

AREA CALCULATIONS @ W.S.L. 92.66

SECTION ①-① O & F

SECTION 2-2 $A = (\frac{1}{2} \times 0 + 4 \times 0.16) + \frac{1}{2}(0.16 + 0.26 \times 11) + (\frac{1}{2} \times 0.67 \times 0.26) = 2.43 \text{ sf}$

SECTION (3)-(3) $A = (\frac{1}{2} \times 0.87 \times 0.26) + \frac{1}{2} (0.26 + 0.6 \times 11) + (\frac{1}{2} \times 0.16 \times 0.36) = 2.45 \text{ sf}$

SECTION 4) - 4) $\lambda = (\frac{1}{2} \times 0.62 \times 0.56) + (8 \times 0.56) + (\frac{1}{2} \times 0.56 \times 3.45) = 5.62 \text{ sf}$

SECTION ⑤-⑤ $A = (0.46 \times \frac{1}{2} \times 0.71) + (\frac{1}{2} \times 0.46 + 0.36 \times 10) - (\frac{1}{2} \times 2.62 \times 0.36) = 4.73 \text{ sf}$

SECTION ⑥-⑥ $A = (0.66)(\frac{1}{2})(11) = 3.63 \text{ sf}$

SECTION 6-7 $A = (0.76)(1/2)(11.4) = 4.33 \text{ sf}$

VOLUME CALCULATIONS

DISTANCE ②-③ = 20 ft $v = (A_2 + A_3)(\frac{1}{2})(20) = 40.8 \text{ cf}$

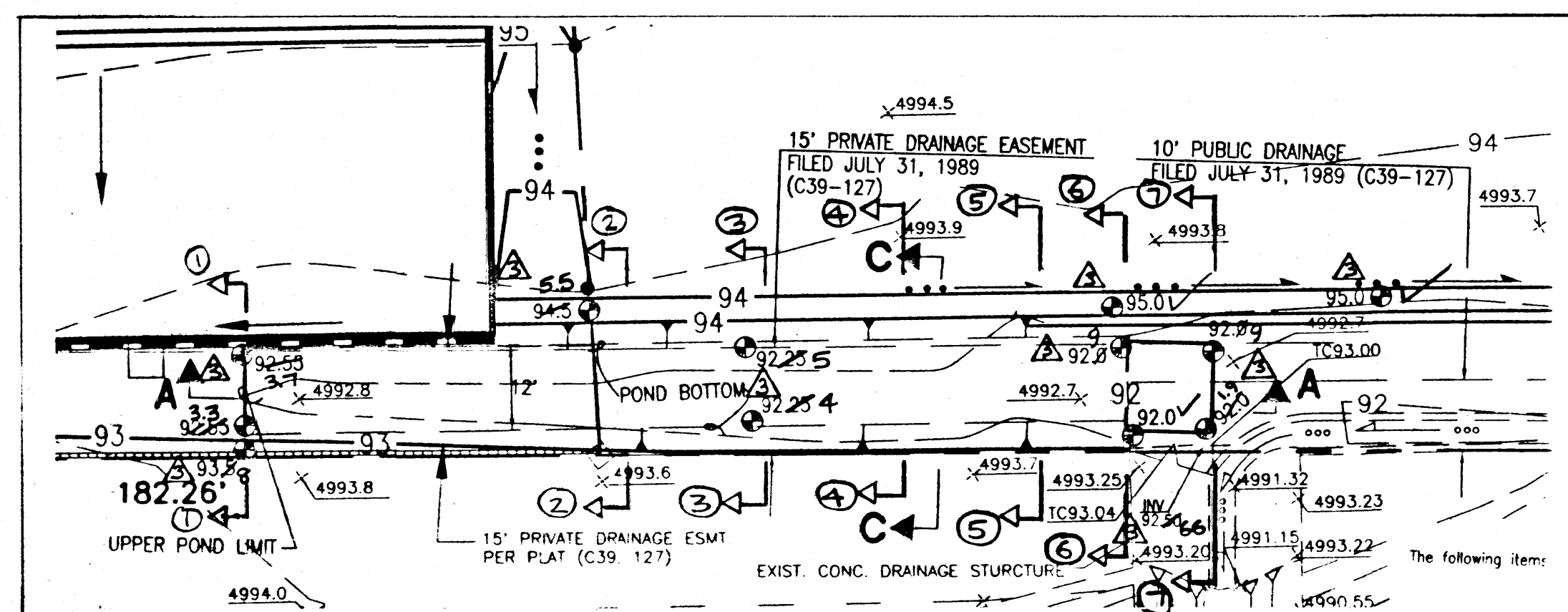
DISTANCE ③ - ④ = 20 ft $V = (A_3 + A_4) \left(\frac{1}{2} (20) \right) = 80.7 \text{ cf}$

DISTANCE (4)-(5) = 20 ft $V = (A_4 + A_5) \left(\frac{1}{2} \right) (20) = 103.5 \text{ cfs}$

DISTANCE (5)-(6) = 10 ft $v = (A_5 + A_6) \cdot \frac{1}{2} \cdot 10 = 41.8 \text{ cf}$

DISTANCE ⑥-⑦ = 12 ft $V = (A_6 + A_7) \left(\frac{1}{2} \right) (12) = 47.8 \text{ cfs}$

$$\Sigma v_d = 322.6 \text{ cf} > V_{\text{Required}}$$



SECTION CUT PLAN (1"=20')



JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, NEW MEXICO 87109
ENGINEERS & SURVEYORS (505)345-4250

AS-BUILT POND VOLUMES AND DRAINAGE CERTIFICATION
GOODWILL INDUSTRIES

DESIGNED BY G.M.

DRAWN BY G.M.

APPROVED BY J.G.M.

NO.	DATE	BY	REVISIONS	JOB NO.
③	10/19/95	G.M.	CREATE THIS SHEET, AS-BUILT & CERTIFY	941034
②	9/9/95	G.M.	AS-BUILT AND CERTIFY	DATE 10-1995
①	9/9/95	G.M.	AS-BUILT AND CERTIFY	SHEET 2 OF 2

DRAINAGE CERTIFICATION

As indicated by the as-built information shown hereon, the Goodwill Industries site has been constructed in substantial compliance with the approved Grading Plan with four (4) exceptions:

- 1) The 1' x 0" curb opening near the northwest corner of the building has not been constructed. This opening must be provided.
- 2) The proposed 6' wide curb opening to allow the parking lot runoff to enter the drainage easement has been constructed only 1.7 feet in width and must be widened per the approved design.
- 3) There is a low spot in the paving near the southwest corner of the building which puddles water. This should be corrected/improved for positive drainage.
- 4) At the time of the as-built survey, the final grading and rip-rap installation within the 15' private drainage easement was in progress, but not yet complete. This work must be completed prior to final acceptance.

Issuance of a Temporary Certificate of Occupancy is recommended until the above corrections are made. Issuance of a Permanent Certificate of Occupancy will be recommended upon correction and recertification. The As-built information has been obtained by me or under my direct supervision and is true and correct to the best of my knowledge and belief.

Jeffrey G. Mortensen

09-07-95

Date

JEFFREY G. MORTENSEN
NEW MEXICO
NMPDE
8547
REGISTERED PROFESSIONAL ENGINEER

DRAINAGE CERTIFICATION

The two curb openings which had not been constructed at the time of the first Certification have now been provided in accordance with the approved Plan. The rip-rap installation and grading within the 15' drainage easement is in progress.

A Temporary Certificate of Occupancy is requested at this time. Issuance of a Permanent Certificate of Occupancy will be recommended upon satisfactory completion of the building's subsequent recertification. The As-Built information was obtained by me or under my direct supervision and is true and correct to the best of my knowledge and belief.

Jeffrey G. Mortensen

Jeffrey G. Mortensen

09-21-95

Date

DRAINAGE SPECIALIZATION

DRAINAGE CERTIFICATION

As indicated by the As-Built information shown hereon, combined with the analysis of the as-built ponding capacities, the Goodrich Industries project has been constructed in substantial compliance with the approved Grading and Drainage Plan. The sediment pond along the east edge of the property has been brought into compliance with the approved plan. In addition, the "bird bath" within the parking lot has been corrected. It is based upon this information that issuance of a Permanent Certificate of Occupancy is hereby recommended. The As-Built information and analyses have been performed by me or under my direct supervision and are true and correct to the best of my knowledge and belief.

Jeffrey G. Mortenson

10-19-95

Date

NEBRASKA MECHANICAL ENGINEERS
8547
REGISTERED PROFESSIONAL ENGINEER



PROJECT BENCHMARK

A.C.S. BENCH MARK 5-C13, LOCATED ON THE EAST R.O.W. LINE OF STATE RD. 448 BEING DESCRIBED AS THE TOP OF STEEL R.O.W. MARKER STA 370+36, STAMPED "ACS BM 5-C13". ELEVATION = 4999.909 FEET (M.S.L.D.)

LEGAL DESCRIPTION

LOT 4A, BOSQUE DEL PUEBLO

T.B.M.

A BOLT PAINTED ORANGE ON THE NORTH FLANGE OF THE FIRE HYDRANT AS SHOWN ON THE PLAN. ELEVATION = 4999.38 FEET (M.S.L.D.)

NOTE: THIS IS NOT A BOUNDARY SURVEY. APPARENT PROPERTY CORNER ARE SHOWN FOR ORIENTATION ONLY. BOUNDARY DATA SHOWN IS FROM A PREVIOUS SURVEY OF TRACTS 3A,4A,5A,6A, BOSQUE DEL PUEBLO, FILED 11-9-1994 IN VOLUME 94C, FOLIO 377.

LEGEND

- TC 4993.8 EXISTING SPOT ELEVATION
- FL 96.50 EXISTING CONTOUR
- TA 96.50 TOP OF CURB
- TW 96.50 TOP OF ASPHALT
- NG 96.50 TOP OF WALL
- 96.50 PROPOSED CONTOUR
- 96.50 PROPOSED SPOT ELEVATION
- 96.50 DIRECTION OF FLOW (PROPOSED)
- 96.50 DIRECTION OF FLOW (EXISTING)
- 96.50 RETAINING WALL
- 96.50 WATER BLOCK
- 96.50 PROPOSED BLOCK WALL
- 96.50 EXISTING BLOCK WALL
- 96.50 SLOPE (PROPOSED)
- 96.50 SLOPE (EXISTING)

Site Characteristics

- Precipitation Zone = 1
- $F_{6.100} = F_{360} = 2.20$
- Total Area (A_T) = 58,100 $\text{sq}/1.33$ ac.
- Existing Land Treatment Treatment Area (sq/ac) % 100
- Developed Land Treatment Treatment Area (sq/ac) % 4

Existing Condition

- Volume $E_W = (E_A + E_B + E_C + E_D + E_E)/A_T$
 $E_W = (0.67)(1.33)/(1.33) = 0.67$ in.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (0.67/12)(1.33) = 0.0743$ ac-ft. = 3,235 cf
- Peak Discharge $Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
 $Q_p = Q_{100} = (2.03)(1.33) = 2.7$ cfs

Developed Condition

- Volume $E_W = (E_A + E_B + E_C + E_D + E_E)/A_T$
 $E_W = [(0.67)(0.35) + (1.97)(0.98)]/(1.33) = 1.63$ in.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (1.63/12)(1.33) = 0.1807$ ac-ft. = 7,870 cf
- Peak Discharge $Q_p = Q_{PA}A_A + Q_{PB}A_B + Q_{PC}A_C + Q_{PD}A_D$
 $Q_p = Q_{100} = (2.03)(0.35) + (4.37)(0.98) = 5.0$ cfs

- Comparison
- $\Delta V_{100} = 7,870 - 3,235 = 4,635$ cf (increase)
 - $\Delta Q_{100} = 5.0 - 2.7 = 2.3$ cfs (increase)

AS-BUILT LEGEND

- TA 92.41 AS-BUILT TOP OF ASPHALT ELEVATION
- 92.41 AS-BUILT ELEVATION
- 92.41 AS-BUILT = AS-DESIGNED
- TC 97.60 AS-BUILT TOP OF CURB ELEVATION
- FL 97.23 AS-BUILT FLOWLINE ELEVATION
- FL 4996 AS-BUILT FINISH FLOOR ELEVATION

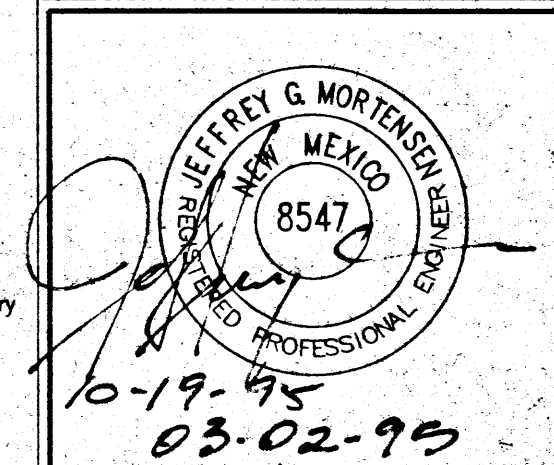
DURA BILT PRODUCTS, INC.
4808 JEFFERSON N.E.
ALBUQUERQUE N.M. 87109
(505) 883-9100
DESIGN/BUILDERS
LICENSE NO. 3044

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DATE: JULY 29, 1994
PLOT DATE: SEPTEMBER 28, 1994
REVISIONS: JANUARY, 1995
REVISED AND REPLOTTED TO REFLECT SITE PLAN CHANGES.

GWSHTA2

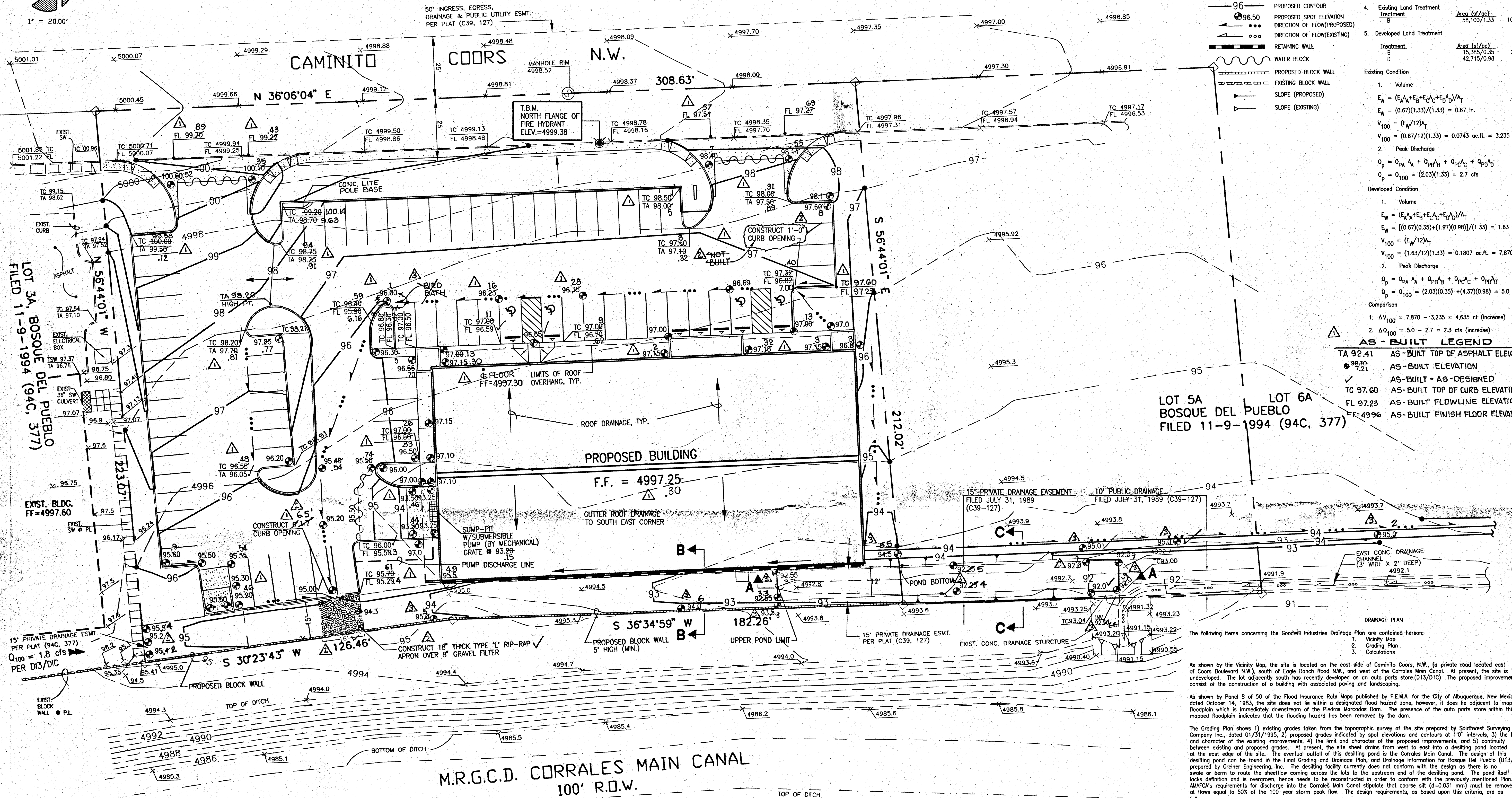
GOODWILL INDUSTRIES
COORS ROAD N.W.
RIO RANCHO, NEW MEXICO 87120



GRADING AND DRAINAGE PLAN

SHEET NO. C2
JOB NO. 94-130 OF 5

CERT. SHEET 1 OF 2



DESILTING CALCULATIONS

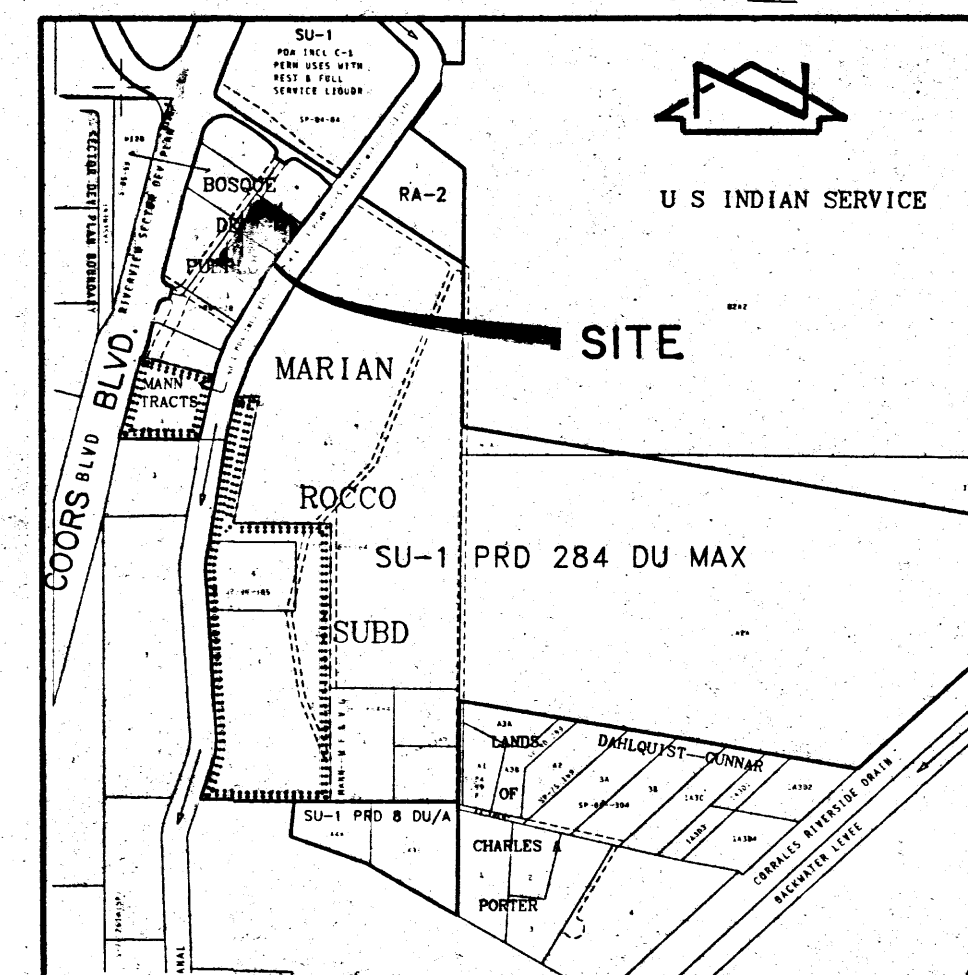
Q_{100} (Lot 3A) = 1.8 cfs (D13/D1C)
 Q_{100} (Lot 4A) = 5.0 cfs
 Q_{100} (Total) = 1.8 + 5.0 = 6.8 cfs
 $Q = Q_{100}/2 = 6.8/2 = 3.4$ cfs
Area (Lot 3A) = 0.55 ac (Plot of Bosque Del Pueblo SP-94-206)
Area (Lot 4A) = 1.33 ac
Area (Total) = 1.88 ac
 $V_{\text{Req}} = 0.0024 \text{ ac-ft}/\text{ac} = (0.0024)(1.88)(43,560) = 200 \text{ cf}$
 $V = 0.47 \text{ ft}/\text{sec}$ (See Channel Hydraulics Calculations)
 $d = 0.56 \text{ ft}$
 $\text{Retain} = 0.56 \text{ ft}/0.002 \text{ ft}/\text{sec} = 280 \text{ sec}$
 $L = (280 \text{ sec})(0.46 \text{ ft}/\text{sec}) = 132 \text{ ft}$

CHANNEL HYDRAULICS CALCULATIONS

(For Cross-Sectional Geometry, Refer to Sections B-B, C-C)
Bottom width = 12'
Left side slope = 3:1
Right side slope = 0:1 (vertical)
 $n = 0.040$ (gravel)
Slope = 0.0004 ft/ft
 $d = 0.56 \text{ ft}$ (max)
 $V = 0.47 \text{ ft}/\text{sec}$ (max)
 $Q = 3.40 \text{ cfs}$

RIP-RAP SIZING CALCULATIONS

- A. Flow Data
 $Q_{100} = 5.0$ cfs
Curb opening = 6.0' wide
 $Q = CLH^{3/2}$, where $C = 2.6$, $L = 6.0$ ft.
 $H = d = 0.47'$, curb height
 $A = d^2L = (0.47)^2(6.0) = 2.82 \text{ sf}$
 $V = Q/A = 5.0/2.82 = 1.77 \text{ fps}$
- B. Rip-Rap Sizing (Section 5.6.2, Drainage Criteria Manual, Major Drainage, Rip-Rap)
 $Q/WH = 5/(6)(0.50) = 1.67$
 Y_f is unknown, use $Y_f/H = 0.4$
Table 5-7 requires Type L Rip-Rap for a distance of three times the culvert.
Height = $3(0.5) = 1.5'$: For this application, use Type L Rip-Rap (4 in. = 9") across the full width of the 15' drainage easement for a distance of 5' upstream and downstream of the 6' curb opening. Rip-rap thickness = 18".



VICINITY MAP
SCALE: 1" = 750'

D-13

The following items concerning the Goodwill Industries Drainage Plan are contained herein:

- Vicinity Map
- Grading Plan
- Calculations

As shown by the Vicinity Map, the site is located on the east side of Coors Road N.W., a private road located east of Coors Road N.W., south of Eagle Ranch Road N.W., and west of the Coors Road N.W. At present, the site is undeveloped. The lot adjacent south has recently developed as an auto parts store (D13/D1C). The proposed improvements consist of the construction of a building with associated paving and landscaping.

As shown by Panel 8 of 50 of the Flood Insurance Rate Maps published by F.E.M.A. for the City of Albuquerque, New Mexico dated October 14, 1983, the site does not lie within a designated flood hazard zone, however, it does lie adjacent to mapped floodplain which is immediately downstream of the Piedra Marcada Dam. The presence of the auto parts store within this mapped floodplain indicates that the flooding hazard has been removed by the dam.

The Grading Plan shows 1) existing grades taken from the topographic survey of the site prepared by Southwest Surveying Company Inc., dated 01/31/1995, 2) proposed grades indicated by spot elevations and contours at 1' intervals, 3) the limit and character of the existing improvements, 4) the limit and character of the proposed improvements, and 5) continuity between existing and proposed grades. At present, the site sheds drains from west to east into a desilting pond located at the east edge of the site. The eventual outfall of this desilting pond is the Coors Road N.W. Canal. The design of this desilting pond can be found in the Final Grading and Drainage Plan, and Drainage Information for Bosque Del Pueblo (D13/D1) prepared by Greiner Engineering, Inc. The desilting facility currently does not conform with the design as there is no swale or berm to route the sheetflow coming across the lots to the upstream end of the desilting pond. The pond itself lacks definition and is overgrown, hence needs to be reconstructed in order to conform with the previously mentioned Plan. AMARC's requirements for discharge into the Coors Road N.W. Canal stipulate that coarse silt (d=0.031 mm) must be removed at flows equal to 50% of the 100-year storm peak flow. The design requirements, as based upon this criteria, are as follows:

- Minimum Pond Sediment Storage (volume below outlet) = 0.0024 Ac Ft per acre of upstream drainage basin.
- Velocity of Sediment Fall = 0.002 ft/sec at 50% of Q_{100} .
- Retention time in Pond (sec) = Depth of Pond (ft)/0.002 ft/sec.
- Maximum Horizontal Velocity in Sediment Pond = 0.5 ft/sec at 50% of Q_{100} .

As shown herein by the Desilting Calculations, the proposed design meets these requirements.

Offsite flows will only enter the site from the south. Peak flows in the amount of 1.8 cfs (D13/D1C) will be accepted at the southeast corner of the site which is in accordance with D13/D1.

The proposed onsite and offsite grading will cause all runoff from lot 4A to conform to the requirements for drainage area "C" as defined in Greiner's Plan. This Plan requires that flows from area "C" be routed to the south so that they enter the head of the desilting pond. It also requires that flows from drainage area "C" enter the north end of a similar pond located within area "C". A recent replat of the subdivision (SP-94-206) has created new lot lines which differ from the ones which had defined drainage areas "B" and "C". The new property line which most closely represents the former boundary line between areas "B" and "C" is that which separates Lots 4A and 5A. By honoring this new property line, while keeping the intent of the original Plan in mind, it follows that flows to the south of this property line be directed to the south, while flows north of the property line be directed to the north. The proposed offsite grading will create a berm to deliver these flows to their intended location.

The Goodwill Industries site makes up 68% of the area of drainage area "B" as defined in Greiner's Plan, (1.33 ac/1.97 ac). The allowable discharge from the site is therefore 68% of the allowable discharge from area "B" which is $(0.68)(6.14) = 6.1$ cfs. As shown by the Calculations performed for this site, the 100-year peak flow is 5.0 cfs which is less than the 6.1 cfs allowed.

The Calculations which appear herein 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 the calculations, the proposed improvements will cause an increase in the peak runoff generated by this site of 2.3 cfs. The total developed peak flow of 5.0 cfs is less than the maximum allowable flow of 6.1 cfs, as allowed per the previously referenced Drainage Plan for this site. Consistent with the General Notes for that Plan, no developed flows will enter the pond perpendicularly except at the upstream end where allowed. There will be modifications to the existing desilting pond which will result in the pond operating as originally designed and approved.



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