



August 25, 1998

Celia Tomlinson
Rhombus PA
2620 San Mateo NE
Suite B
Albuquerque, NM 87110

Re: Grading and Drainage Plan for Spanish Walk Townhouses
Rhombus
Plan dated August 24, 1998
Drainage File #E14 /D2A
Request for Preliminary Plat & Site Plan for Subdivision

Dear Ms. Tomlinson:

The referenced drainage plan dated 8/24/98 and previous calculations are approved for preliminary plat approval.

If I can be of further assistance, please feel free to call me at 924-3984.

Sincerely,

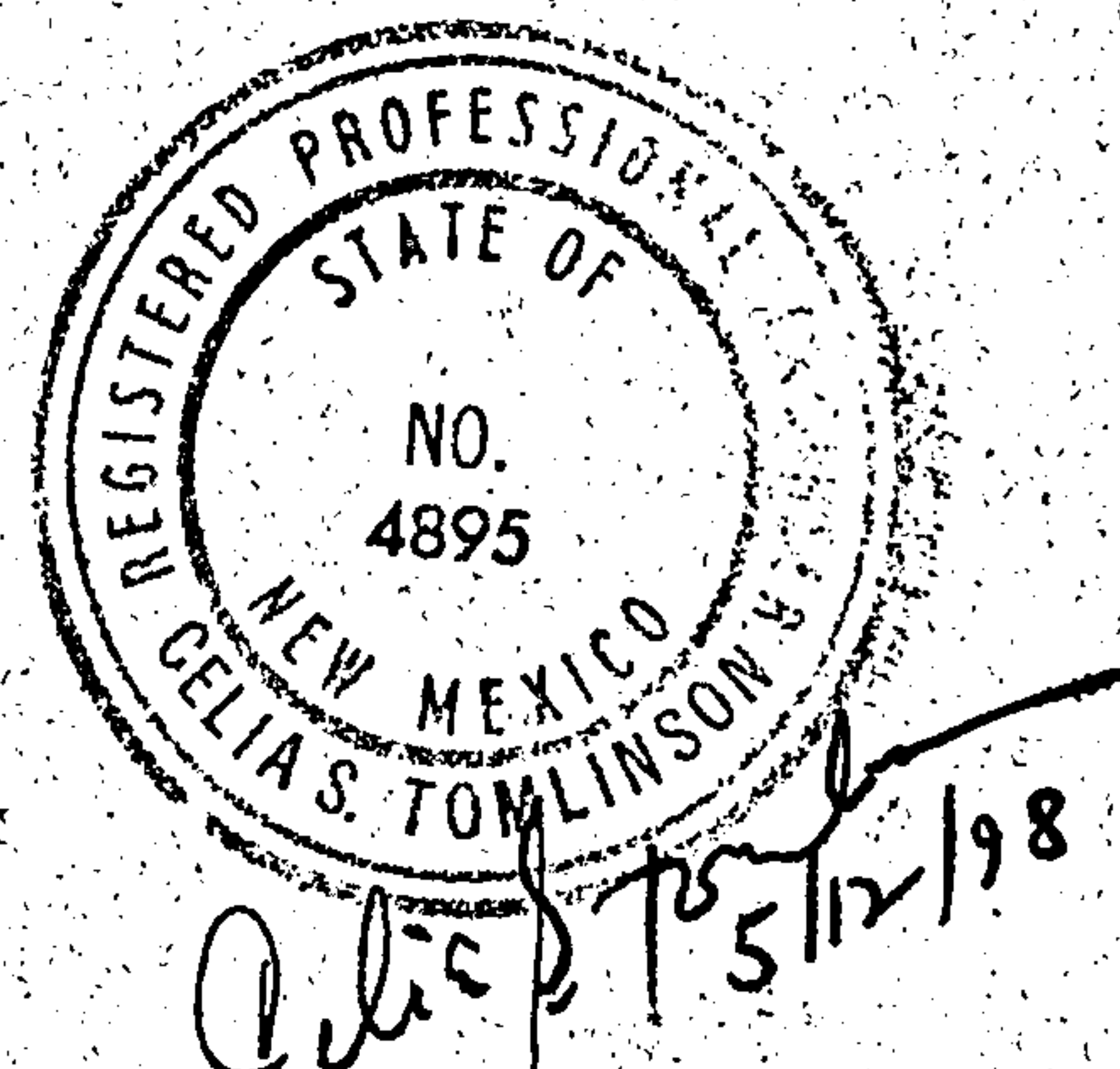
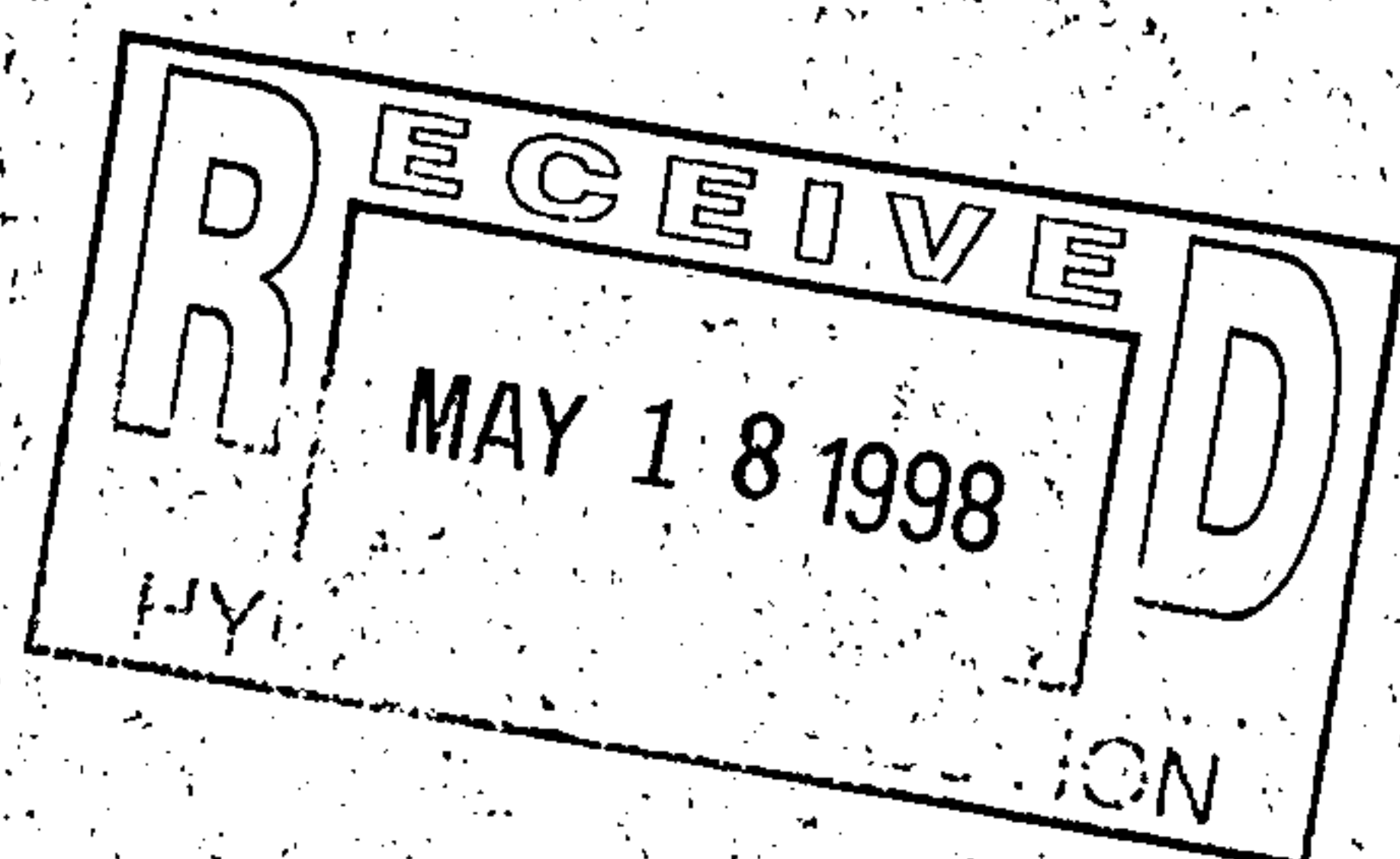
Fred J. Aguirre
City Hydrologist

Enclosure





CONCEPTUAL DRAINAGE AND GRADING PLAN
FOR
SPANISH WALK TOWNHOUSES



DRAINAGE AND GRADING PLAN FOR
SPANISH WALK TOWNHOUSES

LEGAL DESCRIPTION: Tract A-1 Spanish Walk Subdivision

ADDRESS: South side of Camino Espanol, west of 4th Street N.W.

Zone Atlas E-14

FLOODPLAIN INFORMATION: The front part of the property is located on Zone X, areas determined to be within the 500-year flood; 100-year flood with average depths of less than one foot with drainage areas less than one square mile; and areas protected by levees from 100-year flood. The rear portion of the tract is on Zone AH, flood depths of 1 to 3 feet (usually areas of ponding) base flood elevation 4978. According to the Floodway Boundary and Floodway Map of the City of Albuquerque, New Mexico, Community Panel 350002 C0119 September 20, 1996.

EXISTING CONDITIONS: The vacant property consists of approximately 2.5 acres of unimproved land.

The site is bounded by Camino Espanol on the north (asphalt, header curb, no sidewalk); a commercial development on the east (existing paved parking lot, building, and landscaping); and existing residential development on the west side and south side. The site slopes slightly from Camino Espanol southward and ponds at the lot rear. A block wall prevents the water from going to the residential development to the south.

PROPOSED IMPROVEMENTS: Tract A-1 is proposed for development as a site for 18 townhouse lots, each lot containing approximately one-tenth of an acre. Two cul-de-sac private access easements will be built from Camino Espanol. Four-foot concrete sidewalks will be built. The cul-de-sac will be paved with asphalt. Each lot will have perimeter walls built by the owner.

The tract's flat topography, receiving no offsite flows from any basin, except from the crown of Camino Espanol, and having no drainage outlet makes the site ideal for the Flat Grading Scheme. Each house pad will be limited to 45% of the lot area. The runoff developed from the impervious areas per lot will be retained on the lot. In addition, each lot will contain its share of the runoff from the access easements. All lots will be graded flat, with identical pad elevations.

QUANTIFICATION

Precipitation Zone 2

Existing Condition

Offsite: Land Treatment D = $447' \times 20' / 43560$
= 0.20 Acres

Onsite: Land Treatment A = 2.441 Acres

Peak Discharge

10-year frequency: A $2.441 \text{ Ac} \times 0.38 = 0.93 \text{ cfs}$
D $0.20 \text{ Ac} \times 3.14 = 0.63 \text{ cfs}$
TOTAL = 1.56 cfs

100-year frequency: A $2.441 \text{ Ac} \times 1.56 = 3.80 \text{ cfs}$
D $0.20 \text{ Ac} \times 4.70 = 0.94 \text{ cfs}$
TOTAL = 4.74 cfs

Proposed Improvements

Offsite: Land Treatment D = $447' \times 20' / 43560$
= 0.20 Ac

Onsite:

Land Treatment B = 0.50 Ac

Land Treatment C = 0.76 Ac

Land Treatment D Roofs $0.45 \times 18 \text{ Lots} \times 0.10 \text{ Ac} = 0.81 \text{ Ac}$

Driveways $20' \times 20' \times 18 / 43560 = 0.16 \text{ Ac}$

Sidewalks $1020 \times 4 / 43560 = 0.09 \text{ Ac}$

Asphalt $5084 \text{ sf} / 43560 = 0.12 \text{ Ac}$

Total D = 1.18 Ac

Peak Discharge

10-year frequency: B $0.50 \text{ Ac} \times 0.38 = 0.19 \text{ cfs}$
C $0.76 \text{ Ac} \times 1.71 = 1.30 \text{ cfs}$
D $1.18 \text{ Ac} \times 3.14 = 3.71 \text{ cfs}$
TOTAL = 5.20 cfs

100-year frequency: B $0.50 \text{ Ac} \times 1.56 = 3.80 \text{ cfs}$
C $0.76 \text{ Ac} \times 3.14 = 2.39 \text{ cfs}$
D $1.18 \text{ Ac} \times 4.70 = 5.55 \text{ cfs}$
TOTAL = 11.74 cfs

Storage Provisions; Calculation Premises for Each Lot:

1. Each lot basin is bounded by the pavement centerline of the access easement(s), the side lot lines and the rear lot line.

2. Soil treatment consists of the following:

Treatment B - Landscaping 900 sf

Treatment C = Lot area - pad area - driveway area - 900 sf
Treatment D = Pad, 1/2 access pavement, sidewalk and driveway

Constant numbers:

Treatment B: $0.06/12 = 0.06$ (900 x .06 = 54 cf)

Treatment C: $1.13/12 = 0.09$

Treatment D: $2.12/12 = 0.18$

For the 100-year, 10-day event,
the formula $V_{10} = V_{360} + A_D * (P_{10} - P_{360})/12$ is used

$$= V_{360} + A_D * (3.95 - 2.35)/12$$

$$= V_{360} + (A_D * 0.13) = \text{volume of water}$$

The volume of storage required for the volume of water is
calculated by multiplying the storage area by the average depth.

Lot 1:

Treatment D: Pave 3015 sf

SW 516 sf

Pad 1350 sf

DW 400 sf

TOTAL 5231 SF

Treatment C: $4277 - 1350 - 400 - 900 = 1627$ sf

V_{360}	B	54 cf
	C	$1627 \times 0.09 = 146$ cf
	D	$5231 \times 0.18 = 941$ cf
	TOTAL	$= 1141$ cf

$$V_{10} = 1141 + (5231 \times 0.13) = 1821 \text{ cf}$$

Storage area = 1580 sf average depth = 1.66'
Storage volume provided = 2627 cf

Lot 2:

Treatment D: Pave 1330 sf

SW 236 sf

Pad 1330 sf

DW 620 sf

TOTAL 3144 sf

Treatment C: $4473 - 1330 - 620 - 900 = 1623$ sf

V_{360}	B	54 cf
	C	$1623 \times 0.09 = 146$ cf
	D	$3144 \times 0.18 = 565$ cf

TOTAL = 765 cf

$$V_{10} = 765 + (3144 \times 0.13) = 1173 \text{ cf}$$

Storage area = 2016 sf average depth = 0.77'
Storage volume provided = 1562 cf

Lot 3:

Treatment D: Pave 570 sf
 SW 168 sf
 Pad 1350 sf
 DW 400 sf
 TOTAL 2488 sf

Treatment C: 4264 - 1350 - 400 - 900 = 1614 sf

V_{360} B 54 cf
 C 1614 x 0.09 = 145 cf
 D 2488 x 0.18 = 448 cf
 TOTAL = 647 cf

$$V_{10} = 647 + (2488 \times 0.13) = 970 \text{ cf}$$

Storage area = 1722 sf average depth = 0.89'
Storage volume provided = 1541 cf

Lot 4:

Treatment D: Pave 397 sf
 SW 381 sf
 Pad 1350 sf
 DW 400 sf
 TOTAL 2528 sf

Treatment C: 4856 - 1350 - 400 - 900 = 1614 sf

V_{360} B 54 cf
 C 2206 x 0.09 = 198 cf
 D 2528 x 0.18 = 455 cf
 TOTAL = 707 cf

$$V_{10} = 707 + (2528 \times 0.13) = 1035 \text{ cf}$$

Storage area = 2270 sf average depth = 0.93'
Storage volume provided = 2117 cf

Lot 5:

Treatment D: Pave 540 sf
 SW 147 sf

Pad 1125 sf
DW 416 sf
TOTAL 2228 sf

Treatment C: $4255 - 1125 - 416 - 900 = 1814$ sf

V_{360} B 54 cf
C $1814 \times 0.09 = 163$ cf
D $2228 \times 0.18 = 401$ cf
TOTAL = 618 cf

$V_{10} = 618 + (2228 \times 0.13) = 907$ cf

Storage area = 1961 sf average depth = 0.63'
Storage volume provided = 1250 cf

Lot 6:

Treatment D: Pave 378 sf
SW 102 sf
Pad 1200 sf
DW 493 sf
TOTAL 2173 sf

Treatment C: $4578 - \underline{1200} - \underline{493} - 900 = 1985$ sf

V_{360} B 54 cf
C $1985 \times 0.09 = 178$ cf
D $2173 \times 0.18 = 391$ cf
TOTAL = 623 cf

$V_{10} = 623 + (2173 \times 0.13) = 905$ cf

Storage area = 2230 sf average depth = 0.66'
Storage volume provided = 1479 cf

Lot 7:

Treatment D: Pave 665 sf
SW 175 sf
Pad 1200 sf
DW 414 sf
TOTAL 2454 sf

Treatment C: $4565 - 1200 - 414 - 900 = 2051$ sf

V_{360} B 54 cf
C $2051 \times 0.09 = 184$ cf
D $2454 \times 0.18 = 441$ cf
TOTAL = 679 cf

$V_{10} = 679 + (2454 \times 0.13) = 998$ cf

Storage area = 2121 sf average depth = 0.62'
Storage volume provided = 1327 cf

Lot 8:

Treatment D: Pave 1258 sf
 SW 240 sf
 Pad 1330 sf
 DW 647 sf
 TOTAL 3475 sf

Treatment C: $4491 - 1330 - 647 - 900 = 1614$ sf

V360 B 54 cf
 C $1614 \times 0.09 = 307$ cf
 D $3475 \times 0.18 = 625$ cf
 TOTAL = 986 cf

V10 = $986 + (3475 \times 0.13) = 1437$ cf

Storage area = 1861 sf average depth = 0.81'
Storage volume provided = 1509 cf

Lot 9:

Treatment D: Pave 2790 sf
 SW 508 sf
 Pad 1400 sf
 DW 600 sf
 TOTAL 5298 sf

Treatment C: $4264 - 1400 - 600 - 900 = 1364$ sf

V360 B 54 cf
 C $1364 \times 0.09 = 122$ cf
 D $5298 \times 0.18 = 954$ cf
 TOTAL = 1130 cf

V10 = $1130 + (5298 \times 0.13) = 1818$ cf

Storage area = 1764 sf average depth = 1.15'
Storage volume provided = 2028 cf

Lot 10:

Treatment D: Pave 3007 sf
 SW 524 sf
 Pad 1400 sf
 DW 600 sf
 TOTAL 5331 sf

Treatment C: $4264 - 1400 - 600 - 900 = 1364$ sf

V360 B 54 cf
 C $1364 \times 0.09 = 122$ cf
 D $5331 \times 0.18 = 959$ cf
 TOTAL = 1135 cf

V10 = $1135 + (5331 \times 0.13) = 1828$ cf

Storage area = 1731 sf average depth = 1.14'
Storage volume provided = 1971 cf

Lot 11:

Treatment D: Pave 993 sf
 SW 244 sf
 Pad 1330 sf
 DW 660 sf
 TOTAL 3227 sf

Treatment C: $4491 - 1330 - 660 - 900 = 1601$ sf

V360 B 54 cf
 C $1601 \times 0.09 = 144$ cf
 D $3227 \times 0.18 = 580$ cf
 TOTAL = 778 cf

V10 = $778 + (3227 \times 0.13) = 1197$ cf

Storage area = 1774 sf average depth = 0.82'
Storage volume provided = 1456 cf

Lot 12:

Treatment D: Pave 620 sf
 SW 176 sf
 Pad 1200 sf
 DW 400 sf
 TOTAL 2396 sf

Treatment C: $4565 - 1200 - 400 - 900 = 2065$ sf

V360 B 54 cf
 C $2065 \times 0.09 = 186$ cf
 D $2396 \times 0.18 = 431$ cf
 TOTAL = 671 cf

V10 = $671 + (2396 \times 0.13) = 982$ cf

Storage area = 2192 sf average depth = 0.46'
Storage volume provided = 1008 cf

Lot 13:

Treatment D: Pave 324 sf
 SW 101 sf
 Pad 1000 sf
 DW 445 sf
 TOTAL 1870 sf

Treatment C: 4329 - 1000 - 445 - 900 = 1984 sf

V360 B 54 cf
 C 1984 x 0.09 = 178 cf
 D 1870 x 0.18 = 336 cf
 TOTAL = 568 cf

V10 = 568 + (1870 x 0.13) = 811 cf

Storage area = 2317 sf average depth = 0.44'
Storage volume provided = 1017 cf

Lot 14:

Treatment D: Pave 782 sf
 SW 135 sf
 Pad 990 sf
 DW 487 sf
 TOTAL 2394 sf

Treatment C: 4264 - 990 - 487 - 900 = 1887 sf

V360 B 54 cf
 C 1887 x 0.09 = 169 cf
 D 2394 x 0.18 = 430 cf
 TOTAL = 653 cf

V10 = 653 + (2394 x 0.13) = 964 cf

Storage area = 1950 sf average depth = 0.66'
Storage volume provided = 1282 cf

Lot 15:

Treatment D: Pave 435 sf
 SW 127 sf
 Pad 1200 sf
 DW 491 sf
 TOTAL 2253 sf

Treatment C: $4626 - 1200 - 491 - 900 = 2035$ sf

V360 B 54 cf
 C $2035 \times 0.09 = 183$ cf
 D $2253 \times 0.18 = 405$ cf
 TOTAL = 642 cf

V10 = $642 + (2253 \times 0.13) = 934$ cf

Storage area = 2165 sf average depth = 0.47'
Storage volume provided = 1032 cf

Lot 16:

Treatment D: Pave 594 sf
 SW 168 sf
 Pad 1200 sf
 DW 390 sf
 TOTAL 2352 sf

Treatment C: $4369 - 1200 - 390 - 900 = 1879$ sf

V360 B 54 cf
 C $1879 \times 0.09 = 169$ cf
 D $2352 \times 0.18 = 423$ cf
 TOTAL = 646 cf

V10 = $646 + (2352 \times 0.13) = 951$ cf

Storage area = 2009 sf average depth = 0.52'
Storage volume provided = 1039 cf

Lot 17:

Treatment D: Pave 1155 sf
 SW 240 sf
 Pad 1400 sf
 DW 700 sf
 TOTAL 3495 sf

Treatment C: $4556 - 1400 - 700 - 900 = 1556$ sf

V360 B 54 cf
 C $1556 \times 0.09 = 140$ cf
 D $3495 \times 0.18 = 629$ cf
 TOTAL = 823 cf

V10 = $823 + (3495 \times 0.13) = 1277$ cf

Storage area = 1780 sf average depth = 0.81'
Storage volume provided = 1441 cf

Lot 18:

Treatment D: Pave 2697 sf
 SW 528 sf
 Pad 1200 sf
 DW 400 sf
 TOTAL 4825 sf

Treatment C: $4795 - 1200 - 400 - 900 = 2295$ sf

V360 B 54 cf
 C $2295 \times 0.09 = 206$ cf
 D $4825 \times 0.18 = 868$ cf
 TOTAL = 1128 cf

V10 = $1128 + (4825 \times 0.13) = 1755$ cf

Storage area = 2440 sf average depth = 0.96'
Storage volume provided = 2526 cf

EROSION CONTROL: Water, if any, from activities during construction and/or from rain will be temporarily ponded on site to prevent the spread of silt.

CONCLUSION: The proposed grading and drainage plan as shown will not change the direction of the historic flow. During a 100-year, 10-day storm, there will be sufficient volume of storage for the runoff volume resulting from the proposed impervious areas. The proposed grading and drainage plan for the subject property will not have any adverse impact on or will be adversely affected by the existing drainage from the surrounding areas.

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