

DRAINAGE CALCULATIONS:

DRAINAGE PLAN
THIS DRAINAGE PLAN IS FOR A NEW SECOND RESIDENCE AT 2401 ISTLE ROAD NE, IN LOT 1, BLOCK 141, RIO RANCHO ESTATES UNIT 13, CITY OF RIO RANCHO, SANDOVAL COUNTY, NEW MEXICO. CONTAINING THE FOLLOWING ITEMS FOR THE GRADING AND DRAINAGE PLAN ARE CONTAINED HEREON:

- 1. DRAINAGE CALCULATIONS
- 2. VICINITY MAP
- 3. FLOOD INSURANCE RATE MAP 35043C1889D AND 35043C1893D
- 4. GRADING PLAN

EXISTING CONDITIONS
AS SHOWN BY THE VICINITY MAP, THE SITE CONTAINS APPROXIMATELY 0.59 ACRES AND CURRENTLY 2/3 OF THE SITE ON THE SOUTH END OF THE PROPERTY IS ALREADY DEVELOPED WITH AN EXISTING RESIDENCE. THERE WAS A GRADING AND DRAINAGE PLAN DEVELOPED FOR THE ORIGINAL RESIDENCE BY RIO GRANDE ENGINEERING ON NOVEMBER 11, 2020 WHICH WAS APPROVED BY THE CITY OF RIO RANCHO. THIS PLAN WILL NOT ADDRESS THE DRAINAGE FROM THE ORIGINAL RESIDENCE BUT WILL ADDRESS THE PROPOSED RESIDENCE.

THE SITE'S EXISTING TOPOGRAPHY AT THE NEW NORTH RESIDENCE SLOPES FROM A SOUTH TO NORTH DIRECTION, THE NORTH SIDE OF THE PROPERTY CURRENTLY DRAINS NORTH INTO AN EXISTING ARROYO THAT HAS A STORM DRAIN THAT FEEDS FROM THE LOS MILAGROS PARK WHICH IS LOCATED TO THE WEST OF THIS SITE AND CURRENTLY SERVES AS A PONDING AREA. THIS SITE IS NOT LOCATED WITHIN A 100-YEAR FLOODPLAIN, (SEE ATTACHED FIRM MAP).

THERE IS ALSO SOME DRAINAGE THAT CURRENTLY DRAINS FROM THE EXISTING RESIDENCE TO THE SOUTH THROUGH SOME SMALL OPENINGS IN A BLOCK WALL TO THE SOUTH OF THE PROPOSED RESIDENCE. THIS SITE WILL PROVIDE A DRAINAGE SWALE TO DIVERT THESE FLOWS AWAY FROM THE PROPOSED RESIDENCE.

OFFSITE FLOWS
BASED ON A FIELD VISIT AND TOPOGRAPHIC CONTOUR INFORMATION THIS NEW RESIDENCE WILL HAVE STREET FRONTAGE ON GEMINI ROAD NE. IT APPEARS WHERE GEMINI ROAD INTERSECTS THE ARROYO AT THE NORTHWEST CORNER OF THE SITE WE HAVE OFFSITE FLOW THAT ENTERS FROM GEMINI ROAD INTO THE ARROYO.

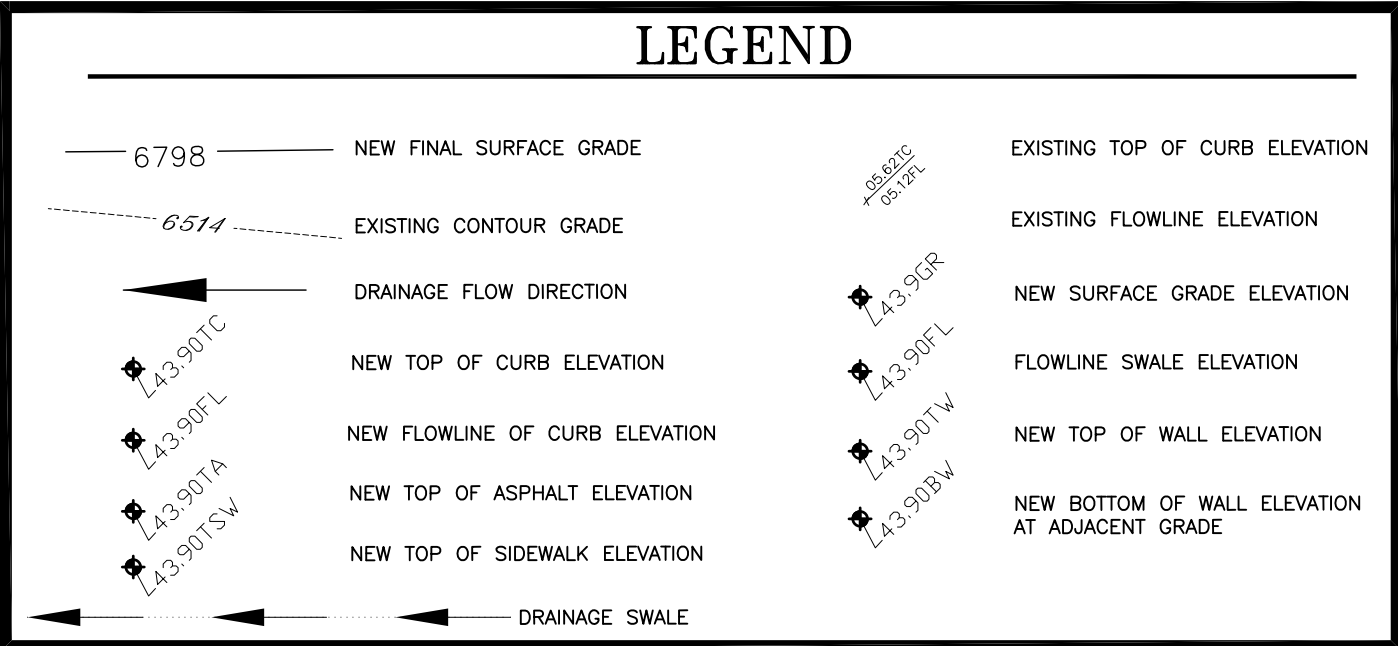
ATTACHED IS AN OFFSITE BASIN MAP THAT SHOWS THE AREA OF DRAINAGE THAT ENTERS GEMINI ROAD AND DISCHARGES INTO THE EXISTING ARROYO. THIS AREA CONTAINS APPROXIMATELY 31.4 ACRES OF RESIDENTIAL DEVELOPMENT. THE PROPOSED PLAN IS TO ELEVATE THE PROPOSED RESIDENCE SO THAT IN THE FUTURE WHEN GEMINI ROAD IS BUILT OUT WITH CURB AND GUTTER THE PROPOSED RESIDENCE WILL BE HIGH ENOUGH THAT THESE OFFSITE FLOWS WILL NOT IMPACT THE RESIDENCE.

DRAINAGE CALCULATIONS.

1. ANALYZE GEMINI ROAD OFFSITE BASIN FLOW RATE "Q"
AREA = 31.4 ACRES, APPROXIMATELY 87 LOTS
DETERMINE TREATMENT TYPE PERCENTAGE, USE TABLE D-3 SSCAFCA CHAPTER 22
SINGLE FAMILY RESIDENTIAL N= UNITS/ACREA = 87/31.4 = 2.77UNITS/ACRES
TREATMENT PERCENT = $7X[(N \times N) + (5 \times N)]^{**1/2}$
 $= 7X[(2.77 \times 2.77) + (5 \times 2.77)]^{**1/2} = 32.5\% = C$
PEAK DISCHARGE $Q = C \times I \times A$
INTENSITY "I" = RAINFALL INTENSITY TABLE D-5, I = 4.4 INCH/HR FOR 100 YEAR
 $Q = 0.325 \times 4.4 \times 31.4 = 44.9\text{CFS}$ FOR 100 YEAR, DUE TO THE AMOUNT OF SEDIMENT AND STEEP INCLINE USE A BULKING FACTOR OF 18% PER SECTION E6, PAGE 22-48, CHAPTER 22
 $Q = 44.9 \times 1.18 = 53\text{CFS}$
ASSUME A FUTURE STREET SECTION OF 32 FOOT WIDE WITH 1.8 % SLOPE IN FRONT OF RESIDENCE, USE STREET CAPACITY PLATE 22.3, D-2, PAGE 22-158
WATER DEPTH = 0.58 FEET, VELOCITY = 5FPS
ASSUME 8" CURB HEIGHT, PAD HEIGHT FROM CENTERLINE OF STREET = $(5440.73 - (0.02 \text{ SLOPE} \times 16') + 0.67 \text{ CURB HEIGHT} + (0.02 \text{ SLOPE} \times 10') \text{ BACK OF SIDEWALK} + (0.015 \times 25') \text{ DRIVEWAY AT GARAGE} + 0.33 \text{ CONCRETE SLAB} = 5442.0 \text{ FINISH FLOOR ELEVATION}$
2. ANALYZE ONSITE FLOW RATE "Q" AND VOLUME REQUIRED "V"
EXISTING CONDITIONS:
AREA (A) = 8.776SF = 0.2015ACRES, TREATMENT "A" = 8.776SF = 0.2015AC, C = 0.27
 $P = 2.37 \text{ (6-HOUR)}, P = 2.90 \text{ (24-HOUR)}$
 $Q = C \times I \times A = 0.270 \times 4.4\text{IN/HR} \times 0.2015\text{AC} = 0.24\text{CFS EXISTING FLOW RATE}$
 $\text{VOLUME (V)} = C \times P \times (A/12), V = 0.270 \times 2.7\text{IN/HR} \times (0.2015/12) = .0122\text{AC-FT} = 533\text{CF}$
- PROPOSED CONDITIONS:
AREA (A) = 8.776SF = 0.2015ACRES, TREATMENT "A" = 0% (C = 0.27),
TREATMENT "B" = 25% (C = 0.43), TREATMENT "C" = 47% (C = 0.61),
TREATMENT "D" = 28% (C = 0.93), P = 2.37 (6-HOUR), P = 2.90 (24-HOUR)
C (COMPOSITE) = $((0.25 \times 0.43) + (0.47 \times 0.61) + (0.28 \times 0.93)) = 0.655 \text{ COMPOSITE C}$
 $\text{VOLUME} = C \times P \times (A/12) = 0.655 \times 2.37 \times (0.2015/12) = 0.0261\text{AC-FT} = 1,135\text{CF}$
 $Q = C \times I \times A = 0.655 \times 4.4\text{IN/HR} \times 0.2015\text{AC} = 0.58\text{CFS EXISTING FLOW RATE}$
- PONDING REQUIRED = $1,135\text{CF} - 533\text{CF} = 602\text{CF}$
 $\text{POND VOLUME PROVIDED} = ((3655\text{F} @ 5433\text{ELEV}) + (1125\text{F} @ 5431\text{ELEV}))/2 \times 3' \text{ DEPTH} = 715\text{CF PROVIDED} > 602\text{CF REQUIRED OK}$

EROSION CONTROL NOTES:

- 1. CONTRACTOR IS RESPONSIBLE FOR OBTAINING A TOPSOIL DISTURBANCE PERMIT PRIOR TO BEGINNING WORK.
- 2. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING RUN-OFF ON SITE DURING CONSTRUCTION.
- 3. CONTRACTOR IS RESPONSIBLE FOR CLEANING ALL SEDIMENT THAT GETS INTO EXISTING RIGHT-OF-WAY.
- 4. REPAIR OF DAMAGED FACILITIES AND CLEANUP OF SEDIMENT ACCUMULATIONS ON ADJACENT PROPERTIES AND IN PUBLIC FACILITES IS THE RESPONSIBILITY OF THE CONTRACTOR.
- 5. ALL EXPOSED EARTH SURFACES MUST BE PROTECTED FROM WIND AND WATER EROSION PRIOR TO FINAL ACCEPTANCE OF THIS PROJECT.



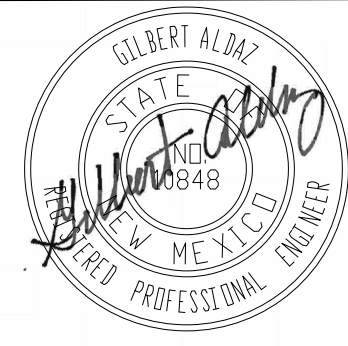
GRADING PLAN

SCALE 1" = 20'

EXCAVATION/UTILITY NOTES:

IF THE ENGINEER HAS UNDERTAKEN NO FIELD VERIFICATION OF THE LOCATION, DEPTH, SIZE OR TYPE OF EXISTING ABOVE AN UNDERGROUND UTILITIES, OR EXISTING PIPELINES, THE ENGINEER MAKES NO REPRESENTATION PERTAINING THERETO, AND ASSUMES NO RESPONSIBILITY OR LIABILITY THEREFOR. THE CONTRACTOR SHALL INFORM HIMSELF OF THE LOCATION OF ANY EXISTING ABOVE AND UNDERGROUND UTILITIES, AND EXISTING PIPELINES, IN AND 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 HIS FAILURE TO LOCATE, IDENTIFY AND PRESERVE ANY AND ALL EXISTING ABOVE AND UNDERGROUND UTILITIES, AND EXISTING PIPELINES. THE CONTRACT SHALL COMPLY WITH STATE STATUTES PERTAINING TO THE LOCATION OF THESE LINES IN PLANNING AND CONDUCTING EXCAVATION WORK.

FILE: 230401



GRADING AND DRAINAGE PLAN
2401 ISTLE ROAD NE
FOR GARCIA CUSTOM HOME

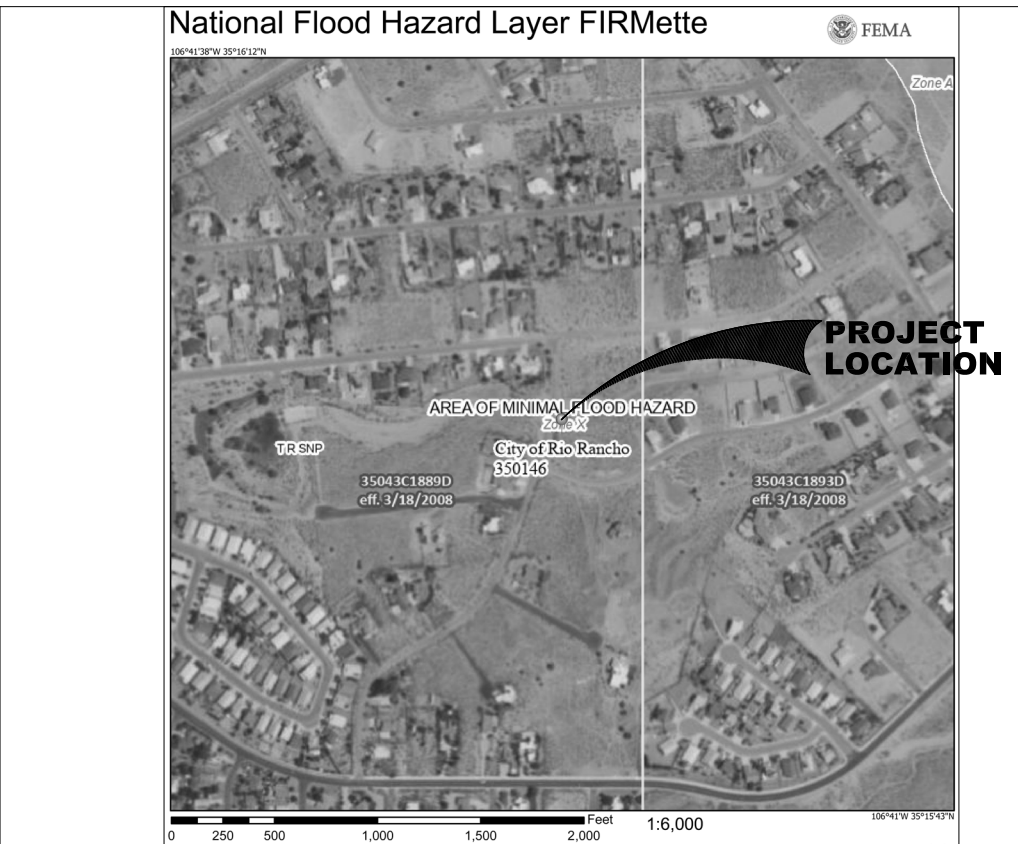
APPLIED Engineering & Suveying, Inc.
1605 BLAIR DRIVE NE, ALBUQUERQUE
NEW MEXICO 87112, galdaz47@yahoo.com, (505)480-8125

DATE/REVISIONS:

SHEET NUMBER:

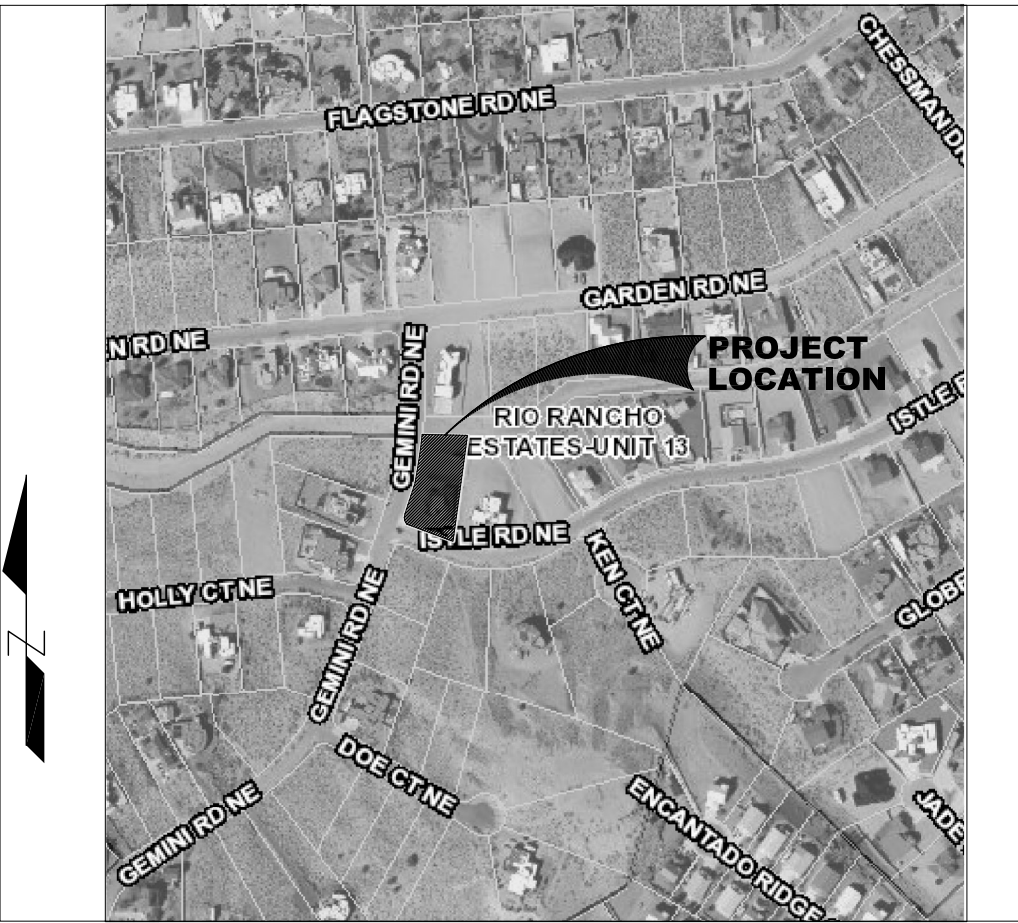
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FLOOD INSURANCE RATE MAP



35043C1889D & 35043C1893D

VICINITY MAP



GEMINI ROAD OFFSITE BASIN

