CITY OF ALBUQUERQUE

Planning Department
Suzanne Lubar, Director

Mayor Richard J. Berry

October 5, 2015

Dennis Lorenz, P.E.
Lorenz Design & Consulting
2501 Rio Grande Blvd. NW Suite A
Albuquerque, New Mexico 87107

RE: **Jackson-Wink MMA Academy**
301 Martin Luther King Jr. Ave. NE
Grading and Drainage Plan
Engineers Stamp Date 5/8/15 (K14D005)
Certification Dated: 6/16/15

Dear Mr. Lorenz,

Based on the Certification received 8/31/2015, the site is acceptable for permanent release of Certificate of Occupancy by Hydrology.

If you have any questions you can contact me at 924-3695 or Rudy Rael at 924-3977.

Sincerely,

Abiel Carrillo, P.E.
City Engineer
Planning and Development Services

RR/AC
C: File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

CITY OF ALBUQUERQUE

Planning Department
Suzanne Lubar, Director

Mayor Richard J. Berry

November 24, 2015

Dennis Lorenz, P.E.
Lorenz Design & Consulting
2501 Rio Grande Blvd. NW Suite A
Albuquerque, New Mexico 87107

RE: **Jackson-Wink MMA Academy**
301 Martin Luther King Jr. Ave. NE
Grading and Drainage Plan
Engineers Stamp Date 5/8/15 (K14D005)

Dear Mr. Lorenz,

Based upon the information provided in your submittal received 7/17/2015, the above referenced Grading and Drainage Plan is acceptable for Grading Permit and Building Permit.

Attach a copy of this approved plan to the construction sets in the permitting process prior to sign-off by Hydrology. This plan is also approved for SO-19. Contact Jason Rodriguez at 235-8016 to schedule an inspection for the side walk culvert before and after concrete is placed. A separate Excavation/Barricading Permit is required for SO-19 construction within City ROW. A copy of this approval letter must be on hand when applying for the permit.

Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

If you have any questions you can contact me at 924-3986 or Rudy Rael at 924-3977.

Sincerely,

Abiel Carrillo, P.E.
Principal Engineer, Hydrology
Planning Department

RR/AC
C: File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

CITY OF ALBUQUERQUE

June 9, 2015

Dennis Lorenz, P.E.
Lorenz Design & Consulting
2501 Rio Grande Blvd. NW Suite A
Albuquerque, New Mexico 87107

RE: **Jackson-Wink MMA Academy**
Grading and Drainage Plan & Report
Engineers Stamp Date 5/8/15 (K14-D005)

Dear Mr. Lorenz,

Based upon the information provided in your submittal received 5/11/2015, the above referenced Grading and Drainage Plan cannot be approved for Grading Permit or Building Permit until the following comments are addressed.

- The flows leaving the south side of the structure need to pass through a landscape buffer before leaving the site via the proposed 12" pipe into the storm sewer system. The 12" pipe should be extended into the landscape area, which is to remain, with a stand pipe and beehive cap.

If you have any questions please contact 6me at 924-3695 or Rudy Rael at 924-3977.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Hydrology
Planning Department

RR/CC
C: File

PO Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

CITY OF ALBUQUERQUE

June 18, 2015

Dennis Lorenz, P.E.
Lorenz Design & Consulting
2501 Rio Grande Blvd. NW Suite A
Albuquerque, New Mexico 87107

RE: **Jackson-Wink MMA Academy-Phase 1**
301 Martin Luther King Jr. Ave NE
Request Permanent C.O. – Not Accepted
Engineers Stamp Date 5/8/15 (K14D005)
Certification Dated: 6/16/15

Dear Mr. Lorenz,

Based on the Certification received 6/17/2015, the site cannot be accepted for release of Certificate of Occupancy by Hydrology until the following comments are addressed.

- This plan dated 5/8/15 was not approved for building permit. The plan dated 2/13/15 was approved for building permit. This is the plan which should be certified.
- The plan dated 5/8/15 needs to address the previous comments provided on 6/9/15. Also, provide an emergency spill way at the north end of the pond directing flows toward Broadway heading north to the pond at Broadway/Lomas.
- Removing the pond as is does not allow for first flush requirements and inundates MLK Jr. Ave., which in turn creates problems in Tijeras at the under pass directly under the rail road tracks.

If you have any questions please contact me at 924-3986 or Rudy Rael at 924-3977.

Sincerely,

Rita Harmon, P.E.
Senior Engineer, Hydrology
Planning Department

RR/RH
C: File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

785402

pg. 2 -

I think curtis intended existing (detached) condition"

Original approved Plan allowe 2.23 cfs.

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 04/2009)

PROJECT TITLE: JACKSON – WINK MMA ACADEMY GYM ZONE MAP: K-14-D005
DRB#: NA EPC#: NA WORK ORDER#: NA

LEGAL DESCRIPTION: PARCELS 8 & 9, PLAT OF MARTINEZTOWN PLAN, PHASE 7

CITY ADDRESS: 301 MARTIN LUTHER KING JR NE

ENGINEERING FIRM: LORENZ DESIGN & CONSULTING CONTACT: DENNIS LORENZ
ADDRESS: 2501 RIO GRANDE BLVD. NW SUITE A PHONE: 888-6088
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87104

OWNER: WINK, INC CONTACT: M. WINKELJOHN
ADDRESS: 301 MARTIN LUTHER KING JR NE PHONE: 489-4531
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

ARCHITECT: RICK BENNETT ARCHITECTS CONTACT: R. BENNETT
ADDRESS: 1104 PARK AVENUE SW PHONE: 242-1859
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

SURVEYOR: HARRIS SURVEYS CONTACT: T. HARRIS
ADDRESS: 2412 D MONROE NE PHONE: 889-8056
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87110

CONTRACTOR: WINK, INC CONTACT: M. WINKELJOHN
ADDRESS: 301 MARTIN LUTHER KING JR NE PHONE: 489-4531
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

TYPE OF SUBMITTAL:
_____ DRAINAGE REPORT
_____ DRAINAGE PLAN 1st SUBMITTAL
_____ DRAINAGE PLAN RESUBMITTAL
_____ CONCEPTUAL G & D PLAN
_____ GRADING PLAN
_____ EROSION CONTROL PLAN
XX ENGINEER'S CERT (HYDROLOGY)
_____ CLOMR/LOMR
_____ TRAFFIC CIRCULATION LAYOUT
_____ ENGINEER'S CERT (TCL)
_____ ENGINEER'S 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
XX CERTIFICATE OF OCCUPANCY (PERM)
_____ CERTIFICATE OF OCCUPANCY (TEMP)
_____ GRADING PERMIT APPROVAL
_____ PAVING PERMIT APPROVAL
_____ WORK ORDER APPROVAL
_____ GRADING CERTIFICATION
_____ OTHER (SPECIFY) SO-19

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

RECEIVED
JUN 17 2015
LAND DEVELOPMENT SECTION

DATE SUBMITTED: 06-17-2015 BY: DENNIS A. LORENZ

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 defines 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.

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV 04/2009)

PROJECT TITLE: JACKSON – WINK MMA ACADEMY ZONE MAP: K-14-D005
DRB#: NA EPC#: NA WORK ORDER#: NA

LEGAL DESCRIPTION: PARCELS 8 & 9, PLAT OF MARTINEZTOWN PLAN, PHASE 7

CITY ADDRESS: 301 MARTIN LUTHER KING JR NE

ENGINEERING FIRM: LORENZ DESIGN & CONSULTING CONTACT: DENNIS LORENZ
ADDRESS: 2501 RIO GRANDE BLVD. NW SUITE A PHONE: 888-6088
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87104

OWNER: WINK, INC CONTACT: M. WINKELJOHN
ADDRESS: 301 MARTIN LUTHER KING JR NE PHONE: 489-4531
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

ARCHITECT: RICK BENNETT ARCHITECTS CONTACT: R. BENNETT
ADDRESS: 1104 PARK AVENUE SW PHONE: 242-1859
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

SURVEYOR: HARRIS SURVEYS CONTACT: T. HARRIS
ADDRESS: 2412 D MONROE NE PHONE: 889-8056
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87110

CONTRACTOR: WINK, INC CONTACT: M. WINKELJOHN
ADDRESS: 301 MARTIN LUTHER KING JR NE PHONE: 489-4531
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

TYPE OF SUBMITTAL:
_____ 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'S CERT (TCL)
_____ ENGINEER'S CERT (DRB SITE PLAN)
XX OTHER (SPECIFY)

RECEIVED
MAY 11 2015
AND DEVELOPMENT SECTION

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
_____ WORK ORDER APPROVAL
_____ GRADING CERTIFICATION
XX OTHER (SPECIFY) SO-19
G+D UPDATE

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

DATE SUBMITTED: 05-11-2015 BY: DENNIS A. LORENZ

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 defines 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.

LORENZ
DESIGN & CONSULTING, LLC
Civil Engineering I Construction Management

May 11, 2015

Rita Harmon, PE
Principal Engineer - Hydrology Section
Development and Building Services
City of Albuquerque
Plaza Del Sol
Albuquerque, New Mexico 87102

SUBJECT: JACKSON WINK MMA ACADEMY (K14/D005)

Dear Rita:

Submitted herewith for review and approval is one copy of the Updated Grading and Drainage Report for the subject site. The Report and Plan have been updated to support changes to the proposed Site Plan, and to present a project phasing plan that is required in order to interface with the proposed Martin Luther King Jr Widening Project, COA Project No. 785402.

The Jackson Wink MMA Academy building permit was issued in November 2014. Site revisions were not planned at the time. Site modifications to increase on-site parking led to a Grading and Drainage Report and Plan that were approved 03-05-2015.

Since then, it was decided not to build the northwest parking lot and instead build 6 new spaces at the southwest corner, which required the redesign of the detention pond at that location. It was then learned that the City of Albuquerque had planned the widening of Martin Luther King Jr Blvd, requiring a right of way take and encroaching into the proposed detention pond.

We have been working with Andrew Varoz, DMD for several months to revise the site plan and drainage solution at the southwest corner of the site. The updated report and plan reflect that effort. The purpose of this submittal is to obtain approval of the Updated Report and Plan ahead of Certificate of Occupancy application. Engineer's certifications will be based on the Updated Report and Plan.

The Report and Plan have been updated as follows:

1. The small parking lot at the northwest corner of the site will not be constructed.
2. The pedestrian link has been moved from MLK to Broadway to accommodate the pending Martin Luther King Jr widening Project.
3. Six (6) new parking spaces are to be constructed at the southwest corner of the site. The existing retention pond that is to be converted to a detention pond is revised. The proposed pond will still function as a detention pond that limits discharge from the site to below existing conditions, however, the pond will temporarily flood the parking spaces in that area to a depth of approximately 1 foot. The pond will drain through a 12-inch pipe connecting to a new storm inlet to be constructed by the MLK Widening

2501 Rio Grande Boulevard NW, Suite A | Albuquerque, New Mexico 87104 | [505] 888-6088 P | [505] 242-6655 F

Project.

4. The Jackson-Wink project site work is scheduled to be completed within 30 days, several months ahead of the MLK Project. Without the 12-inch pipe to be provided by the MLK Project, Pond "D" has no outlet. Therefore, the 6 new parking spaces within Pond "D" will be considered Phase 2, to be constructed after completion of the MLK Project.

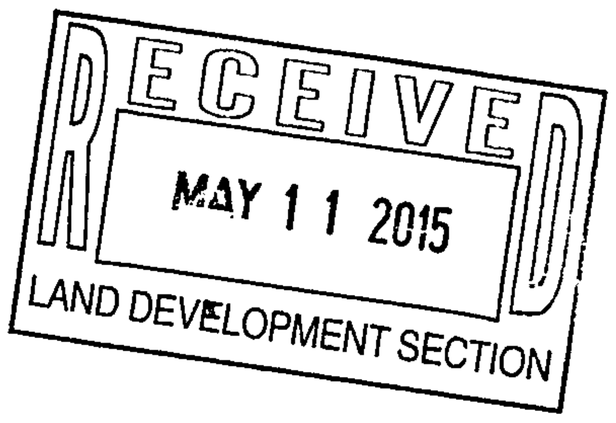
If you have any questions regarding this request, please call me.

Sincerely,

LORENZ DESIGN & CONSULTING, LLC

Dennis A. Lorenz, PE

P\14-034\RH05112015



DRAINAGE REPORT
FOR
JACKSON WINK MMA ACADEMY

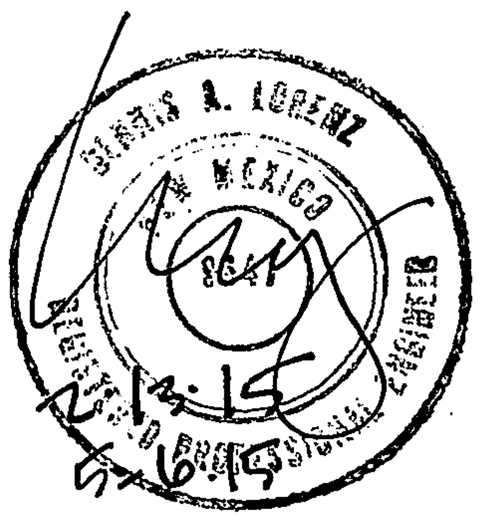
301 Martin Luther King Jr NE
Albuquerque, New Mexico 87103

Prepared For:

Mike Winkeljohn
301 Martin Luther King Jr NE
Albuquerque, New Mexico 87103

Prepared by:

LORENZ
DESIGN & CONSULTING, LLC
Civil Engineering I Construction Management



February 2015

PURPOSE AND SCOPE

This project involves the re-development of the subject property for Jackson Wink MMA Academy, a training center for mixed martial arts. The project proposes site improvements to support the development, including access, grading, drainage and utility improvements.

The purpose of this report is to outline the criteria for re-development of the site and demonstrate that this project will not negatively impact the project site, or upstream and downstream properties. This report is prepared and submitted in support of a building permit application.

The scope of this report is to provide analysis of the existing and improved conditions utilizing state of the art technological storm drainage modeling tools, thereby demonstrating the before and after behavior of the project site during rainfall events. It will be demonstrated that this project will be developed in accordance with the City of Albuquerque, Development Process Manual, Volume 2, the City of Albuquerque Drainage Ordinance, and the approved drainage master plan for the watershed.

EXISTING CONDITIONS

The 1.50-acre project site is fully developed. Site improvements consist of a 16,080-square foot building with site improvements constructed to support the previous property use. The site is bounded north by developed residential property, on the east by developed office property, on the south by Martin Luther King Jr Blvd, and on the west by Broadway Blvd.

All site flows drain west to Broadway by paving improvements and landscaped yard swales. The site was developed in 1978 when commercial properties were required to retain developed storm water. As a result this site retains approximately 13,460-cf within four (4) existing retention ponds. The ponds are not equipped with drains or constructed overflow spillways. The ponds appear to overflow to the west, and eventually to Broadway over the sidewalks or through the drivepads.

No off-site flows enter the property. The upstream boundaries of the site are sealed by solid perimeter walls.

As shown by FIRM Panel 35001C0334G, this property is not located within a mapped 100 year floodplain.

DRAINAGE MASTERPLANS

The property was originally developed as an office building in the 1970's. The Drainage Master Plan, prepared by Kent Trauernicht, a New Mexico Licensed Architect,

recommended on-site retention ponding in accordance with the City's drainage criteria at the time. This project was designed to retain approximately 13,460-cf of excess runoff within four (5) on-site retention ponds. The site also accepted runoff from the parcel to the east, which was undeveloped at the time.

The Drainage Master Plan is provided in the Appendix for review.

MARTIN LUTHER KING JR – BROADWAY WIDENING – PROJECT 785402

The City of Albuquerque Department of Municipal Development is planning the widening of Martin Luther King Jr Boulevard NE (MLK) to provide additional turning lanes and bicycle lanes. The project requires additional right of way. The proposed right of way take at the northeast corner of the intersection impacts the Jackson Wink MMA Academy. Construction of a new right turn and bike lanes encroaches into Detention Pond D at the southwest corner of the project site. The pond outfall, a 12-inch pipe drainage to a storm inlet within MLK, will be provided by the City as a part of the MLK Widening Project.

PROJECT PHASING

The construction schedules for the Jackson Wink MMA Academy and the MLK Widening Project do not coincide; therefore the 12-inch outlet pipe draining Detention Pond D will not be available when the private site work is complete. As a result, the project will be phased. Phase 1 consists of all site work except for construction of the 6 parking spaces located at the southwest corner of the site. After construction of the MLK Widening Project is complete and the 12-inch pond outlet pipe is in place, Phase 2 will be constructed and the project will be complete. The site will operate under a Temporary Certificate of Occupancy until Phase 2 is complete.

PROPOSED CONDITIONS

As shown by the Grading and Drainage Plan (see back pocket), the property is to be re-developed by upgrading and expanding the existing building, and re-constructing the site improvements. The existing parking lot will be resurfaced and re-striped. Additional parking will be provided by expanding the existing parking lot. One of the redundant retention ponds will be removed to allow for expansion of the parking lot. The existing retention ponds located in the northeast and northwest corners of the site will remain in their current conditions. The existing pond located at the southwest corner of the site will be re-built and equipped with an outfall drain connection an existing public storm inlet within MLK.

A Pre-design conference with City Hydrology Staff established the maximum discharge rate from the site at 2.75 cfs/acre (4.13 cfs total), or existing conditions (4.12 cfs/acre, or 6.18 cfs total). We have selected the latter, which will be managed by the re-

constructed pond at the southwest corner of the site.

As shown by the Developed Drainage Basins Map, Figure 3, the developed site is divided into 5 drainage basins. Each drainage basin is described below:

Basin A is an existing closed basin that drains to existing retention Pond A.

Basin B is consists of the building roof and the landscaped area along the north side of the building draining to existing retention Pond B.

Basin C is a small basin that will free discharge thru the drivepad at Broadway.

Basin D is the largest onsite basin. It consists of the front parking lot and public areas. It drains to Pond D which will be converted to a detention pond by connecting a 12-inch storm drain to the existing storm inlet at MLK.

Basin E is an area reserved to be purchased by the City as right-of-way for the proposed Martin Luther King Jr Blvd widening project. Approximately one-half of the basin drains to MLK. The remainder drains to Pond D.

As shown by the AHYMO output files and the Pond Routing Calculations, by converting the existing retention ponds to detention ponds the total developed discharge from the site is calculated at 5.04 cfs, less than the existing peak discharge of 6.18 cfs.

90th Percentile Storm

In accordance with the City of Albuquerque Drainage Ordinance, effective May 12, 2014, all new development projects are required to manage the runoff which occurs during the 90th percentile storm event. In order to comply with this criteria, where practical, all surface drainage shall be routed through landscaped areas before release into downstream drainage facilities. Calculations are provided to demonstrate the First Flush storage proposed on-site.

CALCULATIONS

Hydrology

The calculations contained herein define the 100-year/6-hour rainfall event falling within the project site and contributing off-site areas under existing and developed conditions. The hydrology is per the City of Albuquerque, Development Process Manual, Chapter 22, Volume 2, 1997 Revision. The AHYMO 97 model is used to determine peak runoff. The calculations are presented to demonstrate the capacity and function of all proposed storm drainage improvements.

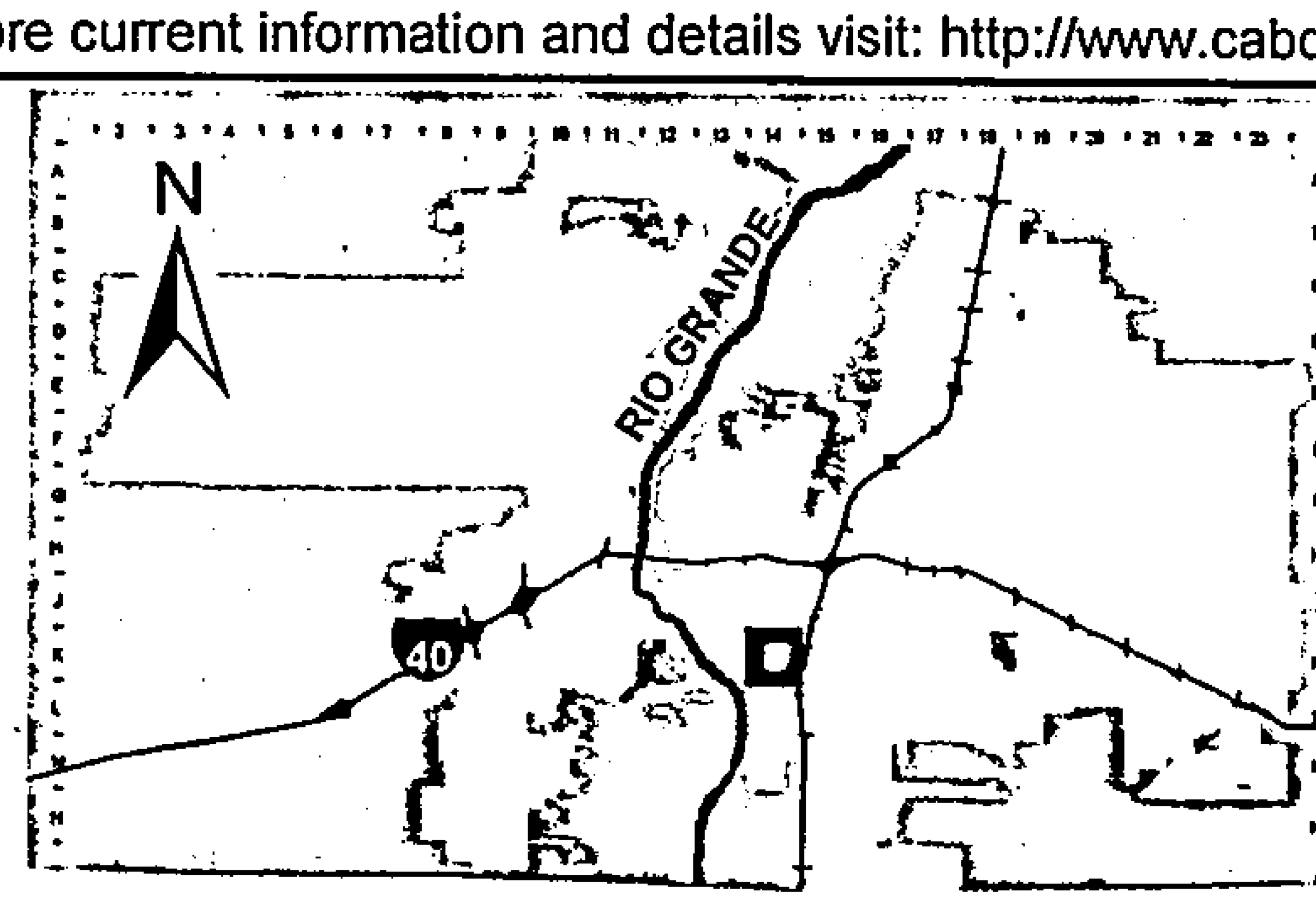
APPENDIX

MAPS

For more current information and details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 9/2/2014



LOCATION MAP

FIGURE 1

Zone Atlas Page:

K-14-Z

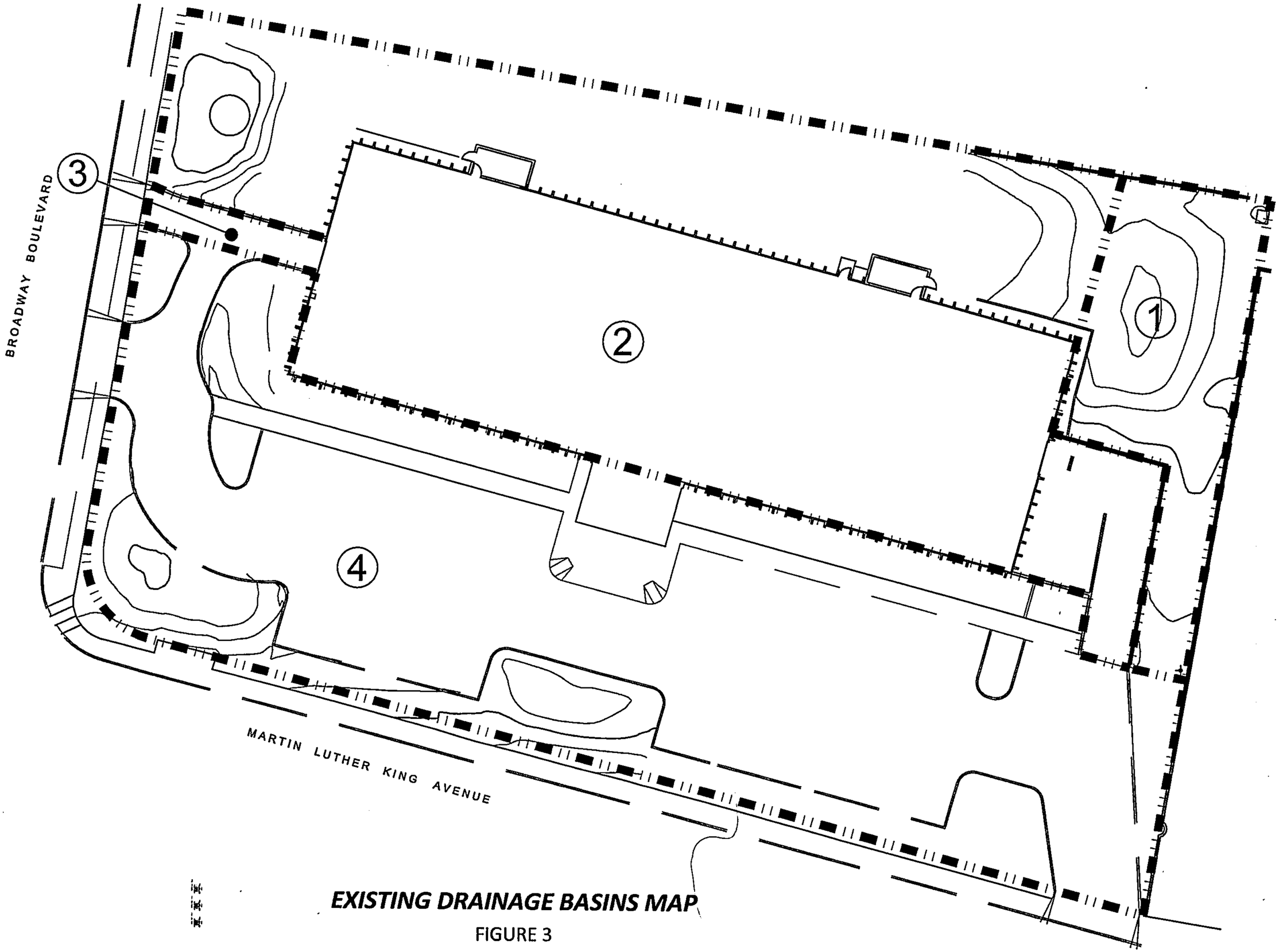
Selected Symbols

SECTOR PLANS
Design Overlay Zones
City Historic Zones
H-1 Buffer Zone
troglyph Mon.
Escarpment
2 Mile Airport Zone
Airport Noise Contours
Wall Overlay Zone

Feet
750
1,500

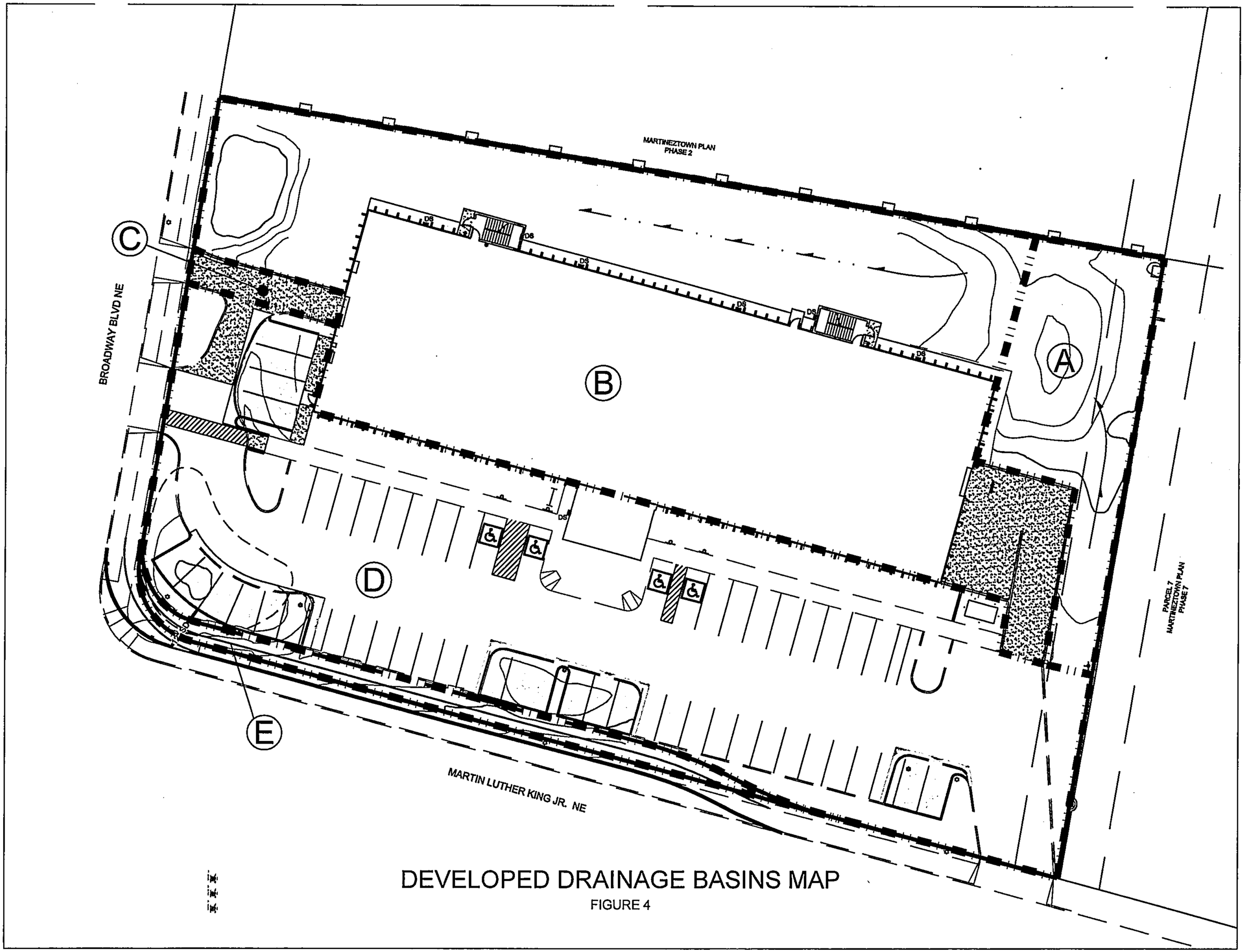
FIRM PANEL

FIGURE 2



EXISTING DRAINAGE BASINS MAP

FIGURE 3



DEVELOPED DRAINAGE BASINS MAP

FIGURE 4

STORM DRAIN FACITILITIES MAP

FIGURE 5

CALCULATIONS

PONDING CRITERIA

LORENZ
DESIGN & CONSULTING, LLC
Civil Engineering I Construction Management

SITE PONDING CRITERIA

I. FIRST FLUSH

By ordinance the site is required to retain the 90th percentile rainfall depth. In order to comply with this criteria, where practical, all surface areas will be routed through landscaped areas before release to downstream public drainage facilities. This is a re-developing site that is fully landscaped. Surface areas were constructed to drain directly to on-site retention ponds. The proposed plan will rout runoff through two existing retention ponds and one reconstructed detention pond. Storage in excess of the 90th percentile rainfall will be provided as illustrated below.

90th percentile depth	0.44"
Less initial abstraction	0.10"
Total retained depth	034"

Ponding requirement = Ad(0.34") = 0.92 ac(43,560 sf/ac)(0.34"/12"/ft) = 1,135 cf

First Flush storage provided:

Pond A	755 cf
Pond B	417 cf
Total	1,172 cf

This site is re-developing and must accept many of the existing surface improvements as they are. It must also be noted that all roof drainage is routed overland through Basin "B" which is landscaped with established sod. Initial abstraction and infiltration will be must higher than typical and is not considered in the requirement. Given these reasons the site complies with the Ordinance to the maximum extent possible.

II. DETENTION POND CRITERIA

The DMP for this site recommended on-site retention ponding in accordance with the drainage criteria at the time of development. Pre-design meetings with City staff established the allowable discharge rate at either the calculated existing discharge or 2.75 cfs/acre. As determined by Ahymo, the existing conditions discharge from the site (assuming no retention storage) is 6.18 cfs, or 4.12 cfs/acre.

Since the site is fully developed and re-developing, most of the historic drainage patterns and improvements will remain. The existing retention ponds in Basins "A" and "B" will remain.

On-site Basin "C" will free discharge 0.11 cfs thru the west drivepad. Basin "D" will drain through reconstructed detention Pond D. Pond D will be converted to a detention pond by connecting a 12" Storm drain to a storm inlet at Martin Luther King Jr.

The proposed detention pond capacities are summarized below:

POND D - STORAGE INDICATION TABLE

ELEVATION feet	Q OUT cfs	AREA sf	VOLUME acre feet
4965.00	0.00	0	0.0000
4965.50	1.00	37.5	0.0009
4966.00	2.10	637.5	0.0146
4966.20	2.40	805.5	0.0185

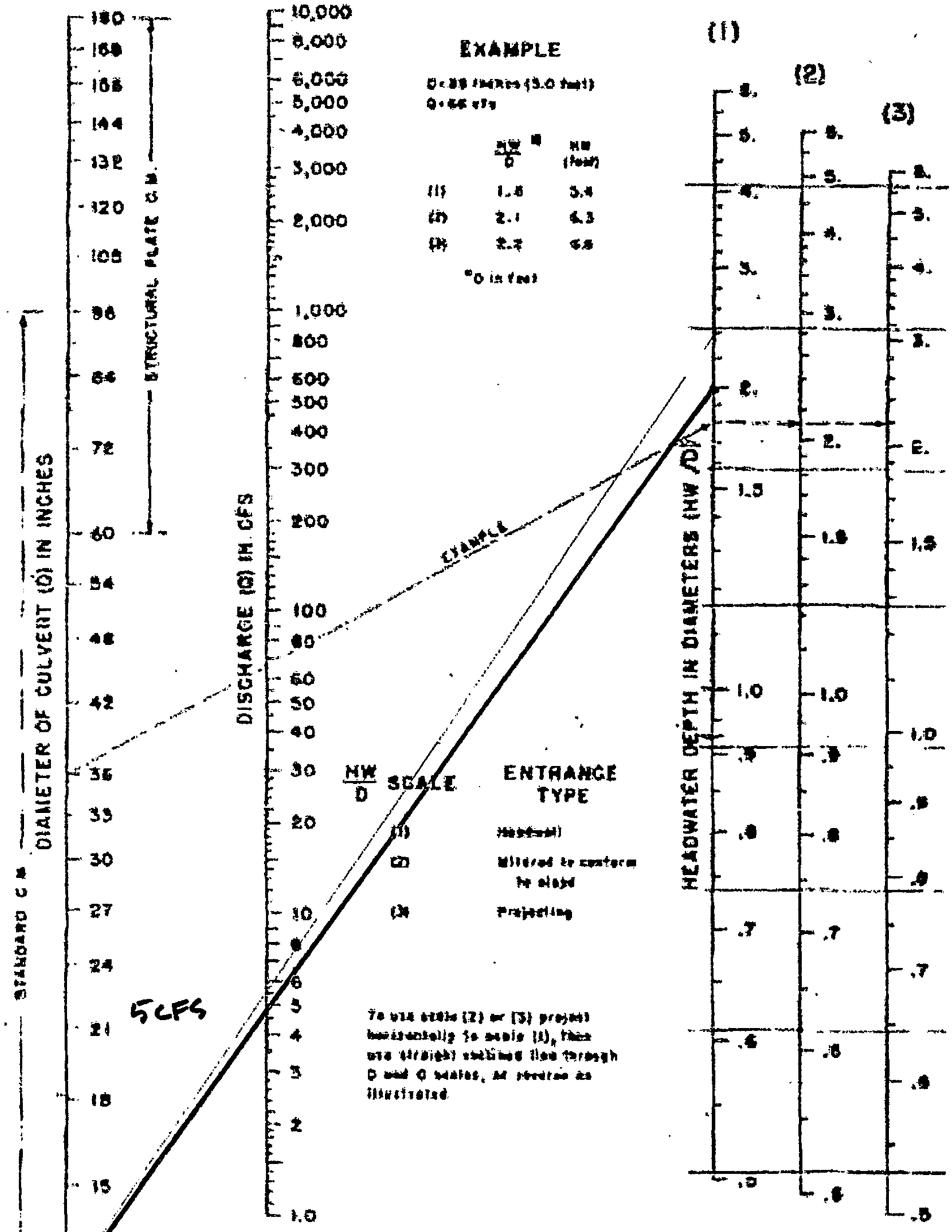
As illustrated by the AHYMO Output file, the discharge from Pond D is calculated at 2.28 cfs, with a maximum water surface elevation of 4966.12 feet.

The total developed discharge from the project site is as follows:

Basin A	0 cfs
Basin B	2.65 cfs ##
Basin C	0.11 cfs
Basin D	2.28 cfs
---	---
Total	5.04 cfs<Q100 Existing (6.18 cfs)

the existing pond within Basin B retains 417 cf.

DRAINAGE STRUCTURE CAPACITIES



BUREAU OF PUBLIC ROADS JAN 1963

HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

Q100 POND 'D' = 2.28 CFS < 5 CFS ✓

Free Online Manning Pipe Flow Calculator

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Can you help me translate this calculator to your language or host this calculator at your web site?

Printable Title

Q100 POND 'b' = 2.28 CFS < 3.98 CFS ✓

Printable Subtitle

Set units: m | mm | ft | inches

Pipe diameter, d_0	1 ft
Manning roughness, n ?	.013
Pressure slope (possibly ? equal to pipe slope), S_0	2 % rise/run
Percent of (or ratio to) full depth (100% or 1 if flowing full)	67 %

Results:

Flow, q	3.9768	cfs
Velocity, v	7.1095	ft/sec
Velocity head, h_v	0.7856	ft
Flow area	0.5594	ft^2
Wetted perimeter	1.9177	ft
Hydraulic radius	0.2917	ft
Top width, T	0.9404	ft
Froude number, F	1.63	
Shear stress (tractive force), tau	0.8367	psf

Please give us your valued words of suggestion or praise. Did this free calculator exceed your expectations in every way?

Last Modified 02/13/2015 16:50:00

AHYMO INPUT FILE

```
**********************************************************************
*
*                          JACKSON-WINK MMA ACADEMY
*                             PROJECT HYDROLOGY
**********************************************************************
START                 TIME=0.0   PUNCH CODE=0
LOCATION              ALBUQUERQUE
RAINFALL              TYPE=1   RAIN QUARTER=0.0   RAIN ONE=2.01
                      RAIN SIX=2.35   RAIN DAY=2.75   DT=0.03333 HRS
**********************************************************************
************************
* EXISTING CONDITIONS   *
************************
* SITE - 1.50 ACRES
COMPUTE NM HYD        ID=1   HYD NO=EX-SITE   DA=0.002344 SQ MI
                      PER A=0 PER B=27 PER C=12   PER D=61
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=1   CODE=20
* BASIN 1 - 0.11 ACRES
COMPUTE NM HYD        ID=2   HYD NO=EX-1   DA=0.000172 SQ MI
                      PER A=0 PER B=100 PER C=0 PER D=0
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=2   CODE=20
* BASIN 2 - 0.67 ACRES
COMPUTE NM HYD        ID=3   HYD NO=EX-2   DA=0.001047 SQ MI
                      PER A=0 PER B=50 PER C=0 PER D=50
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=3   CODE=20
* BASIN 3 - 0.02 ACRES
COMPUTE NM HYD        ID=4   HYD NO=EX-3   DA=0.000031 SQ MI
                      PER A=0 PER B=0 PER C=0 PER D=100
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=4   CODE=20
* BASIN 4 - 0.70 ACRES
COMPUTE NM HYD        ID=5   HYD NO=EX-4   DA=0.001094 SQ MI
                      PER A=0 PER B=0 PER C=32 PER D=68
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=5   CODE=20
************************
* DEVELOPED CONDITIONS   *
************************
* SITE - 1.50 ACRES
COMPUTE NM HYD        ID=6   HYD NO=DEV-SITE   DA=0.002344 SQ MI
                      PER A=0 PER B=26 PER C=13   PER D=61
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=6   CODE=20
* BASIN A - 0.11 ACRES
COMPUTE NM HYD        ID=7   HYD NO=DEV-A   DA=0.000172 SQ MI
                      PER A=0 PER B=100 PER C=0 PER D=0
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=7   CODE=20
* BASIN B - 0.67 ACRES
COMPUTE NM HYD        ID=8   HYD NO=DEV-B   DA=0.001047 SQ MI
                      PER A=0 PER B=44 PER C=0 PER D=56
```

```
                    TP=0.1333 HR  MASS RAIN=-1
PRINT HYD           ID=8  CODE=20
* BASIN C - 0.02 ACRES
COMPUTE NM HYD      ID=9  HYD NO=DEV-C  DA=0.000031 SQ MI
                    PER A=0 PER B=0 PER C=0 PER D=100
                    TP=0.1333 HR  MASS RAIN=-1
PRINT HYD           ID=9  CODE=20
* BASIN D - 0.66 ACRES
COMPUTE NM HYD      ID=10  HYD NO=DEV-D  DA=0.00103 SQ MI
                    PER A=0 PER B=0 PER C=25 PER D=75
                    TP=0.1333 HR  MASS RAIN=-1
PRINT HYD           ID=10  CODE=20
* BASIN E - 0.04 ACRES
COMPUTE NM HYD      ID=11  HYD NO=DEV-E  DA=0.000063 SQ MI
                    PER A=0 PER B=0 PER C=50 PER D=50
                    TP=0.1333 HR  MASS RAIN=-1
PRINT HYD           ID=11  CODE=20
DIVIDE HYD          ID=11  PER=-50   ID I=12   HYD NO=E-MLK
                                     ID II=13  HYD NO=E-POND-IN
PRINT HYD           ID=13  CODE=20
ADD HYD             ID=14 HYD NO=POND-D-IN   ID I=10 ID II=13
PRINT HYD           ID=14 CODE=20
*****************************************************************
* ROUTE DEVELOPED SITE THROUGH DETENTION POND AT AP-1           *
* THRU 12 INCH SD TO EXIST STORM INLET AT MLK                   *
*****************************************************************
ROUTE RESERVOIR     ID=15 HYD NO=POND.E.OUT  INFLOW ID=14  CODE=10
                    OUT (CFS)   STORAGE (AC-FT)    ELEV (FT)
                    0.0           0                  65.00
                    1.0           0.00086            65.50
                    2.1           0.01005            66.00
                    2.4           0.01850            66.20
PRINT HYD           ID=15 CODE=20
FINISH
```

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.01a, Rel: 01a RUN DATE (MON/DAY/YR) =05/06/2015
INPUT FILE = P:\14-034 - Jackson Wink Academy MMA Gym\Ahymo\Wink.Dat USER NO.= Lorenz-NMSingleA33825816

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	0.00
LOCATION		ALBUQUERQUE									
RAINFALL TYPE= 1 NOAA 14										RAIN6=	2.350
COMPUTE NM HYD	EX-SITE	-	1	0.00234	6.18	0.211	1.68405	1.533	4.120	PER IMP=	61.00
COMPUTE NM HYD	EX-1	-	2	0.00017	0.31	0.009	0.95319	1.533	2.858	PER IMP=	0.00
COMPUTE NM HYD	EX-2	-	3	0.00105	2.56	0.085	1.52818	1.533	3.823	PER IMP=	50.00
COMPUTE NM HYD	EX-3	-	4	0.00003	0.11	0.003	2.10318	1.500	5.308	PER IMP=	100.00
COMPUTE NM HYD	EX-4	-	5	0.00109	3.10	0.106	1.81783	1.533	4.425	PER IMP=	68.00
COMPUTE NM HYD	DEV-SITE	-	6	0.00234	6.19	0.211	1.68660	1.533	4.127	PER IMP=	61.00
COMPUTE NM HYD	DEV-A	-	7	0.00017	0.31	0.009	0.95319	1.533	2.858	PER IMP=	0.00
COMPUTE NM HYD	DEV-B	-	8	0.00105	2.65	0.089	1.59718	1.533	3.949	PER IMP=	56.00
COMPUTE NM HYD	DEV-C	-	9	0.00003	0.11	0.003	2.10318	1.500	5.308	PER IMP=	100.00
COMPUTE NM HYD	DEV-D	-	10	0.00103	2.98	0.103	1.88025	1.533	4.521	PER IMP=	75.00
COMPUTE NM HYD	DEV-E	-	11	0.00006	0.19	0.006	1.65733	1.533	4.622	PER IMP=	50.00
DIVIDE HYD	E-MLK	11	12	0.00003	0.09	0.003	1.62886	1.533	4.622		
	E-POND-IN	and	13	0.00003	0.09	0.003	1.62886	1.533	4.622		
ADD HYD	POND-D-IN	10&13	14	0.00106	3.07	0.106	1.87241	1.533	4.524		
ROUTE RESERVOIR	POND.E.OUT	14	15	0.00106	2.28	0.106	1.87241	1.633	3.349	AC-FT=	0.015
FINISH											

```
    AHYMO PROGRAM (AHYMO-S4)                        - Version: S4.01a - Rel: 01a
         RUN DATE (MON/DAY/YR) = 05/06/2015
         START TIME (HR:MIN:SEC) = 14:37:45     USER NO.= Lorenz-NMSingleA33825816
         INPUT FILE = P:\14-034 - Jackson Wink Academy MMA Gym\Ahymo\Wink.Dat

**************************************************************************
*                        JACKSON-WINK MMA ACADEMY
*                           PROJECT HYDROLOGY
**************************************************************************
START               TIME=0.0  PUNCH CODE=0
LOCATION            ALBUQUERQUE
     City of Albuquerque soil infiltration values (LAND FACTORS) used for computations.
     Land Treatment     Initial Abstr.(in)    Unif. Infilt.(in/hour)
          A             0.65                  1.67
          B             0.50                  1.25
          C             0.35                  0.83
          D             0.10                  0.04

RAINFALL            TYPE=1  RAIN QUARTER=0.0  RAIN ONE=2.01
                    RAIN SIX=2.35  RAIN DAY=2.75  DT=0.03333 HRS

               6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE AREAS (NM & AZ) - D1
               DT =   0.033330 HOURS       END TIME =     5.999400 HOURS
                 0.0000  0.0015  0.0030  0.0046  0.0063  0.0080  0.0099
                 0.0117  0.0138  0.0159  0.0180  0.0226  0.0272  0.0321
                 0.0372  0.0424  0.0480  0.0537  0.0595  0.0654  0.0713
                 0.0776  0.0838  0.0904  0.0974  0.1044  0.1124  0.1204
                 0.1340  0.1534  0.1727  0.1987  0.2246  0.2558  0.2921
                 0.3284  0.3829  0.4374  0.5117  0.6058  0.7000  0.9502
                 1.2011  1.3965  1.5355  1.6746  1.7448  1.8147  1.8717
                 1.9157  1.9597  1.9903  2.0208  2.0473  2.0696  2.0919
                 2.1089  2.1258  2.1380  2.1455  2.1529  2.1595  2.1661
                 2.1721  2.1775  2.1829  2.1879  2.1928  2.1977  2.2024
                 2.2072  2.2095  2.2118  2.2141  2.2163  2.2185  2.2206
                 2.2227  2.2247  2.2267  2.2287  2.2307  2.2326  2.2345
                 2.2363  2.2382  2.2399  2.2417  2.2435  2.2452  2.2469
                 2.2485  2.2502  2.2518  2.2534  2.2550  2.2565  2.2581
                 2.2596  2.2610  2.2625  2.2640  2.2654  2.2668  2.2682
                 2.2697  2.2710  2.2724  2.2738  2.2751  2.2765  2.2778
                 2.2791  2.2804  2.2817  2.2830  2.2843  2.2856  2.2868
                 2.2881  2.2893  2.2905  2.2917  2.2929  2.2941  2.2953
                 2.2965  2.2977  2.2988  2.3000  2.3012  2.3023  2.3034
                 2.3045  2.3057  2.3068  2.3079  2.3090  2.3100  2.3111
                 2.3122  2.3132  2.3143  2.3153  2.3164  2.3174  2.3184
                 2.3195  2.3205  2.3215  2.3225  2.3235  2.3245  2.3255
                 2.3264  2.3274  2.3284  2.3293  2.3303  2.3312  2.3322
                 2.3331  2.3341  2.3350  2.3359  2.3368  2.3377  2.3386
                 2.3395  2.3404  2.3413  2.3422  2.3431  2.3440  2.3448
                 2.3457  2.3466  2.3474  2.3483  2.3491  2.3500
```

```
**************************************************************************
************************
* EXISTING CONDITIONS  *
************************
* SITE - 1.50 ACRES
COMPUTE NM HYD       ID=1  HYD NO=EX-SITE  DA=0.002344 SQ MI
                     PER A=0 PER B=27 PER C=12  PER D=61
                     TP=0.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =   5.6451    CFS   UNIT VOLUME =   0.9973       B =   526.28      P60 = 2.0100
     AREA =     0.001430 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330


     K =  0.124506HR    TP =  0.133300HR    K/TP RATIO =  0.934025     SHAPE CONSTANT, N =  3.786679
     UNIT PEAK =   2.3364    CFS   UNIT VOLUME =   0.9945       B =   340.69      P60 = 2.0100
     AREA =     0.000914 SQ MI    IA =   0.45385 INCHES    INF =   1.12077 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD            ID=1  CODE=20

                                HYDROGRAPH FROM AREA EX-SITE

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     0.000      0.0          1.333      1.5          2.666      0.1          4.000      0.0          5.333      0.0
     0.667      0.0          2.000      0.8          3.333      0.0          4.666      0.0          5.999      0.0

    RUNOFF VOLUME =     1.68405 INCHES     =       0.2105 ACRE-FEET
    PEAK DISCHARGE RATE =       6.18 CFS  AT   1.533 HOURS   BASIN AREA =  0.0023 SQ. MI.


* BASIN 1 - 0.11 ACRES
COMPUTE NM HYD       ID=2  HYD NO=EX-1  DA=0.000172 SQ MI
                     PER A=0 PER B=100 PER C=0 PER D=0
                     TP=0.1333 HR  MASS RAIN=-1

     K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE CONSTANT, N =  3.562974
     UNIT PEAK =  0.41923    CFS   UNIT VOLUME =   0.9666       B =   324.90      P60 = 2.0100
     AREA =     0.000172 SQ MI    IA =   0.50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD            ID=2  CODE=20

                                HYDROGRAPH FROM AREA EX-1

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
```

HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 0.95319 INCHES = 0.0087 ACRE-FEET
PEAK DISCHARGE RATE = 0.31 CFS AT 1.533 HOURS BASIN AREA = 0.0002 SQ. MI.

```
* BASIN 2 - 0.67 ACRES
COMPUTE NM HYD      ID=3  HYD NO=EX-2  DA=0.001047 SQ MI
                    PER A=0 PER B=50 PER C=0 PER D=50
                    TP=0.1333 HR  MASS RAIN=-1
```

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 2.0668 CFS UNIT VOLUME = 0.9941 B = 526.28 P60 = 2.0100
AREA = 0.000524 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.132088HR TP = 0.133300HR K/TP RATIO = 0.990905 SHAPE CONSTANT, N = 3.562974
UNIT PEAK = 1.2760 CFS UNIT VOLUME = 0.9900 B = 324.90 P60 = 2.0100
AREA = 0.000524 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

```
PRINT HYD           ID=3  CODE=20
```

HYDROGRAPH FROM AREA EX-2

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.6	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.3	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.52818 INCHES = 0.0853 ACRE-FEET
PEAK DISCHARGE RATE = 2.56 CFS AT 1.533 HOURS BASIN AREA = 0.0010 SQ. MI.

```
* BASIN 3 - 0.02 ACRES
COMPUTE NM HYD      ID=4  HYD NO=EX-3  DA=0.000031 SQ MI
                    PER A=0 PER B=0 PER C=0 PER D=100
                    TP=0.1333 HR  MASS RAIN=-1
```

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 0.12239 CFS UNIT VOLUME = 0.9033 B = 526.28 P60 = 2.0100
AREA = 0.000031 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

```
PRINT HYD           ID=4  CODE=20
```

HYDROGRAPH FROM AREA EX-3

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 2.10318 INCHES = 0.0035 ACRE-FEET
PEAK DISCHARGE RATE = 0.11 CFS AT 1.500 HOURS BASIN AREA = 0.0000 SQ. MI.

* BASIN 4 - 0.70 ACRES
COMPUTE NM HYD ID=5 HYD NO=EX-4 DA=0.001094 SQ MI
PER A=0 PER B=0 PER C=32 PER D=68
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 2.9370 CFS UNIT VOLUME = 0.9955 B = 526.28 P60 = 2.0100
AREA = 0.000744 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.107446HR TP = 0.133300HR K/TP RATIO = 0.806046 SHAPE CONSTANT, N = 4.440407
UNIT PEAK = 1.0073 CFS UNIT VOLUME = 0.9879 B = 383.54 P60 = 2.0100
AREA = 0.000350 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=5 CODE=20

HYDROGRAPH FROM AREA EX-4

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.8	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.81783 INCHES = 0.1061 ACRE-FEET
PEAK DISCHARGE RATE = 3.10 CFS AT 1.533 HOURS BASIN AREA = 0.0011 SQ. MI.

****
* DEVELOPED CONDITIONS *
****
* SITE - 1.50 ACRES
COMPUTE NM HYD ID=6 HYD NO=DEV-SITE DA=0.002344 SQ MI
PER A=0 PER B=26 PER C=13 PER D=61
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428

UNIT PEAK = 5.6451 CFS UNIT VOLUME = 0.9973 B = 526.28 P60 = 2.0100
AREA = 0.001430 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.123874HR TP = 0.133300HR K/TP RATIO = 0.929285 SHAPE CONSTANT, N = 3.806885
UNIT PEAK = 2.3460 CFS UNIT VOLUME = 0.9946 B = 342.09 P60 = 2.0100
AREA = 0.000914 SQ MI IA = 0.45000 INCHES INF = 1.11000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA DEV-SITE

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	1.5	2.666	0.1	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.8	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.68660 INCHES = 0.2108 ACRE-FEET
PEAK DISCHARGE RATE = 6.19 CFS AT 1.533 HOURS BASIN AREA = 0.0023 SQ. MI.

* BASIN A - 0.11 ACRES
COMPUTE NM HYD ID=7 HYD NO=DEV-A DA=0.000172 SQ MI
PER A=0 PER B=100 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = 0.132088HR TP = 0.133300HR K/TP RATIO = 0.990905 SHAPE CONSTANT, N = 3.562974
UNIT PEAK = 0.41923 CFS UNIT VOLUME = 0.9666 B = 324.90 P60 = 2.0100
AREA = 0.000172 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA DEV-A

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 0.95319 INCHES = 0.0087 ACRE-FEET
PEAK DISCHARGE RATE = 0.31 CFS AT 1.533 HOURS BASIN AREA = 0.0002 SQ. MI.

* BASIN B - 0.67 ACRES
COMPUTE NM HYD ID=8 HYD NO=DEV-B DA=0.001047 SQ MI
PER A=0 PER B=44 PER C=0 PER D=56

TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 2.3148 CFS UNIT VOLUME = 0.9941 B = 526.28 P60 = 2.0100
AREA = 0.000586 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.132088HR TP = 0.133300HR K/TP RATIO = 0.990905 SHAPE CONSTANT, N = 3.562974
UNIT PEAK = 1.1229 CFS UNIT VOLUME = 0.9881 B = 324.90 P60 = 2.0100
AREA = 0.000461 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=8 CODE=20

HYDROGRAPH FROM AREA DEV-B

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.6	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.3	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.59718 INCHES = 0.0892 ACRE-FEET
PEAK DISCHARGE RATE = 2.65 CFS AT 1.533 HOURS BASIN AREA = 0.0010 SQ. MI.

* BASIN C - 0.02 ACRES
COMPUTE NM HYD ID=9 HYD NO=DEV-C DA=0.000031 SQ MI
PER A=0 PER B=0 PER C=0 PER D=100
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 0.12239 CFS UNIT VOLUME = 0.9033 B = 526.28 P60 = 2.0100
AREA = 0.000031 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA DEV-C

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 2.10318 INCHES = 0.0035 ACRE-FEET
PEAK DISCHARGE RATE = 0.11 CFS AT 1.500 HOURS BASIN AREA = 0.0000 SQ. MI.

```
* BASIN D - 0.66 ACRES
COMPUTE NM HYD       ID=10  HYD NO=DEV-D  DA=0.00103 SQ MI
                     PER A=0 PER B=0 PER C=25 PER D=75
                     TP=0.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =   3.0499    CFS   UNIT VOLUME =   0.9955       B =   526.28      P60 = 2.0100
     AREA =     0.000773 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330


     K =  0.107446HR    TP =  0.133300HR    K/TP RATIO =  0.806046     SHAPE CONSTANT, N =  4.440407
     UNIT PEAK =  0.74089    CFS   UNIT VOLUME =   0.9833       B =   383.54      P60 = 2.0100
     AREA =     0.000258 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD            ID=10  CODE=20

                                   HYDROGRAPH FROM AREA DEV-D

     TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
      HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS           HRS       CFS
     0.000      0.0          1.333      0.8          2.666      0.0          4.000      0.0          5.333      0.0
     0.667      0.0          2.000      0.4          3.333      0.0          4.666      0.0          5.999      0.0

    RUNOFF VOLUME =      1.88025 INCHES      =       0.1033 ACRE-FEET
     PEAK DISCHARGE RATE =       2.98 CFS  AT   1.533 HOURS   BASIN AREA =  0.0010 SQ. MI.


* BASIN E - 0.04 ACRES
COMPUTE NM HYD       ID=11  HYD NO=DEV-E  DA=0.000063 SQ MI
                     PER A=0 PER B=0 PER C=50 PER D=50
                     TP=0.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =  0.12436    CFS   UNIT VOLUME =   0.9033       B =   526.28      P60 = 2.0100
     AREA =     0.000032 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330


     K =  0.107446HR    TP =  0.133300HR    K/TP RATIO =  0.806046     SHAPE CONSTANT, N =  4.440407
     UNIT PEAK =  0.90633E-01CFS   UNIT VOLUME =   0.8782       B =   383.54      P60 = 2.0100
     AREA =     0.000032 SQ MI    IA =   0.35000 INCHES    INF =   0.83000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD            ID=11  CODE=20

                                   HYDROGRAPH FROM AREA DEV-E
```

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 1.65733 INCHES = 0.0056 ACRE-FEET
PEAK DISCHARGE RATE = 0.19 CFS AT 1.533 HOURS BASIN AREA = 0.0001 SQ. MI.

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DIVIDE HYD          ID=11  PER=-50   ID I=12   HYD NO=E-MLK
                                      ID II=13  HYD NO=E-POND-IN
PRINT HYD           ID=13  CODE=20
```

HYDROGRAPH FROM AREA E-POND-IN

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 1.62886 INCHES = 0.0027 ACRE-FEET
PEAK DISCHARGE RATE = 0.09 CFS AT 1.533 HOURS BASIN AREA = 0.0000 SQ. MI.

```
ADD HYD             ID=14 HYD NO=POND-D-IN   ID I=10 ID II=13
PRINT HYD           ID=14 CODE=20
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HYDROGRAPH FROM AREA POND-D-IN

TIME .HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.8	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.87241 INCHES = 0.1060 ACRE-FEET
PEAK DISCHARGE RATE = 3.07 CFS AT 1.533 HOURS BASIN AREA = 0.0011 SQ. MI.

```
**************************************************************
* ROUTE DEVELOPED SITE THROUGH DETENTION POND AT AP-1        *
* THRU 12 INCH SD TO EXIST STORM INLET AT MLK                *
**************************************************************
ROUTE RESERVOIR     ID=15 HYD NO=POND.E.OUT  INFLOW ID=14  CODE=10
                    OUT (CFS)   STORAGE (AC-FT)    ELEV (FT)
                    0.0           0                  65.00
                    1.0           0.00086            65.50
                    2.1           0.01005            66.00
                    2.4           0.01850            66.20
```

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	65.00	0.000	0.00
0.33	0.00	65.00	0.000	0.00
0.67	0.00	65.00	0.000	0.00
1.00	0.09	65.04	0.000	0.08
1.33	0.84	65.39	0.001	0.78
1.67	1.75	66.09	0.014	2.24
2.00	0.42	65.22	0.000	0.44
2.33	0.12	65.06	0.000	0.12
2.67	0.02	65.01	0.000	0.02
3.00	0.01	65.00	0.000	0.01
3.33	0.01	65.00	0.000	0.01
3.67	0.00	65.00	0.000	0.00

PEAK DISCHARGE = 2.275 CFS - PEAK OCCURS AT HOUR 1.63
MAXIMUM WATER SURFACE ELEVATION = 66.117
MAXIMUM STORAGE = 0.0150 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=15 CODE=20

HYDROGRAPH FROM AREA POND.E.OUT

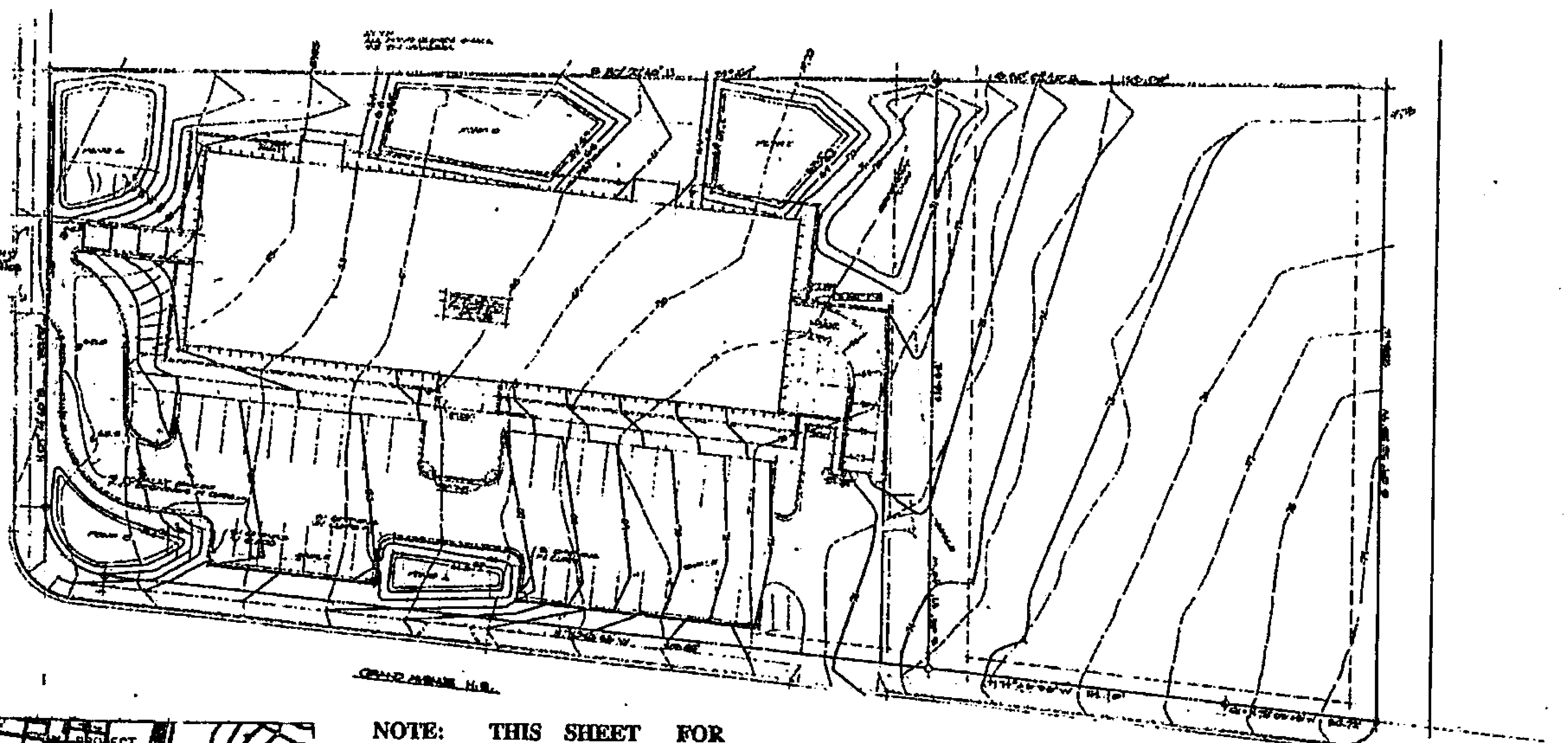
TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.8	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

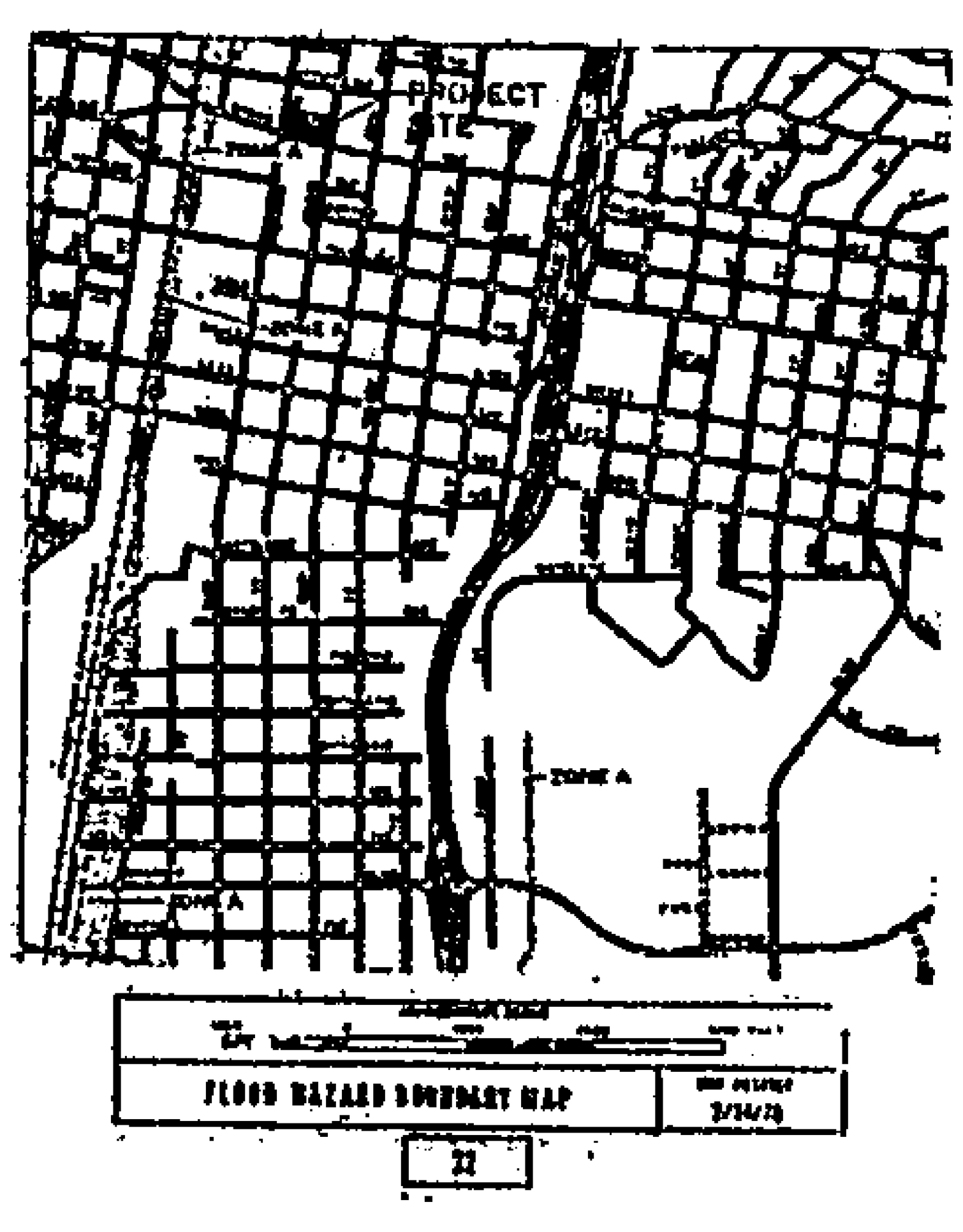
RUNOFF VOLUME = 1.87241 INCHES = 0.1060 ACRE-FEET
PEAK DISCHARGE RATE = 2.28 CFS AT 1.633 HOURS BASIN AREA = 0.0011 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 14:37:45

DRAINAGE MASTERPLAN





22

NOTE: THIS SHEET FOR REFERENCE ONLY

DRAINAGE PLAN

The following items concerning the [illegible] Building Drainage Plan are contained herein:

1. Vicinity Map
2. Flood Hazard Map
3. Site Plan
4. Calculations

The proposed building is located at the northeast corner of the intersection of Grand Avenue, N.E. and Broadway Boulevard, N.E. The building will have offices on the second floor and a parking garage on the ground level. There will be additional parking adjacent to the building. This drainage plan does not provide for any development of the eastern portion of the property.

The natural slope of the land is from east to west at approximately 3 percent. The project: (1) does not lie in a flood plain, (2) does not lie adjacent to a natural or artificial water course, and (3) has no drainage easements on the property.

The land to the north is multi-family units with a block wall separating the two sites. The site is higher than the two bordering streets, and a paved alley along the east boundary intercepts runoff from the east; therefore, the property does not receive any significant flows from upland properties. Erosion will not result from upland runoff or from the proposed construction activities. This development will not block any drainage from adjacent properties.

The grading plan shows: (1) existing contours at 1.0' intervals, (2) proposed contours, (3) swales, (4) continuity between existing and proposed contours, (5) that the elevation at the property line will match the existing sidewalk, (6) that all runoff will be conveyed into ponding areas before leaving the site and (7) that retaining walls are required adjacent to the driveway ramp.

[illegible] percent of the runoff that results from a [illegible] year [illegible] storm. The ponds are [illegible] inches in depth and therefore do not require [illegible].

GRADING - SITE PLAN | SCALE: 1" = 20'-0"

CALCULATIONS

Area of Parcel = [illegible] sf

Impervious Area = [illegible] sf

Required Pond Volume = [illegible] x [illegible] = 11,7[illegible] sf

POND VOLUMES

Note: Entire roof slopes to north.

Pond A

[illegible] = [illegible] cf

Pond B

[illegible] 400 (1) = [illegible] cf

Pond C

[illegible] 420 (1) = 1,300 cf

Pond BC

[illegible] = 2,950 cf

Pond D

[illegible] = [illegible] cf

Pond E

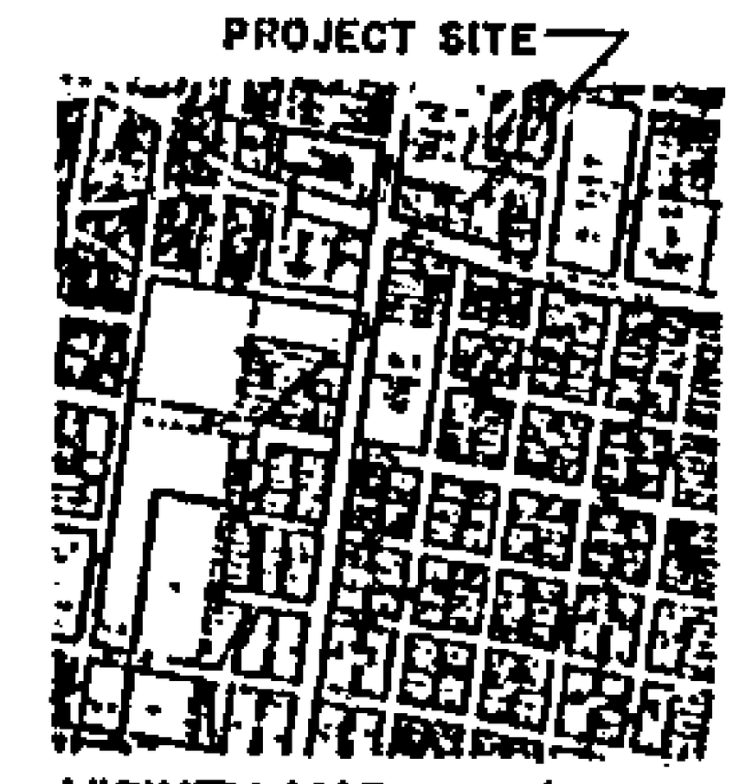
[illegible] = 2,[illegible] cf

Sediment Pond

[illegible] (1) = 1,[illegible] cf

Total Pond Volume = 11,[illegible] cf

PROJECT SITE

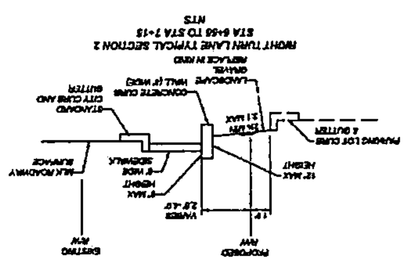


VICINITY MAP

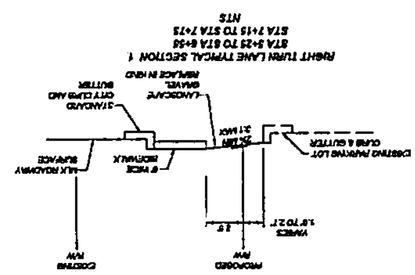
BANKS SOUTHWEST

BNA OF ALBUQUERQUE

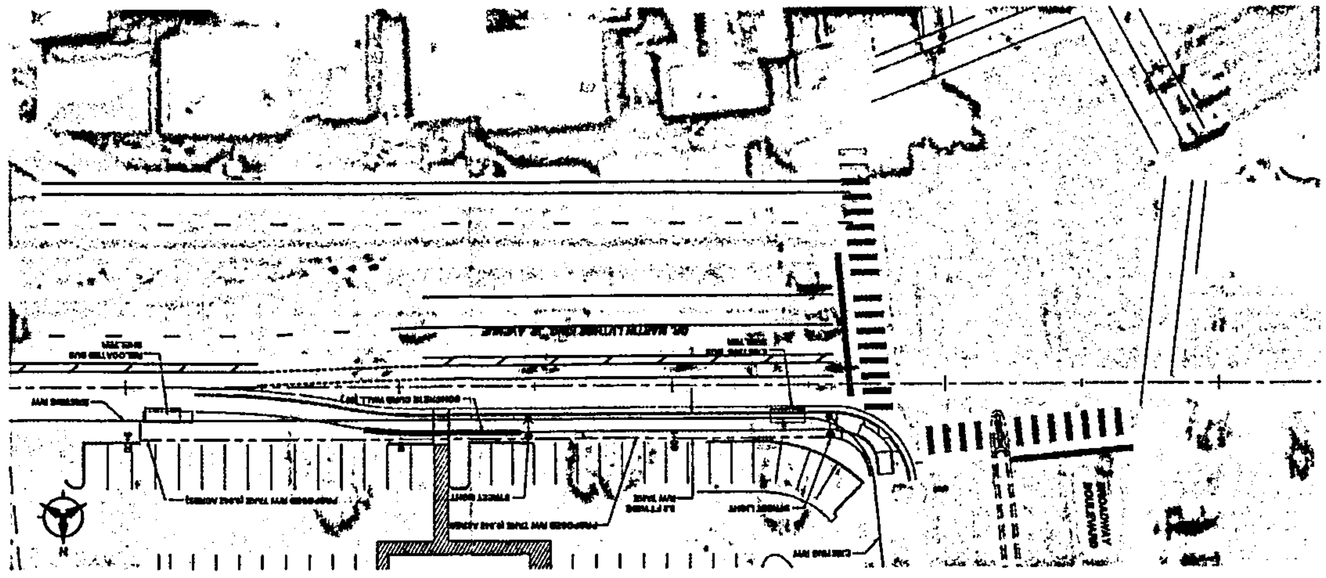
18



RIGHT TURN LANE TYPICAL SECTION 2
STA 6+50 TO STA 7+15
NTS



RIGHT TURN LANE TYPICAL SECTION 1
STA 5+25 TO STA 6+50
STA 7+15 TO STA 7+75
NTS



EXHIBITS

CITY OF ALBUQUERQUE

March 5, 2015

Dennis Lorenz, P.E.
Lorenz Design & Consulting
2501 Rio Grande Blvd. NW Suite A
Albuquerque, New Mexico 87107

RE: **Jackson Wink MMA Academy**
Grading and Drainage Plan and Drainage Report
Engineers Stamp Date 2/13/15 (K14D005)

Dear Mr. Lorenz,

Based upon the information provided in your submittal received 2/17/2015, the above referenced Grading and Drainage Plan and Drainage Report is accepted for Grading Permit and Building Permit. Attach a copy of this approved plan to the construction sets in the permitting process prior to sign-off by Hydrology.

Prior to Certificate of Occupancy release, Engineer Certification per the DPM checklist will be required.

A separate permit (SO 19) is required for construction within City ROW. A copy of this approval letter must be on hand when applying for the excavation or barricading permit. If there is a Work Order associated with this project, this work is to be included in the Work Order. To obtain a permanent CO the sidewalk culvert must be inspected and accepted. Please contact Jason Rodriguez, 235-8016, to schedule an inspection.

If you have any questions please contact 6me at 924-3986 or Rudy Rael at 924-3977.

Sincerely,

Curtis Cherne, P.E.
Principal Engineer
Planning Department

RR/CC
C: File

PO Box 1293
Albuquerque
New Mexico 87103
www.cabq.gov

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV 04/2009)

K14 D005

PROJECT TITLE: JACKSON – WINK MMA ACADEMY ZONE MAP: K-14
DRB#: NA EPC#: NA WORK ORDER#: NA

LEGAL DESCRIPTION: PARCELS 8 & 9, PLAT OF MARTINEZTOWN PLAN, PHASE 7

CITY ADDRESS: 301 MARTIN LUTHER KING JR NE

ENGINEERING FIRM: LORENZ DESIGN & CONSULTING CONTACT: DENNIS LORENZ
ADDRESS: 2501 RIO GRANDE BLVD. NW SUITE A PHONE: 888-6088
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87104

OWNER: WINK, INC CONTACT: M. WINKELJOHN
ADDRESS: 301 MARTIN LUTHER KING JR NE PHONE: 489-4531
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

ARCHITECT: RICK BENNETT ARCHITECTS CONTACT: R. BENNETT
ADDRESS: 1104 PARK AVENUE SW PHONE: 242-1859
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

SURVEYOR: HARRIS SURVEYS CONTACT: T. HARRIS
ADDRESS: 2412 D MONROE NE PHONE: 889-8056
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87110

CONTRACTOR: WINK, INC CONTACT: M. WINKELJOHN
ADDRESS: 301 MARTIN LUTHER KING JR NE PHONE: 489-4531
CITY, STATE: ALBUQUERQUE, NEW MEXICO ZIP CODE: 87103

TYPE OF SUBMITTAL:
_____ DRAINAGE REPORT
__xx__ 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'S CERT (TCL)
_____ ENGINEER'S 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
__xx__ BUILDING PERMIT APPROVAL
_____ CERTIFICATE OF OCCUPANCY (PERM)
_____ CERTIFICATE OF OCCUPANCY (TEMP)
_____ GRADING PERMIT APPROVAL
_____ PAVING PERMIT APPROVAL
_____ WORK ORDER APPROVAL
_____ GRADING CERTIFICATION
_____ OTHER (SPECIFY) SO-19

RECEIVED
FEB 17 2015
LAND DEVELOPMENT SECTION

Paid $50.00

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

DATE SUBMITTED: 02-16-2015 BY: DENNIS A. LORENZ

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 defines 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.

DRAINAGE REPORT
FOR
JACKSON WINK MMA ACADEMY

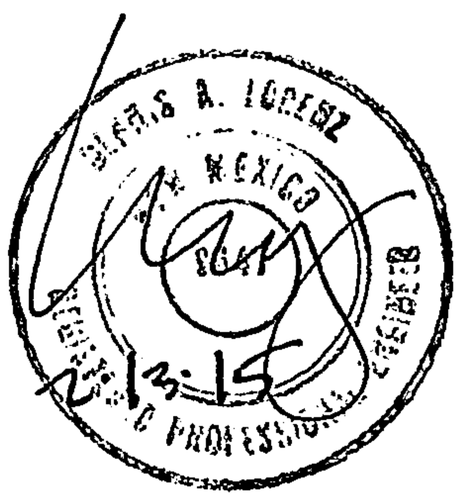
301 Martin Luther King Jr NE
Albuquerque, New Mexico 87103

Prepared For:

Mike Winkeljohn
301 Martin Luther King Jr NE
Albuquerque, New Mexico 87103

Prepared by:

LORENZ
DESIGN & CONSULTING, LLC
Civil Engineering I Construction Management



February 2015

TABLE OF CONTENTS

APPENDIX INDEX

PURPOSE AND SCOPE

This project involves the re-development of the subject property for Jackson Wink MMA Academy, a training center for mixed martial arts. The project proposes site improvements to support the development, including access, grading, drainage and utility improvements.

The purpose of this report is to outline the criteria for re-development of the site and demonstrate that this project will not negatively impact the project site, or upstream and downstream properties. This report is prepared and submitted in support of a building permit application.

The scope of this report is to provide analysis of the existing and improved conditions utilizing state of the art technological storm drainage modeling tools, thereby demonstrating the before and after behavior of the project site during rainfall events. It will be demonstrated that this project will be developed in accordance with the City of Albuquerque, Development Process Manual, Volume 2, the City of Albuquerque Drainage Ordinance, and the approved drainage master plan for the watershed.

EXISTING CONDITIONS

The 1.50-acre project site is fully developed. Site improvements consist of a 16,080-square foot building with site improvements constructed to support the previous property use. The site is bounded north by developed residential property, on the east by developed office property, on the south by Martin Luther King Jr Blvd, and on the west by Broadway Blvd.

All site flows drain west to Broadway by paving improvements and landscaped yard swales. The site was developed in 1978 when commercial properties were required to retain developed storm water. As a result this site retains approximately 13,460-cf within four (4) existing retention ponds. The ponds are not equipped with drains or constructed overflow spillways. The ponds appear to overflow to the west, and eventually to Broadway over the sidewalks or through the drivepads.

No off-site flows enter the property. The upstream boundaries of the site are sealed by solid perimeter walls.

As shown by FIRM Panel 35001C0334G, this property is not located within a mapped 100 year floodplain.

DRAINAGE MASTERPLANS

The property was originally developed as an office building in the 1970's. The Drainage Master Plan, prepared by Kent Trauernicht, a New Mexico Licensed Architect,

recommended on-site retention ponding in accordance with the City's drainage criteria at the time. This project was designed to retain approximately 13,460-cf of excess runoff within four (5) on-site retention ponds. The site also accepted runoff from the parcel to the east, which was undeveloped at the time.

The Drainage Master Plan is provided in the Appendix for review.

PROPOSED CONDITIONS

As shown by the Grading and Drainage Plan (see back pocket), the property is to be re-developed by upgrading and expanding the existing building, and re-constructing the site improvements. The existing parking lot will be resurfaced and re-striped. Additional parking will be provided by expanding the existing parking lot. Two (2) of the redundant retention ponds will be removed to allow for expansion of the parking lot. The existing pond located in the northeast corner of the site will remain in its current condition. The existing pond located at the southwest corner of the site will be re-built and equipped with an outfall drain connection an existing public storm inlet.

A Pre-design conference with City Hydrology Staff established the maximum discharge rate from the site at 2.75 cfs/acre (4.13 cfs total), or existing conditions (4.40 cfs/acre, or 6.60 cfs total). We have selected the latter, which will be managed by the re-constructed ponds at the Northwest southwest corners of the site.

As shown by the Developed Drainage Basins Map, Figure 3, the developed site is divided into 5 drainage basins. Each drainage basin is described below:

Basin A is an existing closed basin that drains to a landscaped retention pond.

Basin B is consists of the building roof and the landscaped area along the north side of the building draining to Pond B.

Basin C is a proposed parking lot draining to Pond C. Flows from Ponds B and C drain to Broadway thru a 24" sidewalk culvert.

Basin D is a small basin that will free discharge thru the drivepad at AP-4.

Basin E is the largest onsite basin. It consists of the front parking lot and public areas. It drains to Pond E which will be converted to a detention pond by connecting a 12' storm drain to the existing storm inlet at Martin Luther King Jr Blvd.

As shown by the AHYMO output files and the Pond Routing Calculations, by converting the existing retention ponds to detention ponds the total developed discharge from the site is calculated at 4.97 cfs, less than the existing peak discharge of 6.18 cfs.

90th Percentile Storm

In accordance with the City of Albuquerque Drainage Ordinance, effective May 12, 2014, all new development projects are required to manage the runoff which occurs during the 90th percentile storm event. In order to comply with this criteria, where practical, all surface drainage shall be routed through landscaped areas before release into downstream drainage facilities. Calculations are provided to demonstrate the First Flush storage proposed on-site.

CALCULATIONS

Hydrology

The calculations contained herein define the 100-year/6-hour rainfall event falling within the project site and contributing off-site areas under existing and developed conditions. The hydrology is per the City of Albuquerque, Development Process Manual, Chapter 22, Volume 2, 1997 Revision. The AHYMO 97 model is used to determine peak runoff. The calculations are presented to demonstrate the capacity and function of all proposed storm drainage improvements.

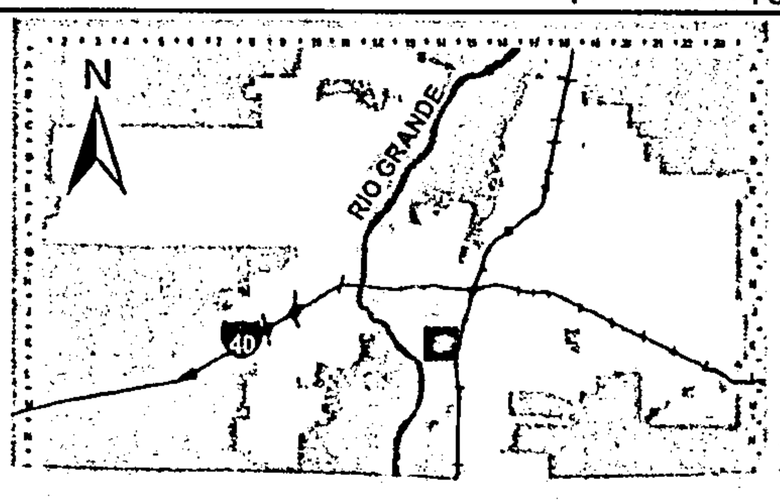
APPENDIX

MAPS

For more current information and details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 9/2/2014



LOCATION MAP

FIGURE 1

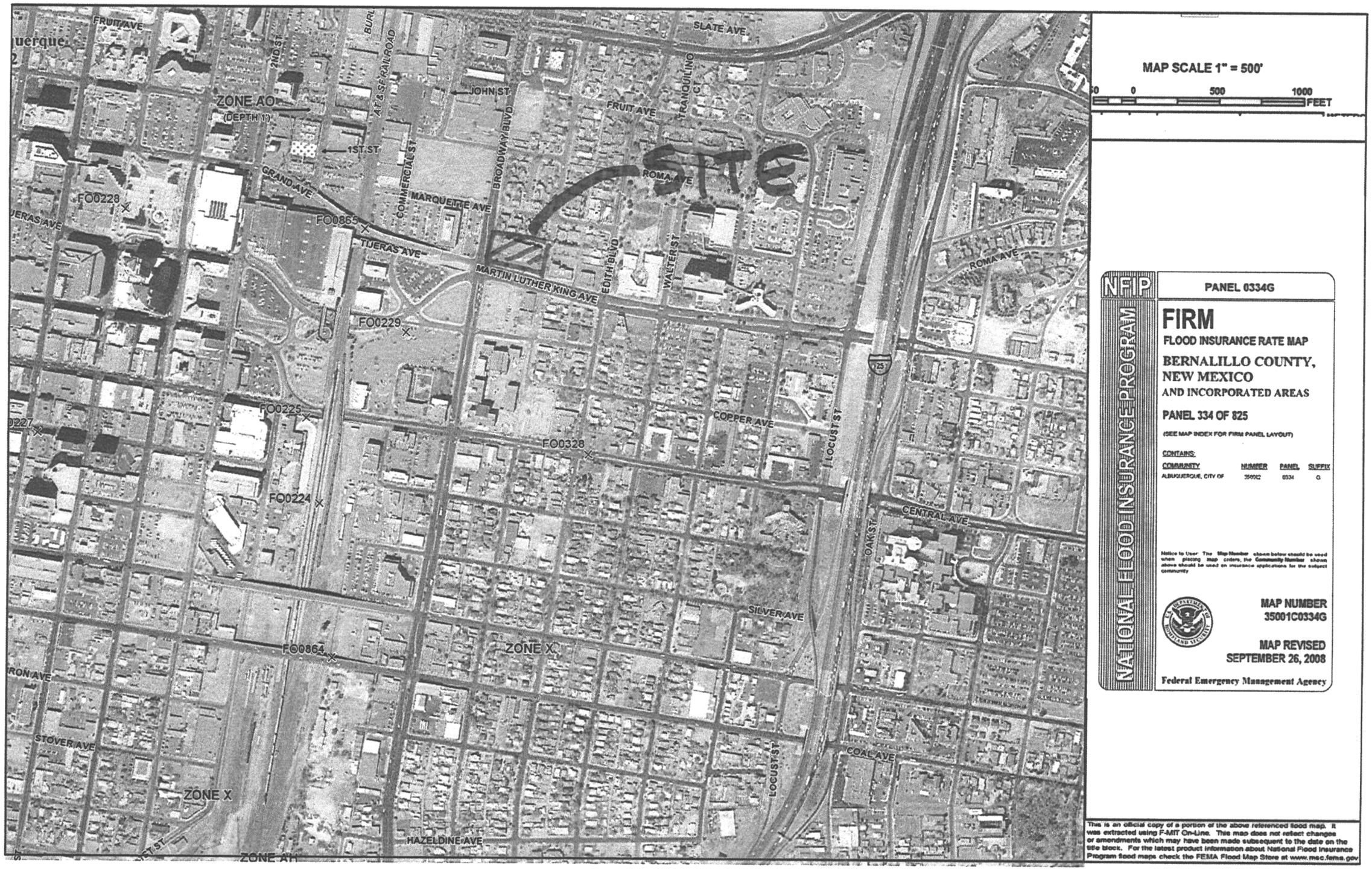
Zone Atlas Page:

K-14-Z

Selected Symbols

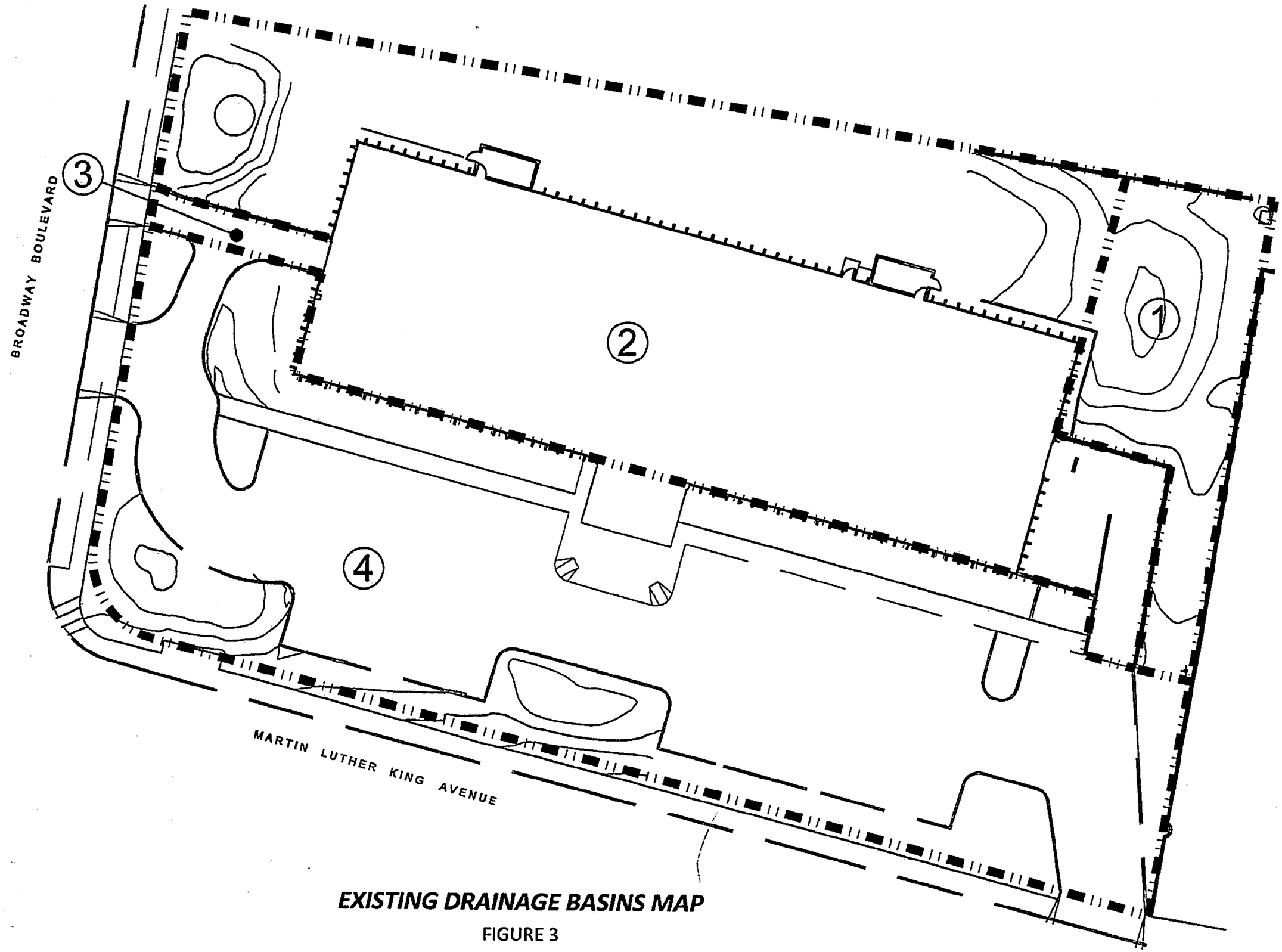
- SECTOR PLANS
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Iroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

750 1,500 Feet



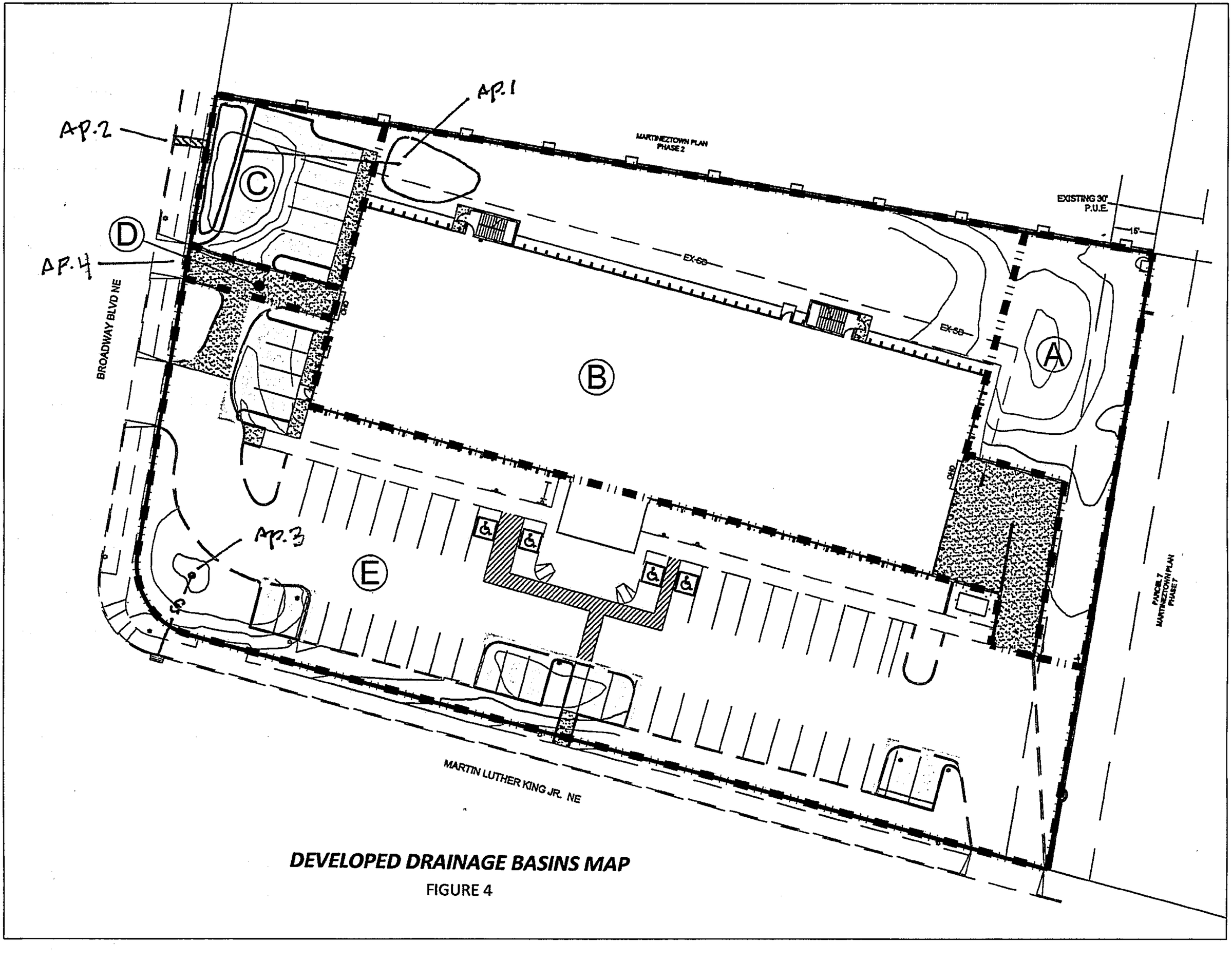
FIRM PANEL

FIGURE 2



EXISTING DRAINAGE BASINS MAP

FIGURE 3



DEVELOPED DRAINAGE BASINS MAP

FIGURE 4

STORM DRAIN FACITILITIES MAP

FIGURE 5

CALCULATIONS

PONDING CRITERIA

SITE PONDING CRITERIA

I. FIRST FLUSH

By ordinance the site is required to retain the 90th percentile rainfall depth. In order to comply with this criteria, where practical, all surface areas will be routed through landscaped areas before release to downstream public drainage facilities. This is a re-developing site that is fully landscaped. Surface areas were constricted to drain directly to on-site retention ponds. The proposed plan will rout runoff through one existing retention pond, one reconstructed detention pond and two new detention ponds. The re-constructed pond bottoms will be placed 4' below the outlet structures. Storage in excess of the 90th percentile rainfall will be provided as illustrated below.

90th percentile depth	0.44"
Less initial abstraction	0.10"
Total retained depth	034"

Ponding requirement = Ad(0.34") = 0.96 ac(43,560 sf/ac)(0.34"?12"/ft) = 1,184 cf

First Flush storage provided:

Pond A	392 cf
Pond B	26 cf
Pond C	40 cf
Pond E	112 cf
Total	570 cf

This site is re-developing and must accept many of the existing surface improvements as they are. It must also be noted that all roof drainage is routed overland through Basin "B" which is landscaped with established sod. Initial abstraction and infiltration will be ~~must~~ much higher than typical and is not considered in the requirement. Given these reasons the site complies with the Ordinance to the maximum extent possible.

II. DETENTION POND CRITERIA

The DMP for this site recommended on-site retention ponding in accordance with the drainage criteria at the time of development. Pre-design meetings with City staff established the allowable discharge rate at either the calculated existing discharge or 2.75 cfs/acre. AS determined by Ahymo, the existing conditions discharge from the site (assuming no retention storage) is 6.18 cfs, or 4.12 cfs/acre.

Since the site is fully developed and re-developing, most of the historic drainage patterns and improvements will remain. The existing retention pond in Basin "A" will remain. The proposed parking lot at the northwest corner of the site requires the existing retention pond to be eliminated. New detention ponds B and C will be constructed to manage Basins "B" and "C" flows.

On-site Basin "D" will free discharge 0.11 cfs thru the west drivepad. Basin "E" will drain through reconstructed detention Pond E. Pond E will be converted to a detention pond by connecting a 12" Storm drain to an existing storm inlet at Martin Luther King Jr.

The proposed detention pond capacities are summarized below:

POND B - STORAGE INDICATION TABLE

ELEVATION feet	Q OUT cfs	AREA sf	VOLUME acre feet
4966.00	0.0	0	0.0000
4967.00	2.1	140	0.0032
4968.00	4.0	540	0.0124

As illustrated by the AHYMO Output file, the discharge from Pond B is calculated at 2.32 cfs, with a maximum water surface elevation of 4967.11 feet.

POND C - STORAGE INDICATION TABLE

ELEVATION feet	Q OUT cfs	AREA sf	VOLUME acre feet
4964.50	0.00	0	0.0000
4965.20	2.75	122	0.0028

As illustrated by the AHYMO Output file, the discharge from Pond C is calculated at 2.63 cfs, with a maximum water surface elevation of 4965.17 feet.

POND E - STORAGE INDICATION TABLE

ELEVATION feet	Q OUT cfs	AREA sf	VOLUME acre feet
4965.00	0.0	0	0.0000
4966.00	2.1	923	0.0212
4966.20	2.4	1343	0.0308

As illustrated by the AHYMO Output file, the discharge from Pond E is calculated at 2.23 cfs, with a maximum water surface elevation of 4966.09 feet.

The total developed discharge from the project site is as follows:

Pond C (AP-2)	2.63 cfs
Pond E (AP-3)	2.23 cfs
Basin "D" (AP-4)	0.11 cfs
Total	4.97 cfs<Q100 Existing (6.18 cfs)

DRAINAGE STRUCTURE CAPACITIES

LORENZ
DESIGN & CONSULTING, LLC
Civil Engineering | Construction Management

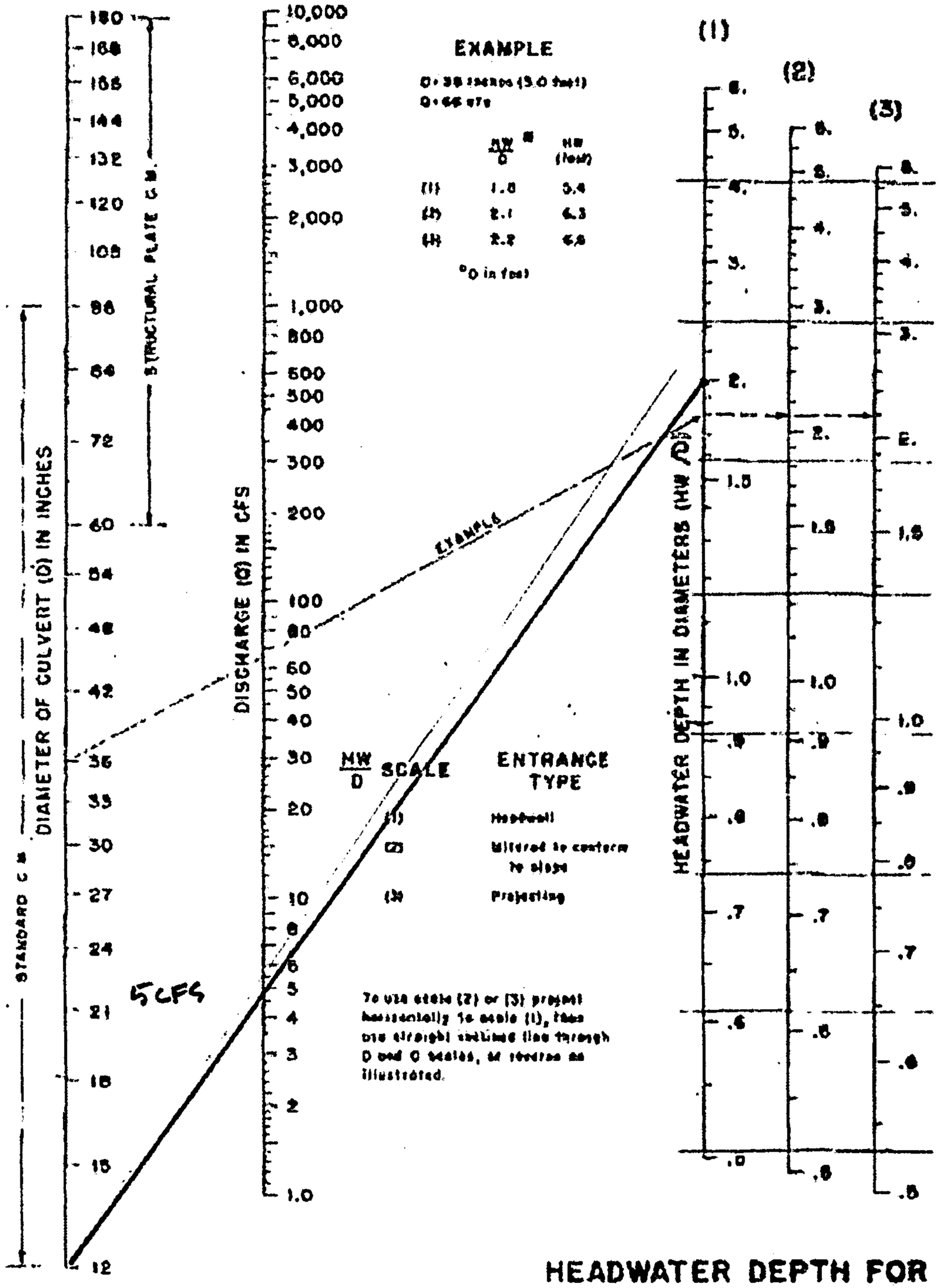
PROJECT: Jackson Wink MMA Academy
DATE: 02-13-2015 PAGE: 1

SIDEWALK CULVERT WIDTHS

POND 'C' OUTLET

ANALYSIS POINT	STRUCTURE TYPE	Q100 cfs	H ft	L FT
AP-2	24" SWC	2.23	0.67	2.0

2



BUREAU OF PUBLIC ROADS JAN 1963

HEADWATER DEPTH FOR C. M. PIPE CULVERTS WITH INLET CONTROL

Q100 POND B = 2.45 CFS < 5 CFS ✓
POND E = 2.23 CFS

Free Online Manning Pipe Flow Calculator

Manning Formula Uniform Pipe Flow at Given Slope and Depth

Can you help me translate this calculator to your language or host this calculator at your web site?

Printable Title

Printable Subtitle

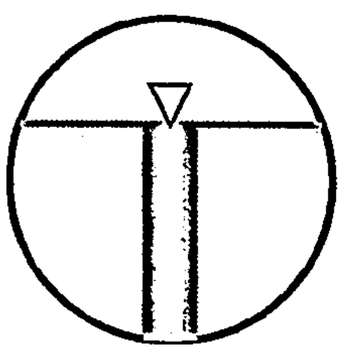
Q100 POND B = 2.45 CFS
POND C = 2.23 CFS
< 3.98 CFS

Set units: m | mm | ft | inches

Pipe diameter, d_0	1 ft
Manning roughness, n ?	.013
Pressure slope (possibly ? equal to pipe slope), S_0	2 % rise/run
Percent of (or ratio to) full depth (100% or 1 if flowing full)	67 %

Results:

Flow, q	3.9768	cfs
Velocity, v	7.1095	ft/sec
Velocity head, h_v	0.7856	ft
Flow area	0.5594	ft^2
Wetted perimeter	1.9177	ft
Hydraulic radius	0.2917	ft
Top width, T	0.9404	ft
Froude number, F	1.63	
Shear stress (tractive force), tau	0.8367	psf



Please give us your valued words of suggestion or praise. Did this free calculator exceed your expectations in every way?

Last Modified 02/13/2015 16:50:00

AHYMO INPUT FILE

```
**********************************************************************
*                        JACKSON - WINK MMA ACADEMY
*                            PROJECT HYDROLOGY
**********************************************************************
START                 TIME=0.0   PUNCH CODE=0
LOCATION              ALBUQUERQUE
RAINFALL              TYPE=1   RAIN QUARTER=0.0   RAIN ONE=2.01
                      RAIN SIX=2.35   RAIN DAY=2.75   DT=0.03333 HRS
**********************************************************************
************************
* EXISTING CONDITIONS  *
************************
* SITE - 1.50 ACRES
COMPUTE NM HYD        ID=1   HYD NO=EX-SITE   DA=0.002344 SQ MI
                      PER A=0 PER B=27 PER C=12   PER D=61
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=1   CODE=20
* BASIN 1 - 0.11 ACRES
COMPUTE NM HYD        ID=2   HYD NO=BASIN-1   DA=0.000172 SQ MI
                      PER A=0 PER B=100 PER C=0 PER D=0
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=2   CODE=20
* BASIN 2 - 0.67 ACRES
COMPUTE NM HYD        ID=3   HYD NO=BASIN-2   DA=0.001047 SQ MI
                      PER A=0 PER B=50 PER C=0   PER D=50
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=3   CODE=20
* BASIN 3 - 0.02 ACRES
COMPUTE NM HYD        ID=4   HYD NO=BASIN-3   DA=0.000031 SQ MI
                      PER A=0 PER B=0 PER C=0   PER D=100
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=4   CODE=20
* BASIN 4 - 0.70 ACRES
COMPUTE NM HYD        ID=5   HYD NO=BASIN-4   DA=0.001094 SQ MI
                      PER A=0 PER B=0 PER C=32   PER D=68
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=5   CODE=20
************************
* PROPOSED CONDITIONS  *
************************
* SITE - 1.50 ACRES
COMPUTE NM HYD        ID=6   HYD NO=PRO-SITE   DA=0.002344 SQ MI
                      PER A=0 PER B=23 PER C=13   PER D=64
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=6   CODE=20
* BASIN A - 0.11 ACRES
COMPUTE NM HYD        ID=7   HYD NO=BASIN-A   DA=0.000172 SQ MI
                      PER A=0 PER B=100 PER C=0 PER D=0
                      TP=0.1333 HR   MASS RAIN=-1
PRINT HYD             ID=7   CODE=20
* BASIN B - 0.60 ACRES
COMPUTE NM HYD        ID=8   HYD NO=BASIN-B   DA=0.000938 SQ MI
                      PER A=0 PER B=38 PER C=0   PER D=62
                      TP=0.1333 HR   MASS RAIN=-1
```

```
PRINT HYD              ID=8  CODE=20
* BASIN C - 0.07 ACRES
COMPUTE NM HYD         ID=9  HYD NO=BASIN-C  DA=0.000109 SQ MI
                       PER A=0 PER B=0 PER C=30  PER D=70
                       TP=0.1333 HR  MASS RAIN=-1
PRINT HYD              ID=9  CODE=20
* BASIN D - 0.02 ACRES
COMPUTE NM HYD         ID=10  HYD NO=BASIN-D  DA=0.000031 SQ MI
                       PER A=0 PER B=0 PER C=0  PER D=100
                       TP=0.1333 HR  MASS RAIN=-1
PRINT HYD              ID=10  CODE=20
* BASIN E - 0.70 ACRES
COMPUTE NM HYD         ID=11  HYD NO=BASIN-E  DA=0.001094 SQ MI
                       PER A=0 PER B=0 PER C=25  PER D=75
                       TP=0.1333 HR  MASS RAIN=-1
PRINT HYD              ID=11  CODE=20
*************************************************************
* ROUTE BASIN B THROUGH POND B AT AP-1 THRU
* 12 INCH SD TO POND C.
*************************************************************
ROUTE RESERVOIR        ID=12 HYD NO=POND.B.OUT  INFLOW ID=8  CODE=10
                       OUT (CFS)    STORAGE (AC-FT)    ELEV (FT)
                       0.0            0                  66.0
                       2.1            0.0032             67.0
                       4.0            0.0124             68.0
PRINT HYD              ID=12 CODE=20
ADD HYD                ID=13 HYD NO=HYD-AP-2    ID I=9 ID II=12
PRINT HYD              ID=13 CODE=20
*************************************************************
* ROUTE BASINS B AND C THROUGH POND C AT AP-2 THRU
* 24 INCH SW CULVERT TO BROADWAY
*************************************************************
ROUTE RESERVOIR        ID=14 HYD NO=POND.C.OUT  INFLOW ID=13  CODE=10
                       OUT (CFS)    STORAGE (AC-FT)    ELEV (FT)
                       0.0            0                  64.5
                       2.75           0.0028             65.2
PRINT HYD              ID=14 CODE=20
*************************************************************
* ROUTE BASIN E THROUGH POND E AT AP-3 THRU
* 12 INCH SD TO EXISTING STORM INLET AT MLK JR.
*************************************************************
ROUTE RESERVOIR        ID=15 HYD NO=POND.C.OUT  INFLOW ID=11  CODE=10
                       OUT (CFS)    STORAGE (AC-FT)    ELEV (FT)
                       0.0            0                  65.0
                       2.1            0.0212             66.0
                       2.4            0.0308             66.2
PRINT HYD              ID=15 CODE=20
FINISH
```

AHYMO OUTPUT FILES

AHYMO PROGRAM SUMMARY TABLE (AHYMO-S4) - Ver. S4.01a, Rel: 01a RUN DATE (MON/DAY/YR) =02/12/2015
INPUT FILE = P:\14-034 - Jackson Wink Academy MMA Gym\Drainage\Wink.1.DAT USER NO.= Lorenz-NMSingleA33825816

COMMAND	HYDROGRAPH IDENTIFICATION	FROM ID NO.	TO ID NO.	AREA (SQ MI)	PEAK DISCHARGE (CFS)	RUNOFF VOLUME (AC-FT)	RUNOFF (INCHES)	TIME TO PEAK (HOURS)	CFS PER ACRE	NOTATION	
START										TIME=	0.00
LOCATION		ALBUQUERQUE									
RAINFALL TYPE= 1 NOAA 14										RAIN6=	2.350
COMPUTE NM HYD	EX-SITE	-	1	0.00234	6.18	0.211	1.68405	1.533	4.120	PER IMP=	61.00
COMPUTE NM HYD	BASIN-1	-	2	0.00017	0.31	0.009	0.95319	1.533	2.858	PER IMP=	0.00
COMPUTE NM HYD	BASIN-2	-	3	0.00105	2.56	0.085	1.52818	1.533	3.823	PER IMP=	50.00
COMPUTE NM HYD	BASIN-3	-	4	0.00003	0.11	0.003	2.10318	1.500	5.308	PER IMP=	100.00
COMPUTE NM HYD	BASIN-4	-	5	0.00109	3.10	0.106	1.81783	1.533	4.425	PER IMP=	68.00
COMPUTE NM HYD	PRO-SITE	-	6	0.00234	6.28	0.215	1.72120	1.533	4.188	PER IMP=	64.00
COMPUTE NM HYD	BASIN-A	-	7	0.00017	0.31	0.009	0.95319	1.533	2.858	PER IMP=	0.00
COMPUTE NM HYD	BASIN-B	-	8	0.00094	2.45	0.083	1.66618	1.533	4.076	PER IMP=	62.00
COMPUTE NM HYD	BASIN-C	-	9	0.00011	0.33	0.011	1.83567	1.533	4.700	PER IMP=	70.00
COMPUTE NM HYD	BASIN-D	-	10	0.00003	0.11	0.003	2.10318	1.500	5.308	PER IMP=	100.00
COMPUTE NM HYD	BASIN-E	-	11	0.00109	3.16	0.110	1.88025	1.533	4.519	PER IMP=	75.00
ROUTE RESERVOIR	POND.B.OUT	8	12	0.00094	2.32	0.083	1.66586	1.567	3.870	AC-FT=	0.004
ADD HYD	HYD-AP-2	9&12	13	0.00105	2.63	0.094	1.68335	1.567	3.920		
ROUTE RESERVOIR	POND.C.OUT	13	14	0.00105	2.63	0.094	1.68335	1.567	3.924	AC-FT=	0.003
ROUTE RESERVOIR	POND.C.OUT	11	15	0.00109	2.24	0.110	1.88000	1.633	3.193	AC-FT=	0.026
FINISH											

```
    AHYMO PROGRAM (AHYMO-S4)                    - Version: S4.01a - Rel: 01a
         RUN DATE (MON/DAY/YR) = 02/12/2015
         START TIME (HR:MIN:SEC) = 11:43:40     USER NO.= Lorenz-NMSingleA33825816
         INPUT FILE = P:\14-034 - Jackson Wink Academy MMA Gym\Drainage\Wink.1.DAT

**************************************************************************
*                       JACKSON - WINK MMA ACADEMY
*                           PROJECT HYDROLOGY
**************************************************************************
START               TIME=0.0  PUNCH CODE=0
LOCATION            ALBUQUERQUE
     City of Albuquerque soil infiltration values (LAND FACTORS) used for computations.
     Land Treatment     Initial Abstr.(in)    Unif. Infilt.(in/hour)
          A             0.65                  1.67
          B             0.50                  1.25
          C             0.35                  0.83
          D             0.10                  0.04

RAINFALL            TYPE=1  RAIN QUARTER=0.0  RAIN ONE=2.01
                    RAIN SIX=2.35  RAIN DAY=2.75  DT=0.03333 HRS

               6-HOUR RAINFALL DIST. - BASED ON NOAA ATLAS 14 FOR CONVECTIVE AREAS (NM & AZ) - D1
               DT =   0.033330 HOURS       END TIME =     5.999400 HOURS
                 0.0000  0.0015  0.0030  0.0046  0.0063  0.0080  0.0099
                 0.0117  0.0138  0.0159  0.0180  0.0226  0.0272  0.0321
                 0.0372  0.0424  0.0480  0.0537  0.0595  0.0654  0.0713
                 0.0776  0.0838  0.0904  0.0974  0.1044  0.1124  0.1204
                 0.1340  0.1534  0.1727  0.1987  0.2246  0.2558  0.2921
                 0.3284  0.3829  0.4374  0.5117  0.6058  0.7000  0.9502
                 1.2011  1.3965  1.5355  1.6746  1.7448  1.8147  1.8717
                 1.9157  1.9597  1.9903  2.0208  2.0473  2.0696  2.0919
                 2.1089  2.1258  2.1380  2.1455  2.1529  2.1595  2.1661
                 2.1721  2.1775  2.1829  2.1879  2.1928  2.1977  2.2024
                 2.2072  2.2095  2.2118  2.2141  2.2163  2.2185  2.2206
                 2.2227  2.2247  2.2267  2.2287  2.2307  2.2326  2.2345
                 2.2363  2.2382  2.2399  2.2417  2.2435  2.2452  2.2469
                 2.2485  2.2502  2.2518  2.2534  2.2550  2.2565  2.2581
                 2.2596  2.2610  2.2625  2.2640  2.2654  2.2668  2.2682
                 2.2697  2.2710  2.2724  2.2738  2.2751  2.2765  2.2778
                 2.2791  2.2804  2.2817  2.2830  2.2843  2.2856  2.2868
                 2.2881  2.2893  2.2905  2.2917  2.2929  2.2941  2.2953
                 2.2965  2.2977  2.2988  2.3000  2.3012  2.3023  2.3034
                 2.3045  2.3057  2.3068  2.3079  2.3090  2.3100  2.3111
                 2.3122  2.3132  2.3143  2.3153  2.3164  2.3174  2.3184
                 2.3195  2.3205  2.3215  2.3225  2.3235  2.3245  2.3255
                 2.3264  2.3274  2.3284  2.3293  2.3303  2.3312  2.3322
                 2.3331  2.3341  2.3350  2.3359  2.3368  2.3377  2.3386
                 2.3395  2.3404  2.3413  2.3422  2.3431  2.3440  2.3448
                 2.3457  2.3466  2.3474  2.3483  2.3491  2.3500
```

```
**************************************************************************
************************
* EXISTING CONDITIONS  *
************************
* SITE - 1.50 ACRES
COMPUTE NM HYD       ID=1  HYD NO=EX-SITE  DA=0.002344 SQ MI
                     PER A=0 PER B=27 PER C=12  PER D=61
                     TP=0.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =   5.6451    CFS   UNIT VOLUME =   0.9973       B =   526.28      P60 = 2.0100
     AREA =     0.001430 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330


     K =  0.124506HR    TP =  0.133300HR    K/TP RATIO =  0.934025     SHAPE CONSTANT, N =  3.786679
     UNIT PEAK =   2.3364    CFS   UNIT VOLUME =   0.9945       B =   340.69      P60 = 2.0100
     AREA =     0.000914 SQ MI    IA =   0.45385 INCHES    INF =   1.12077 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD            ID=1  CODE=20

                                   HYDROGRAPH FROM AREA EX-SITE

  TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
   HRS      CFS            HRS      CFS            HRS      CFS            HRS      CFS            HRS      CFS
 0.000       0.0         1.333       1.5         2.666       0.1         4.000       0.0         5.333       0.0
 0.667       0.0         2.000       0.8         3.333       0.0         4.666       0.0         5.999       0.0

     RUNOFF VOLUME =      1.68405 INCHES      =       0.2105 ACRE-FEET
     PEAK DISCHARGE RATE =       6.18 CFS  AT   1.533 HOURS   BASIN AREA =  0.0023 SQ. MI.


* BASIN 1 - 0.11 ACRES
COMPUTE NM HYD       ID=2  HYD NO=BASIN-1  DA=0.000172 SQ MI
                     PER A=0 PER B=100 PER C=0 PER D=0
                     TP=0.1333 HR  MASS RAIN=-1

     K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE CONSTANT, N =  3.562974
     UNIT PEAK =  0.41923    CFS   UNIT VOLUME =   0.9666       B =   324.90      P60 = 2.0100
     AREA =     0.000172 SQ MI    IA =   0.50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD            ID=2  CODE=20

                                   HYDROGRAPH FROM AREA BASIN-1

  TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW          TIME      FLOW
```

HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS	HRS	CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 0.95319 INCHES = 0.0087 ACRE-FEET
PEAK DISCHARGE RATE = 0.31 CFS AT 1.533 HOURS BASIN AREA = 0.0002 SQ. MI.

```
* BASIN 2 - 0.67 ACRES
COMPUTE NM HYD      ID=3  HYD NO=BASIN-2  DA=0.001047 SQ MI
                    PER A=0 PER B=50 PER C=0  PER D=50
                    TP=0.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =   2.0668    CFS   UNIT VOLUME =   0.9941       B =   526.28      P60 = 2.0100
     AREA =     0.000524 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330


     K =  0.132088HR    TP =  0.133300HR    K/TP RATIO =  0.990905     SHAPE CONSTANT, N =  3.562974
     UNIT PEAK =   1.2760    CFS   UNIT VOLUME =   0.9900       B =   324.90      P60 = 2.0100
     AREA =     0.000524 SQ MI    IA =   0.50000 INCHES    INF =   1.25000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD           ID=3  CODE=20
```

HYDROGRAPH FROM AREA BASIN-2

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.6	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.3	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.52818 INCHES = 0.0853 ACRE-FEET
PEAK DISCHARGE RATE = 2.56 CFS AT 1.533 HOURS BASIN AREA = 0.0010 SQ. MI.

```
* BASIN 3 - 0.02 ACRES
COMPUTE NM HYD      ID=4  HYD NO=BASIN-3  DA=0.000031 SQ MI
                    PER A=0 PER B=0 PER C=0  PER D=100
                    TP=0.1333 HR  MASS RAIN=-1

     K =  0.072649HR    TP =  0.133300HR    K/TP RATIO =  0.545000     SHAPE CONSTANT, N =  7.106428
     UNIT PEAK =  0.12239    CFS   UNIT VOLUME =   0.9033       B =   526.28      P60 = 2.0100
     AREA =     0.000031 SQ MI    IA =   0.10000 INCHES    INF =   0.04000 INCHES PER HOUR
     RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT =  0.033330

PRINT HYD           ID=4  CODE=20
```

HYDROGRAPH FROM AREA BASIN-3

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 2.10318 INCHES = 0.0035 ACRE-FEET
PEAK DISCHARGE RATE = 0.11 CFS AT 1.500 HOURS BASIN AREA = 0.0000 SQ. MI.

* BASIN 4 - 0.70 ACRES
COMPUTE NM HYD ID=5 HYD NO=BASIN-4 DA=0.001094 SQ MI
PER A=0 PER B=0 PER C=32 PER D=68
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 2.9370 CFS UNIT VOLUME = 0.9955 B = 526.28 P60 = 2.0100
AREA = 0.000744 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.107446HR TP = 0.133300HR K/TP RATIO = 0.806046 SHAPE CONSTANT, N = 4.440407
UNIT PEAK = 1.0073 CFS UNIT VOLUME = 0.9879 B = 383.54 P60 = 2.0100
AREA = 0.000350 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=5 CODE=20

HYDROGRAPH FROM AREA BASIN-4

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.8	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.81783 INCHES = 0.1061 ACRE-FEET
PEAK DISCHARGE RATE = 3.10 CFS AT 1.533 HOURS BASIN AREA = 0.0011 SQ. MI.

****
* PROPOSED CONDITIONS *
****
* SITE - 1.50 ACRES
COMPUTE NM HYD ID=6 HYD NO=PRO-SITE DA=0.002344 SQ MI
PER A=0 PER B=23 PER C=13 PER D=64
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428

UNIT PEAK = 5.9227 CFS UNIT VOLUME = 0.9976 B = 526.28 P60 = 2.0100
AREA = 0.001500 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.123189HR TP = 0.133300HR K/TP RATIO = 0.924150 SHAPE CONSTANT, N = 3.829069
UNIT PEAK = 2.1752 CFS UNIT VOLUME = 0.9943 B = 343.61 P60 = 2.0100
AREA = 0.000844 SQ MI IA = 0.44583 INCHES INF = 1.09833 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=6 CODE=20

HYDROGRAPH FROM AREA PRO-SITE

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	1.6	2.666	0.1	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.8	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.72120 INCHES = 0.2152 ACRE-FEET
PEAK DISCHARGE RATE = 6.28 CFS AT 1.533 HOURS BASIN AREA = 0.0023 SQ. MI.

* BASIN A - 0.11 ACRES
COMPUTE NM HYD ID=7 HYD NO=BASIN-A DA=0.000172 SQ MI
PER A=0 PER B=100 PER C=0 PER D=0
TP=0.1333 HR MASS RAIN=-1

K = 0.132088HR TP = 0.133300HR K/TP RATIO = 0.990905 SHAPE CONSTANT, N = 3.562974
UNIT PEAK = 0.41923 CFS UNIT VOLUME = 0.9666 B = 324.90 P60 = 2.0100
AREA = 0.000172 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=7 CODE=20

HYDROGRAPH FROM AREA BASIN-A

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 0.95319 INCHES = 0.0087 ACRE-FEET
PEAK DISCHARGE RATE = 0.31 CFS AT 1.533 HOURS BASIN AREA = 0.0002 SQ. MI.

* BASIN B - 0.60 ACRES
COMPUTE NM HYD ID=8 HYD NO=BASIN-B DA=0.000938 SQ MI
PER A=0 PER B=38 PER C=0 PER D=62

TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 2.2960 CFS UNIT VOLUME = 0.9941 B = 526.28 P60 = 2.0100
AREA = 0.000582 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.132088HR TP = 0.133300HR K/TP RATIO = 0.990905 SHAPE CONSTANT, N = 3.562974
UNIT PEAK = 0.86878 CFS UNIT VOLUME = 0.9845 B = 324.90 P60 = 2.0100
AREA = 0.000356 SQ MI IA = 0.50000 INCHES INF = 1.25000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=8 CODE=20

HYDROGRAPH FROM AREA BASIN-B

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.6	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.3	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.66618 INCHES = 0.0834 ACRE-FEET
PEAK DISCHARGE RATE = 2.45 CFS AT 1.533 HOURS BASIN AREA = 0.0009 SQ. MI.

* BASIN C - 0.07 ACRES
COMPUTE NM HYD ID=9 HYD NO=BASIN-C DA=0.000109 SQ MI
PER A=0 PER B=0 PER C=30 PER D=70
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 0.30124 CFS UNIT VOLUME = 0.9610 B = 526.28 P60 = 2.0100
AREA = 0.000076 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.107446HR TP = 0.133300HR K/TP RATIO = 0.806046 SHAPE CONSTANT, N = 4.440407
UNIT PEAK = 0.94086E-01CFS UNIT VOLUME = 0.8782 B = 383.54 P60 = 2.0100
AREA = 0.000033 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=9 CODE=20

HYDROGRAPH FROM AREA BASIN-C

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.1	2.666	0.0	4.000	0.0	5.333	0.0

0.667	0.0	2.000	0.0	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.83567 INCHES = 0.0107 ACRE-FEET
PEAK DISCHARGE RATE = 0.33 CFS AT 1.533 HOURS BASIN AREA = 0.0001 SQ. MI.

* BASIN D - 0.02 ACRES
COMPUTE NM HYD ID=10 HYD NO=BASIN-D DA=0.000031 SQ MI
PER A=0 PER B=0 PER C=0 PER D=100
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 0.12239 CFS UNIT VOLUME = 0.9033 B = 526.28 P60 = 2.0100
AREA = 0.000031 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=10 CODE=20

HYDROGRAPH FROM AREA BASIN-D

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	0.667	0.0	1.333	0.0	2.000	0.0		

RUNOFF VOLUME = 2.10318 INCHES = 0.0035 ACRE-FEET
PEAK DISCHARGE RATE = 0.11 CFS AT 1.500 HOURS BASIN AREA = 0.0000 SQ. MI.

* BASIN E - 0.70 ACRES
COMPUTE NM HYD ID=11 HYD NO=BASIN-E DA=0.001094 SQ MI
PER A=0 PER B=0 PER C=25 PER D=75
TP=0.1333 HR MASS RAIN=-1

K = 0.072649HR TP = 0.133300HR K/TP RATIO = 0.545000 SHAPE CONSTANT, N = 7.106428
UNIT PEAK = 3.2394 CFS UNIT VOLUME = 0.9961 B = 526.28 P60 = 2.0100
AREA = 0.000821 SQ MI IA = 0.10000 INCHES INF = 0.04000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

K = 0.107446HR TP = 0.133300HR K/TP RATIO = 0.806046 SHAPE CONSTANT, N = 4.440407
UNIT PEAK = 0.78693 CFS UNIT VOLUME = 0.9833 B = 383.54 P60 = 2.0100
AREA = 0.000274 SQ MI IA = 0.35000 INCHES INF = 0.83000 INCHES PER HOUR
RUNOFF COMPUTED BY INITIAL ABSTRACTION/INFILTRATION NUMBER METHOD - DT = 0.033330

PRINT HYD ID=11 CODE=20

HYDROGRAPH FROM AREA BASIN-E

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.9	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.88025 INCHES = 0.1097 ACRE-FEET
PEAK DISCHARGE RATE = 3.16 CFS AT 1.533 HOURS BASIN AREA = 0.0011 SQ. MI.

****
* ROUTE BASIN B THROUGH POND B AT AP-1 THRU
* 12 INCH SD TO POND C.
****

ROUTE RESERVOIR ID=12 HYD NO=POND.B.OUT INFLOW ID=8 CODE=10

OUT (CFS)	STORAGE (AC-FT)	ELEV (FT)
0.0	0	66.0
2.1	0.0032	67.0
4.0	0.0124	68.0

* * * * * * * * * * * * * * * * *

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	66.00	0.000	0.00
0.33	0.00	66.00	0.000	0.00
0.67	0.00	66.00	0.000	0.00
1.00	0.07	66.03	0.000	0.06
1.33	0.59	66.25	0.001	0.52
1.67	1.41	66.75	0.002	1.57
2.00	0.33	66.17	0.001	0.36
2.33	0.10	66.05	0.000	0.10
2.67	0.02	66.01	0.000	0.03
3.00	0.01	66.00	0.000	0.01
3.33	0.00	66.00	0.000	0.00

PEAK DISCHARGE = 2.323 CFS - PEAK OCCURS AT HOUR 1.57
MAXIMUM WATER SURFACE ELEVATION = 67.118
MAXIMUM STORAGE = 0.0043 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=12 CODE=20

HYDROGRAPH FROM AREA POND.B.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.5	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.66586 INCHES = 0.0833 ACRE-FEET

PEAK DISCHARGE RATE = 2.32 CFS AT 1.567 HOURS BASIN AREA = 0.0009 SQ. MI.

```
ADD HYD          ID=13 HYD NO=HYD-AP-2    ID I=9 ID II=12
PRINT HYD        ID=13 CODE=20
```

HYDROGRAPH FROM AREA HYD-AP-2

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.6	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.68335 INCHES = 0.0940 ACRE-FEET
PEAK DISCHARGE RATE = 2.63 CFS AT 1.567 HOURS BASIN AREA = 0.0010 SQ. MI.

```
**********************************************************************
* ROUTE BASINS B AND C THROUGH POND C AT AP-2 THRU
* 24 INCH SW CULVERT TO BROADWAY
**********************************************************************
ROUTE RESERVOIR  ID=14 HYD NO=POND.C.OUT  INFLOW ID=13  CODE=10
                 OUT (CFS)   STORAGE (AC-FT)    ELEV (FT)
                 0.0         0                  64.5
                 2.75        0.0028             65.2

  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *

    TIME      INFLOW    ELEV      VOLUME    OUTFLOW
    (HRS)     (CFS)     (FEET)    (AC-FT)   (CFS)

     0.00      0.00     64.50      0.000     0.00
     0.33      0.00     64.50      0.000     0.00
     0.67      0.00     64.50      0.000     0.00
     1.00      0.07     64.51      0.000     0.06
     1.33      0.60     64.64      0.001     0.56
     1.67      1.76     65.00      0.002     1.95
     2.00      0.39     64.60      0.000     0.41
     2.33      0.11     64.53      0.000     0.11
     2.67      0.03     64.51      0.000     0.03
     3.00      0.01     64.50      0.000     0.01
     3.33      0.00     64.50      0.000     0.00
 PEAK DISCHARGE =       2.629 CFS - PEAK OCCURS AT HOUR    1.57
 MAXIMUM WATER SURFACE ELEVATION =       65.169
 MAXIMUM STORAGE =        0.0027 AC-FT      INCREMENTAL TIME=    0.033330HRS

PRINT HYD          ID=14 CODE=20
```

HYDROGRAPH FROM AREA POND.C.OUT

TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.6	2.666	0.0	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.4	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.68335 INCHES = 0.0940 ACRE-FEET
PEAK DISCHARGE RATE = 2.63 CFS AT 1.567 HOURS BASIN AREA = 0.0010 SQ. MI.

```
**********************************************************************
* ROUTE BASIN E THROUGH POND E AT AP-3 THRU
* 12 INCH SD TO EXISTING STORM INLET AT MLK JR.
**********************************************************************
ROUTE RESERVOIR     ID=15 HYD NO=POND.C.OUT  INFLOW ID=11  CODE=10
                    OUT (CFS)   STORAGE (AC-FT)    ELEV (FT)
                    0.0           0                  65.0
                    2.1           0.0212             66.0
                    2.4           0.0308             66.2

  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *  *
```

TIME (HRS)	INFLOW (CFS)	ELEV (FEET)	VOLUME (AC-FT)	OUTFLOW (CFS)
0.00	0.00	65.00	0.000	0.00
0.33	0.00	65.00	0.000	0.00
0.67	0.00	65.00	0.000	0.00
1.00	0.10	65.02	0.000	0.03
1.33	0.87	65.23	0.005	0.49
1.67	1.80	66.08	0.025	2.21
2.00	0.44	65.38	0.008	0.80
2.33	0.12	65.10	0.002	0.22
2.67	0.02	65.03	0.001	0.05
3.00	0.01	65.01	0.000	0.01
3.33	0.01	65.00	0.000	0.01
3.67	0.00	65.00	0.000	0.00
4.00	0.01	65.00	0.000	0.01
4.33	0.01	65.00	0.000	0.01
4.67	0.01	65.00	0.000	0.01
5.00	0.01	65.00	0.000	0.01
5.33	0.01	65.00	0.000	0.01
5.67	0.01	65.00	0.000	0.01
6.00	0.01	65.01	0.000	0.01
6.33	0.00	65.00	0.000	0.00

PEAK DISCHARGE = 2.235 CFS - PEAK OCCURS AT HOUR 1.63
MAXIMUM WATER SURFACE ELEVATION = 66.090
MAXIMUM STORAGE = 0.0255 AC-FT INCREMENTAL TIME= 0.033330HRS

PRINT HYD ID=15 CODE=20

HYDROGRAPH FROM AREA POND.C.OUT

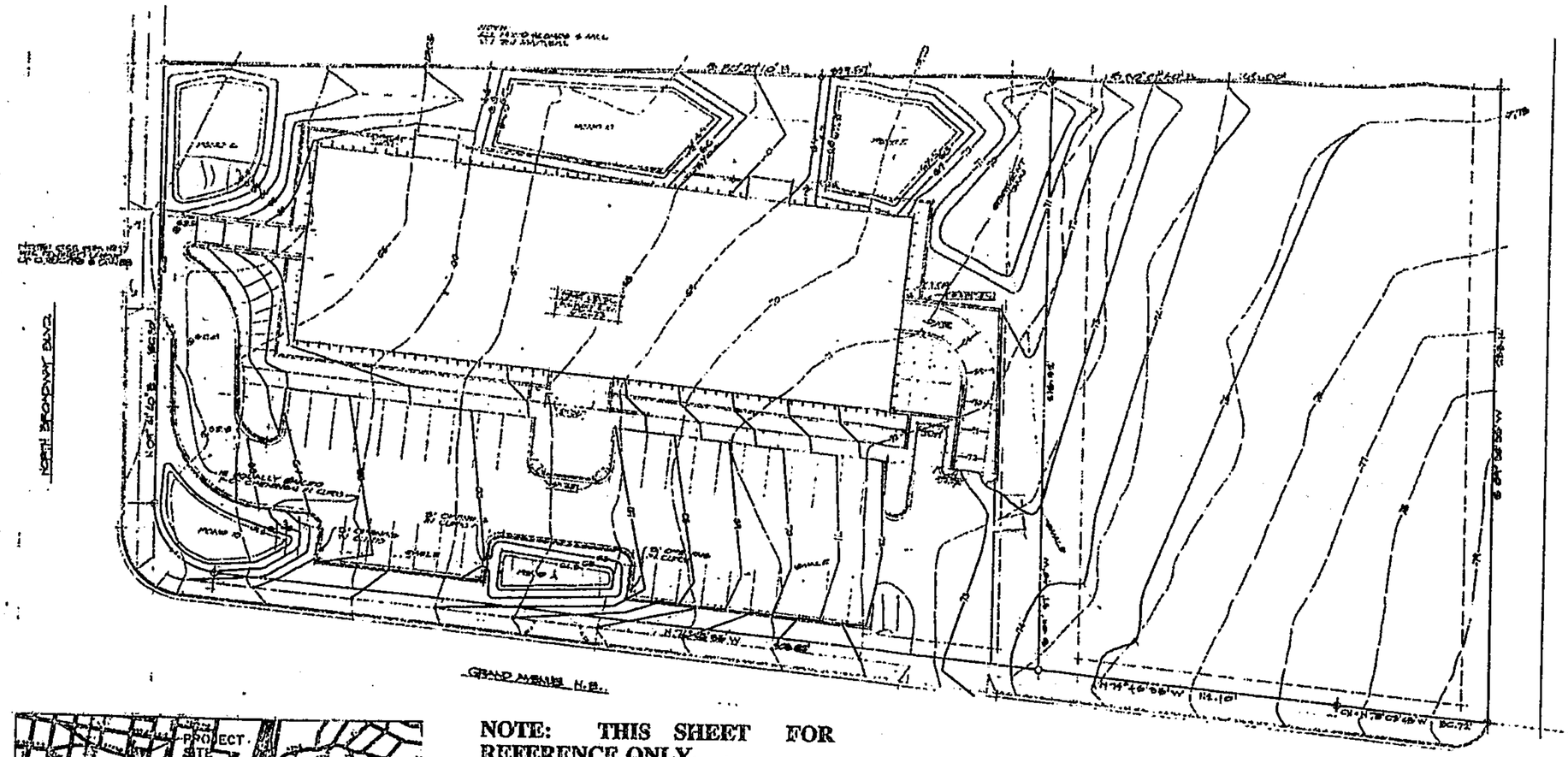
TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS	TIME HRS	FLOW CFS
0.000	0.0	1.333	0.5	2.666	0.1	4.000	0.0	5.333	0.0
0.667	0.0	2.000	0.8	3.333	0.0	4.666	0.0	5.999	0.0

RUNOFF VOLUME = 1.88000 INCHES = 0.1097 ACRE-FEET
PEAK DISCHARGE RATE = 2.24 CFS AT 1.633 HOURS BASIN AREA = 0.0011 SQ. MI.

FINISH

NORMAL PROGRAM FINISH END TIME (HR:MIN:SEC) = 11:43:40

DRAINAGE MASTERPLAN



GRADING - SITE PLAN | SCALE: 1"=20'-0"

NOTE: THIS SHEET FOR REFERENCE ONLY

DRAINAGE PLAN

The following items concerning the FBI Building Drainage Plan are contained hereon:

1. Vicinity Map
2. Flood Hazard Map
3. Site Plan
4. Calculations

The proposed building is located at the northeast corner of the intersection of Grand Avenue, N.E. and Broadway Boulevard, N.E. The building will have offices on the second floor and a parking garage on the ground level. There will be additional parking adjacent to the building. This drainage plan does not provide for any development of the eastern portion of the property.

The natural slope of the land is from east to west at approximately 3 percent. The project: (1) does not lie in a flood plain, (2) does not lie adjacent to a natural or artificial water course, and (3) has no drainage easements on the property.

The land to the north is multi-family units with a block wall separating the two sites. The site is higher than the two bordering streets, and a paved alley along the east boundary intercepts runoff from the east; therefore, the property does not receive any significant flows from upland properties. Erosion will not result from upland runoff or from the proposed construction activities. This development will not block any drainage from adjacent properties.

The grading plan shows: (1) existing contours at 1'0" interval, (2) proposed contours, (3) swales, (4) continuity between existing and proposed contours, (5) that the elevation at the property line will match the existing sidewalk, (6) that all runoff will be conveyed into ponding areas before leaving the site and (7) that retaining walls are required adjacent to the driveway ramp.

The 90th [illegible] retain an excess of [illegible] percent of the runoff this [illegible] from a 10 year frequency storm. The pipes are 24 inches in depth and therefore do not require [illegible].

CALCULATIONS

Area of Parcel = 65,100 sf

Impervious Area = 43,491 sf

Required Pond Volume = 65,100 x 0.18 = 11,718 cf

POND VOLUMES

Note: Entire roof slopes to north.

Pond A

$\left(\frac{2.3+3.4}{2}\right)$ 1 (400) + $\left(\frac{1.3+0.6}{2}\right)\frac{1}{3}$ 400 = 930 cf

Pond B

$\left(\frac{2.7+3.8}{2}\right)$ 400 (1) = 849 cf

Pond C

$\left(\frac{4.0+3.8}{2}\right)$ 4.0 (1) = 1,380 cf

Pond D:

15.5 (450) $\frac{1}{2}$ = 3,900 cf

Pond E

$\left(\frac{5.8+4.0}{2}\right)$ 400 (1) - $\left(\frac{3.0+2.8}{2}\right)$ 400 $\left(\frac{1}{3}\right)$ = 3,187 cf

Pond F

$\left(\frac{4.0+3.6}{2}\right)$ 300 (1) + $\left(\frac{3.6+2.2}{2}\right)$ 400 $\left(\frac{1}{3}\right)$ = 2,11[illegible] cf

Sediment Pond

$\left(\frac{5.8+3.8}{2}\right)$ 400 (1) = 1,920 cf

Total Pond Volume = 33,45[illegible] cf

PROJECT SITE

VICINITY MAP K-14-Z

BANES SOUTHWEST
4532 SECOND ST NW
ALBUQUERQUE NEW MEXICO 87106
PHONE (505) 344-9461 FAX 344-9423

REVISIONS

DEA OF ALBUQUERQUE
301 GRAND AVE NE
ALBUQUERQUE, NEW MEXICO

FOR REFERENCE ONLY
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DATE
CANON PRINTS

EXHIBITS