

VISTA DEL ACUÑA
SUBDIVISION
(04-04-02, 2002C-103)

LOT 3-P1
PG= 30.80

LOT 4-P1
PG= 29.80

LOT 5-P1
PG= 30.20

LOT 6-P1
PG= 30.80

LOT 7-P1
PG= 30.9

LOT 8-P1
PG= 32.4

LOT 9-P1
PG= 33.6

LOT 10-P1
PG= 34.60

LOT 11-P1
PG= 35.90

VISTAS DRIVE N.E.
46' R/W

EAGLE VIEW AVENUE N.E.
44' R/W

TRACT A

TC=29.31 TC=28.33 TC=28.30 TC=28.80 TC=29.17 TC=29.74 TC=38.93 TC=29.4 TC=29.9 TC=30.01 TC=31.21 TC=32.18 TC=33.48 TC=29.47 TC=30.06 TC=31.22 TC=32.18 TC=33.49 TC=30.0 TC=30.4 TC=31.6 TC=32.5 TC=33.8

EL=28.11

30.0 30.4 31.6 32.5 33.8

30.2 30.1 30.0 31.5 32.0 32.0 33.3 33.4 34.2 34.2 35.8 36.0 37.2 37.2 35.4 35.0 34.1 33.7 33.5 34.3 34.3

30.8 30.8 32.5 33.6 33.6 32.5 30.8

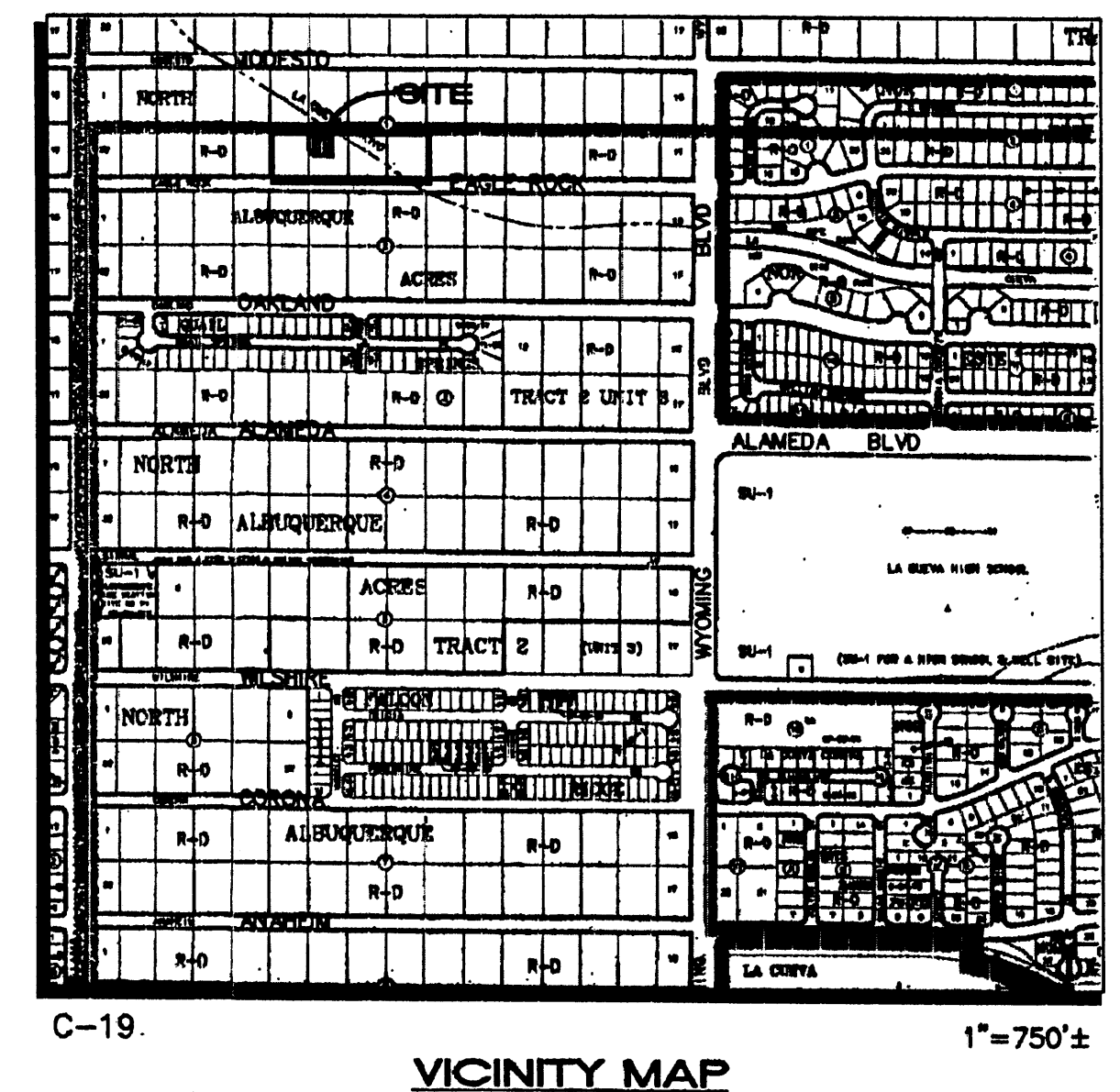
29.7 28.7 28.6 29.1 29.7

1. AN EXCAVATION/CONSTRUCTION PERMIT WILL BE REQUIRED BEFORE BEGINNING ANY WORK WITHIN CITY RIGHT-OF-WAY.
2. ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED, EXCEPT AS OTHERWISE STATED OR PROVIDED HEREON, SHALL BE CONSTRUCTED IN ACCORDANCE WITH CITY OF ALBUQUERQUE INTERIM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, 1985.
3. TWO WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE, 765-1234, FOR LOCATION OF EXISTING UTILITIES.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF ALL CONSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
5. BACK FILL COMPACTION SHALL BE ACCORDING TO TRAFFIC/STREET USE.
6. MAINTENANCE OF THESE FACILITIES SHALL BE THE RESPONSIBILITY OF THE OWNER OF THE PROPERTY SERVED.
7. WORK ON ARTERIAL STREETS SHALL BE PERFORMED ON A 24-HOUR BASIS.

EASEMENT NOTES ○

- KEYED CONSTRUCTION NOTES


- | CURVE TABLE | | | | | | |
|-------------|--------|--------|---------|-------|---------------|-----------|
| CURVE | RADIUS | LENGTH | TANGENT | CHORD | BEARING | DELTA |
| C1 | 25.00 | 39.18 | 24.91 | 35.29 | S 44°42'10" E | 89°48'13" |



4. ALL TRASH, DEBRIS, & SURFACE VEGETATION SHALL BE CLEARED AND LEGALLY DISPOSED OFFSITE.
5. ALL SUBGRADE AND FILL SHALL BE COMPACTED TO A MINIMUM OF 90% ASTM D-1557.
6. EXCAVATION IS UNCLASSIFIED AND INCLUDES EXCAVATION TO SUBGRADE ELEVATIONS INDICATED, REGARDLESS OF CHARACTER OF MATERIALS ENCOUNTERED.
7. CONFORM TO ELEVATIONS AND DIMENSIONS SHOWN ON PLANS WITHIN A TOLERANCE OF 0.3± FEET.
8. SCARIFY AND COMPACT SUBGRADE FOR FILLS. PLACE FILL MATERIALS IN LAYERS NOT MORE THAN 8" IN LOOSE DEPTH. MOISTEN AS NECESSARY TO PROVIDE OPTIMUM MOISTURE (±2%) CONTENT.
9. UNIFORMLY GRADE AREAS WITHIN LIMITS OF GRADING AS SHOWN ON PLAN. SMOOTH FINISHED SURFACE WITHIN SPECIFIED TOLERANCE, COMPACT WITH UNIFORM SLOPES BETWEEN POINTS WHERE ELEVATIONS ARE INDICATED.
10. MAXIMUM SLOPES SHALL BE 3:1 MINIMUM SLOPES SHALL BE 1%.
11. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, 260-1990, FOR LOCATION OF EXISTING UTILITIES.
12. 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. THESE INVESTIGATIONS IS NOT CONCLUSIVE, AND MAY NOT BE COMPLETE, THEREFORE, MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFORE. 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.
13. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT ERODED AND WASHED DOWN THE STREET.
14. OWNER WILL PROVIDE SOIL TESTING AND INSPECTION SERVICES DURING EARTHWORK OPERATIONS. ALLOW TESTING SERVICE TO INSPECT AND APPROVE COMPACTED SUBGRADES AND FILL LAYERS BEFORE FURTHER CONSTRUCTION WORK IS DONE. SHALL COMPACTION TESTS INDICATE INADEQUATE DENSITY, CONTRACTOR SHALL PROVIDE ADDITIONAL COMPACTION AND TESTING AT NO ADDITIONAL EXPENSE.
15. OWNER HAS ESTABLISHED SUBDIVISION BOUNDARY CORNERS. CONTRACTOR SHALL PROVIDE ALL OTHER CONSTRUCTION STAKING INCLUDING TRACT CORNERS. CONTRACTOR SHALL LOCATE AND PRESERVE ALL BOUNDARY CORNERS AND REPLACE ANY LOST OR DISTURBED CORNERS.

DRAINAGE CERTIFICATION

The record information presented hereon is not necessarily complete and intended only to verify substantial compliance of the grading and drainage aspects of this project. Those relying on this record document are advised to obtain independent verification of its accuracy before using it for any other purpose.

 **ISAACSON & ARFMAN, P.A.**
Consulting Engineering Associates
128 Monroe Street N.E.
Albuquerque New Mexico
098EXPOND3.DWGfrh 02/17/03

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: VISTA DEL AGUILA
LOTS 7-P1 TO 9-P1
DRAINAGE & GRADING PLAN

Design Review Committee	City Engineer Approval
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	City Engineer Approval:	Date: _____ Signature: _____ Title: _____

[illegible]

_____ design

[illegible][illegible]

City Project No.	Zone Map No.
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622581	C-19
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		CONTRACT NO. 11-10-100 PROJECT NAME:		CONTRACTOR:	
SHEET NO. 1 OF 1		DATE: 01/03		DATE:	
DESIGNED BY: GLD		DATE: 01/03		DATE:	
DRAWN BY: RPH		DATE: 01/03		DATE:	
CHECKED BY: GLD		DATE: 01/03		DATE:	
Mo./Day/Yr.		Mo./Day/Yr.		Mo./Day/Yr.	
JUN 20 2003 HYDROLOGY SECTION		NO. DATE REMARKS REVISIONS DESIGN		FIELD NOTES 11/99 ALS ACS MONUMENT "1-Big" SET IN THE TOP OF A CONCRETE POST LOCATED IN THE NORTHEAST QUADRANT OF THE INTERSECTION OF WYOMING BLVD. AND MODESTO AVE. (NGVD 1929) ELEV. = 5392.50	
MICRO-FILM INFORMATION RECORDED BY:		DATE:		DATE:	
NO.		NO.		NO.	

ENGINEER'S (DRAINAGE) CERTIFICATION
for SUBDIVISION
VISTA DEL AGUILA
ALBUQUERQUE, NEW MEXICO
MAY, 2000

C19-D24

SHEET	INDEX OF DRAWINGS
1	COVER SHEET, ENGINEER'S CERTIFICATION, AND INDEX OF DRAWINGS
G1	DRAINAGE PLAN, FIRM AND VICINITY MAP
G2	GRADING PLAN
G3	SECTIONS AND DETAILS, GRADING NOTES
G4	CALCULATIONS, SECTIONS AND DETAILS
G5	SECTIONS AND DETAILS
G6	SCOUR WALL PLAN AND PROFILE

ENGINEER'S CERTIFICATION

AS INDICATED BY THE AS-BUILT INFORMATION SHOWN HEREON AND THE EVALUATIONS PRESENTED BELOW, THIS SUBDIVISION HAS BEEN GRADED AND DRAINED IN SUBSTANTIAL COMPLIANCE WITH THE DRB APPROVED GRADING PLAN:

1) HOUSE PADS
HOUSE PAD ELEVATIONS WERE VERIFIED PRIOR TO THE COMMENCEMENT OF HOME CONSTRUCTION AND WERE AS-BUILT ON FEBRUARY 28, 2000. ALL HOUSE PAD GRADES WERE VERIFIED TO WITHIN 0.1 FEET OF THE DRB APPROVED GRADING PLAN ELEVATION.

2) CURB AND GUTTER
THE ONSITE CURB AND GUTTER ELEVATIONS WERE AS-BUILT ON APRIL 7 AND APRIL 11, 2000. THE GREATEST DIFFERENCE IN ELEVATION FROM THE DRB APPROVED GRADING PLAN IS 0.20 FEET. THE CURB AND GUTTER HAS BEEN GRADED AND DRAINED IN A MANNER CONSISTENT WITH THE APPROVED PLAN, AND IN SUBSTANTIAL COMPLIANCE WITH THE WORK ORDER PLANS (CITY PROJECT #622581).

3) RETAINING WALLS
RETAINING WALLS WERE REQUIRED ON THE APPROVED PLAN TO FACILITATE SITE GRADING. THE RETAINING WALLS WERE AS-BUILT ON MAY 4, 2000, AND FOUND TO BE OF SUFFICIENT HEIGHT TO ACCOMMODATE THE DRB APPROVED DESIGN GRADES. THE LIMITS OF RETAINING WALL CONSTRUCTION ARE DEPICTED ON THE GRADING PLAN (SHEET G2).

4) LOT GRADES
ROUGH GRADES WERE AS-BUILT ON FEBRUARY 28, 2000. THESE GRADES WERE WITHIN A TOLERANCE OF 0.5 FEET PRIOR TO ANY RETAINING WALL OR INDIVIDUAL HOME CONSTRUCTION. THE AS-BUILT GRADES SHOWN HEREON WERE OBTAINED ON FEBRUARY 28, APRIL 7 AND APRIL 11, 2000. FINISHED GRADING FOR ALL LOTS SHALL BE WITHIN 0.1 FEET, AND SHALL BE COMPLETED UPON DEVELOPMENT OF EACH LOT BY THEIR RESPECTIVE BUILDERS. THE FINISHED LOT ELEVATIONS AND THE SLOPES MUST CONFORM WITH THE DRB APPROVED GRADING PLAN.

5) DETENTION POND
THE DETENTION POND ON TRACT 'A' WAS AS-BUILT ON APRIL 7, 2000 WITH THE FOLLOWING DEVIATIONS NOTED:

a. THE BOTTOM OF POND IS APPROXIMATELY 0.3 FEET LOWER THAN DRB APPROVED PLAN ELEVATION WITH NO ADVERSE IMPACT.

b. THE POND BOTTOM ELEVATION, AS CONSTRUCTED, IS 5322.7 (AVERAGE), APPROXIMATELY 0.3 FEET BELOW THE DESIGN ELEVATION OF 5323.0 FEET. THIS HAS A NEGLIGIBLE IMPACT ON THE STORAGE CAPACITY OF THE FACILITY.

c. THE OUTLET PIPE FOR THE POND DISCHARGE WAS CONSTRUCTED 0.17 FEET BELOW (LOWER THAN) THE DESIGN ELEVATION. THE NET EFFECT OF THIS DEVIATION IS SLIGHTLY GREATER CONTROLLED DISCHARGE RATE. THE EFFECTIVE DISCHARGE HAS BEEN INCREASED FROM 15.94 CFS TO 16.33 CFS.

d. THE REQUIRED STORAGE VOLUME FOR THE POND REMAINS UNCHANGED, BUT THE AS-BUILT VOLUME HAS INCREASED SLIGHTLY BY APPROXIMATELY 800 CF, WHICH STILL SATISFIES THE REQUIRED STORAGE VOLUME. THIS ANALYSIS DOES NOT TAKE INTO ACCOUNT STORAGE VOLUME BELOW THE OUTLET PIPE, WHICH PROVIDES FOR SEDIMENT STORAGE IF NEEDED.

SUMMARY
IT IS BASED UPON THIS EVALUATION OF AS-CONSTRUCTED CONDITIONS THAT RELEASE OF FINANCIAL GUARANTY FOR THIS SUBDIVISION IS HEREBY RECOMMENDED. 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. THE AS-BUILT INFORMATION IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING FOR ANY OTHER PURPOSE.

JEFFREY G. MORTENSEN, N.M.P.E. 8547
DATE 05-24-2000

WORK ORDER NO. 622581
DRB NO. 99-53
HYDROLOGY FILE NO. C19/D24

File Path: E:\JMM\004\9904\ Plot Date: 05-24-2000
File Name: 990044CV.DWG Plot Time: 1:40 pm

JMA JEFF MORTENSEN & ASSOCIATES, INC.
1501-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, N.M. 87109
ENGINEERS & SURVEYORS (505) 345-4290

DESIGNED BY	NO.	DATE	BY	REVISIONS	JOB NO.
J.G.M.	1	05/00	MDS	COVER SHEET AND CERTIFICATION	990044
DRAWN BY					DATE
ACAD					05-2000
APPROVED BY					SHEET
J.G.M.					1 OF 7

DRAINAGE REPORT

EXECUTIVE SUMMARY

THE SITE IS THE PURPOSE OF THIS DRAINAGE REPORT IS TO OBTAIN ROUGH GRADING APPROVAL, PRELIMINARY AND FINAL PLAT APPROVALS, AND WORK ORDER APPROVAL. THE PROJECT CONSISTS OF THE CONSTRUCTION OF A 40-LOT SINGLE FAMILY RESIDENTIAL SUBDIVISION LOCATED IN NORTH ALBUQUERQUE ACRES ON THE NORTH SIDE OF EAGLE ROCK AVENUE N.E., BETWEEN LOUISIANA BOULEVARD N.E. AND WYOMING BOULEVARD N.E. THE SITE IS MOSTLY UNDEVELOPED. THE SITE LIES ADJACENT TO THE NORTH LA CUEVA ARROYO. THE NORTH LA CUEVA ARROYO IS AN UNDEVELOPED NATURAL CHANNEL. IT IS THE INTENT OF THIS GRADING AND DRAINAGE PLAN TO IMPLEMENT TEMPORARY DETENTION PONDING TO MITIGATE THE INCREASE IN RUNOFF ATTRIBUTABLE TO THE PROPOSED DEVELOPMENT. THE RATE OF DISCHARGE WILL BE LIMITED TO THE EXISTING RATE. THIS DETENTION PONDING WILL BE TEMPORARY IN NATURE, AND PROGRAMMED TO AN ULTIMATE OUTFALL TO THE NORTH LA CUEVA ARROYO WHEN CHANNELIZED IN THE FUTURE. OFFSITE AND ONSITE FLOWS WILL BE ROUTED TO THIS TEMPORARY DETENTION POND VIA PROPOSED PAVING AND STORM DRAINAGE IMPROVEMENTS. OFFSITE FLOWS RESULTING FROM LOCAL DRAINAGE CURRENTLY ENTER THE NORTHEAST CORNER OF THE SITE. THESE FLOWS WILL BE DIVERTED AROUND THE SITE THROUGH OFFSITE GRADING WITH THE UPSTREAM PROPERTY OWNER'S PERMISSION.

THE UNDEVELOPED PROPERTIES TO THE NORTH OF THIS SITE ARE OWNED BY AMAFCA. (EXCEPT FOR LOTS 7 & 8 UPON WHICH AMAFCA HAS A BLANKET DRAINAGE EASEMENT)

THE PROPOSED IMPROVEMENTS WILL BE CLOSELY COORDINATED WITH AMAFCA. A PORTION OF THIS SITE LIES WITHIN THE EROSION SETBACK LIMITS OF THE NORTH LA CUEVA ARROYO. IT IS THE INTENT OF THIS PLAN AND THIS DEVELOPMENT TO ENTER INTO AN AGREEMENT WITH AMAFCA. THIS AGREEMENT, WHICH IS DESCRIBED IN FURTHER DETAIL HEREIN, WILL ADDRESS BOTH THE INTERIM AND ULTIMATE DRAINAGE CONDITIONS OF THE SITE.

INTRODUCTION

THE PROPOSED CONSTRUCTION CONSISTS OF A NEW 40-LOT RESIDENTIAL SUBDIVISION WITH ASSOCIATED PUBLIC INFRASTRUCTURE IMPROVEMENTS. THIS PROJECT WILL REQUIRE THE CONSTRUCTION OF PUBLIC STREETS, PUBLIC WATER AND SANITARY SEWER LINE EXTENSIONS, AND A PUBLIC STORM DRAIN WITH AN OUTFALL FOR THIS SITE TO THE NORTH LA CUEVA ARROYO WHICH WILL BE CHANNELIZED IN THE FUTURE. THE ARROYO IS CURRENTLY UNDEVELOPED. OFFSITE AND ONSITE DRAINAGE WILL BE ROUTED TO AN INTERIM DETENTION POND

LOCATED ON FUTURE LOTS 7-9 WHICH IS PROGRAMMED FOR FUTURE DISCHARGE TO THE NORTH LA CUEVA ARROYO WHEN IT IS IMPROVED. OFFSITE FLOWS FROM THE EAST WILL BE DIVERTED AROUND THE SITE BY OFFSITE GRADING WITH THE CONCURRENCE OF THE ADJACENT PROPERTY OWNER.

A PORTION OF THE SITE LIES WITHIN THE CENTERLINE SETBACK (CSB) ASSOCIATED WITH THE NORTH LA CUEVA ARROYO. INCLUDED HEREIN ARE THE DESIGN AND SUPPORTING CALCULATIONS FOR A SCOUR WALL DESIGNED TO PROTECT THE SITE FROM THE LONG-TERM EROSION AND LATERAL MIGRATION OF THE ARROYO. ALTHOUGH THE SCOUR WALL DESIGN IS PRESENTED HEREIN, IT IS NOT THE INTENT OF THIS PROJECT TO CONSTRUCT THE SCOUR WALL. INCLUDED FOR CONSIDERATION WITH THIS SUBMITTAL IS A DRAFT COPY OF AN AMAFCA AGREEMENT PROPOSED BY THE DRAINAGE ENGINEER WHEREBY THE FUNDS USED FOR THE SCOUR WALL CONSTRUCTION WOULD INSTEAD BE PAID TO AMAFCA FOR FUTURE USE IN CONSTRUCTING THE ULTIMATE CHANNEL. THIS AGREEMENT WILL REQUIRE AMAFCA BOARD APPROVAL, AND IS MORE FULLY DESCRIBED HEREIN. ALSO INCLUDED WITH THIS SUBMITTAL AS ATTACHMENTS ARE DRAINAGE INFORMATION SHEET, A PRELIMINARY INFRASTRUCTURE LIST AND PRELIMINARY PLAT FOR THE PROJECT.

PROJECT DESCRIPTION

AS SHOWN BY THE VICINITY MAP HEREON, THE SITE IS LOCATED ON THE NORTH SIDE OF EAGLE ROCK AVENUE N.E. BETWEEN LOUISIANA BOULEVARD N.E. AND WYOMING BOULEVARD N.E. THE SITE CONSISTS OF FIVE CONTIGUOUS NORTH ALBUQUERQUE ACRES ONE-ACRE LOTS. LOT 24 CONTAINS AN EXISTING ABANDONED HOUSE THAT WILL BE REMOVED FROM THE SITE. LOTS 25-27 ARE UNDEVELOPED AND LOT 28 CONTAINS THE FOUNDATION OF A HOME THAT HAS BEEN PREVIOUSLY REMOVED FROM THE SITE. THE EXISTING LEGAL DESCRIPTION OF THE SITE IS: LOTS 24-28, BLOCK 1, TRACT 2, UNIT 3, NORTH ALBUQUERQUE ACRES. THE PROPOSED LEGAL DESCRIPTION IS: LOTS 1-21-40-61, VISTA DEL AGUILA. THE SITE IS ZONED R-D. THE PROPOSED DEVELOPMENT OF A RESIDENTIAL SUBDIVISION IS CONSISTENT WITH THIS ZONING. THERE ARE NO EXISTING EASEMENTS ON THE SITE. THE LOTS THAT ADJOIN THE SITE TO THE NORTH ARE OWNED BY AMAFCA. EXCEPT FOR LOTS 7 & 8 UPON WHICH AMAFCA HAS A BLANKET DRAINAGE EASEMENT THE NORTH LA CUEVA ARROYO PASSES THROUGH THESE LOTS. THIS SITE DRAINS TO THE NORTH LA CUEVA ARROYO.

AS SHOWN BY PANELS 129, 133, 137 AND 141 OF 825 OF THE NATIONAL FLOOD INSURANCE PROGRAM FLOOD INSURANCE MAPS, BERNALILLO COUNTY, NEW MEXICO, INCORPORATED AREAS, DATED SEPTEMBER 20, 1996, AND REVISED TO REFLECT THE LOWR DATED SEPTEMBER 11, 1998, THIS SITE DOES NOT LIE WITHIN A DESIGNATED FLOOD HAZARD ZONE. THIS SITE DOES DRAIN TO A FLOOD HAZARD ZONE (ZONE A) FOR THE NORTH LA CUEVA ARROYO WHICH LIES ON THE SITES TO THE NORTH. THE FLOODPLAIN LIMITS WERE RECENTLY REVISED BY A LOWR ISSUED 09-11-1998. AS FURTHER DESCRIBED WITHIN THE EXISTING CONDITIONS PORTIONS OF THIS REPORT, A PORTION OF THE SITE LIES WITHIN THE EROSION SETBACK ATTRIBUTABLE TO THE NORTH LA CUEVA ARROYO.

BACKGROUND DOCUMENTS

THERE ARE NO KNOWN DRAINAGE SUBMITTALS FOR THIS SITE, HOWEVER, THE FOLLOWING IS A LIST OF PREVIOUSLY APPROVED DRAINAGE SUBMITTALS FOR THE SURROUNDING AREA THAT ARE AFFECTED BY THIS PROPOSED DEVELOPMENT. THIS LIST MAY NOT BE INCLUSIVE, HOWEVER, REPRESENTS A SUMMARY OF THOSE PLANS AND DOCUMENTS WHICH ARE KNOWN TO THE ENGINEER AT THE TIME OF PLAN PREPARATION.

- LETTER OF MAP REVISION (LOWR) FOR THE LA CUEVA AND SOUTH EL CAMINO ARROYOS PREPARED FOR AMAFCA BY BOHANNAN-HUSTON, INC. APPROVED BY FEMA SEPTEMBER 11, 1998 (CASE NO. 98-06-660P). ONE OF THE RESULTS OF THIS LOWR WAS TO REVISE THE FLOODPLAIN ASSOCIATED WITH THE NORTH LA CUEVA ARROYO SHIFTING IT FARTHER TO THE NORTH AWAY FROM THIS SITE AS RESULT OF THE AMAFCA CONSTRUCTION OF THE LA CUEVA TRAINING DIKE ON THE NORTH SIDE OF EAGLE ROCK, WEST OF WYOMING BOULEVARD AND UPSTREAM OF THIS SITE.
- EAGLE ROCK ESTATES
- EAGLE ROCK SUBDIVISION UNITS 1 AND 2 CONCEPTUAL DRAINAGE MASTER PLAN BY RESOURCE TECHNOLOGY, INC. (RTI) DATED 06/12/97 (C18/D337)
- SUPPLEMENTAL INFORMATION FOR EAGLE ROCK ESTATES SUBDIVISION, UNIT 1 DATED 06/04/98, HYDROLOGY FILE (C18/D339)
- THE DRAINAGE MASTER PLAN OUTLINED REQUIREMENTS FOR DEVELOPMENT OF THE EAGLE ROCK ESTATES SUBDIVISIONS WHICH LIE TO THE WEST IMMEDIATELY DOWNSTREAM OF THE SUBJECT PROJECT. THIS PLAN ESTABLISHES A PRECEDENT TO USE INTERIM RETENTION PONDING PROGRAMMED TO OUTFALL TO THE FUTURE PERMANENT NORTH LA CUEVA ARROYO IMPROVEMENTS. THE SUPPLEMENTAL INFORMATION ADDRESSED THE CONSTRUCTION OF TEMPORARY SCOUR WALLS AND A SCOUR WALL TO PROTECT THE PORTIONS OF EAGLE ROCK ESTATES UNIT 1. CONSTRUCTED OUTSIDE OF THE MAPPED FLOODPLAIN, WITHIN THE EROSION SETBACK. THE PROJECT PHASING, INTERIM PONDING REQUIREMENT, AND SCOUR WALL DESIGN AND SUPPORTING CALCULATIONS ARE SIMILAR TO THOSE PRESENTED HEREIN FOR THIS PROJECT WHICH HAS SIMILAR REQUIREMENTS.
- GRADING AND DRAINAGE PLAN FOR EAGLE ROCK ESTATES UNIT 1 PREPARED BY MARK GOODWIN & ASSOCIATES DATED 08/04/98, HYDROLOGY FILE C19/D19. THIS IS THE GRADING AND DRAINAGE PLAN FOR THE EAGLE ROCK ESTATES UNIT 1 SUBDIVISION THAT LIES IMMEDIATELY WEST OF THE SUBJECT PROJECT. THIS PROJECT SETS A PRECEDENT WHEREBY TEMPORARY SCOUR WALL CONSTRUCTION ALLOWS DEVELOPMENT WITHIN THE EROSION SETBACK LIMIT OF THE NORTH LA CUEVA ARROYO. THE GRADING PLAN FOR THIS SITE WAS SUBSEQUENTLY CERTIFIED ON 12/28/98.
- NORTH ALBUQUERQUE ACRES MASTER DRAINAGE PLAN PREPARED BY RTI FOR THE CITY OF ALBUQUERQUE, REVISED DRAFT DATED 03/1998 AS REFERENCED HEREIN.
- LA CUEVA, EL CAMINO AND NORTH CAMINO DRAINAGE MANAGEMENT PLAN PREPARED BY RTI FOR AMAFCA, DRAFT DATED 03/1997 AS REFERENCED HEREIN.

EXISTING CONDITIONS

THE SITE IS UNDEVELOPED WITH THE EXCEPTION OF ONE EXISTING HOUSE AND AN EXISTING FOUNDATION. ALL RUNOFF GENERATED ONSITE DRAINS FROM SOUTHEAST TO NORTHWEST ONTO AMAFCA OWNED PROPERTY AND THE NORTH LA CUEVA ARROYO, AS SHOWN BY THE CALCULATIONS CONTAINED HEREON. THE EXISTING PEAK 100-YEAR FLOW RATE DISCHARGING TO THE ARROYO FROM THIS SITE IS 9.3 CFS. (BASIN "C") OFFSITE FLOWS ARE INCAPABLE OF ENTERING THE SITE FROM THE PARTIALLY DEVELOPED RESIDENTIAL SUBDIVISION TO THE WEST, OR FROM THE UNDEVELOPED AMAFCA OWNED LOTS TO THE NORTH, BECAUSE THESE LANDS TO THE WEST AND NORTH LIE TOPOGRAPHICALLY LOWER THAN THE SITE. OFFSITE FLOWS IN THE AMOUNT OF 15.1 CFS ENTER THE SITE FROM BASIN "B". THIS BASIN INCLUDES THE EXISTING PAVED STREET AS WELL AS UNDEVELOPED PROPERTY SOUTH OF EAGLE ROCK. THESE FLOWS CROSS THE STREET AND ENTER THE SITE AT A SUPERELEVATED PAVING SECTION. OFFSITE FLOWS IN THE AMOUNT OF 9.4 CFS ENTER THE NORTHEAST CORNER OF THE FROM BASIN "A", WHICH IS MOSTLY UNDEVELOPED, WITH THE EXCEPTION OF A SINGLE RESIDENTIAL HOME ON LOT 23. THESE OFFSITE FLOWS CURRENTLY ENTER THE NORTHEAST



CORNER OF THE SITE AND EXIT THE NORTH SIDE OF THE SITE BEFORE ENTERING THE NORTH LA CUEVA ARROYO. BASIN "B" DRAINS TO THE WEST WITHIN EAGLE ROCK AVENUE TO EXISTING RETENTION POND LOCATED WITHIN EAGLE ROCK ESTATES, UNIT 1. REVIEW OF BACKGROUND DOCUMENT C INDICATES THAT THE POND WAS NOT SIZED FOR UPSTREAM EXISTING FLOWS. THE NORTH LA CUEVA ARROYO IS NOT CHANNELIZED BETWEEN 1-25 AND WYOMING BOULEVARD. DOWNSTREAM OF 1-25, THE ARROYO IS CONFINED TO A CONCRETE-LINED CHANNEL WHICH OUTLETS TO THE AMAFCA NORTH DIVERSION CHANNEL. THE ARROYO IS ALSO CHANNELIZED UPSTREAM OF THE SITE BETWEEN WYOMING BOULEVARD AND BARSTOW STREET N.E. THE ARROYO RECEIVES RUNOFF FROM BOTH DEVELOPED AND UNDEVELOPED PROPERTIES. AS IDENTIFIED IN THE DRAFT COPY OF THE PROPOSED NORTH LA CUEVA SECTOR DEVELOPMENT PLAN, THE NORTH LA CUEVA ARROYO WILL ULTIMATELY BE CHANNELIZED BETWEEN 1-25 AND WYOMING BOULEVARD. ALTHOUGH THERE ARE NO CONSTRUCTION PLANS FOR CHANNEL CONSTRUCTION AT THIS TIME, DISCUSSIONS WITH CITY OF ALBUQUERQUE AND AMAFCA STAFF HAVE CONFIRMED THAT THIS CHANNEL WILL BE LINED IN THE FUTURE. AS INDICATED IN THE SUPPLEMENTAL INFORMATION FOR THE EAGLE ROCK ESTATES UNIT 1 SUBDIVISION (C18/D39) DATED 06/04/98 BY RTI, "BOTH THE CITY OF ALBUQUERQUE DRAFT NORTH ALBUQUERQUE ACRES MASTER DRAINAGE PLAN (NAA MDP) AND THE AMAFCA DRAFT LA CUEVA, EL CAMINO AND NORTH CAMINO ARROYOS DRAINAGE FACILITIES PLAN RECOMMEND CHANNELIZATION OF THIS ARROYO FROM WYOMING TO 1-25 IN THE FUTURE. NO SCHEDULE FOR THIS PROJECT HAS BEEN ESTABLISHED BUT WITH THE NUMBER OF STORM DRAINS, BOTH EXISTING AND PLANNED, THAT DISCHARGE TO THE ARROYO AT UPSTREAM LOCATIONS, IT IS REASONABLE TO EXPECT THAT THIS CHANNELIZATION OF THE ARROYO WILL BE COMPLETED WITHIN THE NEXT 10 TO 15 YEARS." ACCORDING TO THE NAA MDP, CHANNELIZATION OF THE ARROYO IS THIRD IN PRIORITY OUT OF THE 45 STORM DRAINAGE IMPROVEMENTS RECOMMENDED THEREIN. BASED UPON THESE OBSERVATIONS, THE EXISTING EAGLE ROCK ESTATES SUBDIVISIONS ARE PROGRAMMED TOWARDS ULTIMATE DISCHARGE TO THIS LINED CHANNEL AND HAVE CONSTRUCTED PUBLIC STORM DRAINS WITHIN LOUISIANA BOULEVARD AND EAGLE ROCK AVENUE WHICH WILL ULTIMATELY OUTLET TO THE IMPROVED CHANNEL. DUE TO THE MAGNITUDE OF FLOW IN THE ARROYO, AND THE FACT THAT THE ARROYO RECEIVES BOTH PUBLIC AND PRIVATE DRAINAGE, IT IS ANTICIPATED THAT THE ULTIMATE CHANNEL WILL BE CONSTRUCTED USING A MIXTURE OF PUBLIC AND PRIVATE FUNDS. AS INDICATED BY THE LOWR WITH EFFECTIVE DATE SEPTEMBER 11, 1998, THE BASE FLOOD IS CONTAINED WITHIN THE LIMITS SHOWN ON THE REVISED FIRM PANELS. THIS FLOOD REVISION REMOVED THE EXISTING SITE FROM ITS FORMER FLOODPLAIN DESIGNATION, SHIFTING IT FARTHER TO THE NORTH AWAY FROM THIS SITE. THE FLOW RATE USED IN THE LOWR FOR THE PARTICULAR REACH OF THE ARROYO IS 2.994 CFS. AS INDICATED IN THE SUPPLEMENTAL INFORMATION FOR THE EAGLE ROCK UNIT 1 SUBDIVISION (C18/D39) BY R.T.I., THE REACH OF THE NORTH LA CUEVA ARROYO ADJACENT TO THIS SITE (REACH 6A) IS DEGRADATIONAL BOTH FOR SHORT TERM AND CUMULATIVELY OVER A 30-YEAR PERIOD. BECAUSE THIS ARROYO IS DEGRADATIONAL, IT IS APPROPRIATE TO APPLY EROSION SETBACK METHODOLOGY FROM THE AMAFCA SEDIMENT AND EROSION DESIGN GUIDE.

DEVELOPED CONDITIONS

A. GENERAL

AS PREVIOUSLY DESCRIBED, THE PROPOSED IMPROVEMENTS CONSIST OF THE CONSTRUCTION OF A 40-LOT SINGLE FAMILY RESIDENTIAL SUBDIVISION WITH ASSOCIATED PUBLIC INFRASTRUCTURE. THE DRAINAGE OUTFALL FROM THIS SITE IS THE NORTH LA CUEVA ARROYO. THIS SITE LIES WITHIN BASIN 101 AS IDENTIFIED IN THE FOREMENTIONED EAGLE ROCK SUBDIVISION CONCEPTUAL DRAINAGE MASTER PLAN (DMP) PREPARED BY R.T.I., INC. AS SHOWN IN THAT PLAN, BASIN 101 CONTAINS 20 ACRES AND DRAINS TO EAGLE ROCK AVENUE N.E. WITH A DEVELOPED 100-YEAR PEAK FLOW RATE OF 78.1 CFS. THE DMP SHOWS THAT THE SITE TO BE INTRODUCED INTO A STORM DRAIN WITHIN EAGLE ROCK AVENUE N.E., THEN WEST TO A STORM DRAIN IN LOUISIANA BOULEVARD AND NORTH TO A FUTURE OUTFALL TO THE FUTURE LINED NORTH LA CUEVA ARROYO. THE PORTIONS OF STORM DRAIN WITHIN LOUISIANA BOULEVARD AND EAGLE ROCK AVENUE WHICH FRONT THE EXISTING EAGLE ROCK ESTATES SUBDIVISIONS WERE CONSTRUCTED IN ASSOCIATION WITH THOSE PROJECTS. THIS SUBDIVISION CURRENTLY UTILIZES INTERIM RETENTION PONDING ONSITE IN ADVANCE OF THE FUTURE CONDITION WHEREBY FREE DISCHARGE TO THE ARROYO WILL BE APPROPRIATE. AS MENTIONED, THE POND IS NOT SIZED FOR THIS RUNOFF. PORTIONS OF EAGLE ROCK ESTATES UNIT 1 LIE WITHIN THE EROSION SETBACK OF THE NORTH LA CUEVA ARROYO. EXISTING SPUR DIKES AND A SCOUR WALL PROTECT THESE PORTIONS OF THE SUBDIVISION FROM LATERAL ARROYO MIGRATION. THESE IMPROVEMENTS WERE CONSTRUCTED AS PART OF THE GRADING AND DRAINAGE IMPROVEMENTS FOR EAGLE ROCK ESTATES UNIT 1. THIS TYPE OF SCOUR WALL PROTECTION IS SIMILAR TO THAT PROPOSED HEREIN.

IT IS THE INTENT OF THIS DRAINAGE REPORT TO PROVIDE DETENTION PONDING TO LIMIT DISCHARGE FROM THIS SITE TO THE NORTH LA CUEVA ARROYO TO A RATE LESS THAN THE EXISTING DISCHARGE. THIS INTERIM DETENTION POND WILL BE PROGRAMMED TOWARD ULTIMATE FREE DISCHARGE TO THE FUTURE LINED ARROYO. ALTHOUGH THE EXISTING STORM DRAIN WITHIN EAGLE ROCK AVENUE IS SIZED FOR FUTURE FREE DISCHARGE FROM THIS SITE, AND IS THE DISCHARGE POINT DESIGNATED BY THE DMP, THE ULTIMATE OUTFALL TO THE ARROYO PROPOSED HEREIN IS TO THE NORTH DIRECTLY TO THE FUTURE LINED ARROYO. THIS DIRECT DISCHARGE WILL FACILITATE CONVERSION FROM INTERIM TO FUTURE CONDITIONS, WILL INCREASE DOWNSTREAM CAPACITY IN EAGLE ROCK AND LOUISIANA, AND WILL BETTER MATCH THE EXISTING AND PROPOSED SITE GRADING WHICH SLOPES TO THE NORTH.

B. ONSITE DRAINAGE

INTERNAL DRAINAGE GENERATED WITHIN THE SUBDIVISION WILL BE CONVEYED THROUGH A COMBINATION OF STREET FLOW AND STORM DRAIN FLOW. AS SHOWN ON THE GRADING PLAN, INTERNAL DRAINAGE FROM EACH LOT WILL BE DIRECTED TOWARDS THE FRONTING STREET WITH THE EXCEPTION OF LOTS 1-6 WHICH WILL REQUIRE BACKYARD DRAINAGE RUNDOWNS TO DRAIN THE BACKYARDS. THESE DRAINAGE RUNDOWNS WILL BE LOCATED WITHIN PRIVATE DRAINAGE EASEMENTS GRANTED VIA PLAT. THE MAINTENANCE OF THE RUNDOWNS WILL BE THE RESPONSIBILITY OF THE UNDERLYING PROPERTY OWNER. STREET FLOWS WILL TRAVEL FROM EAST TO WEST WITHIN EAGLE VIEW AVENUE N.E. TOWARDS A BATTERY OF STORM DRAIN INLETS LOCATED AT THE WEST END OF THE STREET (ANALYSIS POINT 1). AS SHOWN BY THE STORM INLET AND STREET CAPACITY ANALYSIS CALCULATIONS SHOWN HEREON, THE MAXIMUM 100-YEAR STREET DEPTH OF 0.34' WITHIN EAGLE VIEW AVENUE N.E. WILL PERMIT THE USE OF MOUNTABLE ROLL-TYPE CURB AND GUTTER WITHIN EAGLE VIEW AVENUE N.E. UPSTREAM OF THE STORM DRAIN INLETS. THE STORM DRAIN SYSTEM WILL OUTLET TO THE EAST TO A PROPOSED ONSITE DETENTION POND. THIS STORM DRAIN WILL ULTIMATELY EXTEND DIRECTLY TO THE FUTURE IMPROVED NORTH LA CUEVA CHANNEL.

THE STORM INLET AND STREET CAPACITY ANALYSIS CONTAINED HEREIN ANALYZES THE STREET FLOW DEPTHS AND STORM INLET ENTRANCE CONDITIONS FOR FULLY DEVELOPED CONDITIONS. THE STORM DRAIN TABLE SHOWN HEREON SUMMARIZES THE DIAMETER, SLOPE AND CAPACITIES OF ALL STORM DRAINS PROPOSED BY THIS PLAN. AS SHOWN BY THE STORM DRAIN TABLE AND THE STORM INLET STREET CAPACITY ANALYSIS, THE PROPOSED STORM DRAINAGE IMPROVEMENTS ARE SIZED TO ACCEPT AND CONVEY THE PROPOSED DEVELOPED DISCHARGE. THE STORM DRAINAGE FACILITIES PROPOSED HEREIN WITHIN THE SITE AND WITHIN EAGLE ROCK AVENUE N.E. WILL NOT REQUIRE MODIFICATIONS IN THE FUTURE CONDITION OFFSITE DRAINAGE.

AS PREVIOUSLY MENTIONED, THE EAGLE ROCK ESTATES SUBDIVISIONS (UNITS 1 AND 2) CONSTRUCTED A PUBLIC STORM DRAIN WITHIN EAGLE ROCK AVENUE. THIS STORM DRAIN WAS SIZED TO ACCEPT THE 76 CFS GENERATED BY BASIN 101 WHICH DRAINS TO EAGLE ROCK AVENUE. AS PREVIOUSLY MENTIONED, IT IS NOT THE INTENT OF THIS DEVELOPMENT TO DRAIN TO EAGLE ROCK AS PLANNED BY THE PREVIOUS DRAINAGE MASTER PLAN. THIS CHANGE IN OUTFALL RESULTS IN A DECREASE IN FULLY DEVELOPED FLOW TO EAGLE ROCK FROM 76 CFS TO 59.2 CFS. (PLEASE REFER TO THE STORM INLET ANALYSIS ON THIS SHEET, ANALYSIS POINT 3.) THE PEAK FLOW RATE IN EAGLE ROCK CONCENTRATING AT THE SOUTHWEST CORNER OF THIS SITE IS CALCULATED TO BE 59.2 CFS INCLUDING ALL OFFSITE AND UPSTREAM STREET FLOWS. THIS FLOW RATE ASSUMES FULL UPSTREAM DEVELOPMENT FREELY DISCHARGING TO EAGLE ROCK AS IDENTIFIED IN THE DRAINAGE MANAGEMENT PLAN, BUT EXCLUDING FLOWS FROM THE PROPOSED VISTA DEL AGUILA SUBDIVISION WHICH WILL INSTEAD BE ROUTED TO THE PROPOSED ARROYO. AS PART OF THE PROPOSED CONSTRUCTION, STORM INLETS WILL BE CONSTRUCTED ON THE NORTH SIDE OF EAGLE ROCK AVENUE CONCURRENT WITH PERMANENT PAVEMENT AND UTILITY IMPROVEMENTS. AS SHOWN BY THE STORM INLET ANALYSIS ON THIS SHEET, STREET FLOW CALCULATIONS AND INLET CALCULATIONS HAVE BEEN PERFORMED TO DEMONSTRATE THE ADEQUACY OF EAGLE ROCK AVENUE TO CONVEY THE PROPOSED FLOW RATE AND THE ADEQUACY OF THE INLETS AND STORM DRAIN SYSTEM TO ACCEPT AND CONVEY THE ULTIMATE FLOWS. CONSTRUCTION OF SIMILAR STORM

INLETS ON THE SOUTH SIDE OF EAGLE ROCK AVENUE SHALL BE CONSTRUCTED PERMANENTLY. THESE IMPROVEMENTS WILL BE REQUIRED BY THE CITY OF ALBUQUERQUE ON THE SOUTH SIDE OF EAGLE ROCK AVENUE. STORM DRAINS AND POND ARE DESIGNED TO ALSO ACCEPT EXISTING OFFSITE FLOWS FROM BASIN "B" AND DEVELOPED STREET FLOWS FROM BASIN "C". THIS SIZING WILL ALLOW FOR FUTURE UPSTREAM CONSTRUCTION OF THE NORTH HALF OF EAGLE ROCK AVENUE. ALTHOUGH THE STORM DRAIN IS SIZED FOR FULL UPSTREAM DEVELOPMENT, THE POND IS SIZED FOR THE PROPOSED SUBDIVISION, THE EAGLE ROCK STREET FLOWS, AND THE EXISTING OFFSITE FLOWS.

AS SHOWN BY THE OFFSITE BASIN MAP AND CALCULATIONS CONTAINED HEREON, OFFSITE FLOWS IN THE AMOUNT OF 9.4 CFS ENTER THE NORTHEAST CORNER OF THE SITE. THE CONTRIBUTING OFFSITE BASIN COMPRESSES PORTIONS OF LOTS 19-23, BLOCK 1, TRACT 2, UNIT 3, NORTH ALBUQUERQUE ACRES AND IS MOSTLY UNDEVELOPED, WITH THE EXCEPTION OF A SINGLE RESIDENTIAL HOME ON LOT 23. THESE OFFSITE FLOWS CURRENTLY ENTER THE NORTHEAST CORNER OF THE SITE AND EXIT THE NORTH SIDE OF THE SITE BEFORE ENTERING THE NORTH LA CUEVA ARROYO. THESE FLOWS WILL BE DIVERTED TO THE NORTH BY OFFSITE GRADING ON LOT 23 WITH THE PROPERTY OWNER'S WRITTEN PERMISSION. OFFSITE GRADING ON THE AMAFCA LOTS WILL ALSO BE REQUIRED TO CONVEY THESE FLOWS TO THE NORTH LA CUEVA ARROYO.

D. DETENTION POND

AS STATED ABOVE, DEVELOPMENT IN ADVANCE OF THE PERMANENT DOWNSTREAM CHANNEL IMPROVEMENTS WILL REQUIRE INTERIM DETENTION PONDING. THE INTERNAL STORM DRAIN SYSTEM PROPOSED HEREON WILL DISCHARGE TO THIS TEMPORARY DETENTION POND. THE POND WILL BE LOCATED IN A TEMPORARY DRAINAGE EASEMENT WITH AN AGREEMENT AND COVENANT BY THE DEVELOPER. THE POND OUTLET PIPE WILL BE CONSTRUCTED UNDER LICENSE AGREEMENT WITH AMAFCA. AS SHOWN BY THE DETENTION POND CALCULATIONS, THE DETENTION POND WILL REDUCE DISCHARGE FROM THIS SITE TO A PEAK RATE WHICH IS LESS THAN THAT OF THE EXISTING CONDITION. THIS RUNOFF WILL DISCHARGE DIRECTLY TO THE NORTH LA CUEVA ARROYO WHICH IS THE EXISTING OUTFALL FOR THIS SITE. AS SHOWN ON THE GRADING PLAN, THE EMERGENCY OVERFLOW IS TO THE NORTH LA CUEVA ARROYO. THE POND DOES NOT LIE WITHIN THE FLOODPLAIN LIMITS OF THE ARROYO, AND IS THEREFORE NOT ENDANGERED DURING A 100-YEAR FLOOD EVENT. THIS DETENTION POND WILL BE TEMPORARY UNTIL THE NORTH LA CUEVA ARROYO IS IMPROVED. UPON CONSTRUCTION OF THE FUTURE IMPROVEMENTS, THE STORM DRAIN FROM THE PROPOSED SUBDIVISION WILL BE EXTENDED DIRECTLY TO THE ARROYO.

THE POND IS SIZED TO ACCEPT DEVELOPED RUNOFF FROM THIS SUBDIVISION, DEVELOPED RUNOFF FROM PROPOSED AND FUTURE CONSTRUCTION OF THE NORTH HALF OF EAGLE ROCK AVENUE, AND IN THE INTERIM CONDITION, EXISTING RUNOFF FROM BASIN "B".

E. EROSION SETBACK AND SCOUR WALL

AS SHOWN ON THE GRADING PLAN, A PORTION OF THIS SITE LIES WITHIN THE EROSION SETBACK (ESB) ASSOCIATED WITH THE NORTH LA CUEVA ARROYO. THIS SETBACK HAS BEEN CALCULATED USING INFORMATION FROM THE APPROVED LOWR, AND WITH METHODOLOGY FROM THE AMAFCA SEDIMENT AND EROSION DESIGN GUIDE (PLEASE REFER TO THE ESB CALCULATIONS ON SHEET G4 OF THIS SUBMITTAL). AS DEMONSTRATED BY THE CALCULATIONS, IT IS APPROPRIATE THAT EROSION PROTECTION MEASURES BE CONSTRUCTED TO PROTECT THE PORTIONS OF THE SITE PROPOSED WITHIN THE EROSION SETBACK. THIS CONSTRUCTION WILL BE CONSISTENT WITH THAT FOR THE EAGLE ROCK ESTATES UNIT 1. THESE TEMPORARY EROSION CONTROL MEASURES WILL BE IN THE FORM OF A SCOUR WALL WHICH WILL PROTECT THE SITE FROM THE LATERAL MIGRATION AND EROSION OF THE ARROYO AND WILL NO LONGER BE NECESSARY WHEN THE NORTH LA CUEVA ARROYO IS CHANNELIZED. THE DESIGN AND SUPPORTING CALCULATIONS FOR THE SCOUR WALL ARE SHOWN ON SHEETS G4 AND G5 OF THIS SUBMITTAL. DUE TO THE INTERIM NATURE OF THE TEMPORARY IMPROVEMENTS, THE SCOUR CALCULATIONS WERE PERFORMED FOR THE DOMINANT FLOW RATE, NOT THE 100-YEAR RATE. USE OF THE DOMINANT FLOW RATE IS CONSISTENT WITH THE CALCULATIONS CONTAINED WITHIN THE SUPPLEMENTAL INFORMATION FOR THE EAGLE ROCK UNIT 1 SUBDIVISION, (C18/D39), DATED 06/04/98, BY R.T.I., INC. THE CONSTRUCTION OF A SCOUR WALL ON ONE SIDE OF THE ARROYO WILL NOT ADVERSELY IMPACT PROPERTIES ON THE NORTH SIDE OF THE ARROYO BECAUSE THE PROPOSED IMPROVEMENTS WILL NOT LIE WITHIN THE 100-YEAR FLOODPLAIN. AS INDICATED IN THE RTI ANALYSIS, "CONTROL POINTS ON ONE SIDE OF A CHANNEL, SO LONG AS THEY DO NOT IMPINGE ON THE FLOW AND DEFLECT THE RUNOFF TOWARDS THE OPPOSITE BANK, WOULD HAVE NO IMPACT ON THE EROSION SETBACK ON THE OPPOSITE BANK OTHER THAN TO CHANGE THE POSSIBLE LOCATION OF A FUTURE ARROYO MEANDER." THEREFORE, CONSTRUCTION OF INTERIM SCOUR WALL IMPROVEMENTS AS SHOWN HEREON WILL NOT ADVERSELY AFFECT DOWNSTREAM OR ADJACENT PROPERTIES.

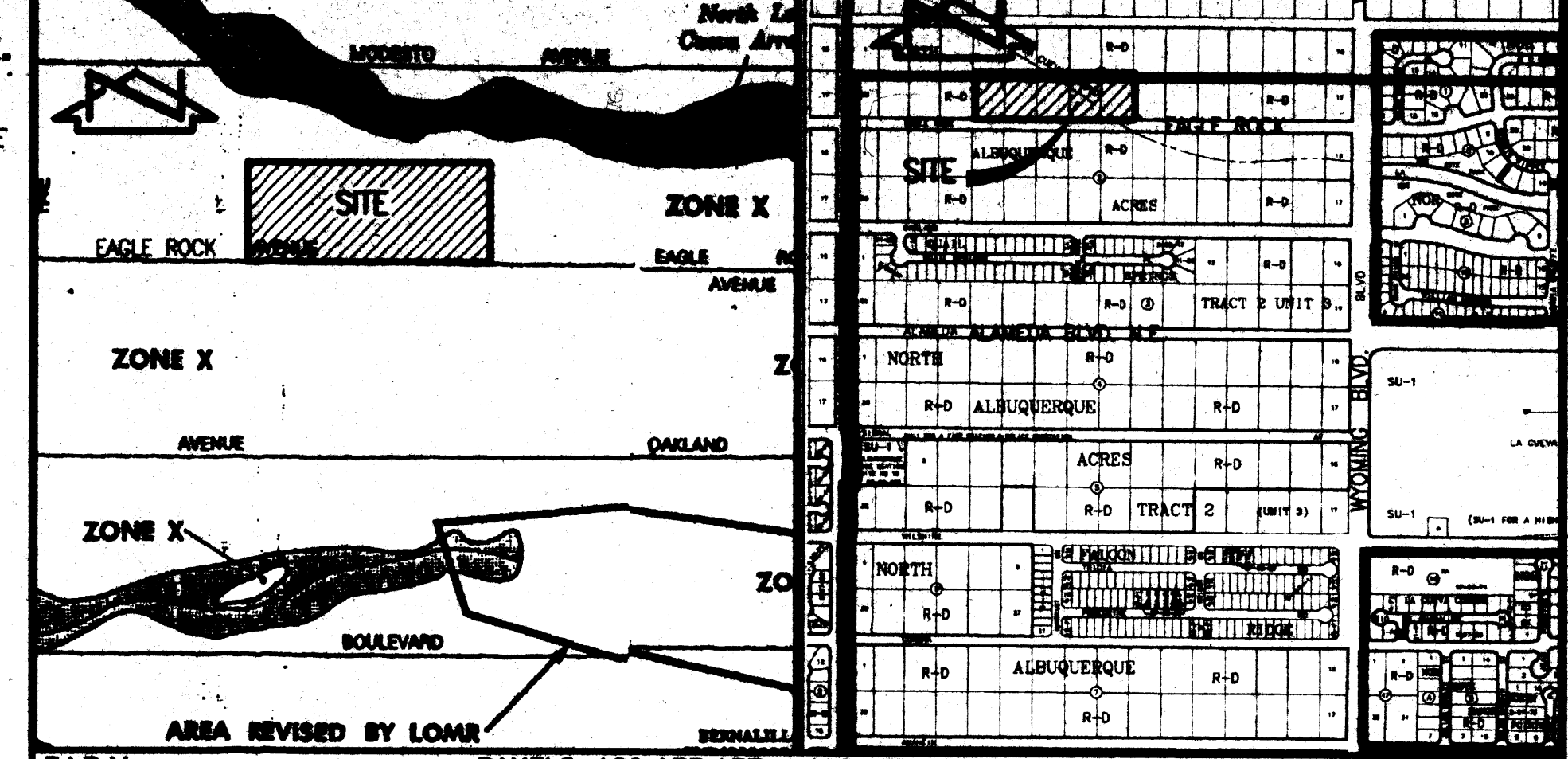
F. AMAFCA AGREEMENT

IT IS PROPOSED THAT THE SUBJECT DEVELOPER WILL ENTER INTO AN AGREEMENT WITH AMAFCA TO ALLOW CONSTRUCTION OF THE REQUIRED DETENTION POND ON THE AMAFCA OWNED PROPERTY TO THE NORTH OF THE SITE. BASED UPON PRELIMINARY DISCUSSIONS WITH AMAFCA STAFF, THIS AGREEMENT WILL REQUIRE APPROVAL OF THE AMAFCA BOARD OF DIRECTORS. THIS AGREEMENT WILL ALSO ADDRESS MINOR OFFSITE GRADING ON THE AMAFCA PROPERTIES, AND THE CONSTRUCTION OF TEMPORARY SCOUR WALL IMPROVEMENTS TO PROTECT PORTIONS OF THE SITE THAT LIE WITHIN THE EROSION SETBACK. AS DESCRIBED ABOVE, CONSTRUCTION WITHIN THE EROSION SETBACK LIMIT WILL REQUIRE TEMPORARY SCOUR WALL IMPROVEMENTS UNTIL THE PERMANENT CHANNEL IMPROVEMENTS ARE IN PLACE. BECAUSE IT IS REASONABLE TO EXPECT THAT THE PERMANENT IMPROVEMENTS WILL BE ACCOMPLISHED WITHIN THE NEXT 10 TO 15 YEARS, IT WOULD SEEM THAT THE EXPENSE ASSOCIATED WITH THE CONSTRUCTION OF THE TEMPORARY IMPROVEMENTS WOULD BE BETTER APPLIED TO THE ULTIMATE DRAINAGE SOLUTION FOR THE AREA. IT IS THE INTENT OF THIS DEVELOPMENT TO ENTER INTO AN AGREEMENT WITH AMAFCA TO NOT ONLY ALLOW INTERIM DETENTION POND AND OFFSITE GRADING, BUT TO ALSO ADDRESS THE INTERIM NATURE AND COST ASSOCIATED WITH THE PROPOSED SCOUR WALL. IT IS HEREBY PROPOSED THAT THE ESTIMATED COST OF THE REQUIRED SCOUR WALL BE INSTEAD CONTRIBUTED TO AMAFCA TOWARDS THE ULTIMATE CONSTRUCTION OF THE FUTURE CHANNEL. IN EXCHANGE FOR THIS CONTRIBUTION, THE DEVELOPER WILL REQUEST THAT AMAFCA ALLOW THE FOREMENTIONED DETENTION POND AND OFFSITE GRADING, MAINTAIN THE DETENTION POND, AND TO MAINTAIN THE EXISTING FLOW PATH OF THE NORTH LA CUEVA ARROYO AS REQUIRED THEREBY EFFECTIVELY REDUCING OR ELIMINATING THE EROSION SETBACK LIMIT. THIS AGREEMENT WILL REQUIRE AMAFCA STAFF AND BOARD OF DIRECTORS APPROVAL. A SIMILAR AGREEMENT WAS ENTERED INTO BETWEEN CURB, INC. AND AMAFCA FOR CONSTRUCTION WITHIN THE EROSION SETBACK LIMIT ALONG THE CALABACILLAS ARROYO.

BECAUSE THE CALCULATED EROSION SETBACK LIMIT IS BASED UPON A 100-YEAR STORM AND 30 YEARS OF MORE FREQUENT EVENTS, THE SITE DOES NOT APPEAR TO BE IN DANGER FROM EROSION WITHIN THE PROJECTED 10 TO 15 YEAR INTERIM TIMEFRAME. IT HAS ALREADY BEEN DEMONSTRATED BY THE LOWR THAT THE 100-YEAR STORM WILL BE CONTAINED WITHIN THE FLOODPLAIN LIMITS. AS PART OF THE FOREMENTIONED AGREEMENT, IT IS PROPOSED HEREIN THAT AMAFCA WILL PERIODICALLY MONITOR THE EXISTING ARROYO TO ENSURE THAT SIGNIFICANT LATERAL MIGRATION IS NOT OCCURRING WHICH WOULD THREATEN THE PROPOSED SUBDIVISION. IN THE CASE THAT SIGNIFICANT LATERAL MIGRATION IS OBSERVED, IT IS REQUESTED THAT AMAFCA PERFORM INTERIM GRADING IN ORDER TO RESTORE THE APPROXIMATE CURRENT FLOW PATH OF THE ARROYO. A COPY OF THIS PROPOSED AGREEMENT IS SUBMITTED WITH THIS GRADING AND DRAINAGE PLAN. IN THE EVENT THAT THIS AGREEMENT IS NOT REACHED, HOWEVER, THE CONSTRUCTION OF THE PROPOSED SCOUR WALL WILL BE PERFORMED IN CONJUNCTION WITH THIS DEVELOPMENT, THEREBY ALLOWING THE PROPOSED DEVELOPMENT. WHILE THE COST TO THE DEVELOPER WILL BE THE SAME IN EITHER CASE, THE USE OF THESE FUNDS FOR THE ULTIMATE SOLUTION IS PREFERRED TO THE CONSTRUCTION OF INTERIM "THROW-AWAY" DRAINAGE MEASURES.

G. FUTURE

IN THE ULTIMATE (FUTURE) CONDITION, THE NORTH LA CUEVA ARROYO WILL BE CONSTRUCTED AS A HARD-LINED PUBLIC DRAINAGE CHANNEL. AS IS CONSISTENT WITH NEW PUBLIC DRAINAGE CHANNEL CONSTRUCTION, THIS CHANNEL WILL BE SIZED FOR FREE DISCHARGE FROM THE CONTRIBUTING DRAINAGE BASIN. THIS CHANNEL WILL CURRENTLY BE CONSTRUCTED, OWNED OPERATED AND MAINTAINED BY AMAFCA. CONCURRENT WITH CHANNEL CONSTRUCTION, THE STORM DRAIN WHICH OUTLETS TO THE DETENTION POND IN THE INTERIM CONDITION SHALL BE EXTENDED DIRECTLY INTO THE NEW CHANNEL. THIS CONNECTION SHOULD BE COMPLETED IN CONJUNCTION WITH THE FUTURE CHANNEL IMPROVEMENTS. THIS DIRECT CHANNEL



F.I.R.M.

SCALE: 1" = 500'

PANELS 129,133,137

AND 141 OF 841

VICINITY MAP

SCALE: 1" = 750'

LEGAL DESCRIPTION

LOTS 24 THRU 28, BLOCK 1, TRACT 2, UNIT 3, NORTH ALBUQUERQUE ACRES, ALBUQUERQUE, NEW MEXICO, AS THE SAME IS SHOWN AND DESIGNATED ON THE PLAT OF TRACT 1, UNIT 3, NORTH ALBUQUERQUE ACRES FILED IN THE OFFICE OF THE COUNTY CLERK OF BERNALILLO COUNTY, NEW MEXICO ON SEPTEMBER 10, 1931, BOOK D1, PAGE 20.



CONNECTION WILL ELIMINATE THE NEED FOR THE INTERIM DETENTION POND. ALSO CONCURRENT WITH CHANNEL CONSTRUCTION, THIS POND SHOULD BE FILLED AND REGRADED. THE RESPONSIBILITIES FOR PROVIDING THE FUTURE STORM DRAIN CONNECTION WILL LIE WITH THE DEVELOPER OF THIS PROJECT, AND WILL BE FINANCIALLY GUARANTEED. THE ELIMINATION OF THE INTERIM DETENTION POND, AND THE CONVERSION TO FREE DISCHARGE TO THE FUTURE IMPROVED CHANNEL WILL BE THE ONLY CHANGE IN THE DRAINAGE CONDITIONS FOR THE SITE IN THE FUTURE CONDITION. ALL OTHER DRAINAGE IMPROVEMENTS WITHIN THE SUBDIVISION AND EAGLE ROCK AVENUE WILL REMAIN UNCHANGED IN THE FUTURE CONDITION.

VII. GRADING PLAN

THE GRADING PLAN SHOWS: 1) EXISTING GRADES INDICATED BY SPOT ELEVATIONS AND CONTOURS AT 1'0" INTERVALS AS TAKEN FROM THE TOPOGRAPHIC SURVEY PREPARED BY JEFF NORTENSEN & ASSOCIATES, INC. DATED 03/18/99 AND UPDATED 04/28/99, 2) PROPOSED GRADES INDICATED BY SPOT ELEVATIONS AND CONTOURS AT 1'0" INTERVALS, 3) THE LIMIT AND CHARACTER OF THE EXISTING IMPROVEMENTS, 4) THE LIMIT AND CHARACTER OF THE PROPOSED IMPROVEMENTS, 5) CONTINUITY BETWEEN EXISTING AND PROPOSED GRADES, 6) THE REVISED FLOODPLAIN LIMITS, 7) EROSION SETBACK LIMITS, AND 8) THE LIMITS OF SCOUR WALL CONSTRUCTION.

VIII. CALCULATIONS

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 2201 OF THE 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. THERE WILL BE AN INCREASE IN THE PEAK RATE AND VOLUME OF RUNOFF GENERATED BY THIS SITE DURING THE 100-YEAR RAINFALL EVENT. PROPOSED STREET AND STORM DRAIN IMPROVEMENTS ARE SIZED TO ACCEPT AND CONVEY THIS PEAK DEVELOPED RATE OF RUNOFF AND CONVEY IT TO A DETENTION POND IN THE INTERIM CONDITION, AND DIRECTLY TO A PUBLIC LINED CHANNEL IN THE FUTURE CONDITION. AS SHOWN BY THE HYDROGRAPHIC CALCULATIONS, THE INTERIM DETENTION POND WILL REDUCE THE PEAK RATE OF RUNOFF FROM THIS SITE AS COMPARED TO THE EXISTING CONDITIONS. STREET CAPACITY CALCULATIONS SHOWN HEREIN WERE PERFORMED USING THE HASTADT METHODS FLOWMASTER VERSION 6.0 PROGRAM. STORM INLET CAPACITIES WERE GRAPHICALLY DETERMINED USING CITY OF ALBUQUERQUE DPM PLATE 22.3, D-5. STORM DRAIN HYDRAULICS WERE CALCULATED USING MANNING'S EQUATION FOR OPEN CHANNEL FLOW WITH A MANNING'S 'N' VALUE OF 0.013. AS SHOWN BY THE STREET CAPACITY STORM INLET AND STORM DRAIN CALCULATIONS, THE PROPOSED IMPROVEMENTS ARE SIZED TO CONVEY THE FULLY DEVELOPED FLOWS FROM THIS SITE.

IX. CONCLUSION

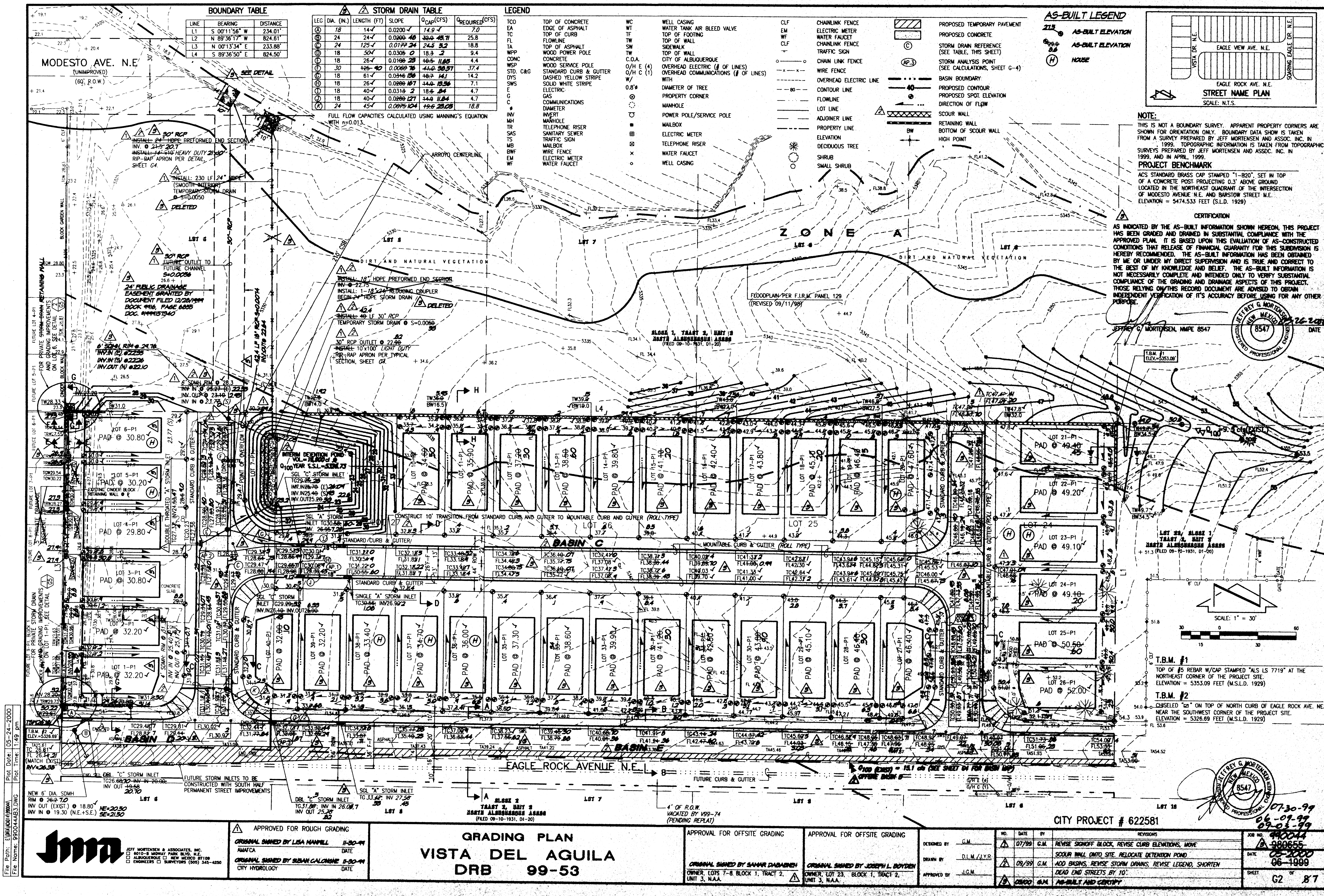
DEVELOPED RUNOFF FROM THIS SITE WILL DRAIN TO AN INTERIM DETENTION POND UNTIL SUCH TIME AS PERMANENT DOWNSTREAM IMPROVEMENTS ARE IN PLACE. ALL RUNOFF GENERATED ONSITE WILL BE CONVEYED TO THIS POND THROUGH PUBLIC STREETS AND PUBLIC STORM DRAINS CONSTRUCTED AS PART OF THIS PROJECT. EXISTING OFFSITE FLOWS FROM BASIN "B" AND DEVELOPED EAGLE ROCK AVENUE STREET FLOWS WILL ALSO BE ROUTED THROUGH THIS POND. OFFSITE FLOWS FROM THE EAST WILL BE ROUTED AROUND THE SITE TO THEIR EXISTING DISCHARGE POINT. THIS ROUTING WILL BE ACCOMPLISHED THROUGH UPSTREAM OFFSITE GRADING WITH THE PERMISSION OF THE UNDERLYING PROPERTY OWNERS. OFFSITE GRADING WILL BE PERFORMED ON LOTS OWNED BY AMAFCA, AND ON LOTS 8, 9, AND 23, BLOCK 1, TRACT 2, UNIT 3, NORTH ALBUQUERQUE ACRES WHICH IS PRIVATELY OWNED. BECAUSE THE BASIN "A" FLOWS ARE GENERATED BY LOCAL DRAINAGE CONTAINED WITHIN THE BLOCK AMOUNTING TO A PEAK RATE OF 9.3 CFS, A DRAINAGE EASEMENT WILL NOT BE REQUIRED FOR THESE OFFSITE FLOWS. PRIVATE DRAINAGE EASEMENTS WILL BE REQUIRED WITHIN THE BACKYARDS OF LOTS 1, 4, 5 AND 6 IN ORDER TO CONVEY BACKYARD DRAINAGE TO PUBLIC RIGHTS-OF-WAY OR PUBLIC DRAINAGE EASEMENTS. THESE PRIVATE DRAINAGE EASEMENTS WILL BE GRANTED VIA PLAT. PERMANENT STORM DRAIN IMPROVEMENTS WILL BE ENTERED WITHIN EAGLE ROCK AVENUE N.E. WHICH ARE SIZED TO ACCEPT THE FULLY DEVELOPED 100-YEAR PEAK DISCHARGE RATE ASSUMING FULL UPSTREAM DEVELOPMENT DRAINING TO EAGLE ROCK AVENUE AS IDENTIFIED IN THE DRAINAGE MASTER PLAN FOR THIS SITE. PREPARED BY R.T.I. THE PROPOSED INTERIM DETENTION POND WILL BE CONSTRUCTED ONSITE. THIS POND WILL BE MAINTAINED BY THE DEVELOPER.

A PROPOSED AGREEMENT BETWEEN THE DEVELOPER OF THIS PROPERTY AND AMAFCA WILL ADDRESS AMAFCA MAINTENANCE OF THE CURRENT FLOW PATH OF THE NORTH LA CUEVA ARROYO SUCH THAT THIS SUBDIVISION IS NOT ENDANGERED BY LATERAL MIGRATION AND EROSION OF THE ARROYO. POND CONSTRUCTION, MAINTENANCE AND THIS ARROYO MAINTENANCE WILL BE ADDRESSED PURSUANT TO THE FOREMENTIONED AGREEMENT. AS PART OF THIS AGREEMENT, THE DEVELOPER OF THIS SUBDIVISION WILL PROVIDE TO AMAFCA A CASH PAYMENT EQUAL TO THE EQUIVALENT AMOUNT OF A TEMPORARY "THROW-AWAY" SCOUR WALL WHICH WOULD HAVE ALLOWED THIS DEVELOPMENT, YET WOULD NOT CONTRIBUTE FUNDS TO THE ULTIMATE DRAINAGE SOLUTION. BECAUSE THE DETENTION POND WILL BE MAINTAINED BY AMAFCA AND LOCATED ON AMAFCA PROPERTY, A DRAINAGE EASEMENT AND COVENANT TO THE CITY OF ALBUQUERQUE IS NOT APPROPRIATE. THIS CASE MAINTENANCE OF ALL STORM DRAINS WITHIN PUBLIC CITY OF ALBUQUERQUE RIGHT-OF-WAY WILL BE BY THE CITY OF ALBUQUERQUE. THERE ARE NO DPM VARIANCES OR PUBLIC DRAINAGE EASEMENTS REQUIRED BY THIS PROPOSAL EXCEPT AS SET FORTH ABOVE. A TEMPORARY PUBLIC DRAINAGE EASEMENT AND AGREEMENT AND COVENANT WILL BE REQUIRED FOR THE DETENTION POND.



CONNECTION WILL ELIMINATE THE NEED FOR THE INTERIM DETENTION POND. ALSO CONCURRENT WITH CHANNEL CONSTRUCTION, THIS POND SHOULD BE FILLED AND REGRADED. THE RESPONSIBILITIES FOR PROVIDING THE FUTURE STORM DRAIN CONNECTION WILL LIE WITH THE DEVELOPER OF THIS PROJECT, AND WILL BE FINANCIALLY GUARANTEED. THE ELIMINATION OF THE INTERIM DETENTION POND, AND THE CONVERSION TO FREE DISCHARGE TO THE FUTURE IMPROVED CHANNEL WILL BE THE ONLY CHANGE IN THE DRAINAGE CONDITIONS FOR THE SITE IN THE FUTURE CONDITION. ALL OTHER DRAINAGE IMPROVEMENTS WITHIN THE SUBDIVISION AND EAGLE ROCK AVENUE WILL REMAIN UNCHANGED IN THE FUTURE CONDITION.

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6010-B MIDWAY PARK BLVD., N.E.
ALBUQUERQUE, NM 87109
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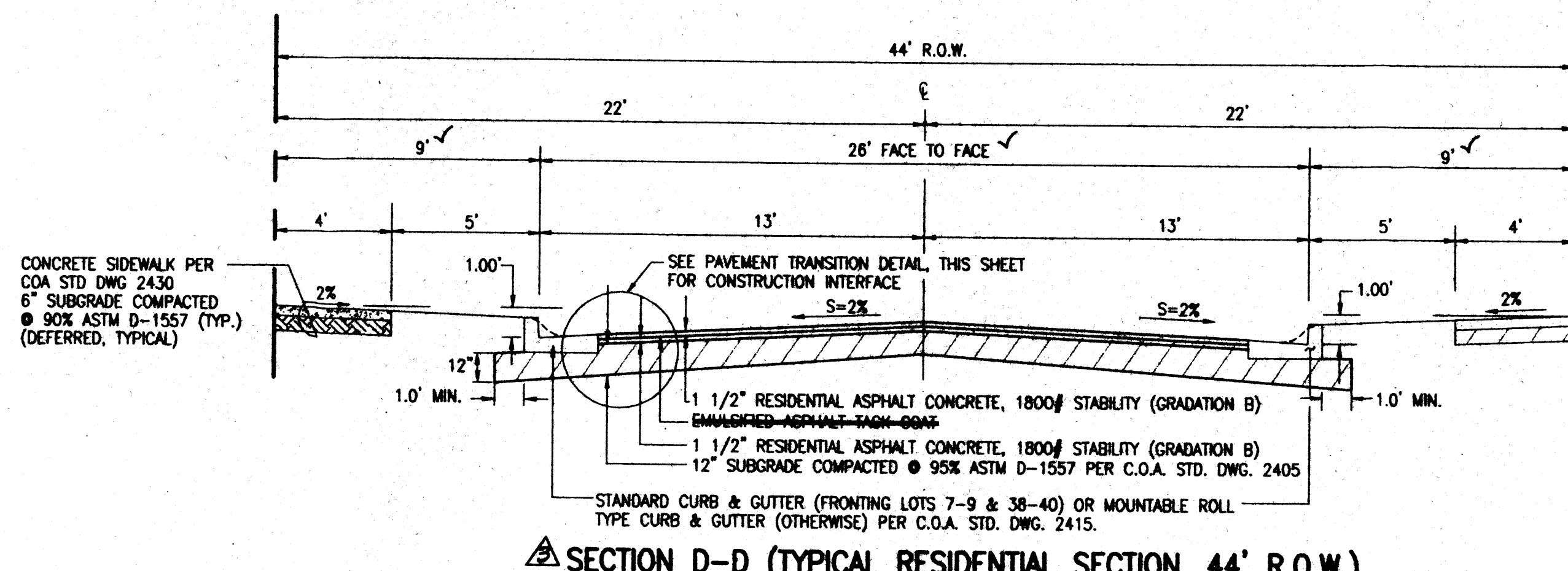
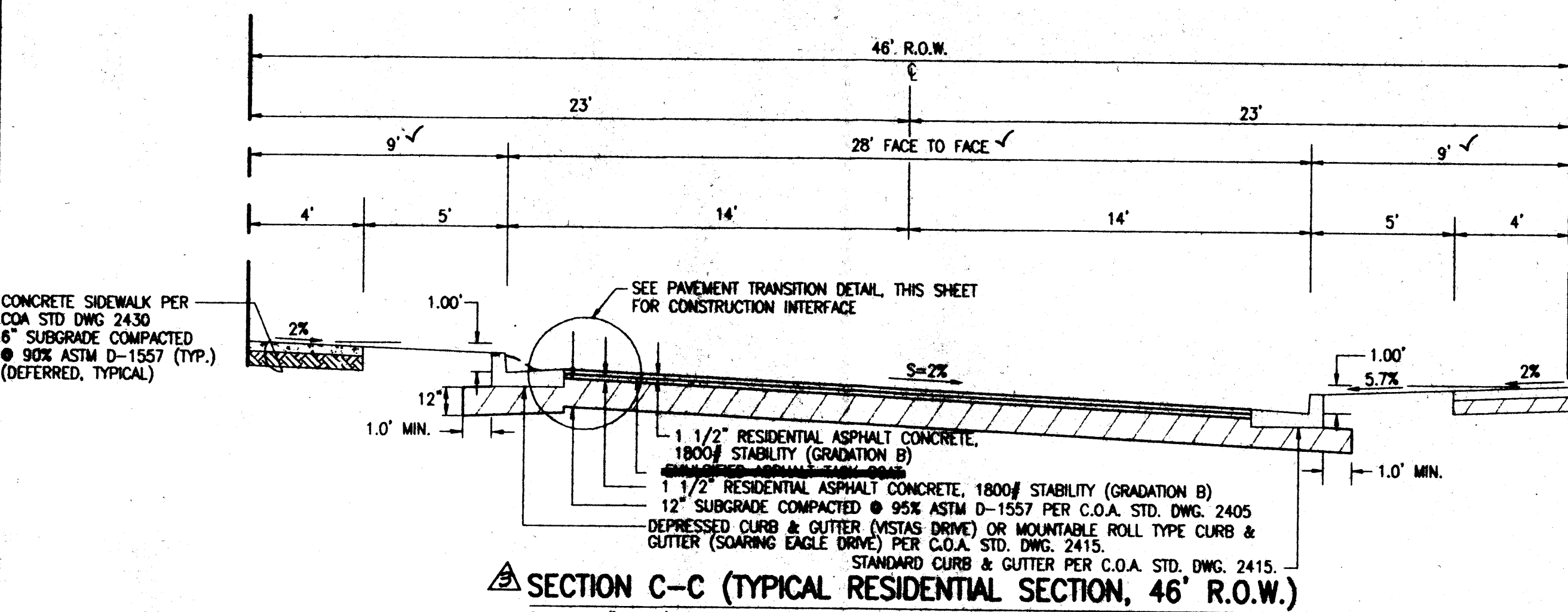
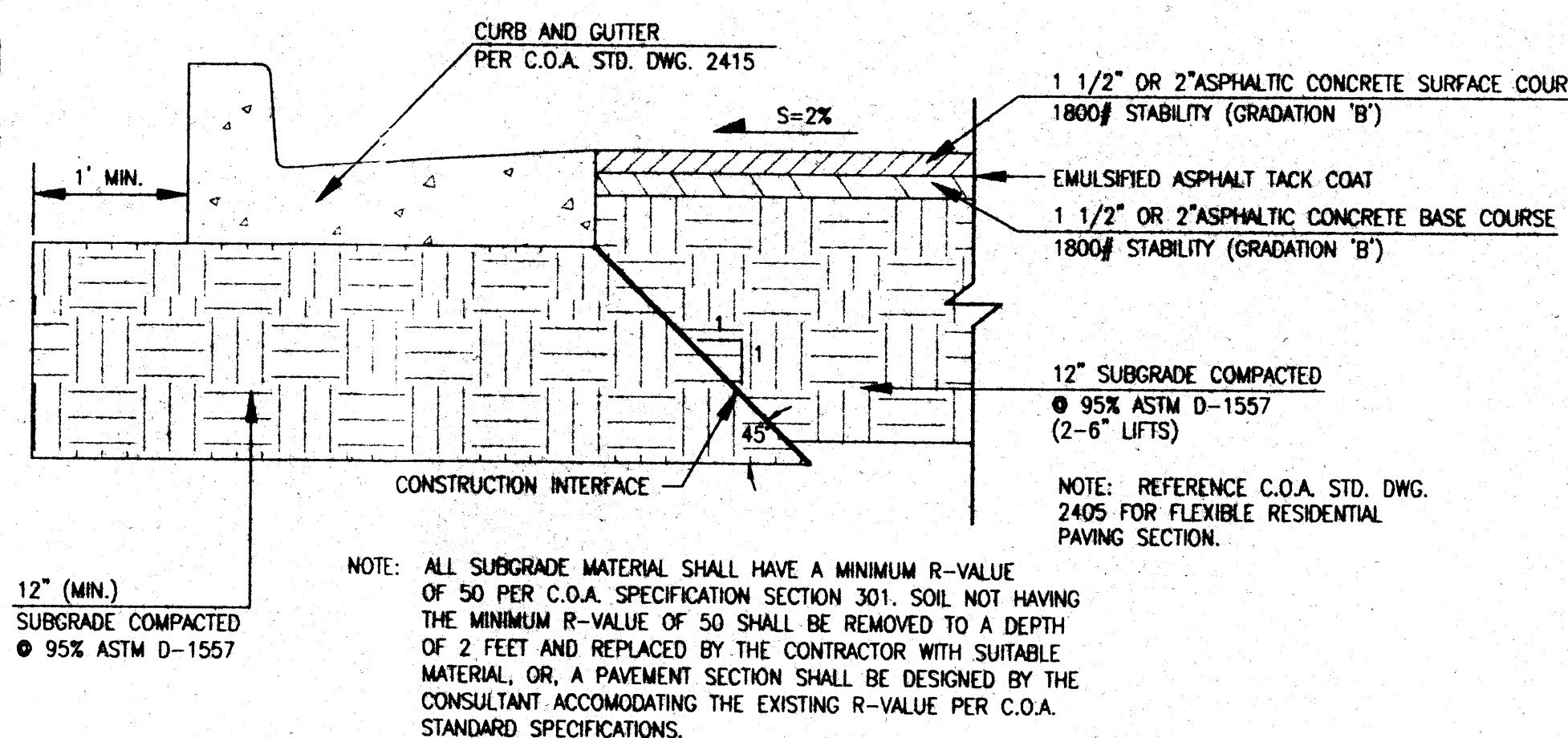
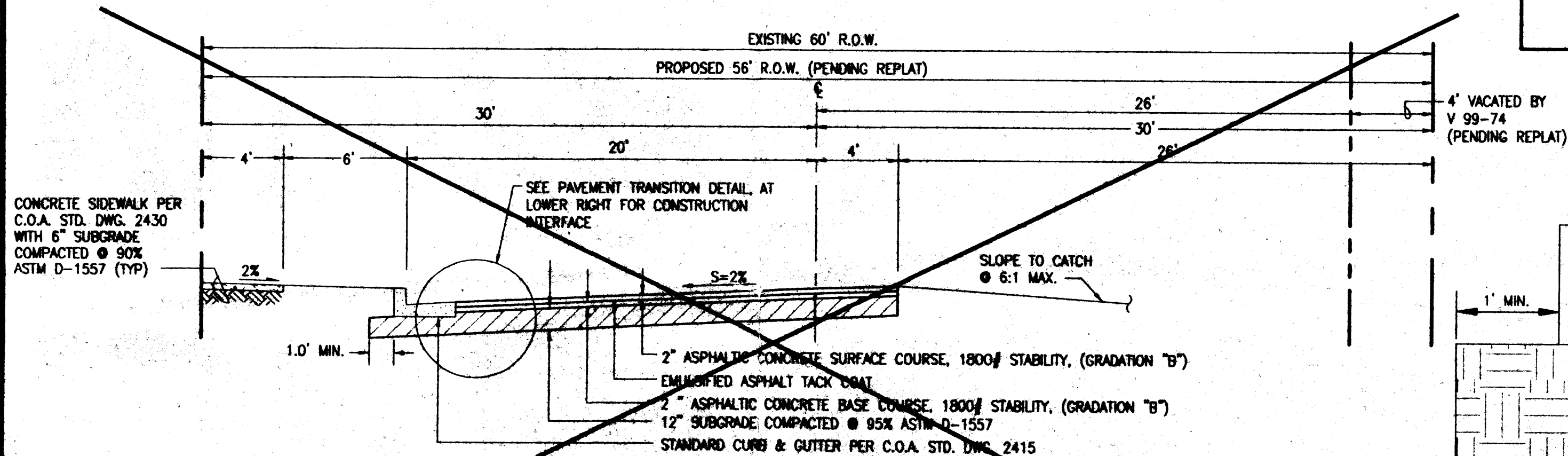
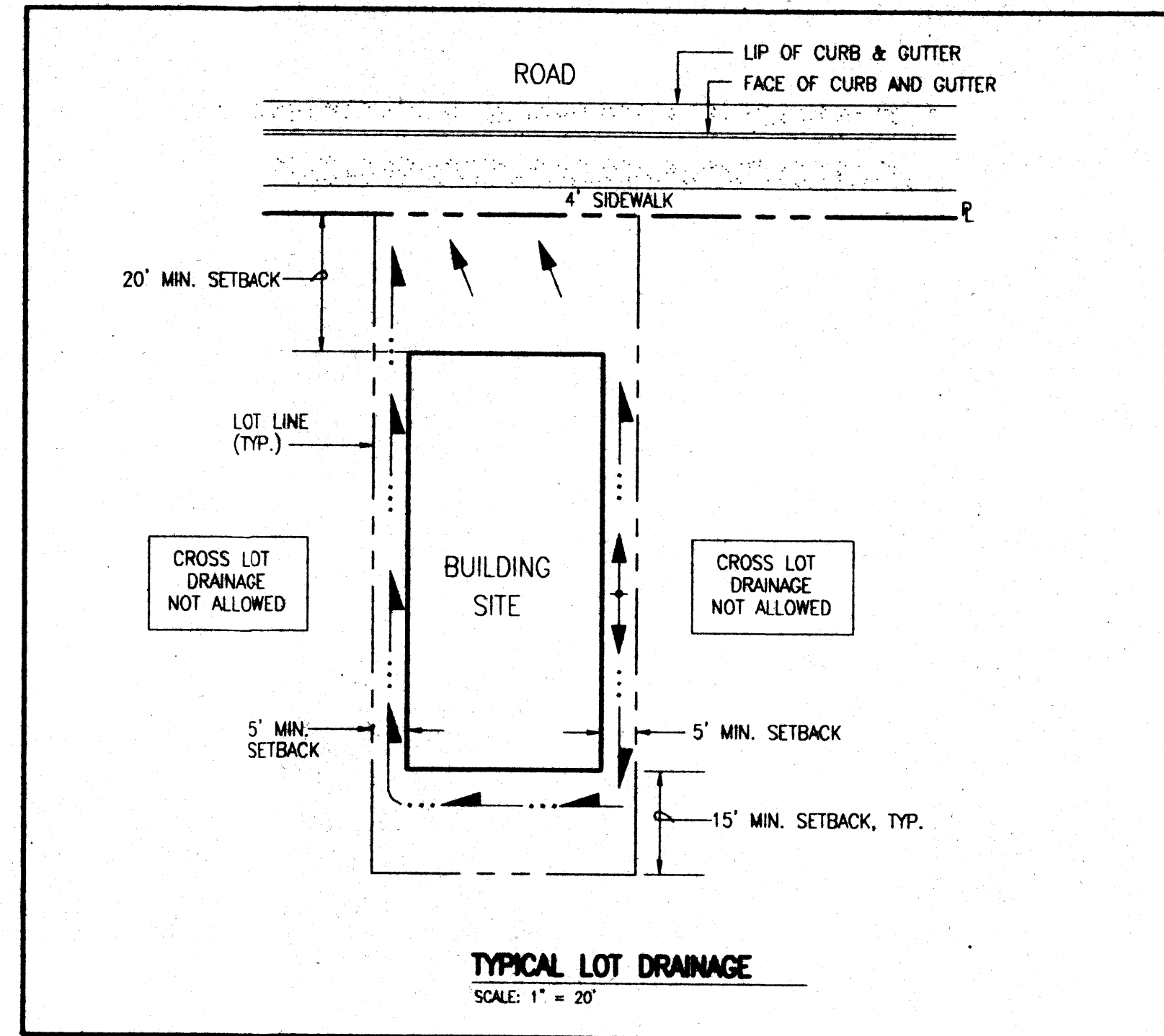
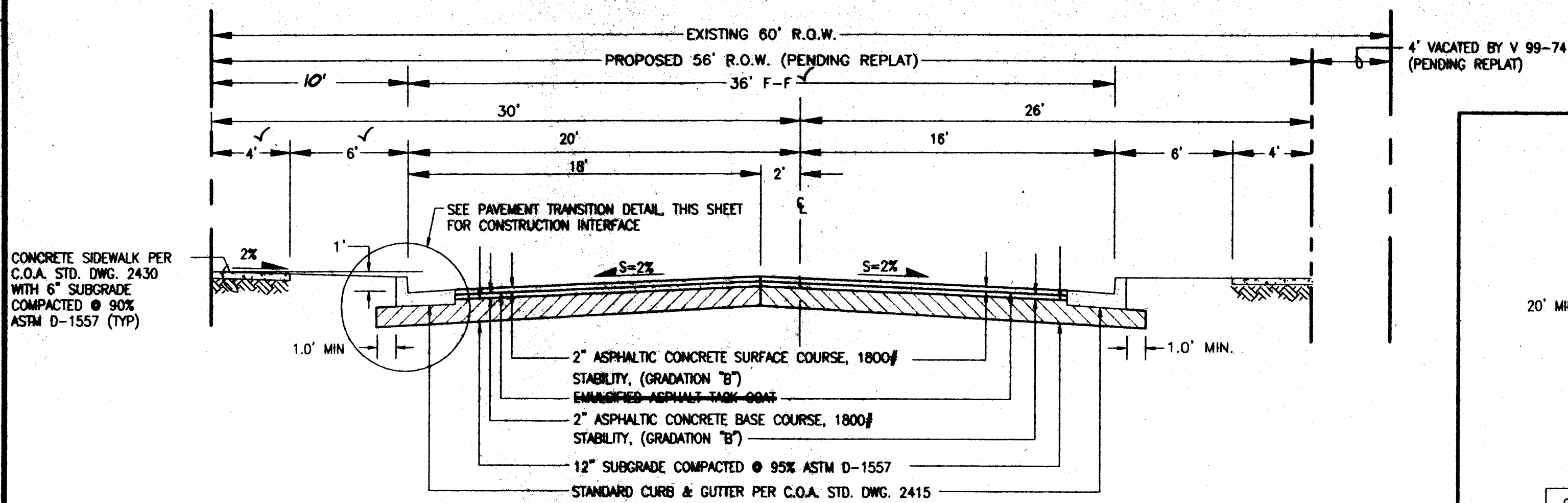
APPROVED FOR ROUGH GRADING
ORIGINAL SIGNED BY LISA MAVILL 11-30-99
DATE
ORIGINAL SIGNED BY SUSAN CALZONE 11-30-99
DATE
CHY HYDROLOGY

GRADING PLAN VISTA DEL AGUILA DRB 99-53

APPROVAL FOR OFFSITE GRADING
ORIGINAL SIGNED BY SAMIR DABABISH
OWNER, LOTS 7-8 BLOCK 1, TRACT 2,
UNIT 3, N.A.A.

APPROVAL FOR OFFSITE GRADING
ORIGINAL SIGNED BY JOSEPH L. BOYDEN
OWNER, LOT 23, BLOCK 1, TRACT 2,
UNIT 3, N.A.A.

DESIGNED BY	G.M.	NO.	07/99	DATE	07/99	BY	G.M.	REVISIONS	REVISION 1: REVISE SIGNOFF BLOCK, REVISE CURB ELEVATIONS, MOVE SCOUR WALL ONTO SITE, RELOCATE DETENTION POND.	JOB NO.	990444
DRAWN BY	D.L.M./J.Y.R.	DATE	08/99	BY	G.M.	REVISIONS	REVISION 2: ADD BASINS, REVISE STORM DRAINS, REVISE LEGEND, SHORTEN DEAD END STREETS BY 10'.	DATE	08-1999	SHEET	87
APPROVED BY	J.G.M.	DATE	08/99	BY	G.M.	REVISIONS	REVISION 3: AS-BUILT AND CERTIFY	DATE	08-1999	SHEET	87



- GENERAL NOTES:
- ALL WORK DETAILED ON THESE PLANS TO BE PERFORMED UNDER CONTRACT SHALL, EXCEPT AS OTHERWISE STATED OR PROVIDED FOR HEREON, BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ALBUQUERQUE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - 1986, UPDATE 6.
 - TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT NEW MEXICO ONE CALL SYSTEM, 260-1990 FOR LOCATION OF EXISTING UTILITIES.
 - 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.
 - SHOULD A CONFLICT EXIST BETWEEN THESE PLANS AND ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER IN WRITING SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY FOR ALL PARTIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL INTERPRETATIONS IT MAKES WITHOUT FIRST CONTACTING THE ENGINEER AS REQUIRED ABOVE.
 - THE CONTRACTOR SHALL MAINTAIN ACCESS TO ADJACENT PROPERTIES DURING CONSTRUCTION.
 - ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING SAFETY AND HEALTH.
 - THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY.
 - THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.
 - THE CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" PRIOR TO BEGINNING CONSTRUCTION. AN EXCAVATION PERMIT IS REQUIRED FOR ALL WORK WITHIN PUBLIC RIGHT-OF-WAY.
 - A DISPOSAL SITE FOR ALL EXCESS EXCAVATION MATERIAL (CONTAMINATED OR OTHERWISE), ASPHALTIC PAVING, CONCRETE PAVING, ETC. SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE REGULATIONS. ALL COSTS INCURRED IN OBTAINING A DISPOSAL SITE AND IN HAUL THERETO SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION, THEREFORE, NO SEPARATE PAYMENT SHALL BE MADE.
 - A BORROW SITE FOR IMPORT MATERIAL SHALL BE OBTAINED BY THE CONTRACTOR IN COMPLIANCE WITH APPLICABLE REGULATIONS. ALL COSTS INCURRED IN OBTAINING A BORROW SITE AND IN HAUL THERETO SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION, THEREFORE, NO SEPARATE PAYMENT SHALL BE MADE.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFELY OBTAINING THE REQUIRED COMPACTION. THE CONTRACTOR SHALL SELECT AND USE METHODS WHICH SHALL NOT BE INJURIOUS OR DAMAGING TO THE EXISTING FACILITIES AND STRUCTURES WHICH SURROUND THE WORK AREAS.
 - THE CONTRACTOR SHALL CONFINE HIS WORK WITHIN THE CONSTRUCTION LIMITS IN ORDER TO PRESERVE THE EXISTING IMPROVEMENTS AND SO AS NOT TO INTERFERE WITH THE OPERATIONS OF THE EXISTING FACILITIES.
 - ALL DIMENSIONS AND RADI OF CURB, CURB RETURNS, AND WALLS ARE SHOWN TO THE FACE OF CURB AND/OR WALL.
 - 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.
 - ALL FILL SHALL BE FREE FROM VEGETATION, DEBRIS, AND OTHER DELETERIOUS MATERIALS.
 - ALL FILL SHALL BE COMPACTED TO A MINIMUM OF 90% ASTM D-1557 UNLESS A GREATER COMPACTION REQUIREMENT IS OTHERWISE SPECIFIED. ALL EARTHWORK FOR BUILDING PADS SHALL BE PERFORMED IN ACCORDANCE WITH THE STRUCTURAL AND GEOTECHNICAL SPECIFICATIONS.
 - ALL EXISTING UTILITIES ENCOUNTERED WITHIN THE WORK LIMITS SHALL BE ADJUSTED TO GRADE AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
 - THE PAD ELEVATIONS SHOWN HEREON ARE FOR ROUGH GRADING PURPOSES.
 - FINISHED FLOOR ELEVATIONS MAY VARY FROM THE PAD ELEVATIONS AND WILL BE DETERMINED AS A FUNCTION OF INDIVIDUAL HOUSE DESIGN.
 - FINISHED FLOOR ELEVATIONS SHOULD BE ESTABLISHED AT A MINIMUM OF SIX INCHES ABOVE PAD ELEVATIONS; DEVIATIONS FROM THESE GUIDELINES MUST BE BASED ON THE RECOMMENDATIONS AND/OR DESIGN OF A COMPETENT DESIGN PROFESSIONAL.
 - CROSS-LOT DRAINAGE WILL NOT BE PERMITTED, EXCEPT ON LOTS 1-P1 THROUGH 6-P1 AS SHOWN ON THE GRADING PLAN WITHIN PRIVATE DRAINAGE EASEMENTS.
 - RETAINING WALLS SHALL BE CONSTRUCTED BY THE DEVELOPER.
 - YARD (GARDEN) WALLS SHALL BE CONSTRUCTED BY THE LOT OWNER OR ITS BUILDER.
 - THE FINISHED GRADING OF EACH LOT SHALL BE ACCOMPLISHED BY THE LOT OWNER OR ITS BUILDER. RUNOFF SHOULD BE DIRECTED TO THE STREETS.
 - MAXIMUM UNPROTECTED SLOPES SHALL BE 3:1; MINIMUM SLOPES SHALL BE 1%.

CERTIFICATION
AS INDICATED BY THE AS-BUILT INFORMATION SHOWN HEREON, THIS PROJECT HAS BEEN GRADED AND DRAINED IN SUBSTANTIAL COMPLIANCE WITH THE APPROVED PLAN. IT IS BASED UPON THIS EVALUATION OF AS-CONSTRUCTED CONDITIONS THAT RELEASE OF FINANCIAL GUARANTY FOR THIS SUBDIVISION IS HEREBY RECOMMENDED. 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. THE AS-BUILT INFORMATION IS NOT NECESSARILY COMPLETE AND INTENDED ONLY TO VERIFY SUBSTANTIAL COMPLIANCE OF THE GRADING AND DRAINAGE ASPECTS OF THIS PROJECT. THOSE RELYING ON THIS RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION OF ITS ACCURACY BEFORE USING FOR ANY OTHER PURPOSE.

JEFFREY G. MORTENSEN, N.M.P.E. 8547

DATE: 05-24-2000

09-03-97
07-30-99 06-09-99

JMA
JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE, N.M. 87109
ENGINEERS & SURVEYORS (CDS) 345-4250

SECTIONS AND DETAILS, GRADING NOTES VISTA DEL AGUILA

DESIGNED BY	DATE	BY	REVISIONS	JOB NO.
JMA	08/28/99	JMA	REVISE EAGLE ROCK STREET SECTIONS	990044
JMA	05/05/00	MDS	AS-BUILT AND CERTIFY	980655
APPROVED BY				DATE
				05-2000
				06-1999
				SHEET
				G3 OF 87



CALCULATIONS

SITE CHARACTERISTICS

- I. PRECIPITATION ZONE = 3
II. $P_{6,100} = P_{360} = 2.60$ IN.; $P_{10 \text{ DAYS}} = 4.90$ IN.
III. TOTAL SITE AREA (A_T) = 192,900 SF/4.43 AC
IV. EXISTING LAND TREATMENT

TREATMENT	AREA (SF/AC)	%
A	174,240/4.00	89
C	17,400/0.40	09
D	4,400/0.10	02

TREATMENT	AREA (SF/AC)	%
A	211,400/4.85	77
C	34,650/0.80	13
D	28,350/0.65	10

TREATMENT	AREA (SF/AC)	%
A	171,100/3.93	87
C	17,000/0.39	11
D	4,800/0.11	02

TREATMENT	AREA (SF/AC)	%
A	15,930/0.37	70
D	6,930/0.16	30

V. DEVELOPED LAND TREATMENT

TREATMENT	AREA (SF/AC)	%
A	170,900/3.92	89
C	12,000/0.28	06
D	10,500/0.24	05

TREATMENT	AREA (SF/AC)	%
B	46,040/1.06	24
C	37,220/0.85	19
D		

TREATMENT	AREA (SF/AC)	%
B	410/0.01	08
D	4,870/0.11	92

TREATMENT	AREA (SF/AC)	%
B	5,220/0.12	10
D	45,270/1.04	90

VI. EXISTING CONDITION

TREATMENT	AREA (SF/AC)	%
A	5,220/0.12	10
D	45,270/1.04	90

1. VOLUME
 $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.66)(4.00) + (1.29)(0.40) + (2.36)(0.10)]/(4.50) = 0.75$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (0.75/12)(196,040) = 12,250$ CF

2. PEAK DISCHARGE
 $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (1.87)(4.00) + (3.73)(0.40) + (5.25)(0.10) = 9.5$ CFS

TREATMENT	AREA (SF/AC)	%
A	5,220/0.12	10
D	45,270/1.04	90

1. VOLUME
 $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.66)(4.85) + (1.29)(0.80) + (2.36)(0.65)]/(6.30) = 0.92$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (0.92/12)(274,400) = 21,040$ CF

2. PEAK DISCHARGE
 $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (1.87)(4.85) + (3.45)(0.80) + (5.02)(0.65) = 15.1$ CFS

TREATMENT	AREA (SF/AC)	%
A	5,220/0.12	10
D	45,270/1.04	90

1. VOLUME
 $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.66)(3.93) + (1.29)(0.39) + (2.36)(0.11)]/(4.43) = 0.76$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (0.76/12)(192,900) = 12,220$ CF

2. PEAK DISCHARGE
 $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (1.87)(3.93) + (3.45)(0.39) + (5.02)(0.11) = 9.3$ CFS

TREATMENT	AREA (SF/AC)	%
A	5,220/0.12	10
D	45,270/1.04	90

1. VOLUME
 $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(1.29)(0.37) + (2.36)(0.16)]/(0.53) = 1.61$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (1.61/12)(22,860) = 3,070$ CF

2. PEAK DISCHARGE
 $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (3.45)(0.37) + (5.02)(0.16) = 2.1$ CFS



CALCULATIONS (CONTINUED)

VII. DEVELOPED CONDITION

- A. BASIN A
NO CHANGE

- B. BASIN B

1. VOLUME

- $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.66)(3.92) + (1.29)(0.28) + (2.36)(0.24)]/(4.44) = 0.79$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (0.79/12)(193,400) = 12,730$ CF

2. PEAK DISCHARGE

- $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (1.87)(3.92) + (3.45)(0.28) + (5.02)(0.24) = 9.5$ CFS

- C. BASIN C

1. VOLUME

- $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.92)(1.06) + (1.29)(0.85) + (2.36)(2.52)]/(4.43) = 1.81$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (1.81/12)(192,900) = 29,100$ CF

2. PEAK DISCHARGE

- $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (2.60)(1.06) + (3.73)(0.85) + (5.02)(2.52) = 18.6$ CFS

- D. BASIN D

1. VOLUME

- $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.92)(0.12) + (2.36)(1.04)]/(1.16) = 2.21$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (2.21/12)(50,490) = 9,300$ CF

2. PEAK DISCHARGE

- $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (2.60)(0.12) + (5.02)(1.04) = 5.5$ CFS

- E. BASIN E

1. VOLUME

- $E_W = (E_A + E_B + E_C + E_D)/A_T$
 $E_W = [(0.92)(0.12) + (2.36)(1.04)]/(1.16) = 2.21$ IN.
 $V_{100} = (E_W/12)A_T$
 $V_{100} = (2.21/12)(50,490) = 9,300$ CF

2. PEAK DISCHARGE

- $Q_p = Q_{PA} + Q_{PB} + Q_{PC} + Q_{PD}$
 $Q_p = Q_{100} = (2.60)(0.12) + (5.02)(1.04) = 5.5$ CFS

- VIII. COMPARISON

- A. BASINS B, C AND E (DRAINS TO ARROYO)
 $\Delta V_{100} = (12,730 + 29,100 + 9,300) - (21,040 + 12,220) = 17,870$ CF (INCREASE)
 $\Delta Q_{100} = (9.5 + 9.3) - 15.3 = 3.5$ CFS (DECREASE DUE TO DETENTION POND)

- B. BASIN D (DRAINS TO INTERSECTION OF EAGLE ROCK & LOUISIANA)
 $\Delta V_{100} = 3,070 - 985 = 2,085$ CF (DECREASE)
 $\Delta V_{10 \text{ DAYS}} = 4,400 - 1,920 = 2,480$ CF (DECREASE)
 $\Delta Q_{100} = 2.1 - 0.8 = 1.3$ CFS (DECREASE)

- IX. POND VOLUME CALCULATIONS

ELEV	AREA (SF)	VOL (CF)	% VOL (CF)
23	3,080	8,800	8
24	3,780	3,420	3.4
25	4,620	4,200	4.2
26	5,385	5,000	5.0
27	6,300	5,840	5.8

1. DETENTION POND CALCULATIONS

- A. 78" OUTLET CONDITION (ORIFICE)
 $Q = CA(2gh)^{1/2}$
 $Q = 0.6$
 $g = 32.2 \text{ FT/S}^2$
 $A = 1.77 \text{ SF (18" DIA.)}$
 $h = \text{DEPTH} - 0.75' (\text{CENTER OF PIPE})$

2. CHANNEL PROTECTION

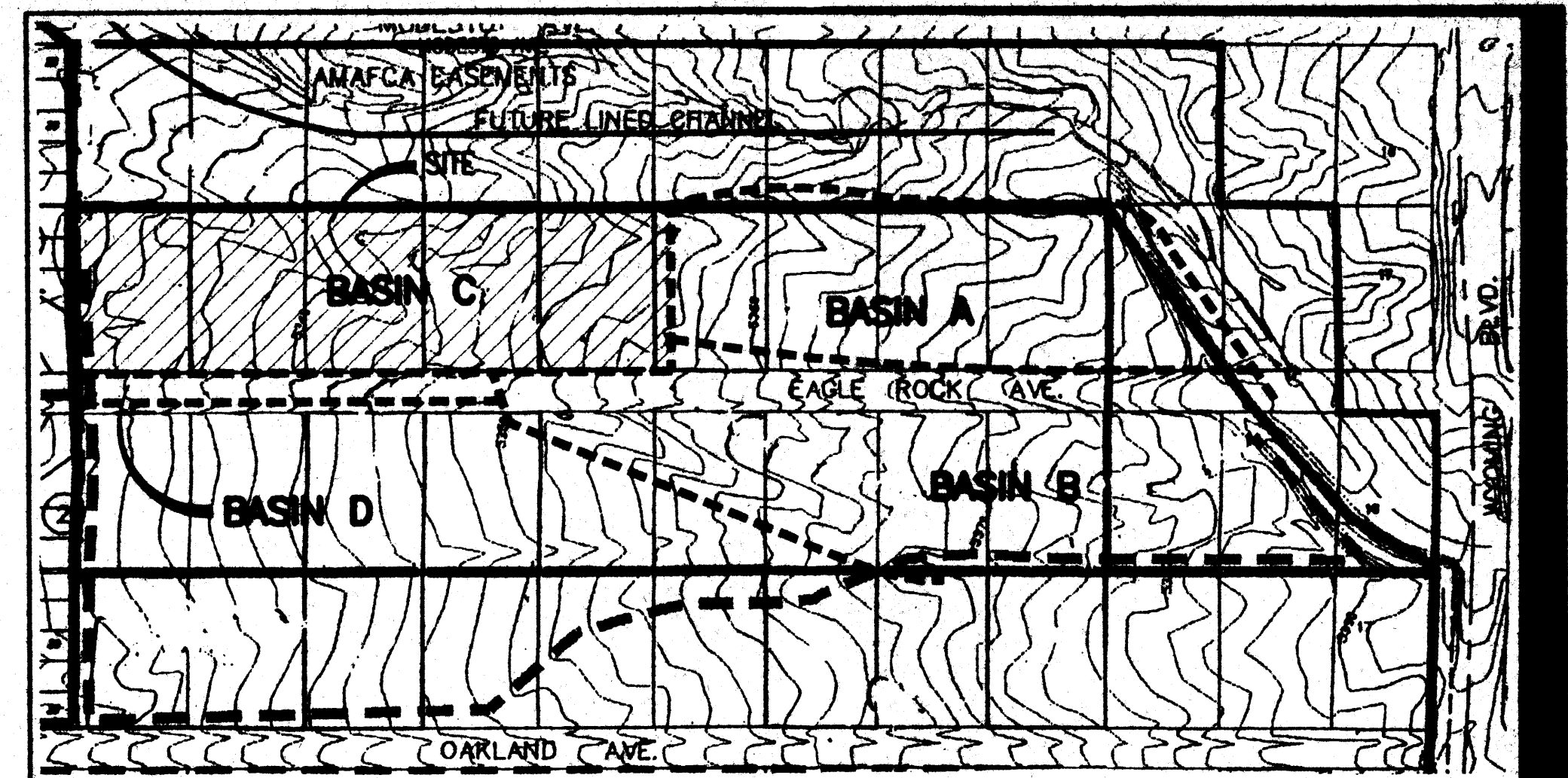
- USING Q_p : $V = 8.61 \text{ fps}$, $\text{Top Width} = 80.35'$, $A = 113.03'$
ASSUMING $T = P$ FOR A WIDE CHANNEL, $R = A/T = 1.41$
 $V_s/R = 0.33 = 66$

3. CHANNEL PROTECTION

- USING TABLE 5-5, USE TYPE "L" RIP-RAP @ 2:1
MINIMUM THICKNESS = $2H_s = 18"$

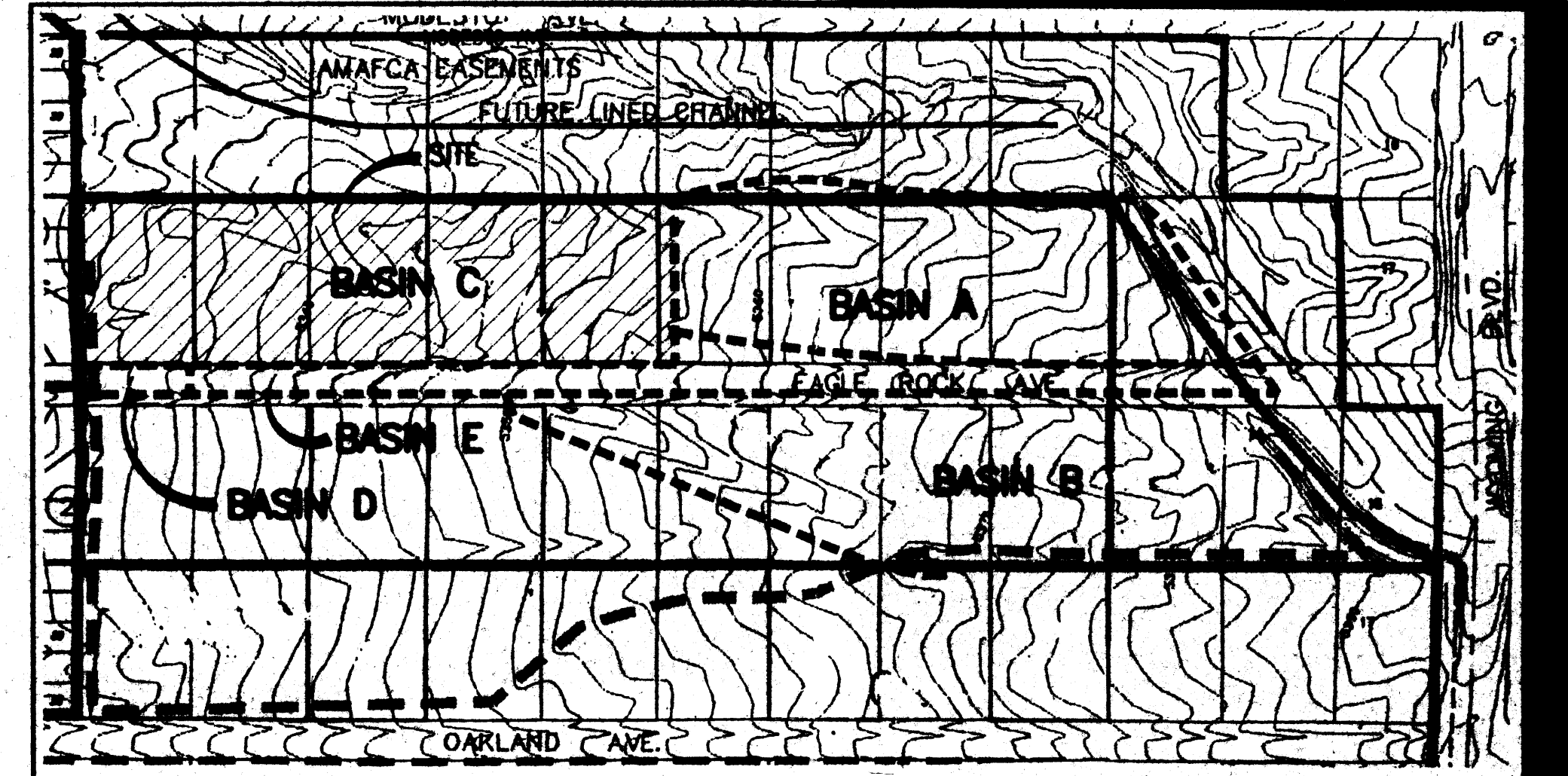
- USE DOUBLE THICKNESS = 36" TO PREVENT UNDERCUTTING

- USE TYPE "M" RIP-RAP TO BE CONSERVATIVE.



EXISTING CONDITIONS BASIN MAP

SCALE: 1"=200'



DEVELOPED CONDITIONS BASIN MAP

SCALE: 1"=200'

STORM INLET AND STREET CAPACITY ANALYSIS

1. (AP.1)
CONTRIBUTING AREA = 3.46 AC = 78% OF BASIN
 $Q_{100} = (0.78)(18.6) = 14.5$ CFS

- STREET DEPTH = 0.34 FT @ $S = 0.0340$ (MANNING'S EQUATION, $n = 0.017$)
INLET CAPACITY = 4.7 CFS PER INLET (DPM PLATE 22.3, D-5)
2 SINGLE 'A' INLETS WILL ACCEPT $2 \times 4.7 = 9.4$ CFS
RESIDUAL FLOW = 14.5 CFS - 9.4 CFS = 5.1 CFS

- STREET DEPTH = 0.25 FT @ $S = 0.034$
INLET CAPACITY = 2.4 CFS PER INLET (DPM PLATE 22.3, D-5)
2 SINGLE 'C' INLETS WILL ACCEPT $2 \times 2.4 = 4.8$ CFS
RESIDUAL FLOW = 5.1 - 4.8 = 0.3 CFS
RESIDUAL FLOW OF 0.3 CFS WILL PASS TO (AP.2)

2. (AP.2)
CONTRIBUTING AREA = 0.97 AC = 22% OF BASIN
 $Q_{100} = (0.22)(18.6) = 4.1$ CFS + 0.3 CFS (RESIDUAL) = 4.4 CFS

- STREET DEPTH = 1.00 FT MAX (SLUMP CONDITION)
INLET CAPACITY = 13 CFS (DPM PLATE 22.3, D-5)
INLET CAPACITY > $2 \times Q_{100}$

3. (AP.3) (EAGLE ROCK)
 Q_{100} TOTAL BASIN = 76.1 CFS/20 AC = 3.8 CFS/AC (FROM RTI REPORT)
 $Q_{100} = (15.57 \text{ AC})(3.8 \text{ CFS/AC}) = 59.2$ CFS (INCLUDES STREET FLOWS)

- CONTRIBUTING AREA = 20 AC - 4.43 AC = 15.57 AC (SITE DOES NOT DRAIN TO EAGLE ROCK)
STREET DEPTH = 0.51 FT @ $S = 0.0384$ (MANNING'S EQUATION, $n = 0.017$)
INLET CAPACITY = 9.4 CFS/INLET (DPM PLATE 22.3, D-5)

- 2 SINGLE 'A' INLETS WILL ACCEPT $2 \times 9.4 = 18.8$ CFS
RESIDUAL FLOW = 59.2 - 18.8 = 40.4 CFS
STREET DEPTH = 0.46' @ $S = 0.0384$

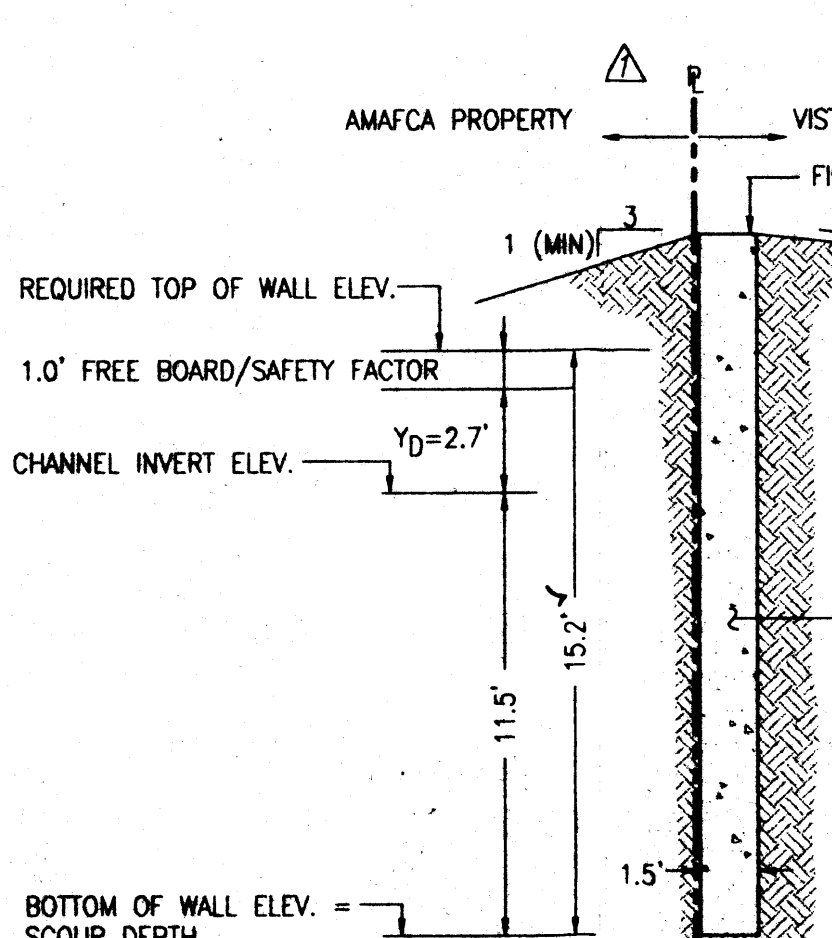
- INLET CAPACITY = 9.4 CFS PER INLET (DPM PLATE 22.3, D-5)
2 DOUBLE 'C' INLETS WILL ACCEPT $2 \times 9.4 = 18.8$ CFS
RESIDUAL FLOW = 40.4 - 18.8 = 21.6 CFS
STREET DEPTH = 0.38' @ $S = 0.0384$

- INLET CAPACITY = 7 CFS PER INLET (DPM PLATE 22.3, D-5)
2 DOUBLE 'C' INLETS WILL ACCEPT $2 \times 7 = 14.0$ CFS
RESIDUAL FLOW = 21.6 - 14.0 = 7.6 CFS (TO INLET AT LOUISIANA)

STORM DRAIN TABLE

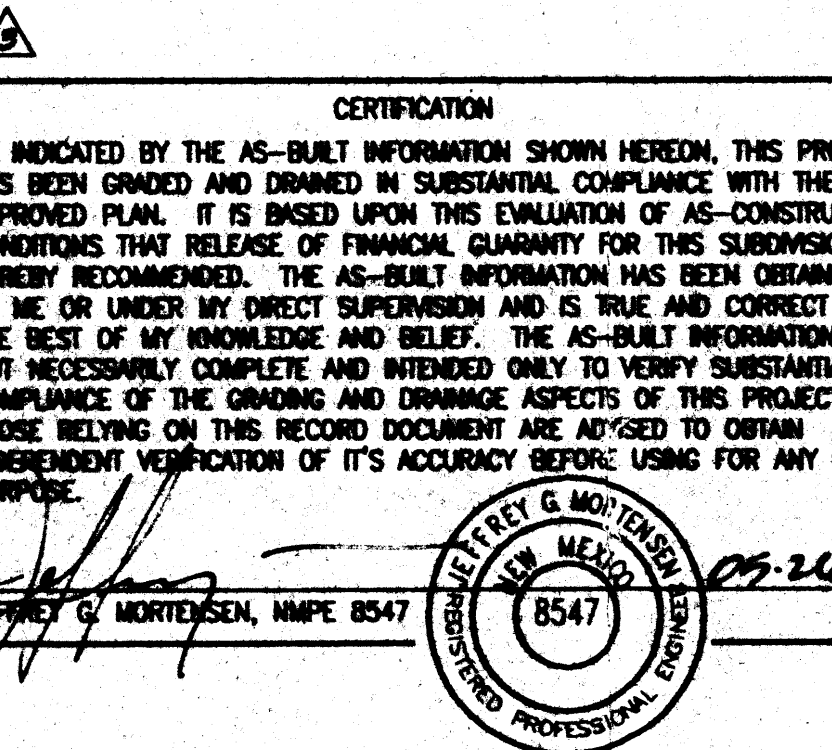
LEG	DA. (IN.)	LENGTH (FT)	SLOPE	Q_{CAP} (CFS)	$Q_{REQUIRED}$ (CFS)
18	14"	14'	0.0200	14.9	7.0
24	24"	0.0200	0.0200	24.9	25.8
24	125'	0.0177	0.0177	24.5	18.8
18	50'	0.0305	0	18.3	9.4
18	26'	0.0100	0.0100	18.3	4.4
30	126'	0.0088	0.0088	40.5	37.4
18	61'	0.0346	0.0346	18.7	14.2
18	26'	0.0288	0.0288	18.7	7.1
18	40'	0.0313	0	18.6	4.7
18	40'	0.0288	0.0288	18.6	4.7
24	45'	0.0075	0.0075	19.9	18.8

FULL FLOW CAPACITIES CALCULATED USING MANNING'S EQUATION WITH $n=0.013$



SECTION H-H

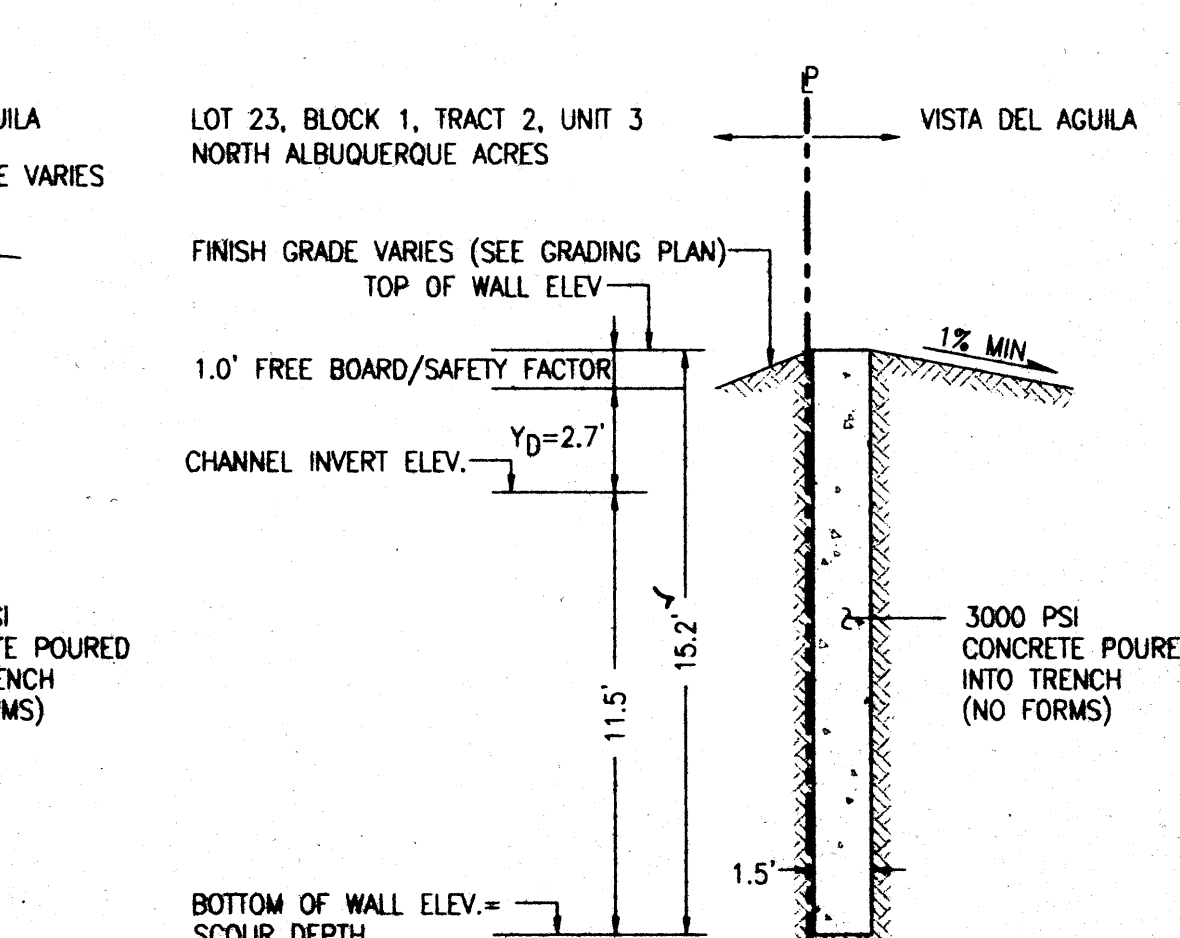
SCALE: 1"=5'



SCOUR WALL ELEVATION TABLE

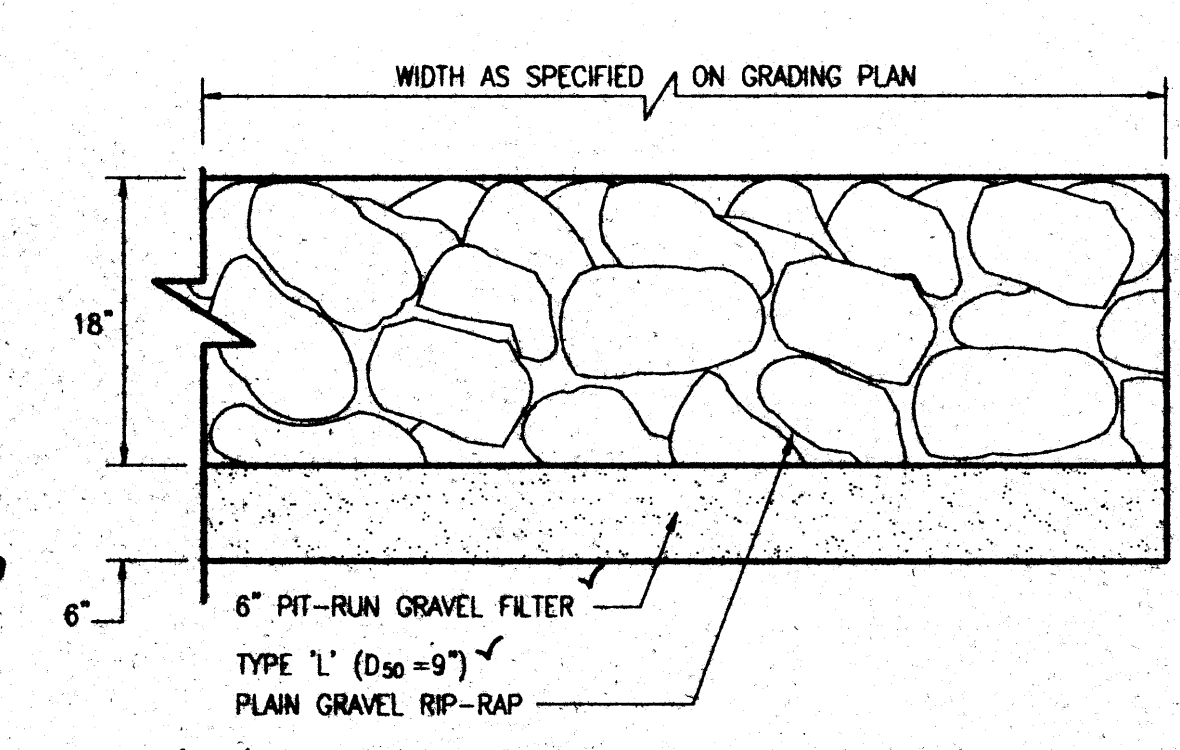
LOCATION	CHANNEL ELEV.	BOTTOM OF WALL 1	TOP OF WALL 2
NE CORNER LOT 21	5346.0	5334.5	5349.7
NW CORNER LOT 21	5343.5	5332.0	5347.2
NW CORNER LOT 20	5339.0	5327.5	5342.7
NW CORNER LOT 17	5333.5	5322.0	5334.2
NW CORNER LOT 14	5330.5	5319.0	5334.2
NW CORNER LOT 11	5328.0	5316.5	5334.7
NW CORNER LOT 8	5325.5	5314.0	5329.2

1-BOTTOM OF WALL ELEVATION = CHANNEL INVERT - 11.5 FT
2-TOP OF WALL ELEVATION = BOTTOM OF WALL + 15.2 FT



SECTION I-I

SCALE: 1"=5'



TYPICAL LIGHT DUTY RIP-RAP APRON SECTION

SCALE: 1"=1'-0'

REFER TO SHEET G6 FOR PLAN AND PROFILE OF SCOUR WALL

E.S.B. AND SCOUR WALL CALCULATIONS

- $Q_{100} = 2989$ CFS
(BULKED FLOW FROM L.O.M.R. APPROVED 9/11/98, FEMA CASE #98-06-660P)
A. EROSION SETBACK CALCULATIONS (ESB)

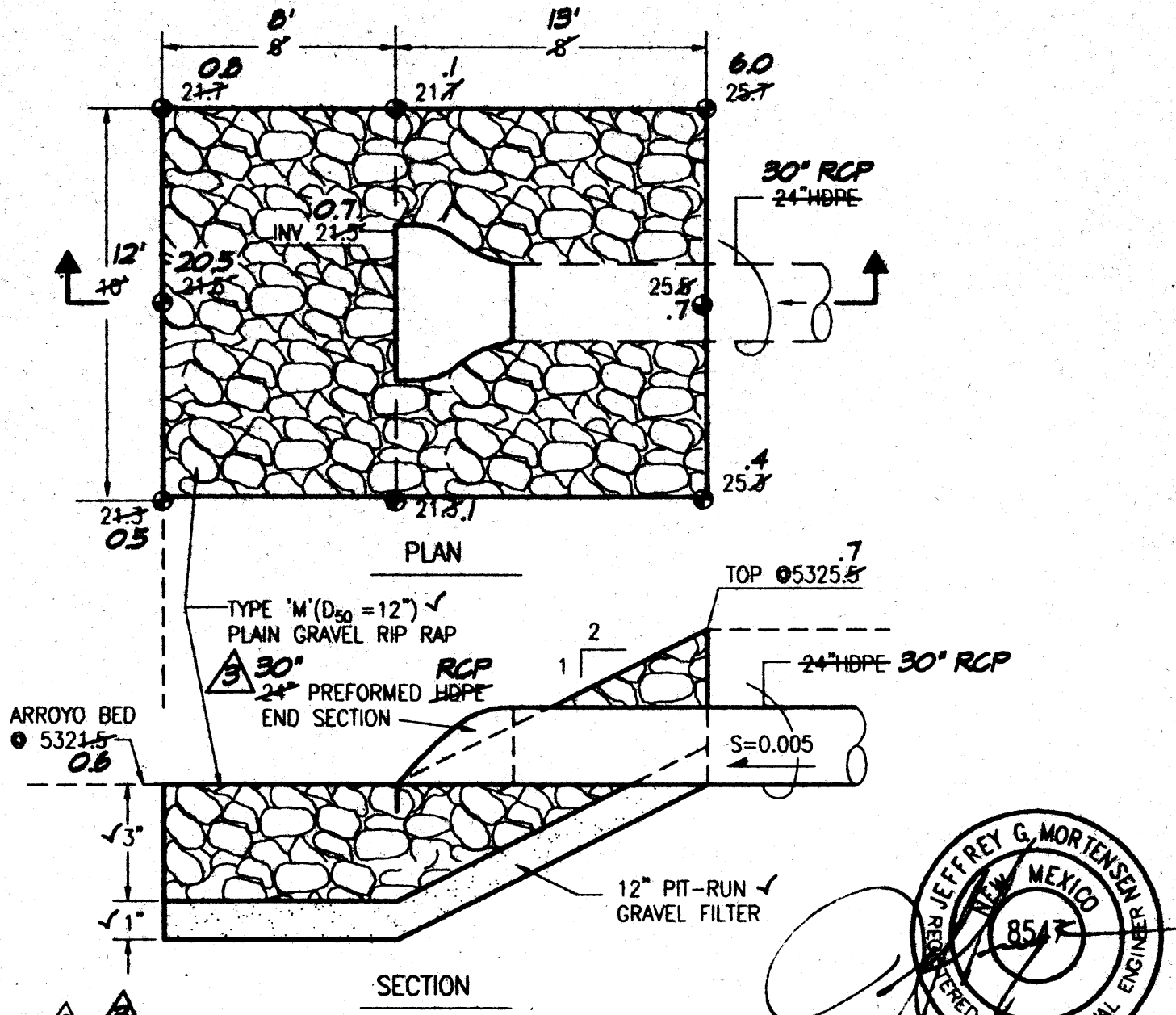
1. "GENERAL GUIDELINE"
 $ESB = 6(Q_{100}/100) = 180'$
(GENERAL GUIDELINE METHOD FROM INTEROFFICE CORRESPONDENCE
RE: BUILDING PERMIT REQUEST ADJACENT TO 100-YEAR FLOODPLAINS,
REF. NO. WPHYD 0157, 3/4/91)

2. AMAFCA/SEDIMENT AND EROSION DESIGN GUIDE
 $Q_0 = 0.20 Q_{100} = 600$ CFS
 $W_0 = 4.60 Q_0^{0.4} = 59.4$ FT (EQ. 3.78)
 $\Delta_{max} = [(0.92) + 4.6 \log(Q_0)] Q_0^{0.4} = 177$ FT (EQ. 3.81b)
CENTERLINE SETBACK (CSB) = $\Delta_{max} + W_0/2 = 207$ FT.

3. R.T.I. EROSION SETBACK FOR EAGLE ROCK ESTATES UNIT 1, C18/D39, 6/4/98
CSB = 210' (GOOD CHECK)
CONCLUSION: USE 210' CSB

- B. MAXIMUM SCOUR DEPTH
 $Q_0 = 0.20 Q_{100} = 600$ CFS
USING DATA FROM SEC 215, $Q = 780$ CFS (AMAFCA DMP BY R.T.I.)
 $y = \bar{y} = 2.65'$, $v = 8.61$ fps, $T = 80.35$ ft, $A = 113.03$ SF
 $\bar{y} = A/T = 113.03/80.35 = 1.41$ ft
 $F_r = v/(g\bar{y})^{1/2} = 1.28$

- MAX SCOUR (90° ANGLE) = $(y/4)(F_r)^{0.33} = 11.5$ FT (BELOW INVERT) (EQ. 3.88)
LET WALL HEIGHT BE SCOUR DEPTH + $y + 1.0' = 15.2$ FT.



HEAVY DUTY RIP-RAP APRON SECTION AND DETAIL

SCALE: 1"=4'

