CITY OF ALBUQUERQUE

Dekker/Perich/Sabatini
architecture interiors landscape planning engineering

Meeting Minutes

Project No.: 11-0024.003
Project: **UNMH Surgical Hospital**
Date: September 5, 2012
Place: City of Albuquerque

Attending: Ed Adams (COA), Kristal Metro (COA), Shahab Biazar (COA), Curtis Cherne (COA), John Curtin (COA), Melissa Lozoya (COA), Roland Penttila (COA), Richard Dourte (COA), Allan Porter (ABCWUA), Terry Brown, Bruce Stidworthy (Bohannan Huston), Michael Balaskovits (Bohannan Huston), Bill Sabatini (DPS), Darren Huval (DPS), Ted Kostranchuk (DPS)

By: Ted Kostranchuk

Copies To: Parties Attending, John Laur, Dale Dekker
Issue Date: September 7, 2012

Discussion Items:

1. Bill discussed a brief history of the Master Plan and development of Lands West. He noted the following items for the Lands West development:

   - At full build out the hospital would be between 600 to 800 beds.
   - Phase one construction would be a 100 bed hospital and a 60,000 square foot MOB.
   - Main Entry to the new facility would be at Legion and Lomas. There would also be two other access points; Camino de Salud and the Frontage Road; and Camino de Salud and University.
   - The new facility would not offer emergency services in Phase 1.
   - UNMH is planning on seeing the first patient in July of 2014.
   - The new facility will be a great economic engine for the community
   - Bradbury Stamm and Hunt were contracted as the CMAR.

2. Ed Adams noted that the University has chosen to go through CID for permitting, however, utilities, access, and storm drainage are still city issues and will be coming through the city for approvals. He added that the access along the frontage road was a DOT issue but the access at Legion and Lomas needed to be examined carefully for right of ways and the throat width.

3. Terry Brown discussed the TIA and access points noting that he extended his study to 2035. Terry noted the following:
   - A signal would be requested at Legion and Lomas as part of the Phase 1 construction even thought the TIS did not warrant it. In a later conversation Ed Adams concurred with this. There was some discussion concerning the ownership of Legion and city staff did not think that it was city owned. Bruce stated that Bohannan had the surveys but would verify who in fact owned it.
   - Access to the site at full build out would consist of intersections at; Lomas and Legion, Camino de Salud and University, Camino de Salud and the frontage road, a non signalized intersection at Indian School and the extension of Mountain Road. He noted that the TIS clearly defines what driveway connections and intersection improvements would be required per phase. He noted that the NMDOT had some issue with the extension of Mountain Road but agreed to remove the limited access at Camino de Salud and the frontage road. It was noted by City staff that there would be concern and potential resistance from Martineztown to the extension of Mountain Road. Terry noted that westbound traffic would not be allowed to proceed west of the east frontage road and in fact be limited to a right out from the Mountain Road extension onto the northbound frontage road.
   - Access modifications as required for Phase 1would be limited to changes at Camino de Salud and the Frontage Road and Legion and Lomas. Camino de Salud would become an unrestricted intersection at the frontage road in Phase on by removing the barriers and allowing a right out.
   - It was noted that Camino de Salud was a private road, however, built to city standards.
   - Camino de Salud at University would require modifications in future phases , however, no modifications would be required of Phase 1.
   - Richard expressed concern over what intersections were included in the TIS and noted that the city requires that intersections beyond the perimeter of the project be included. Terry noted that the TIS

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in fact did include these intersections, and that the scope of the TIS was reviewed and discussed with city staff a few years ago – prior to first draft of the study.

- There was some concern that the MOB was not included in the TIS. It was noted that the initial layout of the building had the MOB included as a part of the hospital construction and that the TIS was based on 250,000 square feet. DPS staff confirmed that the existing layout, a separate hospital and MOB fell within those parameters. City asked both Terry and DPS to verify.

4. Bruce noted that at the time of the Mountain Road extension, a portion of the 54" forced main would need to be relocated. He added that during that relocation, the pipe could be upsized, if needed. Roland noted that main challenge for the Broadway pump station is the difference in elevation between the pump station and the north diversion channel and that upsizing the pipe would probably not appreciably improve the performance of the pump station.

5. Bruce reviewed the re-alignment of the existing gravity storm drain and the following issues were noted;

   - Realignment is a consequence of the building location and is basically a horizontal relocation.
   - A portion of the pipe will be upsized to compensate for reduced slope in the new line.
   - This storm drain dumps into the Odelia pond located in Veteran's park.
   - We were anticipating a paper easement for the relocation of the storm drain and water line and will do a replat at the time Legion Road is replatted. It was noted that a replat of the entire site is not on the critical path and it may be prudent to wait until all changes are made before filing the final plat.

6. Roland Pentilla noted that proposed new city regulations will require that 0.44" of rainfall must be retained on site. Bruce noted that the current plan did not fully conform to the proposed new regulations, but that significant measures were being taken to address water quality issues. These measures include several shallow retention ponds and disconnection of impervious areas. Bruce and Mimi Burns (DPS) will meet with Roland to review the water quality related issues.

7. Bruce discussed Legion Road and the following issues were noted.
   - Legion is currently a 60 foot right of way.
   - It is currently bound by the cemetery on the west and Galles on the east. The Galles lease runs out in approx 3 to 5 years.
   - There is a cell tower and associated trailer that will need to be relocated, its lease runs out July of 2013.
   - Legion is not on the critical path as far as the construction schedule goes, but needs to be complete by early 2014, in advance of the completion of Phase 1.
   - Issues and approvals for Legion Road will be completed by summer of 2013
   - The plan is to offset the road to the east and install a sidewalk along the western boundary.

8. There was some discussion concerning an MOU between the city and the University. City staff agreed that it may be beneficial to establish an MOU so that all parties understand who is responsible for what.

9. With no further issues for discussion, the meeting was adjourned.

This report is assumed to be a true and accurate account of this communication unless notice to the contrary is received within 10 calendar days of issue.

End of Minutes

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CITY OF ALBUQUERQUE

August 28, 2012

Bruce Stidworthy, P.E.
Bohannan Huston, Inc.
7500 Jefferson NE
Albuquerque, NM 87109

Re: UNM Acute Care Hospital Drainage Master Plan
Engineer's Stamp dated 09-07-11 (J15/D027A)

Dear Mr. Stidworthy,

Based upon the information provided in your submittal received August 2, 2012, the above referenced plan is approved for Work Order.

This project will require a National Pollutant Discharge Elimination System (NPDES) permit for storm water discharge if disturbing one acre or more and a Topsoil Disturbance Permit if disturbing ¾ of an acre or more. Please attach a copy of this approved plan to the construction sets prior to sign-off by Hydrology. Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

Albuquerque's MS4 Permit became effective March 1st, 2012. Grading and Drainage Plans and Drainage Reports will have to comply with the requirements of the new permit (http://www.cabq.gov/planning/landcoord/Hydrology.html).

If you have any questions, you can contact me at 924-3695.

Sincerely,

Shahab Biazar, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: e-mail

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Bohannan Huston

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Spatial Data
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toll free: 800.877.5332

CLIENT/COURIER TRANSMITTAL

To: Curtis Cherne
City of Albuquerque
City Hydrologist
One Civic Plaza Room 301
Albuquerque, NM 87102

Requested by: Bruce Stidworthy

Date: August 2, 2012

Time Due:
- ☒ This A.M.
- ☐ This P.M.
- ☐ Rush _____
- ☐ By Tomorrow

Phone: 924-3986
Job No.: 20120348 004 01 CDP

Job Name: UNM Acute Care Hospital DMP

DELIVERY VIA

- ☒ Courier
- ☐ Federal Express
- ☐ Mail
- ☐ UPS
- ☐ Other

PICK UP

Item: _____

ITEM NO.	QUANTITY	DESCRIPTION
1	2	Drainage and Transportation Information Sheet
2	1	University of New Mexio Acute Care Hospital Drainage Management Plan

COMMENTS / INSTRUCTIONS

RECEIVED
AUG 0 2 2012
HYDROLOGY SECTION

REC'D BY:_____ **DATE:**_____ **TIME:**_____

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(Rev. 12/2005)

PROJECT TITLE: UNM Lands West/UNM Acute Care Hospital ZONE MAP/DRG. FILE # J-15 D27A.
DRB#: _____ EPC#: _____ WORK ORDER#: _____

LEGAL DESCRIPTION: Tract Z, Lands of Southwestern Construction Company
CITY ADDRESS: South side of Camino De Salud just east of the I-25 frontage road

ENGINEERING FIRM: Bohannan Huston, Inc. CONTACT: Mike Balaskovits or Bruce Stidworthy
ADDRESS: 7500 Jefferson NE PHONE: 823-1000
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: UNM Hospitals CONTACT: Mark Kistner
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

ARCHITECT: Dekker/Perich/Sabatini CONTACT: John Laur
ADDRESS: _____ PHONE: 761-9700
CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: Bradbury Stamm - Hunt CONTACT: Todd Freed
ADDRESS: _____ PHONE: _____
CITY, STATE: _____ ZIP CODE: _____

TYPE OF SUBMITTAL:
- X DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL G & D PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERT (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT
- ___ ENGINEER CERT (TCL)
- ___ ENGINEER CERT (DRB SITE PLAN)
- ___ OTHER (SPECIFY)

CHECK TYPE OF APPROVAL SOUGHT:
- ___ SIA/FINANCIAL GUARANTEE RELEASE
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV. FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM)
- ___ CERTIFICATE OF OCCUPANCY (TEMP)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- X WORK ORDER APPROVAL
- ___ OTHER (SPECIFY)

RECEIVED
AUG 0 2 2012
HYDROLOGY SECTION

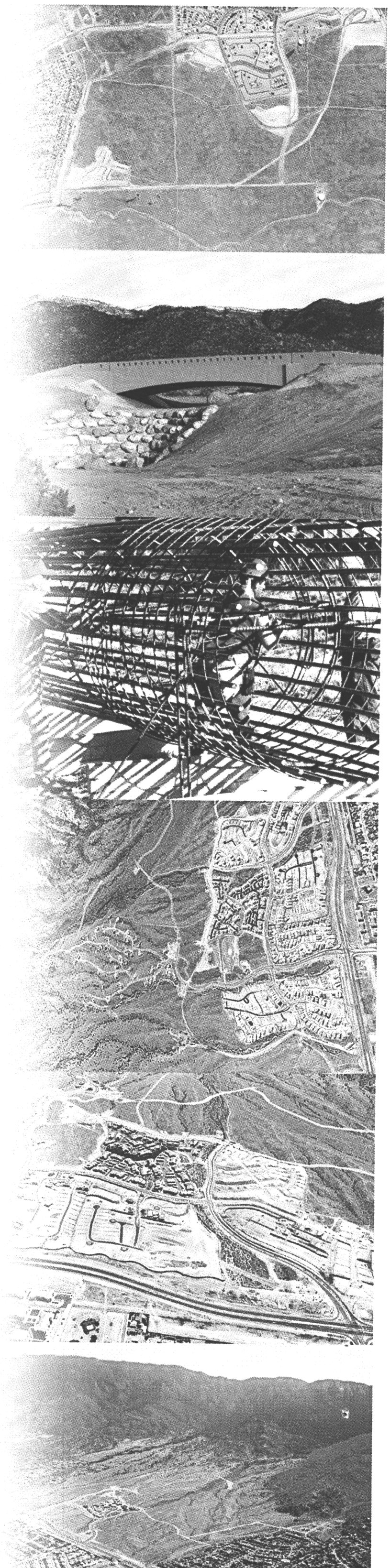
WAS A PRE-DESIGN CONFERENCE ATTENDED:
- X YES
- ___ NO
- ___ COPY PROVIDED

SUBMITTED BY: Mike Balaskovits & Bruce S. Bohannan Huston, Inc. DATE: 8/2/12

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope to the proposed development define the degree of drainage detail. One or more of the following levels of submittal may be required based on the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivision containing more than ten (10) lots or constituting five (5) acres or more.

UNIVERSITY OF NEW MEXICO ACUTE CARE HOSPITAL DRAINAGE MANAGEMENT PLAN



AUGUST 1, 2012

Prepared for:

University of New Mexico Hospital
2211 Lomas Blvd NE
Albuquerque, NM 87106

Prepared by:

Bohannan Huston

Engineering

Spatial Data

Advanced Technologies

UNIVERSITY OF NEW MEXICO ACUTE CARE HOSPITAL
DRAINAGE MANAGEMENT PLAN

AN AMENDMENT TO THE

'AMENDED MASTER DRAINAGE REPORT
UNIVERSITY OF NEW MEXICO NORTH CAMPUS
LANDS WEST OF UNIVERSITY BLVD NE'
ALBUQUERQUE CAMPUS

AUGUST 1, 2012

PREPARED FOR:

UNIVERSITY OF NEW MEXICO HOSPITAL
2211 LOMAS BLVD NE
ALBUQUERQUE, NM 87106

PREPARED BY:

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7500 JEFFERSON ST NE
COURTYARD ONE
ALBUQUERQUE, NM 87109

RECEIVED
AUG 0 2 2012
HYDROLOGY SECTION

BRUCE J. STIDWORTHY
NEW MEXICO
14523
REGISTERED PROFESSIONAL ENGINEER

Prepared by:

Bruce Stidworthy, P.E. Date 8/1/12

Bohannan Huston

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EXHIBITS

EXHIBIT 1: REVISED MASTER PLAN DEVELOPED CONDITIONS DRAINAGE
EXHIBIT 2: PLAN AND PROFILE OF PUBLIC STORM DRAIN SYSTEM
EXHIBIT 3: UNMH MASTER GRADING PLAN

APPENDICES

APPENDIX A – MASTER DRAINAGE REPORT, "ORIGINAL REPORT"
APPENDIX B – NEW MEXICO TRI-LAB BUILDING, ROAD, & SITE UTILITY PACKAGE PUBLIC WORK ORDER AS-BUILTS

I. AMENDED DRAINAGE MANAGEMENT PLAN

The purpose of this submittal is to provide an amendment to the 'Master Drainage Report for the University of New Mexico North Campus Lands West of University Blvd N.E.'(Original report prepared by Jeff Mortensen and Associates, dated July 2003, amended report dated September 2005- referred to hereafter as 'Original Report'). Please see Appendix A for a complete copy of this original report. This amendment will provide an update based on the current layout of the existing State Tri Labs facility and the proposed master plan for the UNM Acute Care Hospital (UNMH). With this submittal we are requesting hydrology approval for City of Albuquerque (COA) work order approval for the re-alignment of the existing 48" storm drain.

This amendment includes 1) redefined basin boundaries for those effected by the existing State Tri Labs Facility and the proposed UNMH master plan; and 2) Analysis of the storm drain based on the revised basins and a proposed realignment.

The remainder of the site and basins, not specifically noted within this amendment, will remain unchanged and drain as previously stated in the attached report. Please note that neither the original report, nor this update, include an AHYMO model. Accordingly, the analysis presented herein is conservative since the peak mitigating impacts of routing have not been considered.

A. AMENDMENT 1) REVISED PROPOSED BASIN BOUNDARIES.

The proposed basin boundaries shown on sheet 2 of 4 of the original report have been updated based on a number of factors. The basins themselves have remained in the same location and all of them continue to outfall to the existing outfall structure located within NMSHTD I-25 ROW (outfall structure); however the points at which the basin flows enter the storm drain have been modified slightly. Please see Exhibit 1, 'REVISED Master Plan – Developed Conditions – Drainage' showing the revised basin boundaries, Basin Data Table, and revised Analysis Points that reflect the current site changes. These basin boundaries were created based on our Master Grading Plan completed for the full build out of the project. The Master Grading Plan can be found on Exhibit 3 for information only.

The basins revised with this amendment include Basin E1, E2, G and H.

Basins E1 and E2 now reflect the current configuration of the proposed UNMH facility and E2 is broken into sub-basins with varying outfall points.

Basin G was also broken into multiple sub-basins. Basin G3 (37.50CFS) plus Basin F (16CFS) now drain directly to an existing inlet located just north of the intersection of Camino de Salud, Basin G2 drains both via storm drain and overland into Camino de Salud and eventually enters the large storm drain system at Manhole #3 (MH3). Basin G1 drains to the 78" storm drain via an onsite storm drain located on the NM State Tri Labs facility directly into MH1.

Basins H1 (3.69CFS) in addition to Basin E1-E (13.35CFS) and Basin D (10CFS) will drain via surface flow into Camino de Salud and head west. It was determined that Camino de Salud has sufficient capacity to convey the 27.04CFS with a 32' F-F roadway at 2.3% slope. During small storm events, these basins will drain into an inlet located on the south side of the Camino de Salud's intersection. During larger storm events the 27.04CFS will bypass this inlet and drain via surface flow west into inlets located at MH3 where they will be combined with Basins H2 and G2 entering the storm drain system. Please note the Hydraulic Grade Line (HGL) was computed with this drainage entering MH3.

B. AMENDMENT 2) EXISTING STORM DRAINAGE ANALYSIS AND REALIGNMENT.

At the end of 2009 the existing 48" storm drain (as shown within the original report) was extended underneath Camino de Salud to the existing outfall structure located at the northwest corner of the site. The pipe consisted of 60" and 78" RCP and was designed to accept the drainage from the developed conditions of the upstream basins along with the developed conditions of the adjacent basins as shown within the original report (Basins D, E1, E2, F, G and H). This extension was constructed within a public easement and followed the COA Design Review/Construction (DRC) Process and was accepted by the City at the completion of the construction. Please see the as-built drawings in Appendix B.

The storm drain was completed as part of the New Mexico State Tri Lab facility. In addition to this facility, UNM has expanded their current OSIS facility along with adding paved areas for parking. UNM now has plans to build an Adult Acute Care Hospital (UNMH) and Medical Office Buildings in multiple phases within Basins E1 and E2. The Revised Developed Conditions Plan (Sheet 5) shows the master plan and revised basins E1 and E2 (now E1-A, E2-A, E2-B, E2-C, E2-D and E2-E) addressing this change.

In addition the MOB is positioned on top of the existing 48" RCP storm drain. UNM proposes to realign the existing 48" line out of the foot print of the proposed building and grant a

40' public easement on this property. Page 7 of the original report references the need for this easement over this storm drain as it is accepting public waters from University Blvd upstream.

A Plan and Profile was completed showing the storm drain that is affected by this amendment and can be found in Exhibit 2. This plan shows the revised storm drain alignment as well as provides an analysis of the entire system showing the flowrates, velocities and Hydraulic Grade Line (HGL) from AP2 to the outfall structure.

II. CONCLUSION

This amendment assures the safe passage of the 100yr storm event through the site and adheres to the requirements set forth within the Developmental Process Manual (DPM) section 22. Based on the findings of this amendment and the additional information provided, the following conclusions addressing key points include:

- A new storm drain easement consistent with the DPM easement width requirements will be provided along the new storm drain line located on the new UNMH tract.
- Offsite flows previously noted on the original report will remain unchanged unless noted within this amendment.
- The development of the site will occur in phases and subsequent phases shall reference this amendment.
- The design and construction of the realignment of the 48" storm drain will occur by COA work order.

With this submittal we are seeking COA hydrology approval for COA work order approval for the re-alignment of the existing 48" storm drain.

EXHIBITS

EXHIBIT 1: REVISED MASTER PLAN DEVELOPED CONDITIONS DRAINAGE

EXHIBIT 2: PLAN AND PROFILE OF PUBLIC STORM DRAIN SYSTEM

EXHIBIT 3: UNMH MASTER GRADING PLAN

APPENDICES

Appendix A – Master Drainage Report, "Original Report" Prepared by Jeff Mortensen & Associates, Inc.

040107-Misc

AMENDED
MASTER DRAINAGE REPORT

UNIVERSITY OF NEW MEXICO NORTH CAMPUS
LANDS WEST OF UNIVERSITY BLVD N.E.
ALBUQUERQUE CAMPUS

The University of New Mexico

University of New Mexico
Real Estate Department & Department of Facility Planning
Albuquerque, New Mexico

Original Report July, 2003
Amended September, 2005

2005.170.8

JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
FAX: 505 345-4254 ESTABLISHED 1977

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Master Drainage Report

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Calculations and Supplemental Information

- City Hydrology Pre-Design Meeting Recap 11
- Hydrologic Calculations 13
- Offsite Basin Map 18
- Hydraulic Calculations (Flow Master P.E. Version 6.0) 19

Drawings

I.	Master Plan Existing Conditions Drainage UNM North Campus - West	Back Pocket
II.	Master Plan Developed Conditions Drainage UNM North Campus – West	Back Pocket
III.	Preliminary Infrastructure Plan UNM North Campus - West	Back Pocket
IV.	Ownership Map UNM North Campus - West	Back Pocket

JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

09-20-2005

Master Drainage Report

I. Introduction and Executive Summary

This plan represents a Master Drainage Plan for the University of New Mexico North Campus – West. The purpose of this plan is to 1) identify and quantify the peak discharge and volume of runoff under existing conditions, 2) calculate changes in the peak discharge and volume of runoff under proposed conditions, 3) present measures to attain favorable drainage conditions under the proposed development scenario, and 4) support proposed public drainage improvements that will be designed and constructed by City Work Order.

This plan, originally prepared, submitted and approved in July of 2003, is now being updated to reflect current existing conditions and a change in the proposed development scenario and method for handling onsite and offsite developed public flows. The text revisions herein associated with this update are italicized for the benefit of the reviewer.

The site is largely undeveloped and receives public and private offsite flows. This site is traversed by an existing public 48 inch reinforced concrete pipe storm drain that conveys offsite public flows through the site to discharge to an undeveloped natural channel at the northwest corner. The channel discharges to an existing public inlet structure located within the NMSHTD I-25 right-of-way also at the northwest corner of the site. From that point, site runoff is conveyed through NMDOT right-of-way to the Odelia Pond, a City owned, operated and maintained storm drainage facility situated downstream from the site. There are no known restrictions for the discharge from the site in the fully developed condition. An existing FEMA Flood Hazard Zone coincides with the approximate limits of the existing storm drain and earth channel.

All existing offsite flows will be accepted in the developed conditions. Developed site runoff will be directed to proposed private internal streets and will be collected ***by private storm drains and inlets outfalling to proposed public 60 inch and 66 inch extensions of the existing public 48" RCP storm drain.*** Whereas the new inlets and connector pipes will be private, the existing 48 inch RCP ***and the proposed 60 inch and 66 inch storm drain***

extensions shall be public. UNM *or its assigns* will construct the improvements and will be responsible for the maintenance of the private streets, private storm inlets and *private storm drain connections*. No map revisions are proposed. ***No building construction is proposed within the FEMA mapped flood zone.***

There are no known easements of record for the existing 48 inch public storm drain and open channel. New public drainage easements will be required to support the existing facilities and the proposed modifications to these public drainage facilities. The easements will be granted by UNM via paper easement documents ***or subdivision plat as appropriate.***

II. Project Description

The site is located on the University of New Mexico North Campus – West, north of Lomas Blvd. NE. The site is bounded on the west by Interstate 25, on the north by private properties fronting onto Indian School Road NE, and on the east by properties fronting onto University Blvd NE. As shown by Panels 332, 334, 351 and 356 of 825 of the National flood Insurance Program Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, ***November 19, 2003***, a portion of these site lies within a designated flood hazard zone (Zone A). This project does not propose to amend, revise or aggravate the existing floodplain.

III. Background Documents

The following document(s) were reviewed and researched as part of the evaluation of downstream conditions and offsite flows for this project.

1. Master Plan and Preliminary Mass Grading Plan for UNM North Campus – West prepared by Jeff Mortensen & Associates, Inc. dated January 2002. This plan provides a *preliminary* concept for the proposed building and site modifications to UNM North Campus – West as shown on the developed conditions plan. This is pertinent as it provides an idea as to how the site may develop.
2. Existing Drainage Basins and Facilities Plan for UNM North Campus prepared by Jeff Mortensen & Associates, Inc. This plan was used to help identify and quantify offsite runoff coming from basins located on the UNM campus outside of the subject site.

3. Final Drainage Report Volume 1 & 2, I25/I40 System Interchange, prepared by URS Greiner Woodward Cylde, date March 2000. This report describes modifications to the new Frontage Road as part of the recent Big "I" Project, including the construction of additional drainage infrastructure and modifications to the existing drainage system serving as the outfall for this site and connecting to the Odelia Pond.
4. Lomas Boulevard Storm Drain Design Analysis Report, prepared by Andrews, Asbury & Robert, Inc., dated June 1991. This Report identifies quantities of offsite runoff entering Lomas Boulevard west of University Boulevard and supported the design of now existing storm drainage improvements in Lomas Boulevard designed to intercept and redirect flows previously impacting Legion Road. The Report did not address street flow capacity in Lomas Boulevard or the upstream inlets and drainage basins at University Boulevard and points east of University Boulevard.
5. *City Hydrology Pre-Design Meeting with Jeff Mortensen and Brad Bingham, City Hydrologist. This meeting, held on July 15, 2005, was held to discuss the project requirements and the required amendment to the previously approved Master Drainage Plan resulting from the proposed change in how the developed flows will be handled (storm drain instead of open channel). A copy of the Recap is included at the end of this report.*
6. *Lands West Interim Parking Lot Improvements and Public Water Line by Jeff Mortensen & Associates, September 2004. A portion of the existing east-west private (UNM) access road (Camino de Salud) and underlying public water line were constructed with these plans. The proposed improvements would extend the private road and public water line.*

IV. Existing Conditions

A. Offsite Flows

The site is surrounded by developed buildings. Those buildings and associated sites contribute offsite flows that impact the project. Six of the sites are UNM owned properties, (Basins C, D and N-7.2, N-5.1 and M-1U). The following is a description of all of the offsite basins that contribute runoff to the site. The basins are shown on both the existing and developed conditions plans.

1. Basin A (French Mortuary Site)

   Runoff amounting to 13 cfs generated by the French Mortuary Site is accepted and conveyed through a private storm drain that ties directly into the existing public 48 inch storm drain, which traverses the site.

2. Basin B (Galles Chevrolet)

   Runoff generated in this basin flows across paved areas behind the Galles Building and onto the SE corner of the site, which is developed as vehicle storage parking leased to Galles by UNM.

3. Basin C (Carrie Tingley Hospital)

   The majority of runoff generated by this basin is ponded in the west section of the site, however, some runoff reaches a storm drain inlet located in the parking lot south of the building. Runoff entering this inlet is conveyed through a 12 inch steel pipe with a calculated maximum capacity of 8 cfs that discharges as overland runoff onto the slope located at the southeast boundary of the site.

4. Basin D (UNM Family Health Center)

   Runoff generated from this basin's parking lot enters a private storm drain. The peak rate of *10* cfs discharges directly to the site as overland runoff.

5. Basin F (UNM *OSIS*)

   This basin consists of the recently constructed UNM *OSIS* Building and parking lot. This site is located at the northeast boundary of the UNM North Campus – West property. 16 cfs of runoff generated on this site is collected in an internal private storm drain and discharged at the northwest corner of the property where it is accepted as overland runoff by the subject property. The runoff flows along the northern end of the property and ultimately drains in the onsite earthen channel.

6. Basin L (Legion Road)

This basin drains to existing public storm drain inlets in Legion Road. Currently the inlets located in the sump area of Legion Road are clogged. The basin includes an existing cemetery, the American Legion building and site, and a self-storage business. Theoretically, flows amounting 39 cfs generated by this basin drain through a public 36 inch public storm drain that connects to the existing 48 inch public storm drain traversing the site.

7. Basin N-7.2 (UNM)

This basin is located near the southwest corner of the UNM North Campus, northeast of the intersection of University Boulevard and Lomas Boulevard. The flows generated in the southern portion of this basin historically enter a private storm drain discharging to the existing 48 inch public storm drain. Site inspection does not reveal any apparent signs of this connection, and it appears that the runoff enters University Boulevard. Flows in the northern portion of the basin are routed through an earthen pond that overflows to University Boulevard. University Boulevard drains to the south towards existing storm inlets at Lomas that drain back to the north in a 36 inch RCP storm drain connecting to the existing 48 inch public storm drain traversing the site. Although these flows appear to drain to University, they have been analyzed for capacity purposes as draining into the 48 inch storm drain to be conservative and consistent with historical flow patterns, ***and to allow for the possibility or re-establishing this historic flow pattern in the future.***

8. Basins N-5.1 and M-1U

These basins include developed UNM properties that generate a total of 173 cfs draining to the intersection of Lomas and University. The amount of runoff intercepted and draining north to the 48 inch public storm drain has been assumed to be limited to the maximum pressure flow capacity of the 36 inch University storm drain calculated to be 107 cfs (see calculations). The inlets were not analyzed to determine if 107 cfs could actually enter the system ***to allow for possible modifications in the future without exceeding downstream capacity.*** It is assumed that runoff bypassing these inlets drains

to the west in Lomas to existing downstream storm drainage improvements constructed approximately *12* years ago (reference 4) which were designed to intercept Lomas flows.

B. Onsite Flows

At present, the site is ***partially developed in a temporary manner.*** Much of the site has been disturbed by grading operations. ***The aforementioned Galles lease lot is paved, as is the temporary UNMH employee parking lot located near the NW corner of the site.*** The undisturbed areas have a cover of natural vegetation. Runoff generated on site has been divided into 2 basins, Basin E and Basin G. The runoff from Basin E consists of surface runoff generated on site and draining to the beginning of the open channel. Basin G is the remainder of the site that drains to the open channel further downstream. The runoff generated by all offsite and onsite basins concentrates at the NW corner of the site and is then conveyed offsite to the Odelia Pond a city maintained facility.

C. Downstream/Outfall

The runoff from the site and from offsite basins discharges into the aforementioned natural channel and is conveyed through an underground system of 3 parallel 72 inch reinforced concrete pipes, recently constructed by the Big "I" project that travel beneath Interstate 25 to the Odelia Pond, a City of Albuquerque owned, operated and maintained drainage facility downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is reported to have adequate capacity to receive free discharge from the site in the existing and developed condition.

V. Developed Conditions

The proposed improvements consist of the construction of new buildings with associated landscaping and paving improvements. As shown by the ***Developed Conditions*** Plan, the site will continue to drain from east to west across the development area and new paving. The existing 48 inch public storm drain will be extended as a ***60 inch and 66 inch storm*** drain and a public easement will be granted for the entire length. The developed runoff will discharge along with the offsite runoff from the extended storm drain into the existing

NMDOT inlet structure and will be conveyed offsite to the City of Albuquerque detention facility, the Odelia Pond. *UNM will grant the City a public drainage easement for the existing 48 inch storm drain and the proposed 60 inch and 66 inch extensions. The public storm drain will be maintained by the City upon acceptance by the City Engineer.*

On-site flows will be directed to the *proposed public storm drain extensions. Basins E1 and E2 shall drain directly to private stubs connecting to the 60 inch portion and shall not drain to the proposed private streets. Flows from Basins B and C shall continue to be accepted by Basin E2 and conveyed to the proposed storm drain connection. Basin D shall continue to drain to the existing east/west access road (Camino de Salud). Basin G shall continue to accept runoff from Basin F and shall drain directly to a proposed private stub from the 66 inch public storm drain extension. Private storm inlets are proposed on the proposed Camino de Salud extension to the I-25 Frontage Road. The private roads themselves are identified as Basin H. The proposed frontage road connection will require NMDOT approval and a driveway permit.*

The addition of the developed runoff would exceed the capacity of the existing 48 inch public storm drain. In response, the storm drain will need to be upsized to a 60 inch *and 66 inch* reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the *downstream NMDOT inlet structure*.

The development will occur in phases. The first phase of the development will be the *extension of the east/west frontage road (Camino de Salud)* coming from University Boulevard along with the extension/upsizing of the onsite storm drain. The drainage improvements will require the granting of easement documents as a condition of work order approval. The next phase in the development will be to the *northwest corner of the site. This area, Basin G, will drain to a 36 inch stub located at the NW corner of the basin.* Ultimately, *a private* access road to the south connecting to Lomas Boulevard via Legion Road will be constructed. These improvements will include reconstruction of the existing public storm drain in Legion Road to correct the existing deficiencies. The *Conceptual Infrastructure Plan* appearing in the back pocket on sheet 3 shows the proposed scenario for *the first phase of* site development.

Land treatment percentages for the developed condition were assumed for commercial use and were done so in accordance with City of Albuquerque Design Process Manual (DPM). An impervious land treatment (D) of 90% was utilized along with a 10% landscaped land treatment (B). All basins were assumed to fully developed, allowing for free discharge in a manner consistent with this plan.

The purpose of the Developed Conditions Master Plan is to demonstrate the proposed drainage conditions under this development scenario. With this grading and drainage concept, developed site runoff will be directed to proposed private streets draining to the existing public storm drain which will be upsized and extended. The storm drain will outlet to *an existing NMDOT inlet structure*, ultimately outfalling to the Odelia Pond.

VI. Calculations

The calculations which appear herein analyze both the existing and the anticipated developed conditions for a 100-year, 6-hour rainfall event. As stated above, an impervious land treatment of 90% and a landscaped land treatment of 10% was assumed. These coefficients where taken from Table A-5 in Section 22.22 of the City of Albuquerque Development Process Manual (DPM) for commercial development.

The Flow Master P.E. Computer program, Version 6.0 by Heasted Methods was used to evaluate the storm drain capacities for the existing public 36 inch and 48 inch storm drains that convey offsite flows in University Boulevard and through the site. Manning's equation was used with the specified "n" value of 0.013 for concrete pipe. The 36 inch storm drain in University Boulevard was determined to have a maximum capacity of 107 cfs under pressure while the 48 inch storm drain was determined to have a maximum capacity under normal (gravity) flow conditions of 211 cfs, equal to the existing flow rate.

The Flow Master program was also used to analyze the existing conditions for the onsite open channel using an "n" value of 0.030 based on DPM Table 22.3, earthen lined channel/arroyo. As shown by this calculation, the existing flow rates are contained within the existing cross-section. The Flow Master program was also used to determine private street and storm drain capacities at several analysis points. The standard City inlets were analyzed using Federal Highway Administration procedures for combination inlets. *The*

double "C" inlets were analyzed with their throats were assumed to be fully clogged and the grates 25% clogged. As shown by the calculations, the street flows are contained within curb height, and the inlets are properly sized to accept *20 cfs of the total 100 year peak street flow of 24 cfs. The remaining 4 cfs will continue to inlets strategically located within a sump location that will accept the remaining runoff. No onsite runoff will continue to the NMDOT right-of-way.*

VII. Conclusions

This Master Drainage Report proposes a responsible approach to managing the storm water runoff associated with the proposed phased development. Improvements consist of development of an infill area in a manner consistent with surrounding development. The introduction of additional impervious areas will cause an increase in the peak discharge rate and volume of runoff currently draining to an existing open channel. Existing developed flows draining to an existing 48 inch storm drain will not be changed. Based upon the findings of this report the following conclusions addressing key points are presented:

- There are no known easements of record for the existing drainage infrastructure that lies within the site. Due to this fact, new public drainage easements will be required for development and modifications to the underground improvements. The locations for the proposed easements are shown on sheets 2 & 3 of this UNM North Campus - West Master Plan and will be provided with the Work Order Plans.
- Offsite flows will continue to be accepted and conveyed through the site.
- The modifications to the existing infrastructure include upsizing the 48 inch storm drain to 60 inch *and 66 inch.* downstream of the new private system.
- The addition of the developed runoff will exceed the capacity of the existing 48 inch public storm drain at the point where the private storm drain system connects. In response, the storm drain will need to be upsized to a 60 inch reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.
- The development will occur in phases. The first phase of the development will be the *extension to the NMDOT I-25 Frontage Road of the private* entrance road to the site

coming from University Boulevard, along with the extension/upsizing of the onsite storm drain *to the NMDOT inlet structure.*

- The design and construction of all public drainage improvements will occur by City Work Order.
- ***NMDOT review and approval will be required for all work within the NMDOT right-of-way.***
- The two proposed private roads along with proposed private storm drain improvements will have adequate capacity to convey runoff generated by the proposed development to the existing downstream public outfall.
- There are no known restrictions for the discharge of runoff to Odelia Pond, the City owned, operated and maintained storm drainage facility downstream from the site; it is believed to have adequate capacity to receive free discharge from the site in the existing and developed conditions.
- *Construction* will occur within the existing FEMA flood zone limits, but will not aggravate or alter the floodplain boundaries, therefore no LOMR will be required.
- ***No buildings are proposed within the existing FEMA flood zone limits, therefore no LOMR will be required.***
- All proposed drainage improvements within the site will be private, with the exception of those drainage improvements that convey public runoff.
- The public drainage improvements will require the granting of public drainage easements as a condition of Work Order approval.
- A SWPPP will be required by the contractor for this development. Along with this, a Notice of Intent will be submitted ***a minimum of 7 days*** before construction takes place.

2005.170.8

CITY OF ALBUQUERQUE
DEVELOPMENT & BUILDING SERVICES CENTER
PLANNING DEPARTMENT/HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NUMBER: J15/D27A DATE: 7-15-2005
CROSS REFERENCE NUMBERS: EPC_____ DRB_____ DRC_____
SUBJECT: UNM LANDS WEST MASTER DRAINAGE PLAN/TRISERVICES
STREET ADDRESS: CAMINO DE SALUD (A PRIVATE ROAD)
SUBDIVISION NAME: UNPLATTED LANDS OF THE UNIVERSITY OF NEW MEXICO

TYPE OF APPROVAL

X PRELIMINARY PLAT	X FINAL PLAT
SITE DEVELOPMENT PLAN	BUILDING PERMIT
X OTHER WORK ORDER/DRC APPROVAL	ROUGH GRADING

ATTENDEE:	ORGANIZATION:	PHONE:
BRAD BINGHAM	CITY	924-3986
JEFF MORTENSEN	JMA	345-4250

FINDINGS:

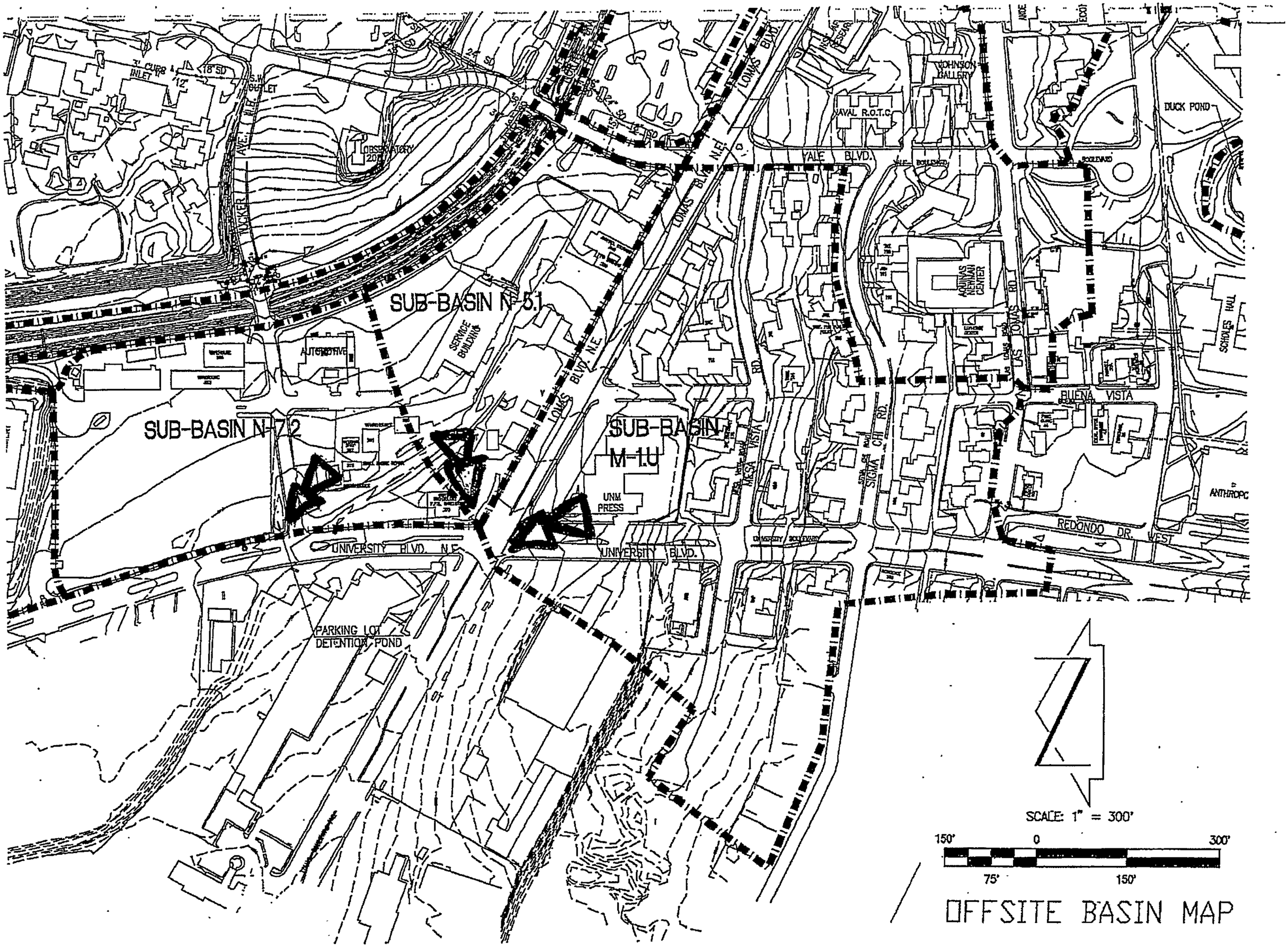
1. A MASTER DRAINAGE PLAN HAS BEEN PREVIOUSLY PREPARED, SUBMITTED AND APPROVED FOR THE UNM PROPERTY KNOWN AS LANDS WEST.
2. ORIGINALLY, IT WAS INTENDED TO ALLOW THE DEVELOPED RUNOFF FROM THE SITE, COMBINED WITH THE OFFSITE FLOWS FOLLOWING THE OLD CAMPUS WASH, TO EXIT THE NORTHWEST CORNER OF THE SITE IN A NATURALISTIC OPEN CHANNEL.
3. IT IS PROPOSED TO ABANDON THE CONCEPT ABOVE AND CONVEY THE FLOWS IN A CLOSED CONDUIT STORM DRAIN THAT WILL CONNECT DIRECTLY TO THE NMDOT OUTFALL STRUCTURE AT THE SE CORNER OF THE INDIAN SCHOOL ROAD OVERPASS OVER THE EAST FRONTAGE ROAD.
4. THE ABOVE CHANGE WILL REQUIRE AN AMENDMENT TO THE PREVIOUSLY APPROVED MASTER DRAINAGE PLAN.
5. A CLOMR AND/OR LOMR WILL NOT BE REQUIRED AS A RESULT OF THE PROPOSED AMENDMENT.
6. PERMANENT DEVELOPMENT (EG BUILDINGS), HOWEVER, MUST NOT ENCROACH INTO THE EXISTING MAPPED FLOODPLAIN, OR A LOMR WILL BE REQUIRED.
7. DESIGNING AND BUILDING A PRIVATE ACCESS ROAD ABOVE THE PROPOSED PUBLIC STORM DRAIN EXTENSION WILL BE ALLOWED AS WELL AS DESIGNING AND INSTALLING PUBLIC WATER AND SANITARY SEWER IMPROVEMENTS ALONG THAT SAME CORRIDOR.

8. DRC REVIEW AND WORK ORDER APPROVAL WILL BE REQUIRED FOR THE PUBLIC STORM DRAIN EXTENSION.
9. NMDOT APPROVALS WILL BE REQUIRED.
10. A PUBLIC STORM DRAINAGE EASEMENT FOR THE NEW EXTENSION AS WELL AS THE EXISTING 48" PIPE PRESENT ON SITE WILL BE REQUIRED AS A CONDITION OF WORK ORDER APPROVAL.
11. UNM WILL NEED TO GRANT THE NECESSARY EASEMENTS FOR ONLY THOSE LANDS IT CONTROLS.
12. THE GRANTING OF PRIVATE ACCESS EASEMENTS MAY ALSO BE REQUIRED.
13. IF PLATTING IS PROPOSED, THE PLAT SHALL GRANT THE PUBLIC STORM DRAIN EASEMENT(S) AS WELL AS SHOW THE FEMA MAPPED FLOODPLAIN; AN EASEMENT FOR THE FEMA MAPPED FLOODPLAIN WILL NOT BE REQUIRED.
14. PLATTING MAY TRIGGER REQUIRED INFRASTRUCTURE ALONG WITH AN SIA AND FINANCIAL GUARANTEES; A MUNICIPAL LIEN WILL BE AN ACCEPTABLE FORM OF FINANCIAL GUARANTY.

THE UNDERSIGNED AGREE THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE ONLY SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THE FINDINGS ARE NOT REASONABLE OR THAT THEY ARE BASED UPON INACCURATE INFORMATION.

SIGNED: Bradley L Bingham	SIGNED:
TITLE: CITY HYDROLOGIST	TITLE: CONSULTANT
DATE: 8/15/05	DATE: 08-15-2005

NOTE: PROVIDE A COPY OF THIS RECAP WITH DRAINAGE SUBMITTAL



OFFSITE BASIN MAP

Worksheet
Worksheet for Pressure Pipe

36" UNIVERSITY STORM DRAIN

Project Description	
Worksheet	36" University Existing Storm Drain
Flow Element	Pressure Pipe
Method	Manning's Formula
Solve For	Discharge

Input Data		
Pressure at 1	0.00	psi
Pressure at 2	0.00	psi
Elevation at 1	100.00	ft
Elevation at 2	86.80	ft
Length	510.00	ft
Mannings Coefficient	0.013	
Diameter	36	in

Results		
Discharge	107.30	cfs
Headloss	13.20	ft
Energy Grade at 1	103.58	ft
Energy Grade at 2	90.38	ft
Hydraulic Grade at 1	100.00	ft
Hydraulic Grade at 2	86.80	ft
Flow Area	7.1	ft^2
Wetted Perimeter	9.42	ft
Velocity	15.18	ft/s
Velocity Head	3.58	ft
Friction Slope	0.025882	ft/ft

Worksheet
Worksheet for Circular Channel

48" EXISTING STORM DRAIN

Project Description	
Worksheet	48" Lands West Existing Storm Drain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Slope	0.018600	ft/ft
Diameter	48	in

Results		
Depth	4.00	ft
Discharge	195.89	cfs
Flow Area	12.6	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.83	ft
Percent Full	100.0	%
Critical Slope	0.016187	ft/ft
Velocity	15.59	ft/s
Velocity Head	3.78	ft
Specific Energy	7.78	ft
Froude Number	0.00	
Maximum Discharg	210.72	cfs
Discharge Full	195.89	cfs
Slope Full	0.018600	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lar
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

EXISTING OPEN CHANNEL

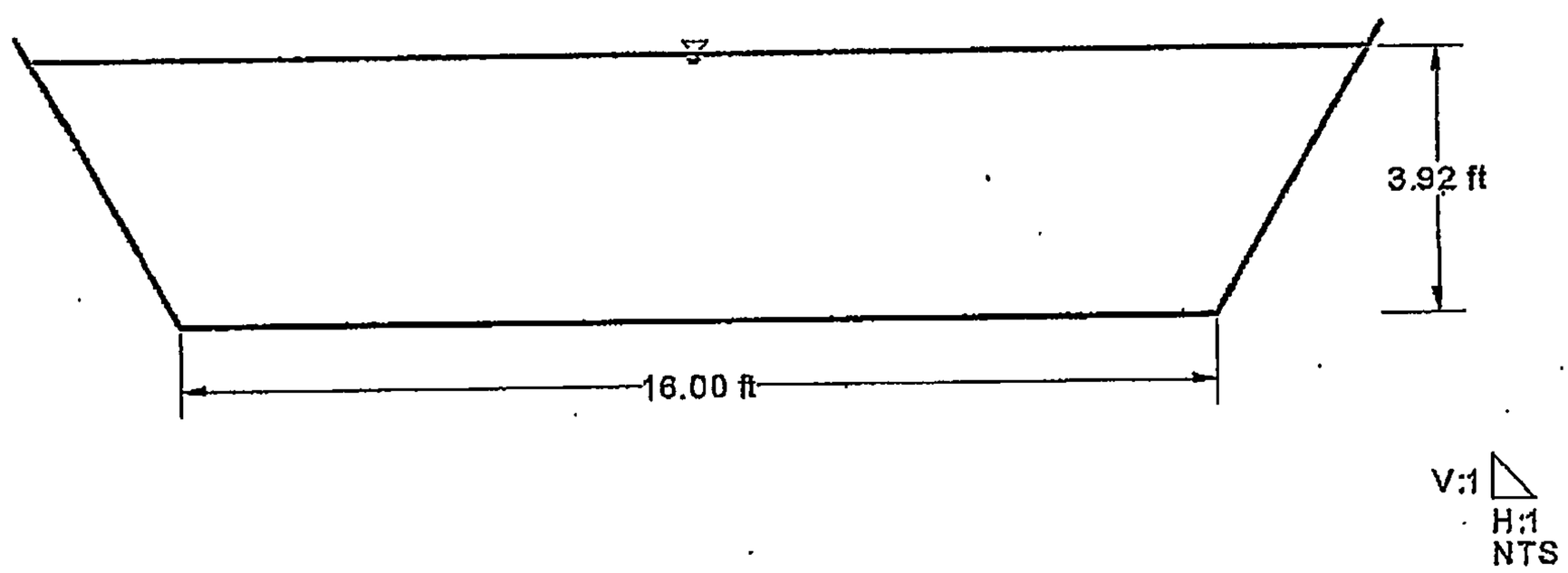
Input Data		
Mannings Coeffic	0.030	
Slope	003300	ft/ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	411.00	cfs

Results		
Depth	3.92	ft
Flow Area	71.7	ft²
Wetted Perim	25.09	ft
Top Width	20.61	ft
Critical Depth	2.65	ft
Critical Slope	0.011866	ft/ft
Velocity	5.73	ft/s
Velocity Head	0.51	ft
Specific Energ	4.43	ft
Froude Numb	0.54	
Flow Type	Subcritical	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lar
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coeffic	0.030	
Slope	003300	ft/ft
Depth	3.92	ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	411.00	cfs



Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	60" Storm Drain - Lands
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

60" STORM DRAIN
$Q_{100} = 311$ CFS

Input Data		
Mannings Coeffic	0.013	
Slope	013000	ft/ft
Diameter	60	in
Discharge	311.00	cfs

Results		
Depth	4.35	ft
Flow Area	18.1	ft²
Wetted Perime	12.03	ft
Top Width	3.36	ft
Critical Depth	4.71	ft
Percent Full	87.0	%
Critical Slope	0.012326	ft/ft
Velocity	17.14	ft/s
Velocity Head	4.57	ft
Specific Energy	8.92	ft
Froude Numbe	1.30	
Maximum Disc	319.41	cfs
Discharge Full	296.93	cfs
Slope Full	0.014261	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	60" Storm Drain - Lands
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

60" STORM DRAIN
$Q_{100} = 331$ CFS

Input Data		
Mannings Coeffic	0.013	
Slope	014000	ft/ft
Diameter	60	in
Discharge	331.00	cfs

Results		
Depth	4.62	ft
Flow Area	19.0	ft²
Wetted Perime	12.91	ft
Top Width	2.65	ft
Critical Depth	4.77	ft
Percent Full	92.4	%
Critical Slope	0.014011	ft/ft
Velocity	17.47	ft/s
Velocity Head	4.74	ft
Specific Energy	9.36	ft
Froude Numbe	1.15	
Maximum Disc	331.47	cfs
Discharge Full	308.14	cfs
Slope Full	0.016154	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	66" SD
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

66" STORM DRAIN
$Q_{100} = 386$ CFS

Input Data		
Mannings Coeffic	0.013	
Slope	013500	ft/ft
Diameter	66	in
Discharge	386.00	cfs

Results		
Depth	4.46	ft
Flow Area	20.6	ft²
Wetted Perime	12.32	ft
Top Width	4.31	ft
Critical Depth	5.15	ft
Percent Full	81.0	%
Critical Slope	0.011420	ft/ft
Velocity	18.72	ft/s
Velocity Head	5.45	ft
Specific Energ:	9.90	ft
Froude Numbe	1.51	
Maximum Disc	419.69	cfs
Discharge Full	390.15	cfs
Slope Full	0.013214	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	66" SD
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

66 STORM DRAIN
Q_{100} = 460 CFS

Input Data		
Mannings Coeffic	0.013	
Slope	017000	ft/ft
Diameter	66	in
Discharge	460.00	cfs

Results		
Depth	4.81	ft
Flow Area	22.0	ft²
Wetted Perime	13.30	ft
Top Width	3.64	ft
Critical Depth	5.32	ft
Percent Full	87.5	%
Critical Slope	0.016453	ft/ft
Velocity	20.87	ft/s
Velocity Head	6.77	ft
Specific Energ:	11.58	ft
Froude Numbe	1.49	
Maximum Disc	470.96	cfs
Discharge Full	437.82	cfs
Slope Full	0.018766	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	Lands West Misc. I
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

30" STUB @ 2%

Input Data		
Mannings Coeffic	0.013	
Slope	020000	ft/ft
Diameter	30	in

Results		
Depth	2.50	ft
Discharge	58.00	cfs
Flow Area	4.9	ft²
Wetted Perime	7.85	ft
Top Width	0.00	ft
Critical Depth	2.38	ft
Percent Full	100.0	%
Critical Slope	017335	ft/ft
Velocity	11.82	ft/s
Velocity Head	2.17	ft
Specific Energ	4.67	ft
Froude Numbe	0.00	
Maximum Disc	62.40	cfs
Discharge Full	58.00	cfs
Slope Full	020000	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	Lands West Misc. f
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

36" STUB @ 2%

Input Data		
Mannings Coeffic	0.013	
Slope	020000	ft/ft
Diameter	36	in

Results		
Depth	3.00	ft
Discharge	94.32	cfs
Flow Area	7.1	ft²
Wetted Perime	9.42	ft
Top Width	0.00	ft
Critical Depth	2.87	ft
Percent Full	100.0	%
Critical Slope	017383	ft/ft
Velocity	13.34	ft/s
Velocity Head	2.77	ft
Specific Energ:	5.77	ft
Froude Numbe	0.00	
Maximum Disc	101.46	cfs
Discharge Full	94.32	cfs
Slope Full	020000	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Irregular Channel

STREET FLOW
CAMINO DE SALUD

Project Description	
Worksheet	40' F-F with Standard
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	020000	ft/ft
Discharge	24.00	cfs

Options	
Current Roughness Method	Lotter's Method
Open Channel Weighting	Lotter's Method
Closed Channel Weighting	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elev	0.44	ft
Elevation Range	0.00 to 1.00	
Flow Area	6.2	ft²
Wetted Perimeter	35.64	ft
Top Width	34.75	ft
Actual Depth	0.44	ft
Critical Elevation	0.51	ft
Critical Slope	0.007178	ft/ft
Velocity	3.86	ft/s
Velocity Head	0.23	ft
Specific Energy	0.67	ft
Froude Number	1.61	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67

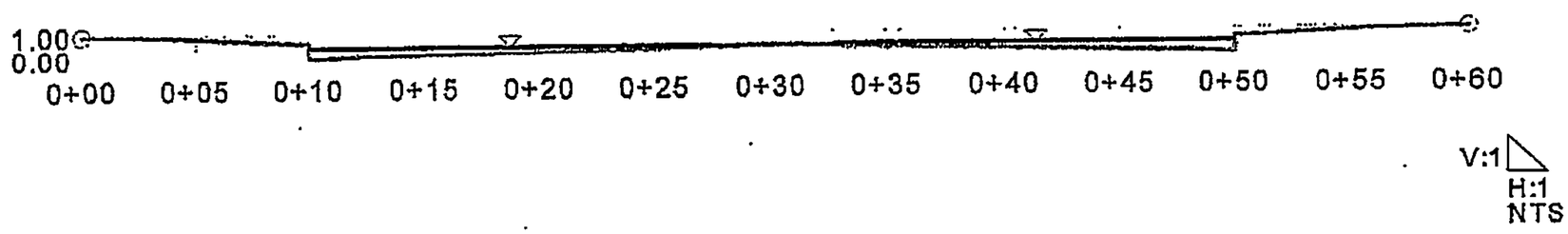
Worksheet
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+56	0.92
0+60	1.00

Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	40' F-F with Standard
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficier	0.017	
Slope	0.020000	ft/ft
Water Surface Elev:	0.44	ft
Elevation Range	.00 to 1.00	
Discharge	24.00	cfs



Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On (
Solve For	Efficiency

DOUBLE "C" INLET
CAMINO DE SALUD

Input Data		
Discharge	24.00	cfs
Local Depression	1.7	in
Local Depression \	7.50	ft
Slope	0.020000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Leng	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	m x 100 mm (P-1-7/8"-4")	
Clogging	25.0	%

Options	
Calculation Optia	Grate Inlet Only
Grate Flow Opti	Exclude None

Results		
Efficiency	0.43	
Intercepted Flow	10.25	cfs
Bypass Flow	13.75	cfs
Spread	20.98	ft
Depth	0.51	ft
Flow Area	4.5	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	5.34	ft/s
Splash Over Velocity	9.03	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.21	
Grate Flow Ratio	0.28	
Equivalent Cross Slo	028532	ft/ft
Active Grate Length	5.00	ft
Length Factor	0.00	
Total Interception Ler	0.00	ft

Appendix B – New Mexico Tri-Lab Building, Road, & Site Utility Package Public Work Order As-Builts

RECORD DRAWING

CONSTRUCTION PLANS FOR New Mexico Tri-Lab Building, Road, & Site Utility Package

ALBUQUERQUE, NEW MEXICO

INDEX

SHEET NUMBER	DESCRIPTION
1	COVER SHEET
1B	PLAT (FOR INFORMATION ONLY)
2	EXISTING CONDITION SITE PLAN
3	EXISTING PARKING LOT DEMOLITION & SITE PLAN
4, 4R	PRIVATE ROAD A PLAN AND PROFILE
5, 5R	STORM DRAIN PLAN AND PROFILE
6	PRIVATE ROAD A UTILITY PLAN AND PROFILE
7	CAMINO SALUD PAVING PLAN & PROFILE
8	CAMINO SALUD UTILITY PLAN & PROFILE
9	STRIPING AND SIGNAGE PLAN/TRAFFIC CONTROL PLAN
10	NMDOT PEDESTRIAN ACCESS DETAIL

UTILITY CONTACTS

Business	Name	Phone
Xspedius Management Co. Operations Support Manager 505 Marquette NW Ste 1605 Albuquerque, NM 87102	Benjamin, Steve	Office phone: (505) 998-2220 Office fax: (505) 998-2200 Steve.Benjamin@xspire.net
PNM Electric 4201 Edith Blvd. NE MS-E510 Albuquerque, NM 87107	Gallo, Tomas	Office phone: (505) 241-3487 Office fax: (505) 241-3415 tgalo@pnm.com
AT&T Resource Supervisor 111 3rd Street NW Albuquerque, NM 87103	Caswell, David	Office phone: (505) 842-2911 Office fax: 842-2890 dcaswell@att.com
MCI Operations Manager 6001 Midway Park NE Albuquerque, NM 87109	Darnell, Andy	Office phone: (505) 346-4470 Office fax: 346-4481 Andy.Darnell@mci.com
Comcast Construction Coordinator 4611 Montbel Place NE Albuquerque, NM 87107	Morlus, Mike	Office phone: (505) 761-6252 Office fax: (505) 761-0599 mike_morlus@cable.comcast.com
Time Warner Telecom Plant Manager 3830 Singer Blvd. NE Suite 1000 Albuquerque, NM 87109	Harrison, Royal	Office phone: (505) 938-7339 Office fax: 938-7380 Royal.Harrison@twtelecom.com
Qwest Long Distance Sr. Operations Tech 400 Tijeras NW Suite 570 Albuquerque, NM 87102	Kelly, Larry	Office Phone: (505) 244-4062 Office Fax: (505) 244-4068 Larry.Kelly@qwest.com
McLeod USA Supervisor of Outside Techs. 505 Marquette NW (Compass Bank) Suite 1500 Albuquerque, NM 87102	Moeller, Rick	Office phone: (505) 244-3161 Office fax: 244-0094 Mobile: 228-3329 rdmoeller@mcleodusa.com
Qwest/US West Qwest Field Services 400 Tijeras Ave. NW Suite 710 Albuquerque, NM 87102	Antonio, Natalie	Office phone: (505) 245-6846 Cell: 710-6499 Pager: 380-7631
Qwest/US West Capacity Provisioning Specialist 400 Tijeras Ave. NW Suite 710 Albuquerque, NM 87102	Whitlow, Billie	Office phone: (505) 245-6142 Office fax: 245-6733 bwhit1@qwest.com
Universal Access, Inc. 233 S Wacker Dr., Suite 600 Chicago, IL 60606	Price, Bryan	Office phone: (312) 660-6476 Office fax: (312) 660-5052 BPrice@universalaccess.net
PNM – Gas Co. of NM Project Engineer 4625 Edith Blvd. NE Albuquerque, NM 87107	Romanowski, Jeff	Office phone: (505) 241-7703 Office fax: (505) 241-7753 jromano@pnm.com
Level 3 Communications, LLC 1025 Eldorado Blvd Broomfield, CO 80021	Weathers, Roger	Office phone: (720) 888-5688 Office fax: (720) 888-5254 Roger.Weathers@Level3.com
City of Albuquerque City Surveyor P.O. Box 1293 Albuquerque, NM 87103	Hakkin, Glen	Office phone: (505) 768-3614 Office fax: (505) 768-2502
City of Albuquerque Water Utility Division P.O. Box 1293 Albuquerque, NM 87103	Stuart, Arthur	Office phone: (505) 857-8239 Office fax: (505) 857-8264 astuart@cabq.gov
City Of Albuquerque ITSD Engineer P.O. Box 1293 Albuquerque, NM 87103	Marsinski, Nancy	Office phone: (505) 768-2729 Office fax: (505) 768-3629 nmarsinski@cabq.gov

CERTIFICATE OF SUBSTANTIAL COMPLIANCE ON PLANS

I, Matthew A. Sanlistevan of the firm of Bohannan Huston, Inc., a Registered Professional Engineer in the State of New Mexico, do hereby certify, to the best of my knowledge and belief, that the infrastructure installed as shown on these drawings (New Mexico Tri-Lab Building, Road & Site Utility Package, Sheets 1, 5, 6, 7, and 8R) has been inspected by me or by a qualified person under my direct supervision and has been constructed in accordance with the plans and specifications and that the original design intent of the approved plans has been met, except as noted by me on the as-built construction drawings. This Certification is based on site inspections by me or personnel under my direction and survey information provided by the contractor, A.S. Horner, Inc. and their surveyor, William F. Brewster, NMPS 10855.

Engineers Seal & Signature

MATTHEW A. SANLISTEVAN NEW MEXICO 14720 REGISTERED PROFESSIONAL ENGINEER

SURVEYOR'S CERTIFICATION

I, William F. Brewster, New Mexico Professional Surveyor No 10855 do hereby certify that the as-built information shown hereon is the result of an actual field survey performed by me or under my direct supervision and that the same is true and correct to the best of my knowledge and belief.

William F. Brewster, NMPS # 10855 — 8/30/07

WILLIAM F. BREWSTER STATE OF NEW MEXICO 10855 REGISTERED PROFESSIONAL SURVEYOR

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL ABIDE BY ALL LOCAL, STATE, AND FEDERAL LAWS, RULES AND REGULATIONS WHICH APPLY TO THE CONSTRUCTION OF THESE IMPROVEMENTS.

2. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OR CONSTRUCTION OBSERVER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.

3. ALL ELECTRICAL, TELEPHONE, CABLE TV, GAS AND OTHER UTILITY LINES, CABLES AND APPURTENANCES ENCOUNTERED DURING CONSTRUCTION THAT REQUIRE RELOCATION, SHALL BE COORDINATED WITH THAT UTILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL NECESSARY UTILITY ADJUSTMENTS. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR DELAYS OR INCONVENIENCES CAUSED BY UTILITY COMPANY WORK CREWS. THE CONTRACTOR MAY BE REQUIRED TO RESCHEDULE HIS ACTIVITIES TO ALLOW UTILITY CREWS TO PERFORM THEIR REQUIRED WORK.

4. DISPOSAL SITE FOR ALL EXCESS EXCAVATION MATERIAL, AND UNSUITABLE MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE ENVIRONMENTAL REGULATIONS AND APPROVED BY THE CONSTRUCTION OBSERVER. ALL COSTS INCURRED IN OBTAINING A DISPOSAL SITE AND HAUL THERETO SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT AND NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE.

5. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE EXISTING UTILITY LINES WITHIN THE CONSTRUCTION AREA. ANY DAMAGE TO EXISTING FACILITIES CAUSED BY CONSTRUCTION ACTIVITY SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE AND APPROVED BY THE CONSTRUCTION OBSERVER.

6. CONSTRUCTION ACTIVITY SHALL BE LIMITED TO THE PROPERTY AND/OR PROJECT LIMITS. ANY DAMAGE TO ADJACENT PROPERTIES RESULTING FROM THE CONSTRUCTION PROCESS IS THE RESPONSIBILITY OF THE CONTRACTOR. ANY COSTS INCURRED FOR REPAIRS SHALL BE THE COST OF THE CONTRACTOR.

7. OVERNIGHT PARKING OF CONSTRUCTION EQUIPMENT SHALL NOT OBSTRUCT DRIVEWAYS OR DESIGNATED TRAFFIC LANES. THE CONTRACTOR SHALL NOT STORE ANY EQUIPMENT OR MATERIAL WITHIN THE PUBLIC RIGHT-OF-WAY.

8. THE CONTRACTOR SHALL OBTAIN ALL THE NECESSARY PERMITS FOR THE PROJECT PRIOR TO COMMENCING CONSTRUCTION (I.E. BARRICADING, SURFACE DISTURBANCE)

9. THE CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE AT HIS EXPENSE ANY AND ALL PROPERTY CORNERS DESTROYED DURING CONSTRUCTION. ALL PROPERTY CORNERS MUST BE RESET BY A REGISTERED LAND SURVEYOR.

10. ALL PERMANENT PAVEMENT MARKING AND TRAFFIC SIGNING SHALL BE FURNISHED BY THE CONTRACTOR PER PLAN.

11. ALL BARRICADES AND CONSTRUCTION SIGNING SHALL CONFORM TO APPLICABLE SECTIONS OF THE "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD), U.S. DEPARTMENT OF TRANSPORTATION, LATEST EDITION.

12. THE CONTRACTOR SHALL MAINTAIN ALL CONSTRUCTION BARRICADES AND SIGNING AT ALL TIMES. THE CONTRACTOR SHALL VERIFY THE PROPER LOCATION OF ALL BARRICADING AT THE END AND BEGINNING OF EACH DAY.

13. ALL SAWCUT PAVEMENT SHALL HAVE A UNIFORM EDGE AND BE SPRAYED WITH TACK.

14. WHEN ABUTTING NEW CURB AND GUTTER TO EXISTING PAVEMENT, A 1' WIDE SECTION OF EXISTING PAVEMENT ADJACENT TO THE CURB AND GUTTER SHALL BE SAWCUT, REMOVED, AND REPLACED AS PER THE STANDARD SPECIFICATIONS.

15. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR ANY DAMAGE TO EXISTING PAVEMENTS, PAVEMENT MARKINGS, CURB & GUTTER, DRIVE PADS, WHEELCHAIR RAMPS, AND SIDEWALK DURING CONSTRUCTION, APART FROM THOSE SECTIONS INDICATED FOR REMOVAL ON THE PLANS AND SHALL REPAIR OR REPLACE PER COA STANDARDS, AT HIS OWN EXPENSE.

16. FOR STORM DRAIN CONSTRUCTION, RCP PIPE JOINTS SHALL NOT BE GROUTED PRIOR TO FINAL INSPECTION. FINAL INSPECTION WILL DETERMINE JOINTS TO BE GROUTED FOR FINAL ACCEPTANCE OF THE CONSTRUCTION.

17. ALL EXCAVATION, TRENCHING, AND SHORING ACTIVITIES MUST BE CARRIED OUT IN ACCORDANCE WITH OSHA 29 CFR 1926.650 SUBPART P.

18. ALL WORK WITHIN THE NMDOT RIGHT-OF-WAY SHALL CONFORM WITH THE NMDOT 2005 INTERIM SPEC.

19. ALL MATERIAL TESTING SHALL BE DONE BY AN NMDOT APPROVED LAB.

20. ALL MATERIAL TESTING SHALL CONFORM TO THE REQUIREMENTS LISTED IN THE NMDOT 2005 INTERIM SPECS.

21. CONTRACTOR WILL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL CONSTRUCTION SIGNING UNTIL PROJECT HAS BEEN ACCEPTED BY THE CITY OF ALBUQUERQUE.

LIST OF ALTERNATES

ALTERNATE NO. 1 – CONSTRUCTION OF SANITARY SEWER LINE FROM STA 14+40, NEAR THE NORTHWEST PROPERTY CORNER TO THE EXISTING MANHOLE ADJACENT TO INDIAN SCHOOL ROAD.

ALTERNATE NO. 2 – CONSTRUCTION OF THE SURFACE COURSE OF PAVEMENT FOR THE PRIVATE ROAD

ALTERNATE NO. 3 – CONSTRUCTION OF THE INTERSECTION OF THE PRIVATE ROAD AND THE EAST I-25 FRONTAGE ROAD, INCLUDING THE RELATED DECELERATION LANE. INCLUDES ALL RELATED WORK SUCH AS DEMOLITION, TRAFFIC CONTROL DURING CONSTRUCTION, GRADING, BASE COURSE, ASPHALT PAVING, AND CONCRETE CURBS AND GUTTERS.

PROJECT BENCHMARK

STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK STAMPED "9–J15, 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I–25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E.. AND LEGION RD. N.E.
ELEVATION = 5090.385 FEET (NGVD 1929)

TEMPORARY BENCHMARKS

T.B.M. #1
ELEV=5041.27
N 1,490,839.83, E 386,006.66

T.B.M. #2
ELEV=5057.89
N 1,490,232.01, E 386,321.35

T.B.M. #3
ELEV=5080.97
N 1,490,685.00, E 386,865.5

NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

2. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED

3. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.

4. CONTRACTOR SHALL PROVIDE THE INSPECTORS, (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.

5. REMOVAL OF THE EXISTING CURB & GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).

6. ELECTRONIC MARKER DISKS (EMD) WILL BE PLACED ACCORDING TO SECTION 170 OF THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION AS REVISED THROUGH UPDATE #7.

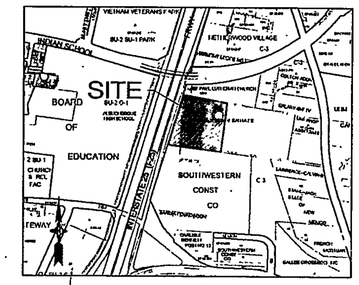
7. TESTING SHALL BE PROVIDED BY THE DEVELOPER OF THE PROJECT. ALL TESTING SHALL BE COORDINATED BY THE CONTRACTOR PER THE PROJECT MANUAL.

EROSION AND SEDIMENT CONTROL NOTES

A. Prevent temporary collection of sediment on sidewalks, parking lots, streets and driveways. Clean such surfaces promptly if such conditions exist due to the Work.

B. National Pollution Discharge Elimination System (NPDES) permit and procedures for preparing a Storm Water Pollution Prevention Plan (SWPPP).

1. Contractor shall determine whether Project requires an EPA NPDES storm water discharge permit in conformance with all regulations governing the disturbance of construction site areas.
2. If storm water discharge permit is required, then both Contractor and Owner shall be designated as separate permittees and the Contractor shall do the following:
   a. Prepare a Storm Water Pollution Prevention Plan (SWPPP) document as necessary to ensure compliance with any and all NPDES construction storm water permitting plan requirements.
   b. Prepare, execute and assist Owner with execution of all necessary forms, notifications and procedures required for permit.
   c. At Final Completion of Project, Contractor shall complete and submit documentation to EPA as required and to Architect as part of Project Closeout documentation package.
3. If a storm water discharge permit is not required, then the Contractor shall submit to the Architect and Owner prior to mobilization a signed statement containing specific written justification why such permit is not required on the Project.
4. The Contractor shall manage the discharge of storm water from the site in accordance with NPDES permit and the provisions of the SWPPP. The Contractor shall be responsible for installing and maintaining any necessary storm water control measures in accordance with control device manufacture's recommendations and the provisions of the SWPPP. The Contractor shall monitor the suitability of the designated control measures and management practices to achieve the storm water quality provisions of the NPDES permit, and shall make any necessary changes to the controls and practices in order to meet the permit requirements. The Contractor shall be responsible for updating the SWPPP and maintaining all records related to the SWPPP. A copy of the approved SWPPP shall be kept on the jobsite at all times. Contractor shall be liable for all fines and construction delays resulting from any governmental agency enforcement action due to failure by the Contractor to satisfy the above requirements.
5. Contractor is responsible for payment of all applicable fees and permits related to SWPPP approval process and for full cost of control measures for the Project.



LOCATION MAP
ZONE ATLAS INDEX MAP No. J-15-Z
NOT TO SCALE

NOTICE TO CONTRACTORS

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN THE CITY RIGHT-OF-WAY.

2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED OUTSIDE OF NMDOT RIGHT-OF-WAY UNDER CONTRACT SHALL EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1986 EDITION AS REVISED THROUGH UPDATE #7.

3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM (260-1990) FOR LOCATION OF EXISTING UTILITIES.

4. FIVE (5) WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL SUBMIT TO CONSTRUCTION COORDINATION DIVISION A DETAILED CONSTRUCTION SCHEDULE. TWO (2) WORKING DAYS PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A BARRICADING PERMIT FROM THE CONSTRUCTION COORDINATION DIVISION. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION COORDINATION ENGINEER (924-3991) PRIOR TO OCCUPYING AN INTERSECTION. REFER TO SECTION 19 OF THE GENERAL CONDITIONS OF THE STANDARD SPECIFICATIONS.

5. ALL WORK EFFECTING ARTERIAL ROADWAYS REQUIRES TWENTY-FOUR HOUR CONSTRUCTION.

6. ALL STREET STRIPING ALTERED OR DESTROYED SHALL BE REPLACED WITH PLASTIC REFLECTORIZED PAVEMENT MARKING BY CONTRACTOR TO THE SAME LOCATION AS WAS EXISTING, OR AS INDICATED BY THIS PLAN SET.

7. CONTRACTOR SHALL NOTIFY THE ENGINEER NOT LESS THAN SEVEN (7) DAYS PRIOR TO STARTING WORK IN ORDER THAT THE CITY SURVEYOR MAY TAKE NECESSARY MEASURES TO INSURE THE PRESERVATION OF SURVEY MONUMENTS. CONTRACTOR SHALL NOT DISTURB PERMANENT SURVEY MONUMENTS WITHOUT THE CONSENT OF THE CITY SURVEYOR AND SHALL NOTIFY THE CITY SURVEYOR AND BEAR THE EXPENSE OF REPLACING ANY THAT MAY BE DISTURBED WITHOUT PERMISSION. REPLACEMENT SHALL BE DONE ONLY BY THE CITY SURVEYOR. WHEN A CHANGE IS MADE IN THE FINISHED ELEVATIONS OF THE PAVEMENT OF ANY ROADWAY IN WHICH A PERMANENT SURVEY MONUMENT IS LOCATED, CONTRACTOR SHALL, AT HIS OWN EXPENSE, ADJUST THE MONUMENT COVER TO THE NEW GRADE UNLESS OTHERWISE SPECIFIED. REFER TO SECTION 4.4 OF THE GENERAL CONDITIONS OF THE STANDARD SPECIFICATIONS.

8. CONTRACTOR SHALL RECORD DATA ON ALL UTILITY LINES AND ACCESSORIES AS REQUIRED BY THE CITY OF ALBUQUERQUE FOR THE PREPARATION OF "AS CONSTRUCTED" DRAWINGS. CONTRACTOR SHALL LOCATE COVER UTILITY LINES AND ACCESSORIES UNTIL ALL DATA HAS BEEN RECORDED.

9. CONTRACTOR SHALL MAINTAIN A GRAFFITI-FREE WORK SITE. CONTRACTOR SHALL PROMPTLY REMOVE ANY GRAFFITI FROM ALL EQUIPMENT, WHETHER PERMANENT OR TEMPORARY.

10. CONTRACTOR SHALL COORDINATE WITH THE CITY OF ALBUQUERQUE WATER SYSTEMS DIVISION (857-8200) SEVEN (7) WORKING DAYS IN ADVANCE OF ANY WORK THAT MAY AFFECT EXISTING PUBLIC WATER OR SEWER UTILITIES. EXISTING VALVES TO BE OPERATED BY CITY PERSONNEL ONLY. CONTRACTOR SHALL CONTACT THE WATER SYSTEMS DIVISION SEVEN (7) WORKING DAYS PRIOR TO NEEDING VALVES TURNED ON OR OFF.

THE FOLLOWING NOTES ALSO APPLY WHEN CHECKED

- [X] ALL UTILITIES AND UTILITY SERVICE LINES SHALL BE INSTALLED PRIOR TO PAVING.
- [X] BACKFILL COMPACTION SHALL BE ACCORDING TO SPECIFIED STREET USE.
- [X] TACK COAT REQUIREMENTS SHALL BE DETERMINED BY THE FIELD ENGINEER.
- [ ] SIDEWALKS AND WHEELCHAIR RAMPS WITHIN THE CURB RETURNS SHALL BE CONSTRUCTED WHEREVER A NEW CURB RETURN IS CONSTRUCTED.
- [ ] IF CURB IS DEPRESSED FOR A DRIVEPAD, THE DRIVEPAD SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB AND GUTTER.
- [X] ALL STORM DRAINAGE FACILITIES SHALL BE COMPLETED PRIOR TO FINAL ACCEPTANCE.
- [X] THE REQUESTOR OR DEVELOPER SHALL BE RESPONSIBLE FOR REPAIR OR REPLACEMENT OF ALL CURB AND GUTTER OR SIDEWALK DAMAGED AFTER APPROVAL BY THE CITY ENGINEER OF WORK COMPLETED BY THE CONTRACTOR.

REV.	SHEETS	CITY ENGINEER	DATE	USER DEPARTMENT	DATE	USER DEPARTMENT	DATE
1	4R, 5R		10-18-07		10/18/07		10/18/07

ENGINEERS STAMP & SIGNATURE

APPROVALS	ENGINEER	DATE
DRC Chairman		12-27-06
Transportation		12-27-06
Water/Wastewater		12/27/06
Hydrology		12/27/06
Parks		
Const. Coord.		
Environ. Health		

MICHAEL J. STICHMAN NEW MEXICO 14623 REGISTERED PROFESSIONAL ENGINEER — 12/13/06

APPROVED FOR CONSTRUCTION

City Engineer — Date 1-22-07

City Project No. 670183

Sheet 1 Of 10

Bohannan Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

BHI JOB NO 040107

DATE: December 2006

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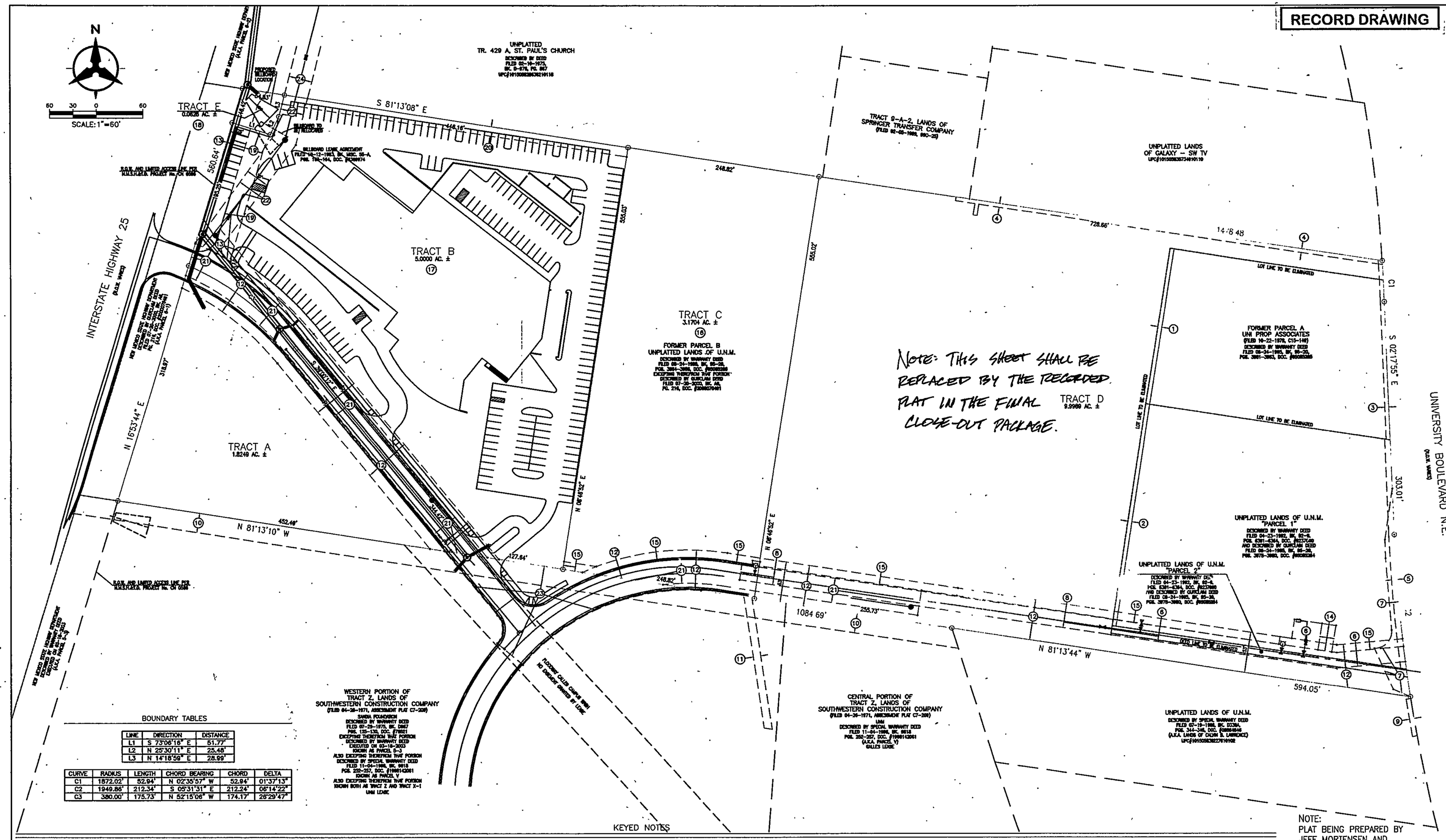
Dec 13, 2006 – 10:57am

RECORD DRAWING



Note: This sheet shall be replaced by the recorded plat in the final close-out package.

BOUNDARY TABLES

LINE	DIRECTION	DISTANCE
L1	S 73°06'16" E	51.77'
L2	N 25°30'11" E	23.48'
L3	N 14°18'59" E	28.99'

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA
C1	1872.02'	52.94'	N 02°35'57" W	52.94'	01°37'13"
C2	1949.86'	212.34'	S 05°31'31" E	212.24'	06°14'22"
C3	380.00'	175.73'	N 52°15'06" W	174.17'	26°29'47"

KEYED NOTES

VACATED EASEMENTS

1. 5' PNM AND MST&T COMPANY EASEMENT GRANTED BY DOCUMENT FILED 05-26-1967, BOOK MISC. 69, PAGE 137; VACATED BY 060RB-00730 (DRB #1004913)
2. 5' PNM AND MST&T COMPANY EASEMENT GRANTED BY DOCUMENT FILED 06-05-1967, BOOK MISC. 69, PAGE 845; VACATED BY 060RB-00730 (DRB #1004913)

EXISTING EASEMENTS

3. 5' MST&T COMPANY R.O.W. EASEMENT GRANTED BY DOCUMENT FILED 03-16-1971, BOOK MISC. 208, PAGES 73-74, DOC. #18473
4. 5' PNM EASEMENT GRANTED BY DOCUMENT FILED 02-12-1960, BOOK D527, PAGE 23
5. 7' MST&T COMPANY R.O.W. EASEMENT GRANTED BY DOCUMENT FILED 03-16-1971, BOOK MISC. 208, PAGE 75

EXISTING EASEMENTS – CONTINUED

6. PUBLIC WATERLINE EASEMENT GRANTED BY DOCUMENT FILED 09-11-2002, BOOK A41, PAGE 4648, DOC. #2002114975
7. PUBLIC ROADWAY EASEMENT GRANTED BY DOCUMENT FILED 09-11-2002, BOOK A41, PAGE 4648, DOC. #2002114976
8. PUBLIC WATERLINE EASEMENT GRANTED BY DOCUMENT FILED 12-21-2004, BOOK A58, PAGE 7410, DOC. #2004177899
9. APPROXIMATE LOCATION OF 6'x49' SIDEWALK ACCESS EASEMENT GRANTED BY DOCUMENT FILED 05-20-1998, BOOK 9810, PAGE 580, DOC. #1998062148; DIVEWAY IS CURRENTLY CLOSED-OFFSITE
10. 25' CITY OF ALBUQUERQUE ROAD EASEMENT AS DEPICTED ON PLAT D3-180, ALSO DESCRIBED BY AMENDMENT TO LEASE EXECUTED ON 04-30-1971-OFFSITE
11. APPROXIMATE LOCATION OF 10' PNM EASEMENT GRANTED BY DOCUMENT FILED 09-26-1958, BOOK D444, PAGE 132-OFFSITE

NEW EASEMENTS

12. PRIVATE ACCESS EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE TRACTS A, B, C, D AND E, U.N.M. LANDS WEST, AND THE UNIVERSITY OF NEW MEXICO AND SANDIA FOUNDATION. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE UNDERLYING PROPERTY OWNER. CITY OF ALBUQUERQUE PUBLIC STORM DRAINAGE EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION.
13. CITY OF ALBUQUERQUE PUBLIC STORM DRAINAGE EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION.
14. CITY OF ALBUQUERQUE PUBLIC WATER METER EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION.
15. 10' PNM GAS SERVICES EASEMENT, ONLY, TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE TRACTS B, C AND D, U.N.M. LANDS WEST
16. NON-SPECIFIC PRIVATE DRAINAGE EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE TRACT D. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNERS OF TRACT C.
17. NON-SPECIFIC PRIVATE DRAINAGE EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE TRACTS C AND D. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNERS OF TRACT B.

NEW EASEMENTS – CONTINUED

18. NON-SPECIFIC PRIVATE DRAINAGE EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE TRACTS B, C AND D. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNERS OF TRACT E
19. PRIVATE VEHICULAR ACCESS EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE TRACT E. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER OF TRACT B.
20. 12' PRIVATE UTILITY EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION TO SERVE THE UNIVERSITY OF NEW MEXICO. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE UNIVERSITY OF NEW MEXICO.
21. CITY OF ALBUQUERQUE PUBLIC WATERLINE AND CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION.
22. CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER EASEMENT TO BE GRANTED BY FORTHCOMING PLATTING ACTION.
23. PRIVATE ACCESS EASEMENT TO BE GRANTED BY SEPARATE EASEMENT DOCUMENT TO SERVE TRACTS A, B, C, D AND E. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE UNDERLYING PROPERTY OWNER. CITY OF ALBUQUERQUE PUBLIC STORM DRAINAGE, CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER AND CITY OF ALBUQUERQUE PUBLIC WATERLINE EASEMENT TO BE GRANTED BY SEPARATE DOCUMENT. (OFFSITE)
24. CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER EASEMENT TO BE GRANTED BY SEPARATE DOCUMENT. (OFFSITE)

NOTE:
PLAT BEING PREPARED BY
JEFF MORTENSEN AND
ASSOCIATES, INC. (JMA).

AS-BUILT INFORMATION

CONTRACTOR	A.S. Hanlek	DATE 8/07
PLANS PREPARED BY	A.S. Hanlek	DATE 8/07
INSPECTORS CHANGES MADE BY	DHT	DATE 8/07
FIELD VERIFICATION BY	A.S. Hanlek	DATE 8/07
DRAWINGS CORRECTED BY	A.S. Hanlek	DATE 8/07

MICRO-FILM INFORMATION

RECORDED BY	
DATE	
NO.	

BENCH MARKS

STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK, STAMPED "9-I25, 1999" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET EAST OF THE INTERSECTION OF LOMAS BLVD. AND LEGION RD. N.
ELEVATION = 5090.385 FEET (NGVD 1929)

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

No.	Date	REMARKS	By
		REVISIONS	
		DESIGN	

Designed By:	BJS	DATE: 12/06
Drawn By:	ARR	DATE: 12/06
Checked By:	BJS	DATE: 12/06

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
DRAFT PRELIMINARY PLAT
(FOR INFORMATION ONLY)

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	1B	10

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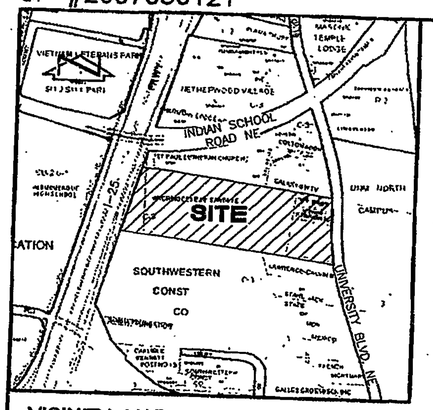
December 21, 2006 – 3:26pm

RECORD DRAWING

SP #2007030121



VICINITY MAP J-15
SCALE: 1" = 750'

DEDICATION AND FREE CONSENT

The subdivision hereon is with the free consent and in accordance with the desires of the undersigned owner and does hereby grant the easements as shown, including the rights of ingress and egress and the right to trim interfering trees.

Kim D. Murphy Feb. 26, 2007
Kim D. Murphy, Director of Real Estate, University of New Mexico — Date

ACKNOWLEDGEMENT

STATE OF NEW MEXICO)
COUNTY OF BERNALILLO) SS

This instrument was acknowledged before me on this 26th day of February, 2007, by Kim D. Murphy, Director of Real Estate, University of New Mexico.

Delbie DeBlanc Trujillo
Notary Public

PLAT OF TRACTS A, B, C, D AND E, U.N.M. LANDS WEST

ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2007

UNIVERSITY OF NEW MEXICO
OWNERS

PROJECTED
SEC. 16, T 10 N, R 3 E, N.M.P.M.
LOCATION

UNIT LANDS WEST
SUBDIVISION

Doc# 2007089423
Rcpt # 0297750 Page 1 of 5 06/19/2007 10:49 AM
Fees $ 127.00 Clerk P Bill A Toulouse, Bernalillo County

COUNTY CLERK FILING DATA

DESCRIPTION

A certain tract of land located within the Corporate Limits of the City of Albuquerque, Bernalillo County, New Mexico, comprising both platted and unplatted tracts of land situated within the Town of Albuquerque Grant, within projected Section 16, Township 10 North, Range 3 East, N.M.P.M., comprising an unplatted tract of land, known as Parcel B, described by Warranty Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on August 24, 1995, Book 95–20, Pages 3984–3986, Doc. # 95085286 excepting therefrom that portion described by Quitclaim Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on July 20, 2000, Book A8, Page 216, Doc. # 2000070491, known as Parcel 6–1; together with Parcel A, UNI Prop Associates, as the same is shown and designated on the plat filed in the Office of the County Clerk of Bernalillo County, New Mexico on October 22, 1979, Book C15, Page 149, and being further described by Warranty Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on August 24, 1995, Book 95–20, Pages 3981–3983, Doc. # 95085285; together with two unplatted tracts of land, known as Parcels 1 and 2, described by Warranty Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on April 23, 1992, Book 92–9, Pages 6361–6364, Doc. # 9237860, and being further described by Quitclaim Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on August 24, 1995, Book 95–20, Pages 3978–3980, Doc. # 95085284, and being more particularly described as follows:

Beginning at the northwest corner of the parcel herein described, being the point of intersection of said unplatted Parcel B, described by Warranty Deed filed August 24, 1995, north property line, with the east right–of–way line of Interstate Highway 25, whence the A.C.S. Control Station "9–J15" bears S 18°10'14" E a distance of 1979.45 feet; thence S 81°13'08" E a distance of 1478.48 feet to the northeast corner of the parcel herein described, being the northeast property corner of said unplatted Parcel B, also being the southeast property corner of an unplatted parcel known as Galaxy–SW TV (UPC #101505836573491011O), and also being a point on the west right–of–way line of University Boulevard N.E.; thence along an arc of a curve to the right with Delta = 01°37'13", R = 1672.02 feet and L = 52.94 feet, (Chord Bearing = S 02°35'57" E, Chord Length = 52.94 feet) along said west right–of–way line to a point on the east property line of said Parcel A, UNI Prop Associates; thence S 02°17'55" E a distance of 303.01 feet along said west right–of–way line to a point on the east property line of said unplatted Parcel 1, described by Warranty Deed filed April 23, 1992; thence along an arc of a curve to the left with Delta = 06°14'22", R = 1949.86 feet and L = 212.34 feet, (Chord Bearing = S 05°31'31" E, Chord Length = 212.24 feet) along said west right–of–way line to the southeast corner of the parcel herein described, being the southeast property corner of said unplatted Parcel B, also being the northeast property corner of an unplatted parcel known as Lands of Calvin B. Lawrence, described by Special Warranty Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on July 19, 1988, Book D338A, Pages 344–345, Doc. # 08864846 (UPC #101505836227610102); thence N 81°13'44" W a distance of 594.05 feet to an angle point on the south boundary of said unplatted Parcel B, being the northwest property corner of said unplatted Lands of Calvin B. Lawrence, and also being the northeast property corner of Tract Z, Lands of Southwestern Construction Company as the same is shown and designated on the plat filed in the Office of the County Clerk of Bernalillo County, New Mexico on April 26, 1971, Book C7, Page 209, Central Portion of Tract Z also being described by Special Warranty Deed filed in the Office of the County Clerk of Bernalillo County, New Mexico on November 04, 1998, Book 98–18, Pages 252–257, Doc. # 1998142061; thence N 81°13'10" W a distance of 1084.69 feet to the southwest corner of the parcel herein described, being the point of intersection of said unplatted Parcel B, described by Warranty Deed filed August 24, 1995, south property line, with the east right–of–way line of Interstate Highway 25, also being a point on the northerly property line of said Tract Z, Lands of Southwestern Construction Company; thence N 16°53'44" E a distance of 560.64 feet along said east right–of–way line to the point of beginning and containing 20.0570 acres more or less.

THIS IS TO CERTIFY THAT TAXES ARE CURRENT AND PAID ON UPC: 101505836023410102 See att. for additional UPCs
PROPERTY OWNER OF RECORD: BOARD OF REGENTS UNM
BERNALILLO COUNTY TREASURER'S OFFICE
6-19-07

DRB PROJECT NUMBER 1004913

APPLICATION NUMBER 06DRC–00730, 06DRB–00731, 07DRB–00072

APPROVALS:

for DRB CHAIRPERSON, PLANNING DEPARTMENT, CITY OF ALBUQUERQUE, NEW MEXICO	6-18-07 DATE
UTILITIES DEVELOPMENT, CITY OF ALBUQUERQUE, NEW MEXICO	3-7-07 DATE
CITY ENGINEER, CITY OF ALBUQUERQUE, NEW MEXICO	3/7/07 DATE
A.M.A.F.C.A.	3/7/07 DATE
TRAFFIC ENGINEERING, TRANSPORTATION DIVISION, CITY OF ALBUQUERQUE, NEW MEXICO	3-7-07 DATE
PARKS AND RECREATION DEPARTMENT, CITY OF ALBUQUERQUE, NEW MEXICO	3/7/07 DATE
CITY SURVEYOR, CITY OF ALBUQUERQUE, NEW MEXICO	2-27-07 DATE
P.N.M. ELECTRIC SERVICES	3-5-07 DATE
QWEST TELECOMMUNICATIONS	3/27/07 DATE
P.N.M. GAS SERVICES	3-5-07 DATE
COMCAST CABLE VISION OF NEW MEXICO, INC.	3-1-07 DATE

SURVEYORS CERTIFICATION

I, Charles G. Cala, Jr., New Mexico Professional Surveyor No. 11184, do hereby certify; that this Plat and the actual survey on the ground upon which it is based were performed by me or under my direct supervision; that the survey shows all easements made known to me by this owner, utility companies, or other parties expressing an interest, that this survey complies with the minimum requirements for Monumentation and Surveys of the Albuquerque Subdivision Ordinance; that this survey meets the Minimum Standards for Surveying in New Mexico, and that it is true and correct to the best of my knowledge and belief.

Charles G. Cala, Jr., NMPS 11184 — 02-09-2007 Date

CHARLES G. CALA, JR. NEW MEXICO 11184 PROFESSIONAL SURVEYOR

JEFF HORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. NE.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
JOB #2005.170.7 FINAL1

RECORD DRAWING

SP-#2007030121

PLAT OF

TRACTS A, B, C, D AND E, U.N.M. LANDS WEST

ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2007

Doc# 2007089423
Rcpt # 0091738 Pgs: 2 of 5 06/19/2007 10:48 AM
PLRI R 327.00 D 30.00 P: 0169 M Toulouse, Bernalillo County

COUNTY CLERK FILING DATA

Notes:

1. A boundary survey was performed in January and February, 2003, updated in July, 2005 and verified in January, 2007. Property corners were found or set as indicated.
2. All distances are ground distances.
3. Site located within projected Section 16, Township 10 North, Range 3 East, N.M.P.M. (Town of Albuquerque Grant).
4. Bearings shown hereon are New Mexico State Plane Grid Bearings, Central Zone. These bearings are positioned from A.C.S. Control Station "9-J15".
5. Record bearings and distances are shown in parenthesis.
6. Private street mileage created by this plat = 0.26 miles (full-width).
7. Upon completion of the construction of the streets, City of Albuquerque approved centerline monuments shall be placed at all intersections or as otherwise indicated in lieu of subdivision block corner monumentation. Location of said monuments are designated with a " ◎ " symbol.
8. The purpose of this plat is to:
   a. Eliminate the interior property and deed lines to create 5 (five) tracts from Parcel A, UNI Prop Associates, Parcels 1 & 2, Unplatted Lands of U.N.M. and Parcel B, Unplatted Lands of U.N.M.
   b. Vacate the P.N.M. and M.S.T.&T. Company easements granted by the following documents: Book Misc. 69, Page 137 and Book Misc. 69, Page 845, records of Bernalillo County, New Mexico (06DRB-00730).
   c. Grant the necessary private utility, private access, private drainage, private vehicular access, City of Albuquerque public water line, City of Albuquerque public storm drainage, City of Albuquerque public water meter, City of Albuquerque public sanitary sewer, and PNM Gas Services (only) easements as shown.
9. The following documents and instruments were used for the performance and preparation of this survey:
   a. Plat of UNI Prop Associates, filed 10-22-1979, Book C15, Page 149, Records of Bernalillo County, New Mexico.
   b. Plat for assessment purposes of Lands of Southwestern Construction Company, filed 01-06-1967, Book C6, Page 149, Records of Bernalillo County, New Mexico.
   c. Plat for assessment purposes of Lands of Southwestern Construction Company, filed 04-26-1971, Book C7, Page 205, Records of Bernalillo County, New Mexico.
   d. Plat of Lands of Southwestern Construction Company, filed 05-18-1964, Book C24, Page 10, Records of Bernalillo County, New Mexico.
   e. Plat of Lands of Springer Transfer Company, filed 02-05-1999, Book 99C, Page 25, Records of Bernalillo County, New Mexico.
   f. New Mexico State Highway and Transportation Department Right of Way, Access Control & Monumentation Map, New Mexico Project No. CN 0586, dated 05-21-2002.
   g. Certificate of Survey of Tracts X & X-1 together with a portion of Tract Z, Southwestern Construction Company prepared by Albuquerque Surveying Company, Inc. dated 12-11-1990.
   h. A.L.T.A./A.C.S.M. Land Title Survey of Parcel IV & V, Tract KK and a portion of Tract Z, Southwestern Construction Company prepared by Southwest Survey Company, Inc. dated 10-22-1998.
   i. A.L.T.A./A.C.S.M. Land Title Survey of Parcels 1 and 2 prepared by Gainer Engineering Sciences, Inc. dated 02-24-1992.
   j. A.L.T.A./A.C.S.M. Land Title Survey of Parcels A and B prepared by Albuquerque Surveying Company, Inc. dated 07-27-1995.
   k. Boundary Survey of Parcels A and B and Parcel A, UNI Prop Associates prepared by this firm dated 01-31-2001
   l. Warranty Deed filed 08-24-1995, Book 95-20, Pages 3984-3986, Doc #95085286, Records of Bernalillo County, New Mexico (Parcel B).
   m. Warranty Deed filed 08-24-1995, Book 95-20, Pages 3981-3983, Doc #95085285, Records of Bernalillo County, New Mexico (Parcel A).
   n. Warranty Deed filed 04-23-1992, Book 92-9, Pages 6361-6364, Doc. #9237860, Records of Bernalillo County, New Mexico (Parcels 1 & 2).
   o. Special Warranty Deed filed 07-19-1988, Book D338A, Pages 344-345, Doc. #08864846, Records of Bernalillo County, New Mexico (Lawrence).
   p. Special Warranty Deed filed 11-04-1998, Book 9818, Page 251, Doc. #1998142060, Records of Bernalillo County, New Mexico (Tract KK).
   q. Quitclaim Deed filed 11-21-1989, Book D374A, Pages 36-38, Doc. #89100100, Records of Bernalillo County, New Mexico (Tracts O.H. & LL).
   r. Special Warranty Deed filed 11-04-1998, Book 9818, Page 252, Doc. #1998142061, Records of Bernalillo County, New Mexico (portion of Tract Z).
   s. Warranty Deed filed 07-29-1975, Book D987, Pages 125-130, Doc. #76521, Records of Bernalillo County, New Mexico (Tract Z).
   t. Quitclaim Deed filed 07-20-2000, Book A8, Page 216, Doc. #2000070491, Records of Bernalillo County, New Mexico (Tract 6-1).
   u. Warranty Deed executed 03-18-2003 (Parcel 5-3).
   v. Plat for assessment purposes of Lands of Southwestern Construction Company, filed 12-29-1967, Book D3, Page 180, Records of Bernalillo County, New Mexico.
   w. Boundary Survey of UNM Lands West prepared by this firm certified 06-26-2003 (unrecorded).
10. Gross subdivision acreage = 20.0570 acres.
11. Current Zoning on site is C-3, based upon review of the City of Albuquerque Zone Atlas.
12. Tracts A, B and C, U.N.M. Lands West are subject to the Temporary Construction Easement between the University of New Mexico and the State of New Mexico executed on January 22, 2007 (unrecorded).

BOUNDARY TABLES

LINE	DIRECTION	DISTANCE
L1	S 73°06'16" E	51.77'
L2	N 25°30'11" E	25.48'
L3	N 14°18'59" E	28.99'
CL1	N 81°13'10" W	886.06'

CURVE	RADIUS	LENGTH	CHORD BEARING	CHORD	DELTA
C1	1872.02'	52.94'	S 02°35'57" E	52.94'	01°37'13"
C2	1949.86'	212.34'	S 05°31'31" E	212.24'	06°14'22"
C3	380.00'	175.73'	N 52°15'06" W	174.17'	26°29'47"
CLC1	300.33'	118.90'	S 87°33'10" W	118.12'	22°40'58"

EASEMENT TABLES

LINE	DIRECTION	DISTANCE	EASEMENT
E1	S 84°43'49" W	88.32'	6
E2	N 81°21'06" W	292.26'	6
E3	N 06°35'14" E	20.00'	6/8
E4	S 81°21'06" E	216.37'	8
E5	N 06°38'54" E	10.00'	8
E6	S 81°21'06" E	15.00'	6
E7	N 06°38'54" E	25.00'	6
E8	S 81°21'06" E	35.00'	6
E9	S 06°38'54" W	35.00'	6/14
E10	S 81°21'06" E	23.49'	6
E11	N 84°43'49" E	85.30'	6
E12	N 63°53'18" W	24.06'	7
E13	N 04°42'50" W	53.81'	7
E14	N 01°40'13" W	24.15'	7
E15	N 06°13'40" E	66.81'	7
E16	S 02°27'53" E	59.73'	7
E17	N 24°18'42" W	58.93'	7
T1	S 07°22'00" E	9.62'	6
E18	N 81°21'06" W	480.81'	8
E19	N 06°38'54" E	20.00'	8
E20	S 81°21'06" E	13.00'	8
E21	N 06°38'54" E	8.74'	8
E22	S 81°21'06" E	10.00'	8
E23	S 06°38'54" W	8.74'	8
E24	S 81°21'06" E	457.78'	8
E25	N 81°13'10" W	255.73'	12
E26	N 81°13'10" W	223.37'	12
E27	S 81°13'31" E	43.26'	12
E28	S 81°13'31" E	255.73'	12
E29	S 81°13'31" E	491.23'	12
E30	N 84°43'47" E	83.80'	12
E31	N 81°13'10" W	44.65'	12
E32	N 39°00'12" W	311.35'	12
E33	S 39°00'12" E	377.48'	12
E34	S 81°13'06" E	31.82'	13
E35	S 39°21'21" W	20.54'	13
E36	S 16°53'44" W	31.43'	13
E37	S 16°53'44" W	150.09'	13
E38	S 39°00'12" E	21.49'	13

LINE	DIRECTION	DISTANCE	EASEMENT
E39	N 39°00'12" W	25.05'	13
E40	N 16°53'44" E	163.36'	13
E41	S 81°21'06" E	17.50'	14
E42	S 06°36'51" W	35.00'	14
E43	N 81°20'27" W	17.50'	14
E44	N 63°49'18" E	17.45'	15
E45	S 81°13'10" E	110.63'	15
E46	N 81°13'10" W	108.45'	15
E47	S 24°37'14" W	20.84'	19
E48	S 16°53'44" W	140.07'	19
E49	NOT USED		
E50	N 16°53'14" E	172.81'	19
E51	S 73°06'16" E	26.77'	15
E52	N 81°13'10" W	44.65'	12
E53	S 81°13'10" E	43.26'	21
E54	S 81°13'10" E	210.36'	21
E55	S 06°46'50" W	33.00'	21
E56	N 81°13'10" W	210.36'	21
E57	N 81°13'10" W	43.34'	21
E58	N 81°13'10" W	85.17'	21
E59	N 81°13'10" W	19.35'	21
E60	N 39°00'12" W	330.09'	21
E61	N 16°53'44" E	13.12'	21
E62	N 16°53'44" E	30.25'	21
E63	S 37°34'55" E	80.62'	21
E64	S 39°00'12" E	368.46'	21
E65	N 81°13'10" W	29.77'	21
E66	S 81°13'06" E	30.14'	22
E67	S 14°18'59" W	62.02'	22
E68	S 35°56'33" W	145.56'	22
E69	S 39°00'12" E	117.74'	22
E70	N 16°53'44" E	1.65'	22
E71	N 35°56'33" E	173.70'	22
E72	N 14°18'59" E	24.39'	22
E73	N 81°13'10" W	10.00'	26
E74	N 06°46'50" E	5.00'	26
E75	S 81°13'10" E	10.00'	26
E76	S 06°46'50" W	5.00'	26
T1	S 81°13'10" E	30.64'	26

CURVE	RADIUS	LENGTH	BEARING	CHORD	DELTA	EASEMENT
EC1	1949.93'	20.01'	S 06°55'53" E	20.01'	00°35'17"	6
EC2	1949.93'	185.96'	S 05°04'56" E	185.88'	05°27'51"	7
EC3	1949.93'	27.57'	S 08°13'09" E	27.57'	00°48'30"	7
EC4	22.00'	36.72'	N 43°08'02" E	32.60'	95°37'43"	7
EC5	330.33'	190.38'	N 82°23'02" E	187.75'	33°01'14"	12
EC6	1949.86'	76.43'	S 07°31'20" E	76.42'	02°14'45"	12
EC7	350.00'	59.33'	N 43°51'34" W	59.26'	09°42'44"	12
EC8	25.00'	19.71'	N 71°18'22" W	19.21'	45°10'52"	12
EC9	48.00'	103.65'	N 37°01'57" W	84.68'	123°43'41"	12
EC10	48.00'	115.92'	S 81°03'10" E	89.89'	138°13'54"	12
EC11	25.00'	16.51'	S 30°51'29" E	16.21'	37°50'32"	12
EC12	410.00'	77.11'	S 44°23'29" E	77.00'	10°46'33"	12
EC13	48.00'	27.18'	S 72°12'23" W	26.82'	32°26'29"	13
EC14	330.33'	19.29'	S 67°32'47" W	19.28'	03°20'44"	15
EC15	48.00'	22.39'	S 82°43'32" W	22.19'	26°43'34"	19
EC16	NOT USED					
EC17	320.33'	168.53'	N 83°49'20" E	166.59'	30°08'36"	21
EC18	267.33'	76.60'	N 86°44'35" W	76.37'	15°16'28"	21
EC19	367.00'	167.96'	N 82°06'58" W	166.52'	26°13'31"	21
EC20	419.00'	112.46'	S 68°11'59" E	112.13'	15°43'07"	21
EC21	410.00'	143.96'	N 55°59'56" W	143.24'	20°07'13"	22

JEFF HORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. NE.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
JOB #2005.170.7 FINAL.1

RECORD DRAWING

SP #2007050121

PLAT OF

TRACTS A, B, C, D AND E, U.N.M. LANDS WEST

ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2007

Doc# 2007069423
Rcpt # 0081789 Page 3 of 5 06/19/2007 10:48 AM
PLAT $:022.00 B 35036 P: 0168 M. Toulouse, Bernalillo County

COUNTY CLERK FILING DATA

KEYED NOTES

VACATED EASEMENTS

(1) 5' PNM AND MST&T COMPANY EASEMENT GRANTED BY DOCUMENT FILED 05-26-1967, BOOK MISC. 69, PAGE 137; VACATED BY 06DRB-00730 (DRB #1004913)

(2) 5' PNM AND MST&T COMPANY EASEMENT GRANTED BY DOCUMENT FILED 06-05-1967, BOOK MISC. 69, PAGE 845; VACATED BY 06DRB-00730 (DRB #1004913)

EXISTING EASEMENTS

(3) 5' MST&T COMPANY R.O.W. EASEMENT GRANTED BY DOCUMENT FILED 03-16-1971, BOOK MISC. 208, PAGES 73-74, DOC. #16473

(4) 5' PNM EASEMENT GRANTED BY DOCUMENT FILED 02-12-1960, BOOK D527, PAGE 23

(5) 7' MST&T COMPANY R.O.W. EASEMENT GRANTED BY DOCUMENT FILED 03-16-1971, BOOK MISC. 208, PAGE 75

(6) PUBLIC WATERLINE EASEMENT GRANTED BY DOCUMENT FILED 09-11-2002, BOOK A41, PAGE 4648, DOC. #2002114976

(7) PUBLIC ROADWAY EASEMENT GRANTED BY DOCUMENT FILED 09-11-2002, BOOK A41, PAGE 4648, DOC. #2002114976

(8) PUBLIC WATERLINE EASEMENT GRANTED BY DOCUMENT FILED 12-21-2004, BOOK A88, PAGE 7410, DOC. #2004177899

EXISTING EASEMENTS - OFFSITE

(9) APPROXIMATE LOCATION OF 6'x49' SIDEWALK ACCESS EASEMENT GRANTED BY DOCUMENT FILED 05-20-1998, BOOK 9810, PAGE 560, DOC. #1998062148; DIVEWAY IS CURRENTLY CLOSED

(10) 25' CITY OF ALBUQUERQUE ROAD EASEMENT AS DEPICTED ON PLAT D3-180, ALSO DESCRIBED BY AMENDMENT TO LEASE EXECUTED ON 04-30-1971

(11) APPROXIMATE LOCATION OF 10' PNM EASEMENT GRANTED BY DOCUMENT FILED 09-26-1958, BOOK D444, PAGE 132

(25) NMSHTD EASEMENT GRANTED BY DOCUMENT FILED 08-25-2002, BOOK A37, PAGE 9956, DOC. #2002080182

MONUMENTS

(A) FOUND REBAR W/ALUMINUM CAP STAMPED "NMSHTD", TAGGED W/WASHER STAMPED "NMPS 11184"

(B) FOUND REBAR W/ALUMINUM CAP STAMPED "NMSHTD", 0.1' SOUTH OF PROPERTY LINE

(C) FOUND #5 REBAR, BENT, 0.7' SOUTH OF PROPERTY LINE

(D) FOUND CHISELED "+" IN CONCRETE SIDEWALK

(E) FOUND MAG NAIL W/WASHER STAMPED "NMPS 11184" IN ASPHALT

(F) FOUND REBAR W/CAP STAMPED "10464", TAGGED W/WASHER STAMPED "NMPS 11184"

(G) FOUND REBAR W/ALUMINUM CAP STAMPED "NMLS 6261", TAGGED W/WASHER STAMPED "NMPS 11184"

(H) SET #5 REBAR W/CAP STAMPED "NEW MEXICO PS 11184"

NEW EASEMENTS

(12) PRIVATE ACCESS EASEMENT GRANTED BY THIS PLAT TO SERVE TRACTS A, B, C, D AND E, U.N.M. LANDS WEST, AND THE UNIVERSITY OF NEW MEXICO AND SANDIA FOUNDATION. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE UNDERLYING PROPERTY OWNER. ALSO CITY OF ALBUQUERQUE PUBLIC STORM DRAINAGE EASEMENT GRANTED BY THIS PLAT.

(13) CITY OF ALBUQUERQUE PUBLIC STORM DRAINAGE EASEMENT GRANTED BY THIS PLAT

(14) CITY OF ALBUQUERQUE PUBLIC WATER METER EASEMENT GRANTED BY THIS PLAT

(15) 10' PNM GAS SERVICES EASEMENT, ONLY, GRANTED BY THIS PLAT TO SERVE TRACTS B, C AND D, U.N.M. LANDS WEST

(16) NON-SPECIFIC PRIVATE DRAINAGE EASEMENT GRANTED BY THIS PLAT TO SERVE TRACT D. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNERS OF TRACT C.

(17) NON-SPECIFIC PRIVATE DRAINAGE EASEMENT GRANTED BY THIS PLAT TO SERVE TRACTS C AND D. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNERS OF TRACT B.

(18) NON-SPECIFIC PRIVATE DRAINAGE EASEMENT GRANTED BY THIS PLAT TO SERVE TRACTS B, C AND D. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNERS OF TRACT E

(19) PRIVATE VEHICULAR ACCESS EASEMENT GRANTED BY THIS PLAT TO SERVE TRACT E. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE OWNER OF TRACT B.

(20) 12' PRIVATE UTILITY EASEMENT GRANTED BY THIS PLAT TO SERVE THE UNIVERSITY OF NEW MEXICO. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE UNIVERSITY OF NEW MEXICO.

(21) CITY OF ALBUQUERQUE PUBLIC WATERLINE AND CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER EASEMENT GRANTED BY THIS PLAT

(22) CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER EASEMENT GRANTED BY THIS PLAT

(26) CITY OF ALBUQUERQUE PUBLIC WATERLINE EASEMENT GRANTED BY THIS PLAT

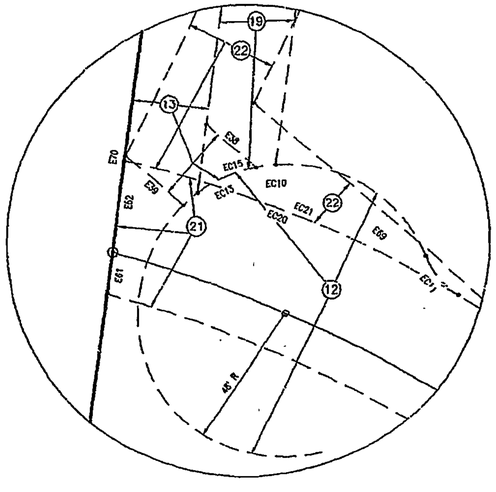
(27) 5' QWEST TELECOMMUNICATIONS EASEMENT GRANTED BY THIS PLAT

NEW EASEMENTS - OFFSITE

(23) PRIVATE ACCESS EASEMENT TO BE GRANTED BY SEPARATE EASEMENT DOCUMENT TO SERVE TRACTS A, B, C, D AND E. MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE UNDERLYING PROPERTY OWNER. CITY OF ALBUQUERQUE PUBLIC STORM DRAINAGE, CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER AND CITY OF ALBUQUERQUE PUBLIC WATERLINE EASEMENT TO BE GRANTED BY SEPARATE DOCUMENT.

(24) CITY OF ALBUQUERQUE PUBLIC SANITARY SEWER EASEMENT TO BE GRANTED BY SEPARATE DOCUMENT.

EASEMENT DETAIL



JEFF HORTENSEN & ASSOCIATES, INC.
6010-B HIDVAY PARK BLVD. NE.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
JOB #2005.170.7 FINAL1

F 5

RECORD DRAWING

SP #2007030121

PLAT OF

TRACTS A, B, C, D AND E, U.N.M. LANDS WEST

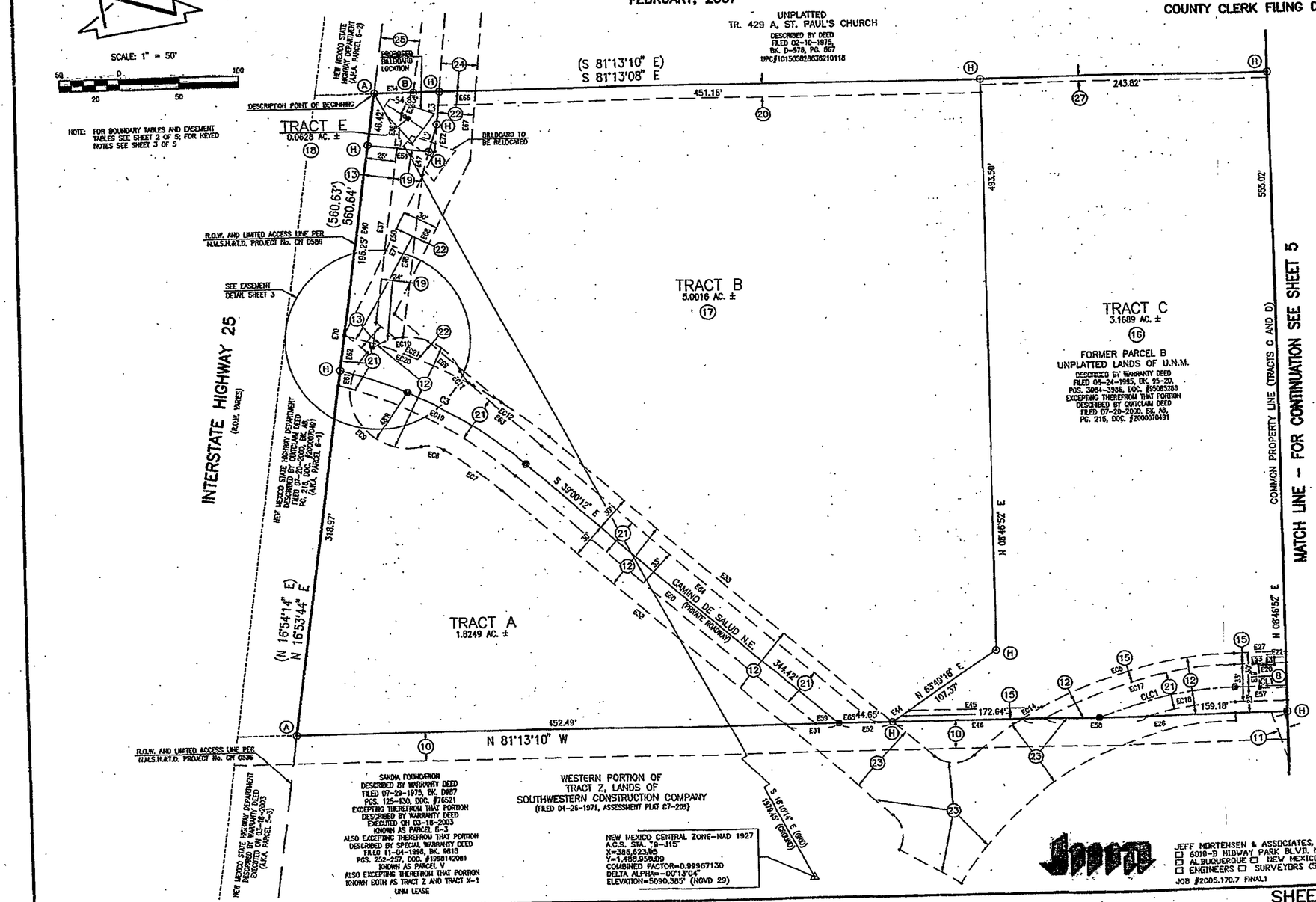
ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

FEBRUARY, 2007

Doc# 2007089423

Book 8:0081780 Page 4 of 5 06/19/2007 10:40 AM
PLAT R:527.00 A: 2007C P: 0160 M: Toulouse, Bernalillo County

COUNTY CLERK FILING DATA



SHEET 4 OF 5

RECORD DRAWING

SP #2007030121

PLAT OF

TRACTS A, B, C, D AND E, U.N.M. LANDS WEST

ALBUQUERQUE, BERNALILLO COUNTY, NEW MEXICO
FEBRUARY, 2007

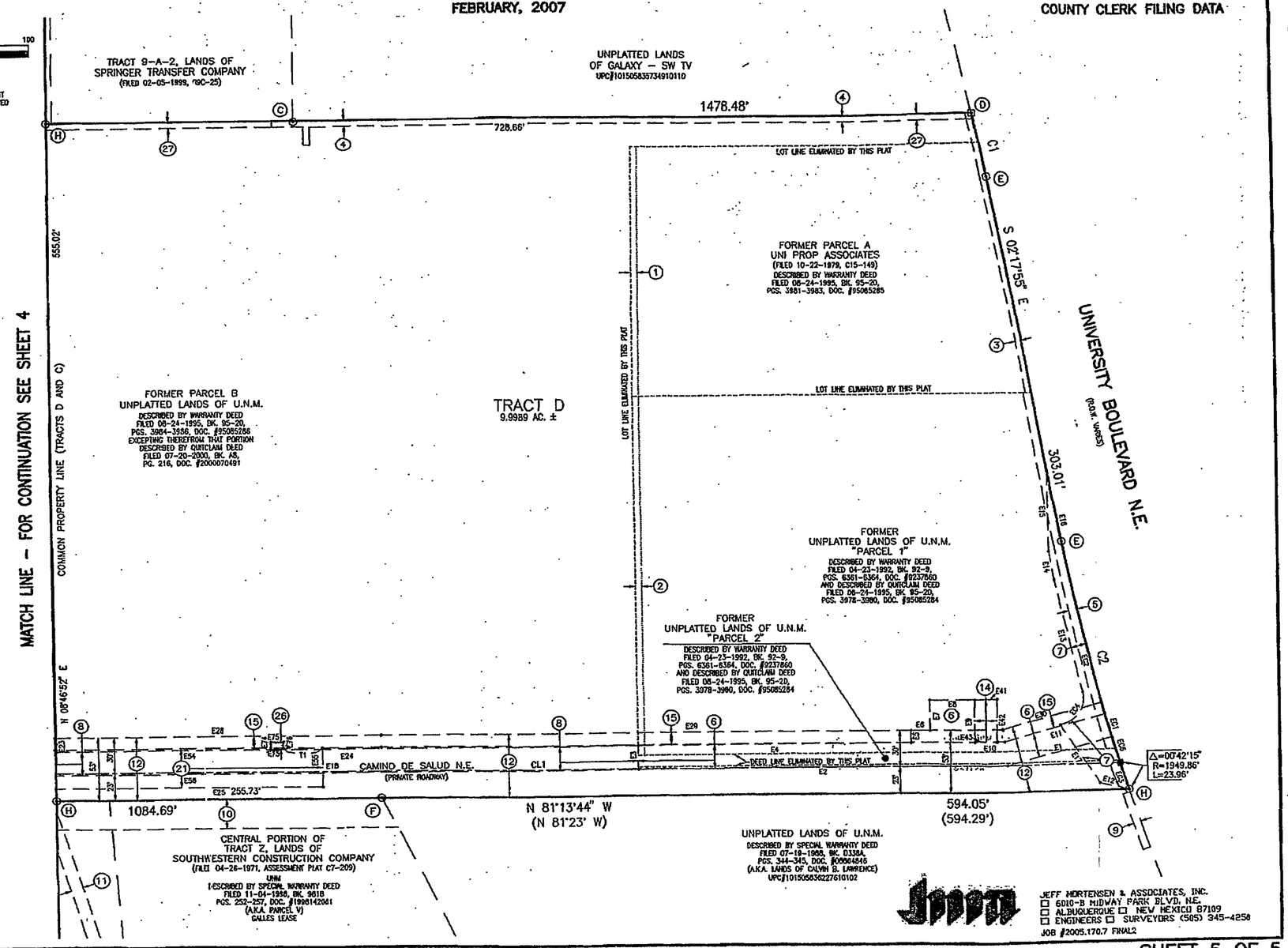
Doc# 2007089423
Rcpt #:591799 Page: 5 of 5 05/10/2007 10 49 AM
Rcpt #:37.00 El 2007C Pl 9108 M Toulouse, Bernalillo County

COUNTY CLERK FILING DATA

SCALE: 1" = 50'

50 0 100
20 50

NOTE: FOR BOUNDARY TABLES AND EASEMENT TABLES SEE SHEET 2 OF 5; FOR KEYED NOTES SEE SHEET 3 OF 5

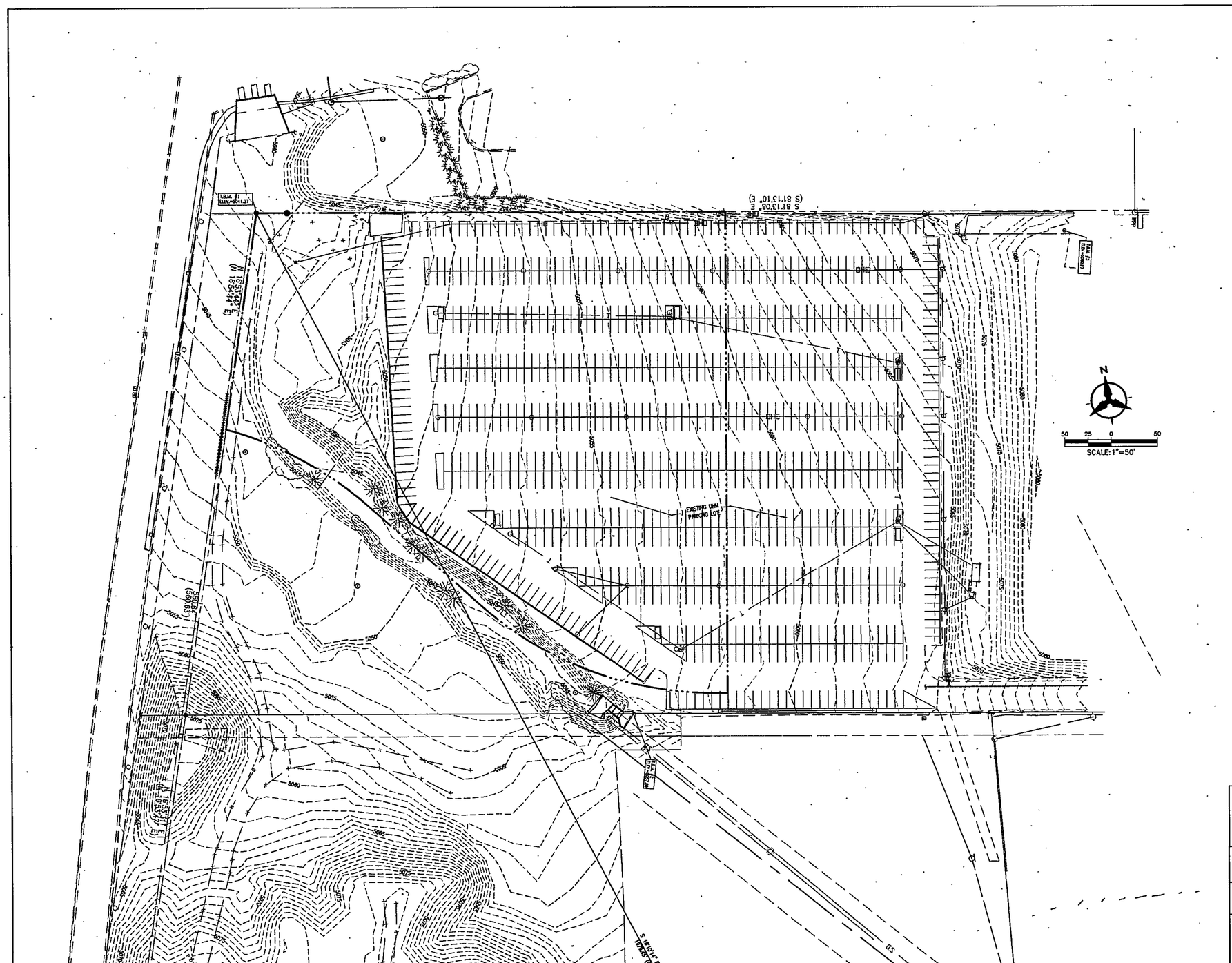


JEFF MORTENSEN & ASSOCIATES, INC.
☐ 6010-B MIDWAY PARK BLVD. N.E.
☐ ALBUQUERQUE ☐ NEW MEXICO 87109
☐ ENGINEERS ☐ SURVEYORS (505) 345-4250

JOB #2005.170.7 FINAL2

SHEET 5 OF 5

RECORD DRAWING



EXISTING CONDITION SITE PLAN

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December 13, 2006 – 10:57am

Bohannan ▲ Huston

Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335

ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
EXISTING CONDITION SITE PLAN

Design Review Committee: PROVED DEC 27 2006 DESIGN REVIEW COMMITTEE

City Engineer Approval: PROVED JAN 26 2007 CITY ENGINEER

Last Design Update: Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	2	10

ENGINEER'S SEAL

BRUCE J. STIDHAM NEW MEXICO 14523 PROFESSIONAL ENGINEER

12/13/06

No.	Date	REMARKS	By
		REVISIONS	
		DESIGN	

Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

BENCH MARKS

STATION IS A STANDARD AGS 3 1/4" ALUMINUM DISK STAMPED "L-815, 1994" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5660.355 FEET (NGVD 1929)

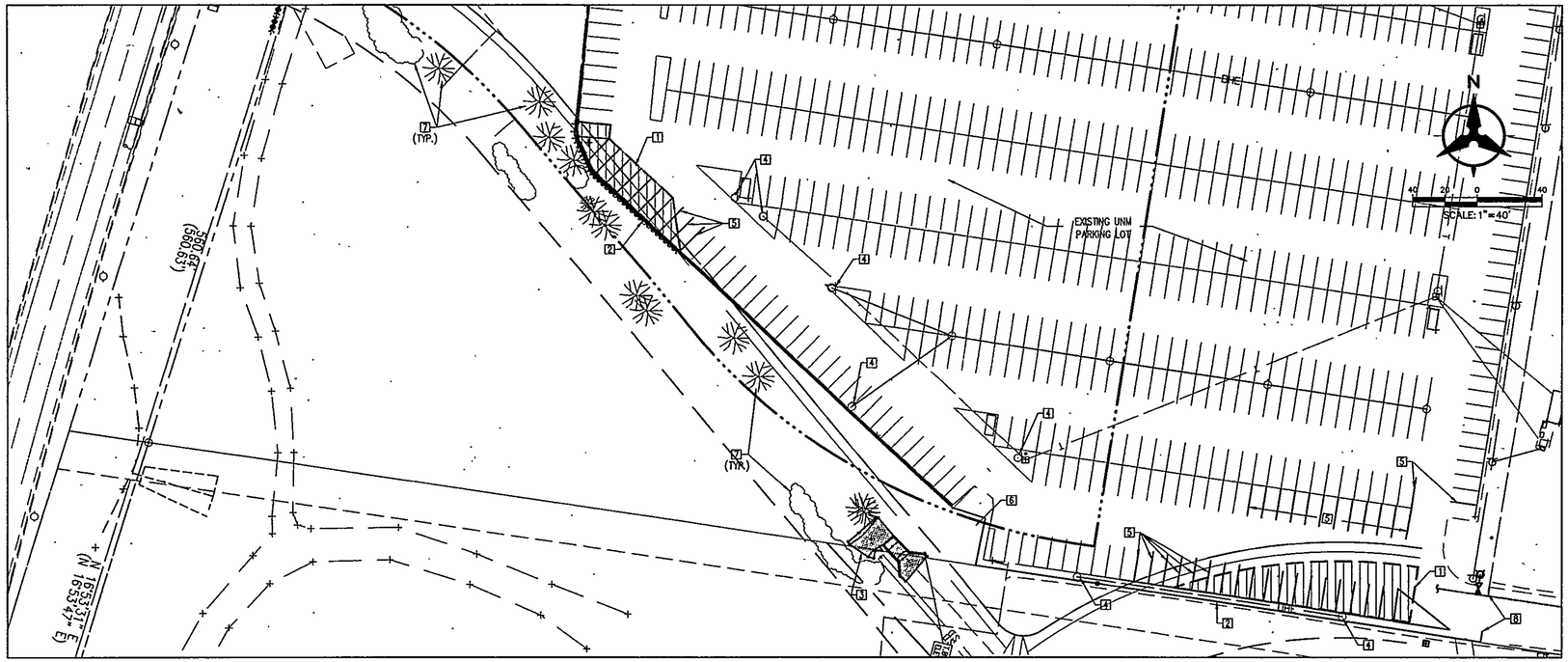
AS-BUILT INFORMATION

CONTRACTOR A.S. Horner DATE 6/07
STAKED BY A.S. Horner DATE 6/07
ACCEPTANCE BY BHI DATE 6/07
FIELD VERIFICATION BY A.S. Horner DATE 8/07
DRAWINGS CORRECTED BY A.S. Horner DATE 8/07

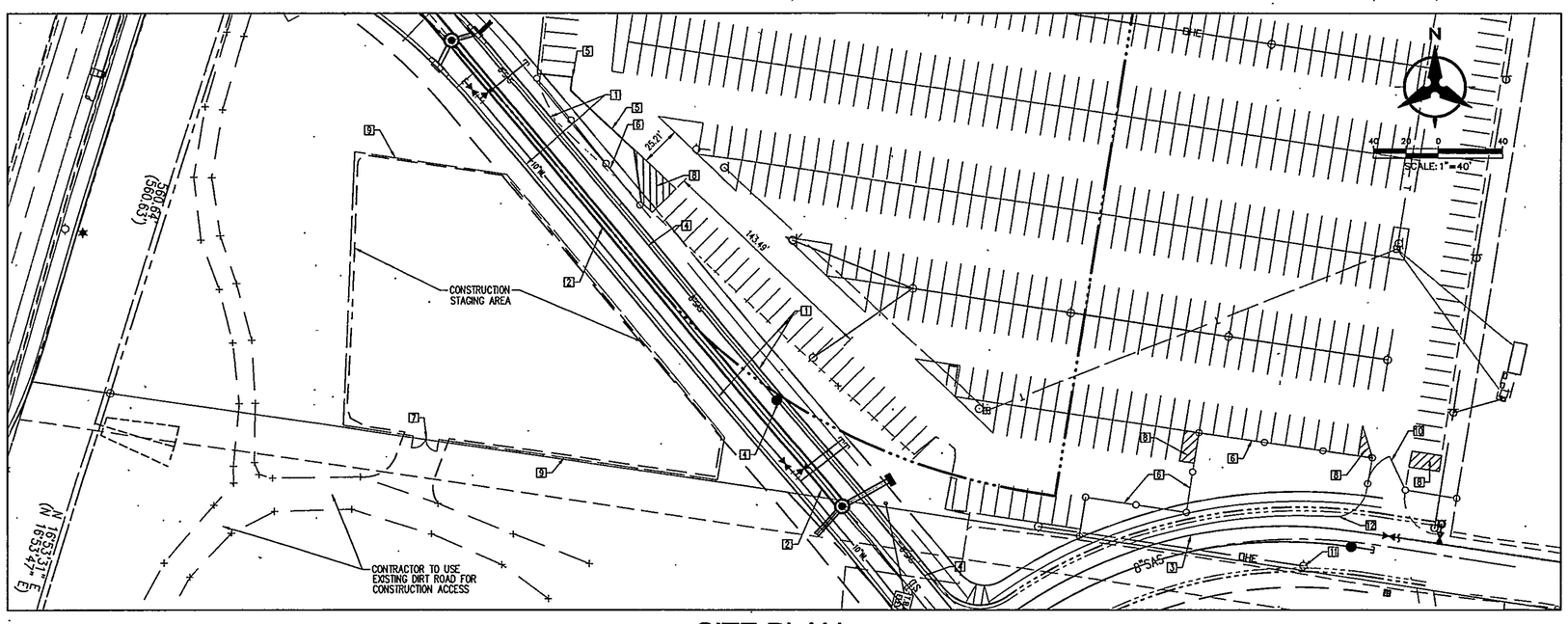
MICRO-FILM INFORMATION

RECORDED BY DATE
NO.

RECORD DRAWING



DEMOLITION PLAN



SITE PLAN

DEMOLITION KEYED NOTES

1. SAWCUT (FULL DEPTH) AND REMOVE EXISTING ASPHALT PAVEMENT.
2. REMOVE AND SALVAGE EXISTING CHAIN LINK FENCE.
3. REMOVE EXISTING CONCRETE HEADWALL, CONCRETE RIP-RAP, AND SALVAGE ROCK-RIP-RAP.
4. EXISTING LIGHT POLE TO REMAIN.
5. OBLITERATE EXISTING PAVEMENT STRIPING.
6. EXISTING FENCE & ROCK RIP-RAP TO REMAIN
7. REMOVE AND DISPOSE OF TREES & VEGETATION
8. REMOVE & SALVAGE CHAIN LINK GATE

LEGEND

- REMOVE ASPHALT PAVEMENT
- SALVAGE RIP-RAP/REMOVE DRAINAGE STRUCTURES
- REMOVE AND SALVAGE CHAINLINK FENCE.

SITE PLAN KEYED NOTES

1. NEW ROADWAY. REF SHT. 4 OF 10
2. NEW STORM DRAIN. REF SHT. 5 OF 10
3. NEW WATER LINE. REF SHT. 8 OF 10
4. NEW SAS LINE. REF SHT. 6 OF 10
5. INSTALL NEW TEMPORARY ASPHALT CURB ON TOP OF EXISTING PAVEMENT.
6. INSTALL NEW 6' CHAIN LINK FENCE TO MATCH EXISTING. USE SALVAGED FENCING AS NECESSARY. CONNECT TO EXISTING CHAIN LINK FENCE.
7. NEW 16' WIDE (DOUBLE SWING) CHAIN LINK GATE W/ BARBED WIRE SECURITY ON TOP TO MATCH EXISTING FENCING.
8. NEW 4" WIDE SOLID YELLOW STRIPE BORDER WITH INTERNAL 4" WIDE YELLOW STRIPES AT 45° ANGLE SPACED 4' APART.
9. INSTALL TEMPORARY CHAIN LINK FENCE AROUND CONSTRUCTION STAGING AREA. FINAL LOCATION TO BE DETERMINED BY CONTRACTOR.
10. RELOCATE SALVAGED CHAIN LINK GATE.
11. EXISTING TEMPORARY LIGHT POLE TO REMAIN-PROTECT IN PLACE.
12. NEW 4" WIDE SOLID WHITE STRIPE.

AS-BUILT INFORMATION

CONTRACTOR A.S. Hanlee DATE 8/07
WORK STAKED BY A.S. Hanlee DATE 8/07
ACCEPTANCE BY B.H.E. DATE 8/07
FIELD VERIFICATION BY A.S. Hanlee DATE 8/07
DRAWINGS CORRECTED BY A.S. Hanlee DATE 8/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS

STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK, STAMPED "2-J15, 1996" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5090.385 FEET (NGVD 1929)

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

BRUCE J. STOWHAS NEW MEXICO REGISTERED PROFESSIONAL ENGINEER 14269
12/14/06

No.	Date	REMARKS	By
		REVISIONS	
		DESIGN	

Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

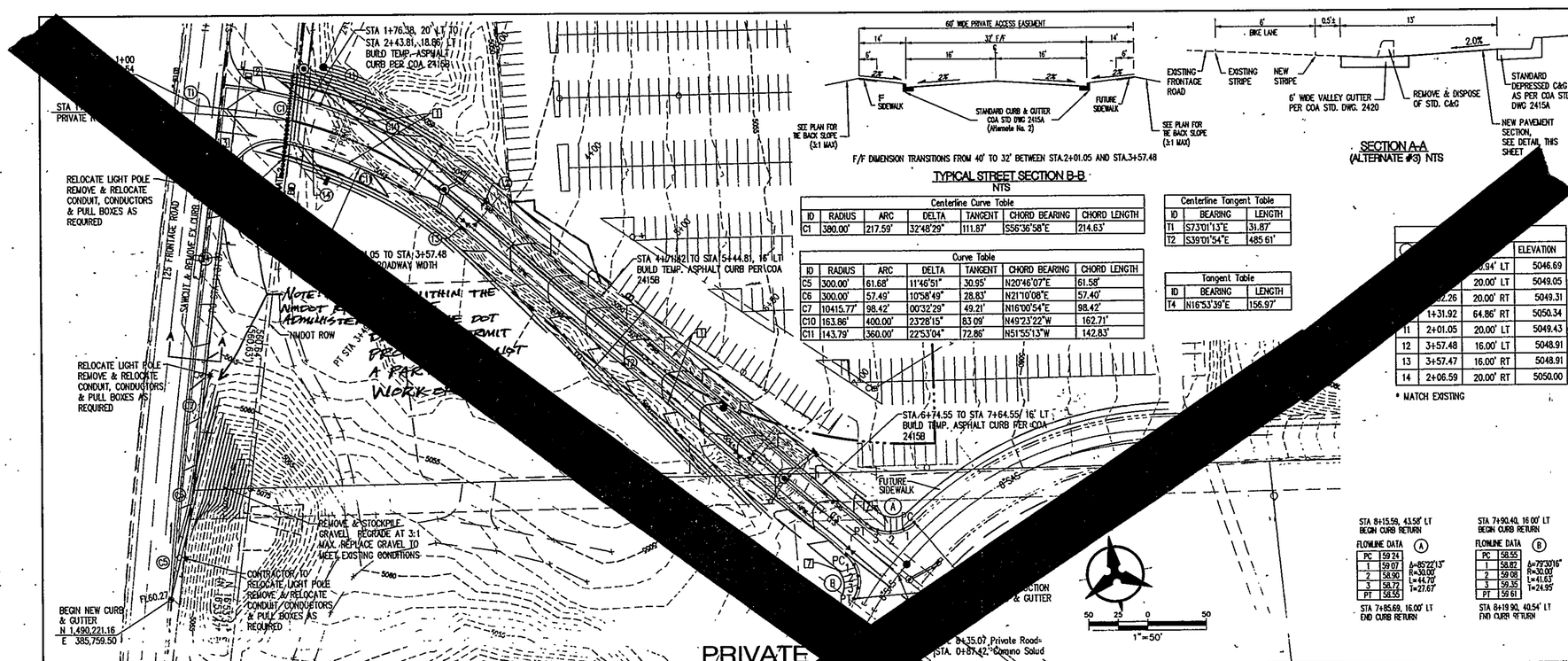
New Mexico Tri-Lab Building, Road, & Site Utility Package
EXISTING PARKING LOT
DEMOLITION & SITE PLAN

Design Review Committee: APPROVED DEC 27 2006 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 26 2007 CITY ENGINEER
Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	3	10

P:\040107\cdp\general\040107Pdemo.dwg, Layout1
December 14, 2006 - 10:18am

RECORD DRAWING



F/F DIMENSION TRANSITIONS FROM 40' TO 32' BETWEEN STA.2+01.05 AND STA.3+57.48

TYPICAL STREET SECTION B-B
NTS

SECTION A-A
(ALTERNATE #3) NTS

Centerline Curve Table						
ID	RADIUS	ARC	DELTA	TANGENT	CHORD BEARING	CHORD LENGTH
C1	380.00'	217.59'	32°48'29"	111.87'	S56°36'58"E	214.63'

Curve Table						
ID	RADIUS	ARC	DELTA	TANGENT	CHORD BEARING	CHORD LENGTH
C5	300.00'	61.68'	11°46'51"	30.95'	N20°46'07"E	61.58'
C6	300.00'	57.49'	10°58'49"	28.83'	N21°10'08"E	57.40'
C7	10415.77'	98.42'	00°32'29"	49.21'	N16°00'54"E	98.42'
C10	163.86'	400.00'	23°28'15"	83.09'	N49°23'22"W	162.71'
C11	143.79'	360.00'	22°53'04"	72.86'	N51°55'13"W	142.83'

Centerline Tangent Table		
ID	BEARING	LENGTH
T1	S73°01'13"E	31.87'
T2	S39°01'54"E	485.61'

Tangent Table		
ID	BEARING	LENGTH
T4	N16°53'39"E	156.97'

			ELEVATION
		0.94' LT	5046.69 *
		20.00' LT	5049.05
	2.26	20.00' RT	5049.31
	1+31.92	64.86' RT	5050.34
11	2+01.05	20.00' LT	5049.43
12	3+57.48	16.00' LT	5048.91
13	3+57.47	16.00' RT	5048.91
14	2+06.59	20.00' RT	5050.00

* MATCH EXISTING

STA 8+15.59, 43.58' LT
BEGIN CURB RETURN

FLOWLINE DATA (A)

PC	59.24
1	59.07
2	58.90
3	58.72
PT	58.55

Δ=85°22'13" R=30.00' L=44.70' T=27.67'

STA 7+85.69, 16.00' LT
END CURB RETURN

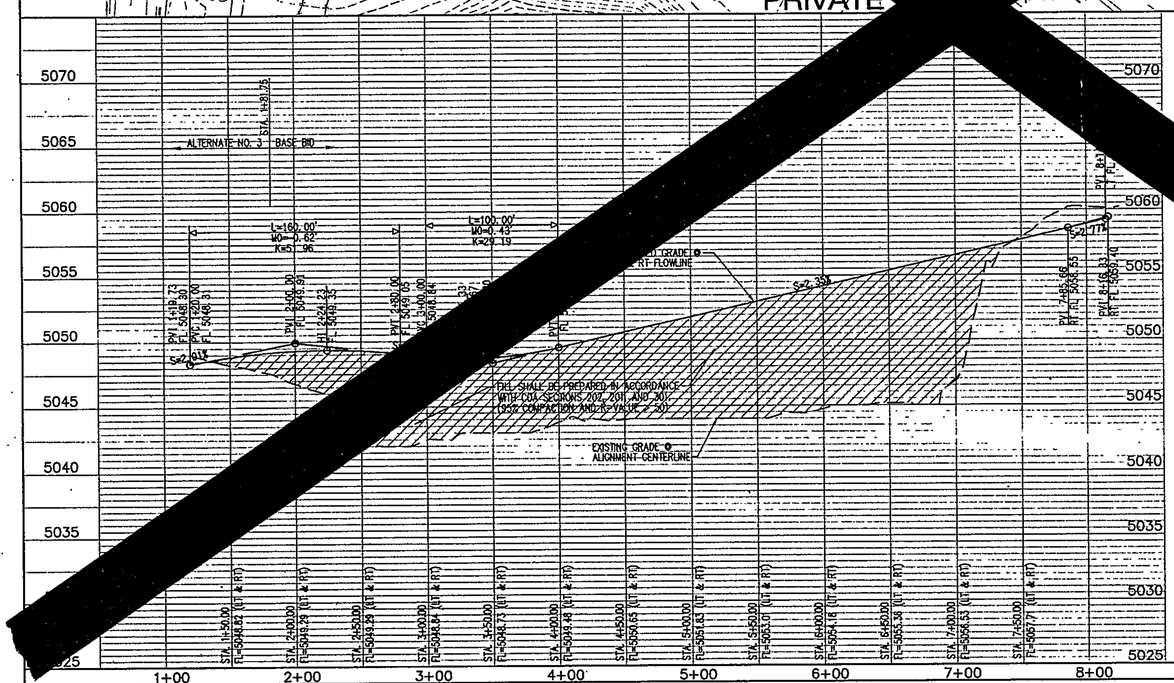
STA 7+90.40, 16.00' LT
BEGIN CURB RETURN

FLOWLINE DATA (B)

PC	58.55
1	58.82
2	59.08
3	59.35
PT	59.61

Δ=79°30'16" R=30.00' L=41.63' T=24.95'

STA 8+19.90, 40.54' LT
END CURB RETURN



STA. 1+19.72, 60.94' LT
PC CURB RETURN

FLOWLINE DATA (A)

PC	46.69
1	47.28
2	47.87
3	48.46
PT	49.05

Δ=86°04'05" R=42.00' L=63.09' T=39.21

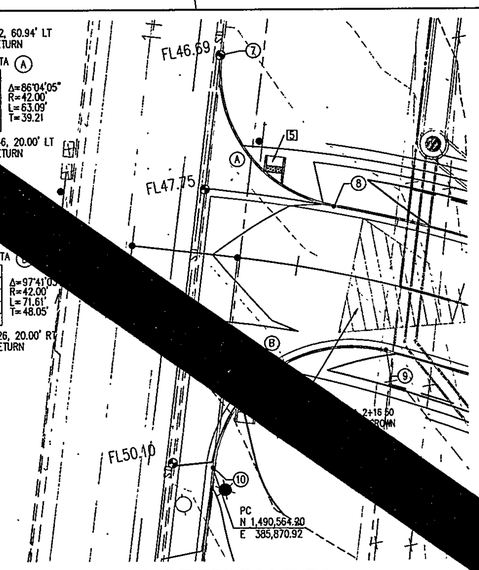
1+57.46, 20.00' LT
RETURN

STA. 1+82.26, 20.00' RT
PT CURB RETURN

FLOWLINE DATA

PC	50.34
1	50.08
2	49.83
3	49.57
PT	49.31

Δ=97°41'0 R=42.00' L=71.61' T=48.05'



INTERSECTION DETAIL
SCALE 1"=20'
(ALL WORK SHOWN IN THIS DETAIL IS PART OF ALT. #3)

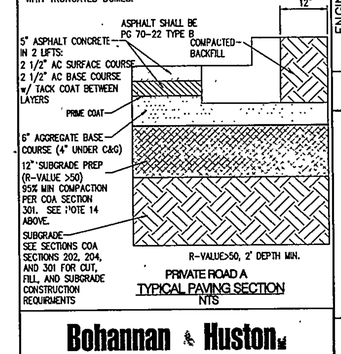
SCALE: 1" = 50' (HORIZ.) 1" = 5' (VERT.)

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. ALL CURB RETURN RADII SHALL BE 42' UNLESS OTHERWISE SPECIFIED.
3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.
5. CONTRACTOR IS TO INSTALL A 4"x 4"x 5' POST AND EMD AT THE END OF EACH SANITARY SEWER SERVICE.
6. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ALL UTILITY CONDUITS AND EXISTING LINES.
7. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.
8. CONTRACTOR SHALL PROVIDE THE INSPECTORS, (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.
9. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.
10. ANY DAMAGE TO THE EXISTING FACILITIES (CURB & GUTTER, PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.
11. REMOVAL OF THE EXISTING CURB & GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).
12. WHEELCHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB & GUTTER.
13. ELECTRONIC MARKER DISKS (EMD'S) MUST BE INSTALLED FOR WATERLINE AND SANITARY SEWER LINE APPURTENANCES AS PER SECTION 170 OF THE STANDARD SPECIFICATIONS.
14. SOIL NOT HAVING THE MIN. R-VALUE OF 50, SHALL BE REMOVED TO A DEPTH OF 2 FEET AND REPLACED BY THE CONTRACTOR WITH SUITABLE MATERIAL, OR A PAVEMENT SHALL BE DESIGNED BY ENGINEER ACCOMODATING THE EXISTING R-VALUE PER C.O.A. STANDARD SPECIFICATIONS.

☐ PAVING KEYED NOTES

1. NEW ASPHALT PAVEMENT AND CONCRETE CURB & GUTTER PER TYPICAL STREET SECTION AND TYPICAL PAVING SECTION DETAILS THIS SHEET. (ALTERNATE No. 2)
2. REMOVE EXISTING CHAIN LINK FENCE (ONLY IF ALTERNATE No. 3 IS ACCEPTED)
3. ALL WORK WITHIN NMDOT R/W SHALL BE BID SEPARATELY AS
4. MILLING
5. PEDESTRIAN ACCESS RAMP TYPE "C" WITH BUFFER PER NMDOT PEDESTRIAN ACCESS DETAILS PAD-001, SHEET 9 OF 9.
6. CONTRACTOR SHALL MATCH EXISTING PAVEMENT SECTION OF FRONTAGE ROAD FOR CONSTRUCTION OF DECEL LANE AND DRIVEWAY (ALTERNATE No. 3)
7. WHEELCHAIR CURB ACCESS RAMP PER COA STD. DWG. 2441 WITH TRUNCATED DOMES.



PRIVATE ROAD A
TYPICAL PAVING SECTION
NTS

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
PRIVATE ROAD A PLAN & PROFILE
STA. 1+00 - 8+16.33

Design Review Committee: APPROVED DEC 27 2006 DESIGN REVIEW COMMITTEE
City Engineer Approval: JAN 26 2007 CITY ENGINEER
Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	4	10

AS-BUILT INFORMATION
CONTRACTOR A.S. Hinkle DATE 9/07
WORK STAKED BY A.S. Hinkle DATE 9/07
INSPECTOR'S ACCEPTANCE BY BHI DATE 9/07
FIELD VERIFICATION BY A.S. Hinkle DATE 9/07
DRAWINGS CORRECTED BY A.S. Hinkle DATE 9/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
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ELEVATION = 5090.395 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES
NC | BY | DATE

ENGINEER'S SEAL
BRUCE J. STOWORAB NEW MEXICO 14623 REGISTERED PROFESSIONAL ENGINEER
12/27/06

No.	Date	REMARKS	By
1	10/06	See sheet 4R, 5R	AMW

REVISIONS
DESIGN
Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

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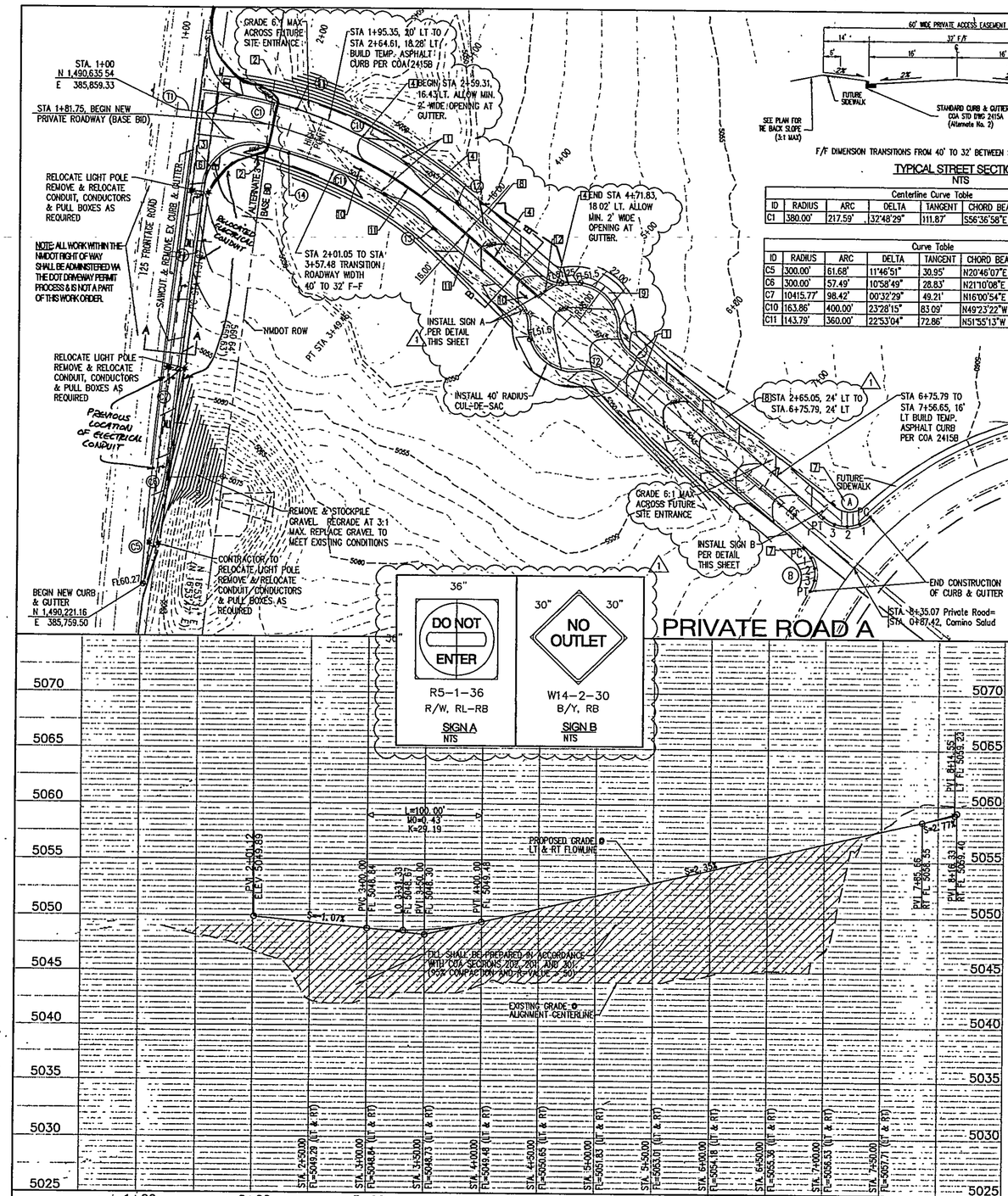

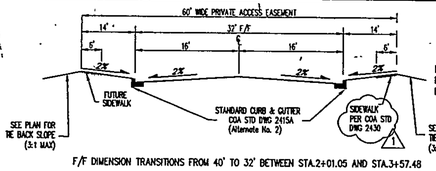

F/F DIMENSION TRANSITIONS FROM 40' TO 32' BETWEEN STA.2+01.05 AND STA.3+57.48

TYPICAL STREET SECTION B-B
NTS

Centerline Curve Table						
ID	RADIUS	ARC	DELTA	TANGENT	CHORD BEARING	CHORD LENGTH
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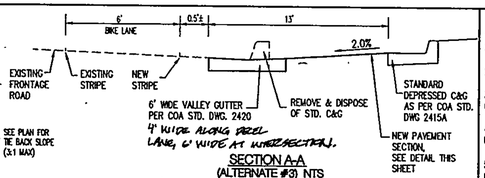
T2	S39°01'54"E	485.61'

Tangent Table		
ID	BEARING	LENGTH
T4	N16°53'39"E	156.97'



SECTION A-A
(ALTERNATE #3) NTS

C & G Point Table			
	STATION	OFFSET	ELEVATION
7	1+31.87	60.94' LT	5046.69 *
8	1+57.46	20.00' LT	5049.05
9	1+82.26	20.00' RT	5049.31
10	1+31.92	64.86' RT	5050.34
11	2+01.05	20.00' LT	5049.43
12	3+57.48	16.00' LT	5048.91
13	3+57.47	16.00' RT	5048.91
14	2+06.59	20.00' RT	5050.00

* MATCH EXISTING

STA 8+15.59, 43.58' LT
BEGIN CURB RETURN

FLOWLINE DATA (A)	
PC	59.24
1	59.07
2	58.90
3	58.72
PT	58.55

Δ=85°22'13"
R=30.00'
L=44.70'
T=27.67'

STA 7+85.69, 16.00' LT
END CURB RETURN

STA 7+90.40, 16.00' LT
BEGIN CURB RETURN

FLOWLINE DATA (B)	
PC	58.55
1	58.62
2	58.68
3	58.35
PT	58.61

Δ=79°36'16"
R=30.00'
L=41.63'
T=24.95'

STA 8+19.90, 40.54' LT
END CURB RETURN

STA. 1+19.72, 60.94' LT
PC CURB RETURN

FLOWLINE DATA (A)	
PC	46.69
1	47.28
2	47.87
3	48.46
PT	49.05

Δ=86°04'05"
R=42.00'
L=63.09'
T=39.21

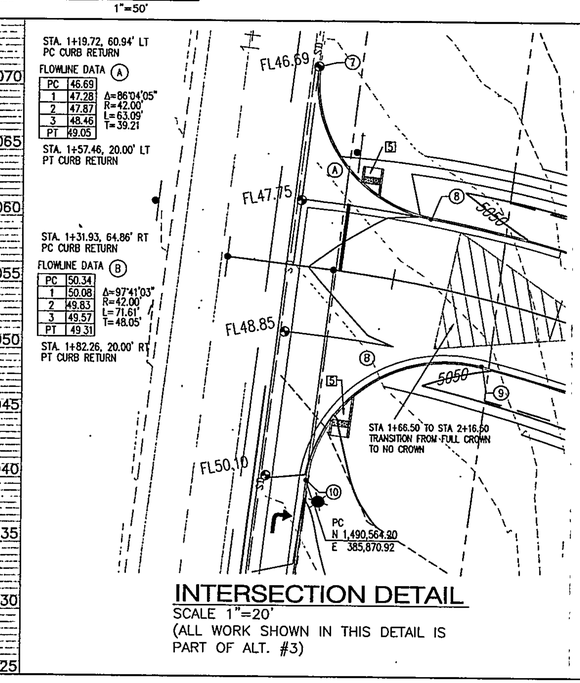
STA. 1+57.46, 20.00' LT
PT CURB RETURN

STA. 1+31.93, 64.86' RT
PC CURB RETURN

FLOWLINE DATA (B)	
PC	50.34
1	50.08
2	49.83
3	49.57
PT	49.31

Δ=97°41'03"
R=42.00'
L=71.61'
T=48.05'

STA. 1+82.26, 20.00' RT
PT CURB RETURN



INTERSECTION DETAIL
SCALE 1"=20'
(ALL WORK SHOWN IN THIS DETAIL IS PART OF ALT. #3)

SCALE: 1" = 50' (HORIZ.)
1" = 5' (VERT.)

GENERAL NOTES

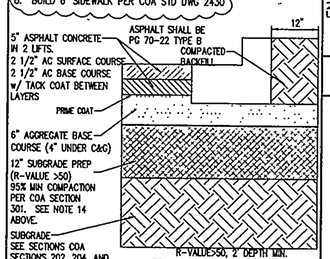
1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. ALL CURB RETURN RADII SHALL BE 42' UNLESS OTHERWISE SPECIFIED.
3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.
5. CONTRACTOR IS TO INSTALL A 4"x 4"x 5' POST AND EMD AT THE END OF EACH SANITARY SEWER SERVICE.
6. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ALL UTILITY CONDUITS AND EXISTING LINES.
7. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.
8. CONTRACTOR SHALL PROVIDE THE INSPECTORS, (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.
9. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.
10. ANY DAMAGE TO THE EXISTING FACILITIES (CURB & GUTTER, PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.
11. REMOVAL OF THE EXISTING CURB & GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).
12. WHEELCHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB & GUTTER.
13. ELECTRONIC MARKER DISKS (EMD'S) MUST BE INSTALLED FOR WATERLINE AND SANITARY SEWER LINE APPURTENANCES AS PER SECTION 170 OF THE STANDARD SPECIFICATIONS.
14. SOIL NOT HAVING THE MIN. R-VALUE OF 50, SHALL BE REMOVED TO A DEPTH OF 2 FEET AND REPLACED BY THE CONTRACTOR WITH SUITABLE MATERIAL, OR A PAVEMENT SHALL BE DESIGNED BY ENGINEER ACCOMODATING THE EXISTING R-VALUE PER C.O.A. STANDARD SPECIFICATIONS.

☐ PAVING KEYED NOTES

1. NEW ASPHALT PAVEMENT AND CONCRETE CURB & GUTTER PER TYPICAL STREET SECTION AND TYPICAL PAVING SECTION DETAILS THIS SHEET. (ALTERNATE No. 2)
2. REMOVE EXISTING CHAIN LINK FENCE (ONLY IF ALTERNATE No. 3 IS ACCEPTED).
3. ALL WORK WITHIN NMDOT R/W SHALL BE BID SEPARATELY AS ALTERNATE No. 3.
4. BUILD TEMPORARY ASPHALT CURB PER COA STD. DWG. 2415B
5. PEDESTRIAN ACCESS RAMP TYPE "C" WITH BUFFER PER NMDOT PEDESTRIAN ACCESS DETAILS PAD-001, SHEET 9 OF 9.
6. CONTRACTOR SHALL MATCH EXISTING PAVEMENT SECTION OF FRONTAGE ROAD FOR CONSTRUCTION OF DECEL LANE AND DRIVEWAY (ALTERNATE No. 3)
7. WHEELCHAIR CURB ACCESS RAMP PER COA STD. DWG. 2441 WITH TRUNCATED DOMES.
8. BUILD 6' SIDEWALK PER COA STD DWG 2430

☐ PAVING KEYED NOTES CONTINUED

9. BUILD 22' WIDE DRIVEPAD PER COA STD DWG 2425
10. NEW PREFORMED THERMOPLASTIC THROUGH LANE ARROW.
11. 4" SOLID ~~YELLOW~~ THERMOPLASTIC LINE ALONG ASPHALT CURB.
12. INSTALL TYPE III BARRICADE, 3' BEHIND ASPHALT CURB.



PRIVATE ROAD A
TYPICAL PAVING SECTION
NTS

Bohannan ▲ Huston
Courtyard 1 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
PRIVATE ROAD A PLAN & PROFILE
STA. 1+00 - 8+16.33

Design Review Committee: APPROVED OCT 19 2007 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED OCT 18 2007 CITY ENGINEER
Last Design Update: Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	4R	10

No.	Date	REMARKS	By
1	9/26/07	ADDED MID-POINT CUL-DE-SAC	RML

REVISIONS
DESIGN
Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

ENGINEER'S SEAL: BRUCE A. STIDHOUT, NEW MEXICO, REGISTERED PROFESSIONAL ENGINEER 10/4/07

AS-BUILT INFORMATION
CONTRACTOR | DATE
WORK STAKED BY | DATE
FIELD INSPECTOR ACCEPTANCE BY | DATE
FIELD VERIFICATION BY | DATE
DRAWINGS CORRECTED BY | DATE
MICRO-FILM INFORMATION
RECORDED BY | DATE
NO.

BENCH MARKS
STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK, STAMPED "3-J15, 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.5 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SID OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5060.365 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

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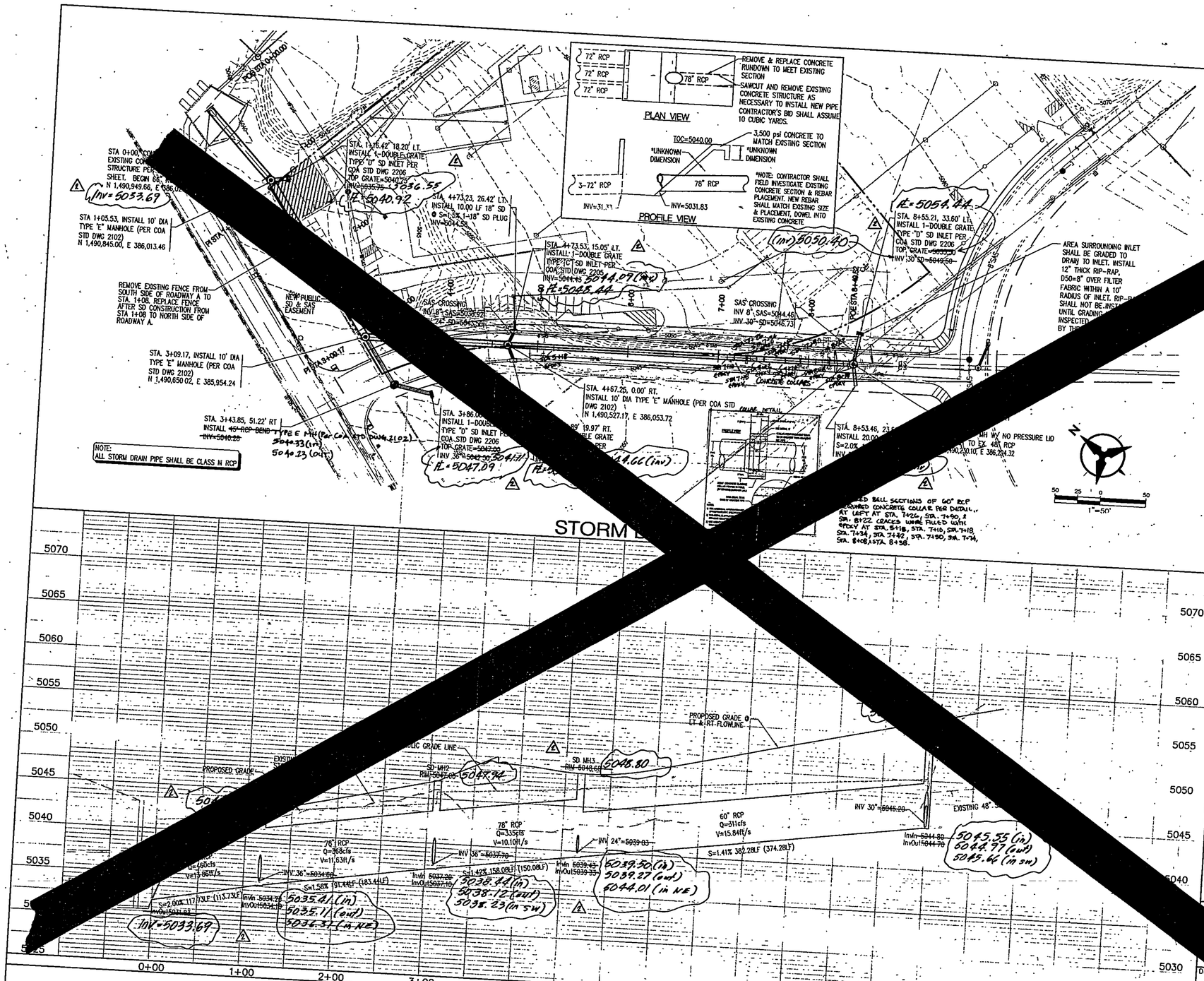
Thu, 11-Oct-2007 - 12:52:pm, Plotted by: RMICHEL

RECORD DRAWING



GENERAL NOTES

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2. ALL CURB RETURN RADII SHALL BE 42' UNLESS OTHERWISE SPECIFIED.

3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR [illegible] TANDARD CURB UNLESS OTHERWISE SPECIFIED.

5. CONTRACTOR IS TO INSTALL A [illegible] THE END OF EACH SANITARY SEWER SE[illegible]

6. CONTRACTOR IS RE[illegible] OR REPLACEMENT OF ALL UTILITY CO[illegible]

7. ANY [illegible] D TO MATCH PROPOSED STREET GR[illegible] PAVING ITEMS.

[illegible] PROVIDE THE INSPECTORS, (CITY AND PRIVATE) [illegible] HYDROSTATIC TESTING PLAN. THE PLAN MUST BE [illegible] ORE TESTING OPERATIONS BEGIN.

[illegible] CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.

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AS-BUILT INFORMATION
CONTRACTOR A.S. Hooker DATE 8/07
WORK STAKED BY A.S. Hooker DATE 8/07
INSPECTED BY Eliff DATE 8/07
FIELD VERIFICATION BY A.S. Garcia DATE 8/07
DRAWINGS CORRECTED BY A.S. Hooker DATE 8/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
STATION IS A STANDARD ABS 3 1/4" ALUMINUM DISK STAMPED "2-HJS 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SD OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BLVD. AND LEGION RD. N.E.
ELEVATION = 5090.385 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES
BY DATE

ENGINEER'S SEAL
BRUCE J. STOUGHTON NEW MEXICO 14652 PROFESSIONAL ENGINEER
12/27/06

No.	Date	REMARKS	By
1	9/07	sta. 1+00 - sta. 4+49.52	JC
2	9/07	Add MH Rim & Inv. Elevs.	JC

REVISIONS
DESIGN
Designed by BJS DATE: 12/06
Drawn By ARR DATE: 12/06
Checked by BJS DATE: 12/06

Bohannan Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING • SPATIAL DATA • ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
New Mexico Tri-Lab Building, Road, & Site Utility Package
STORM DRAIN PLAN & PROFILE
STA. 1+00 - 3+49.52

Design Review Committee: DEC 2 7 2006 DESIGN REVIEW COMMITTEE
City Engineer Approval: JAN 2 6 2007 CITY ENGINEER
Final Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No. 670183 | Zone Map No. J-15-Z | Sheet 5 of 10

SCALE: 1" = 50' (HORIZ.) 1" = 5' (VERT.)

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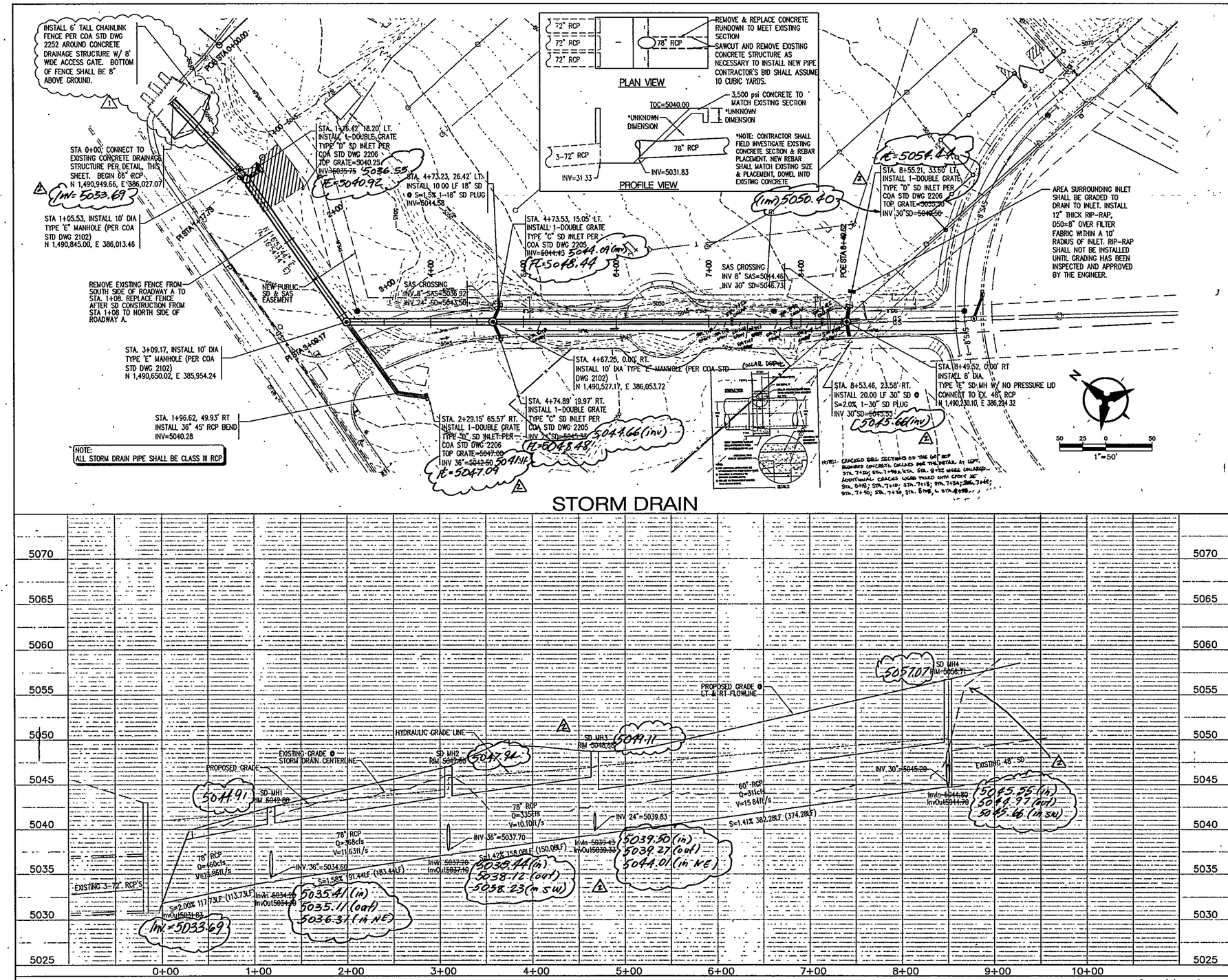

STORM DRAIN

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Thu, 11-Oct-2007 - 12:53:pm, Plotted by: RMICHEL

GENERAL NOTES

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2. ALL CURB RETURN RADII SHALL BE 42' UNLESS OTHERWISE SPECIFIED.

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4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.

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AS-BUILT INFORMATION

CONTRACTOR — DATE
WORK STAKED BY — DATE
STRUCTURE ACCEPTANCE BY — DATE
CONSTRUCTION BY — DATE
COMPUTED BY — DATE
CHECKED BY — DATE

MICRO-FILM INFORMATION
RECORDED BY — DATE
NO.

BENCH MARKS
STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK STAMPED "9-B15 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SD OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5299.365 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL
BRUCE J. STOWORTH NEW MEXICO 14009 REGISTERED PROFESSIONAL ENGINEER
10/11/07

No.	Date	REMARKS	By
1	9/28/07	ADDED FENCE AT DRAINAGE STRUCTURE	RML

REVISIONS
DESIGN
Designed By: BJS — DATE: 12/06
Drawn By: ARR — DATE: 12/06
Checked By: BJS — DATE: 12/06

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

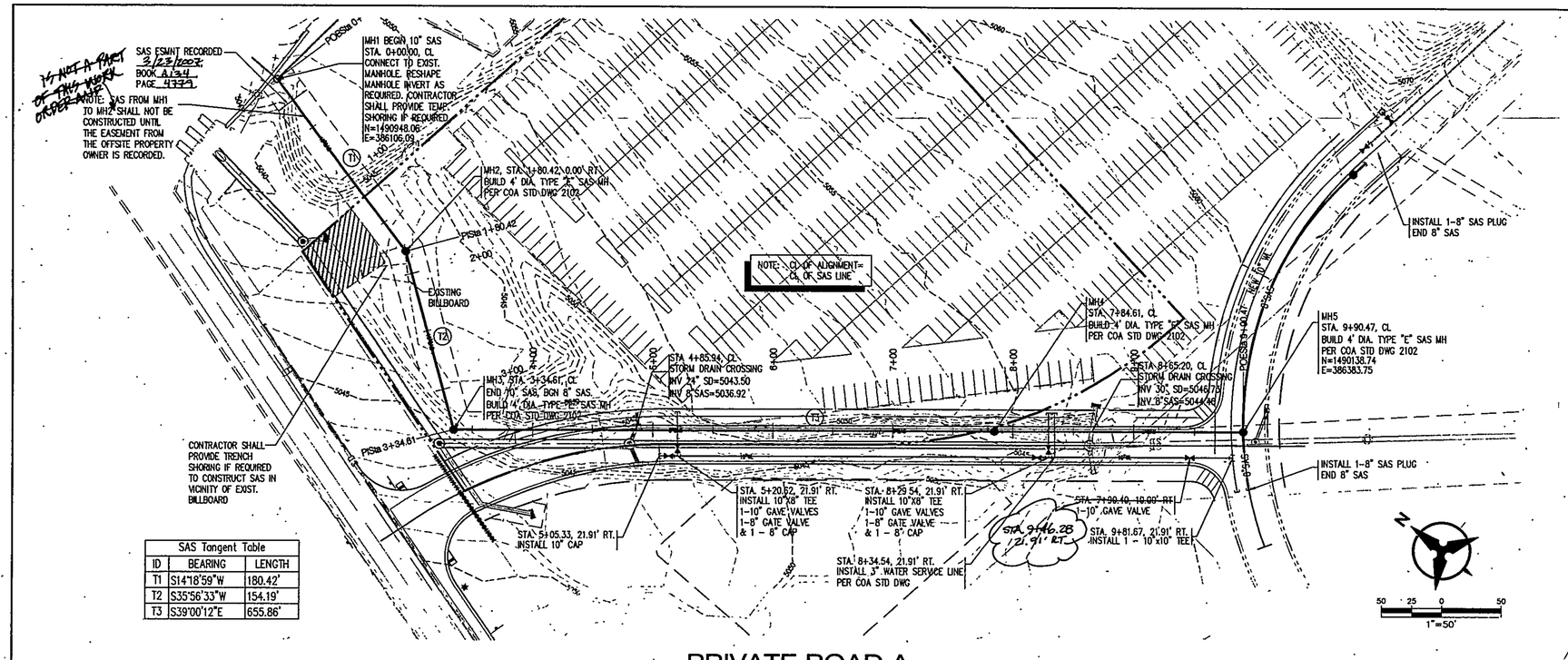
CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
STORM DRAIN PLAN & PROFILE
STA. 1+00 - 3+49.52

Design Review Committee: APPROVED OCT 18 2007 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED OCT 18 2007 CITY ENGINEER
Last Design Update — Mo /Day/Yr.
Mo /Day/Yr.

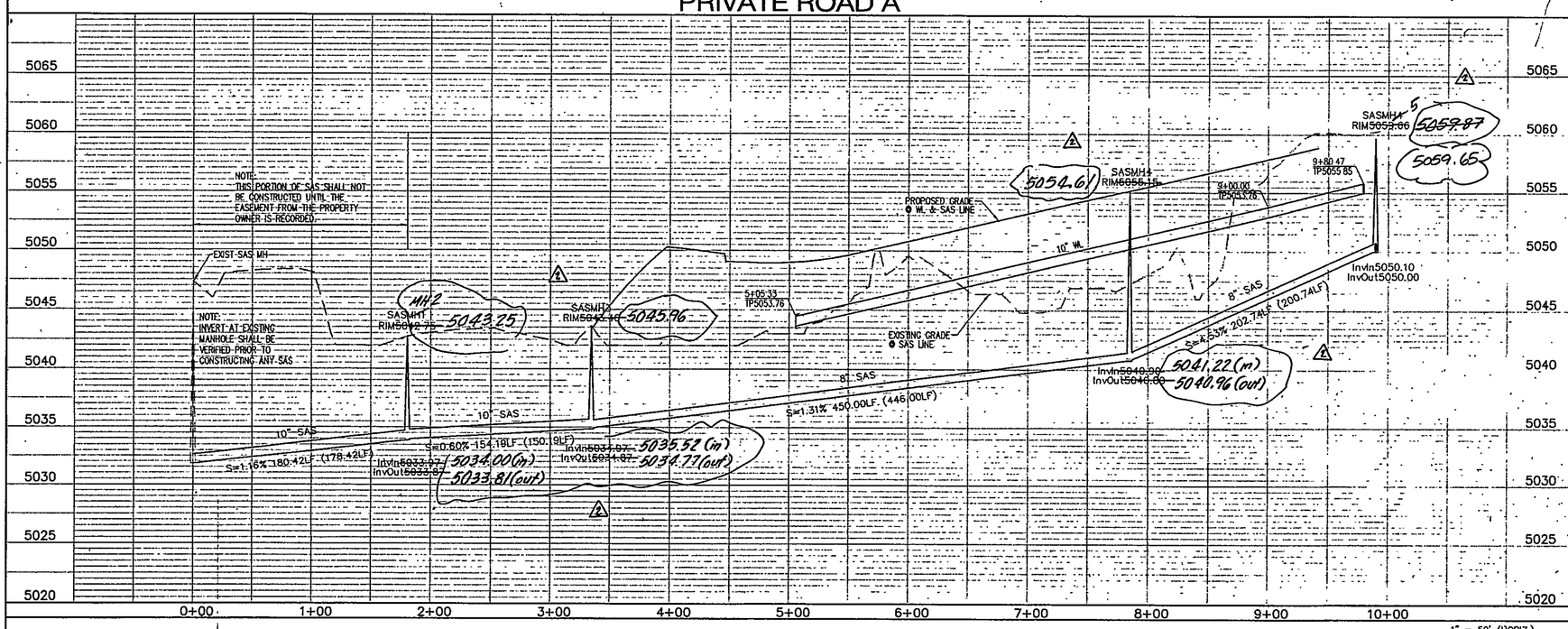
City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	5R	10

RECORD DRAWING



SAS Tangent Table		
ID	BEARING	LENGTH
T1	S14°18'59"W	180.42'
T2	S35°56'33"W	154.19'
T3	S39°00'12"E	655.86'

PRIVATE ROAD A



SCALE: 1" = 50' (HORIZ.) 1" = 5' (VERT.)

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
2. ALL CURB RETURN RADII SHALL BE 42' UNLESS OTHERWISE SPECIFIED.
3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.
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9. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.
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14. SOIL NOT HAVING THE MIN. R-VALUE OF 50, SHALL BE REMOVED TO A DEPTH OF 2 FEET AND REPLACED BY THE CONTRACTOR WITH SUITABLE MATERIAL, OR A PAVEMENT SHALL BE DESIGNED BY ENGINEER ACCOMODATING THE EXISTING R-VALUE PER C.O.A. STANDARD SPECIFICATIONS.

RESTRAINED JOINT TABLE

MECHANICAL JOINTS	LENGTH OF RESTRAINED JOINTS (8")	(10")
11.25° H BEND	3'	3'
22.50° H BEND	5'	6'
45° H BEND	11'	13'
90° H BEND	26'	31'
GATE VALVE/CAP	72'	86'

NOTE:
1. ALL MECHANICAL JOINTS SHALL BE RESTRAINED AT THE FITTING.
2. THE CONTRACTOR SHALL PROVIDE A MINIMUM PIPE LENGTH OF 20 LF FROM ALL MECHANICAL JOINTS. UNLESS SPECIFIED DIFFERENTLY IN THE PLANS. ALL PIPE JOINTS WITHIN 20 LF OF A,M,J SHALL BE RESTRAINED AT THE CONTRACTORS EXPENSE.
3. THE CONTRACTOR SHALL RESTRAIN ALL PIPE JOINTS IN THE SPECIFIED DISTANCE LISTED IN THE TABLE ABOVE.
4. THE CONTRACTOR SHALL RESTRAIN ALL FIRE HYDRANT JOINTS FROM THE TEE ON THE MAIN TO THE FIRE HYDRANT FLANGE.

Bohannan Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING • SPATIAL DATA • ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
PRIVATE ROAD A UTILITY PLAN & PROFILE
STA. 0+00 - 10+00

Design Review Committee: APPROVED DEC 27 2005 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 26 2007 CITY ENGINEER
Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	6	10

AS-BUILT INFORMATION
CONTRACTOR A.S. Hankins DATE 9/07
STAKED BY A.S. Hankins DATE 9/07
INSPECTORS BY BHI DATE 9/07
FIELD SOLUTION BY A.S. Hankins DATE 9/07
DRAWINGS MARKED BY A.S. Hankins DATE 9/07
MICRO-FILM INFORMATION
RECORDED BY DATE NO.

BENCH MARKS
STATION IS A STANDARD AXS 3 1/4" ALUMINUM DISK STAMPED "2-15, 1996" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.05 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5092.385 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES
NC BY DATE

ENGINEER'S SEAL
BRUCE J. STOWORSKI NEW MEXICO 14831 REGISTERED PROFESSIONAL ENGINEER
12/27/06

No.	Date	REMARKS	By
1	1/06	Add Rim & Inv. Elev	KF

REVISIONS
DESIGN
Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

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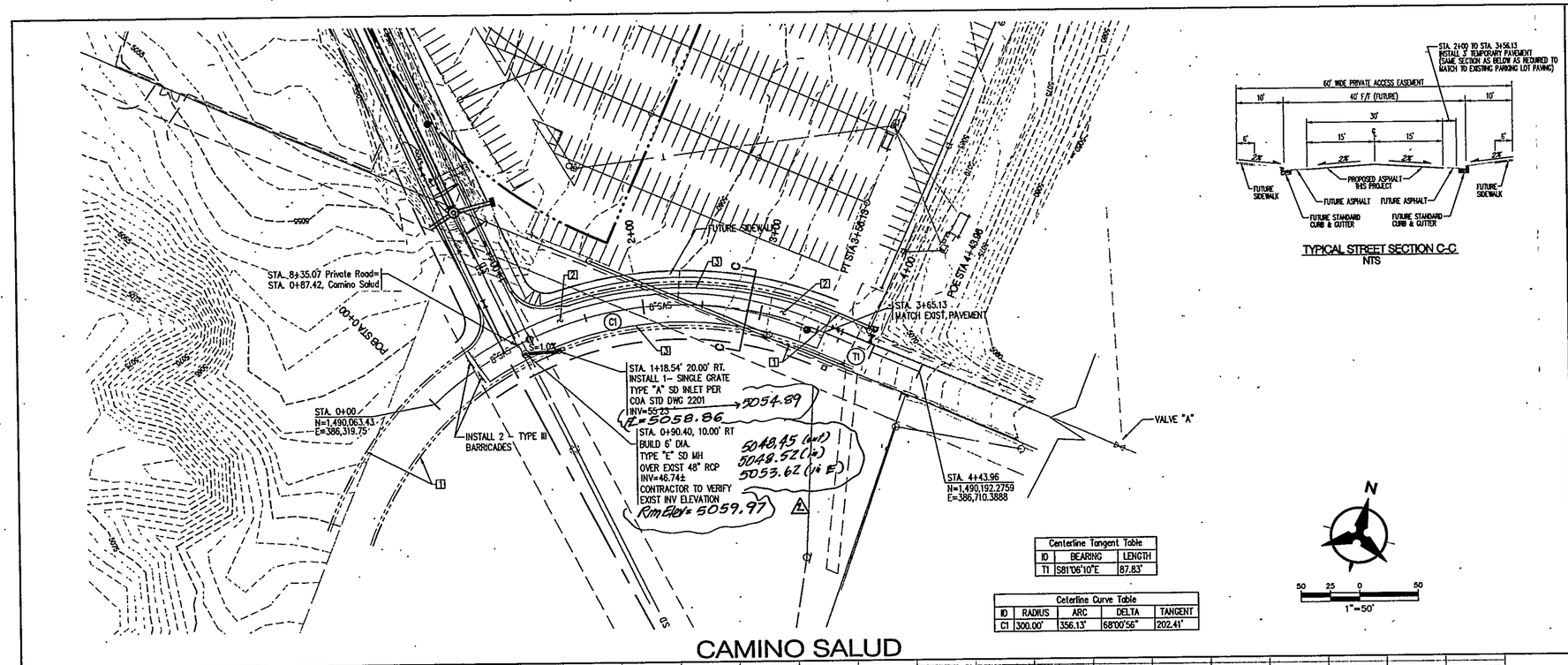
Wed, 27-Dec-2006 - 2:24:pm, Plotted by: CDOUGHTY

RECORD DRAWING



TYPICAL STREET SECTION C-C
NTS

Centerline Tangent Table		
ID	BEARING	LENGTH
T1	S81°06'10"E	87.83'

Centerline Curve Table				
ID	RADIUS	ARC	DELTA	TANGENT
C1	300.00'	356.13'	68°00'56"	202.41'

N

50 25 0 50
1"=50'

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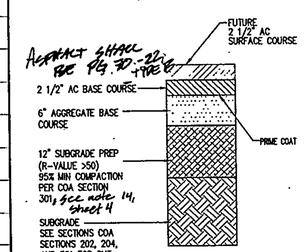
☐ PAVING KEYED NOTES

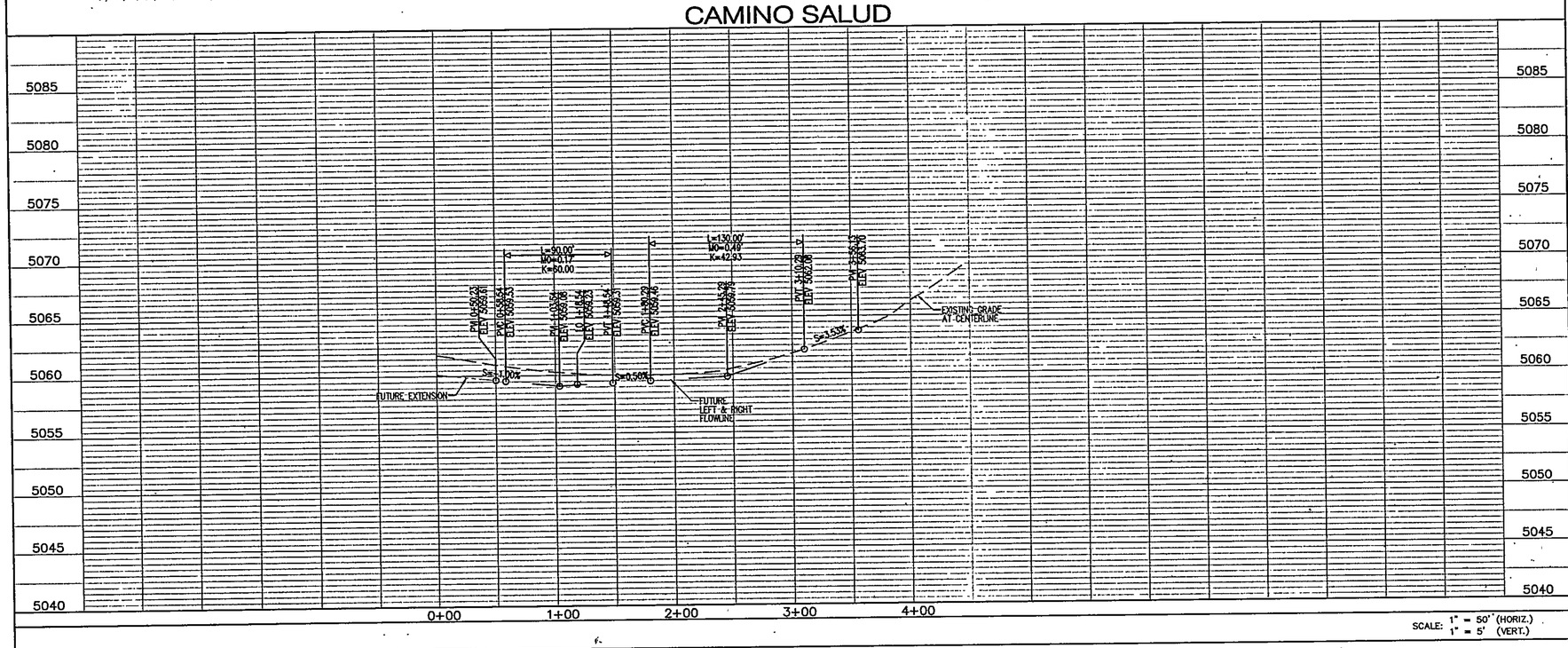
1. FUTURE CURB & GUTTER.

2. NEW ASPHALT PAVEMENT PER TYPICAL STREET SECTION AND TYPICAL PAVING SECTION DETAILS THIS SHEET.

3. EDGE OF PERMENANT ASPHALT THIS PROJECT.



CAMINO SALUD
TYPICAL PAVING SECTION
NTS



SCALE: 1" = 50' (HORIZ.)
1" = 5' (VERT.)

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
CAMINO SALUD PAVING PLAN & PROFILE
STA.1+00 - 3+89.91

Design Review Committee: APPROVED DEC 27 2006 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 26 2007 CITY ENGINEER
Last Design Update: Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	7	10

AS-BUILT INFORMATION
CONTRACTOR A.S. Hanson DATE 8/07
PLANS BY A.S. Hanson DATE 8/07
INSPECTOR'S ACCEPTANCE BY BHT DATE 8/07
VERIFICATION BY A.S. Hanson DATE 8/07
CORRECTIONS CORRECTED BY A.S. Hanson DATE 8/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
STATION IS A STANDARD ABC 3 1/4" ALUMINUM DISK STAMPED "J-15, 1990" RIVETED TO AN ALUMINUM BOLT PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5090.355 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES
NO. | BY | DATE

ENGINEER'S SEAL
BRUCE J. STIDWORTHY NEW MEXICO REGISTERED PROFESSIONAL ENGINEER
12/14/06

No.	Date	REMARKS	By
1A	8/07	Add MH, Rim Elev	RD

REVISIONS
DESIGN
Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

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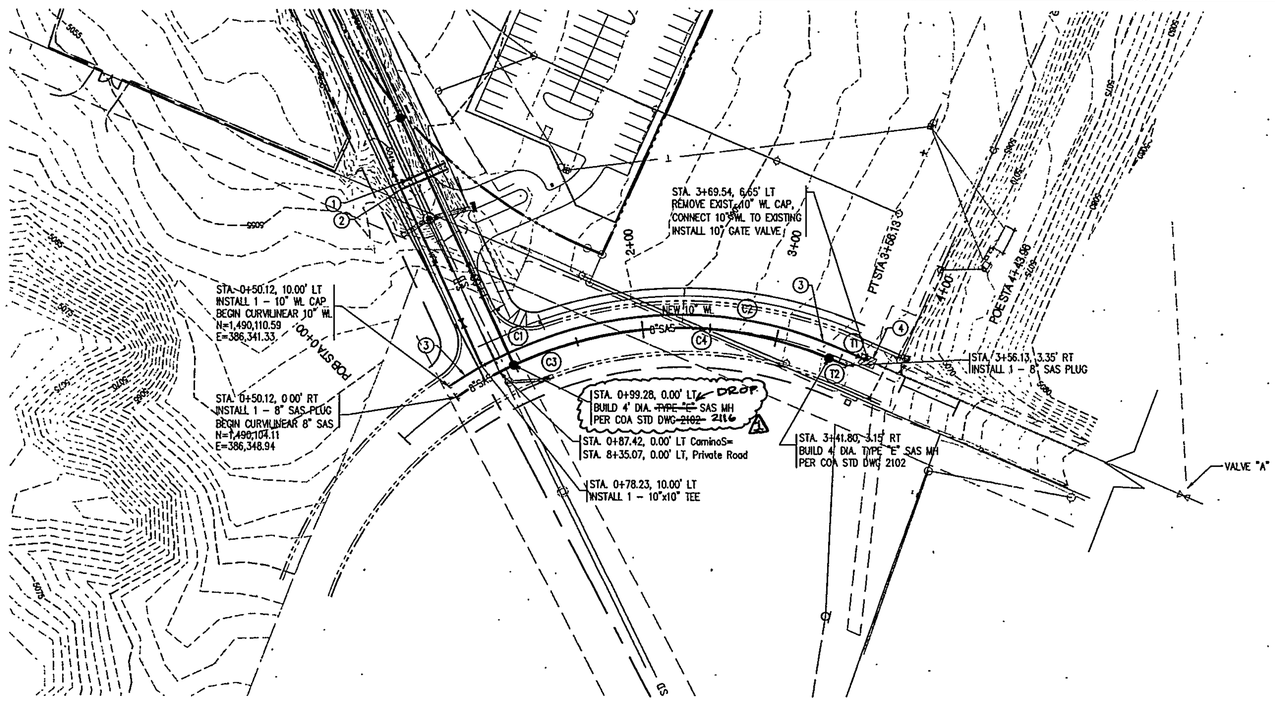
Thu, 14-Dec-2006 - 8:56:am, Plotted by: BORTEGA

RECORD DRAWING



CAMINO SALUD UTILITY PLAN

Waterline Tangent Table		
ID	BEARING	LENGTH
T1	S81°24'16"E	28.93'

Waterline Curve Table				
ID	RADIUS	ARC	DELTA	TANGENT
C1	310.00'	165.12'	30°31'07"	84.57'
C2	280.00'	135.01'	27°37'35"	68.84'

SAS Tangent Table		
ID	BEARING	LENGTH
T2	S81°24'16"E	14.17'

SAS Curve Table				
ID	RADIUS	ARC	DELTA	TANGENT
C3	300.00'	145.67'	27°49'17"	74.30'
C4	275.00'	145.54'	30°19'25"	74.52'

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING UTILITY LOCATIONS AND NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.

2. ALL CURB RETURN RADII SHALL BE 42' UNLESS OTHERWISE SPECIFIED.

3. ALL CURVE DATA AND DIMENSIONS REFER TO FACE OF CURB UNLESS OTHERWISE SPECIFIED.

4. GRADE ELEVATIONS, WHERE NOTED, ARE FOR TOP OF STANDARD CURB UNLESS OTHERWISE SPECIFIED.

5. CONTRACTOR IS TO INSTALL A 4"x 4"x 5' POST AND END AT THE END OF EACH SANITARY SEWER SERVICE.

6. CONTRACTOR IS RESPONSIBLE FOR REPAIR AND/OR REPLACEMENT OF ALL UTILITY CONDUITS AND EXISTING LINES.

7. ANY ADDITIONAL GRADING REQUIRED TO MATCH PROPOSED STREET GRADES SHALL BE INCIDENTAL TO PAVING ITEMS.

8. CONTRACTOR SHALL PROVIDE THE INSPECTORS, (CITY AND PRIVATE) WITH THE PROPOSED HYDROSTATIC TESTING PLAN. THE PLAN MUST BE APPROVED BEFORE TESTING OPERATIONS BEGIN.

9. CONTRACTOR SHALL PARK EQUIPMENT AND VEHICLES AS NOT TO INTERFERE WITH NORMAL ACTIVITIES OF RESIDENTS OR OTHER CONTRACTORS ON SITE.

10. ANY DAMAGE TO THE EXISTING FACILITIES (CURB & GUTTER, PAVEMENT, CONDUITS, LANDSCAPING, UTILITY LINES ETC.) DURING CONSTRUCTION SHALL BE REPLACED AT THE CONTRACTORS' EXPENSE.

11. REMOVAL OF THE EXISTING CURB & GUTTER SHALL BE AS PER COA STD. DWG. 2415 (SAWCUT ONLY).

12. WHEELCHAIR RAMPS SHALL BE CONSTRUCTED PRIOR TO ACCEPTANCE OF CURB & GUTTER.

13. ELECTRONIC MARKER DISKS (EMD'S) MUST BE INSTALLED FOR WATERLINE AND SANITARY SEWER LINE APPURTENANCES AS PER SECTION 170 OF THE STANDARD SPECIFICATIONS.

○ UTILITY KEYED NOTES

1. INSTALL 10"x8" TEE, 2-10" GATE VALVES, 1-8" GATE VALVE, AND 1-8" CAP.

2. INSTALL 3" WATER SERVICE LINE AS PER COA STD DWG.

3. INSTALL NEW 10" WATERLINE PER COA STDS. (3' MIN. COVER)

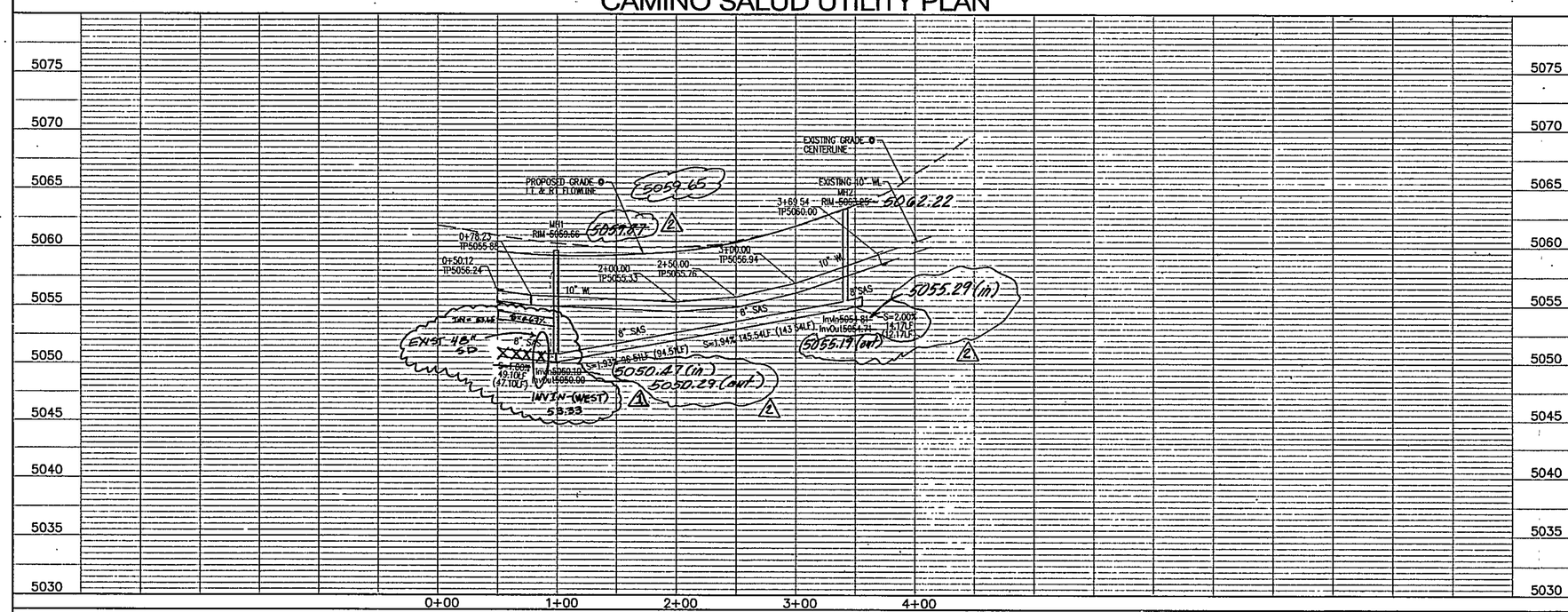
4. CONTRACTOR SHALL REMOVE AND REPLACE EXISTING PAVEMENT (PER COA STD DWG 2465) AND STRIPING AS REQUIRED FOR INSTALLATION OF THE WATERLINE. TRAFFIC CONTROL AND TIMING OF CONSTRUCTION ACTIVITIES SHALL BE COORDINATED WITH THE OWNER AND SHALL BE PERFORMED SO AS TO MINIMIZE INCONVENIENCE TO USERS OF THE PARKING LOT.

WATER SHUT-OFF PLAN

FOR CONNECTION TO THE EXISTING 10" WL STUB, SHUT OFF VALVE A.

CONTRACTOR WILL BE RESPONSIBLE FOR THE TIMING AND COORDINATION OF THE WATER SHUT-OFF REQUIREMENTS.

AT LEAST SEVEN (7) WORKING DAYS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL CONTACT PDW/WATER SYSTEMS DIVISION (857-8200) TO INITIATE IMPLEMENTATION OF THIS WATER SHUT OFF PLAN. CONTRACTOR SHALL NOT OPERATE CITY VALVES.



SCALE: 1" = 50' (HORIZ.)
1" = 5' (VERT.)

SURVEY INFORMATION		
FIELD NOTES		
NO.	BY	DATE

BENCH MARKS	
STATION IS A STANDARD AGS 3 1/4" ALUMINUM DISK STAMPED "9-J15, 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E. ELEVATION = 5099.355 FEET (NGVD 1929)	CONTRACTOR A.S. Horner DATE 8/07 STAKED BY A.S. Horner DATE 8/07 INSPECTOR'S ACCEPTANCE BY BHI DATE 8/07 FIELD VERIFICATION BY A.S. Horner DATE 8/07 DRAWINGS CORRECTED BY A.S. Horner DATE 8/07 MICRO-FILM INFORMATION RECORDED BY DATE NO.

ENGINEER'S SEAL

BRUCE J. STIDHAM
NEW MEXICO
14623
REGISTERED PROFESSIONAL ENGINEER
12/13/06

No.	Date	REMARKS	By
1	12/14/06	MH1 changed to drop manhole.	RDA
2	9/28/07	MH Rim & Inv Elevs.	AJ

REVISIONS
DESIGN

Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
CAMINO SALUD UTILITY PLAN & PROFILE

Design Review Committee: APPROVED DEC 27 2006 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 26 2007 CITY ENGINEER
Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	8R	10

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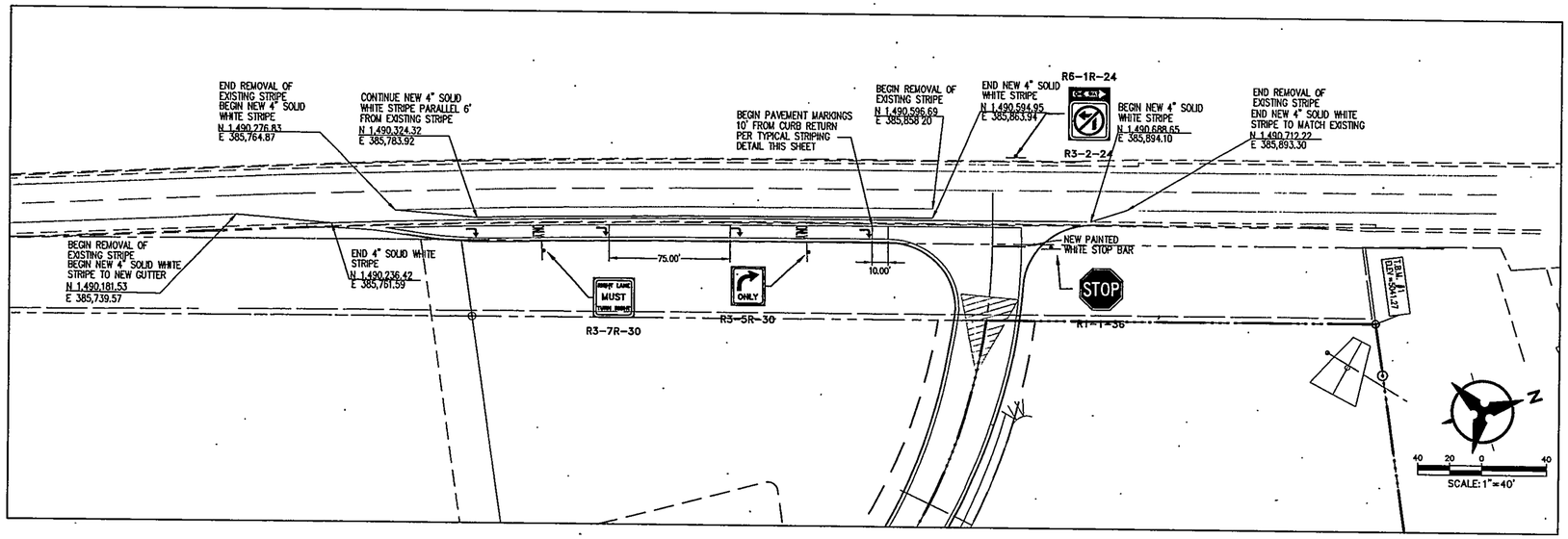
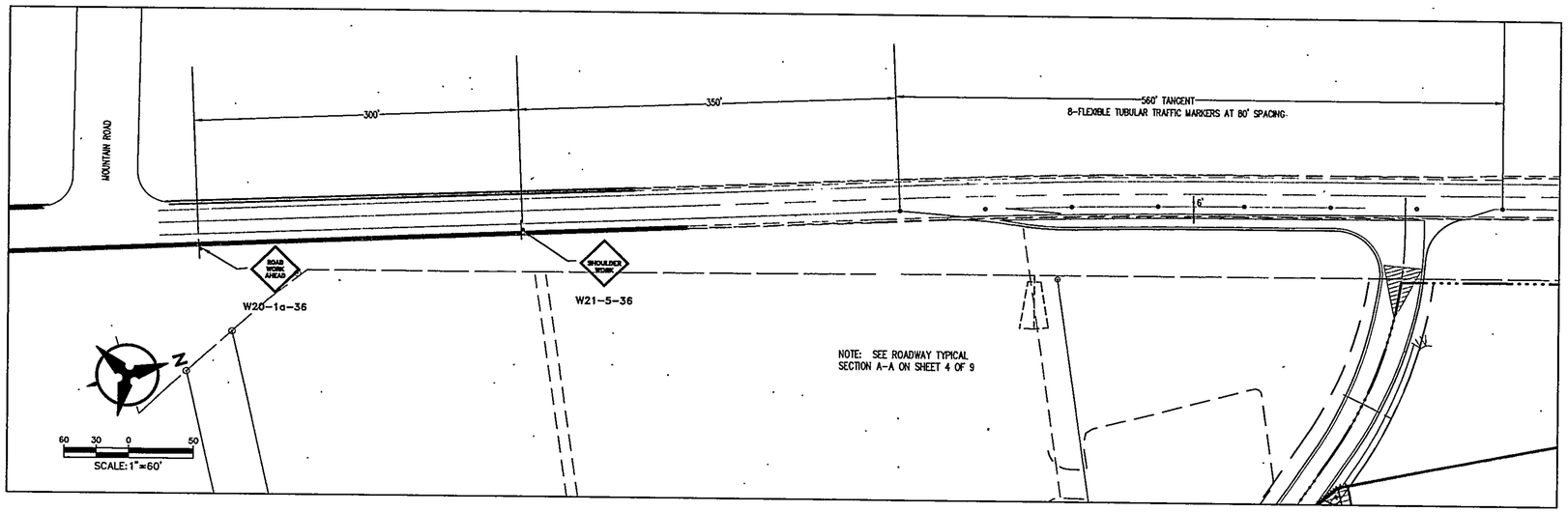
Wed, 13-Dec-2006 - 11:15:am, Plotted by: BORTEGA

RECORD DRAWING



SIGNING AND STRIPING PLAN



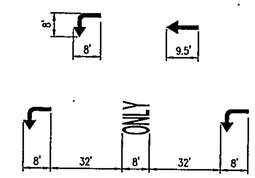
CONSTRUCTION TRAFFIC CONTROL PLAN

SIGNING AND STRIPING NOTES

1. ALL STRIPING SHALL BE DONE USING HOT THERMOPLASTIC.

2. WATER BLASTING SHALL BE THE ONLY APPROVED METHOD OF STRIPING REMOVAL.

3. ALL SIGNS SHALL BE COVERED WITH ANTI-GRAFFITI COATING.



TYPICAL STRIPING DETAIL
NTS
*ALL STRIPING TO BE PREFORMED THERMOPLASTIC

TRAFFIC CONTROL NOTES

1. THE CONTRACTOR MUST ADHERE TO THE DATES AND TIMES LISTED ON THE TCP PERMIT. FAILURE TO DO SO WILL RESULT IN THE PERMIT BEING REVOKED.

2. THE NMDOT RESERVES THE RIGHT TO MAKE ANY CHANGES AND/OR MODIFICATIONS TO THE APPROVED TRAFFIC CONTROL PERMIT.

3. THE CONTRACTOR SHALL ADHERE TO ALL THE REQUIREMENTS LISTED IN THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

4. THE CONTRACTOR SHALL ADHERE TO THE NMDOT DROP-OFF POLICY.

5. THE CONTRACTOR SHALL CONTACT MR. PHIL GALLEGOS, D3 PUBLIC INFORMATION OFFICER AT LEAST 48 HOURS BEFORE ANY WORK LISTED IN THE TCP IS PERFORMED, TO CONFIRM THE ACTUAL START DATES OF THE CONSTRUCTION. MR. GALLEGOS CAN THEN PUBLISH THE UPCOMING WORK IN THE DISTRICT THREE TRAFFIC REPORT. MR. GALLEGOS CAN BE REACHED AT 841-2700.

6. IF ANY OF THE SIGNS AND/OR TRAFFIC CONTROL DEVICES, ON THE ATTACHED TCP, ARE BEING USED OVERNIGHT THE FOLLOWING MINIMUM REFLECTIVITY STANDARDS SHALL BE REQUIRED.

MINIMUM MAINTAINED RETROREFLECTIVITY LEVELS

SIGN COLOR	CRITERIA	SHEETING TYPE (ASTM D4956-01a)					
		I	II	III	VI	VIII	IX
WHITE ON RED	SEE NOTE 1	35/7					
BLACK ON ORANGE OR YELLOW	SEE NOTE 2	*	50				
	SEE NOTE 3	*	75				
BLACK ON WHITE		50					
WHITE ON GREEN	OVERHEAD	*27	*215	*225	250/23		
	SHOULDER	*27	120/15				

NOTES:
LEVELS IN CELLS REPRESENT LEGEND RETROREFLECTIVITY # BACKGROUND RETROREFLECTIVITY (FOR POSITIVE CONTRAST SIGNS). UNITS ARE cd/lx/m ^{2} MEASURED AT AN OBSERVATION ANGLE OF 0.33°
1 MINIMUM CONTRAST RATIO is 3:1 (WHITE RETROREFLECTIVITY ÷ RED RETROREFLECTIVITY).
2 FOR TEXT SIGNS MEASURING 48 INCHES OR MORE AND ALL BOLD SYMBOL SIGNS.
3 FOR TEXT SIGN MEASURING LESS THAN 48 INCHES AND ALL FINE SYMBOL SIGNS.
*SHEETING TYPE SHOULD NOT BE USED.

7. ALL TRAFFIC DEVICES SHALL BE KEPT CLEAN THROUGHOUT THE DURATION OF THE PROJECT. ANY SIGN THAT IS TAGGED BY GRAFFITI SHALL BE CLEANED WITHIN 24 HOURS OR REMOVED AND REPLACED.

8. ALL SIGNS THAT ARE PART OF WORK ZONE THAT IS IN PLACE FOR MORE THAN 3 DAYS SHALL BE PLACED ON POSTS.

9. ALL WARNING AND REGULATORY SIGNS SHALL MEET THE FOLLOWING SIZE REQUIREMENTS: WARNING SIGN 36"X36", REGULATORY SIGN 36"X42".

AS-BUILT INFORMATION
CONTRACTOR A.S. Horner DATE 6/07
STAKED BY A.S. Horner DATE 6/07
INSPECTORS BY OHT DATE 6/07
FIELD VERIFICATIONS BY A.S. Horner DATE 8/07
DRAWINGS CORRECTED BY A.S. Horner DATE 8/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK STAMPED "9-J15, 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SIDE OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGION RD. N.E.
ELEVATION = 5090.385 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL
BRUCE A. STOCKWELL NEW MEXICO 14623 REGISTERED PROFESSIONAL ENGINEER
12/13/06

No.	Date	REMARKS	By
		REVISIONS	
		DESIGN	

Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

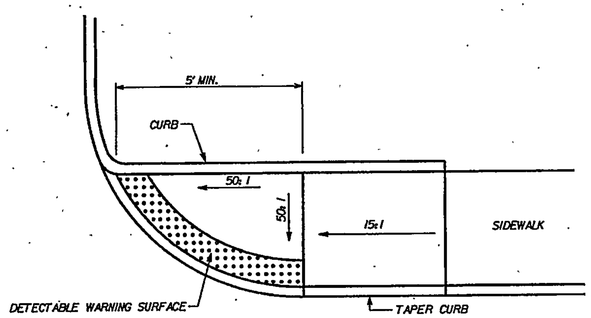
New Mexico Tri-Lab Building, Road, & Site Utility Package
STRIPING AND SIGNAGE PLAN
TRAFFIC CONTROL PLAN

Design Review Committee: APPROVED DEC 27 2006 DESIGN REVIEW COMMITTEE
City Engineer Approval: APPROVED JAN 26 2007 CITY ENGINEER
Last Design Update | Mo./Day/Yr. | Mo./Day/Yr.

City Project No. 670183 | Zone Map No. J-15-Z | Sheet 9 Of 10

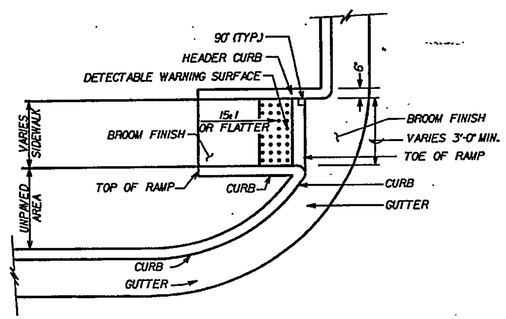
P:\040107\cdp\general\040107traffic.dwg, Layout1
December 13, 2006 - 10:58am

RECORD DRAWING



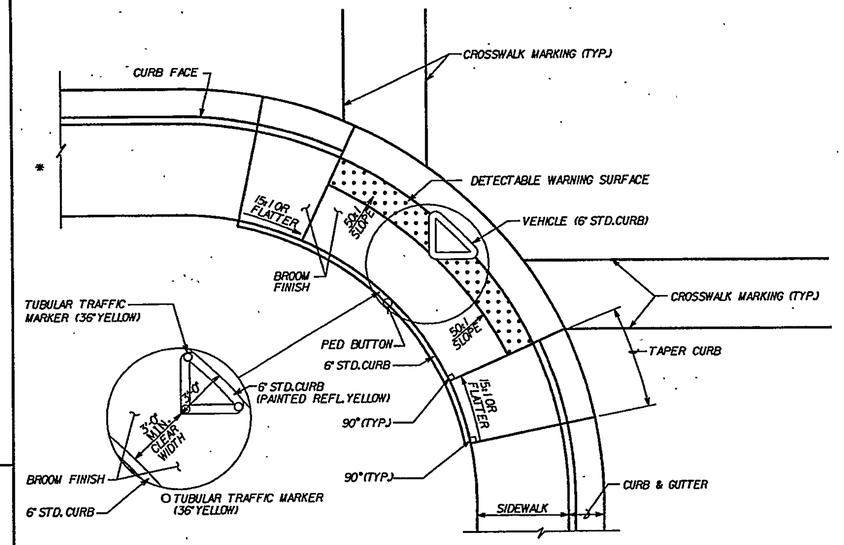
TYPE C

N.T.S.



TYPE C
WITH BUFFER

N.T.S.



TYPE D
PARALLEL CURB RAMPS W/LARGE BOTTOM LANDING

*TRANSITION TO EXISTING SIDEWALK AS FIELD CONDITIONS PERMIT.

METRIC CONVERSIONS

6'-0"	-	1829mm
3'-0"	-	915mm
6"	-	50mm
10:1	-	1:10
12:1	-	1:12
15:1	-	1:15
50:1	-	1:50

NO.	DATE	REV. BY	DESCRIPTION

REVISIONS (OR CHANGE NOTICES)

NEW MEXICO DEPARTMENT OF TRANSPORTATION

PEDESTRIAN ACCESS DETAILS
CURB RAMP DETAILS
TYPE C AND TYPE D

APPROVAL RECOMMENDED ENGINEER 12/2/03 DATE

PAD-001 01/01/04 Sheet 4 of 10

AS-BUILT INFORMATION
CONTRACTOR A.S. Harper DATE 8/07
STAKED BY A.S. Harper DATE 8/07
AGREE/LINES INSPECTOR BY OHT DATE 8/07
FIELD VERIFICATION BY A.S. Harper DATE 8/07
DRAWINGS CORRECTED BY A.S. Harper DATE 8/07
MICRO-FILM INFORMATION
RECORDED BY DATE
NO.

BENCH MARKS
STATION IS A STANDARD ACS 3 1/4" ALUMINUM DISK, STAMPED "2-B15, 1990" RIVETED TO AN ALUMINUM TUBE PROJECTING 0.25 FEET ABOVE THE GROUND AND LOCATED 0.3 MILES FROM THE CENTERLINE OF I-25 ON THE NORTH SD OF LOMAS BLVD. APPROXIMATELY 244 FEET WEST OF THE INTERSECTION OF LOMAS BOULEVARD N.E. AND LEGAN RD. N.E.
ELEVATION = 5060.365 FEET (NGVD 1929)

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

NMDOT STANDARD

No.	Date	REMARKS	By
		REVISIONS	
		DESIGN	

Designed By: BJS DATE: 12/06
Drawn By: ARR DATE: 12/06
Checked By: BJS DATE: 12/06

Bohannan ▲ Huston
Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335
ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT

New Mexico Tri-Lab Building, Road, & Site Utility Package
NMDOT PEDESTRIAN ACCESS DETAIL

Design Review Committee	City Engineer Approval	Last Design Update	Mo./Day/Yr.	Mo./Day/Yr.

City Project No.	Zone Map No.	Sheet	Of
670183	J-15-Z	10	10

P:\040107\cdp\general\040107 NMDOT 4 of 10.dwg, Layout1
December 13, 2006 – 10:58am

Bohannan Huston

Albuquerque
Courtyard I
7500 Jefferson St. NE
Albuquerque, NM
87109-4335

voice: 505.823.1000
facsimile: 505.798.7988
toll free: 800.877.5332

Las Cruces
425 S. Telshor Blvd.
Suite C-103
Las Cruces, NM
88011-8237

voice: 575.532.8670
facsimile: 575.532.8680

Denver
Meridian One
9785 Maroon Circle
Suite 140
Englewood, CO
80112-5928

voice: 303.799.5103
facsimile: 303.799.5104
toll free: 877.799.5103

www.bhinc.com

CITY OF ALBUQUERQUE
PLANNING DEPARTMENT
DEVELOPMENT SERVICE / HYDROLOGY SECTION

DATE: 7-5-12

CONFERENCE RECAP

ZONE ATLAS PAGE NO: J15
DRAINAGE FILE: J15/D027A
ZONING: N/A
DRB:
SUBJECT: Relocate 48" SD
STREET ADDRESS (IF KNOWN): _____
SUBDIVISION NAME: _____

APPROVAL REQUESTED:

ATTENDANCE: Mike Balaskovitz, Curtis Cherne

FINDINGS:

1. It is acceptable to file a paper easement for the new location of the public SD through this site. The easement should be platted when the platting action occurs.
2. It is acceptable to construct the building on the 100' trapezoidal shaped drainage easement subject to future vacation and platting action as well as relocation of exotics SD.
3. BHI to submit an amended drainage report to support the SD relocation.

THE UNDERSIGNED AGREES THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THEY ARE NOT REASONABLE OR THAT THEY ARE BASED ON INACCURATE INFORMATION.

SIGNED: Curtis A. Cherne
NAME (PRINT): Curtis A. Cherne

SIGNED: [signature]
NAME (PRINT): MICHAEL BALASKOVITS

NOTE PLEASE PROVIDE A COPY OF THIS RECAP WITH YOUR DRAINAGE SUBMITTAL.

Alb. Reprographics

HYDROLOGY SECTION
PLANNING DEPARTMENT
DEVELOPMENT & BUILDING SERVICES DIVISION
600 SECOND STREET NW SUITE 201
ALBUQUERQUE, NM 87102
505-924-3982

Records Withdrawal Form 195003

Requested by: Smith Eng. Co. Phone No.: 884-0700
Pat Conley
Name and Company

Hydrology File: J-15/D27A UNM North Campus - West

(a. File) b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Hydrology File: _____

a. File b. Microfilm c. other _____

Picked Up By:

Name: FRANK LUCERO Organization: ARG
Print

Signed: Frank Lucero Date: 23

Office Use Only

Return Acknowledged:

Received by: _____ Date: _____

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 14, 2003

Jeff Mortensen, PE
Jeff Mortensen & Associates, Inc
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

Re: UNM North Campus – West Drainage Master Plan
Engineer's Stamp dated 7-11-03 (J15/D27A)

Dear Mr. Mortensen,

Based upon the information provided in your submittal dated 7-14-03, the above referenced DMP is approved for Work Order and any subsequent development must adhere to this plan.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS
1706 * 2006
ALBUQUERQUE
Making History

September 28, 2005

Jeffrey G. Mortensen, PE
Jeff Mortensen & Associates, Inc.
6010-B Midway Park Blvd. Ne
Albuquerque, NM 87109

Re: UNM North Campus Lands West Grading and Drainage Plan
Engineer's Stamp dated 9-21-05 (J15/D27A)

Dear Mr. Mortensen,

Based upon the information provided in your submittal dated 9-21-05, the above referenced plan is approved for Work Order for Phase I.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Rudy E. Rael, Associate Engineer
Planning Department.
Building and Development Services
BUB

C: file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

2005.170.8

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: UNM North Campus - Lands West of University ZONE ATLAS/DRNG. FILE #: J15/D27A
DRB #: EPC #: WORK ORDER #:

LEGAL DESCRIPTION: Unplatted Lands of Archdiocese of Santa Fe, Southwestern Construction Co, and Sandia Found.
CITY ADDRESS: University Blvd NE

ENGINEERING FIRM: Jeff Mortensen & Assoc., Inc. CONTACT: J. Graeme Means
ADDRESS: 6010-B Midway Park Blvd. NE PHONE: (505) 345-4250
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: University of New Mexico CONTACT: Kim Murphy, Real Estate Dir
ADDRESS: 1717 Las Lomas NE, PHONE: 277-4620
CITY, STATE: Albuquerque, NM ZIP CODE: 87131

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: Jeff Mortensen and Associates CONTACT: Chuck Cala
ADDRESS: PHONE: 345-4250
CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

TYPE OF SUBMITTAL:

X DRAINAGE REPORT
DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal****
****DRB approved site plan will be TCL***
DRAINAGE PLAN RESUBMITTAL
CONCEPTUAL GRADING & DRAINAGE PLAN
GRADING PLAN
EROSION CONTROL PLAN
ENGINEER'S CERTIFICATION (HYDROLOGY)
CLOMR/LOMR
TRAFFIC CIRCULATION LAYOUT (TCL)
ENGINEER'S CERTIFICATION (TCL)
ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
OTHER

CHECK TYPE OF APPROVAL SOUGHT:

SIA/FINANCIAL GUARANTEE RELEASE
PRELIMINARY PLAT APPROVAL
S. DEV. PLAN FOR SUB'D APPROVAL
S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
SECTOR PLAN APPROVAL
FINAL PLAT APPROVAL
FOUNDATION PERMIT APPROVAL
BUILDING PERMIT APPROVAL
CERTIFICATE OF OCCUPANCY (PERM.)
CERTIFICATE OF OCCUPANCY (TEMP.)
GRADING PERMIT APPROVAL
PAVING PERMIT APPROVAL
X WORK ORDER APPROVAL
OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

X YES
NO
X COPY PROVIDED

DATE SUBMITTED: 09/22/2005 BY: J. Graeme Means

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based upon the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

xc: Roger Lujan, Gil Berry, Mary Kenney, Mike McGuire

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SEP 2 9 2005
HYDROLOGY SECTION

CITY OF ALBUQUERQUE
DEVELOPMENT & BUILDING SERVICES CENTER
PLANNING DEPARTMENT/HYDROLOGY SECTION

CONFERENCE RECAP File

DRAINAGE FILE/ZONE ATLAS PAGE NUMBER: J15/D27A DATE:7-15-2005
CROSS REFERENCE NUMBERS: EPC_____ DRB_____ DRC_____
SUBJECT: UNM LANDS WEST MASTER DRAINAGE PLAN/TRISERVICES
STREET ADDRESS: CAMINO DE SALUD (A PRIVATE ROAD)
SUBDIVISION NAME: UNPLATTED LANDS OF THE UNIVERSITY OF NEW MEXICO

TYPE OF APPROVAL

X PRELIMINARY PLAT	X FINAL PLAT
SITE DEVELOPMENT PLAN	BUILDING PERMIT
X OTHER WORK ORDER/DRC APPROVAL	ROUGH GRADING

ATTENDEE:	ORGANIZATION:	PHONE:
BRAD BINGHAM	CITY	924-3986
JEFF MORTENSEN	JMA	345-4250

FINDINGS:

1. A MASTER DRAINAGE PLAN HAS BEEN PREVIOUSLY PREPARED, SUBMITTED AND APPROVED FOR THE UNM PROPERTY KNOWN AS LANDS WEST.
2. ORIGINALLY, IT WAS INTENDED TO ALLOW THE DEVELOPED RUNOFF FROM THE SITE, COMBINED WITH THE OFFSITE FLOWS FOLLOWING THE OLD CAMPUS WASH, TO EXIT THE NORTHWEST CORNER OF THE SITE IN A NATURALISTIC OPEN CHANNEL.
3. IT IS PROPOSED TO ABANDON THE CONCEPT ABOVE AND CONVEY THE FLOWS IN A CLOSED CONDUIT STORM DRAIN THAT WILL CONNECT DIRECTLY TO THE NMDOT OUTFALL STRUCTURE AT THE SE CORNER OF THE INDIAN SCHOOL ROAD OVERPASS OVER THE EAST FRONTAGE ROAD.
4. THE ABOVE CHANGE WILL REQUIRE AN AMENDMENT TO THE PREVIOUSLY APPROVED MASTER DRAINAGE PLAN.
5. A CLOMR AND/OR LOMR WILL NOT BE REQUIRED AS A RESULT OF THE PROPOSED AMENDMENT.
6. PERMANENT DEVELOPMENT (EG BUILDINGS), HOWEVER, MUST NOT ENCROACH INTO THE EXISTING MAPPED FLOODPLAIN, OR A LOMR WILL BE REQUIRED.
7. DESIGNING AND BUILDING A PRIVATE ACCESS ROAD ABOVE THE PROPOSED PUBLIC STORM DRAIN EXTENSION WILL BE ALLOWED AS WELL AS DESIGNING AND INSTALLING PUBLIC WATER AND SANITARY SEWER IMPROVEMENTS ALONG THAT SAME CORRIDOR.

8. DRC REVIEW AND WORK ORDER APPROVAL WILL BE REQUIRED FOR THE PUBLIC STORM DRAIN EXTENSION.
9. NMDOT APPROVALS WILL BE REQUIRED.
10. A PUBLIC STORM DRAINAGE EASEMENT FOR THE NEW EXTENSION AS WELL AS THE EXISTING 48" PIPE PRESENT ON SITE WILL BE REQUIRED AS A CONDITION OF WORK ORDER APPROVAL.
11. UNM WILL NEED TO GRANT THE NECESSARY EASEMENTS FOR ONLY THOSE LANDS IT CONTROLS.
12. THE GRANTING OF PRIVATE ACCESS EASEMENTS MAY ALSO BE REQUIRED.
13. IF PLATTING IS PROPOSED, THE PLAT SHALL GRANT THE PUBLIC STORM DRAIN EASEMENT(S) AS WELL AS SHOW THE FEMA MAPPED FLOODPLAIN; AN EASEMENT FOR THE FEMA MAPPED FLOODPLAIN WILL NOT BE REQUIRED.
14. PLATTING MAY TRIGGER REQUIRED INFRASTRUCTURE ALONG WITH AN SIA AND FINANCIAL GUARANTEES; A MUNICIPAL LIEN WILL BE AN ACCEPTABLE FORM OF FINANCIAL GUARANTY.

THE UNDERSIGNED AGREE THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE ONLY SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THE FINDINGS ARE NOT REASONABLE OR THAT THEY ARE BASED UPON INACCURATE INFORMATION.

SIGNED: Bradley L Bryfogle	SIGNED:
TITLE: CITY HYDROLOGIST	TITLE: CONSULTANT
DATE: 8/15/05	DATE: 08-15-2005

NOTE: PROVIDE A COPY OF THIS RECAP WITH DRAINAGE SUBMITTAL

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 14, 2003

Jeff Mortensen, PE
Jeff Mortensen & Associates, Inc
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

Re: UNM North Campus – West Drainage Master Plan
Engineer's Stamp dated 7-11-03 (J15/D27A)

Dear Mr. Mortensen,

Based upon the information provided in your submittal dated 7-14-03, the above referenced DMP is approved for Work Order and any subsequent development must adhere to this plan.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

JMA 2002.170.9

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

J-15/D27A

PROJECT TITLE: UNM NORTH CAMPUS - WEST
ZONE ATLAS/DRNG. FILE #: J15
DRB #: EPC #:
WORK ORDER #:

LEGAL DESCRIPTION: UNPLATTED LANDS OF ARCHDIOCESE OF SANTA FE, SOUTHWESTERN CONSTRUCTION COMPANY AND SANDIA FOUNDATION

CITY ADDRESS: 1201 UNIVERSITY BOULEVARD NE

ENGINEERING FIRM: JEFF MORTENSEN & ASSOC., INC.
ADDRESS: 6010-B MIDWAY PARK BLVD. NE
CITY, STATE: ALBUQUERQUE, NM
CONTACT: DAMIAN G. LUNA
PHONE: (505) 345-4250
ZIP CODE: 87109

OWNER: UNIVERSITY OF NEW MEXICO
ADDRESS: SCHOLES HALL – ROOM 242
CITY, STATE: ALBUQUERQUE, NM
CONTACT: KIM MURPHY
PHONE: (505) 277-4620
ZIP CODE: 87131

ARCHITECT: N/A
ADDRESS:
CITY, STATE:
CONTACT:
PHONE:
ZIP CODE:

SURVEYOR: N/A
ADDRESS:
CITY, STATE:
CONTACT:
PHONE:
ZIP CODE:

CONTRACTOR: N/A
ADDRESS:
CITY, STATE:
CONTACT:
PHONE:
ZIP CODE:

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)
- ___ ENGINEER'S CERTIFICATION (TCL)
- ___ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- ___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA/FINANCIAL GUARANTEE RELEASE
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- X WORK ORDER APPROVAL
- ___ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- ___ NO
- ___ COPY PROVIDED

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JUL 14 2003
HYDROLOGY SECTION

DATE SUBMITTED: 7/14/03 BY: DAMIAN G. LUNA

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JOB # 2002.170.9

UNIVERSITY OF NEW MEXICO

NORTH CAMPUS -WEST

MASTER
DRAINAGE REPORT

AND

CALCULATIONS

JULY 2003

RECEIVED
JUL 14 2003
HYDROLOGY SECTION

JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

07-11-2003

JEFF MORTENSEN AND ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250

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Master Drainage Report

I. Introduction and Executive Summary

This plan represents a Master Drainage Plan for University of New Mexico North Campus – West. The purpose of this plan is to: 1) identify and quantify the peak discharge and volume of runoff under existing conditions, 2) calculate changes in the peak discharge and volume of runoff under proposed conditions, 3) present measures to attain favorable drainage conditions under the proposed development scenario, and 4) support proposed public drainage improvements that will be designed and constructed by City Work Order.

The site is largely undeveloped and receives public and private offsite flows. This site is traversed by an existing public 48 in. reinforced concrete pipe storm drain that conveys offsite public flows through the site to discharge to an undeveloped natural channel at the northwest corner. The channel discharges to an existing public inlet structure located within the NMSHTD I-25 right-of-way also at the northwest corner of the site. From that point, site runoff is conveyed through NMSHTD right-of-way to the Odelia Pond, a City owned, operated and maintained storm drainage facility situated downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is believed to have adequate capacity to receive free discharge from the site in the fully developed condition. An existing FEMA Flood Hazard Zone coincides with the approximate limits of the existing storm drain and earthen channel.

All existing offsite flows will be accepted in the developed conditions. Developed site runoff will be directed to proposed private internal streets and will be collected by private storm inlets and public storm drains outfalling to an improved open channel located near the northwest corner of the site. Whereas the new inlets and connector pipes will be private, the existing 48 in. RCP and any modifications thereto shall remain public. This open channel will be lined with rip-rap with the bottom to remain as a stable landscaped channel. UNM will construct the improvements and will be responsible for the maintenance of the private streets, private storm inlets and open channel. The open

channel improvements will be contained within the limits of the existing floodplain, and no map revisions are proposed.

There are no known easements of record for the existing 48 in. public storm drain and open channel. New public drainage easements will be required to support the existing facilities and the proposed modifications to these public drainage facilities. The easements will be granted by UNM via paper easement documents. No platting is proposed at this time. UNM will also provide a Type 3 Agreement and Covenant for maintenance of the open channel. A typical example of this drainage covenant can be found in the C.O.A. DPM Chapter 17 and within this report.

II. Project Description

The site is located on the University of New Mexico North Campus – West, north of Lomas Blvd. NE. The site is bounded on the west by Interstate 25, on the north by private properties fronting onto Indian School Road NE, and on the east by properties fronting onto University Blvd NE. As shown by Panels 332, 334, 351 and 356 of 825 of the National Flood Insurance Program Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, September 20,1996 a portion of this site lies within a designated flood hazard zone (Zone A). The existing and developed flows will continue to be confined to this floodplain, which overlaps a portion the existing 48 in. public storm drain and all of the earthen channel. This project does not propose to amend, revise or aggravate the existing floodplain.

III. Background Documents

The following document(s) were reviewed and researched as part of the evaluation of downstream conditions and offsite flows for this project.

1. Master Plan and Preliminary Mass Grading Plan for UNM North Campus – West prepared by Jeff Mortensen & Associates, Inc. dated January 2002. This plan provides a concept for the proposed building and site modifications to UNM North Campus – West as shown on the developed conditions and development plan. This is pertinent as it provides an idea as to how the site may develop.
2. Existing Drainage Basins and Facilities Plan for UNM North Campus prepared by Jeff Mortensen & Associates, Inc. This plan was used to help identify and quantify offsite runoff coming from basins located on the UNM campus outside of the subject site.
3. Final Drainage Report Volume 1 & 2, I25/I40 System Interchange, prepared by URS Greiner Woodward Clyde, dated March 2000. This report describes modifications to the new Frontage Road as part of the recent Big "I" Project, including the construction of additional drainage infrastructure and modifications to the existing drainage system serving as the outfall for this site and connecting to the Odelia Pond.
4. Lomas Boulevard Storm Drain Design Analysis Report, prepared by Andrews, Asbury & Robert, Inc., dated June 1991. This Report identifies quantities of offsite runoff entering Lomas Boulevard west of University Boulevard and supported the design of now existing storm drainage improvements in Lomas Boulevard designed to intercept and redirect flows previously impacting Legion Road. The Report did not address street flow capacity in Lomas Boulevard or the upstream inlets and drainage basins at University Boulevard and points east of University Boulevard.

IV. Existing Conditions

A. Offsite Flows

The site is surrounded by developed buildings. Those buildings and associated sites contribute offsite flows which impact the project. Six of the sites are UNM owned properties, (Basins C, D and N-7.2, N-5.1 and M-1U.) The following is a description of all of the offsite basins which contribute runoff to the site. The basins are shown on both the existing and developed conditions plans.

1. Basin A (French Mortuary Site)

   Runoff amounting to 13 cfs generated by the French Mortuary Site is accepted and conveyed through a private storm drain that ties directly into the existing public 48 in. storm drain which traverses the site.

2. Basin B (Galles Chevrolet)

   Runoff generated in this basin flows across paved areas behind the Galles Building and onto the SE corner of the site which is developed as vehicle storage parking leased to Galles by UNM.

3. Basin C (Carrie Tingley Hospital)

   The majority of runoff generated by this basin is ponded in the west section of the site, however, some runoff reaches a storm drain inlet located in the parking lot south of the building. Runoff entering this inlet is conveyed through a 12 in. steel pipe with a calculated maximum capacity of 8 cfs which discharges as overland runoff onto the slope located at the southeast boundary of the site.

4. Basin D (UNM Family Health Center)

   Runoff generated from this basin's parking lot enters a private storm drain. The peak rate of 8 cfs discharges directly to the site as overland runoff.

5. Basin F (UNM ASIC)

   This basin consists of the recently constructed UNM ASIC Building and parking lot. This site is located at the northeast boundary of the UNM North Campus – West property. 16 cfs of runoff generated on this site is collected in an internal private storm drain and discharged at the northwest corner of the property where it is accepted as overland runoff by the subject property. The runoff flows along the northern end of the property and ultimately drains into the onsite earthen channel.

6. Basin L (Legion Road)

   This basin drains to existing public storm drain inlets in Legion Road. Currently the inlets located in the sump area of Legion Road are clogged. The basin includes an existing cemetery, the American Legion building and site, and a self-storage business. Theoretically, flows amounting to 39 cfs generated by this basin drain through a public 36 in. public storm drain that connects to the existing 48 in. public storm drain traversing the site.

7. Basin N-7.2 (UNM)

   This basin is located near the southwest corner of the UNM North Campus, it lies northeast of the intersection of University Boulevard and Lomas Boulevard. The flows generated in the southern portion of basin historically enter a private storm drain discharging to the existing 48 in. public storm drain. Site inspection does not reveal any apparent signs of this connection, and it appears that the runoff enters University Boulevard. Flows in the northern portion of the basin are routed through an earthen pond that overflows to University Boulevard. University Boulevard drains to the south towards existing storm inlets at Lomas which drain back to the north in a 36 in. RCP storm drain connecting to the existing 48 in. public storm drain traversing the site. Although these flows appear to drain to University, they have been analyzed for capacity purposes as draining into the 48 in. storm drain to be conservative and consistent with historical flow patterns.

8. Basins N-5.1 and M-1U

   These Basins include developed UNM properties which generate a total of 173 cfs draining to the intersection of Lomas and University. The amount of runoff intercepted and draining north to the 48 in. public storm drain has been assumed to be limited to the maximum pressure flow capacity of the 36 in. University storm drain calculated to be 107 cfs (see calculations). The inlets were not analyzed to determine if 107 cfs can actually enter the system. It is assumed that runoff bypassing these inlets drains to the west in Lomas to existing downstream storm drainage improvements constructed approximately 10 years ago (reference 4) which were designed to intercept Lomas flows.

B. Onsite Flows

At present the site is undeveloped. Much of the site has been disturbed by grading operations. The undisturbed areas have a cover of natural vegetation. Runoff generated on site has been divided into 2 Basins, Basin E and Basin G. The runoff from basin E consists of surface runoff generated on site and draining to the beginning of the open channel. Basin G is the remainder of the site which drains to the open channel further downstream. The runoff generated by all offsite and onsite basins concentrates at the NW corner of the site and is then conveyed offsite to the Odelia Pond a city maintained facility.

C. Downstream/Outfall

The runoff from the site and from offsite basins discharges into the aforementioned natural channel and is conveyed through an underground system of 3 parallel 72 in. reinforced concrete pipes, recently constructed by the Big "I" project that travel beneath Interstate 25 to the Odelia Pond, a City of Albuquerque owned, operated and maintained drainage facility downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is reported to have adequate capacity to receive free discharge from the site in the existing and developed condition.

V. Developed Conditions

The proposed improvements consist of the construction of new buildings with associated landscaping and paving improvements. As shown by the Grading Plan the site will continue to drain from east to west across the development area and new paving. The existing 48 in. public storm drain will be extended as a 60 in. storm drain and a public easement will be granted for the entire length. The developed runoff will discharge along with the offsite runoff from the extended storm drain into the existing onsite open channel and will be conveyed offsite to the City of Albuquerque detention facility, the Odelia Pond. The existing open channel will be improved with rip-rap lining with the bottom to remain naturalistic with some aesthetic modifications. The future improvements to the open channel and storm drain will be developed in accordance with

City standards. UNM will maintain the channel and will provide the City with an Agreement and Covenant. A public drainage easement will be granted to the City for the channel. The existing 48 in. storm drain and 60 in RCP extension will be maintained by the City.

On-site flows will be directed to the two proposed private roads on site. Basin E2 and the offsite flows impacting it from basins B and C are assumed to split between the north/south and east/west access roads. Basins D, E, and E3 will drain to the east/west access road. Half of Basin E1 will drain to the north/south access road and the remaining half will drain to the cul-de-sac. Basin G will drain directly the channel. Private storm inlets are proposed on both the proposed access roads. The addition of the developed runoff will exceed the capacity of the existing 48 inch public storm drain. In response the storm drain will need to be upsized to a 60" reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.

The development will occur in phases. The first phase of the development will be the entrance road to the site coming from University Boulevard along with the extension/upsizing of the onsite storm drain and improvements to the public open channel. The drainage improvements will require the granting of easement documents as a condition of work order approval. The next phase in the development will be to the northern section of the site. Ultimately, an access road to the south connecting to Lomas Boulevard via Legion Road will be constructed. These improvements will include reconstruction of the existing public storm drain in Legion Road to correct the existing deficiencies. The Development Plan appearing in the back pocket on sheet 3, shows the proposed scenario for site development.

Land treatment percentages for the developed condition were assumed for commercial use and were done so in accordance with City of Albuquerque Design Process Manual (DPM). An impervious land treatment (D) of 90% was utilized along with a 10%

landscaped land treatment (B). All basins were assumed to fully developed, allowing for free discharge in a manner consistent with this plan.

VI. Grading Plan

The Developed Conditions Master Plan on sheet 2 of 3 shows: 1) Existing grades indicated by spot elevations and contours at 2'-0" intervals as taken from a University of New Mexico aerial survey prepared by Bohannan-Huston, 1991, 2) proposed conceptual grades indicated by spot elevations and contours at 2'-0" intervals, taken from the Jeff Mortensen & Associates, Inc. Master Plan (Reference 1), 3) proposed road and conceptual building improvements taken from the JMA Master Plan (Reference 1), 4) the limit and character of existing improvements, 5) the limit and character of the proposed public storm drainage improvements and required easements and 6) continuity between existing and proposed grades.

The purpose of the Developed Conditions Master Plan and grading shown therein is to demonstrate the proposed drainage conditions under this development scenario. With this grading concept, developed site runoff will be directed to proposed private streets draining to the existing public storm drain which will be upsized and extended. The storm drain will outlet to a rip-rap lined open channel, ultimately outfalling to the Odelia Pond.

VII. Calculations

The calculations which appear herein analyze both the existing and the anticipated developed conditions for a 100-year, 6-hour rainfall event. As stated above, an impervious land treatment of 90% and a landscaped land treatment of 10% was assumed. These coefficients where taken from Table A-5 in Section 22.2. of the City of Albuquerque Development Process Manual (DPM) for commercial development.

The Flow Master PE. Computer program, version 6.0 by Heasted Methods was used to evaluate the storm drain capacities for the existing public 36 and 48 in. storm drains which convey offsite flows in University Boulevard and through the site. Manning's equation was used with the specified "n" value of 0.013 for concrete pipe. The 36 in. storm drain in University Boulevard was determined to have a maximum capacity of 107 cfs under pressure while the 48 in. storm drain was determined to have a maximum capacity under normal (gravity) flow conditions of a 211 cfs, equal to the existing flow rate.

The Flow Master program was also used to analyze the existing and developed conditions for the onsite open channel. The first calculation represents the existing open channel flows and using an "n" value of 0.030 based on DPM Table 22.3, earthen lined channel/arroyo. The second open channel calculation is for the proposed developed open channel design with the addition of landscaping and erosion control. Manning's Equation was also used for this calculation with an assumed "n" value of 0.040 for rip-rap with an unlined bottom. As shown by the calculations, the existing and developed flow rates are contained within the respective sections. The Flow Master program was also used to determine private street and storm drain capacities at several analysis points. The standard City inlets were analyzed using Federal Highway Administration procedures for combination inlets. In recognition of Type "A" inlets used as debris catchers, their throats were assumed to be fully clogged. As shown by the calculations, the street flows are contained within curb height, and the inlets are properly sized to accept the 100-year developed flow rates. The bottom downstream inlet is located at a sump condition, and overflow provisions must be incorporated into the DRC plans to allow overflow to spill to the open channel.

VIII. Conclusions

This Master Drainage Report proposes a responsible approach to managing the storm water runoff associated with the proposed phased development. Improvements consist of development of an infill area in a manner consistent with surrounding development. The

introduction of additional impervious areas will cause an increase in the peak discharge rate and volume of runoff currently draining to an existing open channel. Existing developed flows draining to an existing 48 in. storm drain will not be changed. Based upon the findings of this report the following conclusions addressing key points are presented:

- There are no known easements of record for the existing drainage infrastructure which lies within the site. Due to this fact, new 30 ft and 94 ft public drainage easements will be required for development and modifications to the underground and open channel improvements, respectively. The locations for the proposed easements are shown on sheets 2 & 3 of the UNM North Campus West Master Plan and will be provided with the Work Order Plans.
- Offsite flows will continue to be accepted and conveyed through the site
- The modifications to the existing infrastructure include upsizing the 48 in. storm drain to 60 in. downstream of the new private system and improvements to the open channel.
- The addition of the developed runoff will exceed the capacity of the existing 48 in. public storm drain at the point where the private storm drain system connects. In response, the storm drain will need to be upsized to a 60 in. reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.
- The development will occur in phases. The first phase of the development will be the entrance road to the site coming from University Boulevard, along with the extension/upsizing of the onsite storm drain and improvements to the public open channel.
- The design and construction of all public drainage improvements will occur by City Work Order.
- The two proposed private roads along with proposed private storm drain improvements will have adequate capacity to convey runoff generated by the proposed development to the existing downstream public outfall.

- There are no known restrictions for the discharge of runoff to Odelia Pond, the City owned, operated and maintained storm drainage facility downstream from the site; it is believed to have adequate capacity to receive free discharge from the site in the existing and developed conditions.
- The improved open channel will accept the increased fully developed flows. The proposed section and open channel calculations show that there will be 2 ft. freeboard provided within the proposed rip-rap channel lining under developed conditions.
- The open channel downstream of the proposed 60 in. stub extension is to be lined with rip-rap and the base will be landscaped and stabilized. A Type 3 Agreement and Covenant will be executed with UNM being responsible for the maintenance of this facility.
- Modifications to the open channel will occur within the existing FEMA flood zone limits but will not aggravate or alter the floodplain boundaries, therefore no LOMR will be required.
- All proposed drainage improvements within the site will be private, with the exception of those drainage improvements that convey public runoff.
- The public drainage improvements will require the granting of public drainage easements as a condition of Work Order approval.
- A SWPPP will be required by the contractor for this development. Along with this, a Notice of Intent will be submitted 48 hrs. before construction takes place.

HYDROLOGY CALCULATIONS

I. PRECIPITATION ZONE = 2

II. $P_{6,100} = P_{360} = 2.35$

III. TOTAL AREA (A_T) = 1,889,000 SF / 43.39 AC

IV. EXISTING LAND TREATMENT

BASIN E

TREATMENT	AREA (SF/AC)	%
C	974280 / 22.37	52

BASIN G

TREATMENT	AREA (SF/AC)	%
C	915570 / 21.02	48

V. DEVELOPED LAND TREATMENT

BASIN E1

TREATMENT	AREA (SF/AC)	%
B	47920 / 1.10	03
D	429500 / 9.86	23

BASIN E2

TREATMENT	AREA (SF/AC)	%
B	76230 / 1.75	04
D	686940 / 15.77	36

BASIN E3

TREATMENT	AREA (SF/AC)	%
B	48350 / 1.11	03
D	436470 / 10.02	23

BASIN G

TREATMENT	AREA (SF/AC)	%
C	162480 / 3.73	09

VI. EXISTING CONDITION

A. BASIN E

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [1.13(22.37)] / 22.37 = 1.13$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.13 / 12)22.37 = 2.1065$ AC-FT = 91760 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 3.14(22.37) = 70.2$ CFS

B. BASIN G

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [1.13(21.02)] / 21.02 = 1.13$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.13 / 12)21.02 = 1.9794$ AC-FT = 86220 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 3.14(21.02) = 66.0$ CFS

VII. DEVELOPED CONDITION

A. BASIN E1

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.10) + 2.12(9.86)] / 10.95 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)10.95 = 1.8134$ AC-FT = 78990 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.10) + 4.70(9.86) = 48.9$ CFS

B. BASIN E2

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.75) + 2.12(15.77)] / 17.52 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)17.52 = 2.8998$ AC-FT = 126310 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.75) + 4.70(15.77) = 78.1$ CFS

C. BASIN E3

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.11) + 2.12 (10.02)] / 11.13 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)11.13 = 1.8424$ AC-FT = 80250 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.11) + 4.70(10.02) = 49.6$ CFS

D. BASIN G

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [1.13(3.73)] / 3.73 = 1.13$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.13 / 12)3.73 = 0.3512$ AC-FT = 15300 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 3.14(3.73) = 11.7$ CFS

VIII. COMPARISON

$\Delta V_{100} = 300{,}850 - 177{,}980 = 122{,}870$ CF (INCREASE)

$\Delta Q_{100} = 188.3 - 136.2 = 52.1$ (INCREASE)

IX. OFFSITE

A. FROM BASIN N-7.2 (506480 SF/11.63 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.16) + 2.12\ (10.46)] / 11.62 = 1.98$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.98/ 12)11.62 = 1.9233$ AC-FT = 83780 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.16) + 4.70(10.46) = 52$ CFS

B. BASIN N – 5.1 (FROM JMA EXISTING CONDITIONS PLAN)

A= 10.3 AC

Q = 4.47 CFS/AC

Q = (4.47)(10.3) = 46 CFS

C. BASIN N – 5.1 (FROM JMA EXISTING CONDITIONS PLAN)

A= 28.4 AC

Q = 4.47 CFS/AC

Q = (4.47)(28.4) = 127 CFS

D. FROM BASIN A (126450 SF/ 2.90 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.28) + 2.12\ (2.61)] / 2.90 = 1.98$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.98/ 12)2.90 = 0.4800$ AC-FT = 20910 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.28) + 4.70(2.61) = 12.9$ CFS

E. BASIN B (182081 SF/ 4.18 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.42) + 2.12\ (37.7)] / 4.18 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)4.18 = 0.6933$ AC-FT = 30,200 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.42) + 4.70(3.77) = 18.7$ CFS

F. BASIN L (335810 SF/ 7.70 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.87) + 2.12\ (7.80)] / 8.66 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)8.66 = 1.4346$ AC-FT = 62490 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.87) + 4.70(7.80) = 38.6$ CFS

G. BASIN C (CALCULATED FOR MAXIUMUM CAPACITY OF 12 IN. STEEL PIPE.

PEAK DISCHARGE (12 IN. PIPE WITH N = 0.013, 7.11 FT. HEAD)

$Q_P = 8$ CFS

H. BASIN D (98280 SF/ 2.26 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.23) + 2.12\ (2.03)] / 2.26 = 1.98$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.98/ 12)2.26 = 0.3736$ AC-FT = 16270 CF

2. PEAK DISCHARGE

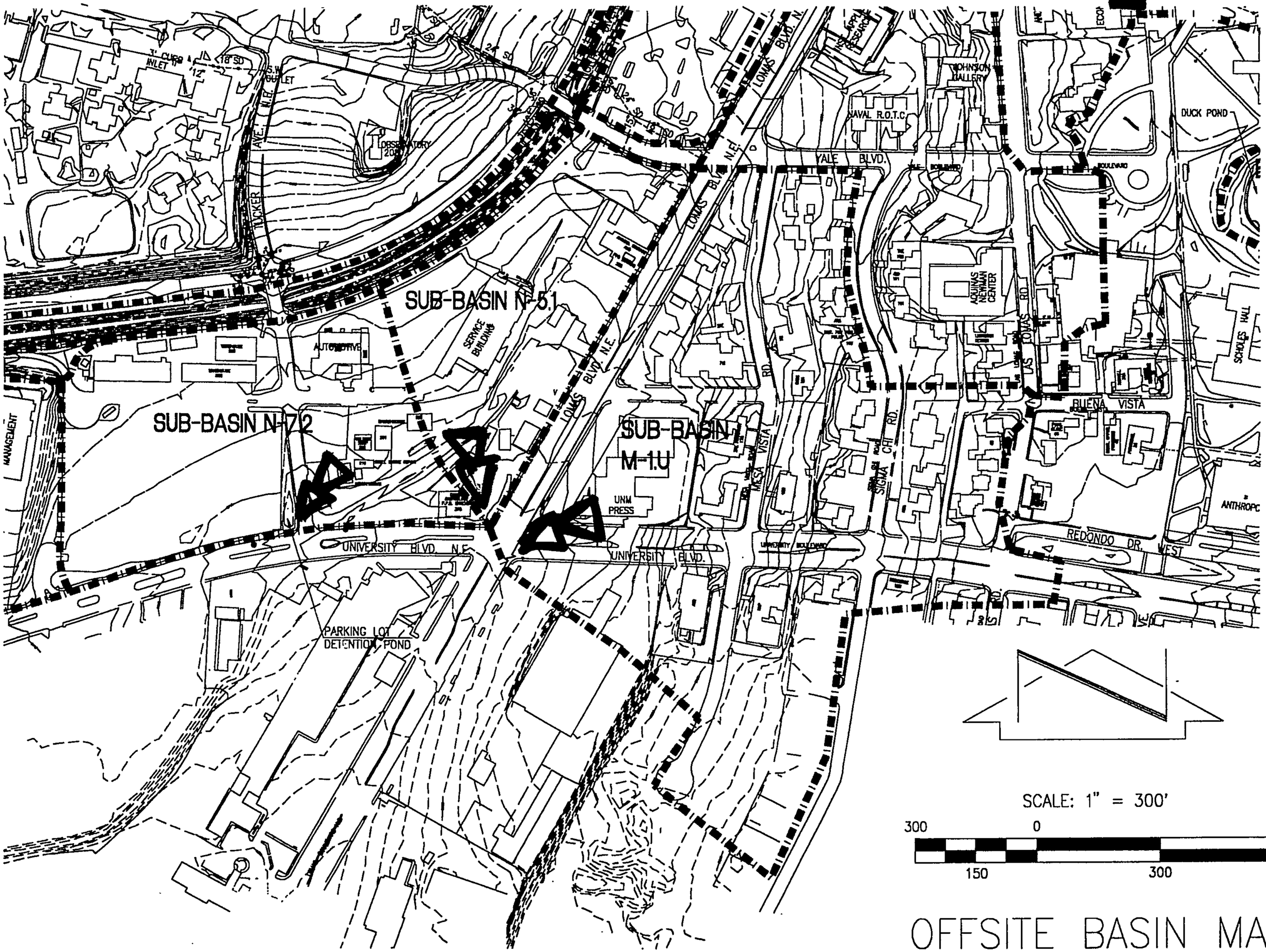
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.23) + 4.70(2.03) = 10.1$ CFS

I. BASIN F (FROM GRADING AND DRAINAGE PLAN PREPARED BY JEFF MORTENSEN & ASSOCIATES, INC. DATED NOVEMBER 26, 2001)

PEAK DISCHARGE

$Q_P = 16$ CFS



OFFSITE BASIN MAP

Worksheet
Worksheet for Pressure Pipe

36" UNIVERSITY S.D.

Project Description	
Worksheet	36" University Existing Storm Drain
Flow Element	Pressure Pipe
Method	Manning's Formula
Solve For	Discharge

Input Data		
Pressure at 1	0.00	psi
Pressure at 2	0.00	psi
Elevation at 1	100.00	ft
Elevation at 2	86.80	ft
Length	510.00	ft
Mannings Coefficient	0.013	
Diameter	36	in

Results		
Discharge	107.30	cfs
Headloss	13.20	ft
Energy Grade at 1	103.58	ft
Energy Grade at 2	90.38	ft
Hydraulic Grade at 1	100.00	ft
Hydraulic Grade at 2	86.80	ft
Flow Area	7.1	ft^2
Wetted Perimeter	9.42	ft
Velocity	15.18	ft/s
Velocity Head	3.58	ft
Friction Slope	0.025882	ft/ft

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Jeff Mortensen & Associates, Inc.
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Worksheet
Worksheet for Circular Channel

48" EXIST. SD

Project Description	
Worksheet	48" Lands West Existing Storm Drain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Slope	0.018600	ft/ft
Diameter	48	in

Results		
Depth	4.00	ft
Discharge	195.89	cfs
Flow Area	12.6	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.83	ft
Percent Full	100.0	%
Critical Slope	0.016187	ft/ft
Velocity	15.59	ft/s
Velocity Head	3.78	ft
Specific Energy	7.78	ft
Froude Number	0.00	
Maximum Discharg	210.72	cfs
Discharge Full	195.89	cfs
Slope Full	0.018600	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lands Wes
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.030	
Slope	0.003300	ft/ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	398.00	cfs

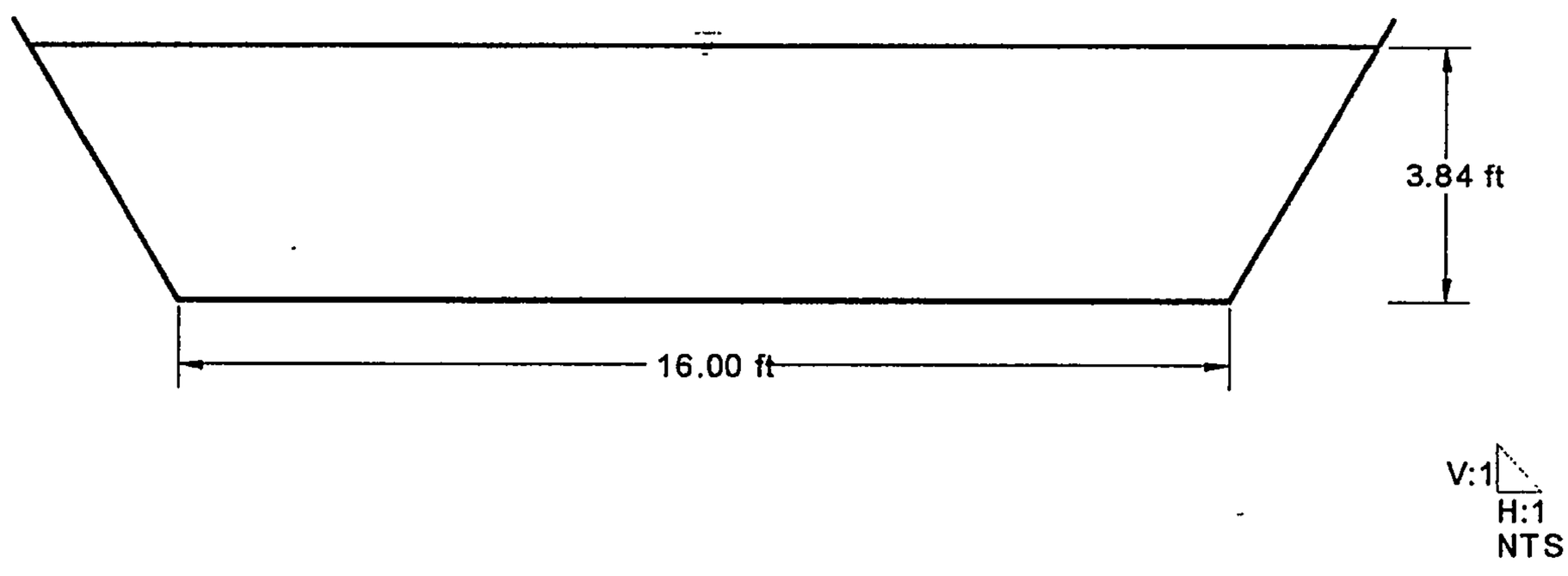
EXIST. OPEN CHANNEL

Results		
Depth	3.84	ft
Flow Area	70.2	ft²
Wetted Perimeter	24.91	ft
Top Width	20.52	ft
Critical Depth	2.59	ft
Critical Slope	0.011904	ft/ft
Velocity	5.67	ft/s
Velocity Head	0.50	ft
Specific Energy	4.34	ft
Froude Number	0.54	
Flow Type	Subcritical	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lands Wes
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.030	
Slope	0.003300	ft/ft
Depth	3.84	ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	398.00	cfs



Worksheet
Worksheet for Irregular Channel

AP-A

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.050000	ft/ft
Discharge	77.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.54	ft
Elevation Range	0.00 to 1.00	
Flow Area	10.1	ft²
Wetted Perimeter	41.09	ft
Top Width	40.00	ft
Actual Depth	0.54	ft
Critical Elevation	0.79	ft
Critical Slope	0.005732	ft/ft
Velocity	7.65	ft/s
Velocity Head	0.91	ft
Specific Energy	1.45	ft
Froude Number	2.69	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Single A Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-A

2 - SGL "A" INLETS

Input Data		
Discharge	47.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.050000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	0.00	ft
Grate Width	2.08	ft
Grate Length	3.33	ft
Grate Type	²-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

USED TO SIMULATE DEPTH OF 0.54'

ASSUMED THROAT CLOGGED 100%

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.23	
Intercepted Flow	10.88	cfs
Bypass Flow	36.12	cfs
Spread	22.79	ft
Depth	0.54	ft
Flow Area	5.3	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	8.89	ft/s
Splash Over Velocity	6.62	ft/s
Frontal Flow Factor	0.80	
Side Flow Factor	0.04	
Grate Flow Ratio	0.25	
Equivalent Cross Slope	0.027776	ft/ft
Active Grate Length	3.33	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

(each)

Worksheet
Worksheet for Irregular Channel

AP-A

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.050000	ft/ft
Discharge	55.20	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.49	ft
Elevation Range	0.00 to 1.00	
Flow Area	8.2	ft²
Wetted Perimeter	41.00	ft
Top Width	40.00	ft
Actual Depth	0.49	ft
Critical Elevation	0.68	ft
Critical Slope	0.006035	ft/ft
Velocity	6.70	ft/s
Velocity Head	0.70	ft
Specific Energy	1.19	ft
Froude Number	2.60	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-A
2 DBL "C" INLETS

Input Data		
Discharge	35.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.050000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	²-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

USED TO SIMULATE DEPTH OF 0.49'

Options	
Calculation Option	Use Grate Inlet Only
Grate Flow Option	Exclude None

Results		
Efficiency	0.42	
Intercepted Flow	14.68	cfs (each)
Bypass Flow	20.32	cfs
Spread	20.33	ft
Depth	0.49	ft
Flow Area	4.2	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	8.29	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.19	
Grate Flow Ratio	0.28	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.03	
Total Interception Length	108.40	ft

Worksheet
Worksheet for Irregular Channel

AP-A

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.050000	ft/ft
Discharge	25.80	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.39	ft
Elevation Range	0.00 to 1.00	
Flow Area	4.6	ft²
Wetted Perimeter	30.68	ft
Top Width	29.89	ft
Actual Depth	0.39	ft
Critical Elevation	0.52	ft
Critical Slope	0.007068	ft/ft
Velocity	5.55	ft/s
Velocity Head	0.48	ft
Specific Energy	0.87	ft
Froude Number	2.48	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-A

2 - Double "C"

Input Data		
Discharge	17.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.050000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	ᵓ-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

TO Get 0.39' Depth

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.53	
Intercepted Flow	8.94	cfs
Bypass Flow	8.06	cfs
Spread	15.30	ft
Depth	0.39	ft
Flow Area	2.4	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	6.99	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.24	
Grate Flow Ratio	0.38	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

each

Lands West - 40 ft F-F with normal crown Section
Worksheet for Irregular Channel

AP-B

Project Description	
Worksheet	40 foot face to face with standard curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	49.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.50	ft
Elevation Range	0.00 to 1.00	
Flow Area	8.7	ft²
Wetted Perimeter	41.03	ft
Top Width	40.13	ft
Actual Depth	0.50	ft
Critical Elevation	0.64	ft
Critical Slope	0.006154	ft/ft
Velocity	5.64	ft/s
Velocity Head	0.49	ft
Specific Energy	0.99	ft
Froude Number	2.14	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Single A Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-B

Input Data		
Discharge	30.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	3.25	ft
Grate Width	2.08	ft
Grate Length	3.33	ft
Grate Type	?-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

TO Get d = 0.50'

assumes Throat clogged

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.32	
Intercepted Flow	9.56	cfs (each)
Bypass Flow	20.44	cfs
Spread	20.76	ft
Depth	0.50	ft
Flow Area	4.4	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	6.82	ft/s
Splash Over Velocity	6.62	ft/s
Frontal Flow Factor	0.98	
Side Flow Factor	0.06	
Grate Flow Ratio	0.28	
Equivalent Cross Slope	0.028538	ft/ft
Active Grate Length	3.33	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

Worksheet
Worksheet for Irregular Channel

AP-C

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	61.30	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.53	ft
Elevation Range	0.00 to 1.00	
Flow Area	9.9	ft²
Wetted Perimeter	41.08	ft
Top Width	40.00	ft
Actual Depth	0.53	ft
Critical Elevation	0.71	ft
Critical Slope	0.005937	ft/ft
Velocity	6.17	ft/s
Velocity Head	0.59	ft
Specific Energy	1.12	ft
Froude Number	2.18	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-C
2- DBL "C"

Input Data		
Discharge	35.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	›-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

to Get d = 0.53'

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.44	
Intercepted Flow	15.28	cfs
Bypass Flow	19.72	cfs
Spread	22.03	ft
Depth	0.53	ft
Flow Area	4.9	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	7.08	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.24	
Grate Flow Ratio	0.26	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

each

Worksheet
Worksheet for Irregular Channel

AP - D

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	76.70	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.57	ft
Elevation Range	0.00 to 1.00	
Flow Area	11.4	ft²
Wetted Perimeter	41.16	ft
Top Width	40.00	ft
Actual Depth	0.57	ft
Critical Elevation	0.78	ft
Critical Slope	0.005735	ft/ft
Velocity	6.74	ft/s
Velocity Head	0.71	ft
Specific Energy	1.28	ft
Froude Number	2.23	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-D

2 - DBL "C"

Input Data		
Discharge	43.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	⁾-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

to get d=0.57 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.41	
Intercepted Flow	17.60	cfs
Bypass Flow	25.40	cfs
Spread	23.85	ft
Depth	0.57	ft
Flow Area	5.8	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	7.44	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.22	
Grate Flow Ratio	0.24	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

each

Worksheet
Worksheet for Irregular Channel

AP - D

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	41.50	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.48	ft
Elevation Range	0.00 to 1.00	
Flow Area	7.8	ft²
Wetted Perimeter	39.96	ft
Top Width	38.99	ft
Actual Depth	0.48	ft
Critical Elevation	0.61	ft
Critical Slope	0.006396	ft/ft
Velocity	5.33	ft/s
Velocity Head	0.44	ft
Specific Energy	0.92	ft
Froude Number	2.10	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-D

Input Data		
Discharge	26.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	ᵓ-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

to get d=0.48'

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.48	
Intercepted Flow	12.43	cfs
Bypass Flow	13.57	cfs
Spread	19.63	ft
Depth	0.48	ft
Flow Area	3.9	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	6.59	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.26	
Grate Flow Ratio	0.29	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

Worksheet
Worksheet for Combination Inlet In Sag

Project Description	
Worksheet	Sump Double C
Type	Combination Inlet In Sag
Solve For	Spread

Input Data		
Discharge	25.00	cfs (per inlet)
Local Depression	1.7	in
Local Depression Width	7.50	ft
Gutter Width	40.00	ft
Gutter Cross Slope	0.020000	ft/ft
Road Cross Slope	0.020000	ft/ft
Curb Opening Length	6.50	ft
Opening Height	0.50	ft
Curb Throat Type	Inclined	
Throat Incline Angle	45.00	degrees
Grate Width	2.08	ft
Grate Length	6.33	ft
Grate Type	P-50 mm (P-1-7/8")	
Clogging	0.0	%

AP - E

Sump

2 - Double "C"

Options	
Calculation Option	Use Both

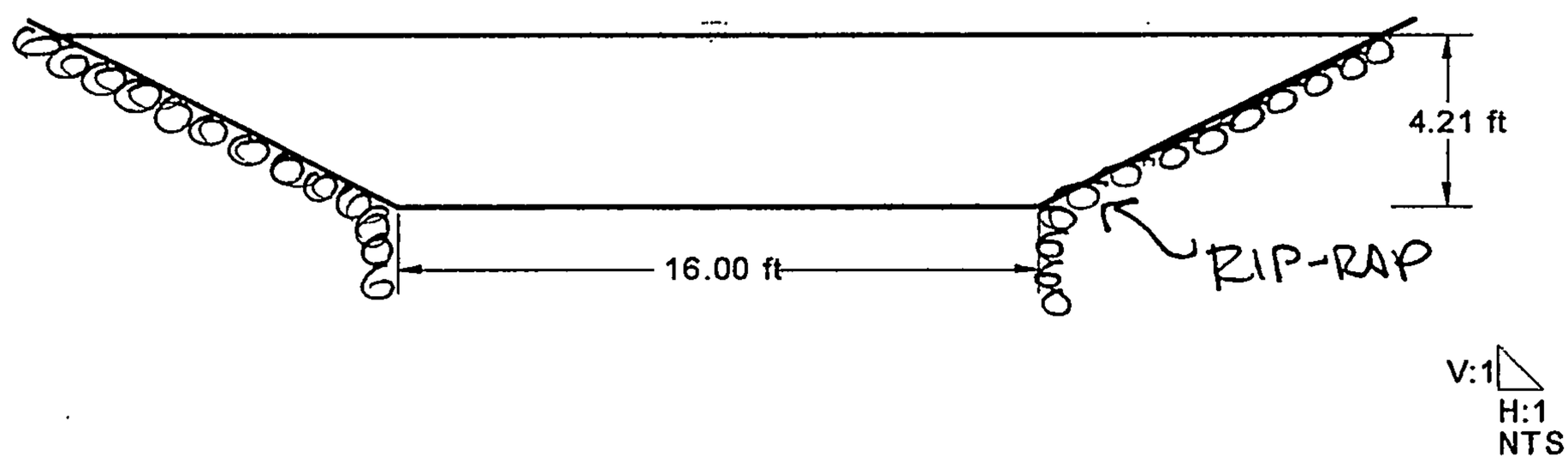
Results		
Spread	17.94	ft
Depth	0.50	ft < Curb Height
Gutter Depression	~~0.0~~	in
Total Depression	1.7	in
Open Grate Area	11.8	ft²
Active Grate Weir Length	10.49	ft

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Proposed Open Channel - Lands W
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

DEVELOPED CONDITION

Section Data		
Mannings Coefficient	0.040	
Slope	0.003300	ft/ft
Depth	4.21	ft
Left Side Slope	0.50	V : H
Right Side Slope	0.50	V : H
Bottom Width	16.00	ft
Discharge	451.00	cfs



Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Proposed Open Channel - Lands We
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

DEVELOPED CONDITION OPEN CHANNEL

Input Data		
Mannings Coefficient	0.040	
Slope	0.003300	ft/ft
Left Side Slope	0.50	V : H
Right Side Slope	0.50	V : H
Bottom Width	16.00	ft
Discharge	451.00	cfs

Results		
Depth	4.21	ft
Flow Area	102.7	ft²
Wetted Perimeter	34.82	ft
Top Width	32.83	ft
Critical Depth	2.60	ft
Critical Slope	0.019386	ft/ft
Velocity	4.39	ft/s
Velocity Head	0.30	ft
Specific Energy	4.51	ft
Froude Number	0.44	
Flow Type	Subcritical	

AGREEMENT AND COVENANT

This Agreement and Covenant, between the City of Albuquerque, New Mexico ("City") and _____, ("User") is made in Albuquerque, New Mexico and is entered into as of the date of recording this Agreement with the Bernalillo County Clerk.

1. Recital. The User is the owner of certain real property ("User's Property") located at _____, in Albuquerque, New Mexico, and more particularly described as: (give legal description and filing information)

The City is the owner of certain real property, easement or public right-of-way ("City's Property") in the vicinity of, contiguous to, abutting or within User's Property, and more particularly described as:

The User wishes to construct upon, improve or repair and to maintain the following "Improvement" on the City's Property (or already has done so):

A sketch of the proposed or existing Improvement is attached as Exhibit A and made a part of this Agreement.

The City agrees to permit the Improvement to exist on the City's Property provided the User complies with the terms of this Agreement.

2. City Use of City's Property and City Liability. The City has the right to enter upon the City's Property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the User. If the Work affects the Improvement the City will not be financially or otherwise responsible for rebuilding or repairing the Improvement. The User promptly will repair the Improvement to the City's satisfaction. The cost of repairing the Improvement will be paid by User.

3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in

accordance with standards required by the City as per the approved Grading and Drainage Plan _____on file at the City Engineer's office. The User will be solely responsible for paying all related costs. The User will be solely responsible for paying all related costs. The User will not permit the Improvement to constitute a hazard to the health or safety of the general public or to interfere with the City's use of the City's Property. The User will conform with all applicable laws, ordinances and regulations.

4. Use of the Improvement. If the City's Property is a public right-of-way, it shall be open to the use of the general public at all times, subject to reasonable curtailment during periods of construction, maintenance or repair.

5. Demand for Repair, Modification or Removal. The City may send written notice ("Notice") to the User requiring the User to repair, modify or remove the Improvement within 30 days ("Deadline") and the User will comply promptly with the requirements of the Notice. If removal is demanded, the City also may require the User to return the City's Property to its original condition by the Deadline. The User will perform all required work by the Deadline, at User's sole expense.

6. Failure to Perform by User and Emergency Work by City. If the User fails to comply with the terms of the Notice by the Deadline stated, or, if the City determines that an emergency condition exists, the City may perform the work itself. The City then may assess the User for the cost of the work and for any other expenses or damages which result from User's failure to perform. The User agrees promptly to pay the City the amount assessed. If the User fails to pay the City within thirty (30) days after the City gives the User written notice of the amount due, the City may impose a lien against User's Property for the total resulting amount.

7. Cancellation of Agreement and Release of Covenant. This Agreement may be canceled and User's covenants released by the City at will by the City's mailing to the User notice of the City's intention to record a Cancellation and Release with the Bernalillo County Clerk. The Cancellation and Release will be effective thirty (30) days after the date of mailing the notice to the User unless a later date is stated in the notice or the Cancellation and Release. After the effective date, the City will record the Cancellation and Release with the Bernalillo County Clerk.

8. Condemnation. If any part of the User's Property is ever condemned by the City, the User will forego all claims to compensation for any portion of User's structure which encroaches on City Property and for severance damage to the remaining portion of User's structure on User's Property.

9. Assessment. Nothing in this Agreement shall be construed to relieve the User, his heirs, assigns and successors from an assessment against User's Property for improvements to the City Property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Improvement will not reduce the amount assessed by the City.

10. Notice. For purposes of giving formal written notice to the User, User's address is:

Notice may be given to the User either in person or by mailing the notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the User within 3 days after the notice is mailed if there is no actual evidence of receipt. The User may change User's address by giving written notice of the change by certified mail, return receipt requested, to the City Engineer at P.O. Box 1293, Albuquerque, New Mexico 87103.

11. Indemnification. The User agrees to defend, indemnify and hold harmless the City, its officials, agents and employees from and against any and all claims, actions, suits or proceedings of any kind brought against said parties as a result of User's use of the City's Property. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give direction or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

12. Term. This Agreement shall continue until revoked by the City pursuant to Section 7 above.

13. Binding on User's Property. The covenants and obligations of the User set forth herein shall be binding on User, his heirs assigns and successors and on User's Property and constitute covenants running with User's Property until released by the City.

14. Entire Agreement. This Agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

15. Changes of Agreement. Changes to this Agreement are not binding unless made in writing, signed by both parties.

16. Construction and Severability. If any part of this Agreement is held to be invalid or unenforceable, the remainder of the Agreement will remain valid and enforceable if the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this Agreement are not part of this Agreement and will not affect the meaning or construction of any of its provisions.

CITY OF ALBUQUERQUE:

By: _____
Title: _____

Dated: _____

USER:

By: _____
Title: _____

Dated: _____

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 20___ by _____, City Engineer, Public Works Department, for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

_____
Notary Public

My Commission Expires:

_____

USER'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 20___ by _____, _____, on behalf of _____.

_____
Notary Public

My Commission Expires:

_____

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3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in

AMENDED
MASTER DRAINAGE REPORT

UNIVERSITY OF NEW MEXICO NORTH CAMPUS
LANDS WEST OF UNIVERSITY BLVD N.E.
ALBUQUERQUE CAMPUS

The University of New Mexico

University of New Mexico
Real Estate Department & Department of Facility Planning
Albuquerque, New Mexico

Original Report July, 2003
Amended September, 2005

2005.170.8

JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
FAX: 505 345-4254 ESTABLISHED 1977

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Calculations and Supplemental Information

- City Hydrology Pre-Design Meeting Recap 11
- Hydrologic Calculations 13
- Offsite Basin Map 18
- Hydraulic Calculations (Flow Master P.E. Version 6.0) 19

Drawings

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III.	Preliminary Infrastructure Plan UNM North Campus - West	Back Pocket
IV.	Ownership Map UNM North Campus - West	Back Pocket

JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

09-20-2005

Master Drainage Report

I. Introduction and Executive Summary

This plan represents a Master Drainage Plan for the University of New Mexico North Campus – West. The purpose of this plan is to 1) identify and quantify the peak discharge and volume of runoff under existing conditions, 2) calculate changes in the peak discharge and volume of runoff under proposed conditions, 3) present measures to attain favorable drainage conditions under the proposed development scenario, and 4) support proposed public drainage improvements that will be designed and constructed by City Work Order.

This plan, originally prepared, submitted and approved in July of 2003, is now being updated to reflect current existing conditions and a change in the proposed development scenario and method for handling onsite and offsite developed public flows. The text revisions herein associated with this update are italicized for the benefit of the reviewer.

The site is largely undeveloped and receives public and private offsite flows. This site is traversed by an existing public 48 inch reinforced concrete pipe storm drain that conveys offsite public flows through the site to discharge to an undeveloped natural channel at the northwest corner. The channel discharges to an existing public inlet structure located within the NMSHTD I-25 right-of-way also at the northwest corner of the site. From that point, site runoff is conveyed through NMDOT right-of-way to the Odelia Pond, a City owned, operated and maintained storm drainage facility situated downstream from the site. There are no known restrictions for the discharge from the site in the fully developed condition. An existing FEMA Flood Hazard Zone coincides with the approximate limits of the existing storm drain and earth channel.

All existing offsite flows will be accepted in the developed conditions. Developed site runoff will be directed to proposed private internal streets and will be collected ***by private storm drains and inlets outfalling to proposed public 60 inch and 66 inch extensions of the existing public 48" RCP storm drain.*** Whereas the new inlets and connector pipes will be private, the existing 48 inch RCP ***and the proposed 60 inch and 66 inch storm drain***

extensions shall be public. UNM ***or its assigns*** will construct the improvements and will be responsible for the maintenance of the private streets, private storm inlets and ***private storm drain connections***. No map revisions are proposed. ***No building construction is proposed within the FEMA mapped flood zone.***

There are no known easements of record for the existing 48 inch public storm drain and open channel. New public drainage easements will be required to support the existing facilities and the proposed modifications to these public drainage facilities. The easements will be granted by UNM via paper easement documents ***or subdivision plat as appropriate.***

II. Project Description

The site is located on the University of New Mexico North Campus – West, north of Lomas Blvd. NE. The site is bounded on the west by Interstate 25, on the north by private properties fronting onto Indian School Road NE, and on the east by properties fronting onto University Blvd NE. As shown by Panels 332, 334, 351 and 356 of 825 of the National flood Insurance Program Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, ***November 19, 2003***, a portion of these site lies within a designated flood hazard zone (Zone A). This project does not propose to amend, revise or aggravate the existing floodplain.

III. Background Documents

The following document(s) were reviewed and researched as part of the evaluation of downstream conditions and offsite flows for this project.

1. Master Plan and Preliminary Mass Grading Plan for UNM North Campus – West prepared by Jeff Mortensen & Associates, Inc. dated January 2002. This plan provides a ***preliminary*** concept for the proposed building and site modifications to UNM North Campus – West as shown on the developed conditions plan. This is pertinent as it provides an idea as to how the site may develop.
2. Existing Drainage Basins and Facilities Plan for UNM North Campus prepared by Jeff Mortensen & Associates, Inc. This plan was used to help identify and quantify offsite runoff coming from basins located on the UNM campus outside of the subject site.

3. Final Drainage Report Volume 1 & 2, I25/I40 System Interchange, prepared by URS Greiner Woodward Cylde, date March 2000. This report describes modifications to the new Frontage Road as part of the recent Big "I" Project, including the construction of additional drainage infrastructure and modifications to the existing drainage system serving as the outfall for this site and connecting to the Odelia Pond.
4. Lomas Boulevard Storm Drain Design Analysis Report, prepared by Andrews, Asbury & Robert, Inc., dated June 1991. This Report identifies quantities of offsite runoff entering Lomas Boulevard west of University Boulevard and supported the design of now existing storm drainage improvements in Lomas Boulevard designed to intercept and redirect flows previously impacting Legion Road. The Report did not address street flow capacity in Lomas Boulevard or the upstream inlets and drainage basins at University Boulevard and points east of University Boulevard.
5. ***City Hydrology Pre-Design Meeting with Jeff Mortensen and Brad Bingham, City Hydrologist. This meeting, held on July 15, 2005, was held to discuss the project requirements and the required amendment to the previously approved Master Drainage Plan resulting from the proposed change in how the developed flows will be handled (storm drain instead of open channel). A copy of the Recap is included at the end of this report.***
6. ***Lands West Interim Parking Lot Improvements and Public Water Line by Jeff Mortensen & Associates, September 2004. A portion of the existing east-west private (UNM) access road (Camino de Salud) and underlying public water line were constructed with these plans. The proposed improvements would extend the private road and public water line.***

IV. Existing Conditions

A. Offsite Flows

The site is surrounded by developed buildings. Those buildings and associated sites contribute offsite flows that impact the project. Six of the sites are UNM owned properties, (Basins C, D and N-7.2, N-5.1 and M-1U). The following is a description of all of the offsite basins that contribute runoff to the site. The basins are shown on both the existing and developed conditions plans.

1. Basin A (French Mortuary Site)

   Runoff amounting to 13 cfs generated by the French Mortuary Site is accepted and conveyed through a private storm drain that ties directly into the existing public 48 inch storm drain, which traverses the site.

2. Basin B (Galles Chevrolet)

   Runoff generated in this basin flows across paved areas behind the Galles Building and onto the SE corner of the site, which is developed as vehicle storage parking leased to Galles by UNM.

3. Basin C (Carrie Tingley Hospital)

   The majority of runoff generated by this basin is ponded in the west section of the site, however, some runoff reaches a storm drain inlet located in the parking lot south of the building. Runoff entering this inlet is conveyed through a 12 inch steel pipe with a calculated maximum capacity of 8 cfs that discharges as overland runoff onto the slope located at the southeast boundary of the site.

4. Basin D (UNM Family Health Center)

   Runoff generated from this basin's parking lot enters a private storm drain. The peak rate of ***10*** cfs discharges directly to the site as overland runoff.

5. Basin F (UNM ***OSIS***)

   This basin consists of the recently constructed UNM ***OSIS*** Building and parking lot. This site is located at the northeast boundary of the UNM North Campus – West property. 16 cfs of runoff generated on this site is collected in an internal private storm drain and discharged at the northwest corner of the property where it is accepted as overland runoff by the subject property. The runoff flows along the northern end of the property and ultimately drains in the onsite earthen channel.

6. Basin L (Legion Road)

This basin drains to existing public storm drain inlets in Legion Road. Currently the inlets located in the sump area of Legion Road are clogged. The basin includes an existing cemetery, the American Legion building and site, and a self-storage business. Theoretically, flows amounting 39 cfs generated by this basin drain through a public 36 inch public storm drain that connects to the existing 48 inch public storm drain traversing the site.

7. Basin N-7.2 (UNM)

This basin is located near the southwest corner of the UNM North Campus, northeast of the intersection of University Boulevard and Lomas Boulevard. The flows generated in the southern portion of this basin historically enter a private storm drain discharging to the existing 48 inch public storm drain. Site inspection does not reveal any apparent signs of this connection, and it appears that the runoff enters University Boulevard. Flows in the northern portion of the basin are routed through an earthen pond that overflows to University Boulevard. University Boulevard drains to the south towards existing storm inlets at Lomas that drain back to the north in a 36 inch RCP storm drain connecting to the existing 48 inch public storm drain traversing the site. Although these flows appear to drain to University, they have been analyzed for capacity purposes as draining into the 48 inch storm drain to be conservative and consistent with historical flow patterns, ***and to allow for the possibility or re-establishing this historic flow pattern in the future.***

8. Basins N-5.1 and M-1U

These basins include developed UNM properties that generate a total of 173 cfs draining to the intersection of Lomas and University. The amount of runoff intercepted and draining north to the 48 inch public storm drain has been assumed to be limited to the maximum pressure flow capacity of the 36 inch University storm drain calculated to be 107 cfs (see calculations). The inlets were not analyzed to determine if 107 cfs could actually enter the system ***to allow for possible modifications in the future without exceeding downstream capacity***. It is assumed that runoff bypassing these inlets drains

to the west in Lomas to existing downstream storm drainage improvements constructed approximately *12* years ago (reference 4) which were designed to intercept Lomas flows.

B. Onsite Flows

At present, the site is ***partially developed in a temporary manner***. Much of the site has been disturbed by grading operations. ***The aforementioned Galles lease lot is paved, as is the temporary UNMH employee parking lot located near the NW corner of the site.*** The undisturbed areas have a cover of natural vegetation. Runoff generated on site has been divided into 2 basins, Basin E and Basin G. The runoff from Basin E consists of surface runoff generated on site and draining to the beginning of the open channel. Basin G is the remainder of the site that drains to the open channel further downstream. The runoff generated by all offsite and onsite basins concentrates at the NW corner of the site and is then conveyed offsite to the Odelia Pond a city maintained facility.

C. Downstream/Outfall

The runoff from the site and from offsite basins discharges into the aforementioned natural channel and is conveyed through an underground system of 3 parallel 72 inch reinforced concrete pipes, recently constructed by the Big "I" project that travel beneath Interstate 25 to the Odelia Pond, a City of Albuquerque owned, operated and maintained drainage facility downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is reported to have adequate capacity to receive free discharge from the site in the existing and developed condition.

V. Developed Conditions

The proposed improvements consist of the construction of new buildings with associated landscaping and paving improvements. As shown by the ***Developed Conditions*** Plan, the site will continue to drain from east to west across the development area and new paving. The existing 48 inch public storm drain will be extended as a ***60 inch and 66 inch storm*** drain and a public easement will be granted for the entire length. The developed runoff will discharge along with the offsite runoff from the extended storm drain into the existing

NMDOT inlet structure and will be conveyed offsite to the City of Albuquerque detention facility, the Odelia Pond. ***UNM will grant the City a public drainage easement for the existing 48 inch storm drain and the proposed 60 inch and 66 inch extensions. The public storm drain will be maintained by the City upon acceptance by the City Engineer.***

On-site flows will be directed to the ***proposed public storm drain extensions. Basins E1 and E2 shall drain directly to private stubs connecting to the 60 inch portion and shall not drain to the proposed private streets. Flows from Basins B and C shall continue to be accepted by Basin E2 and conveyed to the proposed storm drain connection. Basin D shall continue to drain to the existing east/west access road (Camino de Salud). Basin G shall continue to accept runoff from Basin F and shall drain directly to a proposed private stub from the 66 inch public storm drain extension. Private storm inlets are proposed on the proposed Camino de Salud extension to the I-25 Frontage Road. The private roads themselves are identified as Basin H. The proposed frontage road connection will require NMDOT approval and a driveway permit.*** what? size?

The addition of the developed runoff would exceed the capacity of the existing 48 inch public storm drain. In response, the storm drain will need to be upsized to a 60 inch ***and 66 inch*** reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the ***downstream NMDOT inlet structure***.

The development will occur in phases. The first phase of the development will be the ***extension of the east/west frontage road (Camino de Salud)*** coming from University Boulevard along with the extension/upsizing of the onsite storm drain. The drainage improvements will require the granting of easement documents as a condition of work order approval. The next phase in the development will be to the ***northwest corner of the site. This area, Basin G, will drain to a 36 inch stub located at the NW corner of the basin.*** Ultimately, ***a private*** access road to the south connecting to Lomas Boulevard via Legion Road will be constructed. These improvements will include reconstruction of the existing public storm drain in Legion Road to correct the existing deficiencies. The ***Conceptual Infrastructure Plan*** appearing in the back pocket on sheet 3 shows the proposed scenario for ***the first phase of*** site development.

Land treatment percentages for the developed condition were assumed for commercial use and were done so in accordance with City of Albuquerque Design Process Manual (DPM). An impervious land treatment (D) of 90% was utilized along with a 10% landscaped land treatment (B). All basins were assumed to fully developed, allowing for free discharge in a manner consistent with this plan.

The purpose of the Developed Conditions Master Plan is to demonstrate the proposed drainage conditions under this development scenario. With this grading and drainage concept, developed site runoff will be directed to proposed private streets draining to the existing public storm drain which will be upsized and extended. The storm drain will outlet to ***an existing NMDOT inlet structure***, ultimately outfalling to the Odelia Pond.

VI. Calculations

The calculations which appear herein analyze both the existing and the anticipated developed conditions for a 100-year, 6-hour rainfall event. As stated above, an impervious land treatment of 90% and a landscaped land treatment of 10% was assumed. These coefficients where taken from Table A-5 in Section 22.22 of the City of Albuquerque Development Process Manual (DPM) for commercial development.

The Flow Master P.E. Computer program, Version 6.0 by Heasted Methods was used to evaluate the storm drain capacities for the existing public 36 inch and 48 inch storm drains that convey offsite flows in University Boulevard and through the site. Manning's equation was used with the specified "n" value of 0.013 for concrete pipe. The 36 inch storm drain in University Boulevard was determined to have a maximum capacity of 107 cfs under pressure while the 48 inch storm drain was determined to have a maximum capacity under normal (gravity) flow conditions of 211 cfs, equal to the existing flow rate.

The Flow Master program was also used to analyze the existing conditions for the onsite open channel using an "n" value of 0.030 based on DPM Table 22.3, earthen lined channel/arroyo. As shown by this calculation, the existing flow rates are contained within the existing cross-section. The Flow Master program was also used to determine private street and storm drain capacities at several analysis points. The standard City inlets were analyzed using Federal Highway Administration procedures for combination inlets. ***The***

double "C" inlets were analyzed with their throats were assumed to be fully clogged and the grates 25% clogged. As shown by the calculations, the street flows are contained within curb height, and the inlets are properly sized to accept ***20 cfs of the total 100 year peak street flow of 24 cfs. The remaining 4 cfs will continue to inlets strategically located within a sump location that will accept the remaining runoff. No onsite runoff will continue to the NMDOT right-of-way.***

VII. Conclusions

This Master Drainage Report proposes a responsible approach to managing the storm water runoff associated with the proposed phased development. Improvements consist of development of an infill area in a manner consistent with surrounding development. The introduction of additional impervious areas will cause an increase in the peak discharge rate and volume of runoff currently draining to an existing open channel. Existing developed flows draining to an existing 48 inch storm drain will not be changed. Based upon the findings of this report the following conclusions addressing key points are presented:

- There are no known easements of record for the existing drainage infrastructure that lies within the site. Due to this fact, new public drainage easements will be required for development and modifications to the underground improvements. The locations for the proposed easements are shown on sheets 2 & 3 of this UNM North Campus - West Master Plan and will be provided with the Work Order Plans.
- Offsite flows will continue to be accepted and conveyed through the site.
- The modifications to the existing infrastructure include upsizing the 48 inch storm drain to 60 inch ***and 66 inch.*** downstream of the new private system.
- The addition of the developed runoff will exceed the capacity of the existing 48 inch public storm drain at the point where the private storm drain system connects. In response, the storm drain will need to be upsized to a 60 inch reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.
- The development will occur in phases. The first phase of the development will be the ***extension to the NMDOT I-25 Frontage Road of the private*** entrance road to the site

coming from University Boulevard, along with the extension/upsizing of the onsite storm drain *to the NMDOT inlet structure*.

- The design and construction of all public drainage improvements will occur by City Work Order.
- *NMDOT review and approval will be required for all work within the NMDOT right-of-way.*
- The two proposed private roads along with proposed private storm drain improvements will have adequate capacity to convey runoff generated by the proposed development to the existing downstream public outfall.
- There are no known restrictions for the discharge of runoff to Odelia Pond, the City owned, operated and maintained storm drainage facility downstream from the site; it is believed to have adequate capacity to receive free discharge from the site in the existing and developed conditions.
- ***Construction*** will occur within the existing FEMA flood zone limits, but will not aggravate or alter the floodplain boundaries, therefore no LOMR will be required.
- ***No buildings are proposed within the existing FEMA flood zone limits, therefore no LOMR will be required.***
- All proposed drainage improvements within the site will be private, with the exception of those drainage improvements that convey public runoff.
- The public drainage improvements will require the granting of public drainage easements as a condition of Work Order approval.
- A SWPPP will be required by the contractor for this development. Along with this, a Notice of Intent will be submitted ***a minimum of 7 days*** before construction takes place.

2005.170.8

CITY OF ALBUQUERQUE
DEVELOPMENT & BUILDING SERVICES CENTER
PLANNING DEPARTMENT/HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NUMBER:_J15/D27A____ DATE:7-15-2005
CROSS REFERENCE NUMBERS: EPC_____ DRB_____ DRC_____
SUBJECT:_UNM LANDS WEST MASTER DRAINAGE PLAN/TRISERVICES _____
STREET ADDRESS:_CAMINO DE SALUD (A PRIVATE ROAD) _____
SUBDIVISION NAME: UNPLATTED LANDS OF THE UNIVERSITY OF NEW MEXICO

TYPE OF APPROVAL

__X__ PRELIMINARY PLAT
_____ SITE DEVELOPMENT PLAN
__X__ OTHER WORK ORDER/DRC APPROVAL
__X___ FINAL PLAT
_____ BUILDING PERMIT
_____ ROUGH GRADING

ATTENDEE:	ORGANIZATION:	PHONE:
_BRAD BINGHAM _____	CITY	924-3986
_JEFF MORTENSEN	JMA	345-4250

FINDINGS:

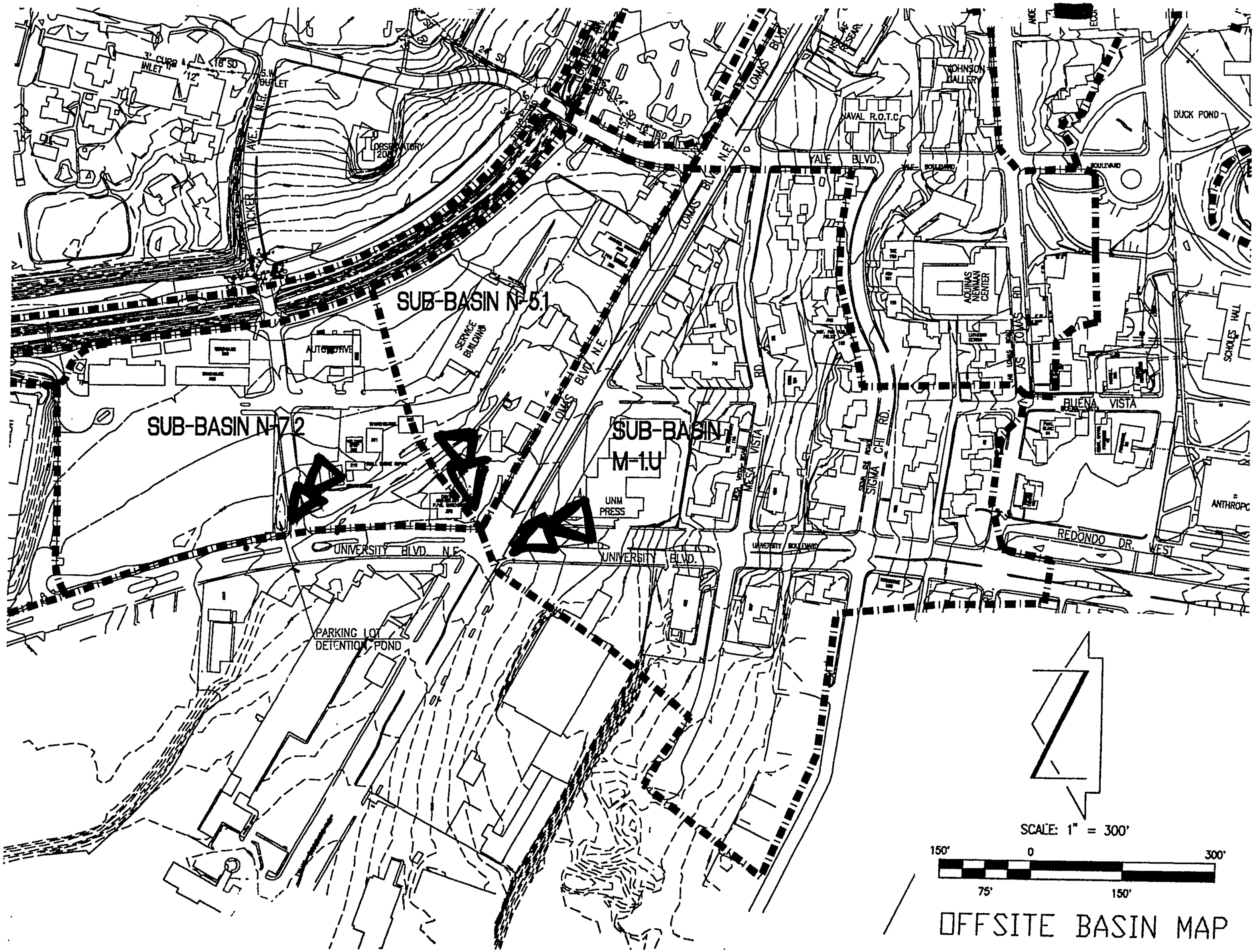
1. A MASTER DRAINAGE PLAN HAS BEEN PREVIOUSLY PREPARED, SUBMITTED AND APPROVED FOR THE UNM PROPERTY KNOWN AS LANDS WEST.
2. ORIGINALLY, IT WAS INTENDED TO ALLOW THE DEVELOPED RUNOFF FROM THE SITE, COMBINED WITH THE OFFSITE FLOWS FOLLOWING THE OLD CAMPUS WASH, TO EXIT THE NORTHWEST CORNER OF THE SITE IN A NATURALISTIC OPEN CHANNEL.
3. IT IS PROPOSED TO ABANDON THE CONCEPT ABOVE AND CONVEY THE FLOWS IN A CLOSED CONDUIT STORM DRAIN THAT WILL CONNECT DIRECTLY TO THE NMDOT OUTFALL STRUCTURE AT THE SE CORNER OF THE INDIAN SCHOOL ROAD OVERPASS OVER THE EAST FRONTAGE ROAD.
4. THE ABOVE CHANGE WILL REQUIRE AN AMENDMENT TO THE PREVIOUSLY APPROVED MASTER DRAINAGE PLAN.
5. A CLOMR AND/OR LOMR WILL NOT BE REQUIRED AS A RESULT OF THE PROPOSED AMENDMENT.
6. PERMANENT DEVELOPMENT (EG BUILDINGS), HOWEVER, MUST NOT ENCROACH INTO THE EXISTING MAPPED FLOODPLAIN, OR A LOMR WILL BE REQUIRED.
7. DESIGNING AND BUILDING A PRIVATE ACCESS ROAD ABOVE THE PROPOSED PUBLIC STORM DRAIN EXTENSION WILL BE ALLOWED AS WELL AS DESIGNING AND INSTALLING PUBLIC WATER AND SANITARY SEWER IMPROVEMENTS ALONG THAT SAME CORRIDOR.

8. DRC REVIEW AND WORK ORDER APPROVAL WILL BE REQUIRED FOR THE PUBLIC STORM DRAIN EXTENSION.
9. NMDOT APPROVALS WILL BE REQUIRED.
10. A PUBLIC STORM DRAINAGE EASEMENT FOR THE NEW EXTENSION AS WELL AS THE EXISTING 48" PIPE PRESENT ON SITE WILL BE REQUIRED AS A CONDITION OF WORK ORDER APPROVAL.
11. UNM WILL NEED TO GRANT THE NECESSARY EASEMENTS FOR ONLY THOSE LANDS IT CONTROLS.
12. THE GRANTING OF PRIVATE ACCESS EASEMENTS MAY ALSO BE REQUIRED.
13. IF PLATTING IS PROPOSED, THE PLAT SHALL GRANT THE PUBLIC STORM DRAIN EASEMENT(S) AS WELL AS SHOW THE FEMA MAPPED FLOODPLAIN; AN EASEMENT FOR THE FEMA MAPPED FLOODPLAIN WILL NOT BE REQUIRED.
14. PLATTING MAY TRIGGER REQUIRED INFRASTRUCTURE ALONG WITH AN SIA AND FINANCIAL GUARANTEES; A MUNICIPAL LIEN WILL BE AN ACCEPTABLE FORM OF FINANCIAL GUARANTY.

THE UNDERSIGNED AGREE THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE ONLY SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THE FINDINGS ARE NOT REASONABLE OR THAT THEY ARE BASED UPON INACCURATE INFORMATION.

SIGNED: Bradley L Bingham	SIGNED:
TITLE: CITY HYDROLOGIST	TITLE: CONSULTANT
DATE: 8/15/05	DATE: 08-15-2005

NOTE: PROVIDE A COPY OF THIS RECAP WITH DRAINAGE SUBMITTAL



OFFSITE BASIN MAP

Worksheet
Worksheet for Pressure Pipe

Project Description	
Worksheet	36" University Existing Storm Drain
Flow Element	Pressure Pipe
Method	Manning's Formula
Solve For	Discharge

36" UNIVERSITY STORM DRAIN

Input Data		
Pressure at 1	0.00	psi
Pressure at 2	0.00	psi
Elevation at 1	100.00	ft
Elevation at 2	86.80	ft
Length	510.00	ft
Mannings Coefficient	0.013	
Diameter	36	in

Results		
Discharge	107.30	cfs
Headloss	13.20	ft
Energy Grade at 1	103.58	ft
Energy Grade at 2	90.38	ft
Hydraulic Grade at 1	100.00	ft
Hydraulic Grade at 2	86.80	ft
Flow Area	7.1	ft^2
Wetted Perimeter	9.42	ft
Velocity	15.18	ft/s
Velocity Head	3.58	ft
Friction Slope	0.025882	ft/ft

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	48" Lands West Existing Storm Drain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

48" EXISTING STORM DRAIN

Input Data		
Mannings Coefficient	0.013	
Slope	0.018600	ft/ft
Diameter	48	in

Results		
Depth	4.00	ft
Discharge	195.89	cfs
Flow Area	12.6	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.83	ft
Percent Full	100.0	%
Critical Slope	0.016187	ft/ft
Velocity	15.59	ft/s
Velocity Head	3.78	ft
Specific Energy	7.78	ft
Froude Number	0.00	
Maximum Discharg	210.72	cfs
Discharge Full	195.89	cfs
Slope Full	0.018600	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lar
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

EXISTING OPEN CHANNEL

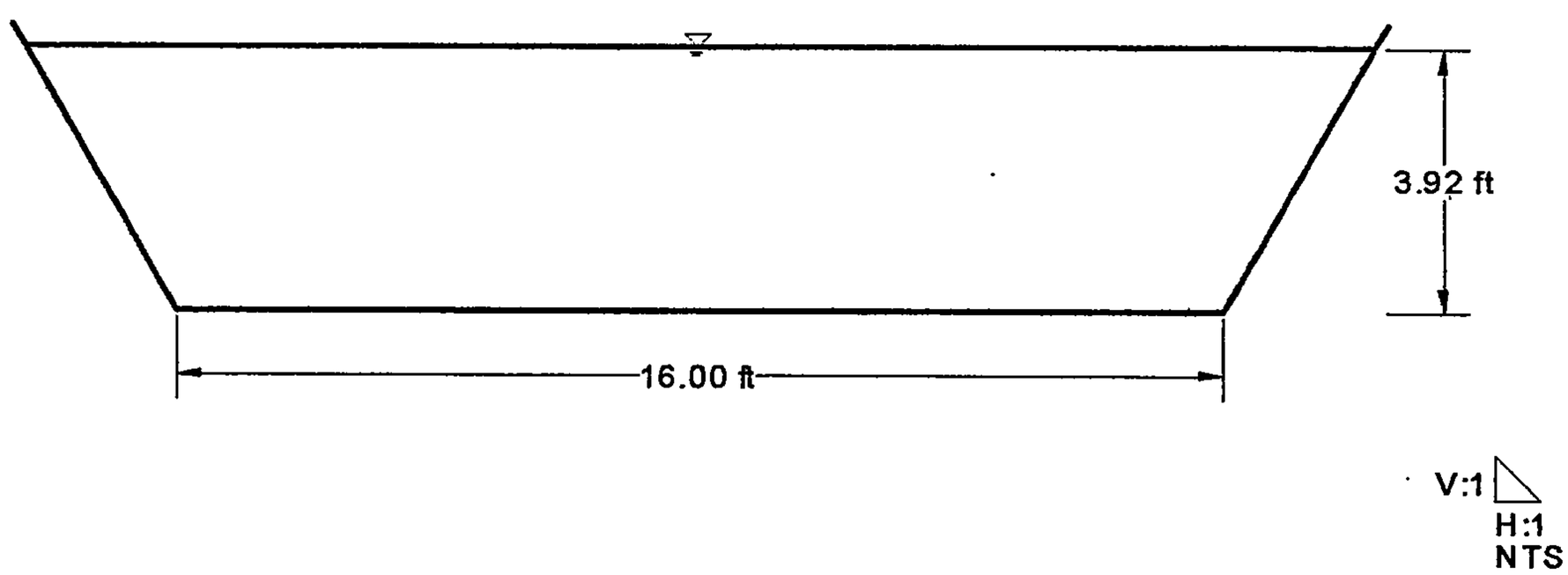
Input Data		
Mannings Coeffic	0.030	
Slope	003300	ft/ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	411.00	cfs

Results		
Depth	3.92	ft
Flow Area	71.7	ft²
Wetted Perim	25.09	ft
Top Width	20.61	ft
Critical Depth	2.65	ft
Critical Slope	0.011866	ft/ft
Velocity	5.73	ft/s
Velocity Head	0.51	ft
Specific Energ	4.43	ft
Froude Numb	0.54	
Flow Type	Subcritical	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lar
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coeffic	0.030	
Slope	003300	ft/ft
Depth	3.92	ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	411.00	cfs



Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	60" Storm Drain - Lands
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

60" STORM DRAIN
Q_{100} = 311 CFS

Input Data		
Mannings Coeffic	0.013	
Slope	013000	ft/ft
Diameter	60	in
Discharge	311.00	cfs

Results		
Depth	4.35	ft
Flow Area	18.1	ft²
Wetted Perime	12.03	ft
Top Width	3.36	ft
Critical Depth	4.71	ft
Percent Full	87.0	%
Critical Slope	0.012326	ft/ft
Velocity	17.14	ft/s
Velocity Head	4.57	ft
Specific Energy	8.92	ft
Froude Numbe	1.30	
Maximum Disc	319.41	cfs
Discharge Full	296.93	cfs
Slope Full	0.014261	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	60" Storm Drain - Lands
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

60" STORM DRAIN
$Q_{100} = 331$ CFS

Input Data		
Mannings Coeffic	0.013	
Slope	014000	ft/ft
Diameter	60	in
Discharge	331.00	cfs

Results		
Depth	4.62	ft
Flow Area	19.0	ft²
Wetted Perime	12.91	ft
Top Width	2.65	ft
Critical Depth	4.77	ft
Percent Full	92.4	%
Critical Slope	0.014011	ft/ft
Velocity	17.47	ft/s
Velocity Head	4.74	ft
Specific Energy	9.36	ft
Froude Numbe	1.15	
Maximum Disc	331.47	cfs
Discharge Full	308.14	cfs
Slope Full	0.016154	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	66" SD
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

Input Data		
Mannings Coeffic	0.013	
Slope	013500	ft/ft
Diameter	66	in
Discharge	386.00	cfs

Results		
Depth	4.46	ft
Flow Area	20.6	ft²
Wetted Perime	12.32	ft
Top Width	4.31	ft
Critical Depth	5.15	ft
Percent Full	81.0	%
Critical Slope	0.011420	ft/ft
Velocity	18.72	ft/s
Velocity Head	5.45	ft
Specific Energy	9.90	ft
Froude Numbe	1.51	
Maximum Disc	419.69	cfs
Discharge Full	390.15	cfs
Slope Full	0.013214	ft/ft
Flow Type	Supercritical	

66" STORM DRAIN
Q_{100} = 386 CFS

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	66" SD
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

66 STORM DRAIN
Q_{100} = 460 CFS

Input Data		
Mannings Coeffic	0.013	
Slope	017000	ft/ft
Diameter	66	in
Discharge	460.00	cfs

Results		
Depth	4.81	ft
Flow Area	22.0	ft²
Wetted Perime	13.30	ft
Top Width	3.64	ft
Critical Depth	5.32	ft
Percent Full	87.5	%
Critical Slope	0.016453	ft/ft
Velocity	20.87	ft/s
Velocity Head	6.77	ft
Specific Energ:	11.58	ft
Froude Numbe	1.49	
Maximum Disc	470.96	cfs
Discharge Full	437.82	cfs
Slope Full	0.018766	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	Lands West Misc. :
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

30" STUB @ 2%

Input Data		
Mannings Coeffic	0.013	
Slope	020000	ft/ft
Diameter	30	in

Results		
Depth	2.50	ft
Discharge	58.00	cfs
Flow Area	4.9	ft²
Wetted Perime	7.85	ft
Top Width	0.00	ft
Critical Depth	2.38	ft
Percent Full	100.0	%
Critical Slope	017335	ft/ft
Velocity	11.82	ft/s
Velocity Head	2.17	ft
Specific Energ:	4.67	ft
Froude Numbe	0.00	
Maximum Disc	62.40	cfs
Discharge Full	58.00	cfs
Slope Full	020000	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	Lands West Misc. !
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

36" STUB @ 2%

Input Data		
Mannings Coeffic	0.013	
Slope	020000	ft/ft
Diameter	36	in

Results		
Depth	3.00	ft
Discharge	94.32	cfs
Flow Area	7.1	ft²
Wetted Perime	9.42	ft
Top Width	0.00	ft
Critical Depth	2.87	ft
Percent Full	100.0	%
Critical Slope	017383	ft/ft
Velocity	13.34	ft/s
Velocity Head	2.77	ft
Specific Energ:	5.77	ft
Froude Numbe	0.00	
Maximum Disc	101.46	cfs
Discharge Full	94.32	cfs
Slope Full	020000	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Irregular Channel

Project Description	
Worksheet	40' F-F with Standard
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

STREET FLOW
CAMINO DE SALUD

Input Data		
Slope	020000	ft/ft
Discharg	24.00	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weighting	Horton's Method

Results		
Mannings Coefficier	0.017	
Water Surface Elev	0.44	ft
Elevation Range	0.00 to 1.00	
Flow Area	6.2	ft²
Wetted Perimeter	35.64	ft
Top Width	34.75	ft
Actual Depth	0.44	ft
Critical Elevation	0.51	ft
Critical Slope	0.007178	ft/ft
Velocity	3.86	ft/s
Velocity Head	0.23	ft
Specific Energy	0.67	ft
Froude Number	1.61	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67

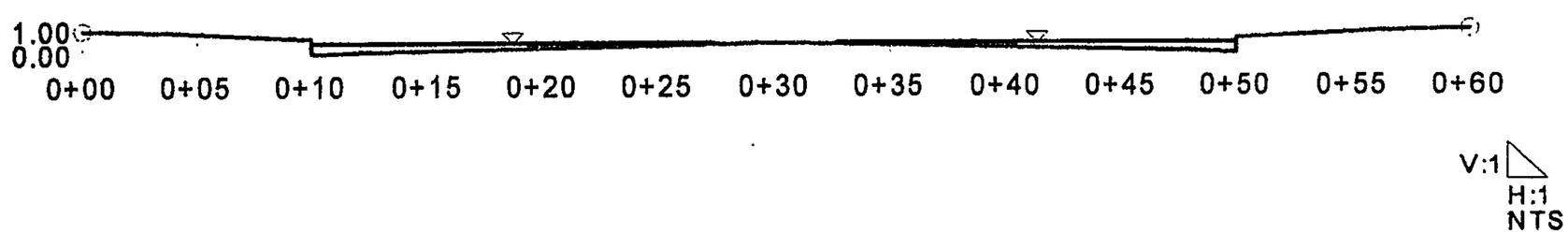
Worksheet
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+56	0.92
0+60	1.00

Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	40' F-F with Standard
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficier	0.017	
Slope	0.020000	ft/ft
Water Surface Elev	0.44	ft
Elevation Range	.00 to 1.00	
Discharge	24.00	cfs



Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On (
Solve For	Efficiency

DOUBLE "C" INLET
CAMINO DE SALUD

Input Data		
Discharge	24.00	cfs
Local Depression	1.7	in
Local Depression \	7.50	ft
Slope	0.020000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len(	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	m x 100 mm (P-1-7/8"-4")	
Clogging	25.0	%

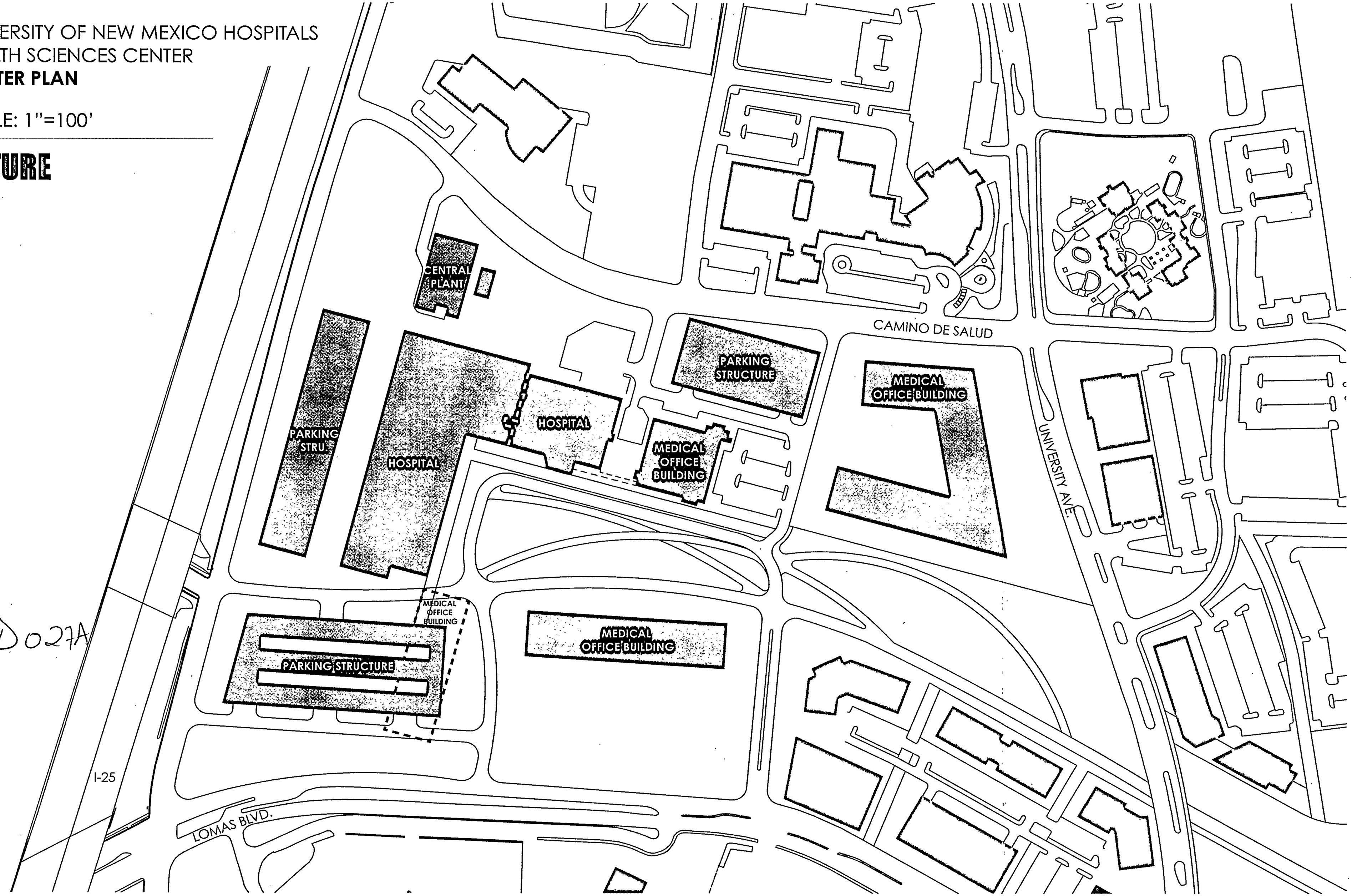
Options	
Calculation Opti	e Grate Inlet Only
Grate Flow Opti	Exclude None

Results		
Efficiency	0.43	
Intercepted Flow	10.25	cfs
Bypass Flow	13.75	cfs
Spread	20.98	ft
Depth	0.51	ft
Flow Area	4.5	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	5.34	ft/s
Splash Over Velocity	9.03	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.21	
Grate Flow Ratio	0.28	
Equivalent Cross Slo	028532	ft/ft
Active Grate Length	5.00	ft
Length Factor	0.00	
Total Interception Ler	0.00	ft

UNIVERSITY OF NEW MEXICO HOSPITALS
HEALTH SCIENCES CENTER
MASTER PLAN

SCALE: 1"=100'

FUTURE



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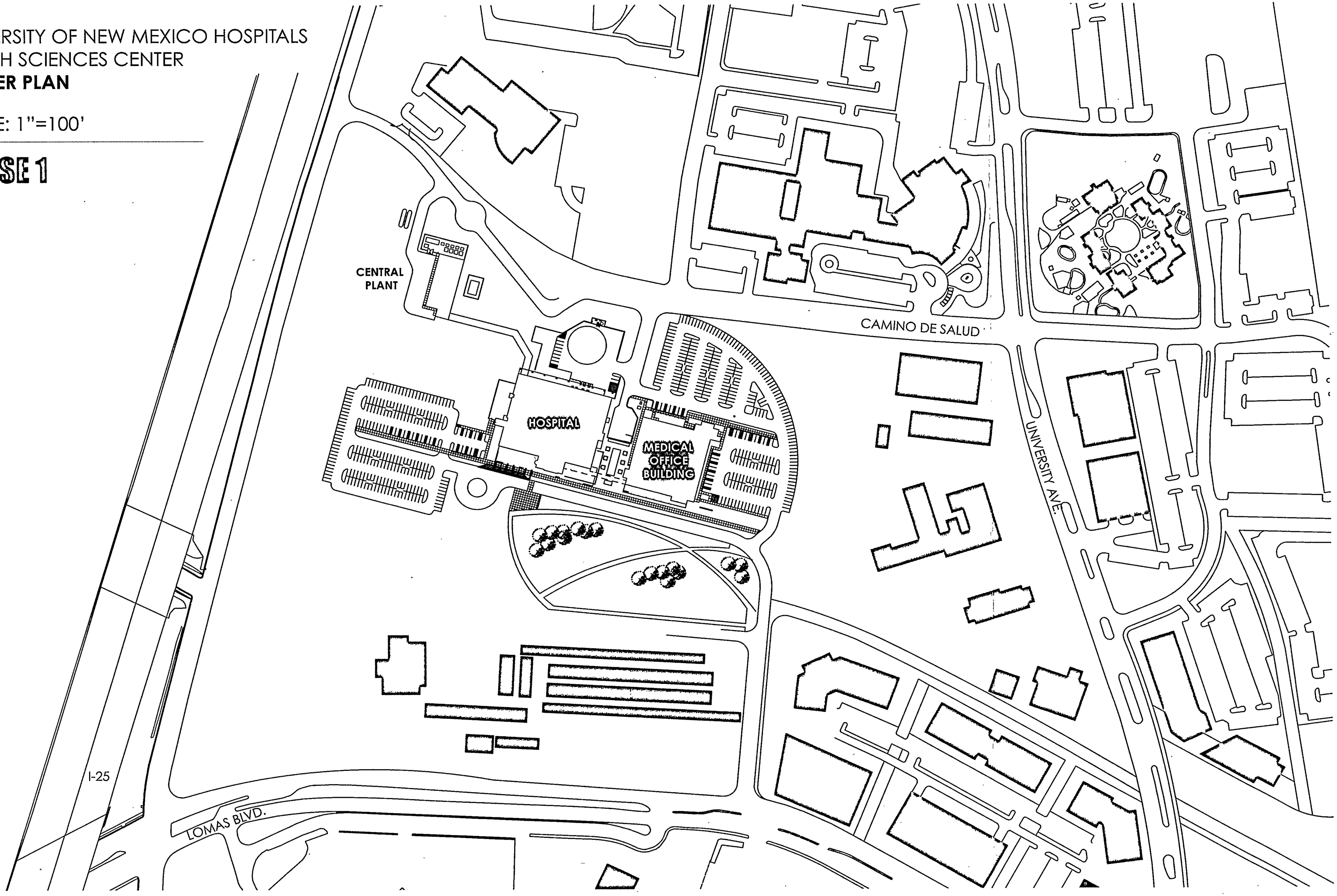
UNIVERSITY OF NEW MEXICO HOSPITALS
HEALTH SCIENCES CENTER
MASTER PLAN

SCALE: 1"=100'

PHASE 1



AMENDED
MASTER DRAINAGE REPORT

UNIVERSITY OF NEW MEXICO NORTH CAMPUS
LANDS WEST OF UNIVERSITY BLVD N.E.
ALBUQUERQUE CAMPUS

The University of New Mexico

University of New Mexico
Real Estate Department & Department of Facility Planning
Albuquerque, New Mexico

Original Report July, 2003
Amended September, 2005

2005.170.8

JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250
FAX: 505 345-4254 ESTABLISHED 1977

RECEIVED
SEP 22 2005
HYDROLOGY SECTION

CITY OF ALBUQUERQUE

THREE HUNDRED YEARS
1706 * 2006
ALBUQUERQUE
Making History

September 28, 2005

Jeffrey G. Mortensen, PE
Jeff Mortensen & Associates, Inc.
6010-B Midway Park Blvd. Ne
Albuquerque, NM 87109

Re: UNM North Campus Lands West Grading and Drainage Plan
Engineer's Stamp dated 9-21-05 (J15/D27A)

Dear Mr. Mortensen,

Based upon the information provided in your submittal dated 9-21-05, the above referenced plan is approved for Work Order for Phase I.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Rudy E. Rael, Associate Engineer
Planning Department.
Building and Development Services
BUB

C: file

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

2005.170.8

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

PROJECT TITLE: UNM North Campus - Lands West of University ZONE ATLAS/DRNG. FILE #: J15/D27A
DRB #: EPC #: WORK ORDER #:

LEGAL DESCRIPTION: Unplatted Lands of Archdiocese of Santa Fe, Southwestern Construction Co, and Sandia Found.
CITY ADDRESS: University Blvd NE

ENGINEERING FIRM: Jeff Mortensen & Assoc., Inc. CONTACT: J. Graeme Means
ADDRESS: 6010-B Midway Park Blvd. NE PHONE: (505) 345-4250
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: University of New Mexico CONTACT: Kim Murphy, Real Estate Dir
ADDRESS: 1717 Las Lomas NE, PHONE: 277-4620
CITY, STATE: Albuquerque, NM ZIP CODE: 87131

ARCHITECT: N/A CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

SURVEYOR: Jeff Mortensen and Associates CONTACT: Chuck Cala
ADDRESS: PHONE: 345-4250
CITY, STATE: ZIP CODE:

CONTRACTOR: CONTACT:
ADDRESS: PHONE:
CITY, STATE: ZIP CODE:

TYPE OF SUBMITTAL:
X DRAINAGE REPORT
DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal****
****DRB approved site plan will be TCL***
___ DRAINAGE PLAN RESUBMITTAL
___ CONCEPTUAL GRADING & DRAINAGE PLAN
___ GRADING PLAN
___ EROSION CONTROL PLAN
___ ENGINEER'S CERTIFICATION (HYDROLOGY)
___ CLOMR/LOMR
___ TRAFFIC CIRCULATION LAYOUT (TCL)
___ ENGINEER'S CERTIFICATION (TCL)
___ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:
___ SIA/FINANCIAL GUARANTEE RELEASE
___ PRELIMINARY PLAT APPROVAL
___ S. DEV. PLAN FOR SUB'D APPROVAL
___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
___ SECTOR PLAN APPROVAL
___ FINAL PLAT APPROVAL
___ FOUNDATION PERMIT APPROVAL
___ BUILDING PERMIT APPROVAL
___ CERTIFICATE OF OCCUPANCY (PERM.)
___ CERTIFICATE OF OCCUPANCY (TEMP.)
___ GRADING PERMIT APPROVAL
___ PAVING PERMIT APPROVAL
X WORK ORDER APPROVAL
___ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:
X YES
___ NO
X COPY PROVIDED

DATE SUBMITTED: 09/22/2005 BY: J. Graeme Means

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based upon the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

xc: Roger Lujan, Gil Berry, Mary Kenney, Mike McGuire

RECEIVED
SEP 22 2005
HYDROLOGY SECTION

CITY OF ALBUQUERQUE
DEVELOPMENT & BUILDING SERVICES CENTER
PLANNING DEPARTMENT/HYDROLOGY SECTION

CONFERENCE RECAP File

DRAINAGE FILE/ZONE ATLAS PAGE NUMBER: J15/D27A DATE:7-15-2005
CROSS REFERENCE NUMBERS: EPC_____ DRB_____ DRC_____
SUBJECT: UNM LANDS WEST MASTER DRAINAGE PLAN/TRISERVICES
STREET ADDRESS: CAMINO DE SALUD (A PRIVATE ROAD)
SUBDIVISION NAME: UNPLATTED LANDS OF THE UNIVERSITY OF NEW MEXICO

TYPE OF APPROVAL

X PRELIMINARY PLAT
_____ SITE DEVELOPMENT PLAN
X OTHER WORK ORDER/DRC APPROVAL
X FINAL PLAT
_____ BUILDING PERMIT
_____ ROUGH GRADING

ATTENDEE:	ORGANIZATION:	PHONE:
BRAD BINGHAM	CITY	924-3986
JEFF MORTENSEN	JMA	345-4250

FINDINGS:

1. A MASTER DRAINAGE PLAN HAS BEEN PREVIOUSLY PREPARED, SUBMITTED AND APPROVED FOR THE UNM PROPERTY KNOWN AS LANDS WEST.
2. ORIGINALLY, IT WAS INTENDED TO ALLOW THE DEVELOPED RUNOFF FROM THE SITE, COMBINED WITH THE OFFSITE FLOWS FOLLOWING THE OLD CAMPUS WASH, TO EXIT THE NORTHWEST CORNER OF THE SITE IN A NATURALISTIC OPEN CHANNEL.
3. IT IS PROPOSED TO ABANDON THE CONCEPT ABOVE AND CONVEY THE FLOWS IN A CLOSED CONDUIT STORM DRAIN THAT WILL CONNECT DIRECTLY TO THE NMDOT OUTFALL STRUCTURE AT THE SE CORNER OF THE INDIAN SCHOOL ROAD OVERPASS OVER THE EAST FRONTAGE ROAD.
4. THE ABOVE CHANGE WILL REQUIRE AN AMENDMENT TO THE PREVIOUSLY APPROVED MASTER DRAINAGE PLAN.
5. A CLOMR AND/OR LOMR WILL NOT BE REQUIRED AS A RESULT OF THE PROPOSED AMENDMENT.
6. PERMANENT DEVELOPMENT (EG BUILDINGS), HOWEVER, MUST NOT ENCROACH INTO THE EXISTING MAPPED FLOODPLAIN, OR A LOMR WILL BE REQUIRED.
7. DESIGNING AND BUILDING A PRIVATE ACCESS ROAD ABOVE THE PROPOSED PUBLIC STORM DRAIN EXTENSION WILL BE ALLOWED AS WELL AS DESIGNING AND INSTALLING PUBLIC WATER AND SANITARY SEWER IMPROVEMENTS ALONG THAT SAME CORRIDOR.

8. DRC REVIEW AND WORK ORDER APPROVAL WILL BE REQUIRED FOR THE PUBLIC STORM DRAIN EXTENSION.
9. NMDOT APPROVALS WILL BE REQUIRED.
10. A PUBLIC STORM DRAINAGE EASEMENT FOR THE NEW EXTENSION AS WELL AS THE EXISTING 48" PIPE PRESENT ON SITE WILL BE REQUIRED AS A CONDITION OF WORK ORDER APPROVAL.
11. UNM WILL NEED TO GRANT THE NECESSARY EASEMENTS FOR ONLY THOSE LANDS IT CONTROLS.
12. THE GRANTING OF PRIVATE ACCESS EASEMENTS MAY ALSO BE REQUIRED.
13. IF PLATTING IS PROPOSED, THE PLAT SHALL GRANT THE PUBLIC STORM DRAIN EASEMENT(S) AS WELL AS SHOW THE FEMA MAPPED FLOODPLAIN; AN EASEMENT FOR THE FEMA MAPPED FLOODPLAIN WILL NOT BE REQUIRED.
14. PLATTING MAY TRIGGER REQUIRED INFRASTRUCTURE ALONG WITH AN SIA AND FINANCIAL GUARANTEES; A MUNICIPAL LIEN WILL BE AN ACCEPTABLE FORM OF FINANCIAL GUARANTY.

THE UNDERSIGNED AGREE THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE ONLY SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THE FINDINGS ARE NOT REASONABLE OR THAT THEY ARE BASED UPON INACCURATE INFORMATION.

SIGNED: Bradley L Bryan	SIGNED:
TITLE: CITY HYDROLOGIST	TITLE: CONSULTANT
DATE: 8/15/05	DATE: 08-15-2005

NOTE: PROVIDE A COPY OF THIS RECAP WITH DRAINAGE SUBMITTAL

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JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

09-20-2005

Master Drainage Report

I. Introduction and Executive Summary

This plan represents a Master Drainage Plan for the University of New Mexico North Campus – West. The purpose of this plan is to 1) identify and quantify the peak discharge and volume of runoff under existing conditions, 2) calculate changes in the peak discharge and volume of runoff under proposed conditions, 3) present measures to attain favorable drainage conditions under the proposed development scenario, and 4) support proposed public drainage improvements that will be designed and constructed by City Work Order.

This plan, originally prepared, submitted and approved in July of 2003, is now being updated to reflect current existing conditions and a change in the proposed development scenario and method for handling onsite and offsite developed public flows. The text revisions herein associated with this update are italicized for the benefit of the reviewer.

The site is largely undeveloped and receives public and private offsite flows. This site is traversed by an existing public 48 inch reinforced concrete pipe storm drain that conveys offsite public flows through the site to discharge to an undeveloped natural channel at the northwest corner. The channel discharges to an existing public inlet structure located within the NMSHTD I-25 right-of-way also at the northwest corner of the site. From that point, site runoff is conveyed through NMDOT right-of-way to the Odelia Pond, a City owned, operated and maintained storm drainage facility situated downstream from the site. There are no known restrictions for the discharge from the site in the fully developed condition. An existing FEMA Flood Hazard Zone coincides with the approximate limits of the existing storm drain and earth channel.

All existing offsite flows will be accepted in the developed conditions. Developed site runoff will be directed to proposed private internal streets and will be collected ***by private storm drains and inlets outfalling to proposed public 60 inch and 66 inch extensions of the existing public 48" RCP storm drain.*** Whereas the new inlets and connector pipes will be private, the existing 48 inch RCP ***and the proposed 60 inch and 66 inch storm drain***

extensions shall be public. UNM ***or its assigns*** will construct the improvements and will be responsible for the maintenance of the private streets, private storm inlets and ***private storm drain connections***. No map revisions are proposed. ***No building construction is proposed within the FEMA mapped flood zone.***

There are no known easements of record for the existing 48 inch public storm drain and open channel. New public drainage easements will be required to support the existing facilities and the proposed modifications to these public drainage facilities. The easements will be granted by UNM via paper easement documents ***or subdivision plat as appropriate.***

II. Project Description

The site is located on the University of New Mexico North Campus – West, north of Lomas Blvd. NE. The site is bounded on the west by Interstate 25, on the north by private properties fronting onto Indian School Road NE, and on the east by properties fronting onto University Blvd NE. As shown by Panels 332, 334, 351 and 356 of 825 of the National flood Insurance Program Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, ***November 19, 2003***, a portion of these site lies within a designated flood hazard zone (Zone A). This project does not propose to amend, revise or aggravate the existing floodplain.

III. Background Documents

The following document(s) were reviewed and researched as part of the evaluation of downstream conditions and offsite flows for this project.

1. Master Plan and Preliminary Mass Grading Plan for UNM North Campus – West prepared by Jeff Mortensen & Associates, Inc. dated January 2002. This plan provides a ***preliminary*** concept for the proposed building and site modifications to UNM North Campus – West as shown on the developed conditions plan. This is pertinent as it provides an idea as to how the site may develop.
2. Existing Drainage Basins and Facilities Plan for UNM North Campus prepared by Jeff Mortensen & Associates, Inc. This plan was used to help identify and quantify offsite runoff coming from basins located on the UNM campus outside of the subject site.

3. Final Drainage Report Volume 1 & 2, I25/I40 System Interchange, prepared by URS Greiner Woodward Cylde, date March 2000. This report describes modifications to the new Frontage Road as part of the recent Big "I" Project, including the construction of additional drainage infrastructure and modifications to the existing drainage system serving as the outfall for this site and connecting to the Odelia Pond.
4. Lomas Boulevard Storm Drain Design Analysis Report, prepared by Andrews, Asbury & Robert, Inc., dated June 1991. This Report identifies quantities of offsite runoff entering Lomas Boulevard west of University Boulevard and supported the design of now existing storm drainage improvements in Lomas Boulevard designed to intercept and redirect flows previously impacting Legion Road. The Report did not address street flow capacity in Lomas Boulevard or the upstream inlets and drainage basins at University Boulevard and points east of University Boulevard.
5. ***City Hydrology Pre-Design Meeting with Jeff Mortensen and Brad Bingham, City Hydrologist. This meeting, held on July 15, 2005, was held to discuss the project requirements and the required amendment to the previously approved Master Drainage Plan resulting from the proposed change in how the developed flows will be handled (storm drain instead of open channel). A copy of the Recap is included at the end of this report.***
6. ***Lands West Interim Parking Lot Improvements and Public Water Line by Jeff Mortensen & Associates, September 2004. A portion of the existing east-west private (UNM) access road (Camino de Salud) and underlying public water line were constructed with these plans. The proposed improvements would extend the private road and public water line.***

IV. Existing Conditions

A. Offsite Flows

The site is surrounded by developed buildings. Those buildings and associated sites contribute offsite flows that impact the project. Six of the sites are UNM owned properties, (Basins C, D and N-7.2, N-5.1 and M-1U). The following is a description of all of the offsite basins that contribute runoff to the site. The basins are shown on both the existing and developed conditions plans.

1. Basin A (French Mortuary Site)

Runoff amounting to 13 cfs generated by the French Mortuary Site is accepted and conveyed through a private storm drain that ties directly into the existing public 48 inch storm drain, which traverses the site.

2. Basin B (Galles Chevrolet)

Runoff generated in this basin flows across paved areas behind the Galles Building and onto the SE corner of the site, which is developed as vehicle storage parking leased to Galles by UNM.

3. Basin C (Carrie Tingley Hospital)

The majority of runoff generated by this basin is ponded in the west section of the site, however, some runoff reaches a storm drain inlet located in the parking lot south of the building. Runoff entering this inlet is conveyed through a 12 inch steel pipe with a calculated maximum capacity of 8 cfs that discharges as overland runoff onto the slope located at the southeast boundary of the site.

4. Basin D (UNM Family Health Center)

Runoff generated from this basin's parking lot enters a private storm drain. The peak rate of ***10*** cfs discharges directly to the site as overland runoff.

5. Basin F (UNM ***OSIS***)

This basin consists of the recently constructed UNM ***OSIS*** Building and parking lot. This site is located at the northeast boundary of the UNM North Campus – West property. 16 cfs of runoff generated on this site is collected in an internal private storm drain and discharged at the northwest corner of the property where it is accepted as overland runoff by the subject property. The runoff flows along the northern end of the property and ultimately drains in the onsite earthen channel.

6. Basin L (Legion Road)

This basin drains to existing public storm drain inlets in Legion Road. Currently the inlets located in the sump area of Legion Road are clogged. The basin includes an existing cemetery, the American Legion building and site, and a self-storage business. Theoretically, flows amounting 39 cfs generated by this basin drain through a public 36 inch public storm drain that connects to the existing 48 inch public storm drain traversing the site.

7. Basin N-7.2 (UNM)

This basin is located near the southwest corner of the UNM North Campus, northeast of the intersection of University Boulevard and Lomas Boulevard. The flows generated in the southern portion of this basin historically enter a private storm drain discharging to the existing 48 inch public storm drain. Site inspection does not reveal any apparent signs of this connection, and it appears that the runoff enters University Boulevard. Flows in the northern portion of the basin are routed through an earthen pond that overflows to University Boulevard. University Boulevard drains to the south towards existing storm inlets at Lomas that drain back to the north in a 36 inch RCP storm drain connecting to the existing 48 inch public storm drain traversing the site. Although these flows appear to drain to University, they have been analyzed for capacity purposes as draining into the 48 inch storm drain to be conservative and consistent with historical flow patterns, ***and to allow for the possibility or re-establishing this historic flow pattern in the future.***

8. Basins N-5.1 and M-1U

These basins include developed UNM properties that generate a total of 173 cfs draining to the intersection of Lomas and University. The amount of runoff intercepted and draining north to the 48 inch public storm drain has been assumed to be limited to the maximum pressure flow capacity of the 36 inch University storm drain calculated to be 107 cfs (see calculations). The inlets were not analyzed to determine if 107 cfs could actually enter the system ***to allow for possible modifications in the future without exceeding downstream capacity***. It is assumed that runoff bypassing these inlets drains

to the west in Lomas to existing downstream storm drainage improvements constructed approximately *12* years ago (reference 4) which were designed to intercept Lomas flows.

B. Onsite Flows

At present, the site is ***partially developed in a temporary manner***. Much of the site has been disturbed by grading operations. ***The aforementioned Galles lease lot is paved, as is the temporary UNMH employee parking lot located near the NW corner of the site.*** The undisturbed areas have a cover of natural vegetation. Runoff generated on site has been divided into 2 basins, Basin E and Basin G. The runoff from Basin E consists of surface runoff generated on site and draining to the beginning of the open channel. Basin G is the remainder of the site that drains to the open channel further downstream. The runoff generated by all offsite and onsite basins concentrates at the NW corner of the site and is then conveyed offsite to the Odelia Pond a city maintained facility.

C. Downstream/Outfall

The runoff from the site and from offsite basins discharges into the aforementioned natural channel and is conveyed through an underground system of 3 parallel 72 inch reinforced concrete pipes, recently constructed by the Big "I" project that travel beneath Interstate 25 to the Odelia Pond, a City of Albuquerque owned, operated and maintained drainage facility downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is reported to have adequate capacity to receive free discharge from the site in the existing and developed condition.

V. Developed Conditions

The proposed improvements consist of the construction of new buildings with associated landscaping and paving improvements. As shown by the ***Developed Conditions*** Plan, the site will continue to drain from east to west across the development area and new paving. The existing 48 inch public storm drain will be extended as a ***60 inch and 66 inch storm*** drain and a public easement will be granted for the entire length. The developed runoff will discharge along with the offsite runoff from the extended storm drain into the existing

NMDOT inlet structure and will be conveyed offsite to the City of Albuquerque detention facility, the Odelia Pond. ***UNM will grant the City a public drainage easement for the existing 48 inch storm drain and the proposed 60 inch and 66 inch extensions. The public storm drain will be maintained by the City upon acceptance by the City Engineer.***

On-site flows will be directed to the ***proposed public storm drain extensions. Basins E1 and E2 shall drain directly to private stubs connecting to the 60 inch portion and shall not drain to the proposed private streets. Flows from Basins B and C shall continue to be accepted by Basin E2 and conveyed to the proposed storm drain connection. Basin D shall continue to drain to the existing east/west access road (Camino de Salud). Basin G shall continue to accept runoff from Basin F and shall drain directly to a proposed private stub from the 66 inch public storm drain extension. Private storm inlets are proposed on the proposed Camino de Salud extension to the I-25 Frontage Road. The private roads themselves are identified as Basin H. The proposed frontage road connection will require NMDOT approval and a driveway permit.*** what size?

The addition of the developed runoff would exceed the capacity of the existing 48 inch public storm drain. In response, the storm drain will need to be upsized to a 60 inch ***and 66 inch*** reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the ***downstream NMDOT inlet structure***.

The development will occur in phases. The first phase of the development will be the ***extension of the east/west frontage road (Camino de Salud)*** coming from University Boulevard along with the extension/upsizing of the onsite storm drain. The drainage improvements will require the granting of easement documents as a condition of work order approval. The next phase in the development will be to the ***northwest corner of the site. This area, Basin G, will drain to a 36 inch stub located at the NW corner of the basin.*** Ultimately, ***a private*** access road to the south connecting to Lomas Boulevard via Legion Road will be constructed. These improvements will include reconstruction of the existing public storm drain in Legion Road to correct the existing deficiencies. The ***Conceptual Infrastructure Plan*** appearing in the back pocket on sheet 3 shows the proposed scenario for ***the first phase of*** site development.

Land treatment percentages for the developed condition were assumed for commercial use and were done so in accordance with City of Albuquerque Design Process Manual (DPM). An impervious land treatment (D) of 90% was utilized along with a 10% landscaped land treatment (B). All basins were assumed to fully developed, allowing for free discharge in a manner consistent with this plan.

The purpose of the Developed Conditions Master Plan is to demonstrate the proposed drainage conditions under this development scenario. With this grading and drainage concept, developed site runoff will be directed to proposed private streets draining to the existing public storm drain which will be upsized and extended. The storm drain will outlet to ***an existing NMDOT inlet structure***, ultimately outfalling to the Odelia Pond.

VI. Calculations

The calculations which appear herein analyze both the existing and the anticipated developed conditions for a 100-year, 6-hour rainfall event. As stated above, an impervious land treatment of 90% and a landscaped land treatment of 10% was assumed. These coefficients where taken from Table A-5 in Section 22.22 of the City of Albuquerque Development Process Manual (DPM) for commercial development.

The Flow Master P.E. Computer program, Version 6.0 by Heasted Methods was used to evaluate the storm drain capacities for the existing public 36 inch and 48 inch storm drains that convey offsite flows in University Boulevard and through the site. Manning's equation was used with the specified "n" value of 0.013 for concrete pipe. The 36 inch storm drain in University Boulevard was determined to have a maximum capacity of 107 cfs under pressure while the 48 inch storm drain was determined to have a maximum capacity under normal (gravity) flow conditions of 211 cfs, equal to the existing flow rate.

The Flow Master program was also used to analyze the existing conditions for the onsite open channel using an "n" value of 0.030 based on DPM Table 22.3, earthen lined channel/arroyo. As shown by this calculation, the existing flow rates are contained within the existing cross-section. The Flow Master program was also used to determine private street and storm drain capacities at several analysis points. The standard City inlets were analyzed using Federal Highway Administration procedures for combination inlets. ***The***

double "C" inlets were analyzed with their throats were assumed to be fully clogged and the grates 25% clogged. As shown by the calculations, the street flows are contained within curb height, and the inlets are properly sized to accept ***20 cfs of the total 100 year peak street flow of 24 cfs. The remaining 4 cfs will continue to inlets strategically located within a sump location that will accept the remaining runoff. No onsite runoff will continue to the NMDOT right-of-way.***

VII. Conclusions

This Master Drainage Report proposes a responsible approach to managing the storm water runoff associated with the proposed phased development. Improvements consist of development of an infill area in a manner consistent with surrounding development. The introduction of additional impervious areas will cause an increase in the peak discharge rate and volume of runoff currently draining to an existing open channel. Existing developed flows draining to an existing 48 inch storm drain will not be changed. Based upon the findings of this report the following conclusions addressing key points are presented:

- There are no known easements of record for the existing drainage infrastructure that lies within the site. Due to this fact, new public drainage easements will be required for development and modifications to the underground improvements. The locations for the proposed easements are shown on sheets 2 & 3 of this UNM North Campus - West Master Plan and will be provided with the Work Order Plans.
- Offsite flows will continue to be accepted and conveyed through the site.
- The modifications to the existing infrastructure include upsizing the 48 inch storm drain to 60 inch ***and 66 inch.*** downstream of the new private system.
- The addition of the developed runoff will exceed the capacity of the existing 48 inch public storm drain at the point where the private storm drain system connects. In response, the storm drain will need to be upsized to a 60 inch reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.
- The development will occur in phases. The first phase of the development will be the ***extension to the NMDOT I-25 Frontage Road of the private*** entrance road to the site

coming from University Boulevard, along with the extension/upsizing of the onsite storm drain ***to the NMDOT inlet structure***.

- The design and construction of all public drainage improvements will occur by City Work Order.
- ***NMDOT review and approval will be required for all work within the NMDOT right-of-way.***
- The two proposed private roads along with proposed private storm drain improvements will have adequate capacity to convey runoff generated by the proposed development to the existing downstream public outfall.
- There are no known restrictions for the discharge of runoff to Odelia Pond, the City owned, operated and maintained storm drainage facility downstream from the site; it is believed to have adequate capacity to receive free discharge from the site in the existing and developed conditions.
- ***Construction*** will occur within the existing FEMA flood zone limits, but will not aggravate or alter the floodplain boundaries, therefore no LOMR will be required.
- ***No buildings are proposed within the existing FEMA flood zone limits, therefore no LOMR will be required.***
- All proposed drainage improvements within the site will be private, with the exception of those drainage improvements that convey public runoff.
- The public drainage improvements will require the granting of public drainage easements as a condition of Work Order approval.
- A SWPPP will be required by the contractor for this development. Along with this, a Notice of Intent will be submitted ***a minimum of 7 days*** before construction takes place.

2005.170.8

CITY OF ALBUQUERQUE
DEVELOPMENT & BUILDING SERVICES CENTER
PLANNING DEPARTMENT/HYDROLOGY SECTION

CONFERENCE RECAP

DRAINAGE FILE/ZONE ATLAS PAGE NUMBER:_J15/D27A____ DATE:7-15-2005
CROSS REFERENCE NUMBERS: EPC_____ DRB_____ DRC_____
SUBJECT:_UNM LANDS WEST MASTER DRAINAGE PLAN/TRISERVICES _____
STREET ADDRESS:_CAMINO DE SALUD (A PRIVATE ROAD) _____
SUBDIVISION NAME: UNPLATTED LANDS OF THE UNIVERSITY OF NEW MEXICO

TYPE OF APPROVAL

__X__ PRELIMINARY PLAT
_____ SITE DEVELOPMENT PLAN
__X__ OTHER WORK ORDER/DRC APPROVAL
__X___ FINAL PLAT
_____ BUILDING PERMIT
_____ ROUGH GRADING

ATTENDEE:	ORGANIZATION:	PHONE:
_BRAD BINGHAM _____	CITY	924-3986
_JEFF MORTENSEN	JMA	345-4250

FINDINGS:

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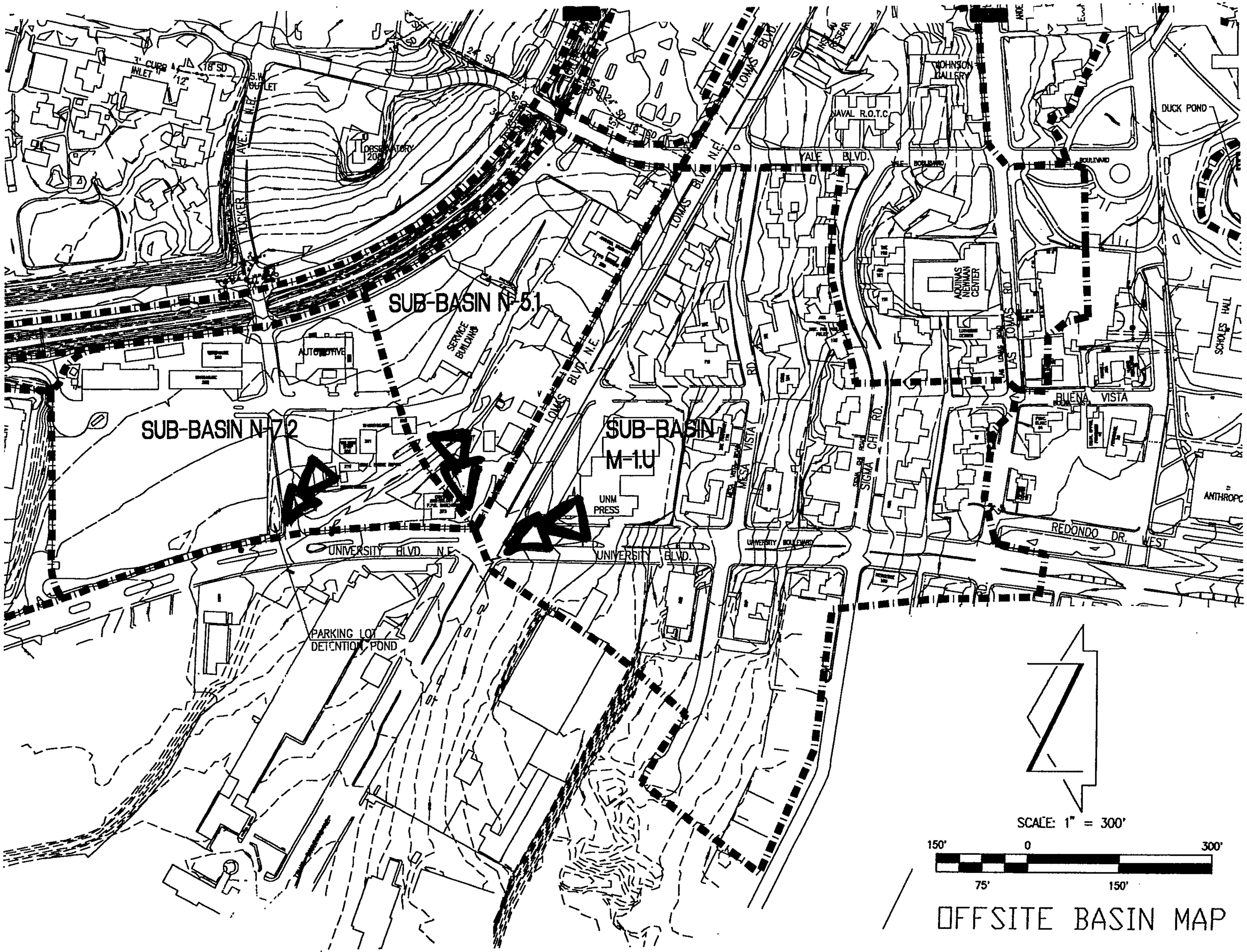
7. DESIGNING AND BUILDING A PRIVATE ACCESS ROAD ABOVE THE PROPOSED PUBLIC STORM DRAIN EXTENSION WILL BE ALLOWED AS WELL AS DESIGNING AND INSTALLING PUBLIC WATER AND SANITARY SEWER IMPROVEMENTS ALONG THAT SAME CORRIDOR.

8. DRC REVIEW AND WORK ORDER APPROVAL WILL BE REQUIRED FOR THE PUBLIC STORM DRAIN EXTENSION.
9. NMDOT APPROVALS WILL BE REQUIRED.
10. A PUBLIC STORM DRAINAGE EASEMENT FOR THE NEW EXTENSION AS WELL AS THE EXISTING 48" PIPE PRESENT ON SITE WILL BE REQUIRED AS A CONDITION OF WORK ORDER APPROVAL.
11. UNM WILL NEED TO GRANT THE NECESSARY EASEMENTS FOR ONLY THOSE LANDS IT CONTROLS.
12. THE GRANTING OF PRIVATE ACCESS EASEMENTS MAY ALSO BE REQUIRED.
13. IF PLATTING IS PROPOSED, THE PLAT SHALL GRANT THE PUBLIC STORM DRAIN EASEMENT(S) AS WELL AS SHOW THE FEMA MAPPED FLOODPLAIN; AN EASEMENT FOR THE FEMA MAPPED FLOODPLAIN WILL NOT BE REQUIRED.
14. PLATTING MAY TRIGGER REQUIRED INFRASTRUCTURE ALONG WITH AN SIA AND FINANCIAL GUARANTEES; A MUNICIPAL LIEN WILL BE AN ACCEPTABLE FORM OF FINANCIAL GUARANTY.

THE UNDERSIGNED AGREE THAT THE ABOVE FINDINGS ARE SUMMARIZED ACCURATELY AND ARE ONLY SUBJECT TO CHANGE IF FURTHER INVESTIGATION REVEALS THAT THE FINDINGS ARE NOT REASONABLE OR THAT THEY ARE BASED UPON INACCURATE INFORMATION.

SIGNED: Bradley L Bingham	SIGNED:
TITLE: CITY HYDROLOGIST	TITLE: CONSULTANT
DATE: 8/15/05	DATE: 08-15-2005

NOTE: PROVIDE A COPY OF THIS RECAP WITH DRAINAGE SUBMITTAL



OFFSITE BASIN MAP

Worksheet
Worksheet for Pressure Pipe

36" UNIVERSITY STORM DRAIN

Project Description	
Worksheet	36" University Existing Storm Drain
Flow Element	Pressure Pipe
Method	Manning's Formula
Solve For	Discharge

Input Data		
Pressure at 1	0.00	psi
Pressure at 2	0.00	psi
Elevation at 1	100.00	ft
Elevation at 2	86.80	ft
Length	510.00	ft
Mannings Coefficient	0.013	
Diameter	36	in

Results		
Discharge	107.30	cfs
Headloss	13.20	ft
Energy Grade at 1	103.58	ft
Energy Grade at 2	90.38	ft
Hydraulic Grade at 1	100.00	ft
Hydraulic Grade at 2	86.80	ft
Flow Area	7.1	ft^2
Wetted Perimeter	9.42	ft
Velocity	15.18	ft/s
Velocity Head	3.58	ft
Friction Slope	0.025882	ft/ft

© Haestad Methods, Inc.
Jeff Mortensen & Associates, Inc.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	48" Lands West Existing Storm Drain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

48" EXISTING STORM DRAIN

Input Data		
Mannings Coefficient	0.013	
Slope	0.018600	ft/ft
Diameter	48	in

Results		
Depth	4.00	ft
Discharge	195.89	cfs
Flow Area	12.6	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.83	ft
Percent Full	100.0	%
Critical Slope	0.016187	ft/ft
Velocity	15.59	ft/s
Velocity Head	3.78	ft
Specific Energy	7.78	ft
Froude Number	0.00	
Maximum Discharg	210.72	cfs
Discharge Full	195.89	cfs
Slope Full	0.018600	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lar
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

EXISTING OPEN CHANNEL

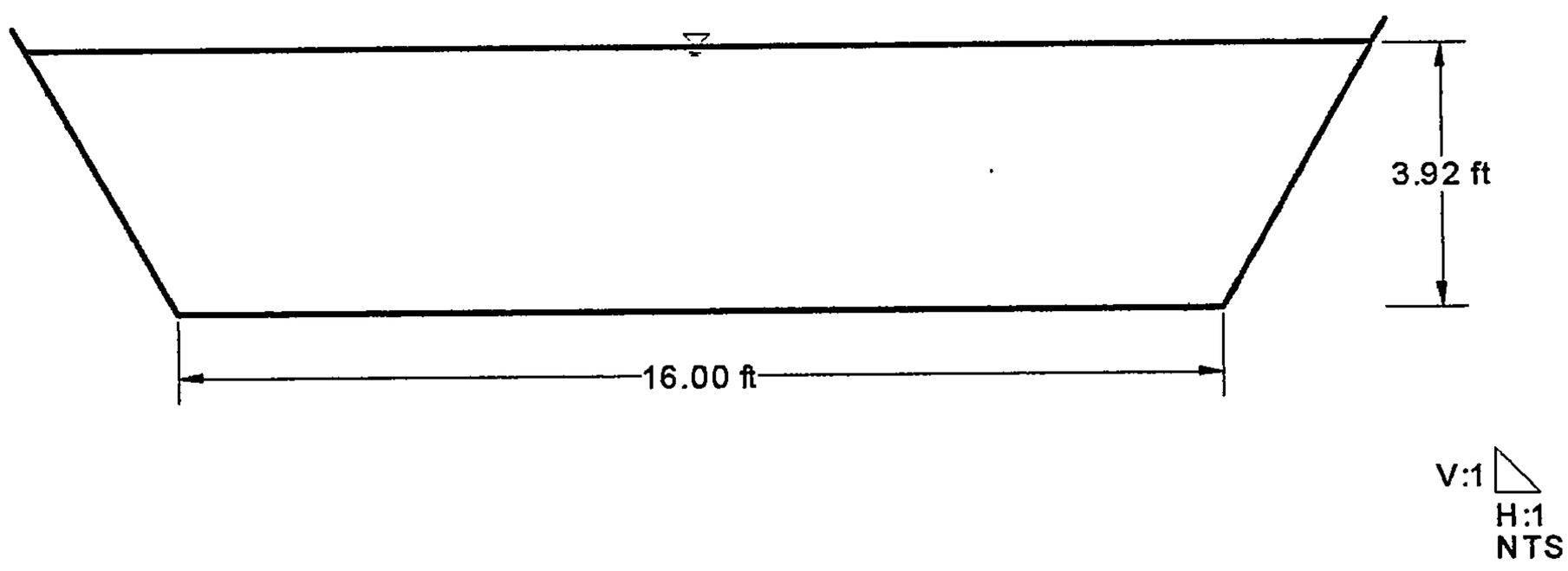
Input Data		
Mannings Coeffic	0.030	
Slope	003300	ft/ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	411.00	cfs

Results		
Depth	3.92	ft
Flow Area	71.7	ft²
Wetted Perim	25.09	ft
Top Width	20.61	ft
Critical Depth	2.65	ft
Critical Slope	0.011866	ft/ft
Velocity	5.73	ft/s
Velocity Head	0.51	ft
Specific Energ	4.43	ft
Froude Numb	0.54	
Flow Type	Subcritical	

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lar
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coeffic	0.030	
Slope	003300	ft/ft
Depth	3.92	ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	411.00	cfs



Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	60" Storm Drain - Lands
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

60" STORM DRAIN
$Q_{100} = 311$ CFS

Input Data		
Mannings Coeffic	0.013	
Slope	013000	ft/ft
Diameter	60	in
Discharge	311.00	cfs

Results		
Depth	4.35	ft
Flow Area	18.1	ft²
Wetted Perime	12.03	ft
Top Width	3.36	ft
Critical Depth	4.71	ft
Percent Full	87.0	%
Critical Slope	0.012326	ft/ft
Velocity	17.14	ft/s
Velocity Head	4.57	ft
Specific Energy	8.92	ft
Froude Numbe	1.30	
Maximum Disc	319.41	cfs
Discharge Full	296.93	cfs
Slope Full	0.014261	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	60" Storm Drain - Lands
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

60" STORM DRAIN
Q_{100} = 331 CFS

Input Data		
Mannings Coeffic	0.013	
Slope	014000	ft/ft
Diameter	60	in
Discharge	331.00	cfs

Results		
Depth	4.62	ft
Flow Area	19.0	ft²
Wetted Perime	12.91	ft
Top Width	2.65	ft
Critical Depth	4.77	ft
Percent Full	92.4	%
Critical Slope	0.014011	ft/ft
Velocity	17.47	ft/s
Velocity Head	4.74	ft
Specific Energy	9.36	ft
Froude Numbe	1.15	
Maximum Disc	331.47	cfs
Discharge Full	308.14	cfs
Slope Full	0.016154	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	66" SD
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

66" STORM DRAIN
Q_{100} = 386 CFS

Input Data		
Mannings Coeffic	0.013	
Slope	013500	ft/ft
Diameter	66	in
Discharge	386.00	cfs

Results		
Depth	4.46	ft
Flow Area	20.6	ft²
Wetted Perime	12.32	ft
Top Width	4.31	ft
Critical Depth	5.15	ft
Percent Full	81.0	%
Critical Slope	0.011420	ft/ft
Velocity	18.72	ft/s
Velocity Head	5.45	ft
Specific Energ;	9.90	ft
Froude Numbe	1.51	
Maximum Disc	419.69	cfs
Discharge Full	390.15	cfs
Slope Full	0.013214	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	66" SD
Flow Element	Circular Chann
Method	Manning's Forr
Solve For	Channel Depth

66 STORM DRAIN
Q_{100} = 460 CFS

Input Data		
Mannings Coeffic	0.013	
Slope	017000	ft/ft
Diameter	66	in
Discharge	460.00	cfs

Results		
Depth	4.81	ft
Flow Area	22.0	ft²
Wetted Perime	13.30	ft
Top Width	3.64	ft
Critical Depth	5.32	ft
Percent Full	87.5	%
Critical Slope	0.016453	ft/ft
Velocity	20.87	ft/s
Velocity Head	6.77	ft
Specific Energ:	11.58	ft
Froude Numbe	1.49	
Maximum Disc	470.96	cfs
Discharge Full	437.82	cfs
Slope Full	0.018766	ft/ft
Flow Type	Supercritical	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	Lands West Misc. S
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

30" STUB @ 2%

Input Data		
Mannings Coeffic	0.013	
Slope	020000	ft/ft
Diameter	30	in

Results		
Depth	2.50	ft
Discharge	58.00	cfs
Flow Area	4.9	ft²
Wetted Perime	7.85	ft
Top Width	0.00	ft
Critical Depth	2.38	ft
Percent Full	100.0	%
Critical Slope	017335	ft/ft
Velocity	11.82	ft/s
Velocity Head	2.17	ft
Specific Energy	4.67	ft
Froude Numbe	0.00	
Maximum Disc	62.40	cfs
Discharge Full	58.00	cfs
Slope Full	020000	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Circular Channel

Project Description	
Worksheet	Lands West Misc. S
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

36" STUB @ 2%

Input Data		
Mannings Coeffic	0.013	
Slope	020000	ft/ft
Diameter	36	in

Results		
Depth	3.00	ft
Discharge	94.32	cfs
Flow Area	7.1	ft²
Wetted Perime	9.42	ft
Top Width	0.00	ft
Critical Depth	2.87	ft
Percent Full	100.0	%
Critical Slope	017383	ft/ft
Velocity	13.34	ft/s
Velocity Head	2.77	ft
Specific Energy	5.77	ft
Froude Numbe	0.00	
Maximum Disc	101.46	cfs
Discharge Full	94.32	cfs
Slope Full	020000	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Irregular Channel

Project Description	
Worksheet	40' F-F with Standard
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

STREET FLOW
CAMINO DE SALUD

Input Data		
Slope	020000	ft/ft
Discharg	24.00	cfs

Options	
Current Roughness Methc	ved Lotter's Method
Open Channel Weighting	ved Lotter's Method
Closed Channel Weighting	Horton's Method

Results		
Mannings Coefficier	0.017	
Water Surface Elev	0.44	ft
Elevation Range	0.00 to 1.00	
Flow Area	6.2	ft²
Wetted Perimeter	35.64	ft
Top Width	34.75	ft
Actual Depth	0.44	ft
Critical Elevation	0.51	ft
Critical Slope	0.007178	ft/ft
Velocity	3.86	ft/s
Velocity Head	0.23	ft
Specific Energy	0.67	ft
Froude Number	1.61	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67

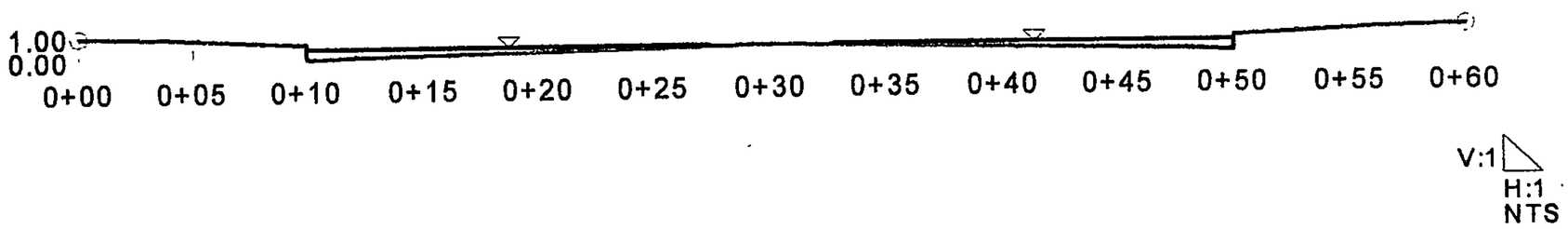
Worksheet
Worksheet for Irregular Channel

Natural Channel Points	
Station (ft)	Elevation (ft)
0+56	0.92
0+60	1.00

Cross Section
Cross Section for Irregular Channel

Project Description	
Worksheet	40' F-F with Standard
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficier	0.017	
Slope	0.020000	ft/ft
Water Surface Elev:	0.44	ft
Elevation Range	.00 to 1.00	
Discharge	24.00	cfs



Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On (
Solve For	Efficiency

DOUBLE "C" INLET
CAMINO DE SALUD

Input Data		
Discharge	24.00	cfs
Local Depression	1.7	in
Local Depression \	7.50	ft
Slope	0.020000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficie	0.017	
Curb Opening Len(	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	m x 100 mm (P-1-7/8"-4")	
Clogging	25.0	%

Options	
Calculation Opti	e Grate Inlet Only
Grate Flow Opti	Exclude None

Results		
Efficiency	0.43	
Intercepted Flow	10.25	cfs
Bypass Flow	13.75	cfs
Spread	20.98	ft
Depth	0.51	ft
Flow Area	4.5	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	5.34	ft/s
Splash Over Velocity	9.03	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.21	
Grate Flow Ratio	0.28	
Equivalent Cross Slo	028532	ft/ft
Active Grate Length	5.00	ft
Length Factor	0.00	
Total Interception Ler	0.00	ft

City of Albuquerque
P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 14, 2003

Jeff Mortensen, PE
Jeff Mortensen & Associates, Inc
6010-B Midway Park Blvd. NE
Albuquerque, NM 87109

Re: UNM North Campus – West Drainage Master Plan
Engineer's Stamp dated 7-11-03 (J15/D27A)

Dear Mr. Mortensen,

Based upon the information provided in your submittal dated 7-14-03, the above referenced DMP is approved for Work Order and any subsequent development must adhere to this plan.

If you have any questions, you can contact me at 924-3986.

Sincerely,

Bradley L. Bingham, PE
Sr. Engineer, Planning Dept.
Development and Building Services

C: file

THE CITY OF ALBUQUERQUE IS AN EQUAL OPPORTUNITY/REASONABLE ACCOMMODATION EMPLOYER

JMA 2002.170.9

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003rd)

J-15/D27A

PROJECT TITLE: UNM NORTH CAMPUS - WEST
ZONE ATLAS/DRNG. FILE #: J15
DRB #: EPC #:
WORK ORDER #:

LEGAL DESCRIPTION: UNPLATTED LANDS OF ARCHDIOCESE OF SANTA FE, SOUTHWESTERN CONSTRUCTION COMPANY AND SANDIA FOUNDATION

CITY ADDRESS: 1201 UNIVERSITY BOULEVARD NE

ENGINEERING FIRM: JEFF MORTENSEN & ASSOC., INC.
ADDRESS: 6010-B MIDWAY PARK BLVD. NE
CITY, STATE: ALBUQUERQUE, NM
CONTACT: DAMIAN G. LUNA
PHONE: (505) 345-4250
ZIP CODE: 87109

OWNER: UNIVERSITY OF NEW MEXICO
ADDRESS: SCHOLES HALL – ROOM 242
CITY, STATE: ALBUQUERQUE, NM
CONTACT: KIM MURPHY
PHONE: (505) 277-4620
ZIP CODE: 87131

ARCHITECT: N/A
ADDRESS:
CITY, STATE:
CONTACT:
PHONE:
ZIP CODE:

SURVEYOR: N/A
ADDRESS:
CITY, STATE:
CONTACT:
PHONE:
ZIP CODE:

CONTRACTOR: N/A
ADDRESS:
CITY, STATE:
CONTACT:
PHONE:
ZIP CODE:

TYPE OF SUBMITTAL:

- X DRAINAGE REPORT
- ___ DRAINAGE PLAN 1st SUBMITTAL, ***REQUIRES TCL or equal***
- ___ DRAINAGE PLAN RESUBMITTAL
- ___ CONCEPTUAL GRADING & DRAINAGE PLAN
- ___ GRADING PLAN
- ___ EROSION CONTROL PLAN
- ___ ENGINEER'S CERTIFICATION (HYDROLOGY)
- ___ CLOMR/LOMR
- ___ TRAFFIC CIRCULATION LAYOUT (TCL)
- ___ ENGINEER'S CERTIFICATION (TCL)
- ___ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
- ___ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

- ___ SIA/FINANCIAL GUARANTEE RELEASE
- ___ PRELIMINARY PLAT APPROVAL
- ___ S. DEV. PLAN FOR SUB'D APPROVAL
- ___ S. DEV. PLAN FOR BLDG. PERMIT APPROVAL
- ___ SECTOR PLAN APPROVAL
- ___ FINAL PLAT APPROVAL
- ___ FOUNDATION PERMIT APPROVAL
- ___ BUILDING PERMIT APPROVAL
- ___ CERTIFICATE OF OCCUPANCY (PERM.)
- ___ CERTIFICATE OF OCCUPANCY (TEMP.)
- ___ GRADING PERMIT APPROVAL
- ___ PAVING PERMIT APPROVAL
- X WORK ORDER APPROVAL
- ___ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ___ YES
- ___ NO
- ___ COPY PROVIDED

RECEIVED JUL 14 2003 HYDROLOGY SECTION

DATE SUBMITTED: 7/14/03 BY: DAMIAN G. LUNA

Requests for approvals of Site Development Plans and/or Subdivision Plats shall be accompanied by a drainage submittal. The particular nature, location and scope of the proposed development defines the degree of drainage detail. One or more of the following levels of submittal may be required based upon the following:

1. **Conceptual Grading and Drainage Plan**: Required for approval of Site Development Plans greater than five (5) acres and Sector Plans.
2. **Drainage Plans**: Required for building permits, grading permits, paving permits and site plans less than five (5) acres.
3. **Drainage Report**: Required for subdivisions containing more than ten (10) lots or constituting five (5) acres or more.

JOB # 2002.170.9

UNIVERSITY OF NEW MEXICO

NORTH CAMPUS -WEST

MASTER DRAINAGE REPORT

AND

CALCULATIONS

JULY 2003

RECEIVED
JUL 14 2003
HYDROLOGY SECTION

JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

07-11-2003

JEFF MORTENSEN AND ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE NEW MEXICO 87109
ENGINEERS SURVEYORS (505) 345-4250

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Master Drainage Report

I.	Introduction and Executive Summary	1
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Calculations and Supplemental Information

▪ Hydrology Calculations	12
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▪ Type 3 Covenant and Agreement Example	38

Drawings

I.	Master Plan Existing Conditions Drainage UNM North Campus – West	Back Pocket
II.	Master Plan Developed Conditions Drainage UNM North Campus – West	Back Pocket
III.	Development Plan UNM North Campus West	Back Pocket

Master Drainage Report

I. Introduction and Executive Summary

This plan represents a Master Drainage Plan for University of New Mexico North Campus – West. The purpose of this plan is to: 1) identify and quantify the peak discharge and volume of runoff under existing conditions, 2) calculate changes in the peak discharge and volume of runoff under proposed conditions, 3) present measures to attain favorable drainage conditions under the proposed development scenario, and 4) support proposed public drainage improvements that will be designed and constructed by City Work Order.

The site is largely undeveloped and receives public and private offsite flows. This site is traversed by an existing public 48 in. reinforced concrete pipe storm drain that conveys offsite public flows through the site to discharge to an undeveloped natural channel at the northwest corner. The channel discharges to an existing public inlet structure located within the NMSHTD I-25 right-of-way also at the northwest corner of the site. From that point, site runoff is conveyed through NMSHTD right-of-way to the Odelia Pond, a City owned, operated and maintained storm drainage facility situated downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is believed to have adequate capacity to receive free discharge from the site in the fully developed condition. An existing FEMA Flood Hazard Zone coincides with the approximate limits of the existing storm drain and earthen channel.

All existing offsite flows will be accepted in the developed conditions. Developed site runoff will be directed to proposed private internal streets and will be collected by private storm inlets and public storm drains outfalling to an improved open channel located near the northwest corner of the site. Whereas the new inlets and connector pipes will be private, the existing 48 in. RCP and any modifications thereto shall remain public. This open channel will be lined with rip-rap with the bottom to remain as a stable landscaped channel. UNM will construct the improvements and will be responsible for the maintenance of the private streets, private storm inlets and open channel. The open

channel improvements will be contained within the limits of the existing floodplain, and no map revisions are proposed.

There are no known easements of record for the existing 48 in. public storm drain and open channel. New public drainage easements will be required to support the existing facilities and the proposed modifications to these public drainage facilities. The easements will be granted by UNM via paper easement documents. No platting is proposed at this time. UNM will also provide a Type 3 Agreement and Covenant for maintenance of the open channel. A typical example of this drainage covenant can be found in the C.O.A. DPM Chapter 17 and within this report.

II. Project Description

The site is located on the University of New Mexico North Campus – West, north of Lomas Blvd. NE. The site is bounded on the west by Interstate 25, on the north by private properties fronting onto Indian School Road NE, and on the east by properties fronting onto University Blvd NE. As shown by Panels 332, 334, 351 and 356 of 825 of the National Flood Insurance Program Flood Insurance Rate Maps published by FEMA for Bernalillo County, New Mexico, September 20,1996 a portion of this site lies within a designated flood hazard zone (Zone A). The existing and developed flows will continue to be confined to this floodplain, which overlaps a portion the existing 48 in. public storm drain and all of the earthen channel. This project does not propose to amend, revise or aggravate the existing floodplain.

III. Background Documents

The following document(s) were reviewed and researched as part of the evaluation of downstream conditions and offsite flows for this project.

1. Master Plan and Preliminary Mass Grading Plan for UNM North Campus – West prepared by Jeff Mortensen & Associates, Inc. dated January 2002. This plan provides a concept for the proposed building and site modifications to UNM North Campus – West as shown on the developed conditions and development plan. This is pertinent as it provides an idea as to how the site may develop.
2. Existing Drainage Basins and Facilities Plan for UNM North Campus prepared by Jeff Mortensen & Associates, Inc. This plan was used to help identify and quantify offsite runoff coming from basins located on the UNM campus outside of the subject site.
3. Final Drainage Report Volume 1 & 2, I25/I40 System Interchange, prepared by URS Greiner Woodward Clyde, dated March 2000. This report describes modifications to the new Frontage Road as part of the recent Big "I" Project, including the construction of additional drainage infrastructure and modifications to the existing drainage system serving as the outfall for this site and connecting to the Odelia Pond.
4. Lomas Boulevard Storm Drain Design Analysis Report, prepared by Andrews, Asbury & Robert, Inc., dated June 1991. This Report identifies quantities of offsite runoff entering Lomas Boulevard west of University Boulevard and supported the design of now existing storm drainage improvements in Lomas Boulevard designed to intercept and redirect flows previously impacting Legion Road. The Report did not address street flow capacity in Lomas Boulevard or the upstream inlets and drainage basins at University Boulevard and points east of University Boulevard.

IV. Existing Conditions

A. Offsite Flows

The site is surrounded by developed buildings. Those buildings and associated sites contribute offsite flows which impact the project. Six of the sites are UNM owned properties, (Basins C, D and N-7.2, N-5.1 and M-1U.) The following is a description of all of the offsite basins which contribute runoff to the site. The basins are shown on both the existing and developed conditions plans.

1. Basin A (French Mortuary Site)

   Runoff amounting to 13 cfs generated by the French Mortuary Site is accepted and conveyed through a private storm drain that ties directly into the existing public 48 in. storm drain which traverses the site.

2. Basin B (Galles Chevrolet)

   Runoff generated in this basin flows across paved areas behind the Galles Building and onto the SE corner of the site which is developed as vehicle storage parking leased to Galles by UNM.

3. Basin C (Carrie Tingley Hospital)

   The majority of runoff generated by this basin is ponded in the west section of the site, however, some runoff reaches a storm drain inlet located in the parking lot south of the building. Runoff entering this inlet is conveyed through a 12 in. steel pipe with a calculated maximum capacity of 8 cfs which discharges as overland runoff onto the slope located at the southeast boundary of the site.

4. Basin D (UNM Family Health Center)

   Runoff generated from this basin's parking lot enters a private storm drain. The peak rate of 8 cfs discharges directly to the site as overland runoff.

5. Basin F (UNM ASIC)

   This basin consists of the recently constructed UNM ASIC Building and parking lot. This site is located at the northeast boundary of the UNM North Campus – West property. 16 cfs of runoff generated on this site is collected in an internal private storm drain and discharged at the northwest corner of the property where it is accepted as overland runoff by the subject property. The runoff flows along the northern end of the property and ultimately drains into the onsite earthen channel.

6. Basin L (Legion Road)

   This basin drains to existing public storm drain inlets in Legion Road. Currently the inlets located in the sump area of Legion Road are clogged. The basin includes an existing cemetery, the American Legion building and site, and a self-storage business. Theoretically, flows amounting to 39 cfs generated by this basin drain through a public 36 in. public storm drain that connects to the existing 48 in. public storm drain traversing the site.

7. Basin N-7.2 (UNM)

   This basin is located near the southwest corner of the UNM North Campus, it lies northeast of the intersection of University Boulevard and Lomas Boulevard. The flows generated in the southern portion of basin historically enter a private storm drain discharging to the existing 48 in. public storm drain. Site inspection does not reveal any apparent signs of this connection, and it appears that the runoff enters University Boulevard. Flows in the northern portion of the basin are routed through an earthen pond that overflows to University Boulevard. University Boulevard drains to the south towards existing storm inlets at Lomas which drain back to the north in a 36 in. RCP storm drain connecting to the existing 48 in. public storm drain traversing the site. Although these flows appear to drain to University, they have been analyzed for capacity purposes as draining into the 48 in. storm drain to be conservative and consistent with historical flow patterns.

8. Basins N-5.1 and M-1U

   These Basins include developed UNM properties which generate a total of 173 cfs draining to the intersection of Lomas and University. The amount of runoff intercepted and draining north to the 48 in. public storm drain has been assumed to be limited to the maximum pressure flow capacity of the 36 in. University storm drain calculated to be 107 cfs (see calculations). The inlets were not analyzed to determine if 107 cfs can actually enter the system. It is assumed that runoff bypassing these inlets drains to the west in Lomas to existing downstream storm drainage improvements constructed approximately 10 years ago (reference 4) which were designed to intercept Lomas flows.

B. Onsite Flows

At present the site is undeveloped. Much of the site has been disturbed by grading operations. The undisturbed areas have a cover of natural vegetation. Runoff generated on site has been divided into 2 Basins, Basin E and Basin G. The runoff from basin E consists of surface runoff generated on site and draining to the beginning of the open channel. Basin G is the remainder of the site which drains to the open channel further downstream. The runoff generated by all offsite and onsite basins concentrates at the NW corner of the site and is then conveyed offsite to the Odelia Pond a city maintained facility.

C. Downstream/Outfall

The runoff from the site and from offsite basins discharges into the aforementioned natural channel and is conveyed through an underground system of 3 parallel 72 in. reinforced concrete pipes, recently constructed by the Big "I" project that travel beneath Interstate 25 to the Odelia Pond, a City of Albuquerque owned, operated and maintained drainage facility downstream from the site. There are no known restrictions for the discharge of runoff to that existing system; it is reported to have adequate capacity to receive free discharge from the site in the existing and developed condition.

V. Developed Conditions

The proposed improvements consist of the construction of new buildings with associated landscaping and paving improvements. As shown by the Grading Plan the site will continue to drain from east to west across the development area and new paving. The existing 48 in. public storm drain will be extended as a 60 in. storm drain and a public easement will be granted for the entire length. The developed runoff will discharge along with the offsite runoff from the extended storm drain into the existing onsite open channel and will be conveyed offsite to the City of Albuquerque detention facility, the Odelia Pond. The existing open channel will be improved with rip-rap lining with the bottom to remain naturalistic with some aesthetic modifications. The future improvements to the open channel and storm drain will be developed in accordance with

City standards. UNM will maintain the channel and will provide the City with an Agreement and Covenant. A public drainage easement will be granted to the City for the channel. The existing 48 in. storm drain and 60 in RCP extension will be maintained by the City.

On-site flows will be directed to the two proposed private roads on site. Basin E2 and the offsite flows impacting it from basins B and C are assumed to split between the north/south and east/west access roads. Basins D, E, and E3 will drain to the east/west access road. Half of Basin E1 will drain to the north/south access road and the remaining half will drain to the cul-de-sac. Basin G will drain directly the channel. Private storm inlets are proposed on both the proposed access roads. The addition of the developed runoff will exceed the capacity of the existing 48 inch public storm drain. In response the storm drain will need to be upsized to a 60" reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.

The development will occur in phases. The first phase of the development will be the entrance road to the site coming from University Boulevard along with the extension/upsizing of the onsite storm drain and improvements to the public open channel. The drainage improvements will require the granting of easement documents as a condition of work order approval. The next phase in the development will be to the northern section of the site. Ultimately, an access road to the south connecting to Lomas Boulevard via Legion Road will be constructed. These improvements will include reconstruction of the existing public storm drain in Legion Road to correct the existing deficiencies. The Development Plan appearing in the back pocket on sheet 3, shows the proposed scenario for site development.

Land treatment percentages for the developed condition were assumed for commercial use and were done so in accordance with City of Albuquerque Design Process Manual (DPM). An impervious land treatment (D) of 90% was utilized along with a 10%

landscaped land treatment (B). All basins were assumed to fully developed, allowing for free discharge in a manner consistent with this plan.

VI. Grading Plan

The Developed Conditions Master Plan on sheet 2 of 3 shows: 1) Existing grades indicated by spot elevations and contours at 2'-0" intervals as taken from a University of New Mexico aerial survey prepared by Bohannan-Huston, 1991, 2) proposed conceptual grades indicated by spot elevations and contours at 2'-0" intervals, taken from the Jeff Mortensen & Associates, Inc. Master Plan (Reference 1), 3) proposed road and conceptual building improvements taken from the JMA Master Plan (Reference 1), 4) the limit and character of existing improvements, 5) the limit and character of the proposed public storm drainage improvements and required easements and 6) continuity between existing and proposed grades.

The purpose of the Developed Conditions Master Plan and grading shown therein is to demonstrate the proposed drainage conditions under this development scenario. With this grading concept, developed site runoff will be directed to proposed private streets draining to the existing public storm drain which will be upsized and extended. The storm drain will outlet to a rip-rap lined open channel, ultimately outfalling to the Odelia Pond.

VII. Calculations

The calculations which appear herein analyze both the existing and the anticipated developed conditions for a 100-year, 6-hour rainfall event. As stated above, an impervious land treatment of 90% and a landscaped land treatment of 10% was assumed. These coefficients where taken from Table A-5 in Section 22.2. of the City of Albuquerque Development Process Manual (DPM) for commercial development.

The Flow Master PE. Computer program, version 6.0 by Heasted Methods was used to evaluate the storm drain capacities for the existing public 36 and 48 in. storm drains which convey offsite flows in University Boulevard and through the site. Manning's equation was used with the specified "n" value of 0.013 for concrete pipe. The 36 in. storm drain in University Boulevard was determined to have a maximum capacity of 107 cfs under pressure while the 48 in. storm drain was determined to have a maximum capacity under normal (gravity) flow conditions of a 211 cfs, equal to the existing flow rate.

The Flow Master program was also used to analyze the existing and developed conditions for the onsite open channel. The first calculation represents the existing open channel flows and using an "n" value of 0.030 based on DPM Table 22.3, earthen lined channel/arroyo. The second open channel calculation is for the proposed developed open channel design with the addition of landscaping and erosion control. Manning's Equation was also used for this calculation with an assumed "n" value of 0.040 for rip-rap with an unlined bottom. As shown by the calculations, the existing and developed flow rates are contained within the respective sections. The Flow Master program was also used to determine private street and storm drain capacities at several analysis points. The standard City inlets were analyzed using Federal Highway Administration procedures for combination inlets. In recognition of Type "A" inlets used as debris catchers, their throats were assumed to be fully clogged. As shown by the calculations, the street flows are contained within curb height, and the inlets are properly sized to accept the 100-year developed flow rates. The bottom downstream inlet is located at a sump condition, and overflow provisions must be incorporated into the DRC plans to allow overflow to spill to the open channel.

VIII. Conclusions

This Master Drainage Report proposes a responsible approach to managing the storm water runoff associated with the proposed phased development. Improvements consist of development of an infill area in a manner consistent with surrounding development. The

introduction of additional impervious areas will cause an increase in the peak discharge rate and volume of runoff currently draining to an existing open channel. Existing developed flows draining to an existing 48 in. storm drain will not be changed. Based upon the findings of this report the following conclusions addressing key points are presented:

- There are no known easements of record for the existing drainage infrastructure which lies within the site. Due to this fact, new 30 ft and 94 ft public drainage easements will be required for development and modifications to the underground and open channel improvements, respectively. The locations for the proposed easements are shown on sheets 2 & 3 of the UNM North Campus West Master Plan and will be provided with the Work Order Plans.
- Offsite flows will continue to be accepted and conveyed through the site
- The modifications to the existing infrastructure include upsizing the 48 in. storm drain to 60 in. downstream of the new private system and improvements to the open channel.
- The addition of the developed runoff will exceed the capacity of the existing 48 in. public storm drain at the point where the private storm drain system connects. In response, the storm drain will need to be upsized to a 60 in. reinforced concrete pipe to adequately convey the increased discharge from the point of introduction to the outlet to the open channel.
- The development will occur in phases. The first phase of the development will be the entrance road to the site coming from University Boulevard, along with the extension/upsizing of the onsite storm drain and improvements to the public open channel.
- The design and construction of all public drainage improvements will occur by City Work Order.
- The two proposed private roads along with proposed private storm drain improvements will have adequate capacity to convey runoff generated by the proposed development to the existing downstream public outfall.

- There are no known restrictions for the discharge of runoff to Odelia Pond, the City owned, operated and maintained storm drainage facility downstream from the site; it is believed to have adequate capacity to receive free discharge from the site in the existing and developed conditions.
- The improved open channel will accept the increased fully developed flows. The proposed section and open channel calculations show that there will be 2 ft. freeboard provided within the proposed rip-rap channel lining under developed conditions.
- The open channel downstream of the proposed 60 in. stub extension is to be lined with rip-rap and the base will be landscaped and stabilized. A Type 3 Agreement and Covenant will be executed with UNM being responsible for the maintenance of this facility.
- Modifications to the open channel will occur within the existing FEMA flood zone limits but will not aggravate or alter the floodplain boundaries, therefore no LOMR will be required.
- All proposed drainage improvements within the site will be private, with the exception of those drainage improvements that convey public runoff.
- The public drainage improvements will require the granting of public drainage easements as a condition of Work Order approval.
- A SWPPP will be required by the contractor for this development. Along with this, a Notice of Intent will be submitted 48 hrs. before construction takes place.

HYDROLOGY CALCULATIONS

I. PRECIPITATION ZONE = 2

II. $P_{6,100} = P_{360} = 2.35$

III. TOTAL AREA (A_T) = 1,889,000 SF / 43.39 AC

IV. EXISTING LAND TREATMENT

BASIN E

TREATMENT	AREA (SF/AC)	%
C	974280 / 22.37	52

BASIN G

TREATMENT	AREA (SF/AC)	%
C	915570 / 21.02	48

V. DEVELOPED LAND TREATMENT

BASIN E1

TREATMENT	AREA (SF/AC)	%
B	47920 / 1.10	03
D	429500 / 9.86	23

BASIN E2

TREATMENT	AREA (SF/AC)	%
B	76230 / 1.75	04
D	686940 / 15.77	36

BASIN E3

TREATMENT	AREA (SF/AC)	%
B	48350 / 1.11	03
D	436470 / 10.02	23

BASIN G

TREATMENT	AREA (SF/AC)	%
C	162480 / 3.73	09

VI. EXISTING CONDITION

A. BASIN E

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [1.13(22.37)] / 22.37 = 1.13$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.13 / 12)22.37 = 2.1065$ AC-FT = 91760 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 3.14(22.37) = 70.2$ CFS

B. BASIN G

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [1.13(21.02)] / 21.02 = 1.13$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.13 / 12)21.02 = 1.9794$ AC-FT = 86220 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 3.14(21.02) = 66.0$ CFS

VII. DEVELOPED CONDITION

A. BASIN E1

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.10) + 2.12(9.86)] / 10.95 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)10.95 = 1.8134$ AC-FT = 78990 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.10) + 4.70(9.86) = 48.9$ CFS

B. BASIN E2

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.75) + 2.12(15.77)] / 17.52 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)17.52 = 2.8998$ AC-FT = 126310 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.75) + 4.70(15.77) = 78.1$ CFS

C. BASIN E3

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.11) + 2.12 (10.02)] / 11.13 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)11.13 = 1.8424$ AC-FT = 80250 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.11) + 4.70(10.02) = 49.6$ CFS

D. BASIN G

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [1.13(3.73)] / 3.73 = 1.13$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.13 / 12)3.73 = 0.3512$ AC-FT = 15300 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 3.14(3.73) = 11.7$ CFS

VIII. COMPARISON

$\Delta V_{100} = 300{,}850 - 177{,}980 = 122{,}870$ CF (INCREASE)

$\Delta Q_{100} = 188.3 - 136.2 = 52.1$ (INCREASE)

IX. OFFSITE

A. FROM BASIN N-7.2 (506480 SF/11.63 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(1.16) + 2.12\ (10.46)] / 11.62 = 1.98$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.98/ 12)11.62 = 1.9233$ AC-FT = 83780 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(1.16) + 4.70(10.46) = 52$ CFS

B. BASIN N – 5.1 (FROM JMA EXISTING CONDITIONS PLAN)

A= 10.3 AC

Q = 4.47 CFS/AC

Q = (4.47)(10.3) = 46 CFS

C. BASIN N – 5.1 (FROM JMA EXISTING CONDITIONS PLAN)

A= 28.4 AC

Q = 4.47 CFS/AC

Q = (4.47)(28.4) = 127 CFS

D. FROM BASIN A (126450 SF/ 2.90 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.28) + 2.12\ (2.61)] / 2.90 = 1.98$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.98/ 12)2.90 = 0.4800$ AC-FT = 20910 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.28) + 4.70(2.61) = 12.9$ CFS

E. BASIN B (182081 SF/ 4.18 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.42) + 2.12 (37.7)] / 4.18 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)4.18 = 0.6933$ AC-FT = 30,200 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.42) + 4.70(3.77) = 18.7$ CFS

F. BASIN L (335810 SF/ 7.70 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.87) + 2.12 (7.80)] / 8.66 = 1.99$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.99/ 12)8.66 = 1.4346$ AC-FT = 62490 CF

2. PEAK DISCHARGE

$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.87) + 4.70(7.80) = 38.6$ CFS

G. BASIN C (CALCULATED FOR MAXIUMUM CAPACITY OF 12 IN. STEEL PIPE. PEAK DISCHARGE (12 IN. PIPE WITH N = 0.013, 7.11 FT. HEAD)

$Q_P = 8$ CFS

H. BASIN D (98280 SF/ 2.26 AC)

1. VOLUME

$E_W = (E_A A_A + E_B A_B + E_C A_C + E_D A_D) / A_T$

$E_W = [0.78(0.23) + 2.12 (2.03)] / 2.26 = 1.98$

$V_{100,6\text{-}HR} = (E_W / 12)A_T$

$V_{100,6\text{-}HR} = (1.98/ 12)2.26 = 0.3736$ AC-FT = 16270 CF

2. PEAK DISCHARGE

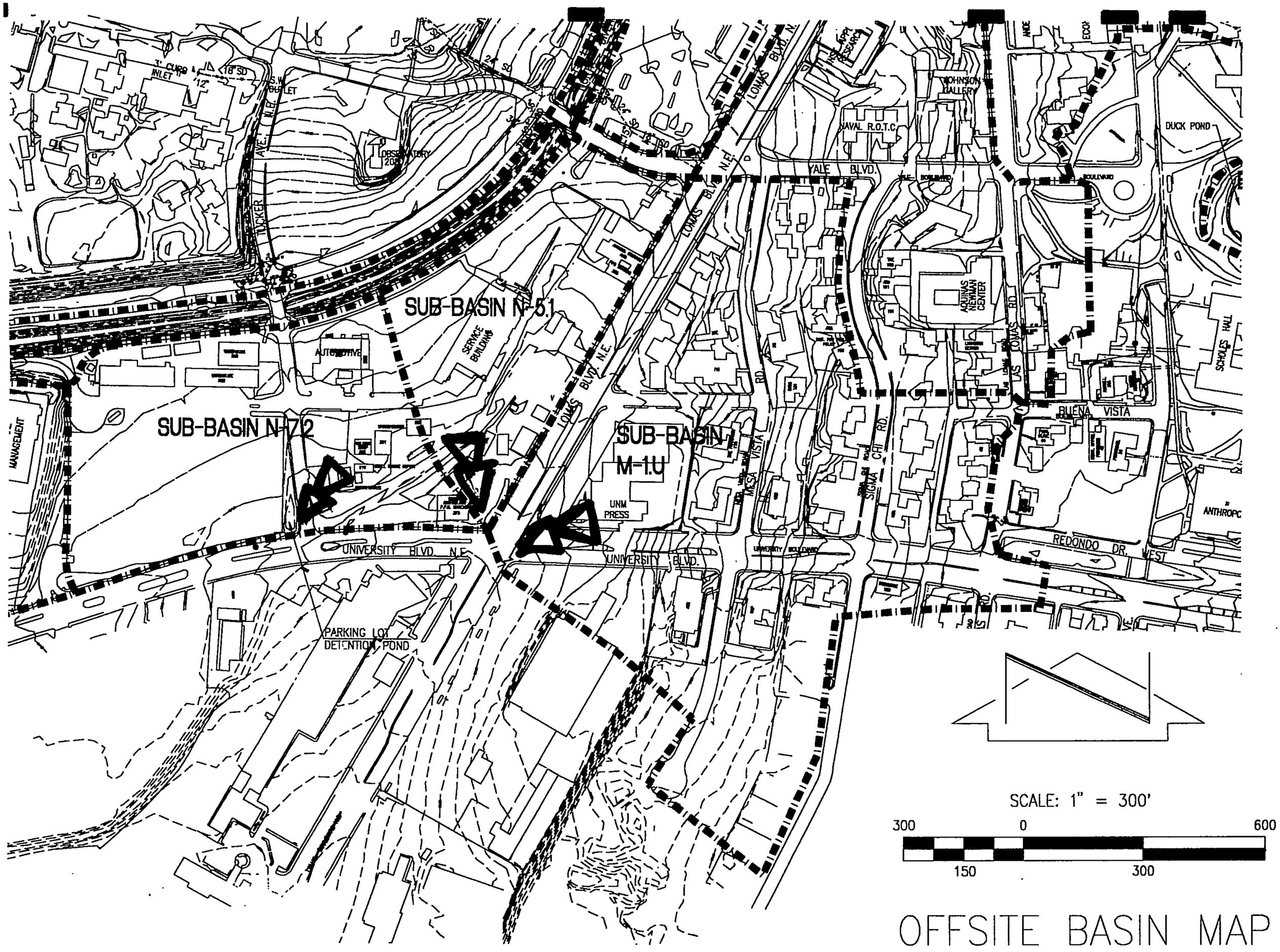
$Q_P = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$

$Q_P = 2.28(0.23) + 4.70(2.03) = 10.1$ CFS

I. BASIN F (FROM GRADING AND DRAINAGE PLAN PREPARED BY JEFF MORTENSEN & ASSOCIATES, INC. DATED NOVEMBER 26, 2001)

PEAK DISCHARGE

$Q_P = 16$ CFS



OFFSITE BASIN MAP

Worksheet
Worksheet for Pressure Pipe

36" UNIVERSITY S.D.

Project Description	
Worksheet	36" University Existing Storm Drain
Flow Element	Pressure Pipe
Method	Manning's Formula
Solve For	Discharge

Input Data		
Pressure at 1	0.00	psi
Pressure at 2	0.00	psi
Elevation at 1	100.00	ft
Elevation at 2	86.80	ft
Length	510.00	ft
Mannings Coefficient	0.013	
Diameter	36	in

Results		
Discharge	107.30	cfs
Headloss	13.20	ft
Energy Grade at 1	103.58	ft
Energy Grade at 2	90.38	ft
Hydraulic Grade at 1	100.00	ft
Hydraulic Grade at 2	86.80	ft
Flow Area	7.1	ft^2
Wetted Perimeter	9.42	ft
Velocity	15.18	ft/s
Velocity Head	3.58	ft
Friction Slope	0.025882	ft/ft

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Jeff Mortensen & Associates, Inc.
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Worksheet
Worksheet for Circular Channel

48" EXIST. SD

Project Description	
Worksheet	48" Lands West Existing Storm Drain
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data		
Mannings Coefficient	0.013	
Slope	0.018600	ft/ft
Diameter	48	in

Results		
Depth	4.00	ft
Discharge	195.89	cfs
Flow Area	12.6	ft²
Wetted Perimeter	12.57	ft
Top Width	0.00	ft
Critical Depth	3.83	ft
Percent Full	100.0	%
Critical Slope	0.016187	ft/ft
Velocity	15.59	ft/s
Velocity Head	3.78	ft
Specific Energy	7.78	ft
Froude Number	0.00	
Maximum Discharg	210.72	cfs
Discharge Full	195.89	cfs
Slope Full	0.018600	ft/ft
Flow Type	N/A	

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lands Wes
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.030	
Slope	0.003300	ft/ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	398.00	cfs

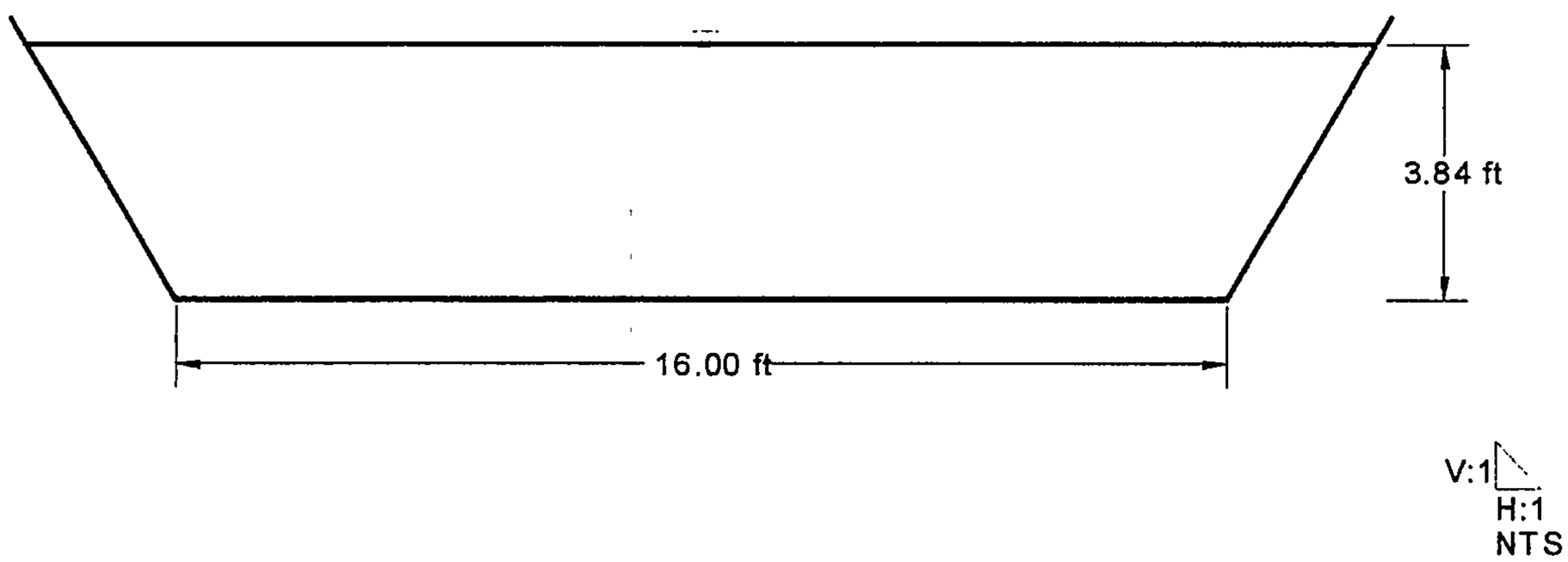
Results		
Depth	3.84	ft
Flow Area	70.2	ft²
Wetted Perimeter	24.91	ft
Top Width	20.52	ft
Critical Depth	2.59	ft
Critical Slope	0.011904	ft/ft
Velocity	5.67	ft/s
Velocity Head	0.50	ft
Specific Energy	4.34	ft
Froude Number	0.54	
Flow Type	Subcritical	

EXIST. OPEN CHANNEL

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Existing Open Channel - Lands Wes
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data		
Mannings Coefficient	0.030	
Slope	0.003300	ft/ft
Depth	3.84	ft
Left Side Slope	1.70	V : H
Right Side Slope	1.70	V : H
Bottom Width	16.00	ft
Discharge	398.00	cfs



Worksheet
Worksheet for Irregular Channel

AP-A

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.050000	ft/ft
Discharge	77.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.54	ft
Elevation Range	0.00 to 1.00	
Flow Area	10.1	ft²
Wetted Perimeter	41.09	ft
Top Width	40.00	ft
Actual Depth	0.54	ft
Critical Elevation	0.79	ft
Critical Slope	0.005732	ft/ft
Velocity	7.65	ft/s
Velocity Head	0.91	ft
Specific Energy	1.45	ft
Froude Number	2.69	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Single A Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-A

2 - SGL "A" INLETS

Input Data		
Discharge	47.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.050000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	0.00	ft
Grate Width	2.08	ft
Grate Length	3.33	ft
Grate Type	²-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

USED TO SIMULATE DEPTH OF 0.54'

ASSUMED THROAT CLOGGED 100%

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.23	
Intercepted Flow	10.88	cfs
Bypass Flow	36.12	cfs
Spread	22.79	ft
Depth	0.54	ft
Flow Area	5.3	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	8.89	ft/s
Splash Over Velocity	6.62	ft/s
Frontal Flow Factor	0.80	
Side Flow Factor	0.04	
Grate Flow Ratio	0.25	
Equivalent Cross Slope	0.027776	ft/ft
Active Grate Length	3.33	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

(each)

Worksheet
Worksheet for Irregular Channel

AP-A

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.050000	ft/ft
Discharge	55.20	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.49	ft
Elevation Range	0.00 to 1.00	
Flow Area	8.2	ft²
Wetted Perimeter	41.00	ft
Top Width	40.00	ft
Actual Depth	0.49	ft
Critical Elevation	0.68	ft
Critical Slope	0.006035	ft/ft
Velocity	6.70	ft/s
Velocity Head	0.70	ft
Specific Energy	1.19	ft
Froude Number	2.60	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-A
2 DBL "C" INLETS

Input Data		
Discharge	35.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.050000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	²-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

USED TO SIMULATE DEPTH OF 0.49'

Options	
Calculation Option	Use Grate Inlet Only
Grate Flow Option	Exclude None

Results		
Efficiency	0.42	
Intercepted Flow	14.68	cfs (each)
Bypass Flow	20.32	cfs
Spread	20.33	ft
Depth	0.49	ft
Flow Area	4.2	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	8.29	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.19	
Grate Flow Ratio	0.28	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.03	
Total Interception Length	108.40	ft

Worksheet
Worksheet for Irregular Channel

AP-A

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.050000	ft/ft
Discharge	25.80	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.39	ft
Elevation Range	0.00 to 1.00	
Flow Area	4.6	ft²
Wetted Perimeter	30.68	ft
Top Width	29.89	ft
Actual Depth	0.39	ft
Critical Elevation	0.52	ft
Critical Slope	0.007068	ft/ft
Velocity	5.55	ft/s
Velocity Head	0.48	ft
Specific Energy	0.87	ft
Froude Number	2.48	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-A

2 - Double "C"

TO Get 0.39' Depth

Input Data		
Discharge	17.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.050000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	>-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.53	
Intercepted Flow	8.94	cfs each
Bypass Flow	8.06	cfs
Spread	15.30	ft
Depth	0.39	ft
Flow Area	2.4	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	6.99	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.24	
Grate Flow Ratio	0.38	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

Lands West - 40 ft F-F with normal crown Section
Worksheet for Irregular Channel

AP-B

Project Description	
Worksheet	40 foot face to face with standard curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	49.00	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.50	ft
Elevation Range	0.00 to 1.00	
Flow Area	8.7	ft²
Wetted Perimeter	41.03	ft
Top Width	40.13	ft
Actual Depth	0.50	ft
Critical Elevation	0.64	ft
Critical Slope	0.006154	ft/ft
Velocity	5.64	ft/s
Velocity Head	0.49	ft
Specific Energy	0.99	ft
Froude Number	2.14	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

AP-B

Project Description	
Worksheet	Single A Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

Input Data		
Discharge	30.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	3.25	ft
Grate Width	2.08	ft
Grate Length	3.33	ft
Grate Type	P-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

TO Get d = 0.50'

assumes Throat clogged

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.32	
Intercepted Flow	9.56	cfs (each)
Bypass Flow	20.44	cfs
Spread	20.76	ft
Depth	0.50	ft
Flow Area	4.4	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	6.82	ft/s
Splash Over Velocity	6.62	ft/s
Frontal Flow Factor	0.98	
Side Flow Factor	0.06	
Grate Flow Ratio	0.28	
Equivalent Cross Slope	0.028538	ft/ft
Active Grate Length	3.33	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

Worksheet
Worksheet for Irregular Channel

AP-C

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	61.30	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.53	ft
Elevation Range	0.00 to 1.00	
Flow Area	9.9	ft²
Wetted Perimeter	41.08	ft
Top Width	40.00	ft
Actual Depth	0.53	ft
Critical Elevation	0.71	ft
Critical Slope	0.005937	ft/ft
Velocity	6.17	ft/s
Velocity Head	0.59	ft
Specific Energy	1.12	ft
Froude Number	2.18	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-C
2- DBL "C"
to Get d = 0.53'

Input Data		
Discharge	35.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.44	
Intercepted Flow	15.28	cfs each
Bypass Flow	19.72	cfs
Spread	22.03	ft
Depth	0.53	ft
Flow Area	4.9	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	7.08	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.24	
Grate Flow Ratio	0.26	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

Worksheet
Worksheet for Irregular Channel

AP - D

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	76.70	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.57	ft
Elevation Range	0.00 to 1.00	
Flow Area	11.4	ft²
Wetted Perimeter	41.16	ft
Top Width	40.00	ft
Actual Depth	0.57	ft
Critical Elevation	0.78	ft
Critical Slope	0.005735	ft/ft
Velocity	6.74	ft/s
Velocity Head	0.71	ft
Specific Energy	1.28	ft
Froude Number	2.23	
Flow Type	Supercritical	

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-D

2 - DBL "C"

Input Data		
Discharge	43.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	2-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

to get d=0.57 ft

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.41	
Intercepted Flow	17.60	cfs
Bypass Flow	25.40	cfs
Spread	23.85	ft
Depth	0.57	ft
Flow Area	5.8	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	7.44	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.22	
Grate Flow Ratio	0.24	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

each

Worksheet
Worksheet for Irregular Channel

AP - D

Project Description	
Worksheet	40' F-F with Standard Curb
Flow Element	Irregular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Slope	0.033000	ft/ft
Discharge	41.50	cfs

Options	
Current Roughness Method	Improved Lotter's Method
Open Channel Weighting Method	Improved Lotter's Method
Closed Channel Weighting Methc	Horton's Method

Results		
Mannings Coefficient	0.017	
Water Surface Elevation	0.48	ft
Elevation Range	0.00 to 1.00	
Flow Area	7.8	ft²
Wetted Perimeter	39.96	ft
Top Width	38.99	ft
Actual Depth	0.48	ft
Critical Elevation	0.61	ft
Critical Slope	0.006396	ft/ft
Velocity	5.33	ft/s
Velocity Head	0.44	ft
Specific Energy	0.92	ft
Froude Number	2.10	
Flow Type	Supercritical	

Calculation Messages:
Flow is divided.

Roughness Segments

Start Station	End Station	Mannings Coefficient
0+00	0+60	0.017

Natural Channel Points

Station (ft)	Elevation (ft)
0+00	1.00
0+04	0.92
0+10	0.67
0+10	0.00
0+12	0.13
0+30	0.49
0+48	0.13
0+50	0.00
0+50	0.67
0+56	0.92
0+60	1.00

Worksheet
Worksheet for Combination Inlet On Grade

Project Description	
Worksheet	Double C Inlet
Type	Combination Inlet On Grade
Solve For	Efficiency

AP-D

Input Data		
Discharge	26.00	cfs
Local Depression	1.7	in
Local Depression Width	7.50	ft
Slope	0.033000	ft/ft
Gutter Width	2.08	ft
Gutter Cross Slope	0.062500	ft/ft
Road Cross Slope	0.020000	ft/ft
Mannings Coefficient	0.017	
Curb Opening Length	6.50	ft
Grate Width	2.08	ft
Grate Length	6.67	ft
Grate Type	?-50 mm x 100 mm (P-1-7/8"-4")	
Clogging	0.0	%

to get d=0.48'

Options	
Calculation Option	Use Both
Grate Flow Option	Exclude None

Results		
Efficiency	0.48	
Intercepted Flow	12.43	cfs
Bypass Flow	13.57	cfs
Spread	19.63	ft
Depth	0.48	ft
Flow Area	3.9	ft²
Gutter Depression	1.1	in
Total Depression	2.8	in
Velocity	6.59	ft/s
Splash Over Velocity	11.51	ft/s
Frontal Flow Factor	1.00	
Side Flow Factor	0.26	
Grate Flow Ratio	0.29	
Equivalent Cross Slope	0.028532	ft/ft
Active Grate Length	6.67	ft
Length Factor	0.00	
Total Interception Length	0.00	ft

Worksheet
Worksheet for Combination Inlet In Sag

Project Description	
Worksheet	Sump Double C
Type	Combination Inlet In Sag
Solve For	Spread

Input Data		
Discharge	25.00	cfs (per inlet)
Local Depression	1.7	in
Local Depression Width	7.50	ft
Gutter Width	40.00	ft
Gutter Cross Slope	0.020000	ft/ft
Road Cross Slope	0.020000	ft/ft
Curb Opening Length	6.50	ft
Opening Height	0.50	ft
Curb Throat Type	Inclined	
Throat Incline Angle	45.00	degrees
Grate Width	2.08	ft
Grate Length	6.33	ft
Grate Type	P-50 mm (P-1-7/8")	
Clogging	0.0	%

AP - E

Sump

2 - Double "C"

Options	
Calculation Option	Use Both

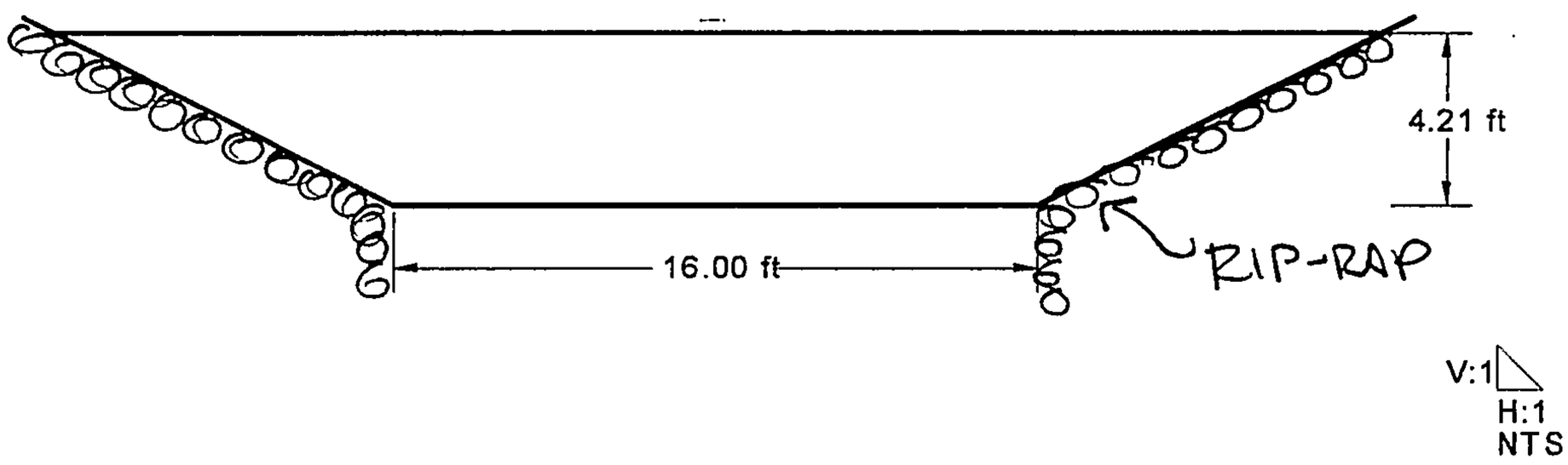
Results		
Spread	17.94	ft
Depth	0.50	ft < Curb Height
Gutter Depression	~~0.0~~	in
Total Depression	1.7	in
Open Grate Area	11.8	ft²
Active Grate Weir Length	10.49	ft

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Proposed Open Channel - Lands We
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

DEVELOPED CONDITION

Section Data		
Mannings Coefficient	0.040	
Slope	0.003300	ft/ft
Depth	4.21	ft
Left Side Slope	0.50	V : H
Right Side Slope	0.50	V : H
Bottom Width	16.00	ft
Discharge	451.00	cfs



Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Proposed Open Channel - Lands We
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Channel Depth

DEVELOPED CONDITION OPEN CHANNEL

Input Data		
Mannings Coefficient	0.040	
Slope	0.003300	ft/ft
Left Side Slope	0.50	V : H
Right Side Slope	0.50	V : H
Bottom Width	16.00	ft
Discharge	451.00	cfs

Results		
Depth	4.21	ft
Flow Area	102.7	ft²
Wetted Perimeter	34.82	ft
Top Width	32.83	ft
Critical Depth	2.60	ft
Critical Slope	0.019386	ft/ft
Velocity	4.39	ft/s
Velocity Head	0.30	ft
Specific Energy	4.51	ft
Froude Number	0.44	
Flow Type	Subcritical	

AGREEMENT AND COVENANT

This Agreement and Covenant, between the City of Albuquerque, New Mexico ("City") and _____, ("User") is made in Albuquerque, New Mexico and is entered into as of the date of recording this Agreement with the Bernalillo County Clerk.

1. Recital. The User is the owner of certain real property ("User's Property") located at _____, in Albuquerque, New Mexico, and more particularly described as: (give legal description and filing information)

The City is the owner of certain real property, easement or public right-of-way ("City's Property") in the vicinity of, contiguous to, abutting or within User's Property, and more particularly described as:

The User wishes to construct upon, improve or repair and to maintain the following "Improvement" on the City's Property (or already has done so):

A sketch of the proposed or existing Improvement is attached as Exhibit A and made a part of this Agreement.

The City agrees to permit the Improvement to exist on the City's Property provided the User complies with the terms of this Agreement.

2. City Use of City's Property and City Liability. The City has the right to enter upon the City's Property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the User. If the Work affects the Improvement the City will not be financially or otherwise responsible for rebuilding or repairing the Improvement. The User promptly will repair the Improvement to the City's satisfaction. The cost of repairing the Improvement will be paid by User.

3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in

accordance with standards required by the City as per the approved Grading and Drainage Plan _____on file at the City Engineer's office. The User will be solely responsible for paying all related costs. The User will be solely responsible for paying all related costs. The User will not permit the Improvement to constitute a hazard to the health or safety of the general public or to interfere with the City's use of the City's Property. The User will conform with all applicable laws, ordinances and regulations.

4. Use of the Improvement. If the City's Property is a public right-of-way, it shall be open to the use of the general public at all times, subject to reasonable curtailment during periods of construction, maintenance or repair.

5. Demand for Repair, Modification or Removal. The City may send written notice ("Notice") to the User requiring the User to repair, modify or remove the Improvement within 30 days ("Deadline") and the User will comply promptly with the requirements of the Notice. If removal is demanded, the City also may require the User to return the City's Property to its original condition by the Deadline. The User will perform all required work by the Deadline, at User's sole expense.

6. Failure to Perform by User and Emergency Work by City. If the User fails to comply with the terms of the Notice by the Deadline stated, or, if the City determines that an emergency condition exists, the City may perform the work itself. The City then may assess the User for the cost of the work and for any other expenses or damages which result from User's failure to perform. The User agrees promptly to pay the City the amount assessed. If the User fails to pay the City within thirty (30) days after the City gives the User written notice of the amount due, the City may impose a lien against User's Property for the total resulting amount.

7. Cancellation of Agreement and Release of Covenant. This Agreement may be canceled and User's covenants released by the City at will by the City's mailing to the User notice of the City's intention to record a Cancellation and Release with the Bernalillo County Clerk. The Cancellation and Release will be effective thirty (30) days after the date of mailing the notice to the User unless a later date is stated in the notice or the Cancellation and Release. After the effective date, the City will record the Cancellation and Release with the Bernalillo County Clerk.

8. Condemnation. If any part of the User's Property is ever condemned by the City, the User will forego all claims to compensation for any portion of User's structure which encroaches on City Property and for severance damage to the remaining portion of User's structure on User's Property.

9. Assessment. Nothing in this Agreement shall be construed to relieve the User, his heirs, assigns and successors from an assessment against User's Property for improvements to the City Property under a duly authorized and approved Special Assessment District. The parties specifically agree that the value of the Improvement will not reduce the amount assessed by the City.

10. Notice. For purposes of giving formal written notice to the User, User's address is:

Notice may be given to the User either in person or by mailing the notice by regular U.S. mail, postage paid. Notice will be considered to have been received by the User within 3 days after the notice is mailed if there is no actual evidence of receipt. The User may change User's address by giving written notice of the change by certified mail, return receipt requested, to the City Engineer at P.O. Box 1293, Albuquerque, New Mexico 87103.

11. Indemnification. The User agrees to defend, indemnify and hold harmless the City, its officials, agents and employees from and against any and all claims, actions, suits or proceedings of any kind brought against said parties as a result of User's use of the City's Property. To the extent, if at all, Section 56-7-1 NMSA 1978 is applicable to this Agreement, this Agreement to indemnify will not extend to liability, claims, damages, losses or expenses, including attorney's fees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications by the indemnitee, or the agents or employees of the indemnitee; or (2) the giving of or the failure to give direction or instructions by the indemnitee, where such giving or failure to give directions or instructions is the primary cause of bodily injury to persons or damage to property.

12. Term. This Agreement shall continue until revoked by the City pursuant to Section 7 above.

13. Binding on User's Property. The covenants and obligations of the User set forth herein shall be binding on User, his heirs assigns and successors and on User's Property and constitute covenants running with User's Property until released by the City.

14. Entire Agreement. This Agreement contains the entire agreement of the parties and supersedes any and all other agreements or understandings, oral or written, whether previous to the execution hereof or contemporaneous herewith.

15. Changes of Agreement. Changes to this Agreement are not binding unless made in writing, signed by both parties.

16. Construction and Severability. If any part of this Agreement is held to be invalid or unenforceable, the remainder of the Agreement will remain valid and enforceable if the remainder is reasonably capable of completion.

17. Captions. The captions to the sections or paragraphs of this Agreement are not part of this Agreement and will not affect the meaning or construction of any of its provisions.

CITY OF ALBUQUERQUE:

By: _____
Title: _____

Dated: _____

USER:

By: _____
Title: _____

Dated: _____

CITY'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 20___ by _____, City Engineer, Public Works Department, for the City of Albuquerque, a New Mexico municipal corporation, on behalf of the corporation.

_____
Notary Public

My Commission Expires:

_____

USER'S ACKNOWLEDGMENT

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

This instrument was acknowledged before me on _____, 20___ by _____, _____, on behalf of _____.

_____
Notary Public

My Commission Expires:

_____

AGREEMENT AND COVENANT

This Agreement and Covenant, between the City of Albuquerque, New Mexico ("City") and _____, ("User") is made in Albuquerque, New Mexico and is entered into as of the date of recording this Agreement with the Bernalillo County Clerk.

1. Recital. The User is the owner of certain real property ("User's Property") located at _____, in Albuquerque, New Mexico, and more particularly described as: (give legal description and filing information)

The City is the owner of certain real property, easement or public right-of-way ("City's Property") in the vicinity of, contiguous to, abutting or within User's Property, and more particularly described as:

The User wishes to construct upon, improve or repair and to maintain the following "Improvement" on the City's Property (or already has done so):

A sketch of the proposed or existing Improvement is attached as Exhibit A and made a part of this Agreement.

The City agrees to permit the Improvement to exist on the City's Property provided the User complies with the terms of this Agreement.

2. City Use of City's Property and City Liability. The City has the right to enter upon the City's Property at any time and perform whatever inspection, installation, maintenance, repair, modification or removal ("Work") it deems appropriate without liability to the User. If the Work affects the Improvement the City will not be financially or otherwise responsible for rebuilding or repairing the Improvement. The User promptly will repair the Improvement to the City's satisfaction. The cost of repairing the Improvement will be paid by User.

3. User's Responsibility for Improvement. The User will be solely responsible for constructing, maintaining, repairing and, if required, removing the Improvement, all in

Master Plan Existing
Conditions Drainage
UNM North Campus - West

Master Plan Developed
Conditions Drainage
UNM North Campus - West

Development Plan
UNM North Campus West

RECYCLED PAPER.
MINIMUM 20% POST-CONSUMER
FIBER CONTENT.
90 Clasp (9 x 12)