



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

October 8, 2002

Jeff Mortensen, P.E.
Jeff Mortensen & Assoc.
6010-B Midway Park Blvd NE
Albuquerque, New Mexico 87109

RE: RIO GRANDE HIGH SCHOOL- ADDN' & RENOV. (M-11/D4)
(2300 Arenal Rd SW)
ENGINEERS CERTIFICATION FOR CERTIFICATE OF OCCUPANCY
ENGINEERS STAMP DATED 8/15/2000
ENGINEERS CERTIFICATION DATED 10/7/2002

Dear Mr. Mortensen:

Based upon the information provided in your Engineers Certification submittal dated 10/8/2002, the above referenced site is approved for a Permanent Certificate of Occupancy.

If I can be of further assistance, please contact me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Development & Bldg. Services Division

C: ~~Certificate of Occupancy Clerk, COA~~
✓ drainage file
approval file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET
(REV. 1/11/2002)

JMA 990379

M-11/D4

PROJECT TITLE: Rio Grande High School Additions & Renovations ZONE ATLAS/DRNG. FILE #: ~~M-11/B4~~
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 179-B-1-A
CITY ADDRESS: 2300 Arenal Rd SW

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

OWNER: The Albuquerque Public Schools CONTACT: Andre Larroque
ADDRESS: 915 Oak Street SE PHONE: (505)242-5865
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

ARCHITECT: Kells & Craig Architects CONTACT: Peter Holloway
ADDRESS: 400 Gold SW Ste 880 PHONE: (505) 243-2724
CITY, STATE: Albuquerque, NM ZIP CODE: 87102

SURVEYOR: Jeff Mortensen & Assoc., Inc. CONTACT: Charles G. Cala
ADDRESS: 6010-B Midway Park Blvd. NE PHONE: (505) 345-4250
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

CONTRACTOR: Gerald Martin General Contractor CONTACT: Roger Garcia
ADDRESS: P.O. Box 91450 PHONE: (505) 828-1144
CITY, STATE: Albuquerque, NM ZIP CODE: 87199

TYPE OF SUBMITTAL:

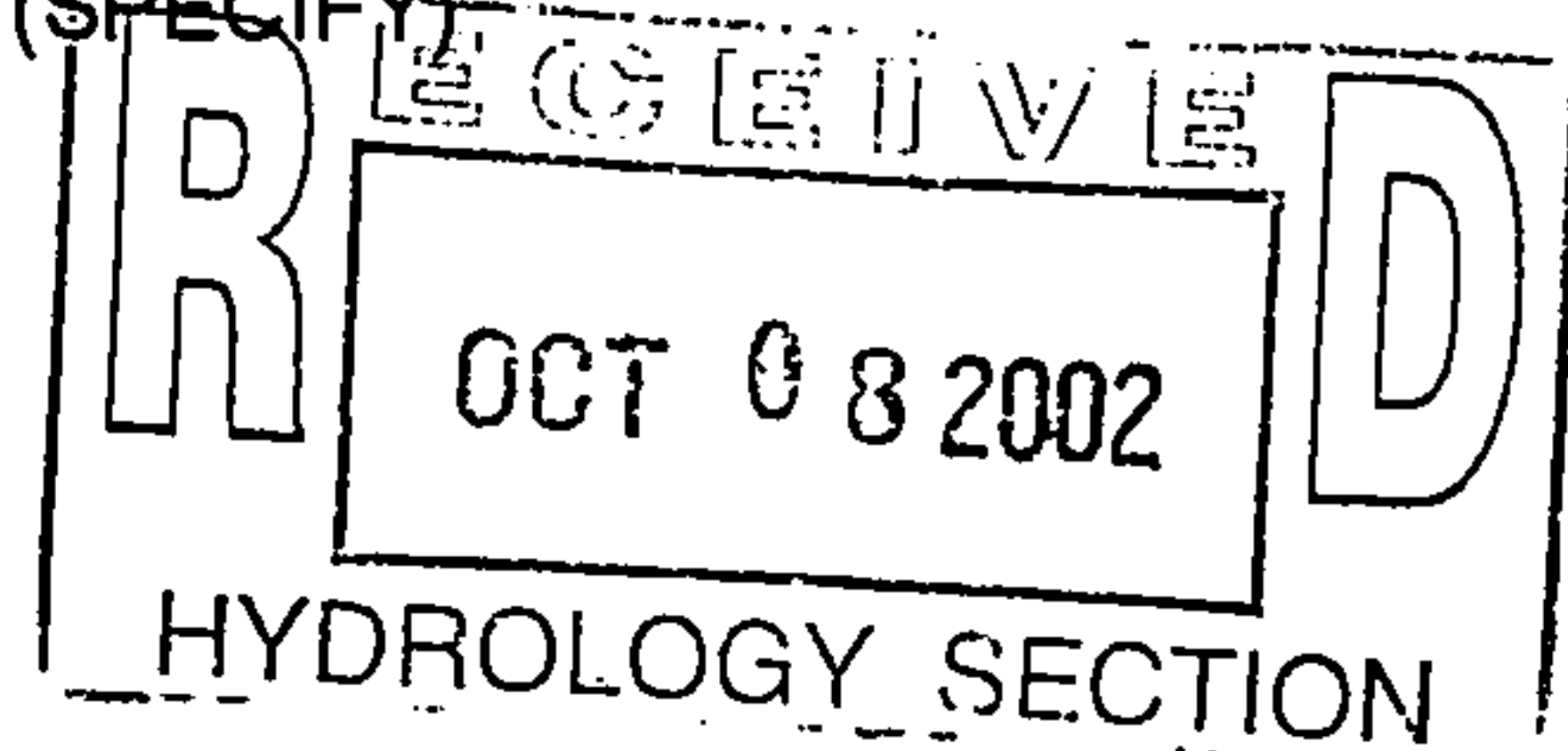
- ☐ DRAINAGE REPORT
☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☐ GRADING PLAN
☐ EROSION CONTROL PLAN
☒ ENGINEER'S CERTIFICATION (HYDROLOGY)
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEER'S CERTIFICATION (TCL)
☐ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
☐ OTHER

CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
☒ NO
☐ COPY PROVIDED



DATE SUBMITTED: 10-08-02 BY: Christian J. Sholtis

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xc: Susan Colongne, PE, BCPWD

DRAINAGE INFORMATION SHEET**PROJECT TITLE:** Rio Grande High School**ZONE ATLAS/DRNG. FILE #:** M-11 / *Doct***DRB #:****EPC #:****WORK ORDER #:****LEGAL DESCRIPTION:** Tract 179-B-1-A, MRGCD Map No. 43**CITY ADDRESS:** 2300 Arenal Rd. SW, Albuquerque, NM 87105**ENGINEERING FIRM:** Jeff Mortensen & Associates, Inc.**CONTACT:** Christian J. Sholtis**ADDRESS:** 6010-B Midway Pk. N.E., Albuquerque, NM 87109**PHONE:** (505)345-4250**OWNER:** The Albuquerque Public Schools**CONTACT:** Pat McMurray**ADDRESS:** P.O. Box 25704, Albuquerque, NM 87125**PHONE:** (505)842-8211**ARCHITECT:** Kells & Craig**CONTACT:** Steve Kells**ADDRESS:** 400 Gold St. SW Ste 880, Albuquerque, NM 87102**PHONE:** (505)243-2724**SURVEYOR:** Jeff Mortensen & Associates, Inc.**CONTACT:** Charles G. Cala**ADDRESS:** 6010-B Midway Pk. N.E., Albuquerque, NM 87109**PHONE:** (505) 345-4250**CONTRACTOR:** Not yet determined**CONTACT:****ADDRESS:****PHONE:****TYPE OF SUBMITTAL:****CHECK TYPE OF APPROVAL SOUGHT:****DRAINAGE REPORT**☒ **DRAINAGE PLAN****CONCEPTUAL GRADING & DRAINAGE
PLAN**☒ **GRADING PLAN****EROSION CONTROL PLAN****ENGINEER'S CERTIFICATION**☒ **OTHER (Master Drainage Plan)****SKETCH PLAT APPROVAL****PRELIMINARY PLAT APPROVAL****S. DEV. PLAN FOR SUB'D APPROVAL****S. DEV. PLAN FOR BLDG. PERMIT APPROVAL****SECTOR PLAN APPROVAL****FINAL PLAT APPROVAL****FOUNDATION PERMIT APPROVAL**☒ **BUILDING PERMIT APPROVAL****CERTIFICATE OF OCCUPANCY APPROVAL****GRADING PERMIT APPROVAL****RAVING PERMIT APPROVAL****S.A.D. DRAINAGE REPORT****DRAINAGE REQUIREMENTS****OTHER (SPECIFY)****PRE-DESIGN MEETING:****YES**☒ **NO****COPY PROVIDED**

RECEIVED
AUG 16 2000
R D
HYDROLOGY SECTION

DATE SUBMITTED: 8-15-00**BY:** Christian J. Sholtis, E.I.



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

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Sincerely,

Teresa A. Martin

Hydrology Plan Checker

Development & Bldg. Services Division

C: Certificate of Occupancy Clerk, COA
✓ drainage file
approval file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

JMA 990379

M-11/D4

PROJECT TITLE: Rio Grande High School Additions & Renovations ZONE ATLAS/DRNG. FILE #: ~~M-11/B4~~
DRB #: _____ EPC #: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Tract 179-B-1-A
CITY ADDRESS: 2300 Arenal Rd SW

ENGINEERING FIRM: Jeff Mortensen & Assoc., Inc. CONTACT: Chris Sholtis
ADDRESS: 6010-B Midway Park Blvd. NE PHONE: (505) 345-4250
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ADDRESS: P.O. Box 91450 PHONE: (505) 828-1144
CITY, STATE: Albuquerque, NM ZIP CODE: 87199

TYPE OF SUBMITTAL:

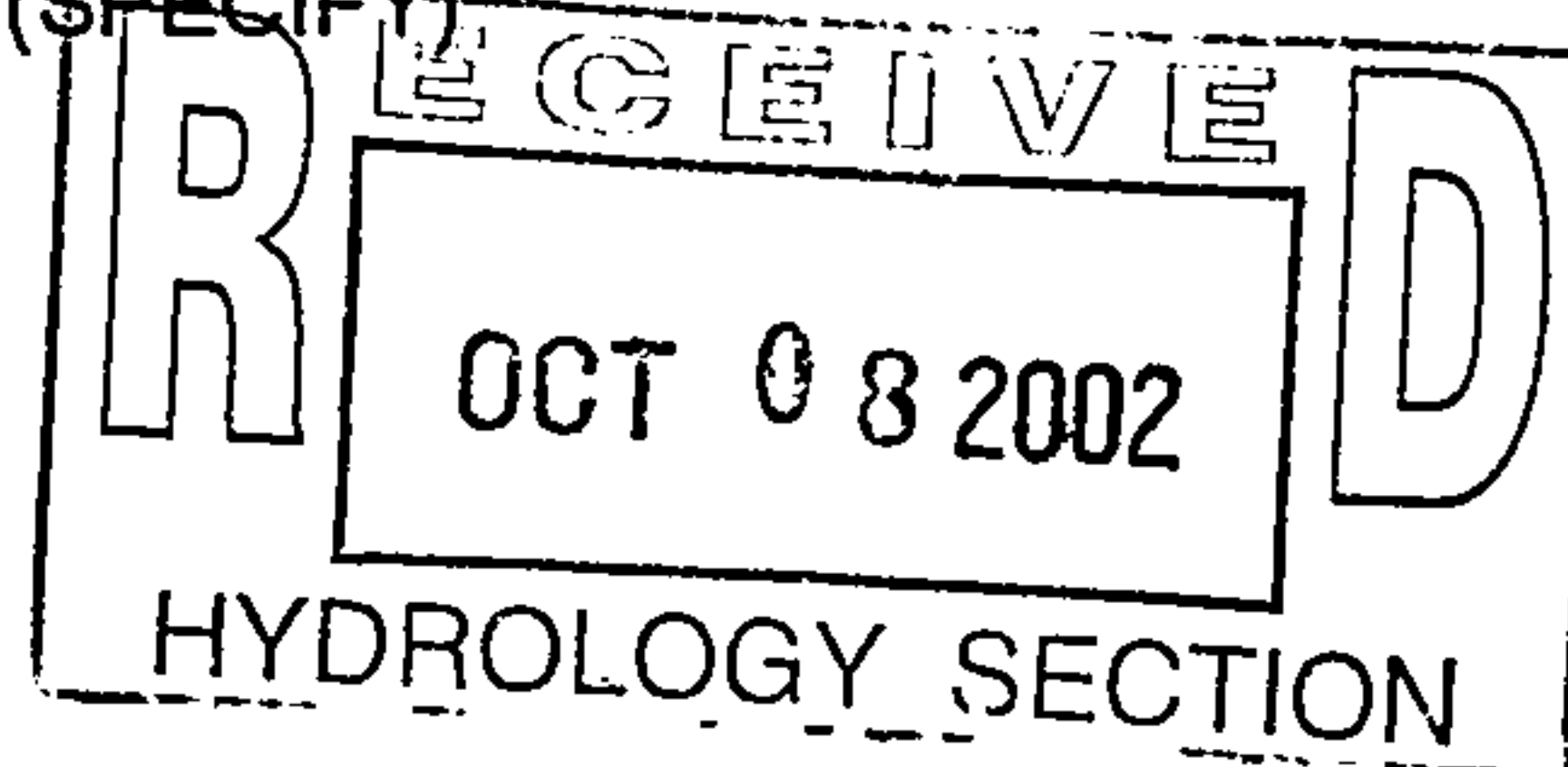
- ☐ DRAINAGE REPORT
- ☐ DRAINAGE PLAN
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- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
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- ☐ ENGINEER'S CERTIFICATION (DRB APPR. SITE PLAN)
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CHECK TYPE OF APPROVAL SOUGHT:

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- ☐ PRELIMINARY PLAT APPROVAL
- ☐ S. DEV. PLAN FOR SUB'D APPROVAL
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- ☐ FINAL PLAT APPROVAL
- ☐ FOUNDATION PERMIT APPROVAL
- ☐ BUILDING PERMIT APPROVAL
- ☒ CERTIFICATE OF OCCUPANCY (PERM.)
- ☐ CERTIFICATE OF OCCUPANCY (TEMP.)
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- ☐ PAVING PERMIT APPROVAL
- ☐ WORK ORDER APPROVAL
- ☐ OTHER (SPECIFY)

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☐ YES
- ☒ NO
- ☐ COPY PROVIDED



DATE SUBMITTED: 10-08-02 BY: Christian J. Sholtis

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

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DRAINAGE INFORMATION SHEET**PROJECT TITLE:** Rio Grande High School**ZONE ATLAS/DRNG. FILE #:** M-11 / *Doof***DRB #:****EPC #:****WORK ORDER #:****LEGAL DESCRIPTION:** Tract 179-B-1-A, MRGCD Map No. 43**CITY ADDRESS:** 2300 Arenal Rd. SW, Albuquerque, NM 87105**ENGINEERING FIRM:** Jeff Mortensen & Associates, Inc.**CONTACT:** Christian J. Sholtis**ADDRESS:** 6010-B Midway Pk. N.E., Albuquerque, NM 87109**PHONE:** (505)345-4250**OWNER:** The Albuquerque Public Schools**CONTACT:** Pat McMurray**ADDRESS:** P.O. Box 25704, Albuquerque, NM 87125**PHONE:** (505)842-8211**ARCHITECT:** Kells & Craig**CONTACT:** Steve Kells**ADDRESS:** 400 Gold St. SW Ste 880, Albuquerque, NM
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AUG 16 2000
HYDROLOGY SECTION**DATE SUBMITTED:** 8-15-00**BY:** Christian J. Sholtis, E.I.



City of Albuquerque

P.O. BOX 1293 ALBUQUERQUE, NEW MEXICO 87103

August 15, 2002

Jeff Mortensen, P.E.
Jeff Mortensen & Assoc.
6010-B Midway Park Blvd ME
Albuquerque, New Mexico 87109

RE: RIO GRANDE HIGH SCHOOL ADDN' & RENOV. (M-11/D4)
(2300 Arenal Rd SW)
CERTIFICATE OF OCCUPANCY APPROVAL-*Temporary*
ENGINEERS CERTIFICATION DATED 8/15/2002

Dear Mr. Mortensen:

Based on the information provided in your submittal dated August 15, 2002, the above referenced project is approved for a **TEMPORARY** Certificate of Occupancy.

A Temporary Certificate of Occupancy has been issued for 60 days, allowing the remaining outstanding drainage issues (which includes the pond volume calculations) to be completed within this time scope.

Upon completion of all of the above outstanding drainage issues, final certification will be required for issuance of a Permanent Certificate of Occupancy.

If I can be of further assistance, please feel free to contact me at 924-3981.

Sincerely,

Teresa A. Martin
Hydrology Plan Checker
Development and Building Services Division

BMB

c: Vickie Chavez, COA
✓ Drainage file
Approval file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

m11/D4

PROJECT TITLE: Rio Grande High School Additions & Renovations ZONE ATLAS/DRNG. FILE #: 1111
 DRB #: _____ EPC #: _____ WORK ORDER #: _____

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 CITY ADDRESS: 2300 Arenal Rd SW

ENGINEERING FIRM: Jeff Mortensen & Assoc., Inc. CONTACT: Chris Sholtis
 ADDRESS: 6010-B Midway Park Blvd. NE PHONE: (505) 345-4250
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TYPE OF SUBMITTAL:

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☐ DRAINAGE PLAN
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
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✓ Drainage file
Approval file

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/11/2002)

m11/D4

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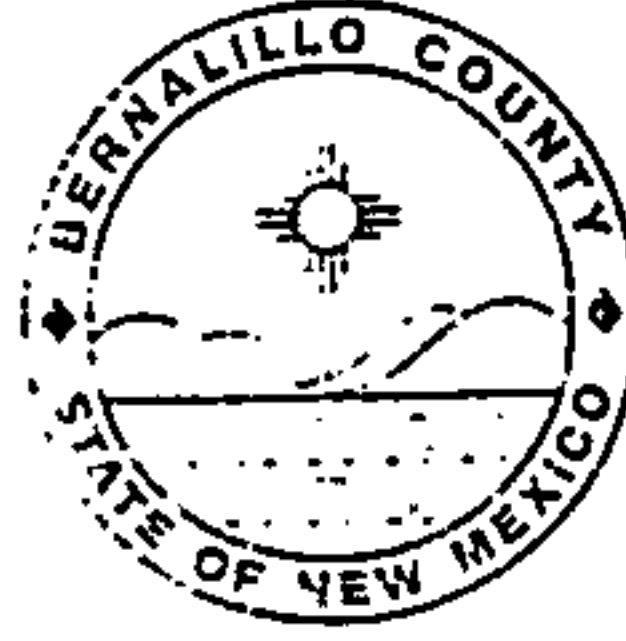
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County of Bernalillo

State of New Mexico

BOARD OF COUNTY COMMISSIONERS

BARBARA J. SEWARD, CHAIR
DISTRICT 4
TOM RUTHERFORD, VICE CHAIR
DISTRICT 3
KEN SANCHEZ, MEMBER
DISTRICT 1
STEVE D. GALLEGOS, MEMBER
DISTRICT 2
LES HOUSTON, MEMBER
DISTRICT 5
JUAN R. VIGIL, COUNTY MANAGER



MARK CARRILLO, ASSESSOR
JUDY D. WOODWARD, CLERK
IRA ROBINSON, PROBATE JUDGE
JOE BOWDICH, SHERIFF
ORLANDO VIGIL, TREASURER

2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

September 7, 2000

Jeffrey G. Mortensen, P.E.
Jeff Mortensen & Associates, Inc.
6010-B Midway Park Blvd. NE
Albuquerque, New Mexico 87109

**RE: Grading and Drainage Plan and Master Drainage Plan for Rio Grande High School
(M11/D4) (PWDN-126) Engineer's Stamp Dated 8/15/00.**

Dear Mr. Mortensen:

Based on the information provided, the above referenced plan for the proposed building additions is approved for Building Permit release.

As you are aware, the Engineer's Certification is required prior to release of the Certificate of Occupancy for these additions.

With respect to the Master Drainage Plan, please provide the pond volume calculations for the small pond at the north side of the site that collects runoff from Basin B. This supplemental information may be provided along with the certification.

NOTE: LETTER DATED 8/15/02

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

A handwritten signature in cursive script, appearing to read "Susan Calongne".

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Brad Catanach, Bernalillo County Public Works Division
Pat McMurray, APS
File



Brian Kent
<bkent@mercury.bern
co.gov>

08/24/00 02:05 PM

To: "Susan Calongne" <scalongne@cabq.gov>

cc:
Subject: Comments for PWDN #126

Susan,

I only have one comment for PWDN # 126. Depending on your comments, you may consider just calling him for this information. .

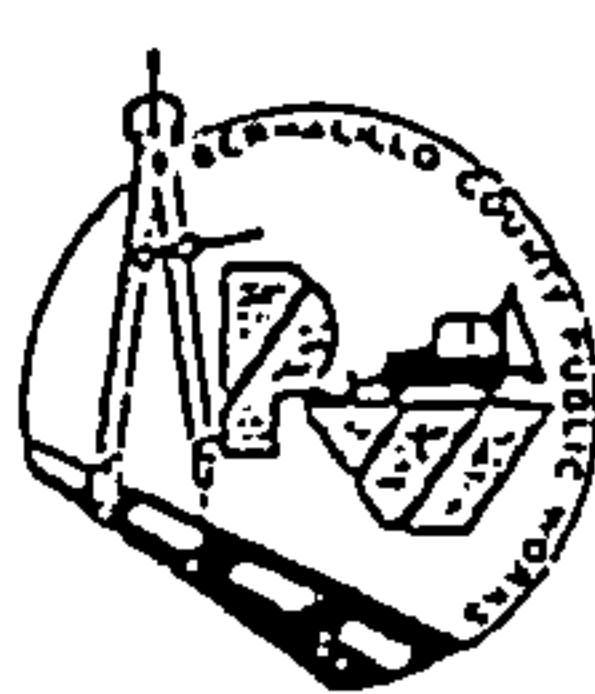
Legal: Tract # 179-B-1-A, MRGCD Map # 43
Zone Map: M-11

Provide calculations for small pond at north side of site (collection from Basin "B").

Thanks,

BK

BERNALILLO COUNTY



PWD SUBMITTAL

- ☒ NEW SUBMITTAL
☐ RESUBMITTAL
☐ FINAL SIGNOFF

Use for all PWD applications EXCEPT Street Excavation

TODAY'S DATE: 8/15/00

CASE NO. PWDN-126

OWNER

OWNER The Albuquerque Public Schools PHONE (505) 842-8211
 MAILING ADDRESS P.O. Box 25704 CITY Albug. ZIP 87125

AGENT

AGENT/CONTRACTOR Jeff Mortensen & Assoc. Inc. PHONE (505) 345-4250

MAILING ADDRESS 6010-B Midway Pk NE CITY Albug. ZIP 87109

STATE LICENSE NO. EXP DATE VOLUME CLASS

ARCHITECT/ENGINEER Jeffrey B. Mortensen LICENSE NO. 8547 PHONE (505) 345-4250

SITE INFORMATION

SITE ADDRESS / DIRECTIONS Rio Grande High School ZONE ATLAS NO.: M-11

2300 Arenal Rd SW Albuquerque, NM 87105

LEGAL DESCRIPTION Tract 179-B-1-A MRBCD Map No. 43

LOT SIZE: 43.73 Ac +/-

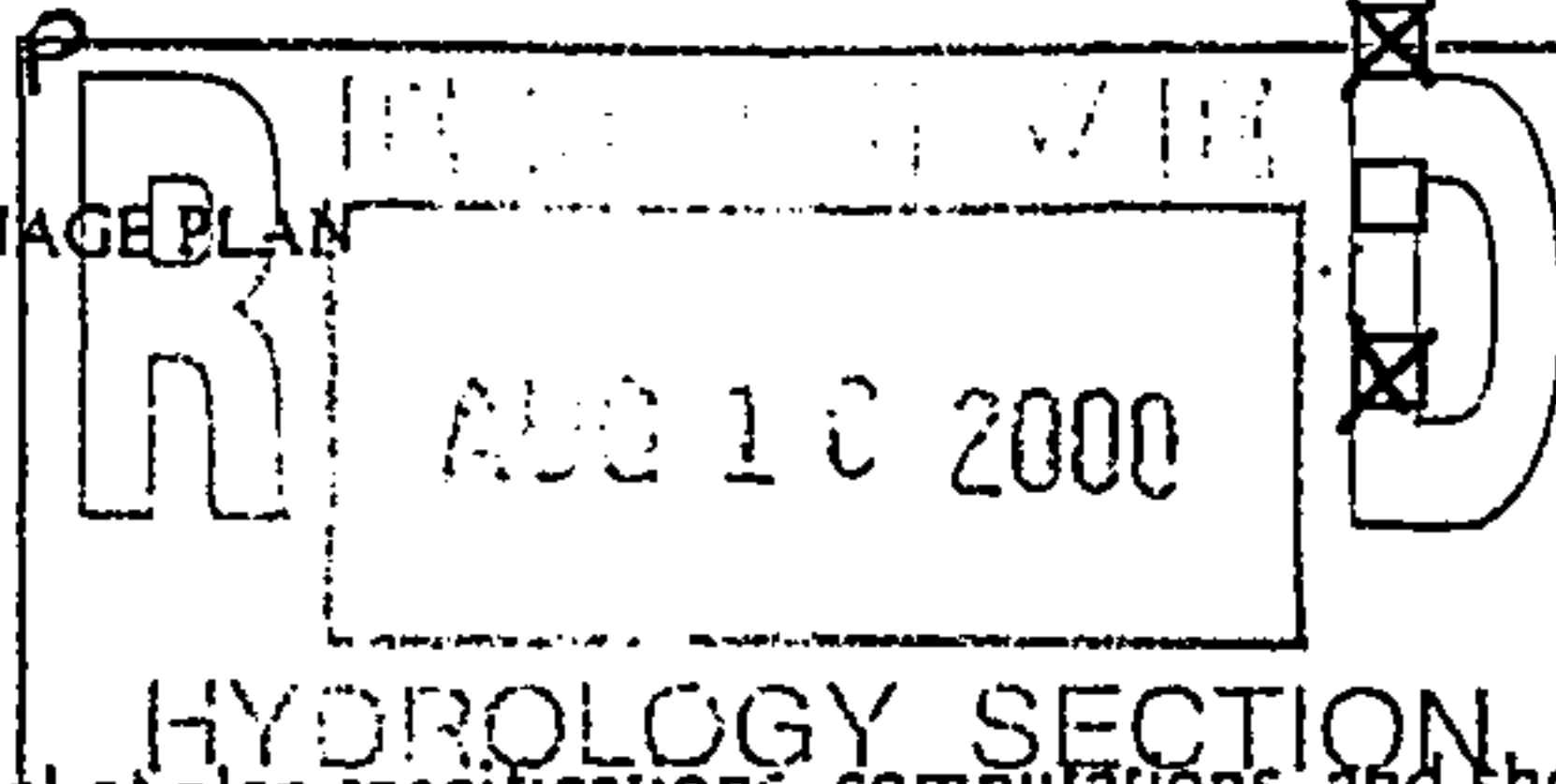
EXISTING BUILDING(S) AND USE: Site developed as High School

PROPOSED BUILDING(S): Classroom Replacement

UPC # 1-011-055-442-207-408-34

TYPE OF SUBMITTAL

- | | |
|---|---|
| ☐ REPLAT | ☐ TRAFFIC IMPACT ANALYSIS / TRAFFIC STUDY |
| ☐ MINOR SUBDIVISION | ☐ INFRASTRUCTURE LIST / DESIGN REVIEW |
| ☐ MAJOR SUBDIVISION | ☐ SPECIAL USE PERMIT |
| ☐ CONSTRUCTION DRAWINGS | ☐ BARRICADING PERMIT |
| ☒ GRADING & DRAINAGE PLAN / MDP | ☒ BUILDING PERMIT |
| ☐ AS-CONSTRUCTED GRADING & DRAINAGE PLAN | ☐ INSPECTION |
| ☐ VARIANCE REQUEST | ☒ OTHER (Specify): MASTER DRAINAGE PLAN |
| ☐ LAND DIVISION | |



The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings, shall not be interpreted to be a permit for, or an approval of any variance or violation of any of the provisions of any COUNTY or STATE codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized COUNTY representative or COUNTY inspector from thereafter requiring the correction of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any COUNTY or STATE codes, ordinances, standards, or policies.

Christian J. Sholtis

- ☐ Owner ☒ Agent ☐ Contractor

Signature

Christian J. Sholtis

Date

8/15/00

COUNTY

BERNALILLO COUNTY USE ONLY

C/R's:

TOTAL FEE:

Receipt No.:

Received By:

County of Bernalillo

State of New Mexico

BOARD OF COUNTY COMMISSIONERS

BARBARA J. SEWARD, CHAIR
DISTRICT 4
TOM RUTHERFORD, VICE CHAIR
DISTRICT 3
KEN SANCHEZ, MEMBER
DISTRICT 1
STEVE D. GALLEGOS, MEMBER
DISTRICT 2
LES HOUSTON, MEMBER
DISTRICT 5
JUAN R. VIGIL, COUNTY MANAGER



2400 BROADWAY, S.E.
ALBUQUERQUE, NEW MEXICO 87102
PUBLIC WORKS (505) 848-1500

MARK CARRILLO, ASSESSOR
JUDY D. WOODWARD, CLERK
IRA ROBINSON, PROBATE JUDGE
JOE BOWDICH, SHERIFF
ORLANDO VIGIL, TREASURER

September 7, 2000

Jeffrey G. Mortensen, P.E.
Jeff Mortensen & Associates, Inc.
6010-B Midway Park Blvd. NE
Albuquerque, New Mexico 87109

**RE: Grading and Drainage Plan and Master Drainage Plan for Rio Grande High School
(M11/D4) (PWDN-126) Engineer's Stamp Dated 8/15/00.**

Dear Mr. Mortensen:

Based on the information provided, the above referenced plan for the proposed building additions is approved for Building Permit release.

As you are aware, the Engineer's Certification is required prior to release of the Certificate of Occupancy for these additions.

With respect to the Master Drainage Plan, please provide the pond volume calculations for the small pond at the north side of the site that collects runoff from Basin B. This supplemental information may be provided along with the certification.

WSTC LETTER DATED 8/15/00

If you have any questions, or if I may be of further assistance to you, please call me at 924-3982.

Sincerely,

A handwritten signature in cursive script, reading "Susan Calongne".

Susan M. Calongne, P.E.
City/County Floodplain Administrator

c: Brad Catanach, Bernalillo County Public Works Division
Pat McMurray, APS
File



Brian Kent
<bkent@mercury.bern
co.gov>

08/24/00 02:05 PM

To: "Susan Calongne" <scalongne@cabq.gov>

cc:

Subject: Comments for PWDN #126

Susan,

I only have one comment for PWDN # 126. Depending on your comments, you may consider just calling him for this information.

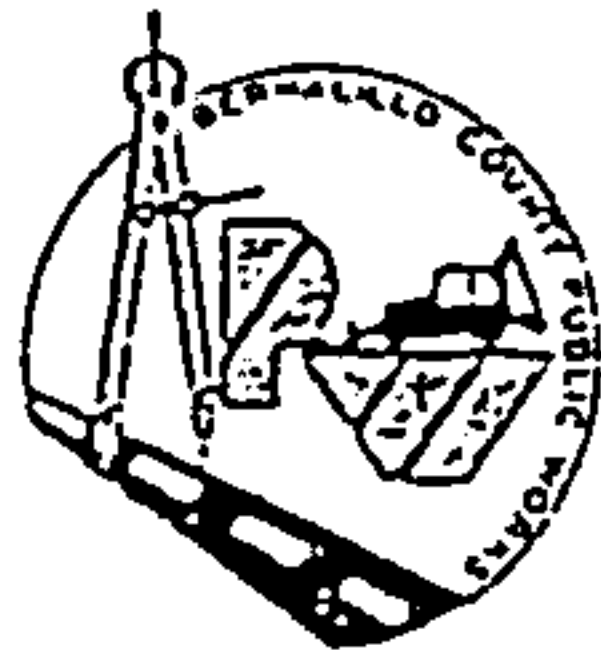
Legal: Tract # 179-B-1-A, MRGCD Map # 43
Zone Map: M-11

Provide calculations for small pond at north side of site (collection from Basin "B").

Thanks,

BK

BERNALILLO COUNTY



PNEP-1358

SCISAW

PWD SUBMITTAL

Use for all PWD applications EXCEPT Street Excavation

☒ NEW SUBMITTAL

☐ RESUBMITTAL

☐ FINAL SIGNOFF

TODAY'S DATE: 8/15/00

FP

CASE NO. PWDN-126

OWNER

OWNER The Albuquerque Public Schools PHONE (505) 842-8211

MAILING ADDRESS P.O. Box 25704 CITY Albuq. ZIP 87125

AGENT

AGENT/CONTRACTOR Jeff Mortensen & Assoc. Inc. PHONE (505) 345-4250

MAILING ADDRESS 6010-B Midway Pk NE CITY Albuq. ZIP 87109

STATE LICENSE NO. EXP DATE VOLUME CLASS

ARCHITECT/ENGINEER Jeffrey B. Mortensen LICENSE NO. 8547 PHONE (505) 345-4250

SITE INFORMATION

SITE ADDRESS / DIRECTIONS Rio Grande High School

ZONE ATLAS NO.: M-11

2300 Arenal Rd SW Albuquerque, NM 87105

LEGAL DESCRIPTION Tract 179-B-1-A MRBCD Map No. 43

LOT SIZE: 43.73 Ac +/-

EXISTING BUILDING(S) AND USE: Site developed as High School

PROPOSED BUILDING(S): Classroom Replacement

UPC # 1-011-055-442-207-408-34

TYPE OF SUBMITTAL

☐ REPLAT

☐ MINOR SUBDIVISION

☐ MAJOR SUBDIVISION

☐ CONSTRUCTION DRAWINGS

☒ GRADING & DRAINAGE PLAN / MDP

☐ AS-CONSTRUCTED GRADING & DRAINAGE PLAN

☐ VARIANCE REQUEST

☐ LAND DIVISION

☐ TRAFFIC IMPACT ANALYSIS / TRAFFIC STUDY

☐ INFRASTRUCTURE LIST / DESIGN REVIEW

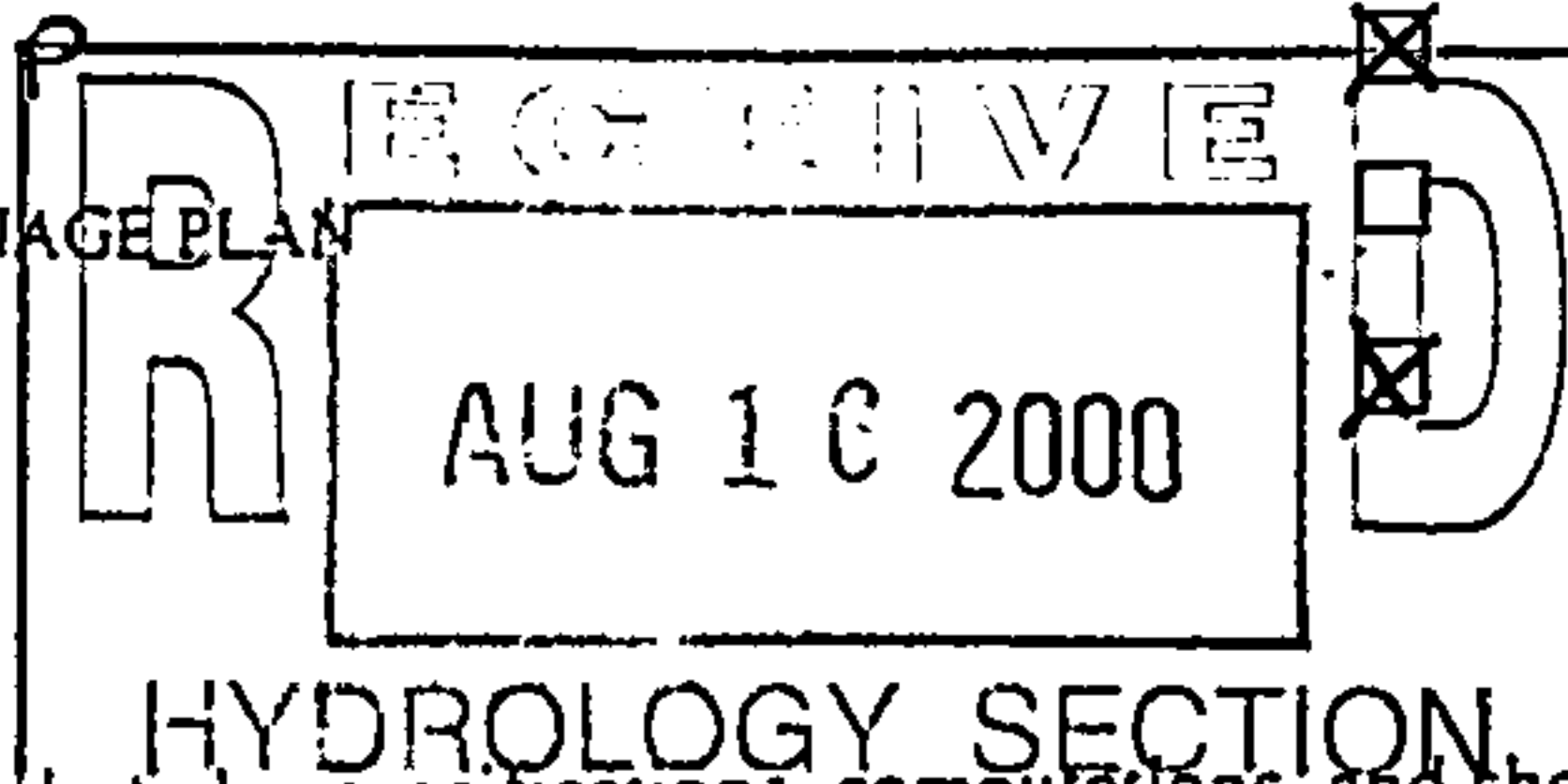
☐ SPECIAL USE PERMIT

☐ BARRICADING PERMIT

☒ BUILDING PERMIT

☐ INSPECTION

☒ OTHER (Specify): MASTER DRAINAGE PLAN



The issuance of a permit or a review or approval of plan specifications, computations, and shop drawings, shall not be interpreted to be a permit for, or an approval of any variance or violation of any of the provisions of any COUNTY or STATE codes, ordinances, standards, or policies. Nor shall such issuance of a permit or approval of plans, specifications, computations, and shop drawings prevent any authorized COUNTY representative or COUNTY inspector from thereafter requiring the correction of errors in said plans, specifications, computations, or shop drawings or from stopping construction operations which are being carried on thereunder when in violation of any COUNTY or STATE codes, ordinances, standards, or policies.

Christian J. Sholtis

☐ Owner ☒ Agent ☐ Contractor

Signature

Christian J. Sholtis

Date 8/15/00

COUNTY

BERNALILLO COUNTY USE ONLY

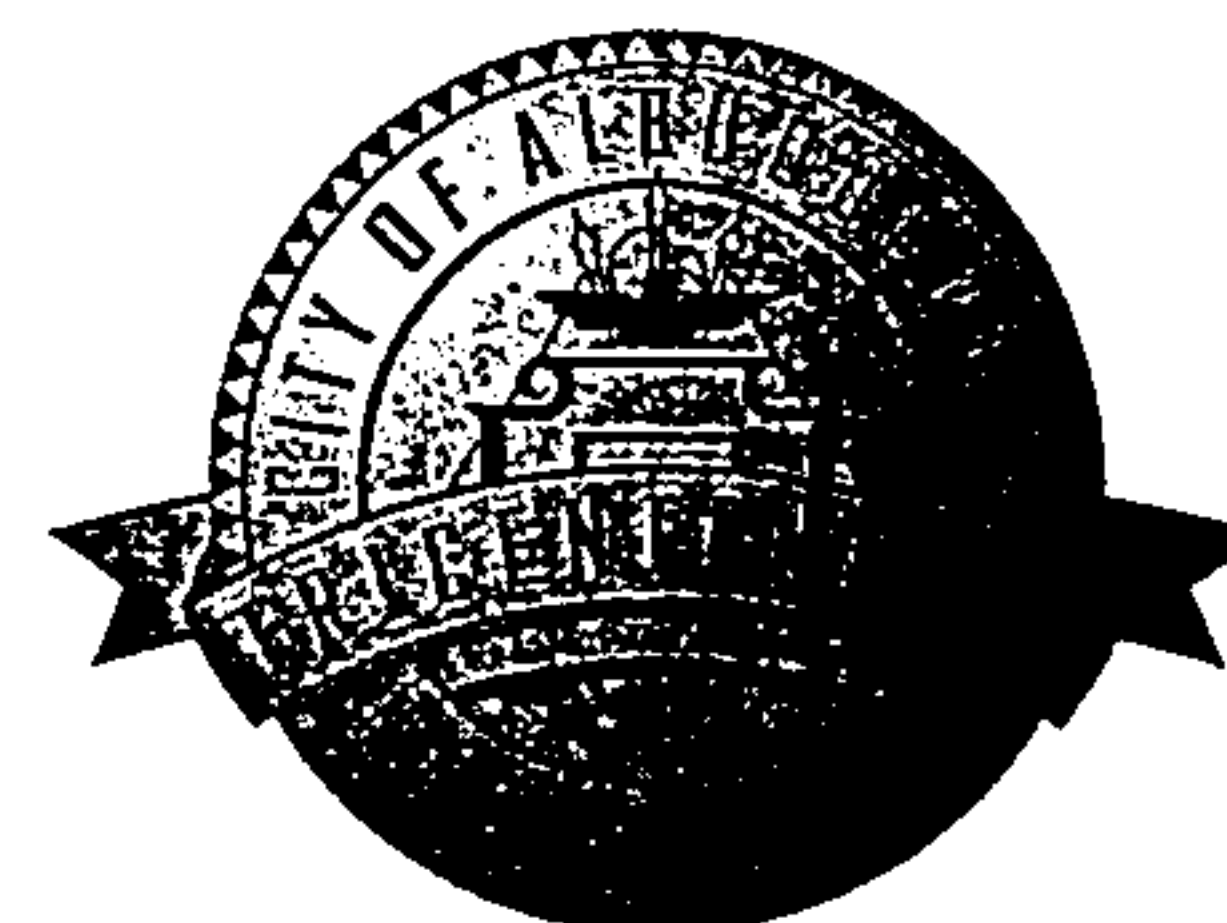
C/R's:

TOTAL FEE:

Receipt No.:

Received By:

CITY OF ALBUQUERQUE



December 26, 2007

Mario G. Juarez-Infante, P.E.
Wilson & Company, Inc.
4900 Lang Avenue NE
Albuquerque, NM 87109

Re: Rio Grande High School, 2300 Arenal Street, Grading and Drainage Plan
Engineer's Stamp dated 12-05-07 (M-11/D004)

Mr. Infante,

Based upon the information provided in your submittal received 12-10-07, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

1. The Drainage Report will need to be Stamped, Dated, and Signed by a licensed New Mexico Engineer; also, this report will need to be bound.
2. Additional research will be required for keyed Note 1. Show the location of the existing storm drain; as well as, the size and type of storm drain that will be connected into. Will there be any specific type of connection, at this location? Provide invert and elevations for this connection.
3. It appears there are some dimensions pertaining to the pipe size on the plan; however, this information is illegible. Provide the size, type, and slope of the proposed pipe. Maybe a different type of hatching will remedy this issue?
4. Please include Detail Sheets 501 and 502.
5. How and where will the run-off enter the "Storm-Tech Chambers"? Specifications for this system are required.
6. It appears the North West corner of the Storm-Tech Chambers protrudes into the Right-of-Way; this will require an Encroachment Agreement or modify the location of the Storm-Tech Chambers.
7. Provide elevations for the existing conditions; as well as, additional elevations for the proposed work.
8. It appears there is an island north of the classrooms; is this painted or is this area raised with curb & gutter? Please clarify.

P.O. Box 1293

Albuquerque

New Mexico 87103

www.cabq.gov

If you have any questions, you can contact me at 924-3982.

Sincerely,

Timothy Sims
Plan Checker-Hydrology, Planning Dept.
Development and Building Services

C: Bradley L. Bingham
File

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003)

M-11/2004

PROJECT TITLE: Rio Grande High School ZONE MAP/DRG. FILE#: M-11

DRB#: _____ EPC#: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Map 43 TR 179B1A BOARD OF ED

CITY ADDRESS: 2300 Arenal st

ENGINEERING FIRM: Wilson & Company Inc., E&A CONTACT: Mario Juarez-Infante, PE
ADDRESS: 4900 Lang Ave. NW PHONE: (505) 348-4064
CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: APS CONTACT: Rolden Pasion
ADDRESS: 915 Oak street PHONE: 505-848-8810
CITY, STATE: Albuquerque, NM ZIP CODE: 87106

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

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

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

CHECK TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
☒ DRAINAGE PLAN 1st SUBMITTAL, REQUIRES TCL OR EQUAL
☐ CONCEPTUAL GRADING & DRAINAGE PLAN
☒ GRADING PLAN
☐ EROSION CONTROL PLAN
☐ ENGINEERS CERTIFICATION (HYDROLOGY)
☐ CLOMR/LOMR
☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☐ ENGINEERS CERTIFICATION (TCL)
☐ ENGINEERS CERTIFICATION (DRB, APPR. SITE PLAN)
☐ OTHER

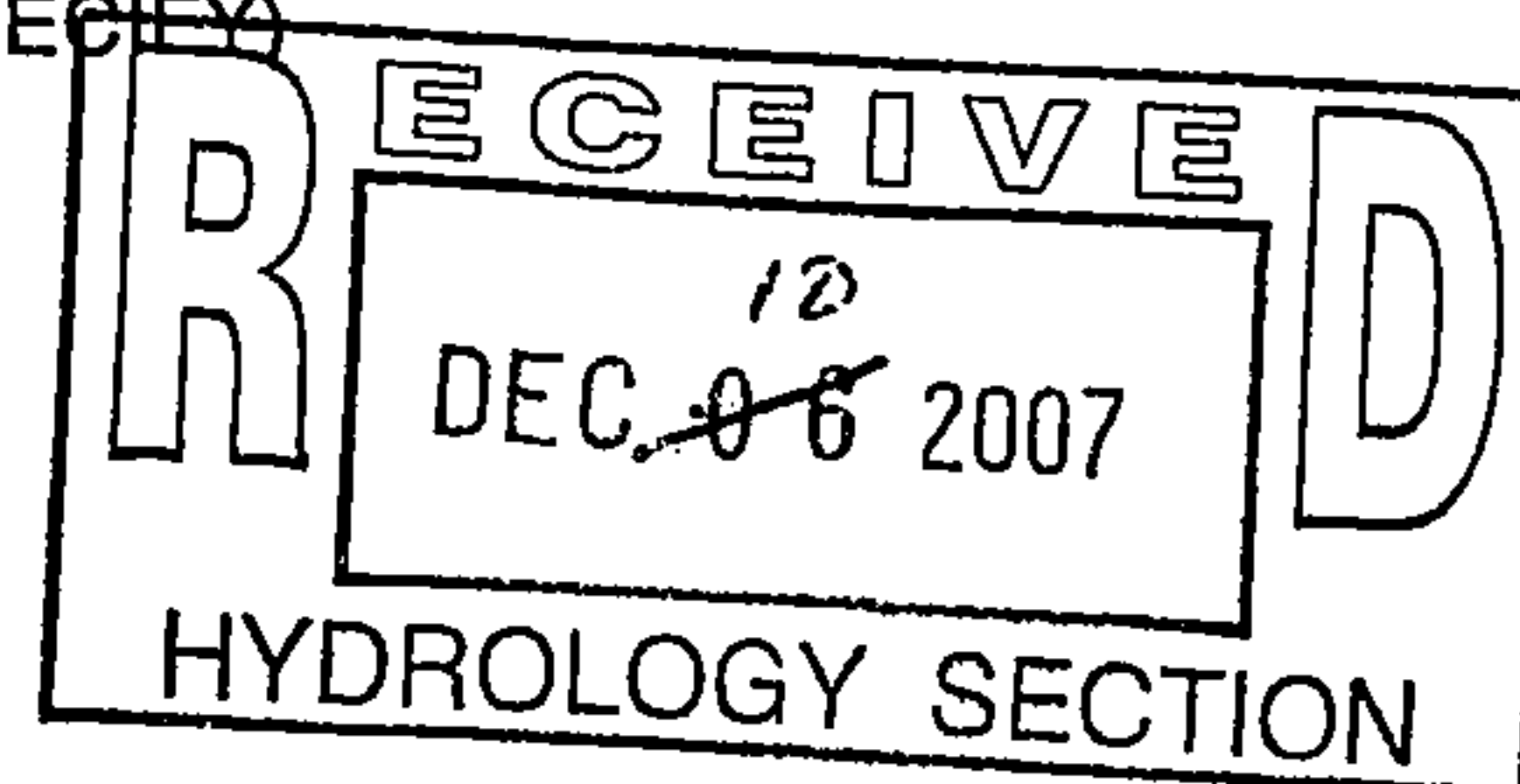
CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☒ YES
☐ NO

PAID
\$50.00



Date Submitted: 12/06/07

By: Marco A. Gamboa

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

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

Rio Grande High School

Drainage Report

Prepared by

WILSON
& COMPANY
ENGINEERS & ARCHITECTS
4900 Lang Ave. NE
Albuquerque, NM 87109

FINAL SUBMITTAL VERSION

December 6, 2007

I, Mario G. Juarez-Infante, P.E., do hereby certify that this document was prepared by me or under my direction, and is true and correct to the best of my knowledge and belief and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Mario G. Juarez-Infante, PE, CFM
NMPE No. 15340

Date

Rio Grande High School Drainage Report

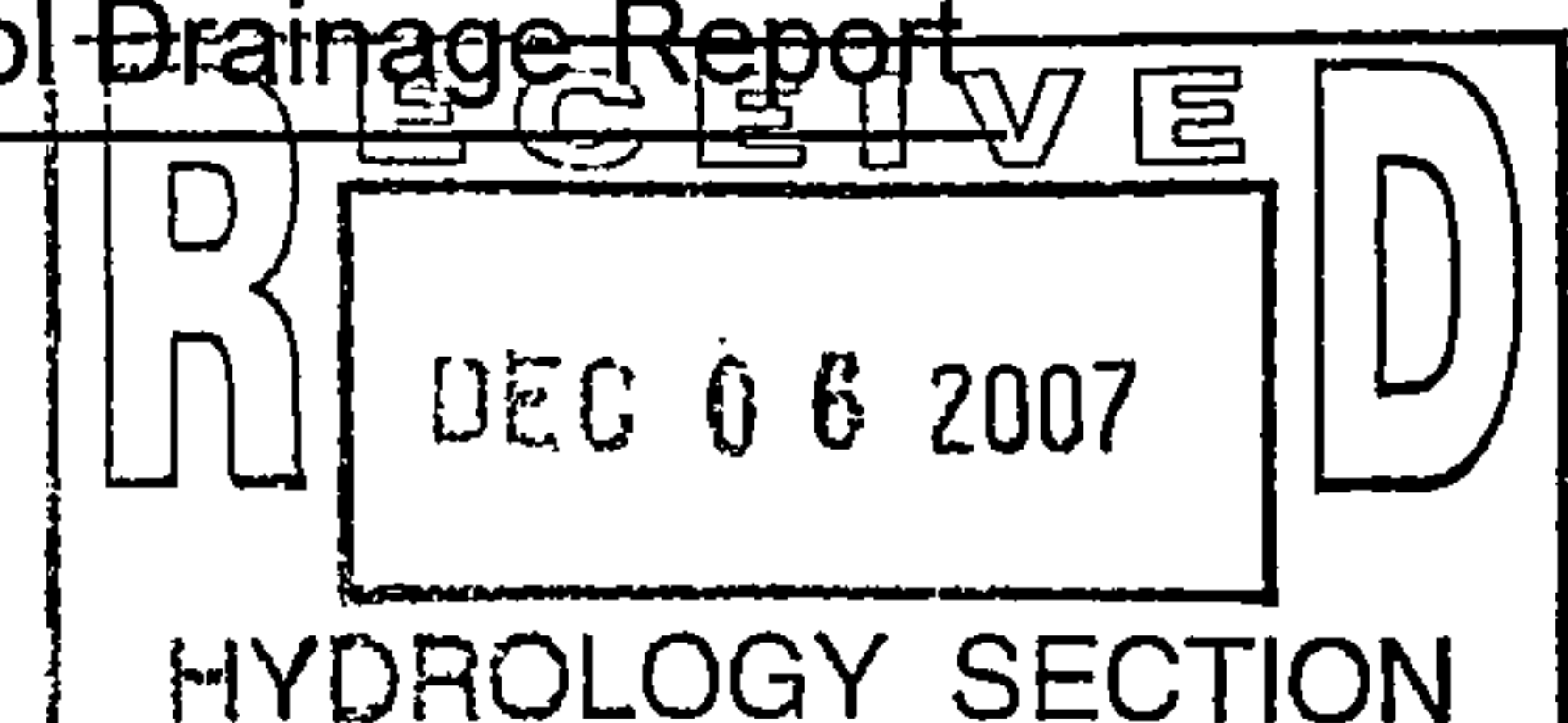


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5. Proposed Pipe Diameter.....	3

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Introduction

Rio Grande High School will be constructing improvements directly north of the recently constructed administration building. These improvements include a new courtyard, parking lot expansion and on-site drainage conveyance and sub-surface detention facility. The existing parking lot will be expanded west, adding a new access drive of Arenal Road, and increasing parking spaces. Signing for parent drop-off/pick up and bus lane drop-off/pickup will also be provided. Rio Grande High School is located at 2300 Arenal Rd. SW, Albuquerque, NM, Zone Atlas M-11-Z. The affected area is approximately 2.74 acres.

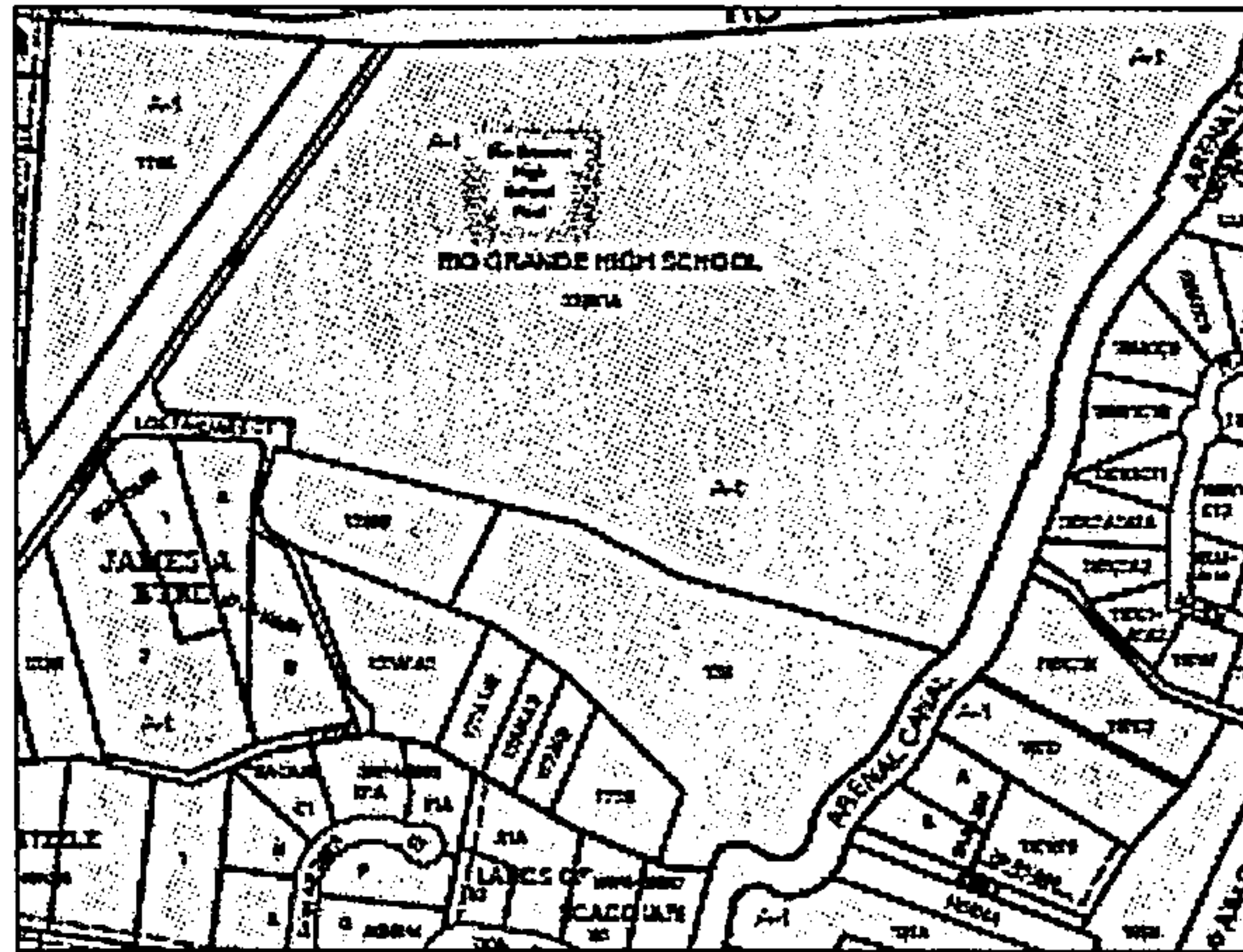


Figure 1-Rio Grande High School in Zone Atlas M-11-Z

Project Description

The purpose of this drainage report is to determine hydrology/ hydraulic analysis of post development flows and provide recommendations for mitigating peak flow and volumetric run-off in accordance with section 22.2 of the city of Albuquerque DPM. The site will self contain its volumetric flow in an underground storage system, StormTech.

Methodology

Section 22.2 of City of Albuquerque Development Process Manual (DPM) was followed to perform hydrologic analysis. All calculations are based on the 100-year 6-hour for peak discharge and the 100-year, 10-day for volumetric runoff.

Hydrology

Existing Conditions

The existing topography of the site is essentially flat with no outfall. The site currently has 2 different soil types in our area of interest, Anapra Silt Loam (An) and Armijo Clay Loam (Ar). The soil information was taken from the NRCS website. According to the DPM, the site is located in precipitation Zone 1 (West of the Rio Grande) and the site has three different land treatments (See Table 1). Based on this information the peak flow and volumetric runoffs were obtained, results are shown on Table 2.

Table 1-Rio Grande High School Basin Soil Treatment Areas

	TOTAL AREA (ft²)	Type D ft²	TYPE C ft²	Type B ft²
Basin 101	114,359	91,833	9,042	13,484

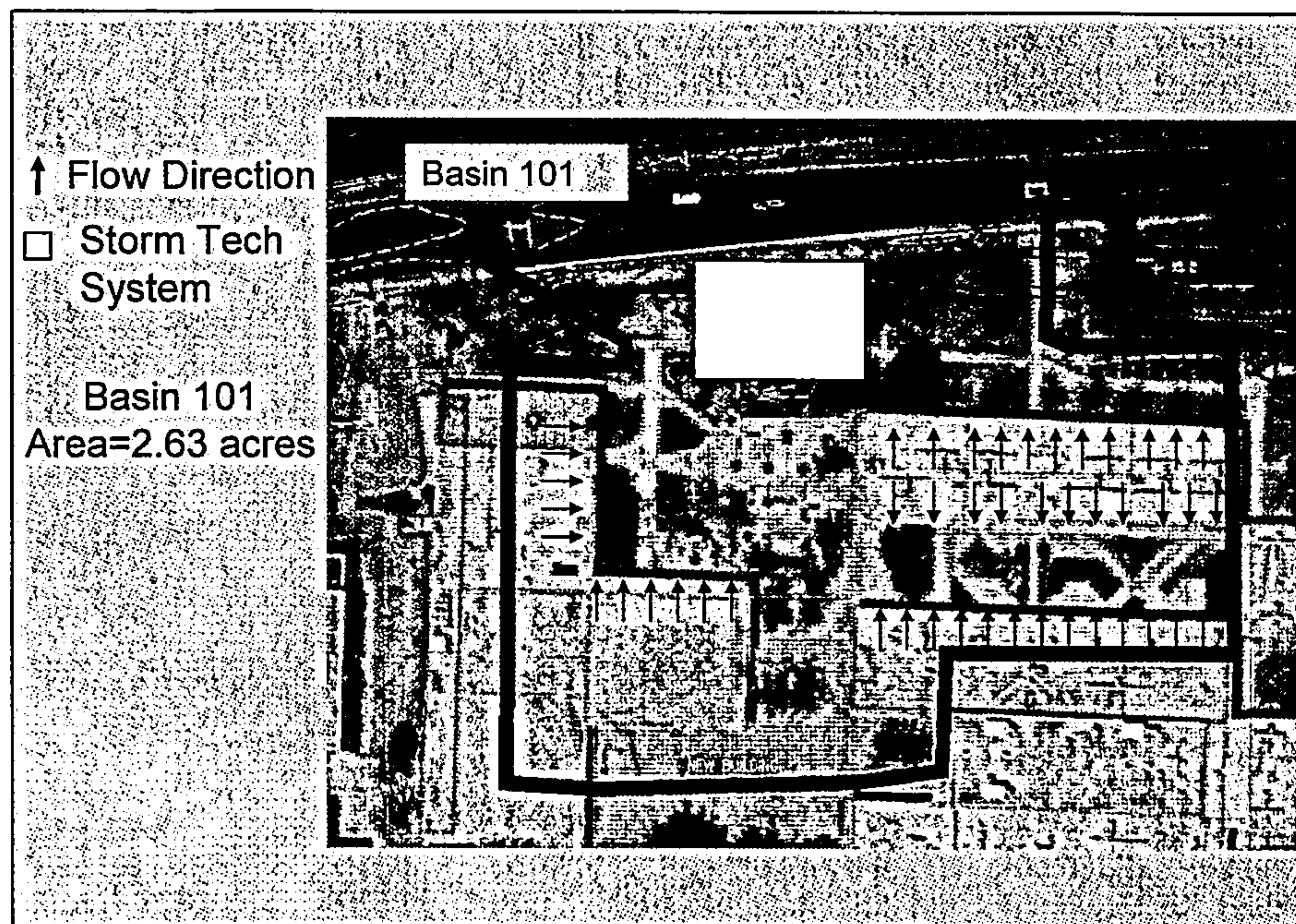


Figure 2-Rio Grande High School Basin and Flow Direction.

Table 2-Existing Hydrology

Existing Basin	Total Area(acres)	Peak Discharge (ft³/s)	Volume(acre-ft)_{10 day}
Basin 101	2.63	10.52	0.64

Table 2 represents the existing hydrology for Rio Grande High School which includes peak discharge and runoff volume for a 100-year, 10-day criterion.

Proposed Conditions

Rio Grande High School improvements will include grading and drainage for the site north of the administration building. The underground StormTech system will be installed under the proposed site parking lot.

Post development flows were determined based on the existing watershed boundaries and modified land treatments. Proposed conditions will decrease Type C and increase Type D land treatment areas, which yields increased volumetric run-off. See Table 3 for the comparison of areas. Table 4 represents the results for the proposed conditions for the site.ft²

Table 3-Comparison of Proposed and Existing Areas by Land Type

	TOTAL AREA (ft²)	Type D ft²	TYPE C ft²	Type B ft²
Existing Conditions	114,359	91,833	9,042	13,484
Proposed Conditions	114,359	104,224	5,450	4,685

Table 4-Proposed Hydrology for Rio Grande High School

Proposed Basin	Total Area(acres)	Peak Discharge (ft³/s)	Volume _{10days}(acre-ft)
Basin 201	2.63	11.13	0.66

The increase peak discharge and volumetric runoff are 5.48% and 8.57%, respectively. Proposed conditions on Basin 201 are for the new courtyard and the underground drainage system. The system will be detaining the storm water runoff for the entire Basin. The 100-year, 10-day volume was used to calculate the total volumetric runoff ($V_{10\text{day}}$). The total volumetric flow is 0.66 acre-ft. This system will use a total of 326 chambers to detain the storm water; as shown on figure 3.

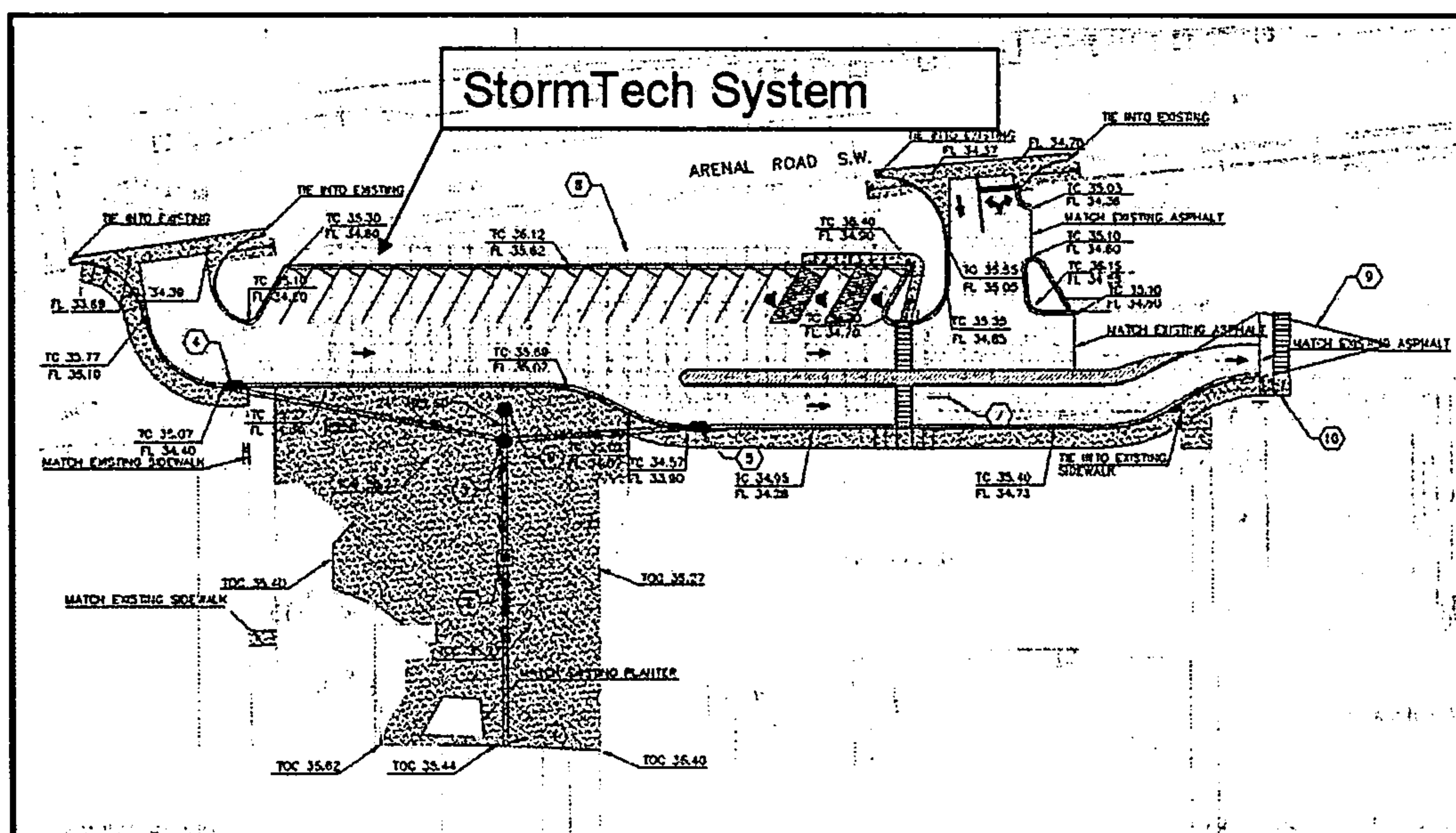


Figure 3- StormTech Chamber Distribution Layout.

Proposed Hydraulic Analysis

To determine the diameter of the pipes for the storm drain system, Manning's Equation was used. The peak discharge is 11.13 cfs for Proposed Basin 201, a roughness coefficient of 0.013 conservative for plastic pipe and a constant k coefficient of 1.46 (for USCS). Using these parameters the mainline storm drain pipe diameter was calculated to be as shown on Table 5.

Table 5-Proposed Pipe Diameter

<i>Basin</i>	<i>Diameter (in)</i>	<i>Recommended Diameter (in)</i>
201	12.8	18

The StormTech system was designed using the following equations from the “StormTech Manual Design”:

In order to calculate the number of chambers the following equation was used:

- $V_{10\text{days}} = 0.66 \text{ acre-ft} = 28,750 \text{ ft}^3$
- Chamber Storage for a foundation of 18 in = 88.4 cfs*

$$C = \left(\frac{V_s}{\text{ChamberStorage}} \right)$$

$$C = \left(\frac{28,749.7}{88.4} \right) = 326 \text{ Chambers}$$

To determine the required bed size for the StormTech System the following formula was used:

- Bed perimeter 326 ft
- Bed area per chamber = 33.8 ft²*

$$S = (C \times 33.8 \text{ ft}^2) + (1 \text{ ft} \times \text{bedperimeter})$$

$$S = (326 \times 33.8) + (1 \times 326) = 11,344.8 \text{ ft}^2$$

*For values see tables from the "StormTech Manual Design"

Conclusion

The existing hydrology peak discharge is 10.52 ft³/s for 0.64 acre-ft volumetric run-off post development peak discharge is 11.3 ft³/s while the volumetric run-off is 0.66 acre-ft. The proposed minimum diameter for the main line storm drain pipe 18 inches. The site will have one Type D Curb Inlets and two Type C Curb Inlets. The StormTech system will be installed at the entrance of the proposed parking lot having 326 chambers to detain the volumetric runoff for the 100-year 10-day event on site.

ASSUMED	
ZONE	1.00
Land treatment	C
Land treatment	D
Land treatment	B
100 yr 6 hr event	

Appendix A Hydrology and Volumetric Runoff (Existing and Proposed)

HYDROLOGY (EXISTING CONDITIONS)

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²
Sub Basin 1	114,359.00	91,833.00	9,042.00	13,484.00
TOTAL AREA(ft ²)	114,359.00	91,833.00	9,042.00	13,484.00
TOTAL AREA(acres)	2.63	2.11	0.21	0.31

HYDROLOGY (EXISTING CONDITIONS)

	TOTAL AREA (ft ²)	IMPERVIOUS DATA ft ²	SOIL TYPE C ft ²	Soil Type B ft ²
Sub Basin 1	114,359.00	91,833.00	9,042.00	13,484.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	9,042.00
Area of watershed (acres)	0.21
Q _C =	0.60 ft ³ /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	91,833.00
Area of watershed (acres)	2.11
Q _D =	9.29 ft ³ /s

Q _T = Q _C + Q _D	10.52 ft ³ /s
--	--------------------------

Sum of Areas	2.63 acres
--------------	------------

<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	13,484.00
Area of watershed (acres)	0.31
Q _B =	0.63 ft ³ /s

TOTAL Q _T =	10.52 ft ³ /s
TOTAL AREA=	2.63 acres

ZONE	1.00
Land treatment B	
Land treatment C	
Land treatment D	
100 yr 6 hr event	

VOLUMETRIC RUNOFF
EXISTING CONDITIONS

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 1	114,359.00	91,833.00	9,042.00	13,484.00	
TOTAL AREA	114,359.00	91,833.00	9,042.00	13,484.00	ft ²
TOTAL AREA	2.63	2.11	0.21	0.31	acres

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 101	114,359.00	91,833.00	9,042.00	13,484.00	0.00

$E_s =$	0.44	in
$E_b =$	0.67	in
$E_c =$	0.99	in
$E_d =$	1.97	in
Area A	0.00	ft ²
Area A	0.00	acres
Area B	13,484.00	ft ²
Area B	0.31	acres
Area C	9,042.00	ft ²
Area C	0.21	acres
Area D	91,833.00	ft ²
Area D	2.11	acres
Total Area Sum	2.63	acres

Weighted E	1.74	in
------------	------	----

$V_{360} = \text{Volume} =$	0.38	acre-ft
-----------------------------	------	---------

10 Day storm	
Zone	1.00
P_{360}	2.20 in
$P_{10 \text{ days}}$	3.67 in
A_D	2.11 acres
$V_{10 \text{ days}}$	0.64 acre-ft



HYDROLOGY (PROPOSED CONDITIONS)

ASSUMED	
ZONE	1.00
Land treatment	C
Land treatment	D
Land treatment	B
100-yr 6 hr event	

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²
Sub Basin 1	114,359.00	104,224.00	5,450.00	4,685.00
TOTAL AREA	114,359.00	104,224.00	5,450.00	4,685.00 ft ²
TOTAL AREA	2.63	2.39	0.13	0.11 acres

HYDROLOGY (PROPOSED CONDITIONS)

	TOTAL AREA (ft ²)	IMPERVIOUS DATA ft ²	SOIL TYPE C ft ²	Soil Type B ft ²
Sub Basin -1	114,359.00	104,224.00	5,450.00	4,685.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	5,450.00
Area of watershed (acres)	0.13
Q _C =	0.36 ft ³ /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	104,224.00
Area of watershed (acres)	2.39
Q _D =	10.55 ft ³ /s

$Q_T = Q_C + Q_D$	11.13	ft ³ /s
-------------------	-------	--------------------

Sum of Areas	2.63	acres
--------------	------	-------

<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	4,685.00
Area of watershed (acres)	0.11
Q _B =	0.22 ft ³ /s

TOTAL Q _T =	11.13	ft ³ /s
------------------------	-------	--------------------

TOTAL AREA=	2.63	acres
-------------	------	-------



ZONE	1.00
Land treatment	B
Land treatment	C
Land treatment	D
100 yr 6 hr event	

VOLUMETRIC RUNOFF
PROPOSED CONDITIONS

TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²	
Sub Basin 1	114,359.00	104,224.00	5,450.00	4,685.00	
TOTAL AREA	114,359.00	104,224.00	5,450.00	4,685.00	ft ²
TOTAL AREA	2.63	2.39	0.13	0.11	acres

VOLUMETRIC RUNOFF PROPOSED CONDITIONS

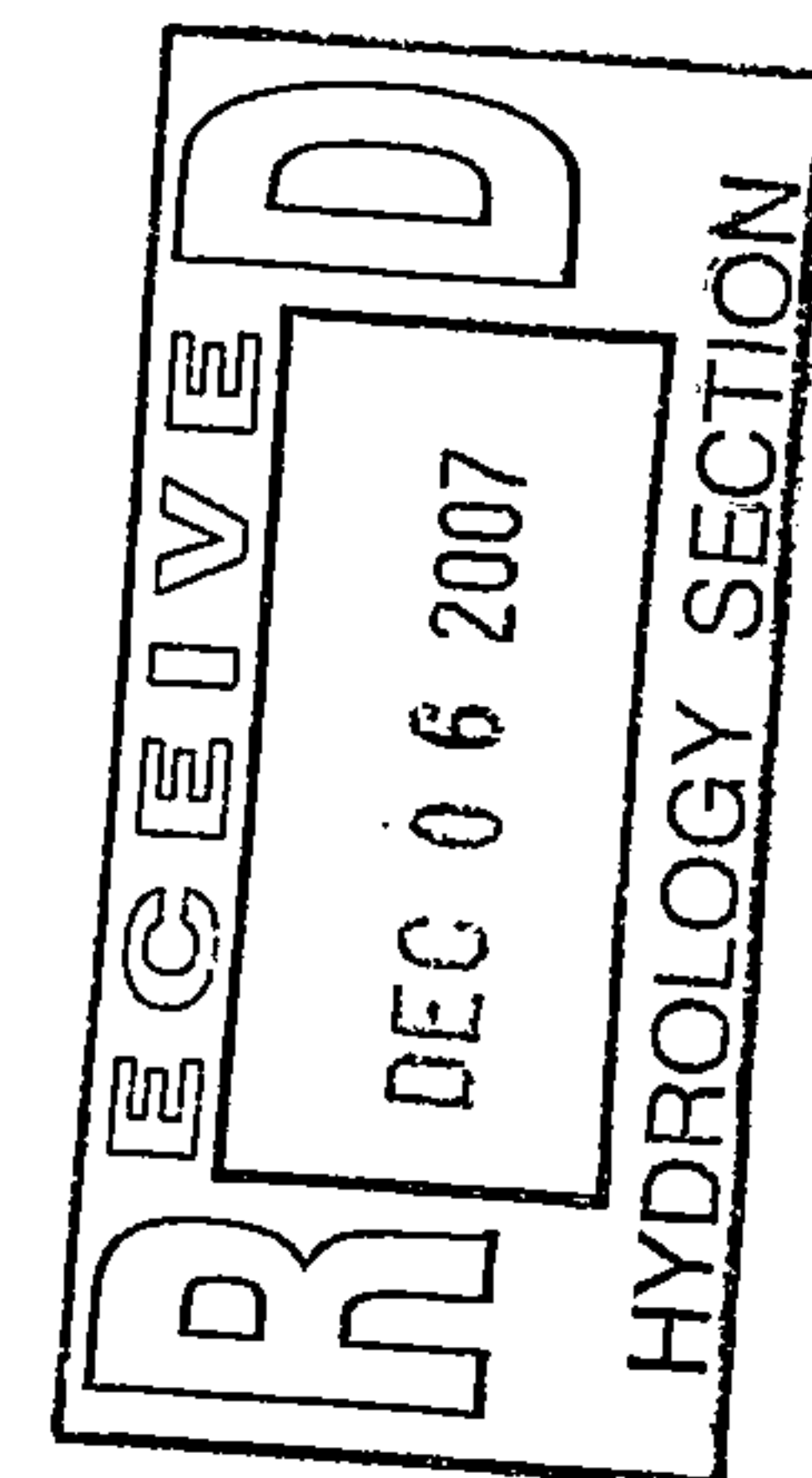
	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 101	114,359.00	104,224.00	5,450.00	4,685.00	0.00

$E_s =$	0.44 in
$E_b =$	0.67 in
$E_c =$	0.99 in
$E_d =$	1.97 in
Area A	0.00 ft ²
Area A	0.00 acres
Area B	4,685.00 ft ²
Area B	0.11 acres
Area C	5,450.00 ft ²
Area C	0.13 acres
Area D	104,224.00 ft ²
Area D	2.39 acres
Total Area Sum	2.63 acres

$Weighted E$	1.87 in
--------------	---------

$V_{360} = Volume =$	0.41 acre-ft
----------------------	--------------

10 Day storm	
Zone	1.00
P_{360}	2.20 in
$P_{10 \text{ days}}$	3.67 in
A_D	2.39 acres
$V_{10 \text{ days}}$	0.70 acre-ft



CITY OF ALBUQUERQUE



December 26, 2007

Mario G. Juarez-Infante, P.E.
Wilson & Company, Inc.
4900 Lang Avenue NE
Albuquerque, NM 87109

Re: Rio Grande High School, 2300 Arenal Street, Grading and Drainage Plan
Engineer's Stamp dated 12-05-07 (M-11/D004)

Mr. Infante,

Based upon the information provided in your submittal received 12-10-07, the above referenced plan cannot be approved for Building Permit until the following comments are addressed:

1. The Drainage Report will need to be Stamped, Dated, and Signed by a licensed New Mexico Engineer; also, this report will need to be bound.
2. Additional research will be required for keyed Note 1. Show the location of the existing storm drain; as well as, the size and type of storm drain that will be connected into. Will there be any specific type of connection, at this location? Provide invert and elevations for this connection.
3. It appears there are some dimensions pertaining to the pipe size on the plan; however, this information is illegible. Provide the size, type, and slope of the proposed pipe. Maybe a different type of hatching will remedy this issue?
4. Please include Detail Sheets 501 and 502.
5. How and where will the run-off enter the "Storm-Tech Chambers"? Specifications for this system are required.
6. It appears the North West corner of the Storm-Tech Chambers protrudes into the Right-of-Way; this will require an Encroachment Agreement or modify the location of the Storm-Tech Chambers.
7. Provide elevations for the existing conditions; as well as, additional elevations for the proposed work.
8. It appears there is an island north of the classrooms; is this painted or is this area raised with curb & gutter? Please clarify.

If you have any questions, you can contact me at 924-3982.

Sincerely,

Timothy Sims
Plan Checker-Hydrology, Planning Dept.
Development and Building Services

C:  Bradley L. Bingham
File

DRAINAGE AND TRANSPORTATION INFORMATION SHEET

(REV. 1/28/2003)

M-11/004

PROJECT TITLE: Rio Grande High School ZONE MAP/DRG. FILE#: M-11

DRB#: _____ EPC#: _____ WORK ORDER #: _____

LEGAL DESCRIPTION: Map 43 TR 179B1A BOARD OF ED

CITY ADDRESS: 2300 Arenal st

ENGINEERING FIRM: Wilson & Company Inc., E&A CONTACT: Mario Juarez-Infante, PE

ADDRESS: 4900 Lang Ave. NW PHONE: (505) 348-4064

CITY, STATE: Albuquerque, NM ZIP CODE: 87109

OWNER: APS CONTACT: Rolden Pasion

ADDRESS: 915 Oak street PHONE: 505-848-8810

CITY, STATE: Albuquerque, NM ZIP CODE: 87106

ARCHITECT: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

SURVEYOR: _____ CONTACT: _____

ADDRESS: _____ PHONE: _____

CITY, STATE: _____ ZIP CODE: _____

CONTRACTOR: - CONTACT: -

ADDRESS: - PHONE: -

CITY, STATE: - ZIP CODE: -

CHECK TYPE OF SUBMITTAL:

- ☒ DRAINAGE REPORT
- ☒ DRAINAGE PLAN 1st SUBMITTAL, REQUIRES TCL OR EQUAL
- ☐ CONCEPTUAL GRADING & DRAINAGE PLAN
- ☒ GRADING PLAN
- ☐ EROSION CONTROL PLAN
- ☐ ENGINEERS CERTIFICATION (HYDROLOGY)
- ☐ CLOMR/LOMR
- ☐ TRAFFIC CIRCULATION LAYOUT (TCL)
- ☐ ENGINEERS CERTIFICATION (TCL)
- ☐ ENGINEERS CERTIFICATION (DRB, APPR. SITE PLAN)
- ☐ OTHER

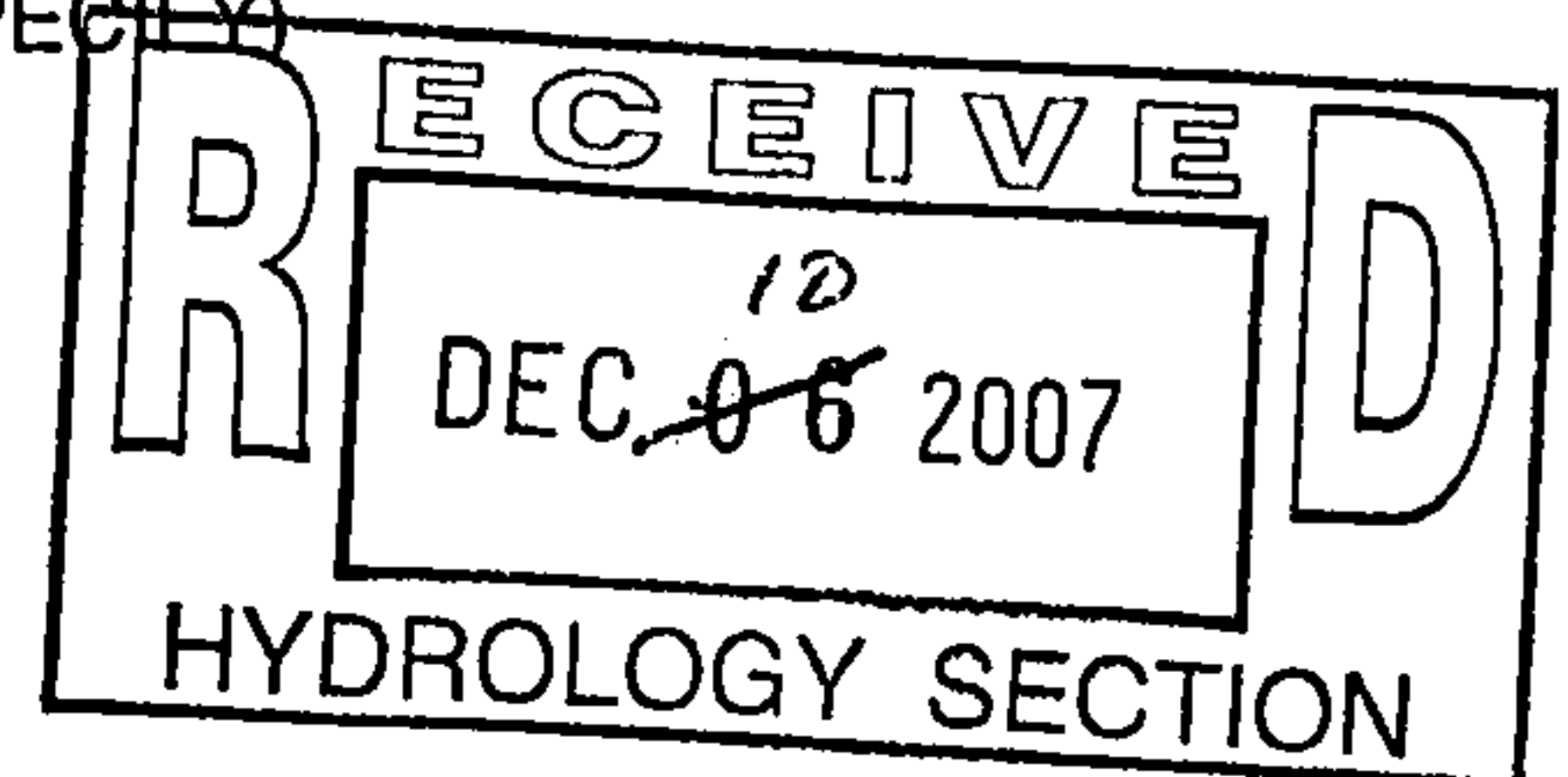
CHECK TYPE OF APPROVAL SOUGHT:

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

WAS A PRE-DESIGN CONFERENCE ATTENDED:

- ☒ YES
- ☐ NO

PAID
\$50.00



Date Submitted: 12/06/07 By: Marco A. Gamboa

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

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

Rio Grande High School

Drainage Report

Prepared by

WILSON
& COMPANY
ENGINEERS & ARCHITECTS

4900 Lang Ave. NE
Albuquerque, NM 87109

FINAL SUBMITTAL VERSION

December 6, 2007

I, Mario G. Juarez-Infante, P.E., do hereby certify that this document was prepared by me or under my direction, and is true and correct to the best of my knowledge and belief and that I am a duly registered Professional Engineer under the laws of the State of New Mexico.

Mario G. Juarez-Infante, PE, CFM
NMPE No. 15340

Date

Rio Grande High School Drainage Report

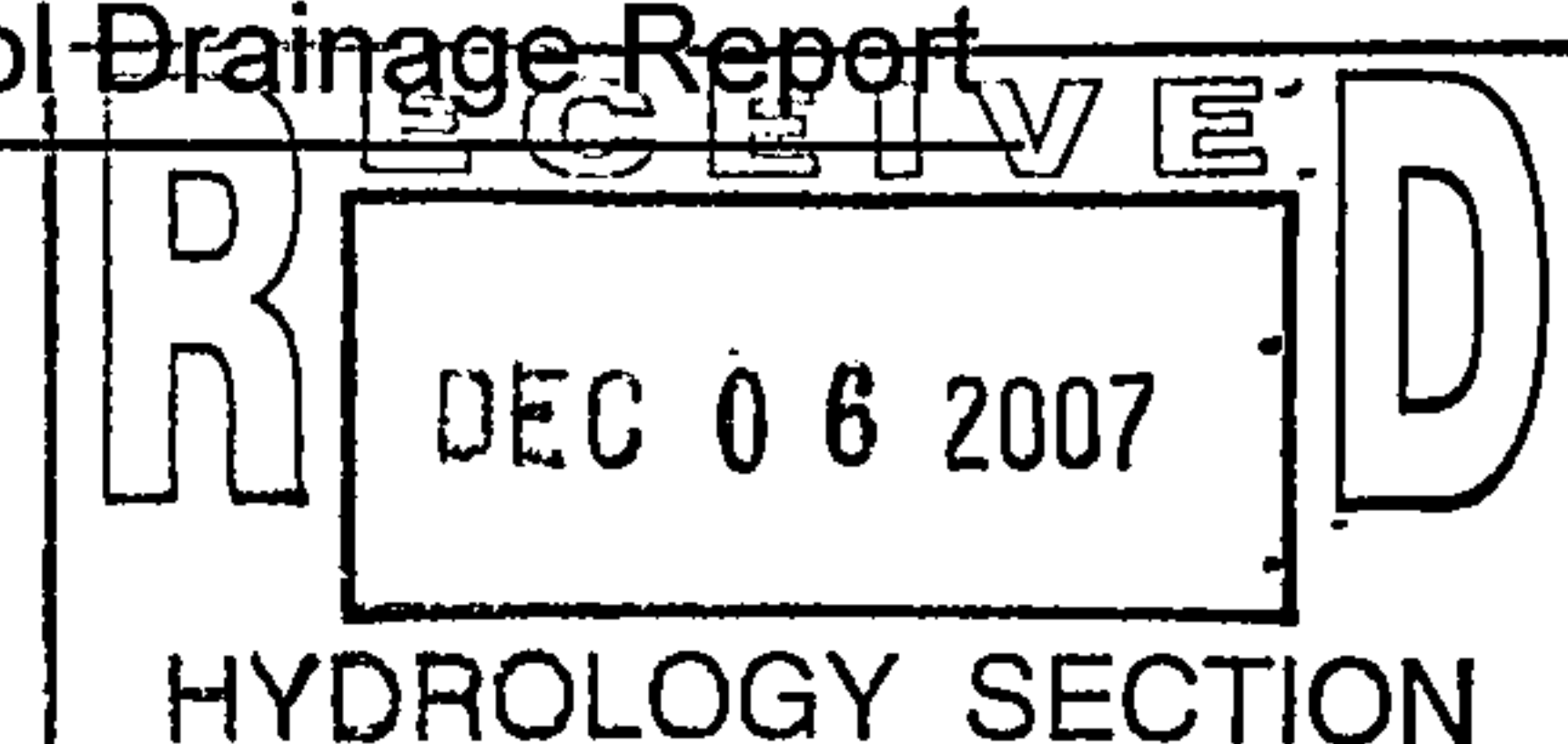


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Introduction

Rio Grande High School will be constructing improvements directly north of the recently constructed administration building. These improvements include a new courtyard, parking lot expansion and on-site drainage conveyance and sub-surface detention facility. The existing parking lot will be expanded west, adding a new access drive of Arenal Road, and increasing parking spaces. Signing for parent drop-off/pick up and bus lane drop-off/pickup will also be provided. Rio Grande High School is located at 2300 Arenal Rd. SW, Albuquerque, NM, Zone Atlas M-11-Z. The affected area is approximately 2.74 acres.

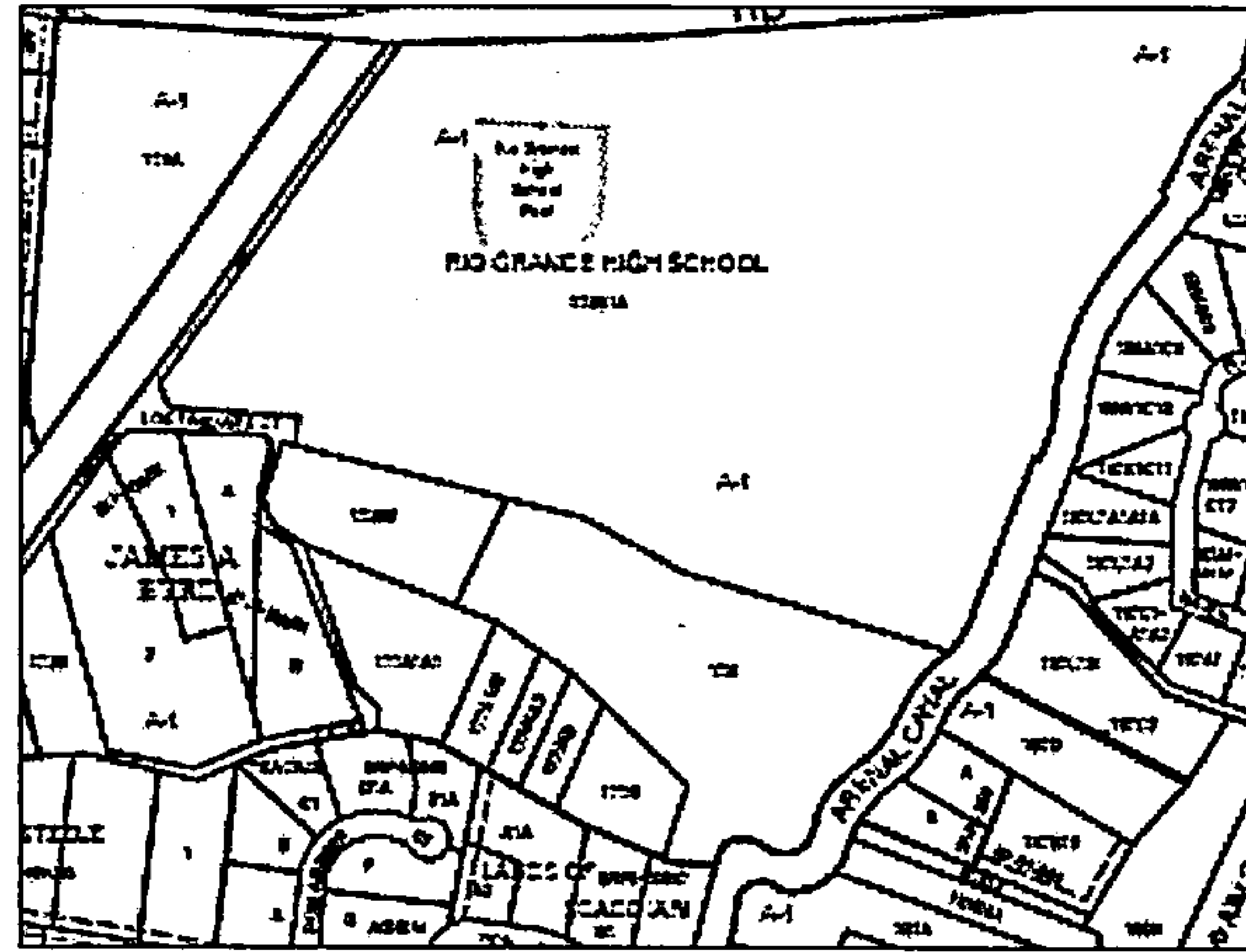


Figure 1-Rio Grande High School in Zone Atlas M-11-Z

Project Description

The purpose of this drainage report is to determine hydrology/ hydraulic analysis of post development flows and provide recommendations for mitigating peak flow and volumetric run-off in accordance with section 22.2 of the city of Albuquerque DPM. The site will self contain its volumetric flow in an underground storage system, StormTech.

Methodology

Section 22.2 of City of Albuquerque Development Process Manual (DPM) was followed to perform hydrologic analysis. All calculations are based on the 100-year 6-hour for peak discharge and the 100-year, 10-day for volumetric runoff.

Hydrology

Existing Conditions

The existing topography of the site is essentially flat with no outfall. The site currently has 2 different soil types in our area of interest, Anapra Silt Loam (An) and Armijo Clay Loam (Ar). The soil information was taken from the NRCS website. According to the DPM, the site is located in precipitation Zone 1 (West of the Rio Grande) and the site has three different land treatments (See Table 1). Based on this information the peak flow and volumetric runoffs were obtained, results are shown on Table 2.

Table 1-Rio Grande High School Basin Soil Treatment Areas

	<i>TOTAL AREA (ft²)</i>	<i>Type D ft²</i>	<i>TYPE C ft²</i>	<i>Type B ft²</i>
Basin 101	114,359	91,833	9,042	13,484

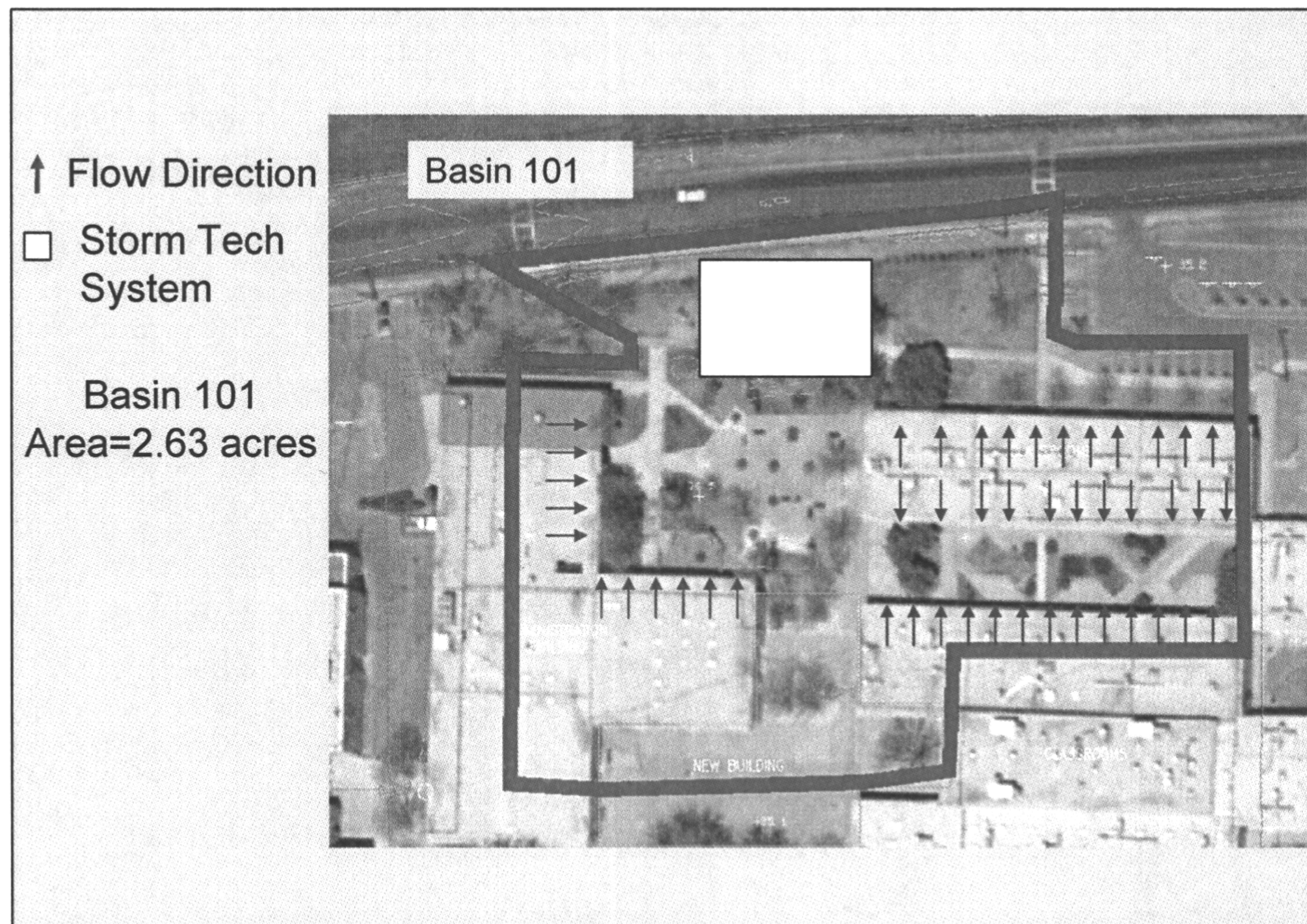


Figure 2-Rio Grande High School Basin and Flow Direction.

Table 2-Existing Hydrology

<i>Existing Basin</i>	<i>Total Area(acres)</i>	<i>Peak Discharge (ft³/s)</i>	<i>Volume(acre-ft)_{10 day}</i>
Basin 101	2.63	10.52	0.64

Table 2 represents the existing hydrology for Rio Grande High School which includes peak discharge and runoff volume for a 100-year, 10-day criterion.

Proposed Conditions

Rio Grande High School improvements will include grading and drainage for the site north of the administration building. The underground StormTech system will be installed under the proposed site parking lot.

Post development flows were determined based on the existing watershed boundaries and modified land treatments. Proposed conditions will decrease Type C and increase Type D land treatment areas, which yields increased volumetric run-off. See Table 3 for the comparison of areas. Table 4 represents the results for the proposed conditions for the site.ft²

Table 3-Comparison of Proposed and Existing Areas by Land Type

	<i>TOTAL AREA (ft²)</i>	<i>Type D ft²</i>	<i>TYPE C ft²</i>	<i>Type B ft²</i>
Existing Conditions	114,359	91,833	9,042	13,484
Proposed Conditions	114,359	104,224	5,450	4,685

Table 4-Proposed Hydrology for Rio Grande High School

Proposed Basin	Total Area(acres)	Peak Discharge (ft³/s)	Volume _{10days}(acre-ft)
Basin 201	2.63	11.13	0.66

The increase peak discharge and volumetric runoff are 5.48% and 8.57%, respectively. Proposed conditions on Basin 201 are for the new courtyard and the underground drainage system. The system will be detaining the storm water runoff for the entire Basin. The 100-year, 10-day volume was used to calculate the total volumetric runoff ($V_{10\text{day}}$). The total volumetric flow is 0.66 acre-ft. This system will use a total of 326 chambers to detain the storm water; as shown on figure 3.

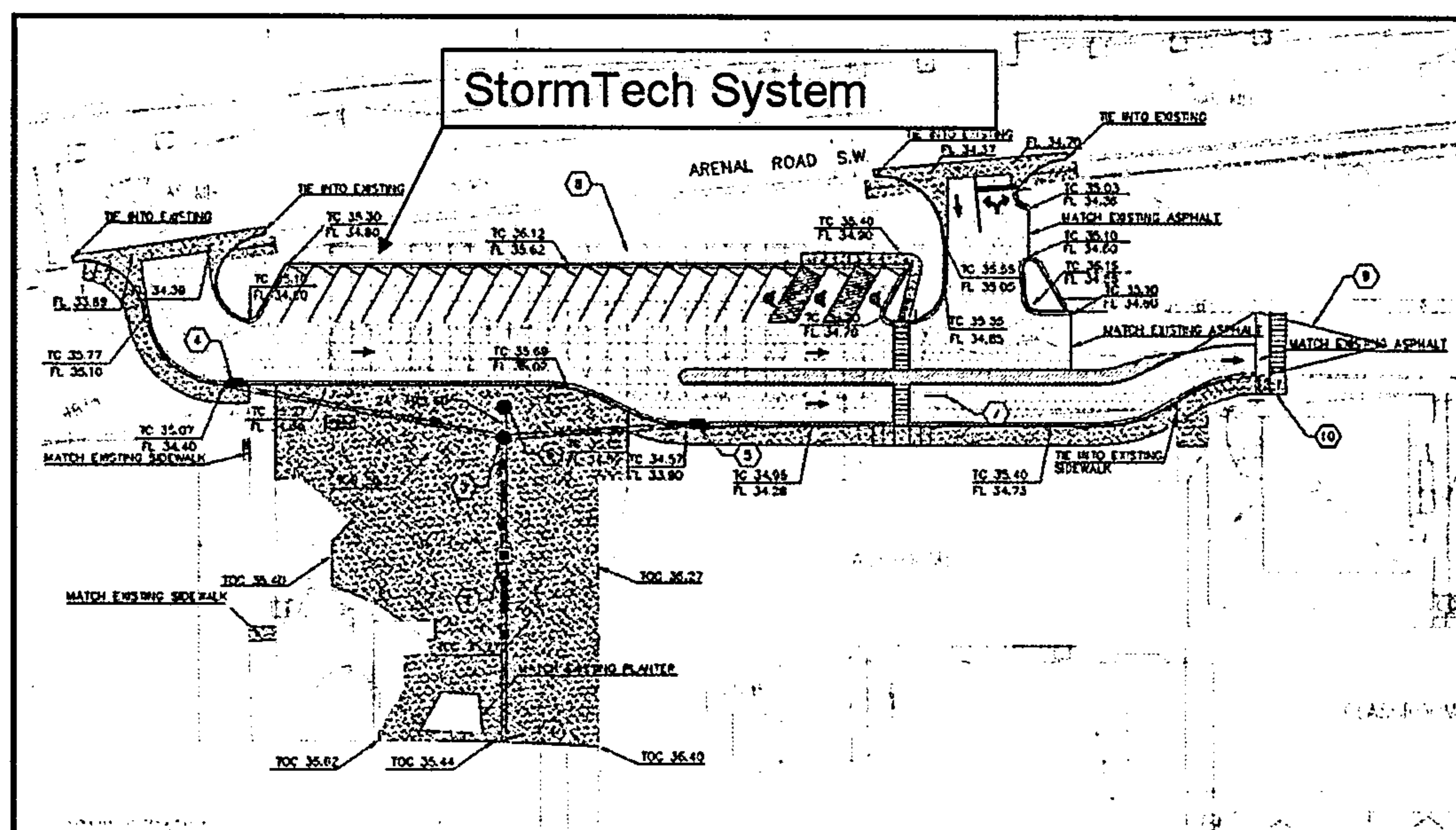


Figure 3- StormTech Chamber Distribution Layout.

Proposed Hydraulic Analysis

To determine the diameter of the pipes for the storm drain system, Manning's Equation was used. The peak discharge is 11.13 cfs for Proposed Basin 201, a roughness coefficient of 0.013 conservative for plastic pipe and a constant k coefficient of 1.46 (for USCS). Using these parameters the mainline storm drain pipe diameter was calculated to be as shown on Table 5.

Table 5-Proposed Pipe Diameter

<i>Basin</i>	<i>Diameter (in)</i>	<i>Recommended Diameter (in)</i>
201	12.8	18

The StormTech system was designed using the following equations from the “StormTech Manual Design”:

In order to calculate the number of chambers the following equation was used:

- $V_{10\text{days}} = 0.66 \text{ acre-ft} = 28,750 \text{ ft}^3$
- Chamber Storage for a foundation of 18 in = 88.4 cfs*

$$C = \left(\frac{Vs}{\text{ChamberStorage}} \right)$$

$$C = \left(\frac{28,749.7}{88.4} \right) = 326 \text{ Chambers}$$

To determine the required bed size for the StormTech System the following formula was used:

- Bed perimeter 326 ft
- Bed area per chamber = 33.8 ft²*

$$S = (C \times 33.8 \text{ ft}^2) + (1 \text{ ft} \times \text{bedperimeter})$$

$$S = (326 \times 33.8) + (1 \times 326) = 11,344.8 \text{ ft}^2$$

*For values see tables from the "StormTech Manual Design"

Conclusion

The existing hydrology peak discharge is 10.52 ft³/s for 0.64 acre-ft volumetric run-off post development peak discharge is 11.3 ft³/s while the volumetric run-off is 0.66 acre-ft. The proposed minimum diameter for the main line storm drain pipe 18 inches. The site will have one Type D Curb Inlets and two Type C Curb Inlets. The StormTech system will be installed at the entrance of the proposed parking lot having 326 chambers to detain the volumetric runoff for the 100-year 10-day event on site.



ASSUMED	
ZONE	1.00
Land treatment	C
Land treatment	D
Land treatment	B
100 yr 6 hr event	

Appendix A Hydrology and Volumetric Runoff
(Existing and Proposed)

HYDROLOGY (EXISTING CONDITIONS)

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²
Sub Basin 1	114,359.00	91,833.00	9,042.00	13,484.00
TOTAL AREA(ft ²)	114,359.00	91,833.00	9,042.00	13,484.00
TOTAL AREA(acres)	2.63	2.11	0.21	0.31

HYDROLOGY (EXISTING CONDITIONS)

	TOTAL AREA (ft ²)	IMPERVIOUS DATA ft ²	SOIL TYPE C ft ²	Soil Type B ft ²
Sub Basin 1	114,359.00	91,833.00	9,042.00	13,484.00

<i>Type C soil</i>	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	9,042.00
Area of watershed (acres)	0.21
Q _C =	0.60 ft ³ /s

<i>Type D soil</i>	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	91,833.00
Area of watershed (acres)	2.11
Q _D =	9.29 ft ³ /s

Q _T =Q _C +Q _I	10.52	ft ³ /s
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Sum of Areas	2.63	acres
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<i>Type B soil</i>	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	13,484.00
Area of watershed (acres)	0.31
Q _B =	0.63 ft ³ /s

TOTAL Q _T =	10.52	ft ³ /s
TOTAL AREA=	2.63	acres



ZONE
Land treatment B
Land treatment C
Land treatment D
100 yr 6 hr event

VOLUMETRIC RUNOFF
 EXISTING CONDITIONS

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 1	114,359.00	91,833.00	9,042.00	13,484.00	
TOTAL AREA	114,359.00	91,833.00	9,042.00	13,484.00	ft ²
TOTAL AREA	2.63	2.11	0.21	0.31	acres

VOLUMETRIC RUNOFF EXISTING CONDITIONS

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 101	114,359.00	91,833.00	9,042.00	13,484.00	0.00

$E_a =$	0.44	in
$E_b =$	0.67	in
$E_c =$	0.99	in
$E_d =$	1.97	in
Area A	0.00	ft ²
Area A	0.00	acres
Area B	13,484.00	ft ²
Area B	0.31	acres
Area C	9,042.00	ft ²
Area C	0.21	acres
Area D	91,833.00	ft ²
Area D	2.11	acres
Total Area Sum	2.63	acres

Weighted E	1.74	in
------------	------	----

$V_{360} = \text{Volume} =$	0.38	acre-ft
-----------------------------	------	---------

10 Day storm	
Zone	1.00
P_{360}	2.20 in
$P_{10 \text{ days}}$	3.67 in
A_D	2.11 acres
$V_{10 \text{ days}}$	0.64 acre-ft



ASSUMED	
ZONE	1.00
Land treatment	C
Land treatment	D
Land treatment	B
100 yr 6 hr event	

HYDROLOGY (PROPOSED CONDITIONS)

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²
Sub Basin 1	114,359.00	104,224.00	5,450.00	4,685.00
TOTAL AREA	114,359.00	104,224.00	5,450.00	4,685.00 ft ²
TOTAL AREA	2.63	2.39	0.13	0.11 acres

HYDROLOGY (PROPOSED CONDITIONS)

	TOTAL AREA (ft ²)	IMPERVIOUS DATA ft ²	SOIL TYPE C ft ²	Soil Type B ft ²
Sub Basin 1	114,359.00	104,224.00	5,450.00	4,685.00

Type C soil	
Rational Coefficient , C	0.61
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	5,450.00
Area of watershed (acres)	0.13
Q _C =	0.36 ft ³ /s

Type D soil	
Rational Coefficient , C	0.93
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	104,224.00
Area of watershed (acres)	2.39
Q _D =	10.55 ft ³ /s

Q _T =Q _C +Q _D	11.13	ft ³ /s
--	-------	--------------------

Sum of Areas	2.63	acres
--------------	------	-------

Type B soil	
Rational Coefficient , C	0.43
Peak Intensity, I (in/hr)	4.70
Peak Intensity, I (ft/sec)	0.00
Area of watershed (ft ²)	4,685.00
Area of watershed (acres)	0.11
Q _B =	0.22 ft ³ /s

TOTAL Q _T =	11.13	ft ³ /s
------------------------	-------	--------------------

TOTAL AREA=	2.63	acres
-------------	------	-------



ZONE	1.00
Land treatment	B
Land treatment	C
Land treatment	D
100 yr 6 hr event	

VOLUMETRIC RUNOFF
PROPOSED CONDITIONS

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 1	114,359.00	104,224.00	5,450.00	4,685.00	
TOTAL AREA	114,359.00	104,224.00	5,450.00	4,685.00	ft ²
TOTAL AREA	2.63	2.39	0.13	0.11	acres

VOLUMETRIC RUNOFF PROPOSED CONDITIONS

	TOTAL AREA (ft ²)	Type D ft ²	TYPE C ft ²	Type B ft ²	Type A ft ²
Sub Basin 101	114,359.00	104,224.00	5,450.00	4,685.00	0.00

$E_a =$	0.44	in
$E_b =$	0.67	in
$E_c =$	0.99	in
$E_d =$	1.97	in
Area A	0.00	ft ²
Area A	0.00	acres
Area B	4,685.00	ft ²
Area B	0.11	acres
Area C	5,450.00	ft ²
Area C	0.13	acres
Area D	104,224.00	ft ²
Area D	2.39	acres
Total Area Sum	2.63	acres

Weighted E	1.87	in
------------	------	----

$V_{360} = \text{Volume} =$	0.41	acre-ft
-----------------------------	------	---------

10 Day storm	
Zone	1.00
P_{360}	2.20 in
$P_{10 \text{ days}}$	3.67 in
A_D	2.39 acres
$V_{10 \text{ days}}$	0.70 acre-ft

