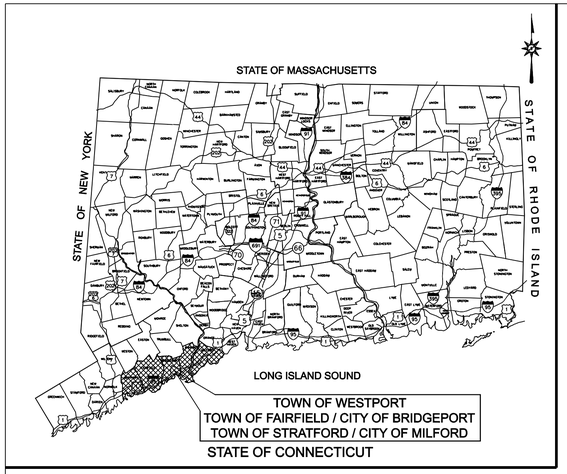
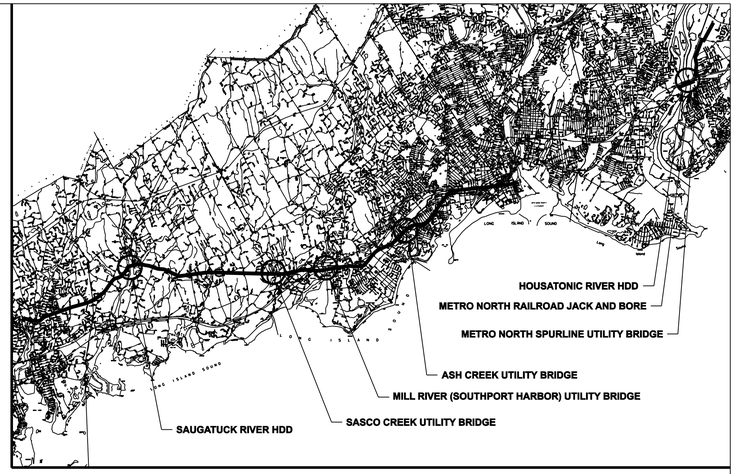


LOCATION MAP

N.T.S.

middletown | norwalk



VICINITY MAP

N.T.S.

CONNECTICUT SITING COUNCIL
DOCKET NO. 272

DEVELOPMENT & MANAGEMENT PLAN

FOR THE

MIDDLETOWN-NORWALK
345-kV TRANSMISSION LINE PROJECT

UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS

TOWN OF WESTPORT / TOWN OF FAIRFIELD / CITY OF BRIDGEPORT / TOWN OF STRATFORD / CITY OF MILFORD, CONNECTICUT

VOLUME 2 OF 2

SEPTEMBER 4, 2006

Burns & McDonnell
SINCE 1898

Connecticut Light & Power
The Northeast Utilities System

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01224-16010 PG 003	UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS GENERAL NOTES AND LEGEND
01224-16010 PG 004	TOWN OF WESTPORT DRAWING LAYOUT INDEX SHEET
01224-16010 PG 005	TOWN OF FAIRFIELD DRAWING LAYOUT INDEX SHEET
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DWG NO	TITLE/DESCRIPTION
01224-16304 PG 001	ASH CREEK GENERAL PLAN
01224-16304 PG 002	ASH CREEK SOIL BORING LOG 1
01224-16304 PG 003	ASH CREEK SOIL BORING LOG 2
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01223-10001 PG 001	TOWN OF STRATFORD PLAN AND PROFILE Sta. 1000+00 TO 1003+00
01223-10001 PG 002	TOWN OF STRATFORD/ CITY OF MILFORD PLAN AND PROFILE Sta. 1002+00 TO 1010+50
01223-10001 PG 003	CITY OF MILFORD PLAN AND PROFILE Sta. 1010+00 TO 1017+25
01223-16401 PG 001	HOUSATONIC RIVER HORIZONTAL DIRECTIONAL DRILL
01223-10001 PG 004	CITY OF MILFORD PLAN AND PROFILE Sta. 1017+25 TO 1023+50
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01223-16402 PG 001	METRO NORTH RR JACK AND BORE PLAN
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01223-46003 PG 002	UTILITY BRIDGE DUCT BANK DETAILS AND UTILITY CROSSING DETAIL
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2	9/4/06	ISSUED CSC	CTC	
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NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN-NORWALK 345kV TRANSMISSION PROJECT

UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS PAGE INDEX

BY SEN-BMCD	CHKD	APP	APP
DATE	DATE	DATE	DATE

SCALE AS NOTED | D | DWG. NO. 01224-16010 PG 002

ABBREVIATIONS

BUILDINGS	
GAR.	GARAGE
GUIDE RAILS	
MBR	METAL BEAM RAIL
CGRM	CABLE GUIDE RAIL METAL POSTS
CGRW	CABLE GUIDE RAIL WOOD POSTS
TGR	TIMBER GUIDE RAIL
FENCES/WALLS	
CLF	CHAIN LINK FENCE
PICK.FENCE	PICKET FENCE
RAIL FENCE	WOOD RAIL FENCE
STOCK.FENCE	STOCKADE FENCE
WIRE FENCE	WIRE FENCE
RET.WALL	RETAINING WALL
MONUMENTATION	
CHD	CONN.HIGHWAY DEPT.MON.
DH	DRILL HOLE
I.PIN	IRON PIN
I.PIPE	IRON PIPE
MAG.NAIL	MAGNETIC NAIL
MON.	MONUMENT
PK NAIL	"PK" NAIL
SPIKE	SPIKE
SURFACE/WALL/CURB MATERIALS	
BIT.	BITUMINOUS
BOL.	BOLLARD
CONC.	CONCRETE
GRAN.	GRANITE
GRAV.	GRAVEL
B.C.I.C.	BITUMINOUS CONCRETE I.P. CURB
UTILITY - WATER	
WG	WATER GATE (OR CURB BOX)
WM	WATER METER
TRAFFIC	
LOOP DET.	LOOP DETECTOR
UTILITY - COMMUNICATIONS AND ELECTRIC	
ELEC.MH	ELECTRIC MANHOLE
TEL.MH	TELEPHONE/COMMUNICATIONS MANHOLE
TRANS.	TRANSFORMER
UI	UNITED ILLUMINATING
SNET	SOUTHERN NEW ENGLAND TELEPHONE
CL&P	CONNECTICUT LIGHT AND POWER

UTILITY - GAS	
GG	GAS GATE
ST.	STEEL
PIPE MATERIALS	
CI	CAST IRON
DI	DUCTILE IRON
H.P.	HIGH PRESSURE
L.P.	LOW PRESSURE
PLA	PLASTIC
PVC	POLYVINYL CHLORIDE
RCP	REINFORCED CONCRETE PIPE
CMP	CORRUGATED METAL PIPE
WRP	WRAPPED PIPE
600#	600 PSI
CWD	CREOSOTE WOOD DUCT
MTD	MULTITILED DUCTS
STD	SINGLE TILED DUCTS
F	FIBERGLASS
P	PLASTIC
I	IRON
W	WOOD
HWF	
TH	TEST HOLE
STRUCTURES	
"C" CB	CURBED CATCH BASIN
"C-L" CB	CURBLESS CATCH BASIN
MH	MANHOLE
SAN.	SANITARY
STM.	STORM
TF	TOP OF FRAME
INV.	INVERT
BTM	BOTTOM
N/A	NOT AVAILABLE
MISC.	
(ABAN.)	ABANDONED
(MAP)	COMPILED FROM EXISTING MAPPING
UG	UNDERGROUND

LEGEND

Edge Of Road
Concrete Pavement
Dirt Road
B.C.I.C.
Curb (Type As Labeled)
Guide Rail
Concrete Median Barrier
Railroad Tracks
Fence
Storm
Sanitary
Gas Main
Water Main
Underground Electric
Telephone Duct Bank
Underground Tele. Conduit
Overhead Wires
Retaining Wall
Highway Line
Street Line
Property Line
Lot Line Of Common Ownership
Town Line
DUCT BANK
Water/RR Crossing
Demolition
Approx. Limits of Thermally Approved Unbound Aggregate Backfill

Easement Line
Edge of Water
Stone Wall
Transmission Tower
Riprap
Hedge Row
Tree Line
Shrub
All Trees
Hand Hole
Pedestrian Signal
Span Pole
Mast Arm
Traffic Controller
Traffic Signal
Sign
2-Post Sign
Double-Faced Sign
Billboard
Utility Pole
Utility Pole With Light
General Purpose Lamp
Light Standard
Guy Wire
Guy Pole
Water Meter
Hydrant
Type "C-L" Catch Basin
Type "C" Catch Basin
Manhole
Benchmark
Control Point
Monuments
Pin, Pipe, Drillhole
Marsh
Wetlands Boundary
Fiber Optic Handhole
Splice Vault
Test Hole
Temperature Monitor Station
D&M PLANS UNDER DIFFERENT SUBMISSION

GENERAL NOTES

1. THE UTILITIES AND NATURAL FEATURES SHOWN HEREON ARE BASED ON FIELD SURVEYS, AERIAL PHOTOGRAPHY AND RECORD DOCUMENTS. OTHER FACILITIES MAY EXIST NOT DISCOVERED THROUGH THE RECORD CHECK. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION, BOTH HORIZONTAL AND VERTICAL, OF ALL UTILITIES THROUGH THE APPROPRIATE UTILITY COMPANIES. CALL BEFORE YOU DIG.
2. ALL VERTICAL RADII ARE 400' UNLESS OTHERWISE NOTED.
3. DUCT BANK SHALL MAINTAIN MINIMUM COVER DEPTH OF 2'-6" UNLESS OTHERWISE SHOWN ON DRAWINGS. MAINTAIN 2'-0" VERTICAL CLEARANCE OVER OR UNDER EXISTING UTILITIES UNLESS OTHERWISE SHOWN ON DRAWINGS.
4. ALL AREAS DISTURBED BY CONSTRUCTION SHALL BE RETURNED TO THE ORIGINAL CONDITIONS AS DETERMINED BY NORTHEAST UTILITIES.
5. COORDINATES AND STATIONING INDICATED ARE AT CENTERLINE OF DUCT BANK.
6. SEE INDEX KEY MAPS FOR THE DESIGNATION BETWEEN MUNICIPAL ROADS AND STATE ROADS.
7. TREES AND SHRUBS SHALL BE REMOVED AND REPLACED WITH SIMILAR TYPES AND SIZES TYPICAL OF GENERAL CONSUMER NURSERY STOCK, PROVIDED THAT NO REPLACEMENT TREE SHALL EXCEED TWELVE (12) FEET IN HEIGHT, NOR SHALL ANY REPLACEMENT SHRUB EXCEED A THREE (3) GALLON POT AND PROVIDED THAT NOTHING SHALL BE PLANTED WITHIN FIFTEEN (15) FEET OF AN INSTALLED VAULT OR WITHIN TEN (10) FEET OF AN INSTALLED CABLE DUCT BANK.
8. COORDINATES ARE BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM. (NAD 83)
9. VERTICAL DATUM IS BASED ON NAVD 88.
10. SILT FENCE SHALL BE USED ALONG THE DOWN SLOPE SIDE OF THE CONSTRUCTION AREA WHERE THERE IS THE POTENTIAL FOR STORM WATER RUNOFF. THIS INCLUDES ANY PERVIOUS AREAS ALONG THE ROUTE. INLET PROTECTION SHALL BE USED IN ROADWAYS WHERE STORM DRAINS ARE PRESENT AND POTENTIAL FOR STORM WATER RUNOFF EXISTS.
11. TEMPORARY AND PERMANENT EASEMENTS WILL BE ACQUIRED FOR INSTALLATION OF THE DUCT BANK AND VAULTS ALONG PRIVATE PROPERTY. A TYPICAL VAULT LOCATION INSTALLED ALONG PRIVATE PROPERTY REQUIRES A PERMANENT EASEMENT OF APPROXIMATELY 10,000 SF AND A TEMPORARY EASEMENT OF APPROXIMATELY 6,500 SF.
12. VAULT AND DUCT BANK LOCATIONS ARE SUBJECT TO ADJUSTMENT DUE TO UNFORESEEN CONDITIONS.
13. NORTHING AND EASTING DESIGNATIONS FOR SPLICE VAULT LOCATIONS ARE REFERENCED TO CENTER OF SPLICE VAULT.

ONE CALL SYSTEMS
1-800-922-4455
CALL BEFORE YOU DIG.....IT'S THE LAW!
48 HOUR NOTICE REQUIRED

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designed C. COURTRIGHT | checked S. NEWLAND

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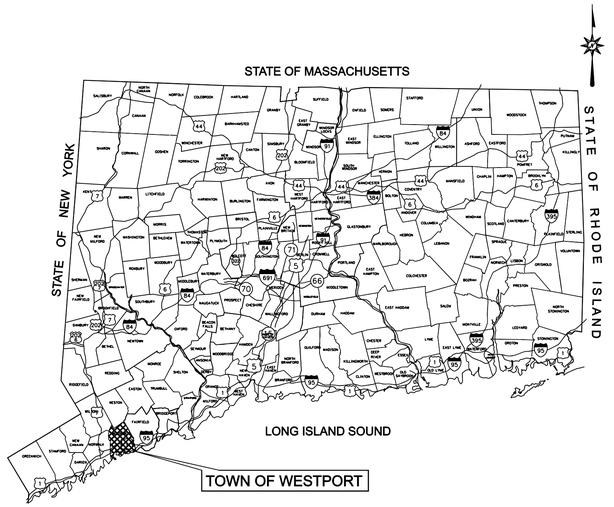
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN-NORWALK 345kV TRANSMISSION PROJECT
UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS
GENERAL NOTES AND LEGEND

BY SEN-BMCD	CHKD	APP	APP
DATE 2-5-05	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16010 PG 003	



LOCATION MAP

N.T.S.

TOWN OF WESTPORT

NOT TO SCALE

MUNICIPAL ROW

ConnDOT ROW

PG 034

PG 035

PG 036

PG 062

SAUGATUCK RIVER "HORIZONTAL DIRECTIONAL DRILL"

SASCO CREEK "UTILITY BRIDGE"

CITY LIMITS OF NORWALK
TOWN LIMITS OF WESTPORT

TOWN LIMITS OF WESTPORT
TOWN LIMITS OF FAIRFIELD

MATCHLINE SEE DWG. NO.
01224-10002 PG 002
ISSUED UNDER SEGMENT
4C DEVELOPMENT AND
MANAGEMENT PLAN

MATCHLINE SEE DWG. NO.
01224-16010 PG 006

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checked S. NEWLAND

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NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

TOWN OF WESTPORT
DRAWING LAYOUT INDEX SHEET

BY SEN–BMCD	CHKD	APP	APP
DATE	DATE	DATE	DATE
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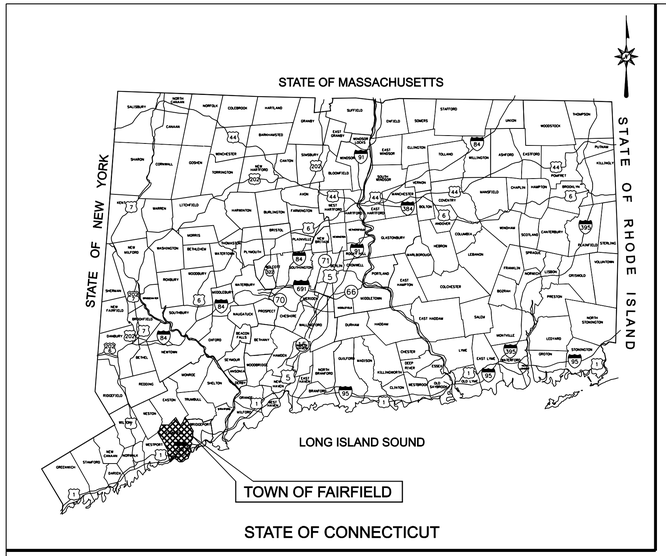

LOCATION MAP

N.T.S.

TOWN OF FAIRFIELD

NOT TO SCALE

PG 088

ASH CREEK "UTILITY BRIDGE"

PG 072

MILL RIVER (SOUTHPORT HARBOR) "UTILITY BRIDGE"

PG 062

SASCO CREEK "UTILITY BRIDGE"

MUNICIPAL ROW

ConnDOT ROW

TOWN LIMITS OF WESTPORT
TOWN LIMITS OF FAIRFIELD

TOWN LIMITS OF FAIRFIELD
CITY LIMITS OF BRIDGEPORT

MATCHLINE SEE DWG. NO. 01224-16010 PG 005

MATCHLINE SEE DWG. NO. 01224-16010 PG 007

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FOR THE CONNECTICUT LIGHT & POWER COMPANY

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TOWN OF FAIRFIELD
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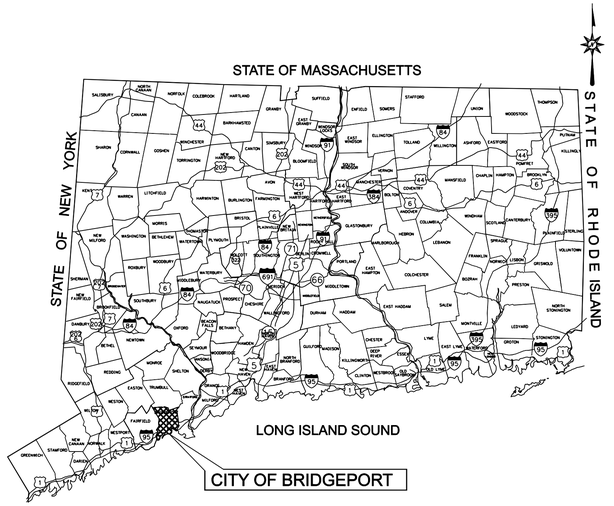
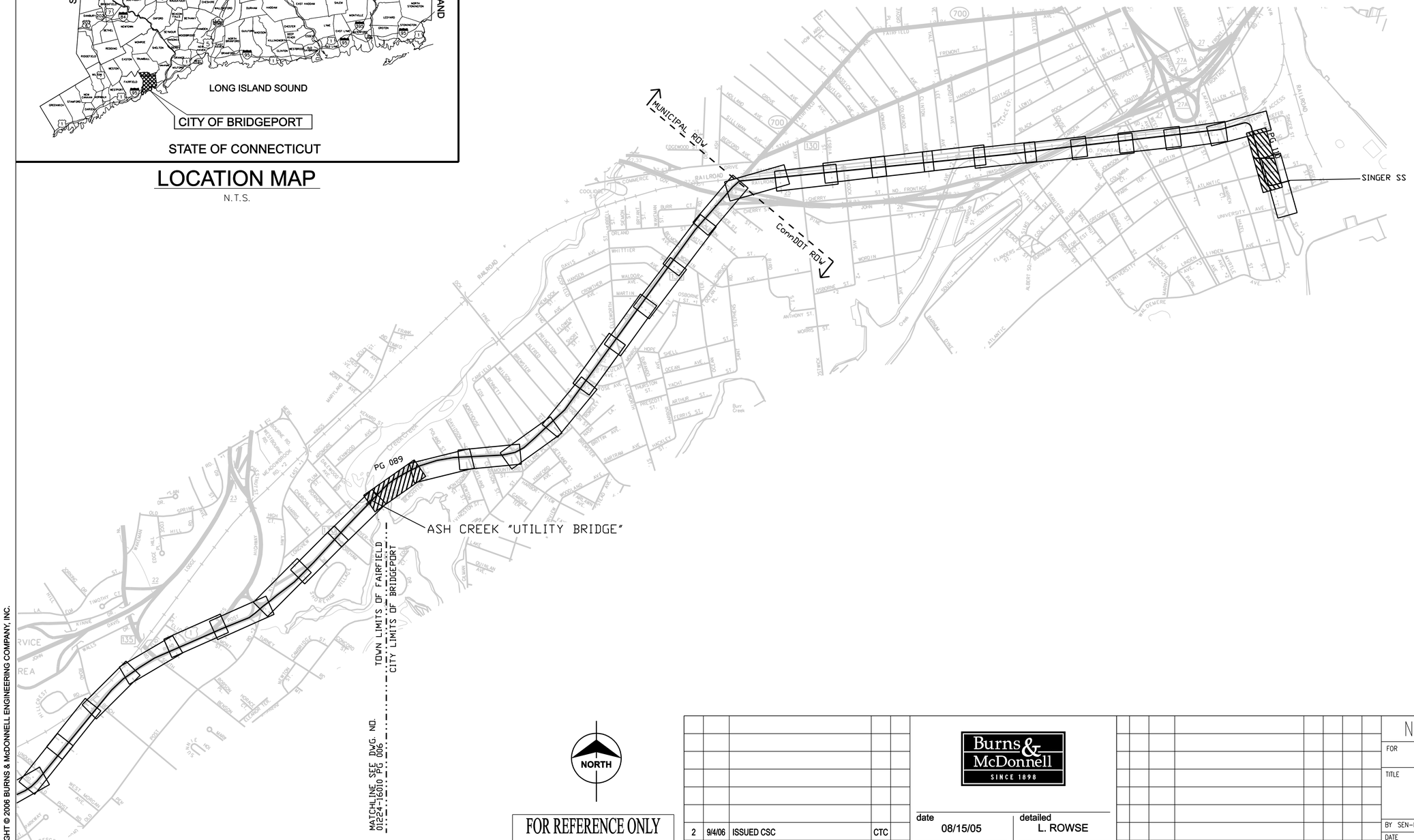


LOCATION MAP

N.T.S.

CITY OF BRIDGEPORT

NOT TO SCALE



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CITY OF BRIDGEPORT
DRAWING LAYOUT INDEX SHEET

BY SEN–BMCD	CHKD	APP	APP
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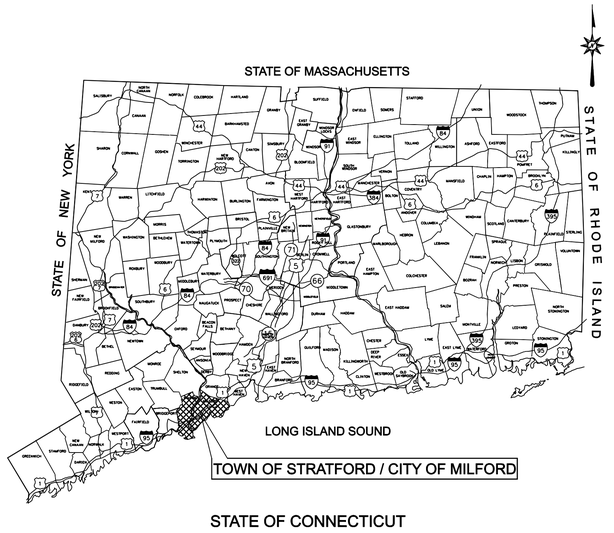
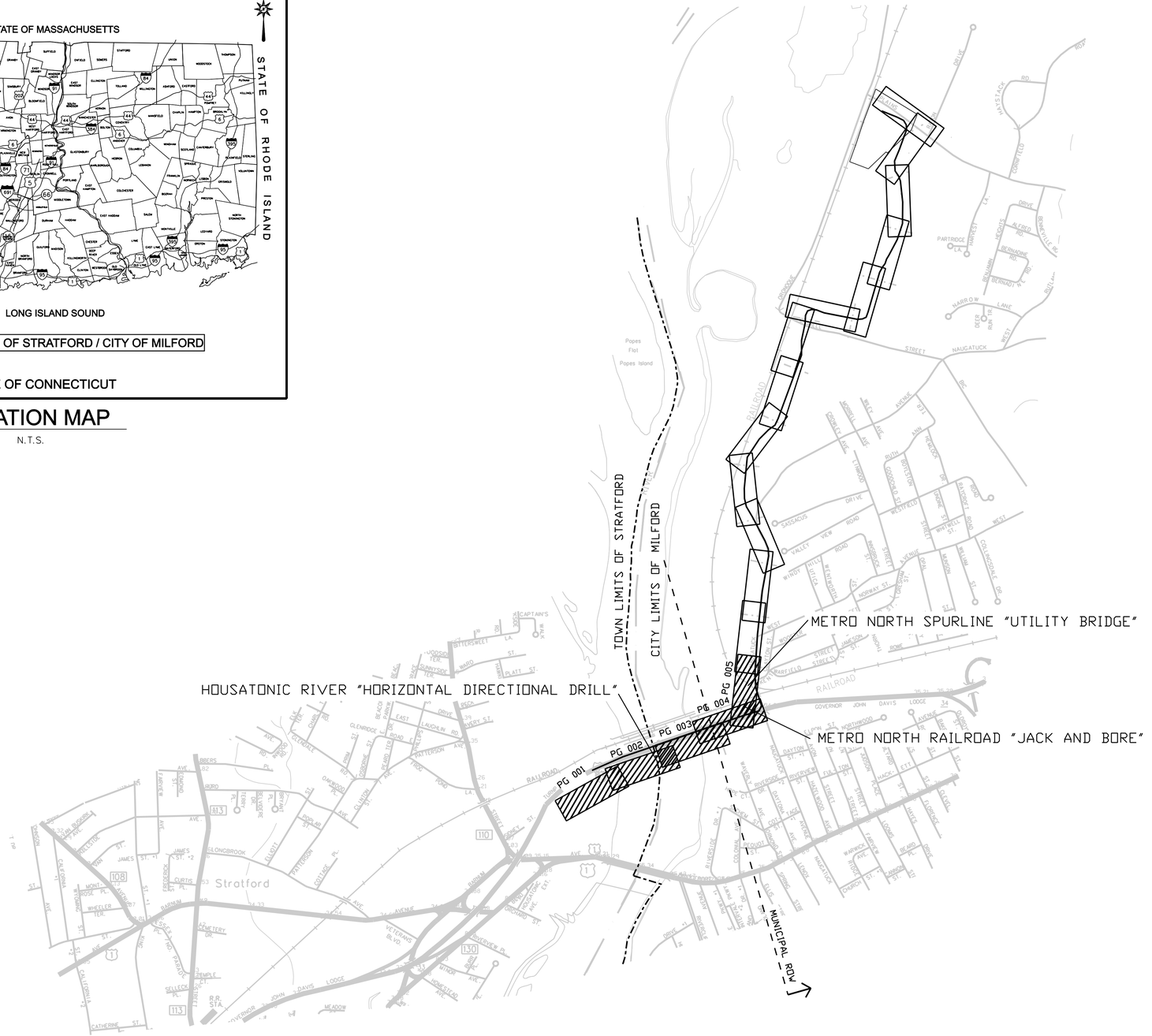


LOCATION MAP

N.T.S.



TOWN OF STRATFORD
CITY OF MILFORD

NOT TO SCALE

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NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

TOWN OF STRATFORD / CITY OF MILFORD
DRAWING LAYOUT INDEX SHEET

BY SEN–BMCD	CHKD	APP	APP
DATE 10/11/05	DATE	DATE	DATE
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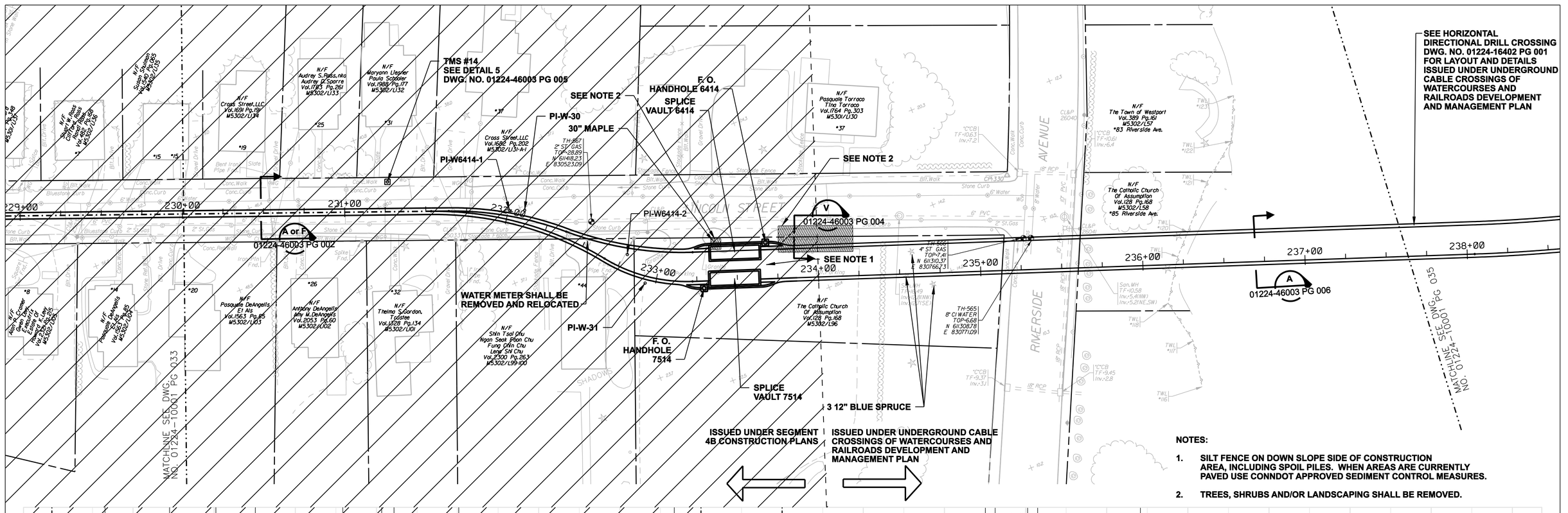
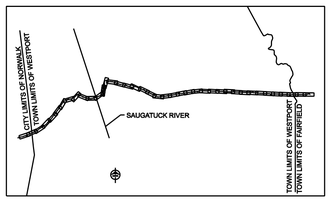


NOTES:

1. SILT FENCE ON DOWN SLOPE SIDE OF CONSTRUCTION AREA, INCLUDING SPOIL PILES. WHEN AREAS ARE CURRENTLY PAVED USE CONNDOT APPROVED SEDIMENT CONTROL MEASURES.
2. TREES, SHRUBS AND/OR LANDSCAPING SHALL BE REMOVED.



NORTH

0 30' 60'
HORIZONTAL SCALE IN FEET
0 10' 20'
VERTICAL SCALE IN FEET

FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

DOCKET No. 272

no.	date	revisions	by	chk
2	9/4/06	ISSUED CSC	CTC	
1	6/1/06	ISSUED 60% PRELIMINARY	CTC	

Burns & McDonnell SINCE 1898

date 11/10/05 | detailed L. ROWSE
designed C. COURTRIGHT | checked S. NEWLAND

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

TOWN OF WESTPORT
PLAN AND PROFILE Sta. 230+00 to 238+50

BY SEN–BMCD	CHKD	APP	APP
DATE 11–10–05	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–10001 PG 034	

MATCHLINE SEE DWG. NO. 01224-10001 PG 034

MATCHLINE SEE DWG. NO. 01224-10001 PG 036

SEE HORIZONTAL DIRECTIONAL DRILL CROSSING DWG. NO. 01224-16402 PG 001 FOR LAYOUT AND DETAILS ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

SAUGATUCK RIVER

237+00 238+00 239+00 240+00 241+00 242+00 243+00 244+00 245+00 246+00

A

01224-46003 PG 006

10 0 -10 -20 -30 -40 -50

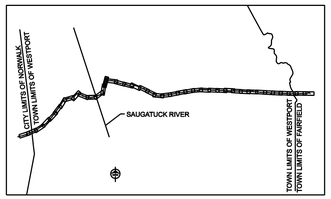
SAUGATUCK RIVER

EXISTING GRADE

SEE HORIZONTAL DIRECTIONAL DRILL CROSSING DWG. NO. 01224-16402 PG 001 FOR LAYOUT AND DETAILS ISSUED UNDER UNDERGROUND . CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

PROPOSED HORIZONTAL DIRECTIONAL DRILL

237+00 238+00 239+00 240+00 241+00 242+00 243+00 244+00 245+00 246+00



NORTH

0 30' 60'
HORIZONTAL SCALE IN FEET
0 10' 20'
VERTICAL SCALE IN FEET

FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

DOCKET No. 272

no.	date	revisions	by	chk
2	9/4/06	ISSUED CSC	CTC	
1	6/1/06	ISSUED 60% PRELIMINARY	CTC	

Burns & McDonnell SINCE 1898

date 11/10/05 | detailed L. ROWSE

designed C. COURTRIGHT | checked S. NEWLAND

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

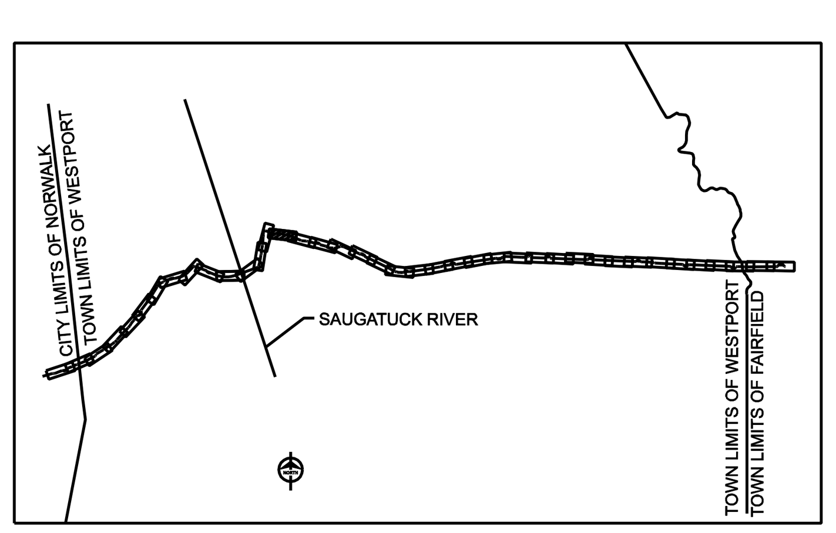
TOWN OF WESTPORT
PLAN AND PROFILE Sta. 237+00 to 246+00

BY SEN–BMCD	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–10001 PG 035	

NOTES:

1. SILT FENCE ON DOWN SLOPE SIDE OF CONSTRUCTION AREA, INCLUDING SPOIL PILES. WHEN AREAS ARE CURRENTLY PAVED USE CONNDOT APPROVED SEDIMENT CONTROL MEASURES.

2. TREES, SHRUBS AND/OR LANDSCAPING SHALL BE REMOVED.



NORTH

HORIZONTAL SCALE IN FEET (0, 30', 60')

VERTICAL SCALE IN FEET (0, 10', 20')

DOCKET No. 272

FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

no.	date	revisions	by	chk
2	9/4/06	ISSUED CSC	CTC	
1	6/1/06	ISSUED 60% PRELIMINARY	CTC	

Burns & McDonnell SINCE 1898

date 11/10/05 — detailed L. ROWSE
designed C. COURTRIGHT — checked S. NEWLAND

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

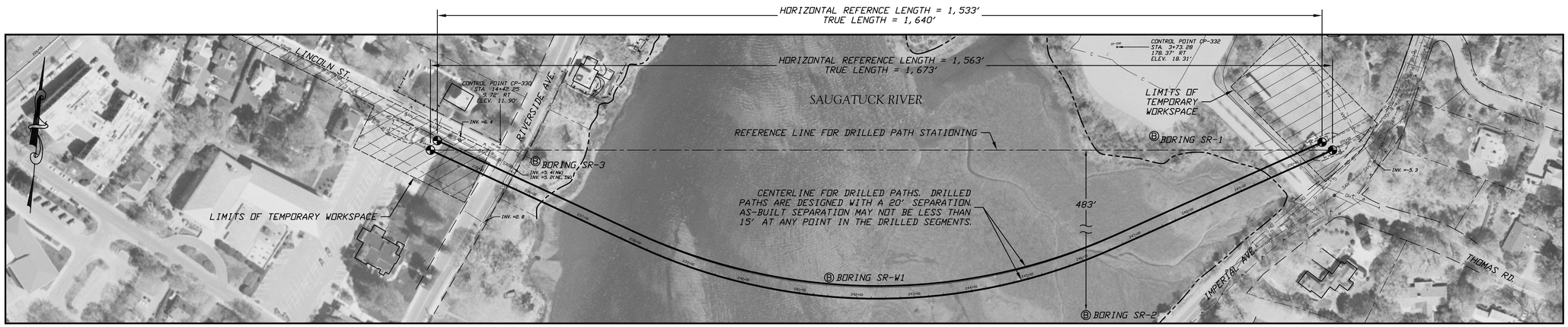
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN-NORWALK 345kV TRANSMISSION PROJECT

TOWN OF WESTPORT
PLAN AND PROFILE Sta. 244+50 to 252+50

BY SEN-BMCD	CHKD	APP	APP
DATE 11-10-05	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-10001 PG 036	



PLAN

SCALE: 1'= 100'

COORDINATES FOR
NORTHERN HDD ALIGNMENT

EXIT POINT @ 16°
15+51.33, 20.37, 16.51 RIGHT
N 611347.14, E 830662.45

P.C. 16° SAG BEND
12+74.04, -35.00
111.77' LEFT
RADIUS = 800'

P.T. 16° SAG BEND
14+74.17, -4.01
19.19' LEFT

P.T. 49° SIDE BEND
12+06.93, -35.00
142.82' LEFT

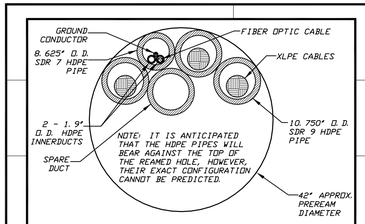
P.C. 49° SIDE BEND
3+77.61, -35.00
147.55' LEFT
RADIUS = 1000'

P.C. 16° SAG BEND
0+57.25, -4.01
3.77' LEFT
RADIUS = 800'

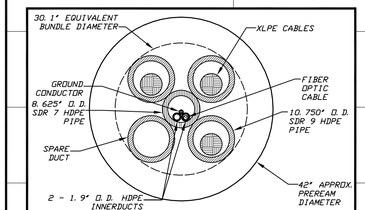
P.T. 16° SAG BEND
2+58.42, -35.00
94.06' LEFT

ENTRY POINT @ 16°
0+18.06, 8.31, 13.82' RIGHT
N 611482.53, E 832189.74

20+00 | 15+00 | 10+00 | 5+00 | 0+00



SCHEMATIC BUNDLE SECTION
(POTENTIAL CONFIGURATION IN REAMED HOLE)



SCHEMATIC BUNDLE SECTION
(FOR DETERMINATION OF EQUIVALENT DIAMETER)

GRADE FROM CONTOURS ALONG NORTHERN ALIGNMENT

MEAN HIGH WATER
3.24 NAVD 88

MEAN LOW WATER
-3.60 NAVD 88

GRADE FROM CONTOURS ALONG SOUTHERN ALIGNMENT

BORING SR-3

Poorly graded SAND with SILT & GRAVEL (SP-SM) NT 11
Poorly graded SAND with SILT (SP-SM) NT 10
Organic Silty SAND (SM) 3. 4 5
Well graded SAND with SILT and GRAVEL (SW-SM) 35. 9 31
Well graded SAND with SILT and GRAVEL (SW-SM) 15. 4 43
Well graded SAND (SW) N 13
Poorly graded SAND with GRAVEL (SP) 27 25
Well graded SAND (SW) N 27
Well graded GRAVEL with SAND (GW) 63 21
Poorly graded GRAVEL with SILT and SAND (GP-GM) 46. 5 31
Poorly graded GRAVEL with SILT and SAND (GP-GM) 51. 1 57

BORING SR-W1

Organic SILT (OL) N 1/24"
Organic SILT with SAND (OL) N 2
Poorly graded SAND with Organic SILT (SP-SM) 6. 2 5
Poorly graded SAND with SILT and SAND (GP-GM) NT 14
Poorly graded GRAVEL with SILT and SAND (GP-GM) 54. 3 17
Sandy Organic SILT (OH) 0 6 PUSH
Undisturbed sample collected 22-24' (UP-1) NT 16
Well graded SAND with SILT and GRAVEL (SW-SM) 2. 8 21
Poorly graded SAND (SP) NT 21
Well graded SAND with SILT (SW-SM) 0. 4 16
Poorly graded SAND with SILT (SP-SM) 0. 1 28
Silty SAND (SM) 0. 8 31

BORING SR-2
483' SOUTH OF DRILLED PATH REFERENCE LINE)

Top 10': Well graded SAND with SILT and GRAVEL (SW-SM)
Bottom 4': Poorly graded SAND with SILT and GRAVEL (SP-SM) NT 36
NT 13
Poorly graded SAND with SILT and GRAVEL (SP-SM) 0 4
NT PUSH
Organic SILT (OH) 0 11
Poorly graded SAND with SILT (SP-SM) 1. 7 17
Poorly graded GRAVEL (GP) NT 25
Poorly graded SAND (SP) 0 45
Poorly graded SAND (SP) 0. 1 72
Poorly graded SAND (SP) 6. 3 87
Poorly graded SAND (SP) 0. 1 49
no recovery 34

BORING SR-1

NT 5
N 5
Well graded SAND with SILT and GRAVEL (SW-SM)
69. 9 21
Poorly graded GRAVEL with SILT (GP-GM)
18. 9 30
Sandy organic SILT with GRAVEL (OL)
0 11
Organic SILT (OH)
no recovery PUSH
no recovery PUSH
NT 39
Well graded SAND with SILT and GRAVEL (SW-SM), with PEAT (PT)
23. 9 98
Silty SAND with GRAVEL (SM)
1. 1 33
Poorly graded SAND with SILT (SP-SM)
0 7
Clayey SAND (SC)
0 3
Sandy SILT (ML)
Lean Clay (CL)
0 3

CENTERLINE FOR NORTHERN DRILLED PATH

CENTERLINE FOR SOUTHERN DRILLED PATH

NOTE: EACH DRILLED PATH TO CONTAIN A BUNDLE OF FIVE CABLE PIPES. REFER TO SCHEMATIC BUNDLE SECTION.

40 | 20 | 0 | -20 | -40 | -60

P.T. 16° SAG BEND
14+86.54, -4.01'
35.50 LEFT

P.T. 49° SIDE BEND
12+07.05, -35.00
164.80' LEFT

P.T. 16° SAG BEND
2+40.81, -35.00
108.08' LEFT

COORDINATES FOR
SOUTHERN HDD ALIGNMENT

EXIT POINT @ 16°
15+63.29, 20.24, 0.00' RIGHT
N 611329.63, E 830652.03

P.C. 16° SAG BEND
12+86.41, -35.00'
128.08 LEFT
RADIUS = 800'

P.C. 49° SIDE BEND
3+77.73, -35.00
169.53' LEFT
RADIUS = 1000'

P.C. 16° SAG BEND
0+39.64, -4.01
17.79' LEFT
RADIUS = 800'

ENTRY POINT @ 16°
0+00.00, 8.45, 0.00' RIGHT
N 611470.39, E 832208.97

PROFILE

SCALE: 1'= 100' HORIZONTAL
1'= 20' VERTICAL

0 100' 200'
HORIZONTAL SCALE IN FEET

0 20' 40'
VERTICAL SCALE IN FEET

ISSUED FOR CONSTRUCTION

PROTECTION OF UNDERGROUND FACILITIES

CONTRACTOR SHALL UNDERTAKE THE FOLLOWING STEPS PRIOR TO COMMENCING DRILLING OPERATIONS:

1. CONTACT THE UTILITY LOCATION/ NOTIFICATION SERVICE FOR THE CONSTRUCTION AREA.
2. POSITIVELY LOCATE AND STAKE ALL EXISTING UNDERGROUND FACILITIES. ANY FACILITIES LOCATED WITHIN 10 FEET OF THE DESIGNED DRILLED PATH SHALL BE EXPOSED.
3. MODIFY DRILLING PRACTICES AND DOWNHOLE ASSEMBLIES AS NECESSARY TO PREVENT DAMAGE TO EXISTING FACILITIES.

GENERAL NOTES

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY BL COMPANIES, MERIDEN, CONNECTICUT.
2. NORTHINGS AND EASTINGS ARE IN U.S. SURVEY FEET REFERENCED TO CONNECTICUT STATE PLANE COORDINATES, NAD 83.
3. ELEVATIONS ARE IN FEET REFERENCED TO NAVD 88.
4. STATIONING IS IN FEET BY HORIZONTAL MEASUREMENT AND IS REFERENCED TO CONTROL ESTABLISHED FOR THE DRILLED SEGMENTS.
5. DRILLED PATH COORDINATES REFER TO CENTERLINE OF PIPE.

PILOT HOLE TOLERANCES

THE PILOT HOLES SHALL BE DRILLED TO THE TOLERANCES LISTED BELOW. HOWEVER, IN ALL CASES, RIGHT-OF-WAY RESTRICTIONS AND CONCERN FOR ADJACENT UTILITIES SHALL TAKE PRECEDENCE OVER THESE TOLERANCES.

1. ELEVATION - PLUS 0 FEET, MINUS 10 FEET
2. ALIGNMENT - PLUS OR MINUS 5 FEET BUT NO CLOSER THAN 15 FEET BETWEEN THE DRILLED PATHS
3. ENTRY POINT - AT THE STAKED LOCATION
4. EXIT POINT - PLUS OR MINUS 5 FEET IN ALIGNMENT, PLUS OR MINUS 10 FEET IN LENGTH

GEOTECHNICAL NOTES

1. GEOTECHNICAL DATA TAKEN FROM A MARCH 2006 GEOTECHNICAL EVALUATION REPORT PRODUCED BY GZA GEOENVIRONMENTAL, INC., NORWOOD, MASSACHUSETTS. REFER TO THIS REPORT FOR MORE DETAILED SUBSURFACE INFORMATION.
2. THE LETTER 'N' TO THE LEFT OF A SPLIT SPOON SAMPLE INDICATES THAT NO GRAVEL WAS OBSERVED IN THE SAMPLE. THE LETTERS 'NT' INDICATE THAT GRAVEL WAS OBSERVED BUT NO GRADATION TESTS WERE PERFORMED.
3. THE GEOTECHNICAL DATA IS ONLY DESCRIPTIVE OF THE LOCATIONS ACTUALLY SAMPLED. EXTENSION OF THIS DATA OUTSIDE OF THE ORIGINAL BORINGS MAY BE DONE TO CHARACTERIZE THE SOIL CONDITIONS, HOWEVER, COMPANY DOES NOT GUARANTEE THESE CHARACTERIZATIONS TO BE ACCURATE. CONTRACTOR MUST USE HIS OWN EXPERIENCE AND JUDGEMENT IN INTERPRETING THIS DATA.

GENERAL LEGEND

DRILLED PATH ENTRY/EXIT POINT

GEOTECHNICAL LEGEND

(B) ← BORING LOCATION

2" O.D. SPLIT SPOON SAMPLE
53 | 23 ← PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

3" O.D. SPLIT SPOON SAMPLE
53 | 23 ← PENETRATION RESISTANCE IN BLOWS PER FOOT FOR A 140 POUND HAMMER FALLING 30 INCHES
PERCENTAGE OF GRAVEL BY WEIGHT FOR SAMPLES CONTAINING GRAVEL

no.	date	revisions	by	chk

John D. Hair, P.E.
Consulting Engineer

date 09-01-06 | detailed
designed JDH&A (JSP/MST) | checked JDH&A (DLB)

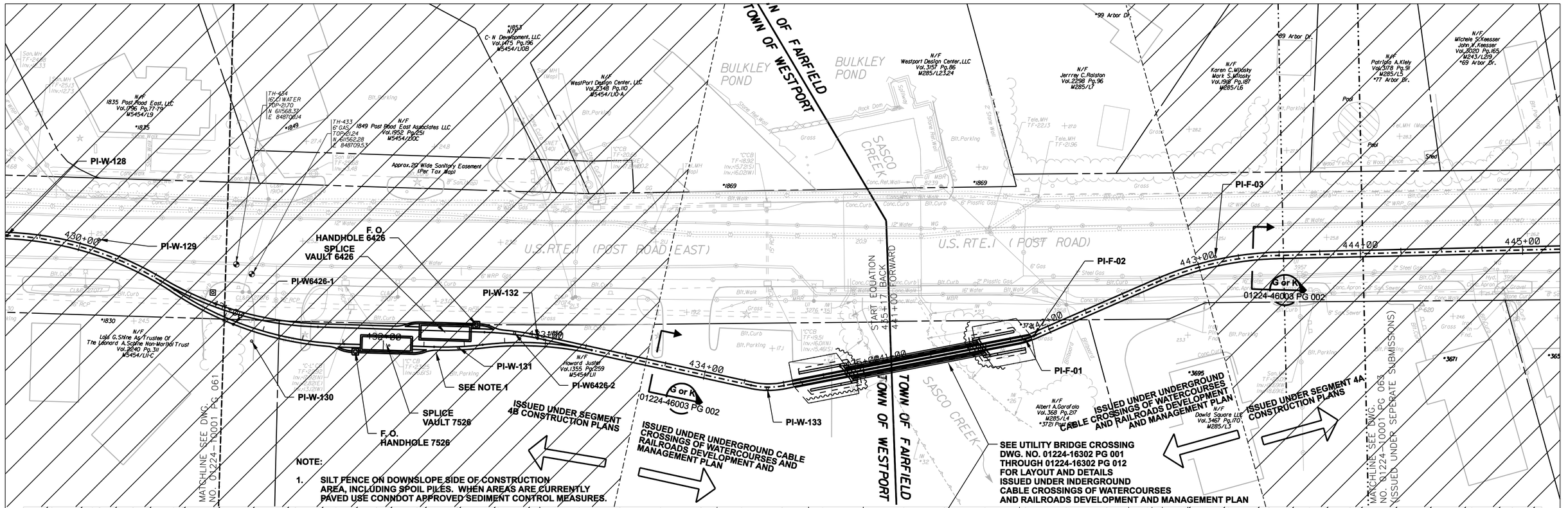
MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

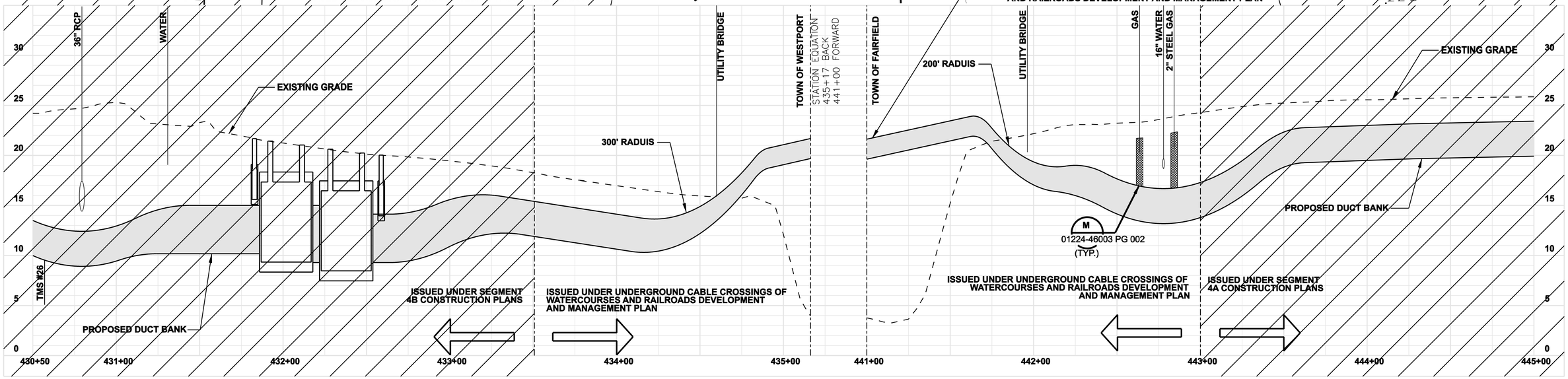
NORTHEAST UTILITIES SERVICE CO.

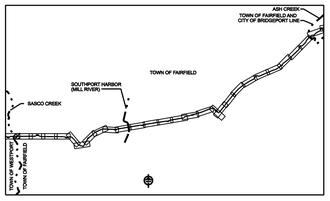
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT
PLAN AND PROFILE
CROSSING OF THE SAUGATUCK RIVER
BY HORIZONTAL DIRECTIONAL DRILLING
WESTPORT, CONNECTICUT

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–16402 PG 001	







NORTH

0 30' 60'
HORIZONTAL SCALE IN FEET

0 5' 10'
VERTICAL SCALE IN FEET

FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

DOCKET No. 272

no.	date	revisions	by	chk
2	9/4/06	ISSUED CSC	CTC	
1	6/1/06	ISSUED 60% PRELIMINARY	CTC	

Burns & McDonnell SINCE 1898

date 08/15/05
designed C. COURTRIGHT
detailed L. ROWSE
checked S. NEWLAND

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

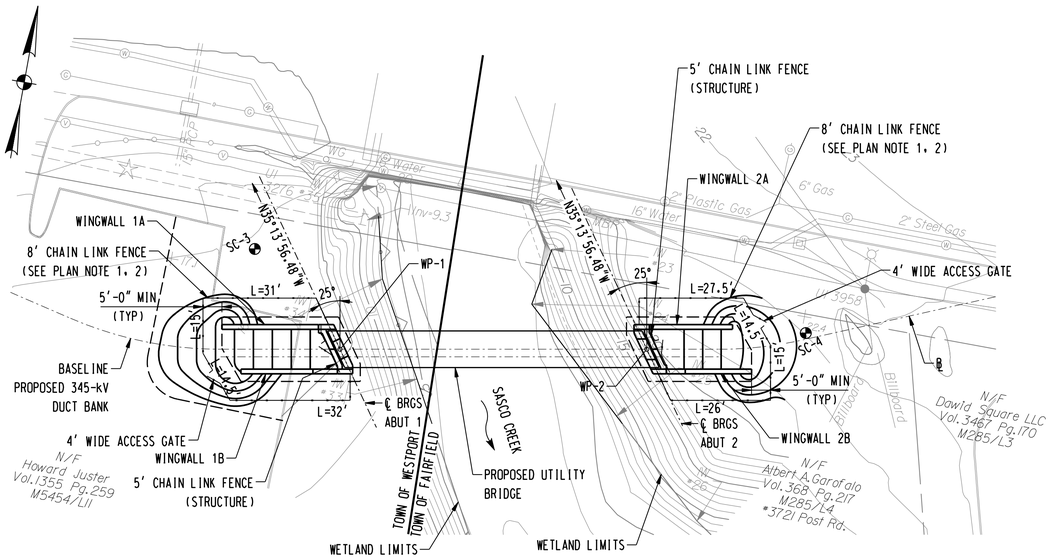
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

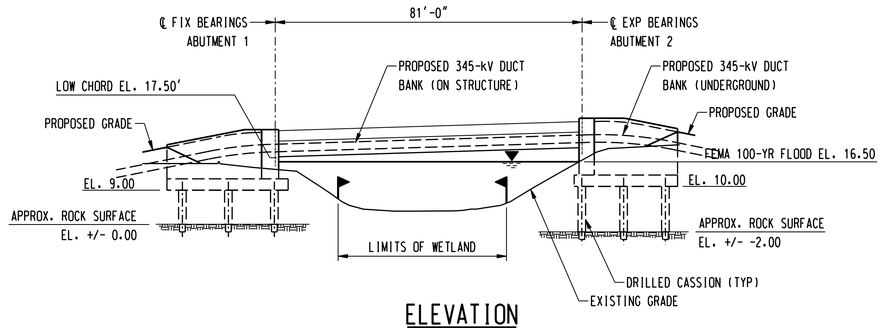
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

TOWN OF WESTPORT/TOWN OF FAIRFIELD
PLAN AND PROFILE Sta. 430+50 to 445+00

BY SEN–BMCD	CHKD	APP	APP
DATE 8–15–05	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–10001 PG 062	



PLAN
SCALE: 1" = 20'-0"



ELEVATION
SCALE: 1" = 20'-0"

PLAN NOTES

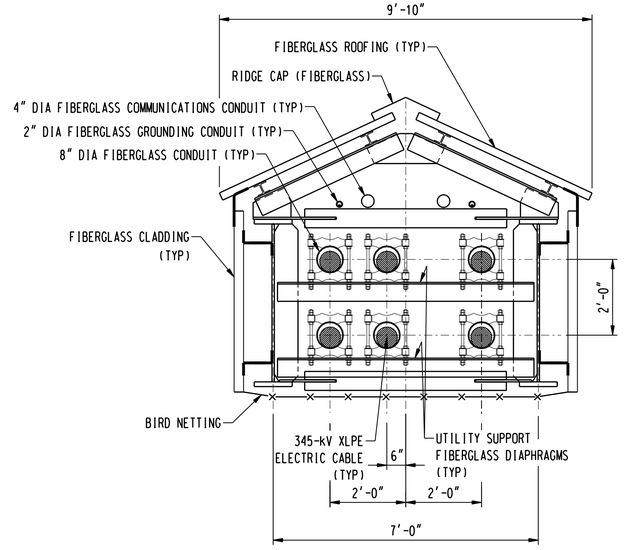
1. 4" OF CRUSHED STONE FOR SLOPE PROTECTION SHALL BE PROVIDED WITHIN THE LIMITS DEFINED IN THE 8' HIGH PROTECTIVE FENCE DETAILS. SEE DWG. No. 01224-16302 PG 013
2. CRUSHED STONE FOR SLOPE PROTECTION SHALL BE INCLUDE IN THE PAY ITEM "8' CHAIN LINK FENCE".

TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	510
PERVIOUS STRUCTURE BACKFILL	CY	220
STEEL-LAMINATED ELASTOMERIC BEARINGS	EA	2
CLASS "A" CONCRETE	CY	210
CLASS "40" CONCRETE	CY	19
DEFORMED STEEL BARS	LB	34500
DRILL ROCK SOCKET FOR 24" DIA. CAISSONS	LF	24
FURNISHING & INSTALLING 24" DIA. CAISSONS	LF	126
INTEGRITY TESTING - CROSS HOLE	EA	2
ACCESS TUBES FOR CROSS HOLE INTEGRITY TESTING	EA	4
ARCHITECTURAL CLADDING (SITE G)	SY	195
STRUCTURAL STEEL (GALVANIZED) (SITE G)	LB	52500
FIBERGLASS STRUCTURAL SHAPES (SITE G)	LB	2800
DAMPPROOFING	SY	180
TEMPORARY SHEET PILING	SY	100
8' CHAIN LINK FENCE	LF	210
5' CHAIN LINK FENCE (STRUCTURE)	LF	30

BORING LEGEND

SC-10 LOCATION OF BORING PERFORMED BY GZA GEO ENVIRONMENTAL, INC.



TYPICAL SECTION
SCALE: 1/2" = 1'-0"

GENERAL NOTES

SPECIFICATIONS: CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 816 (2004), SUPPLEMENTAL SPECIFICATIONS DATED JULY, 2005, AND SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 3RD EDITION (2004); SEI/ASCE STANDARD 7-02, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES; AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL, 2003 EDITION, UP TO AND INCLUDING 2005 REVISIONS.

ALLOWABLE DESIGN STRESSES:

CLASS "A" CONCRETE	BASED ON	f'c = 3000 PSI
CLASS "40" CONCRETE	BASED ON	f'c = 4000 PSI
REINFORCEMENT		
ASTM A615, GRADE 60	BASED ON	fy = 60,000 PSI
STRUCTURAL STEEL		
AASHTO M270, GRADE 50T2	BASED ON	Fy = 50,000 PSI
FIBERGLASS STRUCTURAL SHAPE	BASED ON	Fu = 33,000 PSI

STRUCTURAL STEEL: SEE STRUCTURAL STEEL NOTES FOR DESIGNATIONS AND REQUIREMENTS.

FOUNDATION PRESSURES: THE VARIOUS STRENGTH LIMITS NOTED ON THE SUBSTRUCTURE PLAN SHEETS REFER TO THE STRENGTH LIMITS AS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION.

DIMENSIONS & ELEVATIONS: WHEN DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE CONSIDERED TO BE ZEROS. ALL ELEVATIONS ARE GIVEN IN DECIMAL FEET.

CONCRETE NOTES

CLASS "A" CONCRETE: CLASS "A" CONCRETE SHALL BE USED FOR THE ENTIRE SUBSTRUCTURES.

CLASS "40" CONCRETE: CLASS "40" CONCRETE SHALL BE USED FOR THE CASSIONS.

EXPOSED EDGES: EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1"X1", UNLESS OTHERWISE NOTED.

CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE TWO INCHES CLEAR COVER, UNLESS OTHERWISE NOTED.

REINFORCEMENT: ALL REINFORCEMENT SHALL BE ASTM A615, GRADE 60.

CONSTRUCTION JOINTS: CONSTRUCTION JOINTS, OTHER THAN THOSE SHOWN ON THE PLANS, WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

DESIGN LOADS

GRAVITY LOADS

A. MISCELLANEOUS DEAD LOAD = 94.9 PLF/BEAM
B. UTILITY DEAD LOAD = 92 PLF/BEAM
C. LIVE LOAD = 10 PSF
D. ROOF SNOW LOAD = 22.5 PSF

LATERAL LOADS

WIND:
A. BASIC WIND VELOCITY = 100 MPH
B. HORIZONTAL WIND PRESSURE = 50 PSF
C. VERTICAL WIND PRESSURE = 20 PSF
D. FOR ROOF & CLADDING - WIND PRESSURE ACCORDING SEI/ASCE STANDARD 7-02

SEISMIC:
A. SEISMIC PERFORMANCE ZONE - 2 (PER AASHTO 3.10.4)

NOTICE TO BRIDGE INSPECTORS

IT IS RECOMMENDED THAT CONNDOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY NORTHEAST UTILITIES.

COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
PLATE GIRDERS	01224-16302 PG 008

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATION BY BL COMPANIES AND IS IN NO WAY WARRANTED TO INDICATE THE TRUE CONDITIONS OF ACTUAL QUANTITIES OR DISTRIBUTION OF QUANTITIES OF WORK WHICH WILL BE REQUIRED.

TRANSPORTATION DIMENSIONS AND MASS DATA

MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
G1-G2	82' - 6"	4'-2 1/2"	2'-6"	21 500 LB.

INSPECTION OF FIELD WELDS

METHOD	UNIT	QUANTITY
ULTRASONIC	inch	0
MAGNETIC PARTICLE	feet	0

CONCRETE DISTRIBUTION

SUPERSTRUCTURE	C.Y.	N/A
SUBSTRUCTURE	C.Y.	88
FOOTINGS	C.Y.	112
TOTAL	C.Y.	200

WORKING POINT COORDINATES

WP	NORTHING	EASTING
WP-1	611497.0091	849077.8036
WP-2	611511.3980	849157.5154

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no.	date	revisions	by	chk
6	9/04/06	ISSUED CSC	D.Q.	B.K.
5	6/01/06	ISSUED 60% PRELIMINARY	D.Q.	B.K.
4	5/10/06	ISSUED SECOND REVIEW	D.Q.	B.K.
3	1/31/06	ADDENDUM No.2	D.Q.	B.K.
2	1/23/06	ISSUED TO BMcD & N.U. FOR REVIEW	D.Q.	B.K.
1	1/19/06	ISSUED CIVIL R.F.P.	D.Q.	B.K.

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date 01/10/06
designed M. BEAULIEU
detailed M .BEAULIEU, C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.
FOR THE CONNECTICUT LIGHT & POWER COMPANY
TITLE MIDDLETOWN-NORWALK 345kV TRANSMISSION PROJECT
SASCO CREEK
GENERAL PLAN

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 001	

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SC-3
Page: 1 of 4
File No.: 43411
Check: P. Murphy

Contractor: New England Boring
Foreman: Trent Roe
Logged by: Dan Oaks
Date Start/Finish: 10-28-05 / 11-1-05
Boring Location: N611519 E849051
GS Elev.: 17.0' **Datum:** NAVD 1988

	Auger/ Casing	Sampler
Type:	Auger	S.S.
O.D. / I.D.:	4"	2" O.D.
Hammer Wt.:		140 lb.
Hammer Fall:		30"
Other:	4" HW Casing	

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
11/1/05	08:00	11.2'	17.5	15 hours
11/1/05	13:30	13.7'	17.5	10 min.

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
0	S-1	24/20	0-2	3-5 10-10		Well graded SAND with SILT and GRAVEL (SW-SM), medium dense, olive gray, approximately 75% hard, subangular to subrounded, fine to coarse Sand, 15% fine to coarse Gravel, 10% non-plastic, inorganic Silt, dry	FILL	1	None
4	S-2	24/24	4-6	9-12 6-9		Well graded SAND with SILT and GRAVEL (SW-SM), medium dense, olive gray, approximately 70% hard, subangular to subrounded, fine to coarse Sand, 20% angular, fine to coarse Gravel, 10% non-plastic, inorganic Silt, dry			
8	S-3	24/16	8-10	6-5 11-12		Well graded SAND with SILT and GRAVEL (SW-SM), medium dense, olive gray, approximately 65% hard, subangular to subrounded, fine to coarse Sand, 25% angular, partly micaceous, fine to coarse Gravel, 10% non-plastic, inorganic Silt, dry			
12	S-4	24/24	12-14	5-4 5-27		Top 23.5": Well graded SAND with SILT (SW-SM), loose, dark gray, approximately 90% hard, subangular to subrounded, fine to coarse Sand, 10% non-plastic, inorganic Silt, (some brick), wet Bottom 0.5": Poorly graded SAND (SP), loose, light brown, hard, subangular to subrounded, mostly coarse Sand, 4% non-plastic, inorganic Silt, wet	14" SAND	2	
16				min/ft			17.5' BEDROCK	3	
16	C-1	60/58	17.5-22.5	4 8 10		Hard, very slightly weathered, slightly fractured, silvery gray, medium grained, MICA SCHIST, close, smooth joints, very thin, moderately dipping (40-50°) RQD = 72%			

REMARKS
1. Borehole advanced to 12 feet using 4" O.D. auger, SPT conducted using 3" split spoon and safety hammer
2. Borehole advanced to 17.5 using 4" NW Casing, casting encountered refusal at 17.5 feet
3. Borehole advanced to ___ using NQ2 Corebarrel

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SC-3

345KV REPORT BORINGS.GPJ GZADEPTH.GDT 1/9/06

SC-3 (PAGE 1 OF 3)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SC-3
Page: 2 of 4
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
20				9			BEDROCK		
20				8					
20				min/ft					
20	C-2	60/60	22.5-27.5	7		Hard, slightly weathered, moderately fractured, gray, medium grained, MICA SCHIST, close, smooth joints, very thin, steeply dipping (55-60°) with clay fillings RQD = 47%			
20				6					
24				5					
24				6					
24				5					
24				min/ft					
24	C-3	60/60	27.5-32.5	4		Hard, slightly weathered, moderately fractured, gray, medium grained, MICA SCHIST, close, smooth joints, very thin, steep to vertical dipping (60-90°) RQD = 25%			
28				5					
28				6					
28				7					
28				7					
32				min/ft					
32	C-4	60/60	32.5-37.5	5		Hard, slightly weathered, moderately fractured, gray, medium grained, MICA SCHIST, close, smooth joints, very thin, steeply dipping (55-75°) RQD = 26%			
32				6					
32				6					
32				8					
32				6					
36				min/ft					
36	C-5	60/51	37.5-42.5	5		Hard, slightly weathered, moderately fractured, gray/green, medium grained, MICA SCHIST, close, smooth joints, very thin, shallow dipping (5-10°) RQD = 28% Fault zone at 39-39.5 feet			
36				6					
36				8					
36				7					
36				13					
40				min/ft					
40	C-6	60/58	42.5-47.5	9		Hard, slight weathered, slightly fractured, gray, medium grained MICA SCHIST, close,			

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SC-3

345KV REPORT BORINGS.GPJ GZADEPTH.GDT 1/9/06

SC-3 (PAGE 2 OF 3)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SC-3
Page: 3 of 4
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
44				6		smooth joints, very thin, shallow dipping (15-20°) RQD = 78% Fault zone 50-50.5 feet	BEDROCK		
44				8					
44				8					
44				10					
48				min/ft					
48	C-7	60/60	47.5-52.5	9		Hard, fresh, sound, gray, medium grained, MICA SCHIST, close, smooth joints, very thin, steeply dipping (60-75°) RQD = 82%			
48				7					
48				8					
48				7					
52				9					
52				min/ft					
52	C-8	60/60	52.5-57.5	12		Hard, fresh, sound, gray, medium grained, MICA SCHIST, close, smooth joints, very thin, moderately dipping (30-45°) RQD = 71%			
52				12					
52				11					
52				15					
56				3					
56				min/ft					
56	C-9	60/54	57.5-62.5	10		Hard, very slightly weathered, gray, medium grained, MICA SCHIST, close, smooth joints, very thin, moderately to steeply dipping (40-80°) Fault zone 58-59 feet			
56				6					
60				7					
60				9					
60				9					
60				min/ft					
60	C-10	60/60	62.5-67.5	6		Hard, sound, gray, medium grained MICA SCHIST, close, smooth joints, very thin, shallow to steeply dipping (15-70°) with Gneiss partings and pyrite fillings RQD = 87%			
60				9					
60				11					
60				6					

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SC-3

345KV REPORT BORINGS.GPJ GZADEPTH.GDT 1/9/06

SC-3 (PAGE 3 OF 3)

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2	1/23/06	ISSUED TO BMcD & N.U. FOR REVIEW	D.Q.	B.K.
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designed C. CHAUNG
detailed C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.
FOR THE CONNECTICUT LIGHT & POWER COMPANY
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT
SASCO CREEK
SOIL BORING LOG 1

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 002	

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SC-4
Page: 1 of 2
File No.: 43411
Check: P. Murphy

Contractor: New England Boring
Foreman: Trent Roe
Logged by: Dan Oaks
Date Start/Finish: 11-30-05 / 11-30-05
Boring Location: N611523 E849198
GS Elev.: 22.3' **Datum:** NAVD 1988

	Auger/ Casing	Sampler
Type:	Solid Auger	S.S.
O.D. / I.D.:	4"	3" O.D.
Hammer Wt.:		140 lb.
Hammer Fall:		30"
Other:	4" ID Casing	

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
11/30/05	14:00	15.95'	17	10 min.

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
	S-1	18/15	0-1.5	9-22 16		Well graded SAND with SILT and GRAVEL (SW-SM), dense, olive gray, approximately 55% hard, subangular to subrounded, fine to coarse Sand, 35% fine to coarse Gravel, 10% non-plastic, inorganic Silt, trace (+) Asphalt, trace Metal Fragments, trace Grass, trace Roots, dry	0.26' LOAM FILL	1	FLUSH Mounted Roadbox at Ground Surface Concrete and Road Box (0-1')
5	S-2	18/18	5-6.5	5-4 3		Poorly graded SAND with SILT and GRAVEL (SP-SM), loose, olive gray, approximately 70% hard, subangular to subrounded, fine to medium Sand, 20% fine to coarse Gravel, 10% non-plastic, inorganic Silt, dry (trace Asphalt)			Riser (1-10') Backfill Drill Cuttings (1-10')
8	S-3	18/18	8-9.5	3-3 3		Poorly graded SAND with SILT (SP-SM), loose, dark gray, approximately 95% hard, subangular to subrounded, fine to medium Sand, 5% non-plastic, inorganic Silt, trace Asphalt, trace Roots, dry			Bentonite Seal (10-11')
12	S-4	18/9	12-13.5	2-8 33		Silty SAND with GRAVEL (SM), dense, olive gray, approximately 60% hard, subangular to subrounded, fine to medium Sand, 25% non-plastic, inorganic Silt, 15% fine Gravel, trace Nails, trace Wood Fragments, trace Brick, dry		2	
15				65 50					
16				275					
17	C-1	48/28	17.5-21.5	min/ft 6 4 6		Boulders, Round Alkaline, Feldspar Granite Boulders (4 to 12"). Changing to Mica Schist for last 6" of recovery RQD = 19%	17.6' BOULDERS	3	Filter Sand (11-23') Well Screen (12-23')

REMARKS

1. Borehole advanced using 4" O.D. solid auger to 12 feet; SPT conducted using 3" split spoon and safety hammer
2. Borehole advanced using 4" I.D. (HW) casing
3. Casing encountered refusal at 17 feet. Roller bit advanced to 17.5 feet. Borehole advanced from 17.5 feet using NQ 2" core barrel. Numbers in Field Test Data Column represent casing blows per foot using 300 pound hammer.

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SC-4

345KV REPORT BORINGS GBJ GZADEPTH.GDT 1/9/06

SC-4 (PAGE 1 OF 2)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SC-4
Page: 2 of 2
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
				10			BOULDERS		
21				min/ft			21' BEDROCK		
22	C-2	48/52	21.5-25.5	5		Hard, slightly weathered, slightly to moderately fractured, gray, medium grained, MICA SCHIST, close, smooth joints, moderately dipping (30º-50º) with Quartzite filling, some iron oxide staining. RQD = 79% of 52" recovery.		4	
23				7					
24				5					
25				7					Backfill Drill Cuttings (23-25')
26	C-3	54/32	25.5-30	min/ft 4		Hard, moderately weathered, moderately to extremely fractured, gray, medium grained, MICA SCHIST, close to very close, smooth joints, horizontal to steeply dipping (5º-85º), extremely fractured zone from 26.5 to 30 feet RQD = 9%			
27				3					
28				12					
29				8					
30				6/6"			30'	5	
						END OF EXPLORATION AT 30'		6	
31									
32									
33									
34									
35									
36									
37									
38									
39									
40									
41									
42									
43									

REMARKS

4. Core barrel run C-2 recovery of 52" exceeds penetration of 48" and includes a partial recovery remaining in borehole from core barrel run C-1.
5. Extremely fractured zone in borehole collapsing to 25 feet. Borehole backfilled with drill cuttings from 23 to 25 feet
6. **DRAFT**

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SC-4

345KV REPORT BORINGS GBJ GZADEPTH.GDT 1/9/06

SC-4 (PAGE 2 OF 2)

DOCKET No. 272

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no.	date	revisions	by	chk
6	9/04/06	ISSUED CSC	D.Q.	B.K.
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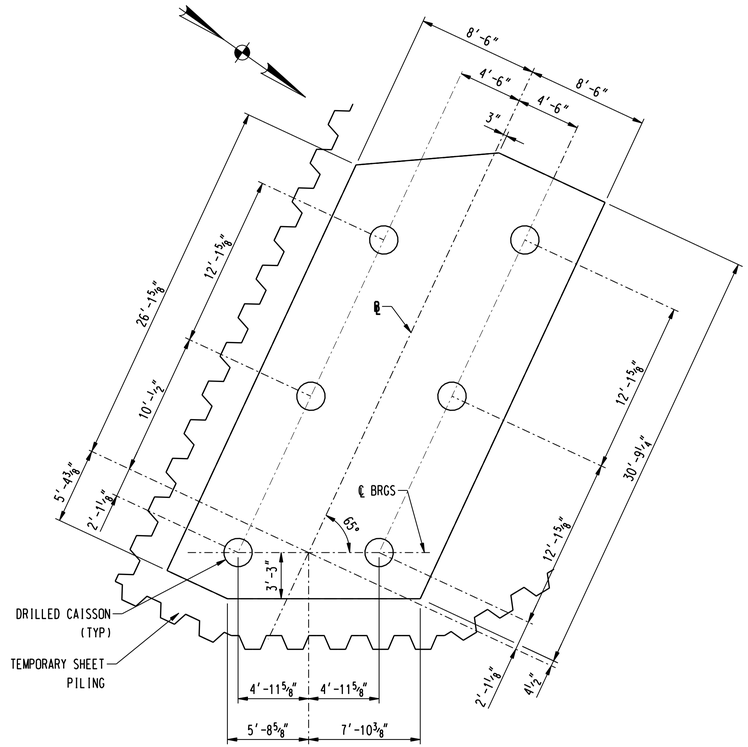
date 01/10/06
designed C. CHAUNG
detailed C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.
FOR THE CONNECTICUT LIGHT & POWER COMPANY
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT
SASCO CREEK
SOIL BORING LOG 2

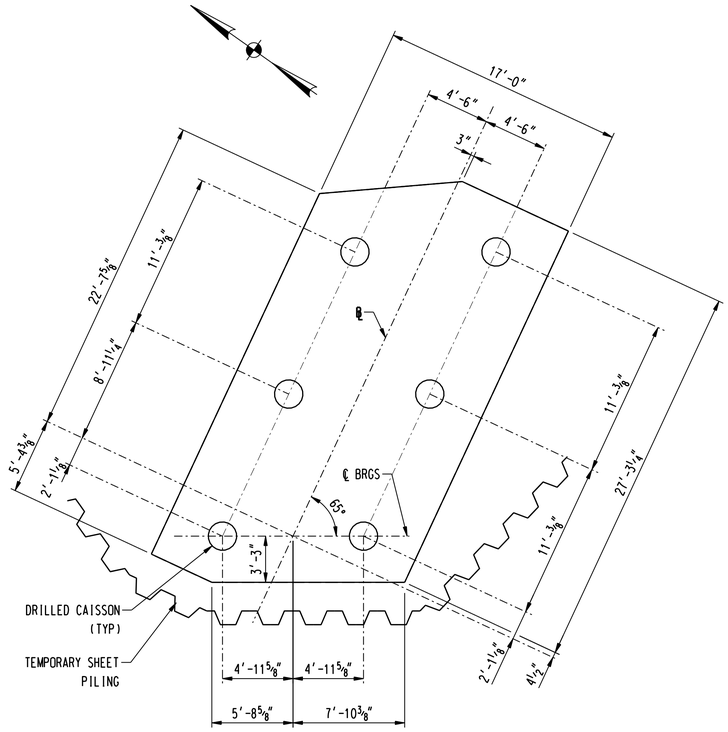
BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–16302 PG 003	



FOOTING LAYOUT PLAN

ABUTMENT 1

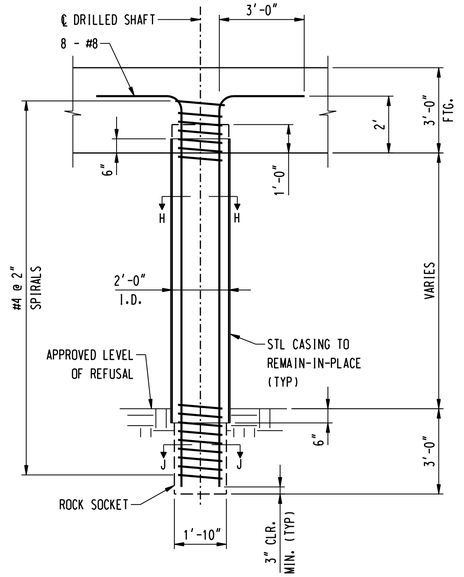
SCALE: 3/16" = 1'-0"



FOOTING LAYOUT PLAN

ABUTMENT 2

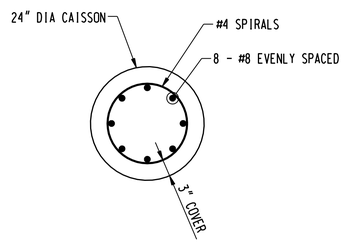
SCALE: 3/16" = 1'-0"



ELEVATION

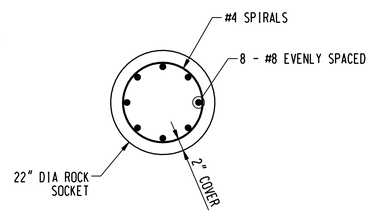
24" DIA DRILLED CAISSON

N.T.S.



SECTION H-H

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



SECTION J-J

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

CAISSON NOTES:

1. ALL DRILLED CONCRETE SHAFTS SHALL BE 24" DIAMETER WITH 22" MIN. DIAMETER ROCK SOCKET.

2. MAIN VERTICAL REINFORCEMENT SHALL NOT BE SPLICED WITHOUT PRIOR APPROVAL BY THE ENGINEER.

3. ESTIMATED CAISSON LENGTHS ARE FOR ESTIMATING PURPOSES ONLY.

4. UPON APPROVAL BY THE ENGINEER OF THE ACTUAL TOP OF SOUND ROCK ELEVATION, SOCKET EMBEDMENT DEPTH, AND TYPE OF ROCK SOCKET, THE CONTRACTOR SHALL PREPARE AND SUBMIT FOR APPROVAL SHOP DRAWINGS SHOWING ALL REINFORCEMENT DETAILS. CAISSON REINFORCING BARS SHALL NOT BE ORDERED UNTIL AFTER THE CAISSON REINFORCING BAR SHOP DRAWINGS HAVE BEEN APPROVED.

5. CLASS "40" CONCRETE SHALL BE USED FOR DRILLED SHAFT CAISSONS.

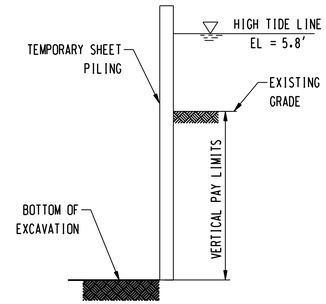
6. ESTIMATED PILE LENGTHS:

   ABUTMENT 1 = 12'-0"
   ABUTMENT 2 = 15' -0"

7. MAXIMUM DESIGN PILE LOADS:

   ABUTMENT 1 = 220 kips (STRENGTH LIMIT I)
   = 159 kips (SERVICE LIMIT I)

   ABUTMENT 2 = 220 kips (STRENGTH LIMIT I)
   = 159 kips (SERVICE LIMIT I)



SHEET PILING PAY LIMIT DETAIL

N.T.S.

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3	1/31/06	ADDENDUM No.2	D.Q.	B.K.
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date 01/10/06
detailed M .BEAUDLIEU
designed M. BEAULIEU, A. GRZADZIEL
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

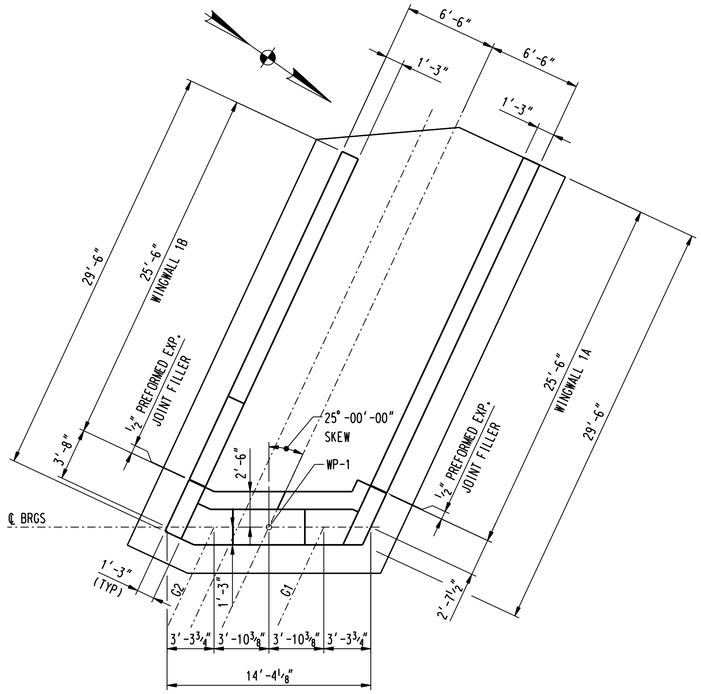
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

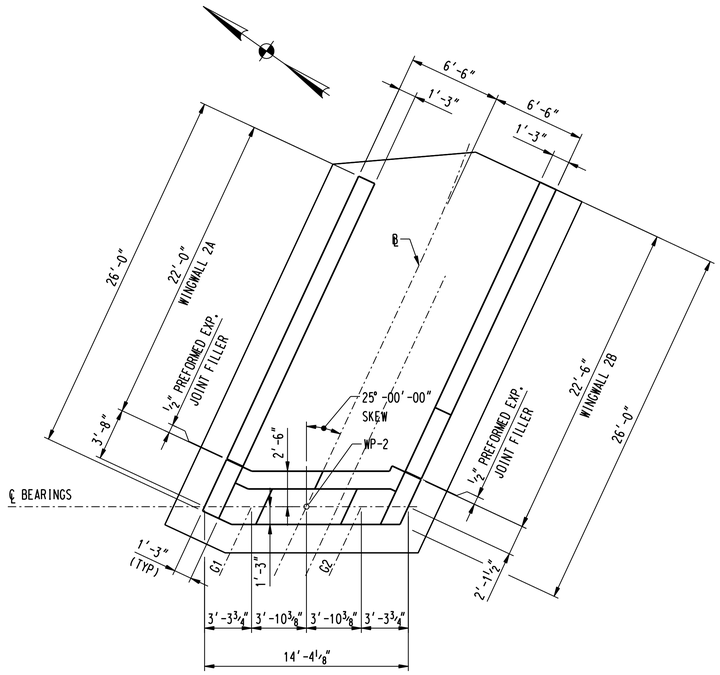
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

SASCO CREEK
ABUTMENT 1 & 2 FOOTING PLAN

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 004	



PLAN

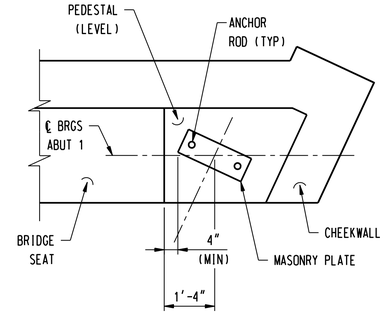


PLAN

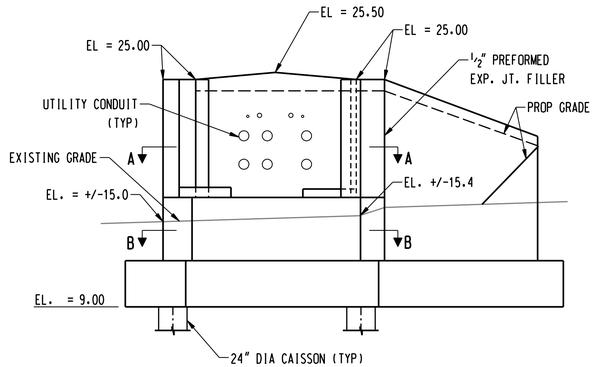
NOTES:

1. FOR SECTION A-A, SEE DWG. NO. 01224-16302 PG 006.
2. FOR SECTION B-B, SEE DWG. NO. 01224-16302 PG 006.
3. FIBERGLASS REINFORCEMENT SHALL BE USED WITHIN THE DESIGNATED LIMITS OF NON-METALLIC AREA.
4. FOR DESIGNATED LIMITS OF NON-METALLIC AREA. SEE "BACKWALL REINFORECMENT DETAIL ON DWG. NO. 01224-16302 PG 006.
5. FOR TYPICAL ABUTMENT SECTION, SEE DWG. NO. 01224-16302 PG 006.
6. FOR GROUNDING DETAIL, SEE DWG. No. 01224-16302 PG 010.
7. FOR PIPE SLEEVE DETAIL, SEE DWG. No. 01224-16302 PG 006.

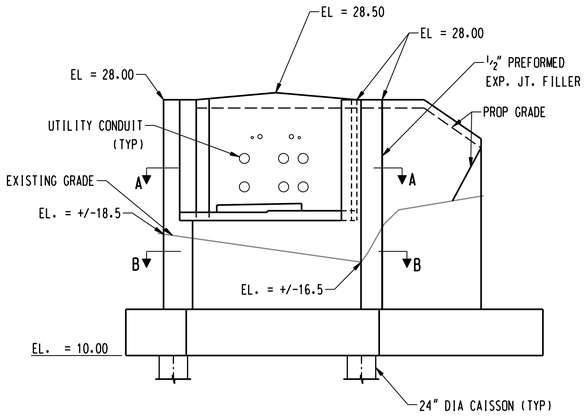
BRIDGE SEAT & PEDESTAL ELEVATIONS		
	ABUTMENT 1	ABUTMENT 2
BRIDGE SEAT	16.70	19.50
G1 PEDESTAL	17.29	20.08
G2 PEDESTAL	17.41	20.19



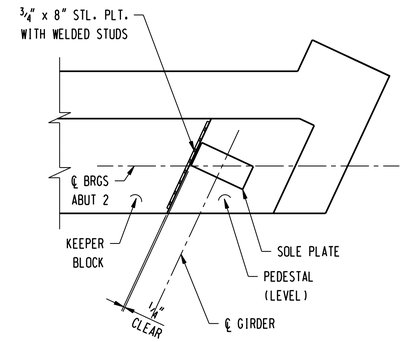
PEDESTAL PLAN
SCALE: ½" = 1'-0"



ELEVATION
ABUTMENT 1
SCALE: 3/16" = 1'-0"



ELEVATION
ABUTMENT 2
SCALE: 3/16" = 1'-0"



KEEPER BLOCK PLAN
SCALE: ½" = 1'-0"

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no.	date	revisions	by	chk
6	9/04/06	ISSUED CSC	D.Q.	B.K.
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2	1/23/06	ISSUED TO BMcD & N.U. FOR REVIEW	D.Q.	B.K.
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date 01/10/06
designed M. BEAULIEU
detailed M .BEAULIEU, C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

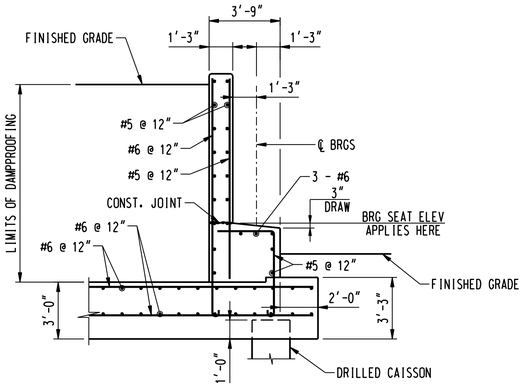
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

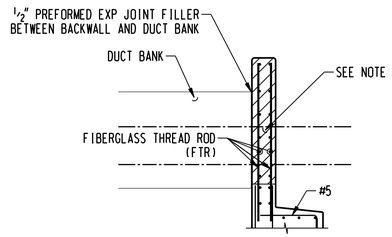
SASCO CREEK
ABUTMENT 1 & 2 PLAN AND ELEVATION

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 005	

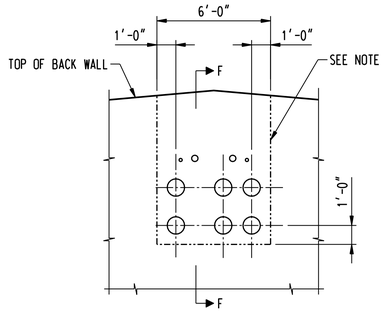


TYPICAL ABUTMENT SECTION

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



SECTION F-F



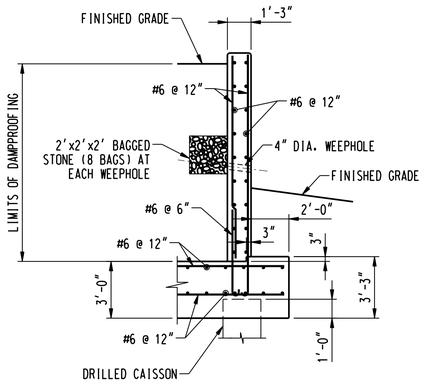
ELEVATION

NOTE:

METALLIC REINFORCEMENT BARS SHALL NOT PASS THROUGH THE AREA SHOWN ON THE PLANS. FIBERGLASS THREADED RODS (FTR) SHALL BE SUBSTITUTED AS SHOWN.

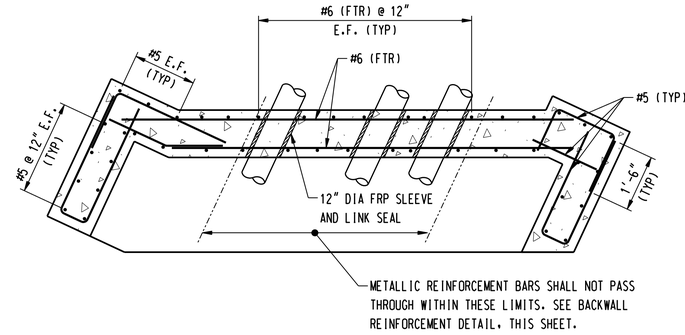
BACKWALL REINFORCEMENT DETAIL

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

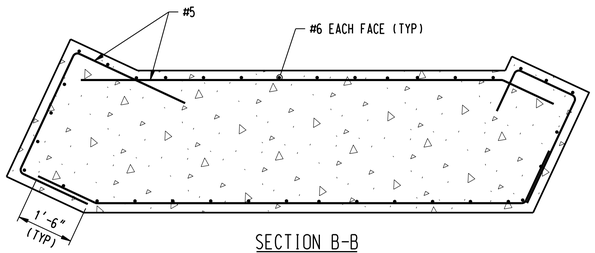


TYPICAL WINGWALL SECTION

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



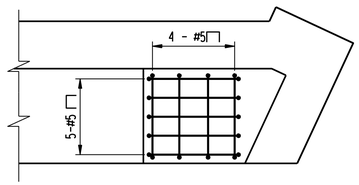
SECTION A-A



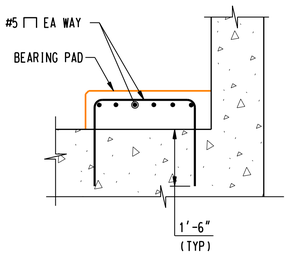
SECTION B-B

TYPICAL REINFORCEMENT LAYOUT

SCALE: 1/2" = 1'-0"



PLAN



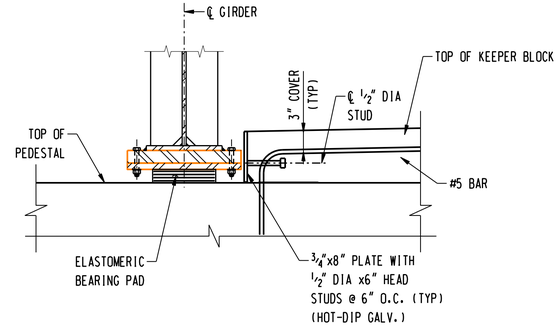
SECTION

PEDESTAL

SCALE: 1/2" = 1'-0"

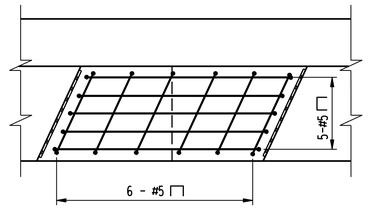
NOTES:

1. KEEPER BLOCKS SHALL BE POURED AFTER THE GIRDERS HAVE BEEN ERECTED AND SET TO THEIR FINAL POSITION.
2. FOR ABUTMENT ELEVATIONS, SEE DWG. NO. 01224-16302 PG 005.
3. FOR WINGWALL ELEVATIONS, SEE DWG. NO. 01224-16302 PG 007.
4. FIBERGLASS THREADED RODS SHALL BE USED WITHIN THE LIMITS OF THE NON-METALLIC AREA. SEE BACKWALL REINFORCEMENT DETAIL, THIS SHEET.
5. COST OF FRP SLEEVE AND LINK SEAL SHALL BE PAID FOR UNDER THE ITEM "CLASS 'A' CONCRETE".

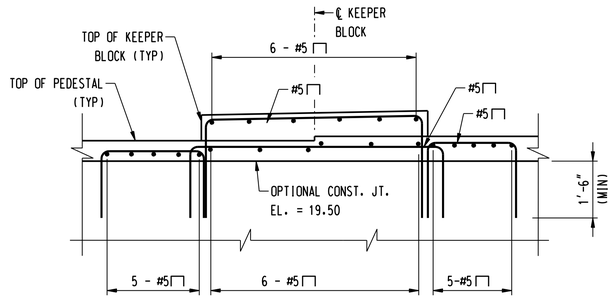


KEEPER BLOCK ELEVATION

SCALE: 1" = 1'-0"



PLAN



SECTION

KEEPER BLOCK DETAIL

SCALE: 1/2" = 1'-0"

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designed M. BEAULIEU
detailed M .BEAULIEU, C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

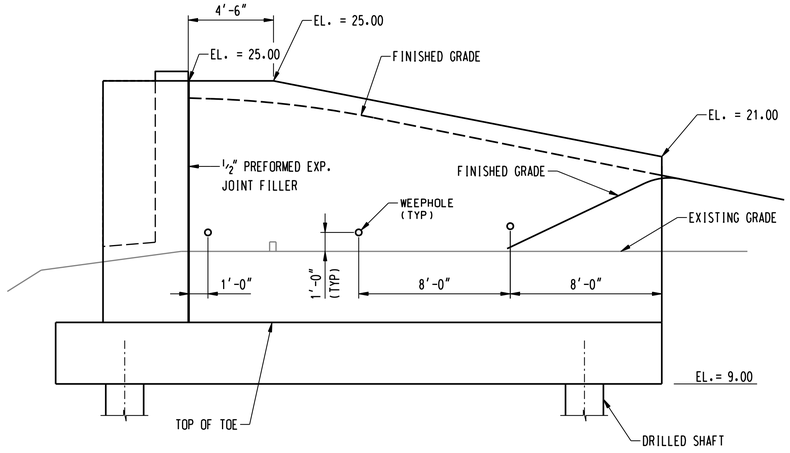
SASCO CREEK
ABUTMENT AND WINGWALL SECTIONS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE

SCALE AS NOTED | D | DWG. NO. 01224-16302 PG 006

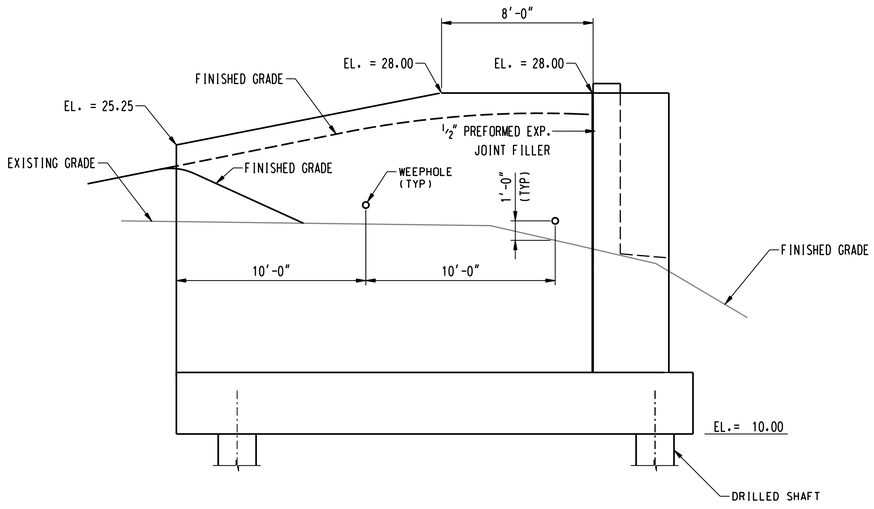
NOTES:

1. FOR TYPICAL WINGWALL SECTION. SEE DWG. NO. 01224-16302 PG 006.
2. FOR FOOTING AND DRILLED SHAFT LAYOUT. SEE DWG. NO. 01224-16302 PG 004.



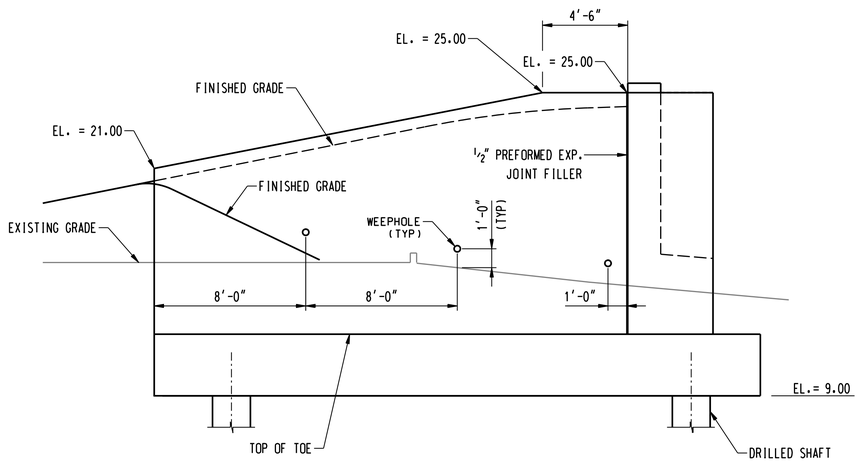
WINGWALL 1A

SCALE: ¼″ = 1′



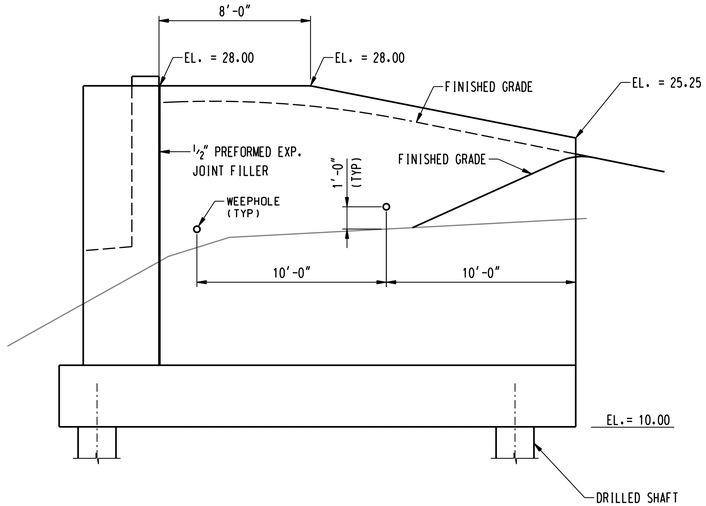
WINGWALL 2A

SCALE: ¼″ = 1′



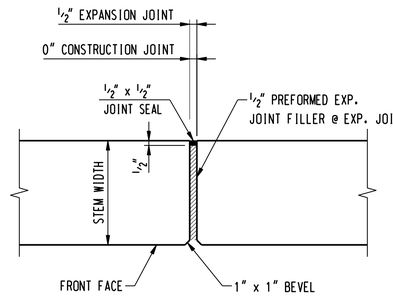
WINGWALL 1B

SCALE: ¼″ = 1′



WINGWALL 2B

SCALE: ¼″ = 1′



NOTE:
NO REINFORCING BARS SHALL PASS THROUGH EXPANSION OR CONTRACTION JOINTS. REINFORCING BARS SHALL PASS THROUGH CONSTRUCTION JOINTS.

STEM JOINT DETAIL

N.T.S.

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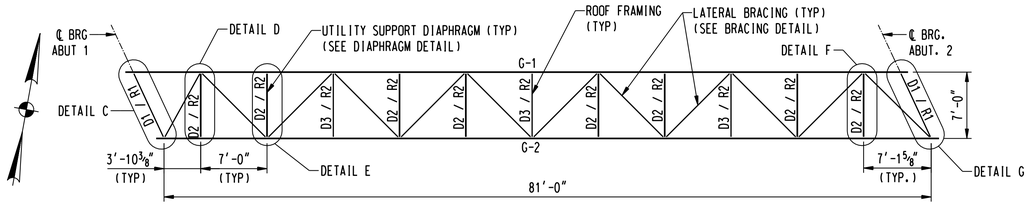
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

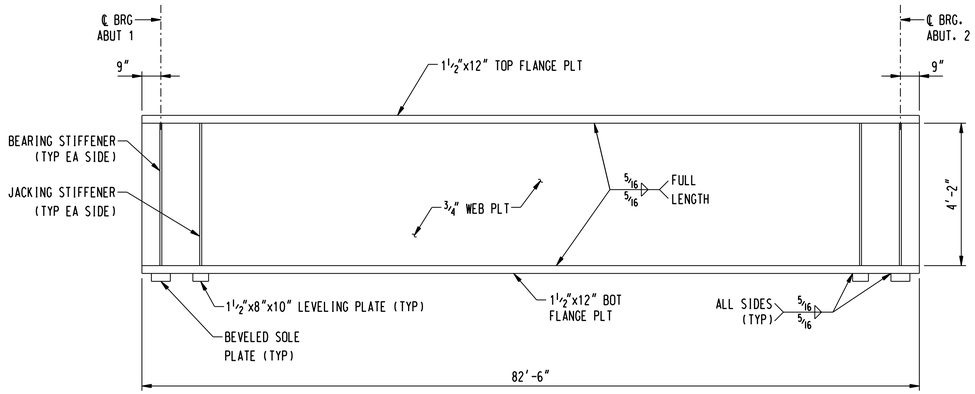
SASCO CREEK
WINGWALL ELEVATIONS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–16302 PG 007	



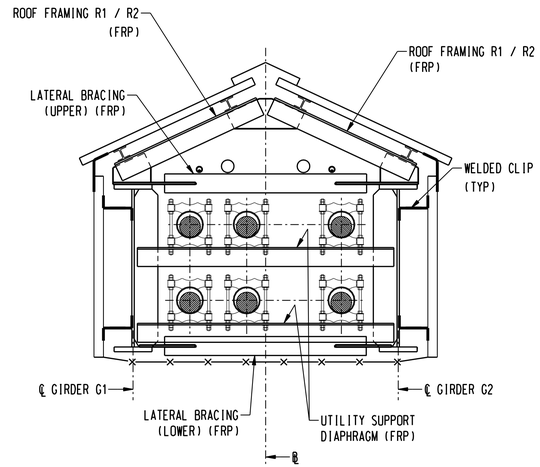
FRAMING PLAN

SCALE: 1/8" = 1'-0"



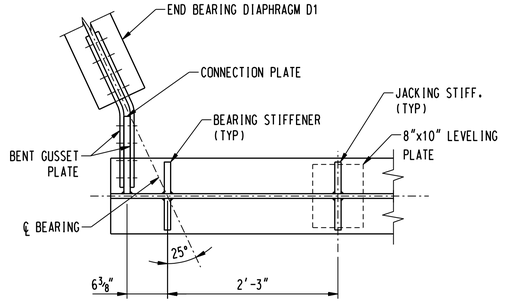
GIRDER ELEVATION (G-2 SHOWN)

N.T.S.



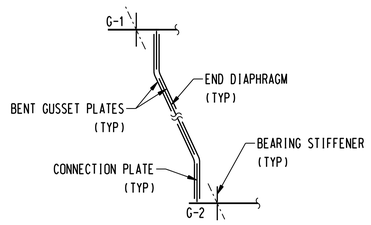
SECTION

SCALE: 1/2" = 1'-0"



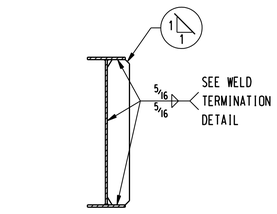
BEARING STIFFENER LAYOUT

N.T.S.



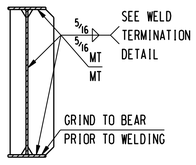
END DIAPHRAGM LAYOUT

N.T.S.



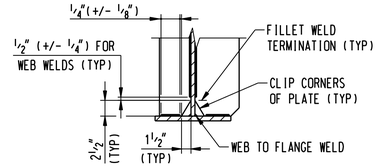
CONNECTION PLATE

N.T.S.



BEARING & JACKING STIFFENER

N.T.S.



WELD TERMINATION DETAIL

N.T.S.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL (LOW ALLOY) SHALL CONFORM TO AASHTO M270, GRADE 50 T2.
2. ALL FABRICATED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
3. ALL BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325, TYPE 1, EXCEPT AS NOTED OTHERWISE. ALL NUTS SHALL MEET THE REQUIREMENTS OF ASTM A653 AND ALL WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F436. ALL BOLTS, NUTS, AND WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695, CLASS 50.
4. ALL CONTACT SURFACES ON BOLTED CONNECTIONS SHALL BE PREPARED IN ACCORDANCE WITH AASHTO SPECIFICATIONS FOR CLASS 'C' SLIP CRITICAL CONDITIONS.
5. WELDING DETAILS, PROCEDURES, AND TESTING METHODS SHALL CONFORM TO THE ANSI/AASHTO/AWS D1.5:2002 - BRIDGE WELDING CODE, UNLESS OTHERWISE NOTED ON THE PLANS.
6. BOLTED FIELD SPLICES, OTHER THAN THOSE INDICATED ON THE PLANS, WILL NOT BE ALLOWED EXCEPT WITH THE WRITTEN PERMISSION OF THE ENGINEER PRIOR TO THE SUBMISSION OF SHOP PLANS. IF ALLOWED, THESE SPLICES SHALL BE DESIGNED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE COST OF THESE SPLICES, INCLUDING THE COST OF DESIGN, SHALL BE AT NO EXTRA EXPENSE TO THE OWNER. WELDED FIELD SPLICES WILL NOT BE ALLOWED.
7. ALL WEB TO FLANGE, WEB TO BEARING STIFFENER, AND BEARING STIFFENER TO FLANGE FILLET WELDS SHALL BE INSPECTED BY THE MAGNETIC PARTICLE METHOD.
8. MULTIPLE PASS WELDS, INSPECTED BY THE MAGNETIC PARTICLE METHOD, SHALL HAVE EACH PASS OR LAYER INSPECTED AND ACCEPTED BEFORE PROCEEDING TO THE NEXT PASS OR LAYER, AS DETERMINED BY THE ENGINEER.
9. SHOP WEB SPLICES SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF THE SPAN.
10. SHOP FLANGE SPLICES SHALL BE LOCATED A MINIMUM OF SIX INCHES FROM WEB SPLICES.
11. FLANGE AND WEB SPLICES SHALL BE LOCATED A MINIMUM OF SIX INCHES FROM STIFFENERS AND CONNECTION PLATES.
12. BEARING STIFFENERS AND ENDS OF GIRDERS SHALL BE VERTICAL AFTER APPLICATION OF FULL DEAD LOADS.
13. THE STRUCTURAL STEEL FABRICATORS SHALL BE CERTIFIED UNDER THE AISC QUALITY CONTROL PROGRAM AS "CATEGORY MBR - MAJOR STEEL BRIDGES".
14. THE CONTRACTOR SHALL TAKE PROPER PRECAUTIONS TO ENSURE THE STABILITY OF ALL STRUCTURAL ELEMENTS UNTIL THE TOTAL STRUCTURE IS IN BEING.

NOTES:

1. ALL DIMENSIONS ARE HORIZONTAL AND MEASURED ALONG THE CENTERLINE OF THE WEB.
2. BEARING STIFFENERS SHALL BE PROVIDED ON BOTH SIDES OF THE WEB.
3. END BEARING DIAPHRAGMS SHALL BE PARALLEL TO THE CENTERLINE OF BEARINGS OF THE STRUCTURE.
4. INTERMEDIATE CONNECTION PLATES SHALL BE PERPENDICULAR TO THE GIRDERS.
5. FOR BEARING DETAILS, SEE DWG. NO. 01224-16301 PG 010.
6. FOR DIMENSIONS OF BEVELED SOLE PLATES, SEE DWG. NO. 01224-16301 PG 010.

FIBERGLASS STRUCTURAL SHAPE NOTES:

1. ALL FIBERGLASS REINFORCED POLYMER (FRP) STRUCTURAL SHAPE PRODUCTS SHALL CONFORM TO THE MANUFACTURER'S SPECIFICATIONS. STRUCTURAL SHAPES AND PLATES SHALL BE MADE FROM VINYL ESTER RESIN WITH FIRE RETARDANT ADDITIVES TO MEET A FLAME RATING OF LESS THAN 25 PER ASTM E-84 TEST METHOD AND MEET THE SELF-EXTINGUISHING REQUIREMENTS OF ASTM D-635.
2. ALL FIBERGLASS STRUCTURAL SHAPES AND PLATES SHALL BE OF THE EXTREN SERIES 625 FIBERGLASS STRUCTURAL SHAPES BY STRONGWELL, OR APPROVED EQUAL.

   MANUFACTURER INFORMATION: STRONGWELL - BRISTOL DIVISION
   400 COMMONWEALTH AVE.
   P.O. BOX 580
   BRISTOL, VA 24203
   TEL. (276) 645-8000

3. ALL FRP STRUCTURAL SHAPE PRODUCTS SHALL CONTAIN A ONE-MIL MINIMUM COATING OF U.V. INHIBITOR.
4. COLOR OF FRP STRUCTURAL SHAPE PRODUCTS SHALL BE GRAY, OR OF COLOR WITH LOW VISIBILITY, OR AS APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL PROTECT FABRICATED FRP UNITS TO PREVENT DAMAGE DURING HANDLING, SHIPPING, AND ON-SITE STORAGE PRIOR TO INSTALLATION. MATERIALS, WHICH ARE, IN THE OPINION OF THE ENGINEER, DAMAGED AS TO BE UNFIT FOR USE, SHALL BE REMOVED FROM THE PROJECT SITE AND PROMPTLY REPLACED BY THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.

DEAD LOAD DEFLECTIONS AND CAMBER TABLE

DEAD LOAD DEFLECTION AT MIDSPAN (in)				CAMBER AT MIDSPAN (in)			
GIRDER	STR STL DEAD LOAD	MISC DEAD LOADS	OTHER DEAD LOADS	TOTAL DEAD LOAD	VERT CURVE ORDINATE	EXTRA CAMBER	TOTAL CAMBER
G1 - G2	0.343	.121	0.144	0.609	0.000	0.810	1.419

CAMBER NOTES:

1. STRUCTURAL STEEL DEAD LOAD DEFLECTION INCLUDES WEIGHTS OF GIRDERS, FIBERGLASS DIAPHRAGMS, AND ROOF FRAMING.
2. MISCELLANEOUS DEAD LOAD DEFLECTION INCLUDES WEIGHTS OF CLADDING AND ROOFING MATERIALS.
3. OTHER DEAD LOAD DEFLECTION INCLUDES THE WEIGHT OF UTILITIES.
4. TOTAL CAMBER APPLIES TO THE TOP OF WEB AT MID-SPAN AND IS MEASURED FROM THE CAMBER REFERENCE LINE.
5. THE CAMBER REFERENCE LINE IS THE STRAIGHT LINE CONNECTING THE TOP OF WEB AT THE CENTERLINE OF BEARING OF ONE ABUTMENT TO THE OTHER.

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date 01/10/06
detailed C. CHUANG
designed A. GRZADZIEL, C. CHAUNG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

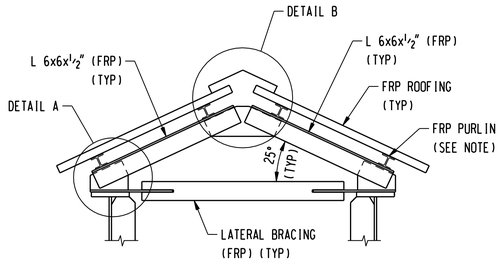
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN-NORWALK 345kV TRANSMISSION PROJECT

SASCO CREEK
FRAMING PLAN & STRUCTURAL NOTES

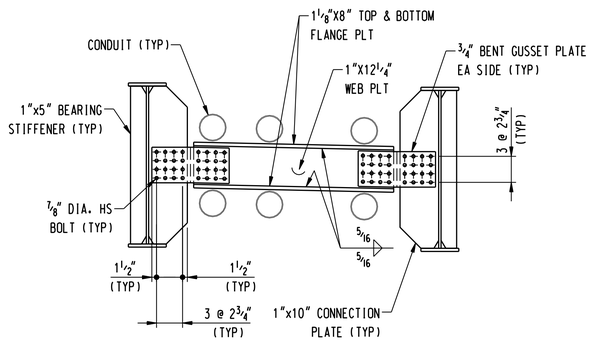
BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 008	



NOTE:
FRP PURLINS SHALL BE DESIGNED BY THE FRP ROOFING MANUFACTURER.

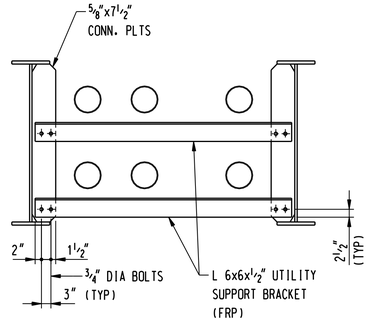
ROOF FRAMING (R2 SHOWN / R1 SIMILAR)

SCALE: 1/2" = 1'-0"



END BEARING DIAPHRAGM (D1)

SCALE: 1/2" = 1'-0"

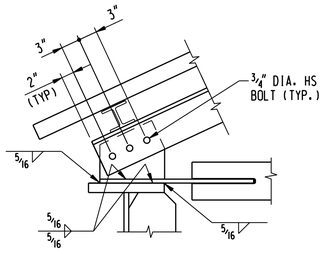


UTILITY SUPPORT BRACKET (D2)

SCALE: 1/2" = 1'-0"

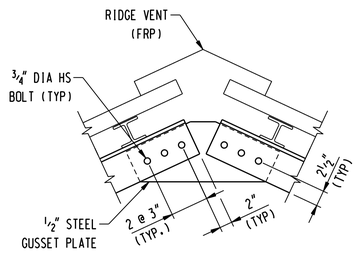
NOTES:

1. THE COST OF FURNISHING AND INSTALLING THE 8" DIA. FIBERGLASS CONDUITS SHALL BE INCLUDED IN THE COST OF THE STANDARD DUCT BANK.
2. THE COST OF FURNISHING AND INSTALLING THE UTILITY DUCT SUPPORT SYSTEM INCLUDING THE 8" ROLLER HANGER SHALL BE INCLUDED IN THE COST OF THE ITEM "FIBERGLASS STRUCTURAL SHAPES". QTY = 66 EA.
3. THE ROLLER HANGER ASSEMBLY SHALL BE TWO-ROD ROLLER HANGER BY: ERICO, MODEL No. 605 (ELECTRO GALVANIZED), PART No. 605080OPL.
4. FOR FIBERGLASS REINFORCED POLYMER (FRP) ROOFING DETAILS AND INFORMATION SEE SHEET 01224-16302 PG 012.



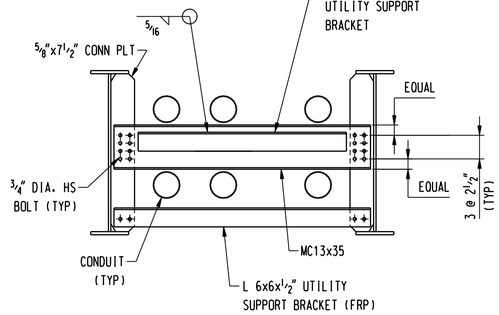
DETAIL A

SCALE: 1" = 1'-0"



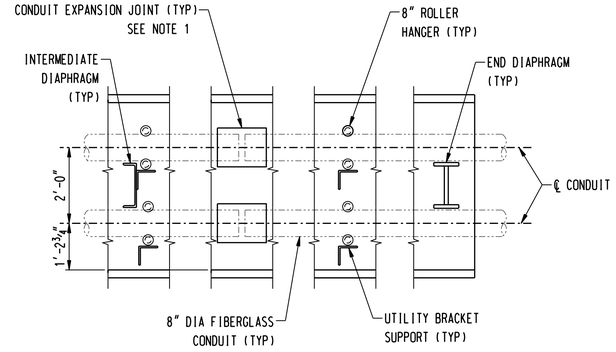
DETAIL 'B'

N.T.S.



INTERMEDIATE DIAPHRAGM (D3)

SCALE: 1/2" = 1'-0"



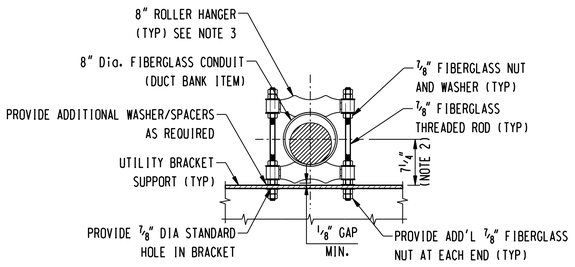
NOTE:
CONDUIT EXPANSION JOINT SHALL BE LOCATED NEAR MID-SPAN OF STRUCTURE.

Double Expansion Joint w/ O-Ring
Fitting IPS No. 80C-XW-39 with Tight Lock Joint

Manufacturer: Champion Fiberglass
6400 Spring Stuebner Rd
Spring, TX 77389
(203) 655-8900

UTILITY DUCT BANK PROFILE

N.T.S.



NOTE:
1. PROVIDE UTILITY DUCT SUPPORT SYSTEM AT EVERY UTILITY SUPPORT BRACKET LOCATION.
2. DIMENSION SHOWN IS APPROXIMATE, UTILITY BRACKETS LOCATIONS SHALL BE ADJUSTED ACCORDINGLY BASE ON ACTUAL ROLLER HANGER DIMENSIONS.

UTILITY DUCT SUPPORT SYSTEM

N.T.S.

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no.	date	revisions	by	chk
6	9/04/06	ISSUED CSC	D.Q.	B.K.
5	6/01/06	ISSUED 60% PRELIMINARY	D.Q.	B.K.
4	5/10/06	ISSUED SECOND REVIEW	D.Q.	B.K.
3	1/31/06	ADDENDUM No.2	D.Q.	B.K.
2	1/23/06	ISSUED TO BMcD & N.U. FOR REVIEW	D.Q.	B.K.
1	1/19/06	ISSUED CIVIL R.F.P.	D.Q.	B.K.

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date 01/10/06
detailed C. CHUANG
designed A. GRZADZIEL, C. CHAUNG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

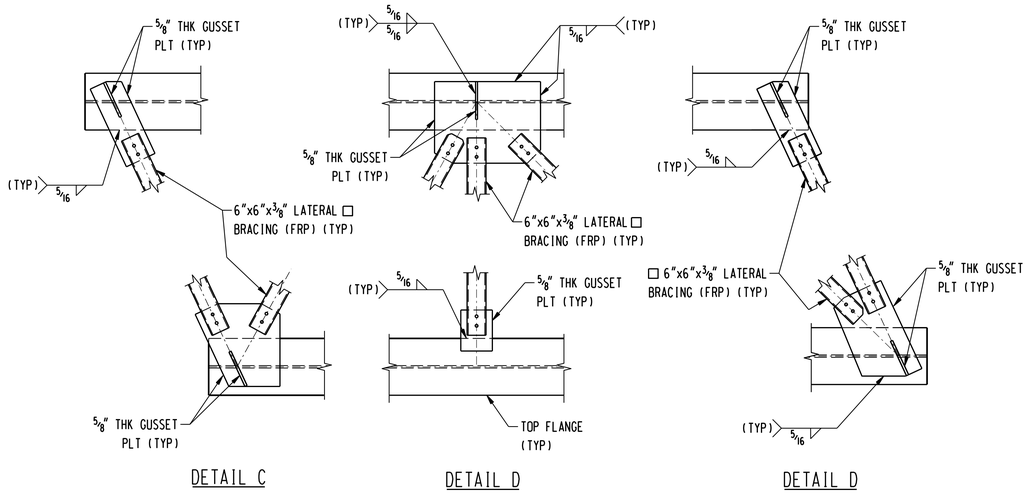
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

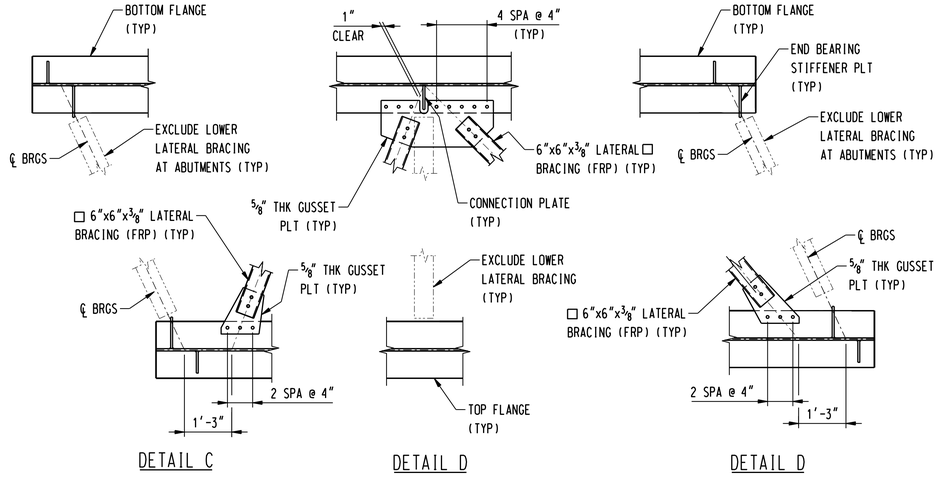
SASCO CREEK
DIAPHRAGM AND CONNECTION DETAILS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 009	



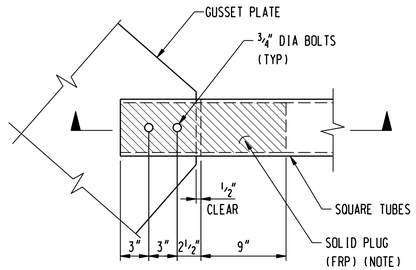
LATERAL BRACING - UPPER

SCALE: 1/2" = 1'-0"

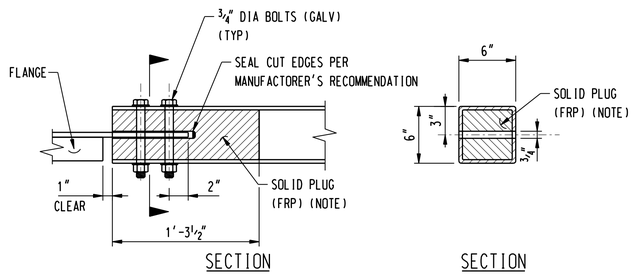


LATERAL BRACING - LOWER

SCALE: 1/2" = 1'-0"



PLAN

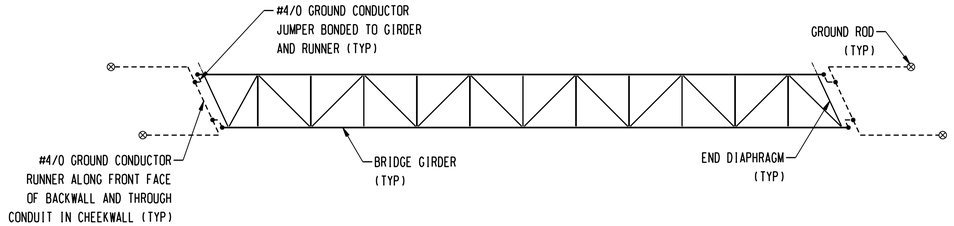


SECTION SECTION

NOTE: SOLID PLUG SHALL BE ATTACHED TO TUBING WITH ADHESIVE PRIOR TO FABRICATING NOTCH. ADHESIVE SHALL BE PER FRP MANUFACTURER'S SPECIFICATION.

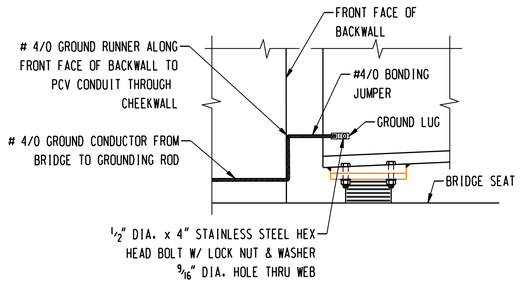
TUBE CONNECTION DETAIL

SCALE: 1 1/2" = 1'-0"



GROUNDING PLAN

N.T.S.



GROUNDING AND BONDING DETAIL

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6	9/04/06	ISSUED CSC	D.Q.	B.K.
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designed A. GRZADZIEL, C. CHAUNG
detailed C. CHUANG
checked D. QUINIT / B. KUTA

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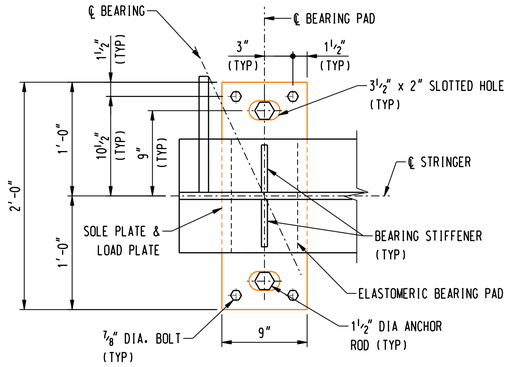
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

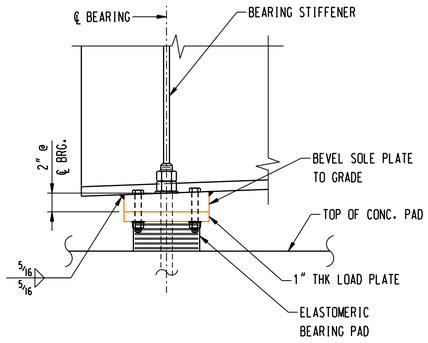
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

SASCO CREEK
LATERAL BRACING DETAILS

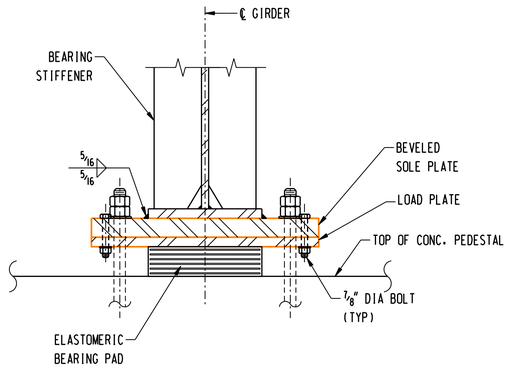
BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16302 PG 010	



PLAN



ELEVATION



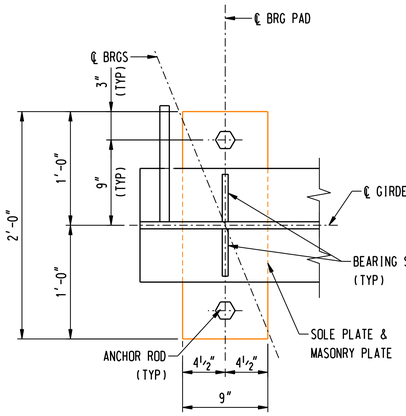
SECTION

EXPANSION BEARING

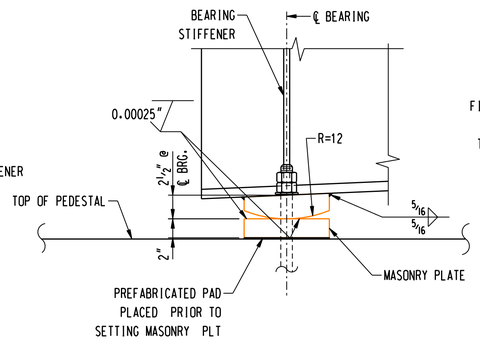
SCALE: 1½" = 1'-0"

BEARING NOTES:

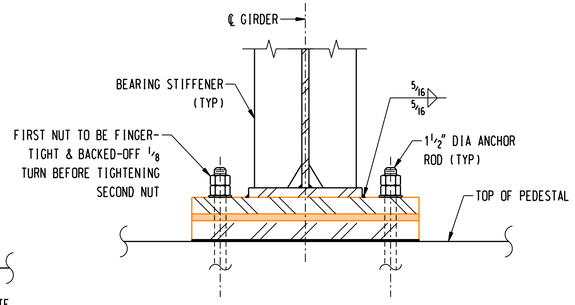
1. ELASTOMER SHALL BE GRADE 3 VIRGIN NEOPRENE WITH SHORE 'A' DUROMETER HARDNESS = 60.
2. STEEL LAMINAE USED IN THE ELASTOMERIC BEARING SHALL CONFORM TO AASHTO M270 GRADE 36.
3. LOAD PLATE SHALL CONFORM TO AASHTO M270, GRADE 50, HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 AND SHALL BE HOT-BONDED TO THE ELASTOMERIC BEARING PAD DURING VULCANIZATION.
4. SOLE PLATE SHALL CONFORM TO AASHTO M270, GRADE 50, HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
5. SOLE PLATES SHALL BE BEVELED TO MATCH THE SLOPE OF THE GIRDER SO THAT THE BOTTOM SURFACE OF THE PLATE IS LEVEL AFTER APPLICATION OF FULL DEAD LOAD.
6. BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325, TYPE 1, EXCEPT AS NOTED OTHERWISE. ALL BOLTS, NUTS, AND WASHERS SHALL BE MECHANICAY GALVANIZED IN ACCORDANCE WITH ASTM B695, CLASS 50.
7. ELASTOMERIC BEARING SHALL BE INSTALLED AT AN AMBIENT TEMPERATURE BETWEEN 50°AND 80°F. CENTERLINE OF BEARING PAD AND SOLE PLATE SHALL BE INSTALLED AT THE CENTERLINE OF BEARINGS.
8. IN NO CASE SHALL THE ELASTOMER OR VULCANIZED BOND BE SUBJECTED TO TEMPERATURE HIGHER THAN 400°F.
9. BEARING DESIGN SERVICE LOADS: TL = 22 kips (SERV LIMIT I)
10. ANCHOR RODS AND NUTS SHALL BE ASTM F1554, GRADE 55 (S1) (S4). ANCHOR RODS AND NUTS SHALL BE MECHANICAY GALVANIZED IN ACCORDANCE WITH ASTM B695, CLASS 50.
11. FOR BEARING AND ANCHOR ROD LAYOUT, SEE PEDESTAL PLAN ON STR. DWG. NO. 01224-16302 PG 005.
12. PEDESTAL ELEVATIONS SHOWN ON THE ABUTMENT DRAWINGS APPLY AT THE TOP OF THE CONCRETE PEDESTAL.



PLAN



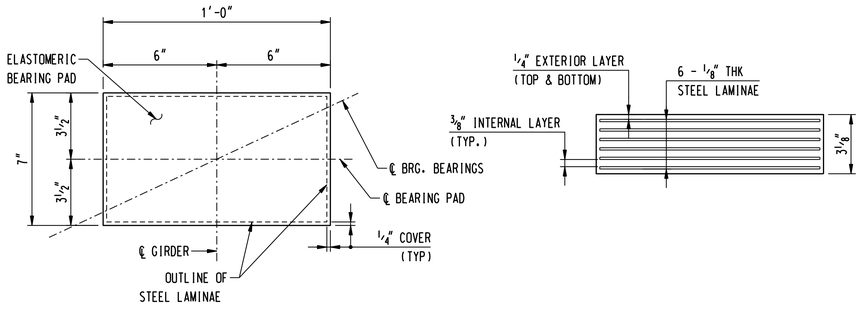
ELEVATION



SECTION

FIXED BEARING

SCALE: 1½" = 1'-0"

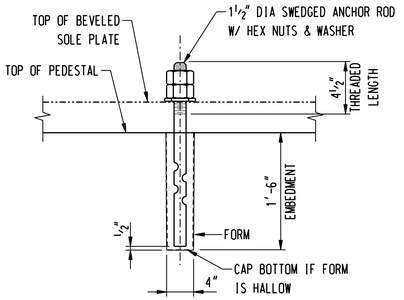


PLAN

SECTION

ELASTOMERIC BEARING PAD

SCALE: 3" = 1'-0"



ANCHOR ROD DETAIL

N.T.S.

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6	9/04/06	ISSUED CSC	D.Q.	B.K.
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2	1/23/06	ISSUED TO BMcD & N.U. FOR REVIEW	D.Q.	B.K.
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date 01/10/06
designed A. GRZADZIEL, C. CHAUNG
detailed C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

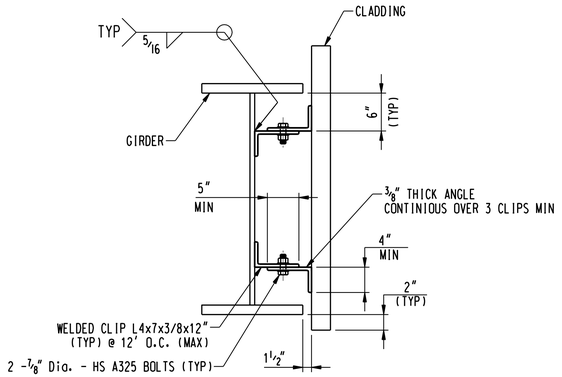
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

SASCO CREEK
BEARING DETAILS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE

SCALE AS NOTED | D | DWG. NO. 01224–16302 PG 011



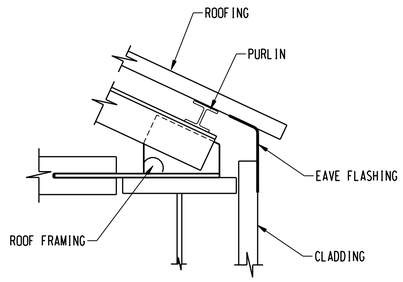
NOTE:

1. CLADDING MANUFACTURER MAY SUBMIT ALTERNATE CLADDING ATTACHMENTS DETAILS TO THE ENGINEER FOR APPROVAL.

SECTION

WELDED CLIP DETAIL

N.T.S.



SECTION

EAVE DETAIL

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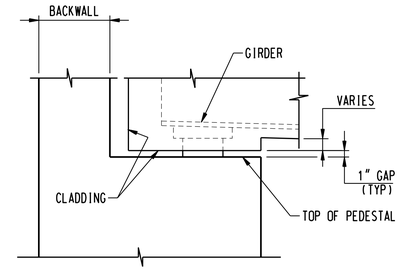
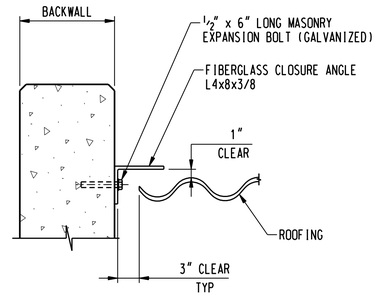


SECTION

BEARING PAD CLOSURE DETAIL

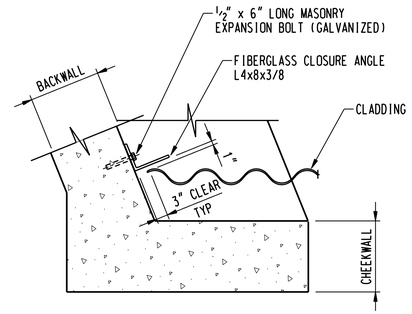
N.T.S.



SECTION

END CLOSURE DETAIL (ROOFING)

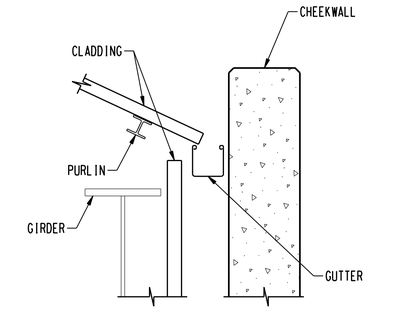
N.T.S.



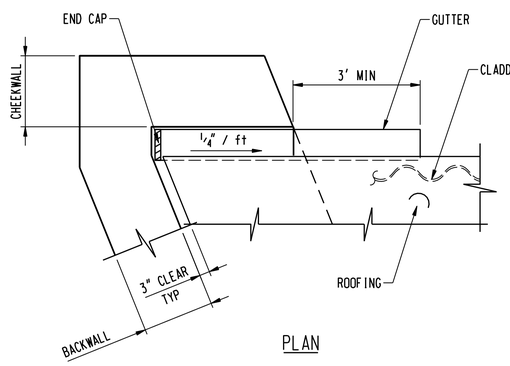
SECTION

END CLOSURE DETAIL (CLADDING)

N.T.S.



SECTION



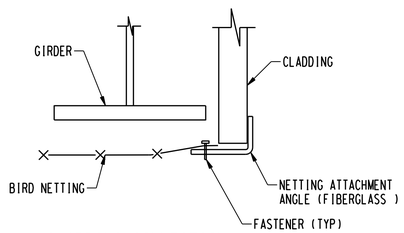
PLAN

NOTE:

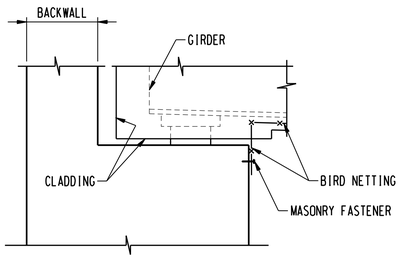
1. GUTTERS SHALL BE INSTALLED AT ALL FOUR CORNERS OF THE ROOF.

CORNER DETAIL

N.T.S.



CLADDING CONNECTION



ABUTMENT CONNECTION

BIRD NETTING DETAIL

N.T.S.

FOR REFERENCE ONLY
NOT FOR CONSTRUCTION

NOTES:

1. ALL FIBERGLASS CLADDING, ROOFING AND MISCELLANEOUS FITTINGS AND ACCESSORIES SHALL BE OF THE TUFF SPAN SERIES BY ENDURO COMPOSITES , OR APPROVED EQUAL.

   MANUFACTURER INFORMATION: ENDURO COMPOSITES
   A DIVISION OF ENDURO SYSTEMS INCORPORATED
   1005 BLUE MOUND ROAD
   FORT WORTH, TX 76131
   TEL. (800) 667-8668
   WWW.ENDUROCOMPSITES.COM

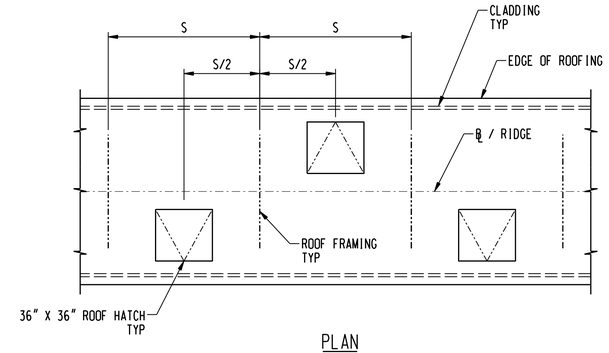
2. THE CONTRACTOR SHALL PROVIDE THE OWNER AND THE ENGINEER WITH COLOR SAMPLES AND PROFILES OF THE CLADDING AND ROOFING MATERIALS FOR APPROVAL.

3. ACCESS HATCH, FLASHING AND MISCELLANEOUS ACCESSORIES SHALL BE OF FIBERGLASS MATERIAL. BOLTS, FASTENERS AND MISCELLANEOUS HARDWARE SHALL EITHER BE GALVANIZED OR STAINLESS STEEL AND SHALL BE IN ACCORDANCE WITH THE ACCESS HATCH MANUFACTURER'S SPECIFICATIONS.

4. FRAMING SYSTEM AND ATTACHMENT DETAILS FOR THE ACCESS HATCH SHALL BE DESIGNED AND DETAILED BY THE ROOFING MANUFACTURER. THE CONTRACTOR SHALL PREPARE WORKING DRAWINGS AND SUBMIT TO BL COMPANIES FOR REVIEW AND APPROVE. WORKING DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CONNECTICUT.

5. ROOFING AND CLADDING, INCLUDING FRAMING AND ATTACHMENTS, SHALL BE DESIGNED FOR WIND AND SNOW LOADS AS SPECIFIED IN THESE PLANS.

6. ROOFING AND CLADDING SHALL BE DESIGNED TO ALLOW FOR THERMAL EXPANSION. TEMPERATURE RANGE TO BE USED FOR THERMAL EXPANSION SHALL BE FROM -10°F TO 170°F.



PLAN

ACCESS HATCH NOTES:

1. CONTRACTOR SHALL SUBMIT CATALOG CUTS OF THE ACCESS HATCH SYSTEM AND DETAILS FOR REVIEW AND APPROVAL. ACCESS HATCH SHALL EITHER BE OR METAL OR OF FIBERGLASS MATERIAL, HAVING NON-REFLECTIVE SURFACE FINISH WITH COLOR CLOSELY MATCHING THE ROOFING MATERIAL.

2. CONTRACTOR SHALL DESIGN FRAMING SYSTEM AROUND THE ACCESS HATCH. ACCESS HATCHES AND ITS FRAMING SYTEM SHALL BE DESIGNED FOR A MINIMUM CONCENTRATED LIVE LOAD OF 500 LBS.

3. CONTRACTOR SHALL DETAIL ACCESS HATCH TO BE ADOPTABLE TO THE ROOFING PROFILE. HATCH AND ROOFING INTERFACE SHALL BE DETAILED TO ENSURE A WATERTIGHT CONNECTION.

4. ORIENTATION, LOCATION AND SPACING BETWEEN HATCHES SHALL BE AS SHOWN ON THESE DRAWINGS.

5. ACCESS HATCH SHALL BE EASY TO OPEN AND SHALL HAVE A LOCKING DEVICE TO HOLD THE DOOR IN THE CLOSED AND OPEN POSITIONS.

6. COST OF FURNISHING AND INSTALLING ACCESS HATCHES, INCLUDING THE HATCH FRAMING SYSTEM SHALL BE INCLUDED IN THE COST OF THE ITEM "ARCHITECTURAL CLADDING".

INSPECTION HATCH LAYOUT

N.T.S.

no.	date	revisions	by	chk
6	9/04/06	ISSUED CSC	D.Q.	B.K.
5	6/01/06	ISSUED 60% PRELIMINARY	D.Q.	B.K.
4	5/10/06	ISSUED SECOND REVIEW	D.Q.	B.K.
3	1/31/06	ADDENDUM No.2	D.Q.	B.K.
2	1/23/06	ISSUED TO BMcD & N.U. FOR REVIEW	D.Q.	B.K.
1	1/19/06	ISSUED CIVIL R.F.P.	D.Q.	B.K.

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date 01/10/06
designed M. BEAULIEU
detailed M .BEAULIEU, C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

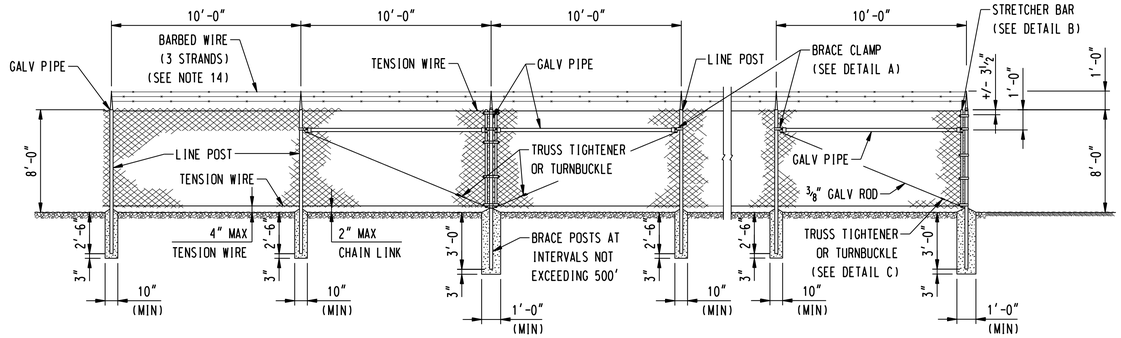
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

SASCO CREEK
CLADDING DETAILS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE

SCALE AS NOTED | D | DWG. NO. 01224–16302 PG 012

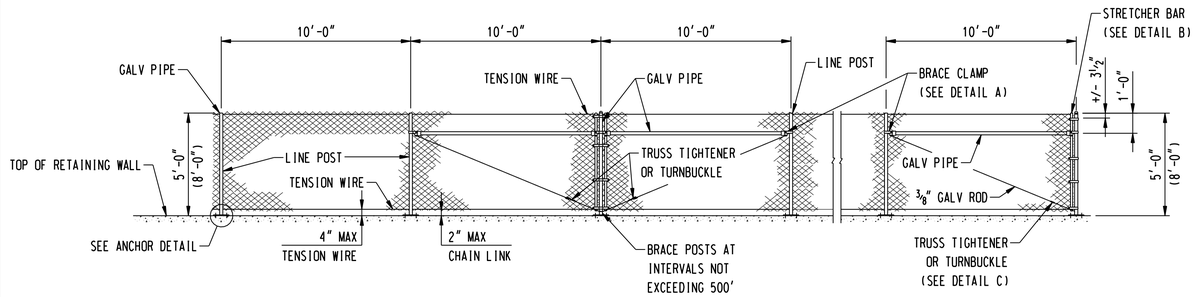


INTERMEDIATE BRACED POST

CORNER OR END POST

8′ CHAIN LINK FENCE

N.T.S.

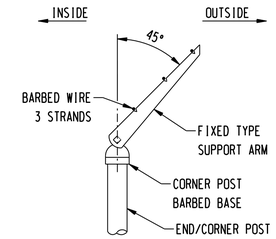


INTERMEDIATE BRACED POST

CORNER OR END POST

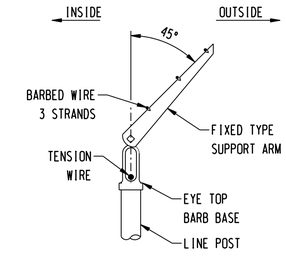
5′ & 8′ CHAIN LINK FENCE (STRUCTURE)

N.T.S.



CORNER POST SUPPORT ARM

N.T.S.

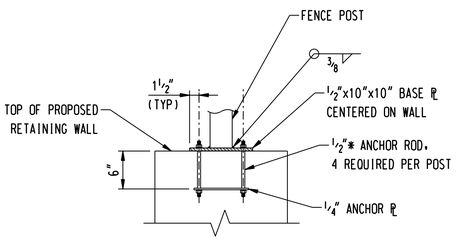


LINE POST SUPPORT ARM

N.T.S.

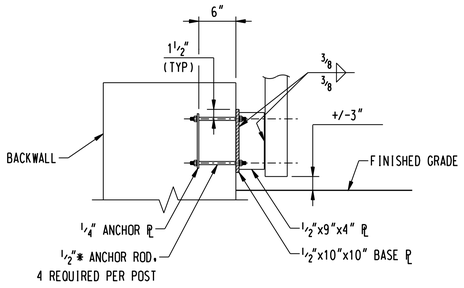
FENCE NOTES:

1. CHAIN-LINK FENCING SHALL CONSIST OF GALVANIZED CHAIN-LINK FABRIC ON STEEL POSTS.
2. ALL POSTS SHALL BE SET IN CLASS A OR AA CONCRETE EXCEPT 5′ CHAIN LINK FENCE ON RETAINING WALL.
3. ALL POSTS TOPS SHALL BE FITTED WITH SUITABLE FINIALS.
4. CORNER, TERMINAL OR PULL POST SHALL BE $2\frac{7}{8}$″ DIA SCHEDULE 40 PER ASTM-F1083.
5. LINE POST: $2\frac{3}{8}$″ DIA SCHEDULE 40 PIPE PER ASTM-F1083.
6. BRACES SHALL BE SPACED APPROXIMATELY 12″ BELOW TOP OF TERMINAL POSTS AND SHALL EXTEND FROM END, GATE OR CORNER POSTS TO FIRST ADJACENT LINE POST.
7. TOP RAIL & BRACE RAIL: $1\frac{1}{4}$″ DIA SCHEDULE 40 PIPE PER ASTM-F1083.
8. FABRIC: 11 GA. CORE WIRE SIZE 2″ MESH, CONFORMING TO ASTM-A392 CLASS 1.
9. TIE WIRE: MINIMUM 11 GA GALVANIZED STEEL.
10. TENSION WIRE: 7 GA. GALVANIZED STEEL.
11. ALL FITTINGS SHALL BE HOT-DIPPED GALVANIZED MALLEABLE, CAST IRON, OR PRESSED STEEL.
12. FABRIC SHALL BE FASTENED TO LINE POSTS WITH FABRIC BANDS SPACED APPROXIMATELY 14″ APART, AND TO TOP TENSION WIRE AND BOTTOM TENSION WIRE WITH HOG RINGS OR TIE WIRES SPACED APPROXIMATELY 24″ APART.
13. ALL WORK SHALL CONFORM WITH THE PROJECT SPECIFICATIONS.
14. THREE STRANDS BARB WIRE APPLY TO 8′-0″ HIGH CHAIN LINK FENCE. SEE GENERAL PLAN FOR CHAIN LINK FENCE LAYOUT.
15. ALL 8′ CHAIN LINK FENCE SHALL BE FITTED WITH BARBED WIRE.
16. PROVIDE 4′ WIDE ACCESS GATES WHEN SHOWN ON PLAN.



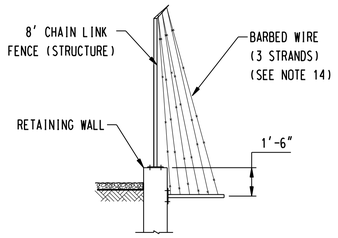
FENCE ANCHOR DETAIL I

SCALE: 1″=1′-0″



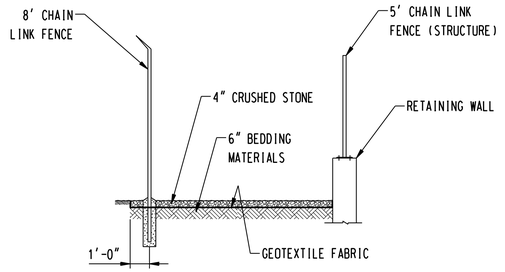
FENCE ANCHOR DETAIL II

SCALE: 1″=1′-0″



PEDESTRIAN BARRIER

N.T.S.



SURFACE FINISHED

N.T.S.

no.	date	revisions	by	chk
2	6/1/06	ISSUED 60% PRELIMINARY	D.Q.	B.K.
1	5/10/06	ISSUED SECOND REVIEW	D.Q.	B.K.

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date 05/10/06
designed C. CHAUNG
detailed C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

SASCO CREEK
CHAIN LINK FENCE DETAILS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–16302 PG 013	

ISSUED UNDER SEGMENT 4A CONSTRUCTION PLANS

ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

MATCHLINE SEE DWG. NO. 01224-10001 PG 071

MATCHLINE SEE DWG. NO. 01224-10001 PG 073

LACEY PLACE (Private)

60' Wide Driveway Easement

30'

30'

N/F Sturm,Roger & Co.,Inc. Vol. 375 Pg.429 M229/L38

N/F Superior Plating Company Vol.744 Pg.314 M229/L37 *2500 Post Rd.

N/F The Superior Plating Company Vol.506 Pg.395 M229/L36

N/F Village Capital,LLC Vol.1675 Pg.63 M229/L35

N/F Superior Plating Company Vol.744 Pg.314 M229/L34

N/F Superior Plating Company Vol.744 Pg.314 M229/L33

N/F Town Of Fairfield "Palmer's Neck Park" Vol.207 Pg.426 *2586 Post Rd.

*2580

*2490

*2480

*2462

*2436

*2473

*2506

*2525

*2425

*2375

PI-F-44

PI-F6430-2

PI-F-43

PI-F-45

PI-F-46

SEE NOTE 1

GARAGE SHALL BE REMOVED

SEE NOTE 1

SEE NOTE 1

NOTE:

1. TREES AND SHRUBBERY SHALL BE REMOVED.

SEE UTILTY BRIDGE CROSSING DWG. NO. 01224-16303 PG 001 THROUGH DWG. NO. 01224-16303 PG 014 FOR LAYOUT AND DETAILS ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

U.S.RTE.1 (POST ROAD)

SOUTHPORT HARBOR

SHADOWS

505+00

507+00

508+00

509+00

510+00

511+00

512+00

513+00

514+00

G or K 01224-46003 PG 002

TH-316 6" PL GAS TOP-25.5 N 619178.99 E 854980.21

TH-316A 6" CWATER TOP-25.98 N 619137.74 E 854799.40

TH-315 6" GAS TOP-21.27 N 619216.73 E 855143.94

N/F Lark Properties,LLC Vol.1729 Pg.172 M229/L44

N/F BLCR Holdings,LLC Vol.2702 Pg.262 M229/L45

N/F 2507 Associates,LLC Vol.1694 Pg.182 M229/L46

N/F 2473 Associates,LLC Vol.1722 Pg.52 M229/L49

N/F Tide Mill,LLC Vol.2458 Pg.136 M231/L429

N/F Oloo G.Delsing Vol.624 Pg.1097 M229/L32

SPLICE VAULT 6430

F.O. HANDHOLE 6430

16" SANITARY SEWER

6" PLASTIC GAS

6" PLASTIC GAS (MAP)

WATER

12" GAS (MAP)

(8) 4" MTD TELEPHONE

16" WATER

8" SANITARY SEWER (MAP)

(16) 4" F & (4) 4" P TELEPHONE

M 01224-46003 PG 002 (TYP.)

EXISTING GRADE

PROPOSED DUCT BANK

ISSUED UNDER SEGMENT 4A CONSTRUCTION PLANS

ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

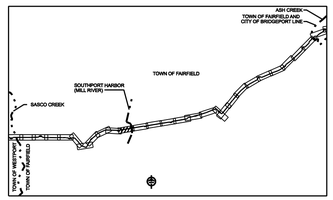
200' RADIUS

UTILITY BRIDGE

PROPOSED DUCT BANK

SEE UTILTY BRIDGE CROSSING DWG. NO. 01224-16303 PG 001 THROUGH DWG. NO. 01224-16303 PG 014 FOR LAYOUT AND DETAILS ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

APPROXIMATE EXISTING GRADE



NORTH

HORIZONTAL SCALE IN FEET 0 30' 60'

VERTICAL SCALE IN FEET 0 5' 10'

FOR REFERENCE ONLY NOT FOR CONSTRUCTION

DOCKET No. 272

no.	date	revisions	by	chk
2	9/4/06	ISSUED CSC	CTC	
1	6/1/06	ISSUED 60% PRELIMINARY	CTC	

Burns & McDonnell SINCE 1898

date 08/15/05 | detailed L. ROWSE

designed C. COURTRIGHT | checked S. NEWLAND

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

TOWN OF FAIRFIELD ROUTE
PLAN AND PROFILE Sta. 505+50 to 514+00

BY SEN–BMCD	CHKD	APP	APP
DATE 8–15–05	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–10001 PG 072	

MATCHLINE SEE DWG. NO. 01224-10001 PG 072

MATCHLINE SEE DWG. NO. 01224-10001 PG 074

NOTES:

1. SILT FENCE ON DOWNSLOPE SIDE OF CONSTRUCTION AREA, INCLUDING SPOIL PILES. WHEN AREAS ARE CURRENTLY PAVED THEN USE EROSION CONTROL LOGS/GUTTER BUDDIES.
2. TREES AND SHRUBBERY SHALL BE REMOVED.

SEE UTILITY BRIDGE CROSSING DWG. NO. 01224-16303 PG 001 THROUGH DWG. NO. 01224-16303 PG 014 FOR LAYOUT AND DETAILS ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

ISSUED UNDER SEGMENT 4A CONSTRUCTION PLANS

PI-F-47

SEE NOTE 2

TMS #31 SEE DETAIL 5 DWG. NO. 01224-46003 PG 005

PI-F-48

PI-F6431-2

SEE NOTE 1

SBC MH, SHORING MAY BE NEEDED

SPLICE VAULT 6431

F.O. HANDHOLE 6431

PI-F6431-3

PI-F6431-4

PI-F6431-1

PI-F-49

PI-F-50

PI-F-51

PI-F-52

F.O. HANDHOLE 7531

SPLICE VAULT 7531

G or K 01224-46003 PG 002

PENT COURT

SASCO HILL ROAD

U.S.RTE 1 (POST ROAD)

513+50 514+00 515+00 516+00 517+00 518+00 519+00 520+00 521+00 522+00 522+50

UTILITY BRIDGE

200' RADIUS

PROPOSED DUCT BANK

(16) 4" F & (4) 4" P TELEPHONE

16" WATER ELECTRICAL

(8) MTD TELEPHONE

12" CI GAS (MAP)

24" X 24" TELEPHONE

8" CI WATER

12" RCP

SANITARY SEWER

12" SANITARY SEWER

WATER

12" RCP

8" CMP

EXISTING GRADE

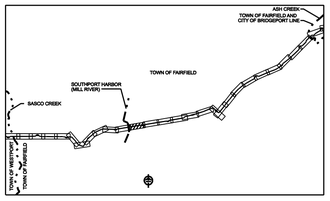
TMS #31

M 01224-46003 PG 002

SEE UTILITY BRIDGE CROSSING DWG. NO. 01224-16303 PG 001 THROUGH DWG. NO. 01224-16303 PG 014 FOR LAYOUT AND DETAILS ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

ISSUED UNDER UNDERGROUND CABLE CROSSINGS OF WATERCOURSES AND RAILROADS DEVELOPMENT AND MANAGEMENT PLAN

ISSUED UNDER SEGMENT 4A CONSTRUCTION PLANS



NORTH

HORIZONTAL SCALE IN FEET 0 30' 60'

VERTICAL SCALE IN FEET 0 5' 10'

FOR REFERENCE ONLY NOT FOR CONSTRUCTION

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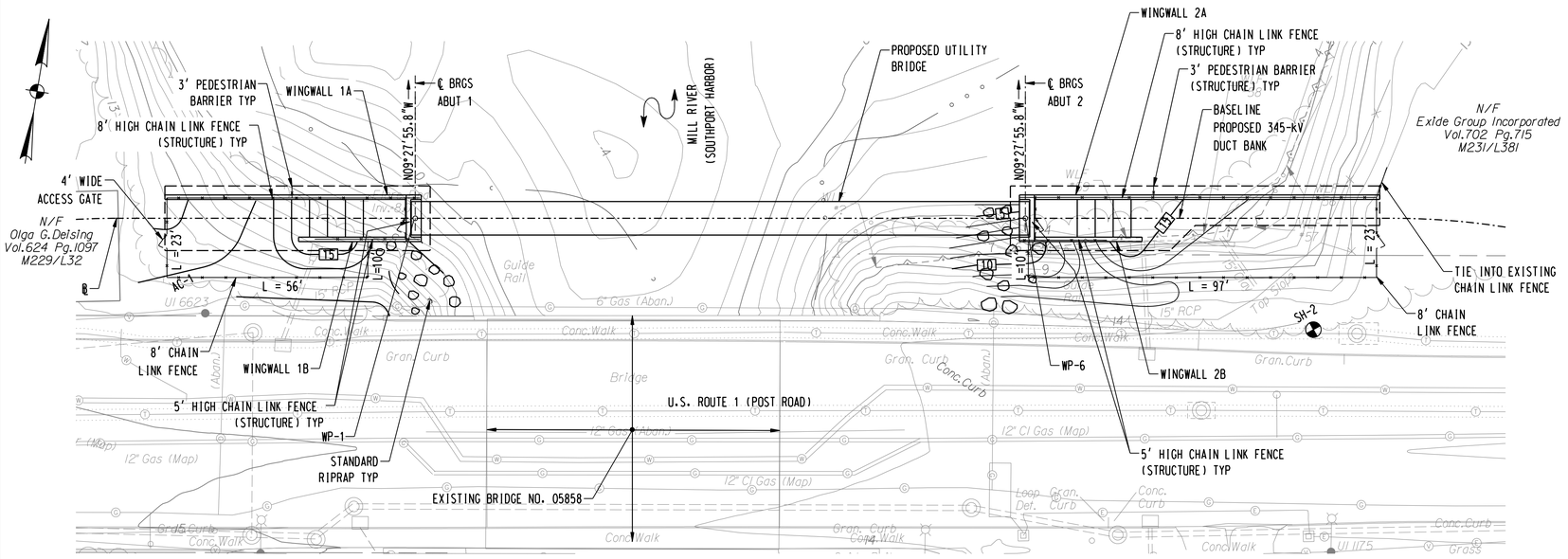
FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

TOWN OF FAIRFIELD ROUTE
PLAN AND PROFILE Sta. 513+50 to 522+50

BY SEN–BMCD	CHKD	APP	APP
DATE 8–15–05	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–10001 PG 073	



PLAN

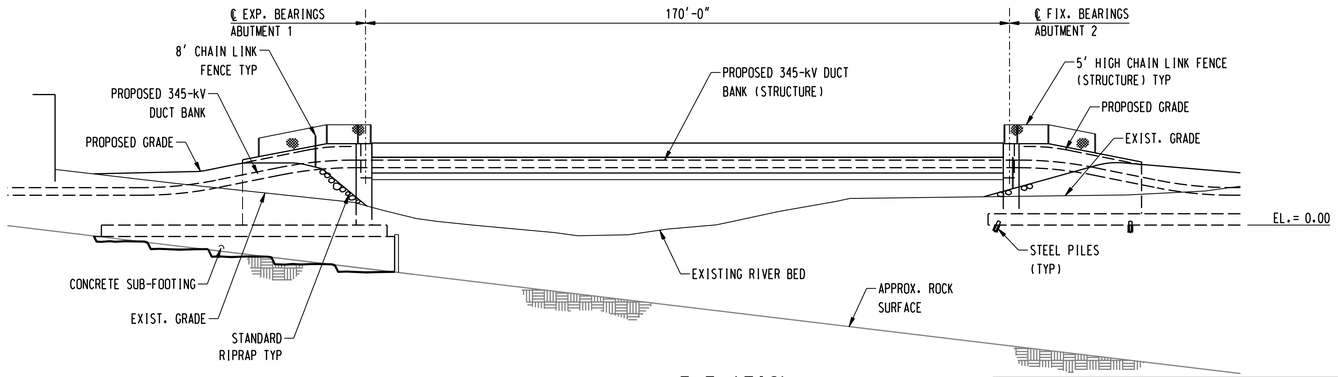
SCALE: 1" = 20'-0"

PLAN NOTES

1. 4" OF CRUSHED STONE FOR SLOPE PROTECTION SHALL BE PROVIDED WITHIN THE LIMITS DEFINED IN THE 8' HIGH PROTECTIVE FENCE DETAILS. SEE DWG. No. 01224-16303 PG 014
2. CRUSHED STONE FOR SLOPE PROTECTION SHALL BE INCLUDED IN THE PAY ITEM "8' CHAIN LINK FENCE".

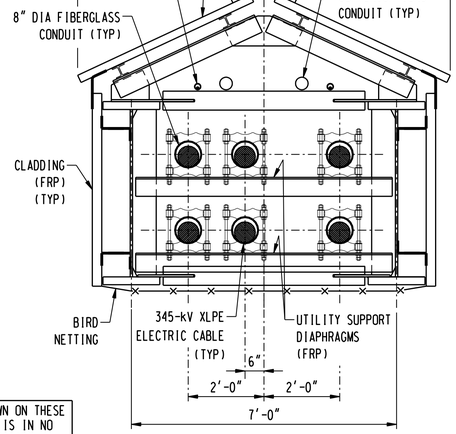
BORING LEGEND

10 LOCATION OF BORING PERFORMED BY GZA GEO ENVIRONMENTAL, INC.



ELEVATION

SCALE: 1" = 20'-0"



TYPICAL SECTION

SCALE: 1/2" = 1'-0"

GENERAL NOTES

SPECIFICATIONS: CONNECTICUT DEPARTMENT OF TRANSPORTATION FORM 816 (2004), SUPPLEMENTAL SPECIFICATIONS DATED JULY, 2005, AND SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 3RD EDITION (2004); SEI/ASCE STANDARD 7-02, MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES; AS SUPPLEMENTED BY THE CONNECTICUT DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN MANUAL, 2003 EDITION, UP TO AND INCLUDING 2005 REVISIONS.

ALLOWABLE DESIGN STRESSES:

CLASS "A" CONCRETE	BASED ON	f'c = 3000 PSI
UNDERWATER CONCRETE	BASED ON	f'c = 3000 PSI
REINFORCEMENT ASTM A615, GRADE 60	BASED ON	fy = 60,000 PSI
STRUCTURAL STEEL AASHTO M270, GRADE 50T2	BASED ON	Fy = 50,000 PSI
FIBERGLASS STRUCTURAL SHAPE	BASED ON	Fu = 33,000 PSI

STRUCTURAL STEEL: SEE STRUCTURAL STEEL NOTES FOR DESIGNATIONS AND REQUIREMENTS.

FOUNDATION PRESSURES: THE VARIOUS STRENGTH LIMITS NOTED ON THE SUBSTRUCTURE PLAN SHEETS REFER TO THE STRENGTH LIMITS AS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION.

DIMENSIONS & ELEVATIONS: WHEN DIMENSIONS AND ELEVATIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES, THE OMITTED DIGITS SHALL BE CONSIDERED TO BE ZEROS. ALL ELEVATIONS ARE SHOWN ARE GIVEN IN DECIMAL FEET AND ARE REFERENCED TO NGVD-29.

CONCRETE NOTES

CLASS "A" CONCRETE: CLASS "A" CONCRETE SHALL BE USED FOR THE ENTIRE SUBSTRUCTURES.

EXPOSED EDGES: EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1"X1", UNLESS OTHERWISE NOTED.

CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE TWO INCHES CLEAR COVER, UNLESS DIMENSIONED OTHERWISE.

REINFORCEMENT: ALL REINFORCEMENT SHALL BE ASTM A615, GRADE 60.

CONSTRUCTION JOINTS: CONSTRUCTION JOINTS, OTHER THAN THOSE SHOWN ON THE PLANS, WILL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL FROM BL COMPANIES.

DESIGN LOADS

GRAVITY LOADS

A. MISCELLANEOUS DEAD LOAD	= 94.9 PLF/BEAM
B. UTILITY DEAD LOAD	= 92 PLF/BEAM
C. LIVE LOAD	= 10 PSF
D. ROOF SNOW LOAD	= 22.5 PSF

LATERAL LOADS

WIND:
A. BASIC WIND VELOCITY = 100 MPH
B. HORIZONTAL WIND PRESSURE = 50 PSF
C. VERTICAL WIND PRESSURE = 20 PSF
D. FOR ROOF & CLADDING - WIND PRESSURE ACCORDING SEI/ASCE STANDARD 7-02

SEISMIC:
A. SEISMIC PERFORMANCE ZONE - 2 (PER AASHTO 3.10.4)

TABLE OF QUANTITIES

ITEM	UNIT	QUANTITY
STRUCTURE EXCAVATION - EARTH (COMPLETE)	CY	1300
PERVIOUS STRUCTURE BACKFILL	CY	900
STEEL-LAMINATED ELASTOMERIC BEARINGS	EA	2
STRUCTURAL STEEL (SITE H)	LB	196000
CLASS "A" CONCRETE	CY	570
UNDERWATER CONCRETE	CY	330
DEFORMED STEEL BARS	LB	75000
ARCHITECTURAL CLADDING (SITE H)	SY	410
FURNISHING STEEL PILES	LB	134500
DRIVING STEEL PILES	LF	1815
SPLICING STEEL PILES	EA	4
POINT REINFORCEMENT FOR STEEL PILES	EA	33
TEST PILES (HP12X74 X 35' LONG)	EA	2
FIBERGLASS STRUCTURAL SHAPES (SITE H)	LB	6500
DAMPPROOFING	SF	450
TEMPORARY SHEET PILING	SY	500
SHEET PILING MATERIAL LEFT IN PLACE	SY	460
8' CHAIN LINK FENCE	LF	235
5' CHAIN LINK FENCE (STRUCTURE)	LF	90
8' CHAIN LINK FENCE (STRUCTURE)	LF	170

CONCRETE DISTRIBUTION

SUPERSTRUCTURE	C.Y.	N/A
SUBSTRUCTURE	C.Y.	269
FOOTINGS	C.Y.	631
TOTAL	C.Y.	900

INSPECTION OF FIELD WELDS

METHOD	UNIT	QUANTITY
ULTRASONIC	inch	0
MAGNETIC PARTICLE	feet	0

NOTICE TO BRIDGE INSPECTORS

IT IS RECOMMENDED THAT CONNDOT'S BRIDGE SAFETY PROCEDURES BE FOLLOWED WHEN INSPECTING THIS BRIDGE FOR, BUT NOT LIMITED TO, ALL APPROPRIATE COMPONENTS INDICATED IN THE GOVERNING MANUALS FOR BRIDGE INSPECTION. ATTENTION MUST BE GIVEN TO INSPECTING THE FOLLOWING SPECIAL COMPONENTS AND DETAILS. (THE LISTING OF COMPONENTS FOR SPECIFIC ATTENTION SHALL NOT BE CONSTRUED TO REDUCE THE IMPORTANCE OF INSPECTION OF ANY OTHER COMPONENT OF THE STRUCTURE.) THE FREQUENCY OF INSPECTION OF THIS STRUCTURE SHALL BE IN ACCORDANCE WITH THE GOVERNING MANUALS FOR BRIDGE INSPECTION, UNLESS OTHERWISE DIRECTED BY NORTHEAST UTILITIES.

COMPONENT OR DETAIL	STRUCTURE SHEET REFERENCE
PLATE GIRDERS	0122H-8530H PG 008
BOLTED FIELD SPLICES	0122H-8530H PG 009

THE INFORMATION, INCLUDING ESTIMATED QUANTITIES OF WORK, SHOWN ON THESE SHEETS IS BASED ON LIMITED INVESTIGATION BY BL COMPANIES AND IS IN NO WAY WARRANTED TO INDICATE THE TRUE CONDITIONS OF ACTUAL QUANTITIES OR DISTRIBUTION OF QUANTITIES OF WORK WHICH WILL BE REQUIRED.

TRANSPORTATION DIMENSIONS AND MASS DATA

MEMBER	SHIPPING LENGTH	SHIPPING HEIGHT	SHIPPING WIDTH	SHIPPING WEIGHT
G1-G2	88'- 0"	5'- 6 3/4"	2'- 6"	31 000 LBS

no.	date	revisions	by	chk
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date 05/10/06
designed M. BEAULIEU
detailed M .BEAULIEU C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN-NORWALK 345kV TRANSMISSION PROJECT

MILL RIVER (SOUTHPORT HARBOR) GENERAL PLAN

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16303 PG 001	

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SH-1
Page: 1 of 3
File No.: 43411
Check: P. Murphy

Contractor: New England Boring
Foreman: Orrin Core
Logged by: Adedeji Adeyoye
Date Start/Finish: 11-17-05 / 11-18-05
Boring Location: N612088 E855393
GS Elev.: 15.3' **Datum:** NAVD 1988

	Auger/ Casing	Sampler
Type:	Solid Auger	S.S.
O.D. / I.D.:	4"	3" O.D.
Hammer Wt.:		140 lb.
Hammer Fall:		30"
Other:	4" Casing	NQ

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
11/17/05	14:35	11.6'	10	10 min.
11/18/05	12:00	11'	Out	15 min.

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
					24		0.2'ASPHALT		FLUSH
1	S-1	24/14	1-3	20-15	19	Well graded SAND with SILT and GRAVEL (SW-SM), medium dense, light brown, approximately 75% hard, subangular, fine to coarse Sand, 15% fine to coarse Gravel, 10% non-plastic Silt, dry	GRAVELY SAND	1	Flush Mounted Roadbox at Ground Surface
2				10-12	38			2	
3					40				Solid PVC Riser (0.5'-5')
4	S-2	24/14	4-6	12-18	52	Silty SAND with GRAVEL (SM), dense, light brown, approximately 70% hard, subangular, fine to coarse Sand, 15% fine to coarse Gravel, 15% non-plastic Silt, micaeous, dry			
5				19-27	48				
6					41		6' SILTY SAND		
7					45				
8	S-3	18/16	8-9.5	25-33	53	Silty SAND (SM), very dense, light brown, approximately 75% hard, subangular, fine Sand, 20% non-plastic Silt, 50% fine Gravel micaceous, dry			
9				33	49				
10							10' POSSIBLY WEATHERED ROCK		
11									
12	S-4	4/0	12-12.3	120/4"		No recovery		3	
13									
14									
15				min/ft			15' BEDROCK		
16	C-1	60/58	15-20	3		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 5%		4	
17				3					
18				4					PVC Screen (5-30')
19				4					

REMARKS

1. Borehole advanced using solid 4" O.D. auger, SPT conducted using safety hammer
2. Numbers in Field Test Data Column represent casing blows per foot.
3. Difficulty in advancing sampler encountered at 12.3 feet. 4" hollow casing installed at 0-10 feet. Borehole augered from 12.3 to 15 feet. Rock coring at 15 to 65 feet using NQ-2.
4. Piezometer installed from 0 to 30 feet, 5 to 30 feet of screen, 0 to 5 feet of riser, 1 to 65 feet backfilled with filter sand (Silica)

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SH-1

345kV REPORT BORINGS.GPJ GZA.GDT 10/9/06

SH-1 (PAGE 1 OF 3)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SH-1
Page: 2 of 3
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
				4			BEDROCK		
21	C-2	60/60	20-25	min/ft		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 50%			
22				4					
23				4					
24				4					
25				4					
26	C-3	60/60	25-30	min/ft		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 70%			
27				4					
28				3					
29				3					
30				3					
31	C-4	60/60	30-35	min/ft		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 60%			
32				4					
33				4					
34				4					
35				5					
36	C-5	60/60	35-40	min/ft		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 73%			
37				4					
38				4					
39				6					
40				6					
41	C-6	60/60	40-45	6 min/ft		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 70%			
42				4					
43				4					

Equipment Installed: Filter Sand (1-65')

REMARKS

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Boring No.: SH-1

345kV REPORT BORINGS.GPJ GZA.GDT 10/9/06

SH-1 (PAGE 2 OF 3)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SH-1
Page: 3 of 3
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
44				4			BEDROCK		
45				4					
46				4 min/ft					
47	C-7	60/58	45-50	4		Hard, moderately weathered, slightly fractured, medium grained, gray SCHIST RQD = 88%			
48				4					
49				4					
50				4					
51				4 min/ft					
52	C-8	60/58	50-55	4		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 63%			
53				4					
54				4					
55				4 min/ft					
56	C-9	60/59	55-60	4		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 83%			
57				4					
58				3					
59				3					
60				3 min/ft					
61	C-10	60/59	60-65	4		Hard, moderately weathered and moderately fractured, medium grained, gray SCHIST RQD = 40%			
62				3					
63				3					
64				3					
65				4		END OF EXPLORATION AT 65'	66'		
66									

REMARKS

DRAFT

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SH-1

345kV REPORT BORINGS.GPJ GZA.GDT 10/9/06

SH-1 (PAGE 3 OF 3)

no.	date	revisions	by	chk
2	6/1/06	ISSUED 60% PRELIMINARY	D.Q.	B.K.
1	5/10/06	ISSUED SECOND REVIEW	D.Q.	B.K.

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detailed C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

MILL RIVER (SOUTHPORT HARBOR)
SOIL BORING LOG 1

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE

SCALE AS NOTED | D | DWG. NO. 01224–16303 PG 002

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SH-2
Page: 1 **of** 3
File No.: 43411
Check: P. Murphy

Contractor: New England Boring
Foreman: Jeff Leavitt
Logged by: Adedeji Adeyoye
Date Start/Finish: 10-12-05 / 10-14-05
Boring Location: N612166 E855784
GS Elev.: 13.5' **Datum:** NAVD 1988

	Auger/ Casing	Sampler
Type:	Solid Auger	S.S.
O.D. / I.D.:	4"	2" O.D.
Hammer Wt.:		140 lb.
Hammer Fall:		30"
Other:	HW	NQ Core

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
10/11/05	14:00	23'	NA	30 min.

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
0	S-1	24/14	0-2	6-7 10-10		Well graded SAND with SILT (SW-SM), medium dense, light brown, approximately 75% hard subangular, fine to coarse Sand, 15% fine to coarse Gravel, 10% non-plastic Silt, dry	0.25' TOP SOIL FILL	1	None
4	S-2	24/16	4-6	4-3 1-2		Silty SAND (SM), very loose, brownish black, approximately 60% hard subangular fine to medium Sand, 35% non-plastic Silt, 5% fine Gravel, trace Brick, dry (trace Peat)			
8	S-3	24/5	8-10	3-5 5-0		Silty SAND with GRAVEL (SM), medium dense, light brown, approximately 60% hard, subangular, fine Sand, 20% fine Gravel, 20% non-plastic, wet			
12	S-4	24/12	12-14	5-6 6-7		Poorly graded SAND with SILT and GRAVEL (SP-SM), medium dense, gray, approximately 60% hard subangular, fine to medium Sand, 30% fine to medium Gravel, 10% non-plastic Silt	15" SAND	2	

REMARKS

1. Borehole advanced using solid 4" O.D. auger, SPT conducted using safety hammer
2. Auger refusal encountered at 14 feet, borehole advanced using 4" O.D. hollow pipe to 20 feet

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SH-2

346KV REPORT BORINGS.GPJ GZAEPTH.GDT 10/9/06

SH-2 (PAGE 1 OF 3)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SH-2
Page: 2 **of** 3
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
20	S-5	24/14	20-22	5-7 7-9		Poorly graded SAND (SP), medium dense, light brown, approximately 96% hard subangular fine Sand, 4% non-plastic Silt, moist	SAND		
22							22" SILT WITH SAND		
24	S-6	24/18	25-27	3-4 4-5		SILT with SAND (ML), loose, light gray, approximately 80% non-plastic Silt, 20% hard subangular, fine Sand, wet			
28	S-7	24/16	30-32	3-3 4-5		SILT with SAND (ML), loose, light gray, approximately 80% non-plastic Silt, 20% hard subangular fine Sand, wet			
32	S-8	24/14	35-37	3-3 3-3		SILT with SAND (ML), loose, light gray, approximately 80% non-plastic Silt, 20% hard subangular fine Sand, wet			
40	S-9	24/14	40-42	3-3 3-4		SILT with SAND (ML), loose, light gray, approximately 80% non-plastic Silt, 20% hard subangular fine Sand, wet	42" SILTY SAND WITH GRAVEL		

REMARKS

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SH-2

346KV REPORT BORINGS.GPJ GZAEPTH.GDT 10/9/06

SH-2 (PAGE 2 OF 3)

GZA GeoEnvironmental, Inc. *Engineers and Scientists*

MIDDLETOWN-NORWALK
345 KV UNDERGROUND TRANSMISSION PROJECT
SEGMENTS 3 & 4

Boring No.: SH-2
Page: 3 **of** 3
File No.: 43411
Check: P. Murphy

Depth	Sample Information: No.	Pen./ Rec. (in.)	Depth (Ft.)	Blows (/6")	Field Test Data	Sample Description & Classification	Stratum Desc.	Remarks	Equipment Installed
44							SILTY SAND WITH GRAVEL		
45	S-10	24/12	45-47	13-22 38-61		Well graded SAND with SILT and GRAVEL (SW-SM), very dense, light gray, approximately 60% hard, subangular fine to coarse Sand, 25% fine to coarse Gravel, 15% non-plastic Silt, wet			
50	S-11	24/10	50-52	25-22 15-12		Silty SAND with GRAVEL (SM), dense, light gray, approximately 60% hard, subangular, fine to medium Sand, 25% fine to medium Gravel, 15% non-plastic, Silt, wet			
54				Min/ft			55' BEDROCK		
55	C-1	60/45	55-100	4 9 9 4 7 min/ft		Hard, moderately to severely weathered, medium grained, gray SCHIST RQD = 20%			
60	C-2			9 8 8 9 9		Hard, moderately to severely weathered, medium grained, gray SCHIST RQD = 73%		3	
65						END OF EXPLORATION AT 65'	65'		

REMARKS

3. Borehole backfilled with drill cuttings
DRAFT

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SH-2

346KV REPORT BORINGS.GPJ GZAEPTH.GDT 10/9/06

SH-2 (PAGE 3 OF 3)

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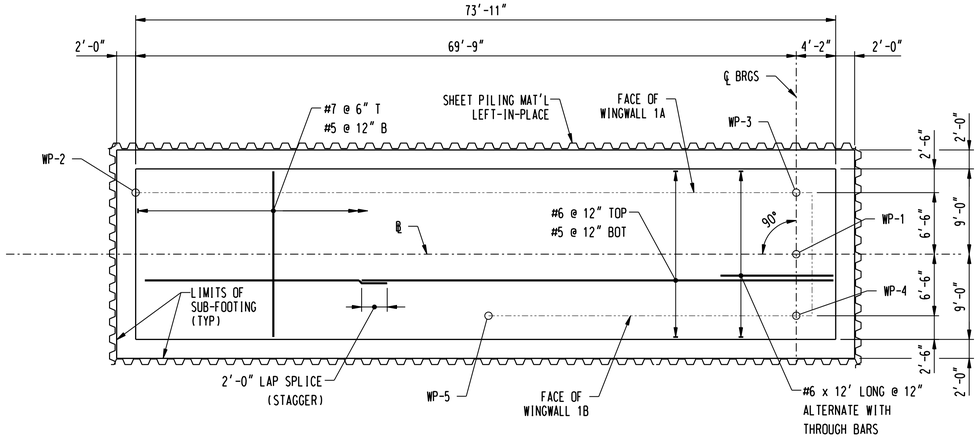
detailed C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

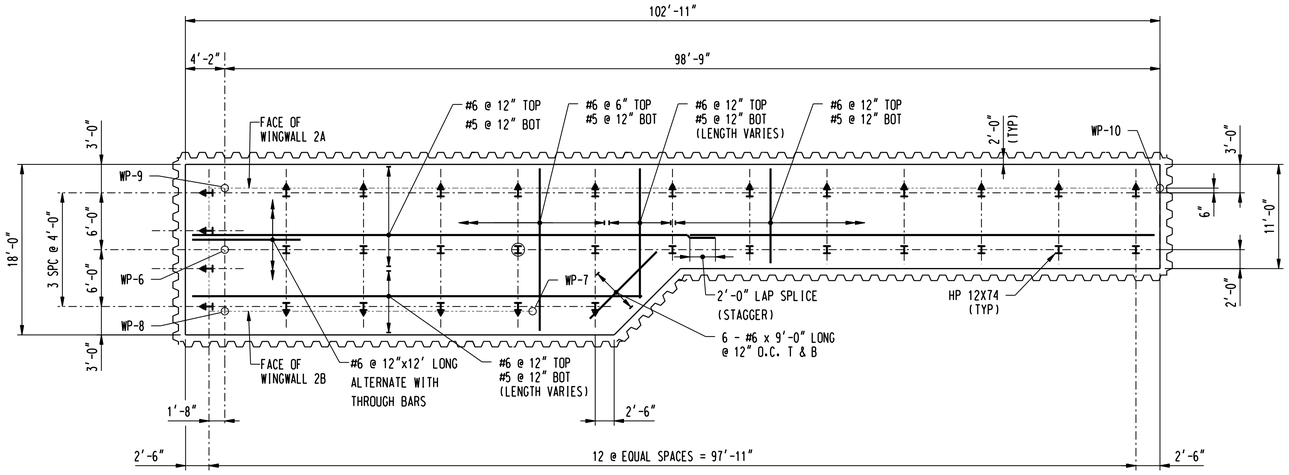
NORTHEAST UTILITIES SERVICE CO.
FOR THE CONNECTICUT LIGHT & POWER COMPANY
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT
MILL RIVER (SOUTHPORT HARBOR)
SOIL BORING LOG 2

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–16303 PG 003	



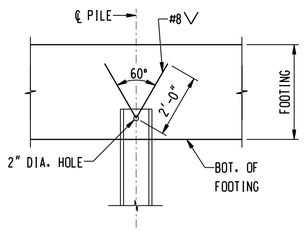
ABUTMENT 1

SCALE: 1/8" = 1'-0"



ABUTMENT 2

SCALE: 1/8" = 1'-0"



NOTE:
PILE ANCHORAGE IS FOR VERTICAL PILES ONLY.

PILE ANCHORAGE DETAIL

SCALE: 1/2" = 1'-0"

LEGEND:

- VERTICAL PILES
- BATTERED PILES
- TEST PILES

PILE NOTES:

1. STEEL PILES SHALL BE HP12x74 CONFORMING TO THE REQUIREMENTS OF AASHTO M270.

2. PRIOR TO DRIVING PILES, THE CONTRACTOR SHALL SUBMIT TO BL COMPANIES, FOR REVIEW AND APPROVAL, THE PROPOSED METHOD AND SEQUENCE OF PILE DRIVING.

3. THE CONTRACTOR SHALL REMAIN COGNIZANT OF ALL UTILITIES IN THE AREA AND SHALL PERFORM ALL PILE DRIVING OPERATIONS IN SUCH A MANNER AS TO AVOID DAMAGING EXISTING UTILITIES. ANY DAMAGE CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED IN-KIND TO THE SATISFACTION OF THE GOVERNING UTILITY COMPANY. THE COST TO REPAIR THESE DAMAGES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

4. PILE LOCATIONS MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF BL COMPANIES. THE DRIVING OF ADDITIONAL PILES RESULTING FROM SUCH MOVE(S) SHALL BE PERFORMED BY THE CONTRACTOR TO THE SAME STANDARDS AS THE REMAINING PILES AND AT NO ADDITIONAL COST TO THE OWNER.

5. ALL FOOTING AND PILE LAYOUT DIMENSIONS SHOWN APPLY AT THE BOTTOM OF THE FOOTING.

6. PILE SPACING SHOWN ARE ALONG THE CENTERLINE OF PILES.

7. ESTIMATED PILE LENGTHS ARE FOR BIDDING PURPOSES ONLY.

   ESTIMATED PILE LENGTHS:

   ABUTMENT 2 = 35'-0"

8. TEST PILES INDICATED ON THE PLANS SHALL BE USED TO VERIFY ORDER LENGTHS AND DRIVING ASSUMPTIONS. PILE DRIVING ANALYZER (PDA) TEST SHALL BE PERFORMED ON THE TEST PILES TO DETERMINE PILE LENGTHS AND PILE CAPACITIES. COST OF PILE LOADING TEST SHALL BE INCLUDED IN THE COST OF THE ITEM "TEST PILE".

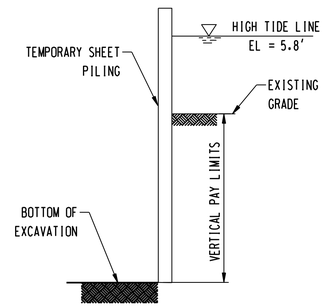
9. ROCK EXCAVATIONS SHALL BE FREED FROM ALL LOOSE MATERIALS, CLEANED AND CUT TO A FIRM SURFACE, LEVEL OR STEPPED AS SHOWN ON THE PLANS OR AS DIRECTED BY THE GEOTECHNICAL ENGINEER

10. MAXIMUM DESIGN PILE LOADS:

    ABUTMENT 2 (WINGWALLS) = 207 kip (STRENGTH LIMIT I)
    (ABUTMENTS) = 178 kip (STRENGTH LIMIT I)

11. MAXIMUM DESIGN BEARING PRESSURE:

    ABUTMENT 1 = 8.7 ksf (STRENGTH LIMIT I)



SHEET PILING PAY LIMIT DETAIL

N.T.S.

no.	date	revisions	by	chk
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checked D. QUINIT / B. KUTA

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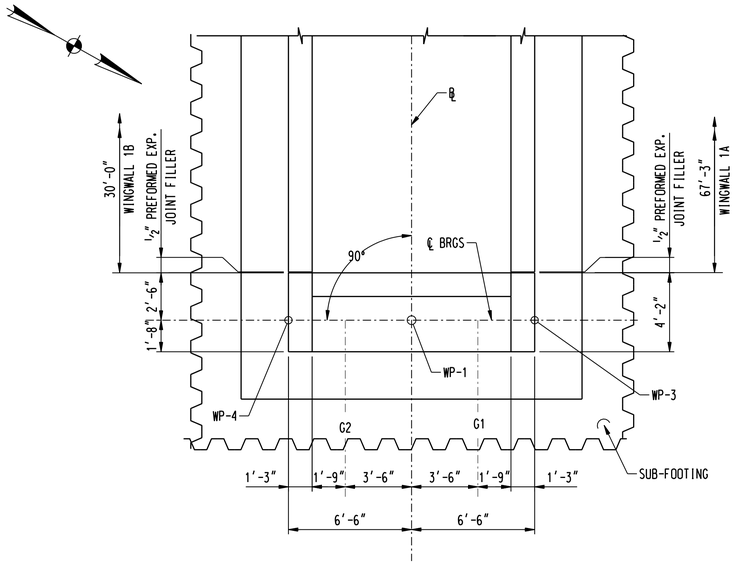
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

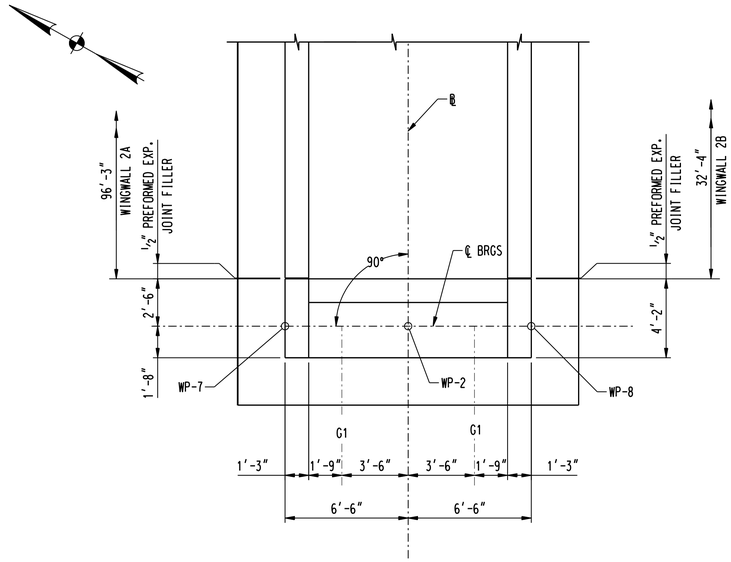
TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

MILL RIVER (SOUTHPORT HARBOR)
ABUTMENT 1 & 2 FOOTING PLAN

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224–16303 PG 004	



PLAN

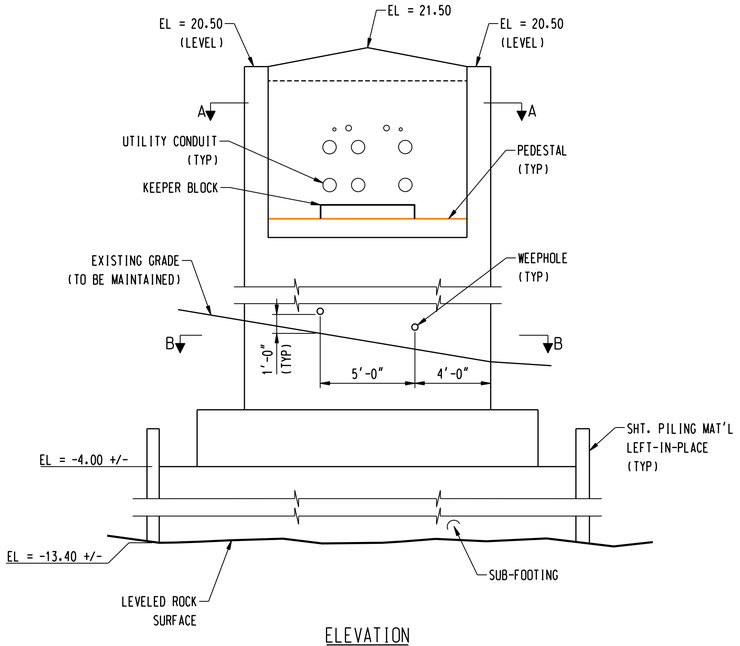


PLAN

NOTES:

1. FOR SECTION A-A AND B-B, SEE DWG. No. 01224-16303 PG 006.
2. FOR WINGWALL LAYOUT. SEE DWG. No. 01224-16303 PG-007.
3. FOR WINGWALL ELEVATION VIEWS, SEE DWG. No. 01224-16303 PG 007.
4. FIBERGLASS REINFORCEMENT SHALL BE USED WITHIN THE DESIGNATED LIMITS OF NON-METALLIC AREA.
5. FOR DESIGNATED LIMITS OF NON-METALLIC AREA. SEE "BACKWALL REINFORECMENT DETAIL" ON DRW. No. 01224-16303 PG 006.
6. FOR FOOTING AND PILE LAYOUTS. SEE DWG . No. 01224-16303 PG 004.
7. FOR WORKING POINT COORDINATES. SEE DWG. No. 01224-16303 PG 001.
8. KEEPER BLOCKS SHALL BE POURED AFTER THE GIRDERS HAVE BEEN ERECTED AND SET TO THEIR FINAL POSITIONS.
9. SHEET PILING MATERIAL LEFT-IN-PLACE SHALL BE CUT 2'-0" MIN BELOW GRADE.
10. FOR GROUNDING DETAIL, SEE DWG. No. 01224-16303 PG 010.
11. FOR PIPE SLEEVE DETAIL, SEE DWG. No. 01224-16303 PG 006.

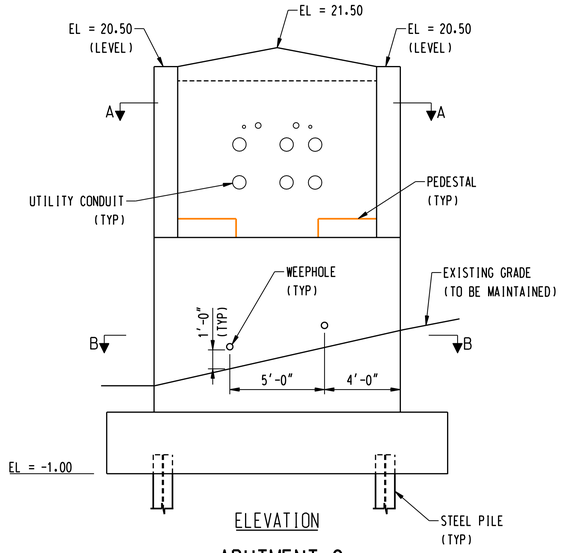
BRIDGE SEAT & PEDESTAL ELEVATIONS		
	ABUTMENT 1	ABUTMENT 2
BRIDGE SEAT	12.100	12.000
G1 PEDESTAL	12.417	12.240
G2 PEDESTAL	12.417	12.240



ELEVATION

ABUTMENT 1

SCALE: ¼" = 1'-0"



ELEVATION

ABUTMENT 2

SCALE: ¼" = 1'-0"

DOCKET No. 272

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designed M. BEAULIEU A. GRZADZIEL

checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

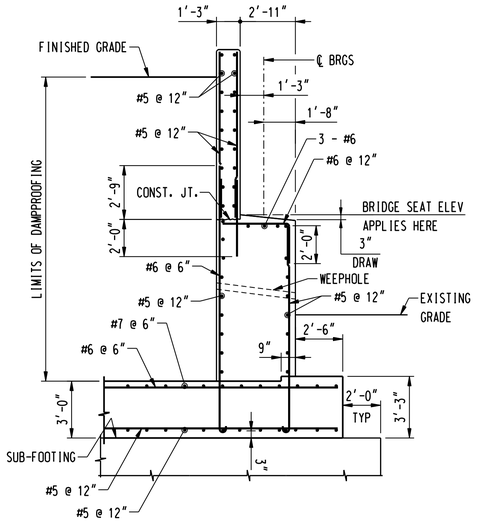
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

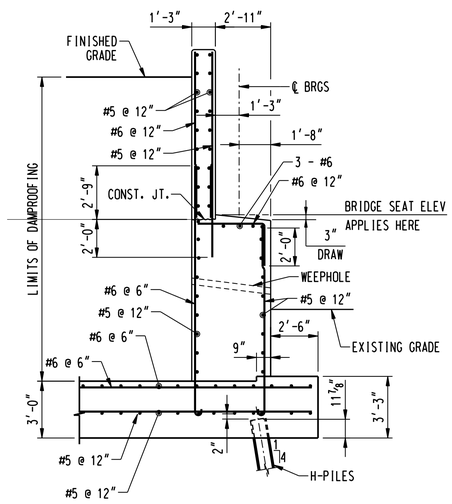
MILL RIVER (SOUTHPORT HARBOR)
ABUTMENT 1 & 2 PLAN AND ELEVATION

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16303 PG 005	



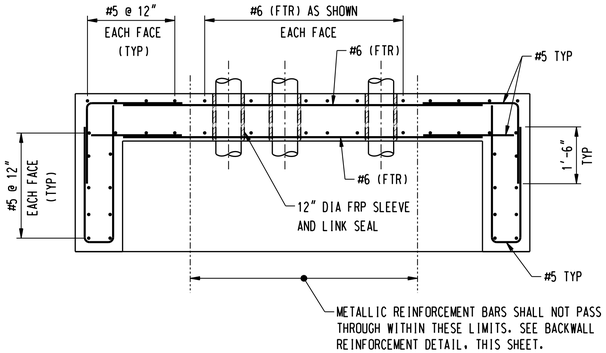
ABUTMENT 1 SECTION

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

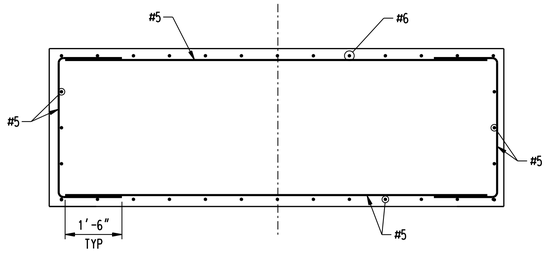


ABUTMENT 2 SECTION

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



SECTION A-A



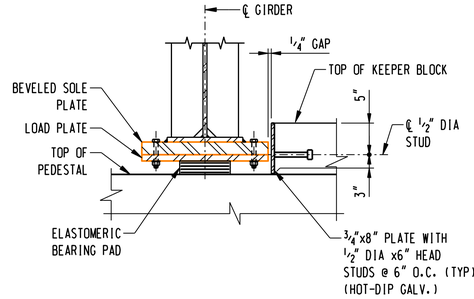
SECTION B-B

TYPICAL REINFORCEMENT LAYOUT

SCALE: 1/2" = 1'-0"

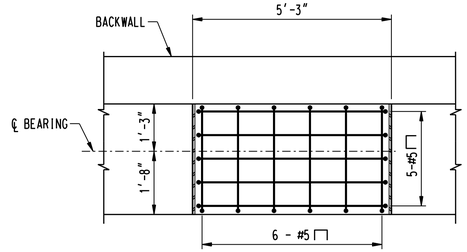
NOTES:

1. KEEPER BLOCKS SHALL BE POURED AFTER THE GIRDERS HAVE BEEN ERECTED AND SET TO THEIR FINAL POSITION.
2. FOR ABUTMENT ELEVATIONS, SEE DWG. NO. 01224-16303 PG 005.
3. FOR WINGWALL ELEVATIONS, SEE DWG. NO. 01224-16303 PG 007.
4. FIBERGLASS THREADED RODS (FRP) SHALL BE USED WITHIN THE LIMITS OF THE NON- METALLIC AREA. SEE BACKWALL REINFORCEMENT DETAIL, THIS SHEET.
5. COST OF FRP SLEEVE AND LINK SEAL SHALL BE INCLUDED IN THE ITEM "CLASS 'A' CONCRETE".

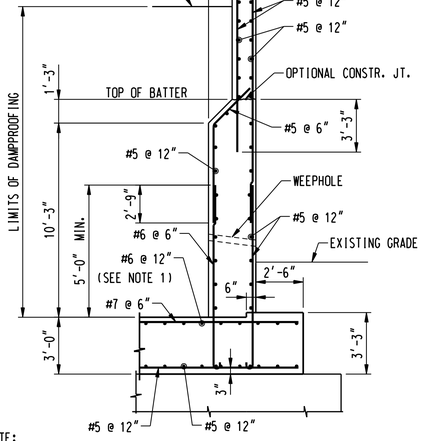


KEEPER BLOCK ELEVATION

SCALE: 1" = 1'-0"



PLAN

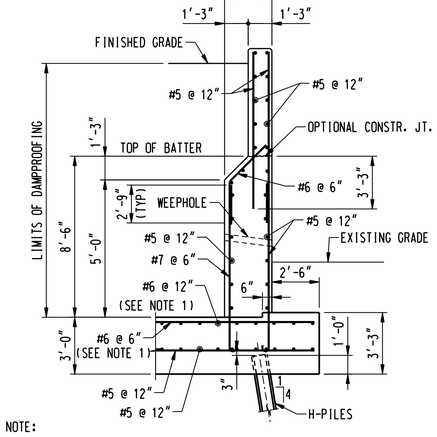


NOTE:
1. FOR ADDITIONAL FOOTING REBAR, SEE FOOTING PLAN.

SECTION

TYPICAL WINGWALL (ABUT. 1)

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

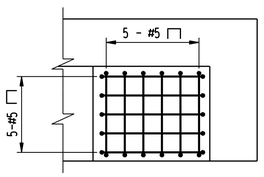


NOTE:
1. FOR ADDITIONAL FOOTING REBAR, SEE FOOTING PLAN.

SECTION

TYPICAL WINGWALL (ABUT. 2)

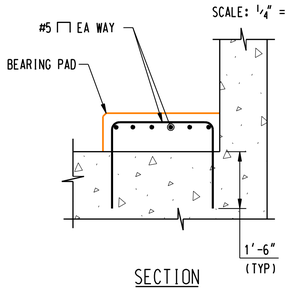
SCALE: 1/4" = 1'-0"



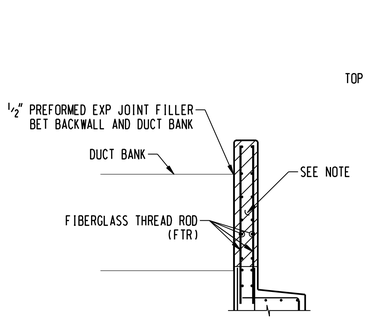
PLAN

PEDESTAL

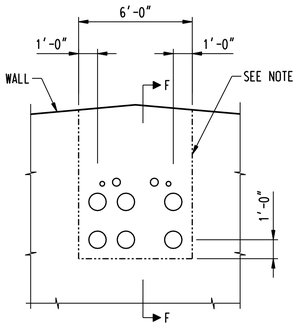
SCALE: 1/2" = 1'-0"



SECTION



SECTION F-F

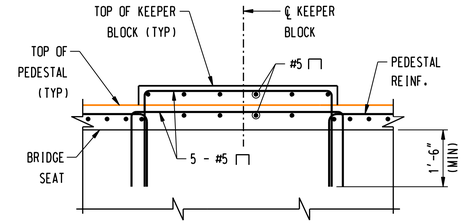


ELEVATION

NOTE:
METALLIC REINFORCEMENT BARS SHALL NOT PASS THROUGH THE AREA SHOWN ON THE PLANS.
FIBERGLASS THREADED RODS (FTR) SHALL BE SUBSTITUTED AS SHOWN.

BACKWALL REINFORCEMENT DETAIL

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



SECTION

KEEPER BLOCK DETAIL

SCALE: 1/2" = 1'-0"

no.	date	revisions	by	chk
2	6/1/06	ISSUED 60% PRELIMINARY	D.Q.	B.K.
1	5/10/06	ISSUED SECOND REVIEW	D.Q.	B.K.

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designed M. BEAULIEU
detailed M .BEAULIEU, C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

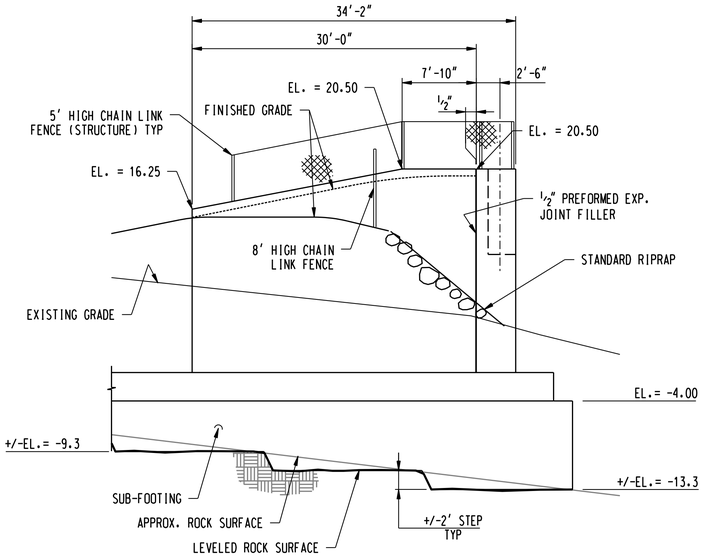
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

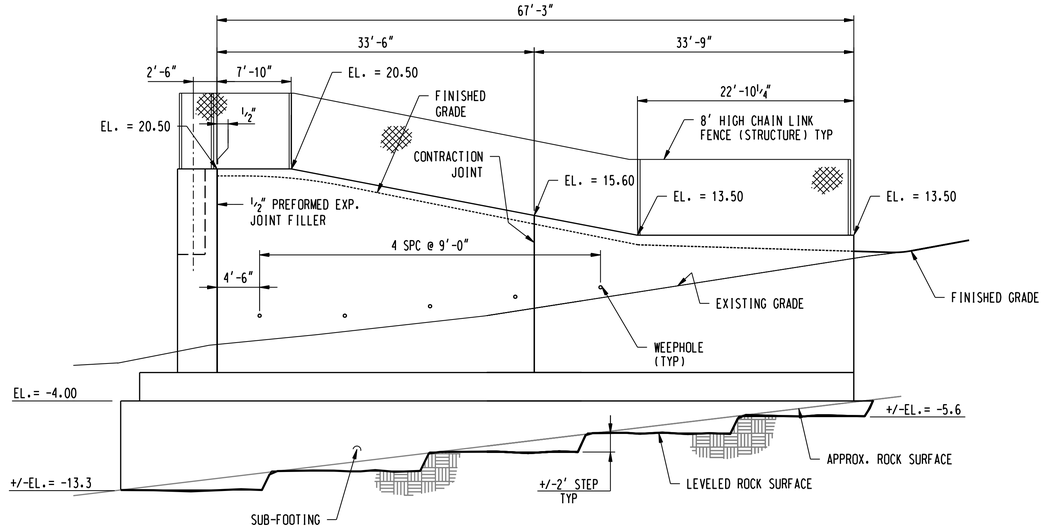
MILL RIVER (SOUTHPORT HARBOR)
ABUTMENT AND WINGWALL SECTIONS

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16303 PG 006	



WINGWALL 1B

SCALE: 1/8" = 1'-0"

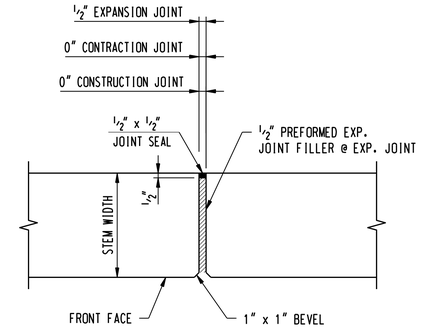


WINGWALL 1A

SCALE: 1/8" = 1'-0"

NOTES:

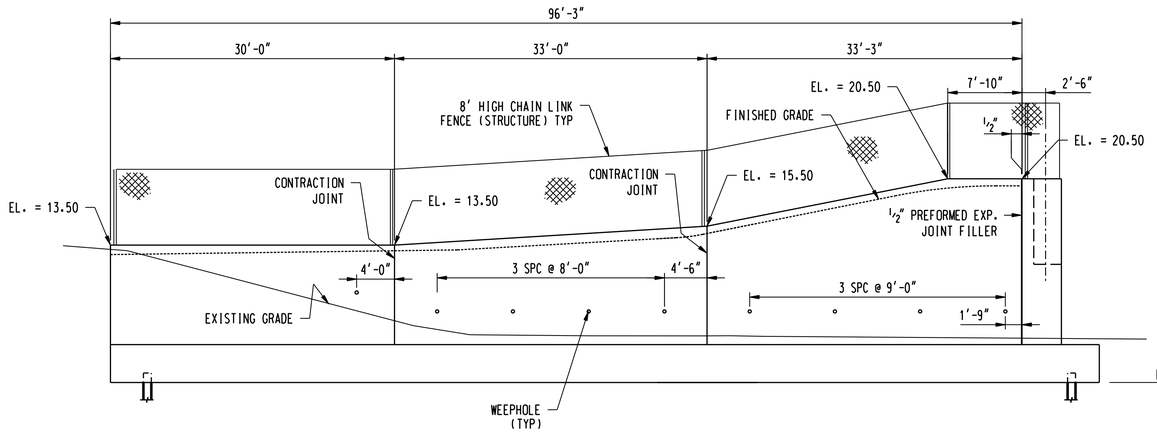
1. FOR TYPICAL WINGWALL SECTION, SEE DWG. NO. 01224-16303 PG 006.
2. FOR FOOTING AND PILE LAYOUT, SEE DWG. NO. 01224-16303 PG 004.
3. THE CONTRACTOR SHALL NOTIFY BL COMPANIES AFTER THE ROCK EXCAVATION IS COMPLETED. NO CONCRETE SHALL BE PLACED UNTIL BL COMPANIES HAVE INSPECTED AND AND APPROVED THE DEPTH OF EXCAVATION AND THE CHARACTER OF THE ROCK FOUNDATION MATERIALS.
4. THE ELEVATION OF BOTTOM OF FOOTINGS, AS SHOWN ON THE PLANS, SHALL BE CONSIDERED AS APPROXIMATE. BL COMPANIES, UPON INSPECTION OF STRUCTURE EXCAVATION, MAY ORDER, IN WRITING, CHANGES IN DIMENSIONS AND/OR ELEVATIONS OF FOOTINGS AS MAY BE NECESSARY TO SECURE A SATISFACTORY FOUNDATION.
5. UNDERWATER CONCRETE PLACEMENT SHALL BE DONE BY MEANS OF A TREME. MEANS AND METHOD OF DEPOSITING CONCRETE UNDER WATER SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES AND WITH ConnDOT STANDARD SPECIFICATIONS FORM 816.



NOTE:
NO REINFORCING BARS SHALL PASS THROUGH EXPANSION OR CONTRACTION JOINTS. REINFORCING BARS SHALL PASS THROUGH CONSTRUCTION JOINTS.

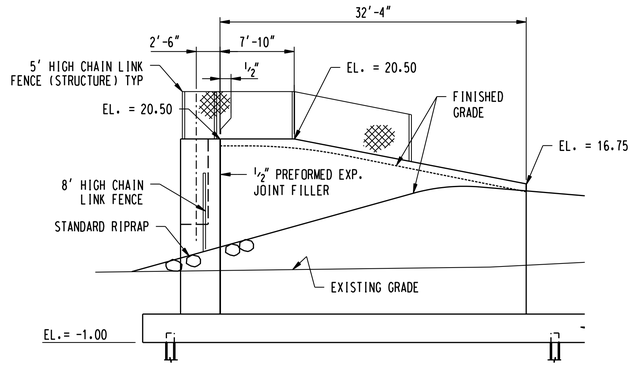
STEM JOINT DETAIL

N.T.S.



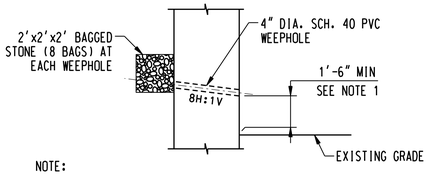
WINGWALL 2A

SCALE: 1/8" = 1'-0"



WINGWALL 2B

SCALE: 1/8" = 1'-0"



NOTE:
1: WEEPHOLE INVERT ELEVATIONS SHOWN ARE SET ABOVE THE DAILY HIGH TIDE ELEVATION.

2. SEE ELEVATION VIEWS FOR LOCATIONS.

TYPICAL WEEPHOLE DETAIL

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

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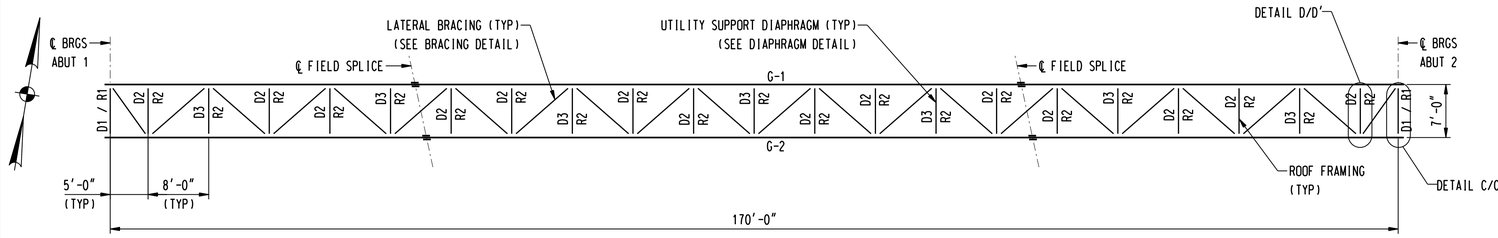
NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

MILL RIVER (SOUTHPORT HARBOR) WINGWALL ELEVATIONS

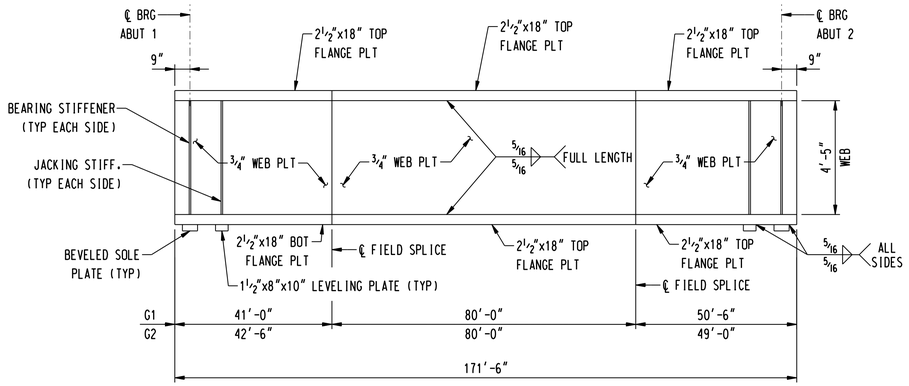
BY	CHKD	APP	APP
DATE	DATE	DATE	DATE
SCALE AS NOTED	D	DWG. NO. 01224-16303 PG 007	



FRAMING PLAN

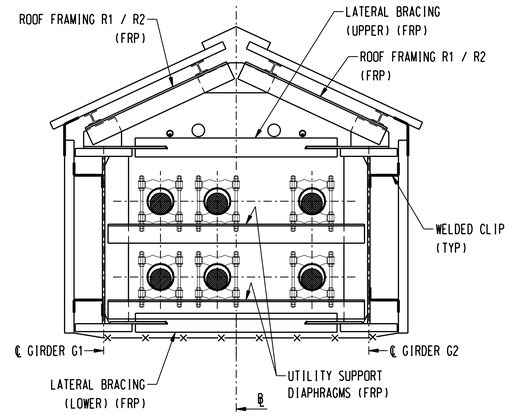
SCALE: 1" = 10'-0"

DEAD LOAD DEFLECTIONS AND CAMBER TABLE							
DEAD LOAD DEFLECTION AT MIDSPAN (in)				CAMBER AT MIDSPAN (in)			
GIRDER	STR STL DEAD LOAD	MISC DEAD LOAD	OTHER DEAD LOADS	TOTAL DEAD LOAD	VERT CURVE ORDINATE	EXTRA CAMBER	TOTAL CAMBER
G1 - G2	4.270	0.700	0.830	5.810	0.000	1.700	7.510



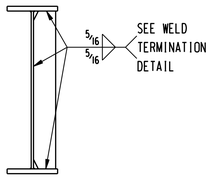
BEAM ELEVATION (G-2 SHOWN)

N.T.S.



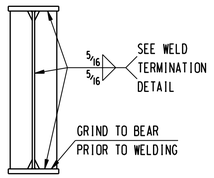
SECTION

SCALE: ½" = 1'-0"



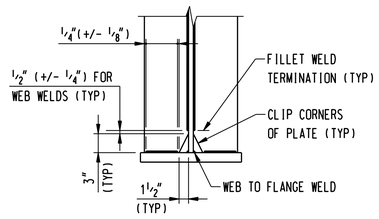
CONNECTION PLATE

N.T.S.



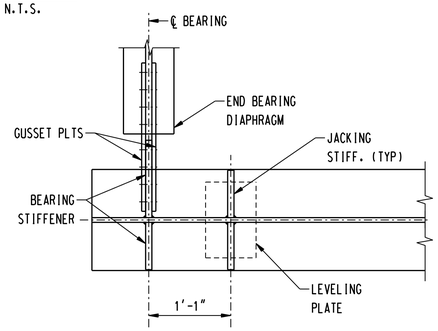
BEARING & JACKING STIFFENER

N.T.S.



WELD TERMINATION DETAIL

N.T.S.



BEARING STIFFENER LAYOUT

N.T.S.

STRUCTURAL STEEL NOTES:

1. STRUCTURAL STEEL (LOW ALLOY) SHALL CONFORM TO AASHTO M270, GRADE 50 T2.
2. ALL FABRICATED STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123.
3. ALL BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325, TYPE 1, EXCEPT AS NOTED OTHERWISE. ALL BOLTS, NUTS, AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.
4. WELDING DETAILS, PROCEDURES, AND TESTING METHODS SHALL CONFORM TO THE ANSI/AASHTO/AWS D1.5:2002 - BRIDGE WELDING CODE, UNLESS OTHERWISE NOTED ON THE PLANS.
5. BOLTED FIELD SPLICES, OTHER THAN THOSE INDICATED ON THE PLANS, WILL NOT BE ALLOWED EXCEPT WITH THE WRITTEN PERMISSION OF THE ENGINEER PRIOR TO THE SUBMISSION OF SHOP PLANS. IF ALLOWED, THESE SPLICES SHALL BE DESIGNED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE COST OF THESE SPLICES, INCLUDING THE COST OF DESIGN, SHALL BE AT NO EXTRA EXPENSE TO THE OWNER. WELDED FIELD SPLICES WILL NOT BE ALLOWED.
6. ALL WEB TO FLANGE, WEB TO BEARING STIFFENER, AND BEARING STIFFENER TO FLANGE FILLET WELDS SHALL BE INSPECTED BY THE MAGNETIC PARTICLE METHOD.
7. MULTIPLE PASS WELDS, INSPECTED BY THE MAGNETIC PARTICLE METHOD, SHALL HAVE EACH PASS OR LAYER INSPECTED AND ACCEPTED BEFORE PROCEEDING TO THE NEXT PASS OR PAYER, AS DETERMINED BY THE ENGINEER.
8. SHOP WEB SPLICES SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF THE SPAN.
9. SHOP FLANGE SPLICES SHALL BE LOCATED A MINIMUM OF SIX INCHES FROM WEB SPLICES.
10. FLANGE AND WEB SPLICES SHALL BE LOCATED A MINIMUM OF SIX INCHES FROM STIFFENERS AND CONNECTION PLATES.
11. BEARING STIFFENERS AND ENDS OF GIRDERS SHALL BE VERTICAL AFTER APPLICATION OF FULL DEAD LOADS.
12. THE STRUCTURAL STEEL FABRICATORS SHALL BE CERTIFIED UNDER THE AISC QUALITY CONTROL PROGRAM AS "CATEGORY MBr - MAJOR STEEL BRIDGES".
13. THE CONTRACTOR SHALL TAKE PROPER PRECAUTIONS TO ENSURE THE STABILITY OF ALL STRUCTURAL ELEMENTS UNTIL THE TOTAL STRUCTURE IS IN BEING.

NOTES:

1. ALL DIMENSIONS ARE HORIZONTAL AND MEASURED ALONG THE CENTERLINE OF THE WEB.
2. BEARING STIFFENERS SHALL BE PROVIDED ON BOTH SIDES OF THE WEB.
3. END BEARING DIAPHRAGMS SHALL BE PARALLEL TO THE CENTERLINE OF BEARINGS OF THE STRUCTURE.
4. INTERMEDIATE CONNECTIONS PLATES SHALL BE PERPENDICULAR TO THE GIRDERS.
5. FOR BEARING DETAILS, SEE DWG. NO. 01224-16303 PG 011.
6. FOR DIMENSIONS OF BEVELED SOLE PLATES, SEE DWG. NO. 01224-16303 PG 011.

CAMBER NOTES:

1. STRUCTURAL STEEL DEAD LOAD DEFLECTION INCLUDES WEIGHTS OF GIRDERS, FIBERGLASS DIAPHRAGMS, AND ROOF FRAMING.
2. MISCELLANEOUS DEAD LOAD DEFLECTION INCLUDES WEIGHTS OF ALUMINUM CLADDING AND ROOFING MATERIALS.
3. OTHER DEAD LOAD DEFLECTION INCLUDES THE WEIGHT OF UTILITIES.
4. TOTAL CAMBER APPLIES TO THE TOP OF WEB AT MID-SPAN AND IS MEASURED FROM THE CAMBER REFERENCE LINE.
5. THE CAMBER REFERENCE LINE IS THE STRAIGHT LINE CONNECTING THE TOP OF WEB AT CENTERLINE OF BEARINGS FROM ONE ABUTMENT TO THE OTHER.

FIBERGLASS STRUCTURAL SHAPE NOTES:

1. ALL FIBERGLASS REINFORCED POLYMER (FRP) STRUCTURAL SHAPE PRODUCTS SHALL CONFORM TO THE MANUFACTURER'S SPECIFICATIONS. STRUCTURAL SHAPES AND PLATES SHALL BE MADE FROM VINYL ESTER RESIN WITH FIRE RETARDANT ADDITIVES TO MEET A FLAME RATING OF LESS THAN 25 PER ASTM E-84 TEST METHOD AND MEET THE SELF-EXTINGUISHING REQUIREMENTS OF ASTM D-635.
2. ALL FIBERGLASS STRUCTURAL SHAPES AND PLATES SHALL BE OF THE EXTREN SERIES 625 FIBERGLASS STRUCTURAL SHAPES BY STRONGWELL, OR APPROVED EQUAL.

   MANUFACTURER INFORMATION: STRONGWELL - BRISTOL DIVISION
   400 COMMONWEALTH AVE.
   P.O. BOX 580
   BRISTOL, VA 24203
   TEL. (276) 645-8000

3. ALL FRP STRUCTURAL SHAPE PRODUCTS SHALL CONTAIN A ONE-MIL MINIMUM COATING OF U.V. INHIBITOR.
4. COLOR OF FRP STRUCTURAL SHAPE PRODUCTS SHALL BE GRAY, OR OF COLOR WITH LOW VISIBILITY, OR AS APPROVED BY THE ENGINEER.
5. THE CONTRACTOR SHALL PROTECT FABRICATED FRP UNITS TO PREVENT DAMAGE DURING HANDLING, SHIPPING, AND ON-SITE STORAGE PRIOR TO INSTALLATION. MATERIALS, WHICH ARE, IN THE OPINION OF THE ENGINEER, DAMAGED AS TO BE UNFIT FOR USE, SHALL BE REMOVED FROM THE PROJECT SITE AND PROMPTLY REPLACED BY THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.

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detailed C. CHUANG
designed A. GRZADZIEL, C. CHUANG
checked D. QUINIT / B. KUTA

MF	NO.	DATE	REVISIONS	BY	CHK	APP	APP

NORTHEAST UTILITIES SERVICE CO.

FOR THE CONNECTICUT LIGHT & POWER COMPANY

TITLE MIDDLETOWN–NORWALK 345kV TRANSMISSION PROJECT

MILL RIVER (SOUTHPORT HARBOR)
FRAMING PLAN & STRUCTURAL NOTES

BY	CHKD	APP	APP
DATE	DATE	DATE	DATE

SCALE AS NOTED | D | DWG. NO. 01224-16303 PG 008