SUPPLEMENTAL INFORMATION:

Approval Letter for E21/D007
Drainage Master Plan (Stamp dated 4-27-09)

Excerpts from Eisenhower Middle School
Drainage Master Plan

* **Stamped & signed cover sheet**

* **Drainage Design Criteria**

* **Existing Conditions**

* **Proposed Conditions**

* **Conclusions**

* **AHYMO Summary Tables – Existing and Proposed Basins**

OVERALL GRADING & DRAINAGE PLAN
(Stamp dated 6-5-09)

CITY OF ALBUQUERQUE

May 11, 2009

Tyler J. Ashton, P.E.
Wilson & Company, Inc.
4900 Lang Ave. NW
Albuquerque, NM 87109

Re: Eisenhower Middle School Master Drainage Plan
Engineer's Stamp dated 4-27-09 (E21/D007)

Dear Mr. Ashton,

Based upon the information provided in your submittal received 4-28-09, the above referenced plan is approved for Drainage Master Plan with the following comment. The pond volumes on the Proposed Basin Map do not match the volumes in the report. The volumes in the report will be used and the ponds are to be graded to achieve: 1.32 ac- ft for the North Pond and 2.15 ac-ft for the South Pond. If this is incorrect, please resubmit.

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

Sincerely,

Curtis A. Cherne

Curtis A. Cherne, P.E.
Senior Engineer, Planning Dept.
Development and Building Services

C: file

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov

Eisenhower Middle School
Drainage Master Plan

APRIL 2009

I, Tyler J. Ashton, P.E., do hereby certify that this report was prepared by me or under my direction and that I am a duly registered Professional Engineer under the laws of the State of New Mexico

Tyler J. Ashton, P.E.
NMPE No. 16205

4-27-09
Date

I. LOCATION

Eisenhower Middle School is located at 11001 Camero Avenue NE in Albuquerque New Mexico and is bounded to the west by Juan Tabo Blvd, Camero Ave to the south, and residential developments to the north and east. See Figure 1 for Vicinity map. The site has an approximate area of 19 acres. This purpose of this drainage report is to study the drainage issues, existing and proposed relating to the proposed development of the site. The Eisenhower Middle School is planning to add a new gymnasium, relocate a few of the modular buildings, pave the access road along the eastern edge of the site and add a proposed for the pick-up/drop-off parking area on the south of the campus.

II. DRAINAGE DESIGN CRITERIA

The design criteria used in this report was in accordance with Section 22.2 of the City of Albuquerque Development Process Manual (DPM). The site is located in Zone 4 as designated in Figure A-1, page 22-7 of DPM. Rainfall depths using P (1 hr) = 2.23", P (6 hr) = 2.90" and P (24 hr) = 3.65" were obtained from the Table A-2, page 22-8 of DPM. AHYMO was used to determine the 100-year, 24-hour storm event to determine the peak runoff and the total volumetric storage required for the detention pond. The onsite Land Treatment values varied depending on the basin. Copies of the original AHYMO input, output and summary files may be found in Appendix A at the end of this report. Hydraflow Storm sewer 2005 was used to model the storm drain pipelines. See Appendix B for hydraulic calculations.

III. EXISTING CONDITIONS

SOILS AND FIRM

The Soil Survey of Bernalillo County Area, New Mexico designates the underlying soil as Embudo-Tijeras Complex (EtC) and Tijeras gravelly fine sandy loam (TgB). Embudo-Tijeras Complex covers 85% of the site while Tijeras gravelly fine sandy loam covers the remainder of the site mostly the northern portion of the campus. Both soils types are classified as well drained. Soil survey map is included in the end of the section. The site is located in Zone Atlas E-21-Z. Eisenhower Middle School is located in FIRM panel number 35001C0144G, dated 09, 26, 2008, zone X (areas determined to be outside the 0.2% annual chance flood with average depths of less than 1% annual chance flood, map). The FIRM and Soils maps are located in appendix C.

DRAINAGE

The existing topography slopes east to west with a wide range of slopes. Approximately half of the school property is fully develop. A small portion of the site drains directly onto Juan Tabo Blvd. right of way. The rest of the runoff generated on site primarily sheet flows into the two drainage ponds. However, there have been issues with the existing ponds not being sufficient to detain the generated flows.

Basin 101

Basin 101 is mostly pervious and includes an asphalt driveway into Juan Tabo Blvd. An existing concrete swale along this driveway conveys any additional flows from the south detention pond to Juan Tabo Blvd. All the runoff generated by this basin about 3.78 cfs sheet flows directly into Juan Tabo Blvd. right of way.

Basin 102

Basin 102 is about 5.21 acres and it is comprised of some modular buildings, the existing gym building, soccer field and the south detention ponds. Runoff from this basin sheet flows into the south detention pond. Runoff from this basin is about 16.55 cfs. The analysis point for this basin (AP2) is located at the inlet of the discharge pipe in the pond.

Basin 103

Basin 103 is about 4.16 acres and it is comprised of a large and a small swimming pool, two paved basketball courts, asphalt parking lot and the rest is bare ground and some grass covered areas. Flows generated from this basin sheets flows west into two existing grate inlet and through a 12" PVC pipe is directed to the south detention pond. The analysis point for the basin is AP3 and is located at the existing grate inlet. The flows that do not enter the 12" pipe will overflow into a concrete rundown into Juan Tabo. Runoff from this basin is about 20.67 cfs.

Basin 104

Basin 104 is about 8.64 acres and it includes the main building, unpaved access road along the eastern edge of the site, the north drainage pond, and several potable buildings. The runoff generated from this basin travels north to the drainage pond. Runoff from this basin is about 37.88 cfs. The analysis point for this basin AP4 is located at the outlet of the north pond. See Table 1 for a summary of existing basins calculation. Plate 1 in Appendix C delineates the existing basin boundaries. Establishment of the basin boundaries are based on a topographic survey and field verification. The site has a total area of ~19 acres. The existing peak discharges and volumes associated with the various basins are as follows:

Table 1- Existing Conditions for Eisenhower Middle School

Basin ID	Area (acres)	Peak Discharge 100yr-24hr (ft^3/sec)	Runoff Volume 100yr-24hr (acre-ft)
101	0.94	3.78	.141
102	6.08	16.55	.556
103	4.16	20.67	1.102
104	5.08	37.88	1.711

The north detention pond collects flows from basins 104 and through 2-24" CMP culverts convey the flows to the south detention pond. The routed flows from pond and flows from basin 102 and 103 are detained in the south pond and it is ultimately released into the Juan Tabo Blvd right of way through an 18" culvert located in the west corner of the site. The allowable discharge rate calculated for the 18" CMP pipe is 9.5 CFS was based on the estimated carrying capacity of the 18" diameter CMP storm drain culvert. Due to the limited discharge allowed by the existing outfall, this pond has insufficient volume. The existing south pond is not large enough to safely handle the generated flows which have caused overflowing into the existing adjacent residential areas on the west side of the campus. Due to the size of the discharge from the north pond it does not detain runoff long enough before it reaches the south pond which adds to the overflow problem at the south pond.

There is no existing storm drain system in the Juan Tabo Blvd. until approximately 2900' downstream of the intersection of Juan Tabo Blvd. and Camero Ave. where an existing grate inlet is located. The existing pond calculations are as follows:

Table 2- Existing Pond Data

Pond	Volume Required (ac-ft)	Volume Provided (ac-ft)	Q in (cfs)	Q out Required (cfs)	Q out Provided (cfs)
North	0.353	0.374	37.88	26.41	26.41
South	2.439	1.196	58.17	13.71	9.5

IV. PROPOSED CONDITIONS

The current drainage issues within the Eisenhower Middle School campus need to be addressed before any expansion. Drainage improvements will include a new gymnasium building, addition of a few modular buildings and paving the existing dirt access road.

Basin 201

This basin will have the same drainage condition as the existing 101 basin and the runoff generated will be same as before.

Basin 202

This basin will decrease in size from basin 102. A portion of the existing field will be removed from the basin and added to basin 104, this area is where the new gym will be constructed.

Basin 203

This basin will have the same condition as the existing 103 basin and there will be no additional runoff generated from this basin due to the expansion.

Basin 204

This basin is larger than Basin 104 due to the addition of the new gym and also includes the old and new gymnasium, cul-de-sac at the end of the access road. Underground storm drain pipes around the two gym buildings will convey flows from roof drains and perimeter of the buildings to the north pond. A curb inlet is designed at the lowest point of the cul-de-sac which ties to this underground storm drain system to convey the flows. This basin also includes addition of a few modular buildings and the access road paved. A second underground storm drain system will convey generated flows form basin 204 to the north pond. The system is comprised of two curb inlets located near the entrance to the existing building which ties to other grate inlets and crosses the access road and drains into the north pond. Plate 2 in Appendix C delineates the proposed basin boundaries. The proposed peak discharges and volumes associated with the various basins are as follows:

Table 3- Proposed Conditions for Eisenhower Middle School

Basin ID	Area (acres)	Peak Discharge 100yr-24hr (ft^3/sec)	Runoff Volume 100yr-24hr (acre-ft)
201	0.94	3.78	0.141
202	4.92	15.85	0.711
203	4.16	20.67	1.102
204	8.88	38.27	1.681

Hydraflow Storm Sewer 2005 calculations may be found in Appendix B. for Specific storm drain configuration and sizes are outlined in Plate 3, Appendix C.

LEED Certification

The new gym is applying for Silver LEED certification. To accomplish this credit is needed for SS credits 6.1 and 6.2. To qualify for these credits a stormwater management plan is needed that will decrease the volume of stormwater runoff and remove 80% of the total suspended solids from the 2 year 24 hour storm. The pond capacities on the campus have been increased by lowering the ponds while keeping the outlets at existing elevations to allow the complete storage of the 2 year storm, thus satisfying the LEED requirements. AHYMO calculations were made to determine this amount. See Appendix A for calculations. The lowering of the ponds also alleviates the existing problems that are currently occurring on site. The proposed pond calculations are as follows:

Table 2- Proposed Pond Data agrees w/ AHYMO

Pond	Volume (ac-ft)	WSEL (ft)	Q in (cfs)	Q out (cfs)
North	1.32	5748.81	38.27	9.78
South	2.15	5745.51	37.20	6.43

V. CONCLUSIONS

Eisenhower Middle School ponds have not been designed to handle the existing runoff. Due to the expansion at the school and the need for LEED certification the ponds were re-designed to safely handle the generated runoffs without changing any of the existing culverts connecting the ponds and discharge from the site has been reduced from historic flows leaving the site.

```
 AHYMO PROGRAM SUMMARY TABLE (AHYMO_97) -                    - VERSION:  1997.02c      RUN DATE (MON/DAY/YR) =03/09/2009
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                                                                                                                    PAGE =   1
                          FROM  TO                  PEAK        RUNOFF                 TIME TO    CFS
                 HYDROGRAPH   ID   ID        AREA    DISCHARGE   VOLUME      RUNOFF     PEAK     PER
COMMAND        IDENTIFICATION  NO.  NO.     (SQ MI)   (CFS)     (AC-FT)   (INCHES)   (HOURS)  ACRE     NOTATION

*S**************************************************************************
*S
*S                 24 HOUR STORM - EXISTING RUNOFF ANALYSIS FOR BASINS DRAINING
*S                 ULTIMATELY TO JUAN TABO BLVD
*S                 RAINFALL DATA FROM DPM Chapter 22 - ZONE 4
*S
*S**************************************************************************
START                                                                                                  TIME=       .00
RAINFALL  TYPE= 2                                                                                      RAIN24=   3.650
COMPUTE NM HYD       101.00   -     1       .00150      3.78      .141     1.76300    1.500    3.936 PER IMP=  16.00
COMPUTE NM HYD       102.00   -     2       .00790     16.55      .556     1.31889    1.500    3.273 PER IMP=   6.00
COMPUTE NM HYD       103.00   -     3       .00650     20.67     1.102     3.17890    1.500    4.970 PER IMP=  90.00
COMPUTE NM HYD       104.00   -     4       .01350     37.88     1.711     2.37669    1.500    4.384 PER IMP=  47.62
ROUTE RESERVOIR     POND1.1    4    10       .01350     26.41     1.711     2.37667    1.600    3.057 AC-FT=     .353
ADD HYD               43.10 10& 3  43       .02000     43.04     2.813     2.63734    1.550    3.363
ADD HYD                6.10 43& 2   6       .02790     58.17     3.369     2.26400    1.550    3.258
ROUTE RESERVOIR     POND2.1    6     7       .02790     13.71     3.353     2.25325    2.100     .768 AC-FT=    2.439
FINISH
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Calculations based on 90% impervious for Basin 103 (existing and proposed).

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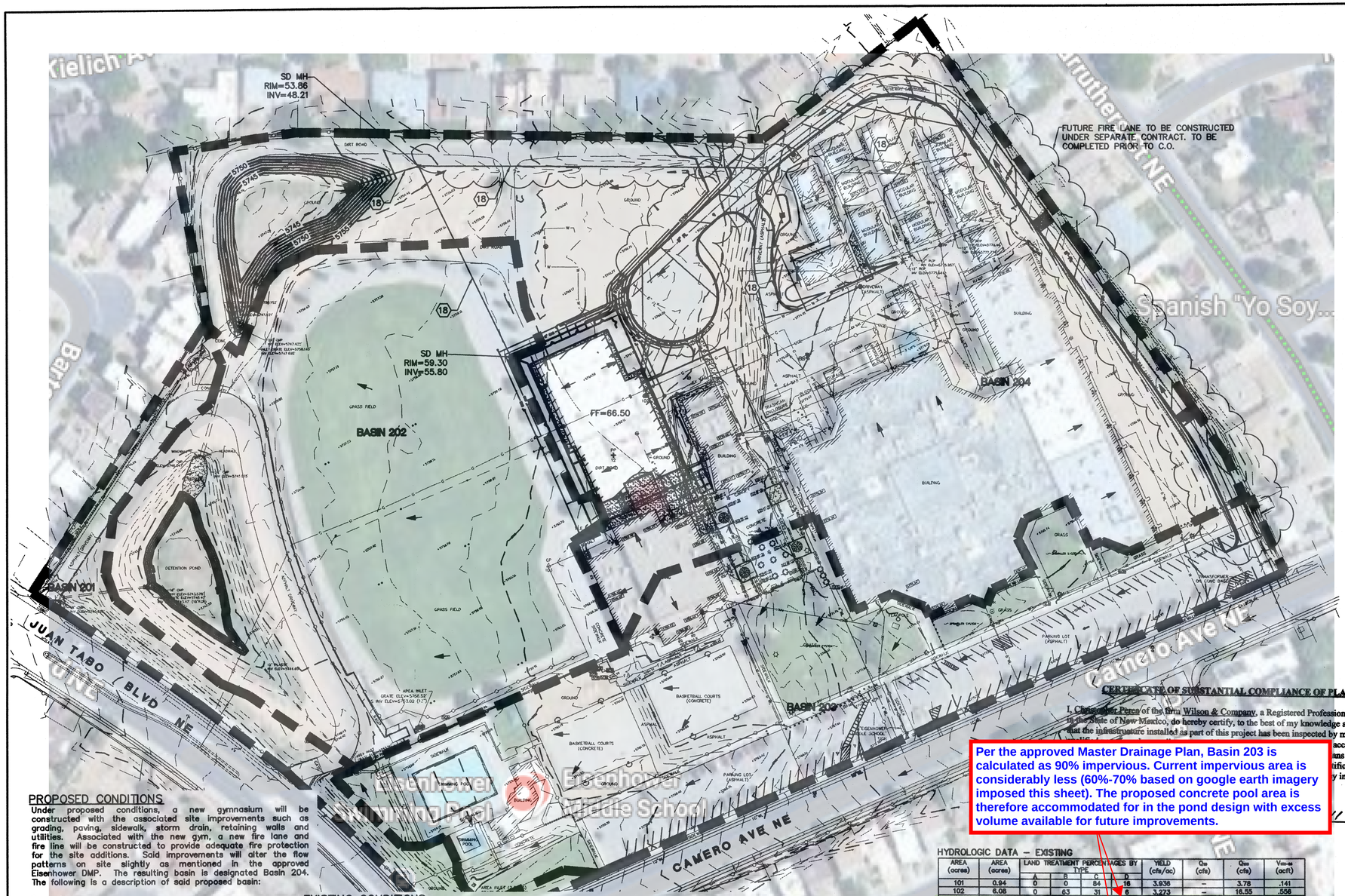
*S											
*S	24 HOUR STORM - PROPOSED RUNOFF ANALYSIS FOR BASINS DRAINING										
*S	ULTIMATELY TO JUAN TABO BLVD										
*S	RAINFALL DATA FROM DPM Chapter 22 - ZONE 4										
*S											
START										TIME=	.00
RAINFALL	TYPE= 2									RAIN24=	3.650
COMPUTE NM HYD	201.00	-	1	.00150	3.78	.141	1.76300	1.500	3.936	PER IMP=	16.00
COMPUTE NM HYD	202.00	-	2	.00760	15.85	.532	1.31178	1.500	3.259	PER IMP=	6.00
COMPUTE NM HYD	203.00	-	3	.00650	20.67	1.102	3.17890	1.500	4.970	PER IMP=	90.00
COMPUTE NM HYD	204.00	-	4	.01390	38.27	1.681	2.26763	1.500	4.301	PER IMP=	42.00
ROUTE RESERVOIR	POND1.1	4	10	.01390	9.78	1.609	2.17108	1.900	1.100	AC-FT=	.928
ADD HYD	43.10	10& 3	43	.02040	21.35	2.712	2.49219	1.500	1.635		
ADD HYD	6.10	43& 2	6	.02800	37.20	3.243	2.17178	1.500	2.076		
ROUTE RESERVOIR	POND2.1	6	7	.02800	6.43	2.335	1.56341	2.400	.359	AC-FT=	1.539
FINISH											

Calculations based on 90% impervious for Basin 103 (existing and proposed).



PROPOSED CONDITIONS

Under proposed conditions, a new gymnasium will be constructed with the associated site improvements such as grading, paving, sidewalk, storm drain, retaining walls and utilities. Associated with the new gym, a new fire lane and fire line will be constructed to provide adequate fire protection for the site additions. Said improvements will alter the flow patterns on site slightly as mentioned in the approved Eisenhower DMP. The resulting basin is designated Basin 204. The following is a description of said proposed basin:

Basin 204
This basin is larger than Basin 104 due to the addition of the new gym and also includes the old gymnasium and cul-de-sac at the end of the access road. Underground storm drain pipes around the proposed gym building will convey flows from roof drains and the building perimeter to the north pond. A series of inlets-on-grade near the eastern boundary of the site within the proposed fire lane and a single curb inlet located at the low point of the cul-de-sac are designed to capture flows within the proposed fire lane. The flows are then conveyed to the improved ponds on the west side of the site.

Also within Basin 204 is a portable classroom park with associated site improvements. Another storm drain system to be constructed around the west and south edges of the portable park will capture and convey flows to the north onsite pond. See proposed basins within the main portion of this sheet.

Improvements to this site will come in several phases. The first phase will require the reconfiguration of the existing portable park and the import of one additional portable building to be placed in an existing paved area. The second phase will include the construction of the fire lane, fire line, and the main site storm drain systems mentioned above. Phase two will also include improvements to the existing ponds (Enlarge to the volumes mentioned in the approved DMP). Finally, the third phase will include improvements directly related to the new gym. Peak discharge from the site will not exceed 9.5 cfs.

EXISTING CONDITIONS

The Soil Survey of Bernalillo County Area, New Mexico designates the underlying soil as Embudo-Tijeras Complex (EtC) and Tijeras gravelly fine sandy loam (TgB). Embudo-Tijeras Complex covers 85% of the site while Tijeras gravelly fine sandy loam covers the remainder of the site mostly the northern portion of the campus. Both soils types are classified as well drained. Soil survey map is included in the end of the section. The site is located in Zone Atlas E-21-Z. Eisenhower Middle School is located in FIRM panel number 35001C0144G, dated 09, 26, 2008, zone X (areas determined to be outside the 0.2% annual chance flood, map). The FIRM and Soils maps are located in appendix C.

Per the approved Eisenhower MS DMP (E21/D001) dated 4-27-09, Basin 104 is about 8.46 acres and it includes the main building, access road along the eastern boundary of the site, the north drainage pond, and several portable buildings. Runoff from this basin discharges into the existing drainage pond (37.88 cfs). Flows generated in Basin 104 are detained in the onsite ponds and ultimately released into the Juan Tabo Right of Way. Due to the limited capacity of the existing outfall into Juan Tabo and the inadequate volumes in the existing ponds, runoff during the design storm overtops the existing embankment. See the Existing Basin Map on the sheet.

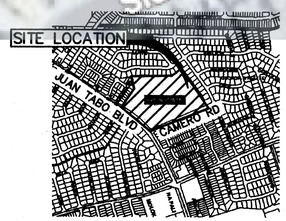
Per the approved Master Drainage Plan, Basin 203 is calculated as 90% impervious. Current impervious area is considerably less (60%-70% based on google earth imagery imposed this sheet). The proposed concrete pool area is therefore accommodated for in the pond design with excess volume available for future improvements.

HYDROLOGIC DATA - EXISTING

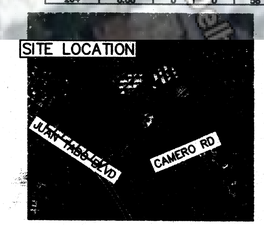
AREA (acres)	AREA (acres)	LAND TREATMENT PERCENTAGES BY TYPE A	B	C	D	YIELD (cfs/ac)	Q_{100} (cfs)	Q_{100} (cfs)	$V_{100-6hr}$ (acft)
101	0.94	0	0	84	16	3.936	–	3.78	.141
102	6.08	0	63	31	6	3.273	–	16.55	.556
103	4.16	0	5	5	90	4.970	–	20.67	1.102
104	8.08	0	0	55	50	4.384	–	37.88	1.711

HYDROLOGIC DATA - PROPOSED

AREA (acres)	AREA (acres)	LAND TREATMENT PERCENTAGES BY TYPE A	B	C	D	YIELD (cfs/ac)	Q_{100} (cfs)	Q_{100} (cfs)	$V_{100-6hr}$ (acft)
201	0.94	0	0	84	16	3.936	–	3.78	0.141
202	4.92	0	85	29	8	3.299	–	15.85	0.711
203	4.16	0	5	5	90	4.970	–	20.67	1.102
204	8.88	0	0	58	42	4.301	–	38.27	1.681



LOCATION MAP
ZONE ATLAS MAP NO. E-21



SOILS MAP
REFERENCE: SCS BERNALILLO COUNTY SOIL SURVEY

FLOOD INSURANCE MAP
REFERENCE: FLOOD INSURANCE STUDY PANEL 35001C0144G

N

A1 OVERALL GRADING & DRAINAGE PLAN
SCALE: 1" = 60'

SHEET KEY NOTES

1. INSTALL ADA ACCESS RAMP. SEE SHEET C-401 & C-402 FOR DETAILS.
2. INSTALL 4" PCC SIDEWALK. SEE DETAIL G9/C-501.
3. INSTALL 3" ASPHALT PAVEMENT. SEE DETAIL A3/C-501.
4. INSTALL 1-TYPE "D" INLET WITH PEDESTRIAN ACCESSIBLE GRATE. SEE DETAIL A5/C-501.
5. INSTALL 1-TYPE "C" INLET. SEE DETAIL A5/C-502.
6. INSTALL 4" STORM DRAIN PIPE.
7. INSTALL 12" STORM DRAIN PIPE.
8. INSTALL 18" STORM DRAIN PIPE.
9. INSTALL 24" STORM DRAIN PIPE.
10. INSTALL RETAINING WALL. SEE SHEET C-403.
11. INSTALL 4" DIA. TYPE "C" MANHOLE. SEE DETAIL E5/C-502.
12. PROPOSED GYM. SEE ARCHITECTURAL SHEETS.
13. NOT USED
14. BUILD SWALE. SEE DETAIL E1/C-501.
15. INSTALL 12" ADS INLET. SEE DETAIL F7/C-501.
16. INSTALL 90° BEND.
17. INSTALL 1-TEE CONNECTION.
18. STORM DRAIN TO BE CONSTRUCTED UNDER SEPARATE CONTRACT.
19. EXISTING FIRE LANE

RECORD DRAWING
DATE 01/06/11

LEGEND

- UTILITY, SANITARY MANHOLE
- UTILITY, STORM DRAINAGE MANHOLE
- UTILITY, WATER METER
- UTILITY, SANITARY CLEANOUT
- UTILITY, CATCH BASIN
- UTILITY, FIRE HYDRANT
- UTILITY, WATER VALVE
- UTILITY, SANITARY CLEANOUT
- UTILITY, SPRINKLER CONTROL BOX
- UTILITY, GAS VALVE
- ELECTRICAL, POWER POLE
- ELECTRICAL, LIGHT POLE
- ELECTRICAL, JUNCTION BOX
- ELECTRICAL, VALVE PIT
- TREE, DECIDUOUS EXISTING
- TREE, EVERGREEN EXISTING
- SITE, TRASH BIN
- SITE, PICNIC TABLE w/BENCH
- SITE, COLUMN (.8"x.8")
- SITE, BASKETBALL GOAL
- SITE, BOLLARD
- 5770.00 SITE, FINISHED FLOOR ELEVATION
- CP100 SITE, CONTROL POINT
- PP10 SITE, PANEL POINT
- UGE UTILITY, UNDERGROUND ELECTRIC LINE
- OHE UTILITY, OVERHEAD ELECTRIC LINE
- TV UTILITY, UNDERGROUND TV LINE
- W UTILITY, UNDERGROUND WATER LINE
- UTILITY, STORM DRAIN PIPE
- SITE, BLOCK WALL
- PROPOSED CONCRETE
- PROPOSED MEDIAN CURB & GUTTER
- 5770 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM DRAIN
- PROPOSED TYPE "C" MANHOLE
- PROPOSED TYPE "D" INLET
- 6" SAS PROPOSED SAS
- GAS PROPOSED GAS
- PROPOSED RETAINING WALL
- PROPOSED ROOF DRAINS
- PROPOSED FIRE HYDRANT
- DIRECTION OF FLOW

RECEIVED
JAN 6 2011
ENVIRONMENTAL HEALTH

WILSON & COMPANY
4900 Lang Avenue NE
Albuquerque, NM 87109
Phone: (505) 348-4000

CONSULTANTS

SEAL R. WOODROW BUTLER NEW MEXICO 17179 REGISTERED PROFESSIONAL ENGINEER

PROJECT NAME
EISENHOWER MIDDLE SCHOOL
GYMNASIUM FACILITY ADDITION
11001 CAMERO Ave. N.E.
ALBUQUERQUE, NM 87111

MARK	DATE	DESCRIPTION

PROJECT NO: 08-500-053-00
DRAWN BY: JLL
CHECKED BY: JRW

SHEET TITLE
OVERALL GRADING & DRAINAGE PLAN

C-102
SHEET __ OF __

M:\IDS\08-600-059-00\CADD\SHEETS\BUILDING PERMIT SET\G&D\8600059 OGD.dwg 6/4/2009 5:17:18 PM MDT