US Army Corps of Engineers ®
Chicago District

BUBBLY CREEK, SOUTH BRANCH OF THE CHICAGO RIVER, ILLINOIS FEASIBILITY STUDY

APPENDIX C
CIVIL DESIGN

DRAFT - NOT FOR DISTRIBUTION

APRIL 2015

BUBBLY CREEK, SOUTH BRANCH OF THE CHICAGO RIVER, ILLINOIS
ECOSYSTEM RESTORATION FEASIBILITY STUDY

APPENDIX C – CIVIL DESIGN

April 2015

List of Attachments

Attachment 1: Civil Design Appendix
Attachment 2: VE Study Civil Quantities
Attachment 3: VE Study Drawings

Attachment 1:

Civil Design Appendix

BUBBLY CREEK ECOSYSTEM RESTORATION – SECTION 206
CHICAGO, IL

APPENDIX C – CIVIL DESIGN

September 17, 2013
Revised September 3, 2014

GENERAL

Purpose and Scope

The purpose of this Appendix is to: 1) discuss existing survey, utility and topographic information; 2) describe design criteria, engineering methods and procedures that were used to layout the project features shown on the civil drawings; 3) present the requirement for the needed real estate; and 4) present the methods used and calculations developed for construction quantities.

DESIGN ANALYSIS

General

The main report discusses the alternatives considered for this report. This design analysis will only cover the recommended plan which involves the placement two substrate restoration sections on the riverbed. The first is a round river rock substrate restoration section (6 inches of rock on 6 inches of sand) between stations 0+00 to 41+00, and station 71+50 to the end of the turning basin. The second is placement of a quarried stone substrate restoration section (6 inches of stone on 6 inches of sand) between stations 41+00 to 71+50. The side slopes of the riverbank (generally ranging from 1:1 to 3:1) will be planted with riparian and emergent seeds and plugs. Other restoration features include woody debris piles, pebble/cobble placement in select areas, and submergent plant habitats.

Survey and Mapping

Although not shown on the civil drawings, the existing topographic contours were created from a LIDAR survey of Cook County. The 1-foot contours of the survey represent the general slopes of the terrain. A bathymetric survey was performed on the river bottom and was also taken from the Cook County GIS database. Also not shown is the mapping for the parcels and easements which are ESRI Shape File format in Illinois State Plane Projection, and NAD83 Datum provided by Cook County. This information will be used in the design phase for general GIS applications and should not to be used in place of a field survey to determine precise location of features and boundaries for any engineering design, legal, or regulatory purposes.

Access/Staging/Storage

The majority of access to and staging for the project area will be made by a barge on the South Branch Chicago River. Vehicle access to the east bank can be made from public roads and alleys

identified on the civil drawings. Measures need to be taken for removing and replacing fence when accessing the riverbanks from land. Coordination with MRWD is required to access the site by land through the RAPS if necessary. There are 4 bridges along Bubbly Creek—CTA and METRA railroad bridge, I-55, Archer Avenue, and W. 35th Street. No as-built information on clearance height is provided. The main report identifies general heights and lengths for these bridges. Any damaged areas or structures will be restored to previous condition.

Utilities

Combined sewer and watermain utility CADD files obtain from the City of Chicago GIS database were available in the vicinity. However, no pipe size or invert elevation information was given. Based on the scope of the project, it is anticipated that there will be no impacts to utilities.

Quantity Calculations

Substrate restoration areas were calculated using Microstation. ArcGIS shapefiles, developed by PM-PL, were imported into Microstation and measured. Substrate restoration volume was computed by applying the section thicknesses to the area. ArcGIS shapefiles for woody debris and riprap were also provided by PM-PL and imported into the drawings.

Attachment 2:

VE Study Civil Quantities

US Army Corps of Engineers® Chicago District	PROJECT TITLE: **BUBBLY CREEK RESTORATION SECTION 206**	COMPUTED BY: **DGA**	DATE: **08/12/13 Rev 08/27/14**	SHEET: of
	COMPUTATION TITLE: **VE STUDY CIVIL QUANTITIES**	CHECKED BY: **A**	DATE: **09/09/13**	

Quantities were calculated from *pw:\\LRC-AP02CHI.lrc.ds.usace.army.mil:lrc-ap02chi.lrc.ds.usace.army.mil\Documents\Projects\South Fork South Branch Chicago River\Bubbly Creek Sect 206\Civil Design\Drawings-Solicitation\Working Files\NER-Quantity-Calc.dgn*

Restoration areas and NER measures were imported into MicroStation from shapefiles found in -
J:\LRC_Projects\PRJ_Bubbly_Creek\Shapefiles\BC_LWD_Measure_2013_05.shp
J:\LRC_Projects\PRJ_Bubbly_Creek\PRJ_BubblyCreek.gdb\BC_Eco_Measures_NER
J:\LRC_Projects\PRJ_Bubbly_Creek\PRJ_BubblyCreek.gdb\Bubbly_Area_SHK

SUBSTRATE RESTORATION QUANTITIES

Total Substrate Area = 1338173.3 sf = **30.7 acres** (Round River Rock 21.04 acres + Quarried Stone 9.68 acres)

Round River Rock Vol = 277441.1 sf + 639142.2 sf = 916583.3 sf × 6" = 458291.7 cf ÷ 27 = 16973.8 cy – 30% voids = 11881.7 cy × 1.5 = 17822.5 tons + 25% contingency = 22278.1 tons **Use 22280 tons**

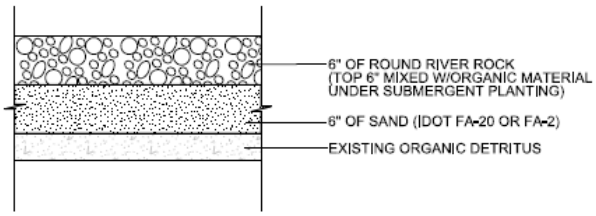
Quarried Stone Vol = 421590 sf × 6" = 210795 cf ÷ 27 = 7807.2 cy – 30% voids = 5465.1 cy × 1.5 = 8197.6 tons + 25% contingency = 10247 tons **Use 10250 tons**

(Geotech has confirmed 30% voids is appropriate)

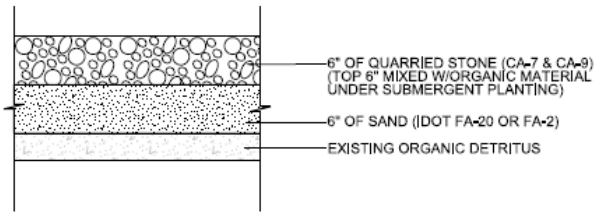
Sand Vol = 1338173.3 sf × 6" = 669086.7 cf ÷ 27 = 24781 cy + 25% contingency = 30976 cy **Use 30980 cy**

Pebble/Cobble Vol = 10890 sf × 18" = 16335 cf ÷ 27 = 605 cy – 30% voids = 423.5 cy × 1.5 = 635.3 tons + 25% contingency = 794.1 tons **Use 795 tons**

(Pebble/Cobble added into the substrate section in certain areas along the river)



SUBSTRATE RESTORATION SECTION
ROUND RIVER ROCK



SUBSTRATE RESTORATION SECTION
QUARRIED STONE

Assumptions: substrate area does not consistently match the NWL of 577.3 shown on the civil drawings.

~~Pebble Bed Vol = 10890 sf × 18" = 16335 cf ÷ 27 = 605 cy – 30% voids = 423.5 cy × 1.5 = 635.3 tons + 25% contingency = 794.1 tons **Use 795 tons**~~

PLANTING HABITAT QUANTITIES

Invasive Species Removal Area = 44213.2 + 125889.9 + 73964.8 + 102583.8 + 36078.9 + 20136 = 402866.6 sf = **9.25 acres**

Riparian Area = 44213.2 + 125889.9 + 73964.8 + 102583.8 + 36078.9 + 20136 = 402866.6 sf = **9.25 acres**

Emergent Area = 7101.8 + 18224.7 + 4968.8 + 12285.8 + 2870.6 = 45451.7 sf = **1.04 acres**

Submergent Area = 24074.1 + 81651.9 + 10155.1 + 16413.4 + 9551 + 2597.5 = 144443 sf = **3.32 acres**

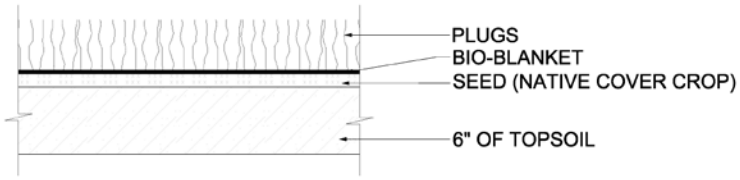
Large Woody Debris (from PM-PL) = **10 piles**

- Size of piles undetermined at this time

Topsoil for Emergent/Riparian Areas

Area = 65587.8 sf (emergent) + 382712.4 sf (riparian) = 448300.2 sf = 10.29 acres

Vol = 448300.2 sf × 6” = 224150.1 cf ÷ 27 = 8301.9 cy + 25% contingency = 10377.4 cy **Use 10380 cy**



EMERGENT/RIPARIAN PLANTING SECTION

RIPRAP REMOVAL QUANTITY

Assume 18” of riprap 5’ wide at 755’ length

Vol = 1.5’ × 5’ × 755’ = 5662.5 cf ÷ 27 = 209.7 cy × 1.5 = **315 tons**

Attachment 3:

VE Study Drawings

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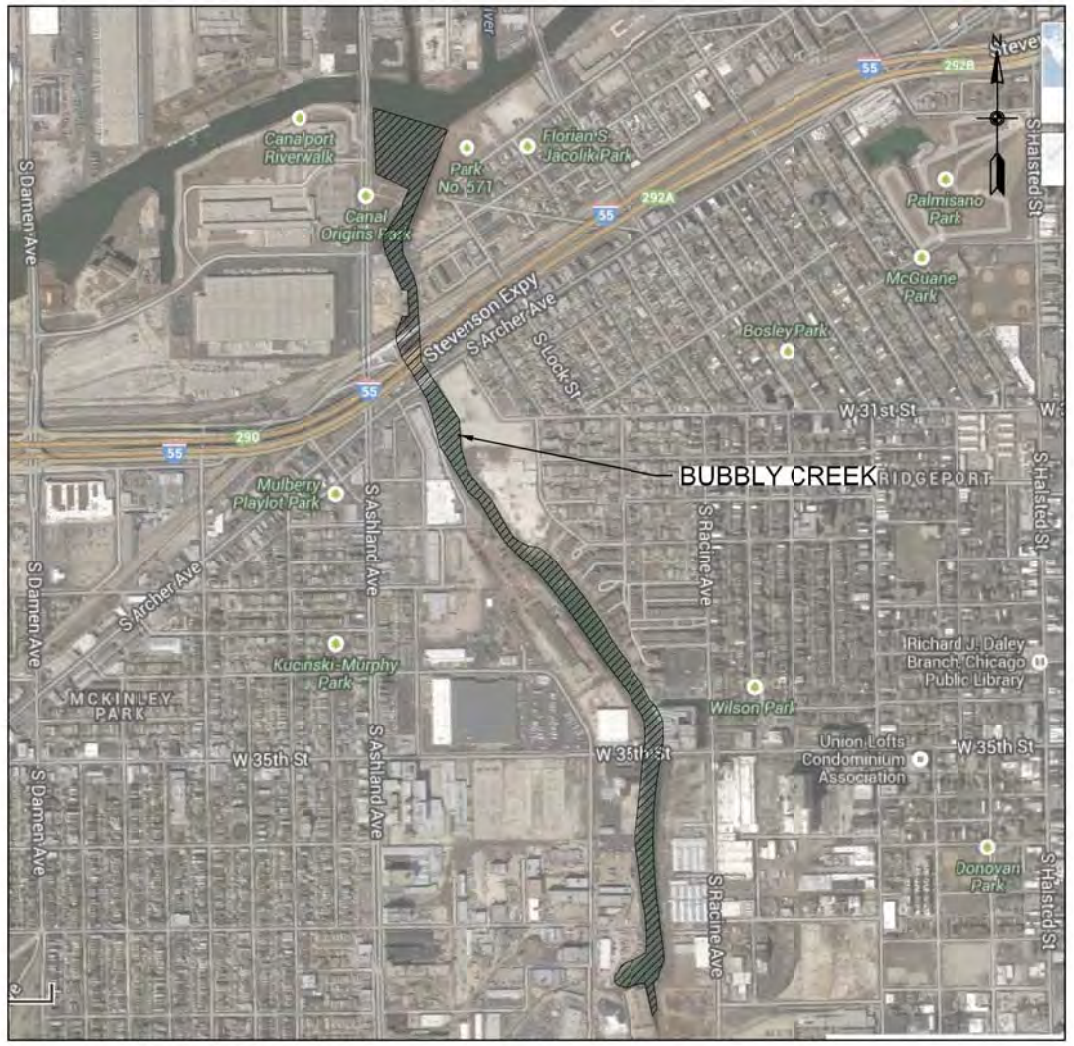
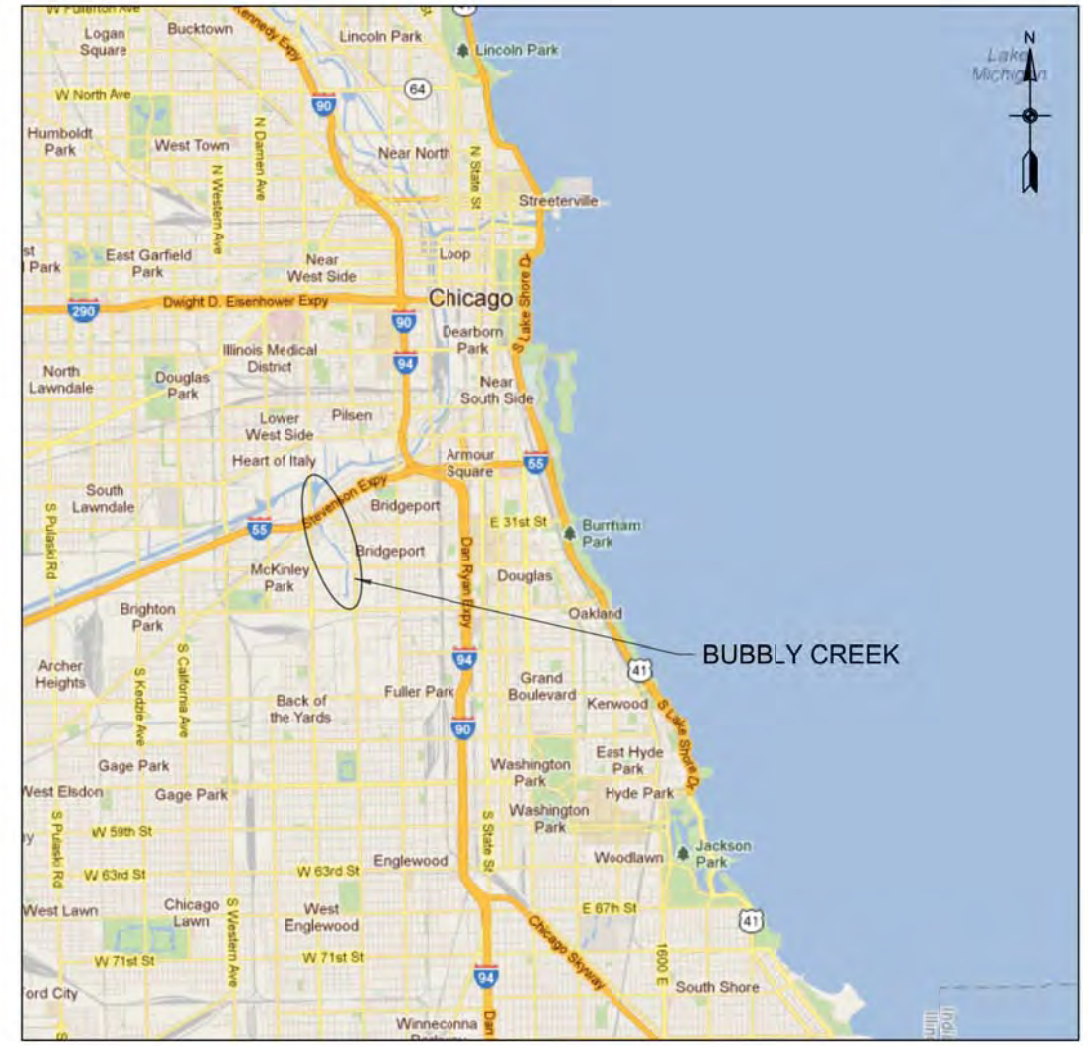
SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
ECOSYSTEM RESTORATION
CHICAGO, ILLINOIS



LOCATION MAP
(N.T.S.)



VICINITY MAP
(N.T.S.)

Preliminary Submittal
September 2014

THIS PROJECT WAS DESIGNED BY THE CHICAGO DISTRICT CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152. SIGNATURES INDICATE OFFICIAL RECOMMENDATION OF ALL DRAWINGS IN THIS SET

REVIEWED BY:

ATR TEAM LEADER DATE

SIGNATURE AFFIXED BELOW INDICATE OFFICAL RECOMMENDATION AND APPROVAL FOR ALL DRAWINGS CONTAINED IN THE SHEET INDEX

APPROVAL RECOMMENDED BY:

PROJECT MANAGER DATE

APPROVED BY:

CHIEF, DESIGN BRANCH DATE

US Army Corps
of Engineers
Chicago District

MARK	DESCRIPTION	TRACKING NO	ACTION	DATE	MARK	DESCRIPTION	TRACKING NO	ACTION	DATE

DESIGNED BY: DGA
DATE: AUGUST 2014
DWN BY: D.B
CKD BY: CKB
SOLICITATION NO.: SOL-06-B-NUMB
SUBMITTED BY: JOHN A. GROBOSKI, P.E.
CONTRACT NO.: CON-06-B-NUMB
PLOT SCALE: AS SHOWN
PLOT DATE: 8/27/2014
FILE NUMBER: BC00FPY12PS
SIZE: ANSI D
FILE NAME: BC00FPY12PS_G-001.dgn

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

TITLE SHEET,
LOCATION, AND VICINITY MAPS

SHEET
IDENTIFICATION
G-001
01 OF 15

SHEET INDEX

SHEET NO.	SHEET I.D.	SHEET TITLE
1	G-001	TITLE SHEET, LOCATION, AND VICINITY MAPS
2	G-002	SHEET INDEX, GENERAL NOTES, AND ABBREVIATIONS
3	C-100	KEY MAP
4	C-101	RESTORATION PLAN - BUBBLY CREEK STA. 0+00 TO STA. 10+00
5	C-102	RESTORATION PLAN - BUBBLY CREEK STA. 10+00 TO STA. 18+00
6	C-103	RESTORATION PLAN - BUBBLY CREEK STA. 18+00 TO STA. 26+00
7	C-104	RESTORATION PLAN - BUBBLY CREEK STA. 26+00 TO STA. 34+00
8	C-105	RESTORATION PLAN - BUBBLY CREEK STA. 34+00 TO STA. 42+00
9	C-106	RESTORATION PLAN - BUBBLY CREEK STA. 42+00 TO STA. 50+00
10	C-107	RESTORATION PLAN - BUBBLY CREEK STA. 50+00 TO STA. 58+00
11	C-108	RESTORATION PLAN - BUBBLY CREEK STA. 58+00 TO STA. 66+00
12	C-109	RESTORATION PLAN - BUBBLY CREEK STA. 66+00 TO STA. 72+00
13	C-110	RESTORATION PLAN - BUBBLY CREEK STA. 72+00 TO STA. 76+23
14	C-111	RESTORATION PLAN - BUBBLY CREEK TURNING BASIN
15	C-301	RESTORATION CROSS-SECTIONS

ABBREVIATIONS

AC-FT	ACRE FEET	IN	INLET
APPROX.	APPROXIMATELY	LF	LINEAR FEET
B/P	BOTTOM OF PIPE	MH	MANHOLE
BM	BENCH MARK	MIN.	MINIMUM
CB	CATCH BASIN	N	NORTH
℄	CENTERLINE	NAVD	NORTH AMERICAN VERTICAL DATUM
COR	CONTRACTING OFFICER'S REPRESENTATIVE	N.T.S.	NOT TO SCALE
		NWL	NORMAL WATER ELEVATION
COE	CORPS OF ENGINEERS	PROP.	PROPOSED
CMP	CORRUGATED METAL PIPE	RCP	REINFORCED CONCRETE PIPE
DIA.	DIAMETER	S	SOUTH
D.I.P.	DUCTILE IRON PIPE	SAN	SANITARY
DWG.	DRAWING	SQ-FT	SQUARE FEET
E	EAST	ST	STORM
ELEV	ELEVATION	T/P	TOP OF PIPE
EXIST.	EXISTING	TYP	TYPICAL
FES	FLARED END SECTION	VIF	VERIFY IN FIELD
F&G	FRAME AND GRATE	W	WEST
FH	FIRE HYDRANT	W/	WITH
H	HORIZONTAL	W/O	WITHOUT
HWL	HIGH WATER ELEVATION		
IE	INVERT ELEVATION		

GENERAL NOTES

1. ALL COORDINATES SHOWN ARE REFERENCED TO THE ILLINOIS STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM (NAD) 1983 (U.S. FEET).
2. ALL ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988 (U.S. FEET).
3. CONSTRUCTION AND RESTORATION ACTIVITIES SHALL BE PERFORMED BY WAY OF ACCESS FROM BUBBLY CREEK.
4. PLACEMENT OF THE SUBSTRATE RESTORATION SHALL BE DONE IN LIFTS AND NOT DUMPED FROM A SCOW OR DROPPED FROM A BUCKET.
5. CONTRACTOR SHALL INSTALL, INSPECT, AND MAINTAIN ALL ENVIRONMENTAL PROTECTION MEASURES INCLUDING BUT NOT LIMITED TO TURBIDITY CONTROL DEVICES.

HABITAT MEASURES

INVASIVE SPECIES REMOVAL	8.79 ACRES
RIPARIAN PLANTING	9.25 ACRES
EMERGENT PLANTING	1.0 ACRES
SUBMERGENT PLANTING	3.3 ACRES
WOODY DEBRIS	10 PILES
SUBSTRATE RESTORATION ROUND RIVER ROCK	21.0ACRES
SUBSTRATE RESTORATION QUARRIED STONE	9.7 ACRES
PEBBLE/COBBLE RESTORATION	0.25 ACRES

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Chicago District

MARK	DESCRIPTION	TRACKING NO.	ACTION	DATE

MARK	DESCRIPTION	TRACKING NO.	ACTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: DJB.
CKD BY: CKB
SUBMITTED BY: JOHN A. GRABOSKI P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: 8/27/2014
SIZE: ANSI D
FILE NAME: BCOOFFY12PS_G-002.dgn
DATE: AUGUST 2014
SOLICITATION NO.: SOL-06-B-NUMB
CONTRACT NO.: CON-06-B-NUMB
FILE NUMBER: BCOOFFY12PS

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

SHEET INDEX, GENERAL NOTES, AND ABBREVIATIONS

SHEET IDENTIFICATION
G-002
SHEET 02 OF 15

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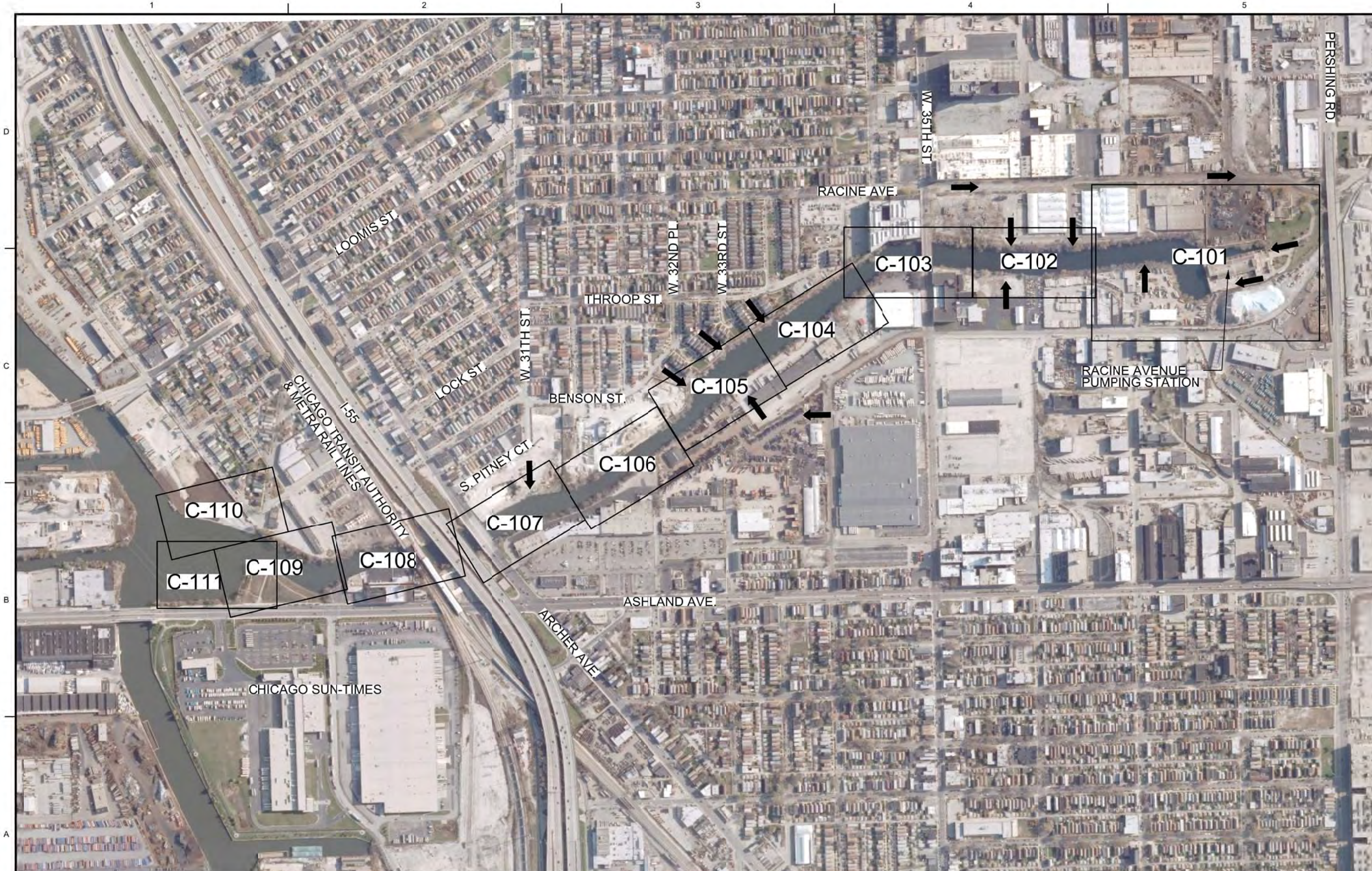


US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	DATE	APPR.	CHK.	DESIGN	CHECK	REVISION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DCA
DWN BY: D.B.
CKD BY: CKB
SUBMITTED BY: JOHN A. GROSSKOPF, P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: 1/7/2015
FILE NAME: SCSOFP1CKB_C-01-06-02.dgn
SIZE: ANSI D
DATE: AUGUST 2014
SOLICITATION NO.: SOL-06-B-NUMB
CONTRACT NO.: CON-06-B-NUMB
FILE NUMBER: ESOFP1-06-2
SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

KEY MAP

SHEET IDENTIFICATION
C-100
SHEET 03 OF 15

LEGEND

- RIPARIAN PLANTING
- EMERGENT PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- WOODY DEBRIS
- EXISTING RIPRAP TO BE REMOVED
- SUBSTRATE RESTORATION ROUND RIVER ROCK

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.
2. DISPOSE OF RIPRAP TO AN APPROVED DISPOSAL SITE.

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	PARK	JT. E	PROJ. NO.	PROJ. CO.	DATE	ACTION	CHECK NO.	DESCRIPTION

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.B.
CKD BY: CKG
SUBMITTED BY: JOHN A. URDIGIAN, P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: 11/07/2014
FILE NAME: BCKSUPPYORS_CH101SP.DGN
DATE: AUGUST 2014
SOLICITATION NO.: SOL09-BA10AB
CONTRACT NO.: CDN4-B-A1AB
FILE NUMBER: 2009PY1205
SHEET MADE BY: BCKSUPPYORS_CH101SP.DGN

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 0+00 TO STA. 10+00

SHEET IDENTIFICATION
C-101
04 OF 15

LEGEND

- RIPARIAN PLANTING
- EMERGENT PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- WOODY DEBRIS
- SUBSTRATE RESTORATION ROUND RIVER ROCK

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	PLOT	PLOT DATE	PLOT SCALE	REVISION	ACTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.B.
CKD BY: CKG
SUBMITTED BY: JOHN A. URDISHON, P.E.
DATE: AUGUST 2014
SOLICITATION NO.: SOL-05-BHAUMB
CONTRACT NO.: CON-06-BAUMB
PLOT SCALE: 1:1
PLOT DATE: 8/29/2014
FILE NUMBER: 4-2-0-0-1
SIZE: ANSI D
FILE NAME: BCSOUPFY12-P3_C-103SP.dgn

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 10+00 TO STA. 18+00

SHEET IDENTIFICATION
C-102
SHEET 05 OF 15

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.
2. DISPOSE OF RIPRAP TO AN APPROVED DISPOSAL SITE.

LEGEND

- RIPARIAN PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- SUBSTRATE RESTORATION ROUND RIVER ROCK
- EXISTING RIPRAP TO BE REMOVED

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	PROJ. NO.	PROJ. CO.	INIT.	APPR.	DESCRIPTION	CHECK NO.	SECTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.B.
CKD BY: DKB
SUBMITTED BY: JOHN A. GRONSKI, P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: AS SHOWN
FILE NAME: SCS\PPT\CR5_C-103.dgn
DATE: AUGUST 2014
SOLICITATION NO.: SOL\06\BHAMB
CONTRACT NO.: CON\06\LOAMB
FILE NUMBER: SCS\PPT\CR5
SIZE: ANSI D

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 18+00 TO STA. 26+00

SHEET IDENTIFICATION
C-103
SHEET 06 OF 15

NOTES

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

LEGEND

- RIPARIAN PLANTING
- EMERGENT PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- WOODY DEBRIS
- SUBSTRATE RESTORATION ROUND RIVER ROCK

SCALE: 1" = 30'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	DATE	APPR.	CHK'D	DRAWN	DESIGN VER.	ACTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: LLG
CKD BY: CKB
SUBMITTED BY: JOHN A. GRONSKI, P.E.
PLOT SCALE: AS STATED
PLOT DATE: AS STATED
SIZE: ANSI D
FILE NAME: BCSUPPY1206_C-103PP.DWG
DATE: AUGUST 2014
SOLICITATION NO.: SOL16B4AMB
CONTRACT NO.: CON16B4AMB
FILE NUMBER: 2006PY1206

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 26+00 TO STA. 34+00

SHEET IDENTIFICATION
C-104
SHEET 07 OF 15

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

LEGEND

- RIPARIAN PLANTING
- EMERGENT PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- WOODY DEBRIS
- SUBSTRATE RESTORATION ROUND RIVER ROCK
- SUBSTRATE RESTORATION QUARRIED STONE

N

1" = 30'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	PROJ. NO.	PROJ. CO.	BY	DATE	APPR.	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.B.
CKD BY: CKG
SUBMITTED BY: John A. Gibbons, P.E.
DATE: AUGUST 2014
SOLICITATION NO.: SOL06/BHUMB
CONTRACT NO.: CON06/0AUMB
PLOT SCALE: 1" = 30'
PLOT DATE: 8/28/2014
FILE NUMBER: 4-2-00704
SIZE: ANSI D
FILE NAME: BCSUPPY12P5_CH105P.dgn

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 34+00 TO STA. 42+00

SHEET IDENTIFICATION
C-105
SHEET 08 OF 15

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

LEGEND

- RIPARIAN PLANTING
- INVASIVE SPECIES REMOVAL
- WOODY DEBRIS
- SUBSTRATE RESTORATION QUARRIED STONE

SCALE: 1" = 30'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	APPD.	DATE	REVISION NO.	DESCRIPTION	APPD.	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: LLB
CKD BY: CKB
SUBMITTED BY: JOHN A. GRONSKI, P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: AS SHOWN
DATE: AUGUST 2014
SOLICITATION NO.: SOL16-B-AAMB
CONTRACT NO.: CON16-B-AAMB
FILE NUMBER: 2009-P1-206
SIZE: 24X36 in
FILE NAME: BCS(P1)206_C-105(P1)06

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 42+00 TO STA. 50+00

SHEET IDENTIFICATION
C-106
SHEET 09 OF 15

LEGEND

- RIPARIAN PLANTING
- INVASIVE SPECIES REMOVAL
- SUBSTRATE RESTORATION QUARRIED STONE

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

0 20' 40'

SCALE: 1" = 20'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	DATE	APPR.	PROJ. NO.	PROJ. CODE	DESIGN	CHECK	SECTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.E.
CKD BY: CKB
SUBMITTED BY: JOHN A. GRONSKI, P.E.
DATE: AUGUST 2014
SOLICITATION NO.: SOL16-B-R/MB
CONTRACT NO.: CON16-B-R/MB
PLOT SCALE: AS STATED
PLOT DATE: AS STATED
FILE NUMBER: 200-FP-F1205
SIZE: 24X36 D
FILE NAME: BCS/FP/1205_C-107-SP.dgn

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 50+00 TO STA. 58+00

SHEET IDENTIFICATION
C-107
SHEET 10 OF 15

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.
2. DISPOSE OF RIPRAP TO AN APPROVED DISPOSAL SITE.

LEGEND

- RIPARIAN PLANTING
- INVASIVE SPECIES REMOVAL
- WOODY DEBRIS
- SUBSTRATE RESTORATION QUARRIED STONE
- EXISTING RIPRAP TO BE REMOVED

SCALE: 1" = 30'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	PROJ. NO.	PROJ. NO.	DRAWN	DESCRIPTION	CHECK NO.	SECTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: LDB
CKD BY: DKB
SUBMITTED BY: JOHN A. URDINSKY, P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: 8/29/2014
SIZE: ANSI D
FILE NAME: SOUTHFORK_C-108SP.dwg
DATE: AUGUST 2014
SOLICITATION NO.: SOL-09-B-NAM-B
CONTRACT NO.: CONA-09-B-NAM-B
FILE NUMBER: [illegible]

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 58+00 TO STA. 66+00

SHEET IDENTIFICATION
C-108
SHEET 11 OF 15

MATCHLINE SHEET C-110 @ STA. 72+00

MATCHLINE SHEET C-108 @ STA. 66+00

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.
2. DISPOSE OF RIPRAP TO AN APPROVED DISPOSAL SITE.

LEGEND

- RIPARIAN PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- SUBSTRATE RESTORATION ROUND RIVER ROCK
- EXISTING RIPRAP TO BE REMOVED
- SUBSTRATE RESTORATION QUARRIED STONE

SCALE: 1" = 30'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	APPR.	CHK.	DR.	DESIGN	CHK.	REVISION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.E.
CKD BY: CKB
SUBMITTED BY: JOHN A. GRONSKI, P.E.
DATE: AUGUST 2014
SOLICITATION NO.: SOL16B4AMB
CONTRACT NO.: CON16B4AMB
PLOT SCALE: AS SHOWN
PLOT DATE: 8/27/2014
FILE NAME: BCSUPPY1206_C-109RP.dgn
FILE NUMBER: BCSUPPY1206
SIZE: ANSI D

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 66+00 TO 72+00

SHEET IDENTIFICATION
C-109
SHEET 12 OF 15

MATCHLINE SHEET C-109 @ STA. 72+00

LEGEND

- RIPARIAN PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- SUBSTRATE RESTORATION ROUND RIVER ROCK
- SUBSTRATE RESTORATION QUARRIED STONE

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

SCALE: 1" = 30'

US Army Corps of Engineers Chicago District

MARK	DESCRIPTION	PROJ. NO.	PROJ. CO.	INIT.	DESCRIPTION	CHECK NO.	SECTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: D.B.
CKD BY: CKB
SUBMITTED BY: John A. Gibbons, P.E.
PLOT SCALE: 1:1
PLOT DATE: 8/28/2014
FILE NUMBER: 4(2)-(1)-(1)
SIZE: ANSI D
FILE NAME: BCSouthFork_C-110SP.dgn
DATE: AUGUST 2014
SOLICITATION NO.: SOL-00-BHUMB
CONTRACT NO.: CON-00-BAUMB
FILE NUMBER: 4(2)-(1)-(1)

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK STA. 72+00 TO 76+23

SHEET IDENTIFICATION
C-110
SHEET 13 OF 15

NOTES:

1. SEE SHEET C-301 FOR RESTORATION CROSS-SECTIONS.

LEGEND

- RIPARIAN PLANTING
- SUBMERGENT PLANTING
- INVASIVE SPECIES REMOVAL
- SUBSTRATE RESTORATION ROUND RIVER ROCK
- SUBSTRATE RESTORATION QUARRIED STONE

SCALE 1" = 30'

US Army Corps of Engineers Chicago District

REVISIONS						
SYMBOL	DESCRIPTION	PROJ. NO.	PROJ. SECTION	JET	TRACK	DESCRIPTION	TRACK NO.	SECTION	DATE

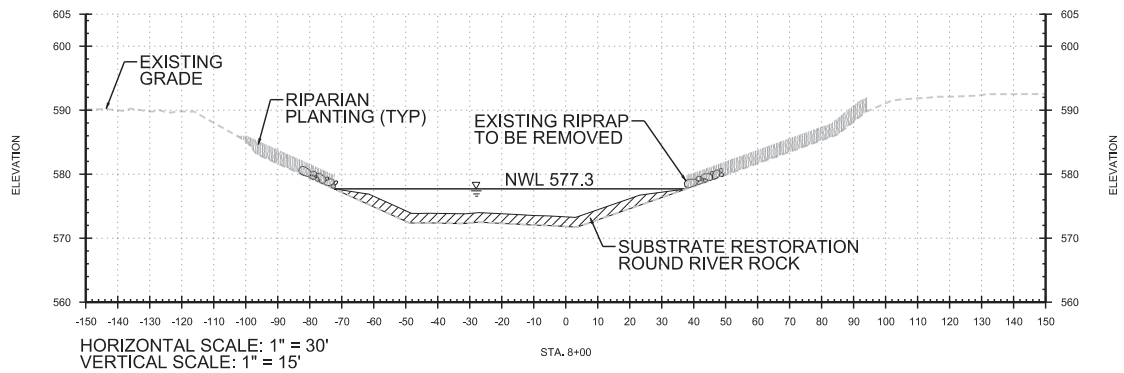
U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DCA
DWN BY: D.B.
CKD BY: CKB
SUBMITTED BY: JOHN A. DROSDOSKI, P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: 8/20/2014
DGN FILE NAME: SCSOFFY1CKB_C-111SP.dgn
DATE: AUGUST 2014
SOLICITATION NO.: SOL-96-B-NUMB
CONTRACT NO.: CON-96-B-NUMB
FILE NUMBER: B-SOFFY-206
SIZE: ANSI D

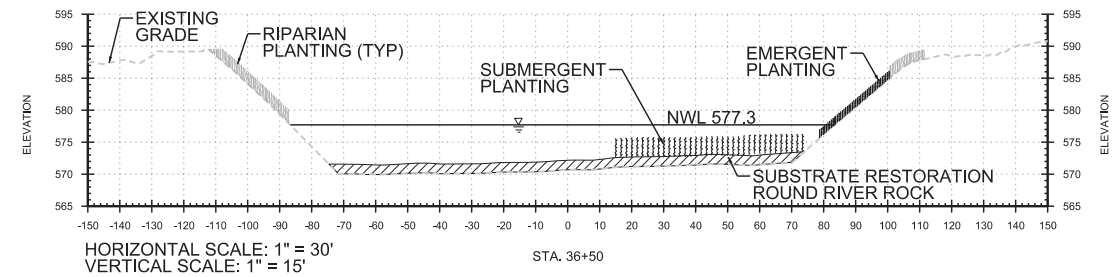
SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION PLAN
BUBBLY CREEK TURNING BASIN

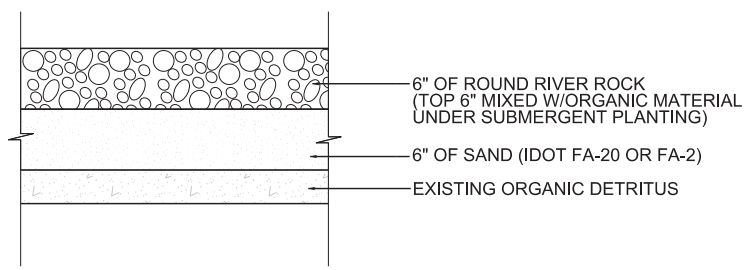
SHEET IDENTIFICATION
C-111
SHEET 14 OF 15



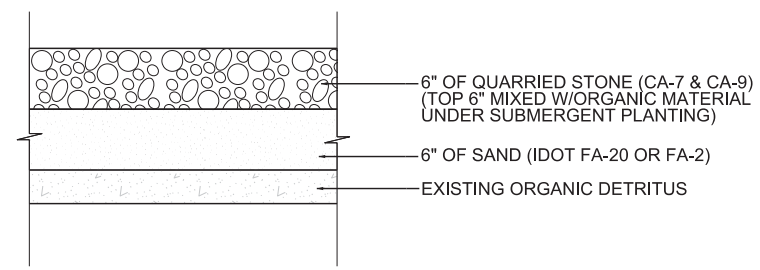
RESTORATION CROSS-SECTION AT STATION 8+00



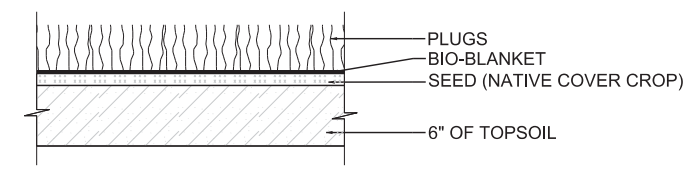
RESTORATION CROSS-SECTION AT STATION 36+50



SUBSTRATE RESTORATION SECTION
ROUND RIVER ROCK



SUBSTRATE RESTORATION SECTION
QUARRIED STONE



RIPARIAN HABITAT PLANTING SECTION

US Army Corps of Engineers®
Chicago District

MARK	DESCRIPTION	TRACKING NO.	ACTION	DATE

MARK	DESCRIPTION	TRACKING NO.	ACTION	DATE

U.S. ARMY CORPS OF ENGINEERS
CHICAGO DISTRICT
CHICAGO, ILLINOIS

DESIGNED BY: DGA
DWN BY: DJB
CKD BY: CKB
SUBMITTED BY: JOHN A. GRABOSKI P.E.
PLOT SCALE: AS SHOWN
PLOT DATE: 11/07/2014
SIZE: ANSI D
FILE NAME: BCDOFPY12PS_C-301KS.dgn
DATE: AUGUST 2014
SOLICITATION NO.: SOL-06-B-NUMB
CONTRACT NO.: CON-06-B-NUMB
FILE NUMBER: BCDOFPY12PS

SOUTH FORK SOUTH BRANCH CHICAGO RIVER
BUBBLY CREEK - SECTION 206
CHICAGO, ILLINOIS

RESTORATION CROSS-SECTIONS

SHEET IDENTIFICATION
C-301
SHEET 15 OF 15

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