Improving the Waterway While Using the Waterway ~

The Chelsea Street Bridge Replacement Project

boston harbor; the chelsea creek transit inbound

An Overview of Chelsea River

The Chelsea River- *of strategic importance*

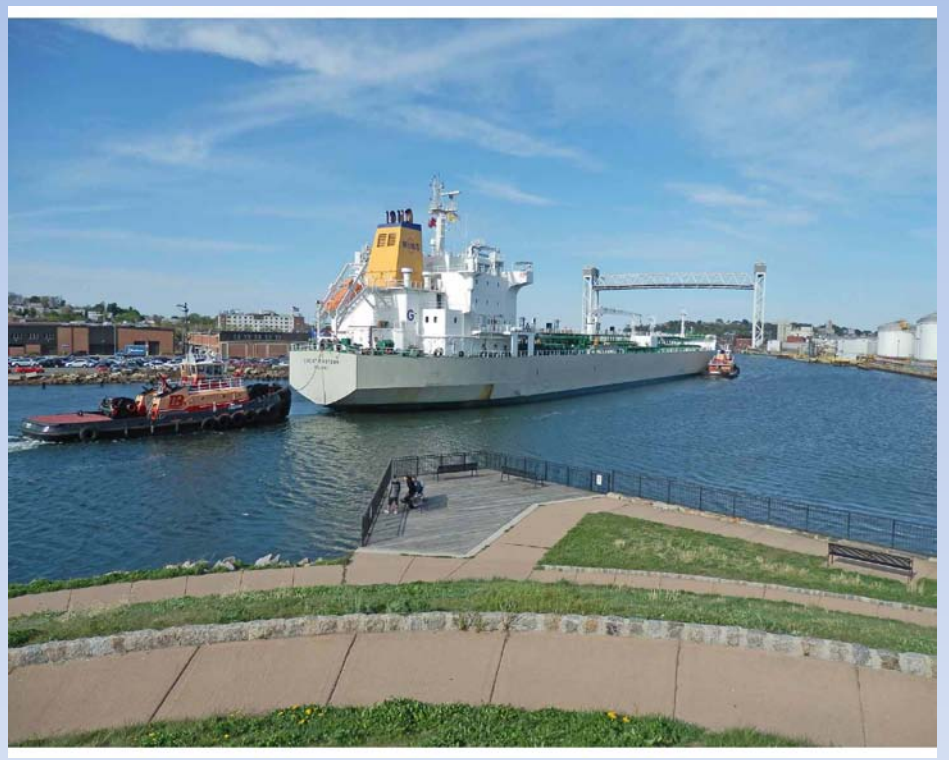
- The Port of Boston handles approximately **93%** of the total volume of petroleum in the state of MA.

- Terminals on the Chelsea handle approximately **2.3 trillion** gallons of petroleum product annually.

- Terminals on the Chelsea have a storage capacity of over **136 million** gallons of petroleum product, with an average tank capacity of approximately 3.2 million gallons.

- Chelsea Creek terminals that are situated upriver from the CSB handle more than half of the regional (Boston- Worcester –NH/VT boarders) supply of motor fuel and home heating oil, of which 90% is supplied by deep draft vessel.

- Chelsea Creek terminals represent a single source supply of aviation fuel for Logan airport with over **365.4 million** gallons of jet fuel supplied annually.



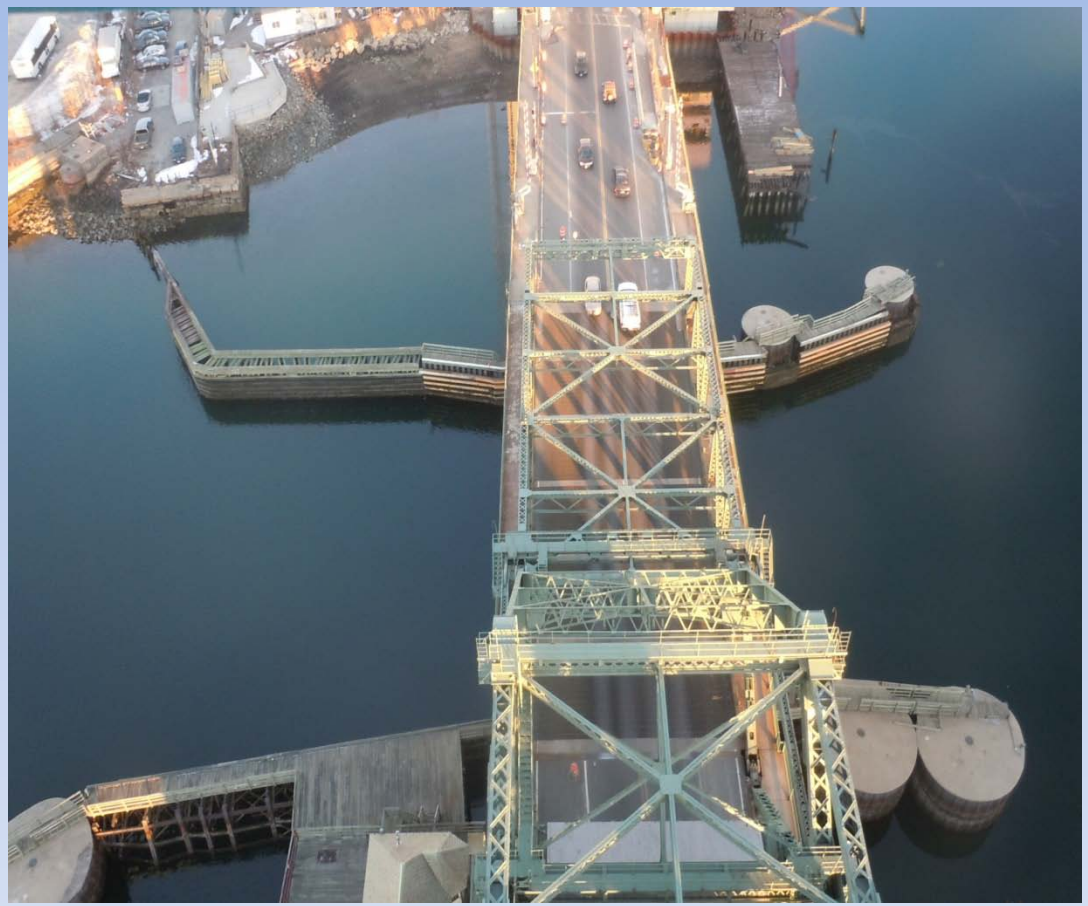
Chelsea Street Bridge ~ *History*

- Originally built in 1900 and rehabilitated in 1936.

- It's design was a Bascule type, which is a moveable bridge with a counterweight that continuously balances the span, or "leaf," throughout the entire upward swing.

- Accommodates approximately ~ 20,000 vehicle transits per day.

- Currently there are approximately 30 deep draft and 25-30 barge transits of the CSB per month (360 annually)



Chelsea Street Bridge ~ An Obstruction to Navigation

- The former bridge offered a **horizontal clearance of 96 feet** between fendering systems.

- Chelsea River acquired its own class of narrow beam tankships. These vessels, with a 90 ft beam, are termed **"Chelsea Class" or "Boston Beam"** tankships.

- Thread-the-needle passage

  +/- 3 feet on either side

Chelsea Street Bridge ~ *Safety Zone*

➢ In 1986 the USCG promulgated a Safety Zone establishing navigation parameters for transits through the bridge.

➢ Restrictions on size and draft of vessels:

▪ No vessel **greater than 661 feet in length or greater than 90.5 feet** in beam shall transit the Safety Zone.

▪ No vessel greater than **630.5 feet in length or 85.5 feet** or greater in beam shall transit the Safety Zone during the period between **sunset and sunrise**.

➢ Requirements for tug assistance:

▪ All tankships **greater than 630.5 feet in length or greater than 85.5 feet in beam** shall be assisted by at least **four tugs** of adequate horsepower.

▪ All tankships from **450 feet in length up to and including 630.5 feet in length and less than 85.5 feet in beam** shall be assisted by at least **three tugs** of adequate horsepower.

▪ All **tug/barge combinations with a tonnage of over 10,000 Gross Tons**, in all conditions of draft, shall be assisted by **at least one tug** of adequate horsepower.

The Path Towards a New Bridge

- In 1992 the USCG issued an "Order to Alter" the configuration of the bridge, in accordance with the Truman-Hobbs Act, after the structure was determined to be a unreasonable obstruction to navigation.

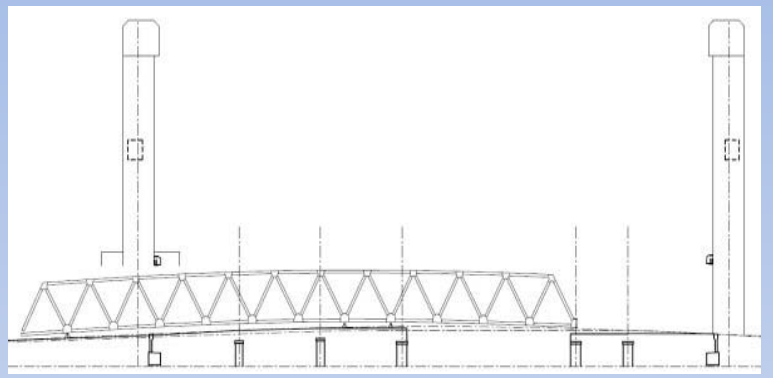
- The project received less than $15 million between 1992 and 2006.

- Additional funds from the Federal Highway Administration (FHWA) for Chelsea Bridge were sought in 2006 but did not become available.

- In 2008 the MA DOT and FHWA proceeded to secure funding for a new bridge through SAFETEA-LU (80%) and State (20%) resources.

Chelsea Street Bridge Project ~
a tale of two steps forward and one step back . . .

- $125 M contract awarded to J.F. White Contracting Co. in 2009 for demolition and installation.



- The new replacement structure, designed by HNTB Corp., consists of a massive steel truss that spans 450 ft between two, 216 ft high towers, and when raised gives 175 ft of vertical clearance for shipping.

- But what about the navigational channel?????
  - ~ currently 96’
  - ~ ACOE authorized to 220’
  - ~ submerged waterline??
  - ~ bulkhead stabilization??
  - ~ impacts of fender removal for shipping??

In Search of an Optimum Solution ~ *formation of the CSB-M*

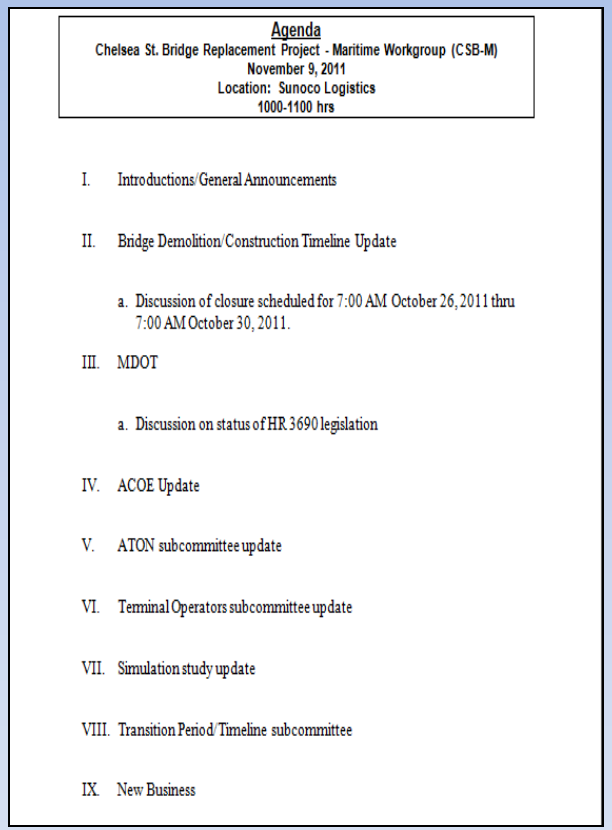
- The Chelsea Street Bridge Replacement Project Maritime Workgroup (CSB-M) was established in December 2009.

- The CSB-M was established as an advisory committee formed under Boston's Port Operators Group (POG), a Harbor Safety Committee, and served as a forum to for all pertinent stakeholders to communicate needs and resolve conflicts.

- Group consisted of +70 members from a diverse spectrum of interests.

- The CSB-M met monthly throughout the project.

- Several standing Work Groups were established to address particular issues:
  - ~ Simulation Study
  - ~Terminal Operators / Alternative Supply
  - ~ ATON
  - ~ Transition



Agenda
Chelsea St. Bridge Replacement Project - Maritime Workgroup (CSB-M)
November 9, 2011
Location: Sunoco Logistics
1000-1100 hrs

I. Introductions/General Announcements

II. Bridge Demolition/Construction Timeline Update

a. Discussion of closure scheduled for 7:00 AM October 26, 2011 thru 7:00 AM October 30, 2011.

III. MDOT

a. Discussion on status of HR 3690 legislation

IV. ACOE Update

V. ATON subcommittee update

VI. Terminal Operators subcommittee update

VII. Simulation study update

VIII. Transition Period/Timeline subcommittee

IX. New Business

So How Wide is this Channel Going to Be????

- During the CSB-M meeting in February 2010, the USACE proposed widening the navigable waterway to 140-ft versus the originally anticipated 220-ft.

- A preliminary USACE engineering study conducted in December 2009 revealed that channel dredging beyond 140-ft could compromise the stability of the existing bulkheads.

- The USACE later advised the CSB-M that an active pipeline owned/operated by the MA Water and Resources Authority would also prevent further widening of the channel.
  - This pipeline is the sole source of water to East Boston.
  - Pipeline relocation will take at least 5 years and cost $12-15M.

- The COTP met with both the state pilots and docking masters to discuss the suitability of a 175-ft channel.
  - All concurred that a 175-ft channel would support current shipping needs;
    - but the use of a simulator (for pilots) is necessary along with "sea trials" over time to determine the feasibility of allowing the industry standard, 106-ft beam Panamax vessel, to transit the creek under the CSB.

- ***But that's not all!!***

Impacts if a 175’ channel is not completed by April 2012

- Upstream terminal operators would need to **barge** product through the new 140-ft channel.
  - — This would result in ~100 barges/month to equate to the ~30 ship transits/month.
  - — There are not enough barges in the Northeast nor lightering areas in Boston to make this volume of transits possible.

- There would be significant shortages of gasoline and heating oil in the immediate 6-12 months;

- Vehicle traffic using bridge would be interrupted an additional 140 times/month.

- The COTP would not allow Chelsea class carriers to proceed through a fender-less 140-ft channel.

- If funding is not identified to support/build the bulkheads necessary to dredge to 175-ft, then the next best alternative (maintain 96’ channel) is to keep portions of the old CSB bridge in place (fender and pier system) and not dredge.
  - — The pilots and docking masters rely upon the current fender system to navigate.
  - — This short term solution would require that an entity assume ownership and maintenance of the fendering system until demolished, which no agency has expressed an interest in.

Challenges & Success

- The Seaport Advisory Council **granted $800K** to Massport for an engineering analysis of the current condition of bulkheads and the development of a schematic of a 175-ft navigational channel.

- The engineering firm analyzed three different schematics provided by USACE and then proposed a fourth, known as "**Plan D**", being the most probable.

  — Plan D would require 455-ft of bulkhead work with a cost of approximately **$3.43M.**

- ***Ok, so who has $3.43M for 400 feet of steel??????***
  — Local congressional support

- This can't be that easy, how about:
  — Emergency state legislation to redefine the harbor boundaries to permit the bulkhead work to commence; and

  — What about those Winter Flounder???

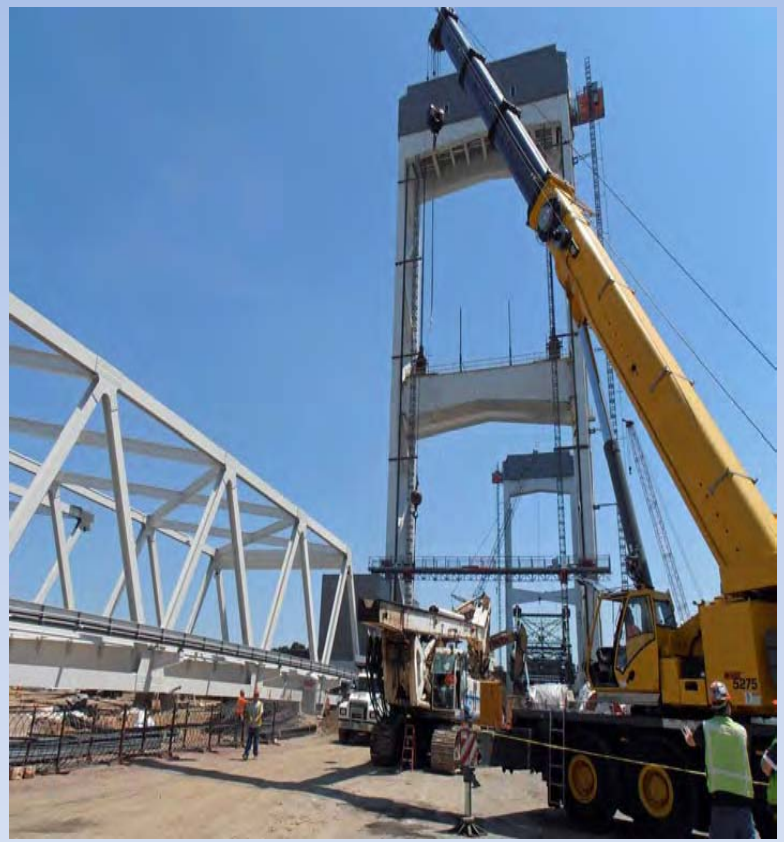
Launching of the Truss ~ *not quite as planned*

- Lift spans (Truss system) consisted of two 225-ft sections fabricated on the Chelsea side and connected to comprise a single 450-ft 1,200 ton lift span.

- Utilized transfer rails placed on former bridge abutments to hydraulically push the truss across the channel in 3.5-ft increments.

- Originally slated for installation on September 14-17th (2011)
  - Terminals planned for a 72 hr closure of the river
  - On September 7th an accident occurred in which the truss slid off of the rail system falling approximately 20-ft resulting in structural damage.

- Deployment rescheduled for November 8th – 12th
  - Alignment issues in launching system
  - 4 day closure turned into a 12 day closure
    - Supplies exhausted
    - Innovative practices



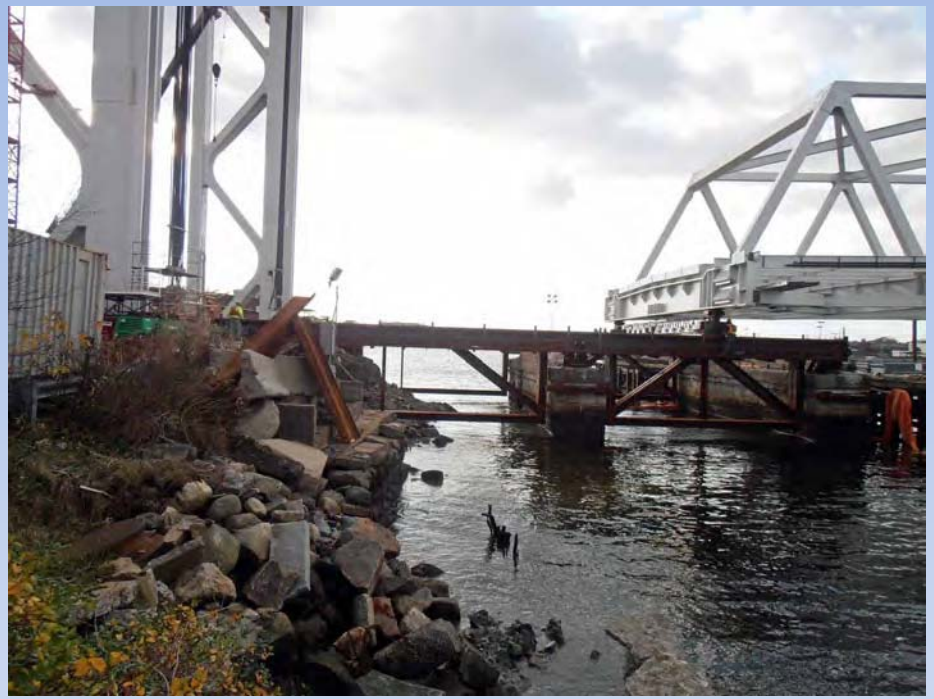
Launching of the Truss

Launching of the Truss

Launching of the Truss

Launching of the Truss

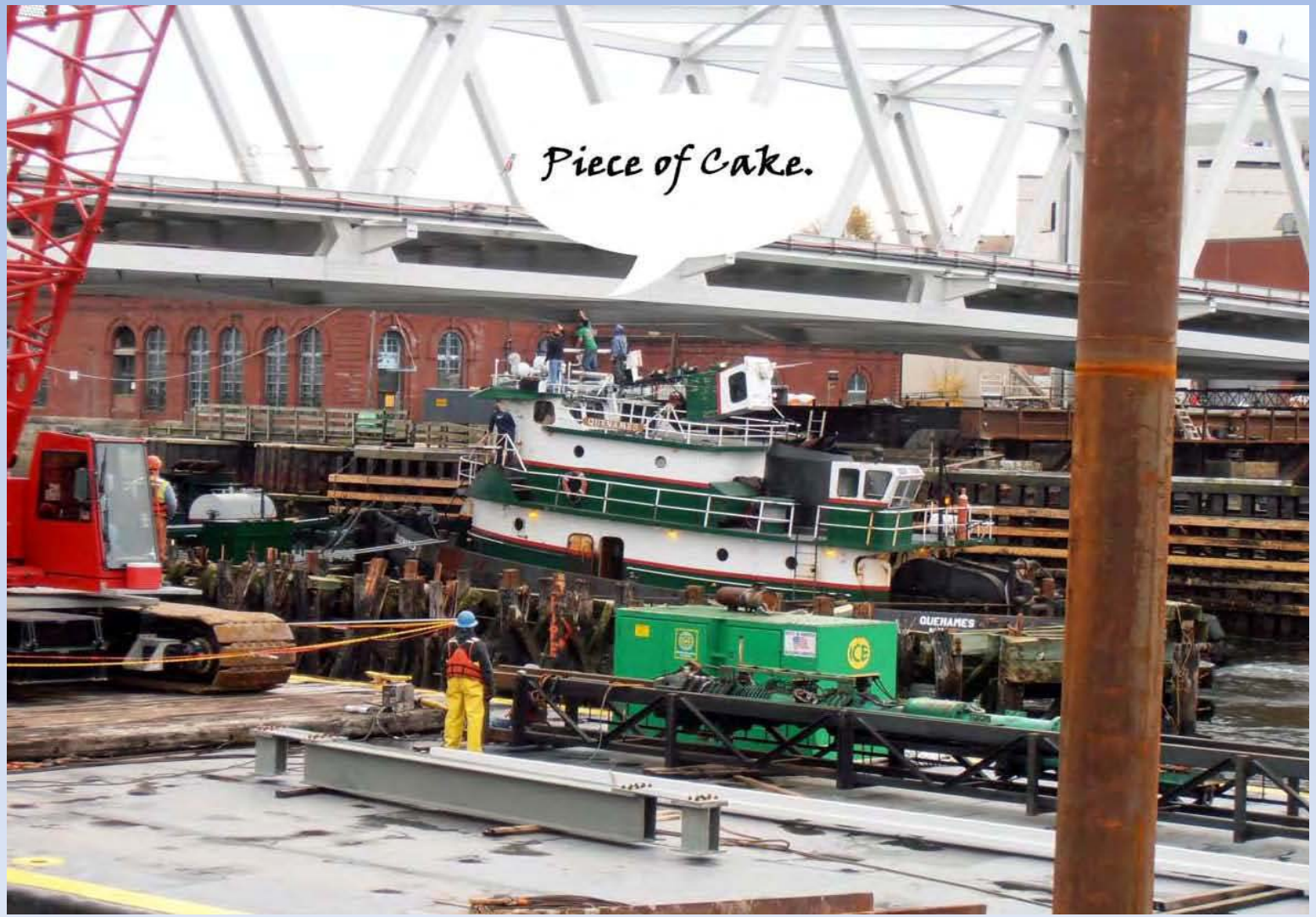
Launching of the Truss



"Low Profile" Transit

“Low Profile” Transit

"Low Profile" Transit



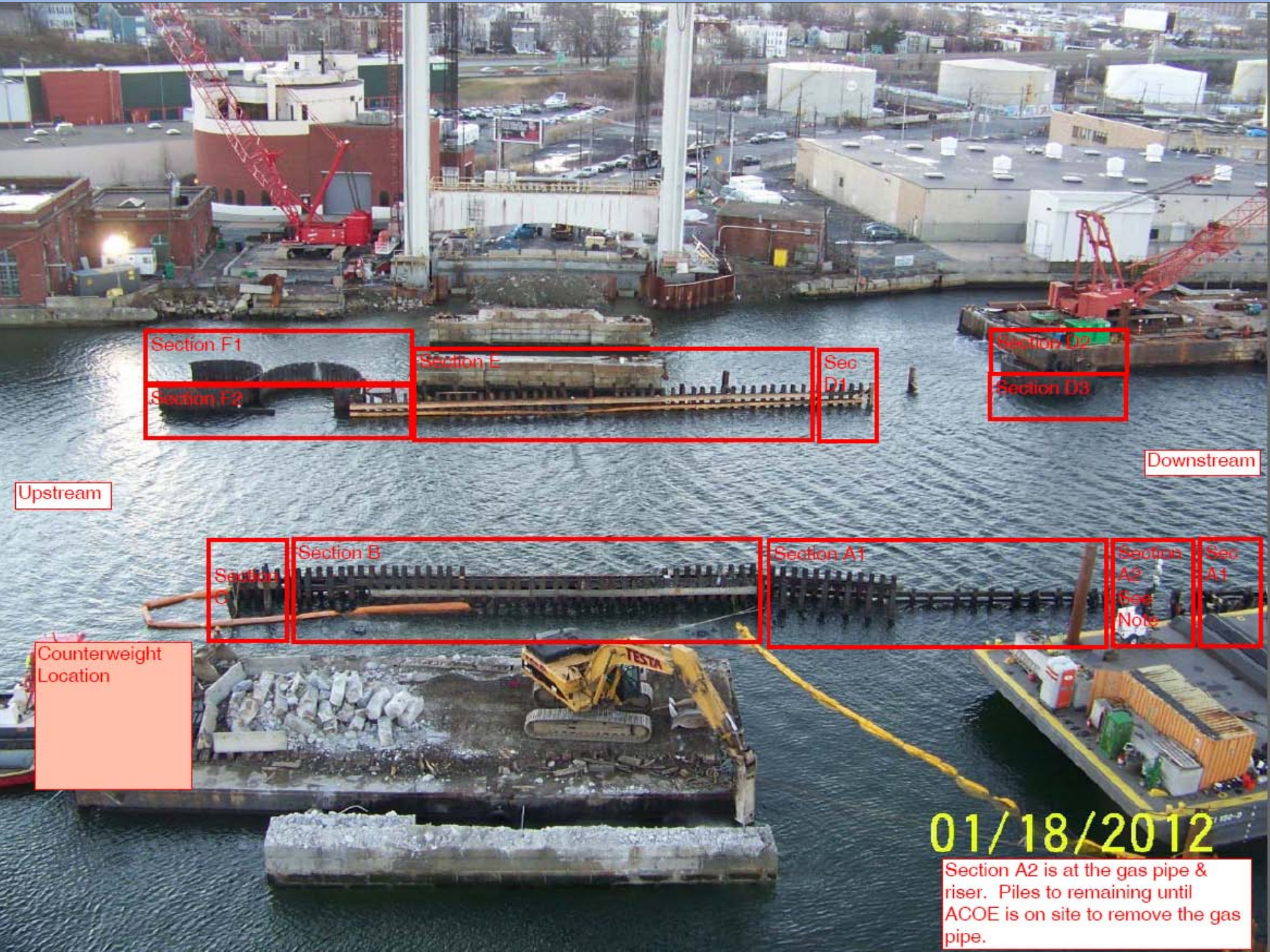
The Transition Phase ~ *Learning to Dance*

- Transition WG established a systematic & disciplined process for all pertinent parties to monitor / track the progression from a 96-ft channel bounded by a fendering system to a 175-ft channel marked with fixed ATON.

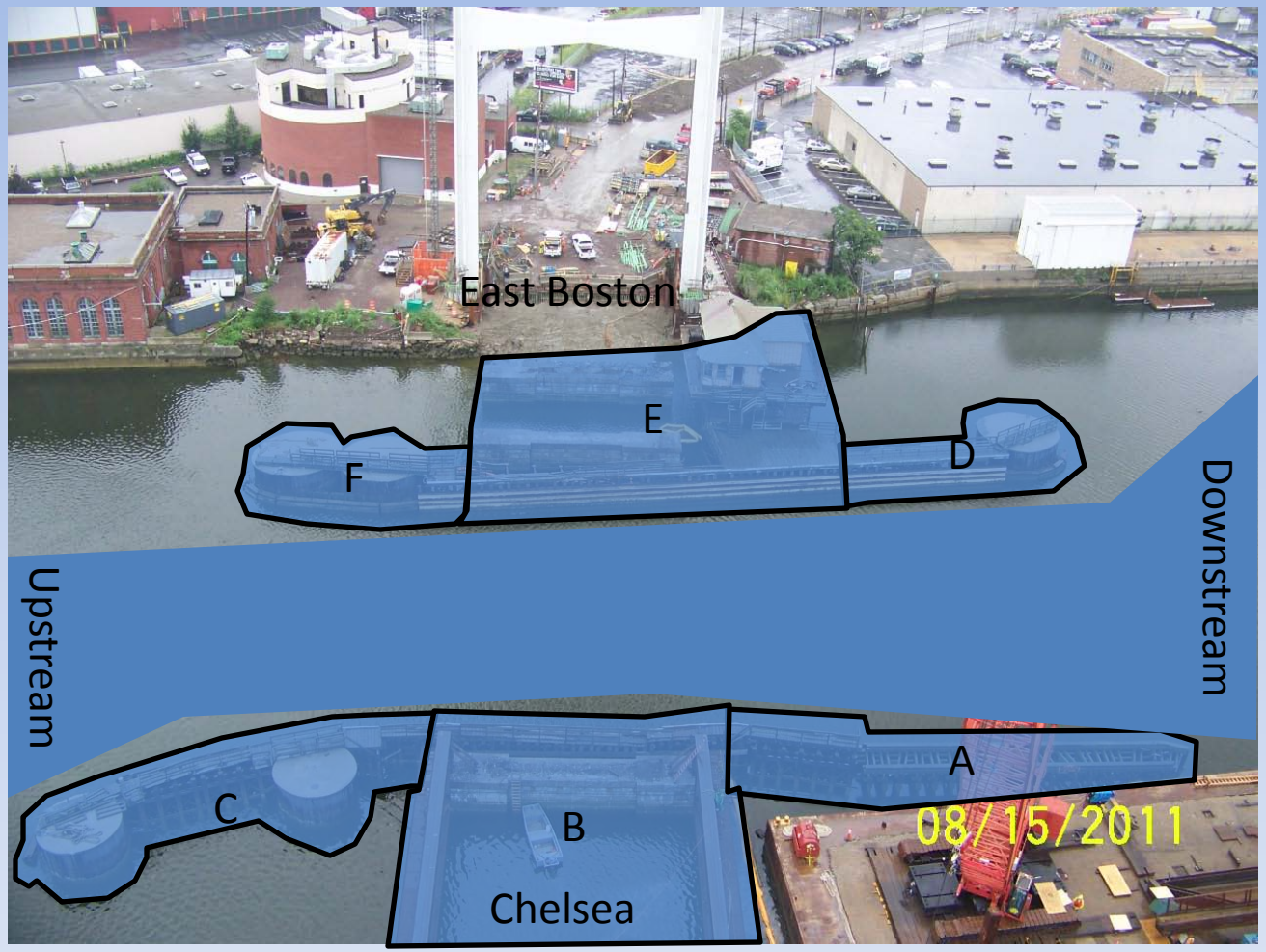
- Weekly meetings to track progress & discuss issues.

- Instituted a daily conference call and reporting system to coordinate vessel transits
  - ❑ Based on MTSRU best practices
  - ❑ Generated efficiencies for bridge work and vessel transits.

9	Dredge Non-Critical Areas (note this will be in conjunction with removal of Critical Section B(non critical section of Chelsea is prority as it needs to be compeleted prior to allowing Barge Traffic on April 6th)	22	11-Mar	2-Apr	GLDD/JF White			rk 21Feb-14Mar	
10	Temporary Hold on Waterway Work: Awaiting Completion of Span Work to Raise Bridge	3	11-Mar	13-Mar	JF White				
11	Cushion to account for unexpected delays in any work	14	14-Mar	27-Mar	NA				Communications Plan 14-Mar (two weeks before closure) - 22-Apr (3 days after partial closure)
12	Mobilize Dredge	5	20-Mar	24-Mar	GLDD				
13	Remove remaining Non-Critical areas left in place for visual reference (1/2 moon of Section D, Face & Water Pipe area of Section A, etc.)	1	28-Mar	29-Mar	JF White				
14	Removal of Critical Section B (JF White Complete on Chelsea side)	5	29-Mar	2-Apr	JF White				
15	Dredge Chelsea Side Critical Section B	3	3-Apr	5-Apr	GLDD				
16	Survey/Install Temporary ATON	1	6-Apr	6-Apr	USCG				
17	Non Critical Chelsea side completed prior to opening channel to barge Traffic		6-Apr	6-Apr	milestone				
18	Dredge Non-Critical Areas (note this will be in conjunction with removal of Critical Section E	10	6-Apr	16-Apr	GLDD				
19	Removal of Critical Section E & Critical Areas of Critical Section F	8	7-Apr	15-Apr	JF White				
20	Remove Keyspan Pipe	1	17-Apr	17-Apr	GLDD				
21	Dredge East Boston Side (Section E)	3	18-Apr	20-Apr	GLDD				
22	Demoblize Dredge	1	21-Apr	21-Apr	GLDD				
23	Survey/Install Temporary ATON	1	21-Apr	21-Apr	ACOE/USCG				
24	Review Survey	4	22-Apr	25-Apr	ACOE/USCG				
25	Install Permanent ATON	16	26-Apr	11-May	USCG				
26	Project Complete								


Section F1
Section F2
Section E
Sec D1
Section D2
Section D3
Downstream
Upstream
Section B
Section A1
Section A2 See Note
Sec A1
Counterweight Location
01/18/2012
Section A2 is at the gas pipe & riser. Piles to remaining until ACOE is on site to remove the gas pipe.

Plans; Removal Overview



January 2012						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

February 2012						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29			

March 2012						
S	M	T	W	T	F	S
				1	2	3
45	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

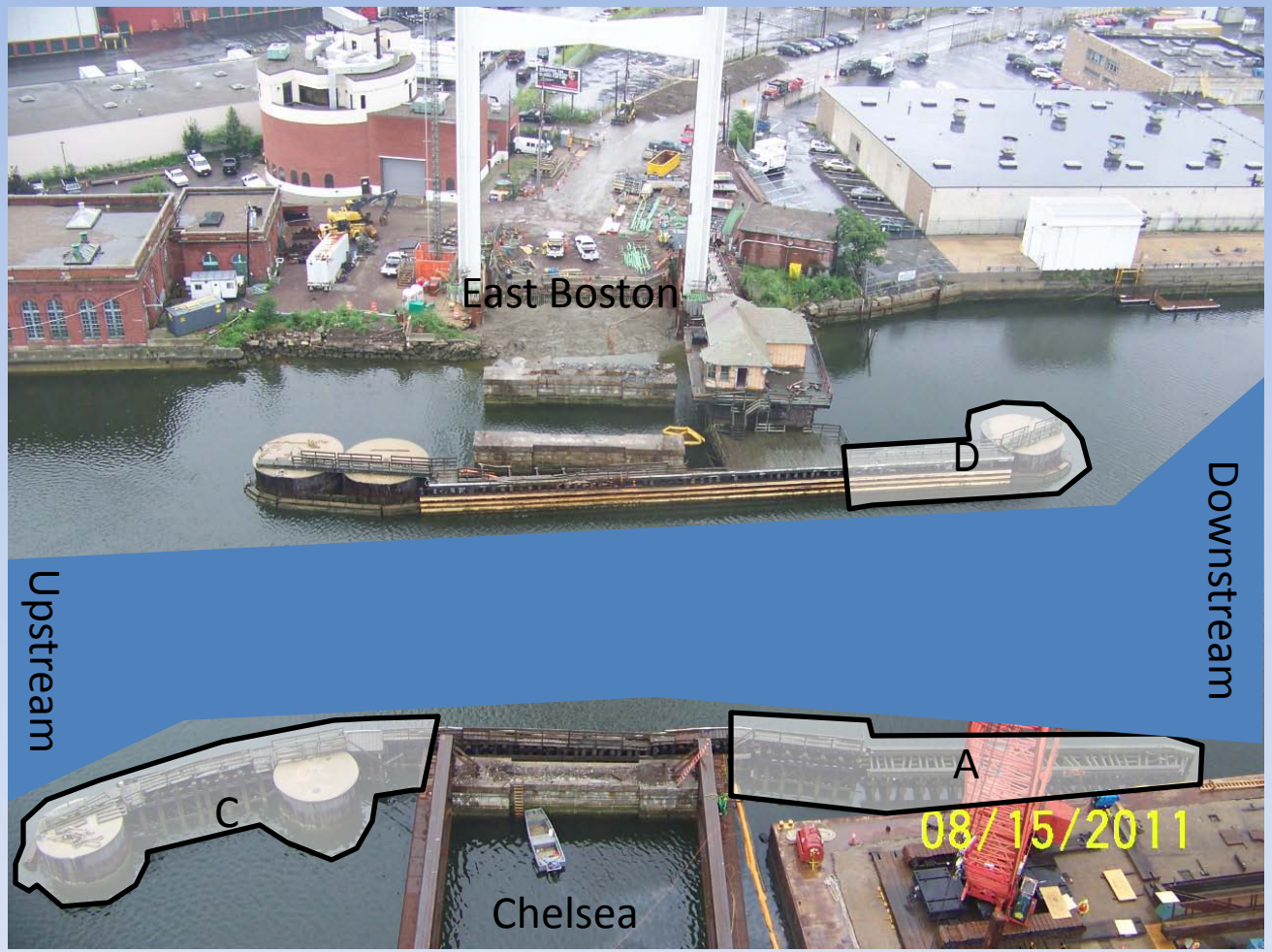
Plans; Phase 1 Channel Open

Key

Dredged Channel

Structure Removal

Removed Structures



January 2012						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

February 2012						
S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29			

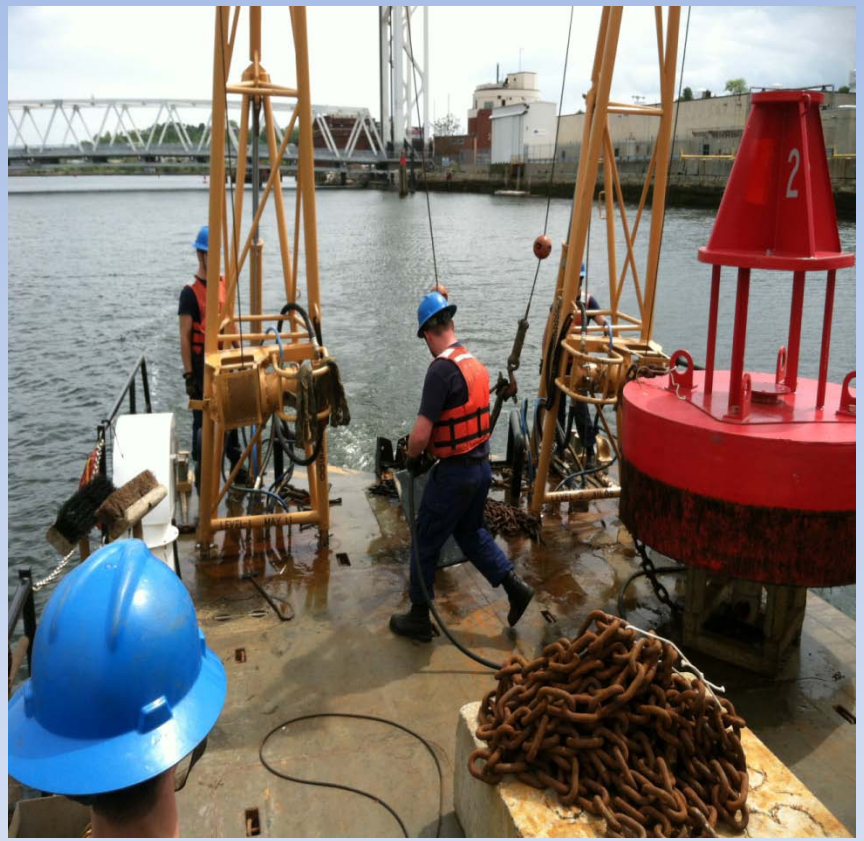
March 2012						
S	M	T	W	T	F	S
				1	2	3
45	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28				

Planned Activity

- Remove counterweight
- Remove Non-Critical Sections A, C, & D

Working Side-by-Side

ATON Installation ~ *building a runway???*



Open for Business

Deserving Recognition

The Path Forward

Establishment of the Chelsea River Navigation Subcommittee ~

- Charged with exploring aspects of existing CSB Safety Zone to determine relevance (if any) of prescribed navigation parameters.

- Exploring feasibility of safe passage for Panamax (106-ft beam) ships.

Fine tuning bridge operations ~

- Time needed for opening

- Wider opening encourages multiple openings for vessels mooring at down river terminal.

Questions / Comments????