LEGEND

- ELEVATION CONTOUR (IN FEET)
- EDGE OF PAVEMENT
- GRANITE CURB
- BIT. CONCRETE BERM
- WATER LINE
- GAS LINE
- ELECTRIC/TELEPHONE LINE
- SEWER LINE
- 6' CHAIN LINK FENCE
- WOOD FENCE
- STEEL GUARD RAIL
- TREE/SHRUB LINE
- UTILITY POLE
- GAS GATE
- GAS METER
- WATER GATE
- HYDRANT
- LIGHT POLE
- TRANSFORMER
- DRAIN CATCH BASIN
- DRAIN MANHOLE
- SEWER MANHOLE
- TELEPHONE MANHOLE
- ELECTRIC MANHOLE
- MONITOR WELL
- SOIL BORING
- SOIL SAMPLE FOUND
- HANDICAP RAMP
- CONCRETE BOUND
- WETLANDS
- SPOT ELEVATION
- RIPRAP
- LIMIT OF IN-RIVER EXCAVATION
- RIVER RELOCATION EASEMENT
- DETAIL NUMBER
- SHEET WHERE DETAIL IS SHOWN
- SHEET WHERE DETAIL IS REFERENCED
- SECTION IDENTIFIER
- SHEET WHERE SECTION IS SHOWN
- SHEET WHERE SECTION IS REFERENCED
- CELL BOUNDARY AND DESIGNATION
- EXCAVATION BOUNDARY
- ELE — EXTEND LIMIT OF EXCAVATION
- QUARRY SPALLS
- RIVERBED STRUCTURES: ROCK SPUR; WING DEFLECTOR; BOULDER
- PLANTING KEY: PLANTING ZONE AND DESIGNATION; TREES AND SHRUBS TO BE ADDED; SHRUB CLUMP; VINE CLUMP
- TEMPORARY EASEMENT
- SECURITY FENCE
- ACCESS ROAD
- O US — UPSTREAM
- • DS — DOWNSTREAM

GENERAL NOTES:

1. EXISTING TOPOGRAPHIC SURVEY PROVIDED BY APPLEWOOD SURVEY CO., 21 GREEN ST., HOLLISTON MA 01746, TERRENCE M. RYAN R.L.S. 37057. RIVERBANK AND RIVERBED SURVEY DATA ARE BASED ON THE 1998 TOPOGRAPHIC SURVEY PERFORMED BY THE U.S. ARMY CORPS OF ENGINEERS.
2. TOPOGRAPHIC FIELD SURVEY AND PLANS WERE PREPARED IN ACCORDANCE WITH THE PROCEDURAL AND TECHNICAL STANDARDS FOR THE PRACTICE OF LAND SURVEYING IN THE COMMONWEALTH OF MASSACHUSETTS BETWEEN SEPTEMBER 19, 2000 AND DECEMBER 1, 2000.
3. HORIZONTAL DATUM BASED ON MASSACHUSETTS STATE PLANE COORDINATES NAD 1983.
4. VERTICAL DATUM BASED ON NAVD 1988.
5. "EXCAVATION SUBCONTRACTOR" SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES PRIOR TO EXCAVATING, TRENCHING, OR GRADING.
6. "EXCAVATION SUBCONTRACTOR" SHALL VERIFY AND COORDINATE THE DIMENSIONS AMONG ALL DRAWINGS PRIOR TO PROCEEDING WITH ANY WORK.
7. DISCREPANCIES IDENTIFIED BY THE "EXCAVATION SUBCONTRACTOR" BETWEEN THE SPECIFICATIONS, DRAWINGS, AND SITE CONDITIONS SHALL BE REPORTED TO THE GENERAL CONTRACTOR. WORK PERFORMED BY THE "EXCAVATION SUBCONTRACTOR" PRIOR TO RESOLUTION OF SUCH DISCREPANCY BY THE GENERAL CONTRACTOR SHALL BE DONE AT THE "EXCAVATION SUBCONTRACTOR'S" RISK.
8. THE "EXCAVATION SUBCONTRACTOR" IS RESPONSIBLE FOR INFORMATION CONTAINED IN THE FOLLOWING REFERENCES:

8.1 PRE-DESIGN GEOTECHNICAL DATA SUMMARY FOR HOUSATONIC RIVER PROJECT FROM LYMAN STREET BRIDGE TO ELM STREET BRIDGE, PREPARED BY HART CROWSER, INC., DATED 9/25/2000.

8.2 SUMMARY OF STRUCTURAL CONDITIONS AND UTILITY SURVEY FROM LYMAN ST. BRIDGE TO ELM ST. BRIDGE ALONG HOUSATONIC RIVER, PITTSFIELD, MASSACHUSETTS, PREPARED BY HART CROWSER, INC., DATED 9/28/2000.

9. LIMITS OF EXCAVATION ARE BASED ON:

9.1 NORMAL WATER FLOW ELEVATION OF 971 FEET AS INDICATED IN THE JULY 14, 2000, VERSION OF THE EE/CA DOCUMENT.

9.2 LIMITS OF IN-RIVER EXCAVATION ARE BASED ON TSCA/NON-TSCA DESIGNATIONS. LIMITS OF IN-RIVER EXCAVATION SHOWN HEREIN ARE FOR IN-RIVER CONSTRUCTION CONTRACT AND DO NOT INCLUDE UPLAND WORK BY THE GENERAL CONTRACTOR.

DRAWING SCHEDULE

SHEET	TITLE	SHEET	TITLE
1	GENERAL NOTES AND LEGEND	16	EXISTING AND PROPOSED RIVERBANK CROSS SECTIONS – SHEET 4 OF 4
2	EXISTING CONDITIONS – SHEET 1 OF 2	17	EXISTING AND PROPOSED DRAIN SWALE CROSS SECTIONS
3	EXISTING CONDITIONS – SHEET 2 OF 2	18	RIVER RESTORATION PLAN – SHEET 1 OF 2
4	STAGING AREAS AND ACCESS ROAD LOCATIONS – SHEET 1 OF 4	19	RIVER RESTORATION PLAN – SHEET 2 OF 2
5	STAGING AREAS AND ACCESS ROAD LOCATIONS – SHEET 2 OF 4	20	RIVERBED RESTORATION – STRUCTURE DETAILS
6	STAGING AREAS AND ACCESS ROAD LOCATIONS – SHEET 3 OF 4	21	RIVERBANK RESTORATION – BIOENGINEERING DETAILS
7	STAGING AREAS AND ACCESS ROAD LOCATIONS – SHEET 4 OF 4	22	RIVERBANK RESTORATION – REVEGETATION PLAN – SHEET 1 OF 2
8	CHAIN LINK FENCE AND GATE DETAILS	23	RIVERBANK RESTORATION – REVEGETATION PLAN – SHEET 2 OF 2
9	REMOVAL AREAS – SHEET 1 OF 2	24	RIVERBANK RESTORATION – REVEGETATION DETAILS
10	REMOVAL AREAS – SHEET 2 OF 2	25	SILVER LAKE OUTFALL
11	WATER DIVERSION PLAN – SHEET 1 OF 2	26	MISCELLANEOUS DETAILS – SHEET 1 OF 3
12	WATER DIVERSION PLAN – SHEET 2 OF 2	27	MISCELLANEOUS DETAILS – SHEET 2 OF 3
13	EXISTING AND PROPOSED RIVERBANK CROSS SECTIONS – SHEET 1 OF 4	28	MISCELLANEOUS DETAILS – SHEET 3 OF 3
14	EXISTING AND PROPOSED RIVERBANK CROSS SECTIONS – SHEET 2 OF 4	29	ACCESS ROAD AND STAGING AREA SECTION AND DETAILS
15	EXISTING AND PROPOSED RIVERBANK CROSS SECTIONS – SHEET 3 OF 4		

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

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A	65% DESIGN SUBMITTAL	1/2/01					
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C	FINAL DESIGN SUBMITTAL	11/30/01					

Designed by: N.JB | Dwn by: DJH | Ckd by: GTB | Reviewed by: MJB | Submitted by: Chief, Arch. Section | Date: | Rev. C | Design file no: | SPEC. No.: | File name: 01_ | Plot date: 28 NOV 01 | Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON | HARTCROWSER | WOODLOT

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
GENERAL NOTES AND LEGEND

Sheet reference number: 1
1 of 29

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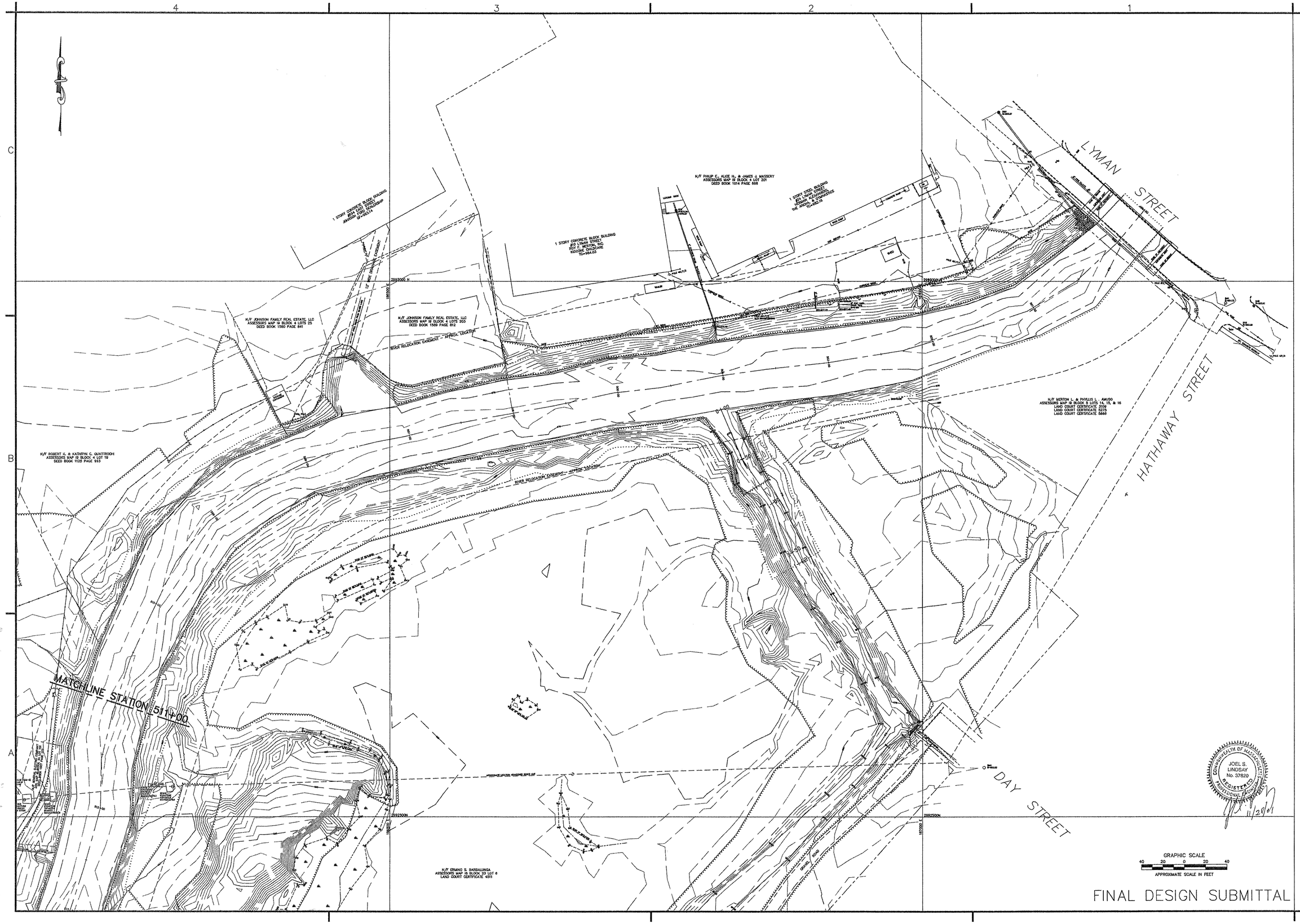

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A	65% REVIEW SUBMITTAL	2/2/01				
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Designed by:
Dwn by: A.J.M.
Ckd by: R.J.J.
Reviewed by: J.S.W.
Submitted by:
Chief, Arch. Section
Date: JAN 01
Rev: C
Design file no:
SPEC. No.:
File name: 02_
Plot date: 26 NOV 01
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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
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1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
EXISTING CONDITIONS
SHEET 1 OF 2

COMMONWEALTH OF MASSACHUSETTS
JOEL S. LINDSAY
No. 37820
REGISTERED PROFESSIONAL ENGINEER
11/26/01

Sheet reference number:
2
2 of 29

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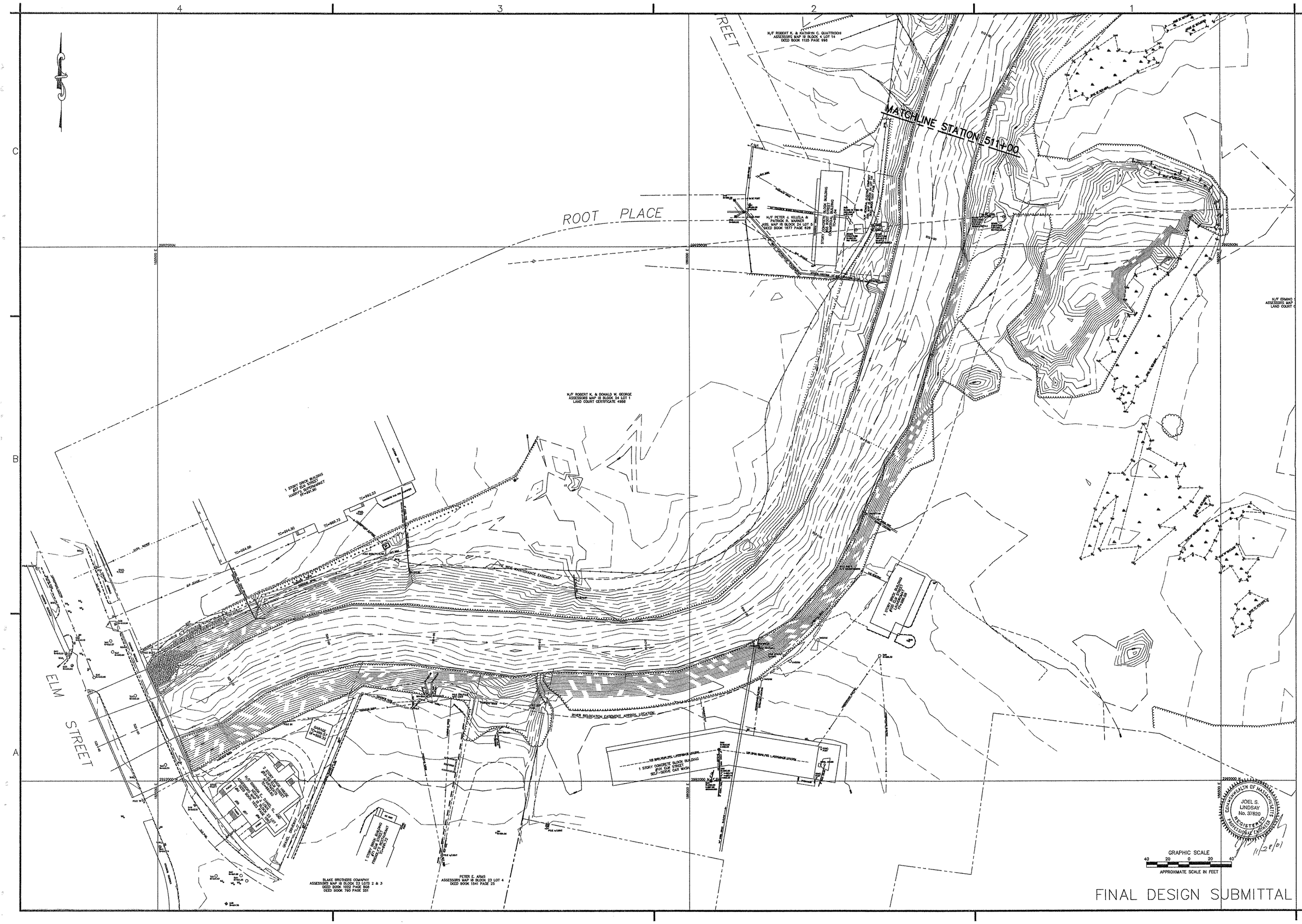

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A	65% REVIEW SUBMITTAL	12/2/99	
B	95% REVIEW SUBMITTAL		
C	FINAL REVIEW SUBMITTAL	11/30/01	

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Designed by: A.J.M.	Date: JAN 01
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	SPEC. No.:
	File name: 03_ Plot date: 26 NOV 01 Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

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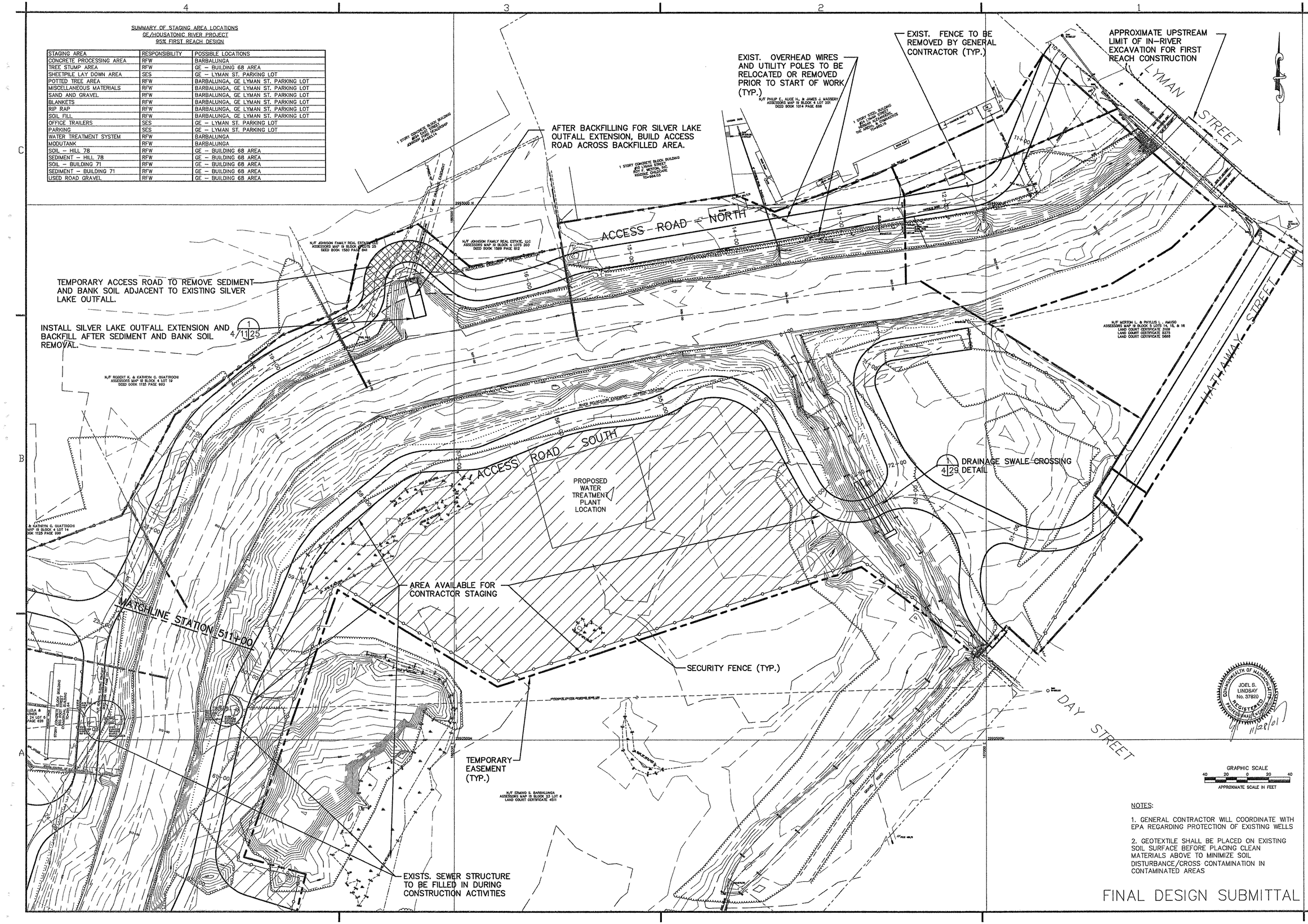
1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

EXISTING CONDITIONS
SHEET 2 OF 2

Sheet reference number:
3
3 of 29

SUMMARY OF STAGING AREA LOCATIONS
GE/HOUSATONIC RIVER PROJECT
95% FIRST REACH DESIGN

STAGING AREA	RESPONSIBILITY	POSSIBLE LOCATIONS
CONCRETE PROCESSING AREA	RFW	BARBALUNGA
TREE STUMP AREA	RFW	GE – BUILDING 68 AREA
SHEETPILE LAY DOWN AREA	SES	GE – LYMAN ST. PARKING LOT
POTTED TREE AREA	RFW	BARBALUNGA, GE LYMAN ST. PARKING LOT
MISCELLANEOUS MATERIALS	RFW	BARBALUNGA, GE LYMAN ST. PARKING LOT
SAND AND GRAVEL	RFW	BARBALUNGA, GE LYMAN ST. PARKING LOT
BLANKETS	RFW	BARBALUNGA, GE LYMAN ST. PARKING LOT
RIP RAP	RFW	BARBALUNGA, GE LYMAN ST. PARKING LOT
SOIL FILL	RFW	BARBALUNGA, GE LYMAN ST. PARKING LOT
OFFICE TRAILERS	SES	GE – LYMAN ST. PARKING LOT
PARKING	SES	GE – LYMAN ST. PARKING LOT
WATER TREATMENT SYSTEM	RFW	BARBALUNGA
MODUTANK	RFW	BARBALUNGA
SOIL – HILL 78	RFW	GE – BUILDING 68 AREA
SEDIMENT – HILL 78	RFW	GE – BUILDING 68 AREA
SOIL – BUILDING 71	RFW	GE – BUILDING 68 AREA
SEDIMENT – BUILDING 71	RFW	GE – BUILDING 68 AREA
USED ROAD GRAVEL	RFW	GE – BUILDING 68 AREA



NOTES:

1. GENERAL CONTRACTOR WILL COORDINATE WITH EPA REGARDING PROTECTION OF EXISTING WELLS

2. GEOTEXTILE SHALL BE PLACED ON EXISTING SOIL SURFACE BEFORE PLACING CLEAN MATERIALS ABOVE TO MINIMIZE SOIL DISTURBANCE/CROSS CONTAMINATION IN CONTAMINATED AREAS

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Designed by: TAG
Date: JAN 01
Rev. C
Dwn by: BEG
Ckd by: JSW
Design file no:
SPEC. No.:
Reviewed by:
Submitted by:
Chief, Arch. Section
File name: 04_
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DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
MANAGERS DESIGNERS/CONSULTANTS

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
STAGING AREAS AND
ACCESS ROAD LOCATIONS
SHEET 1 OF 4

Sheet reference number:
4
4 of 29

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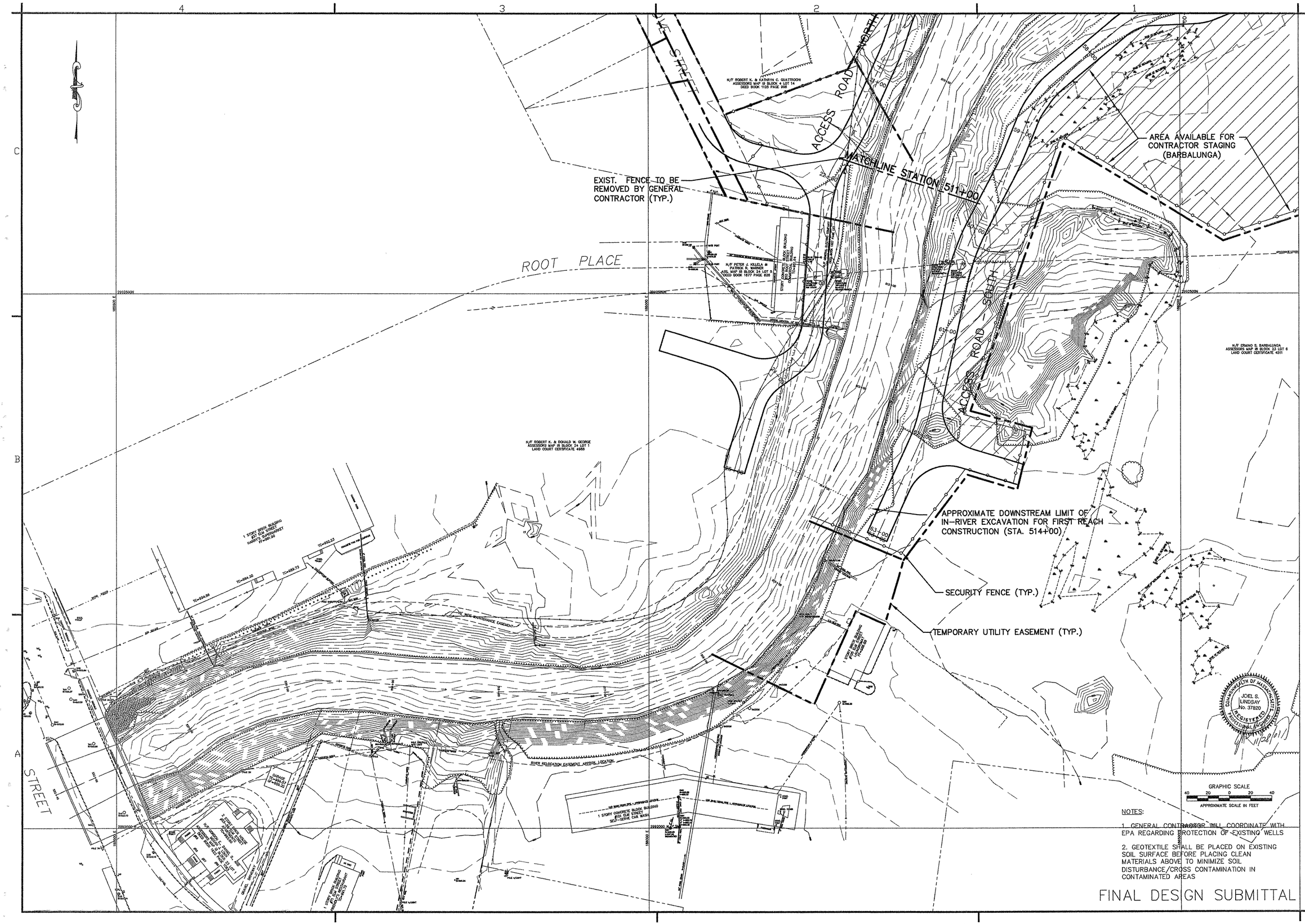

NOTES:

1. GENERAL CONTRACTOR WILL COORDINATE WITH EPA REGARDING PROTECTION OF EXISTING WELLS

2. GEOTEXTILE SHALL BE PLACED ON EXISTING SOIL SURFACE BEFORE PLACING CLEAN MATERIALS ABOVE TO MINIMIZE SOIL DISTURBANCE/CROSS CONTAMINATION IN CONTAMINATED AREAS

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B	95% REVIEW SUBMITTAL		
C	FINAL REVIEW SUBMITTAL	11/30/01	

Symbol	Description	Date	Appr.

Designed by: TAC
Dwn by: BEG
Ckd by: JSW
Reviewed by:
Submitted by: Chief, Arch. Section
Date: JAN 01
Rev. C
Design file no:
SPEC. No.:
File name: 05_
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DEPARTMENT OF THE ARMY
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CONCORD, MASSACHUSETTS

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1.5 MILE REMOVAL ACTION - FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

STAGING AREAS AND
ACCESS ROAD LOCATIONS
SHEET 2 OF 4

Sheet reference number:
5
5 of 29

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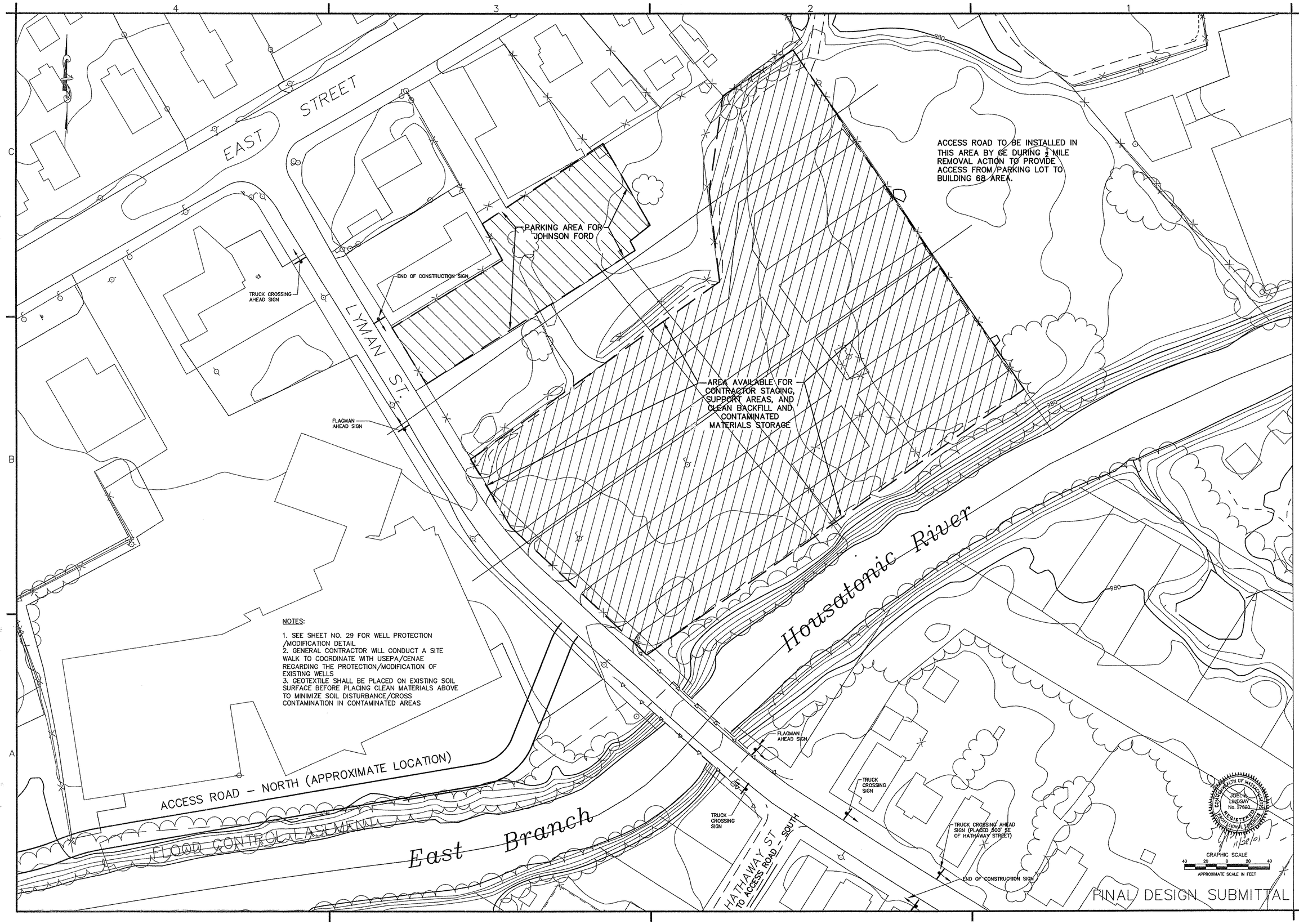

NOTES:

1. SEE SHEET NO. 29 FOR WELL PROTECTION /MODIFICATION DETAIL
2. GENERAL CONTRACTOR WILL CONDUCT A SITE WALK TO COORDINATE WITH USEPA/CENAE REGARDING THE PROTECTION/MODIFICATION OF EXISTING WELLS
3. GEOTEXTILE SHALL BE PLACED ON EXISTING SOIL SURFACE BEFORE PLACING CLEAN MATERIALS ABOVE TO MINIMIZE SOIL DISTURBANCE/CROSS CONTAMINATION IN CONTAMINATED AREAS

US Army Corps of Engineers
New England District

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A	65% REVIEW SUBMITTAL	2/2/01					
B	95% REVIEW SUBMITTAL						
C	FINAL REVIEW SUBMITTAL	11/28/01					

Designed by: R.A.D.
Dwn by: A.J.M.
Ckd by: J.S.W.
Reviewed by:
Submitted by:
Chief, Arch. Section
Date: JAN 01
Rev. C
Design file no:
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File name: 06_
Plot date: 28 NOV 01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
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1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
STAGING AREAS AND
ACCESS ROAD LOCATIONS
SHEET 3 OF 4 – LYMAN STREET

Sheet reference number:
6
6 of 29

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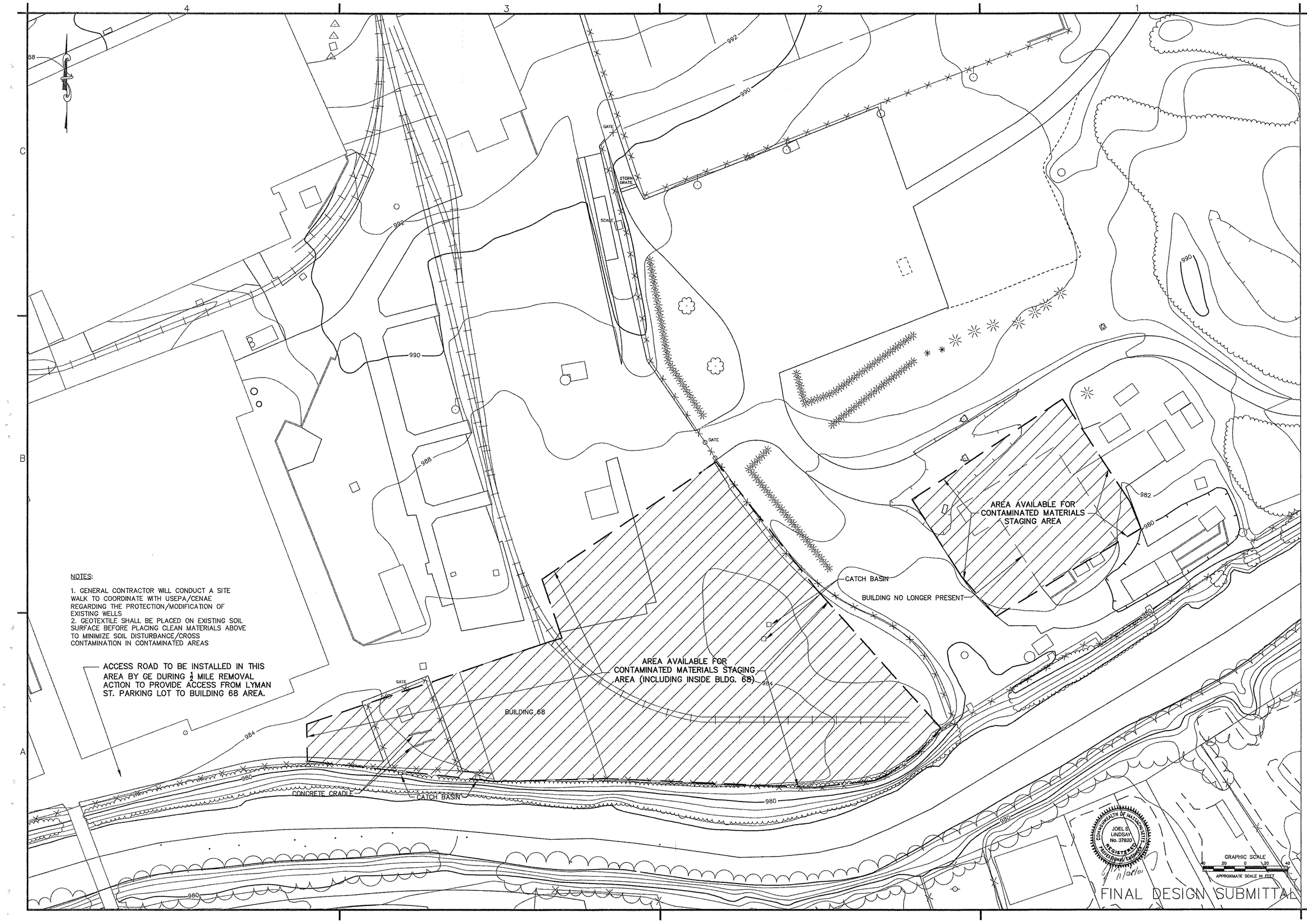

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A	65% REVIEW SUBMITTAL	2/6/01					
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C	FINAL REVIEW SUBMITTAL	11/30/01					

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Dwn by: L.J.B.
Ckd by:
Reviewed by:
Submitted by:
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Date: JUL 01
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DEPARTMENT OF THE ARMY
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CONCORD, MASSACHUSETTS

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1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

STAGING AREAS AND
ACCESS ROAD LOCATIONS
SHEET 4 OF 4 – GE BUILDING 68

Sheet reference number:
7
7 of 29

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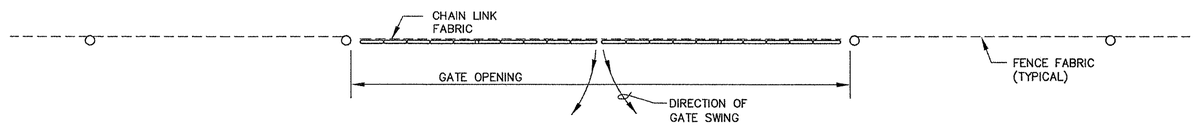
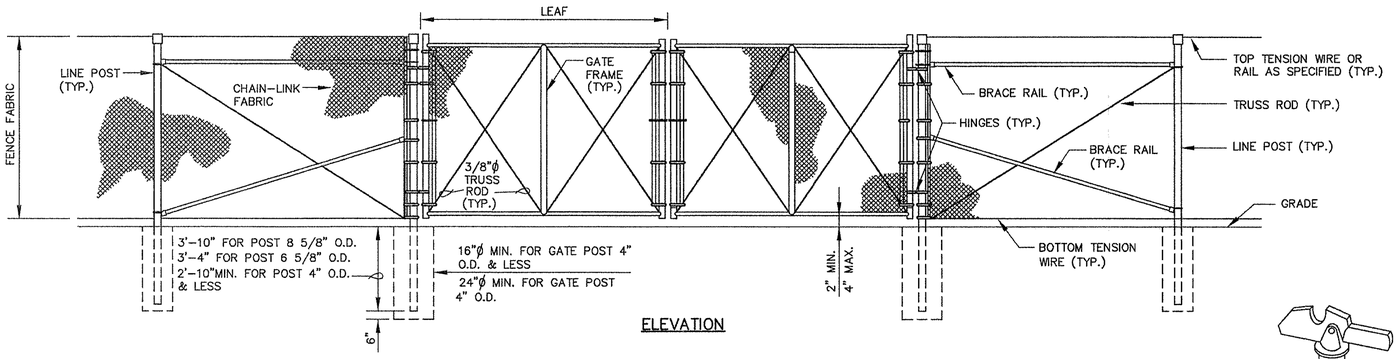


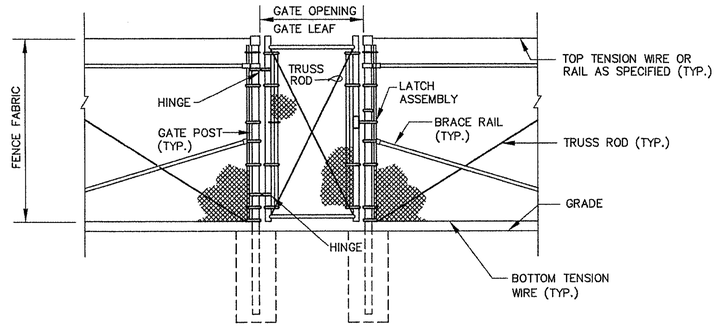
PLAN



ELEVATION

DOUBLE SWING GATE (TYPE FE-5 FENCE SHOWN)

GATE POST SCHEDULE	
GATE LEAF WIDTH (NOMINAL)	OUTSIDE DIMENSION (NOMINAL)
6' OR LESS	2.875" OD. 2.5" SQ.
MORE THAN 6' TO 13'	4.0" OD.
MORE THAN 13' TO 18'	6.625" OD.
MORE THAN 18'	8.625" OD.



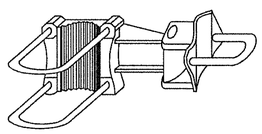
ELEVATION

PERSONNEL GATE (TYPE FE-5 FENCE SHOWN)

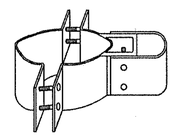
GATE NOTES

1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPE OF FENCE SECTIONS AND METHODS OF INSTALLATION.
2. SWING GATES SHALL BE CONSTRUCTED WITH DROP RODS, PADLOCKS, LATCH ASSEMBLY AND GATE KEEPERS EXCEPT AS NOTED.
3. ALL GATE FRAMES SHALL BE A MINIMUM 1.90" NOMINAL (ROUND) OR 2.00" NOMINAL (SQUARE). GATE FRAMES SHALL BE OF WELDED CONSTRUCTION OR SHALL BE ASSEMBLED USING HEAVY FITTINGS. AT CONTRACTOR'S OPTION, A WELDED HORIZONTAL BRACE MAY BE USED IN LIEU OF TRUSS RODS TO BRACE ALL WELDED GATE FRAMES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER RIGID CONSTRUCTION OF ALL GATES SUPPLIED.
4. GATES SHALL BE DESIGNATED AS FOLLOWS:
   - FENCE TYPE – FE5, FE6, ETC.
   - FENCE HEIGHT – INCHES
   - TYPE OPENING – SO (SINGLE)
   - – DO (DOUBLE)
   - HINGE – RA (STANDARD)
   - – HO (OFFSET)
   - OPENING – FEET (CLEAR OPENING BETWEEN GATE POSTS)

   EXAMPLES: FE6-84-DO-RA-24
   FE5-48-SO-HO-6

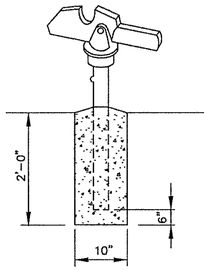


OFFSET HINGE



STANDARD HINGE

SWING GATE DETAILS



GATE KEEPER
(TO KEEP GATE OPEN)

FENCE NOTES:

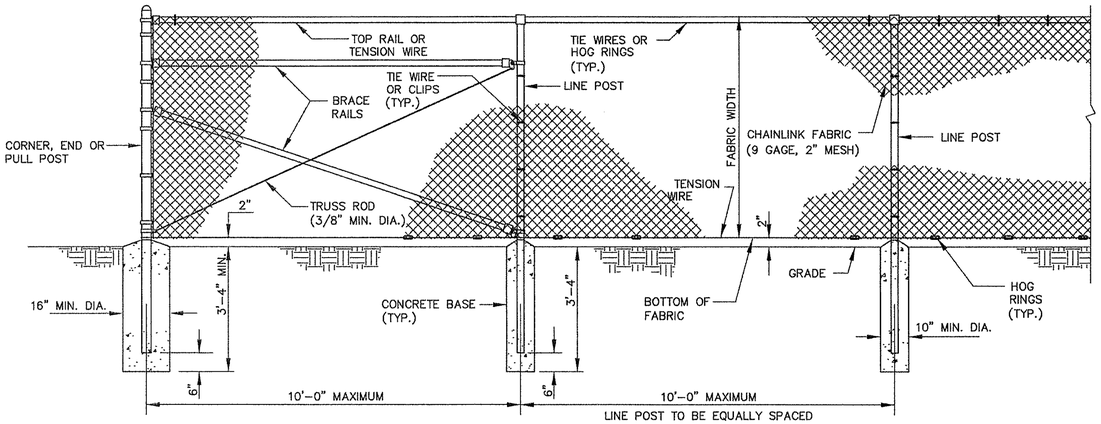
1. DETAILS SHOWN ARE TO CLARIFY REQUIREMENTS AND ARE NOT INTENDED TO LIMIT OTHER TYPES OF FENCE SECTIONS, AND METHODS OF INSTALLATION.
2. WIRE TIES, RAILS, POSTS AND BRACES SHALL BE CONSTRUCTED ON THE SECURE SIDE OF THE FENCE ALIGNMENT. CHAIN-LINK FABRIC SHALL BE PLACED ON THE OPPOSITE SIDE OF THE SECURE AREA.
3. UNLESS SPECIFICALLY SHOWN OR SPECIFIED, ALL FE6 FENCE SHALL HAVE APRON EXTENDED OUTWARD FROM THE AREA BEING PROTECTED.
4. C-SECTION POSTS SHALL BE INSTALLED SO THAT THE VOID INSIDE THE POST IS COMPLETELY FILLED WITH CONCRETE UP TO THE TOP OF THE FOUNDATION.
5. CONCRETE IS REQUIRED FOR PERMANENT FENCE AND ALL GATE POSTS ONLY. 11 GAGE CHAINLINK FABRIC, DRIVEN POSTS, AND STANCHIONS ARE ADEQUATE FOR TEMPORARY INSTALLATIONS.

FENCE LEGEND:

TYPE FE5 – CHAIN-LINK FENCE WITHOUT BARBED-WIRE APRON.
TYPE FE6 – CHAIN-LINK FENCE WITH BARBED-WIRE ON SINGLE OUTRIGGER.
TYPE FE7 – CHAIN-LINK FENCE WITH BARBED-WIRE ON DOUBLE OUTRIGGER.
TYPE FE8 – CHAIN-LINK FENCE WITH BARBED-WIRE AND BARBED-TAPE ON DOUBLE OUTRIGGER.
TR – FENCE WITH TOP RAIL AND TENSION WIRE AT BOTTOM.
TBR – FENCE WITH TOP AND BOTTOM RAIL.
TWB – TENSION WIRE TOP AND BOTTOM
TWBR – FENCE WITH TOP TENSION WIRE AND BOTTOM RAIL.
FINAL NUMBER IS FABRIC WIDTH IN INCHES.

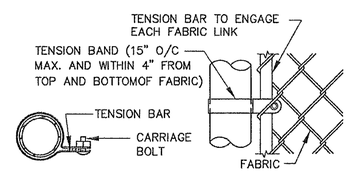
EXAMPLES:

FE6-TR 72 – CHAIN-LINK SECURITY FENCE WITH BARBED-WIRE ON SINGLE OUTRIGGER, TOP RAIL AND 72 INCH FABRIC WIDTH.
FE5-TWB-48-CHAIN-LINK SECURITY FENCE WITH NO APRON, TOP AND BOTTOM TENSION WIRE AND 48 INCH FABRIC WIDTH.

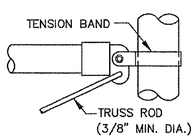


CHAIN-LINK FENCE DETAIL

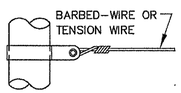
STEEL POST SCHEDULE			
USE AND SECTION	MINIMUM OUTSIDE DIMENSIONS (NOMINAL)		
	FABRIC LESS THAN 72"	FABRIC 72" TO 96"	FABRIC OVER 96"
CORNER, END & PULL POSTS			
TUBULAR – ROUND	2.375"O.D.	2.875"O.D.	4.00"O.D.
TUBULAR – SQUARE	2.00" SQ.	2.50" SQ.	3.00" SQ.
C-SECTION (ROLL-FORMED)	3.50" X 3.50"	3.50" X 3.50"	———
LINE POSTS			
TUBULAR – ROUND	1.90"O.D.	2.375"O.D.	2.875"O.D.
H-SECTION	2.25" X 1.70"	2.25" X 1.70"	2.25" X 1.70"
C-SECTION (ROLL-FORMED)	1.875" X 1.625"	2.25" X 1.70"	———
TOP, BOTTOM & BRACE RAILS			
TUBULAR – ROUND	1.66"O.D.		
TUBULAR – SQUARE	1.50"O.D.		
H-SECTION	1.625" X 1.50"		
C-SECTION (ROLL-FORMED)	1.625" X 1.25"		



END OR GATE POST DETAIL

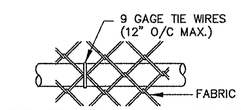


ROUND POST

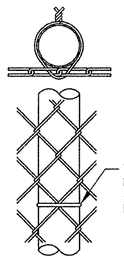


TENSION BAND DETAIL

FASTENING DETAILS

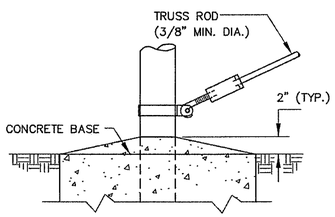


TOP OR BRACE RAIL ATTACHMENT

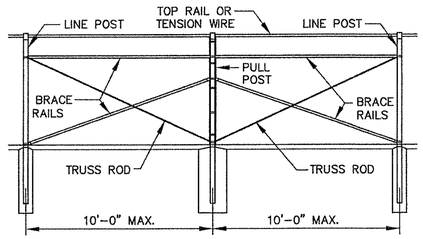


ROUND POST

LINE POST ATTACHMENTS



TRUSS ROD AND BAND



NOTE PROVIDE BRACE PANEL WHENEVER STRAIGHT RUNS EXCEED 500 FEET.

BRACE PANEL DETAIL

COMMONWEALTH OF MASSACHUSETTS
JOEL S. LINDSAY
No. 37820
REGISTERED PROFESSIONAL ENGINEER
11/28/01

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	2/2/01	
B	95% REVIEW SUBMITTAL		
C	FINAL REVIEW SUBMITTAL	11/29/01	

Designed by: J.S.W. | Dwn by: A.J.K. | Ckd by: J.S.W. | Reviewed by: | Submitted by: Chief, Arch. Section | Date: JAN 01 | Rev. C | Design file no: | SPEC. No.: | File name: 08_ | Plot date: 28 NOV 01 | Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON | WOODLOT | HARTCROWSER

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

CHAIN LINK FENCE AND GATE DETAILS

Sheet reference number: 8
8 of 29

M:\Design\DWG\ACOE\SSERC\1st_0.5_m\08_.dwg, Layout1, 11/26/2001 01:32:20 PM, GIRARDEB, 1:1

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-1	2992742.8	186895.0
EX-2	2992732.3	186876.9
EX-3	2992774.0	186840.1
EX-4	2992781.5	186854.2
EX-5	2992822.6	186828.9
EX-6	2992831.2	186846.0
EX-7	2992838.4	186857.6
EX-8	2992845.5	186797.6
EX-9	2992862.5	186787.6
EX-10	2992868.1	186802.5
EX-11	2992874.9	186819.7
EX-12	2992880.1	186816.5
EX-13	2992887.5	186858.5
EX-14	2992874.7	186862.3
EX-15	2992892.7	186907.4
EX-16	2992901.8	186958.5
EX-17	2992937.2	186900.0
EX-18	2992944.7	186950.2
EX-19	2992960.4	186948.1
EX-22	2992740.6	186323.2
EX-23	2992929.5	186850.1
EX-24	2992948.5	186847.1
EX-25	2992961.4	186849.8
EX-26	2992943.0	186806.3
EX-27	2992954.4	186798.9
EX-28	2992930.9	186748.5
EX-29	2992937.5	186747.4
EX-30	2992920.6	186649.2
EX-31	2992928.1	186647.6
EX-32	2992945.5	186746.0
EX-33	2992937.3	186645.7
EX-34	2992952.1	186744.0
EX-35	2992815.9	186472.1
EX-36	2992803.8	186472.9
EX-37	2992790.2	186476.6
EX-38	2992783.9	186437.5
EX-39	2992803.9	186429.0
EX-40	2992871.2	186410.7
EX-41	2992791.8	186378.5
EX-42	2992780.0	186387.6

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-43	2992771.4	186393.6
EX-44	2992758.0	186404.0
EX-45	2992745.9	186413.4
EX-46	2992923.3	186902.0
EX-47	2992931.0	186952.9
EX-48	2992762.0	186338.0
EX-49	2992722.7	186310.9
EX-50	2992713.6	186324.6
EX-51	2992753.2	186350.7
EX-52	2992741.7	186356.3
EX-53	2992699.1	186345.3
EX-54	2992691.4	186356.0
EX-55	2992628.4	186303.5
EX-56	2992621.0	186320.0
EX-57	2992635.9	186284.0
EX-58	2992717.6	186279.8
EX-59	2992705.1	186300.5
EX-60	2992694.5	186263.4
EX-61	2992648.5	186245.6
EX-62	2992654.9	186227.2
EX-63	2992833.0	186354.3
EX-64	2992795.2	186305.8
EX-65	2992769.4	186281.6
EX-66	2992667.0	186320.4
EX-67	2992609.3	186212.0
EX-68	2992561.5	186200.5
EX-69	2992519.0	186201.0
EX-70	2992509.8	186198.6
EX-71	2992566.6	186188.5
EX-72	2992564.3	186194.4
EX-73	2992568.3	186184.3
EX-75	2992656.3	186222.1
EX-76	2992658.8	186216.2
EX-77	2992365.5	186156.6
EX-79	2992330.6	186144.0
EX-80	2992335.1	186211.0
EX-81	2992308.1	186187.4
EX-82	2992358.9	186214.4

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-83	2992447.4	186240.7
EX-84	2992495.2	186256.4
EX-85	2992536.9	186258.0
EX-86	2992857.7	186413.6
EX-87	2992611.9	186205.8
EX-88	2992559.5	186261.7
EX-89	2992611.7	186198.7
EX-90	2993050.8	187226.3
EX-91	2992975.5	187164.0
EX-92	2992948.4	187110.6
EX-93	2992934.4	187061.8
EX-94	2992905.3	186974.8
EX-95	2992894.2	186993.9
EX-96	2992885.7	186952.4
EX-97	2992885.8	186938.6
EX-98	2992884.9	186918.5
EX-99	2992869.8	186839.2
EX-100	2992820.7	186870.8
EX-101	2992747.9	186903.8
EX-102	2992721.8	186858.8
EX-103	2992806.6	186818.3
EX-104	2992843.9	186777.1
EX-105	2992844.9	186711.1
EX-106	2992842.3	186704.0
EX-107	2992828.9	186689.3
EX-108	2992822.1	186665.2
EX-109	2992819.9	186644.8
EX-110	2992821.9	186637.4
EX-111	2992780.0	186515.6
EX-112	2992775.6	186446.5

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-113	2992704.8	186366.0
EX-114	2992665.8	186336.7
EX-115	2992600.4	186310.7
EX-116	2992578.5	186292.7
EX-117	2992550.3	186283.0
EX-118	2992517.6	186276.7
EX-119	2992484.3	186264.6
EX-120	2992469.4	186143.5
EX-121	2992523.8	186177.8
EX-122	2992620.3	186192.2
EX-123	2992640.6	186206.3
EX-124	2992682.4	186226.3
EX-125	2992702.5	186237.1
EX-126	2992726.5	186245.2
EX-127	2992780.7	186268.2
EX-128	2992824.7	186317.5
EX-129	2992853.1	186364.2
EX-130	2992873.2	186418.4
EX-131	2992879.9	186428.9
EX-132	2992894.9	186438.0
EX-133	2992913.1	186437.6
EX-134	2992931.7	186443.6
EX-135	2992941.4	186455.4
EX-136	2992939.6	186463.3
EX-137	2992907.6	186501.2

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-138	2992903.2	186520.5
EX-139	2992922.1	186610.3
EX-140	2992929.5	186629.7
EX-141	2992935.0	186636.4
EX-142	2993002.9	187040.8
EX-143	2993029.7	187081.0
EX-144	2993033.7	187090.8
EX-145	2993040.7	187097.7
EX-146	2993051.9	187118.6
EX-147	2993061.1	187126.6
EX-148	2993069.0	187145.5
EX-149	2993054.1	187163.8
EX-150	2993082.5	187190.9
EX-151	2992381.0	186239.4
EX-152	2992349.6	186227.9
EX-153	2992330.1	186223.7
EX-154	2992297.8	186207.7
EX-155	2992350.2	186105.9
EX-156	2992644.9	186265.2
EX-157	2992819.9	186424.9

CROSS SECTION LOCATIONS	
STATION	CROSS SECTION SHEET NO.
500+00	13
500+50	13
501+00	13
501+50	13
502+00	13
502+50	13
503+00	13
503+50	13
504+10	14
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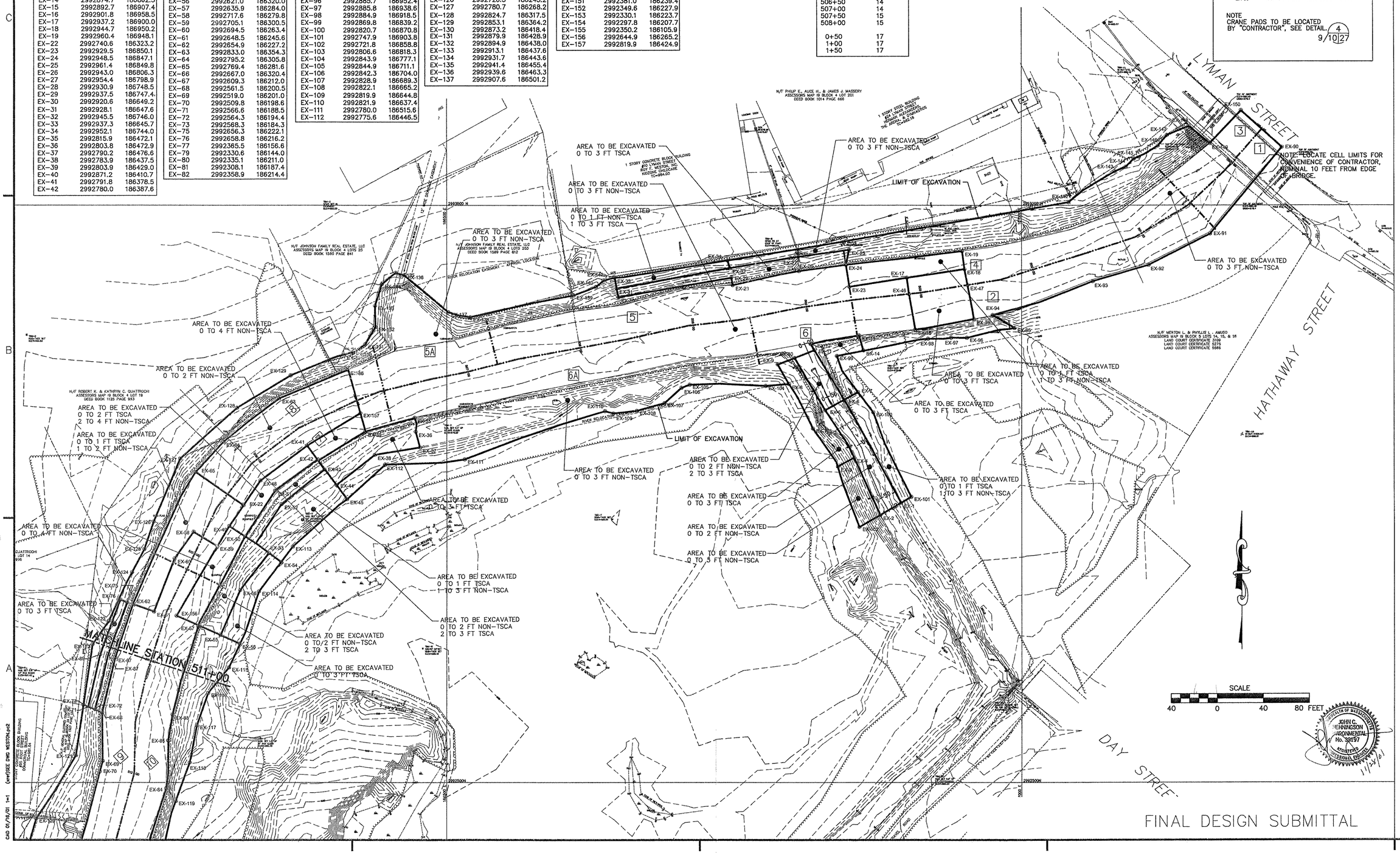
505+00	14
505+50	14
506+00	14
506+50	14
507+00	14
507+50	15
508+00	15
0+50	17
1+00	17
1+50	17

CROSS SECTION LOCATIONS	
STATION	CROSS SECTION SHEET NO.
508+50	15
509+00	15
509+50	15
510+00	15
510+50	15
511+00	16
511+50	16
512+00	16
512+50	16
513+00	16
513+50	16
514+00	16

LEGEND:

- EXCAVATION BOUNDARY
- 1 CELL BOUNDARY AND DESIGNATION
- EX-35 EXCAVATION CONTROL POINT

NOTE
CRANE PADS TO BE LOCATED BY "CONTRACTOR", SEE DETAIL 4/9/10/27



FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	2/2/01					
B	95% REVIEW SUBMITTAL	8/10/01					
C	100% SUBMITTAL	11/30/01					

Designed by: NJB	Date: 11/30/01	Rev. C
Dwn by: DJH	Ckd by: GTB	Design file no:
Reviewed by: MJB		SPEC. No.:
Submitted by: Chief, Arch. Section		File name: 73850506.DWG Plot date: 11/02/01 Plot scale: 1=1

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

HARTCROWSER
WESTON
WOODLOT ENVIRONMENTAL

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

REMOVAL AREAS
SHEET 1 OF 2

Sheet reference number:
9
9 of 29

LEGEND:

- EXCAVATION BOUNDARY
- 1 CELL BOUNDARY AND DESIGNATION
- EX-35 EXCAVATION CONTROL POINT

NOTE
CRANE PADS TO BE LOCATED BY "CONTRACTOR", SEE DETAIL 4/9/10/27

CROSS SECTION LOCATIONS	
STATION	CROSS SECTION SHEET NO.
500+00	13
500+50	13
501+00	13
501+50	13
502+00	13
502+50	13
503+00	13
503+50	13
504+10	14
504+50	14
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505+50	14
506+00	14
506+50	14
507+00	14
507+50	15
508+00	15
0+50	17
1+00	17
1+50	17

CROSS SECTION LOCATIONS	
STATION	CROSS SECTION SHEET NO.
508+50	15
509+00	15
509+50	15
510+00	15
510+50	15
511+00	16
511+50	16
512+00	16
512+50	16
513+00	16
513+50	16
514+00	16

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-1	2992742.8	186895.0
EX-2	2992732.3	186876.9
EX-3	2992774.0	186840.1
EX-4	2992781.5	186854.2
EX-5	2992822.6	186828.9
EX-6	2992831.2	186846.0
EX-7	2992838.4	186857.6
EX-8	2992845.5	186797.6
EX-9	2992862.5	186787.6
EX-10	2992868.1	186802.5
EX-11	2992874.9	186819.7
EX-12	2992880.1	186816.5
EX-13	2992887.5	186858.5
EX-14	2992874.7	186862.3
EX-15	2992892.7	186907.4
EX-16	2992901.8	186958.5
EX-17	2992937.2	186900.0
EX-18	2992944.7	186950.2
EX-19	2992960.4	186948.1
EX-22	2992740.6	186323.2
EX-23	2992929.5	186850.1
EX-24	2992948.5	186847.1
EX-25	2992961.4	186849.8
EX-26	2992943.0	186806.3
EX-27	2992954.4	186798.9
EX-28	2992930.9	186748.5
EX-29	2992937.5	186747.4
EX-30	2992920.6	186649.2
EX-31	2992928.1	186647.6
EX-32	2992945.5	186746.0
EX-33	2992937.3	186645.7
EX-34	2992952.1	186744.0
EX-35	2992815.9	186472.1
EX-36	2992803.8	186472.9
EX-37	2992790.2	186476.6
EX-38	2992783.9	186437.5
EX-39	2992803.9	186429.0
EX-40	2992871.2	186410.7
EX-41	2992791.8	186378.5
EX-42	2992780.0	186387.6

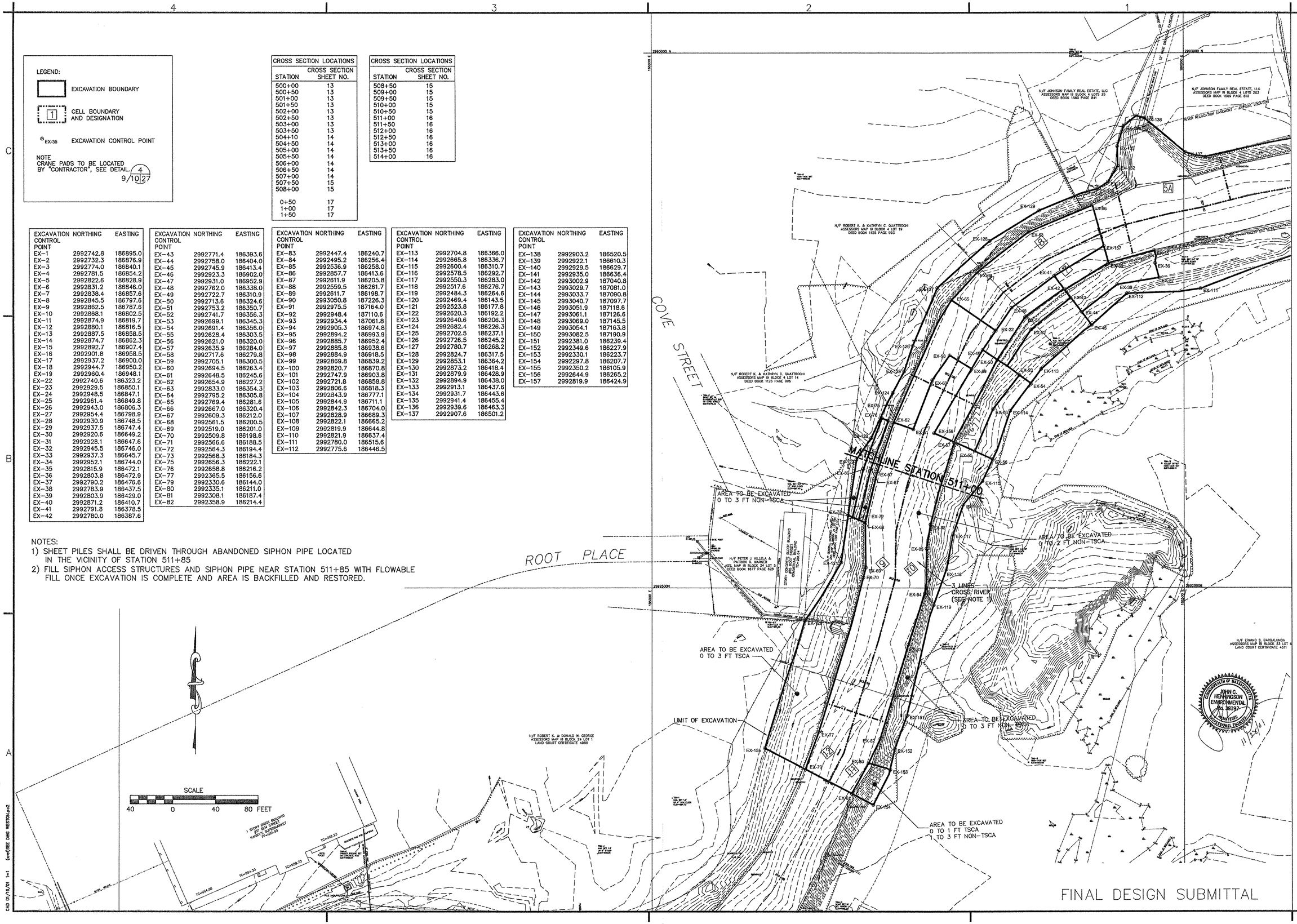
EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-43	2992771.4	186393.6
EX-44	2992758.0	186404.0
EX-45	2992745.9	186413.4
EX-46	2992923.3	186902.0
EX-47	2992931.0	186952.9
EX-48	2992762.0	186338.0
EX-49	2992722.7	186310.9
EX-50	2992713.6	186324.6
EX-51	2992753.2	186350.7
EX-52	2992741.7	186356.3
EX-53	2992699.1	186345.3
EX-54	2992691.4	186356.0
EX-55	2992628.4	186303.5
EX-56	2992621.0	186320.0
EX-57	2992635.9	186284.0
EX-58	2992717.6	186279.8
EX-59	2992705.1	186300.5
EX-60	2992694.5	186263.4
EX-61	2992648.5	186245.6
EX-62	2992654.9	186227.2
EX-63	2992833.0	186354.3
EX-64	2992795.2	186305.8
EX-65	2992769.4	186281.6
EX-66	2992667.0	186320.4
EX-67	2992609.3	186212.0
EX-68	2992561.5	186200.5
EX-69	2992519.0	186201.0
EX-70	2992509.8	186198.6
EX-71	2992566.6	186188.5
EX-72	2992564.3	186194.4
EX-73	2992568.3	186184.3
EX-75	2992656.3	186222.1
EX-76	2992658.8	186216.2
EX-77	2992365.5	186156.6
EX-79	2992330.6	186144.0
EX-80	2992335.1	186211.0
EX-81	2992308.1	186187.4
EX-82	2992358.9	186214.4

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-83	2992447.4	186240.7
EX-84	2992495.2	186256.4
EX-85	2992536.9	186258.0
EX-86	2992857.7	186413.6
EX-87	2992611.9	186205.8
EX-88	2992559.5	186261.7
EX-89	2992611.7	186198.7
EX-90	2993050.8	187226.3
EX-91	2992975.5	187164.0
EX-92	2992948.4	187110.6
EX-93	2992934.4	187061.8
EX-94	2992905.3	186974.8
EX-95	2992894.2	186993.9
EX-96	2992885.7	186952.4
EX-97	2992885.8	186938.6
EX-98	2992884.9	186918.5
EX-99	2992869.8	186839.2
EX-100	2992820.7	186870.8
EX-101	2992747.9	186903.8
EX-102	2992721.8	186858.8
EX-103	2992806.6	186818.3
EX-104	2992843.9	186777.1
EX-105	2992844.9	186711.1
EX-106	2992842.3	186704.0
EX-107	2992828.9	186689.3
EX-108	2992822.1	186665.2
EX-109	2992819.9	186644.8
EX-110	2992821.9	186637.4
EX-111	2992780.0	186515.6
EX-112	2992775.6	186446.5

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-113	2992704.8	186366.0
EX-114	2992665.8	186336.7
EX-115	2992600.4	186310.7
EX-116	2992578.5	186292.7
EX-117	2992550.3	186283.0
EX-118	2992517.6	186276.7
EX-119	2992484.3	186264.6
EX-120	2992469.4	186143.5
EX-121	2992523.8	186177.8
EX-122	2992620.3	186192.2
EX-123	2992640.6	186206.3
EX-124	2992682.4	186226.3
EX-125	2992702.5	186237.1
EX-126	2992726.5	186245.2
EX-127	2992780.7	186268.2
EX-128	2992824.7	186317.5
EX-129	2992853.1	186364.2
EX-130	2992873.2	186418.4
EX-131	2992879.9	186428.9
EX-132	2992894.9	186438.0
EX-133	2992913.1	186437.6
EX-134	2992931.7	186443.6
EX-135	2992941.4	186455.4
EX-136	2992939.6	186463.3
EX-137	2992907.6	186501.2

EXCAVATION CONTROL POINT	NORTHING	EASTING
EX-138	2992903.2	186520.5
EX-139	2992922.1	186610.3
EX-140	2992929.5	186629.7
EX-141	2992935.0	186636.4
EX-142	2993002.9	187040.8
EX-143	2993029.7	187081.0
EX-144	2993033.7	187090.8
EX-145	2993040.7	187097.7
EX-146	2993051.9	187118.6
EX-147	2993061.1	187126.6
EX-148	2993069.0	187145.5
EX-149	2993054.1	187163.8
EX-150	2993082.5	187190.9
EX-151	2992381.0	186239.4
EX-152	2992349.6	186227.9
EX-153	2992330.1	186223.7
EX-154	2992297.8	186207.7
EX-155	2992350.2	186105.9
EX-156	2992644.9	186265.2
EX-157	2992819.9	186424.9

NOTES:
1) SHEET PILES SHALL BE DRIVEN THROUGH ABANDONED SIPHON PIPE LOCATED IN THE VICINITY OF STATION 511+85
2) FILL SIPHON ACCESS STRUCTURES AND SIPHON PIPE NEAR STATION 511+85 WITH FLOWABLE FILL ONCE EXCAVATION IS COMPLETE AND AREA IS BACKFILLED AND RESTORED.



FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	1/2/01					
B	95% REVIEW SUBMITTAL	8/1/01					
C	100% SUBMITTAL	11/30/01					

Designed by: MJB | Dwn by: DJH | Ckd by: GTB | Reviewed by: MJB | Submitted by: | Chief, Arch. Section
Date: 11/30/01 | Rev. C | Design file no: | SPEC. No.:
File name: 73850506.DWG | Plot date: 11/30/01 | Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON | HARTCROWSER | WOODLOT ENVIRONMENTAL

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

REMOVAL AREAS
SHEET 2 OF 2

Sheet reference number:
10
10 of 29

COMMONWEALTH OF MASSACHUSETTS
JOHN C. HENNINGSON
ENVIRONMENTAL
No. 38197
PROFESSIONAL ENGINEER
11/30/01

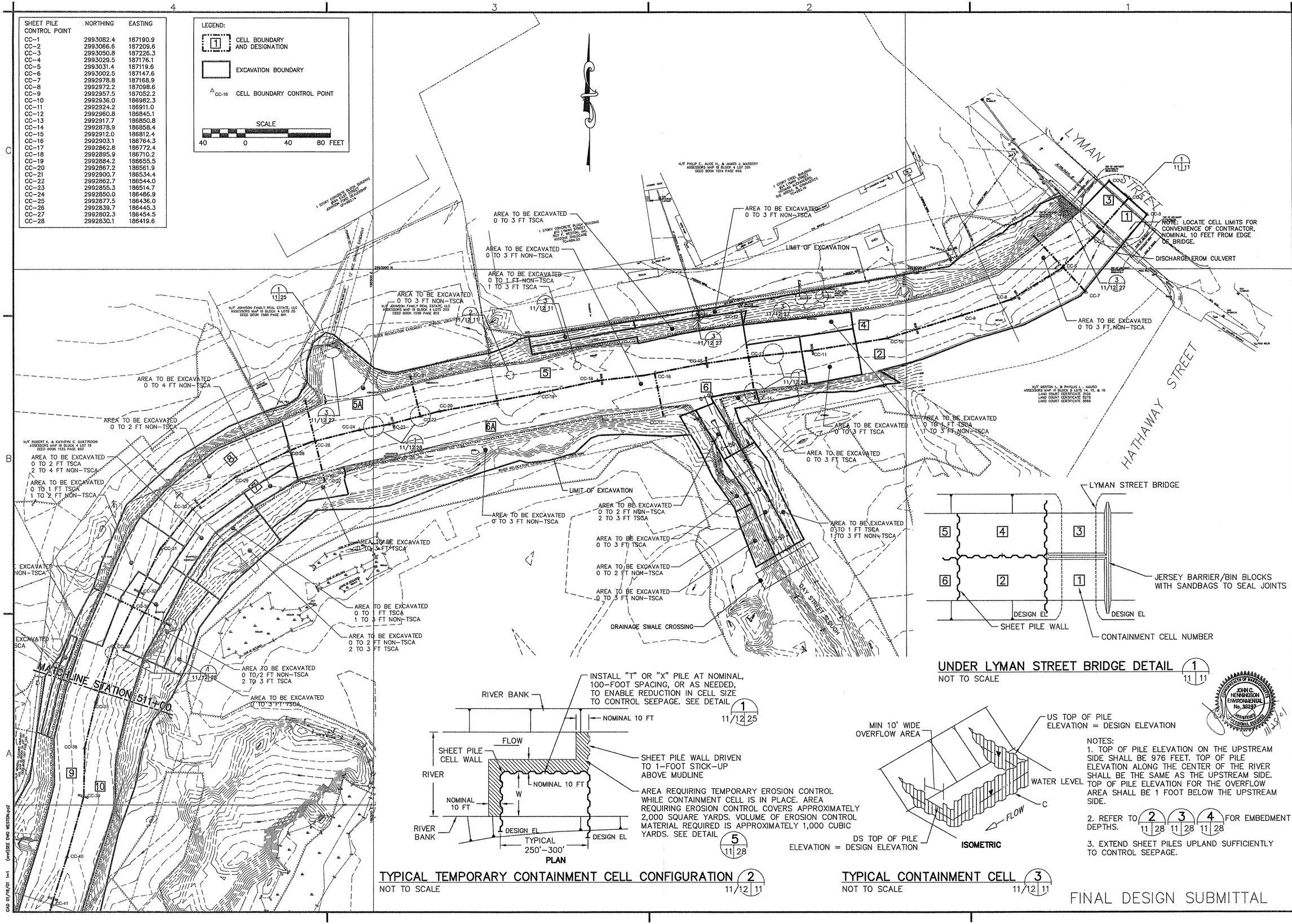
CAD 01/16/01 1=1 (ave)SSE DWG WESTON.pc2

SHEET PILE CONTROL POINT	NORTHING	EASTING
CC-1	2993082.4	187190.9
CC-2	2993066.6	187209.6
CC-3	2993050.8	187226.3
CC-4	2993029.5	187176.1
CC-5	2993031.4	187119.6
CC-6	2993002.5	187147.6
CC-7	2992978.8	187168.9
CC-8	2992972.2	187098.6
CC-9	2992957.5	187052.2
CC-10	2992936.0	186982.3
CC-11	2992924.2	186911.0
CC-12	2992960.8	186845.1
CC-13	2992917.7	186850.8
CC-14	2992878.9	186858.4
CC-15	2992912.0	186812.4
CC-16	2992903.1	186764.3
CC-17	2992862.8	186772.4
CC-18	2992895.9	186710.2
CC-19	2992884.2	186655.5
CC-20	2992867.2	186561.9
CC-21	2992900.7	186534.4
CC-22	2992862.7	186544.0
CC-23	2992855.3	186514.7
CC-24	2992850.0	186486.9
CC-25	2992877.5	186436.0
CC-26	2992839.7	186445.3
CC-27	2992802.3	186454.5
CC-28	2992830.1	186419.6

LEGEND:

- CELL BOUNDARY AND DESIGNATION
- EXCAVATION BOUNDARY
- CC-16 CELL BOUNDARY CONTROL POINT

SCALE: 40 0 40 80 FEET



TYPICAL TEMPORARY CONTAINMENT CELL CONFIGURATION (2/11/12/11)

NOT TO SCALE

UNDER LYMAN STREET BRIDGE DETAIL (1/11/11)

NOT TO SCALE

NOTES:

1. TOP OF PILE ELEVATION ON THE UPSTREAM SIDE SHALL BE 976 FEET. TOP OF PILE ELEVATION ALONG THE CENTER OF THE RIVER SHALL BE THE SAME AS THE UPSTREAM SIDE. TOP OF PILE ELEVATION FOR THE OVERFLOW AREA SHALL BE 1 FOOT BELOW THE UPSTREAM SIDE.
2. REFER TO (2/11/28) (3/11/28) (4/11/28) FOR EMBEDMENT DEPTHS.
3. EXTEND SHEET PILES UPLAND SUFFICIENTLY TO CONTROL SEEPAGE.

TYPICAL CONTAINMENT CELL (3/11/12/11)

NOT TO SCALE

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	2/2/01	
B	95% REVIEW SUBMITTAL	6/1/01	
C	100% SUBMITTAL	11/30/01	

Designed by: NJB | Dwn by: DJH | Ckd by: GTB | Reviewed by: MJB | Submitted by: | Chief, Arch. Section | Date: 11/30/01 | Rev. C | Design file no: | SPEC. No.: | File name: T3850052A.DWG | Plot date: 11/30/01 | Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON | WOODPLOT | HARTCROWSER

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

WATER DIVERSION PLAN
SHEET 1 OF 2

Sheet reference number: 11
11 of 29

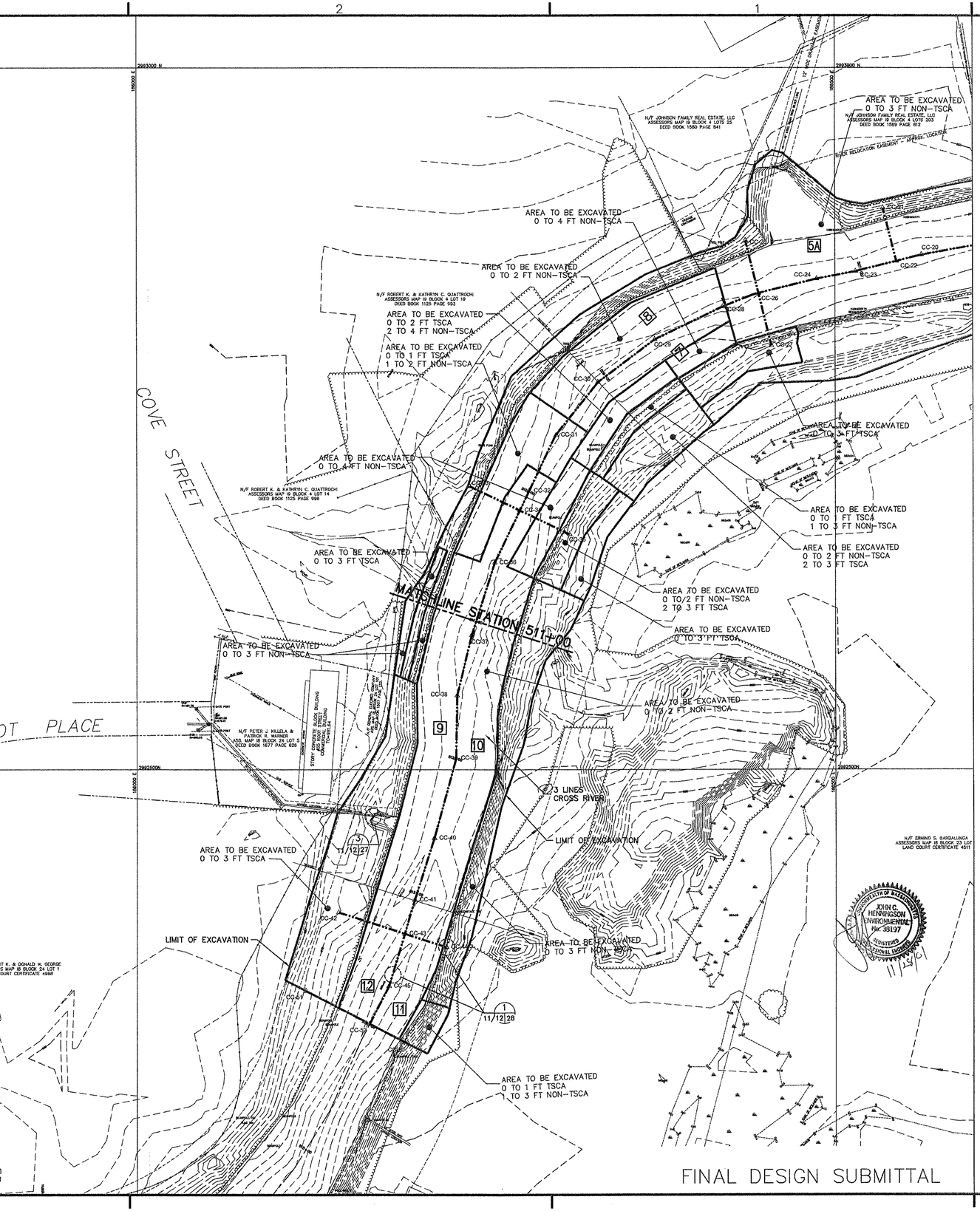
CAD 01/16/01 1=1 (ver)SSE ENG WESTON.pc2

SHEET PILE CONTROL POINT	NORTHING	EASTING
CC-29	2992806.8	186371.1
CC-30	2992776.5	186330.3
CC-31	2992738.9	186300.4
CC-32	2992699.0	186280.9
CC-33	2992702.4	186238.2
CC-34	2992685.0	186274.2
CC-35	2992667.9	186309.8
CC-36	2992647.7	186256.3
CC-37	2992596.2	186239.7
CC-38	2992553.1	186229.3
CC-39	2992508.3	186228.4
CC-40	2992451.4	186212.8
CC-41	2992407.4	186198.8
CC-42	2992398.5	186144.2
CC-43	2992383.4	186191.5
CC-44	2992373.8	186221.4
CC-45	2992346.0	186180.2
CC-50	2992304.8	186194.2
CC-51	2992342.6	186120.7
CC-52	2992319.1	186166.3

LEGEND:

- CELL BOUNDARY AND DESIGNATION
- EXCAVATION BOUNDARY
- CC-49 CELL BOUNDARY CONTROL POINT

SCALE: 40 0 40 80 FEET



US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	1/2/01					
B	95% REVIEW SUBMITTAL	8/1/01					
C	100% SUBMITTAL	11/30/01					

Designed by: NJB	Date: 11/30/01	Rev. C	
Dwn by: DJH	Ckd by: GTB	Design file no:	
Reviewed by: MJB		SPEC. No.:	
Submitted by:		File name: 73950524.DWG Plot date: 11/02/01 Plot scale: 1=1	
Chief, Arch. Section			

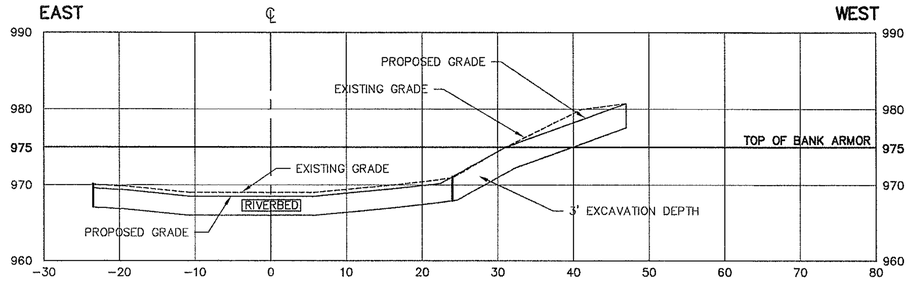
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODLOT ENVIRONMENTAL

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

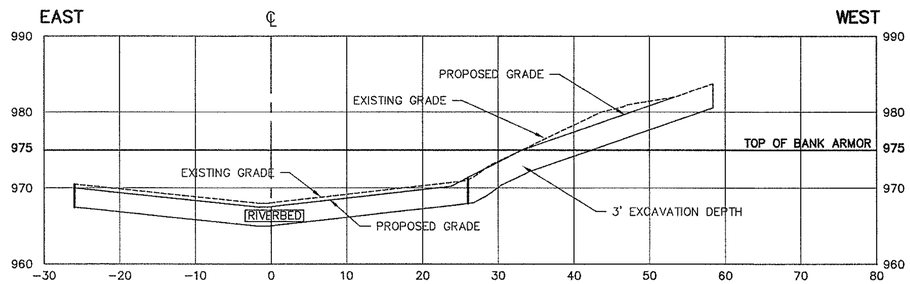
WATER DIVERSION PLAN
SHEET 2 OF 2

Sheet reference number:
12
12 of 29



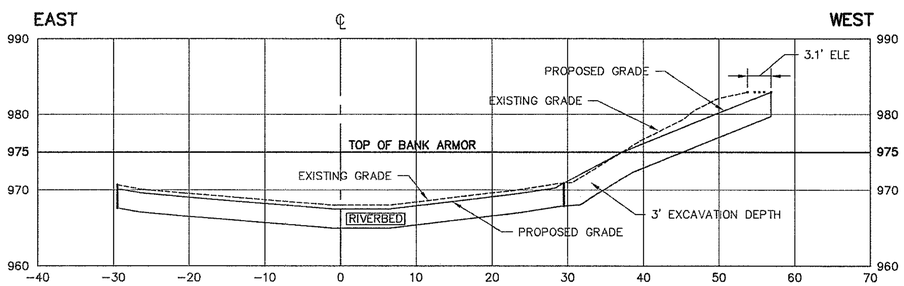
STATION 501+50

PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2.8:1



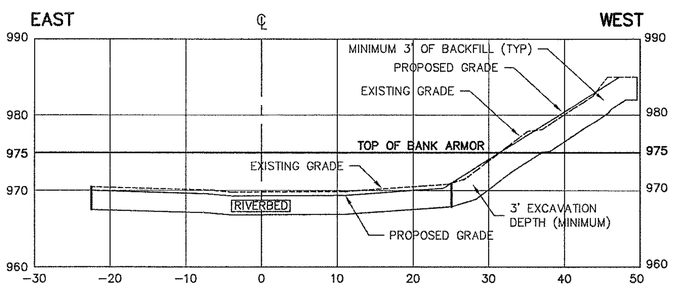
STATION 501+00

PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=2.9:1



STATION 500+50

PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2.5:1



STATION 500+00

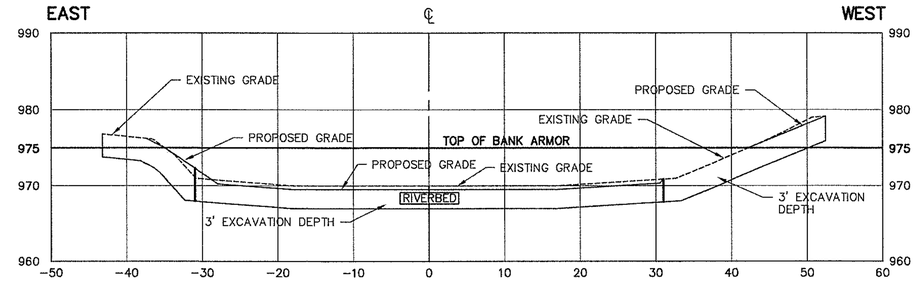
PROPOSED GRADE:
BELOW 975'=1.6:1
ABOVE 975'=1.6:1,FLAT

NOTES:

1) BASED ON BASEMAP INFORMATION PROVIDED BY R.F. WESTON, INC. (01/2001).
2) PROPOSED GRADES ARE H:V.
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT REACH, EXCEPT WHERE NOTED.
4) ELEVATION OF THE TOE OF RIVERBANK SLOPE IS BETWEEN 970'–972' DEPENDING ON BANK TOPOGRAPHY.
5) "ELE"–REFERS TO "EXTEND LIMIT OF EXCAVATION".
6) FOR RIVERBANKS: "3' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 3' EXCAVATION FROM EXISTING SURFACE). MINIMUM 3' OF FILL UP TO PROPOSED SURFACE.
7) FOR RIVERBED: "2' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 2' EXCAVATION FROM EXISTING SURFACE). MINIMUM FILL TO PROPOSED SURFACE VARIES – SEE PLAN.
8) RIVERBED PORTIONS OF THE RIVER ARE LABELED "RIVERBED". REMAINING UNLABELED PORTIONS ARE RIVERBANK.
9) CROSS SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.
10) PROPOSED BACKFILL IN RIVERBED AREA FROM STA. 500+00 TO 508+00 IS 6" BELOW EXISTING GRADE. PROPOSED BACKFILL IN THE RIVERBED AREA FROM STA. 512+50 TO STA. 514+00 IS 3" BELOW THE EXISTING GRADE.
11) REFER TO DETAIL SECTION ON SHEET 17 FOR BACKFILL DESIGNS CONSISTING OF COMMON FILL, FILTER LAYER(S), AND BANK ARMOR/RIPRAP FOR RIVERBANK AND RIVERBED AREA, RESPECTIVELY.
PROPOSED GRADE MATCHES EXISTING GRADE EXCEPT WHERE SHOWN OTHERWISE.
12) RIVERBED/RIVERBANK INTERFACE FROM STATION 499+60 TO 514+00 IS AT 971 AMSL.

HORIZONTAL SCALE
10 0 10 20 FEET

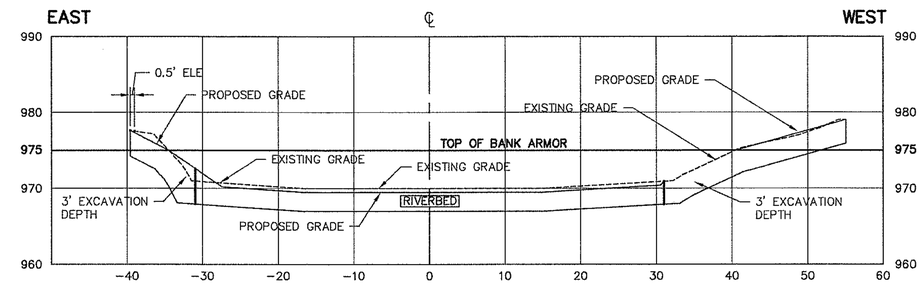
VERTICAL SCALE
10 0 10 20 FEET



STATION 503+50

PROPOSED GRADE:
BELOW 975'=1.5:1
ABOVE 975'=2:1,8:1

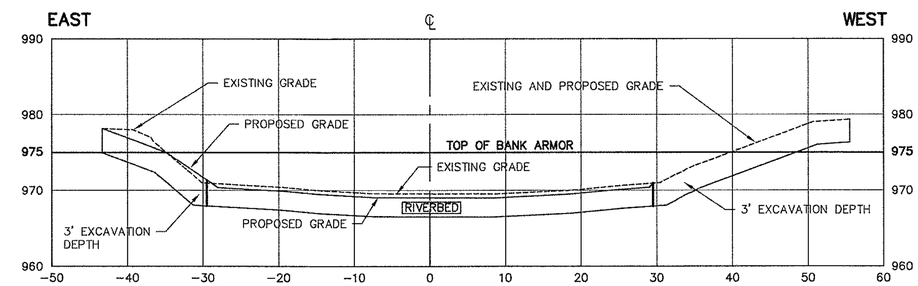
PROPOSED GRADE:
BELOW 975'=2.4:1
ABOVE 975'=2.5:1



STATION 503+00

PROPOSED GRADE:
BELOW 975'=1.5:1
ABOVE 975'=2:1

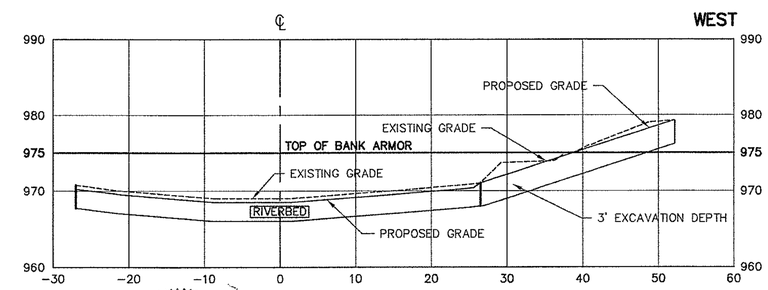
PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=3.6:1



STATION 502+50

PROPOSED GRADE:
BELOW 975'=1.5:1
ABOVE 975'=2.7:1

PROPOSED GRADE:
BELOW 975'=2.4:1
ABOVE 975'=2.7:1,13.8:1



STATION 502+00

PROPOSED GRADE:
BELOW 975'=3:1
ABOVE 975'=3:1

COMMONWEALTH OF MASSACHUSETTS
JOHN C. HENNINGSON
HYDROGEOLOGIST
No. 38197
REGISTERED PROFESSIONAL ENGINEER
11/26/01

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
	PROPOSED GRADES	04/01	
	STA 500+00	04/01	
	STA 507+00 TO 510+00(W)	04/01	
	REVISED GRADES	05/01	
A	65% REVIEW SUBMITTAL	12/00	
B	95% REVIEW SUBMITTAL	8/00	
C	100% SUBMITTAL	11/30/01	

Designed by: WRS/ACJ
Date: 11/30/01
Rev: C
Dwn by: KWH
Ckd by: JPL/MTM
Design file no:
Reviewed by:
SPEC. No.:
Submitted by:
Chief, Arch. Section
File name: WVJ_XSECS5
Plot date: 11/30/01
Plot scale: 1=10

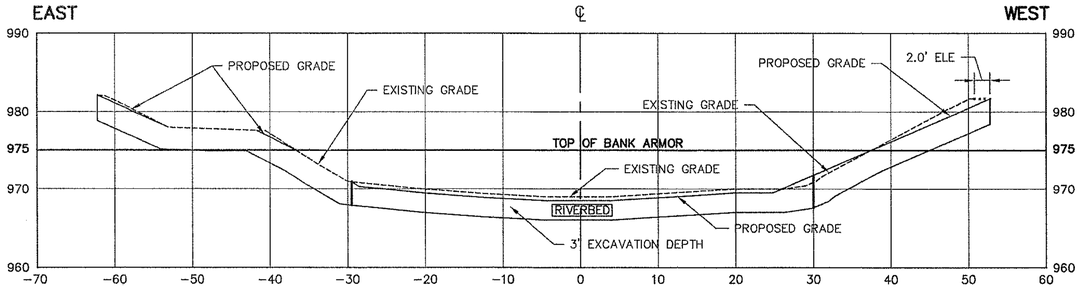
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
HYDROLOGIC

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

EXISTING AND PROPOSED
RIVERBANK CROSS SECTIONS
SHEET 1 of 4

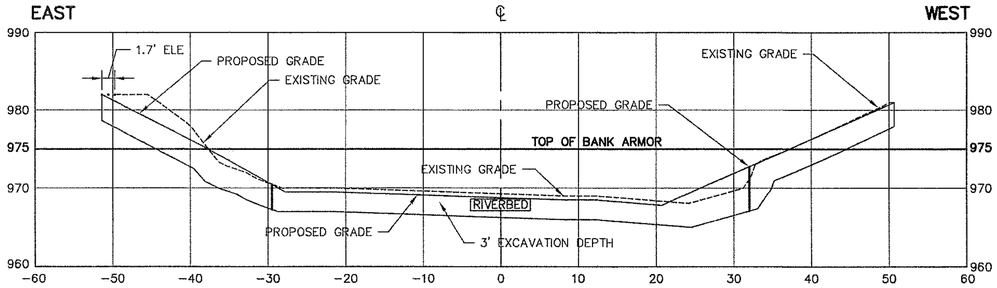
Sheet reference number:
13
13 of 29



PROPOSED GRADE:
BELOW 975'=1.7:1
ABOVE 975'=2:1,FLAT,2.2:1

STATION 505+50

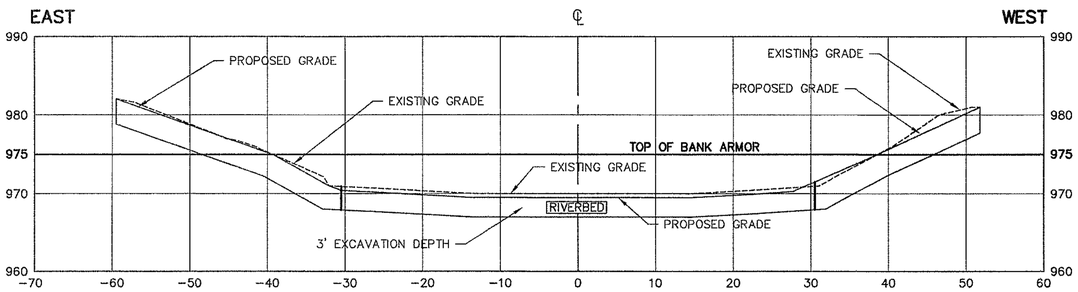
PROPOSED GRADE:
BELOW 975'=2.3:1
ABOVE 975'=2.3:1



PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2:1

STATION 505+00

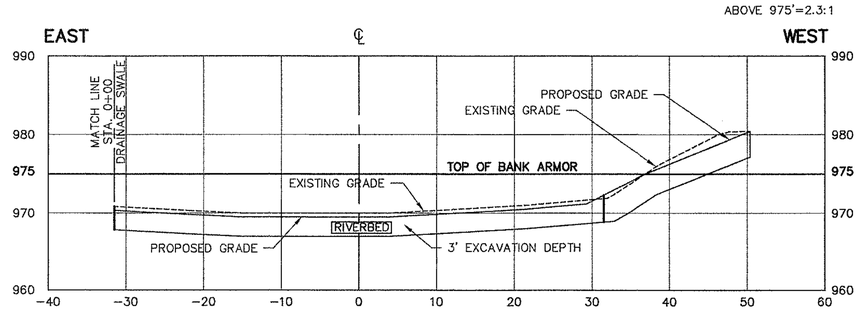
PROPOSED GRADE:
BELOW 975'=2.3:1
ABOVE 975'=2.3:1



PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2.9:1

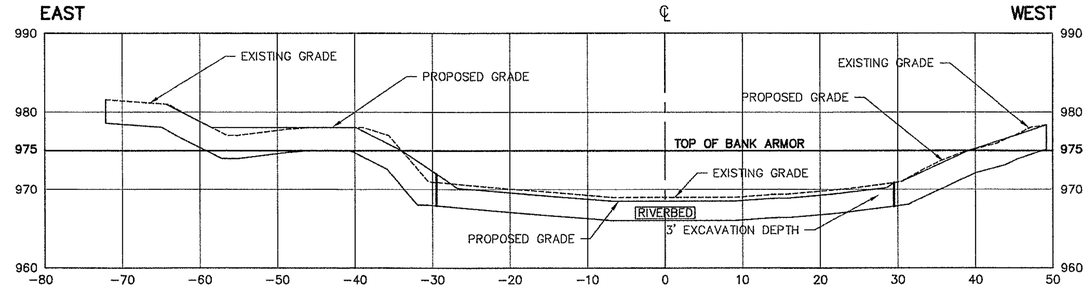
STATION 504+50

PROPOSED GRADE:
BELOW 975'=2.3:1
ABOVE 975'=2.3:1



STATION 504+10

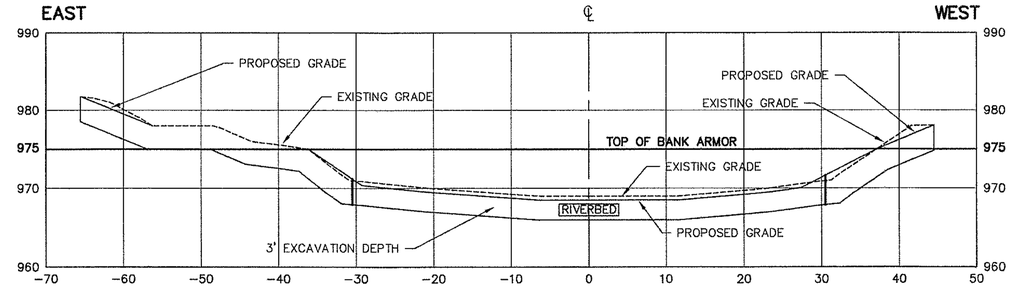
PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=2.5:1



PROPOSED GRADE:
BELOW 975'=1.5:1
ABOVE 975'=2:1,FLAT,2:1,FLAT

STATION 507+00

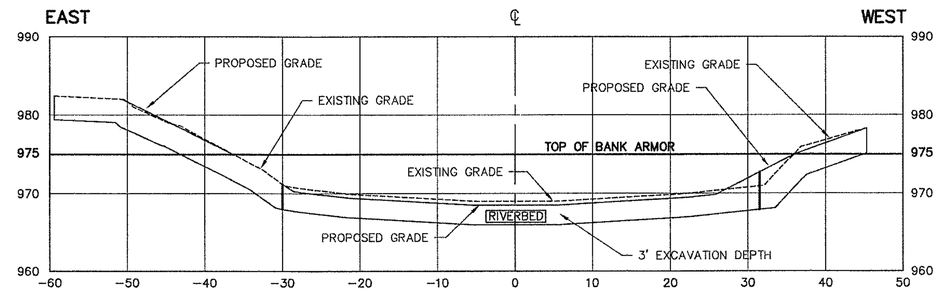
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=3:1



PROPOSED GRADE:
BELOW 975'=1.5:1
ABOVE 975'=7.4:1,2.4:1,FLAT,2.5:1

STATION 506+50

PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=2.4:1



PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2.1:1,22.4:1

STATION 506+00

PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=2.8:1

HORIZONTAL SCALE
10 0 10 20 FEET

VERTICAL SCALE
10 0 10 20 FEET

NOTES:

1) BASED ON BASEMAP INFORMATION PROVIDED BY R.F. WESTON, INC. (01/2001).
2) PROPOSED GRADES ARE H:V.
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT REACH, EXCEPT WHERE NOTED.
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6) FOR RIVERBANKS: "3' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 3' EXCAVATION FROM EXISTING SURFACE). MINIMUM 3' OF FILL UP TO PROPOSED SURFACE.
7) FOR RIVERBED: "2' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 2' EXCAVATION FROM EXISTING SURFACE). MINIMUM FILL TO PROPOSED SURFACE VARIES – SEE PLAN.
8) RIVERBED PORTIONS OF THE RIVER ARE LABELED "RIVERBED". REMAINING UNLABELED PORTIONS ARE RIVERBANK.
9) CROSS SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.
10) PROPOSED BACKFILL IN RIVERBED AREA FROM STA. 500+00 TO 508+00 IS 6" BELOW EXISTING GRADE. PROPOSED BACKFILL IN THE RIVERBED AREA FROM STA. 512+50 TO STA. 514+00 IS 3" BELOW THE EXISTING GRADE.
11) REFER TO DETAIL SECTION ON SHEET 17 FOR BACKFILL DESIGNS CONSISTING OF COMMON FILL, FILTER LAYER(S), AND BANK ARMOR/RIPRAP FOR RIVERBANK AND RIVERBED AREA, RESPECTIVELY.
12) PROPOSED GRADE MATCHES EXISTING GRADE EXCEPT WHERE SHOWN OTHERWISE. RIVERBED/RIVERBANK INTERFACE FROM STATION 499+60 TO 514+00 IS AT 971 AMSL.

COMMONWEALTH OF MASSACHUSETTS
JOHN C. HENNINGSSON
ENVIRONMENTAL
No. 38197
PROFESSIONAL ENGINEER
11/28/01

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	12/2/99	
B	95% REVIEW SUBMITTAL	8/1/01	
C	100% SUBMITTAL	11/30/01	

PROPOSED GRADES
STATION 504+10 04/01
STA 507+00 TO 510+00(W) 04/01
REVISED GRADES 04/01
05/01

Designed by: WRS/LCJ
Dwn by: KWH
Ckd by: JPL/MTM
Reviewed by:
Submitted by:
Chief, Arch. Section
Date: 11/30/01
Rev. C
Design file no:
SPEC. No.:
File name: WA_XSEC03
Plot date: 11/2/01
Plot scale: 1=10

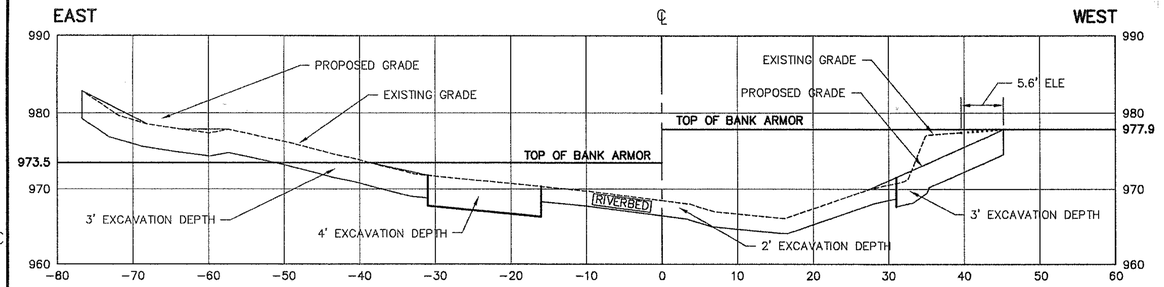
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
WOODLOT ALTERNATIVES, INC.
HARTCROWSER

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

EXISTING AND PROPOSED
RIVERBANK CROSS SECTIONS
SHEET 2 of 4

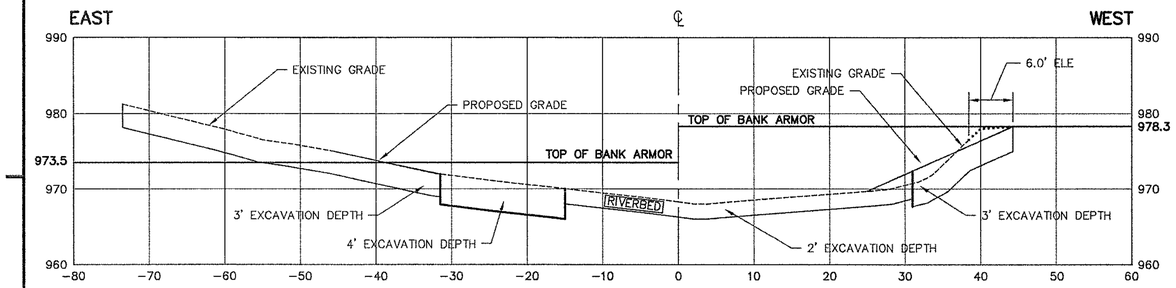
Sheet reference number:
14
14 of 29



PROPOSED GRADE:
BELOW 973.5'=4.5:1
ABOVE 973.5'=4.3:1,FLAT,6.6:1,2:1

STATION 509+00

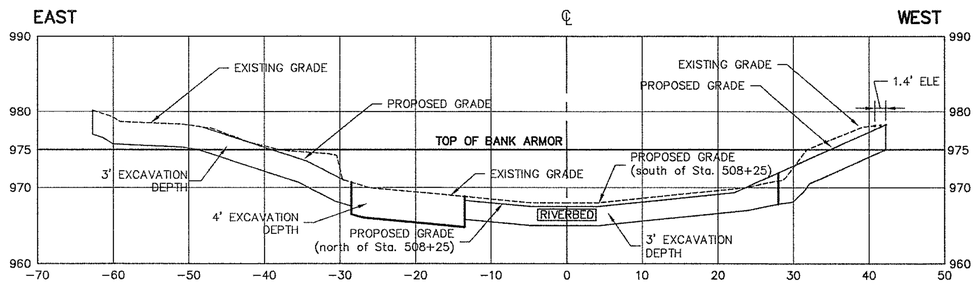
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.2:1



PROPOSED GRADE:
BELOW 973.5'=4.8:1
ABOVE 973.5'=4.5:1,6.2:1,3.9:1

STATION 508+50

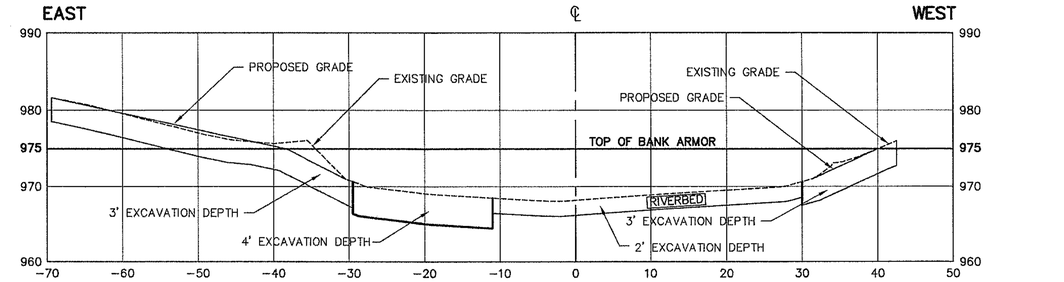
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.2:1



PROPOSED GRADE:
BELOW 973.5'=2:1
ABOVE 973.5'=3:1,7.8:1,23.5:1,2.4:1

STATION 508+00

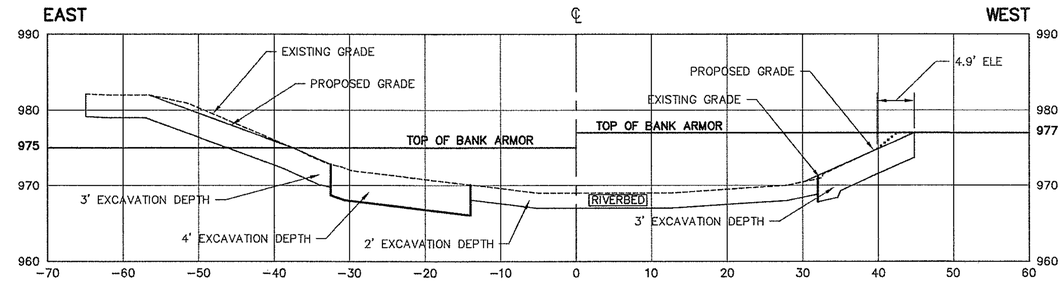
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.2:1



PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=4.7:1

STATION 510+50

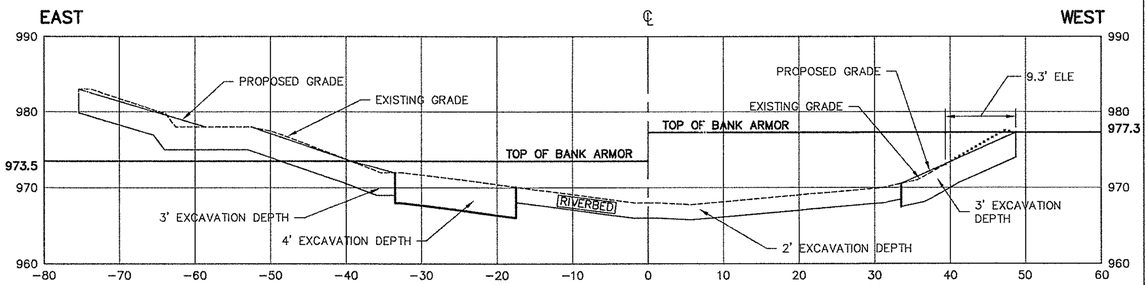
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.5:1



PROPOSED GRADE:
BELOW 975'=2.3:1
ABOVE 975'=2.7:1,FLAT

STATION 510+00

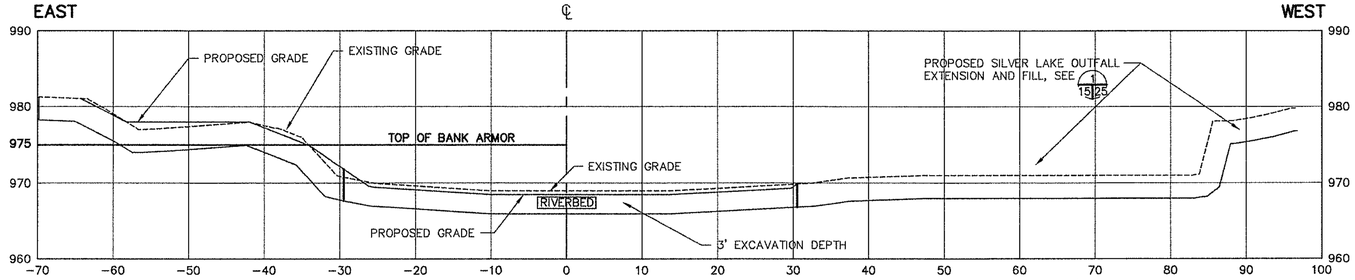
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.2:1



PROPOSED GRADE:
BELOW 973.5'=3.9:1
ABOVE 973.5'=2.9:1,FLAT,3.4:1

STATION 509+50

PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.2:1



PROPOSED GRADE:
BELOW 975'=1.5:1
ABOVE 975'=2.6:1,FLAT,2:1,FLAT

STATION 507+50

NOTES:

1) BASED ON BASEMAP INFORMATION PROVIDED BY R.F. WESTON, INC. (01/2001).
2) PROPOSED GRADES ARE H:V.
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT REACH, EXCEPT WHERE NOTED.
4) ELEVATION OF THE TOE OF RIVERBANK SLOPE IS BETWEEN 970'–972' DEPENDING ON BANK TOPOGRAPHY.
5) "ELE"–REFERS TO "EXTEND LIMIT OF EXCAVATION".
6) FOR RIVERBANKS: "3' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 3' EXCAVATION FROM EXISTING SURFACE). MINIMUM 3' OF FILL UP TO PROPOSED SURFACE.
7) FOR RIVERBED: "2' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 2' EXCAVATION FROM EXISTING SURFACE). MINIMUM FILL TO PROPOSED SURFACE VARIES – SEE PLAN.
8) RIVERBED PORTIONS OF THE RIVER ARE LABELED "RIVERBED". REMAINING UNLABELED PORTIONS ARE RIVERBANK.
9) CROSS SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.
10) PROPOSED BACKFILL IN RIVERBED AREA FROM STA. 500+00 TO 508+00 IS 6" BELOW EXISTING GRADE. PROPOSED BACKFILL IN THE RIVERBED AREA FROM STA. 512+50 TO STA. 514+00 IS 3" BELOW THE EXISTING GRADE.
11) REFER TO DETAIL SECTION ON SHEET 17 FOR BACKFILL DESIGNS CONSISTING OF COMMON FILL, FILTER LAYER(S), AND BANK ARMOR/RIPRAP FOR RIVERBANK AND RIVERBED AREA, RESPECTIVELY.
12) PROPOSED GRADE MATCHES EXISTING GRADE EXCEPT WHERE SHOWN OTHERWISE. RIVERBED/RIVERBANK INTERFACE FROM STATION 499+60 TO 514+00 IS AT 971 AMSL.
13) AT STATION 508+15, WEST BANK TOP OF ARMOR IS AT ELEVATION 978.5 FEET AND EAST BANK TOP OF ARMOR IS AT ELEVATION 973.5.

HORIZONTAL SCALE
10 0 10 20 FEET

VERTICAL SCALE
10 0 10 20 FEET

COMMONWEALTH OF MASSACHUSETTS
JOHN C. HENNINGSSON
ENVIRONMENTAL
No. 38197
REGISTERED PROFESSIONAL ENGINEER
11/28/01

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
	PROPOSED GRADES	04/01	
	STA 500+00	04/01	
	STA 507+00 TO 510+00(W)	04/01	
	REVISED GRADES	05/01	
A	65% REVIEW SUBMITTAL	12/01	
B	95% REVIEW SUBMITTAL	8/01	
C	100% SUBMITTAL	11/30/01	

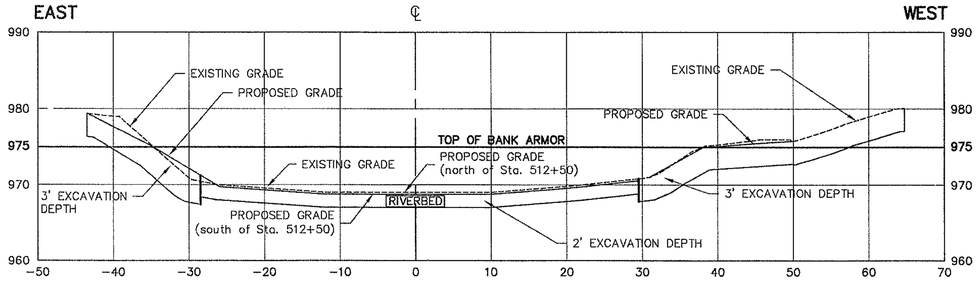
Designed by: WRS/JCJ
Date: 11/30/01
Dwn by: KWH
Ckd by: JPL/KTM
Design file no:
Rev. C
Reviewed by:
SPEC. No.:
Submitted by:
Chief, Arch. Section
File name: WVJ_XSEC38
Plot date: 11/30/2001
Plot scale: 1=10

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
EXISTING AND PROPOSED
RIVERBANK CROSS SECTIONS
SHEET 3 of 4

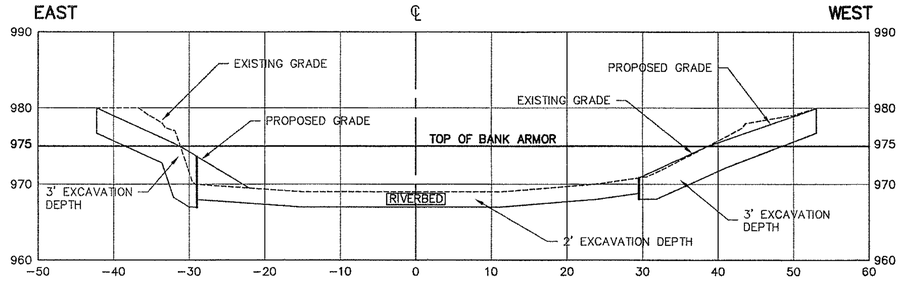
Sheet reference number:
15
15 of 29



PROPOSED GRADE:
BELOW 975'=1.7:1
ABOVE 975'=2:1

STATION 512+50

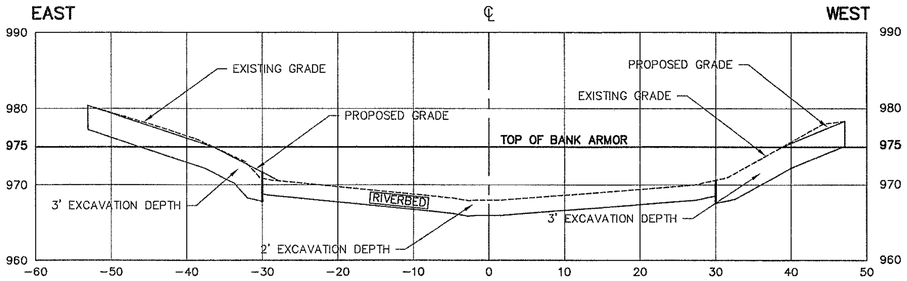
PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=14.6:1,3.4:1



PROPOSED GRADE:
BELOW 975'=1.7:1
ABOVE 975'=2.2:1

STATION 512+00

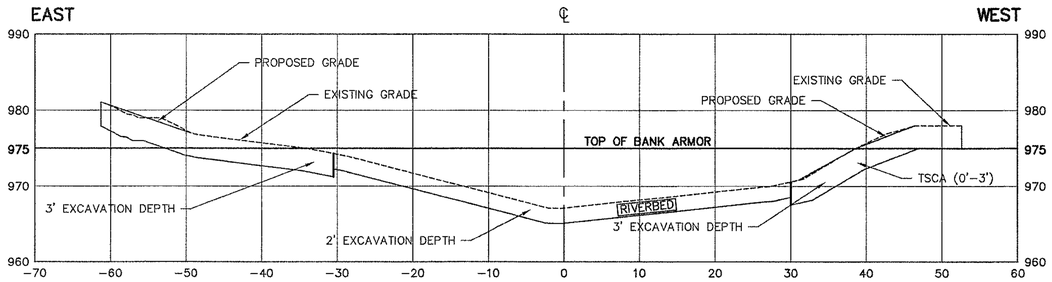
PROPOSED GRADE:
BELOW 975'=2.2:1
ABOVE 975'=2.9:1



PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=3:1

STATION 511+50

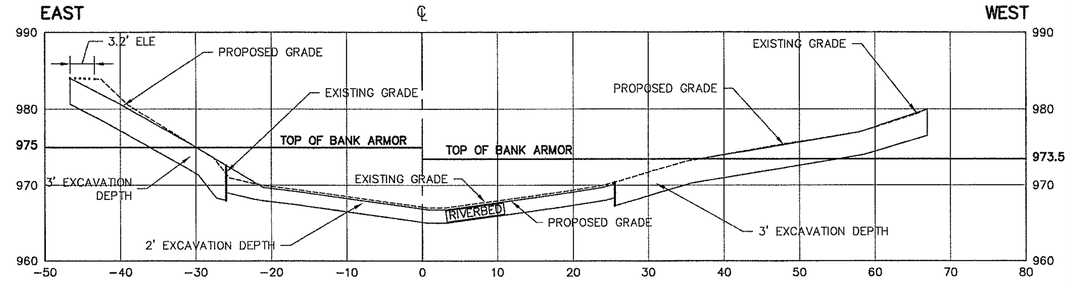
PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2.5:1



PROPOSED GRADE:
BELOW 975'=4.3:1
ABOVE 975'=7.7:1,2.9:1

STATION 511+00

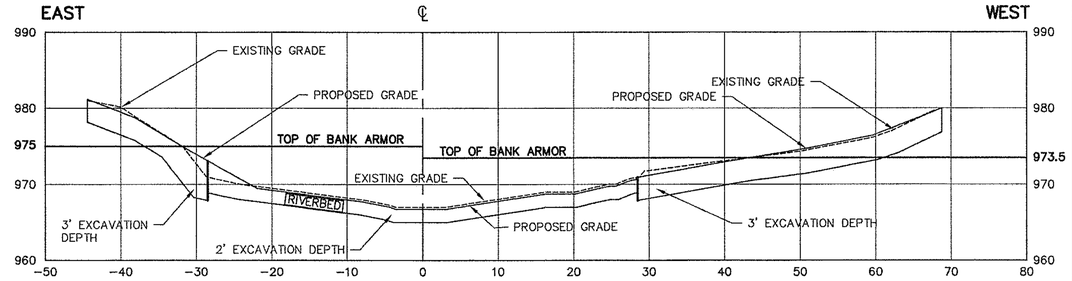
PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=2.6:1,FLAT



PROPOSED GRADE:
BELOW 975'=1.7:1
ABOVE 975'=1.8:1,2:1

STATION 514+00

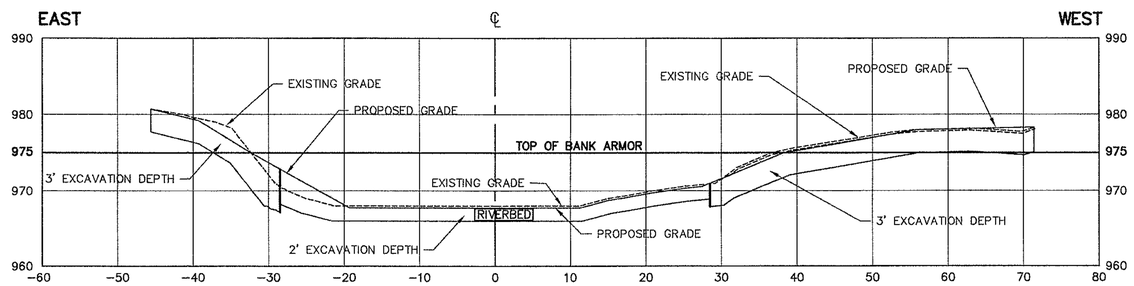
PROPOSED GRADE:
BELOW 973.5'=3.6:1
ABOVE 973.5'=6:1,3.4:1



PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=1.7:1,2.6:1

STATION 513+50

PROPOSED GRADE:
BELOW 973.5'=5.8:1
ABOVE 973.5'=6.2:1,3.3:1



PROPOSED GRADE:
BELOW 975'=1.8:1
ABOVE 975'=1.7:1,4.1:1

STATION 513+00

PROPOSED GRADE:
BELOW 975'=2.4:1
ABOVE 975'=6.1:1,45:1

COMMONWEALTH OF MASSACHUSETTS
JOHN C. HENNINGSON
ENVIRONMENTAL
No. 38107
REGISTERED PROFESSIONAL ENGINEER
11/30/01

NOTES:

1) BASED ON BASEMAP INFORMATION PROVIDED BY R.F. WESTON, INC. (01/2001).
2) PROPOSED GRADES ARE H:V.
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT REACH, EXCEPT WHERE NOTED.
4) ELEVATION OF THE TOE OF RIVERBANK SLOPE IS BETWEEN 970'-972' DEPENDING ON BANK TOPOGRAPHY.
5) "ELE"-REFERS TO "EXTEND LIMIT OF EXCAVATION".
6) FOR RIVERBANKS: "3' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 3' EXCAVATION FROM EXISTING SURFACE). MINIMUM 3' OF FILL UP TO PROPOSED SURFACE.
7) FOR RIVERBED: "2' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 2' EXCAVATION FROM EXISTING SURFACE). MINIMUM FILL TO PROPOSED SURFACE VARIES - SEE PLAN.
8) RIVERBED PORTIONS OF THE RIVER ARE LABELED "RIVERBED". REMAINING UNLABELED PORTIONS ARE RIVERBANK.
9) CROSS SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.
10) PROPOSED BACKFILL IN RIVERBED AREA FROM STA. 500+00 TO 508+00 IS 6" BELOW EXISTING GRADE. PROPOSED BACKFILL IN THE RIVERBED AREA FROM STA. 512+50 TO STA. 514+00 IS 3" BELOW THE EXISTING GRADE.
11) REFER TO DETAIL SECTION ON SHEET 17 FOR BACKFILL DESIGNS CONSISTING OF COMMON FILL, FILTER LAYER(S), AND BANK ARMOR/RIPRAP FOR RIVERBANK AND RIVERBED AREA, RESPECTIVELY.
12) PROPOSED GRADE MATCHES EXISTING GRADE EXCEPT WHERE SHOWN OTHERWISE. RIVERBED/RIVERBANK INTERFACE FROM STATION 499+60 TO 514+00 IS AT 971 AMSL.

HORIZONTAL SCALE
10 0 10 20 FEET

VERTICAL SCALE
10 0 10 20 FEET

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
	PROPOSED GRADES	04/01	
	STA. 500+00	04/01	
	STA. 507+00 TO 510+00(W)	04/01	
	REVISED GRADES	05/01	
A	65% REVIEW SUBMITTAL	12/01	
B	95% REVIEW SUBMITTAL	8/01	
C	100% SUBMITTAL	11/30/01	

Designed by: WRS/ACJ
Dwn by: KWH
Ckd by: JPL/MTM
Reviewed by:
Submitted by: Chief, Arch. Section
Date: 11/30/01
Design file no:
SPEC. No.:
Rev. C
File name: WU_MCESS
Revision date: 11/2/01
Plot scale: 1=10

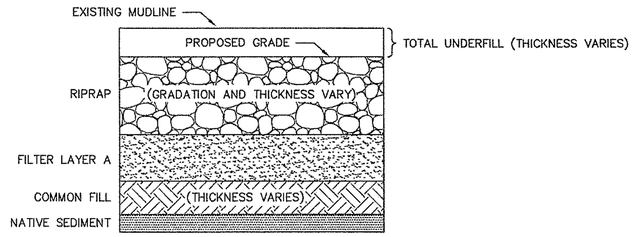
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
WOODPLOT ENVIRONMENTAL
HARTCROWSER

1.5 MILE REMOVAL ACTION - FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

EXISTING AND PROPOSED
RIVERBANK CROSS SECTIONS
SHEET 4 of 4

Sheet reference number:
16
16 of 29



TYPICAL BACKFILL SEQUENCE FOR RIVERBED (1 / 17|17)

NOT TO SCALE

SUMMARY OF BACKFILL REQUIREMENT FOR RIVERBED

STATION	RIPRAP LAYER	RIPRAP THICKNESS	FILTER LAYER A THICKNESS	COMMON FILL THICKNESS	TOTAL UNDERFILL
500+00 TO 504+50	C2	20"	6"	4"	6"
504+50 TO 508+00	C1	15"	6"	9"	6"
508+00 TO 508+25	C2	20"	6"	4"	6"
508+25 TO 512+50	C2	18"	6"	0"	0"
512+50 TO 514+00	C1	15"	6"	0"	3"

NOTE: FROM APPROXIMATELY 508+50 TO 510+50, IN THE AREA OF THE FOUR FOOT EXCAVATION, THE COMMON FILL THICKNESS WILL BE 22", THE RIPRAP THICKNESS 20", THE FILTER LAYER THICKNESS 6", AND THE UNDERFILL 0".

NOTES:

1) BASED ON BASEMAP INFORMATION PROVIDED BY R.F. WESTON, INC. (01/2001).
2) PROPOSED GRADES ARE H:V.
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT REACH, EXCEPT WHERE NOTED.
4) ELEVATION OF THE TOE OF RIVERBANK SLOPE IS BETWEEN 970'–972' DEPENDING ON BANK TOPOGRAPHY.
5) "ELE"–REFERS TO "EXTEND LIMIT OF EXCAVATION".
6) FOR RIVERBANKS: "3' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 3' EXCAVATION FROM EXISTING SURFACE). MINIMUM 3' OF FILL UP TO PROPOSED SURFACE.
7) FOR RIVERBED: "2' EXCAVATION DEPTH" REFERS TO THE EXCAVATION DESIGN REQUIREMENTS (I.E., MINIMUM 2' EXCAVATION FROM EXISTING SURFACE). MINIMUM FILL TO PROPOSED SURFACE VARIES – SEE PLANS.
8) RIVERBED PORTIONS OF THE RIVER ARE LABELED "RIVERBED". REMAINING UNLABELED PORTIONS ARE RIVERBANK.
9) CROSS SECTIONS ARE ORIENTED LOOKING DOWNSTREAM.
10) PROPOSED BACKFILL IN RIVERBED AREA FROM STA. 500+00 TO 508+00 IS 6" BELOW EXISTING GRADE. PROPOSED BACKFILL IN THE RIVERBED AREA FROM STA. 512+50 TO STA. 514+00 IS 3" BELOW THE EXISTING GRADE.
11) REFER TO DETAIL SECTION ON SHEET 17 FOR BACKFILL DESIGNS CONSISTING OF COMMON FILL, FILTER LAYER(S), AND BANK ARMOR/RIPRAP FOR RIVERBANK AND RIVERBED AREA, RESPECTIVELY.
12) PROPOSED GRADE MATCHES EXISTING GRADE EXCEPT WHERE SHOWN OTHERWISE.

13) FILTER LAYER A

SIEVE DESIGNATION	PERCENT LIGHTER BY WEIGHT
3/4–inch	100
1/2–inch	50–85
No. 4	40–75
No. 50	10–30
No. 200	0–5

14) FILTER LAYER B

SIEVE DESIGNATION	PERCENT LIGHTER BY WEIGHT
3–inch	100
2–1/2–inch	95–100
1–inch	30–60
3/4–inch	0–25

15) 9–INCH RIPRAP (RIPRAP LAYER C1)

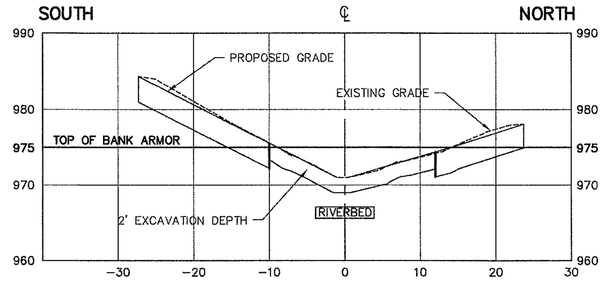
LIMITS OF STONE WEIGHT, LB	PERCENT LIGHTER BY WEIGHT
15 – 35	100
7 – 15	50
2 – 7	15

16) 12–INCH RIPRAP (RIPRAP LAYER C2)

LIMITS OF STONE WEIGHT, LB	PERCENT LIGHTER BY WEIGHT
40 – 90	100
20 – 40	50
5 – 20	15

17) 18–INCH RIPRAP (RIPRAP LAYER C3)

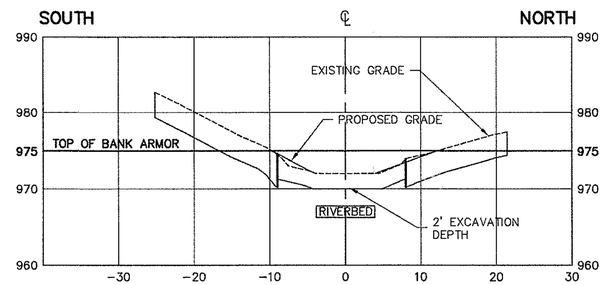
LIMITS OF STONE WEIGHT, LB	PERCENT LIGHTER BY WEIGHT
120 – 300	100
60 – 120	50
20 – 60	15



PROPOSED GRADE:
BELOW 975'=2:1
ABOVE 975'=2:1

STATION 1+50

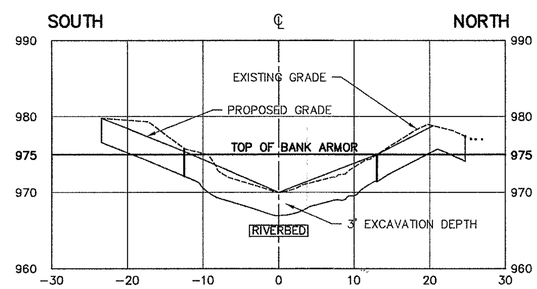
PROPOSED GRADE:
BELOW 975'=3.4:1
ABOVE 975'=3.1:1



PROPOSED GRADE:
BELOW 975'=1.9:1
ABOVE 975'=2.1:1

STATION 1+00

PROPOSED GRADE:
BELOW 975'=2.7:1
ABOVE 975'=3.8:1



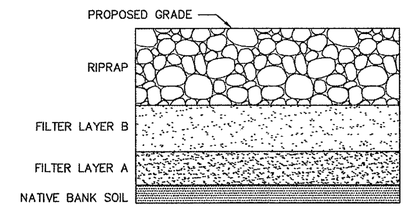
PROPOSED GRADE:
BELOW 975'=2.3:1
ABOVE 975'=2.5:1

STATION 0+50

PROPOSED GRADE:
BELOW 975'=2.6:1
ABOVE 975'=2:1,–3:1

HORIZONTAL SCALE
10 0 10 20 FEET

VERTICAL SCALE
10 0 10 20 FEET

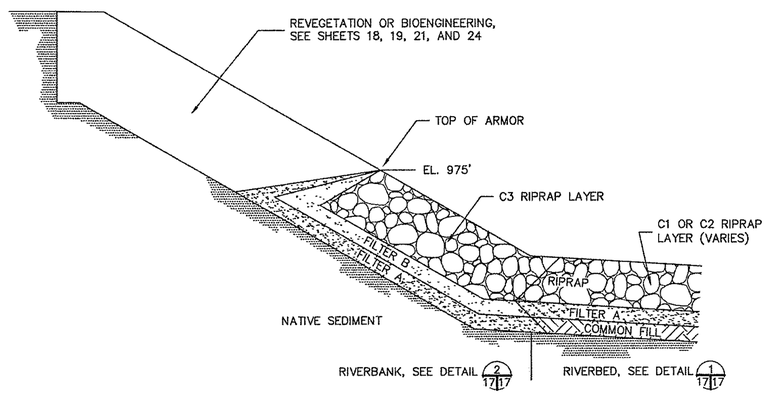


TYPICAL BACKFILL SEQUENCE FOR RIVER BANKS (2 / 17|17)

NOT TO SCALE

SUMMARY OF BACKFILL REQUIREMENT FOR RIVERBANKS

BANK	STATION	RIPRAP LAYER	RIPRAP THICKNESS	FILTER LAYER B THICKNESS	FILTER LAYER A THICKNESS
LEFT	502+50 TO 514+00	C3	24"	6"	6"
RIGHT	500+00 TO 514+00	C3	24"	6"	6"



TYPICAL BACKFILL SEQUENCE FOR RIVER BANKS (3 / 17|17)

NOT TO SCALE

COMMONWEALTH OF MASSACHUSETTS
JOHN C. HEMMINGSON
ENVIRONMENTAL ENGINEER
No. 39197
REGISTERED PROFESSIONAL ENGINEER
11/28/01

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	2/2/01	
B	95% REVIEW SUBMITTAL	8/1/01	
C	100% SUBMITTAL	11/30/01	

PROPOSED GRADES
STA 500+00 04/01
STA 507+00 TO 510+00(W) 04/01
REVISED GRADES 05/01

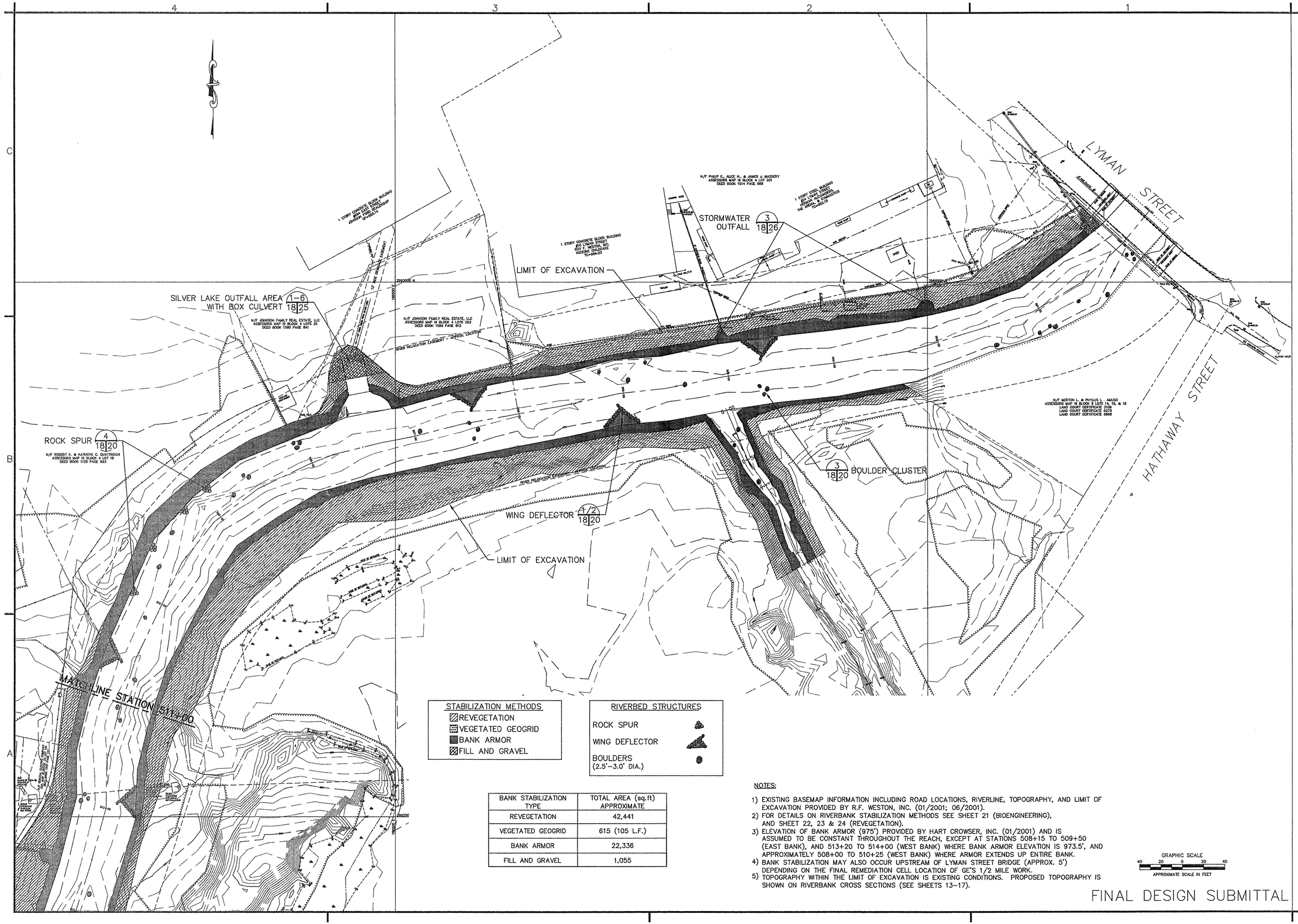
Designed by: WRS/RGJ
Dwn by: KWI
Ckd by: JPL
Reviewed by:
Submitted by:
Chief, Arch. Section
Date: 11/30/01
Rev: C
Design file no:
SPEC. No.:
File name: WA_XSEC06
Plot date: 11/27/01
Plot scale: 1=10

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
WOODLOT ENVIRONMENTAL
HARTCROWSER

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
EXISTING AND PROPOSED
DRAINAGE SWALE CROSS SECTIONS

Sheet reference number:
17
17 of 29



BANK STABILIZATION TYPE	TOTAL AREA (sq.ft) APPROXIMATE
REVEGETATION	42,441
VEGETATED GEOGRID	615 (105 L.F.)
BANK ARMOR	22,336
FILL AND GRAVEL	1,055

NOTES:

1) EXISTING BASEMAP INFORMATION INCLUDING ROAD LOCATIONS, RIVERLINE, TOPOGRAPHY, AND LIMIT OF EXCAVATION PROVIDED BY R.F. WESTON, INC. (01/2001; 06/2001).
2) FOR DETAILS ON RIVERBANK STABILIZATION METHODS SEE SHEET 21 (BIOENGINEERING), AND SHEET 22, 23 & 24 (REVEGETATION).
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT THE REACH, EXCEPT AT STATIONS 508+15 TO 509+50 (EAST BANK), AND 513+20 TO 514+00 (WEST BANK) WHERE BANK ARMOR ELEVATION IS 973.5', AND APPROXIMATELY 508+00 TO 510+25 (WEST BANK) WHERE ARMOR EXTENDS UP ENTIRE BANK.
4) BANK STABILIZATION MAY ALSO OCCUR UPSTREAM OF LYMAN STREET BRIDGE (APPROX. 5') DEPENDING ON THE FINAL REMEDIATION CELL LOCATION OF GE'S 1/2 MILE WORK.
5) TOPOGRAPHY WITHIN THE LIMIT OF EXCAVATION IS EXISTING CONDITIONS. PROPOSED TOPOGRAPHY IS SHOWN ON RIVERBANK CROSS SECTIONS (SEE SHEETS 13-17).

GRAPHIC SCALE
40 20 0 20 40
APPROXIMATE SCALE IN FEET

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% DESIGN SUBMITTAL	04/01					
B	95% DESIGN SUBMITTAL	06/01					
C	FINAL DESIGN SUBMITTAL	11/01					

Designed by: WRS
Dwn by: KWH
Ckd by: JPL/APC
Reviewed by:
Submitted by: Chief, Arch. Section
Date:
Rev. C
Design file no:
SPEC. No.:
File name: 18_RESTOR
Plot date: 02 NOVEMBER 01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODLOT ENVIRONMENTAL

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
RIVER RESTORATION PLAN
SHEET 1 of 2

Sheet reference number:
18
18 of 29

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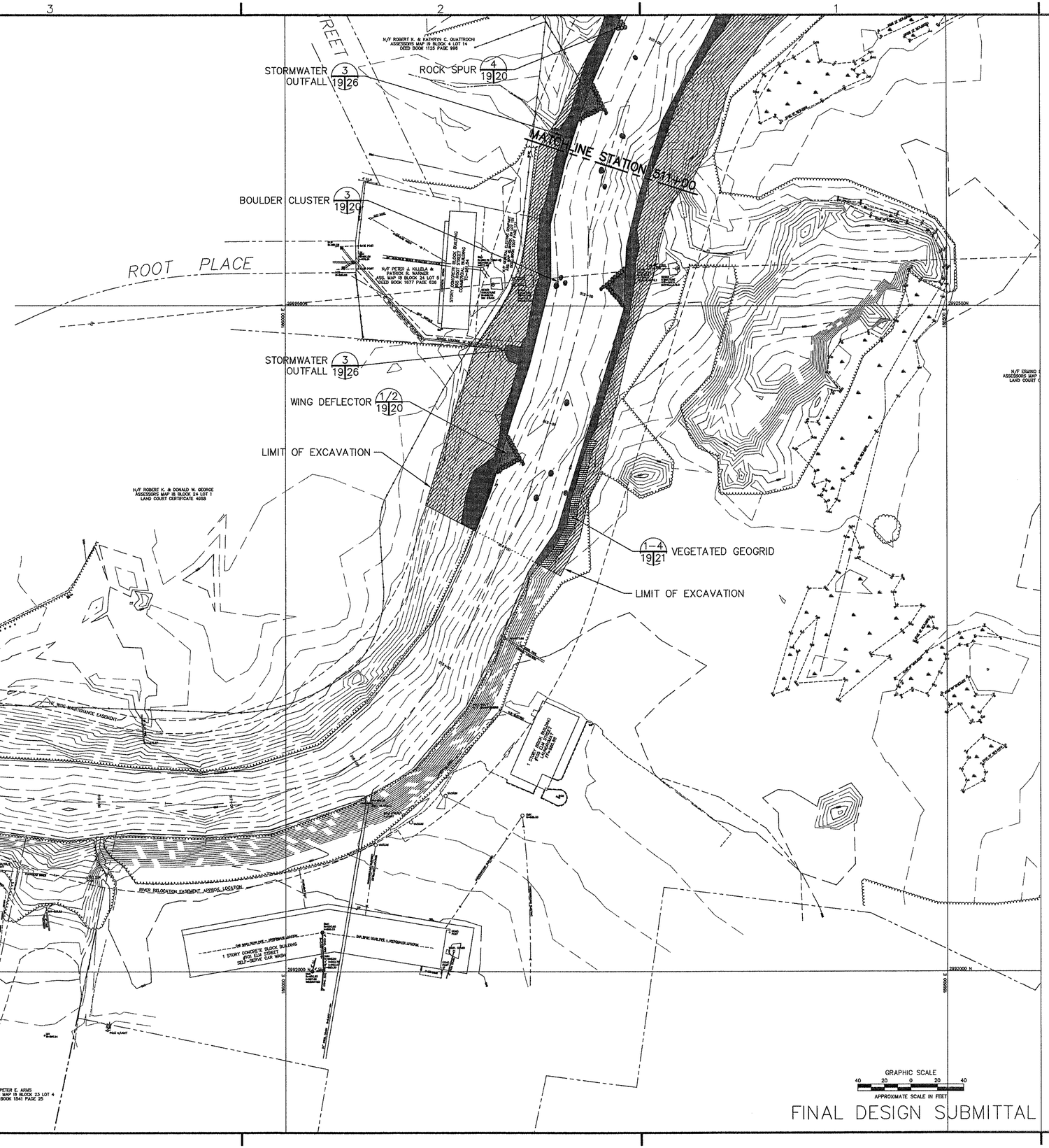
STABILIZATION METHODS
REVEGETATION
VEGETATED GEOGRID
BANK ARMOR
FILL AND GRAVEL

RIVERBED STRUCTURES
ROCK SPUR
WING DEFLECTOR
BOULDERS (2.5'–3.0' DIA.)

BANK STABILIZATION TYPE	TOTAL AREA (sq.ft) APPROXIMATE
REVEGETATION	42,441
VEGETATED GEOGRID	615 (105 L.F.)
BANK ARMOR	22,336
FILL AND GRAVEL	1,055

NOTES:

1) EXISTING BASEMAP INFORMATION INCLUDING ROAD LOCATIONS, RIVERLINE, TOPOGRAPHY, AND LIMIT OF EXCAVATION PROVIDED BY R.F. WESTON, INC. (01/2001; 06/2001).
2) FOR DETAILS ON RIVERBANK STABILIZATION METHODS SEE SHEET 21 (BIOENGINEERING), AND SHEET 22, 23 & 24 (REVEGETATION).
3) ELEVATION OF BANK ARMOR (975') PROVIDED BY HART CROWSER, INC. (01/2001) AND IS ASSUMED TO BE CONSTANT THROUGHOUT THE REACH, EXCEPT AT STATIONS 508+15 TO 509+50 (EAST BANK), AND 513+20 TO 514+00 (WEST BANK) WHERE BANK ARMOR ELEVATION IS 973.5', AND APPROXIMATLY 508+00 TO 510+25 (WEST BANK) WHERE ARMOR EXTENDS UP ENTIRE BANK.
4) BANK STABILIZATION MAY ALSO OCCUR UPSTREAM OF LYMAN STREET BRIDGE (APPROX. 5') DEPENDING ON THE FINAL REMEDIATION CELL LOCATION OF GE'S 1/2 MILE WORK.
5) TOPOGRAPHY WITHIN THE LIMIT OF EXCAVATION IS EXISTING CONDITIONS. PROPOSED TOPOGRAPHY IS SHOWN ON RIVERBANK CROSS SECTIONS (SEE SHEETS 13–17).



FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr	Symbol	Description	Date	Appr
A	65% DESIGN SUBMITTAL	04/01					
B	95% DESIGN SUBMITTAL	06/01					
C	FINAL DESIGN SUBMITTAL	11/01					

Designed by: WRS
Dwn by: KWH
Ckd by: JPL/APC
Reviewed by:
Submitted by: Chief, Arch. Section
Date:
Rev. C
Design file no:
SPEC. No.:
File name: 19_RESTOR
Plot date: 01 NOVEMBER 01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODLOT ALTERNATIVES, INC.

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
RIVER RESTORATION PLAN
SHEET 2 of 2

Sheet reference number:
19
19 of 29

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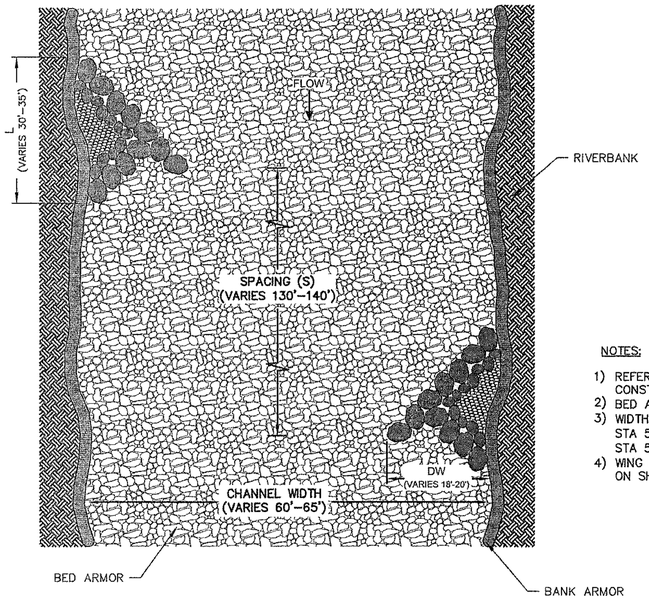
SINGLE WING DEFLECTOR SPACING (TYP.) 1 (18/19/20)

NOT TO SCALE

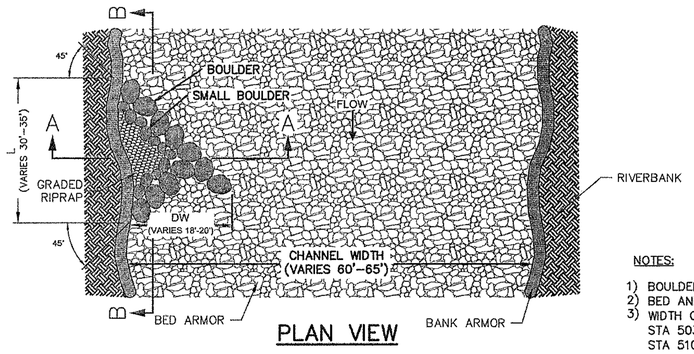


NOTES:

1) REFER TO SINGLE WING DEFLECTOR, DETAIL 2, FOR ADDITIONAL CONSTRUCTION SPECIFICATIONS.
2) BED AND BANK ARMOR SIZE AND THICKNESS VARIES (SEE SHEET 17).
3) WIDTH OF DEFLECTOR (DW) AND LENGTH OF DEFLECTOR (L) VARY:
   STA 503+50 TO STA 507+00: DW=20' AND L=35'
   STA 510+50 TO STA 514+00: DW=18' AND L=30'
4) WING DEFLECTOR SPACING (S) VARIES; SPECIFIC SPACING DEPICTED ON SHEETS 18&19.

SINGLE WING DEFLECTOR (TYP.) 2 (18/19/20)

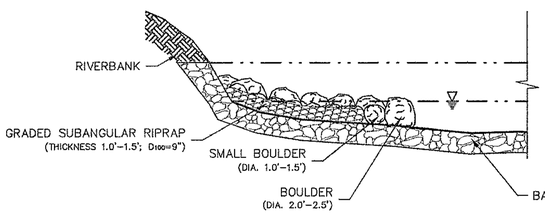
NOT TO SCALE



PLAN VIEW

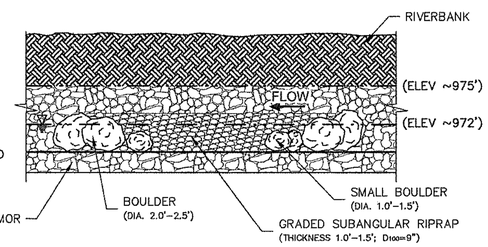
NOTES:

1) BOULDERS SHALL BE PLACED ON TOP OF BED ARMOR.
2) BED AND BANK ARMOR SIZE AND THICKNESS VARIES (SEE SHEET 17).
3) WIDTH OF DEFLECTOR (DW) AND LENGTH OF DEFLECTOR (L) VARY:
   STA 503+50 TO STA 507+00: DW=20' AND L=35'
   STA 510+50 TO STA 514+00: DW=18' AND L=30'



SECTION A (20/20)

NOT TO SCALE

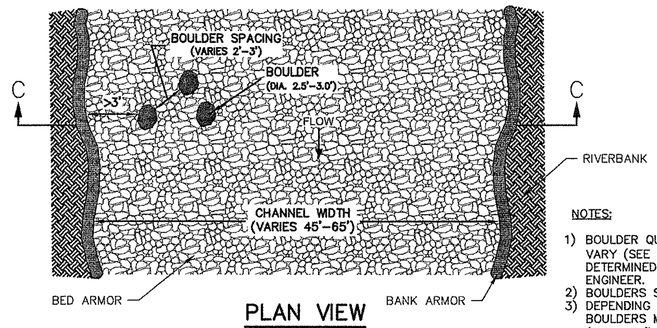


SECTION B (20/20)

NOT TO SCALE

BOULDER CLUSTER (TYP.) 3 (18/19/20)

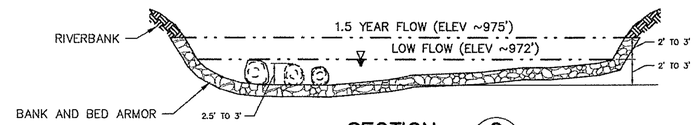
NOT TO SCALE



PLAN VIEW

NOTES:

1) BOULDER QUANTITIES, LOCATIONS, SPACINGS, AND ORIENTATIONS VARY (SEE SHEET 18&19). SPECIFIC BOULDER PLACEMENT WILL BE DETERMINED DURING CONSTRUCTION UNDER THE DIRECTION OF THE ENGINEER.
2) BOULDERS SHALL BE PLACED ON TOP OF BED ARMOR LAYER.
3) DEPENDING ON RIVERBED MORPHOLOGY AND BOULDER SHAPE, SOME BOULDERS MAY EXTEND VERTICALLY ABOVE LOW FLOW ELEVATION (MAX. 0.5')
4) BED AND BANK ARMOR SIZE AND THICKNESS VARIES (SEE SHEET 17).



SECTION C (20/20)

NOT TO SCALE

ROCK SPURS (TYP.) 4 (18/19/20)

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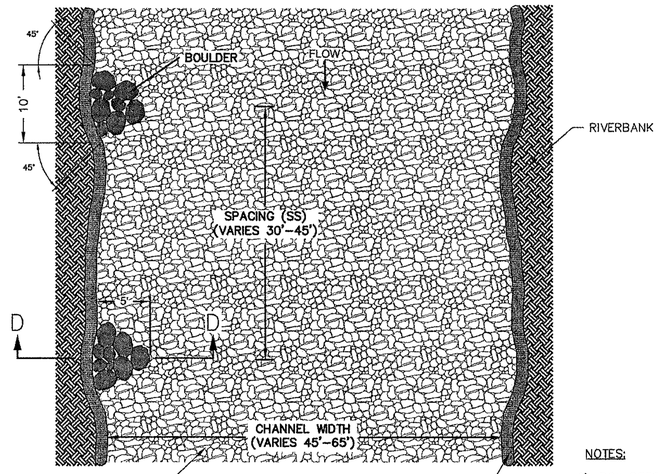
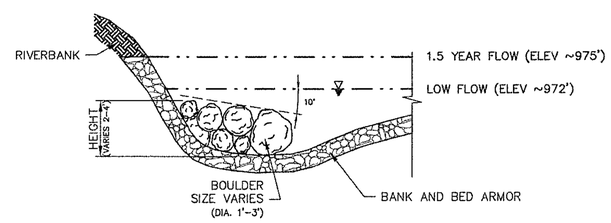


PLAN VIEW

NOTES:

1) BOULDERS SHALL BE PLACED ON TOP OF BED ARMOR.
2) BED AND BANK ARMOR SIZE AND THICKNESS VARIES (SEE SHEET 17)
3) ROCK SPUR SPACING (SS) VARIES; SPECIFIC SPACING DEPICTED ON SHEETS 18&19.



SECTION D (20/20)

NOT TO SCALE

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

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Dwn by: KWH
Ckd by: JPL/APC
Reviewed by:
Submitted by: Chief, Arch. Section
Date:
Rev. C
Design file no:
SPEC. No.:
File name: 20-STREET.dwg
Plot date: 01 NOV/CLASER 10
Plot scale: 1=10

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODPLOT

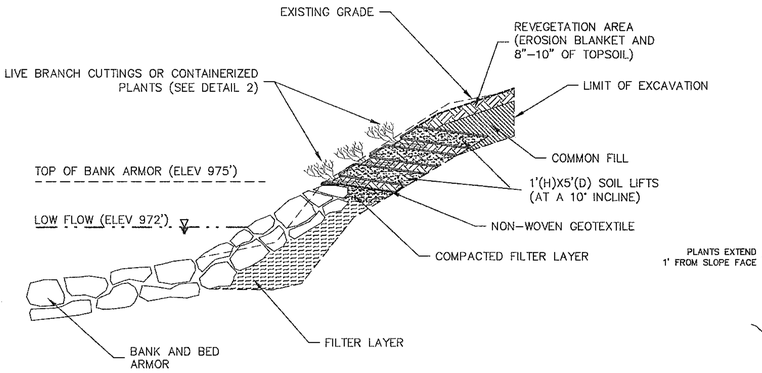
1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
RIVERBED RESTORATION
STRUCTURE DETAILS

Sheet reference number:
20
20 of 29

VEGETATED GEOGRID (TYP.) (1)

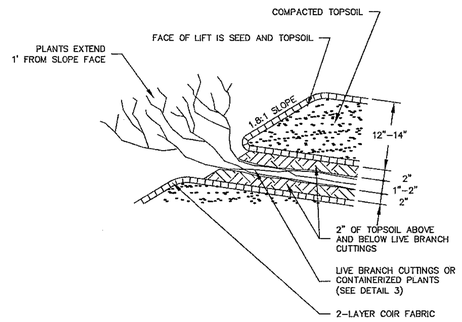
SCALE: 1"=5'

19/23|21



NOTES:

1) ON THE EAST RIVERBANK, THREE SOIL LIFTS ARE USED FROM STATION 513+00 TO 513+60, AND FOUR SOIL LIFTS ARE USED FROM 513+60 TO 514+00.
2) SOIL LIFT FINISHED GRADE IS 1.8H:1V.
3) IF SEEPS ARE ENCOUNTERED DURING CONSTRUCTION GEOTEXTILE AND/OR GRAVEL DRAINS MAY NEED TO BE INSTALLED.
4) ROOTED/BRANCHED CONDITION OF THE LIVE BRANCH CUTTINGS DEPICTED ABOVE IS NOT REPRESENTATIVE OF THE TIME OF INSTALLATION.



DETAIL–GEOGRID FACE (TYP.) (2)

NOT TO SCALE

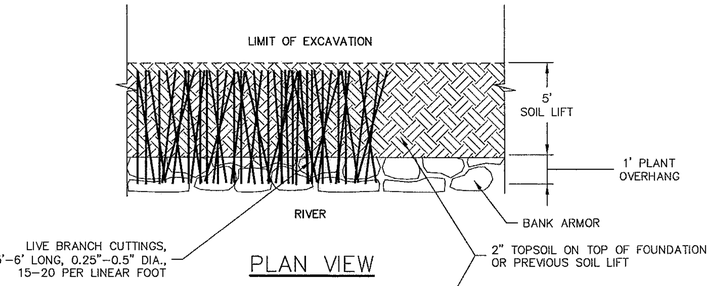
21|21

PLANT INSTALLATION (TYP.) (3)

NOT TO SCALE

19/23|21

DORMANT PERIOD (NOV. 15 TO APRIL 1)

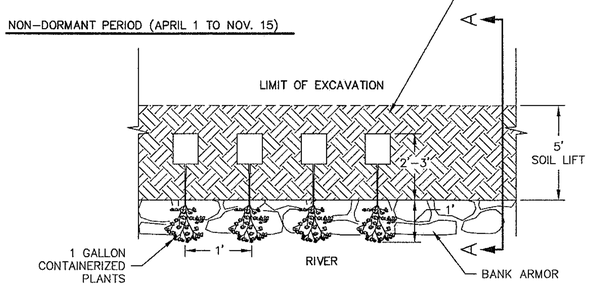


PLAN VIEW

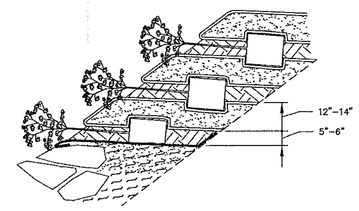
NOTE:

1) SEE SHEET 24 FOR SPECIFIC PLANT SPECIES AND QUANTITIES TO BE INSTALLED IN VEGETATED GEOGRID.
2) IF LIVE BRANCH CUTTINGS ARE USED THEY SHALL BE INSTALLED WHEN DORMANT.

NON–DORMANT PERIOD (APRIL 1 TO NOV. 15)



PLAN VIEW



SECTION (A)

NOT TO SCALE

21|21

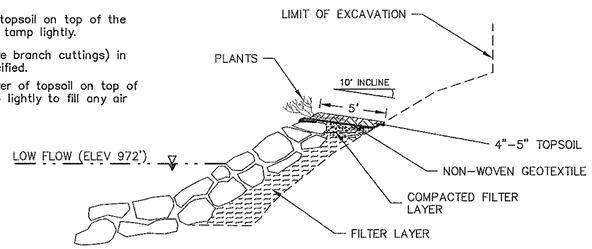
VEGETATED GEOGRID CONSTRUCTION SEQUENCE (TYP.) (4)

NOT TO SCALE

19/23|21

1) PREPARATION FOR FIRST GEOGRID

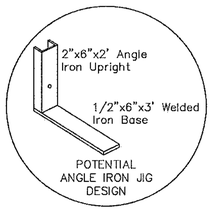
a. Compact top of filter layer to 85% standard Proctor maximum to a depth of 1' to 1.5', at an incline of 10°.
b. Place non–woven geotextile or equivalent (~ 5' wide) on top of compacted filter layer and bank armor.
c. Place a 2" layer of topsoil on top of the geotextile layer, and tamp lightly.
d. Place plants (e.g. live branch cuttings) in topsoil layer as specified.
e. Place another 2" layer of topsoil on top of the plants and tamp lightly to fill any air pockets.

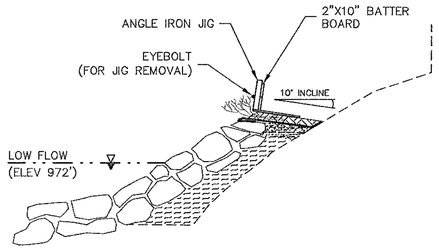


STEP 1

2) PLACEMENT OF JIGS AND BATTER BOARDS

a. Place angle iron jigs on top of prepared base, spaced 4'–6' apart.
b. Place batter boards on jigs to create a form for the front edge of the first geogrid.

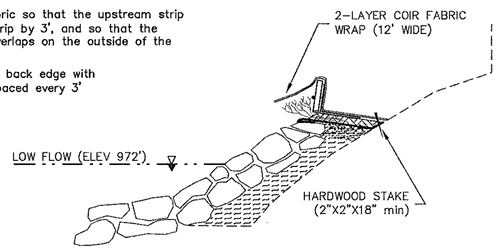




STEP 2

3) PLACEMENT OF COIR FABRIC

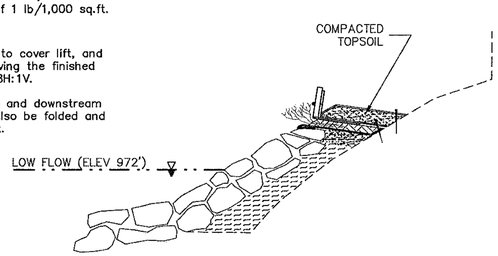
a. Lay specified 2–layer coir fabric on prepared bench as shown, beginning at upstream end, with the long axis of the fabric roll parallel to shoreline.
b. Lay successive strips of fabric so that the upstream strip overlaps the downstream strip by 3', and so that the upstream piece of fabric overlaps on the outside of the downstream piece.
c. Secure the fabric along the back edge with tapered hardwood stakes spaced every 3' (min).



STEP 3

4) FILLING AND WRAPPING SOIL LIFT

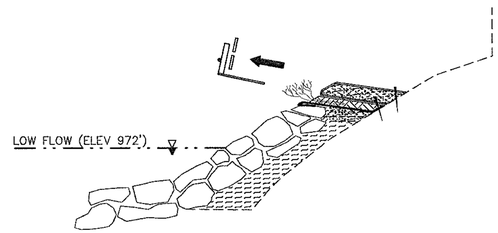
a. Place specified topsoil onto fabric on bench to a thickness of 12"–14", compacting in 6" lifts to 80–85% of standard Proctor maximum (dry density).
b. Add specified seed mix (Sheet 24) to front face of soil lift at a rate of 1 lb/1,000 sq.ft.
c. Maintain 10° incline.
d. Stretch fabric up and over to cover lift, and stake in place securely, leaving the finished front face at a slope of 1.8H:1V.
e. The fabric on the upstream and downstream ends of the soil lift must also be folded and staked securely to riverbank.



STEP 4

5) REMOVING JIGS AND BATTER BOARDS

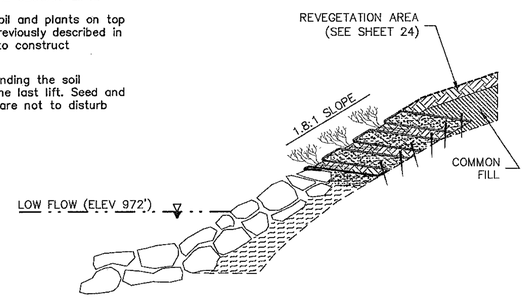
a. Slide angle iron jigs and batter boards out from under completed geogrid lift. If necessary, use a backhoe to pull jigs out, being careful not to tear fabric or damage the installed plants.



STEP 5

6. CONSTRUCTION OF ADDITIONAL GEOGRID LIFTS

a. Lay another layer of topsoil and plants on top of the first geogrid, as previously described in step 1. Repeat process to construct remaining geogrids.
b. Construct upper bank, blending the soil surface with the top of the last lift. Seed and plant upper bank, using care not to disturb geogrid fabric.



STEP 6

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US Army Corps of Engineers
New England District

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A	65% DESIGN SUBMITTAL	04/01					
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C	FINAL DESIGN SUBMITTAL	11/01					

Designed by: WRS | Date: | Rev.: C
Dwn by: KWH/FJD | Ckd by: JPL/APC | Design file no:
Submitted by: | SPEC. No.:
Chief, Arch. Section | Reviewed by:
File name: 21_BIODETL.DWG
Plot date: 01 NOVEMBER 01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
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CONCORD, MASSACHUSETTS

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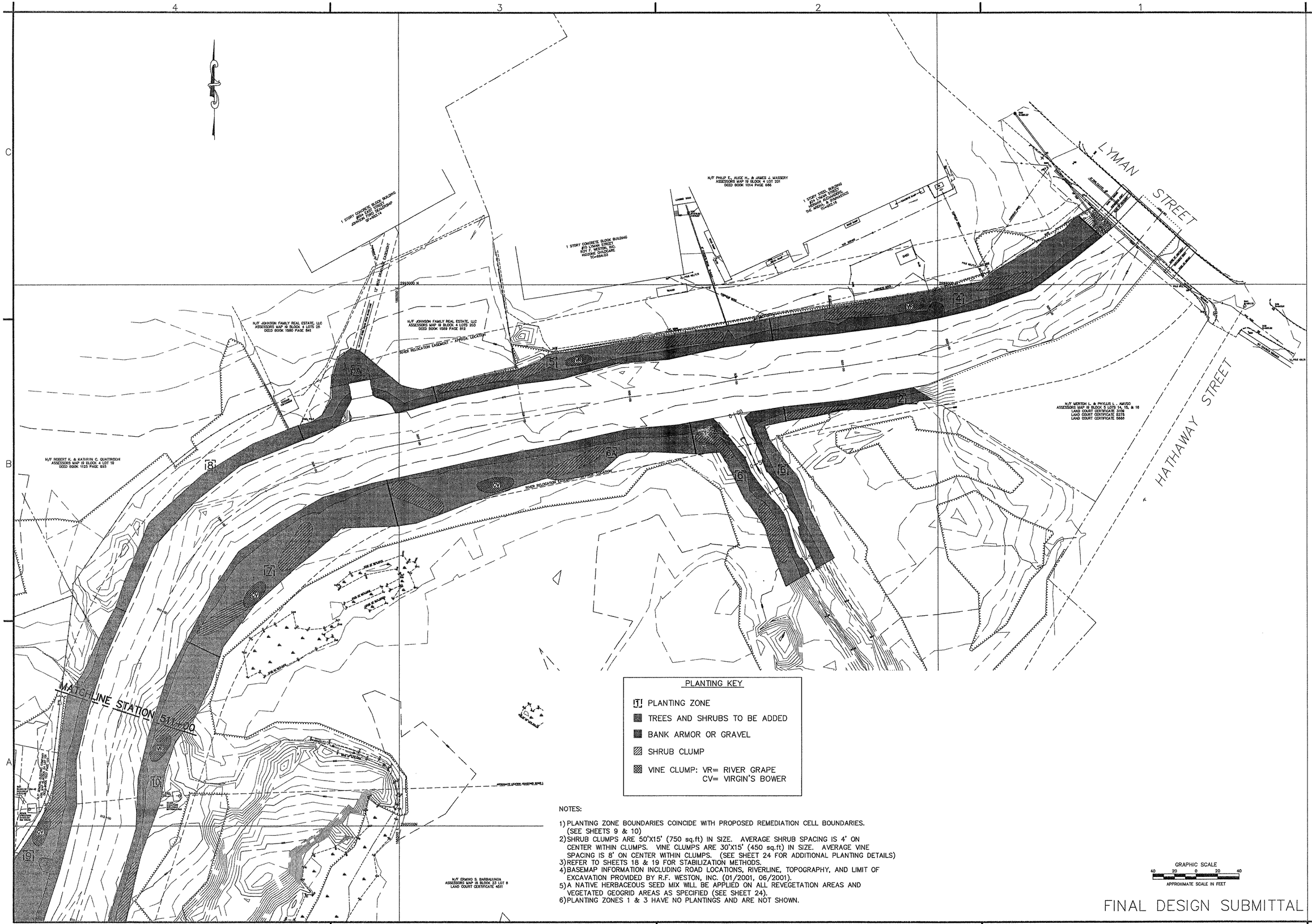
1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
RIVERBANK RESTORATION
BIOENGINEERING DETAILS

Sheet reference number:
21
21 OF 29



PLANTING KEY

- PLANTING ZONE
- TREES AND SHRUBS TO BE ADDED
- BANK ARMOR OR GRAVEL
- SHRUB CLUMP
- VINE CLUMP: VR= RIVER GRAPE
  CV= VIRGIN'S BOWER

NOTES:

1) PLANTING ZONE BOUNDARIES COINCIDE WITH PROPOSED REMEDIATION CELL BOUNDARIES. (SEE SHEETS 9 & 10)
2) SHRUB CLUMPS ARE 50'X15' (750 sq.ft) IN SIZE. AVERAGE SHRUB SPACING IS 4' ON CENTER WITHIN CLUMPS. VINE CLUMPS ARE 30'X15' (450 sq.ft) IN SIZE. AVERAGE VINE SPACING IS 8' ON CENTER WITHIN CLUMPS. (SEE SHEET 24 FOR ADDITIONAL PLANTING DETAILS)
3) REFER TO SHEETS 18 & 19 FOR STABILIZATION METHODS.
4) BASEMAP INFORMATION INCLUDING ROAD LOCATIONS, RIVERLINE, TOPOGRAPHY, AND LIMIT OF EXCAVATION PROVIDED BY R.F. WESTON, INC. (01/2001, 06/2001).
5) A NATIVE HERBACEOUS SEED MIX WILL BE APPLIED ON ALL REVEGETATION AREAS AND VEGETATED GEOGRID AREAS AS SPECIFIED (SEE SHEET 24).
6) PLANTING ZONES 1 & 3 HAVE NO PLANTINGS AND ARE NOT SHOWN.

GRAPHIC SCALE
40 20 0 20 40
APPROXIMATE SCALE IN FEET

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

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Designed by: WRS
Dwn by: KWH
Ckd by: JPL/APC
Reviewed by:
Submitted by:
Chief, Arch. Section
Date:
Rev. C
Design file no:
SPEC. No.:
File name: 22_REVEG
Plot date: 01 NOVEMBER 01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODLOT ENVIRONMENTAL INC.

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

RIVERBANK RESTORATION REVEGETATION PLAN
SHEET 1 of 2

Sheet reference number:
22
22 of 29

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PLANTING KEY

- PLANTING ZONE
- TREES AND SHRUBS TO BE ADDED
- BANK ARMOR OR GRAVEL
- SHRUB CLUMP
- VINE CLUMP: VR= RIVER GRAPE, CV= VIRGIN'S BOWER

NOTES:

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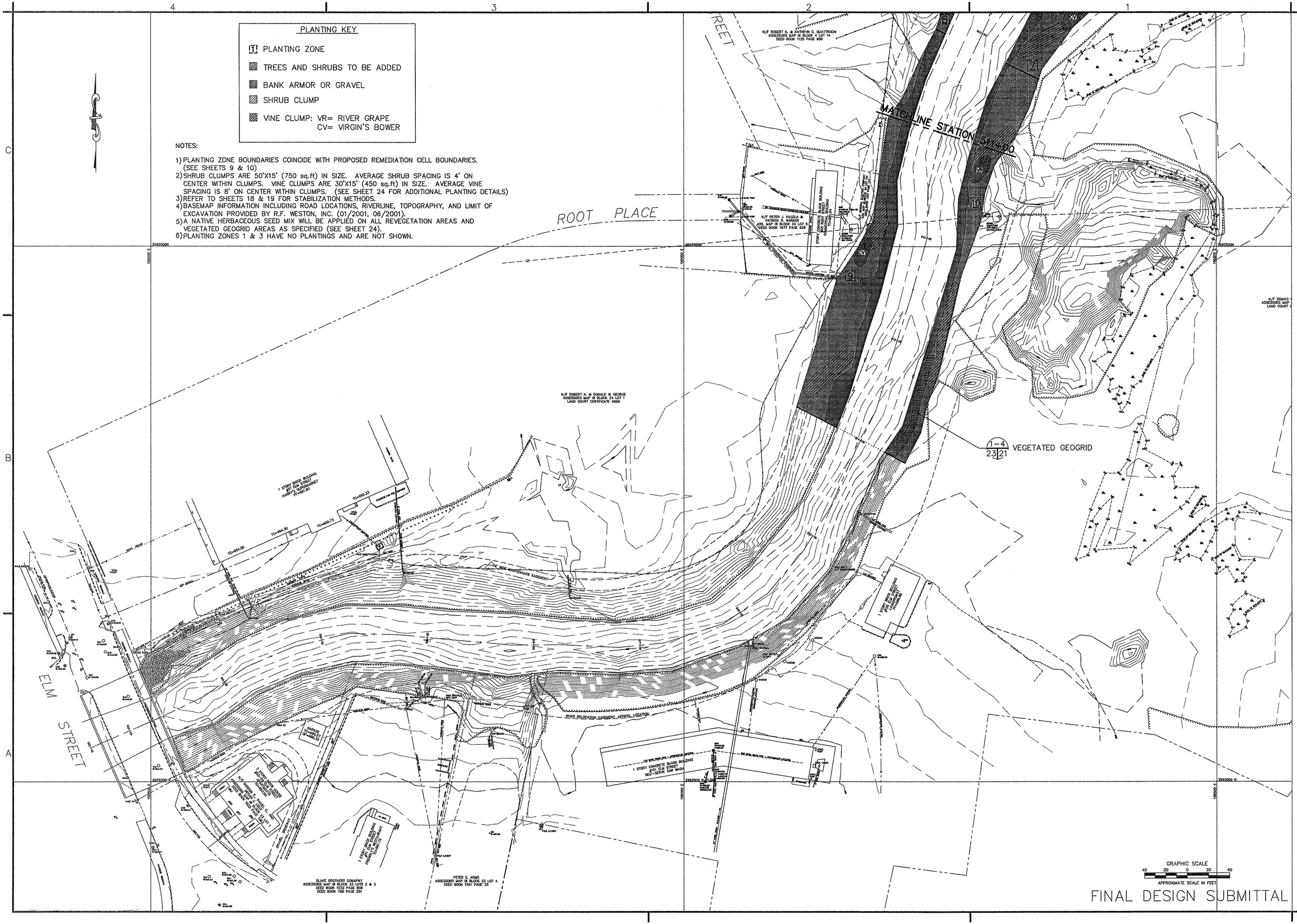
3) REFER TO SHEETS 18 & 19 FOR STABILIZATION METHODS.
4) BASEMAP INFORMATION INCLUDING ROAD LOCATIONS, RIVERLINE, TOPOGRAPHY, AND LIMIT OF EXCAVATION PROVIDED BY R.F. WESTON, INC. (01/2001, 06/2001).
5) A NATIVE HERBACEOUS SEED MIX WILL BE APPLIED ON ALL REVEGETATION AREAS AND VEGETATED GEOGRID AREAS AS SPECIFIED (SEE SHEET 24).
6) PLANTING ZONES 1 & 3 HAVE NO PLANTINGS AND ARE NOT SHOWN.



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C	FINAL DESIGN SUBMITTAL	11/01					

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Dwn by: KWH
Ckd by: JPL/APC
Reviewed by:
Submitted by:
Chief, Arch. Section
Date:
Rev. C
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File name: 23_REVEG
Plot date: 01 NOVEMBER 01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

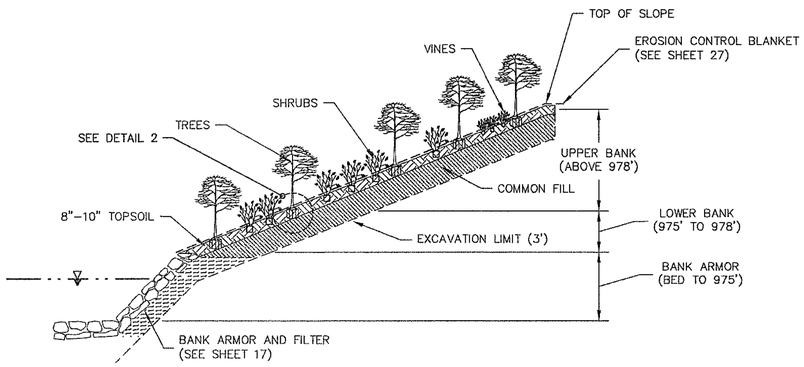
WESTON
HARTCROWSER
WOODLOT ENVIRONMENTAL INC

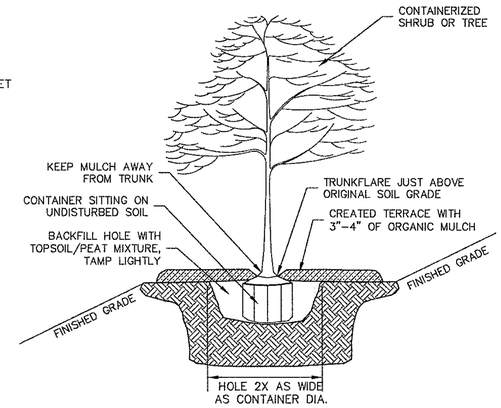
1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
RIVERBANK RESTORATION
REVEGETATION PLAN
SHEET 2 of 2

Sheet reference number:
23
23 of 29

BANK REVEGETATION (TYP.)

NOT TO SCALE (SLOPE GRADE AND LENGTH VARY) 1 22/23/24



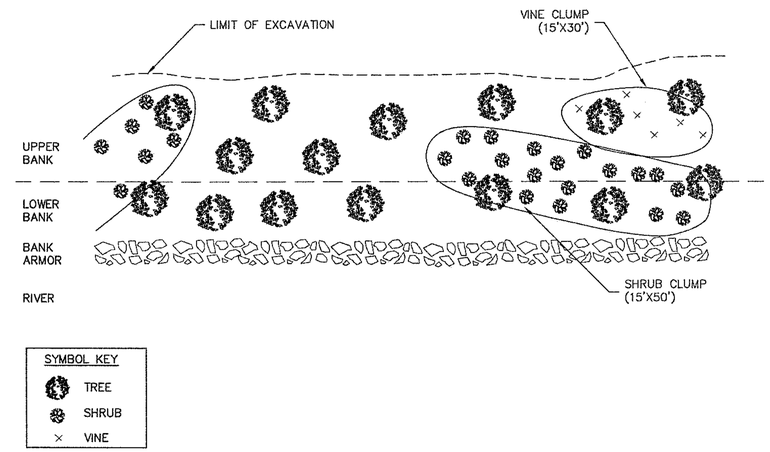


DETAIL–TREE PLANTING (TYP.)

NOT TO SCALE 2 24/24

PLANTING LAYOUT FOR REVEGETATION AREAS (TYP.)

NOT TO SCALE 3 22/23/24



PLANTING SCHEDULE

PLANTING ZONE	AREA (SQ. FT.)	TREES**				SHRUBS**					VINES		LIVE BRANCH CUTTINGS		Totals
		Black Willow	Box–Elder	Silver Maple	Eastern Cottonwood	Silky Dogwood	Red–Osier Dogwood	Northern Arrowwood	Winterberry	Choke Cherry	River Grape	Virgin's Bower	*Willow spp.	Red–Osier Dogwood	
1															
2	983	6 (6/0)	2 (2/0)	6 (6/0)	2 (2/0)	18 (18/0)	17 (17/0)	4 (4/0)	4 (4/0)	4 (4/0)					63
3															
4	5,328	22 (16/6)	22 (5/17)	21 (16/5)	22 (5/17)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)	7				188
5	3,615	16 (13/3)	12 (4/8)	17 (14/3)	13 (5/8)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)	7				159
5A	1,047	4 (3/1)	4 (1/3)	5 (4/1)	4 (2/2)										17
6	3,982	17 (14/3)	15 (5/10)	18 (15/3)	14 (5/9)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)					158
6A	7,349	26 (17/9)	33 (6/27)	27 (18/9)	32 (6/26)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)		7			219
7	7,423	30 (22/8)	30 (8/22)	30 (23/7)	30 (23/7)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)		7			221
8															
9	7,000	35 (31/4)	24 (11/13)	35 (31/4)	22 (10/12)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)					210
10***	6,330	23 (17/6)	24 (7/17)	21 (16/5)	24 (7/17)	24 (18/6)	23 (17/6)	16 (4/12)	16 (4/12)	15 (4/11)	7	7	4,800	2,000	7,000
Totals	43,056	179	166	180	163	186	178	116	116	109	21	21	4,800	2,000	8,235

* 50% ERECT WILLOW, 50% PUSSY WILLOW
** PLANT NUMBERS=TOTAL (LOWERBANK/UPPER BANK)
*** PLANTING ZONE AREA (SQ. FT.) CALCULATION INCLUDES THE VEGETATED GEOGRID

SEED MIX SPECIFICATIONS

SPECIES	COMMON NAME	PERCENT BY WEIGHT
Elymus riparius	stream bank wild rye	25
Elymus canadensis	Canada wild rye	15
Panicum clandestinum	deer–tongue	15
Poa palustris	fowl bluegrass	10
Agrostis stolonifera	creeping bentgrass	10
Desmodium canadense	showy tick–trefoil	5
Polygonum pensylvanicum	Pennsylvania smartweed	5
Asclepias syriaca	common milkweed	2
Rubus allegheniensis	common blackberry	2
Solidago canadensis	Canada goldenrod	2
Solidago gigantea	smooth goldenrod	2
Solidago rugosa var. rugosa	wrinkled goldenrod	2
Aster puniceus	bristly aster	2
Aster lateriflorus	calico or golden aster	1
Aster macrophyllus	big–leaved aster	1
Verbena hastata	blue vervain	1

NOTES:

1) TREES SHALL BE CONTAINERIZED NURSERY STOCK 4' TO 6' HIGH.

TREES SHALL BE PLANTED AT A DENSITY OF 700 PER ACRE, UNEVENLY SPACED (APPROXIMATELY 8' ON CENTER) IN SINUOUS ROWS ROUGHLY PARALLEL TO RIVER.

TREE SPECIES TO BE PLANTED:
BLACK WILLOW (Salix nigra)
SILVER MAPLE (Acer saccharinum)
EASTERN COTTONWOOD (Populus deltoides)
BOX ELDER (Acer negundo)

TREE SPECIES SHALL BE DISTRIBUTED THROUGHOUT UPPER AND LOWER BANKS AS FOLLOWS:
LOWER BANK: 75% SILVER MAPLE AND BLACK WILLOW
25% COTTONWOOD AND BOX ELDER
UPPER BANK: 75% COTTONWOOD AND BOX ELDER
25% SILVER MAPLE AND BLACK WILLOW

2) SHRUBS SHALL BE CONTAINERIZED NURSERY STOCK 2' TO 3' HIGH.

SHRUBS SHALL BE PLANTED AT A DENSITY OF 730 PER ACRE, SPACED 4' ON CENTER WITHIN 15'X50' OBLONG CLUMPS. THE CLUMPS SHALL BE SPACED MORE THAN 40 FEET APART, AND SHALL ENCOMPASS BOTH LOWER AND UPPER BANKS.

SHRUB SPECIES TO BE PLANTED:
SILKY DOGWOOD (Cornus amomum)
RED–OSIER DOGWOOD (Cornus sericea)
NORTHERN ARROWWOOD (Viburnum dentatum)
WINTERBERRY (Ilex verticillata)
CHOKE CHERRY (Prunus virginiana)

SHRUB SPECIES SHALL BE DISTRIBUTED AS FOLLOWS:
LOWER BANK: 75% SILKY AND RED OSIER DOGWOOD
25% ARROWWOOD, WINTERBERRY AND CHOKE CHERRY
UPPER BANK: 75% ARROWWOOD, WINTERBERRY AND CHOKE CHERRY
25% SILKY AND RED–OSIER DOGWOODS

3) VINES SHALL BE CONTAINERIZED NURSERY STOCK, PLANTED AT A DENSITY OF 40 PER ACRE AND SPACED 8' ON CENTER WITHIN CLUMPS.

VINES SHALL BE PLANTED 3 YEARS AFTER INITIAL TREE AND SHRUB PLANTING IN 15'X30' OBLONG CLUMPS SPACED MORE THAN 150' APART.

VINE SPECIES TO BE PLANTED:
RIVER GRAPE (Vitis riparia)–PLANT BETWEEN 975' AND 978' ELEVATION.
VIRGIN'S BOWER (Clematis virginiana)–PLANT ABOVE 978' ELEVATION.

VINES SPECIES SHALL BE DISTRIBUTED EVENLY WITHIN THE VINE CLUMPS.

4) LIVE BRANCH CUTTINGS SHALL BE 5'–6' LONG, 0.25"–0.50" DIA.

LIVE BRANCH CUTTINGS SHALL BE INSTALLED IN BETWEEN SOIL LIFTS AT A DENSITY OF 15–20 PER LINEAR FOOT.

LIVE BRANCH CUTTING SPECIES INCLUDE:
PUSSY WILLOW (Salix discolor)
ERECT WILLOW (Salix eriocephala)
RED–OSIER DOGWOOD (Cornus sericea)

5) PLANTING SCHEDULE (PLANT QUANTITIES) ARE BASED ON USING LIVE BRANCH CUTTINGS IN THE VEGETATED GEOGRIDS, AS OPPOSED TO CONTAINERIZED PLANTS.

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% DESIGN SUBMITTAL	04/01					
B	95% DESIGN SUBMITTAL	06/01					
C	FINAL DESIGN SUBMITTAL	11/01					

Designed by: WRS
Dwn by: FD
Ckd by: JPL/MPC
Reviewed by:
Date:
Submitted by:
Chief, Arch. Section
Rev. C
Design file no:
SPEC. No.:
File name: 24_REVGETDWG
Plot date: 01 NOVEMBER 01
Plot scale: 1=10

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODLOT

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
RIVERBANK RESTORATION
REVEGETATION DETAILS

Sheet reference number:
24
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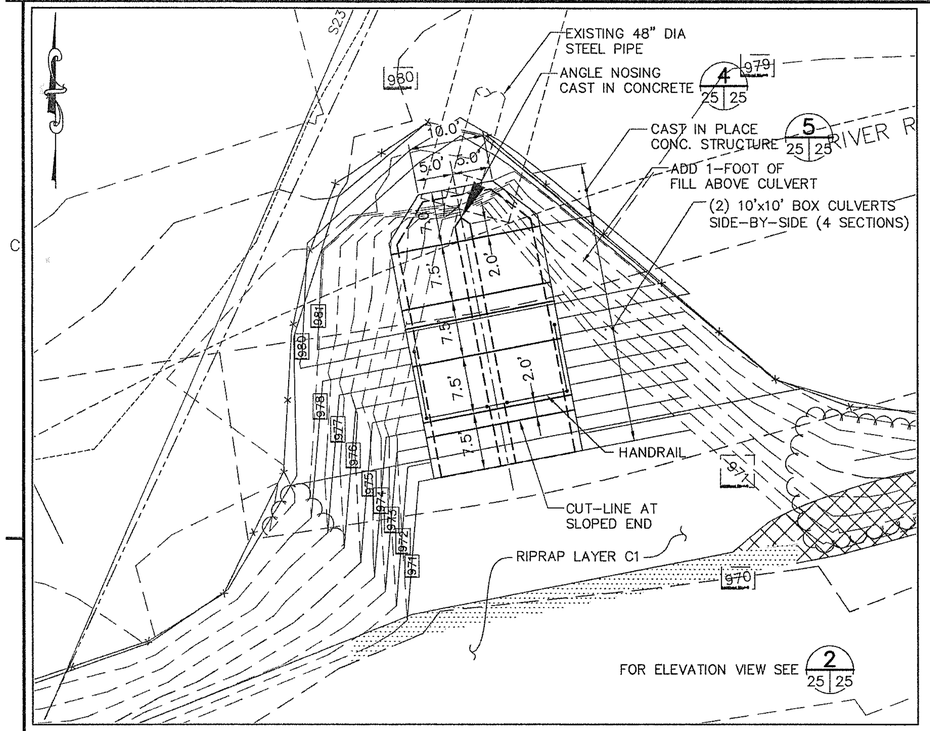
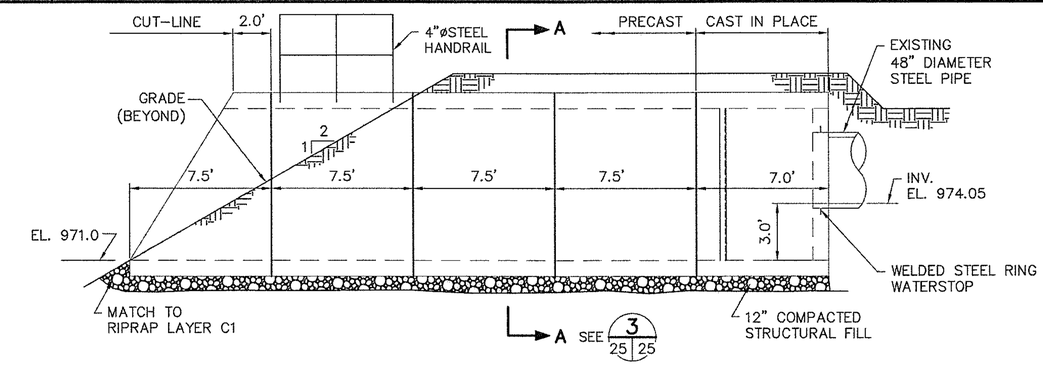


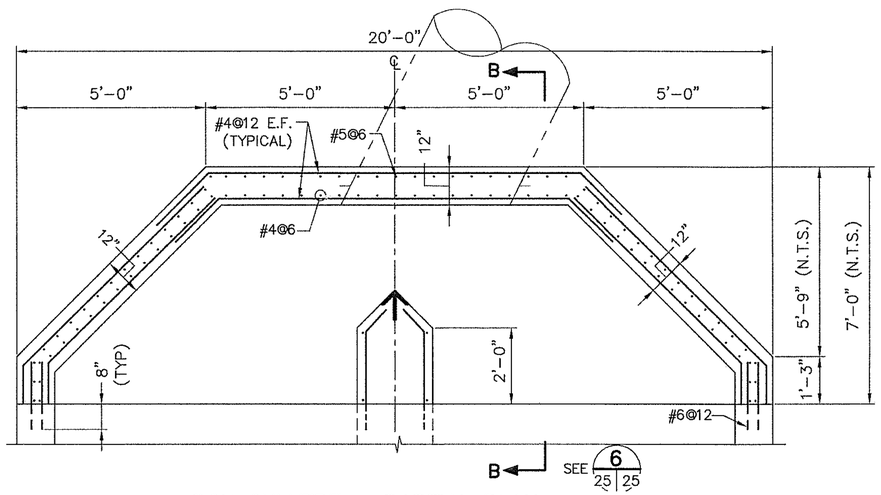
PLAN (SILVER LAKE OUTFALL) 1 4/11 25

GRAPHIC SCALE
APPROXIMATE SCALE IN FEET



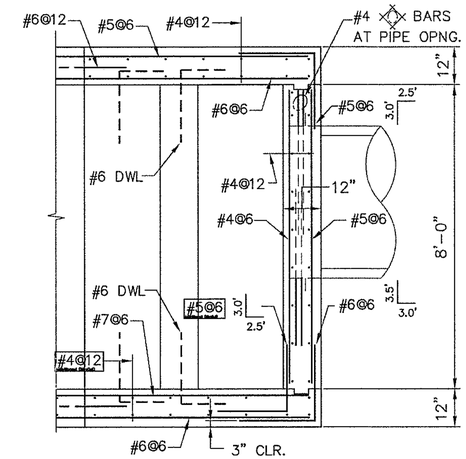
BOX CULVERT – ELEVATION (SILVER LAKE OUTFALL) 2 25 25

GRAPHIC SCALE
APPROXIMATE SCALE IN FEET



BOX CULVERT – PARTIAL PLAN (SILVER LAKE OUTFALL) 5 25 25

GRAPHIC SCALE
APPROXIMATE SCALE IN FEET



SECTION B–B 6 25 25

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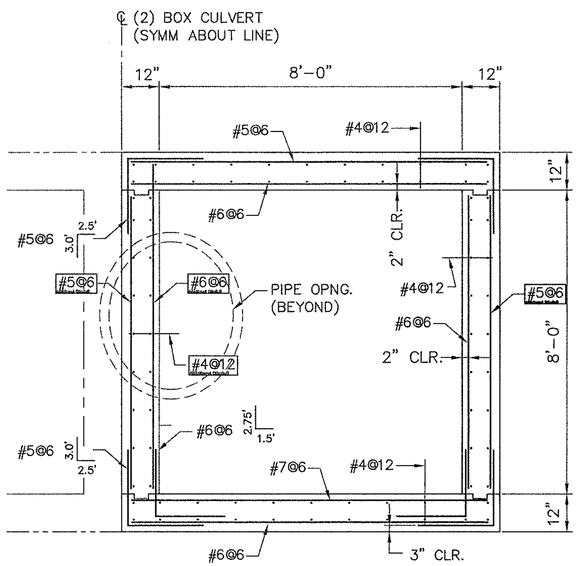

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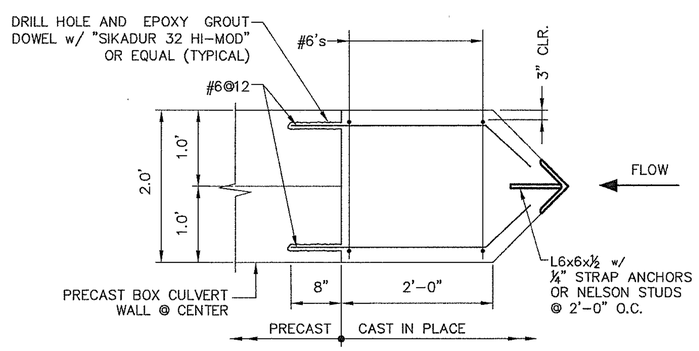

ANGLE NOSING–CAST IN CONCRETE 4 25 25

GRAPHIC SCALE
APPROXIMATE SCALE IN FEET

NOTES

1. CONCRETE SHALL HAVE A 28 DAY COMPRESSIVE STRENGTH OF 5000 PSI, MINIMUM.
2. DESIGN PRECAST UNITS FOR A HS–20 TRUCK AND 150 TON CRANE.
3. EXCAVATION SUPPORT BY OTHERS.
4. REINFORCING SHALL BE ASTM A615, GRADE 60.
5. ALL EXPOSED STEEL AND EMBEDDED ANGLES SHALL BE ASTM A3, HOT DIPPED GALVANIZED.
6. ALL WELDING SHALL CONFORM TO AWS D1.1 LATEST EDITION.
7. THE FIRST AND LAST BARS IN SLAB AND WALLS ARE TO START AND END AT A MAXIMUM OF ONE–HALF OF ADJACENT BAR SPACING. ALL REINFORCING TO BE EQUALLY SPACED UNLESS OTHERWISE SHOWN ON THE DRAWING.
8. THE CONTRACTOR SHALL VERIFY ALL DIMENSION AND CONDITIONS SHOWN, IN THE FIELD, PRIOR TO FABRICATION OR THE START OF THE WORK.
9. BEFORE PLACING CONCRETE, CARE SHALL BE TAKEN THAT ALL EMBEDDED ITEMS ARE IN POSITION AND SECURELY FASTENED IN PLACE.
10. HOOKS AND BEND BARS SHALL CONFORM TO ACI 318, SECTION 7.1 AND 7.2.
11. UNLESS OTHERWISE SHOWN, FOLLOW THE RECOMMENDATIONS ESTABLISHED BY THE AMERICAN CONCRETE INSTITUTE'S "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURE", ACI 318 (DETAILING MANUAL). NO CHANGES SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
12. PROVIDE TIMBER MAT WHEN DRIVING CRANE OVER CULVERT.

COMMONWEALTH OF MASSACHUSETTS
MICHAEL P. WALKER
CIVIL
NO. 38552
REGISTERED PROFESSIONAL ENGINEER
11/28/01

FINAL DESIGN SUBMITTAL

GEI Consultants, Inc.
WINCHESTER · MASSACHUSETTS

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	12/2/00					
B	95% REVIEW SUBMITTAL	8/1/01					
C	100% SUBMITTAL	11/30/01					

Designed by: | Date: 11/30/01 | Rev.
Dwn by: AJB | Ckd by: | Design file no:
Reviewed by: | SPEC. No.:
Submitted by: | File name: Silver Lake Outfall
Chief, Arch. Section | Plot date: 11/28/01
Plot scale: AS NOTED

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
WOODPLOT
HARTCROWSER

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
SILVER LAKE OUTFALL

Sheet reference number:
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25 of 29

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2.0 EROSION AND SEDIMENT CONTROL

2.1 THE EROSION AND SEDIMENT CONTROL DETAILS SHOWN IN THESE PLANS ADDRESS PROCEDURES, EQUIPMENT, AND MATERIALS NECESSARY TO MINIMIZE EROSION AND CONTROL LOSS OF SEDIMENTS FROM RIVERBANK WORK INTO THE RIVER AND PREVENT SEDIMENT TRANSPORT FROM UPLAND AREAS TO IN-RIVER AREAS.

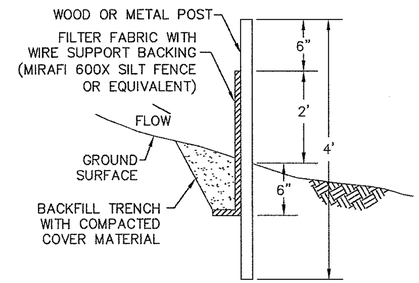
2.2 EROSION AND SEDIMENT CONTROL MEASURES SHALL BE ESTABLISHED UPGRADIENT OF IN-RIVER WORK ACTIVITIES, TO PREVENT TRANSPORT OF SOIL TO THE RIVER AND THE SURROUNDING ENVIRONMENT.

2.3 STAKED HAY BALES, CONSTRUCTED EARTH BERMS, AND/OR SILT FENCES SHALL BE PLACED IMMEDIATELY DOWNGRADIENT OF ALL EXCAVATION AND GRADING AREAS AS SPECIFIED.

2.4 EXCAVATION CONTRACTOR SHALL MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES UNTIL PERMANENT BANK RESTORATION IS COMPLETE AND REVEGETATION IS ESTABLISHED AND SELF SUSTAINING TO THE ENGINEER'S SATISFACTION. REMOVE, REPLACE, OR ADD EROSION AND SEDIMENT CONTROLS AS DIRECTED BY ENGINEER.

2.5 BLOWING DUST IN DRY WEATHER CONDITIONS SHALL BE MINIMIZED BY SPRAYING ALL ACTIVE AREAS OF EXPOSED SOIL SLOPES WITH WATER.

2.6 ALL INGRESS AND EGRESS TO THE PROJECT SITE BY HEAVY EQUIPMENT AND TRUCK/TRAILERS SHALL BE CONTROLLED UTILIZING STABILIZED CONSTRUCTION ENTRANCES, LOCATED IN UPLAND WORK AREAS, THAT WILL BE CONSTRUCTED AND MAINTAINED BY GENERAL CONTRACTOR.

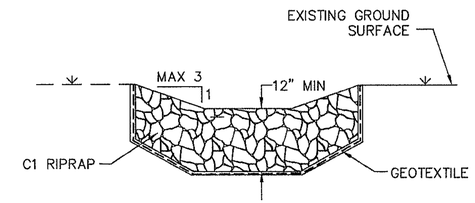


DETAIL – SILT FENCE (TYP.) 1

NOT TO SCALE 18/19/26

NOTES:

1. WOOD OR METAL POSTS SHALL BE SPACED NO MORE THAN 10 FEET APART.
2. EXCAVATE TRENCH 6" DEEP TO BURY BASE OF FILTER FABRIC. BACKFILL TRENCH WITH COMPACTED NATIVE SOILS.

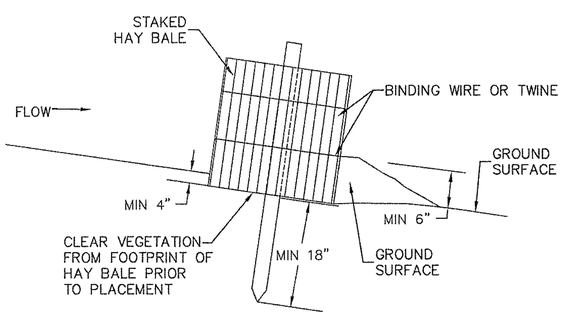


STORMWATER DIVERSION SWALE (TYP.) 3

NOT TO SCALE 18/19/26

NOTES:

1. PROVIDE C1 RIPRAP AND GEOTEXTILE WHERE SWALE GRADE EXCEED 5%.
2. SWALES FLATTER THAN 5% GRADE SHALL BE LINED WITH APPROVED EROSION CONTROL MAT AND SEEDED WITH GRASS.



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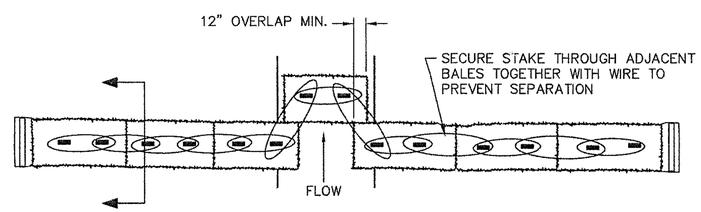
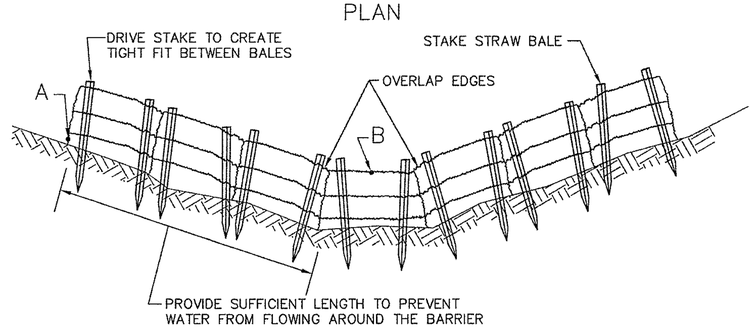


PLAN



ELEVATION

(LOOKING DOWN STREAM)

NOTES:

1. PLACE SUFFICIENT BALES TO ESTABLISH ELEVATIONS AT "A" AT LEAST 6" ABOVE OVERFLOW AT "B".
2. LOCATE BARRIER AS SHOWN ON PLANS AND AT THESE INTERVALS:
3. DITCH SLOPE — MAX. PLACEMENT INTERVAL ALONG SWALE

DITCH SLOPE	MAX. PLACEMENT INTERVAL ALONG SWALE
< 3%	300'
> 3%	150'

TEMPORARY HAY BALE BARRIER 2

NOT TO SCALE 18/19/26

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr	Symbol	Description	Date	Appr
A	65% REVIEW SUBMITTAL	2/2/01					
B	95% REVIEW SUBMITTAL	8/1/01					
C	100% SUBMITTAL	11/30/01					

Designed by: NJB | Date: 11/30/01 | Rev: C
Dwn by: HEL | Ckd by: GTB | Design file no:
Reviewed by: MJB | SPEC. No.:
Submitted by: | File name: 73850520.DWG
Chief, Arch. Section | Plot date: 11/27/01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON | HARTCROWSER | WOODLOT

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

MISCELLANEOUS DETAILS
SHEET 1 OF 3

Sheet reference number:
26
26 of 29

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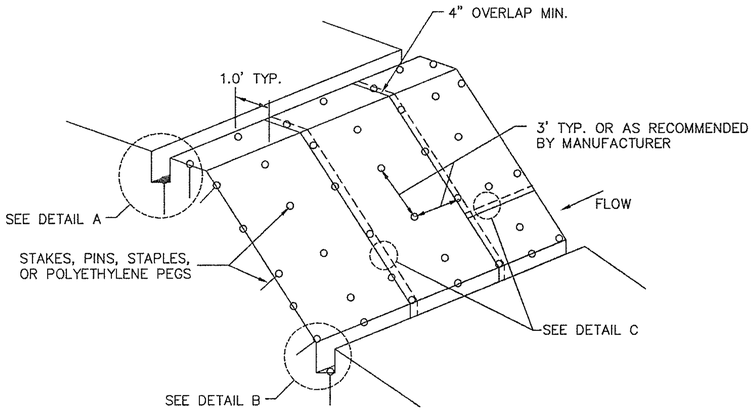

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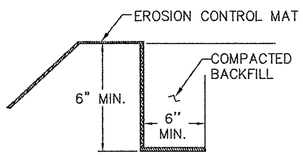

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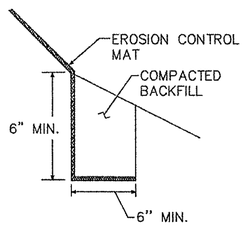

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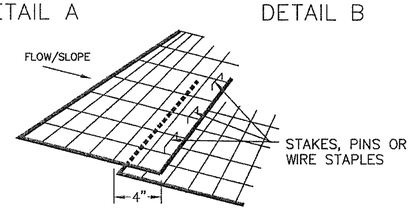
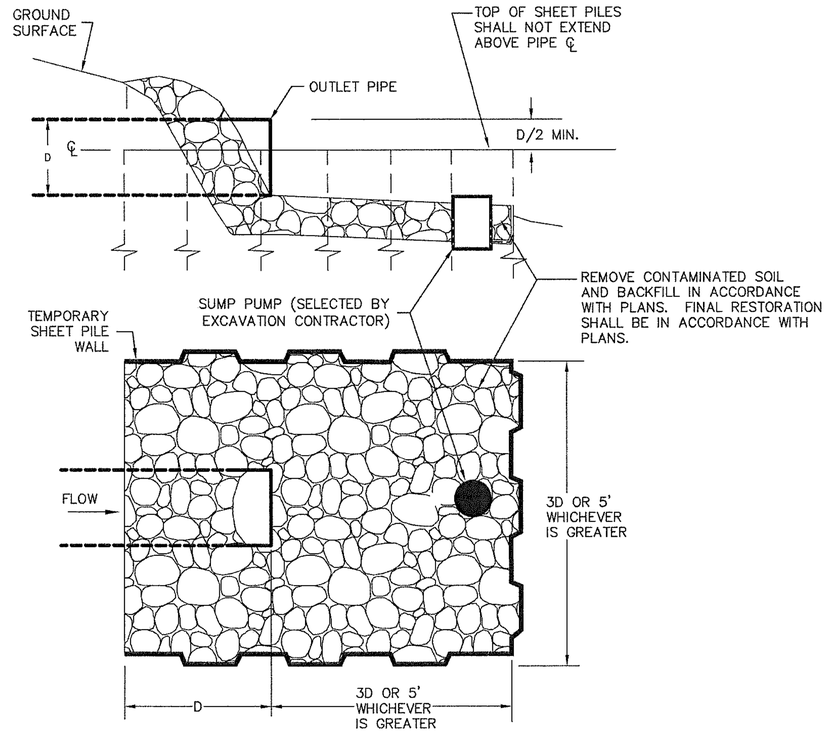


DETAIL C

EROSION CONTROL BLANKET (1)

NOT TO SCALE 24 27

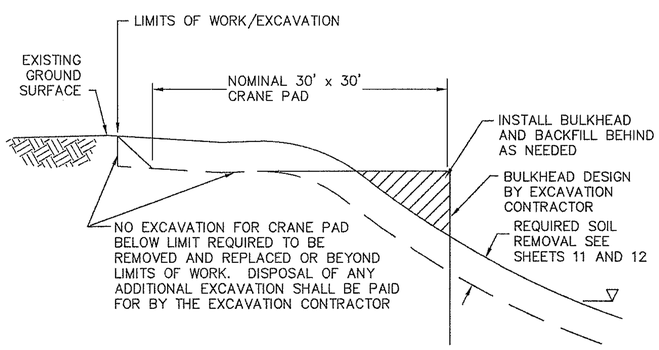


OUTFALL PROTECTION (TYP.) (3)

NOT TO SCALE 11/12 27

NOTES:
1. INSTALL SHEET PILE CELL AND SUMP PUMP TO COLLECT AND DISCHARGE FLOW AWAY FROM MAIN CELL DURING REMEDIATION.

2. CONSTRUCTION SEQUENCE
   a. FINAL RESTORATION
   b. CONSTRUCT TEMPORARY SHEETS



CRANE PAD LOCATIONS TO BE DETERMINED BY EXCAVATION CONTRACTOR

TYPICAL CRANE PAD (4)

NOT TO SCALE 9/10 27

11/26/01

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	12/2/01					
B	95% REVIEW SUBMITTAL	8/1/01					
C	100% SUBMITTAL	11/26/01					

Designed by: MJB
Dwn by: DTN
Ckd by: GTB
Reviewed by: MJB
Submitted by: Chief, Arch. Section
Date: 11/30/01
Rev. C
Design file no:
SPEC. No.:
File name: 73850521.DWG
Plot date: 11/26/01
Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
HARTCROWSER
WOODLOT ENVIRONMENTAL

1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

MISCELLANEOUS DETAILS
SHEET 2 OF 3

Sheet reference number:
27
27 OF 29

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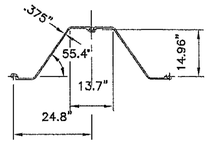
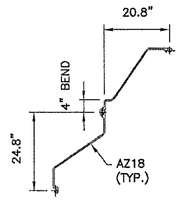
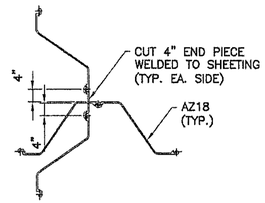
CAD 01/10/01 1=1 (xref)SEE DWG WESTON.pc2



SHEET PILE "ARBED AZ18"



TYP. CORNER DETAIL



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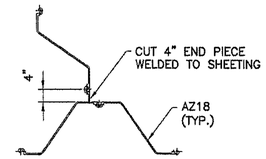
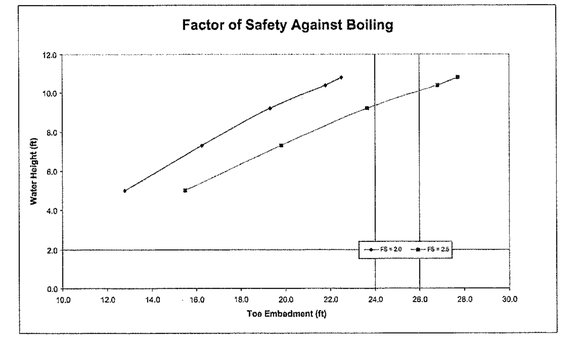
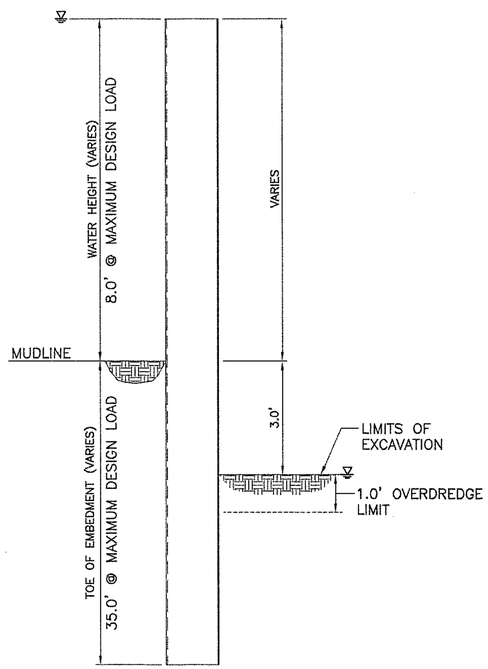


TYP. TEE INTERSECTION

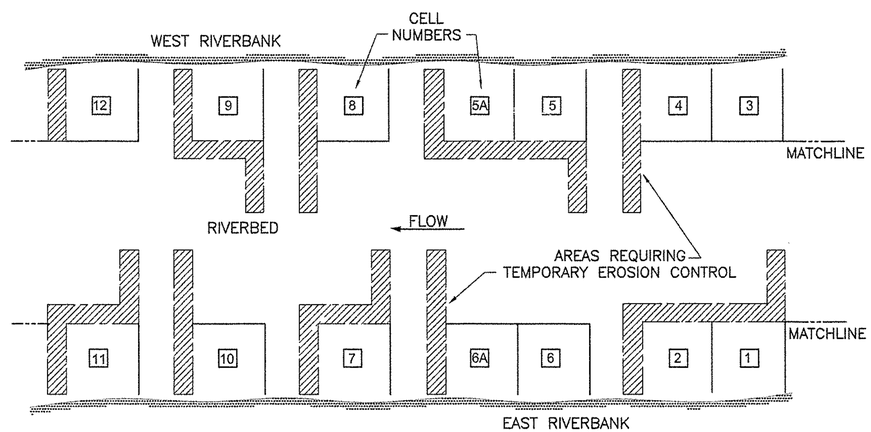
STRUCTURAL DETAILS 1
NOT TO SCALE 11/12/28



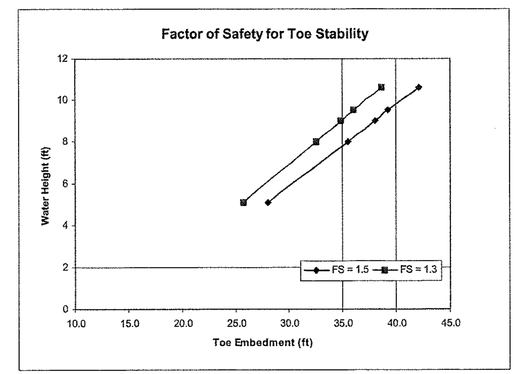
FACTOR OF SAFETY AGAINST BOILING 3
11/28



TYPICAL SHEET PILE SECTION 2
NOT TO SCALE 11/28



TEMPORARY EROSION CONTROL DETAIL 5
NOT TO SCALE 11/28



FACTOR OF SAFETY FOR TOE STABILITY 4
11/28

NOTE:
THE FIGURES ON THIS DRAWING SHOWING FACTOR OF SAFETY (STABILITY AND BOILING) CURVES FOR TOE EMBEDMENT AND DEPTH OF WATER ARE PROVIDED FOR USE BY THE ENGINEER TO EVALUATE THE ADEQUACY OF TOE EMBEDDMENTS ACHIEVED IN THE FIELD. WORK THESE FIGURES WITH TYPICAL SHEETPILE SECTION ON THIS DRAWING.

COMMONWEALTH OF MASSACHUSETTS
MICHAEL F. WALKER
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REGISTERED PROFESSIONAL ENGINEER
11/28/01

FINAL DESIGN SUBMITTAL

GEI Consultants, Inc.
WINCHESTER · MASSACHUSETTS

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr
B	95% REVIEW SUBMITTAL	8/1/01	
C	100% SUBMITTAL	11/30/01	

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Date: 11/30/01
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Ckd by: MPW
Design file no: H-00313
Reviewed by: MPW
SPEC. No.:
Submitted by: Chief, Arch. Section
File name: Sp-1k-01_M0
Plot date: 11/7/01
Plot scale: 1=1

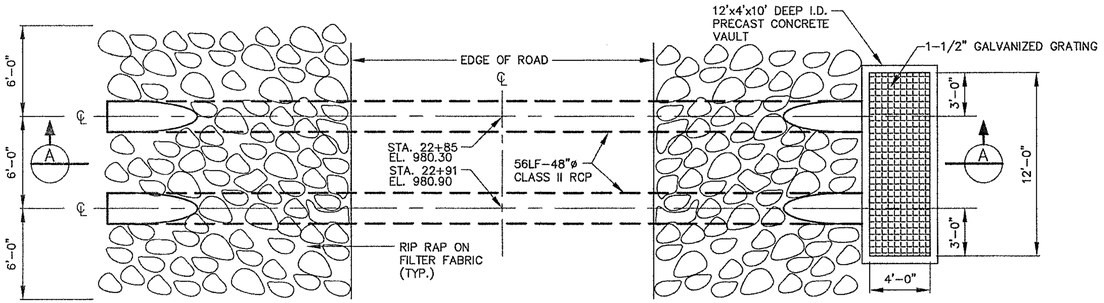
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON
WOODLOT
HARTCROWSER

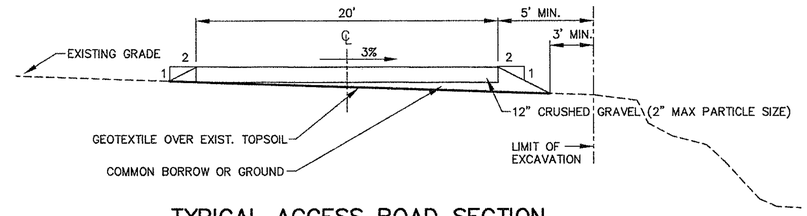
1.5 MILE REMOVAL ACTION – FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS

MISCELLANEOUS DETAILS
SHEET 3 OF 3

Sheet reference number:
28
28 of 29

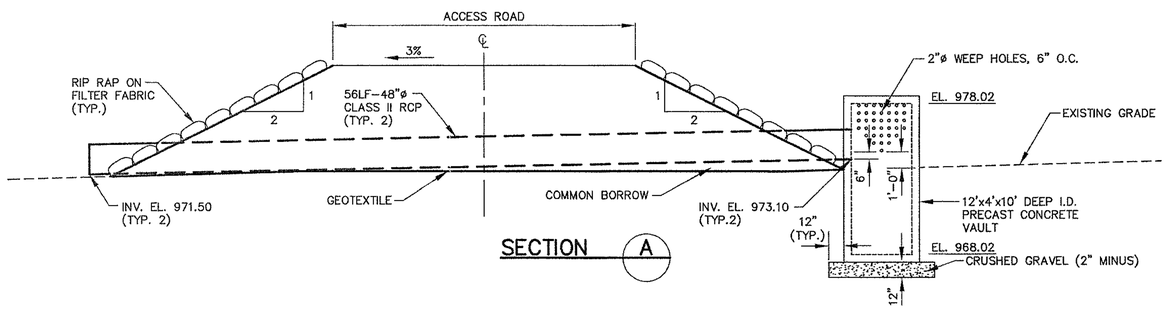


PLAN



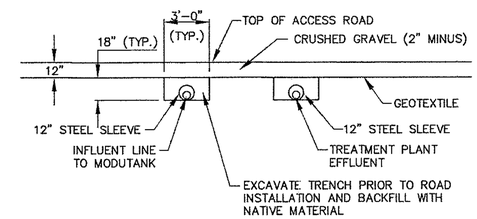
TYPICAL ACCESS ROAD SECTION

NOT TO SCALE



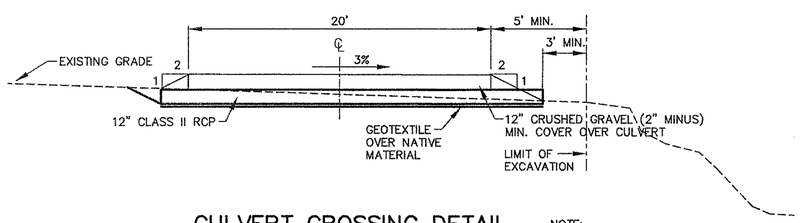
DRAINAGE SWALE CROSSING DETAIL 1/4 29

NOT TO SCALE



ACCESS ROAD PIPELINE CROSSING DETAIL

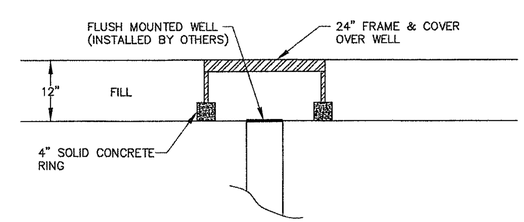
NOT TO SCALE



CULVERT CROSSING DETAIL

NOT TO SCALE

NOTE:
CULVERT CROSSINGS SHALL BE LOCATED IN THE FIELD BY THE CONTRACTOR.



TYPICAL WELL-HEAD PROTECTION DETAIL

NOT TO SCALE

COMMONWEALTH OF MASSACHUSETTS
JOEL S. LINDSAY
No. 37820
REGISTERED PROFESSIONAL ENGINEER
11/28/01

NOTE:
GEOTEXTILE SHALL BE PLACED ON EXISTING SOIL SURFACE BEFORE PLACING CLEAN MATERIALS ABOVE TO MINIMIZE SOIL DISTURBANCE/CROSS CONTAMINATION IN CONTAMINATED AREAS.

FINAL DESIGN SUBMITTAL

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.
A	65% REVIEW SUBMITTAL	7/2/01	
B	95% REVIEW SUBMITTAL		
C	FINAL REVIEW SUBMITTAL	11/30/01	

Designed by: J.S.W. | Date: JAN 01 | Rev. C
Dwn by: E.J.H. | Ckd by: J.S.W. | Design file no:
Reviewed by: | SPEC. No.:
Submitted by: | File name: 29_ | Plot date: 28 NOV 01
Chief, Arch. Section | Plot scale: 1=1

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

WESTON | WOODLOT | HARTCROWSER

1.5 MILE REMOVAL ACTION - FIRST REACH
ENVIRONMENTAL REMEDIATION CONTRACT (SSERC)
GE/HOUSATONIC RIVER SITE
PITTSFIELD, MASSACHUSETTS
ACCESS ROAD AND STAGING AREA
SECTIONS AND DETAILS

Sheet reference number:
29
29 of 29

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