

VICINITY MAP C-18 FIRM PANEL 0137D

GRADING/DRAINAGE PLAN

THE PURPOSE OF THIS GRADING/DRAINAGE PLAN IS TO OBTAIN A BUILDING PERMIT AND SO 19 APPROVALS FOR LOT 2, BLOCK 30, TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES, CITY OF ALBUQUERQUE, BERNALILLO COUNTY.

EXISTING CONDITIONS

AS SHOWN BY THE VICINITY MAP, THE SITE IS LOCATED ON THE SOUTH SIDE OF SIGNAL AVENUE N.E. AND IS THE SECOND LOT EAST OF SAN PEDRO DRIVE N.E. THE SITE IS CURRENTLY ZONED SU-2 IP AND IS THEREFORE NOT SUBJECT TO SITE PLAN CONTROL. AT PRESENT, THE RUN-OFF GENERATED BY THIS SITE DRAINS FROM EAST TO WEST VIA SURFACE FLOW. THE SITE IS CURRENTLY UNDEVELOPED.

DEVELOPED CONDITIONS

AS SHOWN BY THE GRADING/DRAINAGE PLAN, THE PROJECT WILL CONSIST OF AN OFFICE/WAREHOUSE TYPE BUILDING ALONG WITH ASSOCIATED PAVED PARKING AND LANDSCAPED AREAS. THERE EXISTS NO PREVIOUSLY APPROVED DRAINAGE PLAN FOR THIS SITE. HOWEVER, REVIEW OF THE ADJACENT SITE TO THE EAST (GRADING/DRAINAGE PLAN FOR EARTHGRAIN BAKERY PARKING LOT) INDICATES THE ALLOWABLE DESIGN CRITERIA FOR THIS AREA AS SET FORTH IN THE DRAINAGE REPORT FOR SIGNAL HILLS SUBDIVISION (BY AVID ENGINEERING DATED 9/27/1996) OF 1.41 CFS/ACRE. FURTHERMORE, THE DISCHARGE RATE FOR SIGNAL AVENUE FRONTAGE SHOULD BE CALCULATED AND THEN SUBTRACTED FROM THE 1.41 CFS/ACRE IN ORDER TO DETERMINE THE NET ALLOWABLE DISCHARGE RATE FOR THIS SITE. THIS SITE WILL BE GRADED SO AS TO POND THE REQUIRED VOLUME AFTER THE ALLOWABLE RELEASE FLOWRATE HAS BEEN ACCOUNTED FOR. THE CALCULATIONS CONTAINED HEREIN, ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6-HOUR RAINFALL EVENT. THE PROCEDURE FOR 40-ACRES AND SMALLER BASINS, AS SET FORTH IN THE REVISION OF SECTION 22.2, HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA DATED 1997, HAS BEEN USED TO QUANTIFY THE PEAK RATE OF DISCHARGE AND VOLUME GENERATED. ALSO CONTAINED HEREON ARE CALCULATIONS FOR THE HYDROGRAPH PER SECTION A-A. HYDROGRAPH FOR SMALL WATERSHEDS, AS DEMONSTRATED BY THESE CALCULATIONS AS WELL AS THOSE FOR INLET, GRATE AND DISCHARGE CAPACITY. THE INCREASE IN RUN-OFF GENERATED BY THE PROPOSED IMPROVEMENTS WILL BE HANDLED THROUGH THE USE OF AN ADEQUATELY SIZED PONDING AREA WITHIN THE PAVED PARKING AREA TO THE NORTH. IN ADDITION, THE FLOWS EXITING THE SITE WILL BE REGULATED THROUGH THE USE OF A 4" ORIFICE PLATE THAT RESULTS IN FLOWS WELL BELOW THE ALLOWABLE DISCHARGE RATE.

CONCLUSION

THIS PROPOSED GRADING/DRAINAGE PLAN IS CONSISTENT WITH OTHERS IN THE AREA AND HAS FOLLOWED REQUIREMENTS SET FORTH BY THE HYDROLOGY DEPARTMENT.

ALLOWABLE DISCHARGE

1.41 CFS/ACRE - ROAD FRONTAGE RUN-OFF

1.41 CFS/ACRE - 0.40 CFS X 0.88521 ACRES = 0.8941 CFS

DETENTION PONDING CALCULATIONS

A. INLET CONDITION (MAX W.S.L. = 5235.0)

$Q = CA (2gh)^{1/2}$

$C = 0.60$ $g = 32.2$ $h = 2.8'$ $A = 2.28$ (half clogged)

$Q = (.60)(2.28)(2 \times 32.2 \times 2.8)^{1/2}$

$Q = 15.71$ CFS >> $Q_{100} = 3.74$ CFS

B. ENTRANCE CONDITION (4" ORIFICE)

$Q = CA (2gh)^{1/2}$

$C = 0.60$ $g = 32.2$ $h = 2.75'$ $A = 0.09$ sf

$Q = (.60)(0.09)(2 \times 32.2 \times 2.75)^{1/2}$

$Q = 0.72$ CFS = $Q_{RELEASE} << Q_{ALLOWABLE}$ 0.8941 CFS

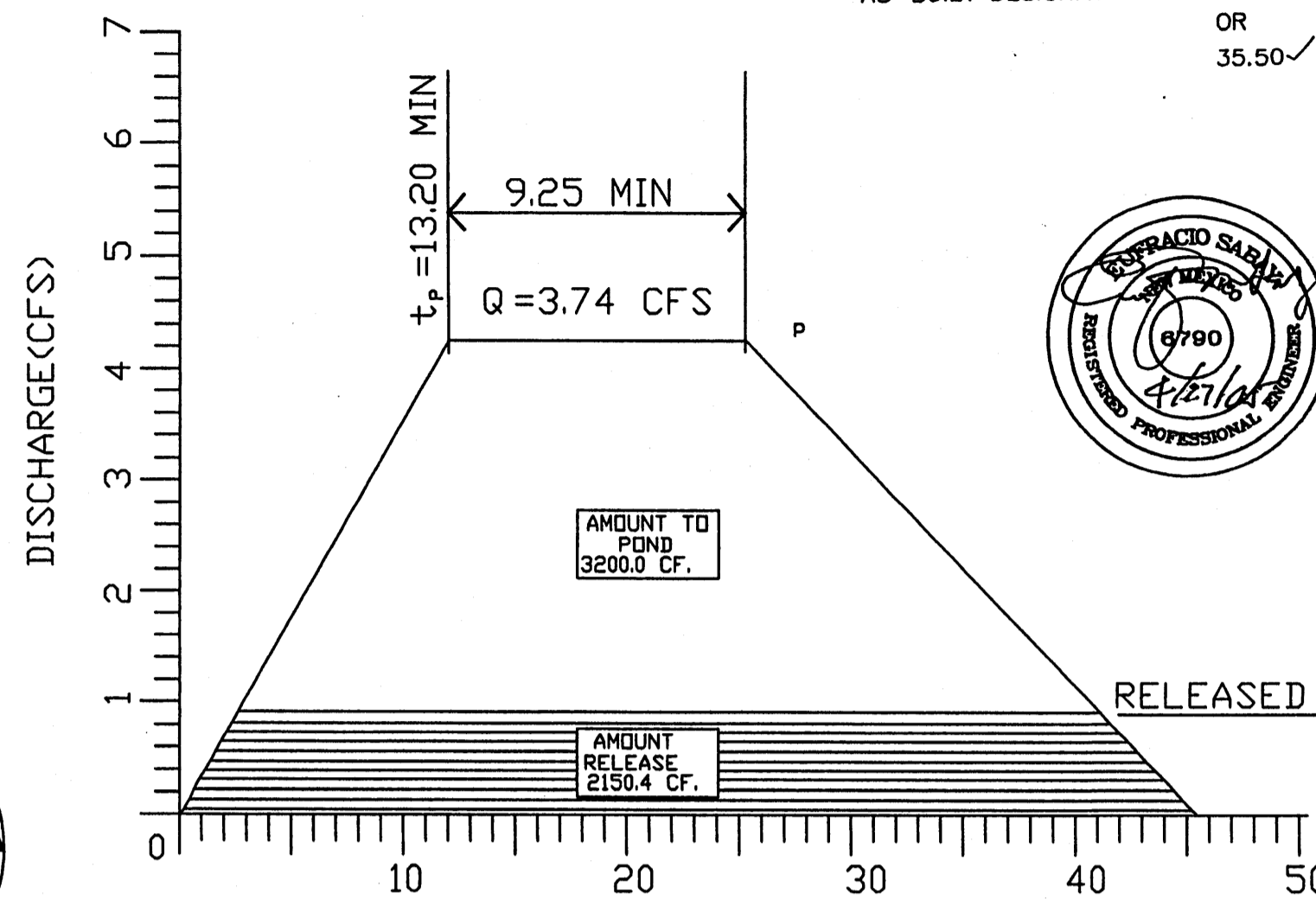
C. POND VOLUME = 3285.0 CF

ENGINEER CERTIFICATION

I, EFRACIO SEBAY, NMPE # 6790, HEREBY CERTIFY THAT THE PROJECT HAS BEEN GRADED AND WILL DRAIN IN ACCORDANCE WITH THE DESIGN INTENT OF THE APPROVED PLAN DATED 08/22/04. THE RECORD INFORMATION EDITED ONTO THE ORIGINAL DESIGN DOCUMENT HAS BEEN OBTAINED BY ME OR UNDER MY DIRECT SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. THIS CERTIFICATION IS SUBMITTED IN SUPPORT OF A REQUEST FOR RELEASE OF CERTIFICATE OCCUPANCY.

NOTE: 1. AN ADDITIONAL 20'X100' OF ASPHALT WAS ADDED TO THE SOUTH OF THE REAR CANOPY AS SHOWN ON THE AS-BUILT. THE DESIGN INTENT STILL REMAINS THE SAME.

AS-BUILT DESIGNATION 35.65
OR 35.50-
35.50



POND CALCULATION

CONTOUR	AREA SQ.FT.	DEPTH FT.	VOLUME CU.FT.
5235	5,696		
5234	1,648	1.00	3,672
5233.75	12	0.25	207.5
TOTAL			3,879.5
POND VOLUME REQUIRED			3,200

0.25 STEEL PLATE PERMANENTLY AFFIX TO THE SIDES OF THE CATCH BASIN
0.25 STEEL PLATE WITH 4" OPENING TO ALLOW FLOW

TYPE "D" (SINGLE) CATCHBASIN
COMPACTED EARTH
12" RCP (2% MIN SLOPE)

SECTION A-A

HYDROGRAPH CALCULATIONS

GIVEN

$Q_p = 3.74$ CFS $E = 1.93$ IN

$A_p = 0.546$ AC $t_c = 0.2$ HRS

$A_t = 0.88521$ AC

TIME TO PEAK

$t_p = (0.7)(0.2) + 1.6 - A_p / A_t > 12$

$t_p = (0.7)(0.2) + 1.6 - 0.546 / 0.88521 > 12$

$t_p = (0.22)(60)$

$t_p = 13.20$ MIN

CONTINUE THE PEAK CALCULATION

$0.25 \times A_p / A_t$

$0.25 \times 0.546 / 0.88521$

$0.154(60)$

9.25 MIN

DURATION OF PEAK

$2.107 \times 1.93 \times 0.88521 / 3.74 - 0.25 \times (0.546 / 0.88521)$

$2.107 \times 1.93 \times 0.88521 / 3.74 - 0.154$

48.54 MIN

SYMBOL LEGEND

EXISTING CONTOUR
PROPOSED CONTOUR
PROPOSED SPOT ELEVATION
EXISTING ELEVATION
FLOW DIRECTION

ABBREVIATION LEGEND

TA = TOP OF ASPHALT
TC = TOP OF CURB
FL = FLOWLINE
TRW = TOP OF RETAINING WALL
TCP = TOP OF CONCRETE PAD

EROSION CONTROL MEASURES

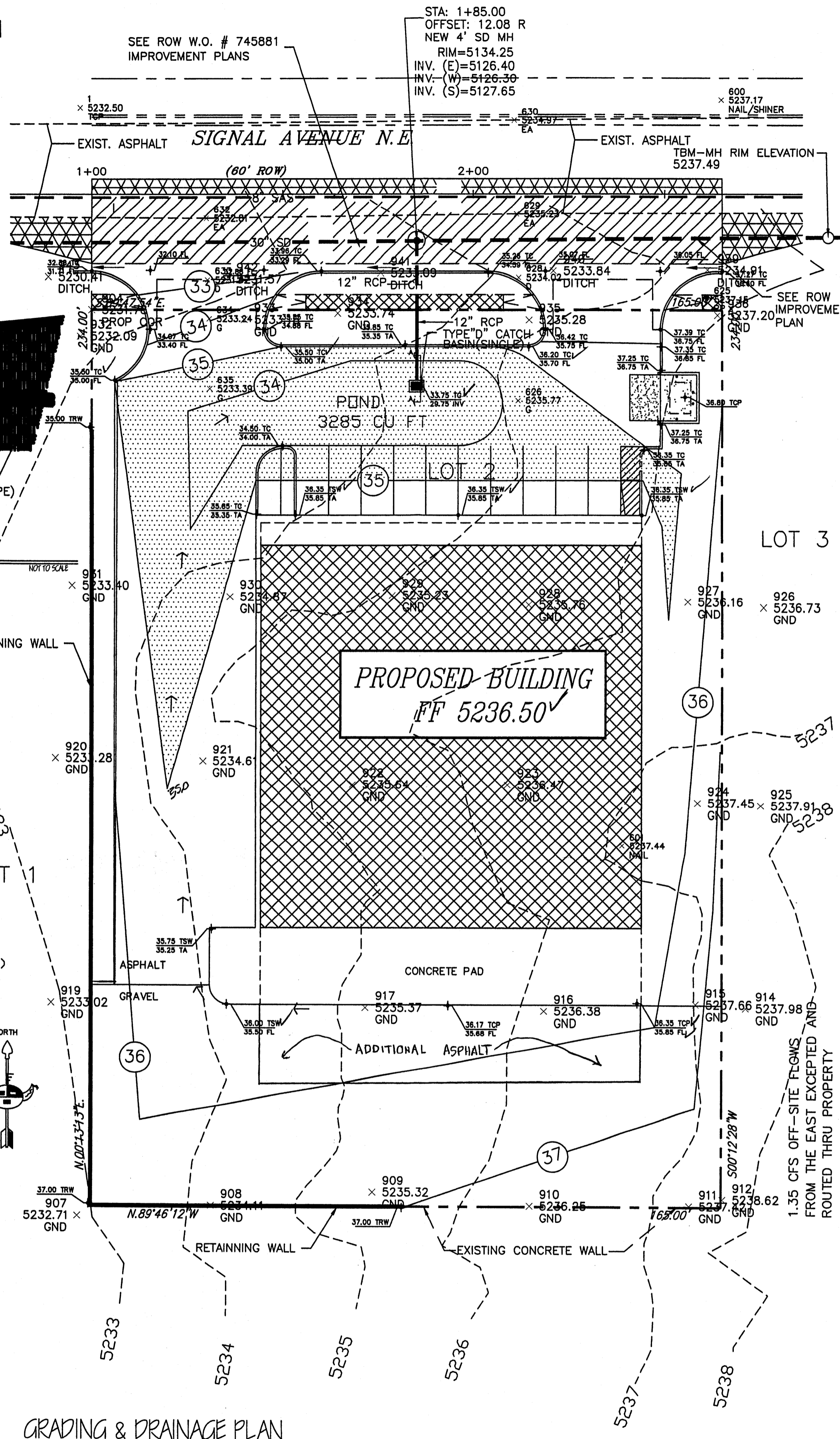
1. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR MANAGEMENT OF STORM RUN-OFF DURING CONSTRUCTION, HE SHALL ASSURE THAT THE FOLLOWING MEASURES ARE TAKEN:

A. ADJACENT PROPERTY SHALL BE PROTECTED AT ALL TIMES BY TEMPORARY BERMS, DIKES, SWALES, AND OTHER TEMPORARY GRADING AS REQUIRED TO PREVENT STORM RUN-OFF FROM LEAVING THE SITE AND ENTERING ADJACENT PROPERTIES.

B. ADJACENT PUBLIC RIGHT-OF-WAY SHALL BE PROTECTED AT ALL TIMES FROM STORM WATER RUN-OFF FROM THE SITE. NO SEDIMENT BEARING WATER SHALL BE PERMITTED TO ENTER THE PUBLIC STREETS.

2. THE CONTRACTOR SHALL IMMEDIATELY AND THOROUGHLY REMOVE ANY OR ALL SEDIMENT WITHIN THE PUBLIC STREETS THAT HAVE BEEN ERODED FROM THE SITE AND DEPOSITED THEREON.

GRADING & DRAINAGE PLAN



PROPOSED-BUILDING
FF 5236.50

LEGAL DESCRIPTION

LOT NUMBERED TWO (2) IN BLOCK NUMBERED THIRTY (30) OF TRACT A, UNIT B, NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, ALBUQUERQUE, NEW MEXICO.

BENCHMARK

AN ACS ALUMINUM CAP STAMPED "9-C18" LOCATED

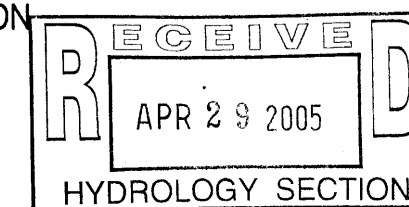
IN THE S.W. QUADRANT OF THE INTERSECTION OF WILSHIRE AVE.

AND SAN PEDRO N.E. ELEVATION 5229.79

T.B.M.

MANHOLE RIM IN THE STREET SHOWN HEREON

BEARS ELEVATION 5237.49



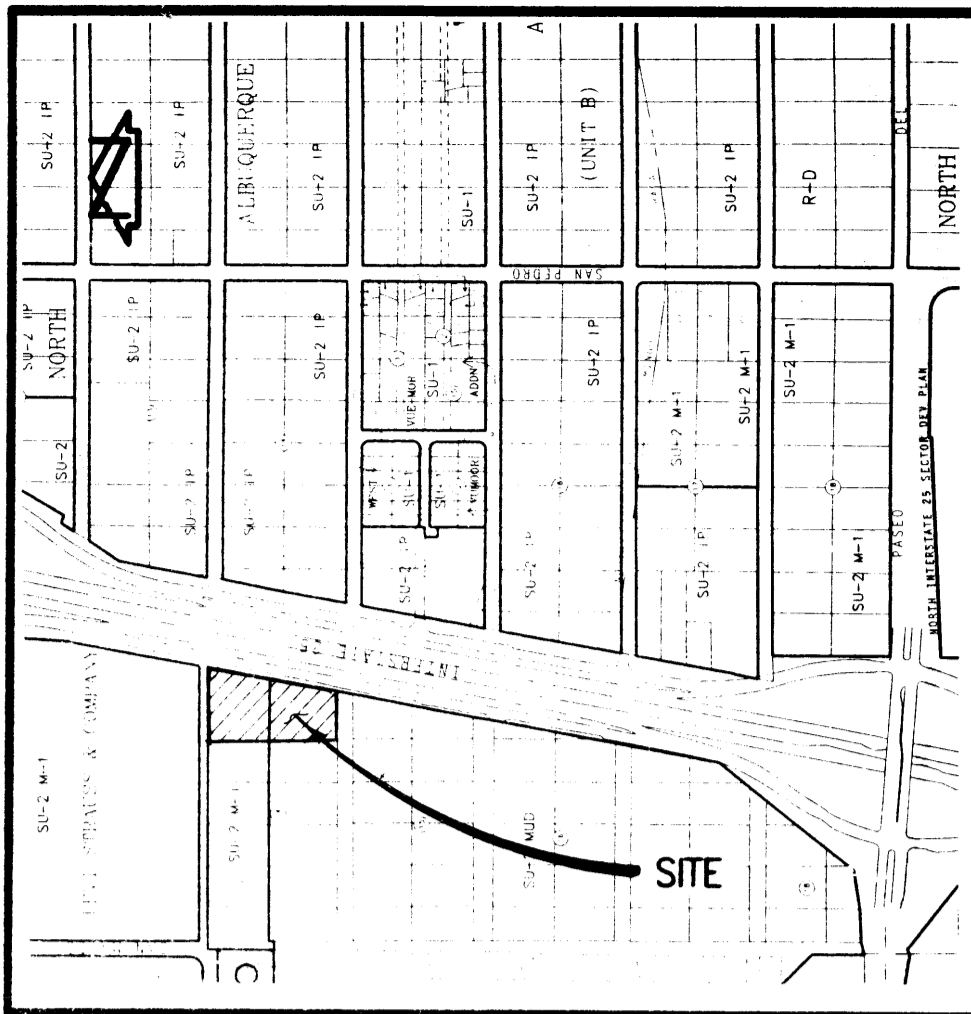
JOB NO:	
DATE:	AUGUST 2, 2004
REVISIONS	
	AUGUST 22, 2004

Sheet Title
GRADING/DRAINAGE PLAN
Drawn By: BLM/HTH Checked By:

Albuquerque, New Mexico

Project Name
ALBUQUERQUE SIGN PRINT
SIGNAL AVENUE N.E.
ALBUQUERQUE, NEW MEXICO 87111

SHEET NO.
C2.1



VICINITY MAP

C-18

Construction Notes

1. The contractor shall provide for any excavation, trenching, and/or foundation work within the project limits. The contractor shall be responsible for obtaining all necessary permits and approvals from the appropriate authorities.

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 in writing 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 public right-of-way shall be performed in accordance with applicable City of Albuquerque Standards and Procedures.

5. If any utility lines, pipelines, or underground utility lines are shown on these drawings, they are shown in an approximate manner only, and such lines may exist where none are shown. If any such existing lines are shown, the location is based upon information provided by the owner of said utility, and the information may be incomplete, or may be obsolete by the time construction commences. The engineer has conducted only preliminary investigation of the location, depth, size, or type of existing utility lines, pipelines, or underground utility lines. This investigation is not conclusive, and may not be complete, therefore, makes no representation pertaining thereto, and assumes no responsibility or liability therefor. The contractor shall inform itself of the location of any utility line, pipeline, or underground utility line in or near the area of the work in advance of and during excavation work. The contractor is fully responsible for any and all damage caused by its failure to locate, identify and preserve any and all existing utilities, pipelines, and underground utility lines. In planning and conducting excavation, the contractor shall comply with state statutes, municipal and local ordinances, rules and regulations, if any, pertaining to the location of these lines and facilities.

6. The design of planters and landscaped areas is not part of this plan. All planters and landscaped areas adjacent to the building(s) shall be provided with positive drainage to avoid any ponding adjacent to the structure. For construction details, refer to landscaping plan.

Person Control Measures

1. The contractor shall ensure that no soil erodes from the site into public right-of-way or onto private property.

2. The contractor shall promptly clean up any material excavated within the public right-of-way so that the excavated system is not a nuisance to be viewed down the street.

3. The contractor shall secure the project perimeter prior to beginning construction.

4. Any areas of excess disturbance (traffic access, storage and excavated material) shall be removed according to the City of Albuquerque's Ordinance 1-10-100. The contractor shall be responsible for the removal of excess disturbance.

LEGAL DESCRIPTION

TRACT 6A, BLOCK 14, NORTH ALBUQUERQUE ACRES, LANDS OF LASERTECHNICS

PROJECT BENCHMARK

AGS STA 9-C18; ALUM. CAP LOCATED IN THE SW QUADRANT OF THE INTERSECTION OF WILSHIRE NE AND SAN PEDRO NE.
ELEVATION: 5229.79 FT (M.S.L.D.)

TBM

A "X" CHISELED ON THE TOP OF CURB ON THE SOUTH SIDE OF WILSHIRE AVE NE APPROX. 70 FEET EAST OF THE NORTHWEST CORNER OF THE SITE.
ELEVATION: 5187.17 FT (M.S.L.D.)

LEGEND

EXISTING SPOT ELEVATION	91.7
PROPOSED SPOT ELEVATION	90.2
PROPOSED CONTOUR	50
EXISTING CONTOUR	
PROPOSED CONCRETE	
PROPOSED FLOWLINE	
EXISTING FLOWLINE	
EXISTING BASIN BOUNDARY LINE	
PROPOSED BASIN BOUNDARY LINE	
AS - BUILT ELEVATION	
AS - BUILT SPOT ELEVATION	
AS - BUILT = AS DESIGNED	
SECTION A-A	

RUNOFF CALCULATED TO ENTER CHANNEL FROM BUILDING = 0.41 CFS

$$Q = (1.49/n)AR^{2/3}S^{1/2} \text{ (Manning Equation)}$$

Where: $n = 0.013$
 $A = 2(S) = 2(0.045) = 0.09 \text{ sf}$
 $P = 2 + 2(D) = 2 + 2(0.045) = 2.09 \text{ ft}$
 $R = A/P = 0.09/2.09 = 0.0431 \text{ ft}$
 $S = 1.29/11 = 0.1173 \text{ ft/ft}$

$$Q = (1.49/0.013)(0.09)(0.0431)^{2/3}(0.1173)^{1/2}$$

$$Q = 0.43 \text{ cfs} \approx 0.41 \text{ cfs calculated runoff from proposed building}$$

$$F_r = V/(gy)^{1/2}$$

Where: $g = 32.2 \text{ ft/sec}^2$
 $V = Q/A = 0.41/0.09 = 4.55 \text{ ft/sec}$
 $y = 0.045 \text{ ft}$

$$F_r = 4.55/(32.2)(0.045)^{1/2} = 3.77 \text{ Super Critical}$$

$$Q = (1.49/n)AR^{2/3}S^{1/2}$$

Where: $n = 0.013$
 $A = 2(d) = 2(0.07) = 0.14 \text{ sf}$
 $P = 2 + 2(D) = 2 + 2(0.07) = 2.14 \text{ ft}$
 $R = A/P = 0.14/2.14 = 0.0654 \text{ ft}$
 $S = 0.61/21.5 = 0.0284 \text{ ft/ft}$

$$Q = (1.49/0.013)(0.14)(0.0654)^{2/3}(0.0284)^{1/2}$$

$$Q = 0.44 \text{ cfs} \approx 0.41 \text{ cfs calculated runoff from proposed building}$$

$$F_r = V/(gy)^{1/2}$$

Where: $g = 32.2 \text{ ft/sec}^2$
 $V = Q/A = 0.41/0.14 = 2.92 \text{ ft/sec}$
 $y = 0.07 \text{ ft}$

$$F_r = 2.92/(32.2)(0.07)^{1/2} = 1.94 \text{ Super Critical}$$

DRAINAGE PLAN

The following items concerning the Lasertechnics site are contained herein:

1. Vicinity Map
2. Grading Plan
3. Sections and Details
4. Calculations

As shown by the Vicinity Map, the site is located at the southwest corner of the intersection of Wilshire Drive NE and the I-25 West Frontage Road. At present, the site is developed as an existing office facility. Inasmuch, the north and west sides of the site are characterized by an existing building, parking lot, concrete sidewalk and landscaped area. The southeast portion of the site is characterized by soil compacted by human activity with minimal vegetation.

As shown by Panel 10 of 50 of the Flood Insurance Program Flood Insurance Rate Maps published by F.E.M.A. for the City of Albuquerque, New Mexico dated October 14, 1983, this site does not lie within the designated flood hazard zone. This panel does indicate, however, that there is a Zone A 100-year flood confined to constructed channel located south of the property flowing east to west. At present, Basin A drains from south to north to Wilshire Drive NE. Wilshire Drive NE drains west to storm inlets on the south side of the intersection of Wilshire Drive NE and San Mateo Boulevard NE. At present, Basin B drains from north to south through an undeveloped part of the property to the aforementioned Zone A 100-year flood confined to constructed channel, which flows east to west.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1'0" intervals, 2) the limit and character of the existing improvements, 3) the limit and character of the proposed improvements, and 4) continuity between existing and proposed grades. As shown by this plan, the proposed improvements consist of construction of a warehouse addition, along with adjacent sidewalk, two concrete pads, and landscaping. In order to accomplish this there will be very little modification to the existing improvements. There will, however, be a minor curb modification at the outflow of the proposed warehouse drainage channel. As stated above, Basin A drains north to Wilshire Avenue and Basin B drains south to the Zone A 100-year flood channel; this drainage pattern will be maintained by this plan. All developed runoff for Basin A will be discharged to Wilshire Avenue. It is the intent of this plan to drain all runoff from the proposed warehouse roof drainage system to Basin A. A typical section for the proposed warehouse drainage channel is shown below, along with supporting hydraulic calculations. All existing developed runoff from Basin B will continue to be discharged in its historic pattern.

On this plan there is an area east of the site that is topographically higher than the site. This area sheet flows directly to Basin B. As shown by the calculations, these offsite flows are less than 2.0 cfs. The proposed improvement to the site will continue to accept the offsite flows and let them pass through the site. The existing dock has no other areas contributing to its runoff, and has area drains on the north and south walls of the eastern end of the dock. This plan does not propose any change to the existing dock. Much of the area surrounding this site is already developed making this a modification to an existing site within an infill area. This indicates that continued free discharge of runoff from both Basin A and Basin B is appropriate.

The Calculations which appear hereon analyze both the existing and developed conditions for the 100-year 6-hour rainfall event. The procedure for 40-acre and smaller basins, as set forth in the Revision of Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated January, 1993, has been used to quantify the peak rate of discharge and volume of runoff generated. As shown by these calculations, the net runoff generated by Basin A will increase as a result of the proposed development and associated drainage basin boundary shift. The net runoff generated by Basin B will conversely decrease as a result of the proposed development. The hydraulic calculations which appear hereon rely upon the Manning Equation for open channel flow within the proposed roof drainage channel.

CALCULATIONS

Site Characteristics

1. Precipitation Zone = 3
2. $P_{6,100} = P_{360} = 2.60 \text{ in.}$
3. Total Area (A_T) = 137740
4. Existing Land Treatment

Basin A Treatment	Area (sf/ac)	%
B	3,050/0.070	9.4
C	4,377/0.100	13.5
D	25,074/0.576	77.1

Basin B Treatment	Area (sf/ac)	%
B	11,704/0.269	13.9
C	49,107/1.127	58.2
D	23,503/0.540	27.9

Offsite Basin Treatment	Area (sf/ac)	%
C	10,970/0.252	56.7
D	8,387/0.193	43.3

Existing Dock Area Treatment	Area (sf/ac)	%
D	1,568/0.036	100.0

5. Developed Land Treatment

Basin A Treatment	Area (sf/ac)	%
B	3,140/0.072	8.5
C	41,363/0.949	11.9
D	29,362/0.674	79.6

Basin B Treatment	Area (sf/ac)	%
B	14,910/0.342	18.6
C	41,363/0.949	51.7
D	23,663/0.543	29.7

Offsite Basin Treatment	Area (sf/ac)	%
C	10,970/0.252	56.7
D	8,387/0.193	43.3

Existing Dock Area Treatment	Area (sf/ac)	%
D	1,568/0.036	100.0

Existing Condition

A. Basin A

1. Volume

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

$$E_W = [(0.92)(0.070) + (1.29)(0.10) + (2.36)(0.576)]/(0.746) = 2.08 \text{ in.}$$

$$V_{100} = (E_W/12)A_T$$

$$V_{100} = (2.08/12)(0.746) = 0.1294 \text{ ac.ft.; } 5,636 \text{ cf}$$

2. Peak Discharge

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

$$Q_p = Q_{100} = (2.60)(0.070) + (3.45)(0.100) + (5.02)(0.576) = 3.4 \text{ cfs}$$

B. Basin B

1. Volume

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

$$E_W = [(0.92)(0.269) + (1.29)(1.127) + (2.36)(0.540)]/(1.936) = 1.53 \text{ in.}$$

$$V_{100} = (E_W/12)A_T$$

$$V_{100} = (1.53/12)(1.936) = 0.2480 \text{ ac.ft.; } 10,801 \text{ cf}$$

2. Peak Discharge

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

$$Q_p = Q_{100} = (2.60)(0.269) + (3.45)(1.127) + (5.02)(0.54) = 7.3 \text{ cfs}$$

C. Offsite Basin

1. Volume

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

$$E_W = [(1.29)(0.252) + (2.36)(0.193)]/(0.445) = 1.75 \text{ in.}$$

$$V_{100} = (E_W/12)A_T$$

$$V_{100} = (1.75/12)(0.445) = 0.0650 \text{ ac.ft.; } 2,833 \text{ cf}$$

2. Peak Discharge

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

$$Q_p = Q_{100} = (3.45)(0.252) + (5.02)(0.193) = 1.8 \text{ cfs}$$

D. Existing Dock Area

1. Volume

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

$$E_W = [(2.36)(0.036)]/(0.036) = 2.36 \text{ in.}$$

$$V_{100} = (E_W/12)A_T$$

$$V_{100} = (2.36/12)(0.036) = 0.0071 \text{ ac.ft.; } 308 \text{ cf}$$

2. Peak Discharge

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

$$Q_p = Q_{100} = (5.02)(0.036) = 0.2 \text{ cfs}$$

Developed Condition

A. Basin A

1. Volume

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

$$E_W = [(0.92)(0.072) + (1.29)(0.10) + (2.36)(0.674)]/(0.846) = 2.11 \text{ in.}$$

$$V_{100} = (E_W/12)A_T$$

$$V_{100} = (2.11/12)(0.846) = 0.1488 \text{ ac.ft.; } 6,483 \text{ cf}$$

2. Peak Discharge

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

$$Q_p = Q_{100} = (2.60)(0.072) + (3.45)(0.10) + (5.02)(0.674) = 3.9 \text{ cfs}$$

B. Basin B

1. Volume

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

$$E_W = [(0.92)(0.342) + (1.29)(0.949) + (2.36)(0.543)]/(1.834) = 1.54 \text{ in.}$$

$$V_{100} = (E_W/12)A_T$$

$$V_{100} = (1.54/12)(1.834) = 0.2350 \text{ ac.ft.; } 10,237 \text{ cf}$$

2. Peak Discharge

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

$$Q_p = Q_{100} = (2.60)(0.342) + (3.45)(0.949) + (5.02)(0.543) = 6.8 \text{ cfs}$$

C. Offsite Basin (No Change)

D. Existing Dock Area (No Change)

Comparison

A. Basin A

1. $\Delta V_{100} = 6,483 - 5,636 = 847 \text{ cf (increase)}$
2. $\Delta Q_{100} = 3.9 - 3.4 = 0.5 \text{ cfs (increase)}$

B. Basin B

1. $\Delta V_{100} = 10,801 - 10,237 = 564 \text{ cf (decrease)}$
2. $\Delta Q_{100} = 7.3 - 6.8 = 0.5 \text{ cfs (decrease)}$

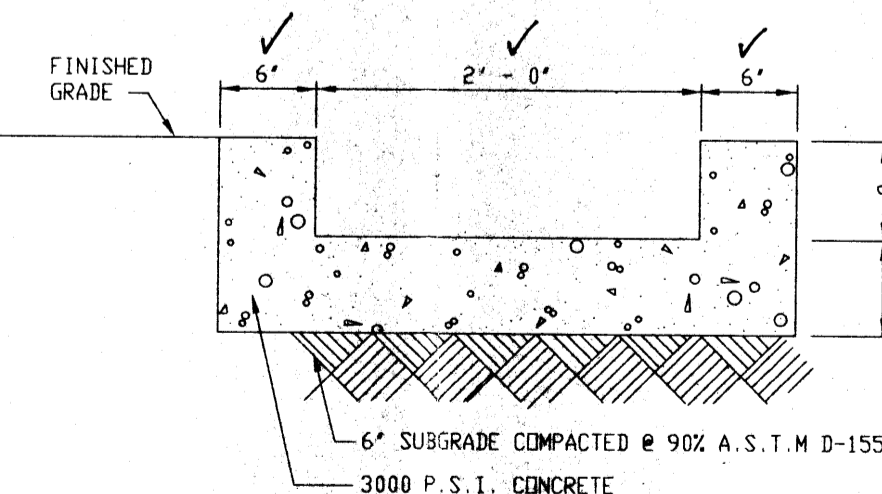
C. Offsite Basin (No Change)

D. Existing Dock Area (No Change)

DRAINAGE CERTIFICATION

As indicated by the as-built information shown hereon, and confirmed by visual inspection, the Lasertechnics project has been constructed in substantial conformance with the approved Grading and Drainage Plan. It is based upon this observation and analyses that issuance of a Permanent Certificate of Occupancy is hereby recommended.

Jeffrey G. Mortensen
Professional Engineer
03-21-95
Date



SECTION A-A

SCALE: 1" = 1' - 0"

Page 22



03-23-95



JEFFREY MORTENSEN & ASSOCIATES, INC.
1000 S. MIDWAY PARK BLVD. NE
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS & SURVEYORS (505) 345-4250

GRADING AND DRAINAGE PLAN LASERTECHNICS

DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
S.G.K.	03/95	J.G.M.	AS - BUILT AND CERTIFY	941152
DRAWN BY	DATE	BY	REVISIONS	DATE
S.G.H.				01-1995
APPROVED BY	DATE	BY	REVISIONS	SHEET
J.G.M.				1 OF 1