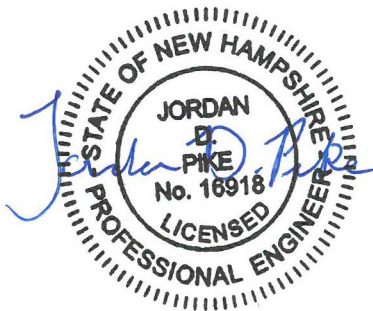


SIDEWALK STUDY LETTER
US ROUTE 302 - MAIN STREET
BETHLEHEM, NEW HAMPSHIRE

Prepared for:
Town of Bethlehem

September 22, 2023

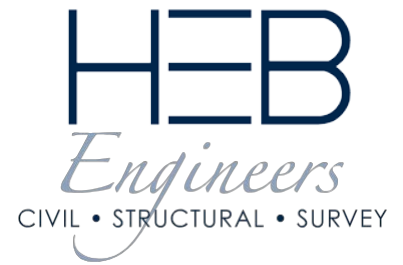


Prepared by:
HEB Engineers, Inc.

Project #2023-065

September 22, 2023

Mary Moritz, Town Administrator
Town of Bethlehem
2155 Main Street, PO Box 189
Bethlehem, NH 03574



**Re: US Route 302 (Main Street), Bethlehem, NH
Sidewalk Study Letter
HEB Project #2023-065**

Dear Mary,

The Town of Bethlehem Select Board (Town) is interested in constructing 1,500 linear feet (LF) of sidewalk along the north side of US Route 302 (Main Street) from the Town Hall to the Elementary School (the Project). Upon request of the Town, HEB Engineers, Inc. (HEB) has prepared conceptual design drawings, a conceptual cost estimate, and this summary letter for the Project.

HEB's total estimate for the Project is \$765,000, which includes all engineering, rights-of-way, utility, construction, and inspection work. The conceptual design includes 5-foot-wide concrete sidewalks with granite curbing along the north side of Main Street between the Town Hall and the Elementary School. The scope of work will require drainage modifications with the new curb line, as well as, improvements to the driveway aprons and local road approaches to achieve an accessible cross slope along the pedestrian route. HEB estimated the project assuming it will be administered through the New Hampshire Department of Transportation's (NHDOT) Local Public Agency (LPA) process.

More detailed Project information is included below.

Existing Conditions

US Route 302 is an east-west, two-lane, Principal Arterial on the National Highway System (NHS), providing a connection between Montpelier, Vermont, and Portland, Maine (see Attachment A - Project Location Plan). Within the Project limits US Route 302 in Bethlehem will be referred to as Main Street. The existing roadway cross section includes on-street parking, and the roadside provides access to residences, local businesses, and public facilities. Major public destinations along the north side of Main Street within the Project limits include the Town Hall, Post Office, Public Library, and Elementary School. Under the existing conditions, there are sidewalks along the south side of Main Street, but there is no sidewalk or accessible pathway along the north side of Main Street to connect these destinations. In order to access these public destinations currently, pedestrians must use the sidewalk on the south side of Main Street and cross at unmarked locations, or walk along the northern roadway shoulder.

A review of available traffic data indicated that the posted speed limit within the Project limits is 30 miles per hour (mph), and there is a posted speed limit of 20 mph when flashing through the school zone for the Elementary School. NHDOT last conducted traffic counts in this area in 2021 and the Average Annual Daily Traffic (AADT) volume was estimated at 6,407 vehicles per day (vpd). However, Pre-COVID-19 AADT's were estimated at 6,794 vpd in 2018. Regionally, traffic volumes have been trending towards recovering or exceeding pre-COVID-19 AADT's, therefore, it's estimated the current AADT's are closer to 7,000 vpd. Based on the traffic speeds and volume, the existing high-visibility mid-block pedestrian crosswalks are acceptable. Other pedestrian traffic control devices can be evaluated upon request.

HEB met with the Town on August 3, 2023 to review the project site. There are new raised concrete islands with granite curbing in front of the Post Office, and adjacent to the Town Hall (see Photo 1 in Attachment B). The raised islands help control access to the businesses, however, there's a long gap of uncontrolled access in front of the auto transmission shop (see Photo 2). NHDOT had previously commented that they were interested in access management at this location.

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Also, from the field review the Town indicated they were interested in saving the maple tree in front of the Public Library, if possible (see Photo 3). There is an existing mid-block pedestrian crossing at the Elementary School that is lacking illumination in the Main Street westbound direction (see Photo 4). Finally, many of the existing drainage structures present a hazard to pedestrians and bicyclists currently utilizing the shoulder on the north side of Main Street (see Photos 5 and 6). The roadway has received numerous pavement overlays, creating 6 – 9-inch depressions from the pavement surface to the top of the catch basin grate.

Proposed Project Scope and Impact Analysis

The Project proposes to provide accessible pedestrian infrastructure that's compliant with the Public Right-of-Way Accessibility Guidelines (PROWAG) along the north side of Main Street within the Project limits by constructing a 5-foot-wide concrete sidewalk with granite curbing. The scope of work will require drainage modifications with the new curb line, as well as, improvements to the driveway aprons and local road approaches to provide an accessible cross slope along the pedestrian route, that meets PROWAG standards.

HEB created a basemap from publicly available databases that included aerial imagery, approximate right-of-way, and topographical information. The basemap was utilized to identify potential impacts to existing infrastructure, utilities, and private property associated with constructing the new sidewalk. Overhead utility poles are already located on the south side of Main Street, where there are existing sidewalks. The only impact to overhead utilities will involve relocating a stub pole in front of the Elementary School. There is one fire hydrant that will need to be relocated in front of the auto transmission shop. Two existing walkways to private residences will need to be modified to tie into the proposed sidewalk. It's assumed the only sub-surface infrastructure that should be impacted by the Project is the existing drainage system. No evidence of gas valves, water gates, or underground electrical was observed during the field review, however, the existence of sub-surface utilities should be confirmed in the design phase.

Overall, there are very limited impacts over the 1,500 LF to install the new sidewalk. The only right-of-way impact is minor grading impacts on the Public Library property. These right-of-way impacts exist because HEB brought the sidewalk alignment away from the roadway to potentially save the maple tree, as requested by the Town. If the minor grading impacts are not agreeable, the maple tree can be removed, and the sidewalk can be located along the roadside to eliminate all right-of-way impacts.

The most significant impact will be shimming the existing catch basin frame and grates to the new curb line. This improvement will also benefit bicyclists utilizing the roadway shoulder, as the current vertical drop-offs at the drainage structures are a safety concern. Drainage was also modified at the Public Library driveway to eliminate the curb-less catch basins in the pedestrian pathway, install new catch basins at the driveway radii, and a new connecting drainage pipe. This will improve pedestrian safety by eliminating ponding or icing at the pedestrian ramps, and improve the longevity of the driveway by eliminating the curb-less drainage basins, which are less efficient and can be an obstacle for plowing.

One of NHDOT's primary concerns with the project was access management with the wide driveways. A raised island was included in front of the Super Secret Ice Cream shop, to better control access. The driveway could likely be further narrowed from the west side, which could further reduce the width of the driveway. One benefit for the property owner to narrow the driveway could be to create additional parking along the west side of the lot. This could be further evaluated in design in coordination with the property owner. Access in front of the auto transmission shop appears to be critical to the function of their business based on the location of the bay doors. Therefore, 6-inch-wide solid single white thermoplastic lines are proposed to delineate the pedestrian pathway across their driveway, to increase driver awareness and visibility. It will also provide a boundary, so that cars do not park and block the pathway, forcing pedestrians into the roadway shoulder.

The conceptual sketches for the proposed sidewalk and associated impacts on Main Street are provided in Attachment C.

Estimated Project Costs

HEB has prepared an Opinion of Probable Cost (cost estimate) for the conceptual design drawings for a sidewalk along Main Street in Bethlehem. As previously mentioned, the estimate assumes the project would go through the NHDOT LPA process. It is possible the Town could choose not to use State or Federal funding to construct the project. If no State or Federal funds are utilized, then the Project schedule could be expedited, and a reduction in project costs could be expected.

The below estimate includes line items for 2023 Construction (CON), 2023 Preliminary Engineering (PE), and 2023 Right-of-Way (ROW) costs. A minor item allowance of 15% was added to the base estimate to account for items too small to quantify during the conceptual design phase. Construction Administration costs were assumed to be 25% of the Base Estimate. The Construction cost includes the Base Estimate, a 10% Contingency, and the Construction Administration costs. Preliminary Engineering is assumed to be 25% of the Construction cost, which accounts for the efforts to deliver a project through the NHDOT LPA process.

All estimated costs are based on recent market prices available through NHDOT, similar HEB project, or engineering judgment. The breakdown described above, along with the unit prices and estimated quantities for construction items is provided in Attachment D. Below is a summary of the Opinion of Probable Costs.

Proposed Improvements:	2023 PE	2023 ROW	2023 CON	Total
Main Street Sidewalk	\$ 152,000	\$ 5,000	\$ 608,000	\$ 765,000

Recommendations

Providing sidewalks along the north side of Main Street between the Town Hall and the Elementary School would connect public facilities, and provide pedestrian access to local businesses such as the bakery and ice cream shop. HEB's study determined that there are minimal impacts to existing utilities or private property with the proposed Project. The most significant impact will be modifications to the existing drainage system, which will improve gutter flow and enhance safety for bicyclists. HEB recommends the Town pursue funding opportunities to provide this worthwhile pedestrian connection. If you have any questions or would like to discuss this matter further, please do not hesitate to contact me.

Sincerely,
HEB Engineers, Inc.



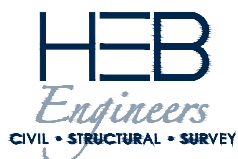
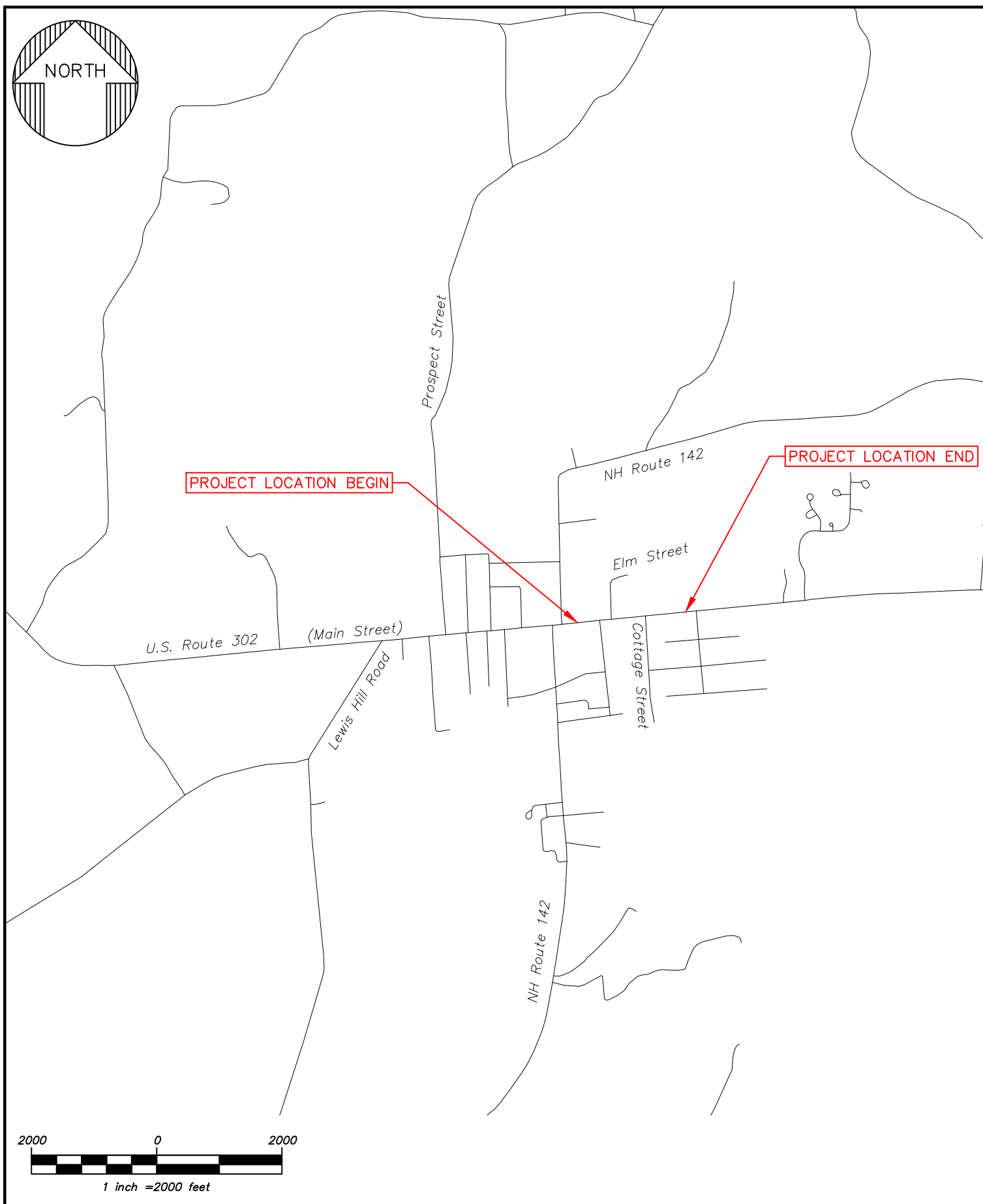
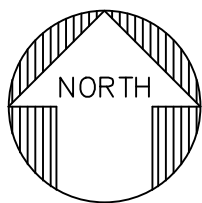
Jordan Pike, PE, PTOE
Senior Transportation Engineer

Enclosures: Attachment A – Project Location Plan
Attachment B – Photo Pages
Attachment C – Conceptual Sidewalk Sketches
Attachment D – Engineer's Opinion of Probable Cost

Copy: Town of Bethlehem
File

ATTACHMENT A

Project Location Plan



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Bridgton, ME 04009

Project Location Plan
for the
U.S. Route 302 (Main Street) Sidewalk Study
located in
Bethlehem, New Hampshire
prepared for the
Town of Bethlehem

P1.01

PROJECT 2023-065

DESIGNED BY	—	REVISION	—
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DRAWN BY	CFX	DATE	09/22/2023
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CHECKED BY	JDP	SCALE	1'=2,000
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ATTACHMENT B

Photo Pages

US Route 302 (Main Street) Sidewalk Study
Bethlehem, New Hampshire
Photo Page 1 of 3



Photo 1: Existing raised concrete islands in front of the Post Office.



Photo 2: Existing driveway at auto transmission shop.

US Route 302 (Main Street) Sidewalk Study
Bethlehem, New Hampshire
Photo Page 2 of 3

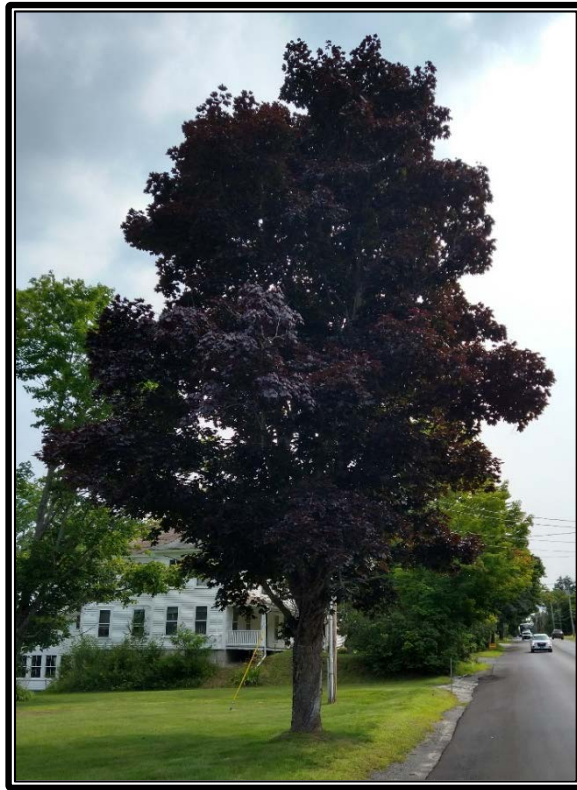


Photo 3: Maple Tree in front of Public Library.



Photo 4: Pedestrian Crossing at Elementary School



Photo 5: Vertical drop-off at existing drainage grates



Photo 6: Bicyclists utilizing US Route 302 shoulder.

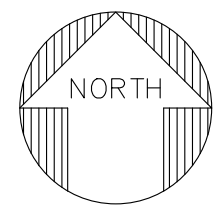
ATTACHMENT C

Conceptual Sidewalk Sketches

P:\Jobs\2023\2023-065 Bethlehem - Main Street Sidewalk Layout\Main Street Sidewalk Conceptual Design.dwg SK-1, 9/21/2023 2:16:16 PM, auto

2023-065
Sidewalk Layout Sta. 100+00-109+00
Main Street Sidewalk Concept

SK-1
SHEET 1 OF 3

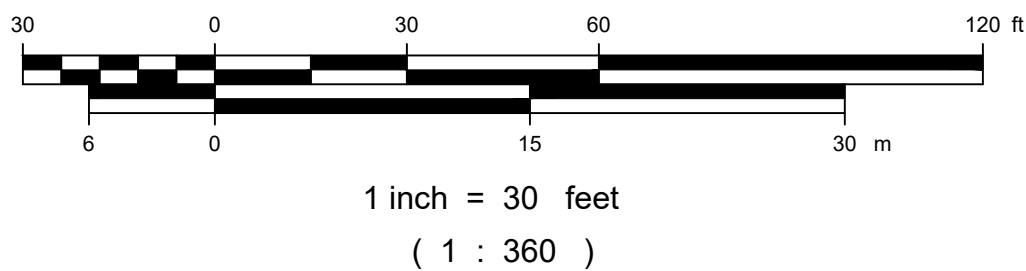


PRELIMINARY
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CONSTRUCTION

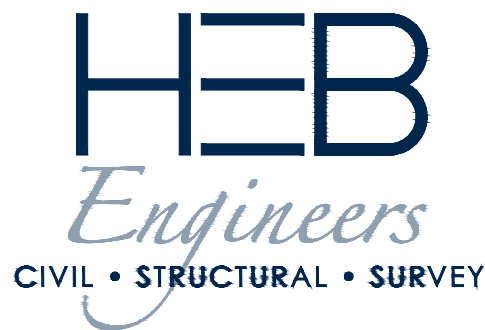
MATCH TO SK-2

Legend

- Proposed Concrete Sidewalk
- Proposed Limits of Grading
- Proposed Full Depth Reconstruction
- Proposed Driveway Reconstruction



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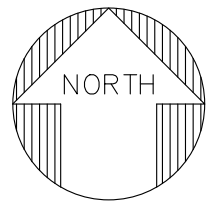
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DESIGNED BY	—
DRAWN BY	TPA
CHECKED BY	JDP
FIELD BOOK	—
SCALE	1" = 30'
DATE	09/22/2023

Sidewalk Layout Sta. 100+00-109+00
for the
Main Street Sidewalk Concept
located in
Bethlehem, New Hampshire
prepared for the
Town of Bethlehem

2023-065

SK-1

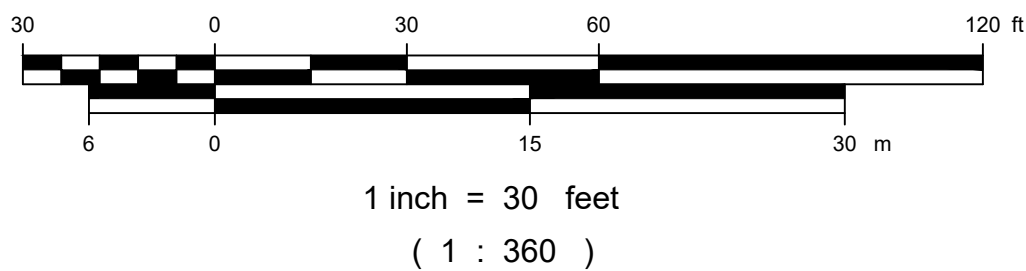
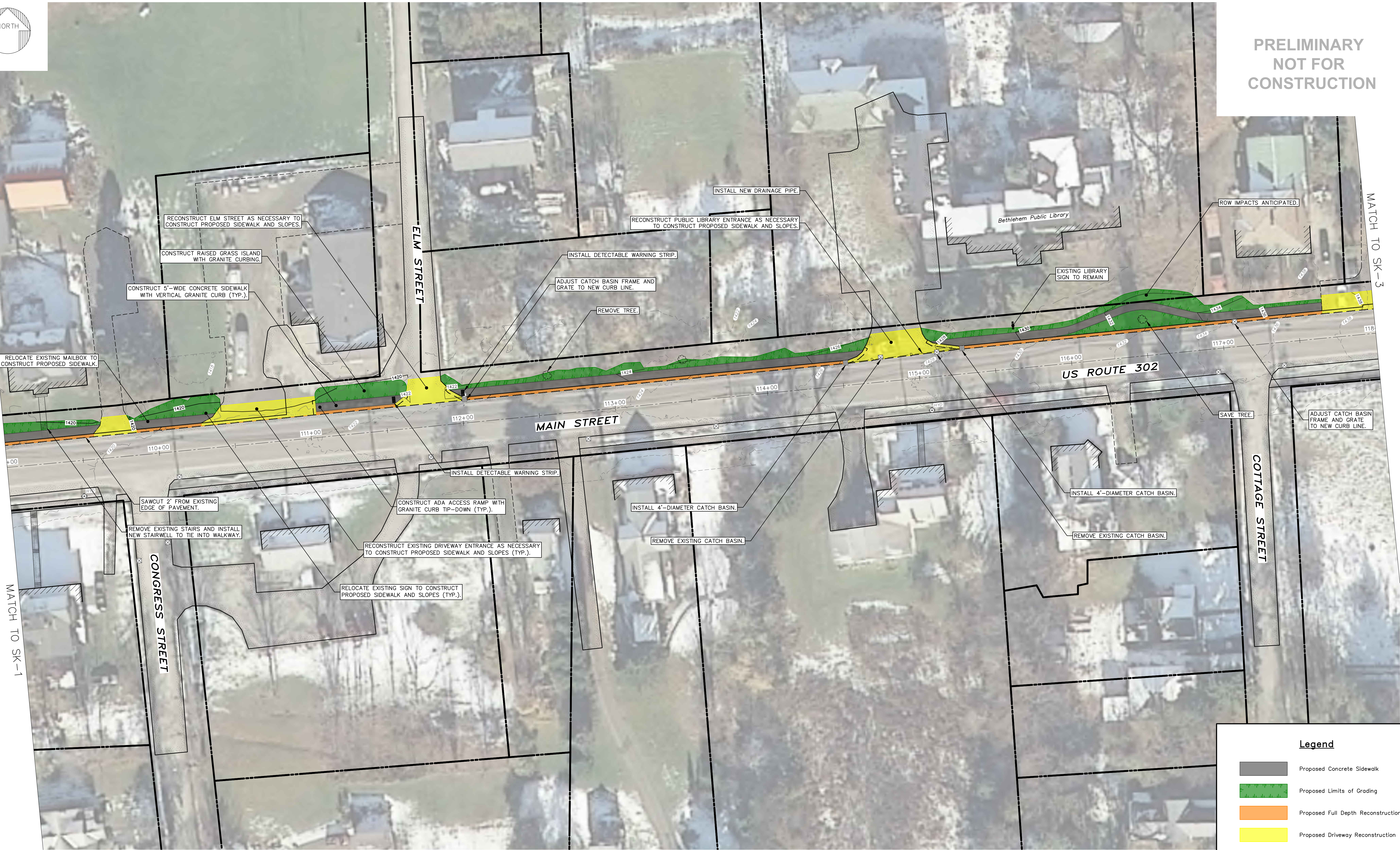
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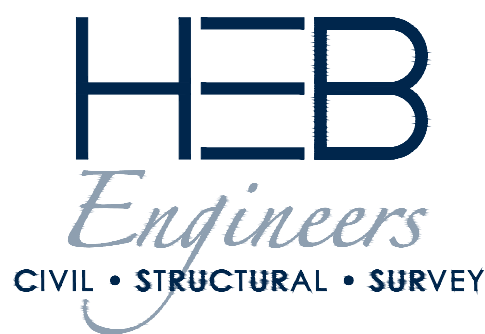
PRELIMINARY
NOT FOR
CONSTRUCTION

SK-2
SHEET 2 OF 3

2023-065
Sidewalk Layout Sta. 109+00-118+00
Main Street Sidewalk Concept



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No.	Revision			DATE	BY

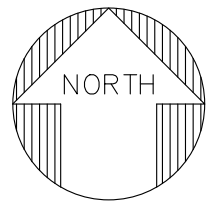


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DESIGNED BY	—
DRAWN BY	TPA
CHECKED BY	JDP
FIELD BOOK	—
SCALE	1" = 30'
DATE	09/22/2023

Sidewalk Layout Sta. 109+00-118+00
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2023-065
SK-2
SHEET 2 OF 3



PRELIMINARY
NOT FOR
CONSTRUCTION

SK-3
SHEET 3 OF 3

2023-065
Sidewalk Layout Sta. 118+00-127+00
Main Street Sidewalk Concept

MATCH TO SK-2

RECONSTRUCT EXISTING CONCRETE PATHWAY.

Bethlehem Elementary School

REMOVE TREE.

REMOVE TREE.

ADJUST CATCH BASIN
FRAME AND GRATE
TO NEW CURB LINE.

REMOVE TREE.

RELOCATE STUB POLE.

INSTALL DETECTABLE WARNING STRIP.

INSTALL OVERHEAD LIGHTING
FOR MID-BLOCK CROSSING.

REMOVE TREE.

MAIN STREET

US ROUTE 302

TURNER STREET

END CONCRETE SIDEWALK.
STA. 120+18

INSTALL DETECTABLE WARNING STRIP.

CONSTRUCT ADA ACCESS RAMP WITH
GRANITE CURB TIP-DOWN (TYP.).

RECONSTRUCT ELEMENTARY SCHOOL ENTRANCE AS NECESSARY
TO CONSTRUCT PROPOSED SIDEWALK AND SLOPES.

SAWCUT 2' FROM EXISTING EDGE OF PAVEMENT.

CONSTRUCT 5'-WIDE CONCRETE SIDEWALK
WITH VERTICAL GRANITE CURB (TYP.).

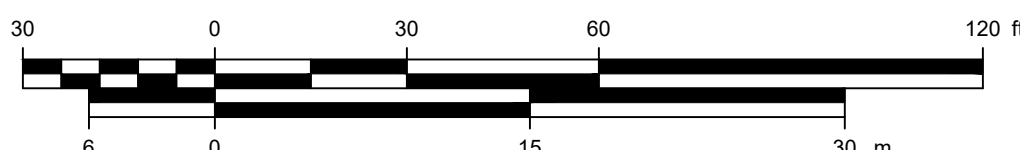
Legend



Proposed Concrete Sidewalk
Proposed Limits of Grading
Proposed Full Depth Reconstruction
Proposed Driveway Reconstruction

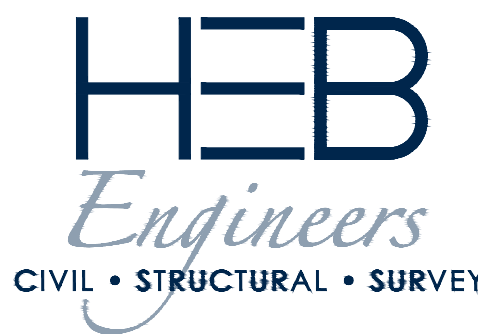
Notes:

1. Install pedestrian crossing layout for uncontrolled midblock locations at school.
2. Crossing markings should be 10 feet long for higher visibility at school zone.
3. Replace school zone crosswalk signs and place new signpost behind crossing to avoid obstructing line of sight to pedestrians in crosswalk.



1 inch = 30 feet
(1 : 360)

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DRAWN BY	TPA
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SCALE	1" = 30'
DATE	09/22/2023

Sidewalk Layout Sta. 118+00-127+00
for the
Main Street Sidewalk Concept
located in
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prepared for the
Town of Bethlehem

2023-065

SK-3

SHEET 3 OF 3

ATTACHMENT D

Engineer's Opinion of Probable Cost

Engineer's Opinion of Probable Costs

HEB Project #: 2023-065
Date: 09/22/2023
Computed by: TPA
Checked by: JDP

**US Route 302 (Main Street) Sidewalk Study
Bethlehem, New Hampshire**

				Main Street Sidewalk Improvements	
NHDOT Item #	Description	Unit	Unit Cost	Quantity	Total Cost
Earthwork					
201.1	Clearing and Grubbing	Acre	\$ 30,000.00	0.2	\$ 6,000.00
201.22	Removing Large Trees	EA	\$ 500.00	5	\$ 2,500.00
203.1	Common Excavation	CY	\$ 30.00	620	\$ 18,600.00
203.2	Rock Excavation	CY	\$ 90.00	30	\$ 2,700.00
202.5	Removal of Catch Basins, Drop Inlets, and Manholes	EA	\$ 1,000.00	3	\$ 3,000.00
214	Fine Grading	Unit	\$ 30,000.00	1	\$ 30,000.00
Base Courses					
304.2	Gravel	CY	\$ 35.00	215	\$ 7,525.00
304.3	Crushed Gravel	CY	\$ 40.00	400	\$ 16,000.00
Pavements					
403.11	Hot Bituminous Pavement, Machine Method	Ton	\$ 120.00	190	\$ 22,800.00
403.12	Hot Bituminous Pavement, Hand Method	Ton	\$ 220.00	70	\$ 15,400.00
410.22	Asphalt Emulsion for Tack Coat	Gal	\$ 8.00	90	\$ 720.00
Incidental Construction					
603.00215	15" R.C. Pipe 2000D	LF	\$ 125.00	80	\$ 10,000.00
604.124	Catch Basins Type B, 4-Foot Diameter	Unit	\$ 4,000.00	3	\$ 12,000.00
604.4	Reconstructing/Adjusting Catch Basins	Unit	\$ 750.00	5	\$ 3,750.00
604.62	Drain Manhole Cover and Frame	EA	\$ 700.00	3	\$ 2,100.00
608.24	4" Concrete Sidewalk	SY	\$ 50.00	620	\$ 31,000.00
608.54	Detectable Warning Plates	SY	\$ 500.00	6	\$ 3,000.00
609.01	Straight Granite Curb	LF	\$ 60.00	1,210	\$ 72,600.00
615.024	Relocating Traffic Sign Type B	EA	\$ 600.00	5	\$ 3,000.00
619.1	Maintenance of Traffic	Unit	\$ 1.00	16000	\$ 16,000.00
625	Light Pole Bases	EA	\$ 4,000.00	1	\$ 4,000.00
625.52	Light Pole	EA	\$ 5,000.00	1	\$ 5,000.00
628.2	Sawed Bituminous Pavement	LF	\$ 4.00	2500	\$ 10,000.00
632.3104	Retroreflect. Thermoplas. Pav. Marking, 4" Line	LF	\$ 0.50	270	\$ 135.00
632.02	Retroreflective Paint Pavement Marking, Symbol or Word	SF	\$ 3.00	160	\$ 480.00
637.1	Granite Steps	LF	\$ 250.00	20	\$ 5,000.00
645.531	Silt Fence	LF	\$ 5.00	900	\$ 4,500.00
646.31	Turf Establishment with Mulch and Tackifiers	SY	\$ 7.00	710	\$ 4,970.00
692	Mobilization	Unit	\$ 1.00	32000	\$ 32,000.00
698.13	Field Office Type C	Mo.	\$ 2,000.00	8	\$ 16,000.00
699	Miscellaneous Temporary Erosion and Sediment Controls	\$	\$ 15,000.00	1	\$ 15,000.00
1008.4	Reset or Relocate Utilities (1 Stub Pole + 1 Hydrant)	EA	\$ 7,500.00	2	\$ 15,000.00
				US-302 (Main Street) Sidewalk Improvements, Bethlehem, NH	
				Minor Item Allowance (15%)	\$ 59,000.00
				2023 Base Estimate	\$ 450,000.00
				2023 Construction Engineering (25%)	\$ 113,000.00
				Contingency	10%
				2023 Construction Cost (CON)	\$ 608,000.00
				2023 Prelim. Engineering (25% PE)	\$ 152,000.00
				2023 Right-of-way (ROW)	\$ 5,000.00
				2023 Total Project Cost	\$ 765,000.00