VERMONT

Vermont Department of Environmental Conservation *Agency of Natural Resources*
Watershed Management Division www.watershedmanagement.vt.gov
Rutland Regional Office
88 Merchants Row, Suite 430 Asa Bloomer Building [cell] 802-490-6163
Rutland, VT 05701-5903 [fax] 802-786-5915

AUTHORIZATION TO CONDUCT STREAM ALTERATION ACTIVITIES

Pursuant to Section C.2.2 of the VT Stream Alteration General Permit (Reporting activities not requiring an application)

Project Number: **SA-07-027-2015** Watercourse: **Tributary to Flood Brook**

Applicant Name: **William Garrison – USDA Forest Service (USFS) Green Mountain National Forest**

Mailing Address: **2538 Depot Street Manchester Center, VT 05255** Phone: **(802) 362 - 2307**

Project Location: **Trail adjacent to Flood Brook** Lat/Lon: **N 43.2559 / W 73.8925** Email: wgarrison@fs.fed.us

The Secretary of the Vermont Agency of Natural Resources (VT ANR) has determined that:

1. This project authorizes under **Section C.2.2.4, installation of new timber bridge with a 20 ft clear span, construction of new abutments, and stacked stone wing walls (reuse of existing stones in stream).**
2. The proposed activity is eligible for coverage under the VT ANR Stream Alteration General Permit.
3. The proposed activity will meet the terms and conditions of the General Permit provided:
   a) The project will be completed and approved **as shown on Structural Plan & Details sheet S-1 prepared by USFS, dated 06/24/2015, as discussed in the field,** and as approved by the Vermont Agency of Natural Resources.
   b) The project will not adversely affect the public safety by increasing flood hazards.
   c) The project will not significantly damage fish life or wildlife.
   d) The project will not significantly damage the rights of riparian owners.
   e) The project will not obstruct the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.
   f) The project is conducted in a manner which minimizes or avoids any discharge of sediment or other pollutants to surface waters in violation of the VT Water Quality Standards.
   g) The ANR River Management Engineer is notified by phone or email when construction begins and when the project is complete.
   h) **In-stream working dates for all GP activities are from July 1st through October 1st**; any in-stream work outside these dates will require an Individual Stream Alteration Permit authorization by the River Management Engineer.
   i) This authorization has been posted for three days public comment. This authorization constitutes final approval.

If there are any changes in the project plan or deviation in construction from the approved plans, the Permittee must notify the ANR River Management Engineer immediately via phone (802) 490-6163 or email joshua.carvaial@state.vt.us.

If the project is constructed as you have described, as shown on the above referenced approved plans and according to the above conditions, there is no reason to expect any violation of Vermont Water Quality Standards.

Signed this 21st day of July, 2015 **This permit expires on October 1, 2015**.
David K. Mears, Commissioner
Department of Environmental Conservation

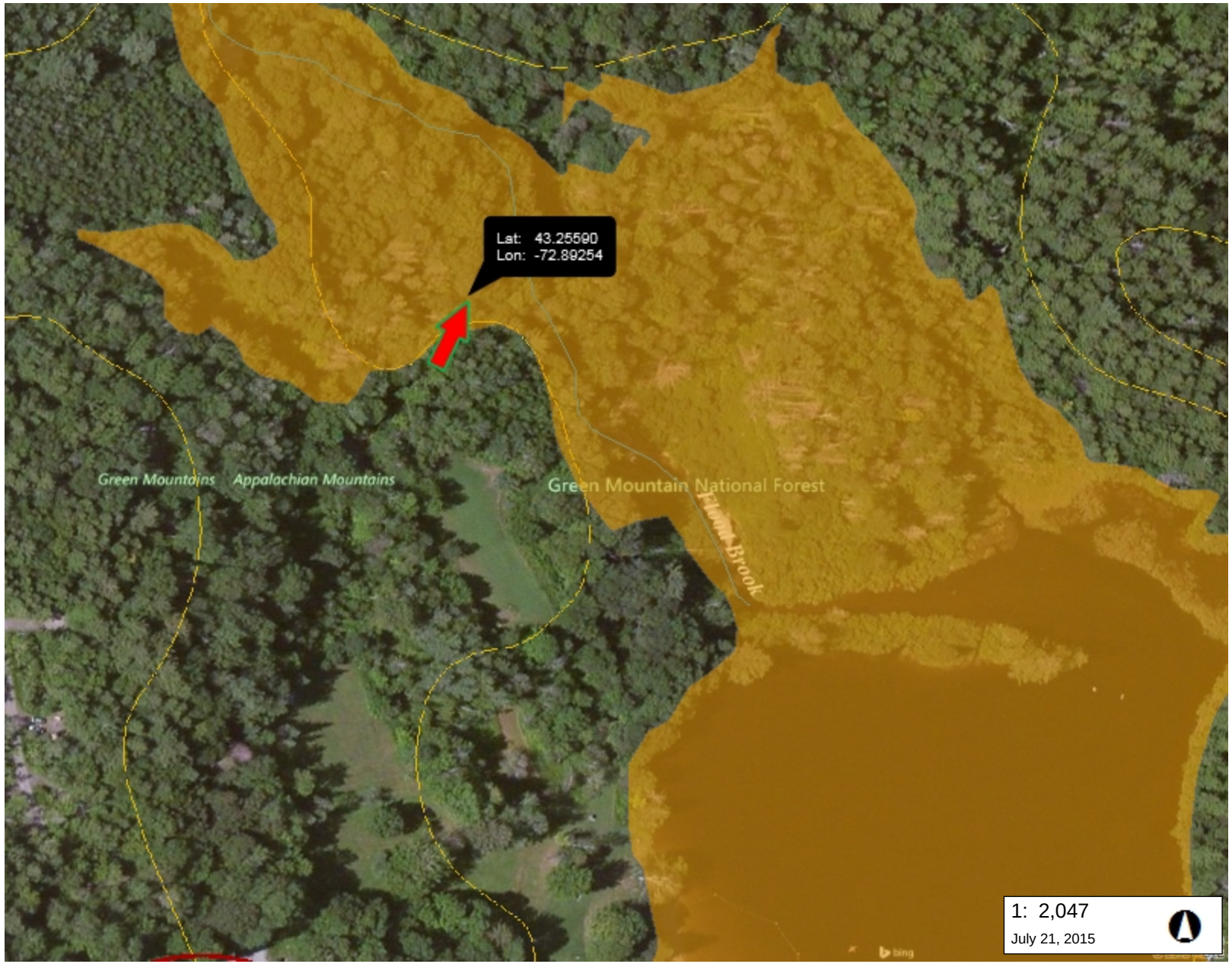
by: _____
Josh Carvajal, P.E. CFM, River Management Engineer

VERMONT

USFS Hapgood Pond Trail Bridge_Peru

Vermont Agency of Natural Resources

vermont.gov



LEGEND

- DFIRM Floodways
- DFIRM Preliminary Floodways
- Special Flood Hazard Areas (A Counties)
  - AE (1-percent annual chance flood
  - A (1-percent annual chance floodpl
  - AO (1-percent annual chance zone feet)
  - 0.2-percent annual chance flood ha
- Special Flood Hazard Areas (F DFIRM)
  - AE (1-percent annual chance flood
  - A (1-percent annual chance floodpl
  - AO (1-percent annual chance zone feet)
  - 0.2-percent annual chance flood ha
- Buildings (E911)
- Stream
- Parcels (where available)
- Town Boundary

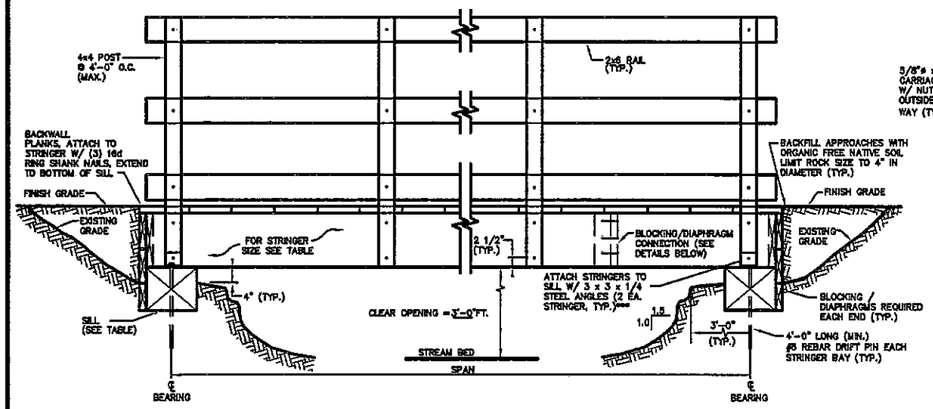
NOTES

Map created using ANR's Natural Resources Atlas

104.0 0 52.00 104.0 Meters

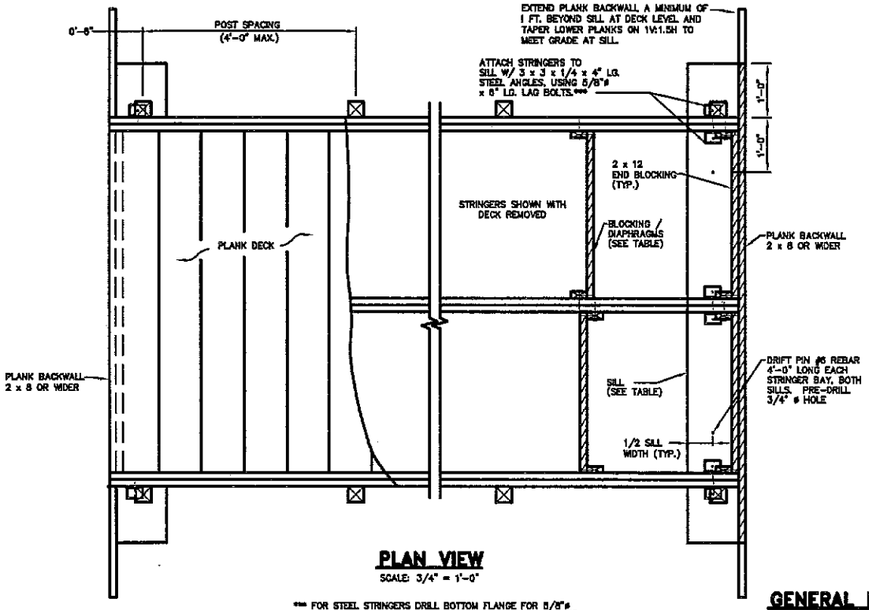
WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 171 Ft. 1cm = 20 Meters

THIS MAP IS NOT TO BE USED FOR NAVIGATION



ELEVATION OF STRUCTURE

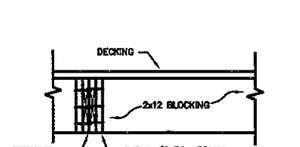
SCALE: 3/4" = 1'-0"



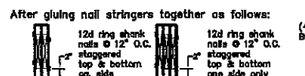
PLAN VIEW

SCALE: 3/4" = 1'-0"

*** FOR STEEL STRINGERS DRILL BOTTOM FLANGE FOR 5/8"ø LAG BOLTING TO SILLS IN LIEU OF USING 3X3X1/4 ANGLES. SLOT HOLES IN FLANGES TO ALLOW FOR TEMPERATURE MOVEMENT.

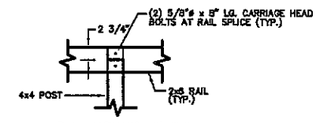


After gluing nail stringers together as follows:



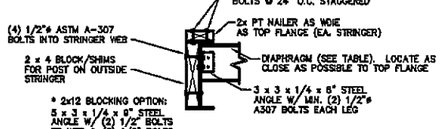
2 X 12/PSL STRINGER / BLOCKING DETAILS

NTS



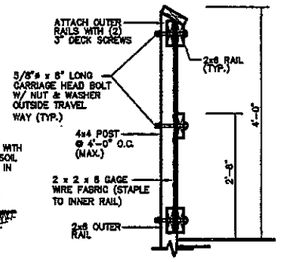
RAIL SPLICE DETAIL

FOR BRIDGE SPANS GREATER THAN 18 FEET ONLY

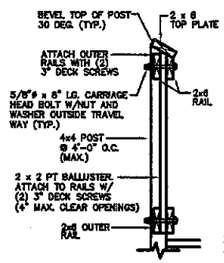


STEEL STRINGER/NAILER & DIAPHRAGM DETAIL

NTS



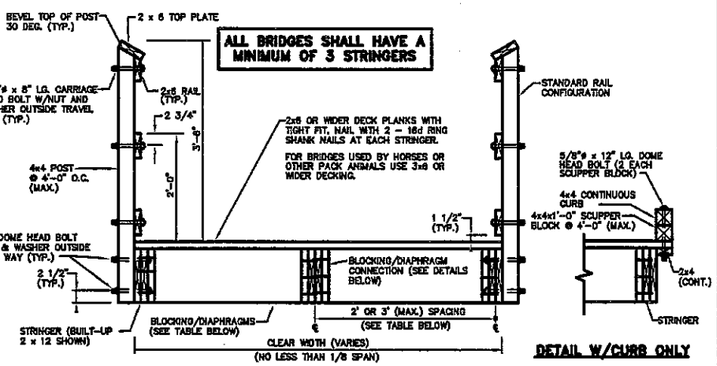
DETAIL W/RAIL AND WIRE FABRIC



DETAIL W/RAIL AND BALLUSTERS

RAILING NOTE:

Rail details shown above shall be used as determined by the Forest Engineer. Railing shall be required on all structures unless waived by the Forest Engineer. All structures without rail shall have 4x4 continuous curbing.



BRIDGE CROSS-SECTION

SCALE: 3/4" = 1'-0"

DETAIL W/CURB ONLY

STRINGER OPTION TABLE

SPAN (FT.)	DIM. LUMBER ** 2 FT. SPACING	WEIGHT (LBS.)	DIM. LUMBER ** 3 FT. SPACING	WEIGHT (LBS.)	BLK. PTS.	BLK. REQ'D	SILL REQ'D	PSL (PARALLAM) 2 FT. SPACING	WEIGHT (LBS.)	PSL (PARALLAM) 3 FT. SPACING	WEIGHT (LBS.)	BLK. PTS.	BLK. REQ'D	SILL REQ'D	STEEL BEAMS 2 FT. SPACING	WGT. (LBS.)	STEEL BEAMS 3 FT. SPACING	WGT. (LBS.)	DIA. PTS.	DIA. REQ'D	SILL REQ'D
8 or less	(1) 2 x 12 Int. (1) 2 x 12 ext.	38	(2) 2 x 12 Int. (1) 2 x 12 ext.	75 38	1/2	2 x 12	8 x 8														
10	(1) 2 x 12 Int. (1) 2 x 12 ext.	47 47	(2) 2 x 12 Int. (1) 2 x 12 ext.	94 47	1/2	2 x 12	8 x 8														
12	(2) 2 x 12 Int. (1) 2 x 12 ext.	113 56	(2) 2 x 12 Int. (2) 2 x 12 ext.	169 113	1/2	2 x 12	8 x 8														
14	(2) 2 x 12 Int. (2) 2 x 12 ext.	131 131	(3) 2 x 12 Int. (2) 2 x 12 ext.	197 131	1/2	2 x 12	8 x 8														
16	(3) 2 x 12 Int. (2) 2 x 12 ext.	225 150	(3) 2 x 12 Int. (2) 2 x 12 ext.	225 150	1/2	2 x 12	8 x 8														
18	(3) 2 x 12 Int. (2) 2 x 12 ext.	253 169	(4) 2 x 12 Int. (3) 2 x 12 ext.	338 253	1/3	2 x 12	8 x 8	3-1/2 x 12 Int. 3-1/2 x 12 ext.	272 272	3-1/2 x 14 Int. 3-1/2 x 14 ext.	320 320	1/3	2 x 12	8 x 8	W 10 x 12	216	W 12 x 14	252	1/2	C5x10.5	8 x 8
20	(4) 2 x 12 Int. (2) 2 x 12 ext.	375 188	(5) 2 x 12 Int. (3) 2 x 12 ext.	469 281	1/3	2 x 12	8 x 8	3-1/2 x 14 Int. 3-1/2 x 14 ext.	356 356	3-1/2 x 14 Int. 3-1/2 x 14 ext.	356 356	1/3	2 x 12	8 x 8	W 10 x 12	240	W 12 x 14	280	1/2	C6x10.5	8 x 8
22								3-1/2 x 14 Int. 3-1/2 x 14 ext.	392 392	3-1/2 x 16 Int. 3-1/2 x 16 ext.	447 447	1/3	2 x 12	8 x 8	W 12 x 14	308	W 12 x 22	308	1/2	C8x10.5	8 x 8
24								3-1/2 x 16 Int. 3-1/2 x 16 ext.	487 497	3-1/2 x 16 Int. 3-1/2 x 16 ext.	547 547	1/3	2 x 12	10 x 10	W 12 x 14	336	W 12 x 22	528	1/2	C8x12.5	10 x 10
26								3-1/2 x 16 Int. 3-1/2 x 16 ext.	526 526	5-1/4 x 16 Int. 3-1/2 x 16 ext.	793 528	1/4	2 x 12	10 x 10	W 12 x 22	572	W 14 x 26	676	1/3	C8x11.5	10 x 10
28								5-1/4 x 16 Int. 3-1/2 x 16 ext.	854 568	5-1/4 x 16 Int. 3-1/2 x 16 ext.	960 636	1/4	2 x 12	10 x 10	W 12 x 22	616	W 14 x 26	728	1/3	C8x11.5	10 x 10
30								5-1/4 x 16 Int. 3-1/2 x 16 ext.	915 609	7 x 18 Int. 3-1/2 x 16 ext.	1332 684	1/4	2 x 12	10 x 10	W 12 x 22	660	W 14 x 26	780	1/3	C8x11.5	10 x 10
32								5-1/4 x 16 Int. 3-1/2 x 16 ext.	1098 730			1/4	2 x 12	10 x 10	W 14 x 26	632	W 16 x 31	992	1/3	C8x11.5	10 x 10
34								7 x 18 Int. 3-1/2 x 16 ext.	1510 775			1/4	2 x 12	10 x 10	W 14 x 26	884	W 16 x 31	1054	1/3	C8x11.5	10 x 10
36															W 16 x 31	1116	W 18 x 35	1260	1/3	C9x13.4	10 x 10
38															W 16 x 31	1178	W 18 x 35	1330	1/3	C9.13.4	10 x 10
40															W 16 x 31	1240	W 18 x 35	1400	1/4	C9x13.4	12 x 12*
42															W 18 x 35	1470	W 21 x 44	1848	1/4	C10x15.3	12 x 12*
44															W 18 x 35	1540	W 21 x 44	1938	1/4	C10x15.3	12 x 12*
46															W 21 x 44	2024	W 24 x 55	2530	1/4	C12x20.7	12 x 12*
48															W 21 x 44	2112	W 24 x 55	2640	1/4	C12x20.7	12 x 12*
50															W 21 x 44	2200	W 24 x 55	2750	1/4	C12x20.7	12 x 12*

* Sills and bridge foundation require design by Forest Engineer ** Use full length stringers, no splices allowed.

GENERAL NOTES AND SPECIFICATIONS

Loading & Design Criteria

1. USE OF THIS PLAN; DETERMINATION OF STRINGER LENGTH, TYPE, AND SPACING; RAILING REQUIREMENTS; AND STRUCTURE HEIGHT ABOVE STREAM BED SHALL BE AS APPROVED BY THE FOREST ENGINEER. ANY MODIFICATIONS TO THIS PLAN MUST BE APPROVED BY THE REGIONAL BRIDGE ENGINEER.
2. Ground Snow Load – Pg = 70 PSF (reduced in combination with Pedestrian Load).
3. Deck Live Load – Pedestrian (AASHTO) = 85 PSF.
4. Posts & Rails – Post & Rails designed for AASHTO Pedestrian Load only.
5. Stringer Live Load Deflection Limits – Steel = L/500, Lumber = L/360.
6. Bridge structure shall meet ADA accessibility requirements for trails. Structure shall have a level cross slope with no more than a 5% grade along its length, minimum 36" clear width, minimum 42" rail height, minimum 3" curb height (if no rail), and minimum 80" overhead clearance. Spacing between decking planks shall not exceed 1/2" after seasoning. The maximum vertical elevation change between deck planks is 1/2". There shall be a smooth transition from the approach onto the bridge.

Specifications

1. AASHTO Standard Specification for Highway Bridges, 1996, 16th Edition.
2. IBC 2000 International Building Code, 2000 Edition.
3. National Design Specification for Wood Construction, 1997 Edition, by National Forest Products Assoc.
4. American Wood Preservers Association Standards, Waterborne Preservative Standard P5 Type A, Standard C2, and Standard C14.

Lumber

1. Lumber for solid sawn stringers, deck, backwall, rail, ballusters, posts, curbs, and mud sill shall be No. 2 or better Southern Yellow Pine pressure treated per AWPA Standards.
2. Drawings are prepared using S4S finished dimensions unless noted otherwise. If rough sawn lumber is used adjust dimensions as required.
3. All lumber shall be sawn and fabricated prior to pressure treatment with respective preservative.
4. PSL (parallel strand lumber) shall be Weimanized Parallam type, service level 2, and CCA pressure treated to 0.60 pcf or approved equal.

Steel

1. Steel for stringers, and other structural sections, shall conform to ASTM A572 Grade 50. Steel angles shall meet ASTM A36. Shop prime with two coats of zinc oxide primer, after fabrication.
2. Once steel is situated in field, apply zinc oxide primer to all areas where primer had been removed due to placement.

Hardware

1. All bolts, washers, nuts and miscellaneous metal hardware shall be ASTM A307 hot dipped galvanized.
2. Fasteners shall be hot dipped galvanized ring shank nails or wood screws. Drift pins for sill shall be deformed No. 6 reinforcing bars meeting ASTM A615.

Glue

1. Apply glue between each lamination using a waterproof exterior adhesive compatible with the preservative treatment such as PL-500 by Contech or approved equal. Apply 3/8" continuous bead @ 1 1/2" o.c.

Construction

1. Clear opening of bridge above the stream bed shall be determined by the Forest Engineer and approved by the governing Federal and State agencies as required.
2. Mud sills shall bear on native soil or ledge rock free from compressible organic material and capable of supporting the bridge under full load. Provide uniform bearing under entire length of sill. Other foundation conditions require approval by a Forest Engineer.
3. Stringers with camber shall be positioned so that camber is up and knots near the edge will be in the top half of the stringers.
4. Deck planks shall be laid heart side down.
5. Railing shall be required on all structures unless waived by Forest En

General Notes

TOWN: PERU, VT
SITE LOCATION: FT446 HAPGOOD NATURE TRAIL

DECK WIDTH: 4'-3"
CLEAR WIDTH: 4'-0"
BRIDGE RAILING: 2-PLANK W/ BALLUSTERS
BRIDGE SKEW: 0°
STRINGER LENGTH: 20'-0" (USE 20'-0" SPAN)
NUMBER OF STRINGERS: 3 EACH
STRINGER TYPE: 2 X 12 PT (4 INT & 2 EXT)
STRINGER SPACING: 2'-0"
DIAPHRAGM TYPE: 2 X 12 PT
DIAPHRAGM SPACING: ENDS & 6'-8" FROM ENDS
SILL REQUIRED: 8 X 8 PT OR PRECAST CONCRETE BLOCKS
CLEAR OPENING ABOVE STREAMBED: 3'-0"
APPROACH RAMPS: GRAVEL, SLOPES BELOW
SLOPE < 5% = NO LENGTH LIMIT
5% > SLOPE < 8.33% = 50' MAX LENGTH
8.33% > SLOPE < 10% = 30' MAX LENGTH
NO SECTION SHALL EXCEED 10%

FOREST ENGINEER: 6/24/15 DATE:

No.	Revision/Issue	Date
4		
3		
2		
1		

U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
R-9
EASTERN REGION

Project Name
STANDARD PEDISTRIAN AND CC SKI TRAIL BRIDGE

COR

Drawing Title
STRUCTURAL PLAN & DETAILS

Drawn: J. W. Kamb	Project: Standard
Checked: J. S. Groenier	Drawing No.: S-1
CAD File No.: R9STDTRAILBRDG.dwg	
Date: April 17, 2003	
Scale: as noted	


2015. 5. 8 10:13