Brunswick Town Council
Workshop Agenda
October 15, 2020
6:30 pm
MEETING VIA ELECTRONIC DEVICES

THIS MEETING IS BEING CONDUCTED VIA ELECTRONIC DEVICES
WITH TOWN COUNCIL MEMBERS PARTICIPATING FROM REMOTE LOCATIONS

THERE IS NO OPPORTUNITY FOR THE PUBLIC TO VIEW THIS MEETING IN PERSON.
THE PUBLIC CAN VIEW OR LISTEN TO THE MEETING ON TV3 (Channel 3 on Comcast) or VIA LIVE STREAM FROM THE TOWN'S WEBSITE
http://tv3hd.brunswickme.org/CablecastPublicSite/watch/1?channel=1

HOW TO SUBMIT PUBLIC COMMENT

Public Comments must be submitted through the Zoom platform by dialing **+1 646 876 9923** and entering the Meeting ID number **886 9294 8810** and the password **444053** when prompted. Please be advised message and data rates may apply.

1. The Town Council will discuss the Downtown Streetscape Enhancement Project, and will take any appropriate action.

DISCUSSION

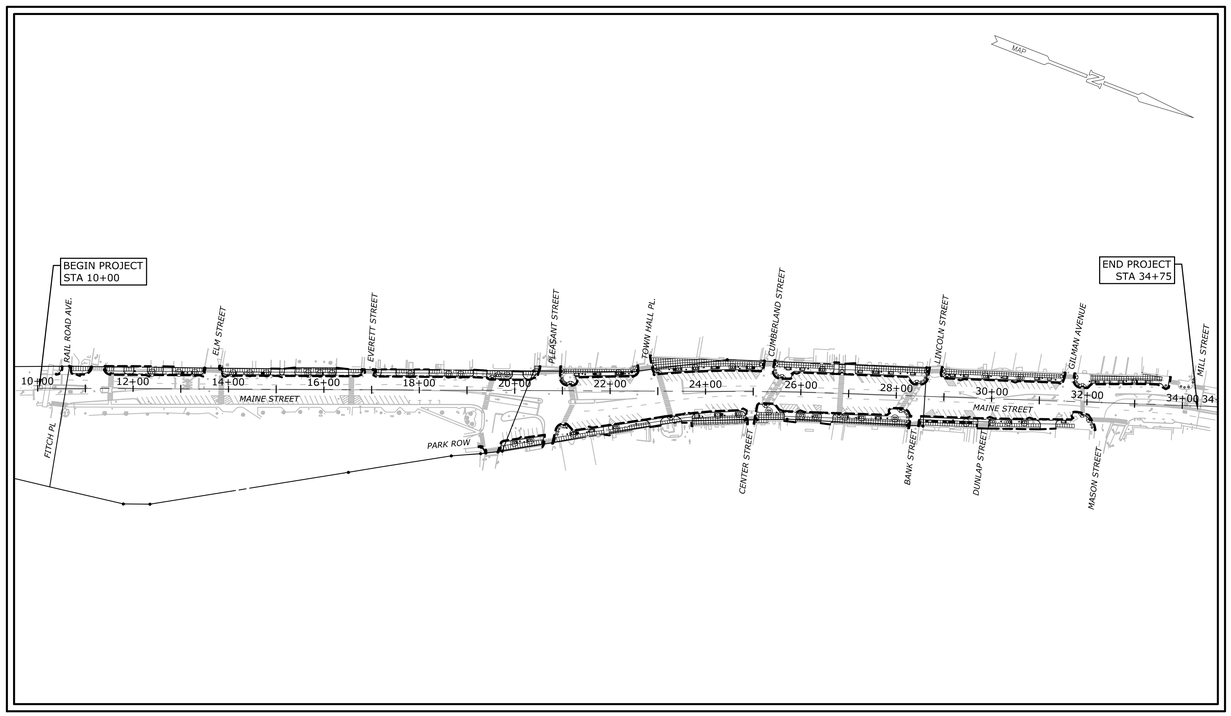
INDIVIDUALS NEEDING AUXILIARY AIDS FOR EFFECTIVE COMMUNICATION SHOULD CONTACT THE TOWN MANAGER'S OFFICE AT 725-6659 (TDD 725-5521)

To email Town Council: towncouncil@brunswickme.org

BRUNSWICK STREETSCAPE ENHANCEMENT PROJECT

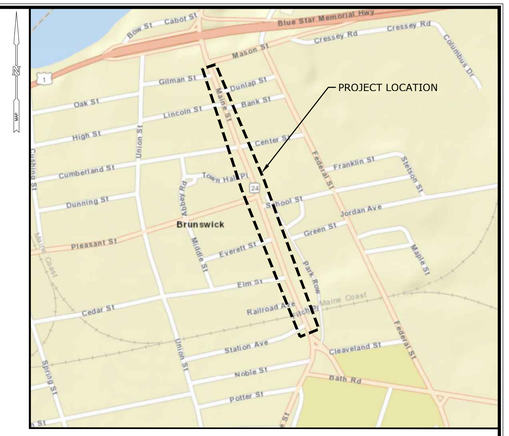
MAINE STREET
BRUNSWICK, MAINE

REGULATORY DRAWINGS
MAY 22, 2020



PROJECT SITE VICINITY MAP:

0' 75' 150'
0 1/2" 1"
SCALE 1" = 150'



LOCATION MAP:

0' 300' 600'
0 1/2" 1"
SCALE 1" = 600'

PREPARED FOR:

RYAN BARNES
TOWN OF BRUNSWICK
85 UNION STREET
BRUNSWICK, ME 04011

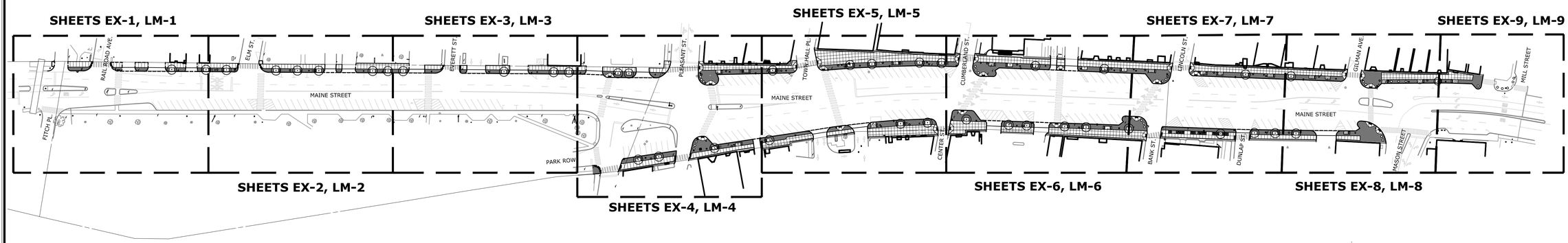
LIST OF DRAWINGS

NO.	NAME	TITLE
01	--	TITLE SHEET
02	IN	INDEX PLAN
03 - 11	EX-1 - EX-9	EXISTING CONDITIONS
12 - 20	LM-1 - LM-9	SITE PLAN - LAYOUT AND MATERIALS
21 - 23	SD-1 - SD-3	SITE DETAILS

PREPARED BY:

MILONE & MACBROOM
121 MIDDLE STREET, SUITE 201
PORTLAND, ME 04101
207.541.9544
WWW.MMINC.COM

811
Know what's below.
Call before you dig.
www.digsafe.com



GENERAL NOTES

1. BOUNDARY INFORMATION IS BASED UPON FIELD SURVEY CONDUCTED BY: XXXX COMPANY, TAKEN FROM A MAP ENTITLED XXXXX PREPARED FOR XXXXXX AT A SCALE OF X"=XX', DATED: XXXXX
2. INFORMATION REGARDING THE LOCATION OF EXISTING UTILITIES HAS BEEN BASED UPON AVAILABLE INFORMATION AND MAY BE INCOMPLETE, AND WHERE SHOWN SHOULD BE CONSIDERED APPROXIMATE. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "CALL BEFORE YOU DIG", 1-800-922-4455. ALL UTILITY LOCATIONS THAT DO NOT MATCH THE VERTICAL OR HORIZONTAL CONTROL SHOWN ON THE PLANS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.
3. MILONE & MACBROOM INC. ACCEPTS NO RESPONSIBILITY FOR THE ACCURACY OF MAPS AND DATA WHICH HAVE BEEN SUPPLIED BY OTHERS.
4. ALL UTILITY SERVICES ARE TO BE UNDERGROUND. THE EXACT LOCATION AND SIZE OF ELECTRIC, TELEPHONE, CABLE TELEVISION AND GAS ARE TO BE DETERMINED BY THE RESPECTIVE UTILITY COMPANIES.
5. ALL DIMENSIONS AND ELEVATIONS SHALL BE VERIFIED IN THE FIELD PRIOR TO CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
6. SEDIMENT AND EROSION CONTROL MEASURES AS DEPICTED ON THESE PLANS AND DESCRIBED WITHIN THE SEDIMENT AND EROSION CONTROL NARRATIVE SHALL BE IMPLEMENTED AND MAINTAINED UNTIL PERMANENT COVER AND STABILIZATION IS ESTABLISHED. ALL SEDIMENT AND EROSION CONTROL MEASURES SHALL CONFORM TO THE "MAINE EROSION AND SEDIMENT CONTROL GUIDELINES FOR CONTRACTORS - 2014", AND IN ALL CASES BEST MANAGEMENT PRACTICES SHALL PREVAIL.
7. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATE FINISHED GRADE.
8. ALL CONSTRUCTION MATERIALS AND METHODS SHALL CONFORM TO THE TOWN OF BRUNSWICK REQUIREMENTS AND TO THE APPLICABLE SECTIONS OF THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS, BRIDGES, AND INCIDENTAL CONSTRUCTION, FORM 816 AND ADDENDUMS
9. ALL GUTTERS, ROOF DRAINS AND FOUNDATION DRAINS SHALL BE TIED INTO THE PROPOSED STORM DRAINAGE SYSTEM.
10. THE PLANS REQUIRE A CONTRACTOR'S WORKING KNOWLEDGE OF LOCAL, MUNICIPAL, WATER AUTHORITY, AND STATE CODES FOR UTILITY SYSTEMS. ANY CONFLICTS BETWEEN MATERIALS AND LOCATIONS SHOWN, AND LOCAL REQUIREMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE EXECUTION OF WORK. THE ENGINEER WILL NOT BE HELD LIABLE FOR COSTS INCURRED TO IMPLEMENT OR CORRECT WORK WHICH DOES N0T CONFORM TO LOCAL CODE.
11. ALL FUEL, OIL, PAINT, OR OTHER HAZARDOUS MATERIALS SHOULD BE STORED IN A SECONDARY CONTAINER AND REMOVED TO A LOCKED INDOOR AREA WITH AN IMPERVIOUS FLOOR DURING NON-WORK HOURS.
12. COMPLIANCE WITH THE PERMIT CONDITIONS IS THE RESPONSIBILITY OF BOTH THE CONTRACTOR AND THE PERMITTEE.

0' 40' 80'
0 1/2" 1"

MILONE & MACBROOM
121 MIDDLE STREET, SUITE 201
PORTLAND, ME 04101
207.543.9344
WWW.MMINC.COM

DESCRIPTION	DATE	BY

INDEX PLAN

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	JJM	DWD

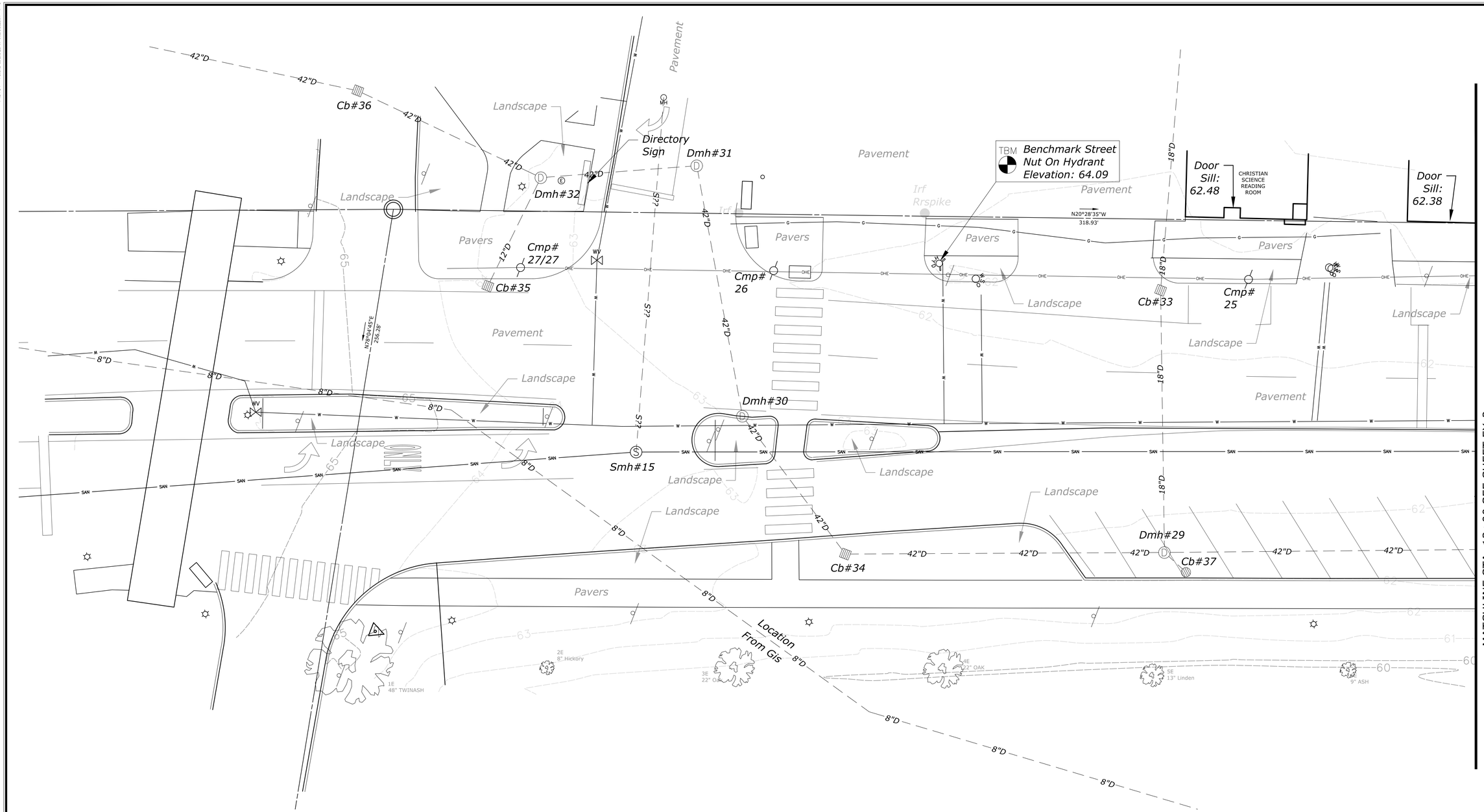
SCALE: 1"=80'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

02 OF 23

SHEET NAME: IN



EXISTING MATERIALS LEGEND

- IRON PIPE OR ROD FOUND
- MONUMENT FOUND
- UTILITY POLE
- MANHOLE
- ELECTRIC METER
- SIGN
- CATCH BASIN
- HYDRANT
- WATER VALVE
- WATER SHUT OFF
- TELEPHONE MANHOLE
- FENCE
- BIKE RACK
- TRASH RECEPTACLE
- CURB
- OVERHEAD WIRES
- WATER LINE
- STORM PIPE
- SANITARY SEWER
- MAJOR CONTOUR
- MINOR CONTOUR
- TREE
- STUMP

EXISTING LIGHTING LEGEND

- EXISTING PEDESTRIAN LIGHT
- COBRA HEAD
- SHOE BOX FIXTURE
- GOOSENECK POLE LIGHT
- CROSSING SIGNAL
- TRAFFIC LIGHT

MILONE & MACBROOM
131 MIDDLE STREET, SUITE 201
PORTLAND, ME 04101
207.541.9544
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DESCRIPTION	DATE	BY

EXISTING CONDITIONS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	JJM	DWD

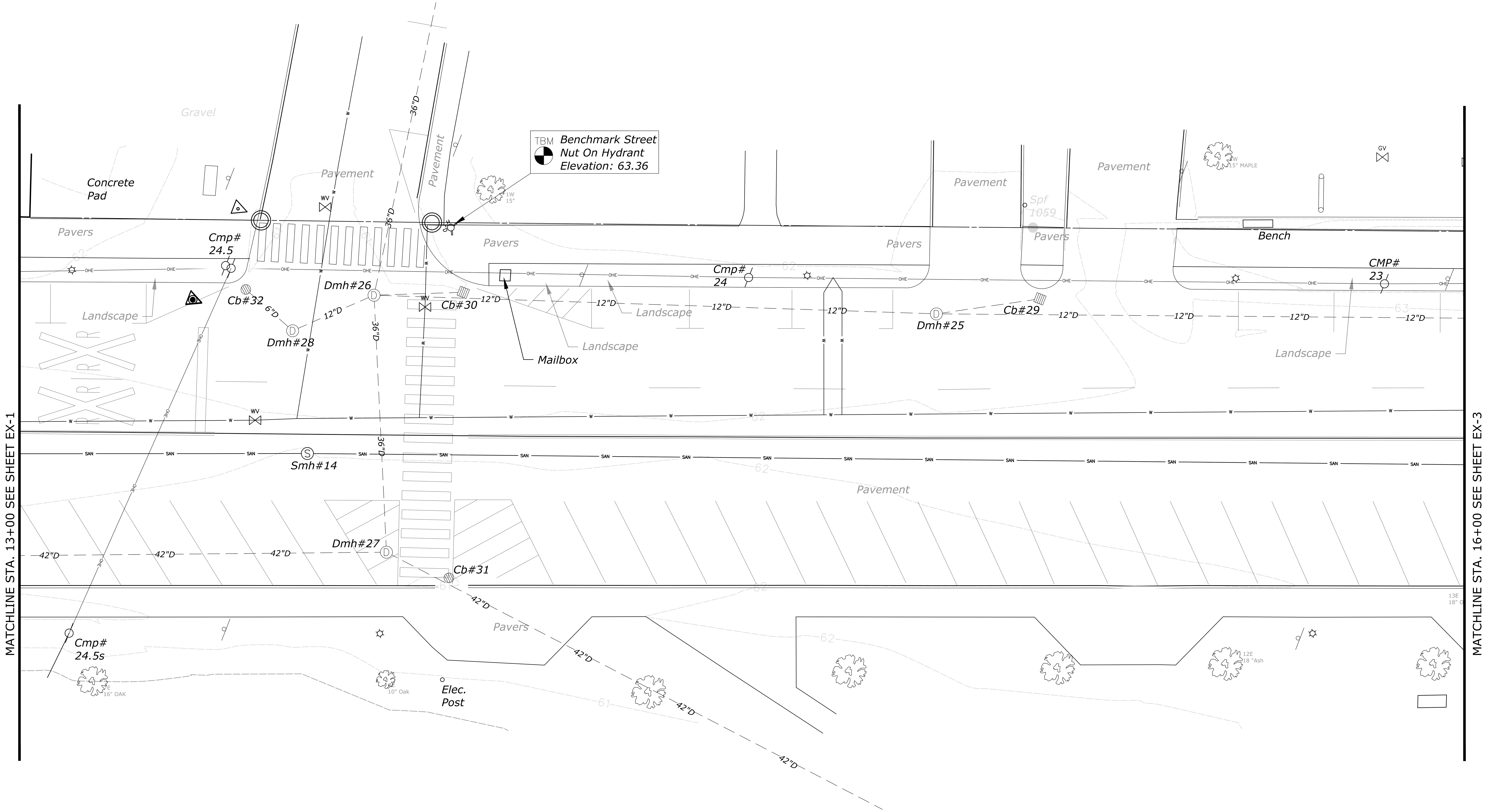
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

03 OF 23

SHEET NAME: EX-1



EXISTING MATERIALS LEGEND

- IRON PIPE OR ROD FOUND
- MONUMENT FOUND
- UTILITY POLE
- MANHOLE
- EM ELECTRIC METER
- SIGN
- CATCH BASIN
- HYDRANT
- WV WATER VALVE
- WSO WATER SHUT OFF
- TELEPHONE MANHOLE
- FENCE
- BR BIKE RACK
- TR TRASH RECEPTACLE
- CURB
- OHW OVERHEAD WIRES
- W WATER LINE
- 12"D STORM PIPE
- SAN SANITARY SEWER
- 70 MAJOR CONTOUR
- 68 MINOR CONTOUR
- TREE
- STUMP

EXISTING LIGHTING LEGEND

- EXISTING PEDESTRIAN LIGHT
- COBRA HEAD
- SHOE BOX FIXTURE
- GOOSENECK POLE LIGHT
- CROSSING SIGNAL
- TRAFFIC LIGHT

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DESCRIPTION	DATE	BY

EXISTING CONDITIONS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

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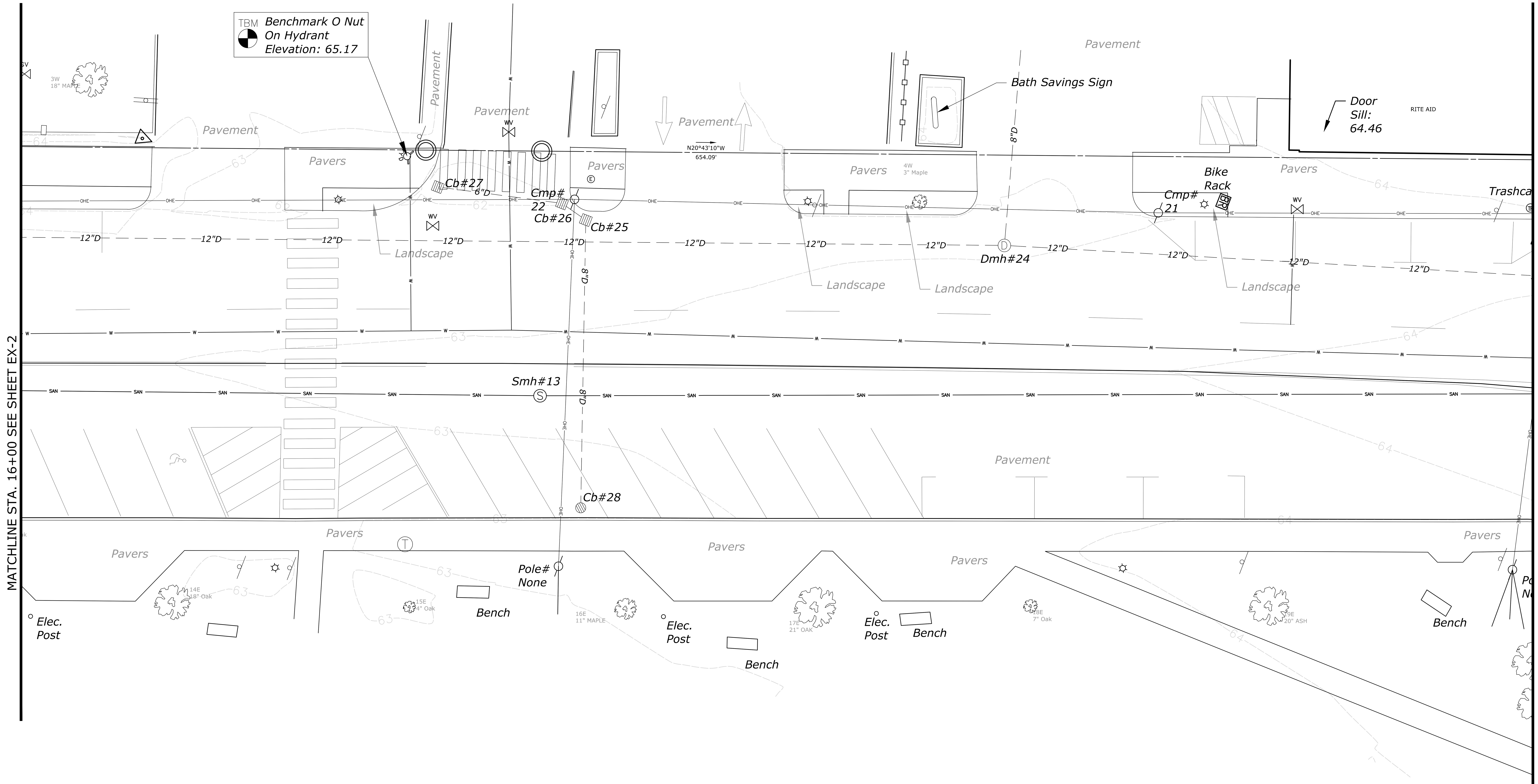
SHEET NAME: **EX-2**



EXISTING MATERIALS LEGEND

Symbol	Description	Symbol	Description
●	IRON PIPE OR ROD FOUND		FENCE
■	MONUMENT FOUND	BR	BIKE RACK
	UTILITY POLE	TR	TRASH RECEPTACLE
○	MANHOLE		CURB
EM	ELECTRIC METER	OHW	OVERHEAD WIRES
	SIGN	W	WATER LINE
	CATCH BASIN	12"D	STORM PIPE
	HYDRANT	SAN	SANITARY SEWER
WV	WATER VALVE	70	MAJOR CONTOUR
WSO	WATER SHUT OFF	68	MINOR CONTOUR
T	TELEPHONE MANHOLE		TREE
			STUMP

EXISTING LIGHTING LEGEND

- EXISTING PEDESTRIAN LIGHT
- COBRA HEAD
- SHOE BOX FIXTURE
- GOOSENECK POLE LIGHT
- CROSSING SIGNAL
- TRAFFIC LIGHT

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DESCRIPTION	DATE	BY

EXISTING CONDITIONS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

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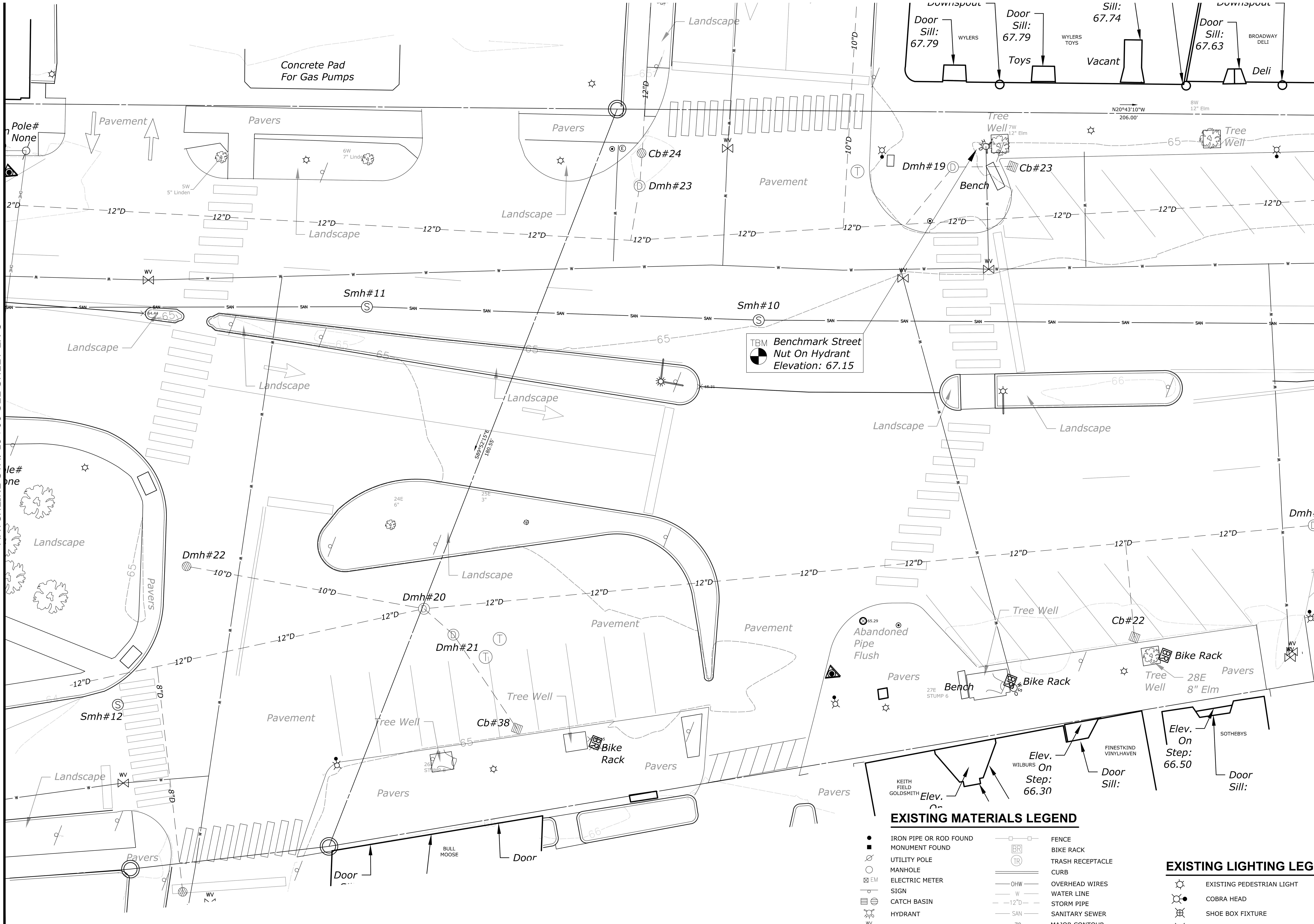
SHEET NAME: **EX-3**



EXISTING MATERIALS LEGEND

- IRON PIPE OR ROD FOUND
- MONUMENT FOUND
- UTILITY POLE
- MANHOLE
- ELECTRIC METER
- SIGN
- CATCH BASIN
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- MINOR CONTOUR
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- STUMP

EXISTING LIGHTING LEGEND

- EXISTING PEDESTRIAN LIGHT
- COBRA HEAD
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- CROSSING SIGNAL
- TRAFFIC LIGHT

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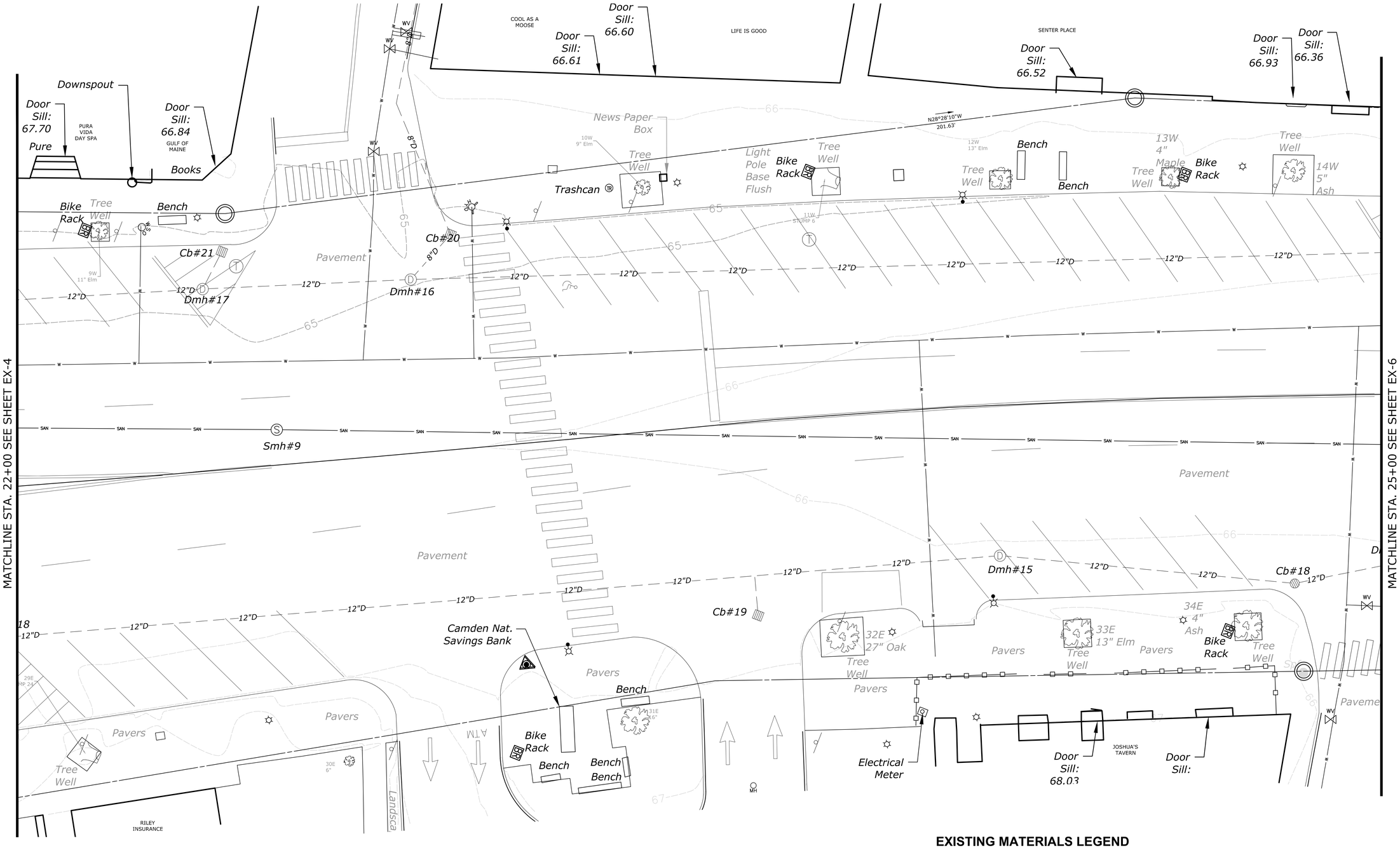
DESCRIPTION	DATE	BY

EXISTING CONDITIONS
DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT
MAINE STREET
BRUNSWICK, MAINE

DWD	GB	DWD
DESIGNED	DRAWN	CHECKED

SCALE: 1"=10'
DATE: MAY 22, 2020
PROJECT NO.: 3516-11
06 OF 23
SHEET NAME: **EX-4**



EXISTING MATERIALS LEGEND

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EXISTING CONDITIONS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

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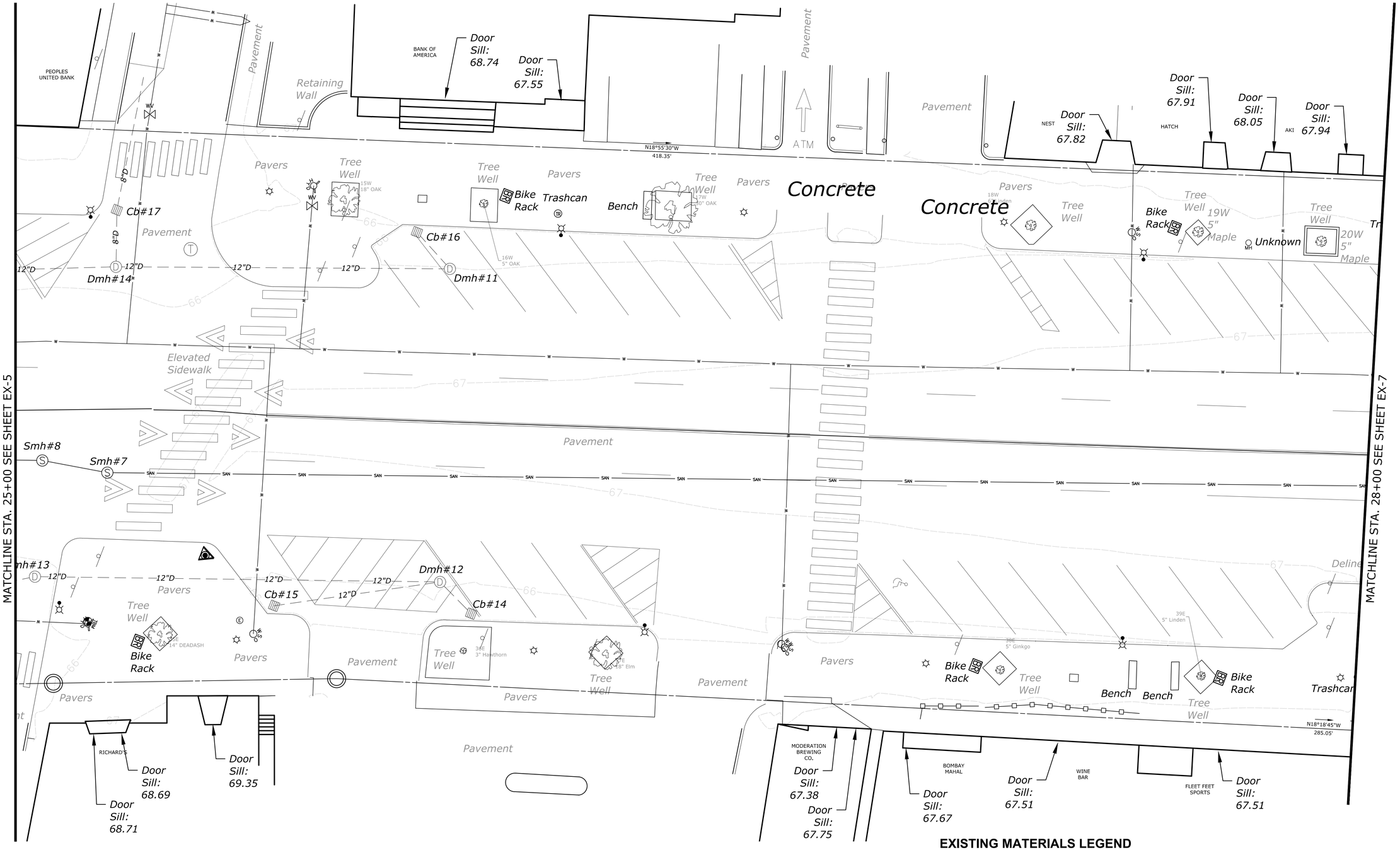
SHEET NAME: EX-5



EXISTING MATERIALS LEGEND

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EXISTING LIGHTING LEGEND

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EXISTING CONDITIONS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DWD	GB	DWD
DESIGNED	DRAWN	CHECKED

1"=10'
SCALE

MAY 22, 2020
DATE

3516-11
PROJECT NO.

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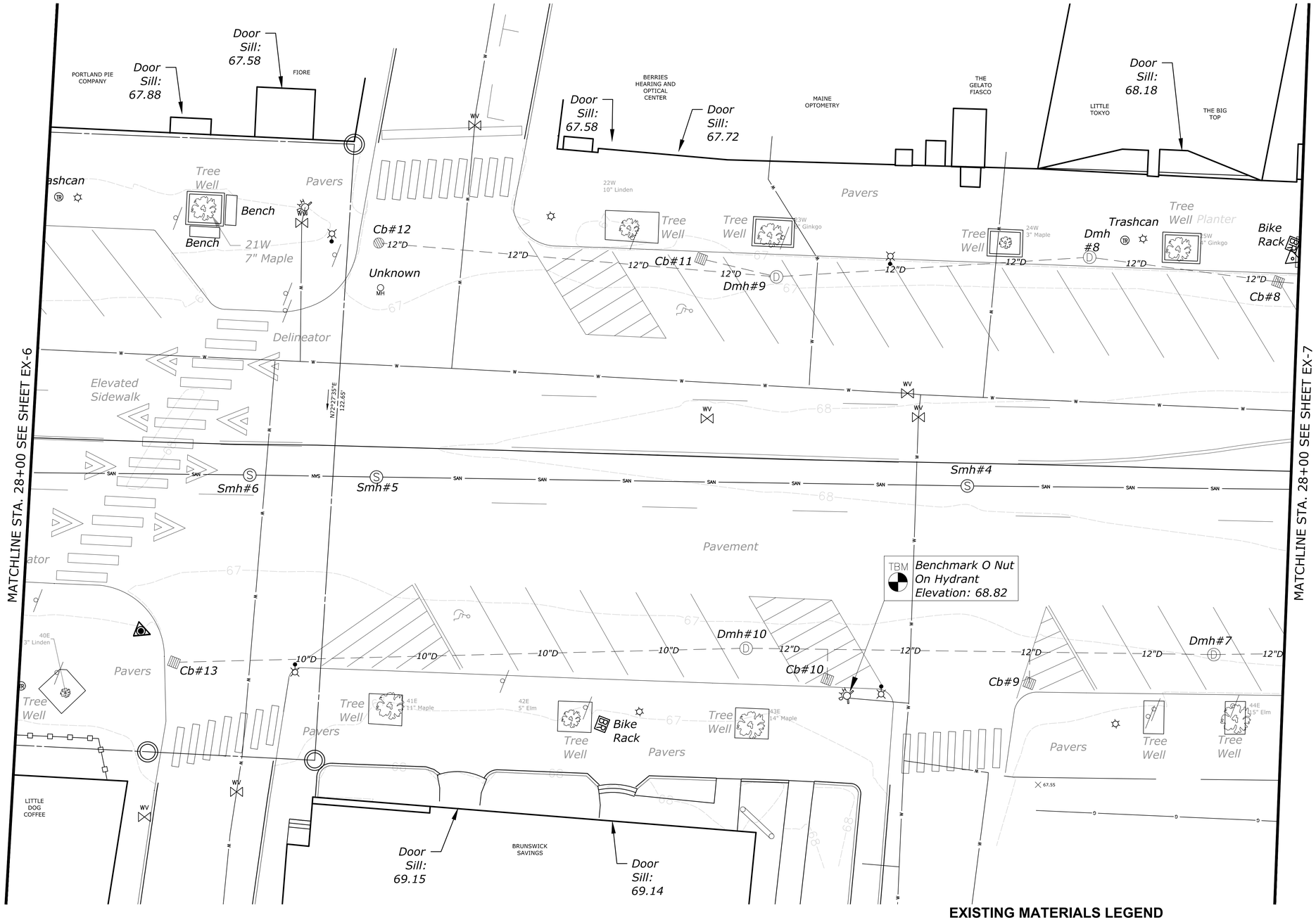
EX-6
SHEET NAME



EXISTING MATERIALS LEGEND

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DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

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BRUNSWICK, MAINE

DWD	GB	DWD
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SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

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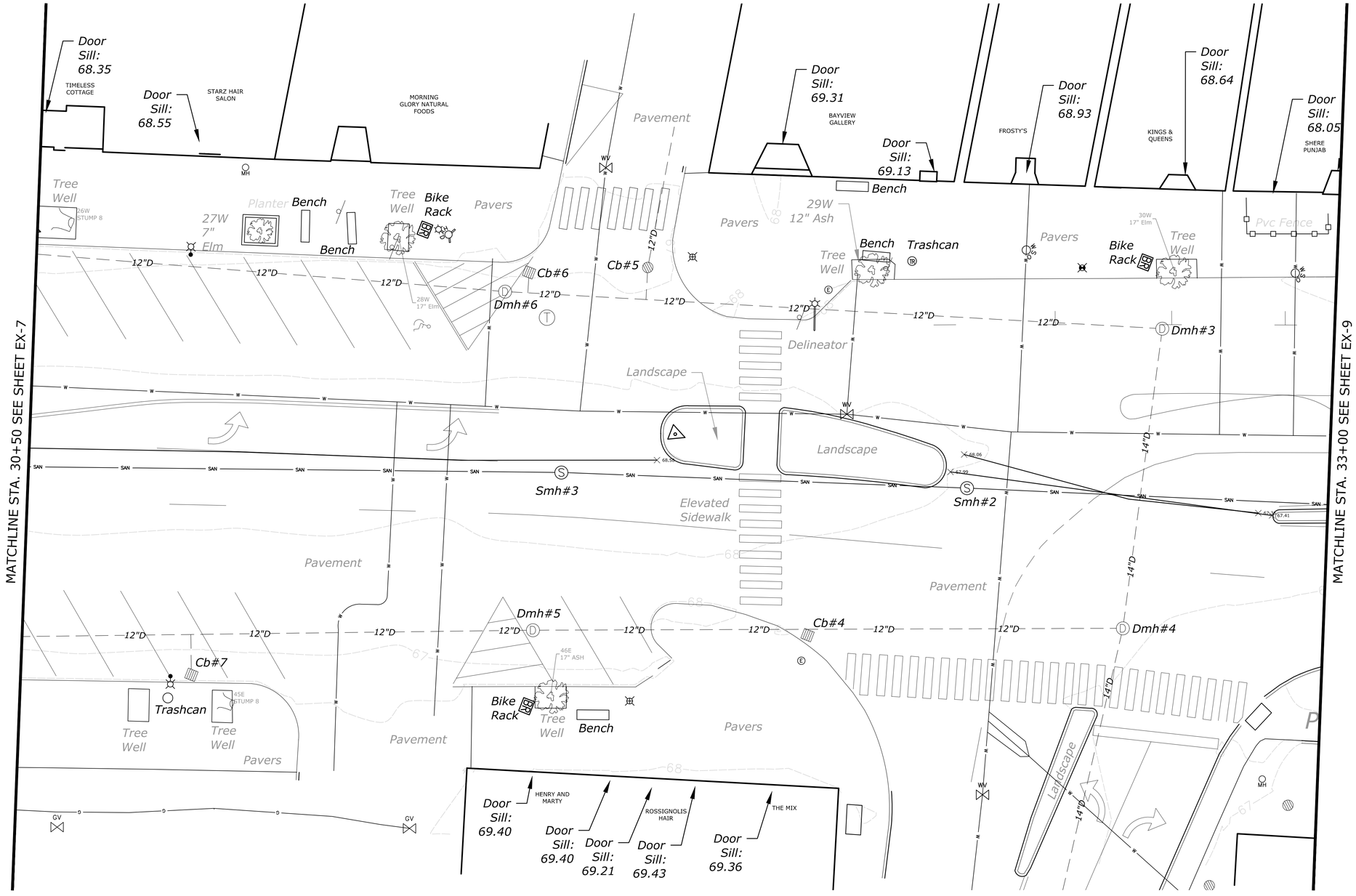
SHEET NAME: EX-7



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EXISTING CONDITIONS

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DWD	GB	DWD

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DATE: MAY 22, 2020

PROJECT NO.: 3516-11

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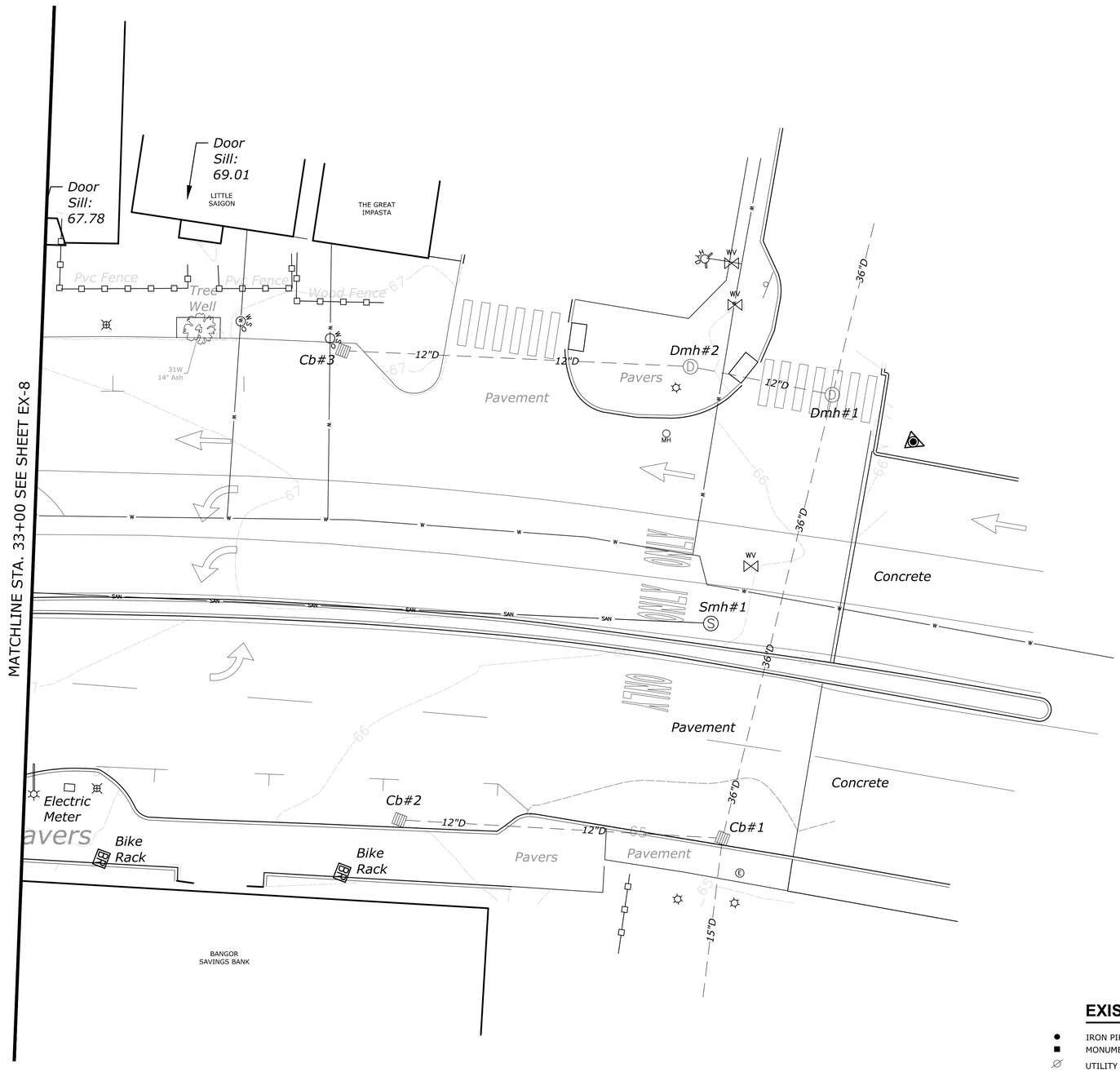
SHEET NAME: EX-8



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EXISTING LIGHTING LEGEND

- EXISTING PEDESTRIAN LIGHT
- COBRA HEAD
- SHOE BOX FIXTURE
- GOOSENECK POLE LIGHT
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0' 5' 10'
0 1/2" 1"

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BRUNSWICK, MAINE

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DWD	GB	DWD

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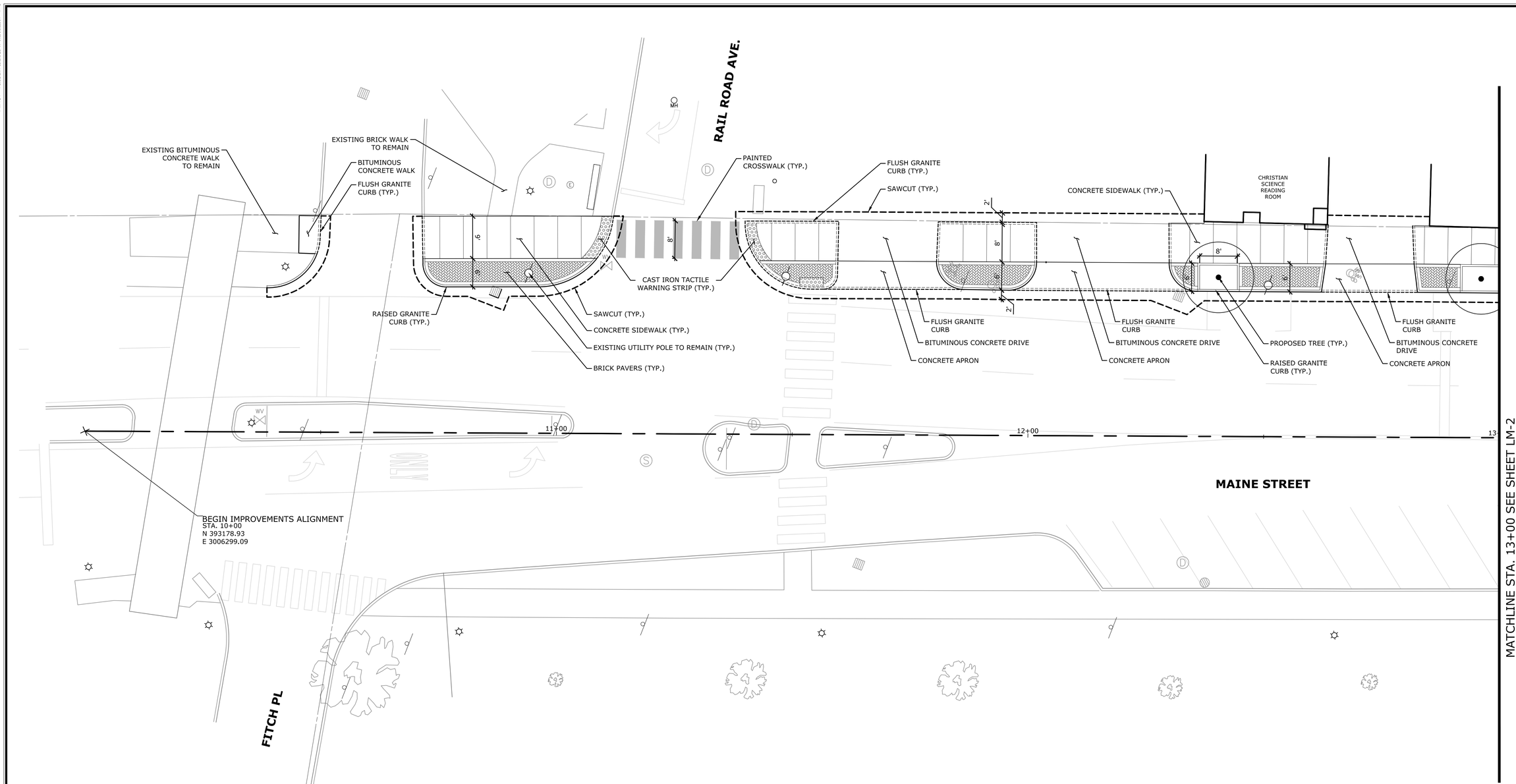
11 OF 23

SHEET NAME: EX-9



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN

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SITE PLAN- LAYOUT AND MATERIALS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

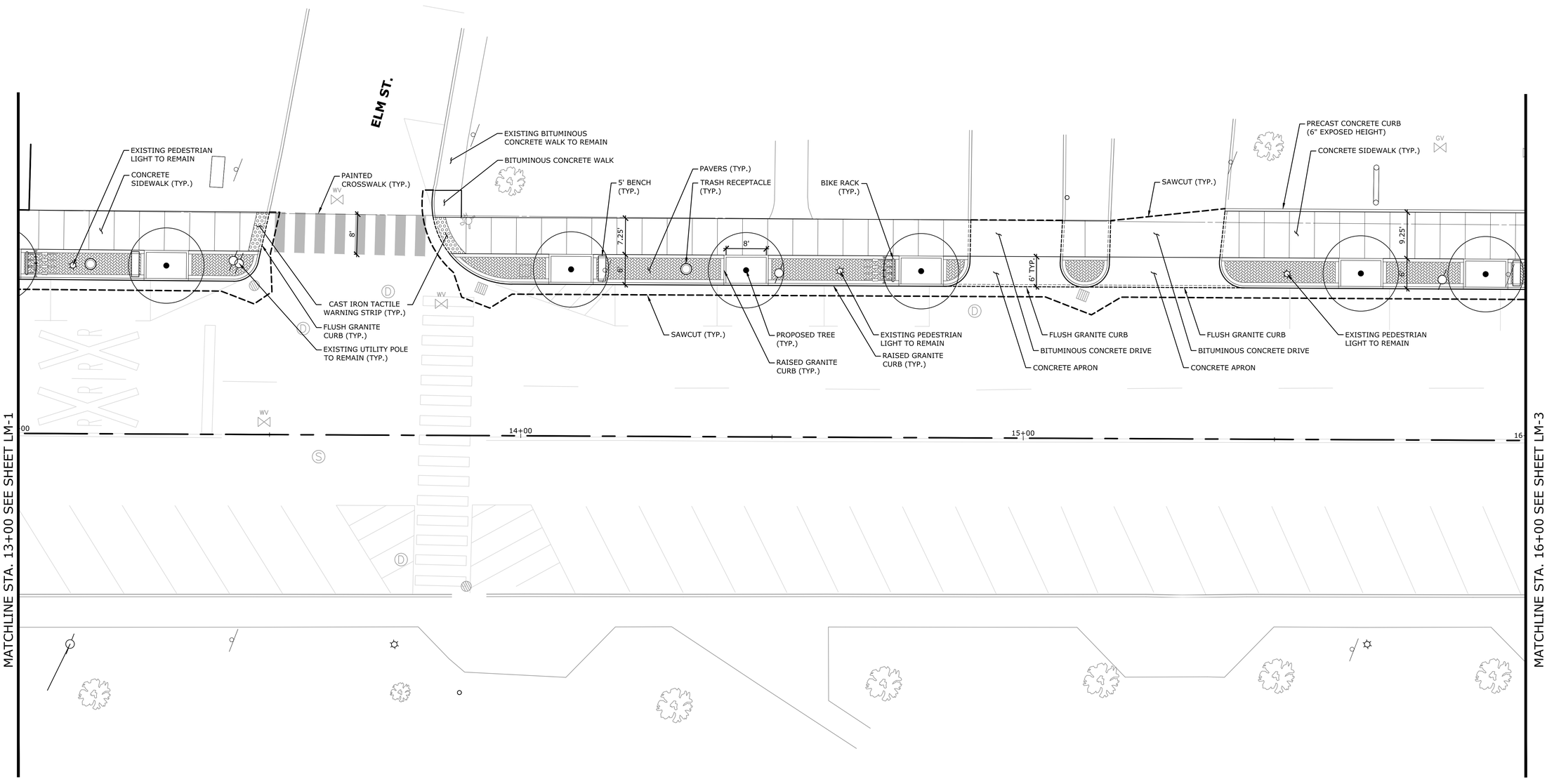
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

12 OF 23

SHEET NAME: LM-1



PROPOSED MATERIAL LEGEND

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SITE PLAN- LAYOUT AND MATERIALS

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DWD	GB	DWD
DESIGNED	DRAWN	CHECKED

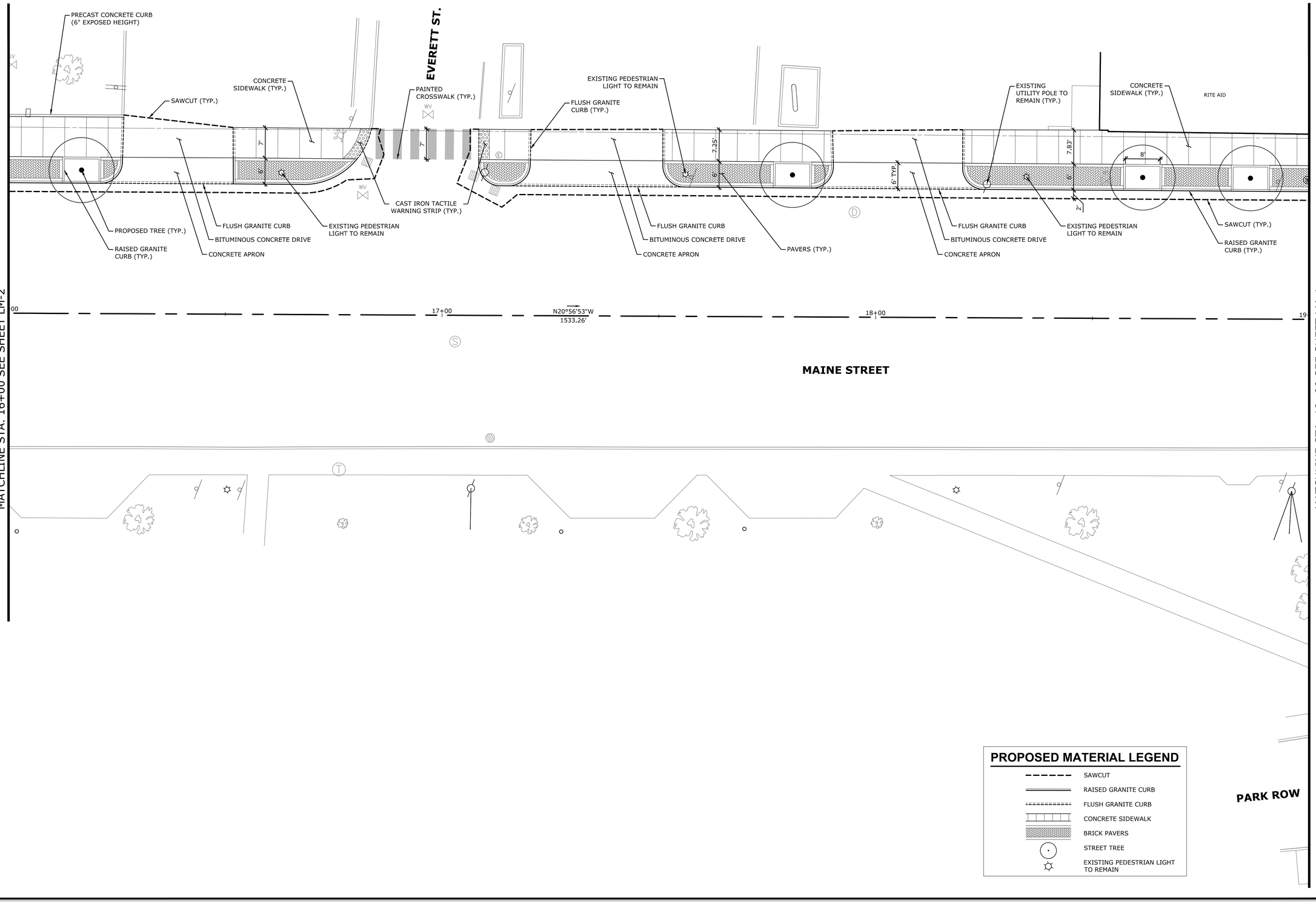
1"=10'
SCALE

MAY 22, 2020
DATE

3516-11
PROJECT NO.

13 OF 23

LM-2
SHEET NAME



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN

0' 5' 10'
0 1/2" 1"

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SITE PLAN- LAYOUT AND MATERIALS

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DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

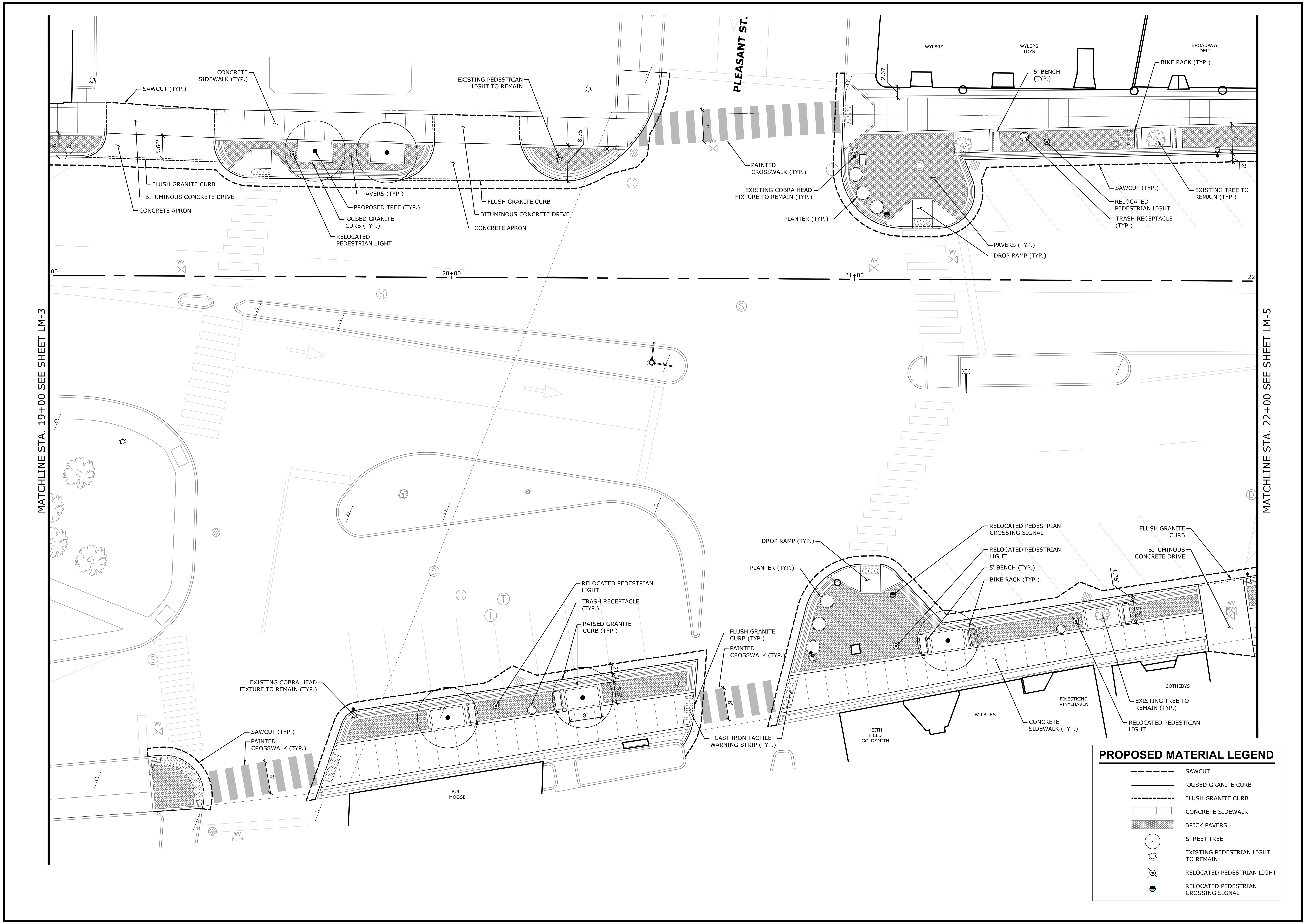
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

14 OF 23

SHEET NAME: **LM-3**


PLEASANT ST.
WYLERS
WYLERS TOYS
BROADWAY DELI
CONCRETE SIDEWALK (TYP.)
SAWCUT (TYP.)
EXISTING PEDESTRIAN LIGHT TO REMAIN
FLUSH GRANITE CURB
BITUMINOUS CONCRETE DRIVE
CONCRETE APRON
PAVERS (TYP.)
PROPOSED TREE (TYP.)
RAISED GRANITE CURB (TYP.)
RELOCATED PEDESTRIAN LIGHT
PAINTED CROSSWALK (TYP.)
EXISTING COBRA HEAD FIXTURE TO REMAIN (TYP.)
PLANTER (TYP.)
5' BENCH (TYP.)
BIKE RACK (TYP.)
SAWCUT (TYP.)
RELOCATED PEDESTRIAN LIGHT
TRASH RECEPTACLE (TYP.)
EXISTING TREE TO REMAIN (TYP.)
PAVERS (TYP.)
DROP RAMP (TYP.)
20+00
21+00
MATCHLINE STA. 19+00 SEE SHEET LM-3
MATCHLINE STA. 22+00 SEE SHEET LM-5
RELOCATED PEDESTRIAN CROSSING SIGNAL
RELOCATED PEDESTRIAN LIGHT
5' BENCH (TYP.)
BIKE RACK (TYP.)
FLUSH GRANITE CURB
BITUMINOUS CONCRETE DRIVE
DROP RAMP (TYP.)
PLANTER (TYP.)
RELOCATED PEDESTRIAN LIGHT
TRASH RECEPTACLE (TYP.)
RAISED GRANITE CURB (TYP.)
FLUSH GRANITE CURB (TYP.)
PAINTED CROSSWALK (TYP.)
EXISTING COBRA HEAD FIXTURE TO REMAIN (TYP.)
SAWCUT (TYP.)
PAINTED CROSSWALK (TYP.)
CAST IRON TACTILE WARNING STRIP (TYP.)
BULL MOOSE
KEITH FIELD GOLDSMITH
WILBURS
FINESTKIND VINYLHAVEN
SOTHEBYS
CONCRETE SIDEWALK (TYP.)
EXISTING TREE TO REMAIN (TYP.)
RELOCATED PEDESTRIAN LIGHT
PROPOSED MATERIAL LEGEND
SAWCUT
RAISED GRANITE CURB
FLUSH GRANITE CURB
CONCRETE SIDEWALK
BRICK PAVERS
STREET TREE
EXISTING PEDESTRIAN LIGHT TO REMAIN
RELOCATED PEDESTRIAN LIGHT
RELOCATED PEDESTRIAN CROSSING SIGNAL

MILONE & MACBROOM
121 MIDDLE STREET, SUITE 201
PORTLAND, ME 04101
207.541.9544
WWW.MMINC.COM

DESCRIPTION	DATE	BY

SITE PLAN- LAYOUT AND MATERIALS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

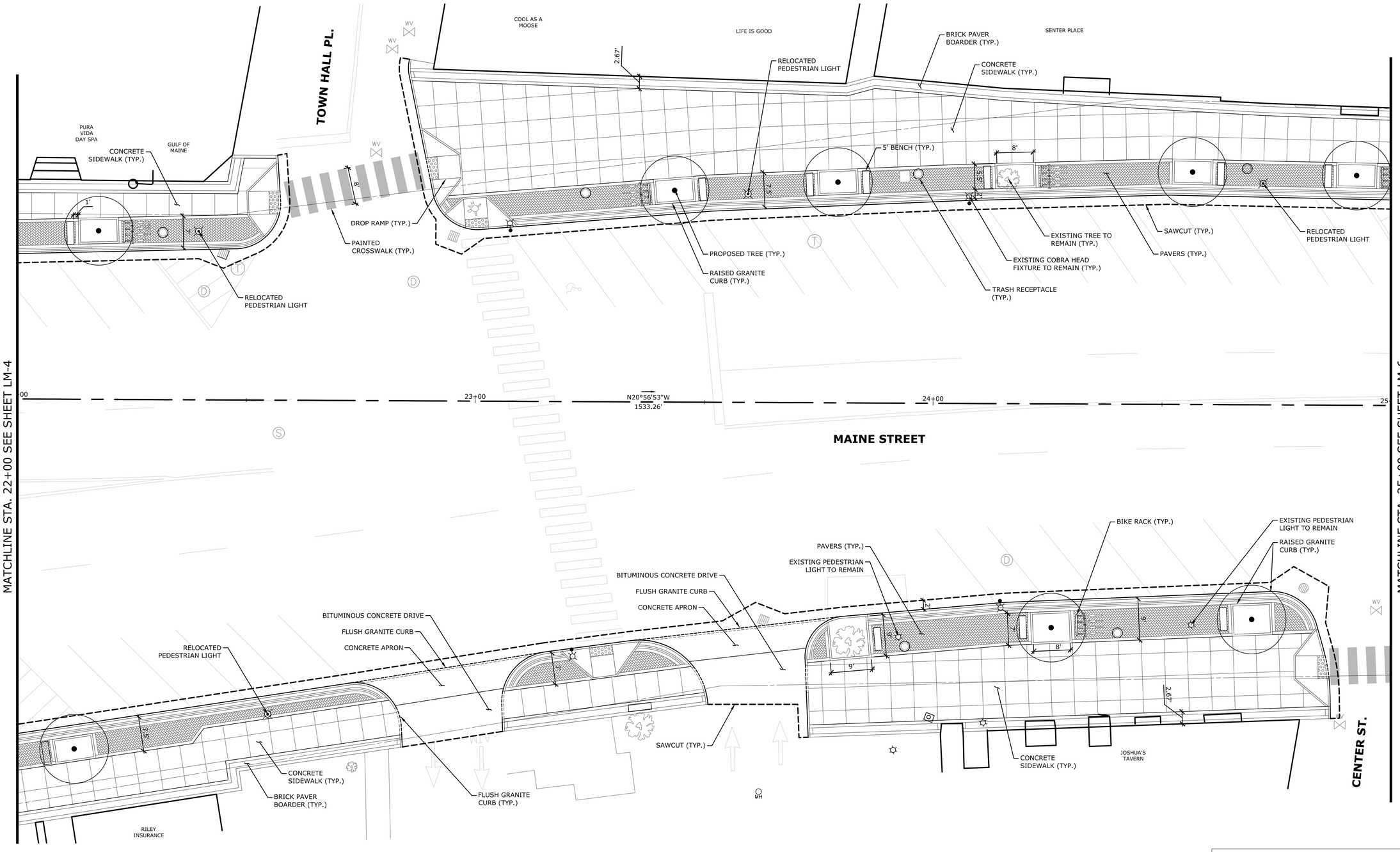
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

15 OF 23

SHEET NAME: LM-4



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN
- RELOCATED PEDESTRIAN LIGHT

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DESCRIPTION	DATE	BY

SITE PLAN- LAYOUT AND MATERIALS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

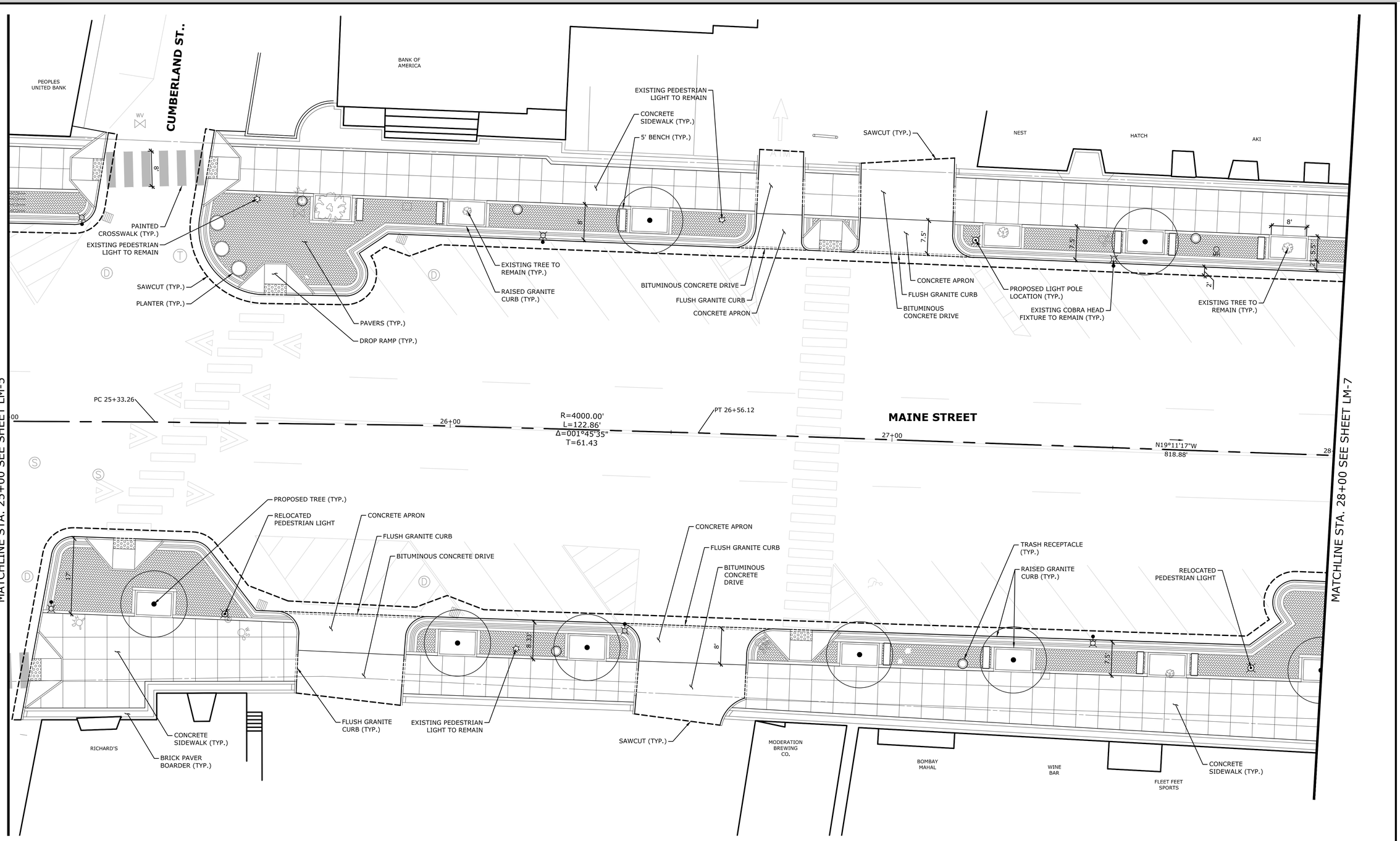
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

16 OF 23

SHEET NAME: LM-5



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN
- RELOCATED PEDESTRIAN LIGHT

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SITE PLAN- LAYOUT AND MATERIALS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

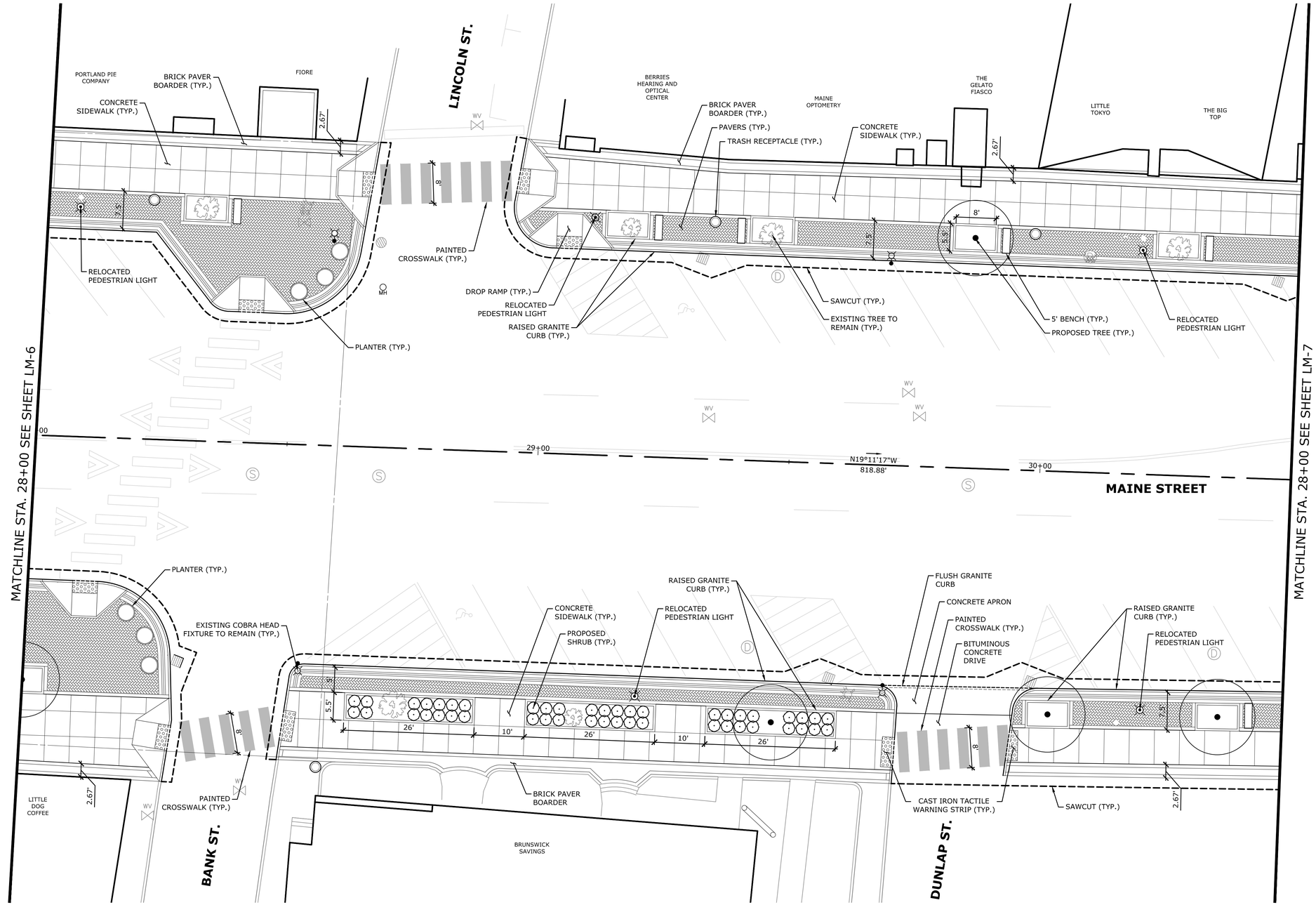
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

17 OF 23

SHEET NAME: LM-6



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN
- RELOCATED PEDESTRIAN LIGHT

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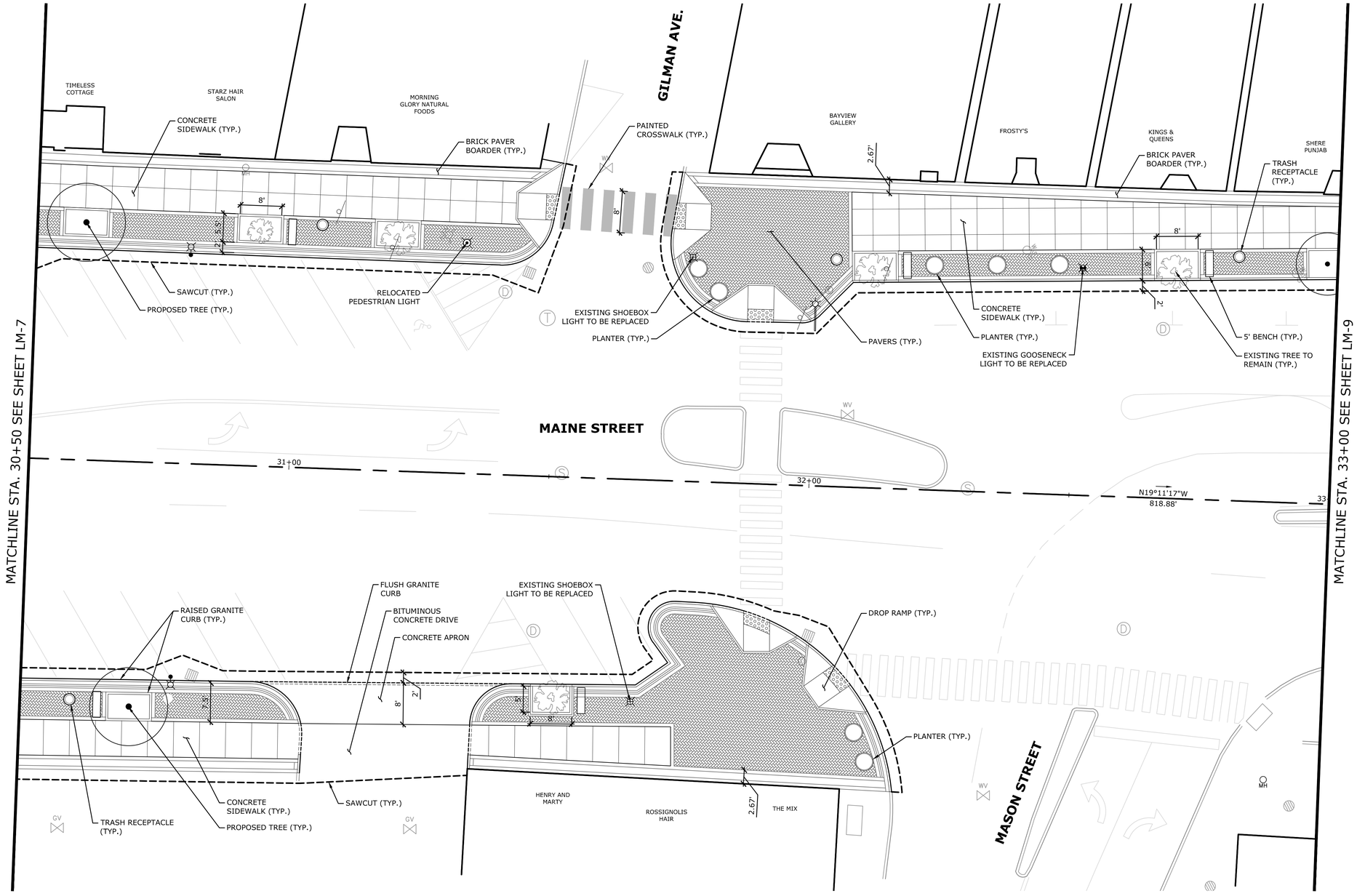
DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT
MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

SCALE: 1"=10'
DATE: MAY 22, 2020
PROJECT NO.: 3516-11
18 OF 23

SHEET NAME: LM-7



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN
- RELOCATED PEDESTRIAN LIGHT
- EXISTING SHOEBOX FIXTURE TO BE REPLACED
- EXISTING GOOSENECK FIXTURE TO BE REPLACED

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DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

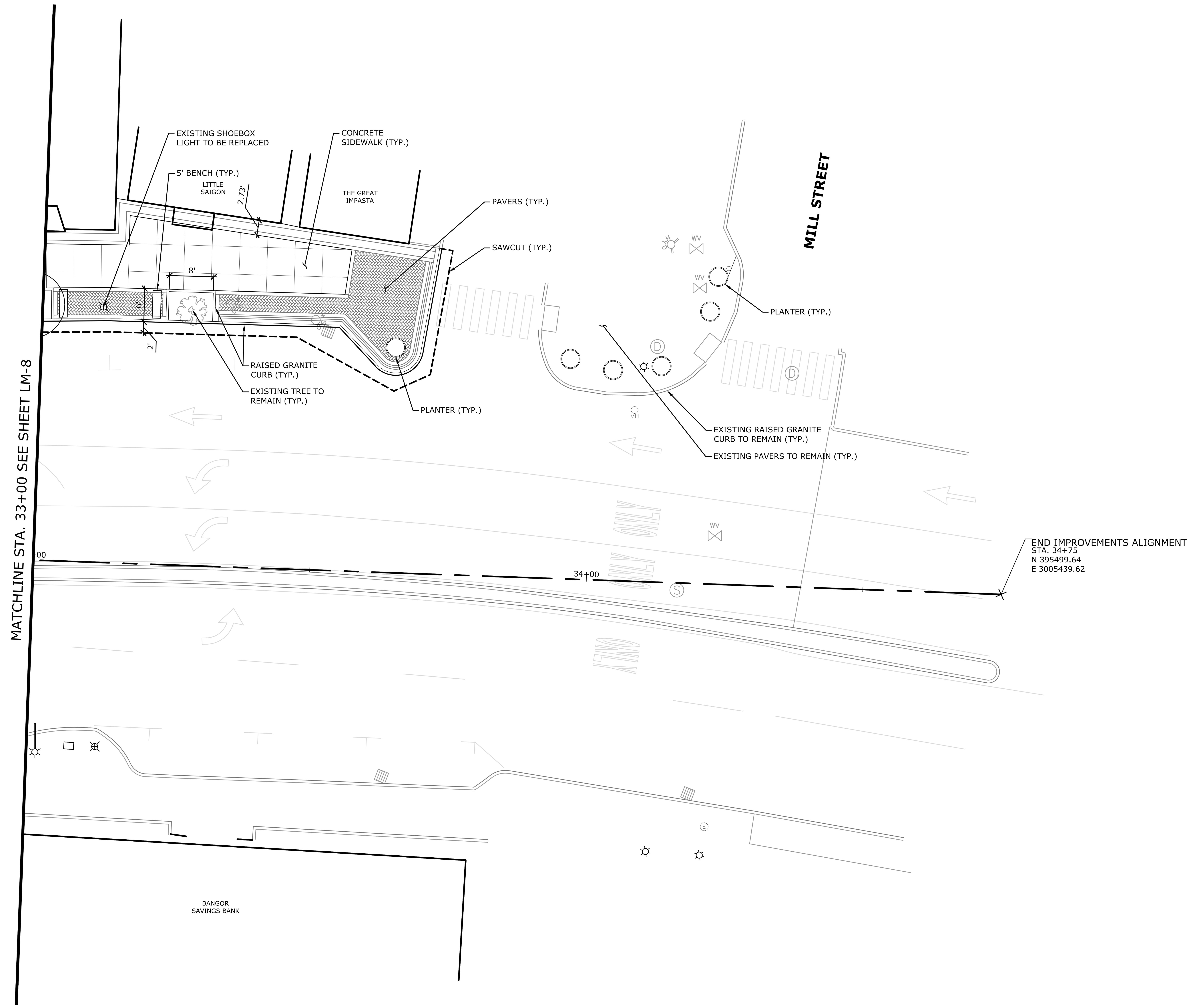
SCALE: 1"=10'

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

19 OF 23

SHEET NAME: LM-8



PROPOSED MATERIAL LEGEND

- SAWCUT
- RAISED GRANITE CURB
- FLUSH GRANITE CURB
- CONCRETE SIDEWALK
- BRICK PAVERS
- STREET TREE
- EXISTING PEDESTRIAN LIGHT TO REMAIN

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SITE PLAN- LAYOUT AND MATERIALS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	GB	DWD

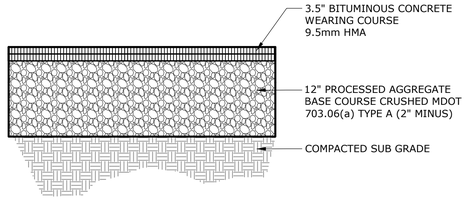
SCALE: 1"=10'

DATE: MAY 22, 2020

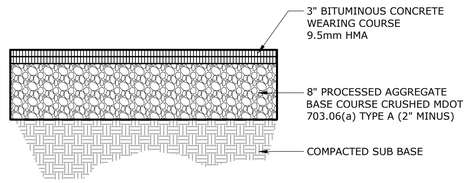
PROJECT NO.: 3516-11

20 OF 23

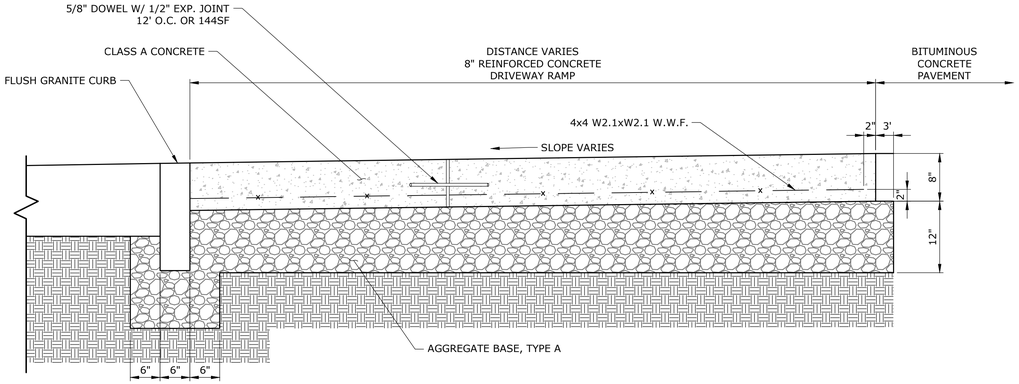
SHEET NAME: **LM-9**



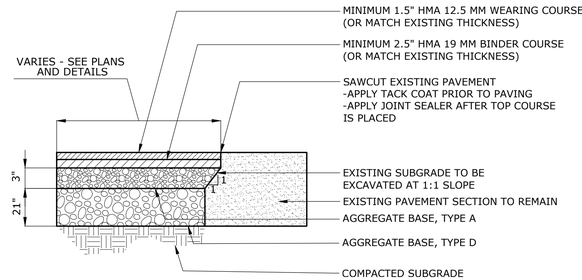
BITUMINOUS CONCRETE DRIVEWAY
NOT TO SCALE



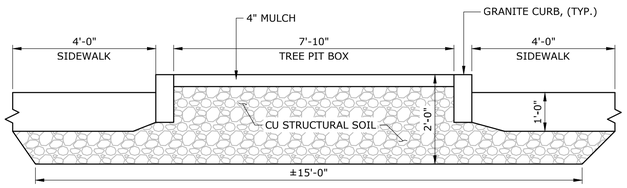
BITUMINOUS CONCRETE SIDEWALK
NOT TO SCALE



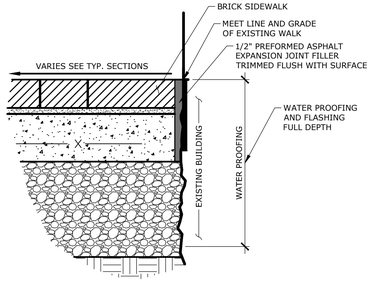
CONCRETE DRIVEWAY APRON
NOT TO SCALE



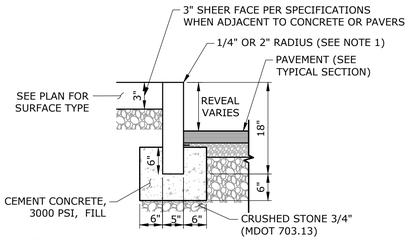
BITUMINOUS CONCRETE PAVEMENT REPAIR
NOT TO SCALE



TYPICAL SIDEWALK SECTION AT
TREE PIT & PARALLEL TO THE TRAVEL WAY
SCALE ½" = 1'



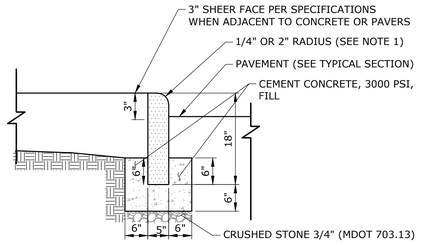
BRICK SIDEWALK AT BUILDING FACE
SCALE: 1"=6"



NOTES:

1. AT ALL JOINTS PROVIDE 4"x8-1/2" UNDERDRAIN FILTER FABRIC SET 1/2" BELOW TOP OF CURB SPANNING THE JOINT.

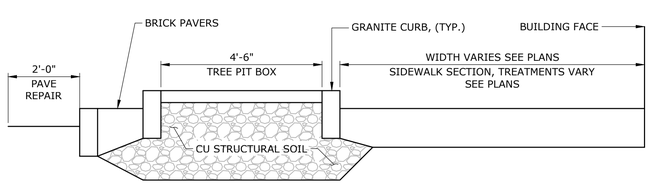
STRAIGHT GRANITE CURB
NOT TO SCALE



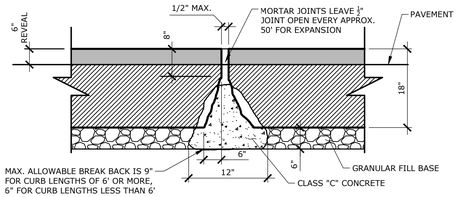
NOTES:

1. ALL RADIUS CURBING LESS THAN 15' RADIUS SHALL BE GROUND TO ACHIEVE 2" RADIUS ON STREET SIDE OF CURB, AND FEATHERED INTO ADJACENT STRAIGHT CURBING.
2. AT ALL JOINTS PROVIDE 4"x8-1/2" UNDERDRAIN FILTER FABRIC SET 1/2" BELOW TOP OF CURB SPANNING THE JOINT.

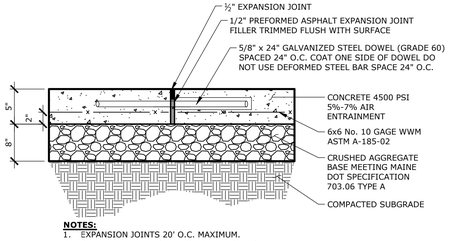
CURVED GRANITE CURBING
NOT TO SCALE



TYPICAL SIDEWALK SECTION AT
TREE PIT & PERPENDICULAR TO THE TRAVEL WAY
SCALE ½" = 1'

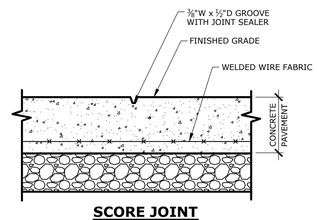


TYPICAL JOINT DETAIL FOR GRANITE CURBING
N.T.S.

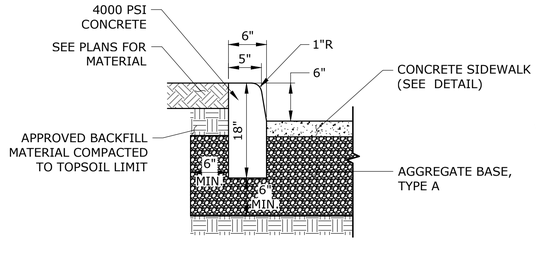


NOTES:
1. EXPANSION JOINTS 20' O.C. MAXIMUM.
2. GRANULAR FILL BASE IS TO EXTEND 6" PAST LINE OF CONCRETE WALK WHERE WALK DOES NOT ABUT A CURB OR STRUCTURE.
3. APPLY STIFF BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL
4. APPLY SALT GUARD TO FINISH

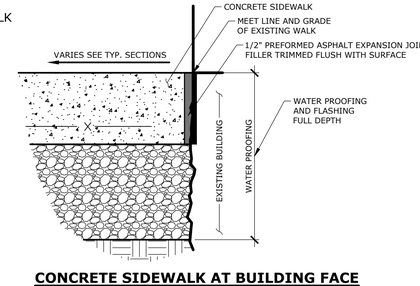
CONCRETE SIDEWALK
N.T.S.



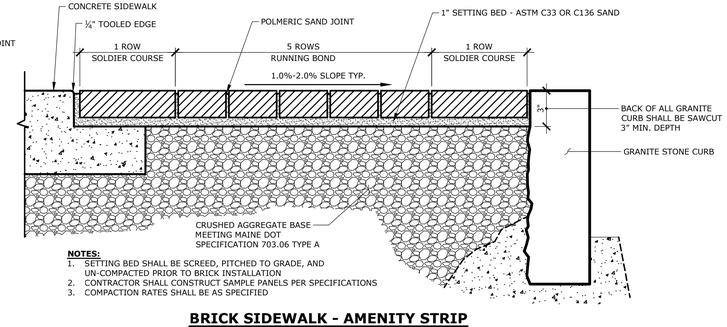
SCORE JOINT
N.T.S.



PRECAST CONCRETE CURB
NOT TO SCALE

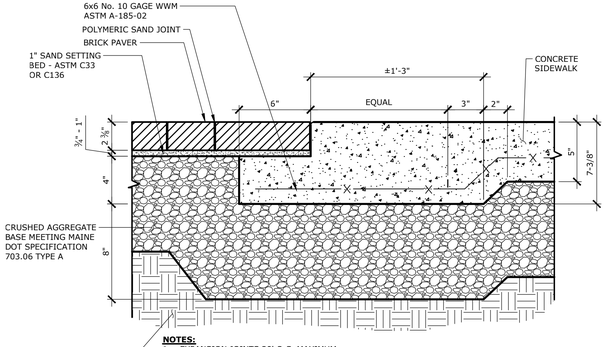


CONCRETE SIDEWALK AT BUILDING FACE
SCALE: 1"=6"



NOTES:
1. SETTING BED SHALL BE SCREED, PITCHED TO GRADE, AND UN-COMPACTED PRIOR TO BRICK INSTALLATION
2. CONTRACTOR SHALL CONSTRUCT SAMPLE PANELS PER SPECIFICATIONS
3. COMPACTION RATES SHALL BE AS SPECIFIED

BRICK SIDEWALK - AMENITY STRIP
N.T.S.



NOTES:
1. EXPANSION JOINTS 20' O.C. MAXIMUM
2. CONCRETE BASE SHALL BE SCREEDED WITH A FLOAT FINISH AND PITCHED TO GRADE

BRICK SIDEWALK - JOINT AT CONCRETE WALK
N.T.S.

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PORTLAND, ME 04101
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DESCRIPTION	DATE	BY

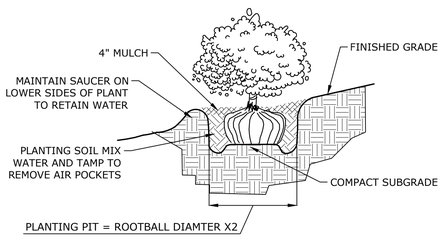
SITE DETAILS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT
MAINE STREET
BRUNSWICK, MAINE

DESIGNED	DRAWN	CHECKED
DWD	JJM	DWD

SCALE: AS NOTED
DATE: MAY 22, 2020
PROJECT NO.: 3516-11
21 OF 23

SHEET NAME: **SD-1**

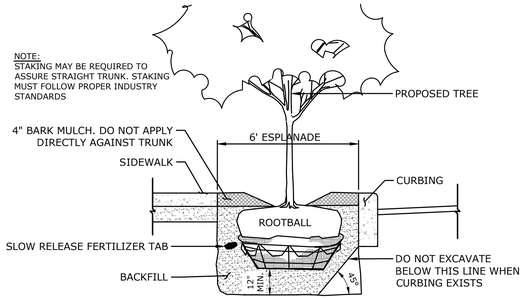


NOTES:

1. MULCHING OF PLANT BEDS:
   UNLESS OTHERWISE DIRECTED MULCH SHALL BE PLACED TO A LIMIT OF TWO FEET BEYOND THE CENTER OF THE OUTERMOST SHRUBS IN SHRUB BED.

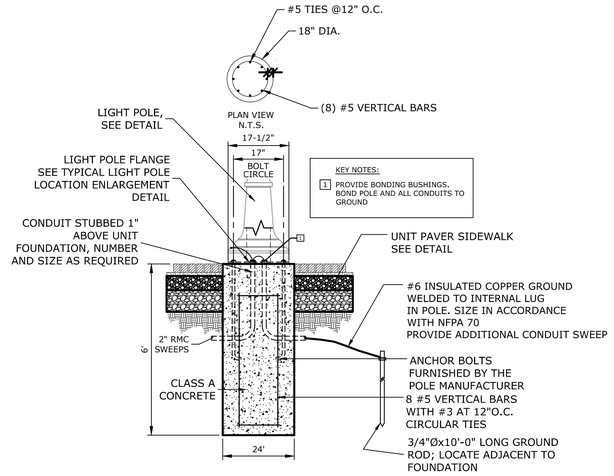
SHRUB PLANTING

NOT TO SCALE



TREE PLANTING ADJACENT TO CURB

NOT TO SCALE

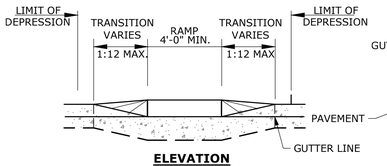


NOTES:

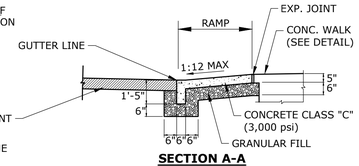
1. LIGHT POLES AND FIXTURES SHALL BE AS INDICATED ON THE ELECTRICAL DRAWINGS.
2. CONTRACTOR TO PROVIDE SHOP DRAWING FOR CONCRETE BASE AND BOLT PATTERN. BOLT PATTERN TO BE COORDINATED WITH LIGHT POLE MANUFACTURER.

TYPICAL LIGHT POLE FOUNDATION DETAIL

NOT TO SCALE

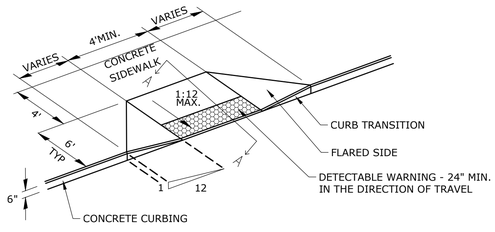


ELEVATION



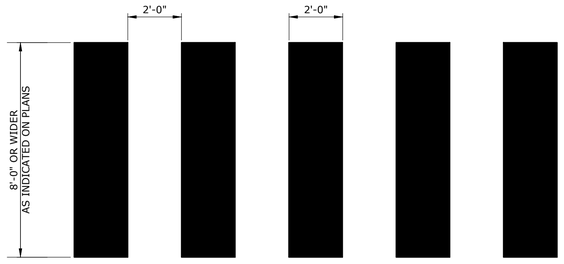
SECTION A-A

NOTE: ALL INDICATED SLOPES ARE MAXIMUMS



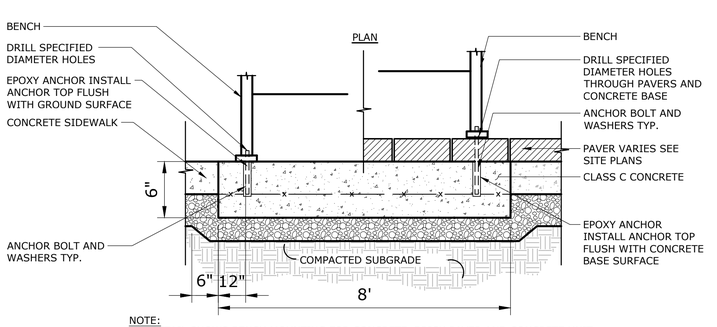
ACCESSIBLE DROP RAMP - TYPE A

NOT TO SCALE



CROSSWALK PAVEMENT MARKINGS

NOT TO SCALE

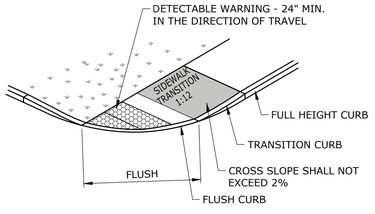


NOTE:

1. DETAIL SHOWS BENCH MOUNTING FOR CONCRETE, BRICK PAVER AND CONCRETE UNIT PAVER SURFACES.
2. CONTRACTOR TO INSTALL BENCHES PER MANUFACTURER'S INSTRUCTIONS.
3. PROVIDE SHOP DRAWINGS FOR APPROVAL.
4. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MOUNTING HARDWARE.
5. CLEAN EACH ANCHOR HOLE IN ACCORDANCE WITH EPOXY INSTRUCTIONS.
6. USE EPOXY IN EPOXY GUN TO FILL EACH ANCHOR HOLES
7. INSERT ANCHOR INTO EACH ANCHOR HOLE SO ANCHOR TOP IS FLUSH AS DETAILED. ALLOW PROPER CURING TIME BEFORE INSTALLING BENCH.

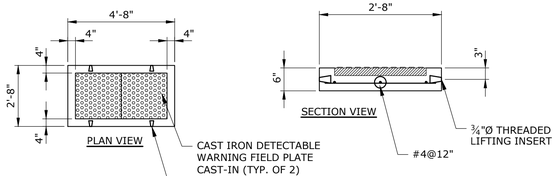
SURFACE MOUNTED BENCH

NOT TO SCALE



ACCESSIBLE DROP RAMP - TYPE C

NOT TO SCALE



NOTES:

1. CONCRETE TO BE 5,075 PSI @ 56 DAYS.
2. AIR CONTENT TO BE 6% - 8.5%.
3. MAX. WATER/CEMENT RATIO = .40
4. REINFORCING TO BE GRADE 60, BLACK.

DETECTABLE WARNING FIELD

NOT TO SCALE

MILONE & MACBROOM
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DESCRIPTION	DATE	BY

SITE DETAILS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET
BRUNSWICK, MAINE

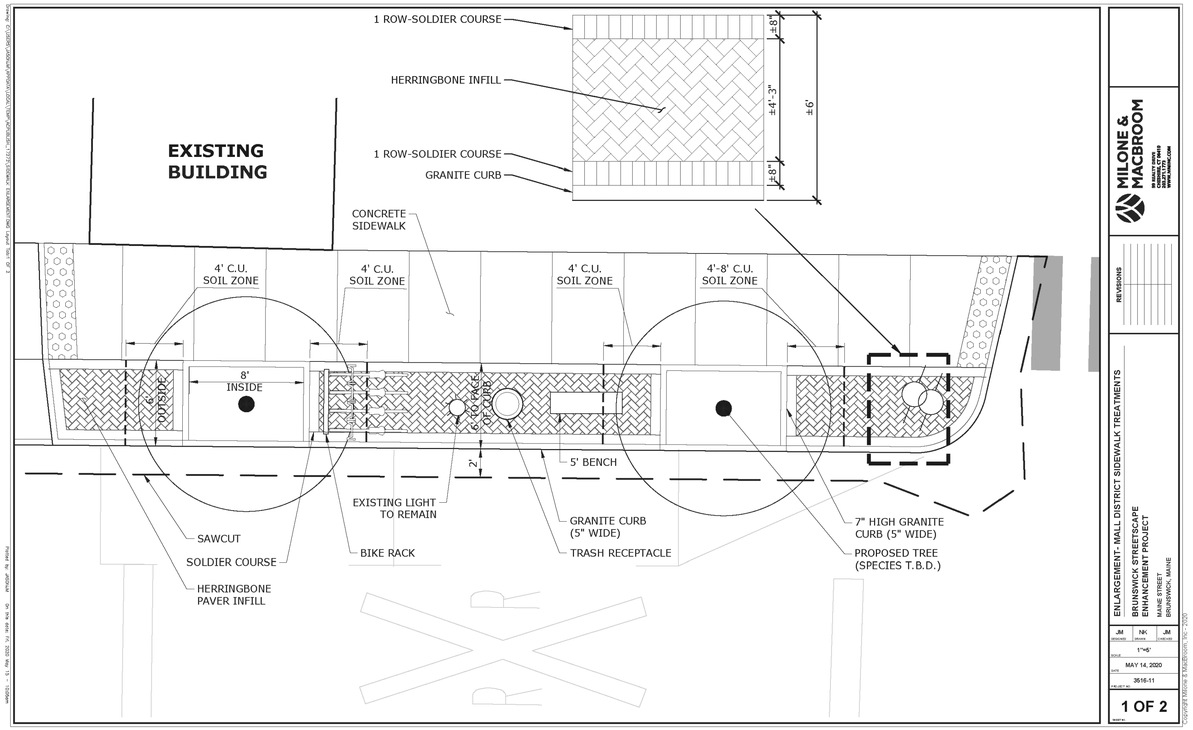
DWD	JJM	DWD
DESIGNED	DRAWN	CHECKED

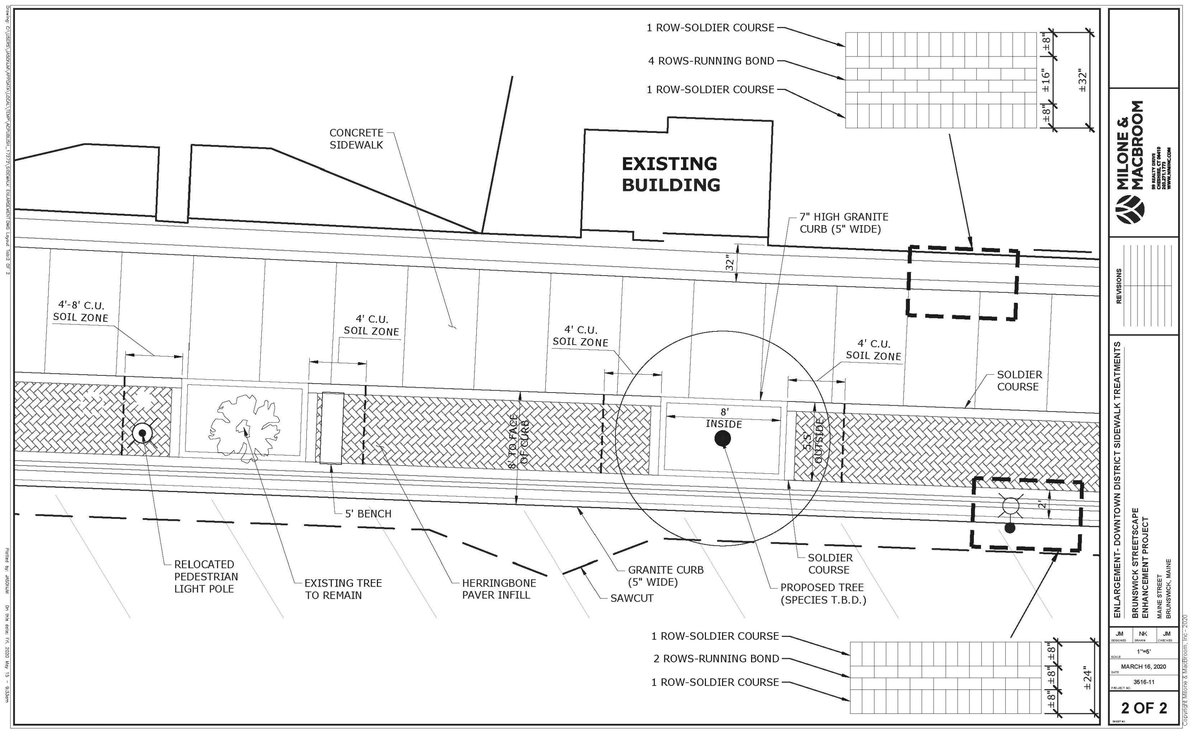
SCALE: AS NOTED

DATE: MAY 22, 2020

PROJECT NO.: 3516-11

SHEET NAME: SD-2





MILONE & MACBROOM
99 BLANCHARD ROAD
CUMBERLAND, ME 04021
207.775.1121
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REVISIONS

ENLARGEMENT- MALL DISTRICT SIDEWALK TREATMENTS
ENLARGEMENT- DOWNTOWN DISTRICT SIDEWALK TREATMENTS

BRUNSWICK STREETSCAPE ENHANCEMENT PROJECT
MAINE STREET
BRUNSWICK, MAINE

JM	NK	JM
DESIGNED	DRAWN	CHECKED

SCALE: 1"=5' / 1"=6'
DATE: MAY 14, 2020 / MARCH 16, 2020
PROJECT NO.: 3516-11

1 OF 2
2 OF 2

MILONE & MACBROOM
131 MIDDLE STREET, SUITE 201
PORTLAND, ME 04101
207.541.9544
WWW.MAINE.COM

DESCRIPTION	DATE	BY

SITE DETAILS

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT
MAINE STREET
BRUNSWICK, MAINE

DWD	JJM	DWD
DESIGNED	DRAWN	CHECKED

SCALE: AS NOTED
DATE: MAY 22, 2020
PROJECT NO.: 3516-11

23 OF 23

SD-3
SHEET NAME

SIDEWALK SURFACING INVESTIGATION

Downtown Streetscape Enhancement Project
Brunswick, Maine **AUGUST 2020**

MILONE & MACBROOM — Now part of SLR

Table of Contents

EXECUTIVE SUMMARY

The Town of Brunswick, Maine, acting through its Sidewalk Replacement Project Advisory Committee (the Committee), commissioned Milone & MacBroom, Inc. (MMI) to prepare plans for the replacement of the sidewalks in the downtown area. The existing sidewalks are concrete unit pavers and are in poor condition. After evaluating several alternative surfaces, the Committee initially supported using concrete as the primary walking surface with brick border along the curb and in areas where there would be outdoor dining and casual seating.

As part of the public discussion of the project, it was suggested that brick would be a more appropriate material given the historic nature of the downtown. The Committee asked MMI to undertake a comparative evaluation of both materials considering durability and life expectancy, construction and maintenance requirements, accessibility requirements (Americans with Disabilities Act [ADA]), and costs.

The findings of this investigation show that both concrete and brick are very durable with life expectancies in excess of 40 years, with a caveat that both materials must be properly designed and installed with appropriate professional construction engineering and inspection to ensure compliance with plans and specifications. Concrete must have a minimum thickness of 5 inches, be reinforced with steel mesh, have doweled expansion joints, have a broom finish to improve traction, and be sealed to resist surface deterioration. Concrete readily meets ADA standards. Concrete must be maintained by power washing to remove dirt and stains and be resealed every 2 to 3 years. Minor deflections can be addressed through the grinding of edges. Based on the literature review of regulatory agencies and comments from other design and public works professionals, concrete is the preferred material in the use of ADA-compliant sidewalks because of its ability to maintain planarity for ADA compliance, ease of maintenance, and lower installation costs. The initial cost of concrete is approximately $12 per square foot, while its annual maintenance cost is in the range of $1.00 to $1.50 per square foot.

Brick has a longer life expectancy because the clay from which brick is manufactured is not susceptible to degradation from deicing products. However, brick sidewalks are subject to “pop-ups” where the individual units become displaced and can cause trip hazards often associated with sand migrating from the joints. When not placed on a firm concrete or asphalt base, brick sidewalks tend to warp, causing low spots that trap water, accumulate algae, and become slippery. The initial cost of a properly installed brick sidewalk is $25 per square foot.

Brick sidewalks have unique maintenance requirements according to reports from the Federal Highway Administration (FHWA). Individual units need to be reset when pop-ups occur, and sand joints need to be replenished regularly. Both of these activities can be performed by local public works personnel without the need for specialized equipment. Snow removal is more difficult as the blades for removal equipment chatter on the surface and sometimes grab edges. Subsequently, bricks are vibrated, the locking sand is lost, and bricks become dislodged. Brick sidewalks can meet ADA requirements when installed correctly but require more frequent maintenance to maintain tight joints and planarity. Brick is not appropriate at curb ramps due to the need to maintain ADA specifications; concrete must be used at these locations. The annual maintenance cost of a brick sidewalk is in the range of $0.75 to $2.25 per square foot.

The findings of this investigation are summarized in the table below.

	Cast-in-Place Concrete	Bricks on Concrete
Life Expectancy*	40 years	40+ years
Initial Cost	$12 per square feet $660,000	$25 per square feet $1,375,000
Maintenance	Periodic pressure washing Resealing (2 to 3 years) Edge repair	Periodic pressure washing Sand joint replacement Remove/replace settled bricks
Maintenance Cost	$1.00 to $1.50 per year $55,000 to $82,500	$0.75 to $2.25 per year $41,250 to $123,750
ADA Compliant	Yes (preferred)	Yes (subject to more frequent maintenance to ensure compliance)
Compressive Strength	4,000 to 6,000 psi	14,000 to 16,000 psi
Solar Reflectivity Index (SRI)**	High (SRI 45-86)	Moderate (SRI 31-36)
Slip Resistance ("Coefficient of Friction")***	Greater than 0.5, suitable	Greater than 0.5, suitable

* In the best circumstances, given a moderate climate and if properly maintained, brick may last up to 80 years, perhaps longer. However, in the harsh northeast climate and given the equipment commonly used for snow removal, a number closer to 60 years might be expected.

** Solar Reflectivity Index (SRI) is a measurement of the ability of a surface product to reflect heat. The higher the SRI, the greater the ability to reduce the urban "Heat Island Effect" (which contributes to the tendency for heat buildup in the urban environment). It should be noted that any surface finish with an SRI greater than 29 is considered as contributing to the reduction of the "Heat Island Effect."

***Wire cut clay brick is typically considered approximately equal to stiff-broomed concrete for pedestrian surfaces when wet. Very little scientific data exists on this topic. Both surfaces generally have a "coefficient of friction" that is greater than 0.5 and are therefore deemed acceptable. Due to brick's natural resistance to absorption, water can sit on the surface longer than on concrete and can freeze during cold winter months, creating a "black ice" condition.

As part of this report, MMI personnel contacted several local municipalities, university public works officials, and professional landscape architects and engineers to inquire about their experience with the selection and maintenance of cast-in-place concrete and brick sidewalks. We prepared a brief questionnaire and requested their input. The questionnaire and responses can be found in Appendix A.

General Conclusions (result of common responses from multiple sources) are as follows:

- Concrete seems to be preferred because of its durability, ADA compliance (smooth surface), and lower initial construction cost when compared to brick.
- Concrete requires sealing every 2 to 3 years to reduce the potential for spalling and maintain resistance to degradation due to deicing salts and staining.
- Concrete provides a smooth, consistent surface when used in the primary travelway of the sidewalk.
- Brick is a suitable surface when properly installed to avoid displacements that can cause trip hazards.

- Concrete must be finished with a stiff-broom finish in order to maximize slip resistance.
- While brick has a reputation for being more slippery than concrete in inclement weather, newer, more tactile surfacing is available (based on the manufacturer).
- Regular maintenance is required for routine brick repair (pop-ups). This work can be done by in-house personnel.
- Brick can be used effectively along less frequently traveled areas as an accent behind curbs or in areas requiring special enhancement treatment.
- Where brick is used as the primary walking surface, the brick should be placed on a base of either concrete (4 inches minimum) or asphalt (2 inches minimum).
- Snow removal on brick can leave ice patches due to irregular surface. Neither brick nor concrete should be used in crosswalks where there is vehicular traffic.
- Concrete is acceptable for driveway aprons if the slab is thickened and more heavily reinforced.
- Concrete or brick is suitable depending on the context of the project site.
- Color matching after repairs is challenging for both surfaces, but perhaps more so for concrete.
- Proper construction methods for either surface require strict adherence to the project specifications. It is always recommended that the municipality engage a full-time construction inspector throughout the process.

INTRODUCTION

The Town of Brunswick, Maine commissioned MMI to prepare plans and specifications for streetscape improvements along Maine Street in downtown Brunswick. The project progressed through the Design Development phase where, after evaluating several alternatives, the Sidewalk Replacement Project Advisory Committee initially supported using concrete with a brick border for the treatment of the new sidewalk surface. During public discussions of the project, it was suggested that brick would be a more appropriate surface material for Maine Street given the historic nature of downtown Brunswick.

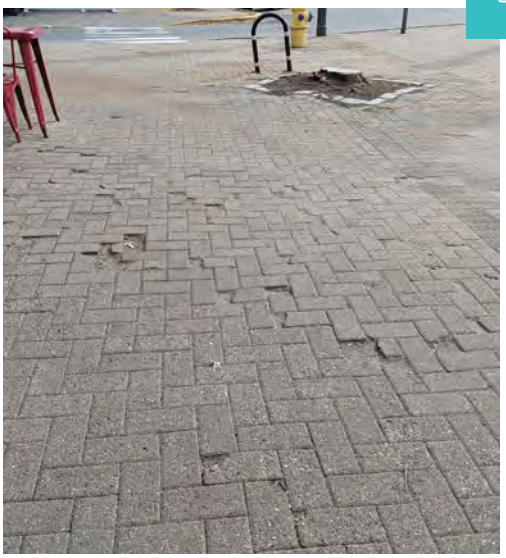
In order to give fair consideration to the suggestion to use brick instead of concrete as the primary surface, the town has asked MMI to compare the performance, longevity, and characteristics of kiln-dried brick with the characteristics of cast-in-place concrete as the surface treatment for the sidewalk. This task included conducting discussions with public works and engineering officials in nearby municipalities, consultation with other design professionals, reviewing literature regarding the materials, observing the conditions of both brick and concrete sidewalks in settings similar to Brunswick, and review of ADA requirements. This review is intended to be a presentation of the advantages and disadvantages of each sidewalk system so that town officials may make an informed decision.

CONTEXT

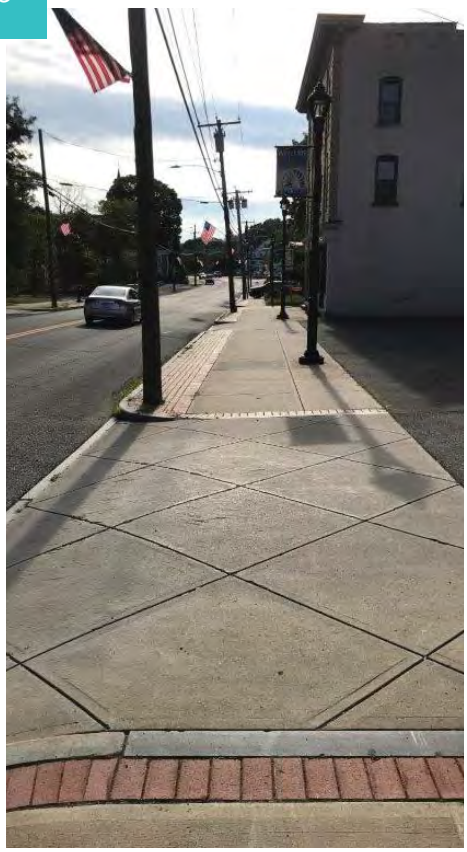
Maine Street is an arterial road traversing the heart of Brunswick connecting to United States Route 1. The street width varies incorporating angled parking and parallel parking on both sides. There are dedicated turn lanes at some intersections. The sidewalks, located on both sides of the street in the downtown, have varying widths ranging from 13 feet to 20 feet with outdoor seating and dining along the sidewalk adjacent to some establishments. The surface of the sidewalk is pre-cast concrete unit pavers ("pavers") and is in fair to poor condition. It is our understanding that the pavers were placed on a compacted granular base (in lieu of a concrete base).

The majority of the "Downtown" district of the project site ranges in age from 28 to 36 years old and has effectively reached its serviceable life. The sidewalks in the "Mall" district are somewhat newer at 20 years old.

The recently completed Design Development plans call for a concrete sidewalk as the primary walking surface. Brick is proposed to be used in areas where there will be seating or outdoor gatherings adjacent to buildings and in a relatively narrow "amenity" strip along the curb. As the project is now envisioned, the concrete will be 5 inches thick and reinforced with welded wire fabric, and there will be doweled expansion joints as needed. The concrete will be thickened at any driveway locations and reinforced with rebar where traffic loading may be higher. The surface will have a broom finish to improve traction. The concrete will be sealed to reduce susceptibility to deicing agents and staining. The concrete will be placed on a compacted gravel base course over a well-drained subbase. The brick will be placed on a sand setting bed over a base course of compacted gravel stone with the surface joints filled with polymeric sand. Structural soil will be used in the tree pits and the tree pits will be surrounded by root barriers to contain the spread of roots beneath the sidewalk. Details of the sidewalk are shown in Appendix C.



Town of Brunswick, Maine



Main Street, Plymouth, Connecticut. Completed in 2015. Thickened concrete slab at driveway apron and brick on 5-inch concrete base

Trumbull Street, Hartford, Connecticut. Completed in 2012. Heavily used urban setting. Note: Concrete unit paver on 5-inch concrete base.

SIDEWALK MATERIALS

When selecting the materials for a sidewalk, one needs to understand that a sidewalk is a type of transportation facility where pedestrian safety is paramount. In addition to satisfying the legal requirements of the ADA, the selection of the appropriate surface for a sidewalk should take into consideration location, durability, maintenance requirements, extent of use, and cost. Aesthetics are also an important consideration, but one that is somewhat subjective giving considerations to setting and historic context. For the purposes of this report, cast-in-place concrete and clay-fired brick are compared. Pre-cast concrete unit pavers, which have many similarities to brick in their function and installation methods, are not being considered for use in Brunswick and are not discussed in this report.

Cast-In-Place Concrete

Concrete, depending on installation practices, has a life expectancy of at least 40 years. According to technical reports by FHWA, many communities are replacing brick and other unit pavers with concrete in order to reduce maintenance problems in the future. By its nature, concrete has a relatively high compressive strength (4,000 to 6,000 pounds per square inch [psi]), that is, the ability to resist downward forces. However, concrete has very low tensile (tension) strength generally, or the ability to resist expansion, stretching, or shrinking and similar movement caused by temperature changes, moisture, and other lateral forces. To overcome the low tensile strength, concrete sidewalks should be reinforced with welded wire fabric in walkways and steel reinforcing bars in driveways. However, the reinforcement does not prevent cracking but does constrain cracks, keeping them tighter than an equivalent concrete pour without the reinforcement. The proper placement of steel reinforcement (relative to the proposed design cross-section – see details in Appendix C) is essential to the effectiveness of the reinforcement. In addition, because of the construction methods, concrete can be formed to meet ADA codes by being able to maintain its planarity (slope) over time. Finally, because of its bright color, concrete has a high reflectivity and has a positive effect on the reduction of the "heat sink" found in an urban environment.

Most people have experienced older sidewalks that have buckled, sagged, or cracked, causing trip hazards, drainage problems, and poor appearance. Typical issues with concrete sidewalks include:

- Uplift or settlement caused by expansion, contraction, and the lack of reinforcement
- Sagging from poor base material
- Heaving from moisture in the base or from nearby tree roots.
- Spalling due to the absence of sealant that prevents moisture from seeping into the pores of the concrete
- Inadequate air entrainment
- Poor curing or finishing
- Excessive salt from deicing

When such problems occur, needed repairs are performed by skilled craftsmen with equipment to grind minor deflections or replace the large concrete panels.

With proper engineering design, inspection, and installation, concrete sidewalks can reach their life expectancy with routine maintenance. This includes:

- Providing a base of compacted stone suitable to the underlying soil conditions
- Using an adequate thickness of concrete (minimum of 5 inches) having a minimum compressive strength of 4,000 psi
- Installing a broom finish to improve traction
- Reinforcing the concrete with a welded wire fabric
- Providing higher air entrainment (up to 8% to 10%) to allow for moisture within the concrete to expand
- Providing joints to account for expansion and contraction caused by temperature changes
- Using dowels to resist deflection of the concrete panels at the expansion joints
- Sealing the concrete to maintain the surface appearance and reduce deterioration from deicing.

The initial cost of concrete (including the granular stone base) is estimated to be approximately **$12 per square foot.**

Concrete is relatively simple to maintain, assuming proper installation. Routine maintenance should include:

- Periodic power washing to remove stains and excessive dirt
- Periodic resealing of the surface (every 1 to 2 years)
- Grinding the edge of concrete panels when needed to remove deflections greater than ¼ inch in order to maintain an ADA-compliant transition
- The use of deicing salt should be minimized

The annual cost of maintenance is estimated to be in the range of $1.00 to $1.50 per square foot.

Brick

Brick has been used for sidewalks dating back to colonial times in the United States due to the ease of material acquisition and conversion of raw clay into pressed bricks. Brick exhibits a high level of durability with a life expectancy exceeding concrete because the raw material (clay) is not susceptible to a chemical degradation from deicing products like concrete. Some literature suggests that brick may last up to 80 years, but the condition of brick degrades over time. Because of its small size, bricks can be easily deflected (pop-ups) if an edge is not beveled and a failure has occurred in the base. However,

Main Street, Plymouth, Connecticut, Completed in 2015.

North Main Street, Bristol, Connecticut. Completed in 2013. Brick on concrete base. Both surfaces look good.

Main Street Bristol, Connecticut. Completed in 2017. Note: Concrete is showing evidence of spalling (most likely not sealed properly) and rust stain.

because of the relatively small areas of disturbance, individual bricks, or groups of brick, can be removed and reinstalled if the damage is limited. Since the color of brick fades with age, replacement brick may not match the color of the original installation; this can be mitigated somewhat by using a blend of colors at the time of installation. When brick is set only on an aggregate base, it is more susceptible to warping over time and more likely to experience differential settlement, particularly along the edges of curbs, which can result in the localized ponding of water or the creation of trip hazards (see photos). This can be attributed to the migration of sand in the joints, resulting in the loss of sand setting bed, or inadequate compaction of the base along the curb line. Snow removal in northerly climates tends to be time consuming. The irregular surfaces from the normal deflection of individual units can cause the blades of snow blowers or plows to catch on edges, further dislocating the individual bricks as well as causing ice to form in low areas. Unlike concrete, brick is highly resistant to the absorption of water, so water will tend to stand on bricks for a longer time before evaporating. During winter months, water can stay on the surface of bricks and freeze, creating icy conditions. This can contribute to the slippery condition frequently associated with brick.

From an ADA perspective, brick is less desirable than concrete because it is more difficult to maintain planarity (longitudinal and lateral pitch), particularly on an inadequate base. Because of the exacting slope requirements, brick should be avoided at handicap-accessible curb ramps.

There are several methods for installing brick sidewalks based in part on the expected use and location. For example, the "primary travel" section sidewalk should have a more robust cross-section that reduces the potential for warping and deflection of the individual bricks. In contrast, an area intended for sitting or outdoor dining, or an "amenity strip" along a curb, can have a less robust cross-section where minor deflections would be less likely to become a trip hazard. The preferred method for constructing a brick sidewalk is as follows:

- Install the brick on an ASTM C-33 sand bed, mortar, or asphaltic mastic.
- Place the setting bed on a 4-inch-minimum concrete or 2-inch-minimum bituminous concrete (asphaltic) base designed to promote stability. The concrete base should be smooth-troweled and will require expansion joints as specified (with caulked joints to reduce the loss of sand from the setting bed).
- Place the concrete or bituminous concrete base on an appropriate aggregate base, typically 6 to 8 inches of processed stone for well-drained soils.
- Brick should be laid "butt tight" with the joints filled with polymeric sand.
- The design should provide for whole and half bricks to avoid thin cuts that can more easily become displaced.
- In locations where less traffic is anticipated and more frequent pop-ups can be tolerated, the brick can be placed directly on the compacted stone base.

In comparison to concrete (4,000 to 6,000 psi), brick has a higher compressive strength (typically in the range of 14,000 to 16,000 psi). The initial cost of brick (laid on a 4-inch concrete base with a 1-inch sand setting bed) is estimated to be approximately **$25 per square foot.**

According to FHWA reports, brick sidewalks have unique maintenance requirements that are more costly to maintain than concrete in part due to the potential for trip hazards caused by the deflection of the individual bricks. Routine maintenance would include:

- Replacement of the polymeric sand on a regular basis
- Power washing the surface on a regular basis to remove dirt
- Removal and replacement of individual bricks or groups of bricks that become displaced

The cost of maintaining a brick sidewalk is estimated to be in the range of $0.75 to $2.25 per square foot depending on the initial construction profile.

PHOTOGRAPHIC LOG

MMI personnel observed the condition of brick and concrete sidewalks in settings similar to Brunswick. Photographs were taken that depict "as-built" conditions. These photographs and comments can be found in Appendix B.

REFERENCES

Guide for Maintaining Pedestrian Facilities for Enhanced Safety, Federal Highway Administration, 2013

New Construction: Minimum Requirements: X02.1 Public Sidewalks, United States Access Board

Why Does Concrete Have Great Compressive Strength, But Poor Tensile Strength? Science ABC, December 2019

Small Town and Rural Multimodal Networks, Federal Highway Administration, 2017

Sidewalk Design, Construction, and Maintenance: A Best Practice by the National Guide to Sustainable Municipal Infrastructure, Federation of Canadian Municipalities, 2004

San Francisco Will Say So Long to Brick Sidewalk, Josh Cohen, Next City, August 2017

"Earning LEED Points with Brick," General Shale

Appendix A

Questionnaire with Responses

Brunswick Sidewalk Paving Study

Responses provided by: Christopher Branch, Director of Public Works, City of Portland, Maine

1. **How much of your s/w infrastructure is comprised of brick and how much is concrete? If you have brick, is it real brick or concrete pavers?**

   Brick is 23% and concrete is 35%.

2. **If Brick (pavers) are they set on gravel or a solid surface? i.e. concrete or bituminous pavement and do you know what the full depth pavement cross section consists of? (e.g., brick set on 1" sand bed over 3" bituminous pavement on 12" gravel)**

   Our brick installation consists of a minimum of 12 inches of gravel, 2 inches of asphalt, 1 inch of sand, and then the bricks are dry laid, no mortar. If we expect vehicle traffic, the gravel layer depth and asphalt thickness will increase and, in some cases, we use concrete in place of asphalt such as at Monument Square.

3. **What do you find to be the challenges of maintaining the brick (pavers), if any? How about Concrete, if any?**

   They can be slippery. The replacement cost is very high, we've found at least a third higher than concrete.

4. **Which material, based on your professional experiences, would you prefer and why?**

   I prefer concrete. It can be used a number of different ways, brush finish, stamped and colored. With the anti-salt additives, they last for a very long time with the biggest problem being tree roots. They are not slippery,

5. **Do you find that one material or the other is easier and/or less expensive to maintain? If so, why?**

   In Portland, concrete is about two thirds the price of brick. We prefer brick from a maintenance standpoint. Our Streets and Sidewalks crews do the localized repairs. They just remove the bricks, fix the asphalt, place the sand, and then put the bricks back or use new ones if needed. Concrete involves cutting the panel out and replacing, which takes a couple days. Our crews prefer to fix brick.

6. **Have you received any tripping hazard complaints and, if so, were they related to your brick or concrete sidewalks?**

   Yes, we do, and they are related to both as well as asphalt and almost always caused by tree roots with frost coming in second.

7. **How do you repair any tripping hazards that your department finds on sidewalks?**

   We use our Streets and Sidewalk crews to do this and it depends on the material. For brick, we will relay the brick; for concrete, either grind or replace; and with asphalt, we replace.

8. **Have you received and complaints about sidewalk surface being slippery? If so, what type of surface was involved and what was the slipperiness related to (i.e., snow, ice, rain, grease, etc.)?**

   Yes, primarily brick when they are wet and installed on a slope. We use Pine Hall Pathway Paver Bricks, which have more texture and help a bit. Bricks work reasonably well in flat areas.

9. **What type of routine maintenance do you perform on your sidewalks and how often is it done? (e.g., sweeping – once per month, power wash and seal – annually). Is this done by your DPW staff or is it a separate contractual service that performs these tasks? What is the approximate annual cost and/or resources that you allocate for this? Please try to detail this separately for each type (brick vs. concrete), if possible and applicable.**

They are swept once per year in the spring and then only as needed during the year. We use a small litter vac to clean litter off them in the downtown.

10. **When you factor in all your responsibilities and legal requirements, like ADA compliance and resident safety and the available resources you have to perform your duties, which surface product for sidewalks would you prefer and why?**

Personally, I prefer concrete with brick inlays, but in Portland the City Council regulates the type of material by policy. There are areas that require brick, others that require concrete, and the rest are asphalt.

Brunswick Sidewalk Paving Study Questionnaire

Responses provided by Daniel Deible, PLA, Jacobs Engineering Group, Arlington, VA

1. How much of your s/w infrastructure is comprised of brick and how much is concrete? If you have brick, is it real brick or concrete pavers?

   30% of the paving we do that is pedestrian oriented is pavers. We often spec plank-style or larger format pavers. When using a 4"x8" module, we usually specify clay rather than precast.

2. If Brick (pavers) are they set on gravel or a solid surface? i.e concrete or bituminous pavement and do you know what the full depth pavement cross section consists of? (e.g brick set on 1" sand bed over 3" bituminous pavement on 12" gravel)

   Generally, we specify a concrete surface under the brick with a 1" setting bed. Concrete is usually 4" on a 6" subbase.

3. What do you find to be the challenges of maintaining the brick (pavers), if any? How about Concrete, if any?

   Brick holds up well but occasionally individual bricks will heave and cause a tripping hazard, or will be caught by a snowplow blade and dislodged. Concrete has few maintenance issues except for cracking if not jointed properly and also at expansion joints, which fail and can be costly to repair.

4. Which material, based on your professional experiences, would you prefer and why?

   Brick is nice for all applications, but due to its cost it is just not practical to use everywhere. A life cycle cost analysis would probably make the disparity greater between brick and concrete. A well-poured and finished concrete paved area is not a negative in my opinion.

5. Do you find that one material or the other is easier and/or less expensive to maintain? If so, why?

   See above – I think the occasional re-setting required of bricks (especially where they are not full size bricks, such as at edges or when cut around another site feature into wedge shapes) clearly would make them more expensive to maintain.

6. Have you received any tripping hazard complaints and, if so, were they related to your brick or concrete sidewalks?

   I have seen firsthand where bricks have become tripping hazards, although in several instances it appears to be more related to subgrade preparation than the bricks

themselves. Conversely, concrete is also capable of developing tripping hazards, especially where two slabs not properly doweled meet, where tree roots heave it and cause differential cracks, or where the sidewalk sinks relative to a curb or building entrance.

7. How do you repair any tripping hazards that your department finds on sidewalks?

   We are using root barriers to alleviate that problem; we always design a ledge at the entrance to buildings into the wall so the concrete can rest on it and not sink relative to the door. Both brick and concrete are generally going to need to be demo'd and replaced to fix a tripping hazard.

8. Have you received and complaints about sidewalk surface being slippery? If so, what type of surface was involved and what was the slipperiness related to (i.e. snow, ice, rain, grease, etc.)?

   I do not see a difference between the two, except that in shady areas brick seems more susceptible to growing algae which can become quite slippery when wet.

9. What type of routine maintenance do you perform on your sidewalks and how often is it done? (e.g. sweeping – once per month, power wash and seal – annually). Is this done by your DPW staff or is it a separate contractual service that performs these tasks? What is the approximate annual cost and/or resources that you allocate for this? Please try to detail this separately for each type (brick vs concrete), if possible and applicable.

10. When you factor in all your responsibilities and legal requirements, like ADA compliance and resident safety and the available resources you have to perform your duties, which surface product for sidewalks would you prefer and why?

    I think both have their place. In a historic area or when trying to highlight a special hardscape into the fabric of a plaza or other special area, brick would be the material of choice. In a very active pedestrian area where safe, efficient movement takes precedent, or where cost is an issue, or simply in a more utilitarian environment, concrete is preferred. Concrete staining or even applying exposed aggregate to the surface can make concrete a bit more attractive if simply gray is not appropriate.

Brunswick Sidewalk Paving Study

Responses provided by: David DeFosses, Construction Supervisor, City of Portsmouth, NH

1. How much of your s/w infrastructure is comprised of brick and how much is concrete? If you have brick, is it real brick or concrete pavers?

   Downtown – bricks ("Pine Hall" – now, "Morin" – previously)
   Downtown suburbs – Concrete travel way with brick border
   Residential - concrete
   DO NOT use concrete pavers – they will not stand up to salt

2. If Brick (pavers) are they set on gravel or a solid surface? i.e concrete or bituminous pavement and do you know what the full depth pavement cross section consists of? (e.g brick set on 1" sand bed over 3" bituminous pavement on 12" gravel)

   Used to be set on gravel but would tend to get a lot of ruts due to snow removal equipment driving on them. About 10 years ago switched to 2" asphalt base with 1" sand/cement mix for setting that tends to hold up better

3. What do you find to be the challenges of maintaining the brick (pavers), if any? How about Concrete, if any?

   Tend to catch edges of brick during snow removal. Concrete tends to heave more and not settle back to grade

4. Which material, based on your professional experiences, would you prefer and why?

   Do not favor one over the other, they both have their uses and applications

5. Do you find that one material or the other is easier and/or less expensive to maintain? If so, why?

   Brick is easier because it takes less people/less equipment to make the repairs

6. Have you received any tripping hazard complaints and, if so, were they related to your brick or concrete sidewalks?

7. How do you repair any tripping hazards that your department finds on sidewalks?

   Take up slab and repour the concrete

8. Have you received and complaints about sidewalk surface being slippery? If so, what type of surface was involved and what was the slipperiness related to (i.e. snow, ice, rain, grease, etc.)?

   Yes, bricks can get slippery that is why they changed from Morin bricks to Pine Hall pavers as they are brick cut and tend to be more slip resistant.

9. What type of routine maintenance do you perform on your sidewalks and how often is it done? (e.g. sweeping – once per month, power wash and seal – annually). Is this done by your DPW staff or is it a separate contractual service that performs these tasks? What is the approximate annual cost and/or resources that you allocate for this? Please try to detail this separately for each type (brick vs concrete), if possible and applicable.

   Bricks go down then very little maintenance, except have one City employee who routinely goes around to check for/fix popped bricks. Only once had to contract out repairs of brick in their downtown plaza area
   Concrete gets sealed about once every 5 years with Siloxane as it tends to wear off with snow blading activity

10. When you factor in all your responsibilities and legal requirements, like ADA compliance and resident safety and the available resources you have to perform your duties, which surface product for sidewalks would you prefer and why?

    Again, they both have their applications and generally like both materials equally.

Brunswick Sidewalk Paving Study

Responses provided by: John McGrane. Former City Engineer, Hartford. CT

1. How much of your s/w infrastructure is comprised of brick and how much is concrete? If you have brick, is it real brick or concrete pavers?

   Less than 5% brick pavers—some clay brick, but mostly dyed concrete pavers. 95% is plain concrete.

2. If Brick (pavers) are they set on gravel or a solid surface? i.e concrete or bituminous pavement and do you know what the full depth pavement cross section consists of? (e.g brick set on 1" sand bed over 3" bituminous pavement on 12" gravel)

   Most of the City of Hartford's pavers are set on a 5" concrete base with 1" bituminous levelling course.

3. What do you find to be the challenges of maintaining the brick (pavers), if any? How about Concrete, if any?

   They last well on sidewalk areas, but cross walks and any installations in traffic do not last. Also, poorly restored utility cuts destroy the appearance.

4. Which material, based on your professional experiences, would you prefer and why?

   Concrete pavers work well in sidewalks if set on concrete base. Avoid pavers in traffic areas.

5. Do you find that one material or the other is easier and/or less expensive to maintain? If so, why?
   Similar costs

6. Have you received any tripping hazard complaints and, if so, were they related to your brick or concrete sidewalks?
7.

   Minor complaints, unless pavers are disturbed by utility cuts

8. How do you repair any tripping hazards that your department finds on sidewalks?

   Asphalt is used as a temporary means, but looks awful.

9. Have you received and complaints about sidewalk surface being slippery? If so, what type of surface was involved and what was the slipperiness related to (i.e. snow, ice, rain, grease, etc.)?
No complaints on slipperiness of surface, although snow/ice removal is bit more difficult and leaves some icing on surface.

10. What type of routine maintenance do you perform on your sidewalks and how often is it done? (e.g. sweeping – once per month, power wash and seal – annually). Is this done by your DPW staff or is it a separate contractual service that performs these tasks? What is the approximate annual cost and/or resources that you allocate for this? Please try to detail this separately for each type (brick vs concrete), if possible and applicable.

Sidewalk cleaning is typically done by business and property owners, except for some litter removal.

11. When you factor in all your responsibilities and legal requirements, like ADA compliance and resident safety and the available resources you have to perform your duties, which surface product for sidewalks would you prefer and why?

Obviously, plain concrete is the most cost effective and easiest to maintain, although ADA and safety issues are minimal. Recommend using pavers only where the impact will be significant and warranted.

Brunswick Sidewalk Paving Study

Responses provided by: Sean Vassington, PLA, University Planning, Design, and Construction, University of Connecticut

1. How much of your s/w infrastructure is comprised of brick and how much is concrete? If you have brick, is it real brick or concrete pavers?

   Our campus sidewalks are primarily comprised of concrete. Clay and concrete pavers are typically only used in special spaces and as accents.

2. If Brick (pavers) are they set on gravel or a solid surface? i.e concrete or bituminous pavement and do you know what the full depth pavement cross section consists of? (e.g brick set on 1" sand bed over 3" bituminous pavement on 12" gravel)

   Clay and brick pavers are typically set on a wet bed over a concrete base with polymeric sand in joints. This supports loading of emergency and service vehicles, including those performing snow/ice removal operations. Total cross sections can range between 16"-24".

3. What do you find to be the challenges of maintaining the brick (pavers), if any? How about Concrete, if any?

   Freeze/thaw on clay pavers has caused popping. With concrete, unless sealers have been applied, salt creates spalling and opportunities for water intrusion.

4. Which material, based on your professional experiences, would you prefer for sidewalks and why?

   Cast/poured in place concrete or bituminous concrete.

5. Do you find that one material or the other is easier and/or less expensive to maintain? If so, why?

6. Have you received any tripping hazard complaints and, if so, were they related to your brick or concrete sidewalks?

7. How do you repair any tripping hazards that your department finds on sidewalks?

8. Have you received and complaints about sidewalk surface being slippery? If so, what type of surface was involved and what was the slipperiness related to (i.e. snow, ice, rain, grease, etc.)?

9. What type of routine maintenance do you perform on your sidewalks and how often is it done? (e.g. sweeping – once per month, power wash and seal – annually). Is this done by your DPW staff or is it a separate contractual service that performs these tasks? What is the approximate annual cost and/or resources that you allocate for this? Please try to detail this separately for each type (brick vs concrete), if possible and applicable.

10. When you factor in all your responsibilities and legal requirements, like ADA compliance and resident safety and the available resources you have to perform your duties, which surface product for sidewalks would you prefer and why?

Cast/poured in place concrete or bituminous concrete for smooth, consistent travel paths.

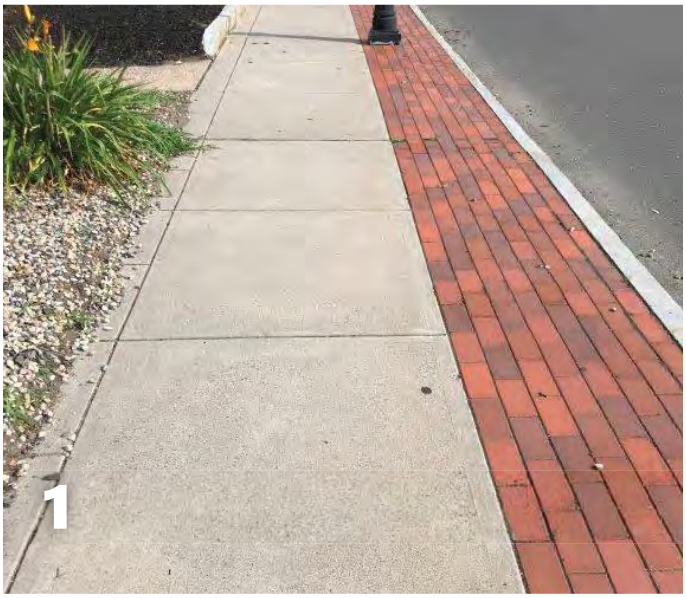
Appendix B

Photographic Log

Main Street, Plymouth, CT

- Completed ±2015
- "Belden" brick on concrete base with 5-inch-thick 4,000 psi concrete pedestrian way and new granite curb

North Main Street, Bristol, CT

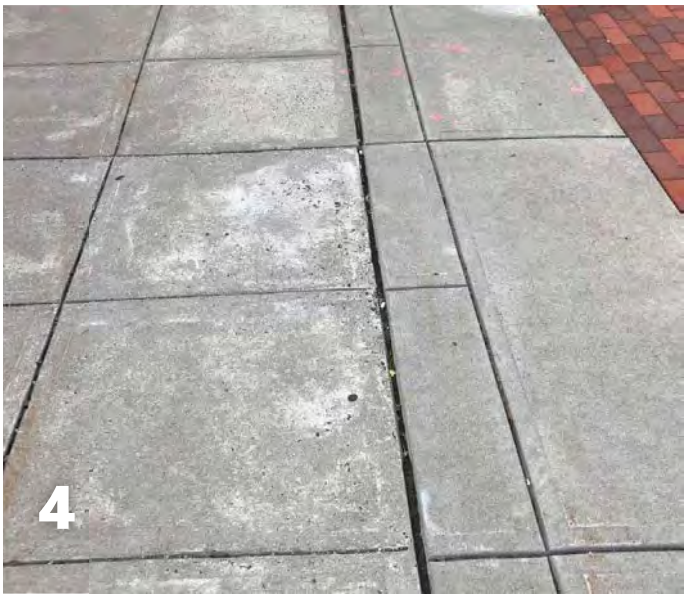


- Completed ±2013
- "Belden" brick on concrete base, with 5-inch-thick concrete pedestrian way and new granite curb
- Area of new concrete walk adjacent to older, deteriorated concrete (Photo 3)
- Plow blade damage to granite curb (Photo 5)

Hope Street, Bristol, CT

- Completed 2019
- "Belden" brick on 5-inch concrete base and 5-inch concrete walk with new granite curb
- Note 8-inch thickened concrete slab at apron (Photo 2)
- Street trees (Zelkova with CU soil) used for root/growth enhancement

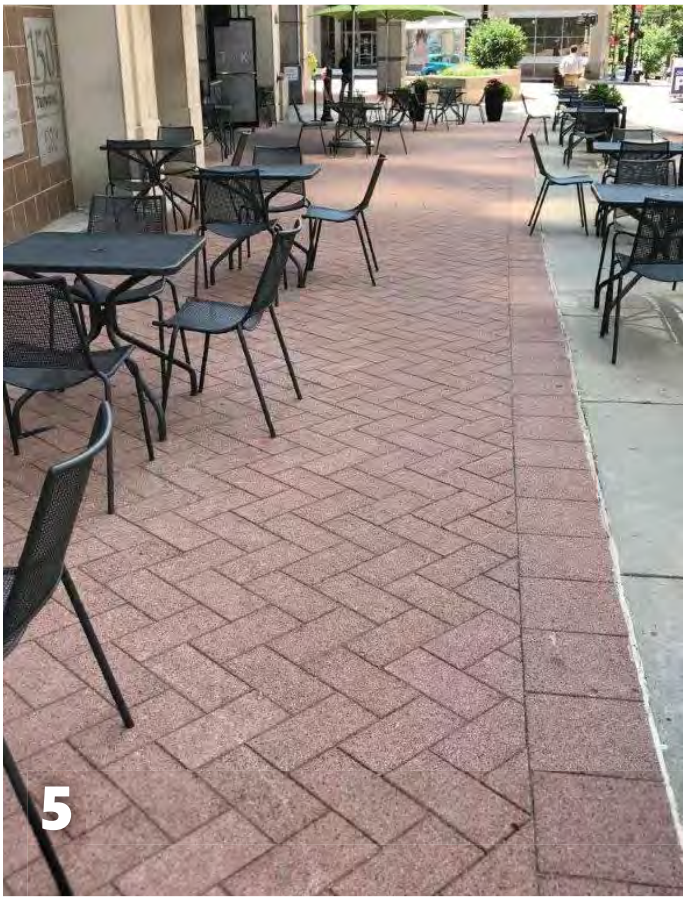
Main Street, Bristol, CT



- Completed ±2017
- Brick on 5-inch concrete base, 5-inch concrete pedestrian way, and new granite curb
- Note possible evidence of the lack of concrete sealant (Photo 4). Brick at driveway apron damaged by plow blade and differential settlement at interface with concrete walk (Photo 5).

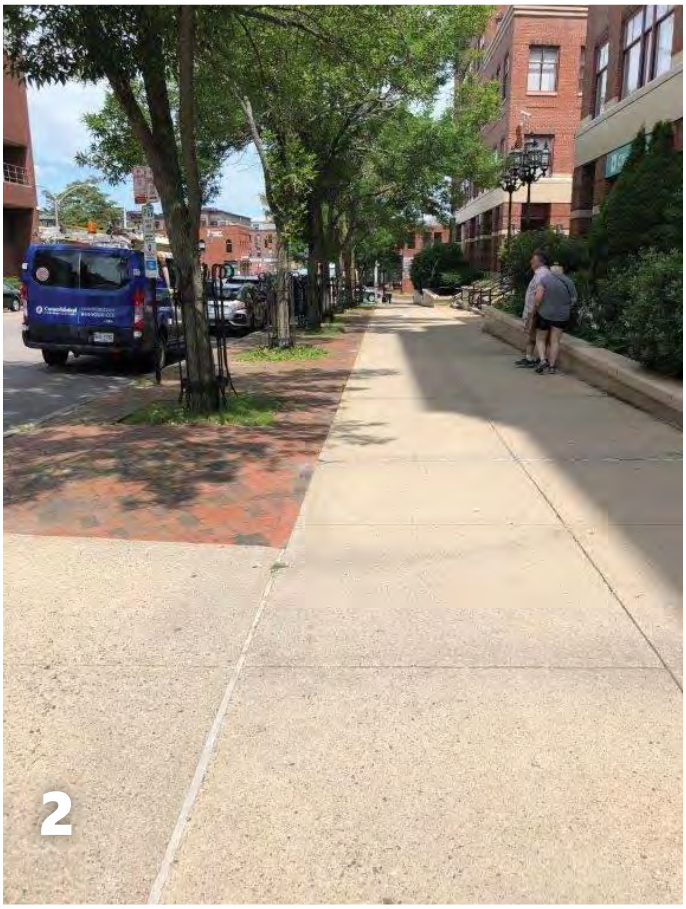
Trumbull Street, Hartford, CT

Trumbull Street, Hartford, CT (Continued)



- Completed ±2012
- Concrete portion intended for main pedestrian travelway
- Note:
  - Pavers are pre-cast concrete manufactured by Unilock
  - Pavers on 5-inch concrete base
  - Outdoor cafe seating on pavers, not concrete (Photo 5)
  - Unsuccessful concrete repair (Photo 4)
  - Dirt or gum stains evident on both concrete and pavers (Photos 2 and 4)

Middle Street, Portland, ME



- Completed late 1990s
- Note: Discoloration from salt use, nonmatching color in repaired area (Photo 3), portion with concrete travelway and brick amenity zone is in better shape than brick areas

Spring Street, Portland, ME

- Completed 2015
- Note: Differential settlement around fixed vault and popped brick in travelway, older portion (Photo 2) shows broken/cracked bricks with differential settlement and loss of joint sand

Union Street, Portland, ME

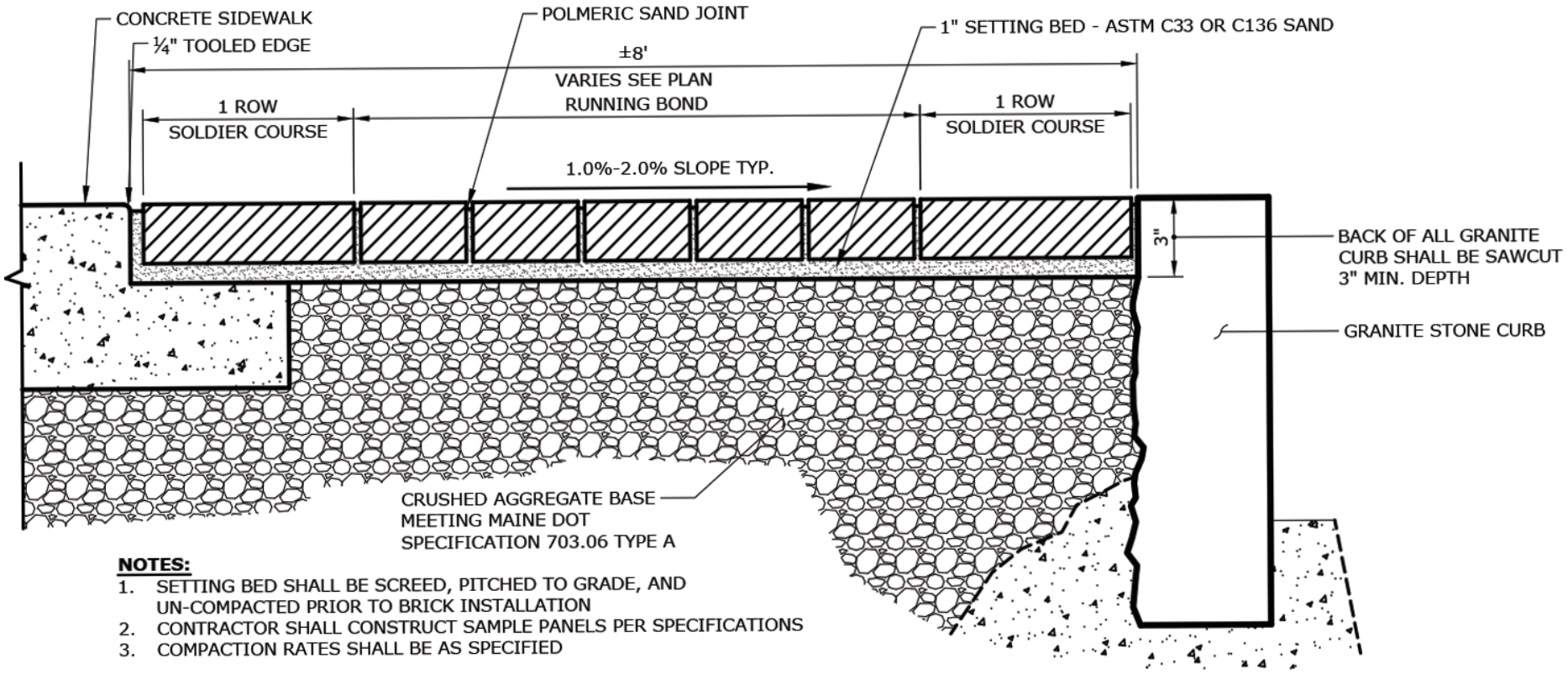
- Completed approximately 2005
- Note: Loss of sand in joints creating gaps and deflection (raised bricks with lip), creating trip hazards

Market Square – Newington, CT

- Completed 2011
- Pre-cast concrete unit paver (not brick) installed on processed stone base
- Still looks good with no noticeable settlement, weaving, or warping
- MMI's design with full-time construction inspection
- Note: Pavers used in pedestrian crosswalks with flush granite header (Photo 4) – some signs of plow blade damage

Appendix C

Design Details

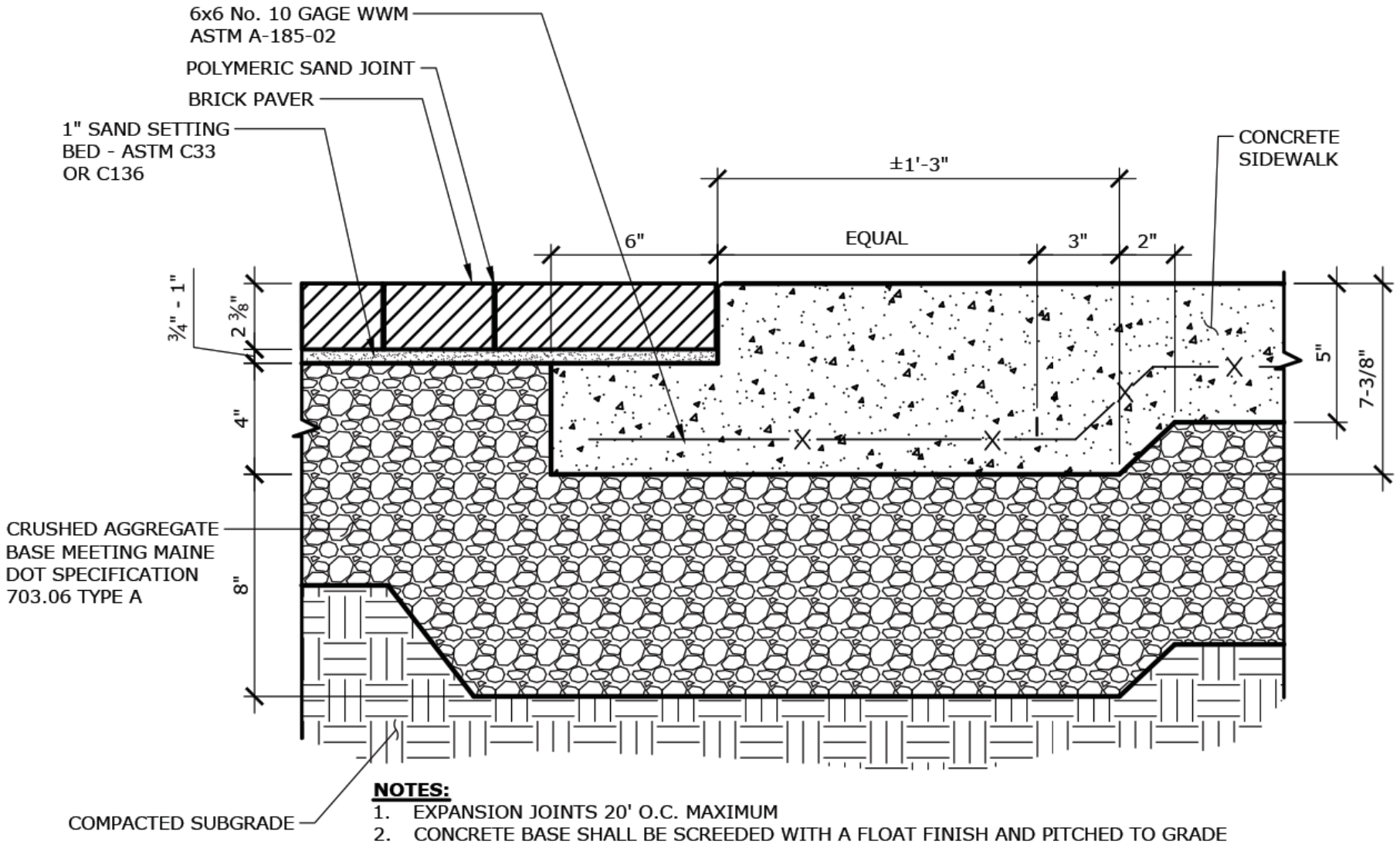


NOTES:

1. SETTING BED SHALL BE SCREED, PITCHED TO GRADE, AND UN-COMPACTED PRIOR TO BRICK INSTALLATION
2. CONTRACTOR SHALL CONSTRUCT SAMPLE PANELS PER SPECIFICATIONS
3. COMPACTION RATES SHALL BE AS SPECIFIED

BRICK SIDEWALK - AMENITY STRIP

N.T.S.

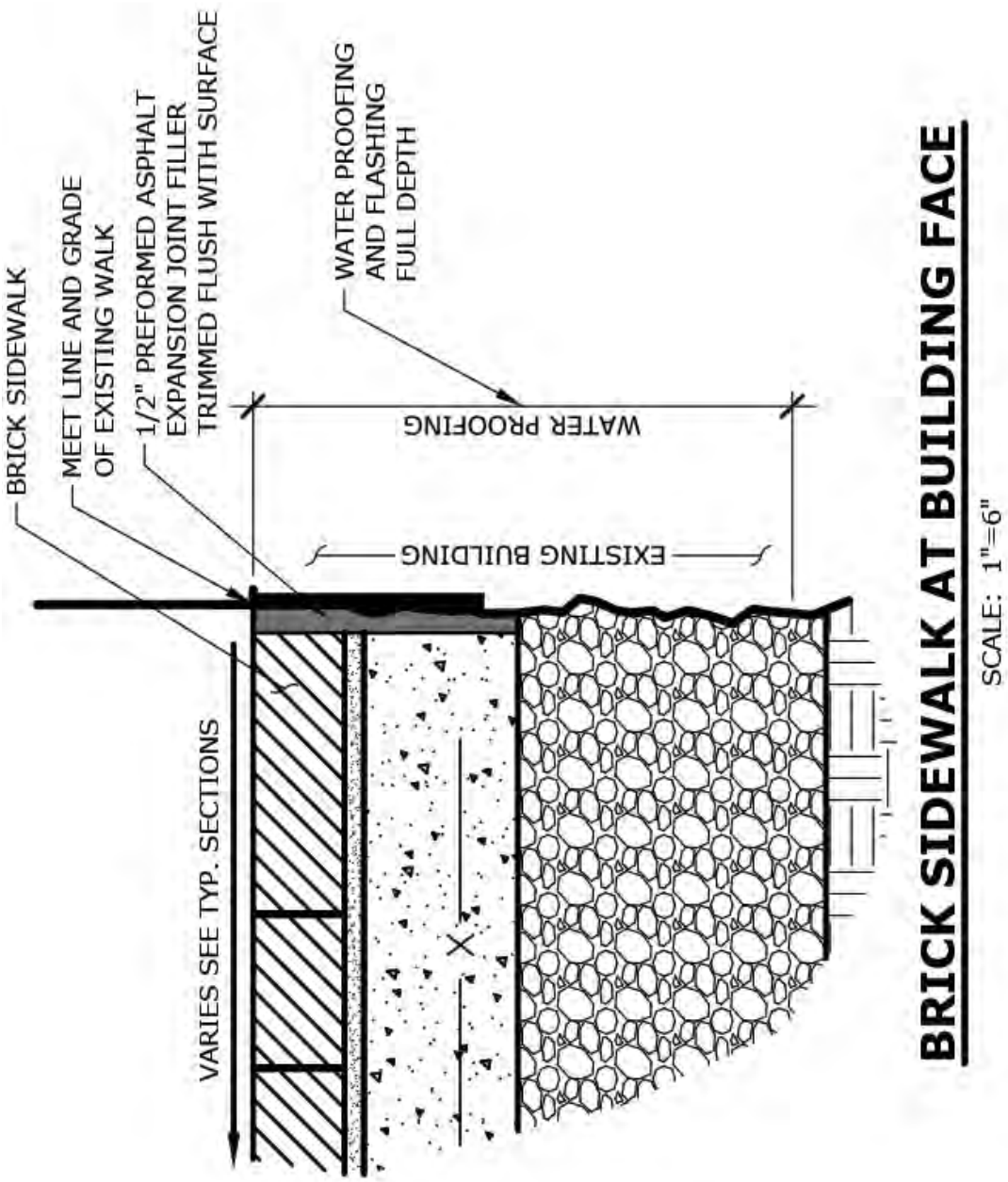


NOTES:

1. EXPANSION JOINTS 20' O.C. MAXIMUM
2. CONCRETE BASE SHALL BE SCREEDED WITH A FLOAT FINISH AND PITCHED TO GRADE

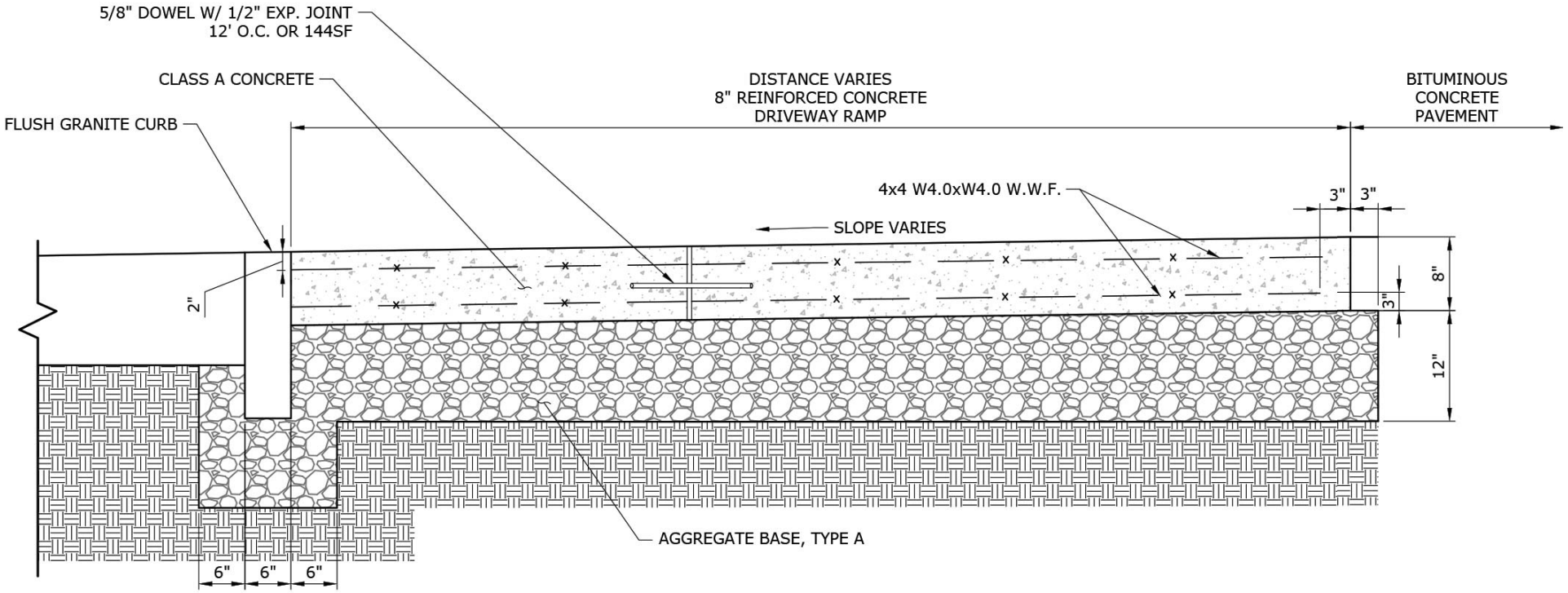
BRICK SIDEWALK - JOINT AT CONCRETE WALK

N.T.S.



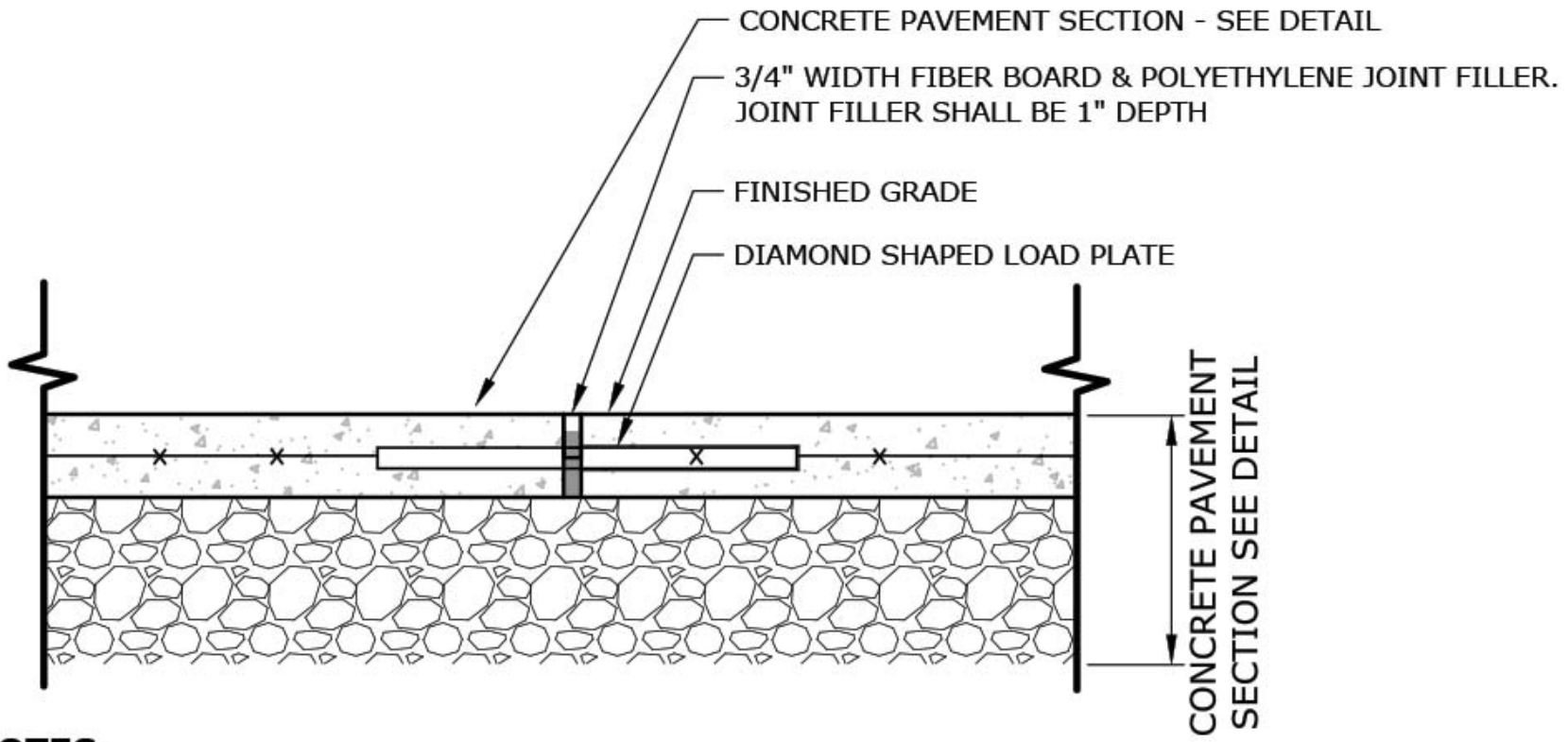
BRICK SIDEWALK AT BUILDING FACE

SCALE: 1"=6"



CONCRETE DRIVEWAY APRON

NOT TO SCALE

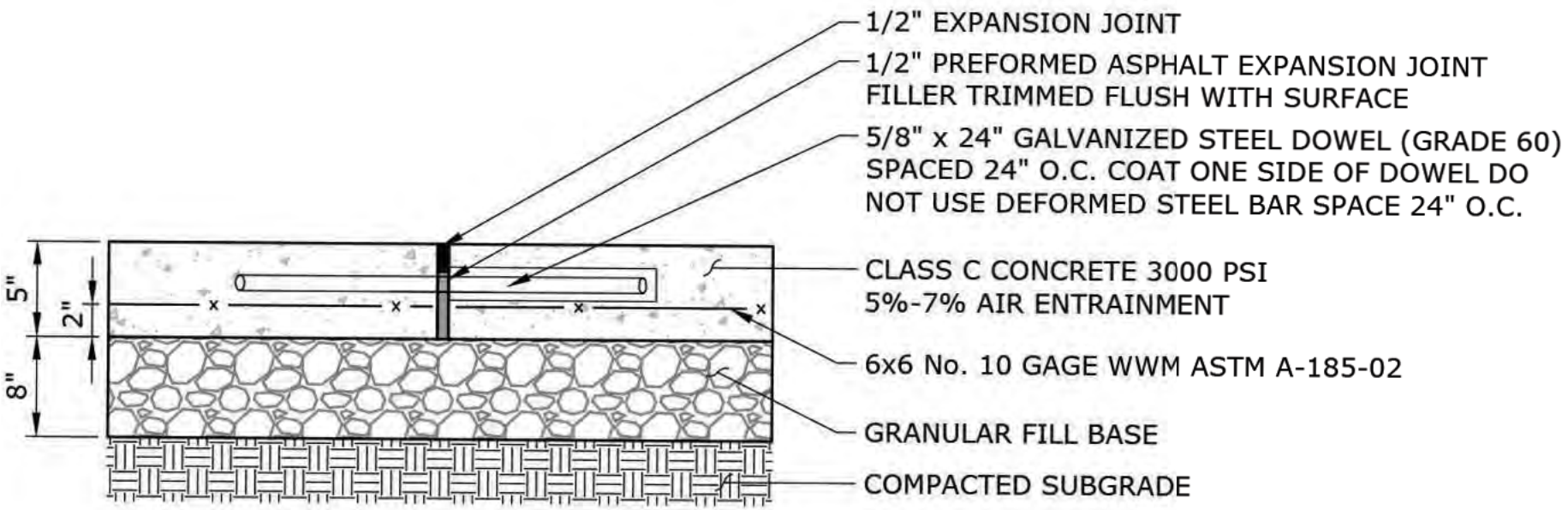


NOTES:

1. PROVIDE PREFORMED EXPANSION JOINT AT ALL CONSTRUCTION JOINT, SAWCUT, AND OTHER LOCATIONS WHERE CONCRETE ABUTTS EXISTING CONCRETE.

CEMENT CONCRETE EXPANSION JOINT

NOT TO SCALE

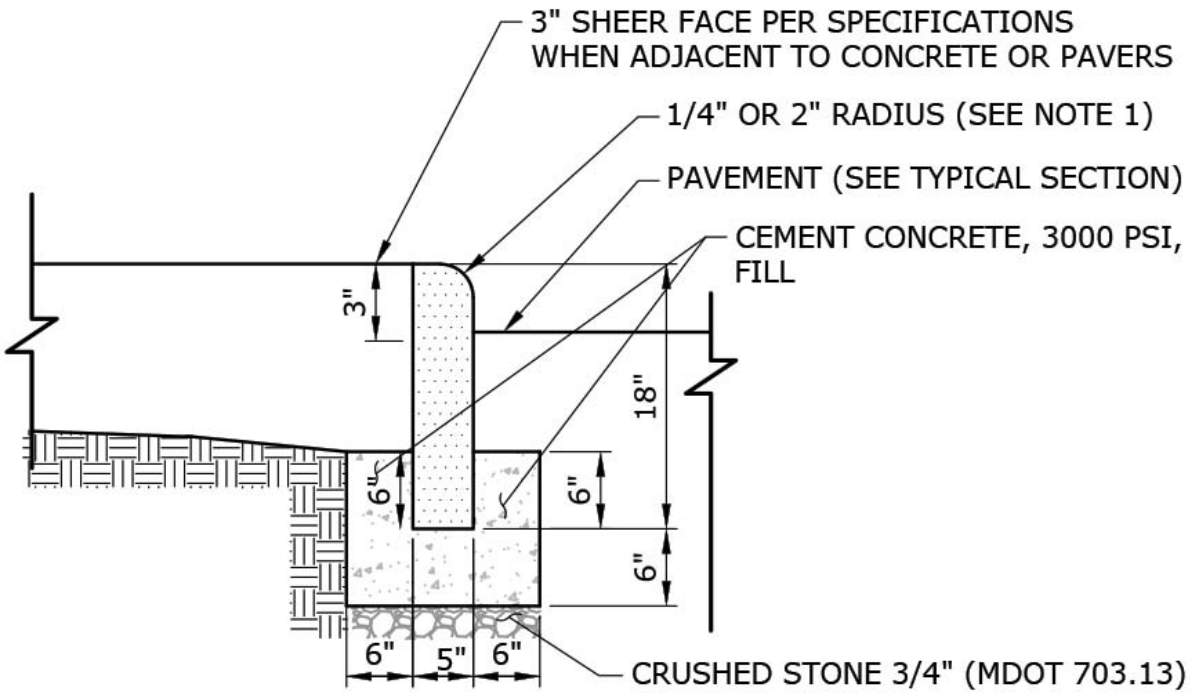


NOTES:

1. EXPANSION JOINTS 20' O.C. MAXIMUM.
2. GRANULAR FILL BASE IS TO EXTEND 6" PAST LINE OF CONCRETE WALK WHERE WALK DOES NOT ABUT A CURB OR STRUCTURE.
3. APPLY STIFF BROOM FINISH PERPENDICULAR TO DIRECTION OF TRAVEL.

CONCRETE SIDEWALK

NOT TO SCALE



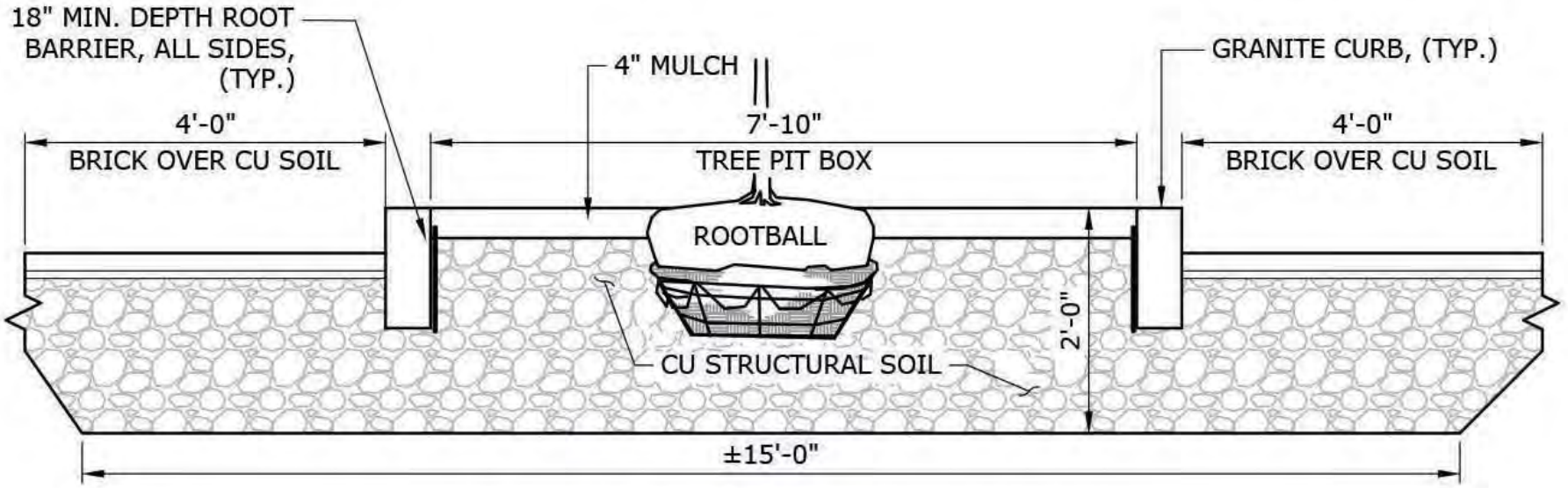
NOTES:

1. ALL RADIUS CURBING LESS THAN 15' RADIUS SHALL BE GROUND TO ACHIEVE 2" RADIUS ON STREET SIDE OF CURB, AND FEATHERED INTO ADJACENT STRAIGHT CURBING.

2. AT ALL JOINTS PROVIDE 4"x8-1/2" UNDERDRAIN FILTER FABRIC SET 1/2" BELOW TOP OF CURB SPANNING THE JOINT.

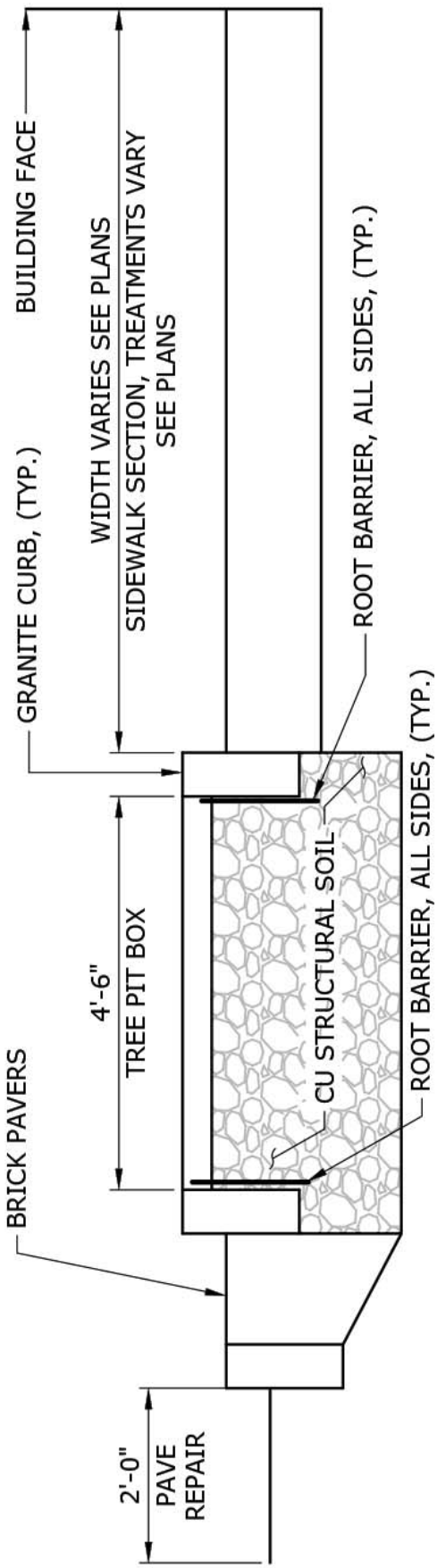
CURVED GRANITE CURBING

NOT TO SCALE



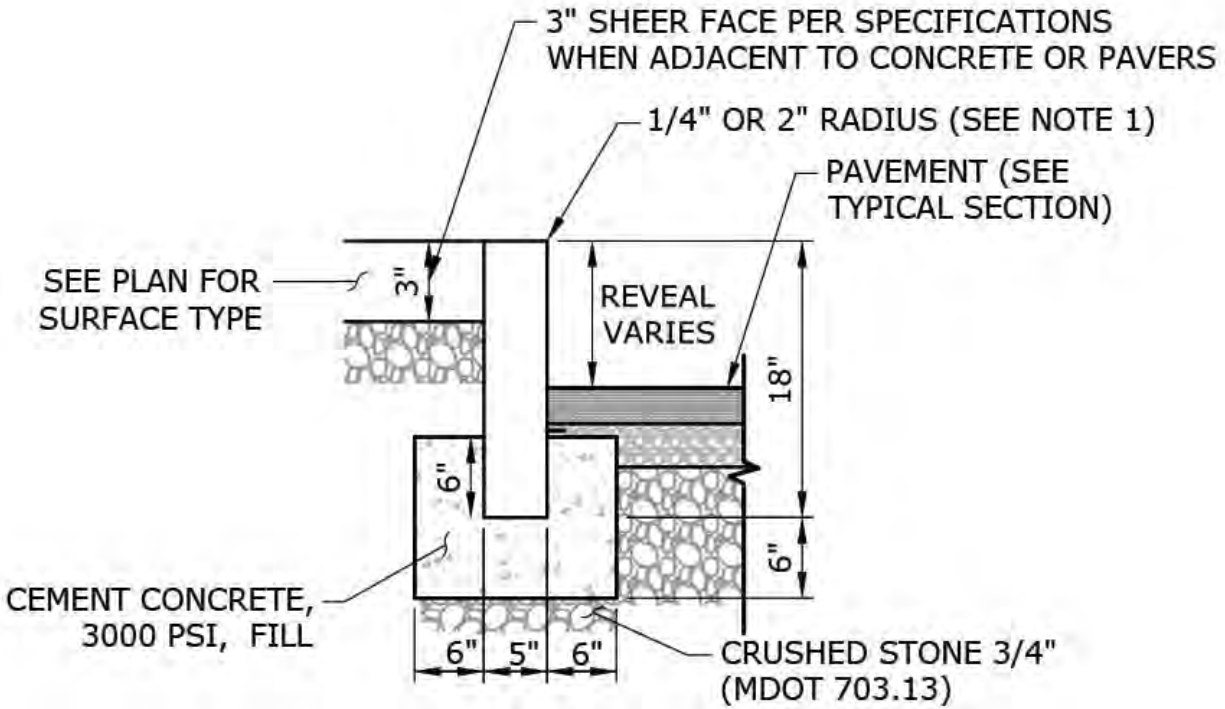
TYPICAL CU SOIL AT TREE PIT PARALLEL TO THE TRAVEL WAY

SCALE ½" = 1'



TYPICAL CU SOIL AT TREE PIT
PERPENDICULAR TO THE TRAVEL WAY

SCALE ½" = 1'

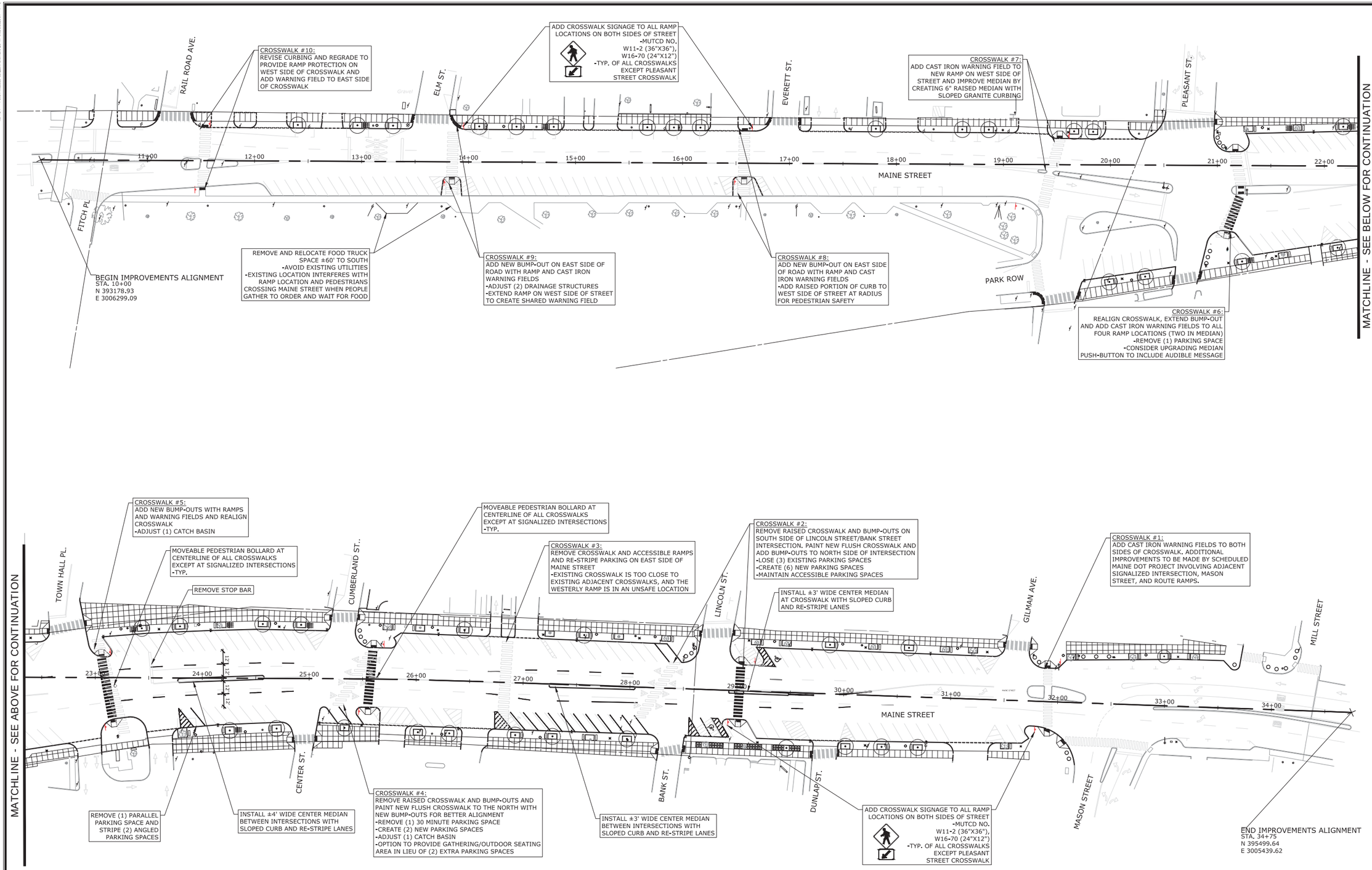


NOTES:

1. AT ALL JOINTS PROVIDE 4"x8-1/2" UNDERDRAIN FILTER FABRIC SET 1/2" BELOW TOP OF CURB SPANNING THE JOINT.

STRAIGHT GRANITE CURB

NOT TO SCALE



MILONE & MACBROOM
121 MIDDLE STREET, SUITE 201
PORTLAND, ME 04101
207.541.9554
WWW.MMINC.COM

DESCRIPTION	DATE	BY
MEDIANS REV.	2020/06/04	HAR

CROSSWALK IMPROVEMENTS PLAN - PROGRESS DRAFT

DOWNTOWN STREETSCAPE ENHANCEMENT PROJECT

MAINE STREET

BRUNSWICK, MAINE

JQA	HAR	JQA
DESIGNED	DRAWN	CHECKED

SCALE: 1"=40'

DATE: JUNE 2, 2020

PROJECT NO.: 3516-11

SHEET NAME: CW

Brunswick
DOWNTOWN ASSOCIATION

Promoting Downtown Brunswick as a vibrant and attractive place to live, work, play and do business.

October 6, 2020

Brunswick Town Council:

The Brunswick Downtown Association supports and endorses the Hybrid Plan of the Brunswick Downtown Streetscape Project as the most desirable option for the community. We feel this plan would provide an attractive, and functional option to replace the aging sidewalks of downtown Brunswick and reflect the historic nature of our Nationally Designated Historic Commercial District.

As a member of the Downtown Streetscape Redesign Committee I have carefully reviewed the various options provided by the consultants from Milone & MacBroom. Their options reflect the many suggestions, concerns, and desires of the community that were expressed at public meetings and data submitted via survey. The Hybrid Plan includes a combination of concrete and brick pavers, which defines the "zones" of the entire sidewalk, making it much more functional and orderly, while still retaining a warm and inviting streetscape.

Prior to the formation of the Streetscape Redesign Committee, the Design Committee of the Brunswick Downtown Association (BDA) has monitored the condition of the downtown including the deteriorating concrete paver sidewalks, the health of the trees, the lighting (specifically the black lamp posts), accessibility issues as they pertain to sidewalk conditions and building entryways along Maine Street and the general maintenance of the sidewalks. The BDA has hired a part-time employee through Parks and Recreation to ensure the sidewalks are kept clean during the typically busy summer months. Because of budget constraints this year, we were unable to fund this employee, but the staff of P & R have stepped up to continue to ensure a well-maintained streetscape in our downtown.

The BDA, through a grant made available by the Brunswick Development Corporation, distributed $250,000 in matching grants to local property owners to make improvements to their building facades. The total investment of improvements made was over $600,000. Having a well-designed streetscape augments the efforts of property owners who have made large investments in their buildings.

Thank you for the opportunity to participate in the Downtown Streetscape Redesign Committee. I look forward to the project proceeding in 2021.

Sincerely,

Debora King

Debora King, Executive Director

Brunswick
DOWNTOWN ASSOCIATION

85 Maine Street / PO Box 15, Brunswick, ME 04011 207-729-4439 www.brunswickdowntown.org

Ryan Barnes

From: Margo Knight <mknight@bates.edu>
Sent: Tuesday, October 6, 2020 9:52 AM
To: Town Council
Cc: Sally Costello; Matt Panfil; Ryan Barnes; Alison Harris; Andrew Hill; Bethany Taylor; Debora; Dee Perry; Kathy E. Wilson; Kathy Wilson; Toby Tarpinian; Tom Barter
Subject: MPIC's Support of the Downtown Streetscape Project

Dear Members of the Brunswick Town Council,

As chair of the Downtown and Outer Pleasant Street Corridor Master Plan Implementation Committee (MPIC), I am writing to inform you of the committee's support of the proposed downtown streetscape project.

MPIC held a Zoom committee meeting on September 22 so that the consultants, Milone and MacBroom, could review the project with us. As I said to the committee and audience, this project is one of the top priorities in the plan, adopted in 2011, and touches on three of the five focus areas of the plan: visual quality, vehicular and pedestrian movement, and neighborhoods.

That evening, eight of the nine MPIC members attended the meeting: Tom Barter (co-chair), Alison Harris, Deb King, Dee Perry, Toby Tarpinian, Bethany Taylor, Kathy Wilson, and I. The consultants presented the plan which includes different design options incorporating brick pavers and concrete, and different design options for benches, trash receptacles, and street lights. They also reviewed the results of the participants' feedback from the public workshop held at Town Hall in February. They answered questions from MPIC members regarding cost, longevity, repair, and pedestrian safety of the different options.

As chair, I asked the members about their preference for the design and five members said that they preferred the hybrid construction and design. The reasons they gave were the cost, appearance, maintenance, and pedestrian safety benefits. Three members did not express an opinion either way.

Thank you for voting last night to go forward this month with a public workshop on this project. I know that MPIC will have representatives there that evening. In the meantime, please let me know if you have any questions.

Sincerely,
Margo Knight
Chair, MPIC

--
Margo Knight
207-798-4600 (h)
207-319-5767 (c)
