

BUILDING A WORLD OF DIFFERENCE

Using a design-build process to deliver a
membrane potable water treatment plant
for the City of Cottage Grove, Oregon

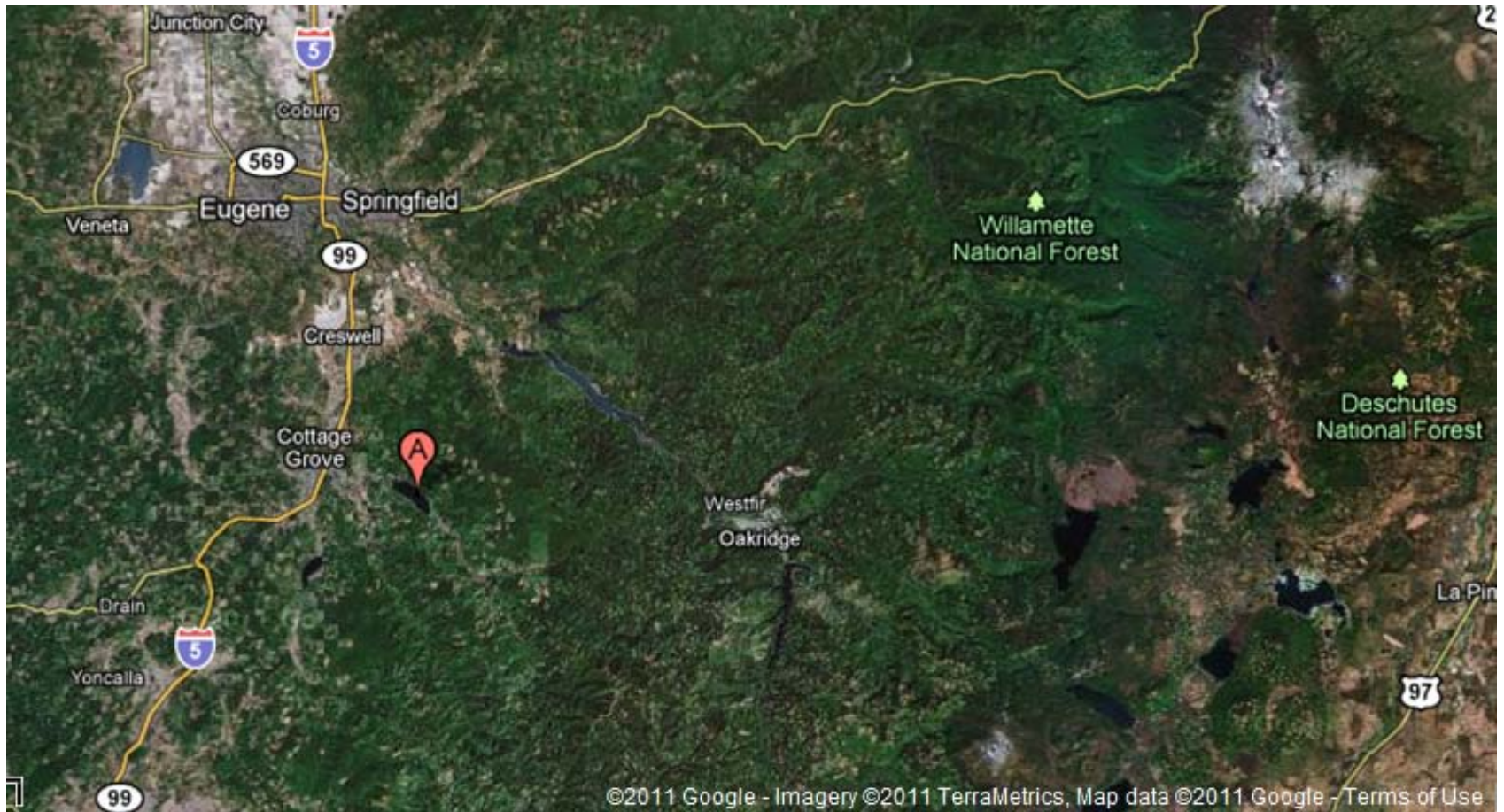
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Licensed in *OR, WA & CA **OR

2012 PNWS AWWA
Yakima, WA May 4, 2012



BLACK & VEATCH
Building a world of difference.

COTTAGE GROVE, OR



BEFORE

- **Row River Water Treatment Plant**
 - 2.0 mgd direct-filtration granular media filter
 - Row River Intake
 - Facilities adjacent to city
- **Layng Creek Filter Plant**
 - 20 miles from the city
 - Water treatment process replacement required to meet drinking water standards
 - Transmission pipeline maintenance concerns
 - Last 3.8 miles of transmission pipeline has 80+ direct service connections

HOW TO MAKE THE TRANSFORMATION?

- **City goals, needs, wants**
 - Consultant and contractor to deliver project
 - Reduced delivery time
 - Reduced delivery cost to system customers
- **City receives proposal from design-build joint venture team consisting of Black & Veatch and Slayden Construction**
 - Guaranteed Maximum Price (GMP) based on 30% design documents
 - GMP approval granted by the City in 2007 and the plant was brought on line in 2008

DESIGN-BUILD APPROACH

- Required permits
 - Joint USACE/DSL permit for the new intake structure
 - Floodplain permits from the City and County
 - City conditional use permit and public works development permit
 - Lane County right-of-way permit, including authorization to hang transmission pipeline from existing highway bridge
 - Approval for WTP modification through Oregon Department of Health Services (DHS) Drinking Water Division

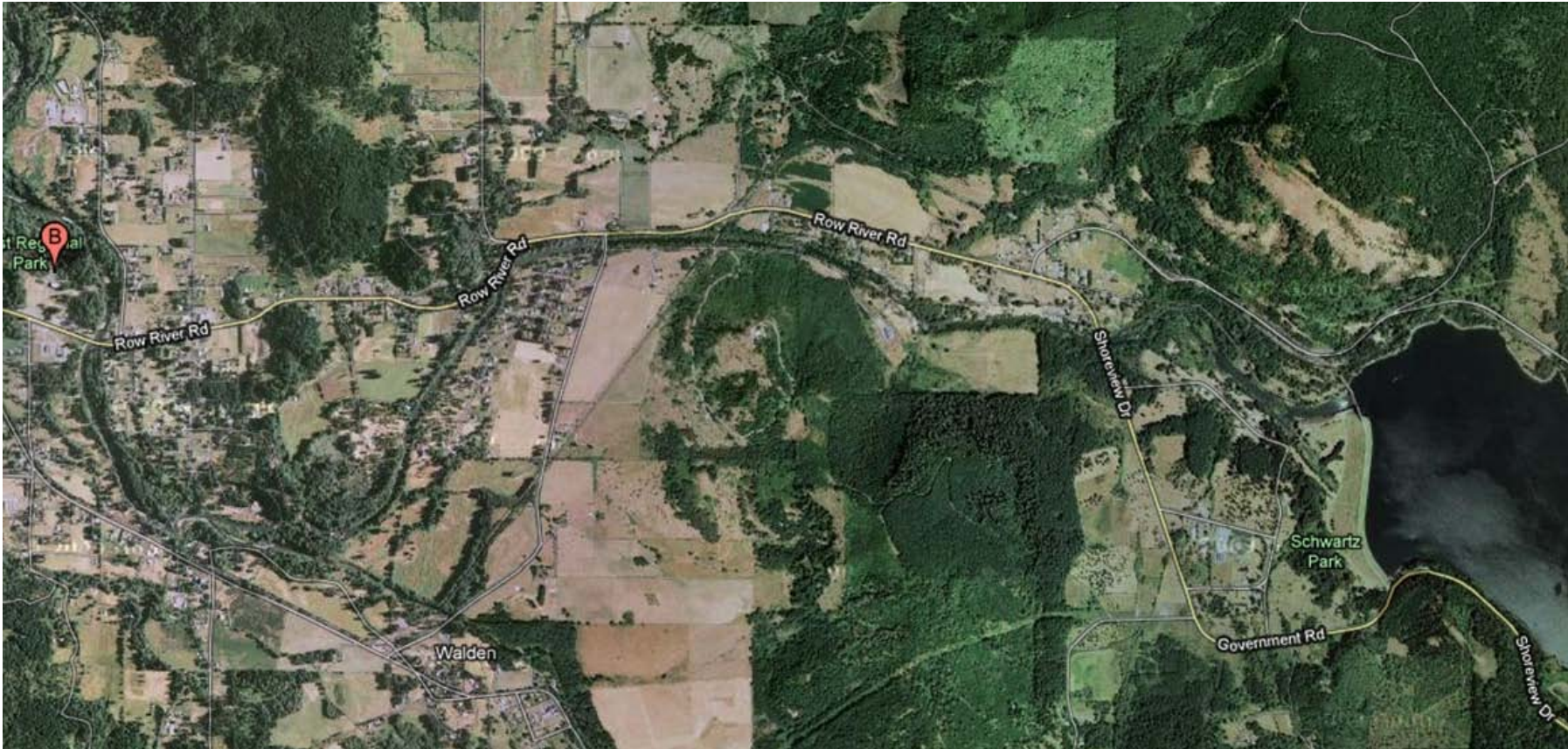
DESIGN-BUILD APPROACH, CONTINUED

- Distribution pipeline broken out as parallel project
- Microfiltration membrane system procurement
 - Competitive process based upon life cycle costs
 - Allows design optimized around one supplier
- Joint venture allows construction to commence before designs are complete and provides synergy between engineer and constructor
- Drawing and specification packages
 - Structural foundation and modular building expansion with early building official approval application
 - Site civil approval and construction while interior process mechanical design is still ongoing

AFTER

- **Layng Creek Filter Plant Decommissioned**
 - Redundant and formerly unused Dam removed to restore habitat
 - Transmission line abandoned below Dorena Reservoir, including buried Row River Crossing with portion exposed due to river scouring
 - Ownership of remaining assets transferred to a new and separate water agency

ROW RIVER WATER TREATMENT PLANT



AFTER, CONTINUED

- **New two-mile long distribution pipeline**
 - Supplies former transmission line service connections
 - 12-inch and 8-inch diameter
 - Bridge crossing over the Row River
 - Design includes 1.8 mile future extension

DISTRIBUTION PIPELINE & ROW RIVER BRIDGE CROSSING



AFTER, CONTINUED

- **Row River Water Treatment Plant**
 - Conversion to 4.0 mgd direct-filtration microfiltration membranes, expandable to 8.0 mgd
 - Chemical feed system additions and upgrades
 - Replacement of gaseous chlorine system with sodium hypochlorite
 - Two new discharging backwash settling ponds
 - New standby power diesel generator
- **New 8.0 mgd Row River intake**
 - NOAA/NMFS compliant fish screens
 - Air burst screen cleaning system

NEW 8.0 MGD ROW RIVER INTAKE



AIR SUPPLY FOR INTAKE SCREEN AIR BURST AND MEMBRANE TREATMENT TRAINS



BACKWASH SETTLING PONDS



STANDBY POWER DIESEL GENERATOR



CLEAN IN PLACE (CIP) CHEMICAL SUPPLY



BACKWASH EQUALIZATION AND NEUTRALIZATION TANKS



PALL MEMBRANE MODULE TRAINS



CONTACT INFO

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Building a World of Difference.®

Implementation of the Green River Filtration Facility Using General Contractor/Construction Manager (GC/CM)

PNWS-AWWA Conference
May 4, 2012

Randy Krueger, PE

PRESENTATION TOPICS

- **Project background, consultant team and Tacoma Water project team**
- **Decision to use GC/CM**
- **Washington State GC/CM**
- **Selection process**
- **Preconstruction services**
- **Benefits realized**
- **Project schedule and budget**
- **Project status**
- **Our project (3D views)**

PROJECT BACKGROUND

- **Tacoma Water is one of the few remaining large unfiltered water systems in the nation**
- **Source Water: Green River**
- **Tacoma Project Partners:**
 - **Covington Water District (11% share)**
 - **City of Kent (11% share)**
 - **Lakehaven Utility District (11% share)**
- **From 2009-2010 Tacoma Water and Partners undertook a study leading to decision to move forward with 150 MGD filtration facility**
- **At the conclusion of the decision report Tacoma Water undertook a study to determine project delivery method**



CONSULTANT TEAM

- **Design Engineer – MWH Americas, Inc.**
- **Owner Agent Support – SAIC and two sub consultants**
- **Legal Support – K&L Gates, LLC (GC/CM experience)**



TACOMA WATER PROJECT STAFF

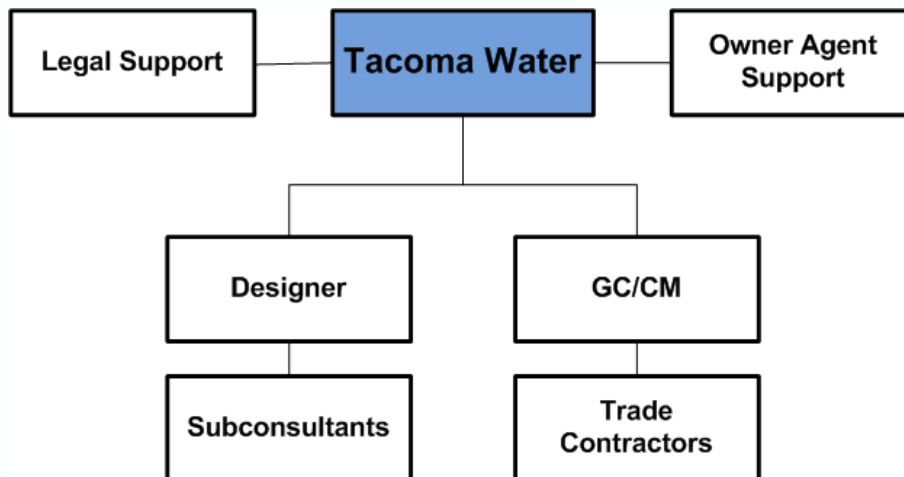
Tacoma Water decision included formation of a 6 member project team

- Project Manager – Randall Krueger 8/2010
- Principal Engineer – Jason Moline 8/2011
- Professional Engineer – Gary Fox 1/2011
- Inspector – George Hauser 4/2012
- Additional Inspector position 7/2012
- Administrative Assistant position 5/2012

TACOMA WATER DECISION TO USE GC/CM

GC/CM selected because Tacoma Water believed this option provides the best balance of benefits

- Ability to obtain early construction involvement (value engineering input, cost estimating, constructability reviews etc.)
- Strong collaboration between Tacoma Water, design engineer and GC/CM (important because of critical nature of facility)
- Reduce claims and change orders
- Importance of working close to critical operating facilities
- Added assurance of keeping project on schedule and within budget



WASHINGTON STATE GC/CM

- **State law – Chapter 39.10 RCW**
- **Administered by CPARB (Capital Projects Advisory Review Board)**
 - Industry wide stakeholders – 23 members
 - Policy development and recommendations
- **Public body use of GC/CM must be approved by CPARB Project Review Committee (PRC)**
 - 30 Members, but uses smaller review panels
 - Two types of approvals:
 - Certify the public body to use GC/CM
 - Approve individual GC/CM projects

WASHINGTON STATE GC/CM (CONTINUED)

- **Prescriptive GC/CM selection process**
- **Bring GC/CM on board early in design process**
- **Two phases of services:**
 - Preconstruction (design)
 - Construction
- **GC/CM develops MACC (Maximum Allowable Construction Cost) at 90% design completion level**
- **GC/CM issues bid packages for all scopes of work and must accept low bid**
- **GC/CM can self-perform up to 30% of the work (MACC), but must bid on this work**

GC/CM SELECTION PROCESS

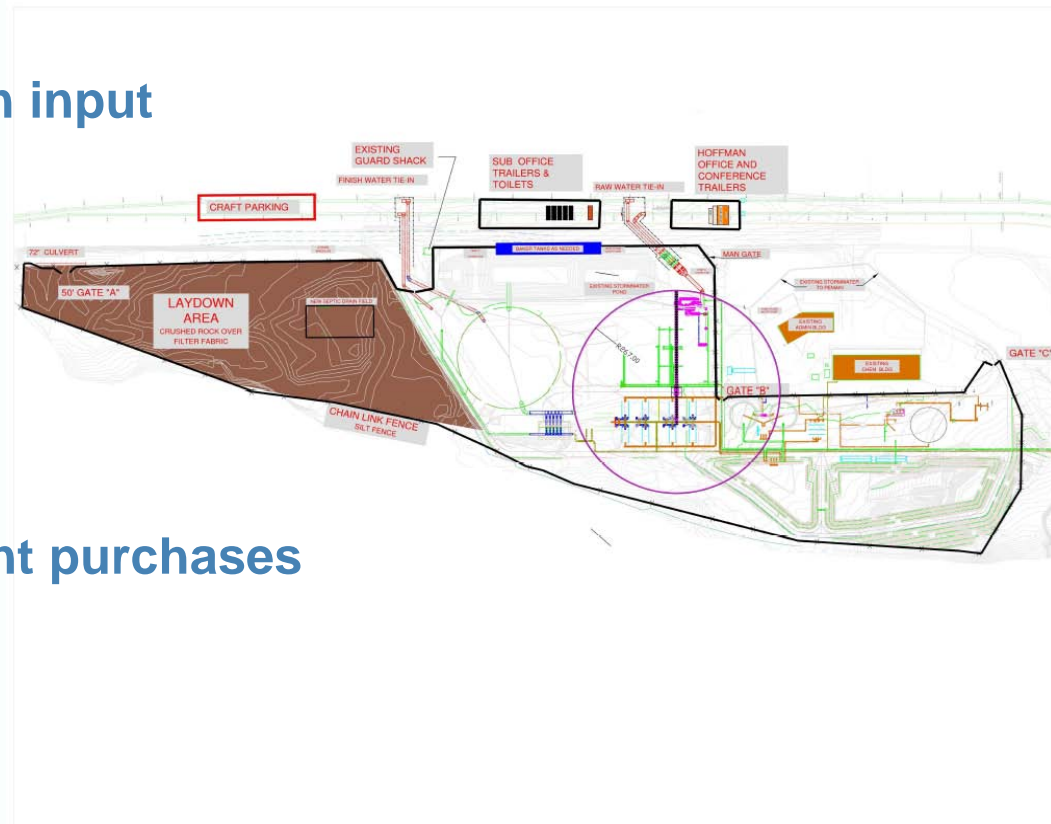
- **Received approval from CPARB-PRC on 12/2/2010**
- **Used 3 step process:**
 - Request for proposals (qualifications based proposal)
 - Interviews
 - Request for final proposals
- **Selection based on point scoring system**
- **Received RFP responses from 6 companies**
- **Based on RFP scoring interviewed 3 companies**
- **Final proposals requested of two companies**
 - GC/CM fee (overhead and profit) expressed as percentage of MACC
 - Fixed cost for Specified General Conditions

OUR SELECTION POINT SCORING

Proposal						
Proposer	Total					
Firm 1	4200					
Firm 2	4319					
Firm 3	3723					
Firm 4	4263					
Firm 5	3081					
Firm 6	3724					
Interview						
Proposer	Total					
Firm 1	1265					
Firm 2	1500					
Firm 4	1435					
Total Score for Proposal and Interview						
Proposer	Total					
Firm 1	5465					
Firm 2	5819					
Firm 4	5698					
Final Proposal						
Proposer	Percent Fee Percentage	Total Estimated MACC	Percent Fee Amount	Specified General Conditions Work	Total Bid	Points
Firm 2	3.69%	\$161,000,000	\$5,940,900.00	\$3,169,000.00	\$9,109,900.00	200
Firm 4	3.60%		\$5,796,000.00	\$3,801,211.00	\$9,597,211.00	190
Results						
Proposer	Total	Hoffman Construction Company of Washington Selected				
Firm 2	6019					
Firm 4	5888					

GC/CM PRECONSTRUCTION SERVICES

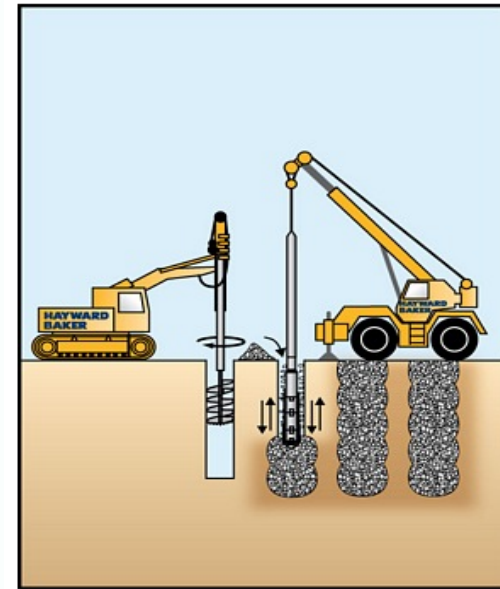
- Develop constr. plans: management, site logistics, safety & QA/QC
- Use of Building Information Management (BIM)
- Cost estimating (30%, 60% and 90% (MACC))
- Document reviews
- Value engineering ideas/design input
- Constructability reviews
- Construction sequencing
- Construction schedule
- Subcontractor outreach
- Early subcontracting/equipment purchases



GC/CM BENEFITS REALIZED

- **Early design input**

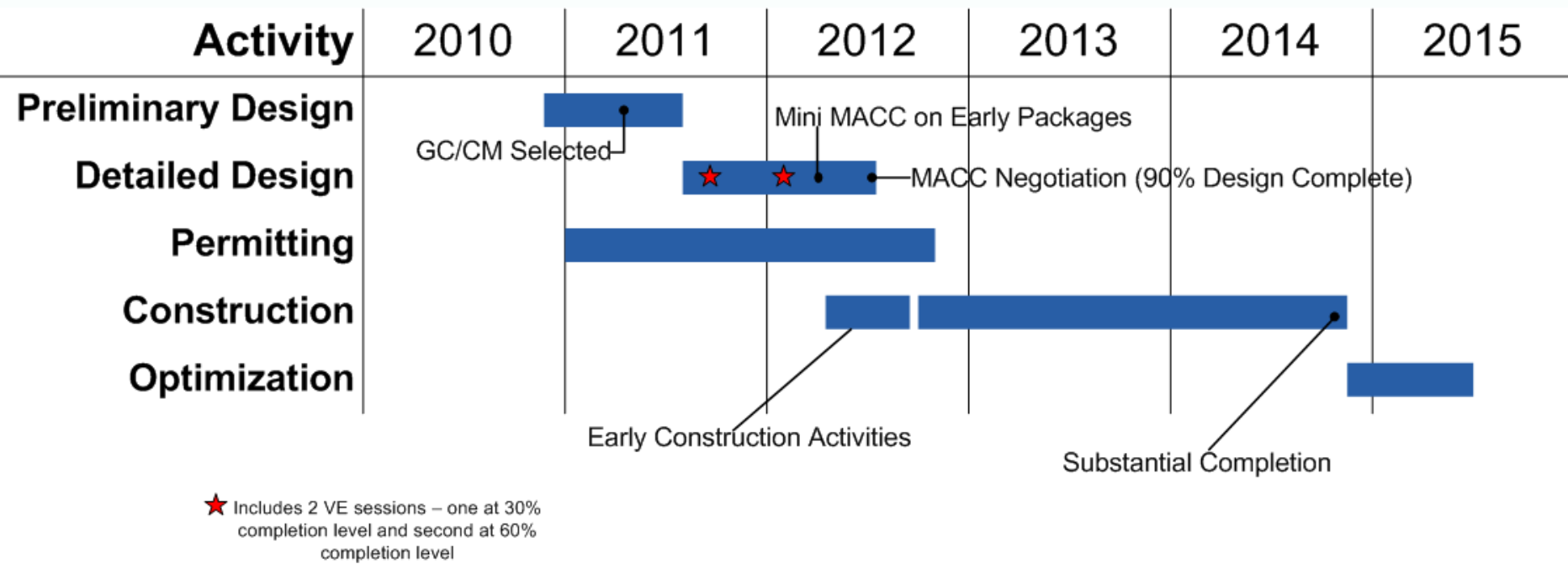
- Creative value engineering analysis
- Alternative construction options for cost savings
- Reliable cost estimates
- Scheduling/sequencing of construction
- Assistance with startup/commissioning plans
- Site logistics plan



- **Ability to separate out early construction and equipment purchases without responsibility concerns**
- **Partnership with owner and designer throughout all project phases**

GC/CM contracting brings the full project team together early and results in collaboration/team decision making

SCHEDULE



BUDGET

60% Design

<u>Opinion of Probable Construction Cost</u>	\$133,833,434
<u>Negotiated Support Services:</u>	\$11,310,488
<u>Escalation:</u>	\$5,776,359
<u>Subtotal</u>	<u>\$150,920,281</u>
<u>MACC Contingency:</u>	\$3,490,245
<u>Subtotal = Maximum Allowable Construction Cost</u>	<u>\$154,410,526</u>
<u>GC/CM Fee: 3.69% (MACC)</u>	\$5,697,748
<u>GC/CM Bid Specified General Conditions</u>	\$3,169,000
<u>Subtotal = Total Construction Cost (Less Sales Tax)</u>	<u>\$163,277,274</u>
<u>GC/CM Preconstruction Services</u>	\$840,000
<u>Estimate PSE Power Upgrade</u>	\$3,500,000
<u>Permits and Special Inspections</u>	\$3,000,000
<u>TW Internal Labor & Expenses</u>	\$6,500,000
<u>Consultant (MWH, SAIC, K&L Gates) Services -through construction</u>	\$15,000,000
<u>Tacoma Water (Owner) Project Contingency</u>	\$4,000,000
<u>Subtotal</u>	<u>\$196,117,274</u>
Sales Tax (8.6%)	\$14,759,086
<u>TOTAL PROJECT COST (midpoint of construction)</u>	<u>\$210,876,360</u>

PROJECT STATUS

- **Pilot work complete**
- **Received approval from Washington State Department of Health for high rate filtration (10 gpm/ft²)**
- **Overall design is nearing 90% completion level**
- **Design included 2 VE sessions conducted by independent team at 30% and 60% design completion levels**
- **Early construction packages – earthwork, yard piping (12” to 108” diameter) and ground improvements start with groundbreaking ceremony on 5-11-12**
- **Permit approvals ongoing**
- **Project is on schedule and budget**

OUR PROJECT



OUR PROJECT



MECHANICAL DEWATERING BUILDING



FLOC/SED BASIN AND FILTER COMPLEX



VIEW FROM UNDER CANOPY AT FILTERS



FILTER GALLERY (EIGHT TWO CELL FILTERS)



CONCLUSIONS

- Tacoma Water internal project management team is bringing benefits
- Washington State Regulations regarding GC/CM procurement are very prescriptive (yields consistency to GC/CM selection, contracting and management process)
- Selection point scoring should be given a critical eye to ensure final cost proposal has impact to overall point scoring
- Specify not only GC/CM project staff positions but time commitment for all listed personnel included in Specified General Conditions cost
- Bring on GC/CM no later than 30% design level to maximize project benefits
- This method of implementing a project fosters collaboration between Owner, Engineer and GC/CM (teamwork vs. adversarial)
- Effective implementation method to allow strong owner involvement while assuring increased predictability of cost, schedule, and quality

Legislating Best Practices

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Who Can Use Design-Build in Washington?

- Any public agency that is either
 - A certified agency under RCW 39.10.270
 - Approved by the Project Review Committee to perform a design-build project under RCW 39.10.280

RCW 39.10.300

(1) Subject to the process in RCW [39.10.270](#) or [39.10.280](#), public bodies may utilize the design-build procedure for public works projects in which the total project cost is over ten million dollars and where:

(a) The design and construction activities, technologies, or schedule to be used are highly specialized and a design-build approach is critical in developing the construction methodology or implementing the proposed technology; or

(b) The project design is repetitive in nature and is an incidental part of the installation or construction; or

(c) Regular interaction with and feedback from facilities users and operators during design is not critical to an effective facility design.

(2) Subject to the process in RCW [39.10.270](#) or [39.10.280](#), public bodies may use the design-build procedure for parking garages, regardless of cost.

(3) The design-build procedure may be used for the construction or erection of preengineered metal buildings or prefabricated modular buildings, regardless of cost and is not subject to approval by the committee.

(4) Except for utility projects and approved demonstration projects, the design-build procedure may not be used to procure operations and maintenance services for a period longer than three years. State agency projects that propose to use the design-build-operate-maintain procedure shall submit cost estimates for the construction portion of the project consistent with the office of financial management's capital budget requirements. Operations and maintenance costs must be shown separately and must not be included as part of the capital budget request.

(5) Subject to the process in RCW [39.10.280](#), public bodies may use the design-build procedure for public works projects in which the total project cost is between two million and ten million dollars and that meet one of the criteria in subsection (1)(a), (b), or (c) of this section.

(6) Subject to the process in RCW [39.10.280](#), a public body may seek committee approval for a design-build demonstration project that includes procurement of operations and maintenance services for a period longer than three years.

Best Practice: Expand Use

- Utilize definition of appropriate projects from Transportation Statute - RCW 47.20.785 :
 - (a) The construction activities are highly specialized and a design-build approach is important in developing the construction methodology; or
 - (b) The projects selected provide opportunity for greater innovation, efficiencies and integration between the designer and the builder; or
 - (c) Significant savings in project delivery time would be realized.
- Eliminate \$10 million ceiling

Projects Under \$10 Million



Washington Public Utility Districts
Assn.
Olympia, WA

The East Harlem School
New York, NY



Projects Under \$10 Million



Miramar Golf Clubhouse and
Complex
Marine Corps Air Station
San Diego, CA

Hidden Oaks Nature Center
Bolingbrook, IL



RCW 39.10.330: Evaluative Factors

- Evaluation factors for request for qualifications shall include, but not be limited to, technical qualifications, such as specialized experience and technical competence; capability to perform; past performance of the proposers' team, including the architect-engineer and construction members; and other appropriate factors. Cost or price-related factors are not permitted in the request for qualifications phase;
- Evaluation factors for finalists' proposals shall include, but not be limited to, the factors listed in (d)(i) of this subsection, as well as technical approach design concept; proposal price; ability of professional personnel; past performance on similar projects; ability to meet time and budget requirements; ability to provide a performance and payment bond for the project; recent, current, and projected workloads of the firm; and location. Alternatively, if the public body determines that all finalists will be capable of producing a design that adequately meets project requirements, the public body may award the contract to the firm that submits the responsive proposal with the lowest price;

Best Practice: Discretion for Public Agencies

- Current law provides discretion but interpretation has been restrictive
- Fix:
 - Expressly allow public bodies full discretion to determine the evaluative factors and relative weight of the factors.
 - Delete ability to create price based “best and final offer”

Best Practice: Qualifications Focused Selection

Allow public bodies to use the following mechanisms:

- Competitive procurement process based on qualifications only, with price established at a point in the progress of the design as set forth in the design-build agreement;
- Procurement with price established in advance by the public body and selection based on selection criteria established by the public body; or
- Procurement based on a combination of qualifications and a pricing component such as costs of the work, design-builder fees, design fees, operations and maintenance costs, general conditions and/or other costs.

Worst Practice: Low Bid Procurement

- Construction claims = combat zone
 - Parties hired experts at the start of construction
 - “No holds barred” claims
 - Fosters combative communications
- You get what you pay for – and a whole lot less!
- Any minimally qualified contractor can bid.





Low Bid Procurement

Qualifications Focused Procurement

- Claims history as a evaluative factor
 - Design-builders cannot throw business relationship under the bus
 - Design-builder/Owner relationship is that of a client, not an adversary
- Can select based on experience, success on other projects, satisfied customers
- Reality = design-build has fewer claims that other forms of delivery
 - Owner gets out of the business of resolving disputes between the designer and the contractor



"Look, I'm not blaming you. I'm just suing you."

Number of Short Listed Proposers

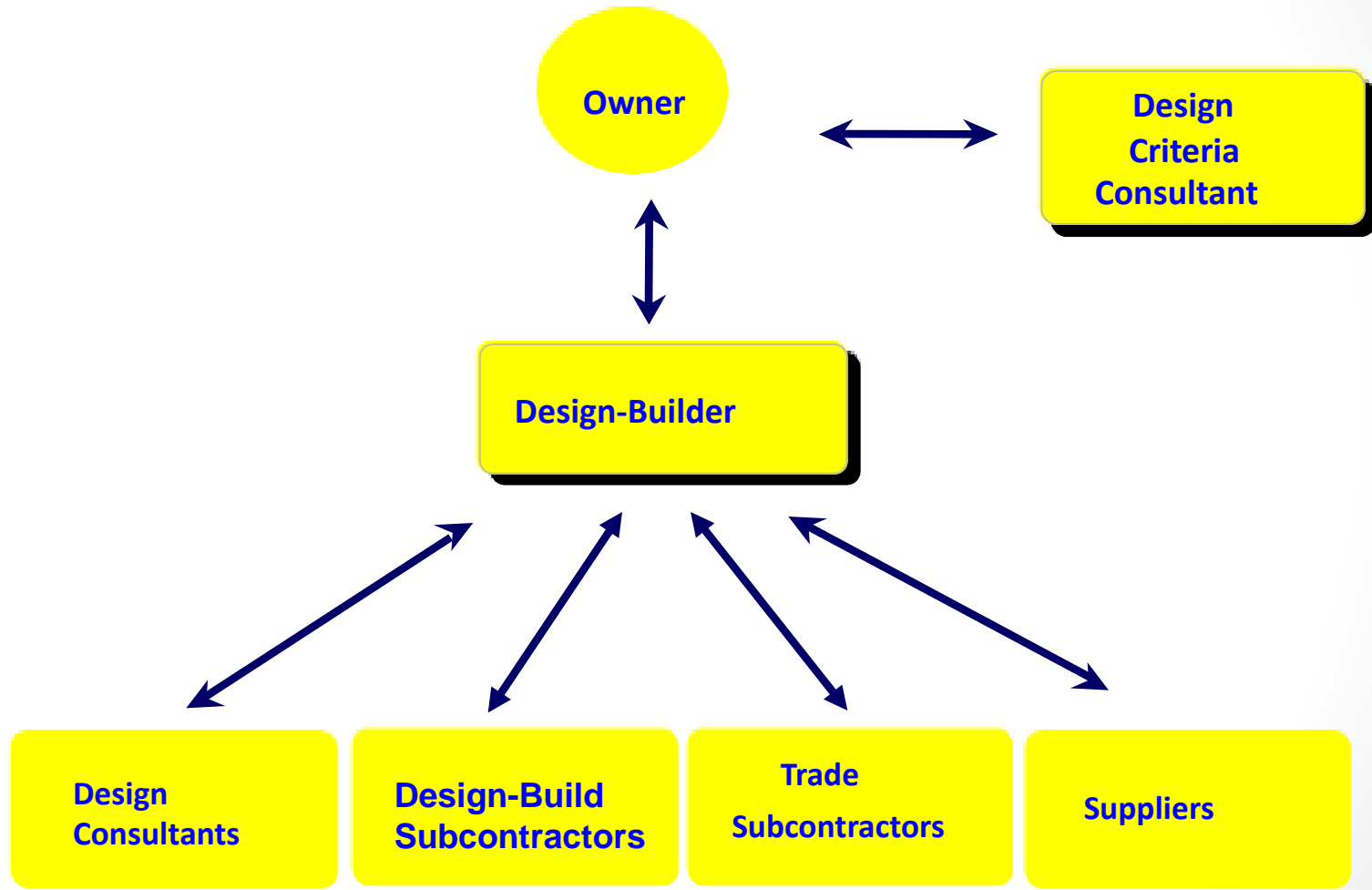
- RCW 39.10.330: no more than Five Finalists
- Best Practice: no more than Three Finalists



Best Practice: Proprietary Meetings

- Establish meetings in RFQ
- Purpose: to make sure procurement works
- Schedule early enough to allow for addenda
- Provide sufficient time to allow for thoughtful process
- Do not have to disclose proprietary information
- HOWEVER, If Basis of Design Documents changes, issue addenda

Design-Build Basic Structure



Design-Builder Carries the Risk of Performance Warranties

- Designers only warrant to professional standard of care.
- Constructors are protected by the *Spearin* warranty provided by owners.
- With design-build, Owners receive performance warranties that can only be provided by a party that both designs and constructs.
- Therefore, an Owner is guaranteed a specific outcome with design-build that is impossible with design-bid-build.

Risk Allocation Best Practice

Allocate risk to the party who is best able to:

- **MANAGE**
- **PRICE**
- **INSURE**

the risk.

Law Offices of Robynne Thaxton Parkinson PLLC



Robynne Thaxton Parkinson is a Seattle based lawyer who provides legal services to a full range of clients performing construction work, including Owners, Contractors, Design Builders, Engineers and Architects. Robynne is one of the leading experts in construction law and alternative procurement both in Washington State and on a national basis. She serves on the Executive Committee of the National Design Build Institute of America Board of Directors and is the Chairperson of the DBIA National Conference Planning Committee. In addition, she leads the DBIA National Contracts Task Force and was instrumental in drafting the new DBIA Teaming and Subconsultant Agreements and revising the DBIA form Design-Build contracts and subcontracts. She is one of DBIA's highest rated speakers. She co-chairs the DBIA NW Region Legislative Committee and served as the President of the Northwest Region from 2008 to 2010 and continues on its Board of Directors. She is also on the American Arbitration Association's National Construction Dispute Resolution Committee. Robynne was named as a Washington Super Lawyer in 2010 and 2011 and is one of the few lawyers who are Designated Design-Build Professionals. Robynne received her undergraduate degree from the University of Texas at Austin and her law degree from the University of Colorado, Boulder School of Law.

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Kennedy/Jenks Consultants

***Design Build Water Projects
for the US Navy***

May 4th, 2012



Agenda

- ▼ Opportunities
 - Who
 - Where
- ▼ Navy design build process
 - Procurement
 - Documents
 - Why
 - Realities
- ▼ Two case studies



Finding New Opportunities



- ▼ The economy means fewer projects
- ▼ Follow the Money
- ▼ Department of Defense (DoD) has work
- ▼ DoD projects:
 - Most are Design Build (DB)
 - There are water projects
- ▼ ARRA projects



Opportunities

- ▼ There are opportunities in all service branches
- ▼ Navy Capital Facilities Budget
 - \$1B for 2012 and 2013 in the Northwest
 - \$120 M in current IDIQ contracts
 - \$607 M in current MACC/JOC
- ▼ Navy almost exclusively uses DB
- ▼ Great small business opportunities



How DB Came to Be - Key Legislative Acts

- ▼ 1893, separates design and construction phases of a capital project
- ▼ 1926 Omnibus Public Buildings Act, plans and specs must be completed before construction begins
- ▼ 1947 Armed Services Procurement Act, A&E must be procured on a negotiated basis, construction continued to be low bid
- ▼ 1949, extended the 1947 requirements to all federal civilian agencies
- ▼ 1972 Brooks Architect-Engineers Act, all federal design contracts must be awarded based on qualifications and not low bid
- ▼ ***The 1996 Federal Acquisitions Reform Act (Clinger-Cohen Act) federal agencies received the legal authority to engage in design-build***



The Navy Mission



Navy Design Build Projects

- ▼ Maintenance facilities
- ▼ Wharfs and piers
- ▼ Operations buildings
- ▼ Aircraft hangers
- ▼ Barracks
- ▼ Utility projects
- ▼ Water facilities



Navy Command Structure

- ▼ Naval Facilities Engineering Command – NAVFAC
 - Headquartered in Virginia
- ▼ Local – NAVFAC Northwest
 - Located Naval Base Kitsap
- ▼ Also relevant
 - NAVFAC Pacific
 - NAVFAC Southwest



Northwest Navy Locations



Also Relevant:

- Hawaii
- Guam



DB Procurement

- ▼ Indefinite Delivery, Indefinite Quantity – IDIQ
 - Used to develop Bridging Documents
- ▼ Task-order Contracts, still competitive
 - Multiple Award Construction Contract - MACC
 - Multiple Award Task Order Contracting – MATOC
 - Job Order Contracts - JOC
- ▼ Individual bids
- ▼ Open and set asides
- ▼ Selected on basis of best value - price and qualifications



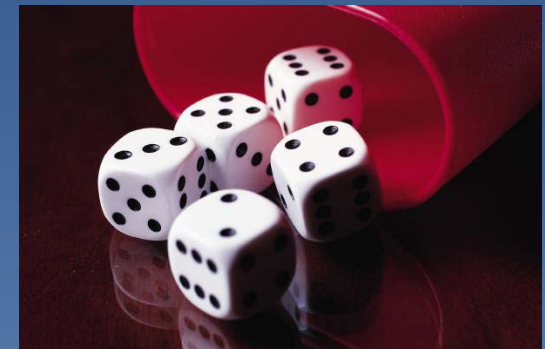
Why Does the Navy Use DB?

▼ The usual reasons

- Compress the schedule
- Reduce the cost
- Allow contractor creativity

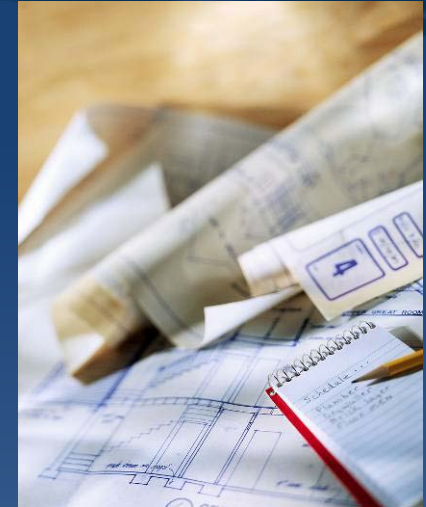
▼ More reasons

- Reduce risk
- Reduce change orders



DB - Parts and Pieces

- ▼ Bridging Documents
- ▼ RFP Documents
- ▼ Shop drawing submittals
 - Prepared during design
- ▼ Basis of Design and Calculations



Bridging Documents

- ▼ DD 1391
- ▼ Done in-house often by IDIQ Consultants
- ▼ Expertise level varies for utility projects
- ▼ Sometimes:
 - Not enough information
 - Wrong information and difficult to change



1. Component Name		FY 2005 SPECIAL PROJECTS PROGRAM		2. Date	
3. Installation and Location/UDC Number		4. Project Title		31 JAN 2005	
ROAD AND STRUCTURE SYSTEM		REPAIR SUNWAY 14 LEFT / 32 RIGHT			
VIRGINIA BEACH, VIRGINIA					
5. Program Element	6. Category Code	7. Project Number	8. Project Cost (\$000)		
000	11110	00 410-05	00-345		
9. COST ESTIMATES					
Item	UM	Quantity	Unit Cost	Cost (\$000)	
REPAIR SUNWAY 14 LEFT / 32 RIGHT	LS	1	8,000,000.00	8,000	
Repair Sunway 14L/32R Pavement - Repair	LS	1	2,740,000.00	(2,740)	
Repair Storm Drainage Poles 14L/32R - Repair	LS	1	3,320,000.00	(3,320)	
Repair Overheadline & Threshold Lighting - Repair	LS	1	230,000.00	(230)	
CONSTRUCT VEHICLE ACCESS PAVEMENTS	LS	1	127,000.00	127	
Construct Vehicle Driveway at IFL/LS Poles	LS	1	40,000.00	(40)	
Construct Vehicle Driveway at Arrestering Pole - Construction	LS	1	84,000.00	(84)	
Subtotal				4,100	
Contingency (5%)				(400)	
PMW (4%)				(400)	
Design/Bid/Design (4%)				(200)	
Total Pooled Cost				2,960	
Classification of Work				2,300	
Repair				180	
Construction				2,120	
UDC - Restoration and Modernization (RM)				8,460	
10. Description of Proposed Construction					
This project will make repairs to Sunway 14L / 32R pavements, repair the storm water drainage system servicing Sunway 14L / 32R and 14B / 32L, replace the feeder circuit wiring between the artificial lighting wells and the overline lighting transformers for Sunway 14L / 32L, repair threshold lighting on Sunway 14L / 32R, and provide vehicular access pavements at the Arrestering Pole and IFL/LS (Improved Front Lens Optical Landing System) poles.					
11. Requirement					
FACILITY PLANNING DATA:					
Category Code	Requirement	UM	Adequate	Substandard	Inadequate
13045 RELIANT DAD	1,600	LP	1,200	400	0
1307000					-400
DD Form 1391					
1 Dec 76					
Page No. 1					



DB RFP Documents

- ▼ Lots of boilerplate
- ▼ Important nuggets can be hard to find
- ▼ Make sure you understand everything
- ▼ Use Pre-Proposal Inquiries (PIPs) during bid
 - Expect some non-specific answers
- ▼ Requirements and documents can change by location
- ▼ References to:
 - Unified Facilities Criteria (UFC)
 - United Facilities Guide Specifications (UFGS)



Navy DB Realities

- ▼ Very limited opportunity for change orders
 - Often the money is not available
- ▼ 100% plans before construction starts
 - Somewhat like design-bid-build
- ▼ Rigid schedule
- ▼ Problems often solved by cutting the project
- ▼ Navy teams may change between design and construction



Navy DB Realities, continued

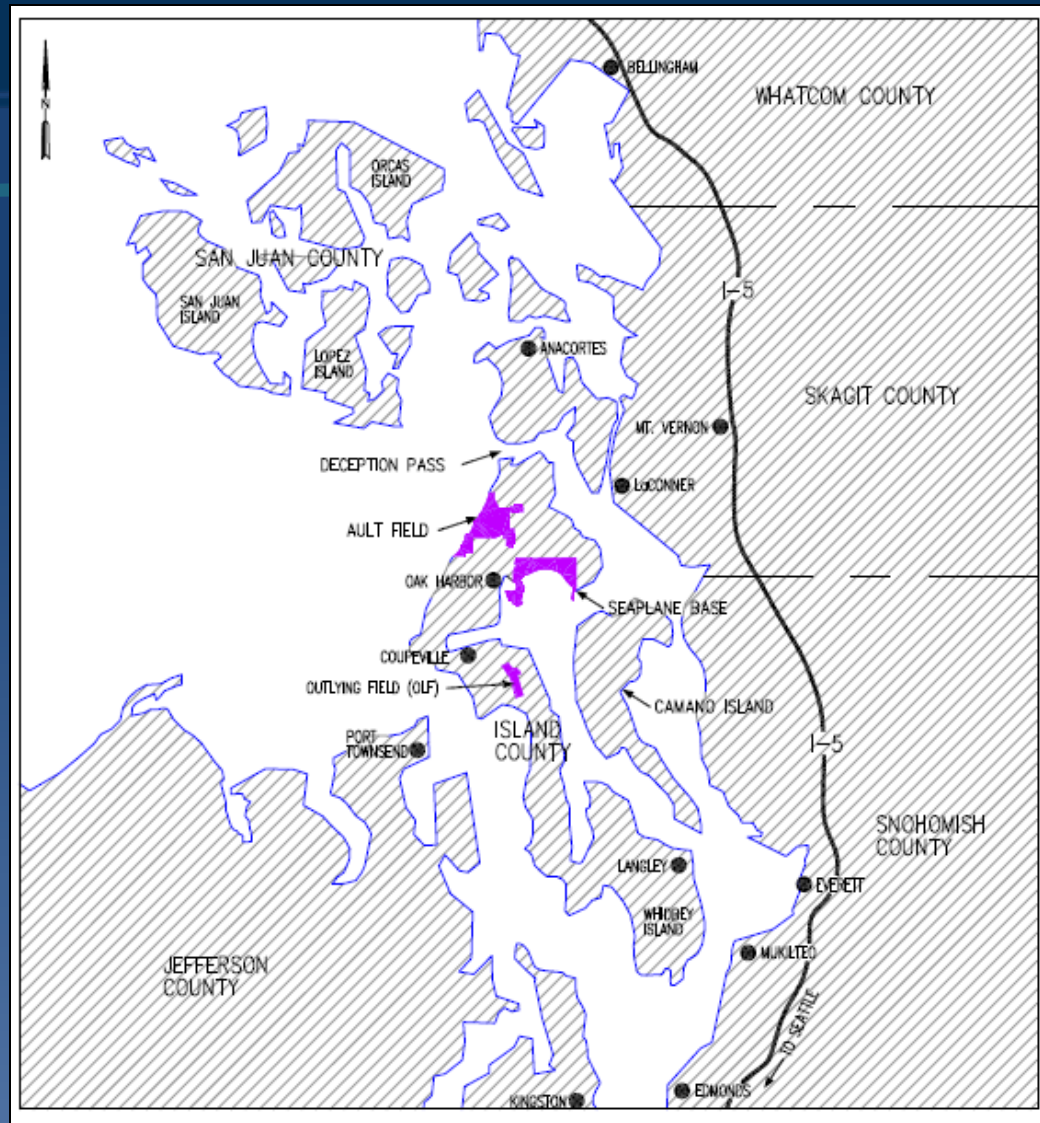
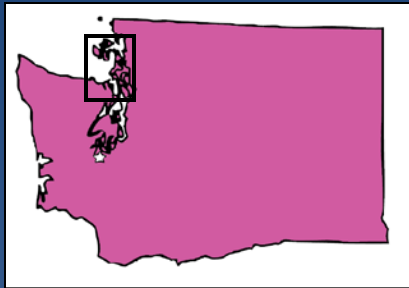
- ▼ Contractor involvement may be limited during design
- ▼ Long Navy review periods
 - Often, 21 to 28 calendar days per review
- ▼ Design Quality Control Manager (DQCM) is important
- ▼ Badging and access can be issues



NAS Whidbey Waterline Replacement



Vicinity Map



* Source: KPFF 2008 Water System Plan



NAS Whidbey Facts

- ▼ Infrastructure is old
 - Commissioned as active facility in 1942
- ▼ Base is large
 - Ault Field, Seaplane Base, Outlying Field
 - 7,800 active, 13,000 family, 2,200 civilian
- ▼ Facility is important
 - 19 active duty/2 ready reserve squadrons

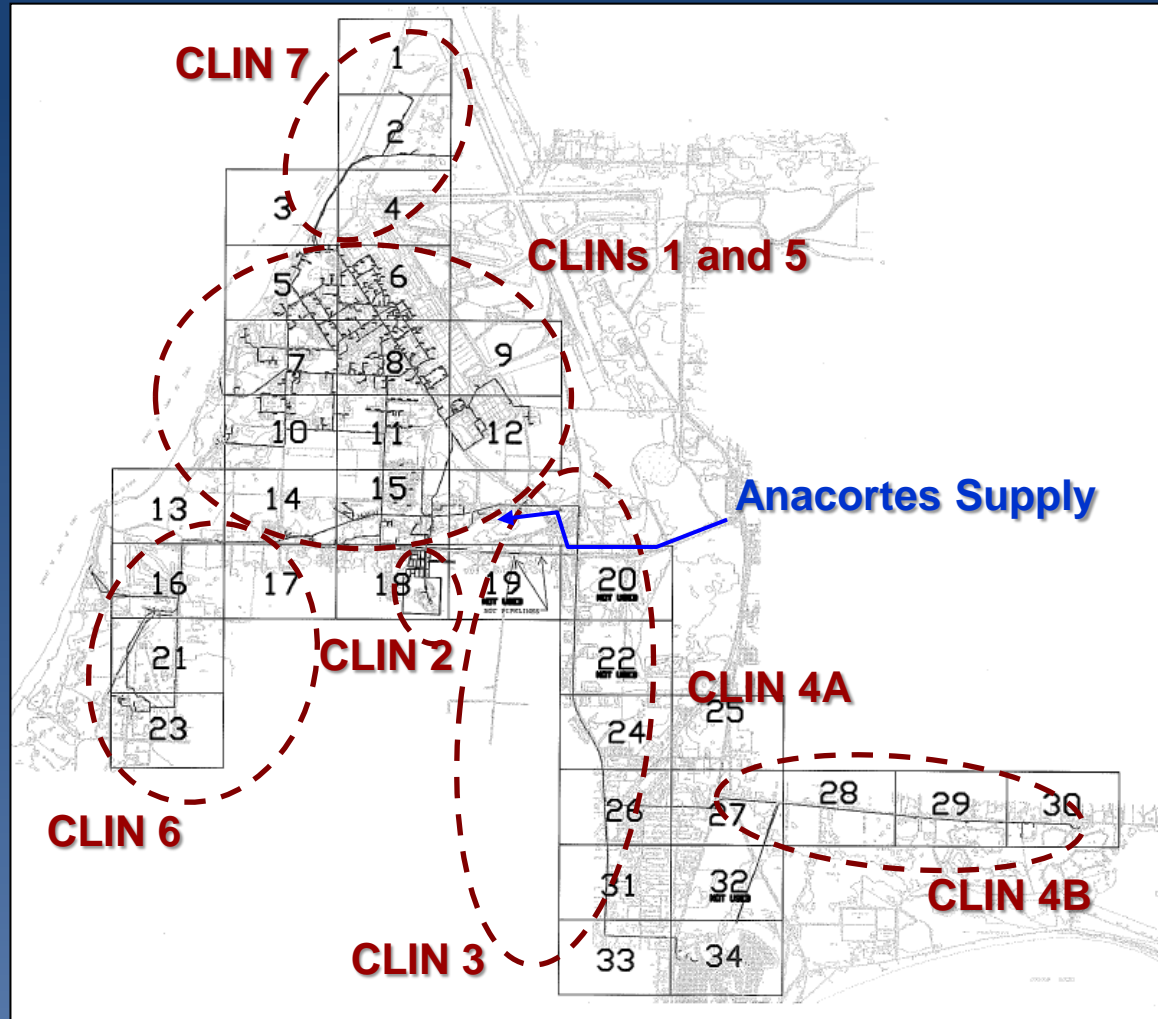


Waterline Replacement Project

- ▼ Replace 17 miles of 45-60 year old AC pipe
- ▼ 7 individual Contract Line Item Numbers (CLINs)
- ▼ Funded through \$18M from ARRA stimulus
- ▼ Section 8(a) designated work
- ▼ Schedule requirements
 - 236 days design phase – ending May 2010
 - Includes 56 days of Navy review time (24%)
 - 549 days construction phase – ending March 2011



Project Extent



Design Period Work

- ▼ Site investigations
 - Utility locates, survey, geotechnical, and wetlands
- ▼ 35%, 100%, Final design reviews
- ▼ Submitted design documents
 - Basis of Design
 - Calculations, pipe size verification
 - Geotechnical Report
 - Plans
 - Performance Technical Specifications (products)
 - Prescriptive Specifications (UFGS)



Project Photos



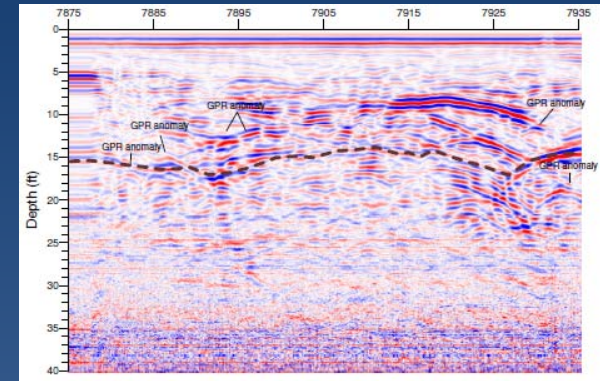
Interesting Design Elements

- ▼ Use of Ground Penetrating Radar (GPR) required
- ▼ Hydraulic modeling to verify pipe sizing
- ▼ Proximity to fuel pipes
- ▼ Trenchless Crossings
- ▼ Special treatment at seismic faults
- ▼ Tight time frame
 - Not enough time to coordinate with City
 - Large part of the job deleted due to right-of-way issues
 - Inter-tie meters



Construction Issues Specific to DB

- ▼ Undocumented utilities
- ▼ Navy thought GPR would find all utilities
- ▼ Temporary patching caused complaints
- ▼ Differing assumptions for pavement restoration
- ▼ Undocumented communication line
 - Conflict with proposed waterline
 - No alternative location available
 - Caused deletion from project



Guam – Water System Rehabilitation

- ▼ 20,000 LF 30-inch HDPE Pipeline
- ▼ 15 MGD Pump Station
- ▼ \$20 million DB contract – DCK Pacific
- ▼ Navy did not select lowest price



Questions?

