DRAINAGE PLAN

THE FOLLOWING ITEMS CONCERNING A NEW SUBDIVISION FOR LOTS 1-13, ARNO SUBDIVISION AT 824 ARNO STREET NE, MARTINEZ TOWN, ALBUQUERQUE, NEW MEXICO, GRADING AND DRAINAGE PLAN ARE CONTAINED HEREON:

1. DRAINAGE CALCULATIONS
2. VICINITY MAP (J-14)
3. FLOOD INSURANCE RATE MAP 35001C0334D
4. DRAINAGE BASIN BOUNDARY MAP (OFFSITE AND ONSITE)
5. GRADING PLAN

EXITING CONDITIONS:

AS SHOWN BY THE VICINITY MAP, THE SITE CONTAINS APPROXIMATELY 1.60 ACRES AND IS LOCATED ON THE EAST SIDE OF ARNO STREET NE AND JUST NORTH OF LOMAS BOULEVARD, (SEE ATTACHED VICINITY MAP J-14). THIS DEVELOPMENT IS CLASSIFIED AS AN INFILL SITE, PER CITY CRITERIA, SINCE THE SURROUNDING AREA IS COMPLETELY DEVELOPED.

THE EXISTING TOPOGRAPHY OF THE SITE SLOPES FROM A EAST TO WEST DIRECTION. THERE IS A STEEP 20-FOOT EMBANKMENT WITH A SLOPE OF 3 HORIZONTAL TO 1 VERTICAL ALONG THE EDGE OF THE EAST PROPERTY LINE. THE SITE CURRENTLY HAS SEVERAL EXISTING SHOP BUILDINGS ALONG WITH VARIOUS CONCRETE PADS. THE SITE HAS BEEN USED AS A MAINTENANCE YARD WITH THE SOILS COMPACTED BY HUMAN ACTIVITY.

PROPOSED CONDITIONS:

AS SHOWN BY THE PLAN, THE PROJECT CONSISTS OF A SUBDIVISION WITH 13 NEW LOTS WITH HOMES THAT AVERAGE 1250SF AND CONSIST OF DETACHED GARAGES. THE PLAN WILL ALSO CONSIST OF CONSTRUCTING A NEW STREET CUL-DE-SAC TO SERVE THE SUBDIVISION AND WILL BE CONSTRUCTED TO CITY OF ALBUQUERQUE STANDARDS.

THE PLAN SHOWS THE PROPOSED ELEVATIONS REQUIRED TO PROPERLY DRAIN THE CUL-DE-SAC AND THE NEW HOMES AND GARAGES WITHIN EACH LOT TO INCLUDE ANY REQUIRED DRAINAGE IMPROVEMENTS TO MINIMIZE ONSITE EROSION. ALL DRIVEWAYS AND PARKING AREAS WILL BE PAVED, LANDSCAPING IS TO BE PROVIDED PER ZONING REQUIREMENTS.

THE CALCULATIONS WHICH APPEAR HEREON, ANALYZE BOTH THE EXISTING AND DEVELOPED CONDITIONS FOR THE 100-YEAR, 6 HOUR RAINFALL RUNOFF FOR PEAK FLOWS AND STORM DURATION FOR VOLUME REQUIREMENTS. THE PROCEDURE FOR 40 ACRE AND SMALLER BASINS AS SET FORTH IN THE REVISION OF SECTION 22.7 HYDROLOGY OF THE DEVELOPMENT PROCESS MANUAL, VOLUME 2, DESIGN CRITERIA, DATED JANUARY 1993. THIS D.P.M. PROCEDURE IS USED FOR ANALYZING ONSITE FLOWS.

DOWNSTREAM CAPACITY:

IT IS THE INTENT OF THIS PLAN TO DRAIN FLOWS FROM THE PROPOSED NEW CUL-DE-SAC INTO ARNO STREET NE, AND ALLOW THESE FLOWS TO CONTINUE NORTH ON ARNO STREET TO THE INTERSECTION OF MARBLE STREET AND ARNO STREET. AT THIS INTERSECTION THERE ARE FOUR EXISTING INLETS THAT CONNECT INTO AN EXISTING 36" STORM DRAIN IN MARBLE STREET. THIS STORM DRAIN GOES WEST ON MARBLE STREET THEN NORTH ON BROADWAY AND ENTERS THE BROADWAY PUMP STATION

ACCORDING TO THE FLOOD INSURANCE RATE MAP (SEE ATTACHED MAP COPY), PANEL 35001C0334 D, DATED SEPTEMBER 20, 1996,THERE IS NO DESIGNATED 100-YEAR FLOODPLAINS THAT EXIST WITHIN THIS SITE; HOWEVER, THERE IS A DESIGNATED 100-YEAR FLOODPLAIN WITH ZONE AH, (ELEVATION = 4954 ON ARNO STREET). ACCORDING TO THE EXISTING TOPOGRAPHIC INFORMATION THE ELEVATION OF 4954 EQUATES TO THE FLOWLINE ELEVATION ON ARNO STREET ADJACENT TO THIS SITE, IT'S THE INTENT OF THIS DEVELOPMENT THAT ALL FINISH FLOORS WILL BE AT A MINIMUM OF ONE FOOT ABOVE THIS ELEVATION.

EROSION CONTROL:

TEMPORARY EROSION CONTROL WILL BE REQUIRED DURING THE CONSTRUCTION PHASE TO PROTECT DOWNSTREAM PROPERY FROM SEDIMENT AND UNCONTROLLED RUNOFF. THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY SILT FENCE ALONG THE WEST PROPERTY LINE ADJACENT TO ARNO STREET IN ORDER TO MINIMIZE SEDIMENT RUNOFF. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROPERLY MAINTAIN THIS SILT FENCE DURING THE ENTIRE CONSTRUCTION PHASE OF THE PROJECT UNTIL SUCH TIME OF CITY OR ENGINEER'S ACCEPTANCE.

OFFSITE FLOWS:

TO THE EAST SIDE OF THIS PROPERTY EXIST OTHER DEVELOPED COMMERCIAL TYPE PROPERTIES WITH MAINTENANCE TYPE BUILDINGS. THESE OFFSITE PROPERTIES CURRENTLY DRAIN INTO THIS DEVELOPMENT THROUGH THE STEEP EMBANKMENT ALONG THE EAST SIDE OF THIS PROPERTY. THIS OFFSITE FLOWS WILL BE ACCOUNTED FOR IN THE CALCULATIONS AND WILL BE ACCEPTED BY THIS DEVELOPMENT. AT THE TWO MOST EASTERN LOTS A DRAINAGE DIVERSION WILL BE CONSTRUCTED IN ORDER TO DIVERT THESE OFFSITE FLOWS INTO THE NEW CUL-DE-SAC, THIW WILL HELP MINIMIZE SEDIMENT DEPOSITION AND DRAINAGE FLOWS ONTO THESE 2 LOTS.

DRAINAGE CALCULATIONS:

1. PRECIPITATION ZONE = 2
2. DESIGN STORM = DEPTH (INCHES) AT 100-YEAR STORM
   - 6-HOUR = 2.35 INCHES
   - 24-HOUR = 2.75 INCHES
   - 10 DAY = 3.95 INCHES
3. PEAK DISCHARGE (CFS/ACRE) FOR 100-YEAR, ZONE 2, TABLE A-9:
   - Q = 1.56 CFS/ACRE SOIL UNCOMPACTED "A"
   - Q = 2.28 CFS/ACRE LANDSCAPED "B"
   - Q = 3.14 CFS/ACRE COMPACTED SOIL "C"
   - Q = 4.70 CFS/ACRE IMPERVIOUS AREA "D"
   FOR WATERSHEDS LESS THAN OR EQUAL TO 40 ACRES
4. EXCESS PRECIPITATION, E (INCHES), 6 HOUR STORM, ZONE 2, TABLE A-8:
   - E = 0.53 INCHES SOIL UNCOMPACTED "A"
   - E = 0.78 INCHES LANDSCAPED "B"
   - E = 1.13 INCHES COMPACTED SOIL "C"
   - E = 2.12 INCHES IMPERVIOUS AREA "D"
5. EXISTING CONDITIONS ONSITE INTO ARNO STREET
   TOTAL AREA OF SITE = 1.60ACRES
   EXISTING BUILDING ROOF AREA (TREATMENT "D")
   = 7,017 + 2,029SF = 9,046SF = 0.21ACRES
   EXISTING CONCRETE AREA (TREATMENT "D")
   = 4,857SF (4X26)SF + (2X73)SF + 392SF + 388SF = 5,887SF
   = 0.14ACRES EXISTING STEEP SLOPE
   EMBANKMENT (TREATMENT "C") = 4,434SF = 0.10AC
   EXISTING SOIL COMPACTED BY HUMAN
   ACTIVITY (TREATMENT "C") = 1.60AC -
   0.21AC - 0.14AC = 1.15AC

TREATMENT	AREA(ACRES)
A	0
B	0
C	0.10 + 1.15AC = 1.25AC
D	0.21 + 0.14AC = 0.35AC

Q(EXISTING) = (3.14 X 1.25) + (4.70 X 0.35)
= 5.57CFS (6HR) EXISTING ONSITE FLOW INTO ARNO STREET
V(EXISTING-6HR) = (1.13 X 1.25)
+ (2.12 X 0.35)/ 12) = 0.17AC-FT
= 7,821CF EXISTING VOLUME INTO ARNO STREET

6. PROPOSED CONDITIONS ONSITE INTO ARNO STREET
   TOTAL AREA OF SITE = 1.60ACRES
   USE LOT 1 AS TYPICAL LOT (SINGLE STORY IS LARGEST ROOF AREA)
   ROOF AREA (TREATMENT "D") =
   (25' X 39')DWELLING + (24' X 12')GARAGE
   = 1,263SF X 13LOTS = 16,419SF = 0.38AC
   DRIVEWAY & SIDEWALKS (TREATMENT "D") =
   (65' X 10')DRIVEWAY + (16' X 4')SDWK =
   714SF X 13LOTS = 9,282SF = 0.21AC
   CUL-DE-SAC (TREATMENT "D")
   = 13,525SF = 0.31AC
   EXISTING STEEP SLOPE EMBANKMENT
   (TREATMENT "C") = 4,434SF = 0.10AC
   REMAINING AREA = 1.60AC - 0.38AC -
   0.21AC - 0.31AC - 0.10AC
   = 0.60AC (DIVIDE TO 50% LANDSCAPED AND 50% COMPACTED)
   50% (TREATMENT "B") = 0.60/2 = 0.30AC
   50% (TREATMENT "C") = 0.60/2 = 0.30AC

TREATMENT	AREA(ACRES)
A	0
B	0.30
C	0.30 + 0.10AC = 0.40AC
D	0.38 + 0.21 + 0.31AC = 0.90AC

Q(PROPOSED) = (2.28 X 0.30) + (3.14 X 0.40)
+ (4.70 X 0.90) = 6.17CFS (6HR)
PROPOSED ONSITE FLOW INTO ARNO STREET
V(EXISTING-6HR) = (0.78 X 0.30) +
(1.13 X 0.40)+ (2.12 X 0.90)/ 12)
= 0.22AC-FT = 9,416CF PROPOSED
VOLUME INTO ARNO STREET

7. IMPACT OF THIS DEVELOPMENT ON DOWNSTREAM CAPACITY FLOW INCREASE
   = 6.17CFS - 5.57CFS = 0.60CFS
   = +/-10% INCREASE FROM EXISTING (NEGLIGIBLE)
   VOLUME INCREASE = 9,416CF - 7,821CF
   = 1,595CF = +/- 20% INCREASE FROM EXISTING (NEGLIGIBLE)

8. OFFSITE FLOWS OVER EMBANKMENT FROM THE EAST SIDE
   TOTAL AREA OF SITE = 0.93ACRES
   ROOF AREA & PAVING AREA = 9,424 +
   2,905 + 1,562 + 1,206 + 607SF
   = 15,704SF = 0.36ACRES TREATMENT "D"
   REMAINING AREA COMPACTED BY HUMAN ACTIVITY
   = 0.93 - 0.36ACRES
   = 0.57ACRES TREATMENT "C"

TREATMENT	AREA(ACRES)
A	0
B	0
C	0.57
D	0.36AC

Q(PROPOSED) = (3.14 X 0.57) + (4.70 X 0.36)
= 3.48CFS (6HR) EXISTING OFFSITE FLOW INTO NEW CUL-DE-SAC
V(EXISTING-6HR) = (1.13 X 0.57) +
(2.12 X 0.36)/ 12) = 0.12AC-FT =
5,109CF EXISTING OFFSITE VOLUME INTO NEW CUL-DE-SAC

9. EVALUATE NEW CUL-DE-SAC STREET CAPACITY
   Q(TOTAL) = 6.17CFS(ONSITE) + 3.48CFS(OFFSITE)
   = 9.65CFS
   STREET SLOPE = 0.50%
   STREET WIDTH = 32 FEET
   REFER TO DPM PLATE 22.3 D-1
   STREET DEPTH = 0.38 FEET
   MOUNTABLE CURB PROPOSED WITH HEIGHT
   = 0.33FEET
   DPM MAXIMUM FLOW ALLOWED = 0.33 + 0.20FEET
   = 0.53FEET ALLOWED
   0.53 FEET ALLOWED > 0.38 FEET
   (THIS DEVELOPMENT) ok

10. EVALUATE OFFSITE FLOWS FROM EAST THRU NEW RAILROAD TIE RUNDOWN, OFFSITE FLOWS DIVERTED BY RAILROAD TIES ALONG RIGHT-OF-WAY OF ABANDONED BARELAS DITCH

AREA DRAINING INTO RUNDOWN IS 2/3 OF OFFSITE AREA, FLOW RATE EQUAL TO (2/3 X 3.48CFS) = 2.3CFS
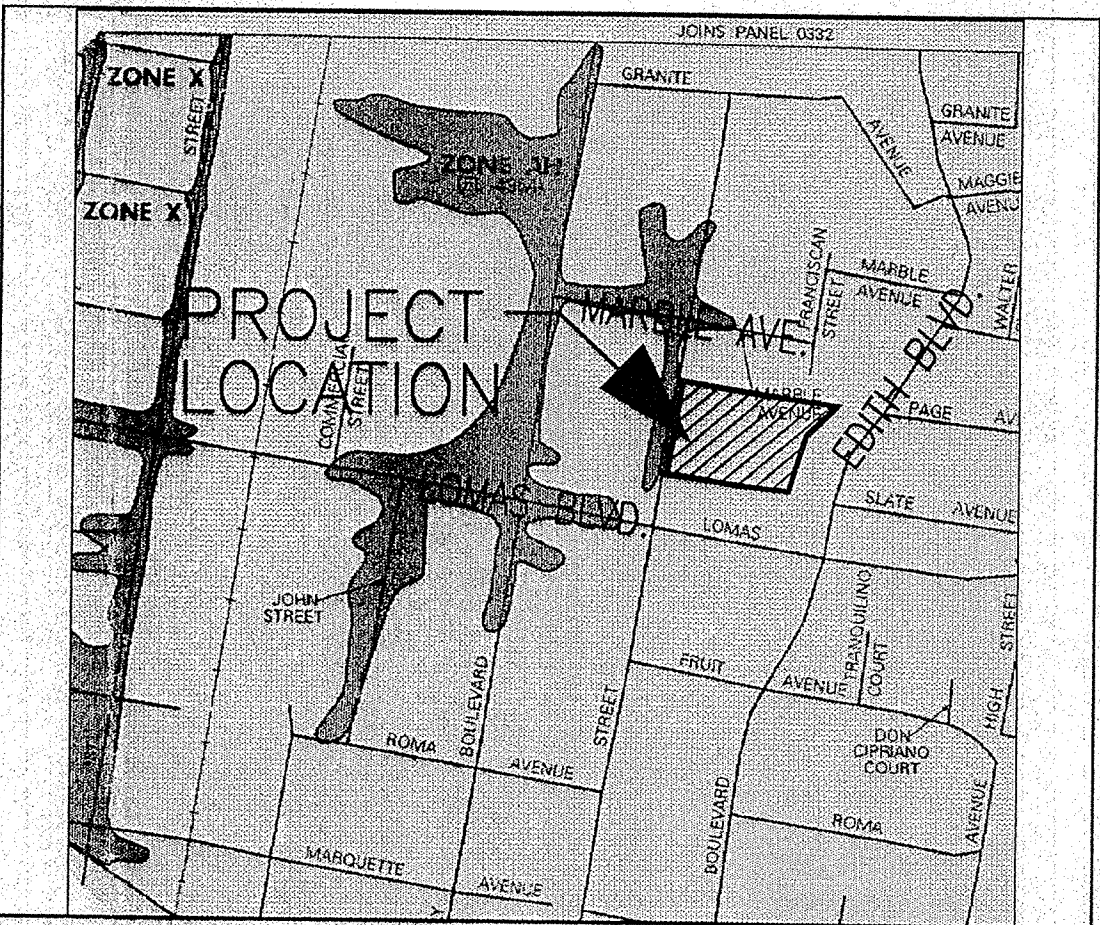
WEIR ANALYSIS, Q = C x L x H**3/2
C = 3.0, L = 8 FEET WIDTH, Q = 2.3CFS
H = (Q/C x L)**2/3
H = (2.3/3 x 8')**2/3
H = 0.21FEET DEPTH THRU RUNDOWN
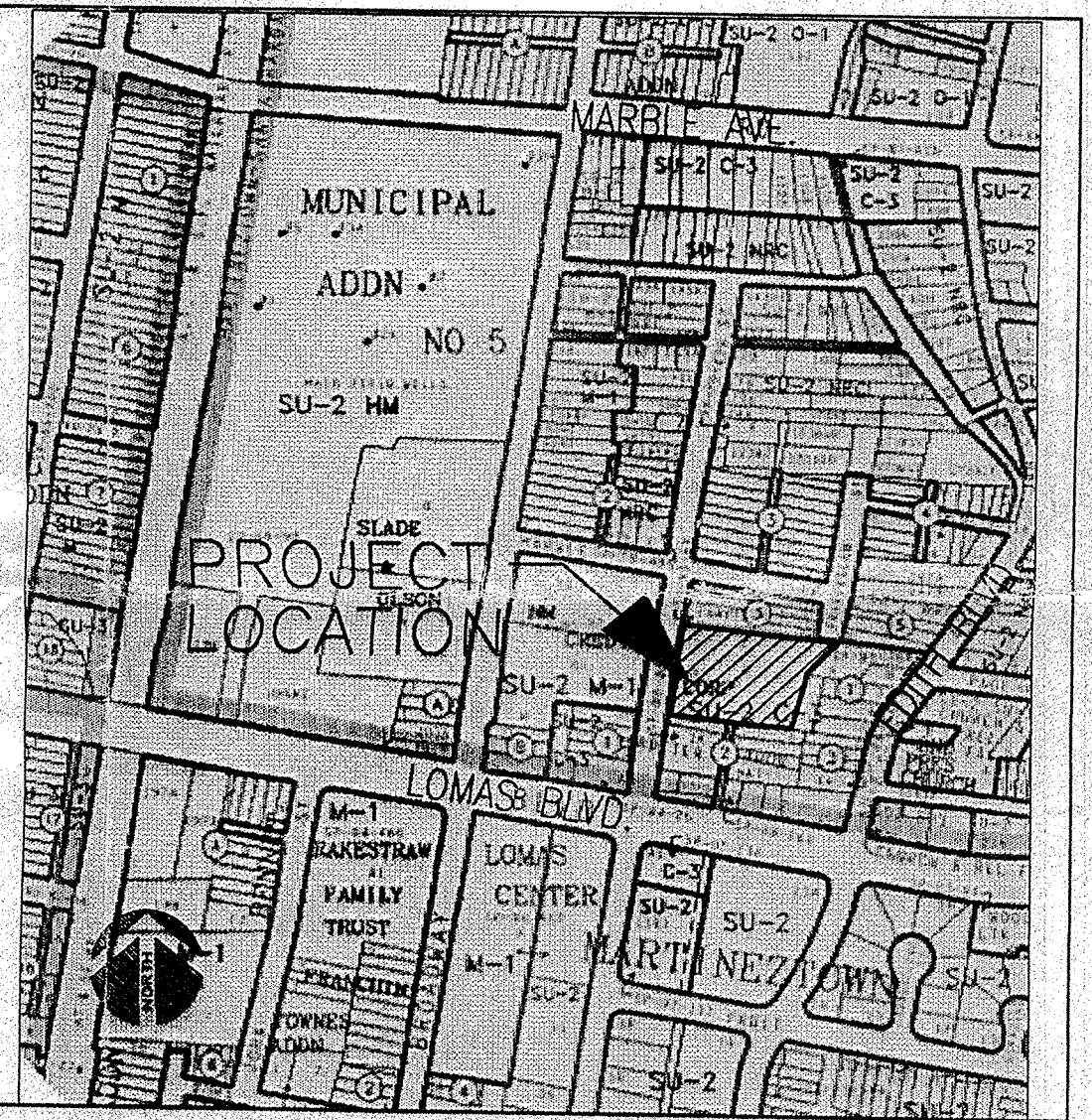
SEE CERTIFICATION AND RAILROAD TIES ADDED

DRAINAGE CERTIFICATION

As Indicated by the as-built information shown hereon, El Porvenir Subdivision Grading and Drainage plan has been constructed in substantial compliance with the approved Grading and Drainage Plan. The only exception is that a railroad retaining wall was constructed near the east boundary with a railroad tie rundown and cobble stone in order to confine these offsite flows into a channel to minimize sheet flow erosion damage to the east embankment. Calculations are shown on sheet 2 for the rundown. This Certification is presented in fulfillment of drainage requirements requested by the City of Albuquerque. The information shown hereon has been obtained by me or under my direct supervision and is true and correct to the best of my knowledge and belief.

Gilbert Aldaz, NMPE 10848   12-16-04
                                 Date

FIRM MAP 35001C0334 D

VICINITY MAP (J-14)

OFFSITE DRAINAGE BASIN MAP

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING DEVELOPMENT GROUP

TITLE:

DRAINAGE CALCULATIONS

Design Review Committee	City Engineer Approval	Mo./Day/Yr.	Mo./Day/Yr.

City Project No. | Zone Map No. J-14 | Sheet 3 | Of 7