

# **CES Consultants, LLC**

September 26, 2022

City of Dacono  
Attn: Jennifer Krieger, Community Development Director  
512 Cherry Street  
Dacono, CO 80514

**Re: Hamilton Subdivision – Lots 2 & 3  
Final Civil Site Construction Plans – Revised Site Drainage Design Narrative  
Report to address Town of Johnstown Comments**

Dear Jennifer:

CES Consultants, LLC (CES), on behalf of TJH Properties, Inc, has prepared a Site Drainage Design Narrative Report for the development of the proposed two (2) two-story 4-plex multi-family buildings located on Hamilton Subdivision, Lots 2&3 in the City of Dacono. This narrative report is being prepared to for the submittal of the Site Plan Application for this site.

The overall proposed development site is located within the North ½ of the Northwest ¼ of Section 6, Township 1 North, Range 67 West, of the 6<sup>th</sup> Principal Meridian, City of Dacono, County of Weld, Colorado. More specifically, the Lot 2 & 3 site is located at the northeast intersection of 7<sup>th</sup> Street and Dahlia Street. The site is bounded to the west by Dahlia Street, to the north by the commercial development on Lot 1, Hamilton Subdivision, to the south by 7<sup>th</sup> Street, and to the east by existing commercial development.

The proposed development of Lots 2 & 3 of the overall site will consist of the construction of two (2) two-story 4-plex Multi-Family buildings, one on each lot. Each building will be approximately 4200 sq. ft. and will be located in the middle of each lot. Additional asphalt parking will be developed north of the two (2) buildings. The site will also have surrounding open landscaped areas around the buildings and along Dahlia Street and 7<sup>th</sup> Street. This development matches the proposed development of Lots 2 & 3 that was shown on the Minor Subdivision Plat Map and application that was prepared for and approved by the City of Dacono in 2001.

The commercial development for Lot 1, that was shown on the approved Minor Subdivision documents was constructed in 2001/2002. At the time of the Minor Subdivision submittal, a drainage report and design for all of Lot 1, 2 & 3 was prepared and at that time, the City of Dacono approved the development of this site without any on-site detention required for the development of Lots 1, 2 & 3.

Per the site drainage calculations attached, the historic/existing (as the site is developed today), and the developed site storm runoff flows area are as follows:

Total Overall Site Existing Runoff Flows:

5 Year Runoff Flow = 1.12 cfs

100 Year Runoff Flow = 3.52 cfs

Total Overall Site Developed Runoff Flows:

5 Year Runoff Flow = 1.24 cfs

100 Year Runoff Flow = 3.72 cfs

The site runoff flows release into the east flowline of Dahlia Street and the north flowline of 7<sup>th</sup> Street. The flows then continue west then north to release into the city drainage outfall ditch located along the south side of Highway 56.

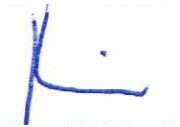
Due to the minor increase in the storm runoff flows after the development of Lots 2 & 3, the applicant is requesting that this development be constructed without the requirement of any on-site detention, as the City approved with the Minor Subdivision Application and the development of Lot 1.

A copy the Site Stormwater Drainage Calculations, including supporting documents, are included with this narrative for your review.

If you have any questions or comments concerning this report, please feel free to contact me at (970)347-0615 or [kurt@cesconsultantsllc.com](mailto:kurt@cesconsultantsllc.com)

Sincerely,

CES CONSULTANTS, LLC



Kurt Rollin, P.E.  
Principal



# CES Consultants, LLC

## HAMILTON SUBDIVISION - LOTS 1,2 & 3 SITE STORM DRAINAGE CALCULATIONS

September 26, 2022

### SITE DESIGN PARAMETERS:

#### HISTORIC/EXISTING (AS OF TODAY) SITE LAND USE:

Total Site Area:	25,200 SF = 0.579 acres = 100%
Building (Roof) Area:	2,000 SF = 0.046 acres = 7.9%
Asphalt Paving & Sidewalks:	9,365 SF = 0.215 acres = 37.2%
Crushed Concrete Paving:	12,460 SF = 0.286 acres = 49.4%
Landscape Area:	1,375 SF = 0.032 acres = 5.5%

#### NRCS HYDROLOGIC SOIL GROUP C

SITE DESIGN STORMS:	Minor Storm – 5-Year
	Major Storm – 100-Year

### HISTORIC/EXISTING SITE STORM RUNOFF FLOWS:

TOTAL SITE AREA = 0.579 acres

DEVELOPED WEIGHTED IMPERVIOUSNESS (I): (per Table 6-3, USDCM 2018)

Building Area (I = 90% - Site Percentage = 7.9%)

$$I_{BLDG} = (90)(0.079) = 7.11\%$$

Asphalt Paving & Sidewalks (I = 100% - Site Percent. = 37.2%)

$$I_{PAVE} = (100)(0.372) = 37.20\%$$

Crushed Concrete Paving (I = 55% - Site Percent. = 49.4%)

$$I_{PAVE} = (55)(0.494) = 27.17\%$$

Landscape Area (I = 2% – Site Percentage = 5.5%)

$$I_{LAND} = (2)(0.055) = 0.11\%$$

Total Developed Weighted Imperviousness (I)

$$7.11 + 37.20 + 27.17 + 0.11 = 71.59\%$$

HISTORIC/EXISTING RUNOFF COEFFICIENTS (C) (Per Table 6-5, USDCM 2018)

For Basin Imperviousness (I) = 71.6%, Soil Type C

$$C_5 = 0.62 \quad C_{100} = 0.77$$

HISTORIC/EXISTING TIME OF CONCENTRATION (Tc)

$$T_c = (\text{per Eq. RO-3 USDCM 2018}) = \frac{0.395 (1.1 - C_5)(L_i^{1/2})}{S^{0.033}}$$

$L_i = 160 \text{ ft.}$

$S = 2\% = 0.020 \text{ ft/ft}$

$C_5$  (for I = 71.6%, Soil Type C) = 0.62



$T_c = 8.8$  minutes

RAINFALL INTENSITIES (I)

(Per Eq 5-3. USDCM)

$$I = \frac{28.5 P_1}{(10 + T_c)^{0.786}}$$

$P_1$  = 1-hour Point Rainfall Depth ( Per NOAA Atlas 14)

$P_1$  for 5-year Storm = 1.11 inches

$P_1$  for 100-year Storm = 2.78 inches

$T_c = 8.8$  minutes

$I_5 = 3.12$  inches/hour

$I_{100} = 7.89$  inches/hour

HISTORIC/EXISTING RUNOFF QUANTITIES (Q)

$Q = CIA$

For Total Site (0.579 acres)

$$Q_5 = (0.62)(3.12 \text{ in/hr})(0.579 \text{ ac.}) = 1.12 \text{ cfs}$$

$$Q_{100} = (0.77)(7.89 \text{ in/hr})(0.579 \text{ ac.}) = 3.52 \text{ cfs}$$

DEVELOPED SITE LAND USE:

Total Site Area:	25,200 SF = 0.579 acres = 100%
Building (Roof) Area:	6,620 SF = 0.152 acres = 26.3%
Concrete Paving & Sidewalks:	13,200 SF = 0.303 acres = 52.4%
Landscape Area:	5,380 SF = 0.124 acres = 21.3%

NRCS HYDROLOGIC SOIL GROUP C

SITE DESIGN STORMS:            Minor Storm – 5-Year  
   Major Storm – 100-Year

DEVELOPED SITE STORM RUNOFF FLOWS:

TOTAL SITE AREA = 0.579 acres

DEVELOPED WEIGHTED IMPERVIOUSNESS (I): (per Table 6-3, USDCM 2018)

Building Area (I = 90% - Site Percentage = 26.3%)

$$I_{BLDG} = (90)(0.263) = 23.67\%$$

Asphalt Paving & Sidewalks (I = 100% - Site Percent. = 52.4%)

$$I_{PAVE} = (100)(0.524) = 52.40\%$$

Landscape Area (I = 2%) – Site Percentage = 21.3%)

$$I_{LAND} = (2)(0.213) = 0.43\%$$

Total Developed Weighted Imperviousness (I)

$$23.67 + 52.40 + 0.43 = 76.50\%$$



DEVELOPED RUNOFF COEFFICIENTS (C) (Per Table 6-5, USDCM 2018)

For Basin Imperviousness (I) = 76.5%, Soil Type C

$$C_5 = 0.66 \quad C_{100} = 0.79$$

DEVELOPED TIME OF CONCENTRATION (T<sub>c</sub>)

$$T_c = (\text{per Eq. RO-3 USDCM 2008}) = \frac{0.395 (1.1 - C_5)(L_i^{1/2})}{S^{0.033}}$$

$$L_i = 160 \text{ ft.}$$

$$S = 2\% = 0.020 \text{ ft/ft}$$

$$C_5 (\text{for } I = 76.5\%, \text{ Soil Type C}) = 0.66$$

$$T_c = 8.1 \text{ minutes}$$

RAINFALL INTENSITIES (I)

(Per Eq 5-3. USDCM)

$$I = \frac{28.5 P_1}{(10 + T_c)^{0.786}}$$

P<sub>1</sub> = 1-hour Point Rainfall Depth (Per NOAA Atlas 14)

P<sub>1</sub> for 5-year Storm = 1.11 inches

P<sub>1</sub> for 100-year Storm = 2.78 inches

T<sub>c</sub> = 8.1 minutes

$$I_5 = 3.25 \text{ inches/hour}$$

$$I_{100} = 8.13 \text{ inches/hour}$$

DEVELOPED RUNOFF QUANTITIES (Q)

$$Q = CIA$$

For Total Site (0.579 acres)

$$Q_5 = (0.66)(3.25 \text{ in/hr})(0.579 \text{ ac.}) = 1.24 \text{ cfs}$$

$$Q_{100} = (0.79)(8.13 \text{ in/hr})(0.579 \text{ ac.}) = 3.72 \text{ cfs}$$

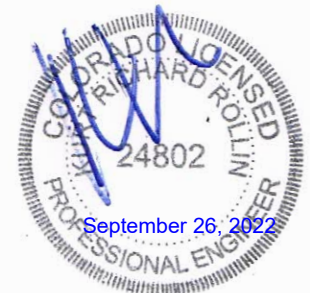
COMPARISON BETWEEN HISTORIC/EXISTING RUNOFF FLOWS AND DEVELOPED RUNOFF FLOWS:

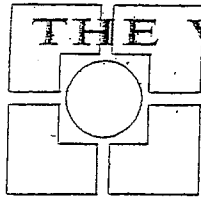
	<u>HISTORIC/EXISTING FLOWS</u>	<u>DEVELOPED FLOWS</u>
5-YEAR	1.12 CFS	1.24 CFS
100-YEAR	3.52 CFS	3.72 CFS

INCREASE IN DEVELOPED FLOWS FROM HISTORIC/EXISTING FLOWS:

5-YEAR                      0.12 CFS = 10.7% INCREASE

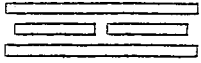
100-YEAR                    0.20 CFS = 5.7% INCREASE





# THE WELLS ARCHITECTURAL GROUP

455 Sherman Street, Suite 205  
Denver, Colorado 80203  
(303) 783-0055 Fax (303) 783-0060



(303) 783-0040 Ext 22

July 6, 2001

Ms. Karen Cumbo, City Administrator  
City of Dacono  
512 Cherry Street  
Dacono, CO 80514

RE: Hamilton Minor Subdivision  
Dacono, Colorado  
RGCE Job No. 34.0046  
WAG Project No. 0016

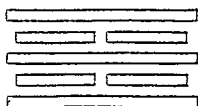
Dear Ms. Cumbo,

On June 22, 2001, we were told by Richard Beck that the preceding day he had met with you, and the city's attorney and planner. During that meeting this project was discussed and it was decided that normal detention ponding will not be required for this site.

As a result of that decision we are revisiting the site grading design. The parking lot grades will be revised to allow parking lot drainage and retail building roof drains to be released through the new curb cut on Dahlia Street. The berm will be eliminated on the west side of the parking area along Dahlia. The residential roof drainage will be handled with downspouts and daylighted roof drains on the south lawn area. That lawn will be graded to drain to the south and west with no detention ponds.

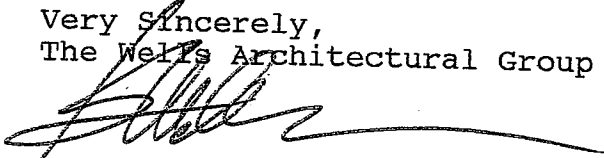
We understand that this project will continue to be considered as being in the flood plain shown on the FEMA map of Dacono, in spite of the evidence which we have given you which indicates that the FEMA map may be inaccurate in this project area. That will mean that Mr. Hamilton will wind up paying for flood insurance which he may very well not need.

Since your engineer is directing that the grading plan be revised to eliminate the detention ponds and outlet structures, the Owner has asked that your engineer put it in writing, and that a copy with his engineer's stamp be forwarded to him for his records. He would also like to understand the reasoning behind this decision and have an explanation why this decision couldn't have been made after your first review of the drawings, rather than after three reviews and six months later.



If the forgoing is inaccurate or if you have any questions,  
please call.

Very Sincerely,  
The Wells Architectural Group



Kermit Wells  
Architect

Copies: Tom Hamilton  
Rick Beck  
Sherry Albertson-Clark  
Andy Patterson  
Todd Schroeder

Attachment: Patterson Partners Letter dated June 13, 2001  
Re: 100 Year Flood Plain Elevations.

# ***Patterson Partners***

9176 Aljan Ave.,  
Longmont Co. 80503  
Ph 303-678-7072 fax 303-678-9663

Date: June 13, 2001

To: Rick Goncalves @ RG Consultants

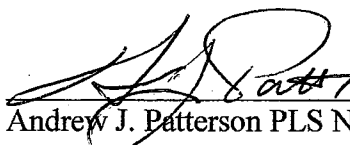
From: Andrew Patterson @ Patterson Partners

cc: Tom Hamilton, Property Owner  
Kermit Wells, Wells Architectural Group  
Cecil Crowe, High Plains Engineering

RE: Hamilton Subdivision 100 Year Flood Plain Elevations.

After shooting the elevations on and around the Subdivision site, which is located within Block 2 of the Original Town of Dacono, it appears that the entire project lies above the 100 Year Flood Plain according to the F.E.M.A. Flood Insurance Rate Map which shows the area in the Flood Plain. The Benchmark used to establish the elevations on the site was Reference Mark 2 (RM2) shown on the Dacono Flood Insurance Rate Map as having an elevation of 5024.53 feet. The concrete structure described on the map (which has an effective Date in 1979) appears to have been built in 1970 as indicated by a date on the structure.

In visually inspecting the Flood Plain area between Blocks 1 and 3 it appears that 7<sup>th</sup> Street is the lowest area and would be the center of a Channel if a flood occurred. The Map seems to indicate that the area between 7<sup>th</sup> Street and 8<sup>th</sup> Street is relatively flat when in actuality 8<sup>th</sup> Street is roughly 1 ½ feet higher than 7<sup>th</sup> Street. Much of the land lying south of 7<sup>th</sup> Street in this area (not in the 100 Year Flood Plain according to the Map) appears to be lower than the land north of 7<sup>th</sup> Street (in the 100 Year Flood Plain according to the Map) implying that if a flood occurred in this area the land south of 7<sup>th</sup> Street may be involved.

  
6/13/01  
Andrew J. Patterson PLS No. 26971

