

CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT THE LOCATING SERVICE AT 743-1234 FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS; SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN CITY RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.

BENCH MARK:

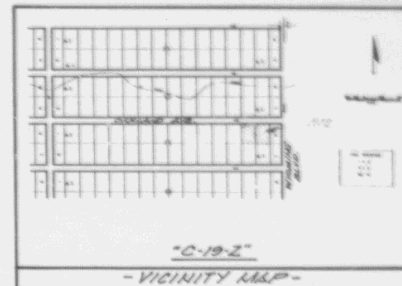
CITY OF ALBUQUERQUE BENCH MARK "5-C1", LOCATED AT THE INTERSECTION OF BARSTON ST. AND WENDOVER AVE., N.E., IN THE SOUTHWEST QUADRANT OF THE INTERSECTION; AN "S" CHISEL ON TOP OF A BRASS ASCE 1000 PROPERTY CORNER MARKER, ELEVATION = 5496.708

LEGAL DESCRIPTION:

LOTS 14 AND 15, BLOCK 3, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES SUBDIVISION.

LEGEND:

EXISTING CONTOUR --- 51
PROPOSED CONTOUR --- 51
EXISTING PIPE ELEVATION --- 52.5
PROPOSED PIPE ELEVATION --- 52.5
PIPE DOWN = R.O.



DRAINAGE CALCULATIONS

I. REFERENCES:

1. City of Albuquerque Development Program Manual (DPM) Volume 2, Division 1, Chapter 10, Section 10.1, Flood Control and Flood Protection.
2. Soil Survey of Bernalillo County and Bernalillo, Sandoval and Valencia Counties, New Mexico, U.S. Department of Agriculture, Soil Conservation Service, 1964.
3. Handbook, Sept. 1964, U.S. Federal Highway Administration, Washington, D.C.

II. GENERAL INFORMATION:

1. Soil Type (Perkins, Sheet No. 111) is a fine to medium sand, well sorted, medium to coarse, with some silt and clay.
2. Imperviousness: 10%.
3. Type of Surface: 1. Existing: 100% impervious. 2. Proposed: 100% impervious.
4. Building Footprint: 10,000 sq. ft.
5. Pavement Surface: 10,000 sq. ft.
6. Landscaping: 10,000 sq. ft.
7. Developed Surface: 10,000 sq. ft.
8. Total: 10,000 sq. ft.
9. Percent Impervious: 10%.
10. Time of Concentration: 1.5 min.
11. Rainfall: 1.5 in. (1.5 in. x 1.5 min. = 2.25 in. min.)
12. Time of Concentration: 1.5 min.
13. Rainfall: 1.5 in. (1.5 in. x 1.5 min. = 2.25 in. min.)
14. Time of Concentration: 1.5 min.
15. Rainfall: 1.5 in. (1.5 in. x 1.5 min. = 2.25 in. min.)

III. PEAK DISCHARGE:

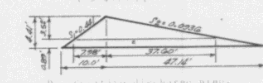
1. Existing: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
2. Developed: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)

IV. PEAK VOLUME:

1. Existing: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
2. Developed: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)

V. POND CALCULATIONS:

1. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
2. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
3. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)



1. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
2. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
3. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
4. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
5. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
6. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
7. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
8. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
9. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)
10. Detention: 10,000 sq. ft. (10,000 sq. ft. x 1.5 min. = 15,000 sq. ft. min.)



GRADING & DRAINAGE PLAN
FOR
BETHANNA ASSEMBLY OF GOD CHURCH
NORTH ALBUQUERQUE ACRES ADDITION
BERNALILLO COUNTY, NEW MEXICO
MARCH, 1985

CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY ESCAVATION, CONTRACTOR MUST CONTACT THE LOCATING SERVICE AT 724-1234 FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN CITY RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.

BENCH MARK:

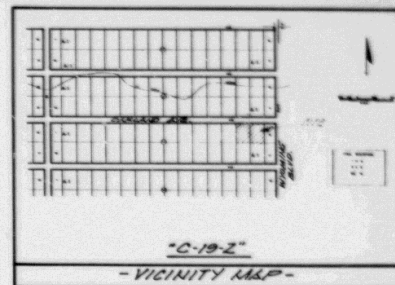
CITY OF ALBUQUERQUE BENCH MARK "5-11", LOCATED AT THE INTERSECTION OF BARSTON ST. AND WILSHIRE AV., S.E. IN THE SOUTHWEST QUADRANT OF THE INTERSECTION: AS "A" CHISELED ON TOP OF A WHITE ANGLE IRON PROPERTY CORNER MARKER, ELEVATION = 5546.708

LEGAL DESCRIPTION:

LOTS 14 AND 15, BLOCK 3, TRACT 2, UNIT 3, NORTH ALBUQUERQUE ACRES SURVIVORS.

LEGEND:

EXISTING CONTOUR --- 51 ---
 PROPOSED CONTOUR --- 51 ---
 EXISTING PAV. ELEVATION --- 52 ---
 PROPOSED PAV. ELEVATION --- 52 ---
 ROAD DOWN --- R.D. ---



DRAINAGE CALCULATIONS

I. REFERENCES:

1. City of Albuquerque Development Process Manual (DPM) Volume 2: Design Criteria, Chapter 52: Drainage, Flood Control and Erosion Control.
2. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, United States Department of Agriculture, Soil Conservation Service.
3. Floodway Map, Panel 39 of 50, Federal Emergency Management Agency.

II. GENERAL INFORMATION:

1. Soil Type (Detail, Sheet No. 11) Soil Type is: CECOMB-1: Ligeres Complex, Hydrologic Soil Group "B".
2. Imperviousness:

Type of Surface	Existing Area Sq. Ft. Acres	Proposed Area Sq. Ft. Acres
Building Foot	10,100 0.23	10,100 0.23
Concrete Surfaces	-	750 0.006
Asphalt Surfaces	-	10,000 0.23
Landscaping	-	500 0.005
Undeveloped Surface	77,200 1.773	3,400 0.078
Site Total	77,200 1.773	17,250 0.393
Percent Impervious	85	92

1. "C" Factor (See Ref. 1, Page 22.1-1)
 1. Undeveloped "C" Factor = 0.35
 2. Developed "C" Factor = 0.50
2. Rainfall, 100-year, 6-hour, R_6 (See Ref. 1, Page 22.2-1) $R_6 = 2.1$ inches.
3. Time of Concentration, T_c (See Ref. 1, Page 22.3-1) Assume longest possible path from S.E. corner to S.W. corner: $L = 164$ ft.; T_c Delta (See Ref. 1, Page 22.3-1) $T_c = 0.0000164^{0.77} = 0.0000164^{0.77} = 1.75$ minutes.
4. Rainfall intensity, I (See Ref. 1, Page 22.4-1) $I = R_6 \times 1.48 \times 1.48 = 2.33 \times 0.0000164^{0.77} = 4.97$ in/hr.

III. PEAK DISCHARGE:

1. Existing Conditions (See Rational Equation)

$$Q_{100} = 0.35 \times 4.97 \times 1.773 = 3.00 \text{ cfs}$$

$$Q_{10} = 0.607 \times 4.97 = 3.01 \text{ cfs}$$
2. Developed Conditions

$$Q_{100} = 0.35 \times 4.97 \times 1.773 = 3.00 \text{ cfs}$$

$$Q_{10} = 0.607 \times 4.97 = 3.01 \text{ cfs}$$

IV. PEAK VOLUME:

1. Existing Conditions:

$$V_{100} = 0.35 \times 4.97 \times 1.77200 = 3140 \text{ cfs}$$

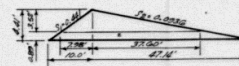
$$V_{10} = 0.607 \times 4.97 \times 1.772 = 5377 \text{ cfs}$$
2. Developed Conditions:

$$V_{100} = 0.35 \times 4.97 \times 1.77200 = 3140 \text{ cfs}$$

$$V_{10} = 0.607 \times 4.97 \times 1.772 = 5377 \text{ cfs}$$

V. POND CALCULATIONS:

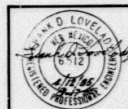
1. Duration, $T = 20.600 = 267591 / (60 \times 4.97) = 57.14 \text{ min.}$
2. Allowable discharge rate: use maximum recommended by the City of Albuquerque of 0.5 cfs per acre, or 0.89 cfs.
3. Required Pond Volume $V = 60(1.32)(7.00)(0.310) = 310.5$
 $V = 4913 \text{ cfs}$



1. Positive discharge pipe:
 For Weir Equation, $Q = C L H^{3/2}$
 solve for $H = \frac{Q}{C L (0.64)^{3/2}} = \frac{4.97}{0.607 \times 1.772 \times 0.67} = 0.89 \text{ ft.}$
 therefore, the difference between spillway and spring line of pipe should not be greater than 0.89 feet.
 therefore, the Weir Equation $Q = C L H^{3/2}$
 $Q = 4.97 \times 1.772 \times 0.67 = 5.84$
 $H = (0.64)^{3/2} = 0.41 / (1.3 \times 0.67) = 0.44$
 therefore, the depth of water over the spillway for Q_{100} is approximately 0.5 feet.

RECEIVED
 OCT 11 1985
 HYDROLOGY SECTION

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 HYDROLOGY SECTION



GRADING & DRAINAGE PLAN
 FOR
 BETANIAS ASSEMBLY OF GOD CHURCH
 NORTH ALBUQUERQUE ACRES ADDITION
 BERNALILLO COUNTY, NEW MEXICO
 MARCH, 1985

CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT THE LOCATING SERVICE AT 765-1236 FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, RULES, AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN CITY RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.

BENCH MARK:

CITY OF ALBUQUERQUE BENCH MARK "5-C19", LOCATED AT THE INTERSECTION OF BARTON ST. AND WILANIRE AV., N.E. IN THE SOUTHWEST QUADRANT OF THE INTERSECTION; AN "X" CHISELED ON TOP OF A WHITE ANGLE IRON PROPERTY CORNER MARKER, ELEVATION = 5486.708

LEGAL DESCRIPTION:

LOTS 14 AND 15, BLOCK 3, TRACT 2, UNIT 1, NORTH ALBUQUERQUE ACRES SUBDIVISION.

LEGEND:

EXISTING CONTOUR
PROPOSED CONTOUR
EXISTING DRAIN ELEVATION
PROPOSED DRAIN ELEVATION
ROAD DRAIN
= R.D.

DRAINAGE CALCULATIONS

I. REFERENCES:

1. City of Albuquerque Development Process Manual (DPM) Volume 2, Design Criteria, Chapter 22, Drainage, Flood Control and Erosion Control.
2. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, United States Department of Agriculture, Soil Conservation Service.
3. Floodway Map, Panel 10 of 30, Federal Emergency Management Agency.

II. GENERAL INFORMATION:

1. Soil Type (Ref. A, Sheet No. 11) Soil type is EC (Bahado Tijeras Complex, Hydrologic Soil Group "B").
2. Imperviousness:

Type of Surface	Existing Area Sq. Ft. Acres	Proposed Area Sq. Ft. Acres
Building Foot	-	10,100 0.232
Concrete Surfaces	-	230 0.006
Asphalt Surfaces	-	16,000 0.367
Landscaping	-	430 0.010
Undeveloped surface	77,220 1.773	50,420 1.158
Site total	77,220 1.773	77,220 1.773
Percent impervious	0%	34%

1. "C" Factor (See Ref. A, Plate 22.2 C-1)

1. Undeveloped "C" Factor = 0.34

2. Developed "C" Factor = 0.50

1. Rainfall, 100-year, 6-hour, R_6 (See Ref. A, Plate 22.2 D-1) $R_6 = 2.35$ inches.

E. Time of Concentration, T_c : Use Kirpich Equation. Assume longest possible path from S.F. corner to N.W. corner: $L = 564$ ft.; Delta Elev. = 20 ft.; $S = 0.0355$
 $T_c = 0.0078(564)^{0.77} / (0.0355)^{0.385} = 3.70$ min.
 Use 10 minutes.

1. Rainfall Intensity, I : (See Ref. A, Plate 22.2 D-2)

$I = R_6 \times 0.84 \times 0.751 = 2.35 \times 0.84 \times (10)^{-0.751}$
 $I = 4.97$ in./hr

III. PEAK DISCHARGE:

1. Existing Conditions: (Use Rational Equation)

$Q_{100} = 0.34 \times 4.97 \times 1.773 = 3.00$ cfs

$Q_{10} = 0.657 \times 3.00 = 1.97$ cfs

2. Developed Conditions:

$Q_{100} = 0.5 \times 4.97 \times 1.773 = 4.41$ cfs

$Q_{10} = 0.657 \times 4.41 = 2.90$ cfs

IV. PEAK VOLUME:

1. Existing Conditions:

$V_{100} = 0.34(2.35)(2777200) = 5140$ cf

$V_{10} = 0.657 \times 5140 = 3377$ cf

2. Developed Conditions:

$V_{100} = (0.5/0.34)5140 = 7559$ cf

$V_{10} = (0.5/0.34)3370 = 4956$ cf

V. POND CALCULATIONS:

1. Duration, $T = 25/600 = 2(7559)/(60 \times 4.41) = 57.14$ min.

2. Allowable discharge rate; use maximum recommended by the City of Albuquerque of 0.5 cf per acre, or: 0.89 cfs.

3. Required Pond volume: $V = 60(3.52(37,604 \times 98)30.5$

$V = 4813$ cf



4. Positive discharge pipe.

Use Orifice Equation, $Q = C_d(2gH)^{1/2}$
 Solve for H : $H = (Q/C_d)^2 / 2g$ $A = 0.1963$ sq. ft. $C_d = 0.6$
 $H = (0.89/0.6)^2 / (2 \times 32.2) = 0.89$ ft.
 Therefore, the difference between spillway and spring-line of pipe should not be greater than 0.89 feet.

5. Spillway: Use Weir Equation: $Q = C_L H^{3/2}$

$C = 3.3$ ft. $L = 4$ ft. Solve for H .

$H = (Q/C_L)^{2/3} = 4.41/(3.3 \times 4) = 0.667$ ft.

Therefore, the depth of water over the spillway for Q_{100} is approximately 0.5 feet.



GRADING & DRAINAGE PLAN
 FOR
 BETANHA ASSEMBLY OF GOD CHURCH
 NORTH ALBUQUERQUE ACRES ADDITION
 BERNALILLO COUNTY, NEW MEXICO
 MARCH, 1985

BP-85-501

Reading
File



BOARD OF COUNTY COMMISSIONERS
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DISTRICT 2
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ALEX ABEYTA, JR., COUNTY MANAGER

County of Bernalillo

State of New Mexico
620 LOMAS, N.W.
ALBUQUERQUE, NEW MEXICO 87102

BOB STOVER, SHERIFF
JAMES B. LEWIS, TREASURER
DOLORES C. WALLER, COUNTY CLERK
JACK H. DARLING, ASSESSOR
ROBERT H. SCOTT,
PROBATE JUDGE

October 14, 1985

Mr. George Rodriguez
12800 San Juan NE
Albuquerque, NM 87123

REF: REVISED DRAINAGE PLAN FOR BETANIA ASSEMBLY OF GOD CHURCH (C19-D2)
BP85-501 ENGINEER'S STAMP DATED 8/17/85

Dear George:

Based on the information provided on your October 11, 1985 resubmittal, revisions as indicated are acceptable.

Please be advised that the filed copy of the replat will be required when submittal of certification is presented for review.

If you should have any questions, please feel free to call me at 766-7644.

Sincerely,

A handwritten signature in cursive script that reads "Carlos A. Montoya".

Carlos A. Montoya, PE
City/County Flood Plain Admin.

CAM:BJM:mrk

cc: Frank Lovelady, 7408 Morrow NE 87123