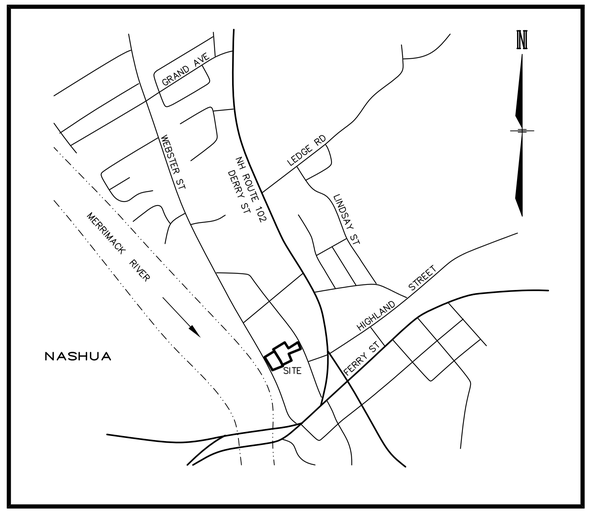
PROPOSED
RESIDENTIAL DEVELOPMENT
MAP 174, LOT 15-1 & MAP 181 LOT 1
20 BAKER ST. & 25 WEBSTER ST.

SYMBOLS LEGEND

EXISTING	PROPOSED
SETBACK LINE	SILT FENCE
EDGE OF PAVEMENT	CATCH BASIN
TEST PIT	DRAIN LINE
2' CONTOUR INTERVAL	DRAIN MANHOLE
10' CONTOUR INTERVAL	RUN-OFF FLOW DIRECTION
IRON ROD FOUND	PROPOSED GRADE CONTOUR
BOUND FOUND	STONE CHECK DAM
UTILITY POLE	BENCHMARK
SEWER MANHOLE	HANDICAP RAMP AT STREET CORNER
DRAIN MANHOLE	PROPOSED CURB EXISTING PAVEMENT
CATCH BASIN	PROPOSED CURB PROPOSED PAVEMENT
OVERHEAD WIRE	SPOT GRADE
DRAIN LINE	RIP-RAP STONE
WATER LINE	PAVED SIDEWALK
SEWER LINE	INFILTRATION BASIN BERM
HYDRANT	CHECKDAM (INFILTRATION BASIN)
WATER VALVE	RIP RAP OUTLET APRON
GAS VALVE	WATER LINE
	SEWER LINE

THE LOCATION OF ANY UTILITY INFORMATION SHOWN IN THIS PLANSET IS APPROXIMATE. RJB ENGINEERING, LLC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ANY UTILITIES WHETHER THEY BE ABOVE OR BELOW GROUND. PRIOR TO ANY EXCAVATION ON SITE THE CONTRACTOR SHALL CONTACT DIG SAFE AT 1-800-DIG-SAFE.



LOCUS MAP
NOT TO SCALE

OWNER:
TUMPNEY, HURD, CLEG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

SHEET INDEX

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

CHAIRPERSON DATE

SECRETARY DATE

SUBDIVISIONS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS, AND CHANGES TO THE ZONING ORDINANCE, SEE RSA 674:39

THIS PLANSET CONTAINS A TOTAL OF 12 SHEETS
SHEET 3 IS TO BE RECORDED AT THE H.C.R.D.
THE REMAINDER ARE ON FILE AT TOWN OF HUDSON

No.	DESCRIPTION	DATE
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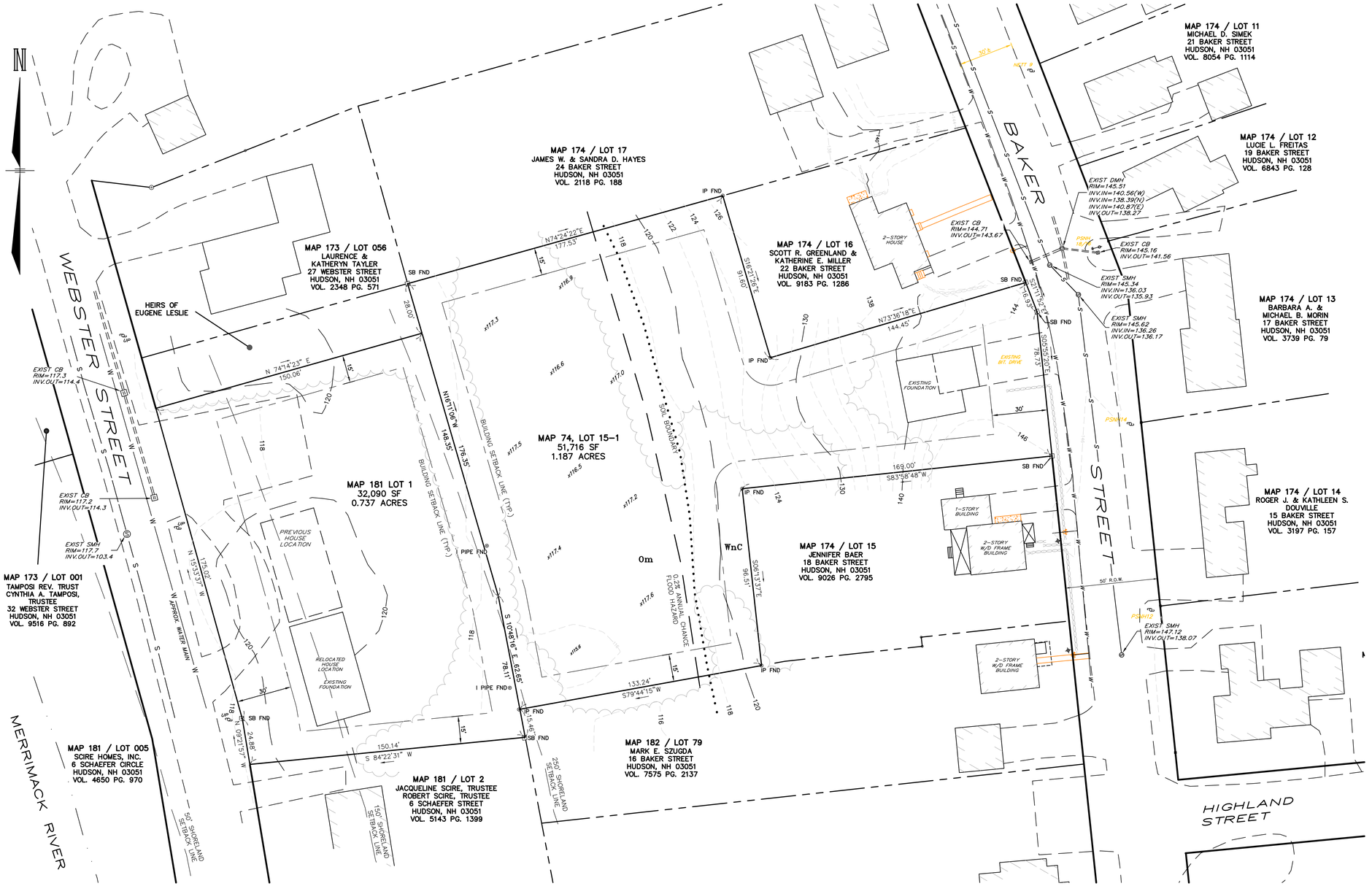
STATE OF NEW HAMPSHIRE
R. JEFFREY BURD
No.9058
LICENSED
PROFESSIONAL ENGINEER

PREPARED BY:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

IN ASSOCIATION WITH:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

DATE: MARCH 30, 2022



REFERENCE PLANS:

1. A PLAN TITLED "CONSOLIDATION & SUBDIVISION PLAN, O'LOUGHLIN SUBDIVISION, MAP 174, LOTS 15 & 16, 18 & 22 BAKER STREET, HUDSON, NH" PREPARED FOR THOMAS & JEANNE O'LOUGHLIN ET AL, AND COOLANGATTA CAPITAL MANAGEMENT, LLC, BY KEACH NORDSTROM ASSOCIATES, INC. DATED LAST REVISED ON OCTOBER 2, 2008 AND RECORDED AT HCRD AS PLAN No ????.
2. A PLAN TITLED "SURVEY PLAN OF LAND OF TUMPNEY HURD CLEGG, LLC, PARCEL ID 181-001, 25 WEBSTER STREET, HUDSON, NH" BY FRANKLIN ASSOCIATES, LLC, DATED FEBRUARY 25, 2021, AND RECORDED AT THE HCRD AS PLAN No ????.

NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE EXISTING CONDITIONS OF LOTS 174-15-1 & 181-1.
2. OWNER OF RECORD:
   TUMPNEY, HURD, CLEGG, LLC
   39 TRIGATE ROAD
   NASHUA, NH 03051
3. DEED REFERENCE TO PARCEL 174-15-1 IS BK 9462, PG 2026 HCRD
   DEED REFERENCE TO PARCEL 181-01 IS BK 9402, PG 2493 HCRD
4. TOTAL AREA OF LOT 174-15-1 IS 51,716 SF AND LOT 181-01 IS 32,090 SF. THE TOTAL COMBINED AREA IS 83,806 SF = 1.924 ACRES
5. PROPERTIES ARE CURRENTLY ZONED: TR – TOWN RESIDENCE
6. ZONING REQUIREMENTS:

LOT AREA:	10,000 SF
MIN. FRONTAGE:	90 feet
FRONT SETBACK:	30 feet
SIDE SETBACK:	15 feet
REAR SETBACK:	15 feet

7. THERE ARE NO WETLANDS ON THIS PROPERTY.
8. THESE PROPERTIES ARE NOT WITHIN THE 100 YEAR FLOOD HAZARD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY MAP NUMBER 330092 0005 B PANEL 5 OF 10, EFFECTIVE DATE JANUARY 3, 1979.
9. PROPERTIES ARE SERVICED BY MUNICIPAL SEWER AND WATER.

No.	DESCRIPTION	DATE
.	.	.
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EXISTING CONDITIONS PLAN

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

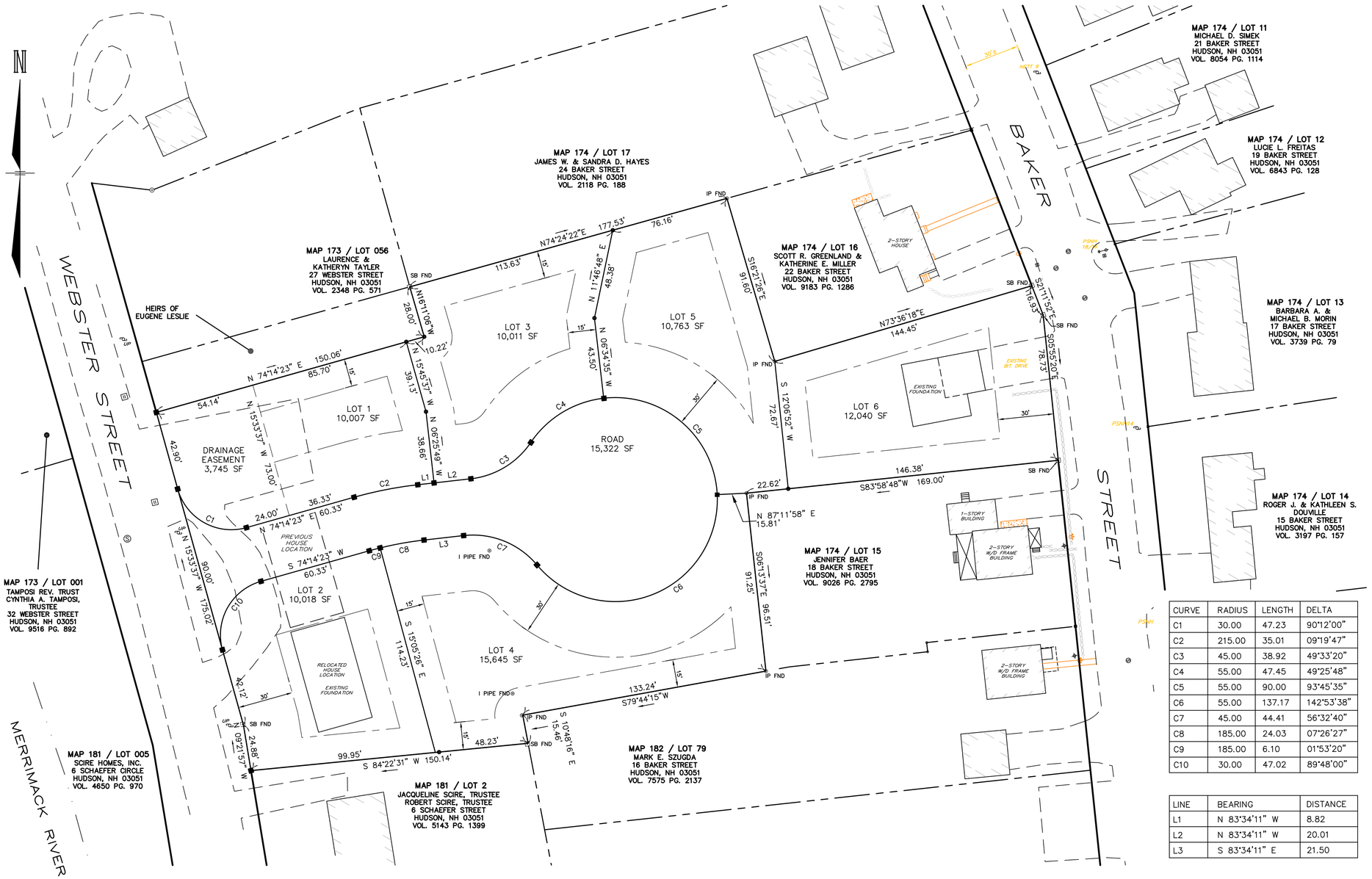
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: 1"=30'*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

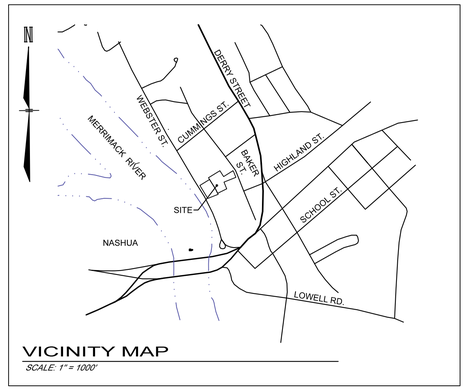
30' 15' 0 30'
SCALE: 1"=30'

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359



CURVE	RADIUS	LENGTH	DELTA
C1	30.00	47.23	90°12'00"
C2	215.00	35.01	09°19'47"
C3	45.00	38.92	49°33'20"
C4	55.00	47.45	49°25'48"
C5	55.00	90.00	93°45'35"
C6	55.00	137.17	142°53'38"
C7	45.00	44.41	56°32'40"
C8	185.00	24.03	07°26'27"
C9	185.00	6.10	01°53'20"
C10	30.00	47.02	89°48'00"

LINE	BEARING	DISTANCE
L1	N 83°34'11" W	8.82
L2	N 83°34'11" W	20.01
L3	S 83°34'11" E	21.50



VICINITY MAP

SCALE: 1" = 1000'

REFERENCE PLANS:

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NOTES:

1. THE PURPOSE OF THIS PLAN IS TO SHOW THE SUBDIVISION OF LOTS 174–15–1 & 181–1 INTO SIX (6) RESIDENTIAL BUILDING LOTS .
2. OWNER OF RECORD:
   TUMPNEY, HURD, CLEGG, LLC
   39 TRIGATE ROAD
   NASHUA, NH 03051
3. DEED REFERENCE TO PARCEL 174–15–1 IS BK 9462, PG 2026 HCRD
   DEED REFERENCE TO PARCEL 181–01 IS BK 9402, PG 2493 HCRD
4. TOTAL AREA OF LOT 174–15–1 IS 51,716 SF AND LOT 181–01 IS 32,090 SF. THE TOTAL COMBINED AREA IS 83,806 SF = 1.924 ACRES
5. PROPERTIES ARE CURRENTLY ZONED: TR – TOWN RESIDENCE
6. ZONING REQUIREMENTS:

LOT AREA:	10,000 SF
MIN. FRONTAGE:	90 feet
FRONT SETBACK:	30 feet
SIDE SETBACK:	15 feet
REAR SETBACK:	15 feet

7. THERE ARE NO WETLANDS ON THE PROPERTIES.
8. THESE PROPERTIES ARE NOT WITHIN THE 100 YEAR FLOOD HAZARD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 330092 0005 B PANEL 5 OF 10, EFFECTIVE DATE JANUARY 3, 1979.
9. ALL LOTS TO BE SERVICED BY MUNICIPAL SEWER AND WATER.

No.	DESCRIPTION	DATE
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WAIVERS GRANTED:

1. HTC 289–18.A – RIGHT–OF–WAY WIDTH
2. HTC 289–18.B(1) – ROW & PAVEMENT WIDTH
3. HTC 289–18.B(3) – TURNAROUND RADII

LEGEND

EXISTING STONEWALL
ABUTTERS PROPERTY LINES
SUBJECT PROPERTY LINES
PROPOSED PROPERTY LINES
PROPERTY TIE LINE
EDGE OF PAVEMENT
EXISTING TREELINE
EXISTING CONTOUR (MNR) 572
EXISTING CONTOUR (MJR) -570
EXISTING BLDG SETBACK

WETLANDS
DRILL HOLE FOUND
REBAR W/ CAP FOUND
STONE BOUND FOUND
5/8" REBAR TO BE SET
4"x4"x36" GRANITE BOUND TO BE SET
PROPOSED WELL

OWNER OF RECORD:

_____ _____
TUMPNEY, HURD, CLEGG, LLC DATE
39 TRIGATE ROAD
HUDSON, NH 03051
(603) 718–2932

I CERTIFY THAT THIS PLAN WAS PREPARED FROM THE BOUNDARY INFORMATION SHOWN ON THE PLANS REFERENCED AND A FIELD SURVEY MADE ON THE GROUND DURING ????? 2020, IN ACCORDANCE WITH TOWN REGULATIONS.

_____
MICHAEL GRAINGER, LLS # 1

APPROVED BY THE HUDSON, NH PLANNING BOARD
DATE OF MEETING: _____

_____ _____
CHAIRMAN DATE

_____ _____
SECRETARY DATE

SUBDIVISIONS ARE VALID FOR ONE YEAR FROM THE DATE OF PLANNING BOARD MEETING FINAL APPROVAL. FOR AN APPLICANT TO GAIN AN EXEMPTION FROM ALL SUBSEQUENT CHANGES IN SUBDIVISION REGULATIONS, SITE PLAN REGULATIONS AND CHANGES TO THE ZONING ORDINANCE, SEE NH RSA 674:39

SUBDIVISION PLAN

MAP 174, LOT 15–1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

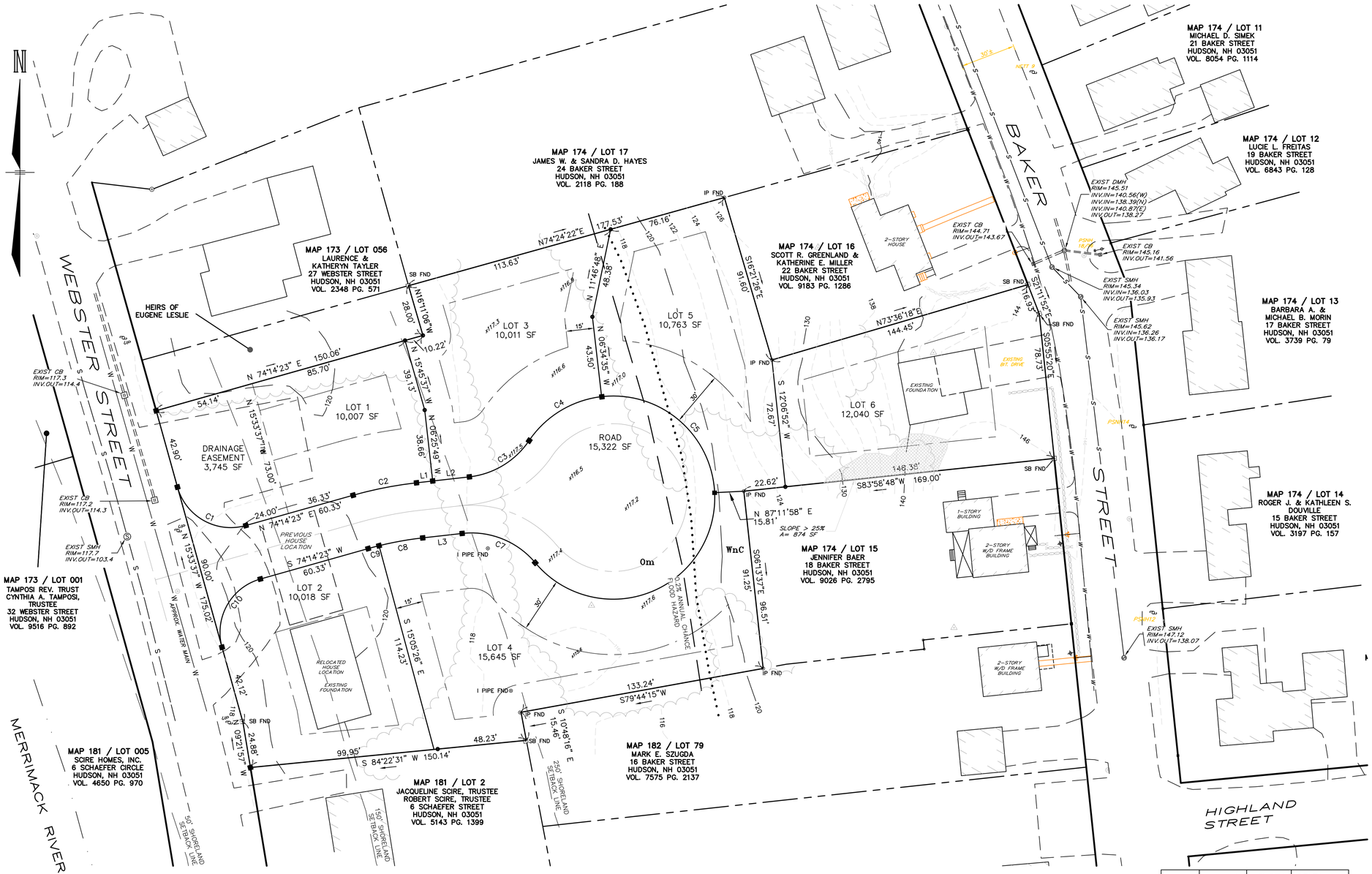
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: 1"=30'*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

30' 15' 0 30'
SCALE: 1"=30'

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359



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   TUMPNEY, HURD, CLEGG, LLC
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6. ZONING REQUIREMENTS:

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MIN. FRONTAGE:	90 feet
FRONT SETBACK:	30 feet
SIDE SETBACK:	15 feet
REAR SETBACK:	15 feet

7. THERE ARE NO WETLANDS ON THE PROPERTIES.
8. THESE PROPERTIES ARE NOT WITHIN THE 100 YEAR FLOOD HAZARD ZONE AS SHOWN ON THE FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY PANEL NUMBER 330092 0005 B PANEL 5 OF 10, EFFECTIVE DATE JANUARY 3, 1979.
9. ALL LOTS TO BE SERVICED BY MUNICIPAL SEWER AND WATER.

BUILDABLE AREA TABLE				
LOT #	LOT AREA	AREA >25%	WETLAND AREA	BUILDABLE AREA
1	10,007 SF	0 SF	0 SF	10,007 SF
2	10,018 SF	0 SF	0 SF	10,018 SF
3	10,011 SF	0 SF	0 SF	10,011 SF
4	15,645 SF	0 SF	0 SF	15,645 SF
5	10,763 SF	0 SF	0 SF	10,763 SF
6	12,040 SF	874 SF	0 SF	11,166 SF

No.	DESCRIPTION	DATE
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LEGEND

EXISTING STONEWALL		WETLANDS	
ABUTTERS PROPERTY LINES		DRILL HOLE FOUND	
SUBJECT PROPERTY LINES		REBAR W/ CAP FOUND	
PROPOSED PROPERTY LINES		STONE BOUND FOUND	
PROPERTY TIE LINE		5/8" REBAR TO BE SET	
EDGE OF PAVEMENT		4"x4"x36" GRANITE BOUND TO BE SET	
EXISTING TREELINE		PROPOSED WELL	
EXISTING CONTOUR (MNR)	572		
EXISTING CONTOUR (MJR)	-570		
EXISTING BLDG SETBACK			

I CERTIFY THAT THIS PLAN WAS PREPARED FROM THE BOUNDARY INFORMATION SHOWN ON THE PLANS REFERENCED AND A FIELD SURVEY MADE ON THE GROUND DURING ????? 2020, IN ACCORDANCE WITH TOWN REGULATIONS.

MICHAEL GRAINGER, LLS # 1

DIG SAFE
1-888-344-7233
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM

CURVE	RADIUS	LENGTH	DELTA
C1	30.00	47.23	90°12'00"
C2	215.00	35.01	09°19'47"
C3	45.00	38.92	49°33'20"
C4	55.00	47.45	49°25'48"
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C8	185.00	24.03	07°26'27"
C9	185.00	6.10	01°53'20"
C10	30.00	47.02	89°48'00"

LINE	BEARING	DISTANCE
L1	N 83°34'11" W	8.82
L2	N 83°34'11" W	20.01
L3	S 83°34'11" E	21.50

TOPOGRAPHIC SUBDIVISION PLAN

MAP 174, LOT 15–1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

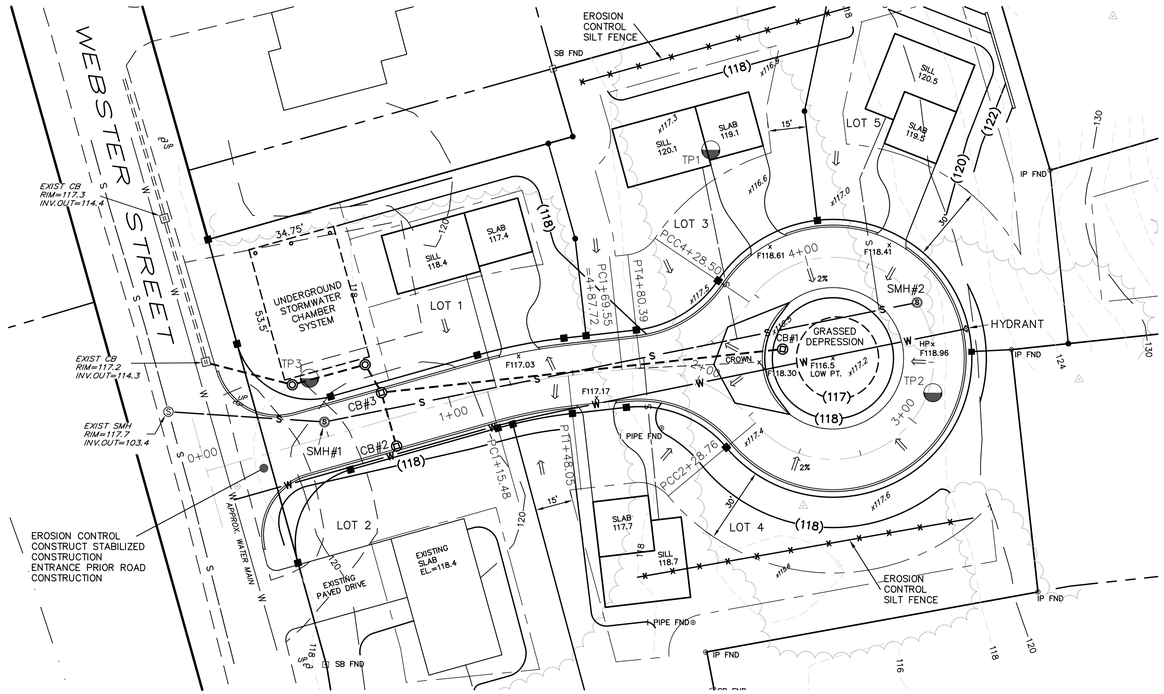
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: 1"=30'*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

30' 15' 0 30'
SCALE: 1"=30'



PLAN

SCALE: 1"=30'

Test Pit Log

TEST PIT #1

0"–12" DARK BROWN (10YR 3/2) LOAM (TOPSOIL), FRIABLE

12"–18" BROWN YELLOW (10YR 5/6) FINE SANDY LOAM, VERY FRIABLE, SINGLE GRAIN STRUCTURE

18"–29" LIGHT BROWNISH YELLOW (10YR 6/4) FINE LOAMY SAND, FRIABLE, SINGLE GRAIN STRUCTURE

29"–100" YELLOWISH BROWN (10YR 5/4) MEDIUM SAND, LOOSE, SINGLE GRAIN STRUCTURE, MOTTLING AT 66" (SHWT)

ESHWT: 66"
ROOTS: TO 36"
WATER: 96"
LEDGE: NONE OBSERVED
TERMINATED AT 100"'

TEST PIT #2

0"–12" DARK BROWN (10YR 3/2) LOAM (TOPSOIL), FRIABLE

12"–24" BROWNISH YELLOW (10YR 5/6) FINE SANDY LOAM, VERY FRIABLE, SINGLE GRAIN STRUCTURE

24"–96" YELLOW (10YR 7/6) MEDIUM SAND, LOOSE, SINGLE GRAIN STRUCTURE, MOTTLING AT 66" (SHWT)

ESHWT: 66"
ROOTS: TO 36"
WATER: 96"
LEDGE: NONE OBSERVED
TERMINATED AT 96" (CAVING IN)

TEST PIT #3

0"–12" DARK BROWN (10YR 3/2) LOAM (TOPSOIL), FRIABLE

12"–28" YELLOWISH BROWN (10YR 5/6) FINE SANDY LOAM, VERY FRIABLE, SINGLE GRAIN STRUCTURE

28"–64" YELLOWISH BROWN (10YR 5/4) FINE LOAMY SAND, FRIABLE, SINGLE GRAIN STRUCTURE

64"–100" VERY PALE BROWN (10YR 7/4) FINE SAND, LOOSE, SINGLE GRAIN STRUCTURE, MOTTLING AT 72" (SHWT)

ESHWT: 72"
WATER: NONE OBSERVED
LEDGE: NONE OBSERVED
TERMINATED AT 100"'
PERCOLATION RATE: <2 MIN/INCH @ 30"

Notes

1. THE PURPOSE OF THIS PLAN IS TO SHOW CONSTRUCTION OF A NEW ROAD, UTILITIES, AND RELATED IMPROVEMENTS TO PROVIDE ACCESS TO 5 NEW SINGLE FAMILY RESIDENTIAL BUILDING LOTS.

2. PROPERTY BOUNDARIES AND TOPOGRAPHY SHOWN HEREON FROM AN ON GROUND SURVEY PERFORMED BY M.J. GRAINGER ENGINEERING, INC. SEE SHEET 2 OF THIS PLAN SET FOR EXISTING CONDITIONS INFORMATION.

3. THERE ARE NO WETLANDS ON THE PROPERTY.

4. THE PROPERTY IS NOT IN THE DESIGNATED FLOOD ZONE.

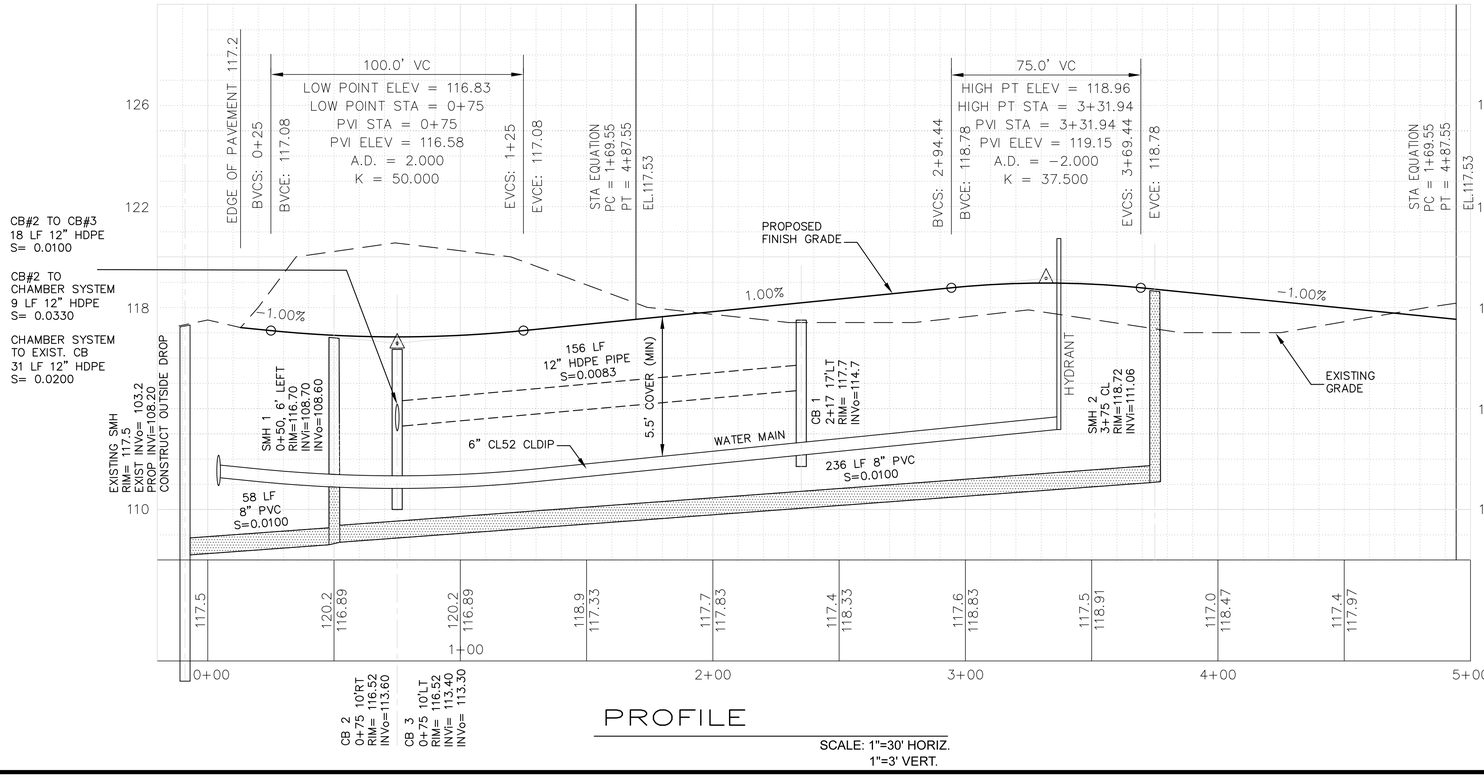
5. THE SITE TO BE SERVICED BY MUNICIPAL SEWER AND WATER.

6. ALL WORK SHALL CONFORM TO THE LATEST TOWN OF HUDSON REGULATIONS AND THE NHDOT STANDARD ROAD AND BRIDGE SPECIFICATIONS.

7. CONTRACTOR TO VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION. UTILITIES SHOWN HEREON ARE FROM REFERENCE PLANS OR FROM OBSERVATIONS MADE IN UTILITY STRUCTURES. THIS OFFICE DOES NOT GUARANTEE THE LOCATION AND ACCURACY OF THE UTILITY DATA. CONTRACTOR TO NOTIFY GIG SAFE 72 HOURS PRIOR TO COMMENCING ANY CONSTRUCTION ACTIVITIES.

8. THE TOWN MAY REQUIRE ADDITIONAL EROSION CONTROL DURING CONSTRUCTION AS DEEMED APPROPRIATE.

9. THE TOTAL AREA OF DISTURBANCE FOR THE CONSTRUCTION OF THE NEW ROAD AND IMPROVEMENTS TO THE EXISTING PUBLIC ROAD IS APPROXIMATELY 32,000 S.F. IT IS NOT REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE U.S.E.P.A. UNDER THE NPDES CONSTRUCTION GENERAL PERMIT OR PREPARE A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) AS THE TOTAL DISTURBANCE IS UNDER ONE ACRE.



PROFILE

SCALE: 1"=30' HORIZ.
1"=3' VERT.

No.	DESCRIPTION	DATE
1.	REVISE PAVEMENT WIDTH, ADD CHAMBER SYSTEM	05/10/2022
.	.	.
.	.	.

ROADWAY PLAN & PROFILE

MAP 174, LOT 15–1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

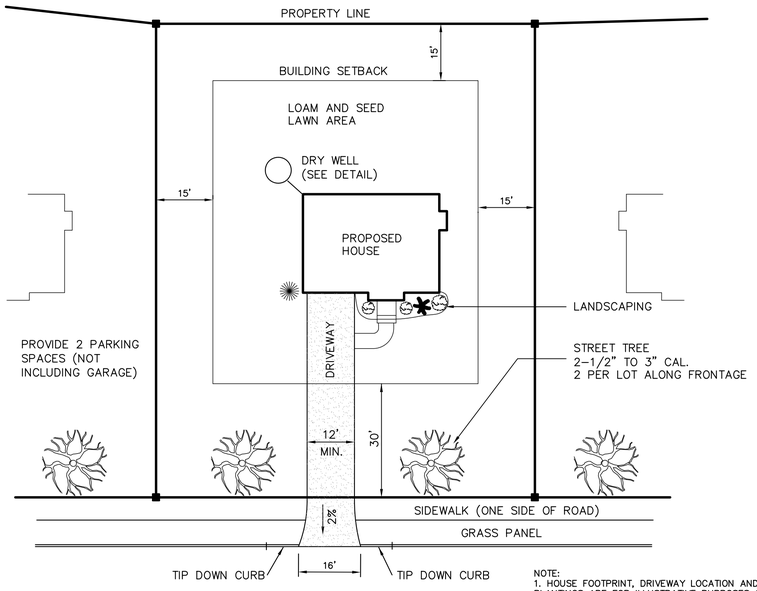
MARCH 30, 2022 *SCALE: 1"=30'*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

30' 15' 0 30'
SCALE: 1"=30'

DIG SAFE
1-888-344-7233
UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
CALL TOLL FREE



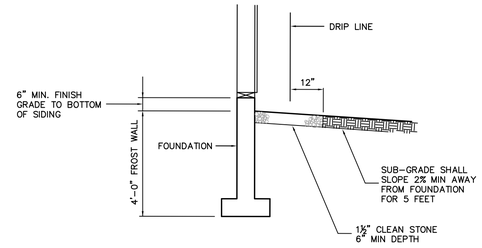
NOTE:
1. HOUSE FOOTPRINT, DRIVEWAY LOCATION AND FOUNDATION PLANTINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY AND ARE SUBJECT TO CHANGE ON A LOT BY LOT BASIS

2. DRIVE GRADES SHALL NOT EXCEED 10%. FIRST 10' OF DRIVE TO SLOPE 2% DOWN TO THE STREET & THE GRADE BEYOND THAT MAY VARY AS NEEDED.

3. ROOF DRAINAGE TO INFILTRATE INTO SOILS IN EITHER A CRUSHED STONE DRIP LINE AROUND THE PERIMETER OF THE FOUNDATION OR INTO A DRY WELL AS SHOWN HEREON.

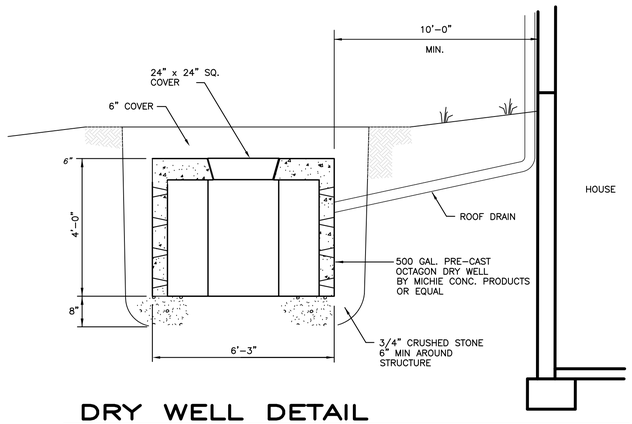
TYPICAL INDIVIDUAL LOT

NOT TO SCALE



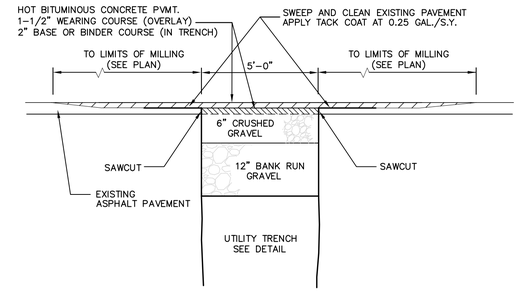
ROOF DRIP LINE DETAIL

NOT TO SCALE



DRY WELL DETAIL

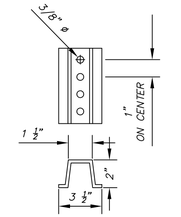
NOT TO SCALE



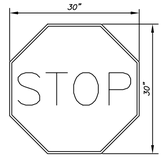
PAVEMENT TRENCH PATCH

IN LEDGE ROAD

NOT TO SCALE



U-CHANNEL SIGN POST
3 LB/FT MIN



MUTCD R1-1 "STOP" SIGN

MUTCD W14-1
"DEAD END" SIGN

AS NEEDED

NELLIE CT.

6" EXTRUDED
STREET SIGN
W/ 4" LETTERS

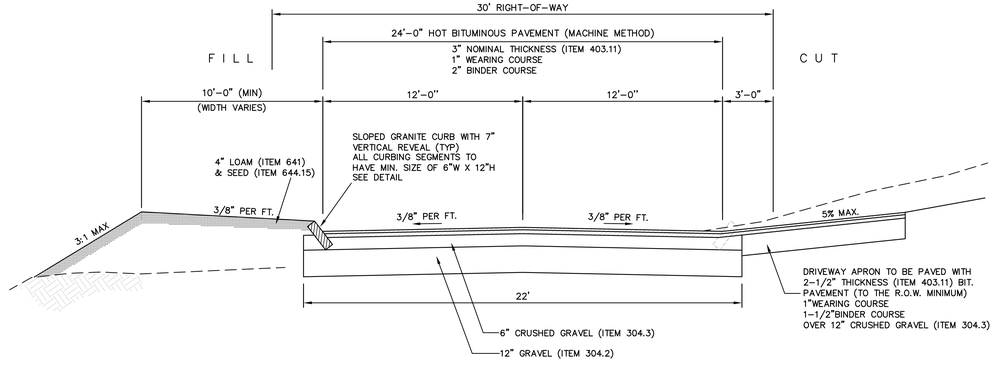
CONSTRUCTION SPECIFICATIONS

1. STOP SIGN TO BE PLACED NO LESS THAN 6.0 FEET FROM PROPOSED EDGE OF PAVEMENT AT A HEIGHT NO LESS THAN 5.0 FEET TO BOTTOM EDGE OF SIGN. ALL MATERIALS SHALL MEET APPLICABLE MUTCD GUIDELINES.

2. NO STOP BAR OR CROSSWALK BARS REQUIRED FOR THIS APPLICATION PER THE TOWN OF HUDSON STANDARDS FOR MINOR RESIDENTIAL DEAD END STREETS.

SITE SIGNAGE DETAIL

NOT TO SCALE



NOTE

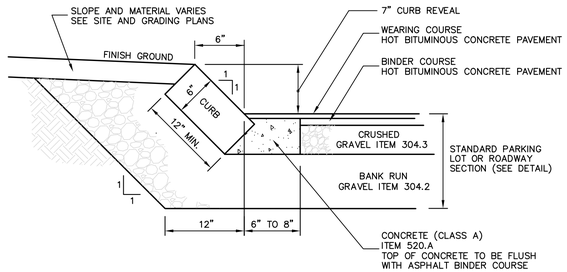
1. ITEM NUMBERS REFERENCE THE LATEST CONSTRUCTION SPECIFICATIONS FOR NHDOT

2. ALL PAVEMENT, BASE MATERIALS, AND WORKMANSHIP SHALL BE IN COMPLIANCE WITH N.H.D.O.T. "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" APPROVED AND ADOPTED 1997.

TYPICAL ROADWAY SECTION

TOWN OF HUDSON (MODIFIED)

NOT TO SCALE



RADIUS FOR STONES WITH SQUARE JOINTS	RADIUS FOR STONES WITH RADIAL JOINTS	MAXIMUM LENGTH
16'-28'	SEE CURB SECTIONS ON RADII DETAIL	1'-6"
29'-41'		2'
42'-55'		3'
56'-68'		4'
69'-82'		5'
83'-96'		6'
97'-110'		7'
OVER 110'		8'

MAXIMUM LENGTH OF STRAIGHT CURB STONES - 18"

MINIMUM LENGTH OF STRAIGHT CURB STONES - 8'

MAXIMUM LENGTH OF STRAIGHT CURB STONES LAID ON CURVES SEE CHART

ADJOINING STONES OF STRAIGHT CURB LAID ON CURVES SHALL HAVE THE SAME OR APPROX-IMATELY THE SAME LENGTH.

SLOPED GRANITE CURB

EMBEDDED IN CONCRETE

NOT TO SCALE

No.	DESCRIPTION	DATE
1.	REVISE TYPICAL PAVEMENT WIDTH TO 24' WIDE	05/10/2022
.	.	.
.	.	.

CONSTRUCTION DETAILS

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: AS NOTED*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

NOTES

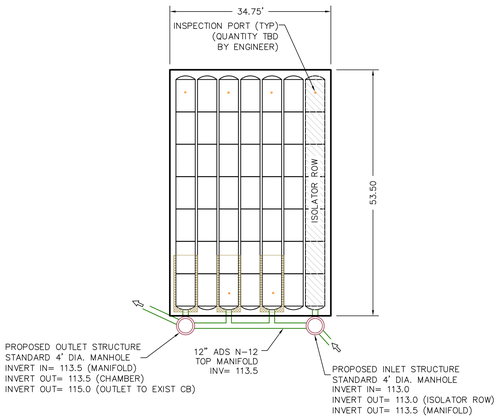
1. CHAMBERS TO BE INSTALLED PER MANUFACTURERS SPECIFICATIONS.
2. CONTRACTOR TO PROVIDE SHOP DRAWINGS OF THE CHAMBER SYSTEM FOR REVIEW BY THE ENGINEER PRIOR TO CONSTRUCTION.
3. MANIFOLD SIZE TO BE 12" HDPE PIPE.
4. DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.

SYSTEM LAYOUT

(49) STORMTECH SC-740 CHAMBERS
(14) STORMTECH SC-740 END CAPS
INSTALLED WITH 6" COVER STONE, 9" BASE STONE, 40% STONE VOID

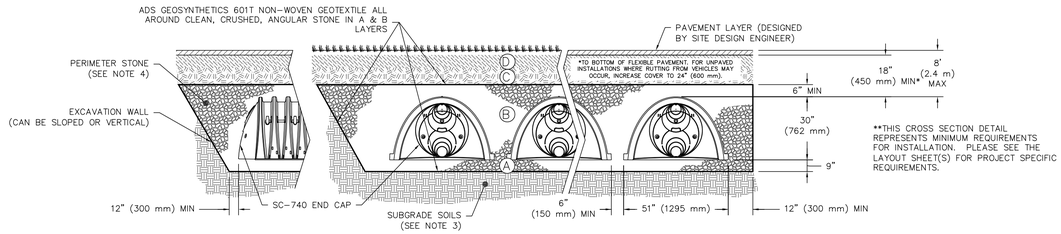
PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	123.00
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	117.00
TOP OF STONE:	116.00
TOP OF CHAMBER:	115.50
12" CONNECTION INVERT:	113.50
24" ISOLATOR ROW CONNECTION INVERT:	113.00
BOTTOM OF CHAMBER:	113.00
BOTTOM OF STONE:	112.25



LAYOUT PLAN DETAIL

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
4. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



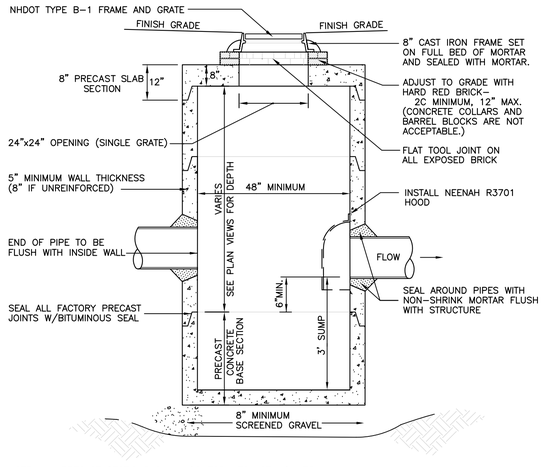
NOTES:

1. CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418-16a, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
4. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
5. REQUIREMENTS FOR HANDLING AND INSTALLATION:
   - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
   - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 2".
   - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 550 LBS/IN/IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

SC-740 CROSS SECTION DETAIL
(MANUFACTURER DETAIL)

UNDERGROUND STORMWATER CHAMBER SYSTEM

NOT TO SCALE

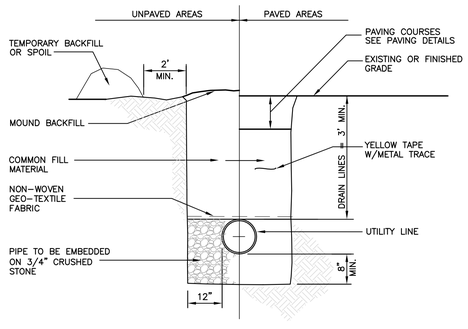


NOTE: ALL PRECAST SECTIONS SHALL CONFORM TO ASTM C-478

CATCH BASIN

SLAB TOP

NOT TO SCALE



TRENCH

FOR DRAIN LINES

NOT TO SCALE

No.	DESCRIPTION	DATE
1.	REMOVE POND DETAIL, ADD CHAMBER SYSTEM DETAIL	05/10/2022
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.	.	.

COSTRUCTION DETAILS

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

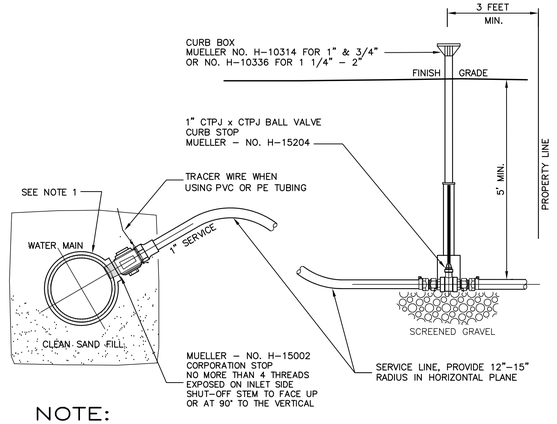
PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 18, 2022 *SCALE: AS NOTED*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

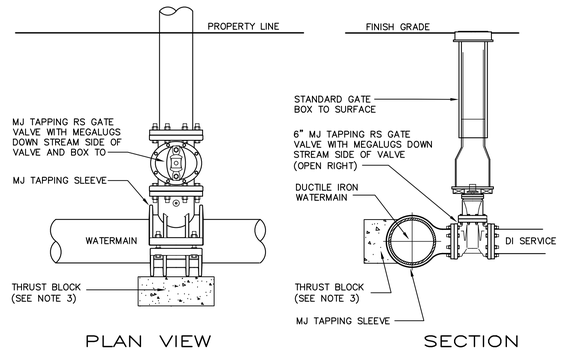


NOTE:

1. CORPORATIONS UP TO 1" DIA. (INCLUSIVE) SHALL BE TAPPED DIRECTLY INTO THE MAIN AND CORPORATIONS ABOVE 1-1/2" SHALL BE INSTALLED USING A TAPPING SADDLE AND SHELL CUTTER

SERVICE CONNECTION

NOT TO SCALE

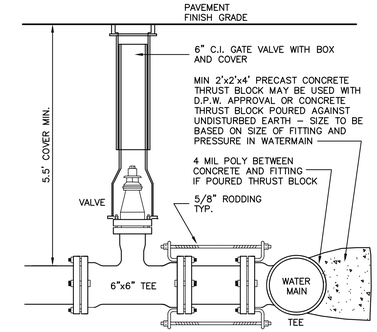


NOTE:

1. ALL MATERIAL AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTHS OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.

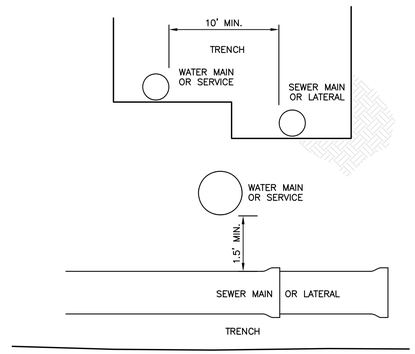
WET TAP TEE INSTALLATION

NOT TO SCALE



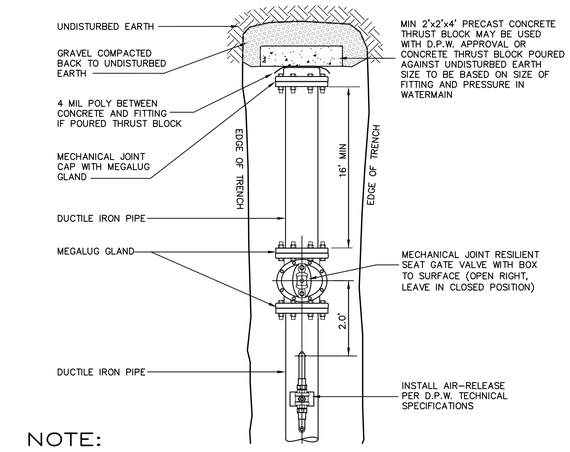
BURIED GATE VALVE

NOT TO SCALE



WATER / SEWER MAIN SEPARATION

NOT TO SCALE

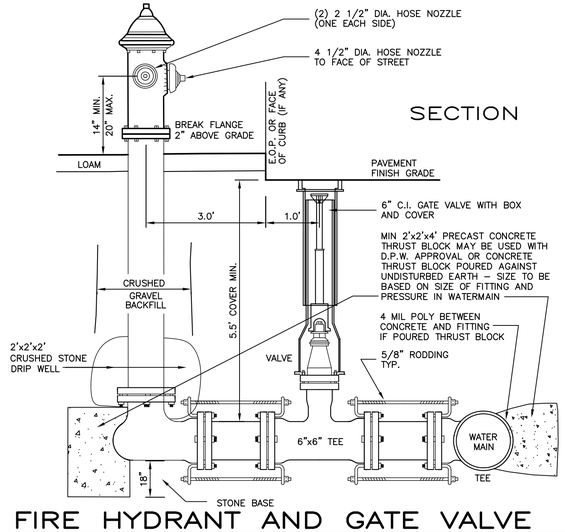


NOTE:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.

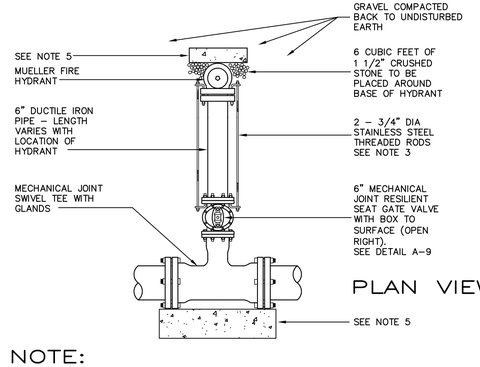
END OF MAIN INSTALLATION

NOT TO SCALE



FIRE HYDRANT AND GATE VALVE

NOT TO SCALE



NOTE:

1. ALL MATERIALS AND INSTALLATION PROCEDURES WILL CONFORM TO D.P.W. TECHNICAL SPECIFICATIONS.
2. ALL PIPE SHOULD HAVE A MINIMUM DEPTH OF 5' FROM TOP OF PIPE TO FINISH GRADE.
3. ALL THREADED RODS AND NUTS MUST BE STAINLESS STEEL.
4. WHEN DISTANCE FROM WATERMAIN TO HYDRANT IS MORE THAN 10', SUBSTITUTE MEGALUGS IN LIEU OF THREADED ROD OR GRIP RINGS.
5. MIN 2'x2'x4' PRECAST CONCRETE THRUST BLOCK MAY BE USED WITH D.P.W. APPROVAL OR CONCRETE THRUST BLOCK POURED AGAINST UNDISTURBED EARTH - SIZE TO BE BASED ON SIZE OF FITTING AND PRESSURE IN WATERMAIN.

NOT TO SCALE

No.	DESCRIPTION	DATE
.	.	.
.	.	.
.	.	.

WATER SYSTEM DETAILS

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: AS NOTED*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
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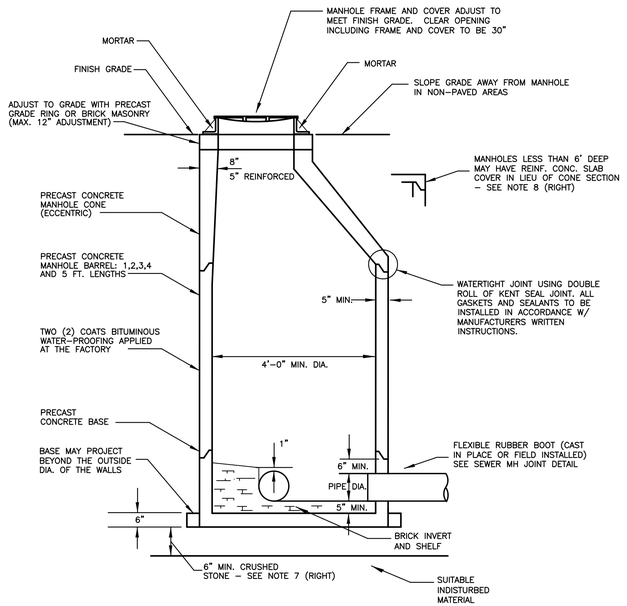
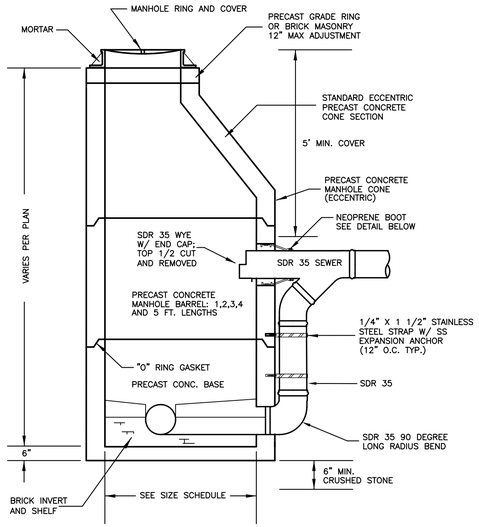


STANDARD SEWER MANHOLE DETAIL

NOT TO SCALE



MANHOLE DIAMETER SIZE GUIDE

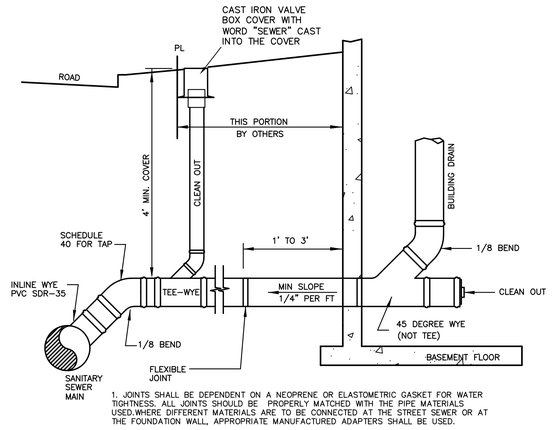
1 – 8" OR 10" DROP – 4 FT. DIA. MH
2 – 8" OR 10" DROP – 5 FT. DIA. MH
1 – 12" OR 15" DROP – 5 FT. DIA. MH

NOTES:

1. MANHOLE STRUCTURE TO BE CAPABLE OF SUPPORTING AASHTO H-20 LOADING
2. SEE ALSO, SEWER MANHOLE DETAIL STANDARD DETAIL.

EXTERIOR DROP SEWER MANHOLE DETAIL

NOT TO SCALE



1. JOINTS SHALL BE DEPENDENT ON A NEOPRENE OR ELASTOMETRIC GASKET FOR WATER TIGHTNESS. ALL JOINTS SHOULD BE PROPERLY MATCHED WITH THE PIPE MATERIALS USED.WHERE DIFFERENT MATERIALS ARE TO BE CONNECTED AT THE STREET SEWER OR AT THE FOUNDATION WALL, APPROPRIATE MANUFACTURED ADAPTERS SHALL BE USED.

2. WYES: WHERE A WYE IS NOT AVAILABLE IN THE EXISTING STREET SEWER, AN APPROPRIATE CONNECTION SHALL BE MADE, FOLLOWING THE MANUFACTURER'S INSTRUCTIONS, USING A BOLTED, CLAMPED, OR EPOXY CEMENTED SADDLE TOPPED INTO A SMOOTHLY DRILLED OR SAWED OPENING IN THE SEWER. THE PRACTICE OF BREAKING IN AN OPENING WITH A SLEDGE HAMMER, STUFFING CLOTH OR OTHER SUCH MATERIAL AROUND THE JOINT, OR EXPECTING MORTAR TO HOLD THE CONNECTION, AND OTHER SUCH CRUDE PRACTICES OR INEPT HASTY IMPROVISATIONS WILL NOT BE PERMITTED. THE CONNECTION SHALL BE CONCRETE ENCASED AS SHOWN IN THE DETAIL.

3. PIPE INSTALLATION: THE PIPE SHALL BE HANDLED, PLACED, AND JOINTED, IN ACCORDANCE WITH INSTALLATION GUIDES OF THE APPROPRIATE MANUFACTURER. IT SHALL BE CAREFULLY BEDDED ON A 4 INCH LAYER OF CRUSHED STONE AND /OR GRAVEL, AS SPECIFIED IN NOTE 7. BEDDING AND RE-FILL FOR A DEPTH OF 12 INCHES ABOVE THE TOP OF THE PIPE SHALL BE CAREFULLY AND THOROUGHLY TAMPED BY HAND OR WITH THE APPROPRIATE MECHANICAL DEVICES. THE PIPE JOINTS MUST BE MADE UNDER DRY CONDITIONS. IF WATER IS PRESENT, ALL NECESSARY STEPS SHALL BE TAKEN TO DEWATER THE TRENCH.

4. TESTING: THE COMPLETED HOUSE SEWER SHALL BE SUBJECTED TO A LEAKAGE TEST IN ANY OF THE FOLLOWING MANNERS: (PRIOR TO BACKFILLING)

A. AN OBSERVATION TEE SHALL BE INSTALLED AS SHOWN AND, WHEN READY FOR TESTING, AN INFLATABLE BLADDER OR SHALL BE INSERTED JUST UPSTREAM FROM THE OPENING IN THE TEE. AFTER INFLATION, WATER SHALL BE INTRODUCED INTO THE SYSTEM TO A HEIGHT OF 5 FEET ABOVE THE LEVEL OF THE PLUG.

B. THE PIPE SHALL BE LEFT EXPOSED AND LIBERALLY HOSED WITH WATER TO SIMULATE, AS CLOSELY AS POSSIBLE, WET TRENCH CONDITIONS OR, IF THE TRENCH IS WET, THE GROUND WATER SHALL BE PERMITTED TO RISE IN THE TRENCH OVER THE PIPE. INSPECTION FOR LEAKS SHALL BE MADE THROUGHOUT THE CLEAN OUT WITH A FLASHLIGHT.

C. DRY FLUORESCENCE DYE SHALL BE SPRINKLED INTO THE TRENCH OVER THE PIPE. IF THE TRENCH IS DRY, THE PIPE SHALL BE LIBERALLY HOSED WITH WATER OR; IF THE TRENCH IS WET, GROUND WATER SHALL BE PERMITTED TO RISE IN TRENCH OVER THE PIPE. OBSERVATIONS FOR LEAKS SHALL BE MADE IN THE FIRST DOWNSTREAM MANHOLE.

LEAKAGE OBSERVED IN ANY OF THE ABOVE TESTS SHALL BE CAUSE FOR NON-ACCEPTANCE AND THE PIPE SHALL BE DUG UP, IF NECESSARY AND RE-LAID SO AS TO ASSURE WATER TIGHTNESS.

5. ILLEGAL CONNECTION: NOTHING BUT SANITARY WASTE FLOW FROM HOUSE TOILETS, SINKS, LAUNDRY, ETC. SHALL BE PERMITTED. ROOF LEADERS, FOOTING DRAINS, SUMP PUMPS, OR ANY OTHER SIMILAR CONNECTION CARRYING RAIN WATER, DRAINAGE, OR GROUND WATER SHALL NOT BE PERMITTED.

6. HOUSE WATER SERVICE SHOULD NOT BE LAID IN THE SAME TRENCH AS SEWER SERVICE BUT, WHEN NECESSARY, SHALL BE PLACED ABOVE AND TO ONE SIDE OF THE HOUSE SEWER AS SHOWN.

7. BEDDING: SCREENED GRAVEL AND /OR CRUSHED STONE FREE FROM CLAY, LOAM ORGANIC MATERIAL, AND MEETING ASTM C33-67.

100% PASSING	1 INCH SCREEN
90-100% PASSING	9 INCH SCREEN
20-55% PASSING	3/8 SCREENTE
0-10% PASSING	#4 SIEVER
0-5% PASSING	#8 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE ½ INCH SHALL BE USED.

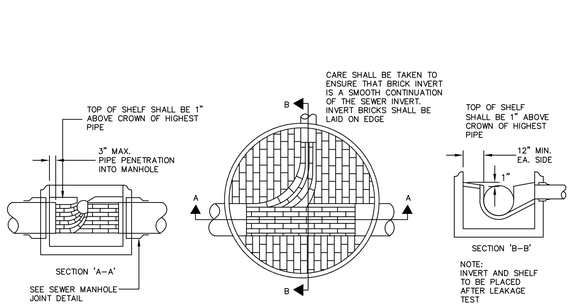
8. LOCATION: THE LOCATION OF THE WYE SHALL BE RECORDED AND FILED WITH THE SEWER DEPARTMENT. IN ADDITION, A METALLIC TAPE SHALL BE PLACED OVER THE PIPE TO THE WYE TO AID IN LOCATING THE BURIED PIPE.

9. CHIMNEYS: NOT PERMITTED.

10. SEWER SERVICE AND CLEAN OUT TO BE CONSTRUCTED AT TIME OF SEWER MAIN CONSTRUCTION TO EACH PROPOSED AND EXISTING LOT SERVICE TO BE BROUGHT TO RIGHT OF WAY LINE.

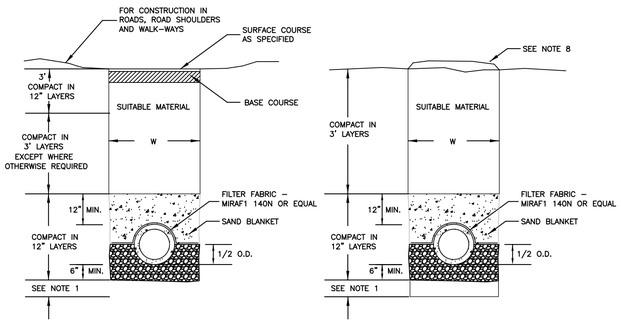
SEWER SERVICE DETAIL

NOT TO SCALE



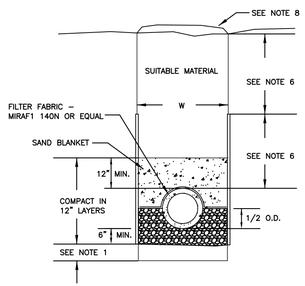
CLEANOUT DETAIL

NOT TO SCALE



LEDGE CONSTRUCTION

EARTH CONSTRUCTION



EARTH CONSTRUCTION WITH SHEETING

NOTES:
1. ORDERED EXCAVATION OF UNSUITABLE MATERIAL BELOW GRADE, REFILL WITH BEDDING MATERIAL. SEE ALSO NOTE 7.

BEDDING: SCREENED GRAVEL AND OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATERIAL, AND MEETING ASTM C33-67.

100% PASSING	1 INCH SCREEN
90-100% PASSING	3/4 INCH SCREEN
20-55% PASSING	3/8 SCREEN
0-10% PASSING	#4 SIEVE
0-5% PASSING	#8 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE TRENCH BASE, SCREENED GRAVEL OR CRUSHED STONE ½ INCH TO 1-1/2 INCH SHALL BE USED.

2. SAND BLANKET: CLEAN SAND FREE FROM ORGANIC MATER, SO GRADED THAT 90-100 % PASSES A ½ SIEVE AND NOT MORE THAN 15% WILL PASS A #200 SIEVE. BLANKET MAY BE OMITTED FOR CAST-IRON, DUCTILE IRON, AND REINFORCED CONCRETE PAPE PROVIDED, HOWEVER, THAT NO STONE LARGER THAN 2" IS IN CONTACT WITH THE PIPE.

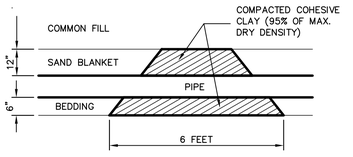
3. FILTER FABRIC SHALL BE INSTALLED ABOVE PIPE – MIRAFI 140N OR EQUAL.

4. SUITABLE MATERIAL: IN ROADS, ROAD SHOULDERS, WALKWAYS, AND TRAVELED WAYS, SUITABLE MATERIAL FOR TRENCH BACKFILL SHALL BE THE NATURAL MATERIAL EXCAVATED DURING THE COURSE OF CONSTRUCTION, BUT SHALL EXCLUDE DEBRIS, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, ALL WET OR SOFT MUCK, PEAT, OR CLAY, ALL EXCAVATED LEDGE MATERIAL, AND ALL ROCKS OVER 6" IN LARGEST DIMENSION, OR ANY MATERIAL WHICH, AS DETERMINED BY THE ENGINEER, WILL NOT PROVIDE SUFFICIENT SUPPORT OR MAINTAIN THE COMPLETED CONSTRUCTION IN A STABLE CONDITION.

IN CROSS COUNTRY CONSTRUCTION SUITABLE MATERIAL SHALL BE AS DESCRIBED ABOVE, EXCEPT THAT THE ENGINEER MAY PERMIT THE USE OF TOP SOIL, LOAM, MUCK, OR PEAT. IF HE IS SATISFIED THAT THE CONSTRUCTION WILL BE ENTIRELY STABLE AND PROVIDED THAT EASY ACCESS TO THE SEWER FOR MAINTENANCE AND POSSIBLE RECONSTRUCTION, WHEN NECESSARY WILL BE PRESERVED.

STANDARD TRENCH SECTIONS

NOT TO SCALE



NOTE:

1. TRENCH DAM INSTALLATIONS SHALL BE AS INDICATED ON THE PROFILES. HOWEVER DURING CONSTRUCTION LOCATIONS MAY BE MOVED DUE TO FIELD CONDITIONS.

2. THE TRENCH DAM SHALL EXTEND FROM THE BOTTOM OF THE EXCAVATION THROUGH THE BEDDING MATERIAL TO THE "NORMAL BACKFILL" AND SHALL EXTEND COMPLETELY TO EACH TRENCH SIDEWALL. MATERIAL TO BE COMPACTED COHESIVE CLAY THAT CONTAINS A MIN. OF 25% MINUS NO. 200 SIEVE MATERIAL, WITH 70% PASSING A 3/4" SIEVE. IF THE NORMAL EXCAVATED MATERIAL IS NOT SUITABLE FOR CONSTRUCTION OF THE TRENCH DAM, THEN THE CONTRACTOR SHALL OBTAIN MATERIAL FROM OUTSIDE SOURCES.

3. DO NOT CONSTRUCT TRENCH DAM AROUND PIPE JOINTS.

TRENCH DAM DETAIL

NOT TO SCALE

5. BASE COURSE, IF ORDERED BY THE ENGINEER, SHALL MEET THE REQUIREMENTS OF DIVISION 300 OF THE LATEST EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OF THE STATE OF NEW HAMPSHIRE, DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS.

6. WOOD SHEETING: IF REQUIRED, WHERE SHEETING IS PLACED ALONGSIDE THE PIPE AND EXTENDS BELOW MID-DIAMETER, IT SHALL BE CUT OFF AND LEFT IN PLACE AT AN ELEVATION NOT LESS THAN 1 FOOT ABOVE THE TOPE OF THE PIPE. WHERE SHEETING IS ORDERED BY THE ENGINEER TO BE LEFT IN PLACE, IT SHALL BE CUT OFF AT LEAST 3 FEET BELOW THE FINISHED GRADE, BUT NOT LESS THEN 1 FOOT ABOVE THE TOP OF THE PIPE.

7. W. = MAXIMUM ALLOWABLE TRENCH WIDTH TO A PLANE 12 INCHED ABOVE THE PIPE. FOR PIPES 15 INCHES NOMINAL DIAMETER, W SHALL BE NO MORE THAN 36 INCHES; FOR PIPES GREATER THAN 15 INCHES NOMINAL DIAMETER, W SHALL 24 INCHES PLUS PIPE O.D W SHALL BE THE PAYMENT WIDTH FOR LEDGE EXCAVATION AND FOR ORDERED EXCAVATION BELOW GRADE.

8. FOR CROSS COUNTRY CONSTRUCTION, BACKFILL OR FILL SHALL BE MOUNDED TO A HEIGHT OF 6 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

9. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL PROTECTION SERVICES DESIGN STANDARDS REQUIRE 10 FT SEPARATION. HOWEVER, SHOULD CONSTRUCTION OR OPERATIONS REVEAL OR EXPOSE A WATERLINE (MAIN OR SERVICE) RUNNING APPROXIMATELY PARALLEL AND LESS THAN 10 FEET HORIZONTALLY FROM THE PROPOSED SEWER INSTALLATION AND WHERE IT IS NOT PRACTICAL TO RELOCATE THE SEWER, THE FOLLOWING METHODS OF PROTECTION MUST BE EMPLOYED.

A. SEWER PIPE SHALL BE CLASS 52 DUCTILE IRON PIPE. (DUCTILE IRON PIPE SHALL CONFORM WITH ANSI A21.51
B. JOINTS SHALL BE PRESSURE TESTED WITH ZERO LEAKAGE AT 25 POUNDS PER SQUARE INCH FOR GRAVITY SEWERS, AND TIMES WORKING PRESSURE FOR FORCE MAINS.

10. WHERE WATER LINES AND SEWER LINES CROSS, THEY SHALL CROSS AS PERPENDICULAR AS POSSIBLE AND THE WATER MAIN SHALL CROSS AT LEAST 18 INCHES ABOVE THE SEWER. FURTHER, THE SEWER JOINTS SHALL BE LOCATED AT LEAST 9 FEET HORIZONTALLY FROM THE WATER MAIN. SEWER JOINTS SHALL BE PRESSURE TESTED WITH ZERO LEAKAGE AT 25 POUNDS PER SQUARE INCH FOR GRAVITY SEWERS, AND 1-1/2 TIMES WORKING PRESSURE FOR FORCE MAINS

11. ALL SEWERS AT 8 % OR GREATER SLOPE SHALL HAVE TRENCH DAMS INSTALLED.

1. IT IS THE INTENTION OF THE COMMISSION THAT THE MANHOLE, INCLUDING ALL COMPONENT PARTS, HAVE ADEQUATE SPACE, STRENGTH, AND LEAKPROOF QUALITIES CONSIDERED NECESSARY BY THE COMMISSION FOR THE INTENDED SERVICE. SPACE REQUIREMENTS AND CONFIGURATIONS SHALL BE AS SHOWN ON THE DRAWING. MANHOLES MAY BE AN ASSEMBLY OF PRECAST SECTIONS WITH OR WITHOUT STEEL REINFORCEMENT, WITH ADEQUATE JOINTING, OR CONCRETE CAST MONOLITHICALLY IN PLACE WITH SECTIONS, WITH OR WITHOUT REINFORCEMENT IN ANY APPROVED MANHOLE, THE COMPLETE STRUCTURE SHALL BE OF SUCH MATERIAL AND QUALITY AS TO WITHSTAND H-20 LOADING WITHOUT FAILURE AND PREVENT LEAKAGE IN EXCESS OF ONE GALLON PER DAY PER VERTICAL FOOT OF MANHOLE, CONTINUOUSLY FOR THE LIFE OF THE STRUCTURE, A PERIOD GENERALLY IN EXCESS OF 25 YEARS IS TO BE UNDERSTOOD IN BOTH CASES.

2. BARRELS AND CONE SECTIONS SHALL BE PRECAST REINFORCED OR NON-REINFORCED CONCRETE, OR POURED IN PLACE REINFORCED OR NON-REINFORCED CONCRETE.

3. PRECAST CONCRETE BARREL SECTIONS, CONES, AND BASES SHALL CONFORM TO ASTM C478.

4. LEAKAGE TESTS SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS.

5. INVERTS AND SHELVES: MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT, CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW AT CHANGES IN DIRECTION INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTER LINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPE TO DRAIN TOWARD THE FLOWING THROUGH CHANNEL. UNDERLAYMENT OF INVERT SHELF SHALL CONSIST OF BRICK MASONRY.

6. MANHOLE FRAMES AND COVERS SHALL BE OF 400 LB. MINIMUM FRAME AND COVER WEIGHT AND PROVIDE A 30" CLEAR OPENING. A 3" (MINIMUM HEIGHT) LETTER "S" FOR SEWERS OR "D" FOR DRAIN SHALL BE PLAINLY CAST INTO THE CENTER OF EACH COVER. MANHOLE COVERS SHALL HAVE NO PENETRATING PICK HOLES.

7. BEDDING: SCREENED GRAVEL AND /OR CRUSHED STONE FREE FROM CLAY, LOAM, ORGANIC MATTER AND MEETING ASTM C-33

100% PASSING 1 INCH SCREEN	0-10% PASSING 4 SIEVE
90-100% PASSING 3/4 INCH SCREEN	0-5 % PASSING 8 SIEVE
20-55% PASSING 3/8 INCH SCREEN	0 % PASSING 2 SIEVE

WHERE ORDERED BY THE ENGINEER TO STABILIZE THE BASE SCREENED GRAVEL OR CRUSHED STONE. 1-1/2 INCH CRUSHED STONE SHALL BE USED.

8. IN LIEU OF A CONE SECTION, WHEN MANHOLE DEPTH IS LESS THAN 6 FEET, A REINFORCED CONCRETE SLAB COVER MAY BE USED HAVING AN ECCENTRIC ENTRANCE OPENING AND CAPABLE OF SUPPORTING H-20 LOADS.

SEWER MANHOLE INVERT & SHELF DETAILS

NOT TO SCALE

No.	DESCRIPTION	DATE
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SEWER SYSTEM DETAILS

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

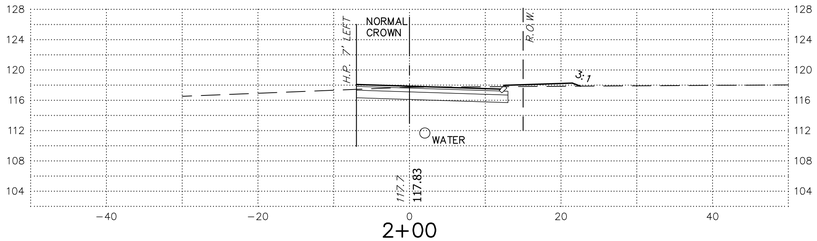
PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: AS NOTED*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359



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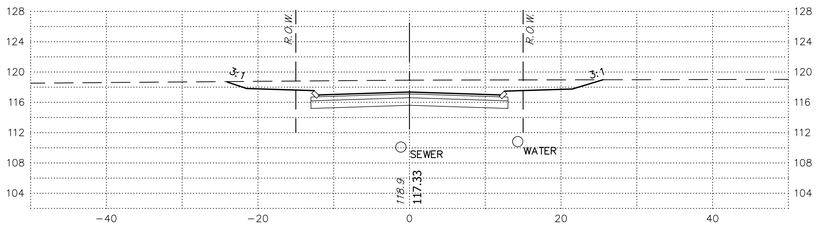

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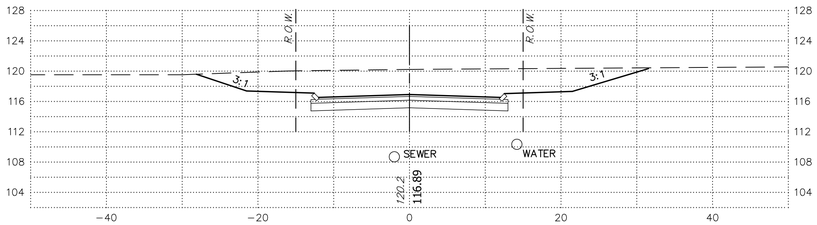

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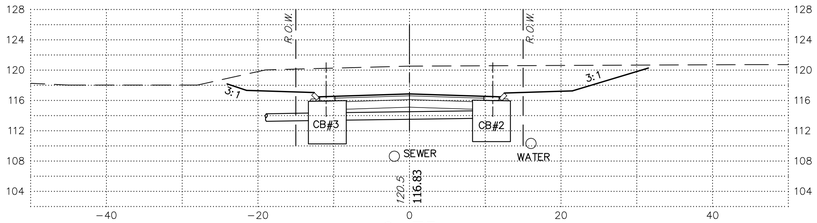

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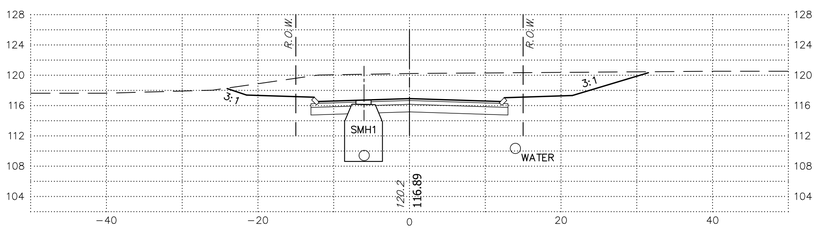

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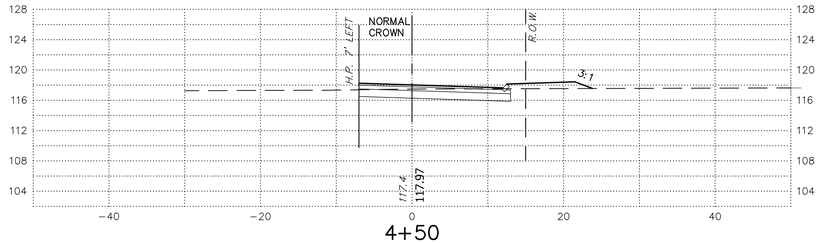

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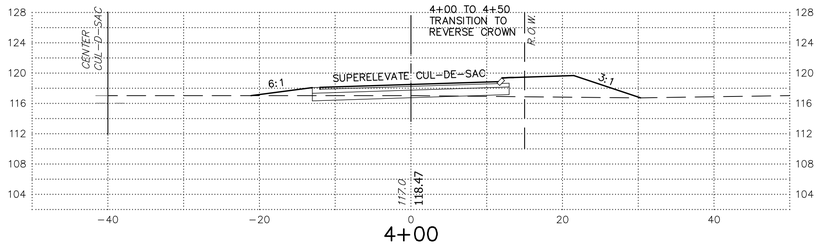

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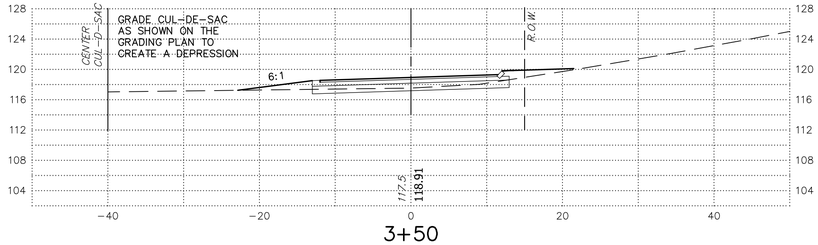

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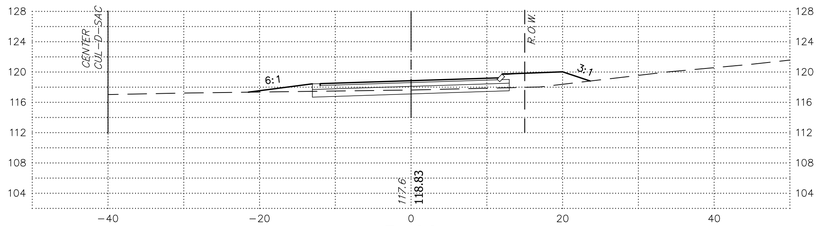

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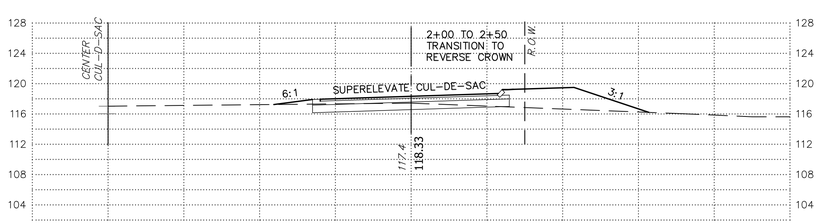

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UTILITIES UNDERGROUND PLANT DAMAGE PREVENTION SYSTEM
1-888-344-7233 ALL TOLL FREE

No.	DESCRIPTION	DATE
1.	REVISE PAVEMENT WIDTH, ELIMINATE CURB IN CUL-DE-SAC	05/10/2022
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ROADWAY CROSS SECTIONS

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

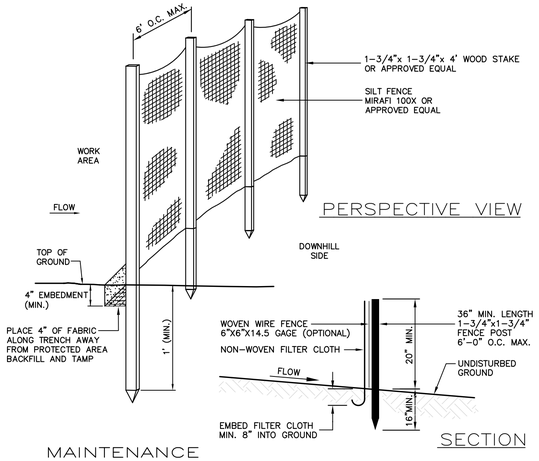
TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 18, 2022 *SCALE: 1''=10'*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

10' 5' 0 10'
SCALE: 1"=10'

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

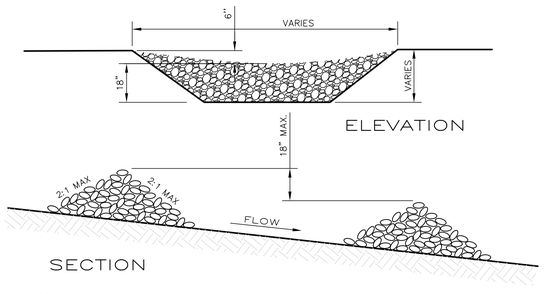


MAINTENANCE

1. SILT FENCES ARE TO BE INSPECTED IMMEDIATELY AFTER EVERY RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE HALF OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED, SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

SILT FENCE DETAIL

NOT TO SCALE

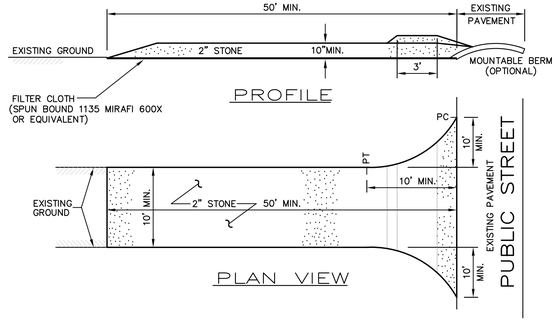


NOTE

1. STRUCTURES SHALL BE INSTALLED ACCORDING TO THE DIMENSIONS SHOWN ON THE PLANS AT THE APPROPRIATE SPACING.
2. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER SO THAT EROSION WILL BE MINIMIZED.
3. WHEN STRAW BALES ARE USED, THEY ARE TO BE EMBEDDED INTO THE SOIL 4 INCHES. WHEN TIMBERS ARE TO BE USED, THE TIMBER SHALL EXTEND AT LEAST 18 INCHES INTO THE SOIL.
4. STRAW OR STRAW BALES SHALL BE ANCHORED INTO THE SOIL USING 2"x2" STAKES DRIVEN THROUGHOUT THE BALES AT LEAST 18 INCHES INTO THE SOIL.
5. SEEDING, FERTILIZING AND MULCHING SHALL CONFORM TO THE RECOMMENDATIONS IN THE APPROPRIATE BMP.
6. STRUCTURES ARE TEMPORARY AND ARE TO BE REMOVED FROM THE CHANNEL WHEN THEIR USEFUL LIFE HAS EXPIRED, WHEN A SOLID STAND OF GRASS HAS GROWN AND STABILIZED.

STONE CHECK DAM

NOT TO SCALE

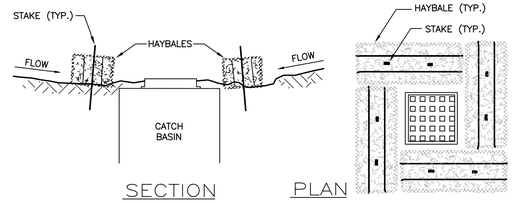


NOTE

1. STONE FOR A STABILIZED CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE RECLAIMED STONE, OR RECYCLED CONCRETE EQUIVALENT.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL BE NOT LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT WHERE A 30 FOOT MINIMUM LENGTH WOULD APPLY
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN THE FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICH EVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE. FILTER CLOTH IS NOT REQUIRED FOR A SINGLE FAMILY RESIDENTIAL LOT.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DIVERTED TOWARD THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, WASHED OR TRACKED ONTO PUBLIC RIGHT-OF-WAY MUST BE REMOVED PROMPTLY.
8. WHEELS SHALL BE CLEANED TO REMOVE MUD PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.

STABILIZED CONSTRUCTION ENTRANCE

NOT TO SCALE



SEDIMENTATION CONTROL AT CATCH BASINS

NOT TO SCALE

No.	DESCRIPTION	DATE
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EROSION CONTROL DETAILS

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 18, 2022 *SCALE: AS NOTED*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

GENERAL NOTES:

1. PROJECT ENGINEER: RJB ENGINEERING, LLC

2. PROJECT SURVEYOR: MICHAEL J. GRAINGER, LLS

3. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO TOWN REGULATIONS AND THE LATEST EDITION OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.

4. IF, DURING CONSTRUCTION IT BECOMES APPARENT THAT DEFICIENCIES EXIST IN THE APPROVED DESIGN DRAWINGS, THE CONTRACTOR, DEVELOPER OR OWNER ARE RESPONSIBLE TO DOCUMENT THE APPARENT DEFICIENCIES AND NOTIFY THE DESIGN ENGINEER PRIOR TO CONTINUING CONSTRUCTION ACTIVITIES. THE DESIGN ENGINEER, IN COOPERATION WITH THE CONTRACTOR, DEVELOPER OR OWNER WILL RESSOLVE THE APPARENT DEFFICIENCIES TO MEET APPLICABLE TOWN REGULATIONS.

5. IF, DURING CONSTRUCTION, IT BECOMES APPARENT THAT ADDITIONAL EROSION CONTROL MEASURES ARE REQUIRED, THE CONTRACTOR, DEVELOPER OR OWNER SHALL BE REQUIRED TO INSTALL ADDITIONAL EROSION PROTECTION MEASURES.

6. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION TO VERIFY THE LOCATION OF ALL UTILITIES OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR. (CONTACT DIG SAFE)

7. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AT ALL TIMES.

8. NO EXCAVATED AREA SHALL BE LEFT UNATTENDED AND SHALL BE THOROUGHLY SECURED ON A DAILY BASIS.

9. THE TOTAL AREA OF DISTURBANCE FOR THE PROJECT IS APPROXIMATELY 62,000 S.F. IT IS THE CONTRACTORS RESPONSIBILITY TO
FILE A NOTICE OF INTENT (NOI) WITH THE U.S.E.P.A. UNDER THE NPDES CONSTRUCTION GENERAL PERMIT 14 DAYS PRIOR TO INITIATING CONSTRUCTION. THE CONTRACTOR IS ALSO RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH THE FEDERAL STORMWATER PERMIT REQUIREMENTS.

CONSTRUCTION SEQUENCE:

1. CUT AND CLEAR TREES WITHIN LIMIT OF WORK (PROPOSED TREELINE), UNLESS OTHERWISE NOTED. ALL STUMPS, BRANCHES, TOPS AND BRUSH TO BE PROPERLY DISPOSED OF, PREFERABLY OFF SITE.

2. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AS SHOWN AND DETAILED IN THIS PLAN SET.

3. CONSTRUCT TEMPORARY (SILT FENCE) AND PERMANENT EROSION CONTROL FACILITIES (STORMWATER BASINS, TREATMENT SWALES, GRASS SWALES AND EXFILTATION BASINS) PRIOR TO ANY EARTH MOVING OPERATION.

4. ALL SWALES AND DITCH LINES SHALL BE PROTECTED FROM EROSION. ALL DITCHES AND SWALES SHALL BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.

5. ALL STORM DRAINAGE SYSTEMS SUCH AS DETENTION/INFILTRATION BASINS, TREATMENT SWALES AND LEVEL SPREADERS (IF ANY)SHALL BE PROTECTED FROM EROSION. ALL STORM DRAINAGE SYSTEMS SHALL BE STABILIZED PRIOR TO DIRECTING FLOW INTO THEM.

6. NO CATCH BASIN FRAME AND GRATE (IF APPLICABLE) SHALL BE INSTALLED PRIOR TO PAVING. ALL DRAINAGE STRUCTURES ARE TO BE "PLATED" AND CUT OUT FOLLOWING PAVING OPERATIONS, ONLY IF ALL DOWNSTREAM DRAINAGE ELEMENTS ARE STABLE, INCLUDING, BUT NOT LIMITED TO OUTLET PROTECTION, ALL SLOPE GRADING, VEGETATED OR RIPRAP SWALES, DETENTION / INFILTRATION BASINS AND TREATMENT SWALES.

7. IF FRAME AND GRATES ARE INSTALLED, SPECIFIC SOIL EROSION MEASURES MUST BE INSTALLED SUCH AS SILT SAK PRTETION DEVICES, GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER OR BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER.

8. CONSTRUCT TEMPORARY CULVERTS, DIVERSION DITCHES/SWALES OR BERMS AS REQUIRED TO MINIMIZE THE EROSIVE AFFECTS OF STORMWATER RUNOFF DURING ALL CONSTRUCTION ACTIVITIES.

9. COMPLETE GRUBBING OPERATIONS. ALL STUMPS AND DEBRIS SHALL BE PROPERLY DISPOSED OF, PREFERABLY OFF SITE.

10. ALL MATERIAL SUITABLE FOR USE AS TOPSOIL SHALL BE STOCKPILED IN UPLANDS AREAS. ALL STOCKPILES SHALL BE SEEDED WITH WINTER RYE AND IF NECESSARY, SURROUNDED WITH SILT FENCE AND/OR STRAW BALES, IN ORDER TO PREVENT OR CONTAIN SOIL EROSION.

11. ALL MATERIAL SUITABLE FOR FILL OR SELECT MATERIAL SHALL BE STOCKPILED IN UPLANDS AREAS. ALL STOCKPILES SHALL BE SURROUNDED WITH SILT FENCE AND/OR STRAW BALES, IN ORDER TO CONTAIN SOIL EROSION.

12. REMOVE ALL IMPROPER ROADWAY/SITE FOUNDATION MATERIAL WITHIN 18" OF SUBGRADE. REPLACE WITH COMPACTED GRANULAR FILL ACCEPTABLE TO THE STATE/TOWN SPECIFICATIONS. ALL SUITABLE FILL MATERIAL SHALL BE COMPACTED TO AT LEAST 95% OF THE DRY WEIGHT AS DETERMINED BY MODIFIED PROCTOR TESTING (ASTM D-1556) REQUIREMENTS.

13. CONSTRUCT ALL UNDERGROUND UTILITIES INCLUDING, BUT NOT LIMITED TO SEWER, WATER, DRAIN, GAS, DATA, CABLE AND POWER.

14. ROUGH GRADE ROADWAY/SITE WITHIN LIMIT OF WORK AND COMMENCE CONSTRUCTION OF ROADWAYS AND PARKING AREAS.

15. COMPLETE ROADWAY SLOPE GRADING/EMBANKMENT CONSTRUCTION. ALL SLOPES SHALL BE STABILIZED AND SEEDED IMMEDIATELY AFTER GRADING. THE CONTRACTOR SHALL STABILIZE SLOPES WITH APPROPRIATE SEEDING PROGRAM OR JUTE MAT, WHEREVER SPECIFIED.

16. APPLY TOPSOIL TO ROADWAY SLOPES AND OTHER AREAS DISTURBED BY CONSTRUCTION. TOPSOIL USED MAY BE NATIVE ORGANIC MATERIAL SCREENED AS TO BE FREE FROM ROOTS, BRANCHES, STONES, AND OTHER DELETERIOUS MATERIALS. TOPSOIL SHALL BE APPLIED SO AS TO PROVIDE A MINIMUM OF A 4-INCH COMPACTED THICKNESS. UPON COMPLETION OF TOPSOILING, FINISHED SECTIONS ARE TO BE LIMED, SEEDED, AND MULCHED. THE CONTRACTOR SHALL INSPECT COMPLETED SECTIONS OF WORK ON A REGULAR BASIS AND REMEDY ANY PROBLEM AREAS UNTIL A HEALTHY STAND OF GRASS IS ESTABLISHED.

17. PERFORM FINAL PAVING OPERATIONS, INSTALL GUARDRAIL (IF APPLICABLE) AND MONUMENTATION AS SHOWN ON THE APPROVED PLANS.

18. MAINTAIN, REPAIR, AND REPLACE TEMPORARY EROSION CONTROL MEASURES AS NECESSARY FOR A MINIMUM PERIOD OF 12 MONTHS FOLLOWING SUBSTANTIAL COMPLETION.

19. AFTER STABILIZATION (12 MONTHLY FOLLOWING SUBSTANTIAL COMPLETION), REMOVE AND PROPERLY DISPOSE OF TEMPORARY EROSION CONTROL MEASURES, PREFERRABLY OFF SITE.

20. FOLLOWING SUBSTANTIAL COMPLETION OF ALL ROADWAY ACTIVITIES AND ONCE STABLE CONDITIONS ARE ACHIEVED, CAREFULLY AND REGULARLY MONITOR CONSTRUCTION ACTIVITIES ON ALL INDIVIDUAL LOTS TO INSURE CONSTRUCTION ACTIVITIES ARE BEING PERFORMED IN SUCH A WAY AS NOT TO ENDANGER THE INTEGRITY OF ROADWAY EMBANKMENTS, STORMWATER SYSTEMS AND UTILITIES.

NOTE: LOT DISTURBANCE, OTHER THAN SHOWN ON THESE APPROVED PLANS, SHALL NOT COMMENCE UNTIL AFTER THE ROADWAY HAS THE BASE COURSE TO THE DESIGN ELEVATION AND ASSOCIATED DRAINAGE IS COMPLETE AND STABLE.

WINTER CONSTRUCTION NOTES

a. ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS.

b. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS.

c. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.

SEEDING SPECIFICATIONS

MIXTURE	POUNDS/ACRE	POUNDS/1,000 SF
TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
BIRDSFOOT TREFOIL	8	0.20
TOTAL	48	1.10

1. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.

   B. STONES LARGER THAN FOUR INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTEFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT FOUR INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

2. ESTABLISHING A STAND
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:

   - AGRICULTURAL LIMESTONE: 2 TONS PER ACRE OR 0.09 LBS. PER SQ. FT.
   - NITROGEN (N): 50 LBS. PER ACRE OR 1.1 LBS. PER 1000 SQ. FT.
   - PHOSPHATE (P_2O_5): 100 LBS. PER ACRE OR 2.2 LBS. PER 1000 SQ. FT.
   - POTASH (K_2O): 100 LBS. PER ACRE OR 2.2 LBS. PER 1000 SQ. FT.

   (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10)

   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH 0.25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.

   C. REFER TO TABLE 7-35 OF "STORMWATER MANAGEMENT AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE", FOR APPROPRIATE SEED MIXTURES AND TABLE 7-36 FOR RATES OF SEEDING. ALL LEGUMES (CROWNVETCH, BIRDSFOOT TREFOIL, AND FLATPEA), MUST BE INOCULATED WITH THEIR SPECIFIC INNOCULANT.

   D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.

3. MULCH
   A. STRAW, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.

   B. MULCH WILL BE HELD IN PLACE USING TECHNIQUES FROM THE "BEST MANAGEMENT PRACTICE FOR MULCHING", AS SHOWN IN, "STORMWATER MANAGEMENT AND SEDIMENTATION CONTROL HANDBOOK FOR URBAN AND DEVELOPING AREAS IN NEW HAMPSHIRE".

4. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.

   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.

   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

EROSION CONTROL NOTES

ALL EROSION CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED FOR THE DURATION OF THE PROJECT IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (EPA, NHDES AND TOWN REGULATIONS). THE GENERAL NOTES AND DETAILS CONTAINED IN THIS PLAN SERVE AS A GUIDE ONLY.

1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS. INSTALLATION OF STRAWBALE BARRIERS AND SILTATION FENCES SHALL BE COMPLETED PRIOR TO THE START OF SITE WORK IN ANY SPECIFIC AREA. PREFABRICATED SILTATION FENCES SHALL BE INSTALLED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.

2. STRAWBALE BARRIERS AND SILTATION FENCES SHALL BE KEPT CLEAN DURING CONSTRUCTION AND REMOVED WHEN ALL SLOPES HAVE A HEALTHY STAND OF VEGETATIVE COVER. EROSION CONTROL MEASURES SHALL BE INSPECTED ON A WEEKLY BASIS AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES

3. EXISTING VEGETATION IS TO REMAIN UNDISTURBED WHEREVER POSSIBLE.

4. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL EXCEED 5 ACRES AT ANY ONE TIME BEFORE DISTURBED AREAS ARE STABILIZED. ALL ROADWAYS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE. CUT AND FILL SLOPES SHALL BE LOAMED & SEEDED WITHIN 72 HOURS OF ACHIEVING FINISH GRADE. TEMPORARY AND/OR PERMANENT STABILIZATION SHALL BE INSTALLED WITHIN 60 DAYS OF INITIAL CONSTRUCTION.

AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURED:
a. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED
b. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED
c. A MINIMUM OF 3 INCHES OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIP-RAP HAS BEEN INSTALLED
d. OR, EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED

TIME LIMIT: ALL AREAS SHALL BE STABILIZED WITHIN 30 DAYS OF INITIAL DISTURBANCE.

5. ALL DISTURBED AREAS SHALL HAVE A MINIMUM OF 4" OF LOAM INSTALLED WITH NOT LESS THAN 1.1 POUNDS OF SEED MIX PER 1,000 SQ. FT. SEE SEEDING SPECIFICATIONS ON THIS SHEET

6. LIME AND FERTILIZER SHALL BE INCORPORATED INTO THE SOIL PRIOR TO OR AT THE TIME OF AT THE TIME OF SEEDING. A MINIMUM OF 2 TONS PER ACRE OF AGRICULTURAL LIMESTONE AND 500 LBS. PER ACRE OF 10-20-20 FERTILIZER SHALL BE APPLIED. SEEDING PRACTICES SHALL COMPLY WITH LOCAL USDA SOIL CONSERVATION SERVICES RECOMMENDATIONS.

7. STRAW MULCH OR JUTE MATTING SHALL BE USED IF/WHERE INDICATED ON THE PLANS. A MINIMUM OF 1.5 TONS OF MULCH PER ACRE SHALL BE APPLIED. MULCH SHALL BE ANCHORED IN PLACE WHERE NECESSARY. JUTE MATTING SHALL BE LAID IN THE DIRECTION OF RUNOFF FLOW FLOW AND APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

8. PERMANENT OR TEMPORARY COVER MUST BE IN PLACE BEFORE THE GROWING SEASON ENDS. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS AREA NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 15 TO SEPTEMBER 15. NO DISTURBED AREA SHALL BE LEFT EXPOSED DURING WINTER MONTHS.

No.	DESCRIPTION	DATE
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.	.	.
.	.	.

EROSION CONTROL NOTES

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: AS NOTED*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

Colin Jean
Attorney at Law, LLC

64 McKean Street
P.O. Box 3661
Nashua, New Hampshire 03061

LICENSED IN NH & MA

Tel: (603) 881-5535
E-mail: ColinJean@nhjean.com
Fax: (603) 881-5536

May 17, 2022

Mr. Brian Groth, MCP
Planning Administrator
Town of Hudson
12 School Street
Hudson, NH 03051

RE: **Authorization for Representation – 20 Baker St. & 25 Webster St., Hudson**

Dear Brian Groth:

Kindly accept this communication as formal notice that I authorize Colin Jean, Esquire of the office of Colin Jean Attorney at Law, LLC and Michael Grainger of MJ Grainger Engineering, Inc., to represent the interests of Tumpney Hurd Clegg, LLC at the Town of Hudson Planning Board meeting scheduled for June 8, 2022 or any subsequent meeting thereafter.

Sincerely,

George Hurd, Member
Tumpney Hurd Clegg, LLC
39 Trigate Road
Hudson, NH 03051

May 17, 2022

Town of Hudson
12 School Street
Hudson, NH 03501

SUBDIVISION APPLICATION

Revised August 30, 2021

The following information must be filed with the Planning Department ***at the time of filing a site plan application***:

1. One (1) original completed application with original signatures, and one (1) copy.
2. Three (3) full plan sets (sheet size: 22" x 34").
3. One (1) original copy of the project narrative, and one (1) copy.
4. A list of direct abutters and a list of indirect abutters, and two (2) sets of mailing labels for abutter notifications.
5. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.
6. All plans shall be folded and all pertinent data shall be attached to the plans with an elastic band or other enclosure.

The following information is required to filed with the Planning Department ***no later than 10:00 A.M., Tuesday ONE WEEK prior to the scheduled Planning meeting. The purpose of these materials is hardcopy distribution to Planning Board members, not review. Any plan revisions that require staff review must be submitted no later than 10:00A.M., Tuesday TWO WEEKS prior to the scheduled Planning meeting. Depending on the complexity of changes, more time may be required for review. Please contact the Town Planner if you have any questions on this matter.***

1. Submission of fifteen (15) 11" X 17" plan sets, revised if applicable.
2. Submission of two (2) full plan sets (sheet size: 22" x 34"), if revised.
3. All of the above application materials, including plans, shall also be submitted in electronic form as a PDF.

Note: Prior to filing an application, it is recommended to schedule an appointment with the Town Planner.

GEORGE HURD, MEMBER, TUMPNEY HURD CLEGG LLC – APPLICANT

TUMPNEY HURD CLEGG, LLC – OWNER

(20 Baker Street & 25 webster Street; Map 174 & 181, Lots 15-1 & 1 respectively)

ATTACHMENT / NARRATIVE TO SITE PLAN APPLICATION

Property Summary

Tumpney Hurd Clegg, LLC is the titled owner of the approximately 83,806 square foot (1.924 acre) parcel of land (Map 174 & 181 – Lots 15-1 & 1 respectively), located in a Town (TR) Zoning District. These particular parcels are located, with frontage, on both Webster Street and Baker Street. The property abuts other residential properties on all borders.

The subject parcel on Webster Street has been razed of the prior existing residence on the property, and the parcel on Baker has no existing residence on it.

Project Overview

It is the intention of Tumpney Hurd Clegg LLC (Applicant & Owner) to construct six single family residences, along with the construction of a public street ending in a cul-de-sac access from the Webster Street frontage. The site plan for the development is entitled "20 Baker St. & 25 Webster St., Hudson, New Hampshire" Dated March 30, 2022. A copy of which is appended to this application.

The proposed six (6) single family residences would each have individual private driveways from the existing and proposed public streets. The residences would each be serviced by municipal water and public sewer, and usual utilities. The utilities will be sub-surface/underground.

The nature and character of the general vicinity include single family homes. The proposed residences are consistent with and in character with the existing neighborhood.

All Zoning Requirements Met

The Site Plan as submitted ensures that all density, setback, frontage, and applicable zoning regulations are and will be met.

Proposed Lot 1:	Frontage on proposed new public street Driveway entrance on proposed new public street 10,007 sq. ft. All frontage & set back requirements met
Proposed Lot 2:	Frontage on Webster Street Driveway entrance on Webster Street 10,018 sq. ft. All frontage & set back requirements met

Proposed Lot 3:	Frontage on proposed new public street Driveway entrance on proposed new public street 10,011 sq. ft. All frontage & set back requirements met
Proposed Lot 4:	Frontage on proposed new public street Driveway entrance on proposed new public street 15,645 sq. ft. All frontage and set back requirements met
Proposed Lot 5:	Frontage on proposed new public street Driveway entrance on proposed new public street 10,763 sq. ft. All frontage & set back requirement met
Proposed lot 6:	Frontage on Baker Street Driveway entrance on Baker Street 12,040 sq. ft. All frontage & set back requirements met

Proposed New Public Road

The construction of the new public street will adequately service the four residences it is intended to provide access for. It is proposed that the new public street be 24 feet in pavement width. The proposed street will have a 30 foot right-of-way. Consistent with the general area there are no proposed sidewalks, however in lieu of such accommodation the developer offers to make monetary contribution. The proposed construction of the new public street will require the following Waivers from Town of Hudson Regulations in order to meet the designs as included in the Sub Division Site Plan:

1. HTC 289-18.A. – Right-of-Way width
2. HTC 289-18.B. (3) – Turnaround Radii
3. HTC 289 – 28.F – Allow for Vertical Granite Curbing
4. HTC 289 – 18. R. – Installation of Improvements (Sidewalk)

PLEASE SEE WAIVER REQUESTS ATTACHED TO APPLICATION

SUBDIVISION APPLICATION

Date of Application: May 17, 2022 Tax Map #: 174 &181 Lot #: 15-1 &1

Site Address: 20 Baker Street & 25 Webster Street, Hudson, New Hampshire 03051

Name of Project: 20 Baker St. & 25 Webster St., Hudson, New Hampshire

Zoning District: TR General SB#: _____

(For Town Use Only)

Z.B.A. Action: _____

PROPERTY OWNER:	DEVELOPER:
Name: Tumpney Hurd Clegg, LLC	Tumpney Hurd Clegg, LLC
Address: 39 Trigate Rd., Hudson, NH 03051	39 Trigate Rd., Hudson, NH 03051
Address:	
Telephone # 603-718-2932	603-718-2932
Email: george@hurdandson.com	george@hurdandson.com
PROJECT ENGINEER:	**SURVEYOR:**
Name: RBJ Engineering, LLC	M.J. Grainger Engineering, Inc.
Address: 2 Glendale Rd., Concord, NH 03301	220 Derry Rd, Hudson, NH 03051
Address:	
Telephone # 603-219-0194	603-882-4359 cell:603-566-0422
Email:	mjgraingereng@gmail.com

PURPOSE OF PLAN:

The purpose of this Plan is to show the subdivision of Lots 174-15-1 & 181-1 into six (6) single family residential building lots.

(For Town Use Only)

Routing Date: _____ Deadline Date: _____ Meeting Date: _____

_____ I have no comments _____ I have comments (attach to form)

_____ Title: _____ Date: _____
(Initials)

Department:

Zoning: ___ Engineering: ___ Assessor: ___ Police: ___ Fire: ___ DPW: ___ Consultant: ___

SUBDIVISION PLAN DATA SHEET

PLAN NAME: 20 Baker St. & 25 Webster St., Hudson, New Hampshire

PLAN TYPE: Conventional Subdivision Plan or Open Space Development (Circle One)

LEGAL DESCRIPTION: MAP 174 &181 LOT 15-1 & 1

DATE: March 30, 2022

Address:	20 Baker Street & 25 Webster Street, Hudson, NH 03051
Total Area:	S.F. 83,806 Acres: 1.924
Zoning:	TR - Town Residence
Required Lot Area:	10,000 sf
Required Lot Frontage:	90 ft
Number of Lots Proposed:	6
Water and Waste System Proposed:	Municipal sewer and water
Area in Wetlands:	None
Existing Buildings To Be Removed:	None
Flood Zone Reference:	FIRM - Community Map Number 330092 0005 B Panel 5 of 10
Proposed Linear Feet Of New Roadway:	480

SUBDIVISION PLAN DATA SHEET

Dates/Case #/Description/
Stipulations of ZBA,
Conservation Commission,
NH Wetlands Board Action:

(Attach Stipulations on
Separate Sheet)

List Permits Required: NH DES Shoreland Protection Permit may be required

Notice to Lower Merrimack River Advisory Committee

*Waivers Requested:	Hudson Town Code Reference	Regulation Description
	1. HTC 289-18.A	Right of Way Width
	2. HTC -289 - 28.F.	Row & Pavement Width
	3. HTC 289-18.B(3)	Turnaround Radii
	4. HTC- 289-18.R.	Sidewalk
	5.	
	6.	
	7.	

(Left Column for Town Use)

(For Town Use Only)

Data Sheets Checked By: _____ Date: _____

SUBDIVISION PLAN APPLICATION AUTHORIZATION

I hereby apply for *Subdivision Plan* Review and acknowledge I will comply with all of the Ordinances of the Town of Hudson, New Hampshire State Laws, as well as any stipulations of the Planning Board, in development and construction of this project. I understand that if any of the items listed under the *Subdivision Plan* specifications or application form are incomplete, the application will be considered rejected.

Pursuant to RSA 674:1-IV, the owner(s) by the filing of this application as indicated above, hereby given permission for any member of the Hudson Planning Board, the Town Planner, the Town Engineer, and such agents or employees of the Town or other persons as the Planning Board may authorize, to enter upon the property which is the subject of this application at all reasonable times for the purpose of such examinations, surveys, tests and inspections as may be appropriate. The owner(s) release(s) any claim to or right he/she (they) may now or hereafter possess against any of the above individuals as a result of any examinations, surveys, tests and/or inspections conducted on his/her (their) property in connection with this applications.

Signature of Owner: _____ Date: 5-17-22

Print Name of Owner: George Hurd, Manager - Tumpney Hurd Clegg, LLC

- If other than an individual, indicate name of organization and its principal owner, partners, or corporate officers.

Signature of Developer: _____ Date: 5-17-22

Print Name of Developer: George Hurd, Manager - Tumpney Hurd Clegg, LLC

- The developer/individual in charge must have control over all project work and be available to the Code Enforcement Officer/Building Inspector during the construction phase of the project. The individual in charge of the project must notify the Code Enforcement Officer/Building Inspector within two (2) working days of any change.

WAIVER REQUEST FORM

Name of Subdivision/Site Plan: 20 Baker St. & 25 Webster St., Hudson, New Hampshire

Street Address: 20 Baker Street & 25 Webster Street, Hudson, NH 03051

I George Hurd, manager - Trumpney Hurd Clegg, LLC hereby request that the Planning Board waive the requirements of item HTC 289-18.A of the Hudson Land Use Regulations in reference to a plan presented by Michael Grainger of MJ Grainger Engineering, Inc (name of surveyor and engineer) dated March 30, 2022 for property tax map(s) 174 &181 and lot(s) 15-1 & 1 in the Town of Hudson, NH.

As the aforementioned applicant, I, herein. acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n). i.e., without the Planning Board granting said waiver, it would pose an unnecessary hardship upon me (the applicant). and the granting of this waiver would not be contrary to the spirit and intent of the Land Use Regulations.

Hardship reason(s) for granting this waiver (if additional space is needed please attach the appropriate documentation hereto):

The intended street is going to service four (4) residential. single family lots. and cannot be extended or lenghtened at any future time. The short run of the proposed street combined with the limited traffic produced will be more than adequately provide spirit and intent of the Land Use regulation as designed and proposed. Given the fact that all utilities will be underground need for the right-of-way width as per the Regulation seres adiminished purpose regarding intent and a harsdhip on the applicant.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations: (if additional space is needed please attach the appropriate documentation hereto):

The road way design will provide safe and adequte travel for the four residences to be serviced and easily access. Absent abouve-ground utilities the intent and spirit of the subject Regulation will be met.

Signed: _____

Applicant or Authorized Agent

WAIVER REQUEST FORM

Name of Subdivision/Site Plan: 20 Baker St. & 25 Webster St., Hudson, New Hampshire

Street Address: 20 Baker Street & 25 Webster Street, Hudson, NH 03051

I George Hurd, manager - Trumpney Hurd Clegg, LLC hereby request that the Planning Board waive the requirements of item HTC 289-18. B (3) of the Hudson Land Use Regulations in reference to a plan presented by Michael Grainger of MJ Grainger Engineering, Inc (name of surveyor and engineer) dated March 30, 2022 for property tax map(s) 174 &181 and lot(s) 15-1 & 1 in the Town of Hudson, NH.

As the aforementioned applicant, I, herein, acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n), i.e., without the Planning Board granting said waiver, it would pose an unnecessary hardship upon me (the applicant), and the granting of this waiver would not be contrary to the spirit and intent of the Land Use Regulations.

Hardship reason(s) for granting this waiver (if additional space is needed please attach the appropriate documentation hereto):

The design of the proposed cul-de-sac, while decreased from the Regulation will adequately service both the residents and safety, emergency, and fire apparatus, thereby fulfilling the spirit and intent of the regulation without the burden and hardship otherwise imposed. Proper access and safety concerns are addressed as designed.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations: (if additional space is needed please attach the appropriate documentation hereto):

The cul-de-sac, which will service only two (2) single family residences will adequately and safely provide the necessary and secure access to vehicular, fire, and emergency traffic and therefore meets the spirit and intent of the Regulation.

Signed: _____

Applicant or Authorized Agent

WAIVER REQUEST FORM

Name of Subdivision/Site Plan: 20 Baker St. & 25 Webster St., Hudson, New Hampshire

Street Address: 20 Baker Street & 25 Webster Street, Hudson, NH 03051

I George Hurd, manager - Trumpney Hurd Clegg, LLC hereby request that the Planning Board waive the requirements of item HTC 289- 28. F. of the Hudson Land Use Regulations in reference to a plan presented by Michael Grainger of MJ Grainger Engineering, Inc (name of surveyor and engineer) dated March 30, 2022 for property tax map(s) 174 &181 and lot(s) 15-1 & 1 in the Town of Hudson, NH.

As the aforementioned applicant, I, herein, acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n), i.e., without the Planning Board granting said waiver, it would pose an unnecessary hardship upon me (the applicant), and the granting of this waiver would not be contrary to the spirit and intent of the Land Use Regulations.

Hardship reason(s) for granting this waiver (if additional space is needed please attach the appropriate documentation hereto):

The proposed design of the new street with vertical granite curbing, given the roadways short length, will provide the same safety and buffer protections as otherwise required by the Regulation. Proper safety concerns are addressed as designed thereby meeting the spirit and intent of the land use Regulation with imposing an unnecesary burden.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations: (if additional space is needed please attach the appropriate documentation hereto):

The spirit and intent of the Regulation is to provide safe passage for the traffic passing along the roadway. The use of vertical granite curbing provides equal safety, given the nature of the environment. Given the increased ease provided to snow removal services the requested Waiver is not contrary tot he spirit and intent of the Regulation.

Signed: _____

Applicant or Authorized Agent

WAIVER REQUEST FORM

Name of Subdivision/Site Plan: 20 Baker St. & 25 Webster St., Hudson, New Hampshire

Street Address: 20 Baker Street & 25 Webster Street. Hudson, NH 03051

I George Hurd, manager - Trumpney Hurd Clegg, LLC hereby request that the Planning Board waive the requirements of item HTC 289- 18. R. of the Hudson Land Use Regulations in reference to a plan presented by Michael Grainger of MJ Grainger Engineering, Inc (name of surveyor and engineer) dated March 30, 2022 for property tax map(s) 174 &181 and lot(s) 15-1 & 1 in the Town of Hudson, NH.

As the aforementioned applicant, I, herein, acknowledge that this waiver is requested in accordance with the provisions set forth in RSA 674:36, II (n), i.e., without the Planning Board granting said waiver, it would pose an unnecessary hardship upon me (the applicant), and the granting of this waiver would not be contrary to the spirit and intent of the Land Use Regulations.

Hardship reason(s) for granting this waiver (if additional space is needed please attach the appropriate documentation hereto):

Given the fact that the adjining roadway has no sidewalk, and given the limited length of the new proposed street, the requirement of imposing the installation of a sidewalk would impose an unnecessary hardship. The installation of a sidewalk at this location would serve no practical purpose, and the granting of the requested waiver would not be contrary to the the spirit and intent of the land use Regulation.

Reason(s) for granting this waiver, relative to not being contrary to the spirit and intent of the Land Use Regulations: (if additional space is needed please attach the appropriate documentation hereto):

The spirit and intent of the Regulation is to provide safe passage and access for the residents and invitees. The lack of sidewalks in and around the surrounding neighborhood negates the Regulation's intent in this particular case, as the proposed new roadway will likely be the least ravelled in the area.The limited use andlack of the intended purpose ould be better offset with monetary uses more in line with the spirit and inten tof the Regulation.

Signed: _____

Applicant or Authorized Agent

NOTE: fees below apply only upon plan approval, NOT collected at time of application.

D. RECORDING FEES:

The applicant shall pay the costs of recording the final site plan layout prior to final site plan approval, in accordance with fees established by the County. Recording fees must be paid prior to recording.

Recording of Plan @ $24.00/sheet + $2.00/surcharge plan
Land & Community Heritage Investment Program (LCHIP) fee @ $25.00
Easements/Agreements @$10.00/first sheet. $4.00/each sheet thereafter + $2.00/surcharge/doc. + First Class return postage rate

E. COST ALLOCATION PROCEDURE AMOUNT CONTRIBUTION AND OTHER IMPACT FEE PAYMENTS:

To be determined by the Planning Board at time of plan approval and shall be paid by the applicant at the time of submittal of the Certificate of Occupancy Permit requests.

*****The applicant shall be responsible for all fees incurred by the town for processing and review of the applicant's application, plan and related materials.*****

Bk 9402 Pg 2493

Return to: Tumpney Hurd Clegg, LLC
39 Trigate Road
Hudson, NH 03051

WARRANTY DEED

I, **Richard D. Brough,** a married person, of 153 Walker Brook Road, Danbury, New Hampshire 03230, for consideration paid, grant to **Tumpney Hurd Clegg, LLC** with an address of 39 Trigate Road, Hudson, New Hampshire 03051, with WARRANTY COVENANTS:

A certain tract or parcel of land with the buildings thereon situated on the east side of Webster Street in Hudson, Hillsborough County, New Hampshire being bounded and described as follows:

Beginning at the southwesterly corner of the premises at a stone bound situate in the westerly line of Webster Street at land formerly of Ella F. Walch, which, and now or formerly of Campbell, thence

1. North 84º 03' 30" East by the northerly line of said Campbell land one hundred fifty and 6/100 (150.06) feet to a stone bound now or formerly of Eliza K. Hoitt, thence
2. North 9º 30' 50" West by the westerly line of said Hoitt land seventy-eight and 10/100 (78.10) feet to a stone bound at the corner of said Hoitt land, thence
3. North 17º 18' 50" West one hundred forty-eight and 59/100ths (148.59) feet to a stone bound at land now or formerly of Leslie, thence
4. South 73º 55' 20" West by the southerly line of said Leslie land one hundred fifty and 60/100 (150.60) feet to a stone bound situate in said easterly line of Webster Street, thence
5. South 16º 05' East by the easterly line of Webster Street one hundred seventy-five and 10/100 (175.10) feet to a stone bound situate in said easterly line, thence
6. South 9º 24' 20" East by said easterly twenty-four and 91/100 (24.91) feet to the point of beginning.

Containing 32,343 square feet of land, more or less.

Reserving and excepting from this conveyance any interest that the Estate of Eliza B. Leslie may have in the premises abutting the northerly side of the above-described premises, if still in existence.

Meaning and intending to describe and convey the same premises conveyed to the Grantor by deed of Conrad J. LaPierre and Elizabeth A. LaPierre dated June 12, 1992, recorded with the Hillsborough County Registry of Deeds in Book 5346, Page 632.

This is NEITHER homestead property of the grantor NOR his Spouse.

Witness:

Richard D. Brough

Richard D. Brough

State of Florida

County of Martin

On this 23 day of December, 2020, before me, the undersigned officer, personally appeared Richard D. Brough, personally known to me, or by proof of valid identification (which was_____), to be the person whose name is subscribed to the within document and acknowledged that he executed the same for its intended purpose.

In Witness Whereof, I hereunto set my hand.

Suzan Koeppen

Notary Public:

Commission Exp.: _____

SUZAN KOEPPEN
MY COMMISSION # GG 338117
EXPIRES: September 23, 2023
Bonded Thru Notary Public Underwriters

Book 9462 Page 2026

Return to: Tumpney Hurd Clegg, LLC
39 Trigate Road
Hudson, NH 03051

WARRANTY DEED

I, **Richard J. Lindquist, Trustee of the Richard J Lindquist Trust of 2000, U/D/T April 3, 2000** with an address of 44 webster Street, Hudson, Hillsborough County, New Hampshire 03051, for consideration paid, grant to **Tumpney Hurd Clegg, LLC** with an address of 39 Trigate Road, Hudson, New Hampshire 03051, with **WARRANTY COVENANTS** the following described property:

A certain tract or parcel of land with any improvements thereon, located on Baker Street, Hudson, Hillsborough County New Hampshire and being shown as Lot 15-1 on a plan entitled: "Consolidation & Subdivision Plan O'Loughlin Subdivision, Map 174, Lots 15 & 16, 18 & 22 Baker Street, Hudson, New Hampshire, Hillsborough County", prepared by Keach-Nordstrom Associates, Inc., dated June 6, 2008 and recorded in the Hillsborough County Registry of Deeds as Plan #36191, and further bounded as follows:

Beginning at a point on the western side of Baker Street, being the easterly corner of the within described lot; then

South 83° 58' 48" West a distance of 169.00 feet to an iron pin, then

South 06° 13' 37" East a distance of 96.51 feet to an iron pin; then

South 79° 44' 15" West a distance of 133.74 feet to an iron pin; then

North 11° 07' 19" West a distance of 62.50 feet to a point; then

North 11° 07' 19" a distance 28.01 feet to an iron pipe found; then

North 16° 48' 37" West a distance of 46.11 feet to a point; then

North 16° 48' 37" West a distance of 102.41 feet to a stone bound; then

North 74° 24' 22" East a distance of 177.53 feet to an iron pipe; then

South 16° 21' 26" East a distance of 91.60 feet to an iron pin; then

North 73° 36' 18" East a distance of 144.45 feet to a stone bound; then

South 21° 11' 52" East a distance of 16.93 feet along Baker Street to a stone bound; then

South 05° 55' 20" East a distance of 100.58 feet along said Baker Street to the point of beginning.

This corrects the improper metes and bounds description in the Deed at Book 8034 Page 1725.

Total area of the parcel is 51,626 sq. ft. or 1.185 acres +/-.

Subject to any easements or encumbrances of record.

The within conveyed property is not the homestead of the grantor.

Meaning and intended to convey the premises conveyed to the within grantor by deed dated November 18, 2008 and recorded at the Hillsborough County Registry of Deeds at Book 8034, page 1725.

For further title reference also see deed recorded at the said Registry of Deeds at Book 8034, Page 1719.

Witness my hand this 29th day of April, 2021.

Richard J. Lindquist Trust of 2000

By: Richard J. Lindquist Trustee

County of Hillsborough

State of New Hampshire

On this 29th day of April, 2021, before me, the undersigned officer, personally appeared the above-named **Richard J. Lindquist**, Trustee of the Richard J Lindquist Trust of 2000, known to me or satisfactorily proven to be the person whose name is subscribed to the foregoing instrument, and he acknowledged that he executed the same for the purposes therein contained.

Colin M. Jean
Notary Public
State of New Hampshire
My Commission Expires:
October 02, 2024

Notary Public: Colin Jean
Commission Exp.: 10-02-2024

TRUSTEE CERTIFICATE

(NH RSA 564-A:7)

The undersigned, Richard J. Lindquist, Trustee under the Richard J. Lindquist Trust of 2000, under Trust Agreement dated April 3, 2000, hereby has absolute power in said trust agreement to convey any interest in real estate and improvements thereon held in said trust and no purchaser or third party shall be bound to inquire whether the trustee has said power or is properly exercising said power or to see to the application of any trust asset paid to the trustee for a conveyance thereof.

Richard J. Lindquist Trust,

By: Richard J. Lindquist, Trustee

Hillsborough, ss. **State of New Hampshire**

On this 29th day of April, 2021, before me, the undersigned officer, personally appeared the above-named Richard J. Lindquist, Trustee of the Richard J. Lindquist Trust of 2000, known to me or satisfactorily proven to be the person whose name is subscribed to the foregoing instrument, and he acknowledged that he executed the same for the purposes therein contained.

Colin M. Jean
Notary Public
State of New Hampshire
My Commission Expires:
October 02, 2024

Notary Public: Colin Jean
My Commission Expires: 10-02-2024

ABUTTERS LIST

TAX MAP 173 LOT 001
CYNTHIA A. TAMPOSI
32 WEBSTER ST
HUDSON, NH 03051

TAX MAP 181 LOT 005
SCIRE HOMES, INC
6 SCHAEFER CIRCLE
HUDSON, NH 03051

MAP 174 / LOT 14
ROGER J. & KATHLEEN S.
DOUVILLE
15 BAKER STREET
HUDSON, NH 03051

MAP 181 / LOT 2
JACQUELINE SCIRE, TRUSTEE
ROBERT SCIRE, TRUSTEE
6 SCHAEFER STREET
HUDSON. NH 03051

MAP 174 / LOT 13
BARBARA A. &
MICHAEL B. MORIN
17 BAKER STREET
HUDSON, NH 03051

MAP 174 / LOT 12
LUCIE L. FREITAS
19 BAKER STREET
HUDSON, NH 03051

MAP 182 / LOT 79
MARK E. SZUGDA
16 BAKER STREET
HUDSON, NH 03051

MAP 174 / LOT 16
SCOTT R. GREENLAND &
KATHERINE E. MILLER
22 BAKER STREET
HUDSON, NH 03051

MAP 173 / LOT 056
LAURENCE &
KATHERYN TAYLER
27 WEBSTER STREET
HUDSON, NH 03051

MAP 181 / LOT 005
SCIRE HOMES, INC.
6 SCHAEFER CIRCLE
HUDSON, NH 03051

MAP 174 / LOT 15
JENNIFER BAER
18 BAKER STREET
HUDSON, NH 03051

MAP 174 / LOT 11
MICHAEL D. SIMEK
21 BAKER STREET
HUDSON, NH 03051

MAP 174 / LOT 17
JAMES W. & SANDRA D. HAYES
24 BAKER STREET
HUDSON, NH 03051

ABUTTERS LIST ADDITIONAL

OWNER: GEORGE HURD, MEMBER
TUMPMEY, HUD, CLEGG, LLC
13 MERRIMACK STEET
HUDSON, NH 03051

ATTORNEY: COLIN JEAN
64 McKEAN STREET
NASHUA, NH 03061

ENGINEER: MJ GRAINGER ENGINEERING, INC
MICHAEL J. GRAINGER, PE
220 DERRY ROAD
HUDSON, NH 03051

ENGINEER: RJB ENGINEERING, LLC
JEFFREY BURD
2 GLENDALE ROAD
CONCORD, NH 03301

PROPERTIES WITHIN 200 FEET

MARYILYN D. FREOTAS
CARIA PETRILLO
29 WEBSTER STREET
HUDSON, NH 03051

RICHARD & DAWN GENDRON
31 WEBSTER STREET
HUDSON, NH 03051

JACAU & MICHELLE RICCI
16 CUMMINGS ST
HUDSON, NH 03051

THOMAS & NANCY McCOY
27 HAWK RIDGE ROAD
MEREDITH, NH 03253

MICHAEL SIMEK
21 BAKER STREET
HUDSON, NH 03051

BRANDIE PERSONS
23 BAKER ST
HUDSON, NH 03051

FRANCIS CORCORAN
329 MAIN ST
NASHUA, NH 03060

GREGORY SULLIVAN
156 SAGAMORE ST
MANCHESTER, NH 03104

DAWNMARIE & RICHARD McCORMICK
1 HIGHLAND AVE
HUDSON, NH 03051

JEFFREY LEVESQUE
13 BAKER ST
HUDSON, NH 03051

G. HURD & SON CONST
13 MERRIMACK ST
HUDSON, NH 03051

ROBERT & JACQUELINE SCIRE
6 SCHAEFER CIRCLE
HUDSON, NH 03051

STORMWATER MANAGEMENT REPORT

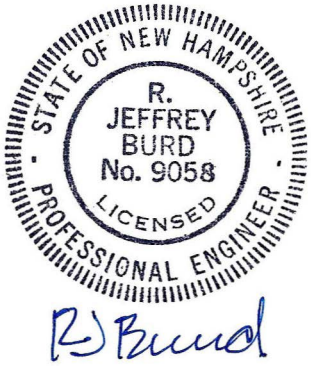
PROPOSED RESIDENTIAL SUBDIVISION

TAX MAP 174, PARCEL 15-1
TAX MAP 181, LOT 1
20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NH

May 10, 2022

Prepared for:
Tumpney, Hurd, Clegg, LLC
39 Trigate Road
Hudson, NH 03051

Prepared By:
RJB Engineering, LLC
2 Glendale Road
Concord, NH 03301



Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report

TABLE OF CONTENTS

Appendix:

Tax Map 174, Lot 15-1 & Map 181, Lot 1, Hudson, NH
Stormwater Management Report

Introduction

This project is a single-family residential subdivision on 1.92 acres in Hudson, New Hampshire. Two properties are being merged and re-subdivided into six building lots. The properties are located between, and have frontage on, Baker Street and Webster Street. There is an existing house on 25 Webster Street that was recently moved to accommodate the proposed development. The project is in a fairly dense residential area of Hudson near the Merrimack River. The property is zoned Town Residence (TR).

The development includes construction of a new road approximately 250 feet long to provide access to and frontage for five new building lots – the sixth lot will have frontage solely on Baker Street. Lots will be served with municipal sewer and water.

The stormwater surface runoff from Baker Street, including all of the 20 Baker Street property and more than half of the 25 Webster Street property is directed to a low depressed area in the middle of the combined parcels where it infiltrates into the underlying soils. The stormwater runoff in the front portion of 25 Webster Street drains to a closed drainage system in Webster Street, which ultimately flows into the Merrimack River.

Existing Conditions

Again, the project includes two properties that are being merged and re-subdivided. The first property is located at 20 Baker Street and includes an area of 1.187 acres. The second parcel is located at 25 Webster Street and has an area of 0.737 acres. The total combined area is approximately 1.92 acres. Both properties have historically been used as single-family residences.

Baker Street is more than 25 feet higher than Webster Street. The land slopes fairly steeply (15 to 25%) behind the house on Baker Street to a low flat grassy area. The back yard of 25 webster Street also slopes to this low flat area. Slopes in this grassy area range from flat, 0% to less than 1/2%. Portions of both lots are sparsely wooded.

There are no wetlands on the property. Soils on the site are identified on the USDA NRCS Web Soil Survey as a Windsor-urban land complex and Occum fine sandy loam. The Windsor soil is in the Group A hydrologic soil group, having well to excessively drained sands and gravel. The Occum soil is in the Group B hydrologic soil group, having moderately well to well drained soils with moderately fine to moderately coarse sands. Both soils have good infiltration rates.

Most of the stormwater surface runoff from the combined lots flows to the low flat grassy area in the middle of the parcels. There is no outlet for this depressed area and no evidence of concentrated flows, and as such, it is apparent that the contributing runoff naturally infiltrates into the underlying soils. The stormwater runoff in the front portion of 25 Webster Street drains to a closed drainage system in Webster Street, which ultimately flows into the Merrimack River. The total drainage area included in this analysis is approximately 2.6 acres. Approximately 2.2 acres drains to the low flat grassy area located in the middle of the development.

Proposed development

This project is a single-family residential subdivision that will create a total of six lots. The existing house at 25 Webster Street has been recently moved within the lot in order to accommodate the proposed development. Each lot will exceed 10,000 s.f. in size and will be served by public sewer and water. The proposed road length is less than 300 linear feet and terminates in a cul-de-sac. The road will be curbed with a closed drainage system in accordance with Town standards. The total impervious surface area of the new road is approximately 12,250 s.f. The total area to be disturbed, not including the home construction on each lot, is approximately 32,000 s.f.

Drainage in the new roadway will be routed to a closed drainage system through two detention and infiltration basins. The area that is easterly of the cul-de-sac drains toward and will be captured in the cul-de-sac island in a grassed depression, designed to detain and infiltrate drainage into the sandy underlying soils. The outlet for this basin is routed to two catch basins that are located at the beginning of the proposed road. The two catch basins will collect stormwater runoff from the lots on both sides of the road and will be routed to an underground chamber system in the northwesterly corner of the property adjacent to Webster Street. This chamber system is designed to detain and infiltrate drainage into the underlying soil. Peak stormwater flows will drain into the existing closed system in Webster Street. The infiltration basins are sufficiently sized to detain and infiltrate increased runoff from the new impervious surfaces. There is no increase in stormwater runoff from the project into the existing closed system in Webster Street.

It is also proposed that each house be constructed with gutters and routed to an infiltration catch basin. This design will minimize any increase in stormwater flows for the new home construction. Details are provided in the plan set.

The low flat grassy area will remain natural and undisturbed adjacent to the northerly and the southerly property lines – runoff from the back of the parcels on Baker Street will continue to naturally drain to these areas where it will infiltrate into the underlying soils. There will be no increase in runoff to these areas and therefor the adjacent properties will not be affected by the development.

Design methodology

The drainage analysis in this study was completed using HydroCad Version 10.0, a stormwater modeling program utilizing TR-20 and TR-55 methodology. This program performs both the hydrologic computations for determination of runoff flows, and the hydraulic calculations for pipe, ditch, and pond design. Calculations were performed for 2, 10, 25, and 50-year return frequency storms in accordance with Municipal regulations. The following design parameters were used:

Rainfall distribution: Type III
2-year storm rainfall: 2.95 inches
10-year storm rainfall: 4.44 inches
25-year storm rainfall: 5.61 inches
50-year storm rainfall: 6.70 inches

Design analysis

Peak runoff flows have been evaluated in this study to insure that post-development flows do not exceed pre-development flows. Mitigation for increased flows has been provided by using an infiltration basin as previously described. Pre and post development flows were analyzed to the two design nodes. The peak flows are shown in the accompanying table:

Storm frequency	**Design node**	**Pre-development Flow (cfs)**	**Post-development Flow (cfs)**
2-year	CB in Webster St	3P= 0.6	3P= 0.1
	Grassy flat area	5R= 0.0	7P= 0.0 8P=0.0
10-year	CB in Webster St	3P= 1.2	3P= 0.3
	Grassy flat area	5R= 0.0	7P= 0.0 8P=0.0

25-year	CB in Webster St	3P= 1.7	3P= 0.5
	Grassy flat area	5R= 0.0	7P= 0.0 8P=0.0
50-year	CB in Webster St	3P= 2.2	3P= 1.5
	Grassy flat area	5R= 1.5	7P= 0.0 8P=0.0

Stormwater volumes were also reviewed in accordance with Town Regulations. Post development volumes are less than the pre-development volumes since the detention basin is designed to infiltrate peak stormwater volumes. The peak volumes are shown in the accompanying table:

Storm frequency	**Pre-development volume (AF)**	**Post-development volume (AF)**
2-year	3P= 0.045	3P= 0.010
	5R= 0.000	8P=0.000
10-year	3P= 0.088	3P= 0.025
	5R= 0.000	8P=0.000
25-year	3P= 0.125	3P= 0.039
	5R= 0.000	8P=0.000
50-year	3P= 0.160	3P= 0.092
	5R= 0.027	8P=0.000

The recharge volume was also reviewed in accordance with Town requirements. The calculations demonstrate that the recharge volume exceeds the required minimum:

Impervious area = 18,019 sf
Required recharge volume = 0.40 x 18,019 / 12 = 601 cf
Recharge volume provided = 5,215 cf

Stormwater Treatment

Stormwater treatment is provided to reduce pollutants and sediment from discharging into downstream public waters. Several best management practices recommended in the NHDES Stormwater Manual are proposed for this project. While this site does not require a NHDES Alteration of Terrain Permit, the design utilizes practices recommended by NHDES. The following water quality measures were used to minimize downstream impacts:

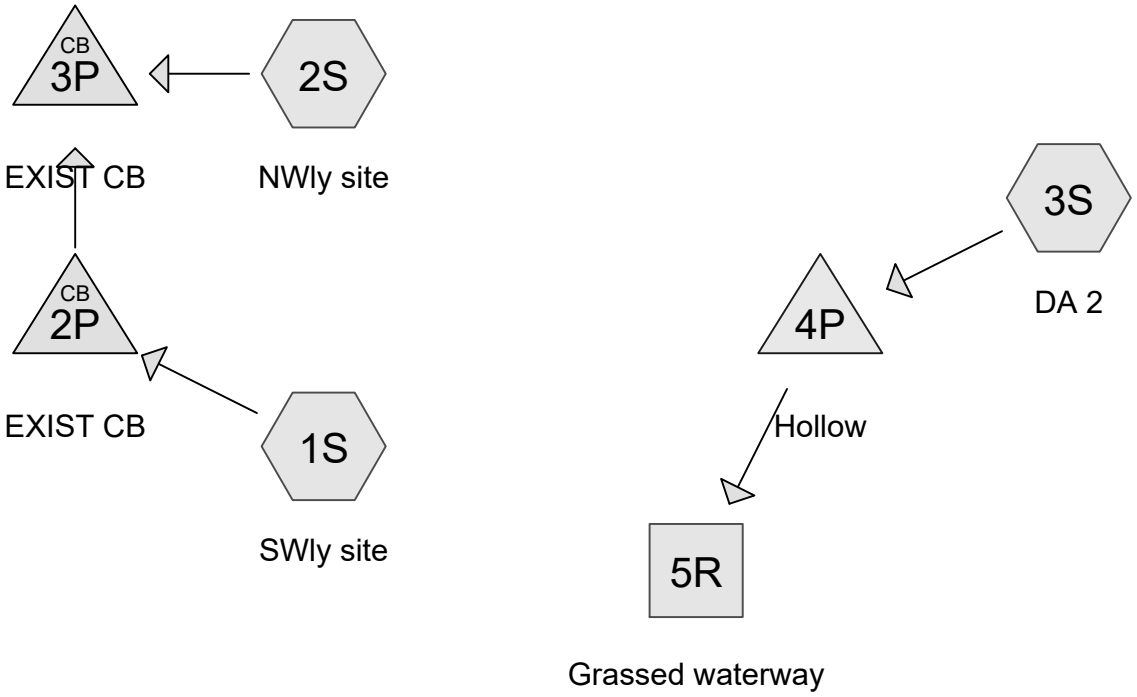
- Catch basins with sumps (for sediment collection) are proposed in the new road.
- An open infiltration basin is proposed for detention and infiltration into the underlying soils providing further water quality treatment. The basin is also designed with a sediment forebay to reduce sediment movement.

Erosion Control Measures

This site is very flat and the soils are sandy. There is not a high level of concern for erosion during construction. Several best management practices are however proposed to minimize erosion during construction. Following are some of the practices required for the development:

- Silt Fence
- Hay bale barriers
- Stabilized construction entrance
- Proper construction sequencing

Pre-development computations



Subcat Reach Pond Link

Routing Diagram for 03-30-22 THC pre
Prepared by RJB Engineering, Printed 4/2/2022
HydroCAD® 10.00-25 s/n 05821 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.563	39	Pasture/grassland/range, Good, HSG A (3S)
0.948	61	Pasture/grassland/range, Good, HSG B (1S, 2S, 3S)
0.282	98	Paved roads w/curbs & sewers (1S, 2S, 3S)
0.487	30	Woods, Good, HSG A (3S)
0.336	55	Woods, Good, HSG B (3S)
2.617	**54**	**TOTAL AREA**

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=1.28"
Tc=6.0 min CN=81 Runoff=0.36 cfs 0.026 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=1.28"
Tc=6.0 min CN=81 Runoff=0.26 cfs 0.019 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=0.05"
Flow Length=375' Tc=11.9 min CN=48 Runoff=0.02 cfs 0.010 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=20.0' S=0.0025 '/' Capacity=5.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: EXIST CB Peak Elev=114.89' Inflow=0.36 cfs 0.026 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/' Outflow=0.36 cfs 0.026 af

Pond 3P: EXIST CB Peak Elev=114.41' Inflow=0.61 cfs 0.045 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.61 cfs 0.045 af

Pond 4P: Hollow Peak Elev=115.61' Storage=0 cf Inflow=0.02 cfs 0.010 af
Discarded=0.02 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.010 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.055 af Average Runoff Depth = 0.25"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=2.50"
Tc=6.0 min CN=81 Runoff=0.70 cfs 0.051 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=2.50"
Tc=6.0 min CN=81 Runoff=0.51 cfs 0.037 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=0.39"
Flow Length=375' Tc=11.9 min CN=48 Runoff=0.37 cfs 0.072 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=20.0' S=0.0025 '/' Capacity=5.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: EXIST CB Peak Elev=115.02' Inflow=0.70 cfs 0.051 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/' Outflow=0.70 cfs 0.051 af

Pond 3P: EXIST CB Peak Elev=114.61' Inflow=1.22 cfs 0.088 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=1.22 cfs 0.088 af

Pond 4P: Hollow Peak Elev=115.94' Storage=147 cf Inflow=0.37 cfs 0.072 af
Discarded=0.30 cfs 0.072 af Primary=0.00 cfs 0.000 af Outflow=0.30 cfs 0.072 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.160 af Average Runoff Depth = 0.73"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=3.53"
Tc=6.0 min CN=81 Runoff=0.99 cfs 0.072 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=3.53"
Tc=6.0 min CN=81 Runoff=0.72 cfs 0.053 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=0.83"
Flow Length=375' Tc=11.9 min CN=48 Runoff=1.15 cfs 0.152 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.00' Max Vel=0.00 fps Inflow=0.00 cfs 0.000 af
n=0.035 L=20.0' S=0.0025 '/' Capacity=5.09 cfs Outflow=0.00 cfs 0.000 af

Pond 2P: EXIST CB Peak Elev=115.11' Inflow=0.99 cfs 0.072 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/' Outflow=0.99 cfs 0.072 af

Pond 3P: EXIST CB Peak Elev=114.76' Inflow=1.71 cfs 0.125 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=1.71 cfs 0.125 af

Pond 4P: Hollow Peak Elev=116.40' Storage=794 cf Inflow=1.15 cfs 0.152 af
Discarded=0.66 cfs 0.152 af Primary=0.00 cfs 0.000 af Outflow=0.66 cfs 0.152 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.276 af Average Runoff Depth = 1.27"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: SWly site Runoff Area=10,657 sf 55.01% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=81 Runoff=1.26 cfs 0.092 af

Subcatchment 2S: NWly site Runoff Area=7,803 sf 54.59% Impervious Runoff Depth=4.53"
Tc=6.0 min CN=81 Runoff=0.92 cfs 0.068 af

Subcatchment 3S: DA 2 Runoff Area=95,538 sf 2.28% Impervious Runoff Depth=1.34"
Flow Length=375' Tc=11.9 min CN=48 Runoff=2.24 cfs 0.244 af

Reach 5R: Grassed waterway Avg. Flow Depth=0.29' Max Vel=0.71 fps Inflow=1.44 cfs 0.027 af
n=0.035 L=20.0' S=0.0025 '/' Capacity=5.09 cfs Outflow=1.46 cfs 0.027 af

Pond 2P: EXIST CB Peak Elev=115.19' Inflow=1.26 cfs 0.092 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0089 '/' Outflow=1.26 cfs 0.092 af

Pond 3P: EXIST CB Peak Elev=114.89' Inflow=2.18 cfs 0.160 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=2.18 cfs 0.160 af

Pond 4P: Hollow Peak Elev=116.61' Storage=988 cf Inflow=2.24 cfs 0.244 af
Discarded=0.73 cfs 0.218 af Primary=1.44 cfs 0.027 af Outflow=2.17 cfs 0.244 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.404 af Average Runoff Depth = 1.85"
89.21% Pervious = 2.335 ac 10.79% Impervious = 0.282 ac

Summary for Subcatchment 1S: SWly site

Runoff = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Description
*	5,862	98	Paved roads w/curbs & sewers
	4,795	61	Pasture/grassland/range, Good, HSG B
	10,657	81	Weighted Average
	4,795		44.99% Pervious Area
	5,862		55.01% Impervious Area

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

Summary for Subcatchment 2S: NWly site

Runoff = 0.51 cfs @ 12.09 hrs, Volume= 0.037 af, Depth= 2.50"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
4,260	98	Paved roads w/curbs & sewers
3,543	61	Pasture/grassland/range, Good, HSG B
7,803	81	Weighted Average
3,543		45.41% Pervious Area
4,260		54.59% Impervious Area

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

Summary for Subcatchment 3S: DA 2

Runoff = 0.37 cfs @ 12.40 hrs, Volume= 0.072 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
2,178	98	Paved roads w/curbs & sewers
24,523	39	Pasture/grassland/range, Good, HSG A
32,952	61	Pasture/grassland/range, Good, HSG B
21,234	30	Woods, Good, HSG A
14,651	55	Woods, Good, HSG B
95,538	48	Weighted Average
93,360		97.72% Pervious Area
2,178		2.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.3	35	0.0400	0.17		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.95"
1.9	200	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.7	140	0.0025	0.35		**Shallow Concentrated Flow,** Short Grass Pasture Kv= 7.0 fps
11.9	375	Total			

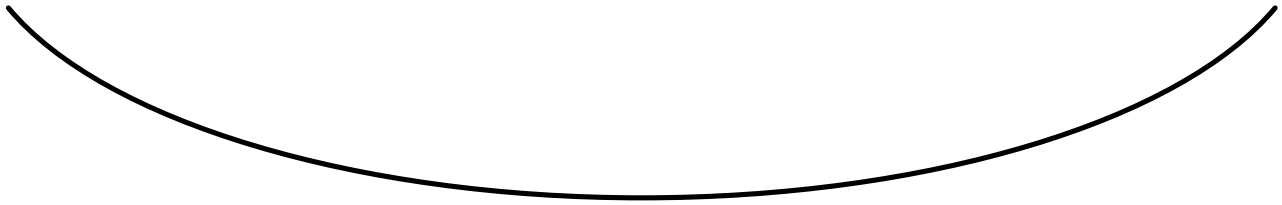
Summary for Reach 5R: Grassed waterway

Inflow Area = 2.193 ac, 2.28% Impervious, Inflow Depth = 0.00" for 10 year event
Inflow = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af
Outflow = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind+Trans method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Max. Velocity= 0.00 fps, Min. Travel Time= 0.0 min
Avg. Velocity = 0.00 fps, Avg. Travel Time= 0.0 min

Peak Storage= 0 cf @ 2.00 hrs
Average Depth at Peak Storage= 0.00'
Bank-Full Depth= 0.50' Flow Area= 5.0 sf, Capacity= 5.09 cfs

15.00' x 0.50' deep Parabolic Channel, n= 0.035 Earth, dense weeds
Length= 20.0' Slope= 0.0025 '/'
Inlet Invert= 116.50', Outlet Invert= 116.45'



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Summary for Pond 2P: EXIST CB

[57] Hint: Peaked at 115.02' (Flood elevation advised)

Inflow Area = 0.245 ac, 55.01% Impervious, Inflow Depth = 2.50" for 10 year event
Inflow = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af
Outflow = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.0 min
Primary = 0.70 cfs @ 12.09 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 115.02' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	114.60'	**12.0" Round Culvert** L= 56.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 114.60' / 114.10' S= 0.0089 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.69 cfs @ 12.09 hrs HW=115.02' (Free Discharge)
1=Culvert (Inlet Controls 0.69 cfs @ 2.20 fps)

Summary for Pond 3P: EXIST CB

[57] Hint: Peaked at 114.61' (Flood elevation advised)
[79] Warning: Submerged Pond 2P Primary device # 1 INLET by 0.01'

Inflow Area = 0.424 ac, 54.83% Impervious, Inflow Depth = 2.50" for 10 year event
Inflow = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af
Outflow = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af, Atten= 0%, Lag= 0.0 min
Primary = 1.22 cfs @ 12.09 hrs, Volume= 0.088 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 114.61' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	114.00'	**12.0" Round Culvert** L= 20.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 114.00' / 113.80' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=1.19 cfs @ 12.09 hrs HW=114.60' (Free Discharge)
1=Culvert (Barrel Controls 1.19 cfs @ 3.45 fps)

Summary for Pond 4P: Hollow

[92] Warning: Device #1 is above defined storage

Inflow Area = 2.193 ac, 2.28% Impervious, Inflow Depth = 0.39" for 10 year event
Inflow = 0.37 cfs @ 12.40 hrs, Volume= 0.072 af
Outflow = 0.30 cfs @ 12.56 hrs, Volume= 0.072 af, Atten= 19%, Lag= 9.7 min
Discarded = 0.30 cfs @ 12.56 hrs, Volume= 0.072 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 115.94' @ 12.56 hrs Surf.Area= 859 sf Storage= 147 cf

Plug-Flow detention time= 3.3 min calculated for 0.072 af (100% of inflow)
Center-of-Mass det. time= 3.3 min (954.8 - 951.5)

Volume	Invert	Avail.Storage	Storage Description
#1	115.60'	988 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

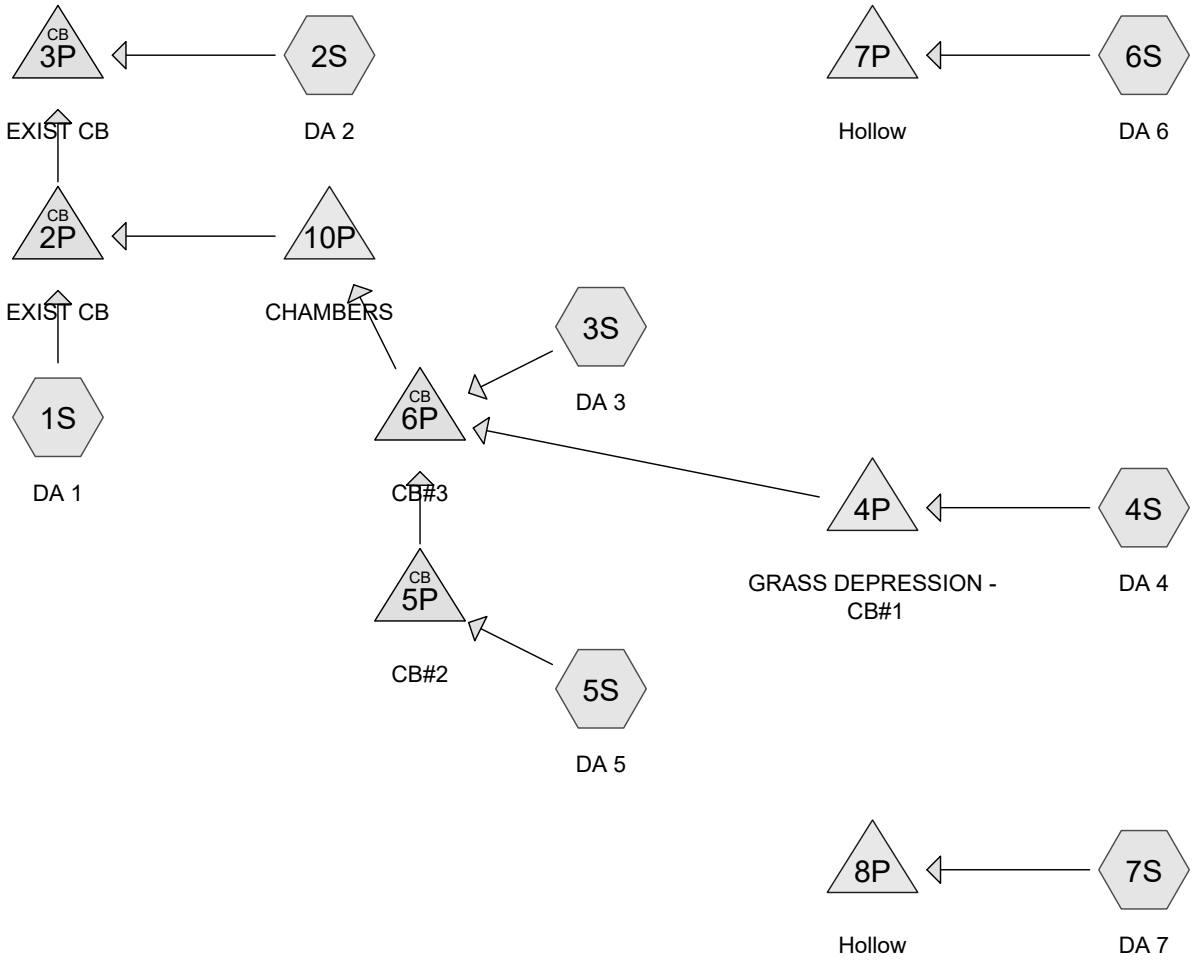
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.60	20	0	0
116.00	1,020	208	208
116.50	2,100	780	988

Device	Routing	Invert	Outlet Devices
#1	Primary	116.50'	**15.0' long x 10.0' breadth grassed waterway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	115.60'	**15.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.30 cfs @ 12.56 hrs HW=115.93' (Free Discharge)
2=Exfiltration (Exfiltration Controls 0.30 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=115.60' (Free Discharge)
1=grassed waterway (Controls 0.00 cfs)

Post-development computations



Subcat Reach Pond Link

Routing Diagram for 05-10-22 THC post
Prepared by RJB Engineering, Printed 5/11/2022
HydroCAD® 10.00-25 s/n 05821 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.399	39	Pasture/grassland/range, Good, HSG A (4S, 6S, 7S)
1.183	61	Pasture/grassland/range, Good, HSG B (1S, 2S, 3S, 4S, 5S, 6S, 7S)
0.030	98	Paved roads w/curbs & sewers (1S, 2S)
0.088	98	Paved roads w/curbs & sewers-exist (3S, 4S, 5S, 7S)
0.414	98	Paved roads w/curbs & sewers-prop (3S, 4S, 5S)
0.115	98	Unconnected roofs (2S, 3S, 5S, 6S, 7S)
0.374	30	Woods, Good, HSG A (4S, 6S, 7S)
0.015	55	Woods, Good, HSG B (6S)
2.617	**62**	**TOTAL AREA**

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: DA 1 Runoff Area=549 sf 71.40% Impervious Runoff Depth=1.70"
Tc=6.0 min CN=87 Runoff=0.02 cfs 0.002 af

Subcatchment 2S: DA 2 Runoff Area=8,054 sf 23.45% Impervious Runoff Depth=0.56"
Tc=6.0 min UI Adjusted CN=67 Runoff=0.09 cfs 0.009 af

Subcatchment 3S: DA 3 Runoff Area=17,685 sf 38.67% Impervious Runoff Depth=0.93"
Tc=6.0 min CN=75 Runoff=0.41 cfs 0.031 af

Subcatchment 4S: DA 4 Runoff Area=33,397 sf 22.99% Impervious Runoff Depth=0.21"
Flow Length=430' Tc=6.2 min CN=56 Runoff=0.06 cfs 0.013 af

Subcatchment 5S: DA 5 Runoff Area=22,857 sf 40.99% Impervious Runoff Depth=0.98"
Tc=6.0 min CN=76 Runoff=0.57 cfs 0.043 af

Subcatchment 6S: DA 6 Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=0.05"
Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.00 cfs 0.002 af

Subcatchment 7S: DA 7 Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=0.04"
Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.00 cfs 0.001 af

Pond 2P: EXIST CB Peak Elev=103.27' Inflow=0.02 cfs 0.002 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=0.02 cfs 0.002 af

Pond 3P: EXIST CB Peak Elev=102.47' Inflow=0.12 cfs 0.010 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.12 cfs 0.010 af

Pond 4P: GRASS DEPRESSION - CB#1 Peak Elev=116.63' Storage=15 cf Inflow=0.06 cfs 0.013 af
Discarded=0.05 cfs 0.013 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.013 af

Pond 5P: CB#2 Peak Elev=113.98' Inflow=0.57 cfs 0.043 af
12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=0.57 cfs 0.043 af

Pond 6P: CB#3 Peak Elev=113.81' Inflow=0.98 cfs 0.074 af
12.0" Round Culvert n=0.010 L=9.0' S=0.0333 '/' Outflow=0.98 cfs 0.074 af

Pond 7P: Hollow Peak Elev=117.50' Storage=0 cf Inflow=0.00 cfs 0.002 af
Outflow=0.00 cfs 0.002 af

Pond 8P: Hollow Peak Elev=115.60' Storage=0 cf Inflow=0.00 cfs 0.001 af
Discarded=0.00 cfs 0.001 af Primary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.001 af

Pond 10P: CHAMBERS Peak Elev=112.72' Storage=353 cf Inflow=0.98 cfs 0.074 af
Discarded=0.43 cfs 0.074 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.074 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.101 af Average Runoff Depth = 0.46"
75.30% Pervious = 1.971 ac 24.70% Impervious = 0.646 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: DA 1 Runoff Area=549 sf 71.40% Impervious Runoff Depth=3.04"
Tc=6.0 min CN=87 Runoff=0.04 cfs 0.003 af

Subcatchment 2S: DA 2 Runoff Area=8,054 sf 23.45% Impervious Runoff Depth=1.42"
Tc=6.0 min UI Adjusted CN=67 Runoff=0.29 cfs 0.022 af

Subcatchment 3S: DA 3 Runoff Area=17,685 sf 38.67% Impervious Runoff Depth=2.00"
Tc=6.0 min CN=75 Runoff=0.93 cfs 0.068 af

Subcatchment 4S: DA 4 Runoff Area=33,397 sf 22.99% Impervious Runoff Depth=0.77"
Flow Length=430' Tc=6.2 min CN=56 Runoff=0.50 cfs 0.049 af

Subcatchment 5S: DA 5 Runoff Area=22,857 sf 40.99% Impervious Runoff Depth=2.08"
Tc=6.0 min CN=76 Runoff=1.25 cfs 0.091 af

Subcatchment 6S: DA 6 Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=0.39"
Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.07 cfs 0.012 af

Subcatchment 7S: DA 7 Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=0.35"
Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.05 cfs 0.010 af

Pond 2P: EXIST CB Peak Elev=103.30' Inflow=0.04 cfs 0.003 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=0.04 cfs 0.003 af

Pond 3P: EXIST CB Peak Elev=102.58' Inflow=0.33 cfs 0.025 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.33 cfs 0.025 af

Pond 4P: GRASS DEPRESSION - CB#1 Peak Elev=117.11' Storage=307 cf Inflow=0.50 cfs 0.049 af
Discarded=0.22 cfs 0.049 af Primary=0.00 cfs 0.000 af Outflow=0.22 cfs 0.049 af

Pond 5P: CB#2 Peak Elev=114.21' Inflow=1.25 cfs 0.091 af
12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=1.25 cfs 0.091 af

Pond 6P: CB#3 Peak Elev=114.13' Inflow=2.18 cfs 0.159 af
12.0" Round Culvert n=0.010 L=9.0' S=0.0333 '/' Outflow=2.18 cfs 0.159 af

Pond 7P: Hollow Peak Elev=117.50' Storage=1 cf Inflow=0.07 cfs 0.012 af
Outflow=0.07 cfs 0.012 af

Pond 8P: Hollow Peak Elev=115.65' Storage=4 cf Inflow=0.05 cfs 0.010 af
Discarded=0.05 cfs 0.010 af Primary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.010 af

Pond 10P: CHAMBERS Peak Elev=113.82' Storage=1,781 cf Inflow=2.18 cfs 0.159 af
Discarded=0.43 cfs 0.159 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.159 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.256 af Average Runoff Depth = 1.17"
75.30% Pervious = 1.971 ac 24.70% Impervious = 0.646 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: DA 1 Runoff Area=549 sf 71.40% Impervious Runoff Depth=4.14"
Tc=6.0 min CN=87 Runoff=0.06 cfs 0.004 af

Subcatchment 2S: DA 2 Runoff Area=8,054 sf 23.45% Impervious Runoff Depth=2.24"
Tc=6.0 min UI Adjusted CN=67 Runoff=0.47 cfs 0.035 af

Subcatchment 3S: DA 3 Runoff Area=17,685 sf 38.67% Impervious Runoff Depth=2.95"
Tc=6.0 min CN=75 Runoff=1.38 cfs 0.100 af

Subcatchment 4S: DA 4 Runoff Area=33,397 sf 22.99% Impervious Runoff Depth=1.37"
Flow Length=430' Tc=6.2 min CN=56 Runoff=1.06 cfs 0.088 af

Subcatchment 5S: DA 5 Runoff Area=22,857 sf 40.99% Impervious Runoff Depth=3.05"
Tc=6.0 min CN=76 Runoff=1.84 cfs 0.133 af

Subcatchment 6S: DA 6 Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=0.83"
Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.23 cfs 0.026 af

Subcatchment 7S: DA 7 Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=0.77"
Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.19 cfs 0.022 af

Pond 2P: EXIST CB Peak Elev=103.32' Inflow=0.06 cfs 0.004 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=0.06 cfs 0.004 af

Pond 3P: EXIST CB Peak Elev=102.67' Inflow=0.53 cfs 0.039 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=0.53 cfs 0.039 af

Pond 4P: GRASS DEPRESSION - CB#1 Peak Elev=117.55' Storage=824 cf Inflow=1.06 cfs 0.088 af
Discarded=0.32 cfs 0.087 af Primary=0.03 cfs 0.000 af Outflow=0.35 cfs 0.088 af

Pond 5P: CB#2 Peak Elev=114.39' Inflow=1.84 cfs 0.133 af
12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=1.84 cfs 0.133 af

Pond 6P: CB#3 Peak Elev=114.52' Inflow=3.22 cfs 0.234 af
12.0" Round Culvert n=0.010 L=9.0' S=0.0333 '/' Outflow=3.22 cfs 0.234 af

Pond 7P: Hollow Peak Elev=117.57' Storage=29 cf Inflow=0.23 cfs 0.026 af
Outflow=0.19 cfs 0.026 af

Pond 8P: Hollow Peak Elev=115.76' Storage=37 cf Inflow=0.19 cfs 0.022 af
Discarded=0.15 cfs 0.022 af Primary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.022 af

Pond 10P: CHAMBERS Peak Elev=114.98' Storage=3,295 cf Inflow=3.22 cfs 0.234 af
Discarded=0.43 cfs 0.234 af Primary=0.00 cfs 0.000 af Outflow=0.43 cfs 0.234 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.408 af Average Runoff Depth = 1.87"
75.30% Pervious = 1.971 ac 24.70% Impervious = 0.646 ac

Time span=2.00-30.00 hrs, dt=0.05 hrs, 561 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: DA 1 Runoff Area=549 sf 71.40% Impervious Runoff Depth=5.19"
Tc=6.0 min CN=87 Runoff=0.07 cfs 0.005 af

Subcatchment 2S: DA 2 Runoff Area=8,054 sf 23.45% Impervious Runoff Depth=3.07"
Tc=6.0 min UI Adjusted CN=67 Runoff=0.65 cfs 0.047 af

Subcatchment 3S: DA 3 Runoff Area=17,685 sf 38.67% Impervious Runoff Depth=3.89"
Tc=6.0 min CN=75 Runoff=1.81 cfs 0.131 af

Subcatchment 4S: DA 4 Runoff Area=33,397 sf 22.99% Impervious Runoff Depth=2.03"
Flow Length=430' Tc=6.2 min CN=56 Runoff=1.66 cfs 0.129 af

Subcatchment 5S: DA 5 Runoff Area=22,857 sf 40.99% Impervious Runoff Depth=3.99"
Tc=6.0 min CN=76 Runoff=2.40 cfs 0.175 af

Subcatchment 6S: DA 6 Runoff Area=16,207 sf 7.10% Impervious Runoff Depth=1.34"
Flow Length=300' Tc=6.6 min UI Adjusted CN=48 Runoff=0.45 cfs 0.041 af

Subcatchment 7S: DA 7 Runoff Area=15,249 sf 5.50% Impervious Runoff Depth=1.26"
Flow Length=200' Tc=6.6 min UI Adjusted CN=47 Runoff=0.39 cfs 0.037 af

Pond 2P: EXIST CB Peak Elev=103.79' Inflow=1.26 cfs 0.045 af
12.0" Round Culvert n=0.010 L=56.0' S=0.0107 '/' Outflow=1.26 cfs 0.045 af

Pond 3P: EXIST CB Peak Elev=103.00' Inflow=1.52 cfs 0.092 af
12.0" Round Culvert n=0.010 L=20.0' S=0.0100 '/' Outflow=1.52 cfs 0.092 af

Pond 4P: GRASS DEPRESSION - CB#1 Peak Elev=117.91' Storage=1,394 cf Inflow=1.66 cfs 0.129 af
Discarded=0.40 cfs 0.122 af Primary=0.09 cfs 0.007 af Outflow=0.49 cfs 0.129 af

Pond 5P: CB#2 Peak Elev=114.55' Inflow=2.40 cfs 0.175 af
12.0" Round Culvert n=0.010 L=16.0' S=0.0125 '/' Outflow=2.40 cfs 0.175 af

Pond 6P: CB#3 Peak Elev=115.04' Inflow=4.21 cfs 0.313 af
12.0" Round Culvert n=0.010 L=9.0' S=0.0333 '/' Outflow=4.21 cfs 0.313 af

Pond 7P: Hollow Peak Elev=117.68' Storage=107 cf Inflow=0.45 cfs 0.041 af
Outflow=0.31 cfs 0.041 af

Pond 8P: Hollow Peak Elev=115.89' Storage=112 cf Inflow=0.39 cfs 0.037 af
Discarded=0.26 cfs 0.037 af Primary=0.00 cfs 0.000 af Outflow=0.26 cfs 0.037 af

Pond 10P: CHAMBERS Peak Elev=115.58' Storage=3,836 cf Inflow=4.21 cfs 0.313 af
Discarded=0.43 cfs 0.274 af Primary=1.24 cfs 0.039 af Outflow=1.67 cfs 0.313 af

Total Runoff Area = 2.617 ac Runoff Volume = 0.566 af Average Runoff Depth = 2.60"
75.30% Pervious = 1.971 ac 24.70% Impervious = 0.646 ac

Summary for Subcatchment 1S: DA 1

Runoff = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Depth= 3.04"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

Area (sf)	CN	Description
392	98	Paved roads w/curbs & sewers
157	61	Pasture/grassland/range, Good, HSG B
549	87	Weighted Average
157		28.60% Pervious Area
392		71.40% Impervious Area

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

Summary for Subcatchment 2S: DA 2

Runoff = 0.29 cfs @ 12.10 hrs, Volume= 0.022 af, Depth= 1.42"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Adj	Description
	902	98		Paved roads w/curbs & sewers
*	987	98		Unconnected roofs
	6,165	61		Pasture/grassland/range, Good, HSG B
	8,054	70	67	Weighted Average, UI Adjusted
	6,165			76.55% Pervious Area
	1,889			23.45% Impervious Area
	987			52.25% Unconnected

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

Summary for Subcatchment 3S: DA 3

Runoff = 0.93 cfs @ 12.10 hrs, Volume= 0.068 af, Depth= 2.00"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Description
*	260	98	Paved roads w/curbs & sewers-exist
*	6,170	98	Paved roads w/curbs & sewers-prop
*	408	98	Unconnected roofs
	10,847	61	Pasture/grassland/range, Good, HSG B
	17,685	75	Weighted Average
	10,847		61.33% Pervious Area
	6,838		38.67% Impervious Area
	408		5.97% Unconnected

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

Summary for Subcatchment 4S: DA 4

Runoff = 0.50 cfs @ 12.12 hrs, Volume= 0.049 af, Depth= 0.77"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Description
*	1,569	98	Paved roads w/curbs & sewers-exist
*	6,110	98	Paved roads w/curbs & sewers-prop
	6,975	39	Pasture/grassland/range, Good, HSG A
	9,528	61	Pasture/grassland/range, Good, HSG B
	9,215	30	Woods, Good, HSG A
	33,397	56	Weighted Average
	25,718		77.01% Pervious Area
	7,679		22.99% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	25	0.0400	0.16		**Sheet Flow,** Grass: Short n= 0.150 P2= 2.95"
1.6	165	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
2.0	240	0.0100	2.03		**Shallow Concentrated Flow,** Paved Kv= 20.3 fps
6.2	430	Total			

Summary for Subcatchment 5S: DA 5

Runoff = 1.25 cfs @ 12.09 hrs, Volume= 0.091 af, Depth= 2.08"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Description
*	1,500	98	Paved roads w/curbs & sewers-exist
*	5,739	98	Paved roads w/curbs & sewers-prop
*	2,130	98	Unconnected roofs
	13,488	61	Pasture/grassland/range, Good, HSG B
	22,857	76	Weighted Average
	13,488		59.01% Pervious Area
	9,369		40.99% Impervious Area
	2,130		22.73% Unconnected

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

Summary for Subcatchment 6S: DA 6

Runoff = 0.07 cfs @ 12.31 hrs, Volume= 0.012 af, Depth= 0.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Adj	Description
*	1,150	98		Unconnected roofs
	4,430	39		Pasture/grassland/range, Good, HSG A
	6,232	61		Pasture/grassland/range, Good, HSG B
	3,754	30		Woods, Good, HSG A
	641	55		Woods, Good, HSG B
	16,207	50	48	Weighted Average, UI Adjusted
	15,057			92.90% Pervious Area
	1,150			7.10% Impervious Area
	1,150			100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
3.4	25	0.0500	0.12		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.95"
3.2	275	0.0800	1.41		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.6	300	Total			

Summary for Subcatchment 7S: DA 7

Runoff = 0.05 cfs @ 12.34 hrs, Volume= 0.010 af, Depth= 0.35"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Type III 24-hr 10 year Rainfall=4.44"

	Area (sf)	CN	Adj	Description
*	489	98		Paved roads w/curbs & sewers-exist
*	350	98		Unconnected roofs
	5,992	39		Pasture/grassland/range, Good, HSG A
	5,102	61		Pasture/grassland/range, Good, HSG B
	3,316	30		Woods, Good, HSG A
	15,249	48	47	Weighted Average, UI Adjusted
	14,410			94.50% Pervious Area
	839			5.50% Impervious Area
	350			41.72% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.9	25	0.0200	0.08		**Sheet Flow,** Grass: Dense n= 0.240 P2= 2.95"
1.7	175	0.1200	1.73		**Shallow Concentrated Flow,** Woodland Kv= 5.0 fps
6.6	200	Total			

Summary for Pond 2P: EXIST CB

[57] Hint: Peaked at 103.30' (Flood elevation advised)

Inflow Area = 1.710 ac, 32.59% Impervious, Inflow Depth = 0.02" for 10 year event
Inflow = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af
Outflow = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af, Atten= 0%, Lag= 0.0 min
Primary = 0.04 cfs @ 12.09 hrs, Volume= 0.003 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 103.30' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	103.20'	**12.0" Round Culvert** L= 56.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 103.20' / 102.60' S= 0.0107 '/' Cc= 0.900 n= 0.010 Concrete pipe, straight & clean, Flow Area= 0.79 sf

Primary OutFlow Max=0.04 cfs @ 12.09 hrs HW=103.30' (Free Discharge)
1=Culvert (Inlet Controls 0.04 cfs @ 1.07 fps)

Summary for Pond 3P: EXIST CB

[57] Hint: Peaked at 102.58' (Flood elevation advised)

Inflow Area = 1.895 ac, 31.70% Impervious, Inflow Depth = 0.16" for 10 year event
Inflow = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af
Outflow = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af, Atten= 0%, Lag= 0.0 min
Primary = 0.33 cfs @ 12.10 hrs, Volume= 0.025 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs

Peak Elev= 102.58' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	102.30'	**12.0" Round Culvert** L= 20.0' RCP, sq.cut end projecting, Ke= 0.500 Inlet / Outlet Invert= 102.30' / 102.10' S= 0.0100 '/' Cc= 0.900 n= 0.010, Flow Area= 0.79 sf

Primary OutFlow Max=0.33 cfs @ 12.10 hrs HW=102.58' (Free Discharge)
↑**1=Culvert** (Barrel Controls 0.33 cfs @ 2.69 fps)

Summary for Pond 4P: GRASS DEPRESSION - CB#1

[92] Warning: Device #3 is above defined storage

Inflow Area = 0.767 ac, 22.99% Impervious, Inflow Depth = 0.77" for 10 year event
Inflow = 0.50 cfs @ 12.12 hrs, Volume= 0.049 af
Outflow = 0.22 cfs @ 12.48 hrs, Volume= 0.049 af, Atten= 57%, Lag= 21.6 min
Discarded = 0.22 cfs @ 12.48 hrs, Volume= 0.049 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 117.11' @ 12.48 hrs Surf.Area= 943 sf Storage= 307 cf

Plug-Flow detention time= 10.2 min calculated for 0.049 af (100% of inflow)
Center-of-Mass det. time= 10.2 min (910.9 - 900.7)

Volume	Invert	Avail.Storage	Storage Description
#1	116.50'	1,547 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
116.50	10	0	0
117.00	830	210	210
117.70	1,550	833	1,043
118.00	1,810	504	1,547

Device	Routing	Invert	Outlet Devices
#1	Primary	117.50'	**2.0" x 2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Discarded	116.50'	**10.000 in/hr Exfiltration over Surface area**
#3	Primary	118.00'	**40.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Discarded OutFlow Max=0.22 cfs @ 12.48 hrs HW=117.11' (Free Discharge)
└**2=Exfiltration** (Exfiltration Controls 0.22 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=116.50' (Free Discharge)
├**1=Orifice/Grate** (Controls 0.00 cfs)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Summary for Pond 5P: CB#2

[57] Hint: Peaked at 114.21' (Flood elevation advised)

Inflow Area = 0.525 ac, 40.99% Impervious, Inflow Depth = 2.08" for 10 year event
Inflow = 1.25 cfs @ 12.09 hrs, Volume= 0.091 af
Outflow = 1.25 cfs @ 12.09 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.0 min
Primary = 1.25 cfs @ 12.09 hrs, Volume= 0.091 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 114.21' @ 12.09 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	113.60'	**12.0" Round Culvert** L= 16.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.60' / 113.40' S= 0.0125 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=1.23 cfs @ 12.09 hrs HW=114.21' (Free Discharge)
└**1=Culvert** (Barrel Controls 1.23 cfs @ 3.53 fps)

Summary for Pond 6P: CB#3

[57] Hint: Peaked at 114.13' (Flood elevation advised)
[79] Warning: Submerged Pond 5P Primary device # 1 INLET by 0.53'

Inflow Area = 1.697 ac, 32.31% Impervious, Inflow Depth = 1.12" for 10 year event
Inflow = 2.18 cfs @ 12.10 hrs, Volume= 0.159 af
Outflow = 2.18 cfs @ 12.10 hrs, Volume= 0.159 af, Atten= 0%, Lag= 0.0 min
Primary = 2.18 cfs @ 12.10 hrs, Volume= 0.159 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 114.13' @ 12.10 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	113.30'	**12.0" Round Culvert** L= 9.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 113.30' / 113.00' S= 0.0333 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Primary OutFlow Max=2.15 cfs @ 12.10 hrs HW=114.13' (Free Discharge)
└**1=Culvert** (Inlet Controls 2.15 cfs @ 3.10 fps)

Summary for Pond 7P: Hollow

Inflow Area = 0.372 ac, 7.10% Impervious, Inflow Depth = 0.39" for 10 year event
Inflow = 0.07 cfs @ 12.31 hrs, Volume= 0.012 af
Outflow = 0.07 cfs @ 12.32 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.2 min
Discarded = 0.07 cfs @ 12.32 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 117.50' @ 12.32 hrs Surf.Area= 310 sf Storage= 1 cf

Plug-Flow detention time= 0.2 min calculated for 0.012 af (100% of inflow)
Center-of-Mass det. time= 0.2 min (946.8 - 946.6)

Volume	Invert	Avail.Storage	Storage Description
#1	117.50'	575 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
117.50	300	0	0
118.00	2,000	575	575

Device	Routing	Invert	Outlet Devices
#1	Discarded	117.50'	**15.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.11 cfs @ 12.32 hrs HW=117.50' (Free Discharge)
↑**1=Exfiltration** (Exfiltration Controls 0.11 cfs)

Summary for Pond 8P: Hollow

[92] Warning: Device #1 is above defined storage

Inflow Area = 0.350 ac, 5.50% Impervious, Inflow Depth = 0.35" for 10 year event
Inflow = 0.05 cfs @ 12.34 hrs, Volume= 0.010 af
Outflow = 0.05 cfs @ 12.38 hrs, Volume= 0.010 af, Atten= 2%, Lag= 2.6 min
Discarded = 0.05 cfs @ 12.38 hrs, Volume= 0.010 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs
Peak Elev= 115.65' @ 12.38 hrs Surf.Area= 146 sf Storage= 4 cf

Plug-Flow detention time= 0.5 min calculated for 0.010 af (100% of inflow)
Center-of-Mass det. time= 0.5 min (955.0 - 954.5)

Volume	Invert	Avail.Storage	Storage Description
#1	115.60'	988 cf	**Custom Stage Data (Prismatic)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
115.60	20	0	0
116.00	1,020	208	208
116.50	2,100	780	988

Device	Routing	Invert	Outlet Devices
#1	Primary	116.50'	**15.0' long x 10.0' breadth grassed waterway** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64
#2	Discarded	115.60'	**15.000 in/hr Exfiltration over Surface area**

Discarded OutFlow Max=0.05 cfs @ 12.38 hrs HW=115.65' (Free Discharge)
↑—**2=Exfiltration** (Exfiltration Controls 0.05 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=115.60' (Free Discharge)
↑—**1=grassed waterway** (Controls 0.00 cfs)

Summary for Pond 10P: CHAMBERS

[81] Warning: Exceeded Pond 6P by 0.22' @ 12.65 hrs

Inflow Area = 1.697 ac, 32.31% Impervious, Inflow Depth = 1.12" for 10 year event
Inflow = 2.18 cfs @ 12.10 hrs, Volume= 0.159 af
Outflow = 0.43 cfs @ 11.80 hrs, Volume= 0.159 af, Atten= 80%, Lag= 0.0 min
Discarded = 0.43 cfs @ 11.80 hrs, Volume= 0.159 af
Primary = 0.00 cfs @ 2.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 2.00-30.00 hrs, dt= 0.05 hrs / 2
Peak Elev= 113.82' @ 12.56 hrs Surf.Area= 1,858 sf Storage= 1,781 cf

Plug-Flow detention time= (not calculated: outflow precedes inflow)
Center-of-Mass det. time= 25.6 min (864.7 - 839.2)

Volume	Invert	Avail.Storage	Storage Description
#1A	112.25'	1,880 cf	**34.75'W x 53.46'L x 3.75'H Field A** 6,966 cf Overall - 2,266 cf Embedded = 4,700 cf x 40.0% Voids
#2A	113.00'	2,266 cf	**ADS_StormTech DC-780 +Cap** x 49 Inside #1 Effective Size= 45.4"W x 30.0"H => 6.49 sf x 7.12'L = 46.2 cf Overall Size= 51.0"W x 30.0"H x 7.56'L with 0.44' Overlap 49 Chambers in 7 Rows
		4,146 cf	Total Available Storage

Storage Group A created with Chamber Wizard

Device	Routing	Invert	Outlet Devices
#1	Discarded	112.25'	**10.000 in/hr Exfiltration over Surface area**
#2	Primary	115.00'	**12.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 115.00' / 114.40' S= 0.0200 '/' Cc= 0.900 n= 0.010 PVC, smooth interior, Flow Area= 0.79 sf

Discarded OutFlow Max=0.43 cfs @ 11.80 hrs HW=112.29' (Free Discharge)
↑—**1=Exfiltration** (Exfiltration Controls 0.43 cfs)

Primary OutFlow Max=0.00 cfs @ 2.00 hrs HW=112.25' (Free Discharge)
↑—**2=Culvert** (Controls 0.00 cfs)

NRCS Web Soils Map

Soil Map—Hillsborough County, New Hampshire, Eastern Part
(THC)

Map Scale: 1:3,000 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 40 80 160 240

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 19N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Hillsborough County, New Hampshire, Eastern Part
Survey Area Data: Version 24, Aug 31, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 19, 2020—Aug 6, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Om	Occum fine sandy loam, high bottom	1.1	59.9%
WnC	Windsor-Urban land complex, 3 to 15 percent slopes	0.7	40.1%
Totals for Area of Interest		**1.8**	**100.0%**

Extreme Precipitation Tables

Extreme Precipitation Tables

Northeast Regional Climate Center

Data represents point estimates calculated from partial duration series. All precipitation amounts are displayed in inches.

Smoothing	Yes
State	New Hampshire
Location	
Longitude	71.442 degrees West
Latitude	42.767 degrees North
Elevation	0 feet
Date/Time	Thu, 31 Mar 2022 09:48:23 -0400

Extreme Precipitation Estimates

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.27	0.42	0.52	0.68	0.85	1.07	**1yr**	0.74	1.01	1.24	1.56	1.96	2.48	2.72	**1yr**	2.19	2.61	3.04	3.73	4.34	**1yr**
2yr	0.33	0.51	0.64	0.84	1.05	1.32	**2yr**	0.91	1.21	1.53	1.91	2.37	2.95	3.28	**2yr**	2.61	3.15	3.66	4.38	4.98	**2yr**
5yr	0.39	0.61	0.77	1.03	1.32	1.67	**5yr**	1.14	1.52	1.93	2.41	3.00	3.72	4.17	**5yr**	3.29	4.01	4.64	5.50	6.22	**5yr**
10yr	0.44	0.70	0.88	1.20	1.56	1.99	**10yr**	1.34	1.80	2.31	2.90	3.60	4.44	5.00	**10yr**	3.93	4.81	5.55	6.54	7.36	**10yr**
25yr	0.53	0.83	1.06	1.46	1.94	2.51	**25yr**	1.68	2.25	2.92	3.67	4.56	5.61	6.37	**25yr**	4.97	6.12	7.05	8.22	9.20	**25yr**
50yr	0.59	0.95	1.21	1.70	2.30	3.00	**50yr**	1.99	2.66	3.51	4.41	5.47	6.70	7.65	**50yr**	5.93	7.35	8.45	9.77	10.90	**50yr**
100yr	0.68	1.10	1.42	2.01	2.73	3.58	**100yr**	2.36	3.16	4.20	5.28	6.54	8.01	9.19	**100yr**	7.09	8.84	10.12	11.63	12.92	**100yr**
200yr	0.77	1.26	1.63	2.35	3.24	4.28	**200yr**	2.80	3.75	5.03	6.33	7.83	9.57	11.05	**200yr**	8.47	10.62	12.14	13.83	15.31	**200yr**
500yr	0.93	1.53	2.00	2.90	4.07	5.41	**500yr**	3.51	4.70	6.38	8.04	9.94	12.12	14.10	**500yr**	10.73	13.56	15.44	17.42	19.18	**500yr**

Lower Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.22	0.35	0.42	0.57	0.70	0.80	**1yr**	0.60	0.78	1.06	1.32	1.67	2.28	2.56	**1yr**	2.02	2.46	2.71	3.01	3.68	**1yr**
2yr	0.32	0.49	0.60	0.81	1.00	1.20	**2yr**	0.86	1.17	1.37	1.79	2.30	2.89	3.21	**2yr**	2.56	3.08	3.57	4.28	4.88	**2yr**
5yr	0.36	0.55	0.69	0.94	1.20	1.42	**5yr**	1.04	1.39	1.63	2.11	2.69	3.49	3.89	**5yr**	3.09	3.74	4.28	5.14	5.82	**5yr**
10yr	0.39	0.61	0.75	1.05	1.36	1.60	**10yr**	1.17	1.57	1.82	2.39	3.04	4.03	4.51	**10yr**	3.57	4.34	4.91	5.89	6.65	**10yr**
25yr	0.45	0.68	0.85	1.21	1.59	1.87	**25yr**	1.38	1.83	2.13	2.81	3.54	4.88	5.51	**25yr**	4.32	5.30	5.89	7.05	7.91	**25yr**
50yr	0.49	0.74	0.92	1.33	1.79	2.13	**50yr**	1.54	2.08	2.41	3.20	3.99	5.65	6.42	**50yr**	5.00	6.17	6.78	8.08	9.03	**50yr**
100yr	0.53	0.81	1.01	1.46	2.00	2.40	**100yr**	1.72	2.35	2.72	3.48	4.49	6.53	7.52	**100yr**	5.78	7.23	7.82	9.28	10.27	**100yr**
200yr	0.59	0.88	1.12	1.62	2.25	2.72	**200yr**	1.94	2.66	3.06	3.94	5.09	7.57	8.82	**200yr**	6.70	8.48	9.01	10.65	11.71	**200yr**
500yr	0.66	0.99	1.27	1.84	2.62	3.22	**500yr**	2.26	3.15	3.60	4.64	6.03	9.23	10.94	**500yr**	8.17	10.52	10.85	12.78	13.93	**500yr**

Upper Confidence Limits

	5min	10min	15min	30min	60min	120min		1hr	2hr	3hr	6hr	12hr	24hr	48hr		1day	2day	4day	7day	10day	
1yr	0.31	0.48	0.58	0.78	0.96	1.13	**1yr**	0.83	1.10	1.27	1.66	2.10	2.62	2.88	**1yr**	2.32	2.77	3.45	4.24	4.77	**1yr**
2yr	0.35	0.54	0.67	0.91	1.12	1.31	**2yr**	0.97	1.28	1.49	1.93	2.47	3.04	3.39	**2yr**	2.69	3.26	3.77	4.49	5.13	**2yr**
5yr	0.44	0.67	0.83	1.14	1.46	1.67	**5yr**	1.26	1.63	1.89	2.43	3.05	4.01	4.52	**5yr**	3.55	4.35	5.00	5.90	6.63	**5yr**
10yr	0.52	0.81	1.00	1.40	1.80	2.04	**10yr**	1.56	2.00	2.31	2.90	3.62	4.97	5.62	**10yr**	4.40	5.41	6.20	7.26	8.09	**10yr**
25yr	0.68	1.03	1.28	1.83	2.40	2.65	**25yr**	2.07	2.59	2.99	3.68	4.51	6.58	7.51	**25yr**	5.83	7.22	8.26	9.54	10.55	**25yr**
50yr	0.82	1.24	1.55	2.23	3.00	3.23	**50yr**	2.59	3.16	3.63	4.40	5.33	8.16	9.34	**50yr**	7.22	8.98	10.25	11.74	12.89	**50yr**
100yr	1.00	1.51	1.89	2.73	3.74	3.95	**100yr**	3.23	3.86	4.42	5.46	6.31	10.13	11.60	**100yr**	8.97	11.16	12.74	14.47	15.79	**100yr**
200yr	1.21	1.82	2.31	3.34	4.66	4.82	**200yr**	4.02	4.71	5.37	6.57	7.48	12.55	14.41	**200yr**	11.10	13.85	15.83	17.83	19.34	**200yr**
500yr	1.58	2.35	3.02	4.39	6.25	6.25	**500yr**	5.39	6.11	6.97	8.39	9.35	16.65	19.14	**500yr**	14.74	18.41	21.10	23.50	25.31	**500yr**

Powered by ACIS
Northeast Regional Climate Center

Infiltration Feasibility Report

March 30, 2022

Infiltration Feasibility Report

Proposed 6 lot residential subdivision
Tumpney, Hurd, Clegg, LLC
Tax map 174, lot 15-1 & Map 181, Lot 1
Hudson, NH

The following provides test pit and infiltration information for the above-referenced project:

Infiltration Basin Data:

The bottom surface area of the pond as designed is 824 sq. ft.
Elevation of existing ground at test pit: approx. 117.5'
Elevation of existing ground at basin: 117.5' to 118'
Design elevation of the pond bottom: 113.0'
Elevation of SHWT: none found to bottom of pit elev. 112'
Elevation of bedrock: none found to bottom of pit elev. 110'

Test Pit #3

0"-12"	Dark Brown (10yr 3#2) Loam (Topsoil), Friable
12"-28"	Yellowish Brown (10yr 5#6) Fine Sandy Loam, Very Friable, Single Grain Structure
28"-64"	Yellowish Brown (10yr 5#4) Fine Loamy Sand, Friable, Single Grain Structure
64"-100"	Very Pale Brown (10yr 7#4) Fine Sand, Loose, Single Grain Structure, Mottling At 72" (Shwt)

ESHWT: 72"
Water: None Observed
Ledge: None Observed
Terminated At 100"'
Percolation Rate: <2 Min/Inch @ 30"

Site Specific soil type:

Om: Occum fine sandy loam
Well drained
Hydrologic Soil Group: B

Infiltration rate:

Based on the NRCS Web Soil Survey data the Ksat rates in both the C horizon is estimated between 6.0 to 20.0 inches per hour. The field percolation test estimates the percolation rate at less than 2 min/inch (30 in/hr) exceeding the high value in the tables. For design purposes, the higher rate of 20 in/hr from the table was used, and a safety factor of 2 applied, to provide a design value of 10 in/hr. This value is thought to be a conservative estimate based on the actual field measurement.

Soil Series	legend number	Ksat low - B in/hr	Ksat high - B in/hr	Ksat low - C in/hr	Ksat high - C in/hr	Hyd. Grp.	Group	Land Form	Temp.	Soil Textures	Spodosol ?	Other
Mundal	610	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	gravelly sandy loam in Cd
Natchaug	496			0.20	2.0	D	6	Organic Materials - Freshwater	mesic	loamy	no	organic over loam
Naumburg	214	6.0	20.0	6.00	20.0	C	5	Outwash and Stream Terraces	frigid	sandy	yes	
Newfields	444	0.6	2.0	0.60	2.0	B	3	Loose till, sandy textures	mesic	loamy over sandy	no	sandy or sandy-skeletal
Nicholville	632	0.6	2.0	0.60	2.0	C	3	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Ninigret	513	0.6	6.0	6.00	20.0	B	3	Outwash and Stream Terraces	mesic	loamy over sandy	no	sandy or sandy-skeletal
Occum	1	0.6	2.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	mesic	loamy	no	loamy over loamy sand
Ondawa	101	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	loamy over loamy sand
Ondawa	201	0.6	6.0	6.00	20.0	B	2	Flood Plain (Bottom Land)	frigid	loamy	no	occ flood, loamy over l. sand
Ossipee	495			0.20	2.0	D	6	Organic Materials - Freshwater	frigid	loamy	no	organic over loam
Pawcatuck	497			20.00	100.0	D	6	Tidal Flat	mesic	sandy or sandy-skeletal	no	organic over sand
Paxton	66	0.6	2.0	0.00	0.2	C	3	Firm, platy, loamy till	mesic	loamy	no	
Peacham	549	0.6	2.0	0.00	0.2	D	6	Firm, platy, silty till, schist & phylitte	frigid	loamy	no	organic over loam
Pemi	633	0.6	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	
Pennichuck	460	0.6	2.0	0.60	2.0	B	4	Friable till, silty, schist & phyllite	mesic	loamy-skeletal	no	20 to 40 in. deep
Peru	78	0.6	2.0	0.06	0.6	C	3	Firm, platy, loamy till	frigid	loamy	yes	
Pillsbury	646	0.6	2.0	0.06	0.2	C	5	Firm, platy, loamy till	frigid	silty	no	
Pipestone	314					B	5	Outwash and Stream Terraces	mesic	sandy	yes	
Pittstown	334	0.6	2.0	0.06	0.2	C	3	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	channery silt loam in Cd
Plaisted	563	0.6	2.0	0.06	0.6	C	3	Firm, platy, silty till, schist & phyllite	frigid	loamy	yes	channery silt loam in Cd
Podunk	104	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	frigid	loamy	no	loamy to coarse sand in C
Pondicherry	992			6.00	20.0	D	6	Organic Materials - Freshwater	frigid	sandy or sandy-skeletal	no	organic over sand
Poocham	230	0.6	2.0	0.20	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	silt loam in C
Pootatuck	4	0.6	6.0	6.00	20.0	B	3	Flood Plain (Bottom Land)	mesic	loamy	no	single grain in C
Quonset	310	2.0	20.0	20.00	100.0	A	1	Outwash and Stream Terraces	mesic	sandy-skeletal	no	shale
Rawsonville	98	0.6	6.0	0.60	6.0	C	4	Loose till, bedrock	frigid	loamy	yes	20 to 40 in. deep
Raynham	533	0.2	2.0	0.06	0.2	C	5	Terraces and glacial lake plains	mesic	silty	no	
Raypol	540	0.6	2.0	6.00	100.0	D	5	Outwash and Stream Terraces	mesic	co. loamy over sandy (skeletal)	no	
Redstone	665	2.0	6.0	6.00	20.0	A	1	Weathered Bedrock Till	frigid	fragmental	yes	loamy cap
Ricker	674	2.0	6.0	2.00	6.0	A	4	rganic over bedrock (up to 4" of minera	cryic	fibric to hemic	no	well drained, less than 20 in. deep
Ridgebury	656	0.6	6.0	0.00	0.2	C	5	Firm, platy, loamy till	mesic	loamy	no	
Rippowam	5	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	mesic	loamy	no	
Roundabout	333	0.2	2.0	0.06	0.6	C	5	Terraces and glacial lake plains	frigid	silty	no	silt loam in the C
Rumney	105	0.6	6.0	6.00	20.0	C	5	Flood Plain (Bottom Land)	frigid	loamy	no	
Saco	6	0.6	2.0	6.00	20.0	D	6	Flood Plain (Bottom Land)	mesic	silty	no	strata
Saddleback	673	0.6	2.0	0.60	2.0	C/D	4	Loose till, bedrock	cryic	loamy	yes	less than 20 in. deep
Salmon	630	0.6	2.0	0.60	2.0	B	2	Terraces and glacial lake plains	frigid	silty	yes	very fine sandy loam
Saugatuck	16	0.06	0.2	6.00	20.0	C	5	Outwash and Stream Terraces	mesic	sandy	yes	ortstein
Scantic	233	0.0	0.2	0.00	0.2	D	5	Silt and Clay Deposits	frigid	fine	no	
Scarboro	115	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	mesic	sandy	no	organic over sand, non stony
Scio	531	0.6	2.0	0.60	2.0	B	3	Terraces and glacial lake plains	mesic	silty	no	gravelly sand in 2C
Scitico	33	0.0	0.2	0.00	0.2	C	5	Silt and Clay Deposits	mesic	fine	no	
Scituate	448	0.6	2.0	0.06	0.2	C	3	Firm, platy, sandy till	mesic	loamy	no	loamy sand in Cd
Searsport	15	6.0	20.0	6.00	20.0	D	6	Outwash and Stream Terraces	frigid	sandy	no	organic over sand
Shaker	439	2.0	6.0	0.00	0.2	C	5	Sandy/loamy over silt/clay	mesic	co. loamy over clayey	no	
Shapleigh	136					C/D	4	Sandy Till	mesic	sandy	yes	less than 20 in. deep
Sheepscot	14	6.0	20.0	6.00	20.0	B	3	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	gravelly coarse sand
Sisk	667	0.6	2.0	0.00	0.6	C	3	Firm, platy, loamy till	cryic	loamy	yes	sandy loam in Cd
Skerry	558	0.6	2.0	0.06	0.6	C	3	Firm, platy, sandy till	frigid	loamy	yes	loamy sand in Cd
Squamscott	538	6.0	20.0	0.06	0.6	C	5	Sandy/loamy over silt/clay	mesic	sandy over loamy	yes	
Stetson	523	0.6	6.0	6.00	20.0	B	2	Outwash and Stream Terraces	frigid	sandy-skeletal	yes	loamy over gravelly
Stissing	340	0.6	2.0	0.06	0.2	C	5	Firm, platy, silty till, schist & phyllite	mesic	loamy	no	
Success	154	2.0	6.0	6.00	20.0	A	1	Sandy Till	frigid	sandy-skeletal	yes	cemented
Sudbury	118	2.0	6.0	2.00	20.0	B	3	Outwash and Stream Terraces	mesic	sandy	no	loam over gravelly sand

Groundwater Recharge Volume

GROUNDWATER RECHARGE VOLULME (GRV) CALCULATION (Env-Wq 1507.04)

0.41	ac	Area of HSG A soil that was replaced by impervious cover	0.40"
	ac	Area of HSG B soil that was replaced by impervious cover	0.25"
	ac	Area of HSG C soil that was replaced by impervious cover	0.10"
	ac	Area of HSG D soil or impervious cover that was replaced by impervious cover	0.0"
0.40	inches	Rd = Weighted groundwater recharge depth	
0.164	ac-in	GRV = AI * Rd	
595	cf	GRV conversion (ac-in x 43,560 sf/ac x 1ft/12”)	

Provide calculations below showing that the project meets the groundwater recharge requirements (Env-Wq 1507.04):

volume of the chamber system below elevation 115.0 = 3318 cf

Stormwater Maintenance Manual

Stormwater Maintenance Manual

FOR

Subdivision of
Tax Map 174, Lot 15-1 & Map 181, Lot 1
20 Baker St. & 25 Webster St.
Hudson, NH

May 2022

Prepared by:

RJB Engineering, LLC
2 Glendale Road
Concord, NH 03301

Compliance with Stormwater Facility Maintenance Requirements

The property owner, Tumpney, Hurd, Clegg, LLC, is the party initially responsible for ensuring that stormwater facilities installed on the properties are properly maintained and that they function as designed. In the future, this maintenance responsibility will be assigned to the Town of Hudson since this road and the associated drainage system will be turned over to the Town and will thereafter be a publicly maintained road.

Long term inspection, maintenance, and repair are key elements in maintaining a successful stormwater management program on the developed property. Routine inspections will ensure permit compliance; will reduce the potential for deterioration of infrastructure and the high cost to repair/replace, and will reduced the degradation of water quality. See the attached inspection report form.

Maintaining Stormwater Management Facilities

Stormwater management facilities must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed. Routine maintenance performed on a frequently scheduled basis, can help avoid more costly rehabilitative maintenance that results when facilities are not adequately maintained. Maintenance personnel must be qualified to properly maintain stormwater management facilities. Inadequately trained personnel can cause additional problems resulting in additional maintenance costs.

<u>The following provides a list of recommendations and guidelines for managing the stormwater facilities.</u>

MANICURED LANDSCAPED AREAS - FERTILIZER MANAGEMENT

Note- This is more applicable to the individual house lots that the road provides access to and frontage on. This section is included for future reference as may be warranted.

Function – Fertilizer management involves controlling the rate, timing and method of fertilizer application so that the nutrients are taken up by the plants thereby reducing the chance of polluting the surface and ground waters. Fertilizer management can be effective in reducing the amounts of phosphorus and nitrogen in runoff from landscaped areas, particularly lawns. Soil tests shall be conducted to determine fertilizer application rates.

Maintenance

- Have the soil tested by your landscaper or local Soil Conservation Service for nutrient requirements and follow the recommendations.
- Do not apply fertilizer to frozen ground.
- Clean up any fertilizer spills.
- Do not allow fertilizer to be broadcast into water bodies.

- When fertilizing a lawn, water thoroughly, but do not create a situation where water runs off the surface of the lawn.

MANICURED LANDSCAPED AREAS - LITTER CONTROL

Function – Landscaped areas tend to filter debris and contaminates that may block drainage systems and pollute the surface and ground waters.

Maintenance

- Litter Control and lawn maintenance involves removing litter such as trash, leaves, lawn clippings, pet wastes, oil and chemicals from streets, parking lots, and lawns before materials are transported into surface waters.
- Litter control shall be implemented as part of the grounds maintenance program.

STREET/PARKING LOT SWEEPING

Function – Parking lots accumulate sand and debris. Street sweeping removes the sand and debris, which lowers transport of sediment and pollutants the stormwater systems and into the environment.

Maintenance

- A regular periodic cleaning schedule is recommended. The more frequent, the greater the sediment and pollutant removal. Regular cleaning of paved areas reduces the frequency of cleaning catch basins and drainage systems. It is recommended that the parking lots and access ways shall be swept at least once a month during winter months.

CATCH BASINS, CULVERTS, AND DRAINAGE PIPES

Function – Catch basins collect stormwater runoff and culverts and drainage pipes convey stormwater away from buildings, walkways, and parking areas.

Maintenance

- Catch basins should be inspected annually to insure they are working properly and that the inlet and outlet pipes are clean and free from sediment buildup, trash or debris, and that they are able to freely pass stormwater flows. Sediment should be removed from the sump (if any) as necessary.
- Culverts and drainage pipes shall be inspected annually, or more often as needed, for accumulation of debris and structural integrity. Leaves and other debris shall be removed from the inlet and outlet to insure the functionality of drainage structures.

INFILTRATION / DETENTION BASINS

Note- This section is applicable to the grassed depression area inside the cul-de-sac which is designed to temporarily detain and infiltrate stormwater runoff.

Function – These basins are designed to temporarily store stormwater from smaller rainfall events and allow it to exfiltrate into the ground. They also attenuate the peak stormwater runoff from larger events. The sediment forebays preceding each basin are designed to capture sediment before it enters the infiltration basin, and therefore must be periodically inspected and cleared of sediment.

Maintenance

- Periodically mow embankments (one to three times annually)
- Inspect inlet and outlet structures after significant storm events and remove debris
- Annually inspect embankments, inlet/outlet structures and forebay
    - Remove woody vegetation from fill embankments
    - Repair any damaged facilities
    - Repair any erosion;
    - Fill rodent holes
    - Check for invasive species and eradicate if found
- Inspect sediment forebay twice annually and remove accumulated sediment as needed
- Inspect infiltration area twice annually and following a rainfall event exceeding 2.5 inches in a 24-hour period. If the basin is not draining within 72 hours of a rainfall event, then the condition of the basin should be assessed by a qualified professional.

UNDERGROUND STORMWATER CHAMBER SYSTEM

Function – These basins are also designed to temporarily store stormwater from smaller rainfall events and allow it to exfiltrate into the ground. They also attenuate the peak stormwater runoff from larger events. The catch basins preceding the chamber system are designed to with sumps to capture sediment before it enters the chamber system, and therefore must be periodically inspected and cleared of sediment.

Maintenance

- See the ADS cut sheet in the appendix of this manual for the proper care of the chambers.
- Inspect annually the catch basins preceding the chamber system and remove built up sediment accumulation as necessary.
- Inspect annually the isolator row of the chamber system and clean any sediment buildup as specified in the ADS cutsheet.

EXOTIC (INVASIVE) SPECIES

Most native plant species are very beneficial to our waterbodies, providing food, shelter, and oxygen for organisms in and around the water. Unlike our native species, exotic plant species can reduce the diversity of our native plants, animals and insect species. If exotic species begin to grow in a stormwater management facility, owner shall eradicate the species per best management practices. For additional information on exotic species and procedures for managing them, reference is made to http://des.nh.gov/organization/divisions/water/wmb/exoticspecies/categories/publications.htm#factsheets.

Safety

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper training or equipment. A confined space should never be entered without at least one additional person present.

Inspecting Stormwater Management Facilities

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent best management practices. Stormwater management facilities must be periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

A. Inspection Procedures

All stormwater management facilities are required to be inspected by a qualified individual at a minimum of once per year. Inspections should follow the inspection guidance found in this Inspection and Maintenance Manual for the specific type of facility.

B. Inspection Report

The person(s) conducting the inspection activities shall complete the appropriate inspection report for the specific facility. An inspection and maintenance report is provided.

General Information

This section identifies the facility location, person conducting the inspection, the date and time the facility was inspected, and approximate days since the last rainfall. The reason for the inspection is also identified on the form depending on the nature of the inspection. All facilities should be inspected on an annual basis at a minimum. In addition, all facilities should be inspected after a significant precipitation event to ensure the facility is draining

appropriately and to identify any damage that occurred as a result of the increased runoff. For the purpose of this Stormwater Management Program, a significant rainfall event is considered an event of three (3) inches in a 24-hour period or 0.5 inches in a one-hour period. It is anticipated that a short, intense event is likely to have a higher potential of erosion for this site than a longer, high volume event.

Inspection Scoring

For each inspection item, a score must be given to identify the urgency of required maintenance. The scoring is as follows:

0 = No deficiencies identified.

1 = Monitor – Although maintenance may not be required at this time, a potential problem exists that will most likely need to be addressed in the future. This can include items like minor erosion, concrete cracks/spalling, or minor sediment accumulation. This item should be revisited at the next inspection.

2 = Routine Maintenance Required – Some inspection items can be addressed through the routine maintenance program (See SOP in appendix A). This can include items like vegetation management or debris/trash removal.

3 = Immediate Repair Necessary – This item needs immediate attention because failure is imminent or has already occurred. This could include items such as structural failure of a feature (outlet works, forebay, etc), significant erosion, or significant sediment accumulation. This score should be given to an item that can significantly affect the function of the facility.

Inspection Summary/Additional Comments

Additional explanations to inspection items, and observations about the facility not covered by the form, are recorded in this section.

C. Verification of Inspection and Form Submittal

The Stormwater Management Facility Inspection Form provides a record of inspection of the facility. The verification and the inspection form(s) shall be reviewed and maintained by the property owner or responsible party. Any transfer in ownership or responsibility shall be documented in writing to NHDES.

INSPECTION AND MAINTENANCE REPORT FORM
SUBDIVISION ON TAX MAP 174, LOT 15-1 & MAP 181, LOT 1
20 Baker St. & 25 Webster St., Hudson, NH

Inspector: _____ Date: _____

BMP	Date Since Last Inspection	Inspection Scoring	Inspection summary / Additional comments of type and date of repairs made
Manicured Landscape Areas - Litter Control			
Catch basins, Culverts, and Drainage Pipes			
Street/Parking Lot Sweeping			
Underground Chamber System			
De-ice Chemical Use – List Type and Quantity			
Detention Ponds & Grass Swales			
Invasive Species Assessment			

INSPECTION

The frequency of Inspection and Maintenance varies by location. A routine inspection schedule needs to be established for each individual location based upon site specific variables. The type of land use (i.e. industrial, commercial, public, residential) anticipated pollutant load, percent imperviousness, climate, rain fall data, etc. all play a critical role in determining the actual frequency of inspection and maintenance practices.

At a minimum, StormTech recommends annual inspections. Initially, the Isolator Row should be inspected every 6 months for the first year of operation. For subsequent years, the inspection should be adjusted based upon previous observation of sediment deposition.

The Isolator Row incorporates a combination of standard manhole(s) and strategically located inspection ports (as needed). The inspection ports allow for easy access to the system from the surface, eliminating the need to perform a confined space entry for inspection purposes.

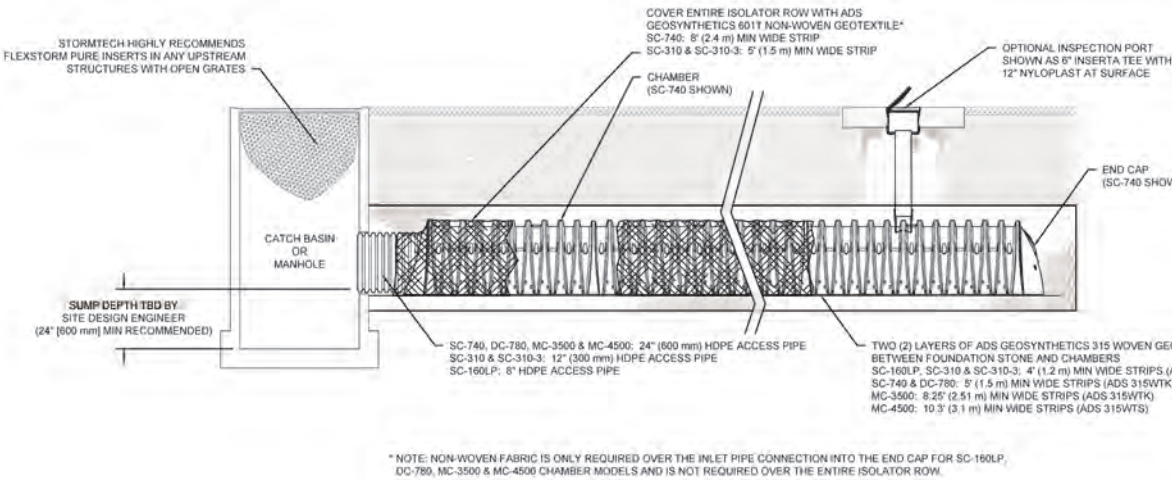
If, upon visual inspection it is found that sediment has accumulated, a stadia rod should be inserted to determine the depth of sediment. When the average depth of sediment exceeds 3 inches throughout the length of the Isolator Row, clean-out should be performed.

MAINTENANCE

The Isolator Row was designed to reduce the cost of periodic maintenance. By "isolating" sediments to just one row, costs are dramatically reduced by eliminating the need to clean out each row of the entire storage bed. If inspection indicates the potential need for maintenance, access is provided via a manhole(s) located on the end(s) of the row for cleanout. If entry into the manhole is required, please follow local and OSHA rules for a confined space entries.

Maintenance is accomplished with the jetvac process. The jetvac process utilizes a high pressure water nozzle to propel itself down the Isolator Row while scouring and suspending sediments. As the nozzle is retrieved, the captured pollutants are flushed back into the manhole for vacuuming. Most sewer and pipe maintenance companies have vacuum/jetvac combination vehicles. Selection of an appropriate jetvac nozzle will improve maintenance efficiency. Fixed nozzles designed for culverts or large diameter pipe cleaning are preferable. Rear facing jets with an effective spread of at least 45" are best. Most jetvac reels have 400 feet of hose allowing maintenance of an Isolator Row up to 50 chambers long. The jetvac process shall only be performed on StormTech Isolator Rows that have AASHTO class 1 woven geotextile (as specified by StormTech) over their angular base stone.

Examples of culvert cleaning nozzles appropriate for Isolator Row maintenance. (These are not StormTech products.)



Pre-Development Drainage Area Plan


N
WEBSTER STREET
BAKER STREET
1
2
3
3P
2P
4P
TP1
TP2
TP3
Om
WnC
EXIST CB
RIM=117.3
INV.OUT=114.4
EXIST CB
RIM=117.2
INV.OUT=114.3
EXIST SMH
RIM=117.7
INV.OUT=103.4
EXIST DMH
RIM=145.51
INV.IN=140.56(W)
INV.IN=138.39(N)
INV.IN=140.87(E)
INV.OUT=138.27
EXIST CB
RIM=144.71
INV.OUT=143.67
EXIST CB
RIM=145.16
INV.OUT=141.56
EXIST SMH
RIM=145.34
INV.IN=136.03
INV.OUT=135.93
EXIST SMH
RIM=145.62
INV.IN=136.26
INV.OUT=136.17
EXIST SMH
RIM=147.12
INV.OUT=138.07
N74°24'22"E
177.53'
N 74°14'23" E
150.06'
N73°36'18"E
144.45'
169.00'
S83°58'48"W
133.24'
S79°44'15"W
150.14'
S 84°22'31" W
S16°21'26"E
91.60'
S06°13'37"E
96.51'
SB FND
IP FND
I PIPE FND
APPROX. WATER MAIN
50' R.O.W.
250' SHORELAND SETBACK LINE
150' SHORELAND SETBACK LINE
50' SHORELAND SETBACK LINE

No.	DESCRIPTION	DATE
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PREDEVELOPMENT DRAINAGE AREA PLAN

MAP 174, LOT 15-1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

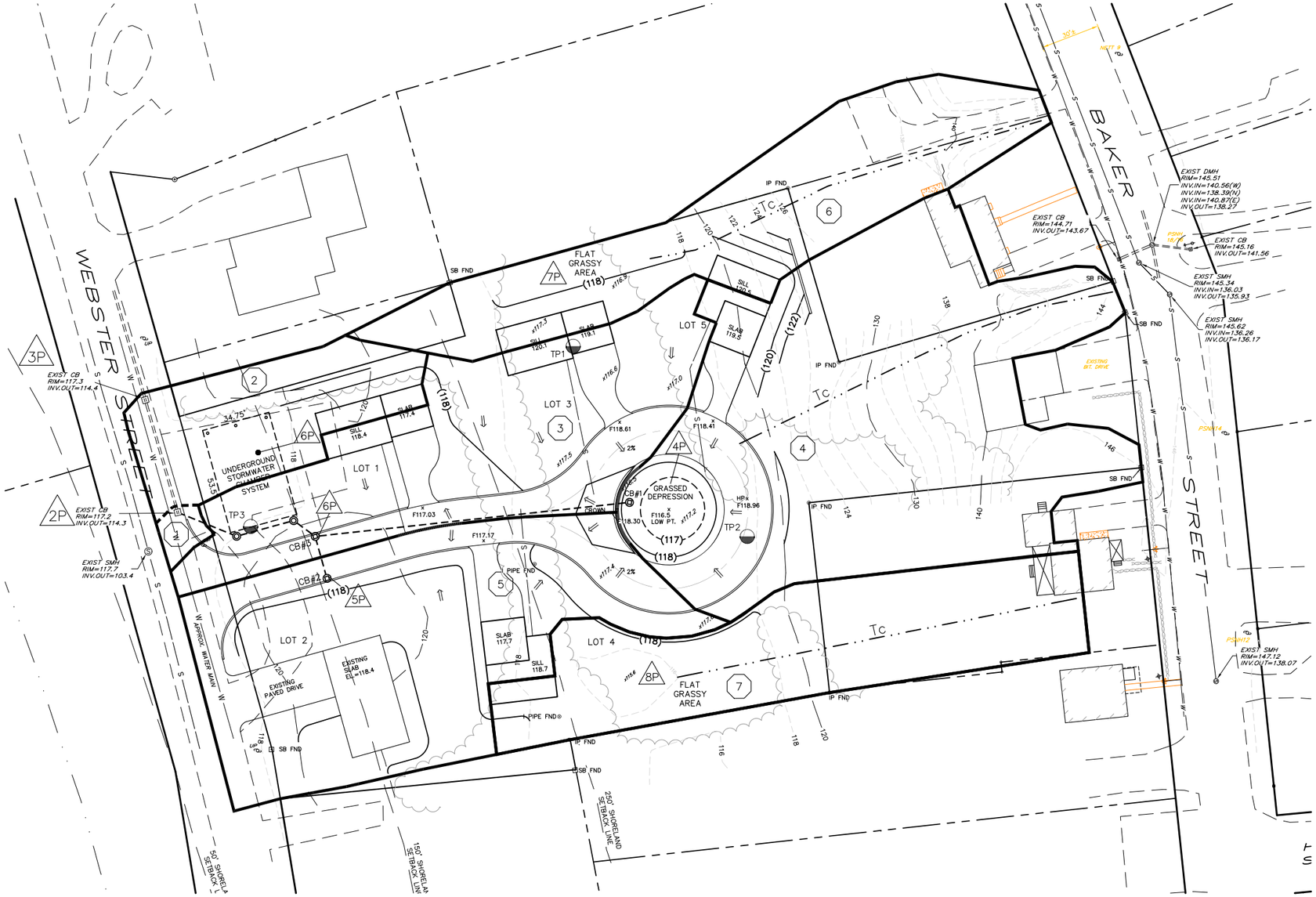
MARCH 30, 2022 *SCALE: 1"=30'*

ENGINEER:
RJB ENGINEERING, LLC
2 GLENDALE ROAD
CONCORD, NH 03301
PH. 603-219-0194

30' 15' 0 30'
SCALE: 1"=30'

ENGINEER & SURVEYOR:
M.J. GRAINGER ENGINEERING, INC.
PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

Post-Development Drainage Area Plan



No.	DESCRIPTION	DATE
1.	ADD CHAMBER SYSTEM, GRASSED DEPRESSION	05/10/2022
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.	.	.

POST–DEVELOPMENT DRAINAGE AREA PLAN

MAP 174, LOT 15–1
MAP 181, LOT 1

20 BAKER ST. & 25 WEBSTER ST.
HUDSON, NEW HAMPSHIRE

PREPARED FOR:

TUMPNEY, HURD, CLEGG, LLC
39 TRIGATE ROAD
HUDSON, NH 03051

MARCH 30, 2022 *SCALE: 1"=30'*

ENGINEER:
RJB ENGINEERING, LLC
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PROFESSIONAL ENGINEERS - SURVEYORS - PLANNERS
220 DERRY ROAD HUDSON, NH 03051 (603) 882-4359

30' 15' 0 30'
SCALE: 1"=30'