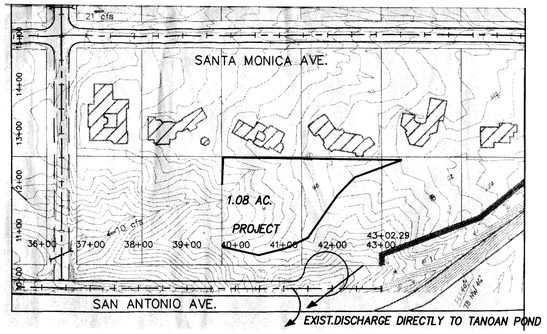
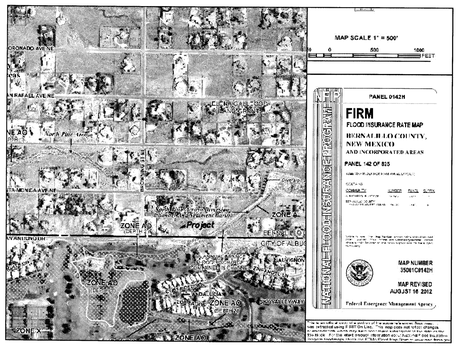


NAA & SHS DRAINAGE STUDY

WAIVER AREAS – PHASE I
REF: RTI, 1999

(NORTH ALBUQ. ACRES & SANDIA HTS. SOUTH DRAINAGE STUDY)



CALCULATIONS

DESIGN CRITERIA

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REVISED JANUARY 1993 FOR CITY OF ALBUQUERQUE ADOPTED BY THE COUNTY OF BERNALILLO
DISCHARGE RATE: Q=QPEAK x AREA.."Peak Discharge Rates For Small Watersheds"
VOLUMETRIC DISCHARGE: VOLUME = EWeighted x AREA
P100 = 2.90 Inches, Zone 4 Time of Concentration, TC = 10 Minutes
DESIGN STORM: 100-YEAR/6-HOUR, 10-YEAR/6-HOUR [ ] = 10 YEAR VALUES

ALLOWABLE CONDITIONS WHERE: A=43% B&C = 20% EA, D=17%

LOT AREA = 0.89 ACRES, WHERE EXCESS PRECIP. 'Comp' = 1.3 In.
PEAK DISCHARGE, Q100 = 2.83 CFS
THEREFORE: VOLUME 100 = 4181 CF

DEVELOPED CONDITIONS

DETERMINE LAND TREATMENTS, PEAK DISCHARGE AND VOLUMETRIC DISCHARGE FOR STUDY AREA

	AREA	LAND TREATM'T	Q Peak	E
UNDEVELOPED	0.25 Ac.(28%)	A	2.20[0.87]	0.80[0.28]
LANDSCAPING,;10-20% SL	0.18 Ac.(20%)	B	2.92[1.45]	1.08[0.46]
GRAVEL & COMP. SOIL; 20%>	0.22 Ac.(25%	C	3.73[2.26]	1.46[0.73]
ROOF – PAVEMENT	0.24 Ac.(27%)	D	5.25[3.57]	2.64[1.69]
	0.89 Ac.			

THEREFORE: $E_{Weighted}$ = 1.52 In.[0.81] &
Q100 = 3.16 CFS VOLUME 100 = 4891 CF
Q10 = 1.84 CFS VOLUME 10 = 2606 CF

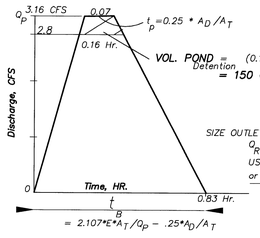
QUANTIFY UPSTREAM RUNOFF IMPACTING THE PROPERTY

AS PER AMAFCA AND "FLOOD PRONE MAPS" (RTI STUDY) SEE ABOVE

RECALC – 1.1 AC. @ 3.2 CFS/AC (DEVELOPED) ~ 4 CFS

DETERMINE POND SIZE

DETENTION POND PER HYDROGRAPH & DPM, Section A.8
STORAGE VOLUME (Required) = VOLUME AREA ABOVE ALLOWABLE RELEASE



VOL. POND = (0.16 + 0.07)/2 * 0.36 CFS x 3600 s/Hr.
Detention = 150 C.F.

SIZE OUTLET PIPE: Q = CA $\sqrt{2gH}$ Where: C = 0.7
Q_o = 0.5 CFS Release A = 0.09 SF
USE 1 – 4" DIA. PIPE H = 1.0'
or EQUIVALENT (4x3" OPENING) g = 32 f/s²

SEE MEMORIAL GARDEN (DEPRESSED L.S.)
500 SF + 200 SF/2 X 0.5' = 175 C.F.
(TOP) (BOT.)

BASIN AREA = 1200 SF X 1.5 IN/12 = 150 CF
(ROOF)

GRADING & DRAINAGE PLAN

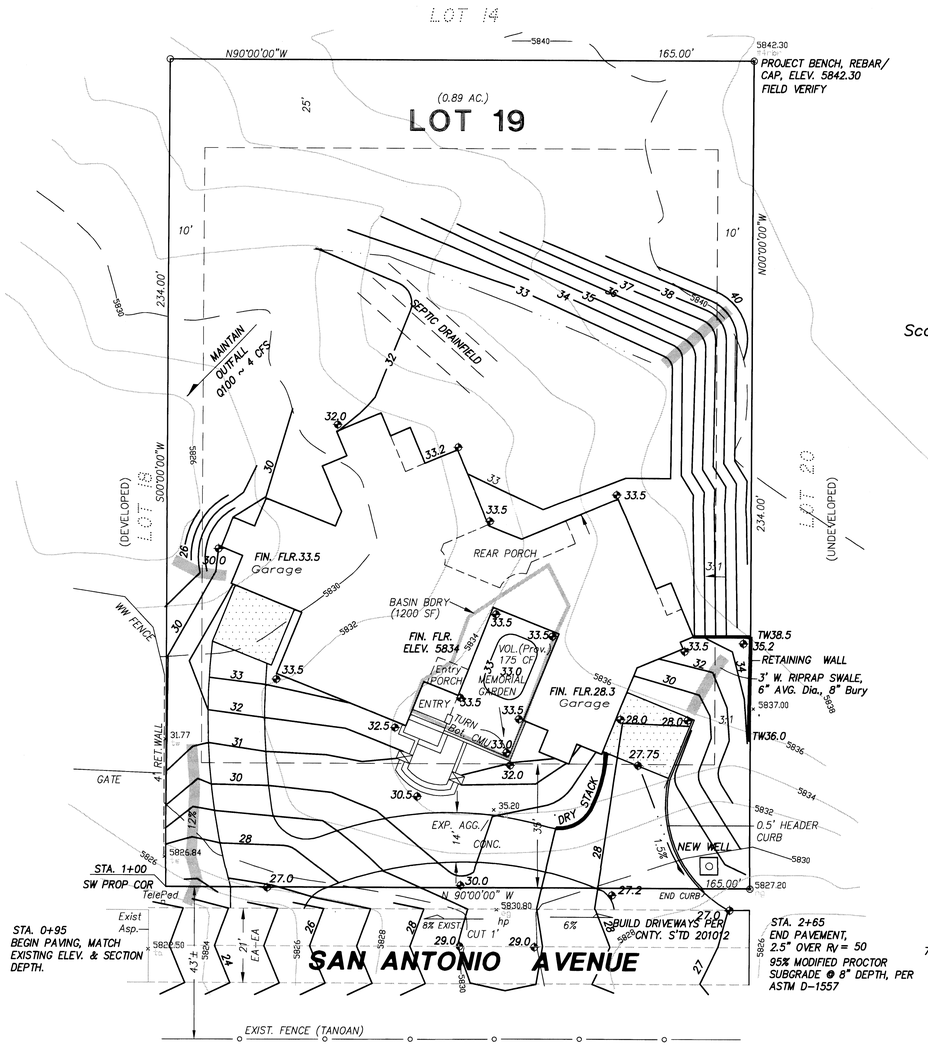
THE RESIDENTIAL HOME PROJECT IS LOCATED IN UNIT 2 OF NORTH ALBUQUERQUE ACRES APPROXIMATELY 11 MILES FROM THE DOWNTOWN CORE OF ALBUQUERQUE, NM. THE GRADING AND DRAINAGE SCHEME HEREON IS IN COMPLIANCE WITH THE BERNALILLO COUNTY FLOOD HAZARD ORDINANCE, NO. 88-46, AND STORM DRAINAGE ORDINANCE. THE PLAN IS REQUIRED IN ORDER TO FACILITATE THE OWNER'S REQUEST FOR BUILDING PERMIT. THE PLAN SHOWS:

1. EXISTING CONTOURS, SPOT ELEVATIONS, AND EXISTING DRAINAGE PATTERNS.
2. PROPOSED IMPROVEMENTS: NEW RESIDENCE, CONCRETE DRIVEWAY, AND NEW GRADE ELEVATIONS, SEPTIC SYSTEM AND WELL LOCATION.
3. CONTINUITY BETWEEN EXISTING AND PROPOSED ELEVATIONS.
4. QUANTIFICATION AND ACCEPTANCE OF UPSTREAM OFFSITE FLOWS WHICH CONTRIBUTE TO THE DEVELOPED FLOWS GENERATED BY THE IMPROVEMENTS.
5. ANALYSIS AS TO PONDING REQUIREMENTS PURSUANT TO THE NORTH ALBUQUERQUE ACRES DRAINAGE MANAGEMENT PLAN.

THE PURPOSE OF THE PLAN IS TO ESTABLISH CRITERIA FOR CONTROLLING STORM RUNOFF AND EROSION, AND ESSENTIALLY ALLOWING HISTORIC FLOWS TO CONTINUE TO DRAIN THROUGH THE PROPERTY. PRESENTLY, THE SITE IS BOUNDED ON THE NORTH AND WEST BY DEVELOPED PROPERTY. SAN ANTONIO AVENUE ON THE SOUTH IS AN UNIMPROVED CITY UNMAINTAINED ROADWAY. THE SITE GENERALLY FALLS FROM EAST TO WEST AT APPROXIMATELY 4%. MINIMAL DRAINAGE RUNOFF FLOWS THROUGH THE NORTHERN PORTION OF SUBJECT SITE. ALL OFFSITE FLOWS ARE QUANTIFIED ON THE PLAN, AND ADDRESSED IN THE CALCULATIONS.

THE SITE IS NOT ENCUMBERED BY A DESIGNATED FEMA 100-YR. FLOODPLAIN.

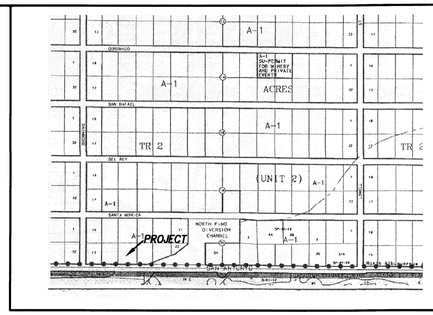
HISTORICAL SITE RUNOFF OUTFALL LOCATIONS WILL REMAIN UNCHANGED IN DEVELOPMENT. SINCE SAN ANTONIO AVE. IS UNIMPROVED GRADING IS PROPOSED WITHIN THE CITY R.O.W. FREE DISCHARGE OF DEVELOPED FLOW IS NOT ACCEPTABLE SINCE THE PROJECT EXCEEDS THE ALLOWABLE RUNOFF ESTABLISHED FOR THIS ZONE (4) OF NORTH ALBUQUERQUE ACRES.



Scale: 1" = 20'

LEGEND

+24.0	EXIST. SPOT ELEVATION
10	EXIST. CONTOUR
24.0	NEW SPOT ELEVATION
12	NEW CONTOUR
	EXIST. EDGE OF ROAD
	NEW SWALE
	DRAINAGE DIRECTION
PP	EXISTING POWER POLE
	RIPRAP ROCK 'V'-SHAPE SWALE
	NEW STRUCTURE



VICINITY MAP

ZONE D-22
1" = 500'

NOTES

1. THIS PLAN SHOWS A FIXED PERCENTAGE OF LAND TREATMENT A REMAINING IN AN UNDISTURBED CONDITION. IF A GREATER AREA IS DISTURBED A REVISED PLAN MAY BE REQUIRED PER COUNTY PUBLIC WORKS DEPARTMENT (UNLESS THE COMPOSITE TREATMENT IS < ALLOWABLE).
2. NO PERIMETER FENCING AROUND THE PROPERTY IS PROPOSED ON THE BDRY. CONSTRUCTION OF ALL FENCING SHALL PERMIT THE PASSING OF DRAINAGE TO AND FROM HISTORIC OUT FALL AND ENTRANCE LOCATIONS. MAINTAIN FUTURE FENCING AND KEEP FREE OF ALL DEBRIS, WEEDS, AND/OR OBSTRUCTIONS.
3. CONTACT THE CITY OF ALBUQUERQUE DEVELOPMENT SERVICES FOR ACCESS PERMIT @ PLAZA DEL SOL TELE: 924-3400
4. REVEGETATE ALL AREAS DISTURBED DUE TO CONSTRUCTION PER CITY OF ALBUQ. SPEC. 1011, NATIVE SEED MIX.
5. MAXIMUM SITE GRADING WITHOUT EROSION PROTECTION: 3 HORIZONTAL TO 1 VERTICAL, 3:1.

EROSION CONTROL PAD

NO SCALE

PROJECT DATA

LEGAL DESCRIPTION

LOT 19, BLOCK 20, TRACT 2, UNIT 2 NORTH ALBUQ. ACRES
BERNALILLO COUNTY, NEW MEXICO

PROJECT BENCHMARK

TOP OF REBAR, #4, AT THE PROJECT NORTHEAST CORNER
MSL ELEVATION = 5842.30

TOPOGRAPHIC SURVEY SUPPLEMENTED

COMPILED FROM NORTH ALBUQ ACRES DRAINAGE MANAGEMENT PLAN, 1999, FIELD VERIFIED / ADJUSTED TO NAVD 88 DATUM.

RECEIVED
JUL 18 2013
LAND DEVELOPMENT SECTION

7/10/13 PHILIP W. CLARK NEW MEXICO 10265 REGISTERED PROFESSIONAL ENGINEER

I, PHILIP W. CLARK, A PROFESSIONAL ENGINEER LICENSED IN ACCORDANCE WITH THE LAWS OF THE STATE OF NEW MEXICO, DO HEREBY CERTIFY THAT I HAVE VISITED THE SITE SHOWN HEREON, AND THAT THE CONTOURS SHOWN REPRESENT THE EXISTING GROUND CONDITIONS, AND DO FURTHER CERTIFY THAT NO EARTHWORK OF ANY KIND, NOR ANY DISTURBANCE OF THE EXISTING GROUND HAS OCCURRED ON THIS SITE SINCE THE CONTOURS WERE DETERMINED.

PHILIP W. CLARK NMPE #10265

Clark Consulting Engineers
19 Ryan Road
Edgewood, New Mexico 87015
Tele: (505) 281-2444 Fax: (505) 281-2444

DATE	REVISION
6/26/13	ADDR. CNTY
7/10/13	ADDR. CITY

LOT 19, BLOCK 20, TRACT 2, UNIT 2 NORTH, ALBUQUERQUE ACRES
ROMERO / GOODNOW RESIDENCE

Grading & Drainage Plan

DESIGNED BY: PWC	DRAWN BY: CCE	JOB #: HIGHTOWER	1 OF 1
CHECKED BY: PWC	DATE: 24MAY13	FILE #: G/D	

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LEGEND

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- NEW SWALE
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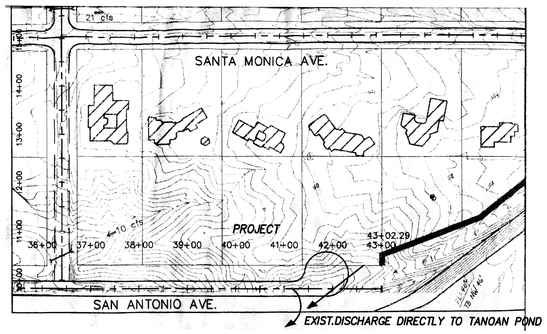
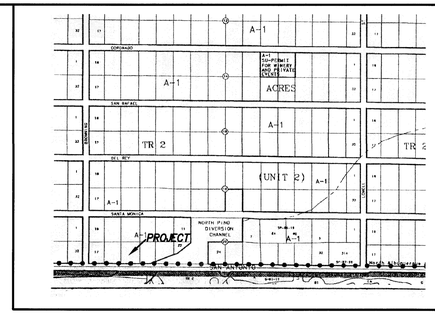


FLOOD PRONE MAPS

WAIVER AREAS - PHASE I
REF: RTI, 1999



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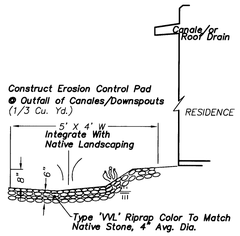
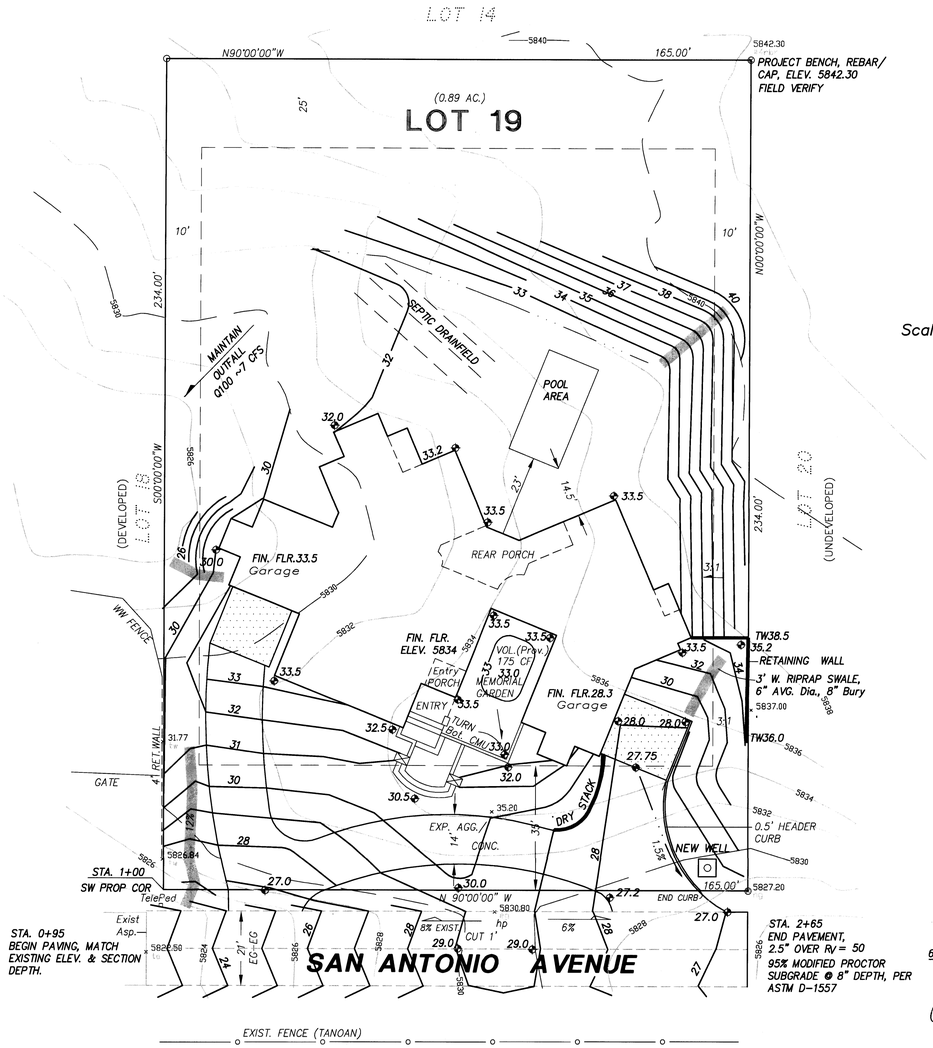
ZONE D-22
1" = 500'



EROSION CONTROL PAD

NO SCALE



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ALLOWABLE CONDITIONS WHERE: A=4.3% B&C = 20% EA. D=17%

LOT AREA = 0.89 ACRES, WHERE EXCESS PRECIP. 'Comp' = 1.3 In.
PEAK DISCHARGE, Q100 = 2.83 CFS
THEREFORE: VOLUME 100 = 4181 CF

DEVELOPED CONDITIONS

DETERMINE LAND TREATMENTS, PEAK DISCHARGE AND VOLUMETRIC DISCHARGE FOR STUDY AREA

	AREA	LAND TREATM'T	Q Peak	E
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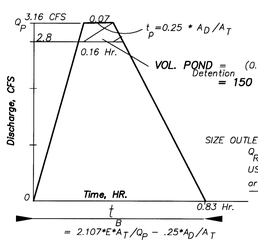
QUANTIFY UPSTREAM RUNOFF IMPACTING THE PROPERTY

AS PER AMAFCA AND "FLOOD PRONE MAPS" (RTI STUDY)

DETERMINE POND SIZE

DETENTION POND PER HYDROGRAPH & DPM, Section A.8
STORAGE VOLUME (Required) = VOLUME AREA ABOVE ALLOWABLE RELEASE



SIZE OUTLET PIPE: Q = CA $\sqrt{2gH}$ Where: C = 0.7
$Q_{Release}$ = 0.5 CFS A = 0.09 SF
USE 1 - 4" DIA. PIPE H = 1.0'
or EQUIVALENT (4x3" OPENING) g = 32 f/s²

SEE MEMORIAL GARDEN (DEPRESSED L.S.)
500 SF + 200 SF/2 X 0.5' = 175 C.F.
(TOP) (BOT.)

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PHILIP W. CLARK NMPE #10265

6/7/13

PHILIP W. CLARK NEW MEXICO 10265 REGISTERED PROFESSIONAL ENGINEER

PROJECT DATA

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PROJECT BENCHMARK
TOP OF REBAR, #4, AT THE PROJECT NORTHEAST CORNER MSL ELEVATION = 5842.30

TOPOGRAPHIC SURVEY SUPPLEMENTED
COMPILED FROM NORTH ALBUQ ACRES DRAINAGE MANAGEMENT PLAN, 1999, FIELD VERIFIED / ADJUSTED TO NAVD 88 DATUM.

RECEIVED
JUN 17 2013
LAND DEVELOPMENT SECTION

Clark Consulting Engineers
19 Ryan Road
Edgewood, New Mexico 87015
Tele: (505) 281-2444 Fax: (505) 281-2444

DATE	REVISION

LOT 19, BLOCK 20, TRACT 2, UNIT 2 NORTH ALBUQUERQUE ACRES
ROMERO / GOODNOW RESIDENCE
Grading & Drainage Plan

DESIGNED BY: PWC	DRAWN BY: CCE	JOB #: HIGHTOWER	1 OF 1
CHECKED BY: PWC	DATE: 24MAY13	FILE #: G/D	