift station to serve property to the south, the easement from Union Avenue to the lift station would have to be extended southerly to Park Drain. The Flores Agreement, that was approved by the University in September 1992, was tabled by the City Council at its December 7, 1992, meeting. City staff was directed to continue negotiating with the University regarding the southerly extension of sewer service.

6. City and University staff have been working toward a mutually acceptable agreement for the southerly extension of the sewer line and have considered various options. City and

University staff would prefer to have the sewer lines and the lift station constructed in one project to minimize the disruption to the horse farm.

7. City Utility Department staff presented other options, including relocating the lift station to adjacent private property, to the City Council at a work session on November 8, 1993. The Council rejected these other options and directed staff to pursue the horse farm location with the University.

CONDITIONS

1. The University will grant the City a utility easement from the proposed lift station tract on the horse farm property southerly to Park Drain.

2. The University will grant the City a temporary construction easement to allow the City to do all things necessary for the construction of the sewer line, including but not limited to, excavating dirt and refilling trenches, storing equipment and materials, and removing vegetation and other obstructions interfering with the construction project.

3. To the extent that the utility easement and the temporary construction easement properties are altered or damaged as a result of the construction by the City, the property will be re-contoured by the City comparable to the surrounding property, and re-seeded and allowed to return to its previously existing condition. Any existing facilities, which are impacted by the construction, including surface structures and the underground water system, will be restored to their previously existing condition or as otherwise approved by the University.

4. The City will not begin construction until the summer of 1994 or 1995 because of heavy class loads on the horse farm property during the spring 1994 or 1995 semesters.

5. The existing underground irrigation pipe, which is buried in the present horse farm roadway, will be extended to the south and the City will provide a water valve in the large arena at the south side of the horse farm property.

6. The City will replace the open irrigation ditch along the south side of Union Avenue adjacent to the horse farm property with appropriate underground piping including turnout structures and valves. This new underground irrigation system will be covered with an earth berm of sufficient size to restrict vehicles from driving across it. This construction work will be coordinated so that it is done after the Elephant Butte Irrigation District irrigation season is completed.

7. City and University staff will work closely together during the design phase of the entire project, and will schedule and coordinate the construction of the irrigation ditch, lift station and sewer lines to minimize the disruption to the horse farm property and to the irrigation system.

Executed in duplicate on this 21st day of Jan, 1994.

THE BOARD OF REGENTS OF
NEW MEXICO STATE UNIVERSITY

By_____

CITY OF LAS CRUCES

By_____
RUBEN A. SMITH, Mayor

ATTEST:

_____
CITY CLERK Dep

APPROVED BY:

_____
MARCIA B. DRIGGERS
Assistant City Attorney

RESOLUTION NO. 75-89

A RESOLUTION AUTHORIZING THE CITY OF LAS CRUCES TO ENTER INTO AN AGREEMENT IN CONSIDERATION FOR THE GRANT OF A RIGHT OF WAY EASEMENT FOR THE EXTENSION OF THE CITY OF LAS CRUCES STORM DRAIN IMPROVEMENTS IN THE AREA OF EL PASEO EXTENSION (UNION AVENUE) BETWEEN THE PARK DRAIN AND INTERSTATE 10.

The City Commission is informed that:

To facilitate the construction of the City of Las Cruces Storm Drain Improvements in the area of the El Paseo extension (Union Avenue) between the Park Drain and Interstate 10 in a most economical manner and in keeping with good engineering design and principals it is necessary for the City to acquire right of way in which to locate said storm drain in and through the property of University Land Investment Company, a limited partnership, acting by and through its two general partners, Gale V. Grose, and Robert A. Mahaney. The terms and conditions for the obtaining of the necessary Right of Way Easement have been included in the proposed form which is attached hereto and made a part hereof, marked Exhibit "A", and the same has been accepted by the University Land Investment Company and has been offered to the City for its acceptance.

THEREFORE, the City Commission of the City of Las Cruces, New Mexico, determines, resolves and orders as follows:

THAT the City Commission of the City of Las Cruces accepts the Right of Way Easement attached hereto and marked Exhibit "A" and authorizes the Mayor to execute the same on behalf of the City.

DONE AND APPROVED this 6th day of January, 1975

Mayor

ATTEST:

Acting City Clerk

(SEAL)

Moved by Tomson

Seconded by Johnson

VOTE:

Commissioner Thaeler:	Aye
Commissioner Tomson:	Aye
Commissioner Blanco:	Absent
Commissioner Johnson:	Aye
Commissioner Munson:	Aye

RIGHT OF WAY EASEMENT

UNIVERSITY LAND INVESTMENT COMPANY, a limited partnership, acting by and through its two general partners, Gale V. Grose and Robert A. Mahaney, pursuant to the Articles of Limited Partnership, dated November 1, 1970, and recorded in Misc. Book 94 at Pages 14-26 of the Records of Dona Ana County, New Mexico, for and in consideration of the agreements and obligations imposed upon the grantee herein, and upon the consideration of the grantor's right to introduce water into the storm sewer system as provided for hereinafter, has bargained, sold, conveyed and granted and does hereby bargain, sell, convey and grant, subject to all of the terms contained hereinafter, a right of way easement to the CITY OF LAS CRUCES, a municipal corporation, affecting and covering the following described land for the purposes set forth hereinafter, said land being described as follows:

> A 20 foot strip of land being 10 feet on either side of the following described centerline situate within the exterior boundaries of the Dona Ana Bend Colony Grant, Dona Ana County, New Mexico, being more particularly described as follows:
>
> Beginning at a point on the east right of way line of the Park Drain from whence right of way marker 6+53 on the southeasterly right of way line of El Paseo Road, also known as Union Avenue, bears the three following courses and distances: S. 47 deg. 01' W. 52.05 feet to a point being on the centerline of USRS Park Drain; thence along said drain centerline N. 12 deg. 59' W. 55.82 feet to a point on the southeasterly right of way of said El Paseo Road; thence along said right of way of El Paseo Road N. 61 deg. 44' E. 52.16 feet; thence from the said point of beginning and along the centerline of the easement described herein N. 47 deg. 01' E. a distance of 34.75 feet to a point which is S. 23 deg. 16' E. 31.50 feet from the said southeasterly right of way line of El Paseo Road; thence N. 67 deg. 20' 12" E. a distance of 237.5 feet to a point which is S. 23 deg. 16' E. 53.0 feet from the said southeasterly right of way line of El Paseo Road; thence N. 55 deg. 56' 48" E. a distance of 358.8 feet to a point on the said southeasterly right of way line of El Paseo Road end of this easement excluding that portion crossing the Tortugas Lateral.

The above right of way is granted for the purposes specifically set forth hereinafter and subject to all of the terms and conditions set forth hereinafter, to-wit:

1. The grantee is authorized to enter in and upon the above described tract of land and to dig a trench or trenches across said tract of land to construct, install and maintain therein a storm sewer, pipe or conduit for the purpose of carrying storm water and rain water from portions of the City of Las Cruces and discharging same in the Park Drain or other similar drain or drains and further to install, construct and maintain in and upon the above described tract of land in addition to said storm sewer, municipal water lines, gas lines, sanitary sewers and such other utilities as the grantee herein shall require hereafter. Grantee shall be obligated to prepare the trench and install the aforesaid storm sewer, pipe or conduit and to recover and refill said trench with the exception of the manholes provided for hereinafter, within one hundred twenty days from day hereof and shall be obligated to restore the surface of the above described easement after the installation of said storm sewer to a condition as nearly as practical as said surface is at this time, provided, however, that the grantee shall have the right to construct three manholes 8 feet in diameter to be constructed along said right of way in the places designated on the plat styled "City of Las Cruces Storm Drain Improvements", dated May, 1974, provided that the grantee may, if it desires, eliminate the manhole at Station 8+25.8 and that each of the manholes will be connected into the drain pipe installed in the easement so that water can be discharged into the manholes and passed into the pipe for eventual discharging into the Park Drain or other similar drain or drains that the grantee shall determine to be adequate for the purpose. It is expressly understood that the one hundred twenty days construction period set forth above applies only to the storm sewer, the two sewer line stubs, the 12-inch water pipe and the PVC sleeve to be placed under the Las Cruces Lateral and it is not a limitation upon the grantee's right to install and construct any other utilities line, pipe or conduit in the easement granted hereby.

During construction and installation of the above pipe the grantor does hereby grant and authorize the grantee to operate over and across the land owned by the grantor lying between the above described right of way easement and El Paseo and to operate its machinery and temporarily stored dirt and generally use for the above purpose an additional area of land being a strip of land 30 feet in width southeast and parallel to the subject easement. It is specifically understood that this right is granted to the grantee only during the above construction period and is not a part of the right of way easement and that after the construction has been completed the grantee will be obligated to restore any part of these additional premises used by it to the condition as same exists at this time including the removal of any excess dirt taken from the ditch and stored on the operating area above described.

2. That as a part of the consideration for the granting of this right of way, the grantee specifically contracts, covenants and agrees with the grantor that the grantor which owns land to the north and south of the subject easement may introduce from its lands or the general area affecting its lands, a maximum of 16 cubic feet per second of storm or rain water into any manhole located on this easement hereinabove described. It is understood that the 16 cubic feet per second is the maximum amount that may be introduced into the storm drain, and it may be introduced into one of the manholes or may be divided between the several manholes, but that the total input into the system shall not exceed 16 cubic feet per second. The subject water may be introduced from any of the grantor's land in the area not to exceed the maximum input above set forth and the grantor shall have the right to allocate all or any portion of this maximum input to any persons or companies to which it may sell part of its land and if any is allocated to separate parcels of land, it is specifically understood that the total amount from all of the grantor's land that may be injected is 16 cubic feet per second. This right shall cover and include waters falling upon, flowing upon, collecting or affecting said lands described in the above deed, whether or not the water may have fallen on other lands, such as the highway, and then be discharged onto the grantor's land, it being the specific intent that the grantor shall have a way to dispose of any such water affecting its lands through this storm drain but not to exceed the above input.

3. As a part of the consideration for the grantor executing this easement in favor of the grantee, the grantee agrees that it will at its sole cost and expense install an 8 inch sewer line on the east side of its storm drain pipe and also a similar 8 inch sewer line on the west of this storm drain pipe within the easement estimated to be 70 feet in length as to each sewer line and located so as to pass underneath the Las Cruces Lateral. These two sewer lines shall pass completely beneath the Las Cruces Lateral and any lands on either side of the Las Cruces Lateral owned or controlled by the Bureau of Reclamation so that the ends of each of the sewer pipes will extend north and south of the lands located in the Las Cruces Lateral and owned, occupied or controlled by the Bureau of Reclamation so that the grantor shall not be obligated in any manner to obtain any consent, license or approval from the Bureau of Reclamation or any other agency owning, controlling or operating the Las Cruces Lateral for the installation of such

lines under the lateral. It shall be the specific obligation of the grantee prior to exercising any of its rights granted under the terms of this instrument to secure verbal consent to these pipe installations from the Bureau of Reclamation and confirm the verbal consent by a letter from the grantee to the grantor prior to construction and as soon as feasible to make all of the necessary written applications and secure in writing the consent and the approval from the Bureau of Reclamation or any other agency claiming to control, own, or operate the Las Cruces Lateral, granting the unrestricted right to install these two sewer lines underneath said lateral. A copy of this instrument shall be promptly furnished to the grantor. The two 8 inch sewer lines to be installed by the grantee at its expense shall be plugged at each end and left in such a condition that a gravity sewer line can be installed and attached to each of said lines in the future. Grantee shall further be obligated to install these two sewer lines upon such grades and elevations as is necessary to make it feasible to connect with the sewer system to the west and that there is attached hereto, marked Exhibits A, B, and C and incorporated herein by reference, a copy of a letter dated October 16, 1974, from Charles F. Horne & Associates, Inc., pertaining to the proper elevations and grades with Exhibits B and C being the plats attached to said letter setting forth the grades and elevations, and it shall be the sole obligation of the grantee to install these two pipes in accordance with the grades and elevations shown in Exhibits A, B and C and that should it be determined when the sewer line is to be used that these pipes have not been installed with the grades and elevations as shown in the three exhibits attached hereto, then at that time grantee shall be obligated at its expense to relocate these two sewer pipes so that they will conform in all particulars to the grades and elevations shown in the exhibits attached hereto which have been prepared by the consulting engineers and represented to the grantor as the proper grades and elevations for a sewer system connection to the present sewer system to the west and it will not require the grantor to install any lift station or lift equipment between the location of the two sewer pipes being installed by the grantee in the easement granted herein and the present sewer to the west located in the vicinity of the intersection of Oak and Union Avenues provided, of course, that the grantor follows the grades and elevations shown in the exhibit when installing the sewer pipes connecting these stub pipes connecting the sewer pipes to the west.

Provided further, however, that should the lines vary slightly from the grades and elevations shown in the exhibits and in any event the grantee will furnish after the completion and installation of these sewer lines an

as-built drawing from the grantee's consultant engineers certifying that as installed the sewer line when connected from these stub pipes to the present sewer to the west in accordance with the grades and elevations in the exhibits will constitute a gravity flow sewer line. The grantee will also furnish a certificate reflecting that the grantor will be able to tie its sewer lines into these two sewer stub pipes for use as a sewer in the future when it so desires and the grantor or its successors and assigns shall have the right to connect said sewer stub pipes to the present sewer located in the vicinity of the intersection of Oak and Union Avenues when requested in the future subject to the customary connection procedures required by the City for normal connections and to inject into the sewer system sewage in a volume up to but not to exceed the remaining capacity in the sewage system in which it is connected which is presently located in the vicinity of the intersection of Oak and Union Avenues.

As additional consideration the grantee also agrees to install at its expense under the Las Cruces Lateral a standard 12" water pipe and to install under said lateral a PVC sleeve of sufficient size to accomodate a standard gas pipe, both of which will be of the same length as the sewer pipe and the permit and the provisions pertaining to it shall cover these two lines in the same manner as the permit for the sewer pipe specifically granting a right or permit for the installation of these two lines under the Las Cruces Lateral.

4. As additional consideration for the granting of this easement, the grantee agrees and obligates itself during construction of the subject project to insert through the manhole located at Station 0+72.5 on the above map an 8 inch cast iron sewer line through the manhole at a 45 deg. angle from the sewer line on the southeast side of the easement in such a manner that the grantor or its successors in the future will be able to extend the sewer lines being installed by the grantee on the southeast side of the easement to this stubbed sewer line and attach it thereto in order to cross over the storm drainage pipe in question. This stub will likewise be set at the proper elevation and grade as specified in the exhibits or as specified by the engineer for the grantee so that it will be at the proper grade and elevation in order to attach said sewer lines and complete the sewer system. The as-built drawing will also cover this stub through the manhole to satisfy the requirement that it is in a proper position and elevation in order to have a gravity flow sewer line between the line under the lateral and the sewer to the west providing that the sewer pipes joining and completing this line are at the grades and elevations shown in the exhibits.

5. For the same consideration the grantor specifically grants to the

grantee the unrestricted right to install, operate and maintain its water lines, gas lines and sewer lines in the above easement provided, however, that the grantor specifically reserves the right to pave over and across said easement should it so desire and which right shall extend to its grantees or successors and to install fences crossing said easement and to install advertising signs over and above said easement provided that the footings for the signs are not located in the said easement and the grantee by its acceptance does hereby agree to the above rights being reserved by the grantor and should it be required to damage the paving or the cross fences or the signs in maintaining any of its utilities or storm sewer lines located in the easement, then it shall be the obligation of the grantee to promptly repair and/or replace the above improvements that are damaged or destroyed by its operations to the same condition as they existed prior to the damage by the grantee.

The parties recognize that from time to time in the future the grantor or its successors will request the right to cross said easement with utility pipes in order to tie onto the system and that these tie ons will be allowed by the grantee and not unreasonably refused provided that they first are furnished the engineering data concerning the proposed tie on prior to any construction or installation and same is constructed in the manner to meet the specifications of similar tie ons or crossovers of utilities as required throughout the utility system operated by the City of Las Cruces taking into consideration the grantee's rights in an unrestricted easement for utilities.

6. It is further stipulated and agreed that if the grantee or its successors should abandon and not use this easement for a period of three years, then in such event the easement herein will expire and become null and void. The grantee will execute any instruments necessary to terminate its rights granted herein which have been determined to have been terminated by non-use upon request. This easement will continue in full force and effect so long as the grantee or its successors use the easement for all or any part of the purposes for which the easement is granted as above set forth.

7. The grantee by its acceptance of this right of way easement specifically acknowledges that it is a right of way easement and acknowledges that it has agreed to perform at its expense the above obligations as consideration for this easement and to allow the induction of rain and storm water into the system in the manner provided above so long as the drain pipe is in use as a storm drain pipe, and to that extent these obligations imposed upon the grantee shall be a full and binding contract on the grantee to do and perform the above obligations being given as consideration for this easement.

8. This easement shall be binding on the parties hereto, their successors, grantees and assigns and shall extend to and benefit any successors to the grantor's interest in the lands owned by it in the area described in the above deed.

EXECUTED this 20th day of December, 197_.

UNIVERSITY LAND INVESTMENT COMPANY

By _____
Gale V. Grose, General Partner

By _____
Robert A. Mahaney, General Partner

STATE OF NEW MEXICO)
ss.
COUNTY OF DONA ANA)

The foregoing instrument was acknowledged before me this 20th day of December, 1974, by Gale V. Grose, General Partner on behalf of UNIVERSITY LAND INVESTMENT COMPANY, a limited partnership.

_____
Notary Public

My commission expires:

May 9, 1976

STATE OF FLORIDA)
ss.
COUNTY OF DADE)

The foregoing instrument was acknowledged before me this _____ day of _____, 197_, by Robert A. Mahaney, General Partner on behalf of UNIVERSITY LAND INVESTMENT COMPANY, a limited partnership.

_____
Notary Public

My commission expires:

_____

******

ACCEPTANCE

The City of Las Cruces, acting by and through its mayor, does hereby accept the foregoing right of way easement and agrees and obligates the City of Las Cruces in all particulars to do and perform the work and obligations imposed upon it in the foregoing instrument and agrees that this shall con-

stitute a binding contract on the City of Las Cruces to do and perform the work imposed upon it hereinabove and to allow the grantor and its successors to introduce water into the drain pipe in the manner set forth hereinabove, and the mayor does further certify that he has full authority to execute this instrument on behalf of the City of Las Cruces and that he has secured any and all authority necessary from the City Commissioners who have specifically granted unto him the authority to sign in his aforesaid capacity on behalf of said city and to make same a full and complete binding contract on the City of Las Cruces.

DATED this _____ day of _____, 197_.

CITY OF LAS CRUCES

ATTEST:

By _____
Robert B. Munson, Mayor

By _____
Its City Clerk

STATE OF NEW MEXICO)
ss.
COUNTY OF DONA ANA)

The foregoing instrument was acknowledged before me this _____ day of _____, 197_, by Robert B. Munson, Mayor of the CITY OF LAS CRUCES, a municipal corporation, on behalf of said corporation.

_____
Notary Public

My commission expires:

_____

Charles F. Horne & Associates, Inc.
CONSULTING ENGINEERS

227 East Palace Ave.
P.O. Box 283
Santa Fe, N.M. 87501
Tel. (505) 982-4481

October 16, 1974

Dr. Tom Gebhard
Director of Utilities
P.O. Box 760
Las Cruces, New Mexico 88001

Re: Sewer Profile
Union Ave. & Oak Ave.

Dear Dr. Gebhard:

Transmitted herewith is a profile of conditions as they will exist in the above area after installation of the storm pipe. Sewer can be extended east on El Paseo extension (Union Ave.) as shown to serve properties both on north and south of El Paseo and between Park Drain and Interstate 10. Property plats and elevations will be necessary to detail the possibility of extensions into the properties.

Please advise if any further investigation is necessary.

Very truly yours,

Charles F. Horne & Assoc. Inc.

H. U. Gaines

Henry U. Gaines

HUG/kg
213 W. Griggs
P.O. Box 401
Las Cruces, New Mexico 88001

ATTACHED TO AND MADE PART OF
THAT CERTAIN NONEXCLUSIVE RIGHT OF WAY
EASEMENT FROM UNIVERSITAY LAND INVESTMENT
COMPANY TO THE CITY OF LAS CURCES, DATED
NOVEMBER 8, 1974.

EXHIBIT "A"

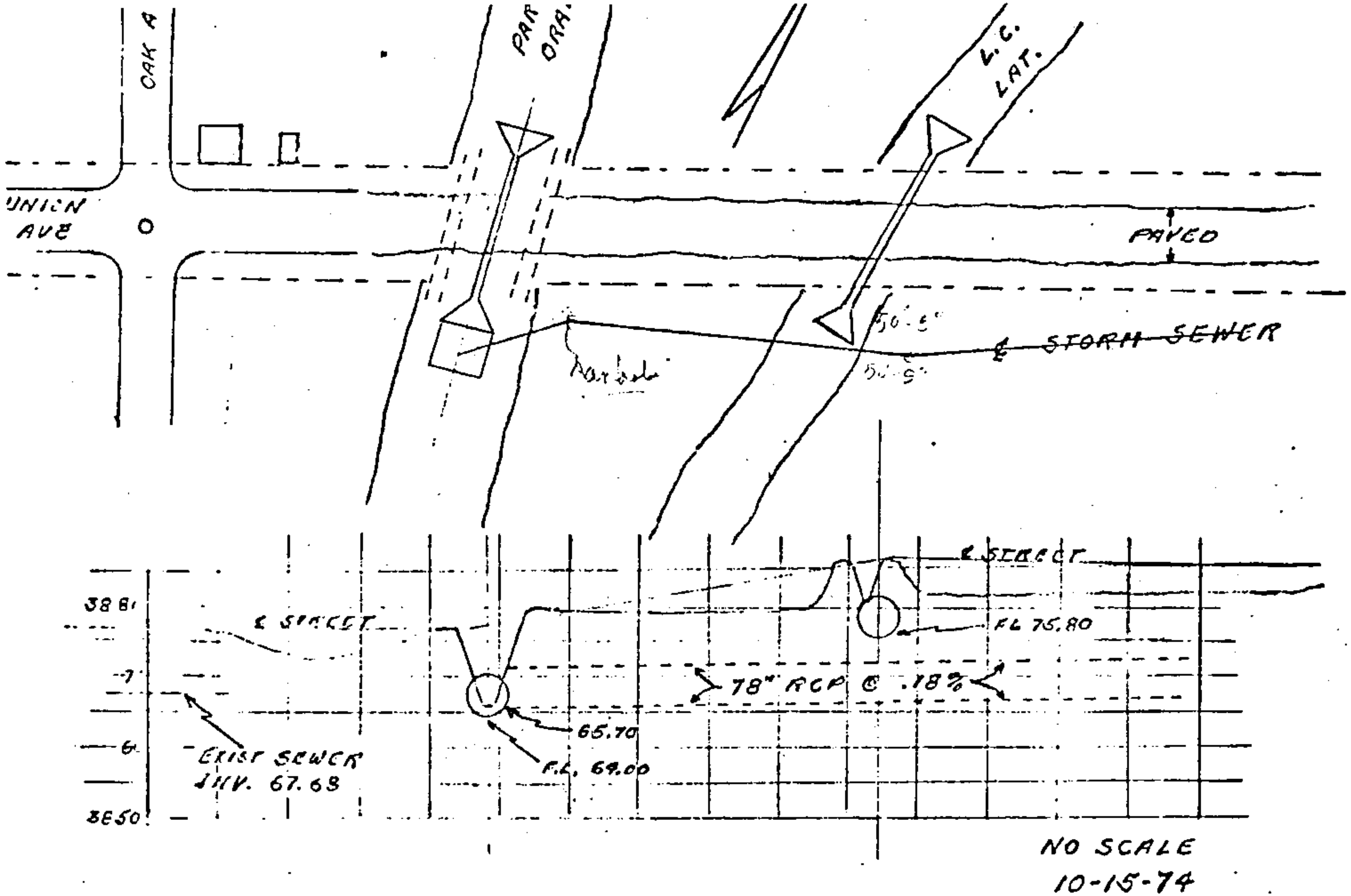
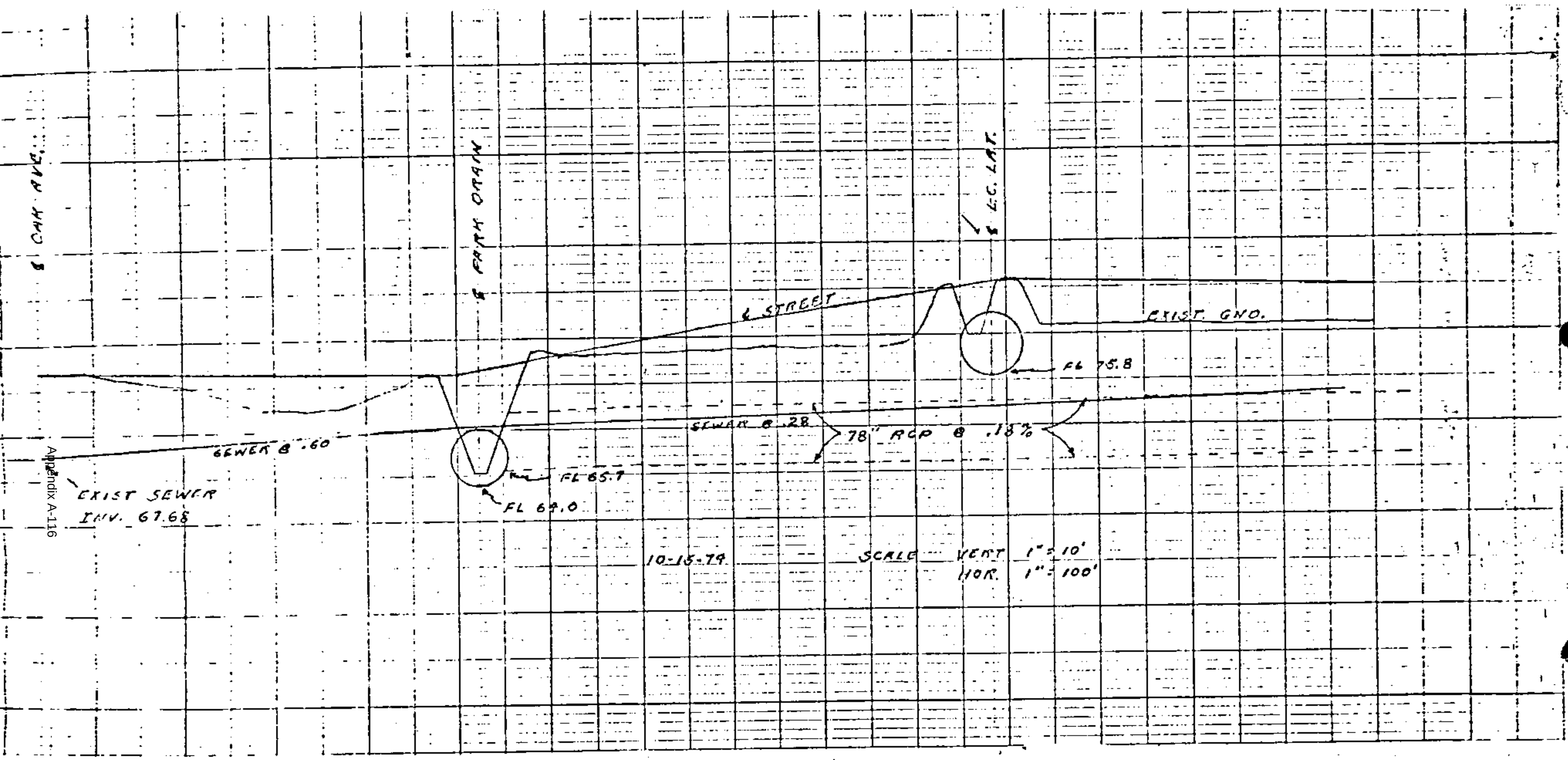

OAK A
UNION
AVE
PAR
ORA.
L.C.
LAT.
PAVED
℄ STORM SEWER
℄ STREET
℄ STREET
FL 75.80
78" RCP @ .18%
65.70
F.L. 69.00
EXIST SEWER
INV. 67.63
38 81
-7
-6
3E50
NO SCALE
10-15-74

EXHIBIT "B"



℄ OAK AVE.
℄ PARK DRAIN
℄ L.C. LAT.
℄ STREET
EXIST. GND.
FL 75.8
SEWER @ .28
78" RCP @ .18%
SEWER @ .60
FL 65.7
FL 64.0
EXIST SEWER
INV. 67.68
10-15-79
SCALE VERT 1" = 10'
HOR. 1" = 100'

EXHIBIT "C"

RESOLUTION NO. 98-332

A RESOLUTION APPROVING AN AGREEMENT BETWEEN THE CITY OF LAS CRUCES AND THE BOARD OF REGENTS OF NEW MEXICO STATE UNIVERSITY TO RESOLVE DISPUTED CLAIMS RELATED TO THE CONSTRUCTION OF A DRAINAGE POND ADJACENT TO THE UNION AVENUE RECONSTRUCTION PROJECT AND A PARCEL OF RIGHT-OF-WAY ON UNIVERSITY AVENUE EAST OF TELSHOR.

The City Council is informed that:

WHEREAS, in 1992, the City of Las Cruces and the New Mexico State Highway and Transportation Department undertook the reconstruction of Union Avenue from University Avenue to the Atchison, Topeka and Santa Fe railroad tracks, west of South Main Street; and,

WHEREAS, as a part of this project, the City had to acquire several tracts of property from New Mexico State University at an estimated appraised value of $11,300; and,

WHEREAS, as a part of the discussion on the acquisition of this property, the City and University conceptually agreed to have the City undertake or participate in the development, including landscaping, of a drainage retention pond located east of University Avenue and north of Sam Steele Way; and,

WHEREAS, the City and University have never been able to agree on the actual value the City should contribute towards this project; and,

WHEREAS, the section of University Avenue from Telshor Boulevard east to the Desert Greens Subdivision includes the existing roadway and certain underground utilities; and,

WHEREAS, the City is in the process of undertaking a project to construct a new gas line along a section of this alignment. However, the University believes that it holds title free and clear to the property with no existing easements and no right-of-way for the utilities or the road; and,

WHEREAS, City and University staff have negotiated a potential settlement to this dispute which provides that the City will pay the University $40,000; $20,000 from Fund 400500 Flood Control and $20,000 being paid from Fund 502000 Gas Utility. The University will agree to utilize this money solely for the purposes of construction and improvements, (including landscaping) of the drainage pond located east of Union Avenue and north of Sam Steele Way.

WHEREAS, the University will dedicate to the City the existing right-of-way consisting of approximately 2.03 acres of property and an 80 foot wide right-of-way for a segment of University Avenue east of Telshor.

WHEREAS, the Agreement incorporates all of the aforementioned issues, and is written such that this is a complete and total settlement of all of these issues.

NOW, THEREFORE, the City Council of the City of Las Cruces does hereby determine and resolve as follows:

(I)

THAT the Agreement between the City of Las Cruces and the Board Of Regents of New Mexico State University to resolve issues relating to the acquisition of right-of-way on Union Avenue, the development of a drainage pond adjacent to Union Avenue and the ownership status of a section of University Avenue east of Telshor is hereby approved.

(II)

THAT the Mayor is authorized to execute the Agreement on behalf of the City.

(III)

THAT the City staff is hereby authorized to do all deeds necessary in the accomplishment of the hereinabove.

DONE AND APPROVED this 4th day of May, 1998.

APPROVED:

MAYOR

ATTEST:

CITY CLERK (SEAL)

VOTE:

Mayor Smith:	aye
Councillor Frietze:	absent
Councillor Gustafson:	aye
Councillor Valencia:	aye
Councillor Stevens:	aye
Councillor Tomlin:	aye
Councillor Haltom:	absent

Moved by: Valencia

Seconded by: Stevens

APPROVED AS TO FORM:

CITY ATTORNEY

CITY OF LAS CRUCES

INTER-DEPARTMENTAL MEMORANDUM

TO: Shirley Clark, City Clerk	
FROM: Jim Ericson, Director of Development Services	
SUBJECT: Signed Agreement	June 1, 1998
	F#98-245JE.MMO

Please find attached a copy of the Agreement between the City and NMSU, as approved by the City Council by Resolution No. 98-332, at its May 4, 1998, meeting.

If you have questions or require additional information, please advise.

jm

Attachment: As noted

c: Robert Garza, Chief Engineer
Jorge Garcia, Chief Utilities Engineer

PHYSICAL PLANT

MSC 3545
New Mexico State University
P.O. Box 30001
Las Cruces, NM 88003-8001
(505) 646-2101
FAX: (505) 646-1460

May 27, 1998

Mr. James A. Ericson, AICP
Director of Development Services Division
City of Las Cruces
P.O. Box 20000
Las Cruces, New Mexico 88004

Dear Jim:

Enclosed are two signed originals of the Agreement between the City of Las Cruces and New Mexico State University. This Agreement was approved by the NMSU Board of Regents on May 16, 1998.

We will prepare the appropriate quitclaim deeds and easement documents, and arrange a time for final closure on this Agreement. In order to expedite your project, I am currently in the process of obtaining the necessary signatures on the Authority to Enter (Item 3 of the Agreement). As soon as that document is ready, I will forward it to you.

I look forward to hearing from you. Thanks for your efforts in getting this accomplished.

Sincerely,

Benjamin E. Woods
Assistant Vice President/Director

Enclosures
cc: Dr. William B. Conroy, President, NMSU
Dr. John Owens, Interim Executive Vice President, NMSU
cc w/one signed original Agreement: Ms. Christina Chavez Kelley, Assistant to the President, NMSU

AGREEMENT TO RESOLVE DISPUTED CLAIMS BETWEEN THE CITY OF LAS CRUCES AND NEW MEXICO STATE UNIVERSITY

This Agreement is entered into on this 4th day of May, 1998, between the City of Las Cruces ("City") , and the Board of Regents of New Mexico State University ("University").

RECITALS

Whereas, the City of Las Cruces participated with the New Mexico State Highway and Transportation Department in the widening of Union Avenue in 1992. As a part of this widening, several parcels of land were acquired from the University; and,

Whereas, the City and University had agreed that the City would participate in the costs of developing and landscaping a drainage retention pond on the east side of Union Avenue immediately north of Sam Steele Way in exchange for the land and drainage rights. However, the City and the University have never been able to agree on the actual participation by the City; and,

Whereas, the appraised value of the parcels acquired at the time from the University was $11,300; and,

Whereas, the City has an existing street known as University Avenue east of Telshor Boulevard. This street includes roadway surface and certain underground utilities; and,

Whereas, the City is planning to install a new high-pressure gas line along this section of right-of-way; and,

Whereas, the University believes that it holds fee-simple title to the property and there are no easements for the existing utility and the road is not there by either easement or dedication.

NOW THEREFORE, in order to solve these disputes, the City and University agree as follows:

1. The City will pay the University $40,000.00, all of which will be utilized by the University for development, including landscaping, of the drainage pond located east of Union Avenue and north of Sam Steele Way.

2. The University will transfer and dedicate to the City an approximate 2.03 acre parcel of land as shown on the attached plat. Said land will be utilized by the City solely as a City street for the purposes of vehicular traffic, underground and above ground utilities, and such other uses as may be customary for a street.

3. The University will grant the City immediate right of entry to the parcel in order for the City to move expeditiously on its gas line project.

4. All prior claims referenced in this Agreement shall be considered settled in their totality as a result of the execution of this Agreement. Neither party shall have any further claim on the other arising out of any of these issues.

5. This Agreement contains the entire Agreement between the parties, and it may not be modified except by instrument, in writing, approved by the governing bodies of both parties.

CITY OF LAS CRUCES

BY: _____
Ruben A. Smith, Mayor

ATTEST:

_____
City Clerk

APPROVED:

_____
City Attorney

BOARD OF REGENTS OF
NEW MEXICO STATE UNIVERSITY

BY: _____

CITY OF LAS CRUCES
COUNCIL ACTION FORM

For Meeting of May 4, 1998
(date)

AGENDA ITEM TITLE:

A RESOLUTION APPROVING AN AGREEMENT BETWEEN THE CITY OF LAS CRUCES AND THE BOARD OF REGENTS OF NEW MEXICO STATE UNIVERSITY TO RESOLVE DISPUTED CLAIMS RELATED TO THE CONSTRUCTION OF A DRAINAGE POND ADJACENT TO THE UNION AVENUE RECONSTRUCTION PROJECT AND A PARCEL OF RIGHT-OF-WAY ON UNIVERSITY AVENUE EAST OF TELSHOR.

BACKGROUND, SUPPORT INFORMATION, AND COUNCIL OPTIONS (in order):

BACKGROUND:

In 1992, the City of Las Cruces and the New Mexico State Highway and Transportation Department undertook the reconstruction of Union Avenue from University Avenue to the Atchison, Topeka and Santa Fe railroad tracks, west of South Main Street.

As a part of this project, the City had to acquire several tracts of property from New Mexico State University at an estimated appraised value of $11,300. As a part of the discussion on the acquisition of this property, the City and University conceptually agreed to have the City undertake or participate in the development, including landscaping, of a drainage retention pond located east of University Avenue and north of Sam Steele Way. The City and University have never been able to agree on the actual value the City should contribute towards this project.

The section of University Avenue from Telshor Boulevard east to the Desert Greens Subdivision includes the existing roadway and certain underground utilities.

The City is in the process of undertaking a roadway project to construct a new gas line along a section of this alignment. However, the University believes that it holds title free and clear to the property with no existing easements and no right-of-way for the utilities or the road.

(continue on additional sheets as required)

Name of Drafter: Juana Montoya	Department/Division: Development Services	Phone: 5 2 8 - 3350

STAFF COORDINATION

Division/Department	Signature	Phone
FIRE		
POLICE		
FINANCE		
UTILITIES		8-3509
COMM FACIL		
DEVEL SVCS		528-3350

Division/Department	Signature	Phone
ADMIN		
LEGAL		3128
BUDGET		2107
ASST CITY MGR		
CITY MANAGER		

City and University staff have negotiated a potential settlement to this dispute which provides that the City will pay the University $40,000; $20,000 from Fund 400500 Flood Control and $20,000 being paid from Fund 502000 Gas Utility. The University will agree to utilize this money solely for the purposes of construction and improvements (including landscaping) of the drainage pond located east of Union Avenue and north of Sam Steele Way.

The University will dedicate to the City the existing right-of-way consisting of approximately 2.03 acres of property as an 80 foot wide right-of-way for a segment of University Avenue east of Telshor.

The Agreement incorporates all of the aforementioned issues and is written such that this is a complete and total settlement of all of these issues.

SUPPORT INFORMATION:

1. Resolution.
2. Agreement.
3. Map of pond and Union Avenue.
4. Map of University Avenue.

OPTIONS FOR COUNCIL INCLUDE:

1. Vote YES on the Resolution. This will approve the Agreement as written and these disputed issues with New Mexico State University being resolved.

2. Vote NO on the Resolution. This will not authorize the Agreement and will result in significant impacts on the implementation of the gas line project, which is on hold until right-of-way can be obtained. It will leave all of the other issues unresolved, although they are not as pressing as the gas line issue.

3. Postpone consideration of the Resolution. This will require Council to provide staff with direction on potential modifications to the Agreement, or renegotiation of specific terms of the Agreement.

Appendix B

FEMA Flood Maps

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone (FIPS 3002). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided by the Dona Ana County Flood Commission, 2004 and 2010; Bureau of Land Management, 2004; U.S. Geological Survey, 1989 and 2005; NGS, 2004; and U.S. Census Bureau, 2009. Additional information was compiled from U.S. Department of Agriculture aerial photography, 2009 at a scale of 1:12,000.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at to http://www.fema.gov/national-flood-insurance-program

Dona Ana County Unincorporated Areas 350012

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Area of different Base Flood Elevations, flood depths or flood velocities.
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A Cross section line
- 23 — 23 Transect line
- 97° 07' 30", 32° 22' 30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 3576000m E 1000-meter Universal Transverse Mercator grid values, zone 13N
- 600000 FT 5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 27, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

SEPTEMBER 3, 1992 - to add Base Flood Elevations, to change Special Flood Hazard Areas, to change zone designations, and to reflect updated topographic information.
SEPTEMBER 6, 1995 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to change zone designations, to advance the sufix, to add roads and road names, and to reflect updated topographic information.
JULY 6, 2016 - to update corporate limits, to change Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Change, and to update map format.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1092G

FIRM

FLOOD INSURANCE RATE MAP

DONA ANA COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 1092 OF 1925

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DONA ANA COUNTY (UNINCORPORATED AREAS)	350012	1092	G
LAS CRUCES, CITY OF	355332	1092	G
MESILLA, TOWN OF	350113	1092	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 35013C1092G

MAP REVISED JULY 6, 2016

Federal Emergency Management Agency

NOTES TO USERS

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LEGEND

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ZONE A No Base Flood Elevations determined.

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ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

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OTHERWISE PROTECTED AREAS (OPAs)

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1% annual chance floodplain boundary
0.2% annual chance floodplain boundary
Floodway boundary
Zone D Boundary
CBRS and OPA Boundary
Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
513 Base Flood Elevation line and value; elevation in feet*
(EL 987) Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)—(A) Cross section line
(23)- - - - -(23) Transect line
97° 07' 30", 32° 22' 30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{42}76^{000m}$E 1000-meter Universal Transverse Mercator grid values, zone 13N
600000 FT 5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
DX5510 × Bench mark (see explanation in Notes to Users section of this FIRM panel)
● M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD
INSURANCE RATE MAP PANEL
SEPTEMBER 27, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

SEPTEMBER 3, 1992 - to add Base Flood Elevations, to change Special Flood Hazard Areas, to change zone designations, and to relfect updated topographic information.
SEPTEMBER 6, 1995 - to update corporate limits, to change Base Flood Elevations, to add Base Flood Elevations, to add Special Flood Hazard Aresa, to change Special Flood Hazard Areas, to change zone designations, to advance the sufix, to add roads and road names, and to relfect updated topographic information.
JULY 6, 2016 - to update corporate limits, to change Base Flood Elevations, to add Special Flood Hazard Areas, to change Special Flood Hazard Areas, to add roads and road names, to incorporate previously issued Letters of Map Change, and to update map format.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP

PANEL 1094G

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
DONA ANA COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 1094 OF 1925

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DONA ANA COUNTY (UNINCORPORATED AREAS)	350012	1094	G
LAS CRUCES, CITY OF	355332	1094	G
MESILLA, TOWN OF	350113	1094	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35013C1094G

MAP REVISED
JULY 6, 2016

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map was New Mexico State Plane, Central Zone (FIPS 3002). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey, SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242**, or visit their website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was provided by the Dona Ana County Flood Commission, 2004 and 2010; Bureau of Land Management, 2004; U.S. Geological Survey, 1989 and 2005; NGS, 2004; and U.S. Census Bureau, 2009. Additional information was compiled from U.S. Department of Agriculture aerial photography, 2009 at a scale of 1:12,000.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables for the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

For information on available products associated with this FIRM visit the **Map Service Center (MSC)** website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the MSC website.

If you have **questions about this map**, how to order products or the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at to http://www.fema.gov/national-flood-insurance-program

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D Boundary
- CBRS and OPA Boundary
- Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

A — A	Cross section line
23 - - - - 23	Transect line
97° 07' 30", 32° 22' 30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
$^{42}76^{000m}$E	1000-meter Universal Transverse Mercator grid values, zone 13N
600000 FT	5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

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EFFECTIVE DATE OF COUNTYWIDE FLOOD
INSURANCE RATE MAP PANEL
SEPTEMBER 27, 1991

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MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1111G

FIRM
FLOOD INSURANCE RATE MAP

DONA ANA COUNTY, NEW MEXICO
AND INCORPORATED AREAS

PANEL 1111 OF 1925

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DONA ANA COUNTY (UNINCORPORATED AREAS)	350012	1111	G
LAS CRUCES, CITY OF	355332	1111	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35013C1111G

MAP REVISED
JULY 6, 2016

Federal Emergency Management Agency

NOTES TO USERS

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- Floodway boundary
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- 513 (EL 987) Base Flood Elevation line and value; elevation in feet* / Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A Cross section line
- 23 — 23 Transect line
- 97° 07' 30", 32° 22' 30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 76 000 m E 1000-meter Universal Transverse Mercator grid values, zone 13N
- 600000 FT 5000-foot grid ticks: New Mexico State Plane coordinate system, Central zone (FIPSZONE 3002), Transverse Mercator
- DX510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index.

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
SEPTEMBER 27, 1991

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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MAP SCALE 1" = 500'

250 0 500 1000 FEET
150 0 150 300 METERS

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1113G

FIRM

FLOOD INSURANCE RATE MAP

DONA ANA COUNTY, NEW MEXICO AND INCORPORATED AREAS

PANEL 1113 OF 1925

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DONA ANA COUNTY (UNINCORPORATED AREAS)	350012	1113	G
LAS CRUCES, CITY OF	355332	1113	G

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
35013C1113G

MAP REVISED
JULY 6, 2016

Federal Emergency Management Agency

Appendix C

Rainfall Data

NOAA Atlas 14, Volume 1, Version 5
Location name: Las Cruces, New Mexico, USA*
Latitude: 32.279°, Longitude: -106.747°
Elevation: 3957 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.218 (0.190-0.248)	0.283 (0.248-0.322)	0.381 (0.333-0.432)	0.457 (0.398-0.518)	0.559 (0.485-0.632)	0.642 (0.553-0.725)	0.727 (0.623-0.821)	0.816 (0.695-0.923)	0.939 (0.792-1.06)	1.04 (0.871-1.18)
10-min	0.332 (0.289-0.378)	0.430 (0.378-0.490)	0.579 (0.507-0.658)	0.696 (0.606-0.788)	0.851 (0.738-0.962)	0.977 (0.842-1.10)	1.11 (0.949-1.25)	1.24 (1.06-1.40)	1.43 (1.20-1.62)	1.58 (1.32-1.79)
15-min	0.412 (0.358-0.468)	0.533 (0.468-0.607)	0.718 (0.629-0.815)	0.862 (0.752-0.977)	1.06 (0.914-1.19)	1.21 (1.04-1.37)	1.37 (1.18-1.55)	1.54 (1.31-1.74)	1.77 (1.49-2.00)	1.96 (1.64-2.22)
30-min	0.554 (0.482-0.630)	0.718 (0.630-0.818)	0.967 (0.847-1.10)	1.16 (1.01-1.32)	1.42 (1.23-1.60)	1.63 (1.40-1.84)	1.85 (1.58-2.09)	2.07 (1.77-2.34)	2.38 (2.01-2.70)	2.64 (2.21-2.99)
60-min	0.686 (0.597-0.780)	0.889 (0.779-1.01)	1.20 (1.05-1.36)	1.44 (1.25-1.63)	1.76 (1.52-1.99)	2.02 (1.74-2.28)	2.29 (1.96-2.58)	2.57 (2.19-2.90)	2.95 (2.49-3.34)	3.27 (2.74-3.70)
2-hr	0.786 (0.692-0.890)	1.02 (0.900-1.16)	1.38 (1.21-1.56)	1.66 (1.45-1.87)	2.04 (1.77-2.30)	2.34 (2.02-2.63)	2.66 (2.28-2.98)	2.99 (2.54-3.36)	3.45 (2.89-3.87)	3.82 (3.16-4.29)
3-hr	0.828 (0.736-0.936)	1.07 (0.948-1.21)	1.42 (1.26-1.61)	1.70 (1.50-1.92)	2.09 (1.83-2.34)	2.40 (2.08-2.68)	2.72 (2.34-3.04)	3.05 (2.61-3.42)	3.52 (2.96-3.94)	3.89 (3.24-4.37)
6-hr	0.944 (0.843-1.06)	1.20 (1.08-1.35)	1.58 (1.41-1.77)	1.87 (1.66-2.09)	2.26 (2.00-2.52)	2.57 (2.25-2.86)	2.88 (2.51-3.21)	3.21 (2.77-3.58)	3.66 (3.12-4.09)	4.02 (3.40-4.50)
12-hr	1.03 (0.926-1.15)	1.32 (1.18-1.47)	1.71 (1.53-1.90)	2.00 (1.79-2.22)	2.40 (2.13-2.66)	2.70 (2.38-2.99)	3.01 (2.64-3.34)	3.32 (2.90-3.69)	3.74 (3.23-4.17)	4.08 (3.49-4.56)
24-hr	1.07 (0.998-1.16)	1.36 (1.26-1.48)	1.79 (1.64-1.96)	2.17 (1.94-2.40)	2.72 (2.36-3.12)	3.20 (2.68-3.80)	3.74 (3.00-4.64)	4.34 (3.33-5.64)	5.24 (3.80-7.33)	6.03 (4.15-8.97)
2-day	1.15 (1.07-1.25)	1.46 (1.35-1.58)	1.92 (1.76-2.09)	2.30 (2.07-2.54)	2.87 (2.50-3.26)	3.34 (2.83-3.92)	3.87 (3.15-4.75)	4.45 (3.49-5.68)	5.31 (3.93-7.41)	6.11 (4.33-9.06)
3-day	1.23 (1.14-1.34)	1.57 (1.45-1.70)	2.07 (1.90-2.25)	2.47 (2.24-2.72)	3.05 (2.68-3.45)	3.53 (3.02-4.11)	4.04 (3.35-4.89)	4.60 (3.68-5.76)	5.47 (4.16-7.44)	6.28 (4.58-9.10)
4-day	1.31 (1.21-1.43)	1.68 (1.56-1.83)	2.22 (2.03-2.41)	2.64 (2.40-2.90)	3.24 (2.86-3.65)	3.71 (3.21-4.29)	4.22 (3.54-5.03)	4.75 (3.86-5.84)	5.63 (4.38-7.48)	6.44 (4.83-9.15)
7-day	1.51 (1.40-1.64)	1.94 (1.79-2.10)	2.55 (2.35-2.77)	3.04 (2.77-3.33)	3.71 (3.29-4.16)	4.25 (3.69-4.90)	4.82 (4.07-5.71)	5.42 (4.44-6.61)	6.25 (4.90-8.01)	6.92 (5.26-9.28)
10-day	1.69 (1.56-1.84)	2.17 (2.00-2.36)	2.87 (2.64-3.13)	3.42 (3.11-3.75)	4.17 (3.70-4.67)	4.77 (4.14-5.47)	5.40 (4.57-6.35)	6.04 (4.96-7.34)	6.94 (5.48-8.79)	7.64 (5.86-10.1)
20-day	2.15 (1.99-2.34)	2.77 (2.55-3.00)	3.60 (3.32-3.90)	4.23 (3.87-4.61)	5.06 (4.54-5.61)	5.70 (5.03-6.46)	6.35 (5.48-7.35)	6.99 (5.90-8.31)	7.86 (6.41-9.70)	8.53 (6.78-10.9)
30-day	2.57 (2.38-2.78)	3.27 (3.03-3.53)	4.20 (3.88-4.54)	4.91 (4.50-5.34)	5.85 (5.26-6.48)	6.57 (5.80-7.42)	7.29 (6.30-8.42)	8.00 (6.76-9.51)	8.96 (7.31-11.1)	9.71 (7.74-12.4)
45-day	3.12 (2.89-3.37)	3.97 (3.69-4.28)	5.04 (4.69-5.43)	5.83 (5.39-6.31)	6.82 (6.21-7.49)	7.55 (6.78-8.42)	8.26 (7.30-9.38)	8.94 (7.75-10.4)	9.81 (8.28-11.8)	10.4 (8.67-12.9)
60-day	3.58 (3.31-3.86)	4.55 (4.23-4.91)	5.77 (5.37-6.21)	6.63 (6.14-7.16)	7.72 (7.04-8.43)	8.49 (7.66-9.41)	9.23 (8.21-10.4)	9.94 (8.66-11.4)	10.8 (9.21-12.8)	11.4 (9.59-13.8)

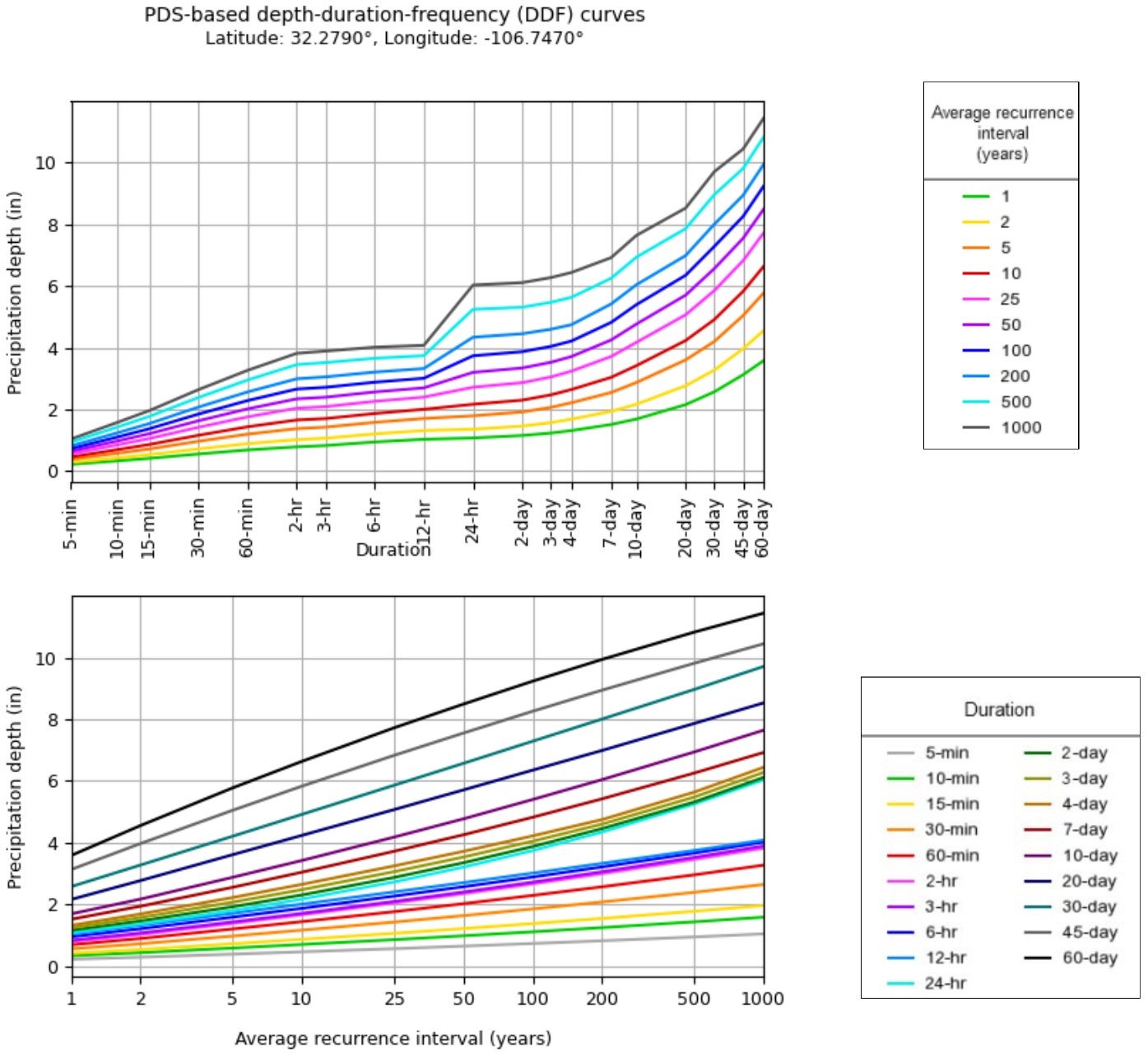
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



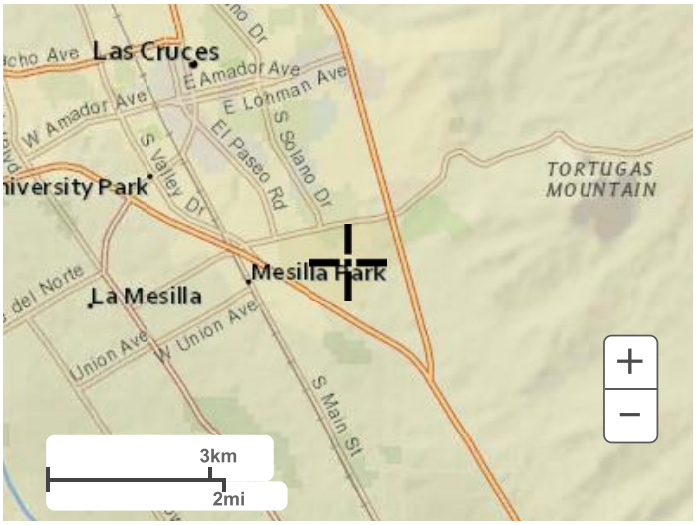
NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Thu Aug 31 23:08:20 2023

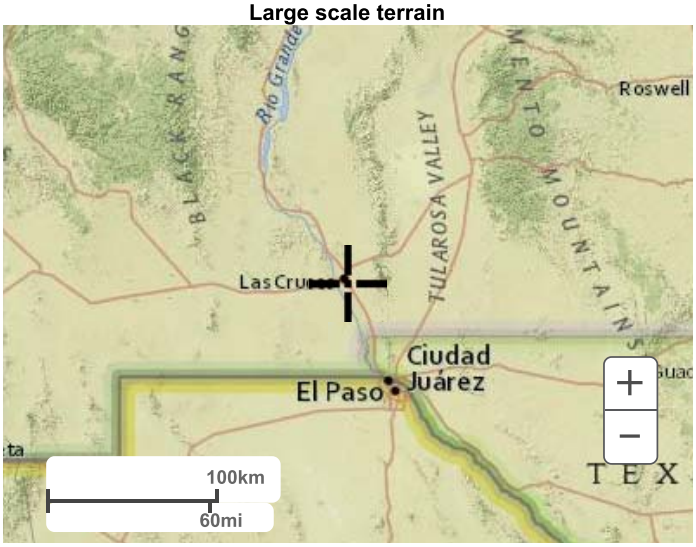
Back to Top

Maps & aerials

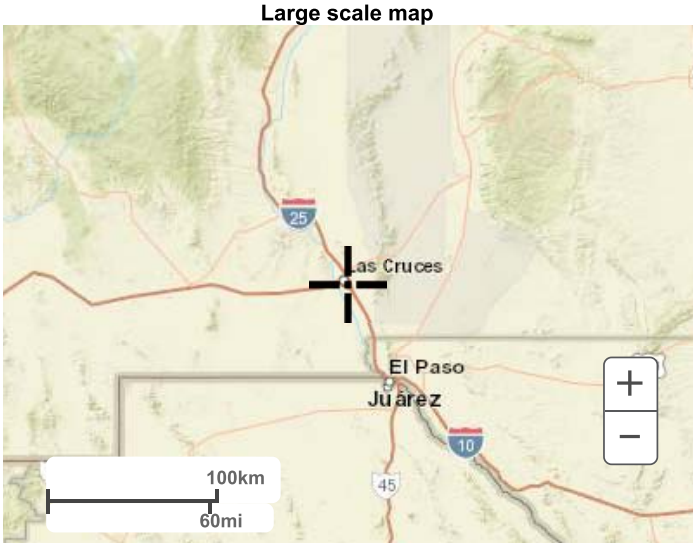
Small scale terrain



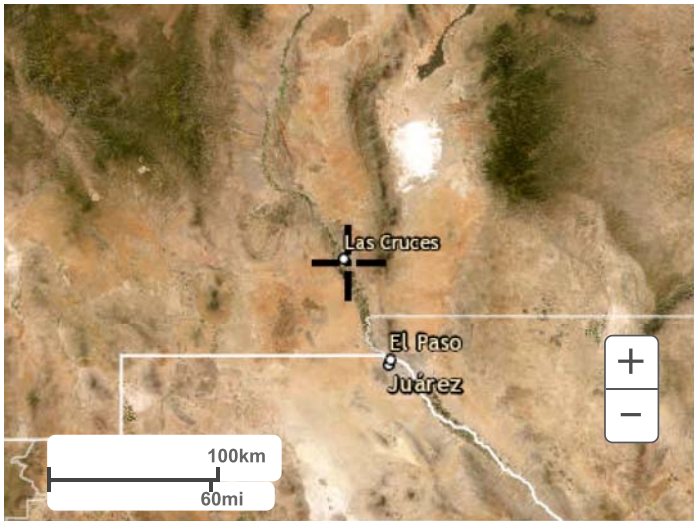
Large scale terrain



Large scale map



Large scale aerial



Back to Top

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix D

Time of Concentration Calculations

Time of Concentration Calculations
Tc=(L1/V1+L2/V2…)/60)
Upland velocity values found using Figure 402-15 and Table 402-8
Hydraulic Velocity Values found using Section 402.9.5

Kirpich Formula .0078*L^.77*S^.385
Upland Formula (grassed waterways) L/(3600*V)

Basin	Tc	Method	L	E1	E2	dH	S	V	Lag
	min		Length of flow path, ft	Elevation at begin of flow path, ft	Elevation at end of flow path, ft	Change in elevatiom through flow path, ft	Slope, ft/ft	ft/s	min
Basin 1	10								6.00
Basin 2	10								6.00
Basin 3	10								6.00
Basin 4	10								6.00
Basin 5	22.0	Kirpich	3687	3937	3882	55.00	0.015		13.17
Basin 6	10								6.00
Basin 7	10								6.00
Basin 8	10								6.00
Basin 9	10								6.00
Basin 10	26.6	Kirpich	5405	3988	3883	105.00	0.019		15.98
Basin 11	10								6.00
Basin 12	35.2	Kirpich	6183	3959	3883	76.00	0.012		21.13
Basin 13	10								6.00
Basin 14	10								6.00
Basin 15	10								6.00
Basin 16	26.9	Kirpich	5636	3999	3883	116.00	0.021		16.14
Basin 17	5.5	Kirpich	1382	3999	3891	108.00	0.078		3.27
Basin 18	16.4	Kirpich	3054	3959	3892	67.00	0.022		9.82
Basin 19	23.5	Kirpich	4000	3970	3911	59.00	0.015		14.09
Basin 20	13.7	Kirpich	2392	3970	3919	51.00	0.021		8.23
Basin 21	10								6.00
Basin 22	11.7	Kirpich	2045	3990	3942	48.00	0.023		7.03
Basin 23	9.63	Upland	1361	3990	3961	29.00	0.021	2.36	5.78
Basin 24	10								6.00
Basin 25	10								6.00
Basin 26	10								6.00

Basin 27	10								6.00
Basin 28	10								6.00
Basin 29	10								6.00
Basin 30	10								6.00
Basin 31	10								6.00
Basin 32	36.98	Upland	911	3993	3991	2.00	0.002	0.41	22.19
Basin 33	10								6.00
Basin 34	10								6.00
Basin 35	12.60	Upland	603	3887	3882	5.00	0.008	0.80	7.56
Basin 36	10								6

Appendix E

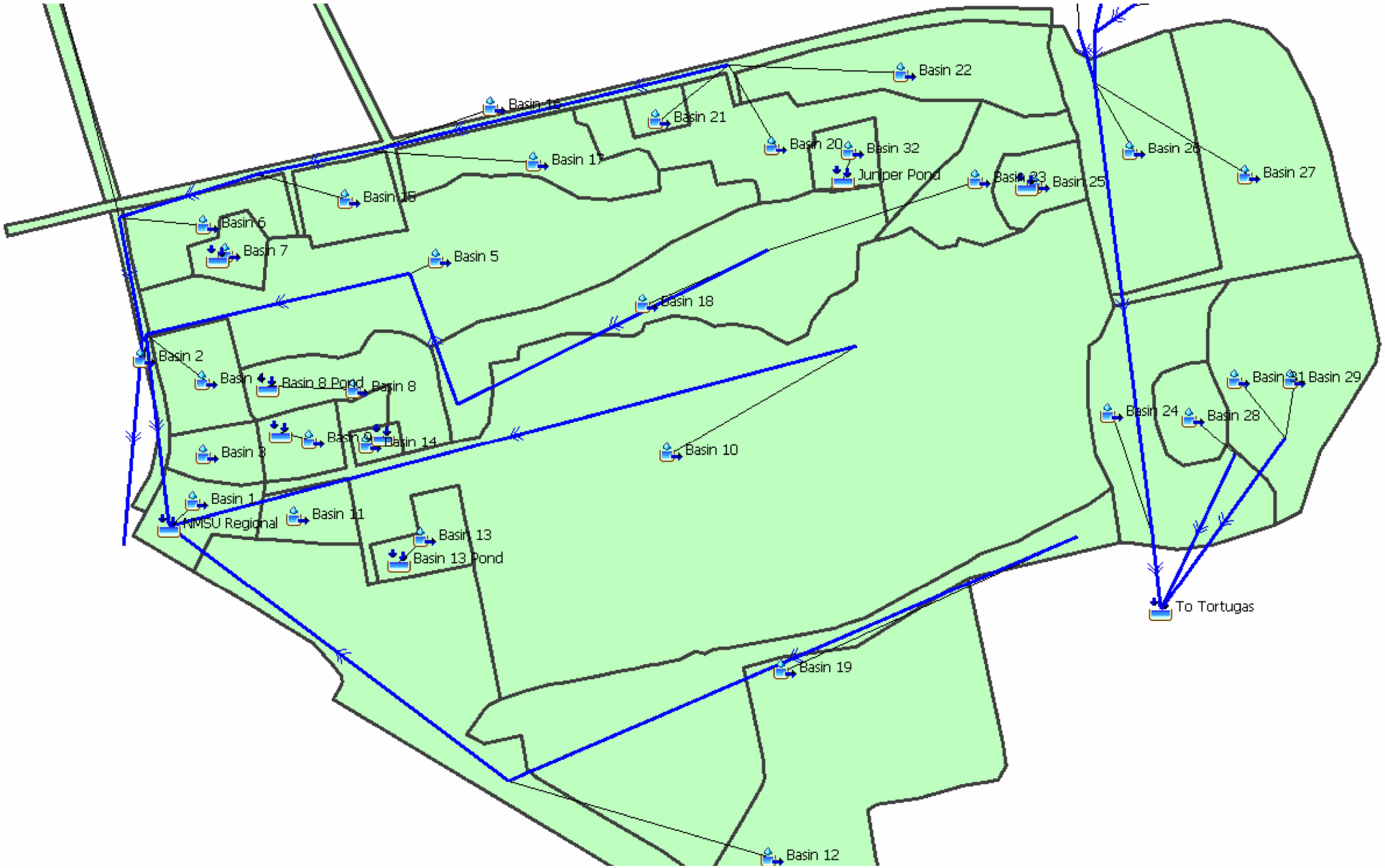
Curve Number Calculations

Curve Number Calculations

Basin	Area (ac)	Description	CN1	%	CN2	%	CN3	%	%Impervious	Total CN
Basin 1	6.17	Pond with SG C and D	74	40%	80	50%			10%	79.4
Basin 2	2.84	Road	98						100%	98
Basin 3	3.89	Field with SG C&D	74	40%	80	60%			0%	77.6
Basin 4	6.63	Field with SG C&D	80		80	100%			0%	80
Basin 5	46.21	College Dr, Horseshoe area, SG A&D	80	15%	39	40%			45%	71.7
Basin 6	7.7	Field and Parking, SG C&D	74	40%	40	5%			55%	85.5
Basin 7	3.33	Pond and Parking, SG D	80	35%					65%	91.7
Basin 8	10.29	Buildings, parking, pond, SG C&D	80	20%					80%	94.4
Basin 9	4.43	Ag facilities, onsite ponding, SG B&C&D	89	20%	79	30%	86	10%	40%	89.3
Basin 10	172.13	Stewart Basin, Buildings, Grass, SGA	39	40%					60%	74.4
Basin 11	4.2	Ag facilities, onsite ponding, SG B&C&D	89	20%	79	30%	86	5%	45%	89.9
Basin 12	92.52	Sam Steel Wy Basin, Open Areas, SGA	72	35%	68	5%			60%	87.4
Basin 13	4.68	Ag bldg, onsite pond, SG A	68	15%					85%	93.5
Basin 14	1.35	Ag bldg, onsite pond, SG A	68	15%					85%	93.5
Basin 15	6.17	Parking, Green Space, SGD	80	20%					80%	94.4
Basin 16	13.08	University Ave, Impervious	98						100%	98
Basin 17	10.94	Performing arts basin, SGA	39	30%					70%	80.3
Basin 18	29.44	Frenger Basin, SGA	39	20%					80%	86.2
Basin 19	38.71	Wells St Basin, SGA	39	15%					85%	89.15
Basin 20	20.5	Garcia to Art Bldg, SGA	39	30%					70%	80.3
Basin 21	1.9	Pond, SGA	39	100%					0%	39
Basin 22	16.04	Pinon to Jordan Rd, SGA	39	15%					85%	89.15
Basin 23	9.33	Pinon to Corbet, SGA	39	75%					25%	53.75
Basin 24	21.78	West of Stadium, SGA	39	40%					60%	74.4
Basin 25	4.53	Duck Pond	39	40%					60%	74.4
Basin 26	22.96	Pan Am & Parking, SGA	39	5%					95%	95.05
Basin 27	25.78	Arrowhead to Stewart, SGA	39	3%					97%	96.23
Basin 28	4.88	Inside Stadium,	39	80%					20%	50.8
Basin 29	23.41	Arrowhead to Tortugas, SGA	39	80%					20%	50.8
Basin 30	6.89	El Paseo to University	98						100%	98
Basin 31	9.67	Convention Center, onsite ponding	79	10%					90%	96.1
Basin 32	21.24	Mostly fields, SGC and D	86	20%	89	70%			10%	89.3
Basin 33	2.9	SGC, buildings, parking	86	40%					60%	93.2
Basin 34	12.52	Ag field, SGC	86	100%					0%	86
Basin 35	4.7	Buildings, parking, SGC and D	86	5%	89	5%			90%	96.95
Basin 36	3.33	Juniper Hall Basin	39	40%					60%	74

Appendix F

Hydrologic Results


Basin 22
Basin 15
Basin 21
Basin 20
Basin 32
Basin 17
Juniper Pond
Basin 23
Basin 25
Basin 26
Basin 27
Basin 16
Basin 6
Basin 7
Basin 5
Basin 18
Basin 2
Basin 8 Pond
Basin 8
Basin 14
Basin 10
Basin 31
Basin 29
Basin 24
Basin 28
Basin 3
Basin 1
NMSU Regional
Basin 11
Basin 13
Basin 13 Pond
To Tortugas
Basin 19
Basin 12

Hydrological Analysis Data

	Peak Discharge (cfs)			Volume (ac-ft)		
Hydrologic Elements	10-Year	50-Year	100-Year	10-Year	50-Year	100-Year
Alunmi Pond	2.4	5.6	7.4	0.2	0.4	0.5
Arrowhead North of Wells	0	1.1	2.7	0	0.3	0.7
Basin 1	5.3	10.6	13.3	0.3	0.7	0.9
Basin 10	64.7	147.7	191.3	6.4	15.1	20.4
Basin 11	7.8	12.6	14.8	0.4	0.8	0.9
Basin 12	87.8	149.8	179.6	8	14.7	18.3
Basin 13	10.6	16.1	18.6	0.6	1	1.2
Basin 13 Pond	10.6	16.1	18.6	0.6	1	1.2
Basin 14	3	4.6	5.4	0.2	0.3	0.3
Basin 14 Pond	3	4.6	5.4	0.2	0.3	0.3
Basin 15	14.6	21.8	25.2	0.8	1.3	1.6
Basin 16	24.8	35.3	40.2	2.2	3.4	4
Basin 17	10.2	20	24.9	0.6	1.3	1.7
Basin 18	37.1	64.4	77.6	2.4	4.5	5.7
Basin 19	45.1	72.9	86	3.8	6.7	8.3
Basin 2	6.3	8.9	10.2	0.4	0.6	0.7
Basin 20	20.6	41	51.2	1.3	2.8	3.6
Basin 21	0	0	0	0	0	0
Basin 22	28.3	46.3	54.8	1.6	2.8	3.5
Basin 23	0	0.8	1.5	0	0.2	0.3
Basin 24	11.3	27	35.3	0.8	1.9	2.6
Basin 25	2.4	5.6	7.4	0.2	0.4	0.5
Basin 26	56.2	83.4	95.9	3.2	5.1	6.1
Basin 27	66.6	97	111	3.8	5.9	7.1
Basin 28	0	0.2	0.5	0	0.1	0.1
Basin 29	0	1	2.3	0	0.3	0.5
Basin 3	2.8	6	7.7	0.2	0.4	0.5
Basin 30	19	27.1	30.8	1.1	1.7	2
Basin 31	24.7	36.1	41.3	1.4	2.2	2.6
Basin 32	22.4	37	43.9	2.1	3.7	4.5
Basin 33	6.3	9.7	11.3	0.4	0.6	0.7
Basin 34	73	126.5	152.3	4.2	7.8	9.8
Basin 35	12.4	17.9	20.4	0.7	1.1	1.3
Basin 36	1.6	4	5.3	0.1	0.3	0.4
Basin 4	17	24.9	28.5	1	1.5	1.8
Basin 5	54.2	90.3	107.6	4.5	8	9.9
Basin 6	16.9	25.9	30.1	0.9	1.6	1.9
Basin 7	4.8	8.3	10	0.3	0.5	0.6
Basin 7 Pond	4.8	8.3	10	0.3	0.5	0.6
Basin 8	27.4	39.5	45.1	1.6	2.4	2.9
Basin 8 Pond	27.4	39.5	45.1	1.6	2.4	2.9
Basin 9	4	7.9	9.9	0.2	0.5	0.7
Basin 9 Pond	4	7.9	9.9	0.2	0.5	0.7
College Arroyo	116.7	176.3	202.8	12	21	26
College Arroyo Inlet	123.4	191.2	221.9	12.8	22.9	28.6
College Dr	79.6	133.6	159.7	6.9	12.6	15.8
Don Roser Pond 1	33.7	55.6	64.8	3.8	8.1	10.6
El Paseo 1	106	171.5	203.1	8.6	14.8	18.2
El Paseo 2	95.1	154.2	182.7	8.6	14.8	18.2
Espina	28.9	51.2	62.5	2.4	4.7	5.9
Frenger	34.9	61.3	74.7	2.4	4.7	6

I-Mall	52.5	85.6	102	4.5	8	9.9
Juniper Pond	1.6	4	5.3	0.1	0.3	0.4
NMSU Regional Pond	273.3	493	602.4	26.4	51.1	65.3
Reach-Triviz1	7.3	10.9	12.6	0.5	0.8	1
Reach-Univ1	0.9	1.3	1.5	0.1	0.1	0.1
Reach-Univ2	39	61.3	71.3	5	10	12.8
Sam Steel Way	129.8	218.2	260.4	11.8	21.4	26.6
Stewart Street	55.5	129.7	169.4	6.4	15.1	20.3
To Tortugas	123.4	192.3	224.6	12.8	23.3	29.2
Union Storm Drain	88.1	145.1	172.7	8.3	14.7	18.3
University 1	46.1	82.3	100.1	2.9	5.6	7.1
University 2	43.4	77.7	94.6	2.9	5.6	7.1
University 3	72.4	123.7	148.9	5.7	10.2	12.7
University 4	82.3	137.9	165	6.5	11.5	14.3
Wells Street	44.9	72.8	85.9	3.8	6.7	8.3

Appendix G

Hydraulic Results

Hydraulic Analysis Report

Project Data

Project Title:

Designer:

Project Date: Tuesday, September 19, 2023

Project Units: U.S. Customary Units

Notes:

Channel Analysis: Sam Steel Channel

Notes:

Input Parameters

Channel Type: Trapezoidal

Side Slope 1 (Z1): 2.0000 ft/ft

Side Slope 2 (Z2): 2.0000 ft/ft

Channel Width 6.00 ft

Longitudinal Slope: 0.0067 ft/ft

Manning's n: 0.0250

Depth 2.0000 ft

Result Parameters

Flow 118.1725 cfs

Area of Flow 20.0000 ft^2

Wetted Perimeter 14.9443 ft

Hydraulic Radius 1.3383 ft

Average Velocity 5.9086 ft/s

Top Width 14.0000 ft

Froude Number: 0.8712

Critical Depth 1.8530 ft

Critical Velocity 6.5705 ft/s

Critical Slope: 0.0090 ft/ft

Critical Top Width 13.41 ft

Calculated Max Shear Stress 0.8362 lb/ft^2

Calculated Avg Shear Stress 0.5595 lb/ft^2

Channel Analysis: Wells

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width 30.00 ft

Longitudinal Slope: 0.0180 ft/ft

Manning's n: 0.0120

Depth 0.5000 ft

Result Parameters

Flow 153.5977 cfs

Area of Flow 15.0000 ft^2

Wetted Perimeter 31.0000 ft

Hydraulic Radius 0.4839 ft

Average Velocity 10.2398 ft/s

Top Width 30.0000 ft

Froude Number: 2.5520

Critical Depth 0.9337 ft

Critical Velocity 5.4833 ft/s

Critical Slope: 0.0023 ft/ft

Critical Top Width 30.00 ft

Calculated Max Shear Stress 0.5616 lb/ft^2

Calculated Avg Shear Stress 0.5435 lb/ft^2

Channel Analysis: College

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width 30.00 ft

Longitudinal Slope: 0.0005 ft/ft

Manning's n: 0.0160

Depth 0.5000 ft

Result Parameters

Flow 19.1997 cfs

Area of Flow 15.0000 ft^2

Wetted Perimeter 31.0000 ft

Hydraulic Radius 0.4839 ft

Average Velocity 1.2800 ft/s

Top Width 30.0000 ft

Froude Number: 0.3190

Critical Depth 0.2334 ft

Critical Velocity 2.7416 ft/s

Critical Slope: 0.0062 ft/ft

Critical Top Width 30.00 ft

Calculated Max Shear Stress 0.0156 lb/ft^2

Calculated Avg Shear Stress 0.0151 lb/ft^2

Channel Analysis: Frenger

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width 20.00 ft

Longitudinal Slope: 0.0200 ft/ft

Manning's n: 0.0150

Depth 0.5000 ft

Result Parameters

Flow 85.4338 cfs

Area of Flow 10.0000 ft^2

Wetted Perimeter 21.0000 ft

Hydraulic Radius 0.4762 ft

Average Velocity 8.5434 ft/s

Top Width 20.0000 ft

Froude Number: 2.1292

Critical Depth 0.8275 ft

Critical Velocity 5.1620 ft/s

Critical Slope: 0.0039 ft/ft

Critical Top Width 20.00 ft

Calculated Max Shear Stress 0.6240 lb/ft^2

Calculated Avg Shear Stress 0.5943 lb/ft^2

Channel Analysis: Espina

Notes:

Input Parameters

Channel Type: Rectangular

Channel Width 48.00 ft

Longitudinal Slope: 0.0070 ft/ft

Manning's n: 0.0150

Depth 0.5000 ft

Result Parameters

Flow 123.6036 cfs

Area of Flow 24.0000 ft^2

Wetted Perimeter 49.0000 ft

Hydraulic Radius 0.4898 ft

Average Velocity 5.1502 ft/s

Top Width 48.0000 ft

Froude Number: 1.2835

Critical Depth 0.5905 ft

Critical Velocity 4.3606 ft/s

Critical Slope: 0.0040 ft/ft

Critical Top Width 48.00 ft

Calculated Max Shear Stress 0.2184 lb/ft^2

Calculated Avg Shear Stress 0.2139 lb/ft^2

Curb and Gutter Analysis: Stewart (at EC)

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0000 ft/ft

Cross-Slope of Pavement: 0.0200 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0120

Gutter Width: 1.0000 ft

Gutter Result Parameters

Width of Spread: 17.0000 ft

Gutter Result Parameters

Design Flow: 18.5824 cfs

Gutter Depression: 0.0000 in

Area of Flow: 2.8900 ft^2

Eo (Gutter Flow to Total Flow): 0.1494

Gutter Depth at Curb: 4.0800 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.0000 ft

Grate Length: 0.0000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 1.7245 cfs

Bypass Flow: 16.8579 cfs

Approach Velocity: 6.4299 ft/s

Splash-over Velocity: 2.2186 ft/s

Efficiency: 0.0928

Curb and Gutter Analysis: Espina

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0000 ft/ft

Cross-Slope of Pavement: 0.0200 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0120

Gutter Width: 1.0000 ft

Gutter Result Parameters

Width of Spread: 25.0000 ft

Gutter Result Parameters

Design Flow: 36.7477 cfs

Gutter Depression: 0.0000 in

Area of Flow: 6.2500 ft^2

Eo (Gutter Flow to Total Flow): 0.1033

Gutter Depth at Curb: 6.0000 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.0000 ft

Grate Length: 0.0000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 2.5444 cfs

Bypass Flow: 34.2033 cfs

Approach Velocity: 5.8796 ft/s

Splash-over Velocity: 2.2186 ft/s

Efficiency: 0.0692

Curb and Gutter Analysis: Sam Steel 1/2 Roadway

Notes:

Gutter Input Parameters

Longitudinal Slope of Road: 0.0000 ft/ft

Cross-Slope of Pavement: 0.0200 ft/ft

Uniform Gutter Geometry

Manning's n: 0.0150

Gutter Width: 2.0000 ft

Gutter Result Parameters

Width of Spread: 16.0000 ft

Gutter Result Parameters

Design Flow: 8.9427 cfs

Gutter Depression: 0.0000 in

Area of Flow: 2.5600 ft^2

Eo (Gutter Flow to Total Flow): 0.2999

Gutter Depth at Curb: 3.8400 in

Inlet Input Parameters

Inlet Location: Inlet on Grade

Inlet Type: Grate

Grate Type: P - 1-7/8

Grate Width: 0.0000 ft

Grate Length: 0.0000 ft

Local Depression: 0.0000 in

Inlet Result Parameters

Intercepted Flow: 2.3742 cfs

Bypass Flow: 6.5684 cfs

Approach Velocity: 3.4932 ft/s

Splash-over Velocity: 2.2186 ft/s

Efficiency: 0.2655

Appendix H

Cost Estimates

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Storage Alt 1: Restore NMSU Regional Pond

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$27,000.00	$27,000.00
2	Unclassified Excavation, include disposal	CY	18000	$30.00	$540,000.00
3	Demobilization, close out documents	LS	1	$13,500.00	$13,500.00
	Construction Sub Total				*$580,500.00*
4	Contingencies		25%		$145,125.00
5	NM Gross Receipts Tax		6.500%		$37,732.50
	Total Construction Project Cost				**$763,357.50**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Storage Alt 2: NMSU Regional Pond Automatic Outfall

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, permits, submittals	LS	1	$4,550.00	$4,550.00
2	Traffic Control	LS	1	$20,000.00	$20,000.00
3	Unclassified Excavation, include disposal	CY	50	$30.00	$1,500.00
4	24" Diameter Corrugated Culvert Pipe, complete in place	LF	180	$250.00	$45,000.00
5	Concrete Outfall Structure	LS	1	$20,000.00	$20,000.00
6	Asphalt and Concrete Repair	SY	44	$100.00	$4,444.44
7	Demobilization, close out documents	LS	1	$2,280.00	$2,280.00
	Construction Sub Total				*$97,774.44*
8	Contingencies		25%		$24,443.61
9	NM Gross Receipts Tax		6.500%		$6,355.34
	Total Construction Project Cost				**$128,573.39**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Storage Alt 3: Cole Village Pond

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$30,680.00	$30,680.00
2	Traffic Control	LS	1	$20,000.00	$20,000.00
3	Unclassified Excavation, include disposal	CY	13000	$30.00	$390,000.00
4	Riprap Slope Stabilization	SY	1189	$100.00	$118,888.89
5	Trench Drain Inlet	EA	2	$30,000.00	$60,000.00
6	36" Diameter Corrugated Culvert Pipe, complete in place	LF	75	$275.00	$20,625.00
7	Asphalt and Concrete Repare	SY	39	$100.00	$3,888.89
8	Demobilization, close out documents	LS	1	$15,340.00	$15,340.00
	Construction Sub Total				*$659,422.78*
9	Contingencies		25%		$164,855.69
10	NM Gross Receipts Tax		6.500%		$42,862.48
	Total Construction Project Cost				**$867,140.95**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Storage Alt 4: Central Heating Plant Underground Storage*

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$6,780.00	$6,780.00
2	Traffic Control	LS	1	$30,000.00	$30,000.00
3	Unclassified Excavation, include disposal	CY	50	$30.00	$1,500.00
4	6-ft Diameter Diversion Manhole	EA	2	$25,000.00	$50,000.00
5	48" Diameter Corrugated Culvert Pipe, complete in place	LF	130	$300.00	$39,000.00
6	Asphalt and Concrete Repare	SY	150	$100.00	$15,000.00
7	1000 gpm Pump, access hatch, discharge piping and valves, including power and controls	LS	1	$500,000.00	$500,000.00
8	Demobilization, close out documents	LS	1	$3,390.00	$3,390.00
	Construction Sub Total				*$645,670.00*
10	Contingencies		25%		$161,417.50
11	NM Gross Receipts Tax		6.500%		$41,968.55
	Total Construction Project Cost				**$849,056.05**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Storage Alt 5: Dispersed Green Stormwater Infrastructure

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	College near Zuhl	CY	3871	$35.00	$135,492.00
2	College Dr and Knox St	CY	419	$35.00	$14,678.30
3	Wells St Median	CY	484	$35.00	$16,936.50
5	Horseshoe Perimeter	CY	645	$35.00	$22,582.00
6	Intermural Fields Sidewalk Culverts	EA	2	$5,000.00	$10,000.00
7	Preciado Park Sidewalk Culverts	EA	3	$5,000.00	$15,000.00
8	Hardman Residence Sidewalk Culvert	EA	1	$5,000.00	$5,000.00
9	Bioswale near Universty and Jordan	LF	300	$30.00	$9,000.00
10	Bioswales in pine tyree grove west of duck pond	LF	300	$30.00	$9,000.00
	Construction Sub Total				*$237,688.80*

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 1: Stewart St Storm Drain

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$84,140.00	$84,140.00
2	Traffic Control	LS	1	$50,000.00	$50,000.00
3	5-ft Diameter Manhole	EA	5	$10,000.00	$50,000.00
4	6-ft Diameter Manhole	EA	6	$15,000.00	$90,000.00
5	24" Diameter Corrugated Culvert Pipe, complete in place	LF	689	$225.00	$155,025.00
6	36" Diameter Corrugated Culvert Pipe, complete in place	LF	729	$250.00	$182,250.00
7	48" Diameter Corrugated Culvert Pipe, complete in place	LF	2200	$300.00	$660,000.00
8	Curb Drop Inlet	EA	13	$15,000.00	$195,000.00
9	Asphalt and Concrete Repare	SY	3004	$100.00	$300,377.78
10	Demobilization, close out documents	LS	1	$42,070.00	$42,070.00
	Construction Sub Total				*$1,808,862.78*
11	Contingencies		25%		$452,215.69
12	NM Gross Receipts Tax		6.500%		$117,576.08
	Total Construction Project Cost				**$2,378,654.55**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 2: Water Harvesting and Pedestrian Corridor (Locust to Espina)

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$144,560.00	$144,560.00
2	Traffic Control	LS	1	$75,000.00	$75,000.00
3	Unclassified Excavation, include disposal	CY	10200	$30.00	$306,000.00
4	Channel Improvements (Riprap or other)	SY	7344	$50.00	$367,200.00
5	Concrete Path 4" Thick	SY	9180	$80.00	$734,400.00
6	Pedestrian Channel Crossings	EA	6	$75,000.00	$450,000.00
7	48" Diameter Culvert Pipe, complete in place	LF	1411	$300.00	$423,300.00
8	6-ft Diameter Manhole	EA	1	$15,000.00	$15,000.00
9	Landscaping, including irrigation	SY	10404	$50.00	$520,200.00
10	Demobilization, close out documents	LS	1	$72,280.00	$72,280.00
	Construction Sub Total				*$3,107,940.00*
11	Contingencies		25%		$776,985.00
12	NM Gross Receipts Tax		6.500%		$202,016.10
	Total Construction Project Cost				**$4,086,941.10**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 3: College Dr Storm Drain

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$17,330.00	$17,330.00
2	Traffic Control	LS	1	$20,000.00	$20,000.00
3	Unclassified Excavation, include disposal	CY	100	$20.00	$2,000.00
4	42" Diameter Corrugated Culvert Pipe, complete in place	LF	753	$300.00	$225,900.00
5	Curb Drop Inlet	EA	2	$15,000.00	$30,000.00
6	Pond Inlet	EA	1	$10,000.00	$10,000.00
7	Asphalt and Concrete Repare	SY	586	$100.00	$58,566.67
8	Demobilization, close out documents	LS	1	$8,670.00	$8,670.00
	Construction Sub Total				*$372,466.67*
9	Contingencies		25%		$93,116.67
10	NM Gross Receipts Tax		6.500%		$24,210.33
	Total Construction Project Cost				**$489,793.67**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 4: College Arroyo at Wells St

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$8,740.00	$8,740.00
2	Traffic Control	LS	1	$20,000.00	$20,000.00
3	Unclassified Excavation, include disposal	CY	75	$20.00	$1,500.00
4	36" Diameter Corrugated Culvert Pipe, complete in place	LF	420	$250.00	$105,000.00
5	36" Diameter End Section	EA	6	$1,800.00	$10,800.00
6	Concrete Roadway Cap	SY	311	$120.00	$37,333.33
7	Demobilization, close out documents	LS	1	$4,370.00	$4,370.00
	Construction Sub Total				*$187,743.33*
8	Contingencies		25%		$46,935.83
9	NM Gross Receipts Tax		6.500%		$12,203.32
	Total Construction Project Cost				**$246,882.48**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 5: Arrowhead Dr C&G From Wells to Stewart

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$45,320.00	$45,320.00
2	Traffic Control	LS	1	$20,000.00	$20,000.00
3	Unclassified Excavation, including removals & disposal	CY	2315	$20.00	$46,296.30
4	Cold Milling	SY	6944	$5.00	$34,722.22
5	Subgrade Prep, Base Course, Tack Coat complete in place	SY	6944	$15.00	$104,166.67
6	3" Asphaltic Concrete Surface Course, complete in place	SY	6944	$50.00	$347,222.22
7	Concrete Curb & Gutter, complete in place	LF	2788	$50.00	$139,400.00
8	Concrete Sidewalk, 4" thick, complete in place	SY	1204	$125.00	$150,541.67
9	Pavement Markings 4", yellow, complete in place	LF	1400	$1.25	$1,750.00
10	Landscaping, complete in place	SY	1244	$50.00	$62,222.22
11	Demobilization, close out documents	LS	1	$22,660.00	$22,660.00
	Construction Sub Total				*$974,301.30*
12	Contingencies		25%		$243,575.32
13	NM Gross Receipts Tax		6.500%		$63,329.58
	Total Construction Project Cost				**$1,281,206.20**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 6: Arrowhead at Wells

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$2,550.00	$2,550.00
2	Traffic Control	LS	1	$10,000.00	$10,000.00
3	Unclassified Excavation, include disposal	CY	84	$20.00	$1,685.19
4	24" Diameter Corrugated Culvert Pipe, complete in place	LF	63	$225.00	$14,175.00
5	Median Drop Inlet	EA	1	$20,000.00	$20,000.00
7	Asphalt and Concrete Repair	SY	51	$100.00	$5,055.56
8	Demobilization, close out documents	LS	1	$1,280.00	$1,280.00
	Construction Sub Total				*$54,745.74*
9	Contingencies		25%		$13,686.44
10	NM Gross Receipts Tax		6.500%		$3,558.47
	Total Construction Project Cost				**$71,990.65**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 7: Wells St at Sam Steel Way

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$22,960.00	$22,960.00
2	Traffic Control	LS	1	$10,000.00	$10,000.00
3	Unclassified Excavation, include disposal	CY	1426	$20.00	$28,518.52
4	36" Diameter Corrugated Culvert Pipe, complete in place	LF	1100	$250.00	$275,000.00
5	Curb Drop Inlet	EA	4	$15,000.00	$60,000.00
7	Asphalt and Concrete Repair	SY	856	$100.00	$85,555.56
8	Demobilization, close out documents	LS	1	$11,480.00	$11,480.00
	Construction Sub Total				*$493,514.07*
9	Contingencies		25%		$123,378.52
10	NM Gross Receipts Tax		6.500%		$32,078.41
	Total Construction Project Cost				**$648,971.01**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 8: Sam Steel Channel Improvements

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$3,370.00	$3,370.00
2	Unclassified Excavation, include disposal	CY	100	$20.00	$2,000.00
3	36" Diameter Corrugated Culvert Pipe, complete in place	LF	100	$250.00	$25,000.00
4	12" thick concrete or rock cladding	SY	134	$300.00	$40,333.33
5	Demobilization, close out documents	LS	1	$1,690.00	$1,690.00
	Construction Sub Total				*$72,393.33*
6	Contingencies		25%		$18,098.33
7	NM Gross Receipts Tax		6.500%		$4,705.57
	Total Construction Project Cost				**$95,197.23**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Conveyance Alt 9: Locust St and Sam Steel Way

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$2,360.00	$2,360.00
2	Traffic Control	LS	1	$15,000.00	$15,000.00
4	Cold Milling	SY	372	$5.00	$1,858.33
5	Subgrade Prep, Base Course, Tack Coat complete in place	SY	372	$15.00	$5,575.00
6	3" Asphaltic Concrete Surface Course, complete in place	SY	372	$50.00	$18,583.33
7	Concrete Curb & Gutter, complete in place	LF	120	$50.00	$6,000.00
11	Demobilization, close out documents	LS	1	$1,180.00	$1,180.00
	Construction Sub Total				*$50,556.67*
12	Contingencies		25%		$12,639.17
13	NM Gross Receipts Tax		6.500%		$3,286.18
	Total Construction Project Cost				**$66,482.02**

ESTIMATED SUMMARY OF COSTS AND QUANTITIES

Water Quality Recommendations

ITEM NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT COST	ESTIMATED COST
	Base Bid				
1	Mobilization, bonds, insurance, submittals	LS	1	$1,630.00	$1,630.00
2	Unclassified Excavation, include disposal	CY	344	$20.00	$6,874.07
3	Earth and Gravel Berm	LF	1278	$20.00	$25,560.00
4	Demobilization, close out documents	LS	1	$820.00	$820.00
	Construction Sub Total				*$34,884.07*
5	Contingencies		25%		$8,721.02
6	NM Gross Receipts Tax		6.500%		$2,267.46
	Total Construction Project Cost				**$45,872.56**