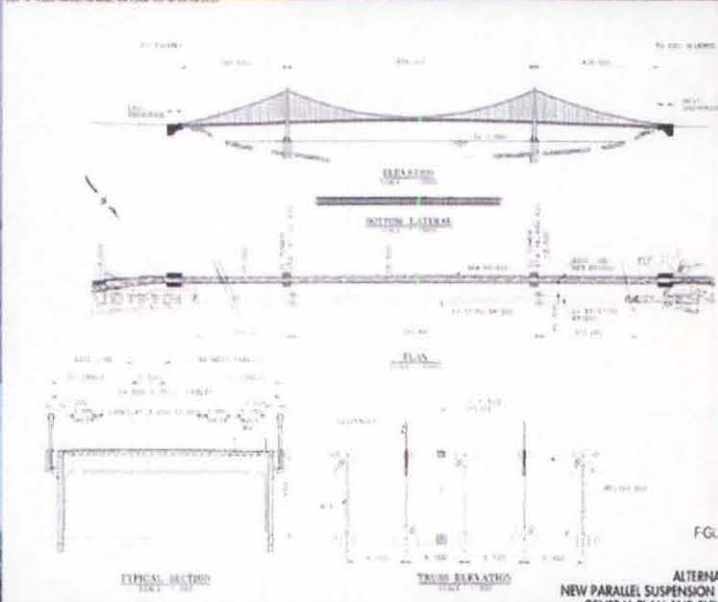
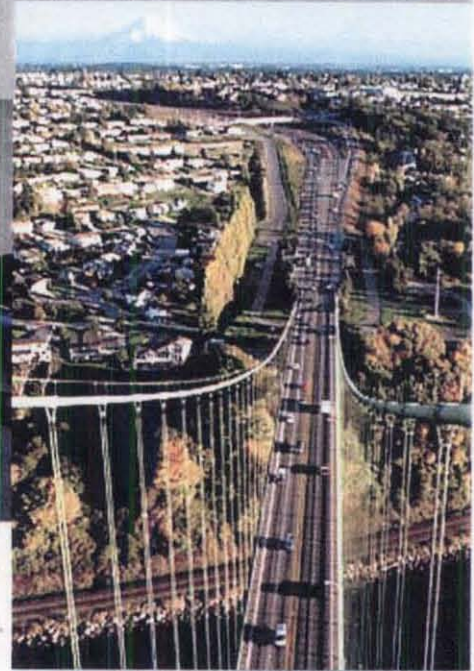


# Tacoma Narrows Bridge – Year 1 Lessons Learned

*Backup on  
turn back - legally*

## DESIGN - BUILD





Tacoma Narrows Bridge Project  
 Design-Build  
Year 1 - - - Lessons Learned  
 October 22, 2003 - 8:30 a.m. - 4:30 p.m.  
 Best Western - Fife

**Purpose of session:** To provide an overview (scan) of the major elements from the first year ("design phase") of the Tacoma Narrows Bridge design-build project. This is intended to provide insights to the use of the design-build method on the TNB project for those WSDOT staff that may be using design-build for delivery of future projects.

Agenda

1. Welcome and Overview .....	8:30 - 8:40	<i>Team / Senior</i>
2. Opening Comments .....	8:40 - 8:50	
John Conrad, Asst. Sec. of Transportation		
Linea Laird, TNB Project Manager		
3. "Setting the Stage" & Project Management.....	8:50 - 9:45	
Break .....	9:45 - 10:00	
4. Design Oversight .....	10:00 - 11:30	
5. Right-of-Way .....	11:30 - 11:50	
Lunch (provided) .....	11:50 - 12:30	
6. Alignment & Partnering with the Design-Builder .....	12:30 - 12:55	<i>A</i>
7. Business Management .....	12:55 - 1:35	
Break .....	1:35 - 1:45	
8. Public Information .....	1:45 - 2:10	
9. Environmental Oversight & Compliance .....	2:10 - 2:30	
10. Utility Relocates .....	2:30 - 2:45	
11. Panel Discussion.....	2:45 - 3:15	
Break .....	3:15 - 3:30	
12. Build It! .....	3:30 - 4:00	
13. Summary & Closure .....	4:00 - 4:30	



## TACOMA NARROWS BRIDGE EXECUTIVE COMMITTEE

### Leadership Values & Objectives

We the members of the Tacoma Narrows Bridge Project Executive Committee are committed to the following:

- **Safety**: achieve zero accidents for both workers and the public
- **Budget**: meet or beat our respective budgets
- **Schedule**: meet or beat the project schedule and integrate schedules with TransCore
- **Quality**: building a quality project that meets the standards and specifications, has zero environmental violations and is recognized as a quality project
- **Be a Good Neighbor**: provide proactive and timely information to the community, responsibly manage traffic to minimize disruptions and meet or exceed permit requirements
- **Professional Development**: develop personal and professional competence and fulfillment while having fun

**We are committed to achieving these objectives through open and effective communications in compliance with our Leadership Covenants.**

# TACOMA NARROWS BRIDGE ONE PROJECT – ONE TEAM COMMITMENT STATEMENT

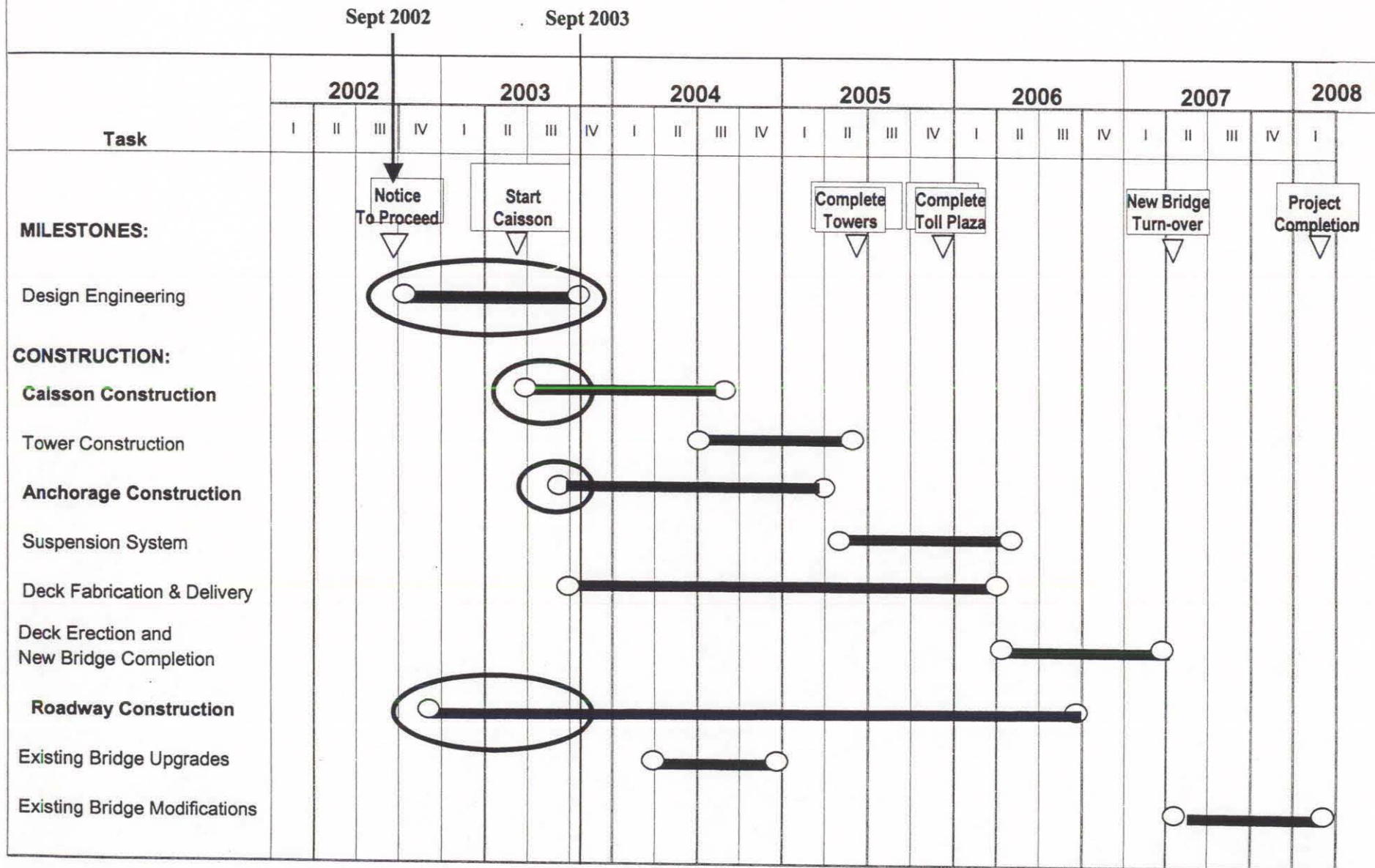
We the members of the Tacoma Narrows Bridge Project are committed to the following:

- Safety excellence for the life of the bridge: for all project personnel, the traveling public & maintenance operations
- Being good stewards of the environment
- Successful schedule and budget performance striving for early delivery and under budget in all areas
- Quality excellence – do it right the first time
- Regional/National/International awards recognizing project excellence
- Promote all project stakeholders success
- Provide Design-Build as a model of success
- Resolve all issues in a timely manner
- Attain respect and support by generating positive community perception
- All ships rise together – through mentoring, knowledge transfer, and personal growth
- Build and maintain lasting friendships
- Collectively enjoy the project and have fun
- Celebrate accomplishments
- Communicate all these goals out into the team – share the “vision”



# TACOMA NARROWS BRIDGE PROJECT

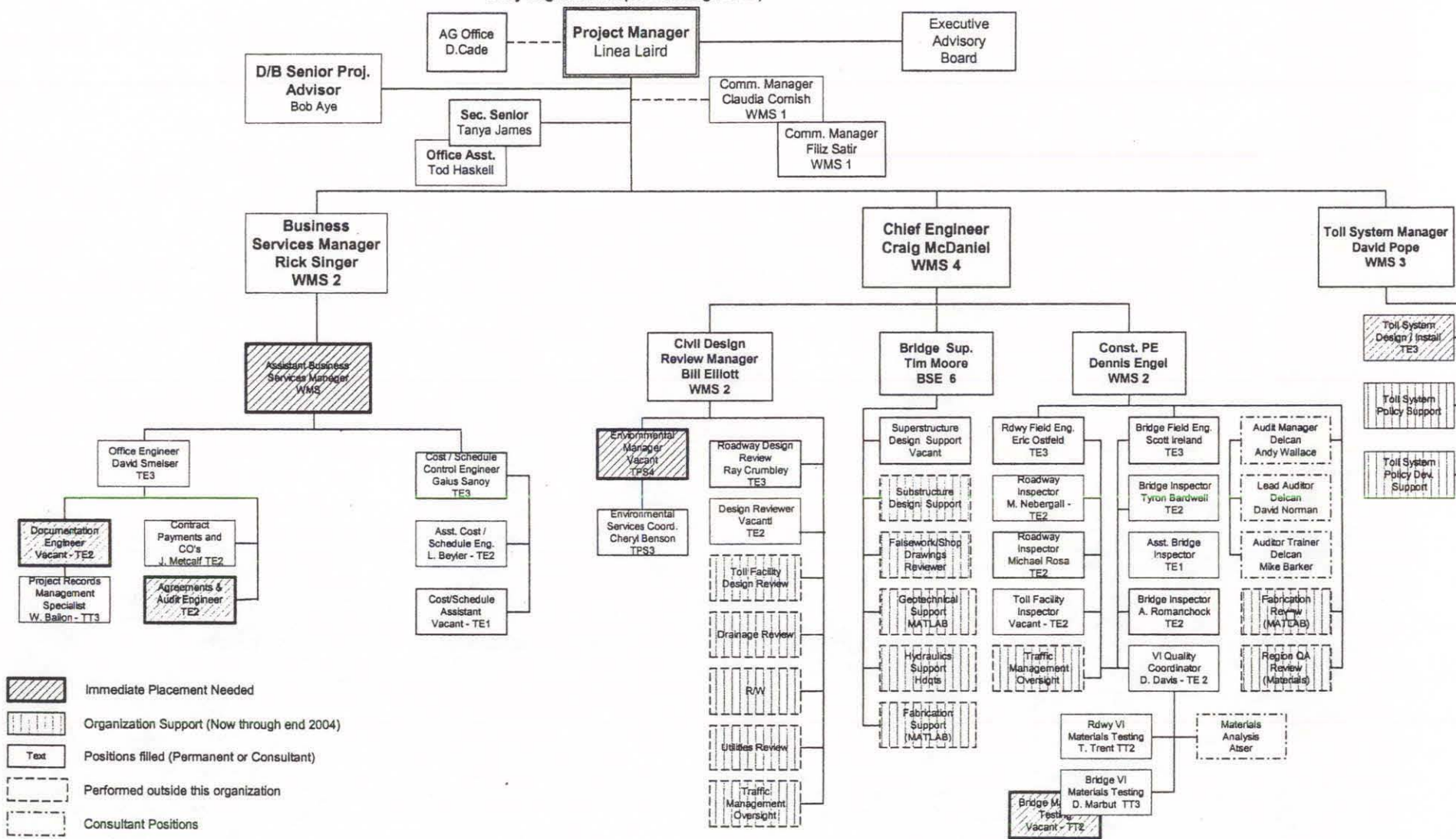
## Summary Schedule








# WSDOT TNB Table of Organization

## Org 434102

Early Organization (Now through 2004)



-  Immediate Placement Needed
-  Organization Support (Now through end 2004)
-  Positions filled (Permanent or Consultant)
-  Performed outside this organization
-  Consultant Positions

\* Assumes single shift

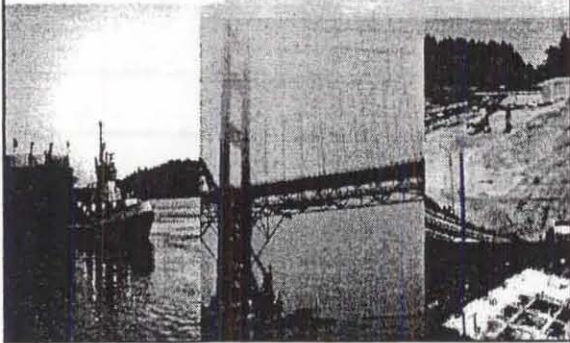
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
TACOMA NARROWS BRIDGE PROJECT OFFICE

Approved by: \_\_\_\_\_  
TNB Project Manager

Approved by: \_\_\_\_\_  
Region Administrator



## Tacoma Narrows Bridge Lessons Learned



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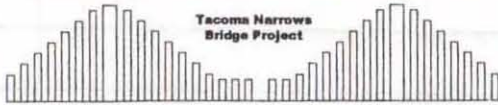
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## Setting the Stage

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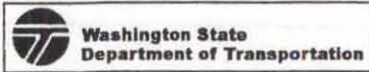
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## TNB Partnership



Design Build Operate Maintain

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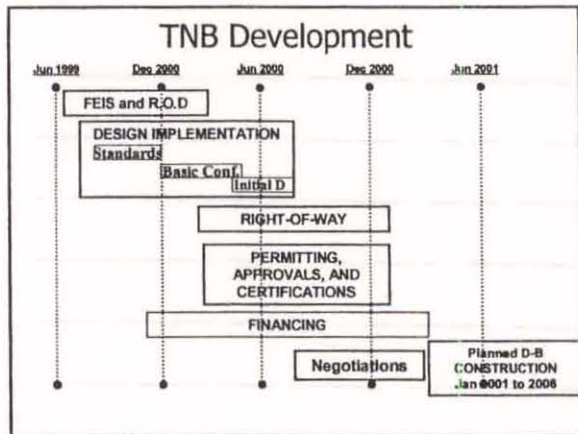
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- ### 2002 RCW 47.46 Role Change
- Allows:
    - Public funds - R-49 bonds
    - WSDOT to toll existing facility
    - WSDOT to use previously negotiated contracts
  - Requires:
    - Citizens Advisory Committee to advise Commission on tolling
    - Reporting to LTC on Design Build
  - Establishes Commission as Toll Authority

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- ### Design-Build Agreement
- July 16, 2002 - Executed design-build contract
  - Design-Builder
    - Tacoma Narrows Constructors
      - Joint Venture - Bechtel / Kiewit
      - Design JV - PTG/HNTB
    - TransCore
      - Toll Systems Delivery and Operations
  - September 25, 2002 - Notice to Proceed

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## Project Costs

### TNB Total Cost: \$849 million

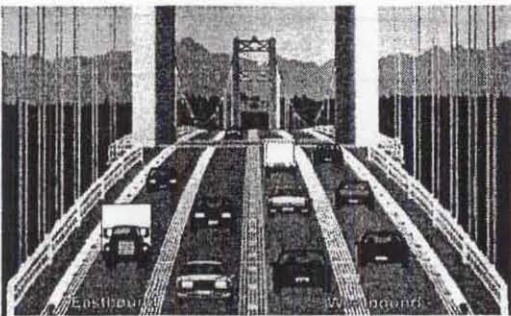
- Design-Build Contract \$615
- TransCore (Toll System) \$9.2
- Construction Mgt/Oversight \$41
- Contingency \$55
- Development Costs \$41
- Reserve Financing Funds \$88

## Project Scope

- New suspension bridge
- 2.5 miles of roadway approach work
- Toll operations facility
- Bridge maintenance facility
- Upgrade existing suspension bridge

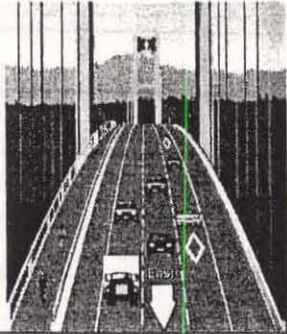


## Existing Bridge



## New Parallel Suspension Bridge

- Three eastbound lanes
- Shoulders for emergency access and incidents
- Improved travel for pedestrians and bicyclists
- Future flexibility – built to allow lower deck installation



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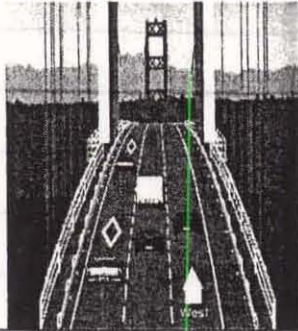
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## Existing Suspension Bridge

- Three standard-sized lanes westbound
- Shoulder for emergencies
- Earthquake reinforcements



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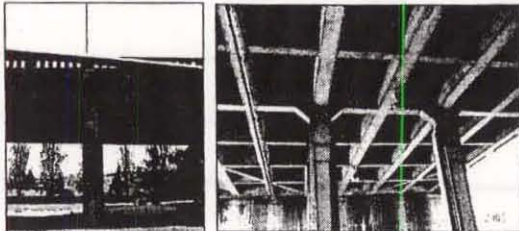
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## Seismic Upgrades

Strengthen most critical and most vulnerable elements - mostly approaches



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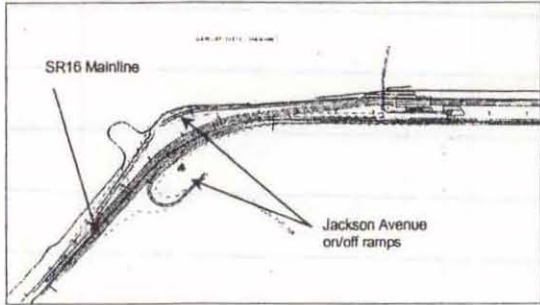
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## Access Improvements

Tacoma



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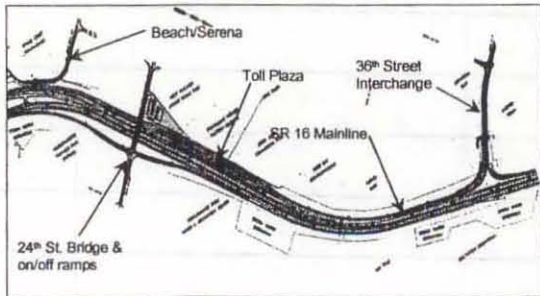
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## Access Improvements

Gig Harbor



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## Toll Operations

- Electronic toll collection all lanes
- 3 highway speed mainline lanes
- Toll collected in eastbound direction only
- All account information kept confidential



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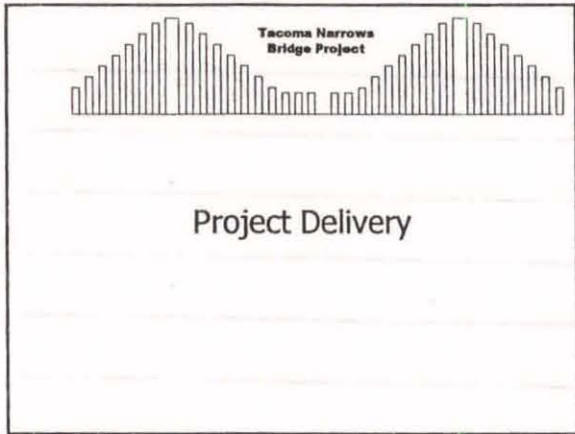
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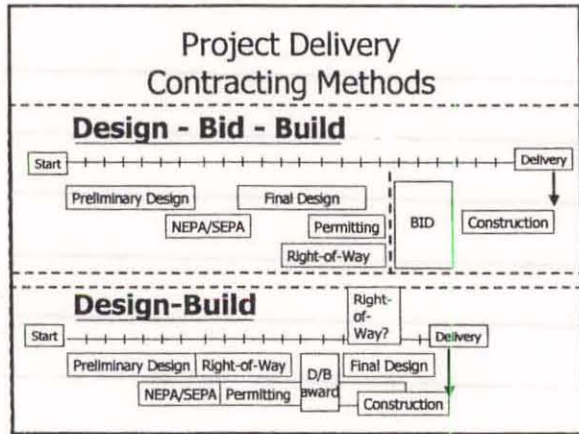
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- Advantages of Design, Bid, Build
- Owner has more control
  - Owner assumes more risk
  - Managed by phase
  - Designed in advance

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### Advantages of Design-Build

- At risk construction
- Single point of responsibility
- Resources readily available
- Compressed schedule
- Fixed Price

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### Common Items for Discussion

- testing requirements
- standard application
- standard interpretation
- designer discretion
- scope interpretation

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### Contract Preparation

- Learn from other design-build projects
- Goals/values as well as function
- Clear assignment of risk
- Gather realistic cost data
- Management and oversight processes/roles
- Clear definition of technical requirements
- Beware of the box

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## Contract Preparation

- Early Permit Acquisition
  - Special plans - construction means, method
  - Mitigate to highest impact
  - Agreement for potential reduced mitigation
- Acquire Right-of-Way on preliminary plans
- Develop audit plan, incorporate into RFP

## Cost Estimate Types

- "Reference" Estimate
    - based on historical bid pricing
  - "Build Estimate"
    - based on means and methods
- Don't underestimate the value of "Risk"

## Risk Allocation Examples

### TNB

- insurance
- caisson mooring anchorage
- first \$10 million changed condition
- weather

### WSDOT

- noise variance
- hazardous material



**What I wish I had known**

- Co-locate early !!!
- Scope
- Standards
- Changes
- Issue Resolution

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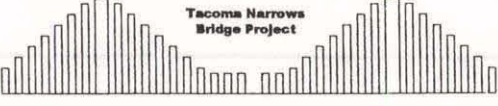
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**Tacoma Narrows  
Bridge Project**

**Management**

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**Key Points**

- Joint Executive Management Committee
- Functional alignment between WSDOT and design build project managers (zippered)
- Empowerment consistent with responsibility and accountability
- Strong working relationships
- Communicate - Communicate – Communicate!

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**Leadership Values & Objectives**

**We the members of the Tacoma Narrows Bridge Project Executive Committee are committed to the following:**

- Safety:
- Budget:
- Schedule:
- Quality:
- Be a Good Neighbor:
- Professional Development:

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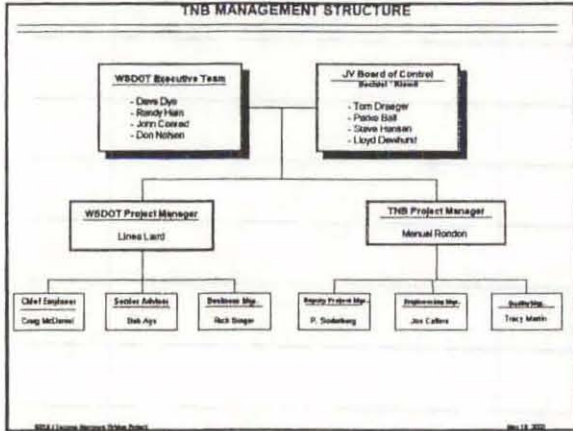
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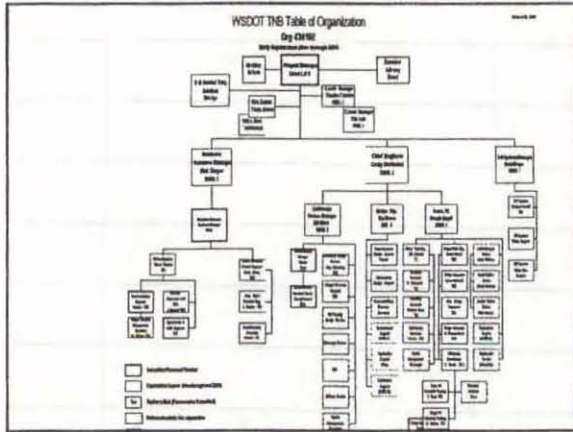
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- Staffing**
- Experienced, knowledgeable
  - Collaborative
  - Strong communication skills
  - Committed, motivated

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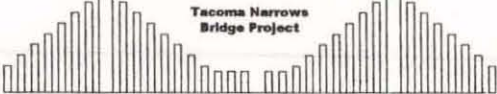
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Tacoma Narrows  
Bridge Project

Design Oversight

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Key Points

- Expect to get what is explicitly required in contract
  - "Standards" - WSDOT Manuals & AASHTO are not written as contractual documents
- Prepare for pace and magnitude of design review submittals
  - 14-day turn around
- The design engineer's customer is the constructor
  - Design-build contractor
  - Quality vs. quantity vs. cost

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Key Distinctions

- REQUIREMENTS

VS.

- EXPECTATIONS

VS.

- PREFERENCES

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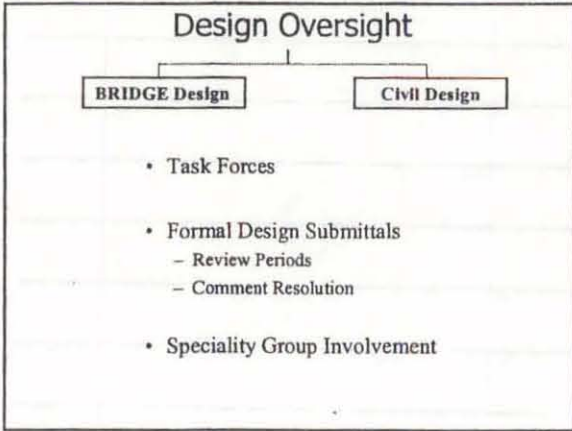
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### Task forces

- Major work packages
- Meetings every 2 weeks
- Design & construction attendees
- Fast -paced
- Plan review
- Issue resolution




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### Civil Task Forces

- Roadway & Drainage
- Construction Traffic Management Plan (CTMP)
- Utilities
- Toll Facility and Maintenance Building
- Landscaping
- Illumination and SC&DI
- Living War Memorial Park




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## Formal Design Submittals and Review

<u>Level</u>	<u>Intended Development</u>
➤ 35%	Conceptual layout
➤ 65%	Bulk of analysis and design complete
➤ 90%	Details complete
➤ 100%	IFC (Issued for Construction)
➤ FCR (Field Change Request)	Numerous design details

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## 14-Day Review

- Hard-copy submittals
- 14 days OK if review completed in project office
- Support groups lost time
  - delivery and comment response
- Complex submittals
- WSDOT met review commitments only with hard work, dedication, many hours

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## 14 – Calendar - Day Review

SUN	MON	TUE	WED	THU	FRI	SAT
				DAY 1	DAY 2	DAY 3
DAY 4	DAY 5	DAY 6	DAY 7	DAY 8	DAY 9	DAY 10
DAY 11	DAY 12	DAY 13	DAY 14			

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### 14 – Calendar - Day Review

SUN	MON	TUE	WED	THU	FRI	SAT
		DEC 24	DEC 25	DEC 26	DEC 27	DEC 28
		DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
DEC 29	DEC 30	DEC 31	JAN 1	JAN 2	JAN 3	JAN 4
DAY 6	DAY 7	DAY 8	DAY 9	DAY 10	DAY 11	DAY 12
JAN 5	JAN 6					
DAY 13	DAY 14					

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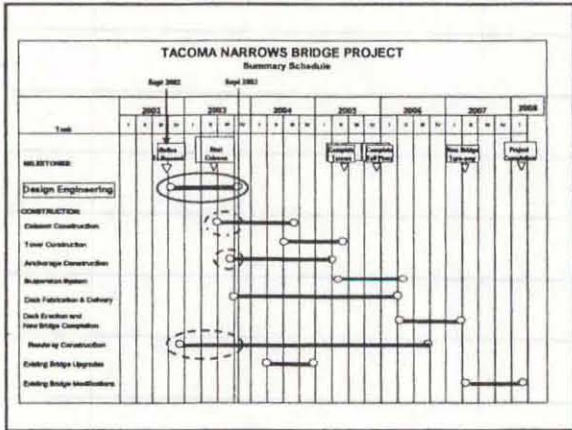
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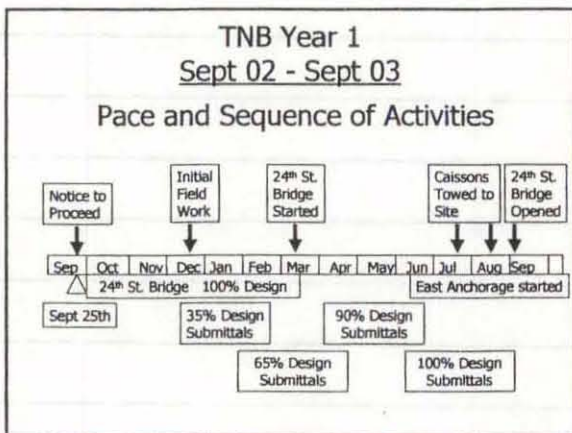
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### Formal Design Submittals and Review

- Work Packages
- Comment Forms
- Comment Resolution

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### Civil Work Packages

- Construction Traffic Management Plans
- Tacoma Mainline
- Gig Harbor Mainline
- 36<sup>th</sup> Street I/C & 22<sup>nd</sup> Ave.
- 24<sup>th</sup> Street I/C & Stone Drive
- Toll Facility & Maintenance Building
- Landscaping
- Living War Memorial Park
- Utility Relocations

All (except Utilities) submitted for review at 35%, 65%, 90% & 100 % (IFC)

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### Tacoma Narrows Bridge Comment Disposition Form

Submittal Title		Submittal Date		
WRCOT Reviewer		Response By		
Date of WRCOT Comments		Date of Disposition		
Comment No.	Standard Reference	Review Comment	Response Code	TRC Response
1.				
2.				
3.				

A reference to a Standard must be provided.

**Status Code Legend:**  
**A = Incorporated**  
**B = Open/Under Review**  
**C = Evaluated/Not Incorporated**  
**D = Beyond Scope/Not Evaluated**

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**REQUIREMENTS**

**"WSDOT Standards"**

**TNB Design-Build Agreement**

**3.2 Design Work**

3.2.1 **General.** Design/Builder shall perform Design Work in accordance with the Contract Documents. The Plans and Specifications shall be consistent with and develop in detail the intent of the Contract Documents.

3.2.2 **Plans and Specifications.** Upon receipt of the Notice to Proceed, Design/Builder shall commence preparation of the Plans and Specifications. The Plans and Specifications shall be based on the Initial Design as a starting point and shall comply with the following (collectively, "Design Work Requirements"):

- 3.2.2.1 Project Description;
- 3.2.2.2 Basic Configuration;
- 3.2.2.3 Applicable WSDOT Standards; (see Exhibit F)
- 3.2.2.4 WSDOT Approved Deviations or CRB Authorized Deviations;
- 3.2.2.5 All Applicable Laws;
- 3.2.2.6 Regulatory Approvals;
- 3.2.2.7 Interpretive Engineering Decisions; and
- 3.2.2.8 All applicable provisions of the Contract Documents.

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**Civil Work Package Submittals**

- 35% ..... 166 Comments
  - 65% ..... 855 Comments
  - 90% ..... 488 Comments
  - 100% IFC .... 176 Comments
- 
- Total            1,685 Comments

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**Civil Work Package  
Comment Resolution**

- "A" – Incorporated            70%
- "B" - Under Review            7%
- "C" - Not Incorporated        18%
- "D" - Out of Scope            5%

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**Bridge Design Oversight**

- Key Points

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**Engineer's Primary Customer = Constructor**

- Values prioritized differently
  - cost/schedule vs. quality
- Engineering talent level is high
- Engineering analysis incorporates advanced techniques
  - FEM to reduce stresses beyond AASHTO standard distribution criteria
- Material decreases = incentives
- Material increases = penalties

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**Peer Review, Independent Check  
Seismic Analysis & Design**

- Puget Sound region controlling load case for foundation elements will be seismic
- Design schedule critical path
  - all bridge elements included
- Specific project written criteria
  - include drift, strain and damping limits
- Widening/Retrofit criteria
  - may include considerable risk

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### Ultra-Specific Architectural Definition

- Bridge Type
- Material
- Surface Texture
- Color
- Paint
- Corrosion protection
- Decorative fixtures

### Bridge Task Forces

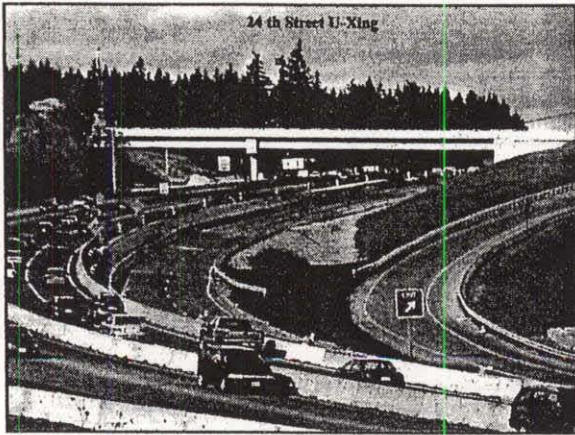
- Caisson
- Tower
- Anchorage
- Superstructure & suspension
- Existing bridge & access walkway
- Scour
- 24<sup>th</sup> Street bridge
- Geotechnical, aerodynamic, seismic analysis

### Bridge Work Package, Submittals

- 22 work package topics (excluding calculations)
  - Example - towers, anchorages
- 101 formal design submittals to date
- 35% 249 Comments
- 65% 496 Comments
- 90% 339 Comments
- 100% IFC 234 Comments
- Post IFC 102 Comments
  
- Total 1,420 Comments

## Bridge Design Standards

- TNB Structural Design Criteria
- WSDOT Bridge Design Manual BDM
- AASHTO Bridge Design Code LFD & LRFD
- Less prescriptive than the WSDOT Standard Specs.
  - Contract tested
- Preferences abound



## 24th NW Street Bridge

- Successful design and plans
- WF74G prestressed girder
- WSDOT BDM design criteria fundamentally sound
- AASHTO Div 1A seismic design criteria worked well
- Need specific architectural requirements



### Issues

- Live load lanes
- Require design condition for future lane configuration
  - Example - pedestrian lane converted to traffic
- Typical girder bridges guided by design codes to include capacity of sidewalks converted to traffic

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### Issues (Cont.)

- Seismic reinforcing steel detailing
- Expect challenge to tight confinement required by design codes to increase constructibility
- Sophisticated analysis to analyze confinement bar strain limits and AASHTO 1.1.1

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### Issues (Cont.)

- Long-term maintenance
  - difficult to quantify choices made by design-builder
- Standards - lacking
- Corrosion protection measures
  - discussed for all types of material

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## Examples - Material Incentives

- Caisson
- Anchorage
- Tower
- Superstructure
- Suspension System

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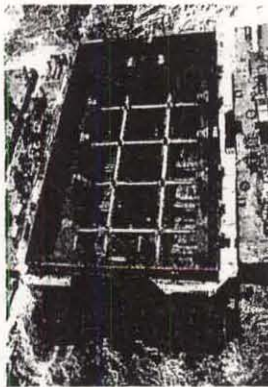
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### Caisson

- Plan Area 130' by 80'
- 15 Dredge wells
- 22' by 22'
- Exterior walls advancing in front of interior walls
- Exterior walls braced by internal strut and reshore system

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### Caisson

- Round dredge well changed to square
- Soil toggle anchor vs. concrete block anchor
- Distribution cap voids outside tower pedestal
- Reduced embedment
- Concrete savings 22,000 cy (-30%)

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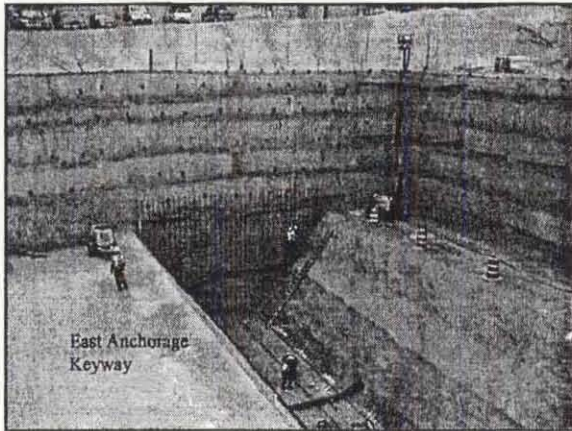
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### Anchorage

- Mass concrete replaced by sand box
- Splay saddle compound curve (casting)
- Steel casting weight savings 130,000 lbs. (-20%)
- Concrete savings 5700 cy (-12%)

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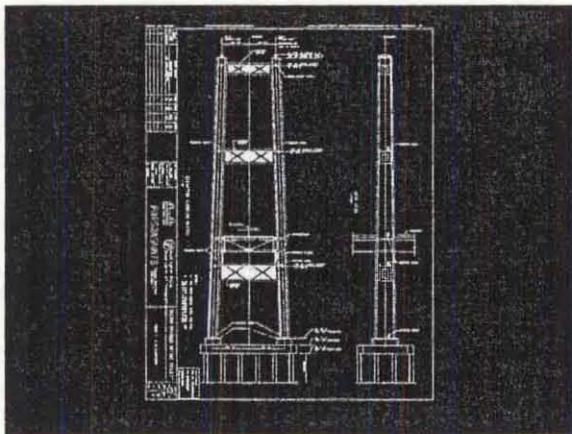
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Carquinez Straits

Self-Climbing  
Form

Intermediate  
Struts

Temporary Stage  
Wind Excitation  
(Vortex  
Shedding)

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### Tower

- Tower wall thickness 30" to 24"
- Lower tower wall 24" to 48"
- Strut increase in PT and concrete
- Added concrete 1000 cy (+6%)
- Added reinforcing steel 1.5M (+12%)

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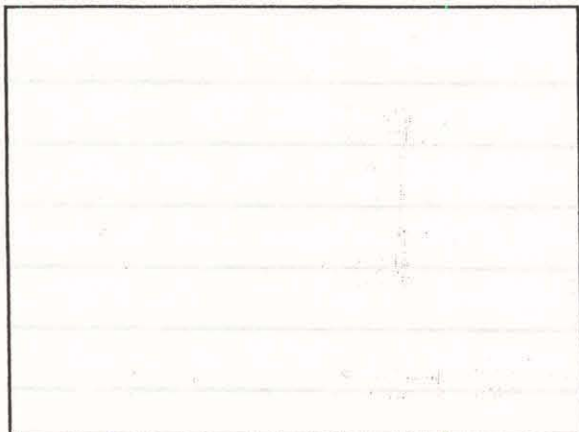
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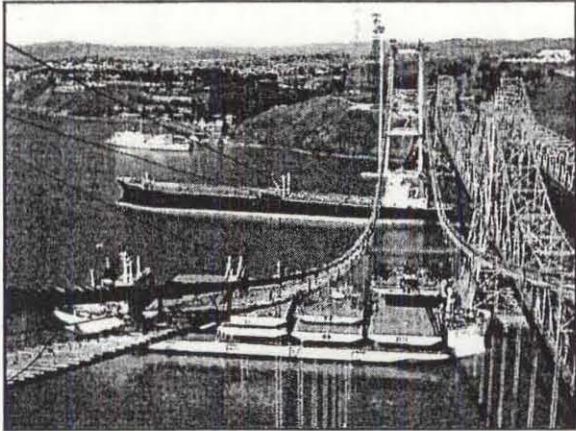
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### Superstructure

- Tapered web depth of floor beam
- Veriendeel truss reduces truss vertical
- Eliminated bottom traveler rail by incorporating traveler runway into bottom chord of truss
- Steel savings 4.5M lbs (-10%)

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### Suspension System

- Superstructure weight reduction
- 500,000 lbs (-6%)

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### Proof Engineer

- Include in contract
- Independent (owner-employed) engineering check
- Errors & omission liability or possibly design warranty liability

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### Specialty Group Perspective

- Traffic
- Materials
- Maintenance
- Signals & Electrical
- Geotech
- Hydraulics
- Landscaping

Don Andrus → not good quality designer  
 Geotech → wiggle room in specifications  
 → Not much control or say.  
 Reference manuals ⇒ Mandatory Guidelines  
 → Changes decided - loop not always closed.





Panel Discussion

Design Oversight

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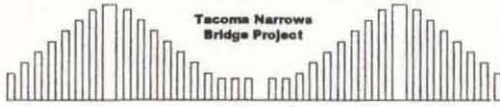
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Right of Way

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**Key Points**

- Wait until 100% design to take condemnation cases to court, or
  - Include clauses to allow settlement adjustments
- Expect to acquire some R/W after contract begins (requirement defined by final design)
- Avoid inverse condemnation
  - Disclose all potential uses of property during right-of-way negotiations
    - Example - construction staging or temporary uses

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# Tacoma Narrows Bridge Project

## Comment Disposition Form

<b>Submission</b> Title: 90% Gig Harbor Mainline			<b>Submission</b> Date:	
WSDOT Reviewer: R. Crumbley, M. Nebergall, K. Burt, F. Blakely, D. Sowers, M. Hitzke, D. Anders, B. Lindgren			Responses By: D.Holmquist, R.Wright, K.Hixson	
Date of WSDOT Comments: May 23, 2003			Date of Disposition: 5/29/2003	
Comment No.	Standard Reference	Review Comment	Status Code	TNC Response
8.	Plans, GRW-028	<p><u>Geotechnical Report</u> - "Wall by others" should be replaced by "Wall 14B designed by others."</p> <p>In addition, the ½ inch premolded joint filler above Wall 14B should be replaced with material that does not allow transfer of loading to the wall fascia, unless the wall is identified as carrying the canopy column load. In that case, the load from the slab and canopy columns should be shown on this drawing so that the soil nail contractor/designer understands that the nails should be designed to carry shear.</p>	A  A	The drawings will be clarified to show wall 13c/14b interface.
9.		SPGGP-004 - Wet weather construction, number 1, 3, 4, 6, 7, have subjective statements. Most of these requirements are already exist in other specifications, just reference these sections.	A	
10.	Design Manual Figure 640-10a	<u>All Roadway Sections</u> – On the high side of the superelevation, subgrade should be broken back at 2%. See Standard Reference.	A	Will add detail

**Status Code LEGEND:**    A = Incorporated    B = Open/Under Review    C = Evaluated/Not Incorporated    D = Beyond Scope/Not Evaluated



# Tacoma Narrows Bridge Project

## Comment Disposition Form

<b>Submission Title:</b> 90% Gig Harbor Mainline			<b>Submission Date:</b>	
<b>WSDOT Reviewer:</b> R. Crumbley, M. Nebergall, K. Burt, F. Blakely, D. Sowers, M. Hitzke, D. Anders, B. Lindgren			<b>Responses By:</b> D.Holmquist, R.Wright, K.Hixson	
<b>Date of WSDOT Comments:</b> May 23, 2003			<b>Date of Disposition:</b> 5/29/2003	
Comment No.	Standard Reference	Review Comment	Status Code	TNC Response
13.		<u>Typical Roadway Sections</u> - A roadway section is required for the approach slab to the new Narrows Bridge. There needs to be coordination between the civil and structure plan sheets. There should be a matchline and a sheet referenced.	A	Section of approach slab is shown in the bridge anchorage drawing.
14.	DM 640.07	<u>Typical Sections</u> - State the maximum acceptable slope, not just "varies". Varies is only acceptable when the slope is not within clear zone.	C	Not required for construction.
15.	HM 4-5.3.1	<u>Typical Sections</u> - Construction Note 11, cement lined ditches are allowed only behind walls. All roadway ditches should be lined with riprap sized for the slope and water quantity.	C	Asphalt lining will be specified, where acting almost as a cur' tying into adjacent fill slope.

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# Tacoma Narrows Bridge Project

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Date of WSDOT Comments: May 23, 2003			Date of Disposition: 5/29/2003	
Comment No.	Standard Reference	Review Comment	Status Code	TNC Response
20.	DM 1020.03(6)	GGD-011 - Construction note 5 - A reference should be provided to a Pedestrian/bike Rail detail, or this should be labeled "Pedestrian/bike rail minimum height 54 in."	C	By design our pedestrian rail is 54" in height.
21.	DM 640.07	GGD-014 - Gig Harbor Median section 1 - The slope on the WB must be specified. A 4:1 slope is preferred, 2:1 minimum.	C	Will modify section to show west anchorage of the existing bridge. The slope will not be modified so the gradelines will not change.
22.	DM 700.01	GGD-015 - Wall Typical Sections - All walls within clear zone must have a single slope barrier face.	A	
23.		GGD-015 - Could the slopes be adjusted to create a roadway turnpike section, so asphalt curb can be used instead of a concrete ditch?	A	Asphalt lining in ditch will be used, BUT grading can't be modified at the ramp nosing.
24.	DM 640.07	GGD-016 - Fill Sections - Show and specify slope rounding on all slopes per standard plan H-8.	A	

**Status Code LEGEND:**    A = Incorporated    B = Open/Under Review    C = Evaluated/Not Incorporated    D = Beyond Scope/Not Evaluated

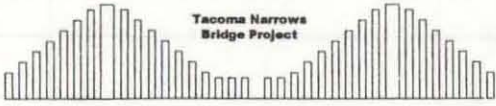
# Tacoma Narrows Bridge Project

## Comment Disposition Form

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<b>WSDOT Reviewer:</b> R. Crumbley, M. Nebergall, K. Burt, F. Blakely, D. Sowers, M. Hitzke, D. Anders, B. Lindgren			<b>Responses By:</b> D.Holmquist, R.Wright, K.Hixson	
<b>Date of WSDOT Comments:</b> May 23, 2003			<b>Date of Disposition:</b> 5/29/2003	
Comment No.	Standard Reference	Review Comment	Status Code	TNC Response
25.	DM fig. 1020-1a	GGD-016 - Bike transition sections - Show the location of the railing. There needs to be two feet of gravel shoulder along the BP1 line.	A	Railing will be added where applicable 2ft gravel replaced with asphalt.
26.	DM fig. 920-5	GGD-020 - Roadway section Z - CA Sta. 12+57.54 to CA Sta. 12+69.41 (Madrona Woods driveway) shows width of only 13 ft. (This dimension also shows on sheet GGP-056.) Minimum width for a commercial driveway is 30 ft.  In addition, this driveway is to be widened to provide a second exit lane.	D	WSDOT is of the understanding that TNC would provide the widening when the VE study for the bicycle tunnel was evaluated and excepted.  TNC Response: Layout conforms with approved layout shown in Basic Configuration. Additional width would require rebuilding the entire approach, which wasn't provided for in Basic Config. (also comment 35).
27.		GGD-031 - Toll Plaza Median Section 4 and 5 reference construction note 7 yet it does not appear on sheet.	A	Note will be added.
28.	DM 720.02	GGD-031 - Toll Plaza Median Section 6 - The slope in front of an impact attenuator cannot exceed 10:1.	A	

**Status Code LEGEND:**    A = Incorporated    B = Open/Under Review    C = Evaluated/Not Incorporated    D = Beyond Scope/Not Evaluated





Tacoma Narrows  
Bridge Project

Partnering & Alignment

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Partnering

- Executive Management Team
  - Values & Objectives
- Formal Partnering Sessions
  - Commitment Statement

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Partnering

- Results Leadership Team
  - Pulse Check
  - Commitment survey
  - Breakthrough Opportunities
  - Design Management Team

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### One Project – One Team




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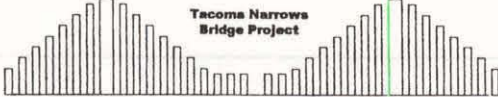
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### Business Management

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### Key Points

- Use an electronic document control system
- Clarify requirements and expectations for final records
- Set up payment and cost control systems up front
- Assess risk and allocate for contingencies *early*

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## Documentation & Final Records

### •TNB Practice

- Defined work product and final records formats
- Log/track documents and submittals electronically
- Document project with digital photographs

### •Lessons

- Define work product/final records early
- Involve WSDOT support offices  
(Region Ops, Mats Lab, HQ Const. Office)

## Documentation (cont'd)

### •Electronic/Digital Formats

- Electronic submittals and digital photos
  - Decreases need for external support groups
  - Increases efficiency of copy and distribution
  - Decreases physical size of work product and final records

### •Shared Web Server

- Shared issue list helps resolve issues
- Efficiently transmits review submittals
- Supports electronic document exchange
- Increases efficiency of copy and distribution

## Payments and Cost Control

### •TNB Practice

- "pre-invoicing" process with design-builder
- Review design-builder's documentation for payments
- Payment within 3-5 days
- Accountability in cost control system

### • Lessons

- Involve WSDOT support offices in planning
- Plan/review process early with design-builder
- Key to success = building relationships

## Risk & Contingency Management

### TNB Practice

- Risk management plan tied to WBS
- Contingency allocation based on contract risk not project risk
- Schedule and progress constantly monitored

### Lessons

- Identify & validate risks *before* construction
- WBS is important tool when identifying risks

## More Ideas

### • Build Relationships

- Partnering = important key to success
  - Design-builder
  - WSDOT support offices
- External support offices
  - Attorney General
  - State Auditor
- Private Business
  - Copier Services
  - Catering Services

## More Ideas (cont'd)

### • Plan Early

- Work Breakdown Structure
  - Integral to risk assessment and contingency allocation
  - WSDOT workforce planning
- Reporting
  - Identify *early* who, what, when
  - Define expectations and reporting format
- Quality Audits
  - Identify parameters *early*
  - Define expectations and audit format
  - Identify audit resources and management structure



### More Ideas (cont'd)

- Change Orders
  - Identify, define WSDOT roles and responsibilities
    - include delegation of authority
  - Establish quick response process
  - Involve WSDOT support offices
  - Identify resources (copy, IT, facilities, etc.)
  - Pricing expertise is critical

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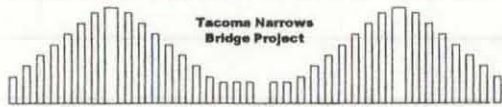
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### Communications

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### Key Points

- Develop detailed media relations and public outreach plan in RFP
  - clearly define expectations
  - connect responsibility and authority
- Build in flexible communication strategies and implementation
  - concurrent design and construction
- Broaden definition of public outreach
  - seek creative, innovative opportunities for partnership

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### Communications (cont'd)

- Reflect WSDOT's values and goals in contract
- Identify agency/contractor overlapping values and goals (contract)
- Create "covenant" that describes basic communication tenants

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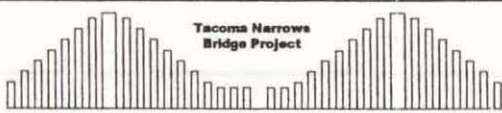
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### Environmental Oversight

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### Key Points

- Clarify WSDOT/design-builder roles and responsibilities
- Construction activities were permitted that design-builder never used (docks, material conveyors)
- Need process with regulatory agencies to change project permitting as project evolves
- Need knowledgeable environmental manager in project team.

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## EIS & Permitting Phase

1996 – 2000

- Private Developer
  - United Infrastructure of Washington (UIW)
- Permitting without final design
- Permits negotiated by and issued to UIW

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## Design-Build Agreement – Role Change

- Permits that had been negotiated by and issued to the private developer (UIW) were changed to WSDOT as the permittee

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## Design-Build Agreement

- "WSDOT Regulatory Approvals"
- "Non-WSDOT Regulatory Approvals"
- Roles & Responsibilities

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### Design-Build Agreement

- > "WSDOT Regulatory Approvals"
  - Permits required to build the project
    - All acquired before DBA executed
    - Negotiated and issued to UIW
    - Transferred to WSDOT as permittee upon change to public financing
- > "Non-WSDOT Regulatory Approvals"
  - For design-builder selected construction methods
  - Design-builder would be applicant and permittee
  - Some agencies (Corps) not willing to issue permit (NW) directly to the design-builder

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### Roles & Responsibilities

- > Design-Build
  - "Assignment of Responsibility" to Design-Builder
  - Owner relinquishes "prescriptive" control
  - Yet, as the permittee and contracting agency, WSDOT ultimately retains responsibility to resource agencies
  - Communications – Who "speaks for" the project?

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### Ongoing Resource Agency Involvement

Environmental Task Force

- Has met every two weeks since NTP
- TNC, WSDOT and resource agency reps
  - DOE
  - WDFW
  - Pierce County
  - City of Tacoma
  - DNR

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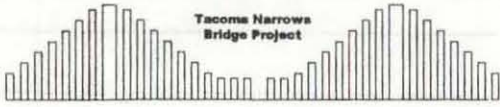
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Tacoma Narrows  
Bridge Project

Utility Relocates

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Key Points

- Clearly state design-builder has complete responsibility to identify and accomplish relocations
- All utilities need up-front education on roles & responsibilities using the design-build method
  - WSDOT & Design-Builder need to "speak with one voice"
- Region Utility Engineer is key player in success

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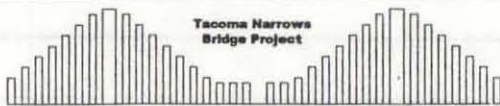
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Tacoma Narrows  
Bridge Project

Panel Discussion  
&  
Questions

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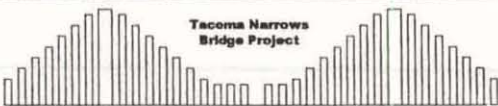
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Tacoma Narrows  
Bridge Project



**Build It**

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**Key Points**

- Quick response needed to field change requests
  - track changes for verification
- Identify duties WSDOT prefers to or must retain
  - example - electrical inspection
- Design-builder responsible for Q/C and Q/A
- WSDOT responsible for Q/V (Quality Verification) and performance audits
- Increase trust by clearly defining processes that provide desired results

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**Inspection Staffing**

- 2 Field Engineers – 1 roadway, 1 bridge
- 1 Material Coordinator
- 4 Inspectors
- 2 Testers

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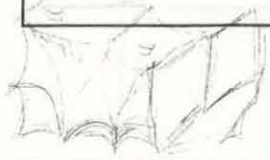
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**Quality Program**

- Quality Control – Design-Builder
- Quality Assurance – Design-Builder Designer
- Quality Verification - WSDOT



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**ATSER**

Assists in the statistical analysis of material testing

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**DELCAN**

Audit system

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### Field Changes

- FCR – Field Change Request
- FCN – Field Change Notice
- RFI – Request For Information
- NCR – Non-Conformance Report

### Process

- Design-builder field staff write request
- Design-builder sends to designer and WSDOT
- WSDOT forwards to internal design lead
- Design-builder sends designer's response
- WSDOT agrees = sends concurrence
- WSDOT does not agree = sends comments

### For September 2003

- 49 FCR's
- 10 FCN's
- 28 RFI's
- 11 NCR's

At Risk Construction

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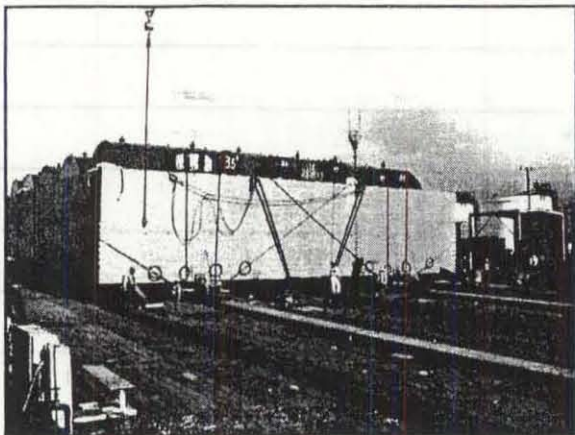
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**Construction Segments**

- 24<sup>th</sup> St. wb ramps and structure
- 22<sup>nd</sup>, 36<sup>th</sup> St. and 36<sup>th</sup> St. eb ramps
- SR 16 west anchorage to 24<sup>th</sup> St. vic
- Jackson St. eb exit
- Jackson St.wb on-ramp
- SR 16 project begin to east anchorage
- Existing bridge – seismic upgrade

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**Segment Substantial Completion**

- Public can enjoy full and unrestricted use and benefit
- Major safety features installed
- Required illumination installed
- Required signs and signals installed
- Need for temporary traffic control ceased
- All lanes in final configuration

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**Emergency Callouts**

Need to have clear area of responsibility with local maintenance crews

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WSDOT Tasks

Electrical Inspection ✕

HMA mix design

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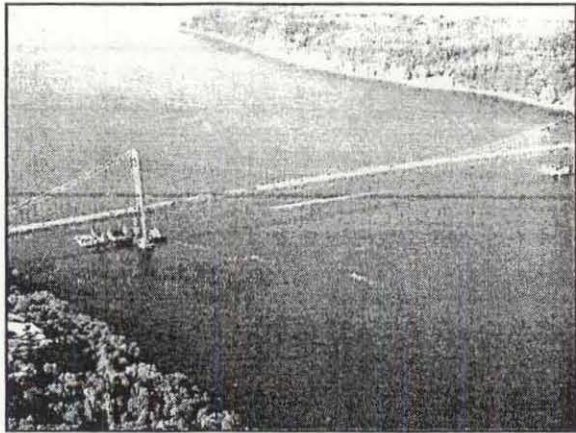
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Tacoma Narrows Bridge Project

Summary

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### Key Points

- Can't anticipate all issues in contract
- WSDOT control = higher contract cost
- Let Designer of Record design - use to your advantage
- Partnering is key
  - Expect different perspectives and struggles
- First year - project is going well!

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### Lessons Learned

- Project oversight
- Staffing
- Partnering
- Task forces
- Compliance audit
- Public information
- Public and governmental interests

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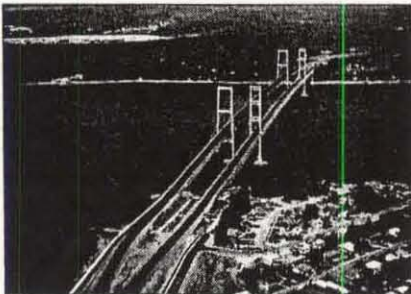
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*Celebrate  
They love it*

### Tacoma Narrows Bridge



Scheduled Completion February 26, 2008

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**TACOMA NARROWS BRIDGE PROJECT**  
**TNC Alignment Session**  
**Pulse Check Feedback - October**

- The relationship between WSDOT and TNC is strong and functioning well. Some of the initial get acquainted activities that took place at co-location were seen as very useful and effective. However, people are still not getting out of their offices enough and taking advantage of being co-located and the leadership needs to champion this.
- When asked about safety and environmental, most see that the level of conversation about and commitment to these areas has increased. However, there is still some concern about how well managed the subs are out in the field (especially the night shift – standards not always being followed). Some feel that there is too much of a “hands off” approach and that there are still a lot of “at risk” behaviors and activities taking place in construction.
- People still complain about access to information especially on the WSDOT side. There is a realization that sometimes it’s due to business concerns inside of the JV but often it is seen as a barrier to work, limiting people’s ability to make informed decisions and for resolving issues quickly.
- One thing that is missing for people is the process for handling design change orders and the resolution of the number of outstanding FCR’s/FCN’s/RFI’s. Another area for improvement is the cost reporting and production performance systems (level of detail, usefulness for decision making and data in/out).
- In talking to construction folks, almost all say that the work out in the field is going well (good worker attitude) and that more work has been accomplished than planned (people are really humping it). However, many also state that people are waiting to the last minute to set things up which they see as potential for upsets and poor planning. Some would also like to see more partnering between contracts and construction (areas like identifying timing, scopes, estimates).
- More trust, openness and alignment needs to be developed between the project and the Delcan and Asher especially within the construction organization. Currently, they are viewed as a threat and people don’t buy in on the possible value they might bring to the project (besides being a requirement of WSDOT). This as well as the number of samples being taken (redundancy) is affecting people’s perception around how well quality is going.

**TACOMA NARROWS BRIDGE  
ONE PROJECT – ONE TEAM  
COMMITMENT SURVEY**

The Results Leadership Team is focused on supporting and promoting the Commitments made by the Project Team. Please take the time to assess the following issues and provide your impression of how the Tacoma Narrows Bridge Project is performing – we welcome your input.

**I. Safety, Quality, Budget & Schedule**

**1. Safety excellence for the life of the bridge is treated as a priority**

Strongly Disagree Strongly Agree

0    1    2    3    4    5    6    7    8    9    10

**2. Quality excellence and “doing it right the first time” are emphasized at all levels of the Project**

Strongly Disagree Strongly Agree

0    1    2    3    4    5    6    7    8    9    10

**3. A balance is being achieved between these 4 critical aspects of the Project: Safety, Quality, Budget & Schedule**

Strongly Disagree Strongly Agree

0    1    2    3    4    5    6    7    8    9    10

If your assessment was a 5 or less, please note which element(s) you believe are being treated as a lower priority:

\_\_\_\_\_

**Please provide general comments for Section I responses (Questions 1 - 3):**

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## II. Decision Making

### 4. Timely decisions are made to support the Project Schedule

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

### 5. Issues are being resolved at the lowest possible level

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

Please provide general comments for Section II responses (Questions 4 - 5):

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## III. Outward Perceptions of the Project Team

### 6. 3rd Party stakeholders and their concerns are being respected within the project decision-making process

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

### 7. Personnel are involved with the local community and helping to foster a positive image of the Project

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

### 8. The execution of this Project is a positive reflection on the Design-Build model

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10

### 9. Efforts are underway to recognize project excellence on a Regional/National/International level

Strongly Disagree Strongly Agree

0 1 2 3 4 5 6 7 8 9 10



Please provide general comments for Section III responses (Questions 6 - 9):

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**IV. Inward Perceptions of the Project Team**

**10. Ethical standards of conduct, integrity, and honesty are evident at all levels of the project**

Strongly Disagree Strongly Agree  
0 1 2 3 4 5 6 7 8 9 10

**11. This Project is behaving as a good steward of the environment**

Strongly Disagree Strongly Agree  
0 1 2 3 4 5 6 7 8 9 10

**12. Mentoring, knowledge transfer, and personal growth are occurring at all levels of this Project**

Strongly Disagree Strongly Agree  
0 1 2 3 4 5 6 7 8 9 10

Please provide general comments for Section IV responses (Questions 10 - 12):

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**V. Overall Impressions of the Project**

**13. This Project is performing well and being true to the Commitments agreed upon through Partnering**

Strongly Disagree Strongly Agree  
0 1 2 3 4 5 6 7 8 9 10

Please provide general comments for Section V response (Question 13) or elaborate on any other issues that you feel need recognition or attention:

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# Commitment Survey - Data Analysis

AUGUST 2003

Question No.	1	2	3	4	5	6	7	8	9	10	11	12	13
8	4	6	6	7	6	6	7	4	6	4	7	6	6
9	7	8	8	8	8	8	8	8	8	8	8	6	9
8	7	7	7	7	8	8	9	8	9	7	7	6	7
7	6	6	8	8	7	7	7	7	7	7	8	8	8
9	7	5	7	6	7	8	7	5	6	7	4	6	6
8	5	7	8	6	7	7	5	6	5	9	6	7	7
1	2	0	1	1	1	3	0	5	0	4	4	0	0
7	3	5	5	4	4	5	2	5	5	3	3	5	5
9	7	7	8	8	9	9	8	6	7.5	7	6	7	7
10	8	9	N/A	9	9	9	9	8	10	10	8	9	9
8	6	7	4	7	7	8	6	7	7	7	7	7	7
8	7	7	9	9	7	5	8	7	9	8	8	N/A	8
8	7	8	7	8	7	9	8	7	6	8	8	8	8
7	7	8	8	6	7	8	8	6	7	6	8	7	7
8	7	7	7	8	7	8	7	6	8	7	5	7	7
8	6	7	6	7	7	3	5	7	8	7	7	7	7
8	8	8	5	8	6	6	7	6	8	8	8	8	7
10	7	8	10	6	10	10	10	8	10	10	6	9	9

12 of 30 surveys were not returned

**Average** 7.8 6.2 6.6 6.7 6.8 6.9 7.1 6.7 6.5 7.0 7.1 6.4 6.8

**Median** 8.0 7.0 7.0 7.0 7.0 7.0 8.0 7.0 6.5 7.3 7.0 6.5 7.0

**Sensitivity Average** 8.1 6.3 6.9 6.9 7.1 7.1 7.2 6.9 6.5 7.3 7.2 6.5 7.1

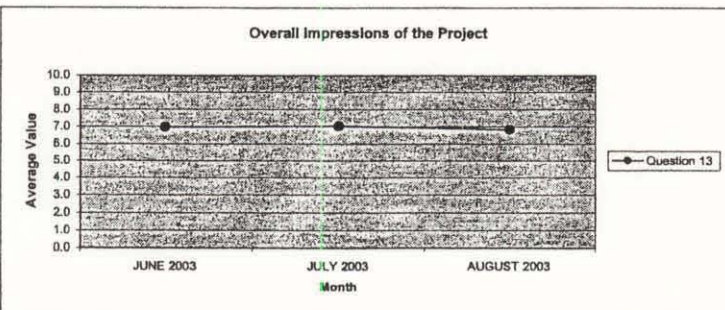
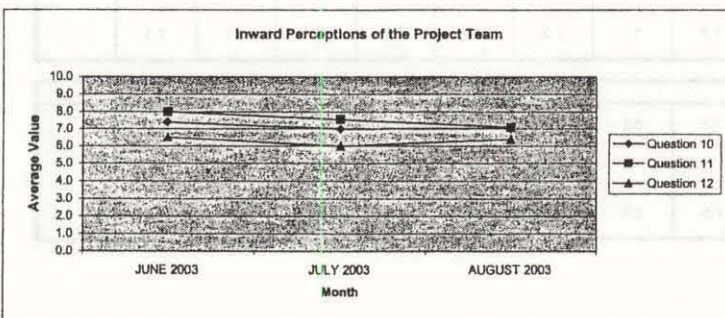
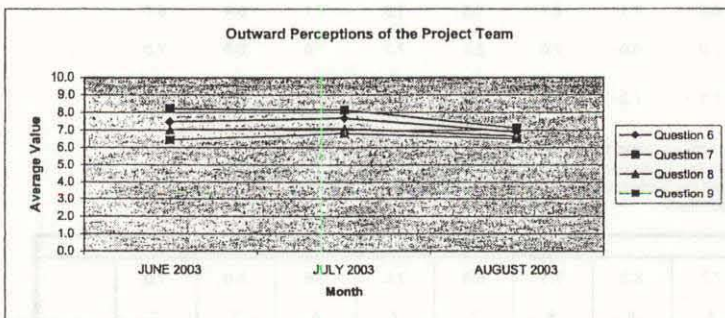
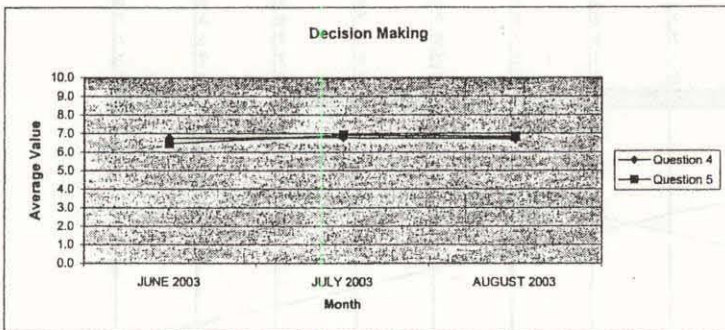
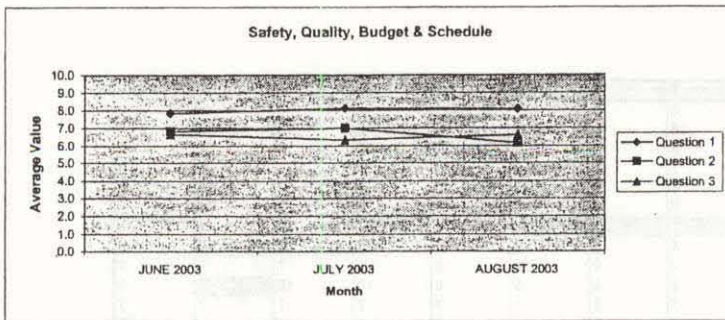
Scores designated as "N/A" signify that the survey participant chose to leave the score blank for this question - these entries are not included in the "Average", "Median" or "Sensitivity Average" calculations. Note that 12 August Surveys were not returned from the evaluators (3 in July). "Sensitivity Average" is the average calculated when a high and low score (as shaded) is eliminated from the averaging calculation - the intent is to assess how the extreme scores affect the overall score for each item.

JULY 2003 Results For Comparison													
<b>Average</b>	8.1	7.0	6.3	6.8	6.9	7.7	8.2	7.1	6.8	7.0	7.6	6.0	7.0
<b>Median</b>	9	7	7	7	8	8	8	8	7	7	8	7	7
<b>Sensitivity Average</b>	8.3	7.1	6.5	6.9	7.1	7.8	8.2	7.2	6.9	7.1	7.6	6.1	7.1

JUNE 2003 Results For Comparison													
<b>Average</b>	8.1	6.8	6.7	6.8	6.5	7.5	8.2	7.0	6.4	7.4	8.0	6.5	7.0
<b>Median</b>	8	7	7	7	6.5	7	8	7.5	6	8	8	6	7
<b>Sensitivity Average</b>	8.1	6.9	6.7	6.9	6.5	7.5	8.3	7.1	6.4	7.5	8.1	6.5	7.1



# Commitment Survey - Graphic Analysis





**TACOMA NARROWS BRIDGE PROJECT**  
**Alignment Renewal Session – August 2003**  
**Potential Breakthrough Opportunities**

Actions	Lead	Actions
Enhance both leadership's and project's commitment to environmental compliance and awareness	Manuel & Linea	<ul style="list-style-type: none"> <li>* TNC reporting and staffing changes.</li> <li>* WSDOT staff change</li> </ul>
Co-location – generate a shift in everyone's thinking in the realization that co-location is not just a goal in itself but a means of creating a fully integrated team. Also look at potential areas where all department personal are actually physically officed together for synergy	All RLT	<ul style="list-style-type: none"> <li>* Open House to invite partners to visit office</li> <li>* Set Behavior examples</li> <li>* Mentor teams to take a walk vs. sending an e-mail</li> </ul>
Build a world-class website including community participation/involvement in making this a site that is highly regarded and used	Linea / PIO's	Filiz will incorporate caisson video clips, etc., continue to improve web
Bring employees to the field/jobsites who do not have field responsibilities so they can better understand the project and do their jobs better with the insights they may gain from seeing firsthand job issues/constraints/opportunities	Joe Collins - (All RLT Managers)	<p>On-Going</p> <p>All parties should take responsibility</p>
Bring the project to the community and the community to the project – create a more powerful relationship between these two entities	Craig	<p>On-Going Community meetings and working through issues ie, 35<sup>th</sup>/22<sup>nd</sup>, Madrona Woods, Aqua Vista, etc.</p>

**TACOMA NARROWS DESIGN MANAGEMENT TEAM (DMT) - ACTION ITEMS  
No. 1**

Item Number	Subject	Responsible Person(s)		Dates		Closed Status	Discussion/Actions
		WSDOT	TNC	Due	Completed	Resolutions/Agreements	
1.1							<i>Dated discussions for each issue along with action items</i>
1.2							
1.3							
2.1							
2.2							
2.3							

DMT #1 – 3/28/03    J. Collins, C. McDaniel, K. Sabol in Gig Harbor  
DMT #2 – 4/4/03    J. Collins, C. McDaniel, B. Whistler in Tacoma

**RESOLUTION STATUS CODES:**

- 1 = Value Engineering proposal deemed acceptable and design is proceeding
- 2 = No-Cost Change Order deemed acceptable to match completed design
- 3a = Change Order anticipated to match completed design
- 3b = Change Order anticipated – design not proceeding
- Closed/no change order required

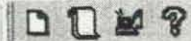
## EXHIBIT H

### Work Product

“Work Product” shall include the following:

1. Correspondence with WSDOT directly related to design decisions
2. Correspondence with WSDOT directly related to Deviations
3. Design Documentation as listed in WSDOT Design Manual
4. 30%, 60% and 90% Plans and Specifications
5. Landscape Plans
6. Final Designs
7. Final Bridge Design Calculations and Specialty Reports (Geotechnical, Aerodynamic, etc.)
8. Final Drawings
9. Final Specifications
10. Construction Plans
11. Correspondence with WSDOT directly related to construction decisions and changes
12. Change Orders
13. Resident Engineer Diaries
14. Inspection Personnel List
15. Inspector’s Daily Reports
16. Daily Reports of Traffic Control
17. As-Built Plans
18. Final Quantities (as available)
19. Pile Driving Records
20. Record of Accidents and Traffic Surveillance
21. Inspector’s Record of Field Tests
22. Concrete Pour Records
23. Surfacing Depth Check Records
24. Prints of Shop Drawings
25. Alignment (Transit) Book
26. Grade Book
27. Cross-Section Notes
28. Drainage Notes
29. Record of Surveys
30. Photographs (Include Quarterly Aerial Photography)
31. Falsework and Form Plans
32. Record of Construction Materials
33. Operating and Maintenance Manuals and Procedures
34. Spraying Records
35. Inventory of Roadway Features and Corresponding Service
36. Records (Signals, Illuminations, Signs, Oil-Water Separators, Drainage, etc.)
37. Reports required by applicable WSDOT Standards





View Find

- All Projects
  - TNB - Tacoma Narrows Brid
    - Project Information
      - Project Properties
      - Schedule
      - Companies
      - Issues
    - Communication
      - Transmittals
      - Request for Informal Notices
      - Non-Compliance No Letters
      - Corr. Sent
      - Corr. Received
      - Meeting Minutes
      - Notepads
      - Telephone Records
      - Safety
    - Contract Information
    - Logs
      - Drawing Sets
      - Drawings
      - Submittal Packages
      - Submittals
      - Materials
      - Daily Reports
      - Insurance
      - Punch Lists
  - PUBLIC - Public Information
  - TRANSCOR - Toll System S
  - Templates

# Project Center

TNB - Tacoma Narrows Bridge Project

Tuesday, October 21, 2003

Wendy McAbee

Alerts - All

Print Refresh Edit

Forward Mark Read Mark Unread

Back To Summary

Expand All Collapse All Select All Unselect All

▼ Notepad item due/overdue

<input type="checkbox"/> <u>Invoices, Sched. of Values, Tax percents, etc. - 00</u> due tomorrow	<u>David Smelser</u>	TNB
<input type="checkbox"/> <u>TANYA - Invoices for Voucher Preparation - 00054</u> due tomorrow	<u>Gaius Sanoy</u>	TNB
<input type="checkbox"/> <u>TANYA - Invoices for Voucher Preparation - 00060</u> due today	<u>Filiz Satir</u>	TNB
<input type="checkbox"/> <u>TANYA - Invoices for Voucher Preparation - 00061</u> due tomorrow	<u>Rick Singer</u>	TNB

▼ Medium

▼ Notepad item due/overdue

<input type="checkbox"/> <u>Environmental Documents - 00152</u> due in 7 days	<u>Filiz Satir</u>	TNB
---	--------------------	-----

▼ Low

▼ Notepad item due/overdue

<input type="checkbox"/> <u>TransCore Invoices to be paid - 00012</u> due in 9 days	<u>David Smelser</u>	TRANSCOR
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▼ Submittals Overdue

<input type="checkbox"/> <u>100% IFC Living War Memorial Park</u> due in 9 days		TNB
<input type="checkbox"/> <u>90% EB SEISMIC UG PCKG #1</u> due in 9 days		TNB
<input type="checkbox"/> <u>90% EB SEISMIC UP #2</u> due in 9 days		TNB
<input type="checkbox"/> <u>Weld Procedure for Wall #14A</u> due in 10 days		TNB
<input type="checkbox"/> <u>Zentech Cais. Mooring Analysis Rev 1</u> due in 10 days		TNB



Microsoft

## Notepads

Job No:

Date: 10/21/2003

Project No:

Page: 1 of 3

Note Pad	Item No.	Status	Required	Ball In Court	Notes	Opened	Closed
<b>ENVIRON</b>	<b>Environmental Documents</b>						
	00152	NEW	10/28/2003	WSDOT FS	APEX Invoices for the following: #21641 - in the amount of \$444.80 #21537 - in the amount of \$752.86	10/7/2003	
<b>INVOICES</b>	<b>Invoices, Sched. of Values, Tax percents, etc.</b>						
	00063	NEW	10/22/2003	WSDOT DS	TNC DK1E-24777-015 Monthly Invoice #15 in the amount of \$12,908,750.00	9/30/2003	
<b>MATERIAL</b>	<b>Material Test Results from TNC</b>						
	00129	NEW	11/10/2003	WSDOT DE	TNC changes to the QA/QC Plan - Concurred with by WSDOT per Dave Davis but no formal submittal/review period has taken place regarding these changes. Check with D. Engel to see if we will be "officially" approving these changes.  D. Davis will be prompting T. Martin of TNC to submit these changes for WSDOT approval. Reset required date to 9/10/2003.  D. Davis has reminded T. Martin of TNC during the Quality Task Force Meeting that this is still an outstanding issue. T. Martin assured D. Davis that the paperwork would be forthcoming shortly. Reset required date to 10/10/2003.  10/10/2003 - Reminded D. Davis that WSDOT Document Control still has not received a proposed change to the QA/QC Manual as promised by D. Davis and T. Martin back in August. Reset required date to 11/10/2003	8/21/2003	
<b>MISC</b>	<b>Miscellaneous C.O. Items</b>						
	00004	NEW	11/16/2003	WSDOT BE	Right Of Way For Parcel NO. 3-09022 - Property owner was supposed to remove metal building by Jan. 1 2001 and it's still encroaching on right of way.  Jeannie - check with Bill Elliott to insure that this is a closed issue.	10/16/2003	



## Work Breakdown Structure Management & Oversight

WBS Code	WBS Description	Group Assignment
<b>Project Total</b>		
<b>1.3.1</b>	<b>Project Management</b>	<b>61-62</b>
1.3.1.1	Project-Management	61
1.3.1.2	Project-Administration Support	62
1.3.1.3	Project-Agreements	63
<b>1.3.2</b>	<b>Design</b>	<b>64-67</b>
1.3.2.1	Design-New Bridge	64
1.3.2.2	Design-Existing Bridge	65
1.3.2.3	Design-Roadway	66
1.3.2.4	Design Management - Roadway	67
1.3.2.5	Design-Agreements	
<b>1.3.3</b>	<b>Construction</b>	<b>69-74</b>
1.3.3.1	Construction Management	69
1.3.3.2	Construction Engineering-Bridge	70
1.3.3.3	Construction Engineering-Roadway	71
1.3.3.4	Construction-New Bridge	72
1.3.3.5	Construction-Existing Bridge	73
1.3.3.6	Construction-Roadway	74
1.3.3.7	Construction-Agreements	
<b>1.3.4</b>	<b>Toll System</b>	<b>77-80</b>
1.3.4.1	Toll System-Design Oversight	77
1.3.4.2	Toll System-Installation Oversight	78
1.3.4.3	Toll System-TNC Site Transition Plan	79
1.3.4.4	Toll System-System Test & Start-up	80
1.3.4.5	Toll System-Agreements	
<b>1.3.5</b>	<b>Environmental</b>	<b>82-86</b>
1.3.5.1	Environmental-Management	82
1.3.5.2	Environmental-Compliance Oversight	83
1.3.5.3	Environmental-Permits	84
1.3.5.4	Environmental-Agreements	85
1.3.5.5	Environmental-Access Feasibility Study	86
<b>1.3.6</b>	<b>Communications</b>	<b>88-89</b>
1.3.6.1	Communications-Internal/External Communications	88
1.3.6.2	Communications-Historical Documentation	89
1.3.6.3	Communications-Agreements/Resources	90
<b>1.3.7</b>	<b>Business Services</b>	<b>93-97</b>
1.3.7.1	Business-Management	93
1.3.7.2	Business-Project Controls	94
1.3.7.3	Business-Verification & Control	95
1.3.7.4	Business-Document and Records Control	96
1.3.7.5	Business-Office Administration	97
1.3.7.6	Business-Agreements	



# Contingency Allocation Process:

## Risk Rating

	Schedule of Value \$M	Schedule			Cost			Technical			Public			Total	Algorithm Amount	Manager's Validation	Program Manager's Validation	
		High (5)	Med (3)	Low (1)	High (5)	Med (3)	Low (1)	High (5)	Med (3)	Low (1)	High (5)	Med (3)	Low (1)					
<b>4.4 TNC</b>	815																	
Insurance	35.9	5			5					1			1			12		
Scour Protection	9			1			1			1					1	4		
Anchoring System	16.7			1			1	5								7		
Caisson Structural Steel	33.7			1			1			1					1	4		
Cassion Concrete	17.9	5					3			1					1	10		
Caisson Rebar	19.7			1			1			1					1	4		
Dredge & Sink Caisson	8.9	5			5			5							1	16		
Seal Concrete	5.1			1			1			1					1	4		
Caisson Cap Concrete	5.4			1			1			1					1	4		
Caisson Cap Rebar	1.9			1			1			1					1	4		
D-2 Towers	25	5					3			3					3	14		
D-3 Anchorages	23			1			3			3					3	10		
D-4 Suspension System	53.4			3			3			3					3	12		
D-5 Suspension Deck	82.4			3			5			5					3	16		
Deck Finishes	6.7			3			1			3					3	10		
Miscellaneous	11	5			5			5							1	16		
D-8 Grading & Drainage	32.5			1			1			1					3	6		
D-9 Structures	24.2			1			3			3					3	10		
D-10 Surfacing	12.6			1			1			1					1	4		
D-11 Roadside Development	7.7			1			1			1					5	8		
D-12 Traffic Services & Safety	21.9			1			1			1					3	6		
D-13 Other Items	14.3			3			3			1					1	8		
D-14 Mitigation	8			3			3			1					5	12		
D-15 Existing Bridge	20.8			1			3			3					3	10		

# MONTHLY PROJECT REPORT

## SR 16 Tacoma Narrows Bridge Project

SEPTEMBER 2003

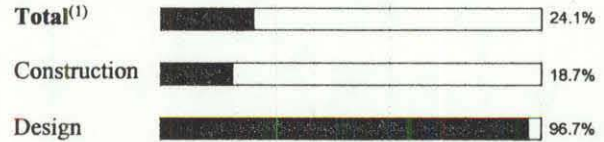
**Project Location:** SR 16, Jackson Avenue to 36<sup>th</sup> Street

**PIN:** 301699A **WIN:** C01699C, C01699D

**Contractors:** Tacoma Narrows Constructors, A Joint Venture (Design/Build); TransCore, L.P (Toll System Supply and Installation)

<b>Project Cost Summary:</b>	\$Millions	Expended
Design/Build Contract	615.0	215.2
Toll System Contract	9.2	1.0
WSDOT Oversight	41.0	5.1
Contingencies	54.7	3.8
Phase I Dev. Cost (UIW)	40.5	39.9
<b>Total</b>	<b>760.4</b>	<b>265.0</b>
<b>Total Expended/Total Cost</b>	<b>35.0%</b>	

### Project Progress To Date: (% Complete)



1. Weighted 7% Design progress and 93% Construction progress

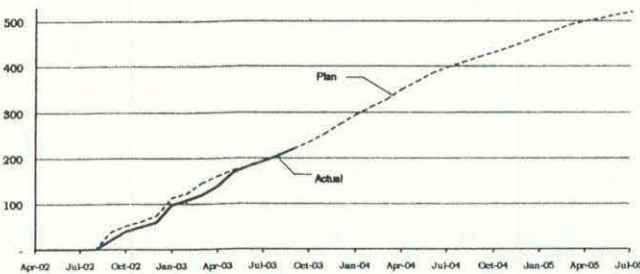
### Progress Highlights for month of September 2003:

- WSDOT project office co-located with TNC
- East anchorage excavation complete
- Noise Variance re-issued
- 24<sup>th</sup> Street bridge Open to traffic
- WSDOT visited fabrication plant in Korea
- 398,525 man-hours worked without any lost-time accident



Tacoma anchorage excavation

### Project Cash Flow: (Through 03-05 Biennium in Millions)



### Project Schedule Status:

- Critical Path facilities (Pier 11 Caisson) three weeks behind schedule, TNC made adjustments from 5 to 6 day work week on towers to accommodate the delay.
- Some Contract Milestones are scheduled ahead of contract dates

### Contract Milestones Overview:

Milestone	Contract	TNC	Months Ahead
Provide Final Plans and Spec. for Toll Facilities	25Sep03	22Jul03	2.2
Place order for Saddles	17Feb04	15Oct03	4.2
Complete new bridge substructure	12May05	20Apr05	0.7
Guaranteed TCAAS Installation Readiness Date	08Dec05	19Sep05	2.7
Lift first deck unit	07May06	14Feb06	2.7
Complete Superstructure joining of deck sections	03Dec06	29Aug06	3.2
Guaranteed Tolling Completion Date	02Apr07	02Apr07	0.0
Guaranteed Project Substantial Completion Date	26Feb08	26Feb08	0.0

### Quality Control:

- Quality auditor training underway
- Materials Testing & Acceptance System in operation

### Risks/Challenges/Issues

- Erosion Control
- Marine Safety in fall/winter weather

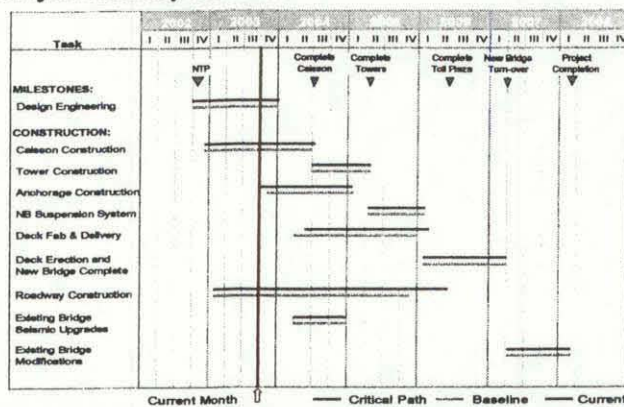
### Upcoming Activities for October 2003:

- Open 24<sup>th</sup> Street ramps to traffic
- Begin concrete pour of East Anchorage Shear Key
- Complete 36<sup>th</sup> St – 22<sup>nd</sup> Avenue construction
- Lifts number 8 & 9 of Tacoma and Gig Harbor caissons

### Public Information:

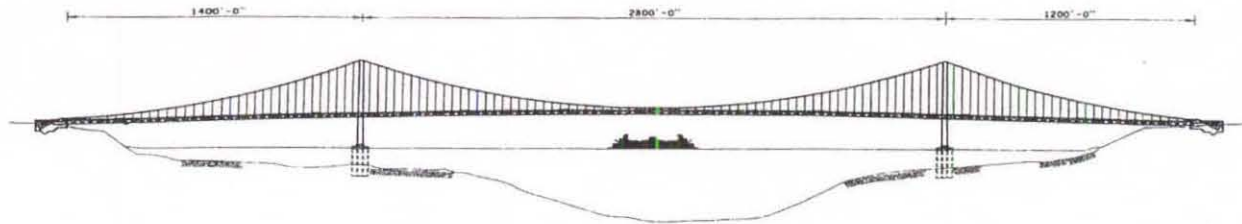
- Hosted several project tours for elected officials
- Facilitated 4-page article on project in trade publication *Pacific Builder & Engineer*
- Provided extensive project access to, and communication with regional reporters resulting in positive newspaper coverage
- Coordinated project presentations to interested groups, including regional Rotary Clubs, engineering companies, UW students and professional associations

### Project Summary Schedule:



For more information, Call toll free at 1.877.762.7769, or 253.534.4640  
Or visit our website: [www.tacomanarrowsbridge.com](http://www.tacomanarrowsbridge.com)



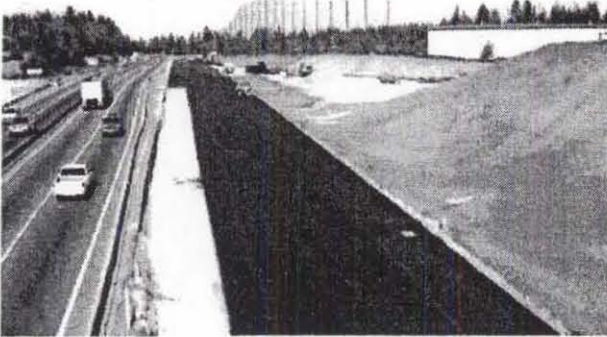


## Tacoma Narrows Bridge Project Update

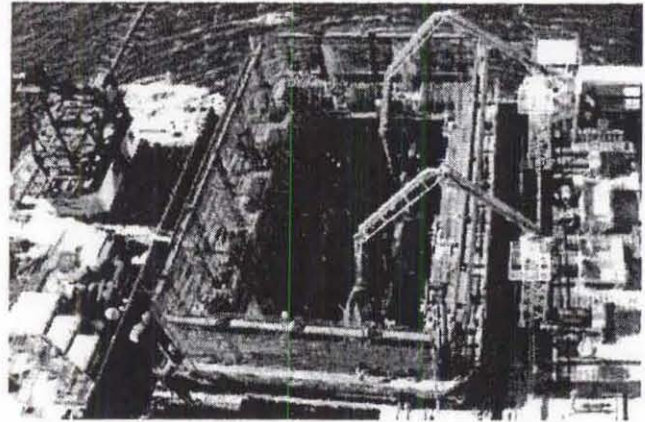
As of September 30, design/builder Tacoma Narrows Constructors (TNC) has completed 19.9% of the new State Route 16 Tacoma Narrows Bridge project. The Gig Harbor caisson was successfully towed and moored to the Narrows Bridge site in August. Now that both caissons are at the bridge site, crews continue the "top-down" construction of the caissons by pouring layers of reinforced concrete. Slowly and methodically the caissons will reach and become embedded in the Narrows seabed. At that point, crews can start building the towers above water. Other bridge work continues as well, including excavation for both anchorages.

The excavation for the Tacoma and Gig Harbor anchorages began and is nearing completion. After excavation is complete, massive concrete will be poured to build the anchorage.

Simultaneous roadwork continues at a rapid pace. Crews have completed the 24<sup>th</sup> Street NW overpass and the bridge opened to traffic on September 2. The new westbound SR 16 on-ramp and exit at the 24<sup>th</sup> Street NW overpass and the new eastbound on-ramp and exit being built at 36<sup>th</sup> Street NW are being paved and are expected to open to traffic by the end of October. Crews also continue work to relocate utilities, grade, realign



Widening along westbound SR 16 is shown in this photo taken from the 24<sup>th</sup> Street NW overpass.

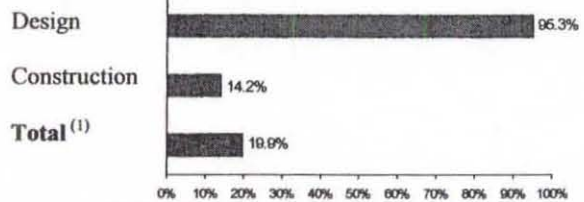


Concrete being placed into the Gig Harbor caisson in the Narrows.

local roads, widen and improve intersections, create bicycle facilities, and widen State Route 16 to accommodate future HOV lanes. For more information, visit [www.tacomannarrowsbridge.com](http://www.tacomannarrowsbridge.com).

### Project Progress To Date

Percent Complete



1. Weighted 7% Design progress and 93% Construction progress

The percent completion is arrived at through an assignment of budgeted hours to the design and construction with both being weighted. The weighting is distributed as follows: Design contributes 7% toward the physical completion of the project whereas construction contributes 93%. Once the percent of progress is determined based on the budgeted hours, the weight is then applied for a percent of completion.