



Town of Marshfield

870 Moraine Street
Marshfield, Massachusetts 02050-3498

Planning Board

Tel: 781-834-5554

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STREET DETERMINATION APPLICATION

1. Name of Applicant Dana Junior
Address 26 Idaho St Marshfield
Telephone # 617 840 2820
E-mail walzkobentcc@hotmail.com Fax # —

 2. Name of Engineer or Surveyor Land Planning
Address 1115 Main St Hanson
Telephone # 781 294 4144
E-mail grr40@msn.com Fax # —

 3. Deed of property recorded in Plymouth Registry,
Book 49730 Page 233

 4. Assessor's Map: G12 Block 18 Lot 05

 5. Street address of property: 108 California St

 6. Location of street proposed for improvement: _____
California St
- Signature and Address of Owner(s) Dana Junior (UCI TRUST)
26 Idaho St
Marshfield, MA 02050
- Date 3-11-20

108 California Street
Parcel G12-18-05

Drainage Summary

June 27, 2019

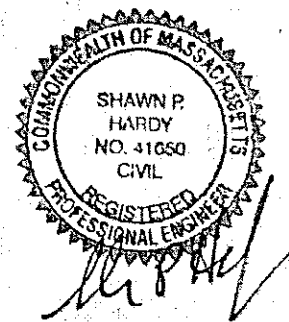
Received
MAR 5 2019
Marshfield Planning Dept.

The proposed project includes a short asphalt pavement extension of California Street from 105 California Street (south of the intersection of Waltham Avenue), approximately 130 feet south to provide access to 108 California Street (Parcel G12-18-05). The existing California Street right-of-way is recycled asphalt pavement approximately fifteen feet wide, and slopes to the southwest.

Test pits conducted on site for septic design show that the soils are a medium sand, which is classified as a Hydrologic Soil Group A type soil. In order to mitigate the increased runoff from the proposed pavement surface, a subsurface infiltration system consisting of six concrete galleys surrounded by crushed stone is proposed. The pre- vs. post-development rate and volume of runoff for the 2-, 10-, 25- and 100-year storm events is tabulated below. The detailed HydroCAD report is attached.

Storm Event	Peak Rate of Runoff (cfs)		Volume of Runoff (ac-ft)	
	Existing	Proposed	Existing	Proposed
2-year	0.14	0	0.010	0
10-year	0.23	0	0.016	0
25-year	0.30	0.06	0.020	0
100-year	0.38	0.26	0.027	0.003

As shown above, and detailed in the attached HydroCAD report, rate and volume of runoff will not be increased during any of the design storm events.



California Street

Prepared by Hardy + Man Group, P.C.

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Type III 24-hr 2 year Rainfall=3.40"

Printed 7/29/2019

Page 3

Summary for Subcatchment 1S: Existing

Runoff = 0.14 cfs @ 12.08 hrs, Volume= 0.010 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 year Rainfall=3.40"

Area (sf)	CN	Description
* 1,997	98	Ex impervious
961	49	50-75% Grass cover, Fair, HSG A
2,958	82	Weighted Average
961		32.49% Pervious Area
1,997		67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S: New Road

Runoff = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af, Depth= 3.17"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 2 year Rainfall=3.40"

Area (sf)	CN	Description
* 2,958	98	Proposed Road
2,958		100.00% Impervious Area

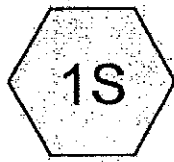
Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Pond 5P: Chambers

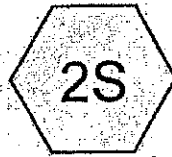
Inflow Area = 0.068 ac, 100.00% Impervious, Inflow Depth = 3.17" for 2 year event
 Inflow = 0.23 cfs @ 12.07 hrs, Volume= 0.018 af
 Outflow = 0.05 cfs @ 12.47 hrs, Volume= 0.018 af, Atten= 78%, Lag= 23.8 min
 Discarded = 0.05 cfs @ 12.47 hrs, Volume= 0.018 af
 Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 72.83' @ 12.47 hrs Surf.Area= 135 sf Storage= 198 cf

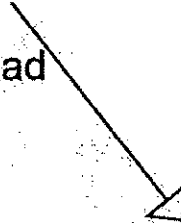
Plug-Flow detention time= 25.1 min calculated for 0.018 af (100% of inflow)
 Center-of-Mass det. time= 25.1 min (779.3 - 754.2)



Existing



New Road



Chambers



Routing Diagram for California Street
Prepared by Hardy + Man Group, P.C., Printed 7/29/2019
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Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing

Runoff Area=2,958 sf 67.51% Impervious Runoff Depth=2.81"
Tc=5.0 min CN=82 Runoff=0.23 cfs 0.016 af

Subcatchment 2S: New Road

Runoff Area=2,958 sf 100.00% Impervious Runoff Depth=4.46"
Tc=5.0 min CN=98 Runoff=0.32 cfs 0.025 af

Pond 5P: Chambers

Peak Elev=74.03' Storage=308 cf Inflow=0.32 cfs 0.025 af
Discarded=0.06 cfs 0.025 af Primary=0.00 cfs 0.000 af Outflow=0.06 cfs 0.025 af

Total Runoff Area = 0.136 ac Runoff Volume = 0.041 af Average Runoff Depth = 3.64"
16.24% Pervious = 0.022 ac 83.76% Impervious = 0.114 ac

California Street

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Type III 24-hr 10 year Rainfall=4.70"

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Page 7

Volume	Invert	Avail.Storage	Storage Description
#1A	70.50'	129 cf	5.40'W x 25.00'L x 5.00'H Field A 675 cf Overall - 353 cf Embedded = 322 cf x 40.0% Voids
#2A	71.00'	266 cf	Concrete Galley 4x4x4 x 6 Inside #1 Inside= 42.0"W x 43.0"H => 12.67 sf x 3.50'L = 44.3 cf Outside= 52.8"W x 48.0"H => 14.72 sf x 4.00'L = 58.9 cf
		395 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Primary	75.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	70.50'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 68.00'

Discarded OutFlow Max=0.06 cfs @ 12.49 hrs HW=74.03' (Free Discharge)
 ↳ 2=Exfiltration (Controls 0.06 cfs)

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=70.50' (Free Discharge)
 ↳ 1=Orifice/Grate (Controls 0.00 cfs)

Summary for Subcatchment 1S: Existing

Runoff = 0.30 cfs @ 12.07 hrs, Volume= 0.020 af, Depth= 3.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 year Rainfall=5.60"

Area (sf)	CN	Description
* 1,997	98	Ex impervious
961	49	50-75% Grass cover, Fair, HSG A
2,958	82	Weighted Average
961		32.49% Pervious Area
1,997		67.51% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Subcatchment 2S: New Road

Runoff = 0.38 cfs @ 12.07 hrs, Volume= 0.030 af, Depth= 5.36"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
Type III 24-hr 25 year Rainfall=5.60"

Area (sf)	CN	Description
* 2,958	98	Proposed Road
2,958		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					Direct Entry,

Summary for Pond 5P: Chambers

Inflow Area = 0.068 ac, 100.00% Impervious, Inflow Depth = 5.36" for 25 year event
 Inflow = 0.38 cfs @ 12.07 hrs, Volume= 0.030 af
 Outflow = 0.14 cfs @ 12.35 hrs, Volume= 0.030 af, Atten= 64%, Lag= 16.6 min
 Discarded = 0.07 cfs @ 12.34 hrs, Volume= 0.030 af
 Primary = 0.06 cfs @ 12.35 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-40.00 hrs, dt= 0.02 hrs
 Peak Elev= 75.03' @ 12.34 hrs Surf.Area= 135 sf Storage= 369 cf

Plug-Flow detention time= 38.8 min calculated for 0.030 af (100% of inflow)
 Center-of-Mass det. time= 38.8 min (784.0 - 745.3)

California Street

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Type III 24-hr 100 year Rainfall=6.80"

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Page 11

Time span=0.00-40.00 hrs, dt=0.02 hrs, 2001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment 1S: Existing

Runoff Area=2,958 sf 67.51% Impervious Runoff Depth=4.73"
Tc=5.0 min CN=82 Runoff=0.38 cfs 0.027 af

Subcatchment 2S: New Road

Runoff Area=2,958 sf 100.00% Impervious Runoff Depth=6.56"
Tc=5.0 min CN=98 Runoff=0.47 cfs 0.037 af

Pond 5P: Chambers

Peak Elev=75.08' Storage=372 cf Inflow=0.47 cfs 0.037 af
Discarded=0.07 cfs 0.034 af Primary=0.26 cfs 0.003 af Outflow=0.33 cfs 0.037 af

Total Runoff Area = 0.136 ac Runoff Volume = 0.064 af Average Runoff Depth = 5.65"
16.24% Pervious = 0.022 ac 83.76% Impervious = 0.114 ac

Volume	Invert	Avail. Storage	Storage Description
#1A	70.50'	129 cf	5.40'W x 25.00'L x 5.00'H Field A 675 cf Overall - 353 cf Embedded = 322 cf x 40.0% Voids
#2A	71.00'	266 cf	Concrete Galley 4x4x4 x 6 Inside #1 Inside= 42.0"W x 43.0"H => 12.67 sf x 3.50'L = 44.3 cf Outside= 52.8"W x 48.0"H => 14.72 sf x 4.00'L = 58.9 cf
		395 cf	Total Available Storage

Storage Group A created with Chamber Wizard

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#1	Primary	75.00'	6.0" Horiz. Orifice/Grate X 2.00 C= 0.600 Limited to weir flow at low heads
#2	Discarded	70.50'	8.270 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 68.00'

Discarded OutFlow Max=0.07 cfs @ 12.16 hrs HW=75.08' (Free Discharge)

↑ 2=Exfiltration (Controls 0.07 cfs)

Primary OutFlow Max=0.25 cfs @ 12.16 hrs HW=75.08' (Free Discharge)

↑ 1=Orifice/Grate (Weir Controls 0.25 cfs @ 0.94 fps)