



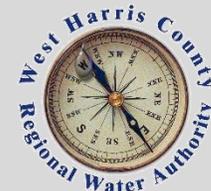
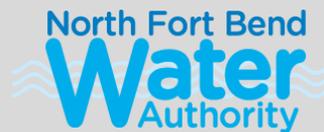
WATER PURIFICATION PLANT EXPANSION

Overview of Progressive Design-Build Project Delivery Process and NEWPP Expansion Project Update

June 18, 2018



Central Harris County
Regional Water Authority

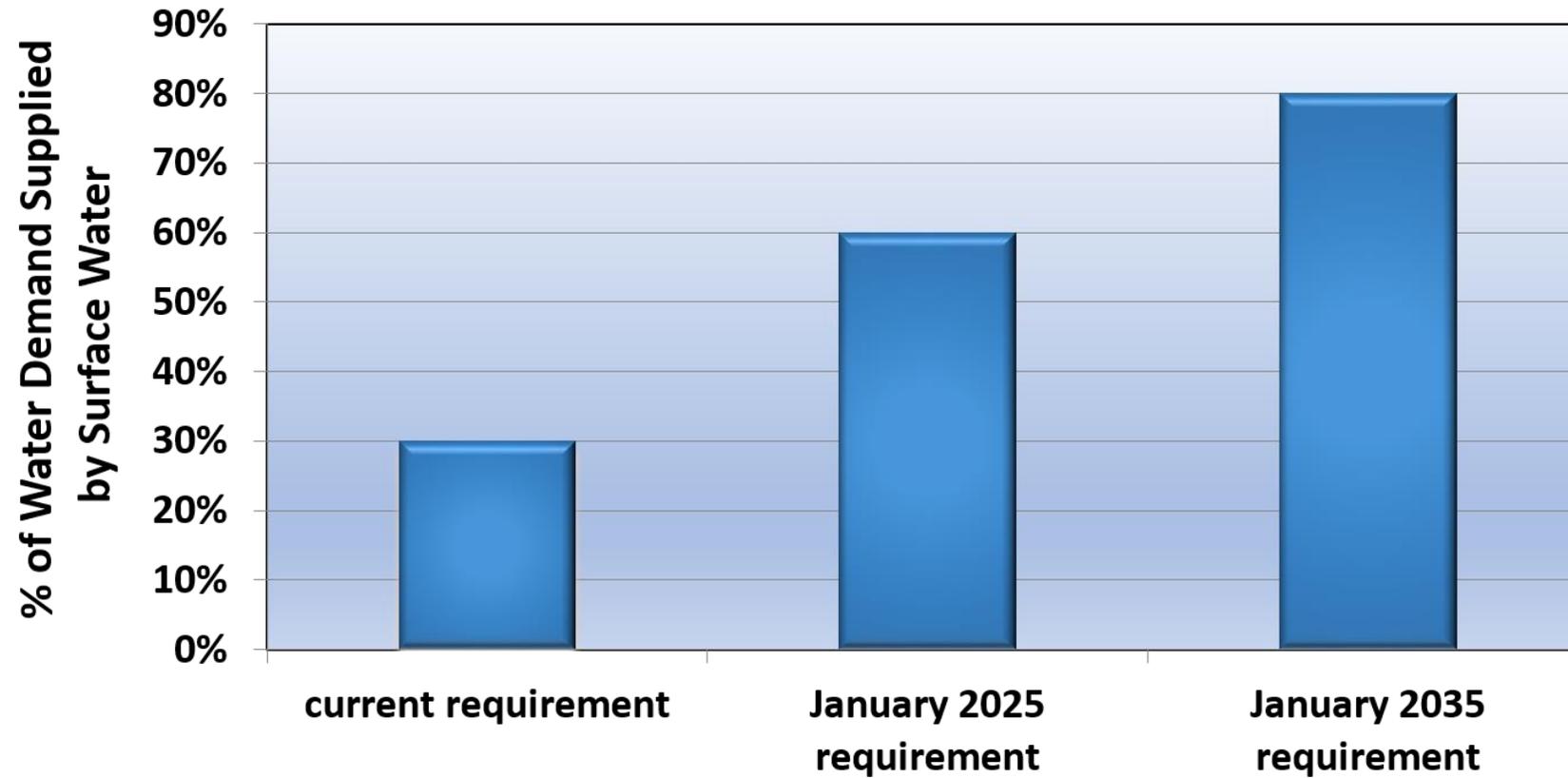


Agenda

- 1** Project Background
- 2** Progressive Design-Build Process
- 3** Project Status
- 4** Q&A

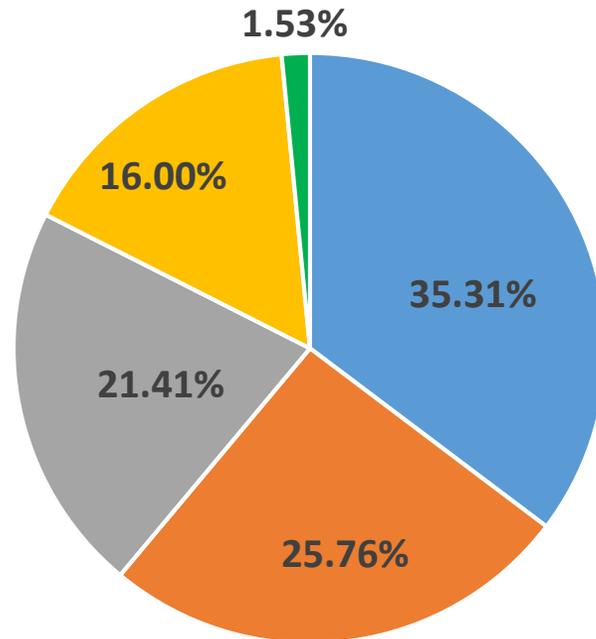
Project Background

Project needed to meet subsidence regulations & growth



Houston is delivering project on behalf of four Authority partners

Cost Share



- North Harris County Regional Water Authority
- West Harris County Regional Water Authority
- North Fort Bend Water Authority
- City of Houston
- Central Harris County Regional Water Authority

Progressive Design-Build Process

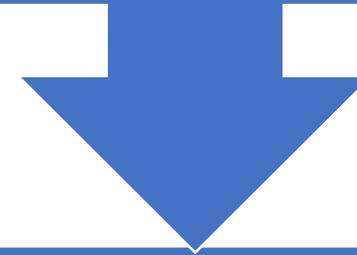
About Design-Build Institute of America (DBIA)

- **Mission** – The Design-Build Institute of America (DBIA) promotes the value of design-build project delivery and teaches the effective integration of design and construction services to ensure success for Owners and design and construction practitioners.
- **Purpose** - DBIA is the only organization that defines, teaches and promotes best practices in design-build project delivery.



Design-Build Defined

One entity, the design-builder, enters into a single contract with the Owner to provide both design and construction services.



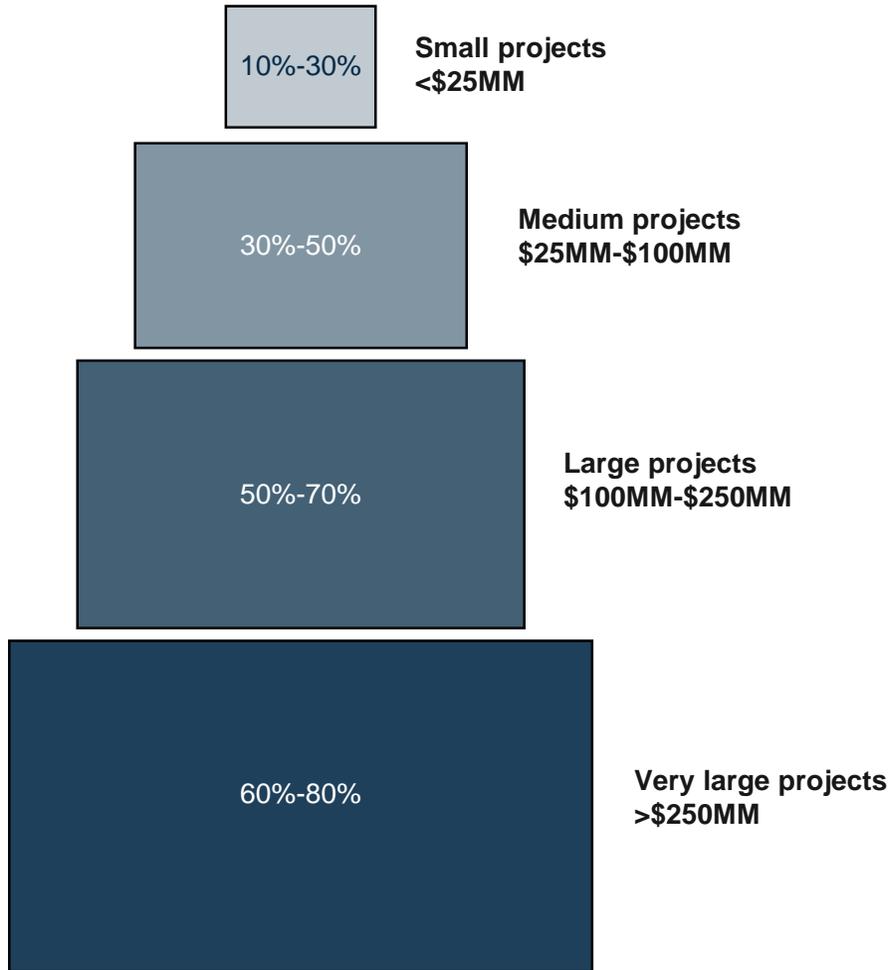
Design-build is also defined by the attitude of everyone involved in the project. In successful design-build projects, everyone makes the mental shift to think and act as a single entity.



Design-build utilization continues to expand into project sizes <\$25 million as Owners continue to gain exposure to benefits of design-build.

Likelihood of projects utilizing design-build by project size

Source(s): FMI analysis of multiple sources – June 2018



“Historically, design-build has been used on large projects. Recently, we have seen a growing use of design-build on smaller projects.”

“When we have a multimillion-dollar project we look towards design-build. Generally, we believe that we get a better value for the investment with design-build.”

“We will continue to see bigger projects going design-build.”



Key Design-Build Advantages

- Errors are addressed - not used as excuses or claims;
- Project benefits from innovation;
- Close coordination among entire team (*especially beneficial for complex projects*);
- Fewer changes, fewer claims & less litigation;
- Allocate risks to those who can best manage;
- Faster, more cost-effective delivery system; and
- Ability to fast track the project.

WHY?

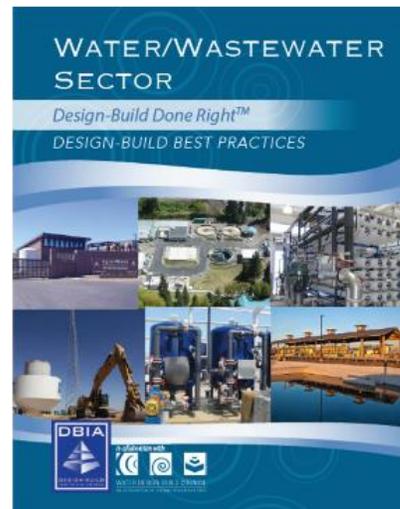
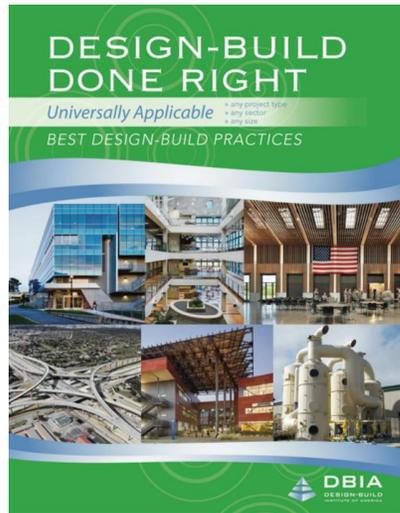
Design-Build Performance

COMPARISON OF PROJECT DELIVERY METHODS

METRIC	DESIGN-BUILD VS. DESIGN-BID-BUILD	DESIGN-BUILD vs. CM@R
UNIT COST	6.1% lower	4.5% lower
CONSTRUCTION SPEED	12% faster	7% faster
DELIVERY SPEED	33.5% faster	23.5% faster
COST GROWTH	5.2% less	12.6% less
SCHEDULE GROWTH	11.4% less	2.2% less

Source: Construction Industry Institute (CII)/Penn State research comprising 351 projects ranging from 5,000 to 2.5 million square feet. The study includes varied project types and sectors.

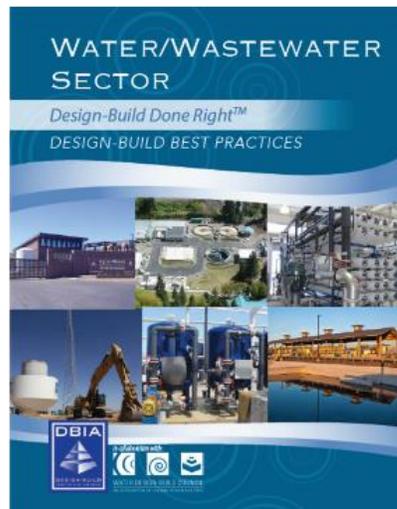
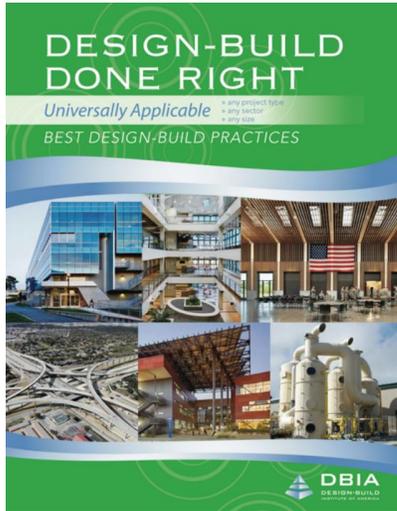




Design-Build Done Right™ Principles

- Principles that create high likelihood of superior project outcomes
- Articulated in DBIA's Best Practices publication
- Philosophies
 - Integration and collaboration
 - Environments based on trust and flexibility
 - Integrity
 - Honest communication
 - Mutual respect for and appreciation of diverse perspectives and ideas





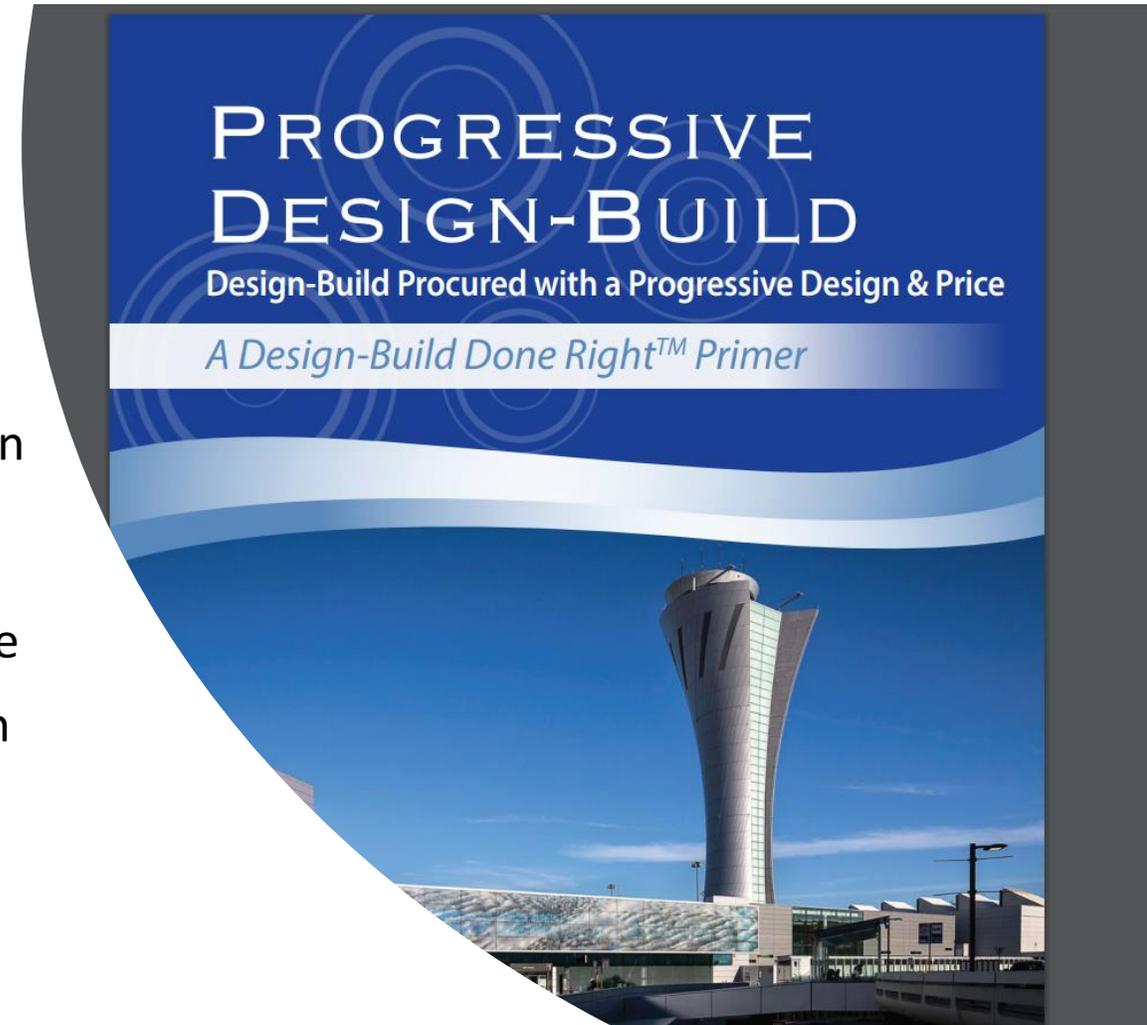
Design-Build Done Right™ Principles (cont.)

- Manifested through specific implementing techniques
 - Selecting most qualified team
 - Letting design-builder use its ingenuity and experience to develop design solutions
 - Weighting price significantly less important than non-price factors
 - Seeking best value solutions
- Over 50 other techniques



Progressive Design-Build

- Differs from traditionally procured design-build: design and price are progressively developed after design-builder is under contract
- Design-builder retained by Owner early in project's life
- Design-builder selected primarily, if not exclusively, on qualifications
- Final project cost and schedule commitment is not established as part of the selection process
- Two phases of services
 - Preliminary Services (including Early Work Packages)
 - Final Design and Construction



Progressive Design-Build: Core Features

- Design-builder collaborates with Owner during Phase 1 to create or confirm project's basis of design
- Design-builder advances design
 - Decisions based on cost, schedule, operability, life cycle and other considerations
 - Ongoing, transparent, cost estimates to achieve budget requirements



Progressive Design-Build: Core Features (cont.)

- Formal commercial proposal for Phase 2
 - “Appropriate” level of definition, often at 40-60% design completion
 - Often dependent on amount of control Owner desires to maintain over design definition and reduction of contingency
- Phase 2 initiated upon acceptance of commercial proposal



Trade-Offs: Control of Design vs. Price Certainty

	Best Value	Progressive
Early Knowledge of Firm Price/Cost	Provides Owner <u>firm fixed-price</u> (lump sum) or GMP at time of contract award.	Final cost is not finalized until GMP is set, allowing Owner and design-builder to <u>co-create and agree upon the final scope, cost and schedule.</u>

Early Work Packages (EWPs)

Developed in conjunction with design-builder

Independent packages that take into account all potential impacts to the project (*minimal technical interference with other elements of the scope*)

Schedule requirements tied to overall project schedule

Used for discrete elements of the physical work (e.g., procurement of long lead items, demolition, site work, etc.)

Allows for overlap of design and construction



Advantages of Early Work Packages

Helps expedite project completion

Cost savings

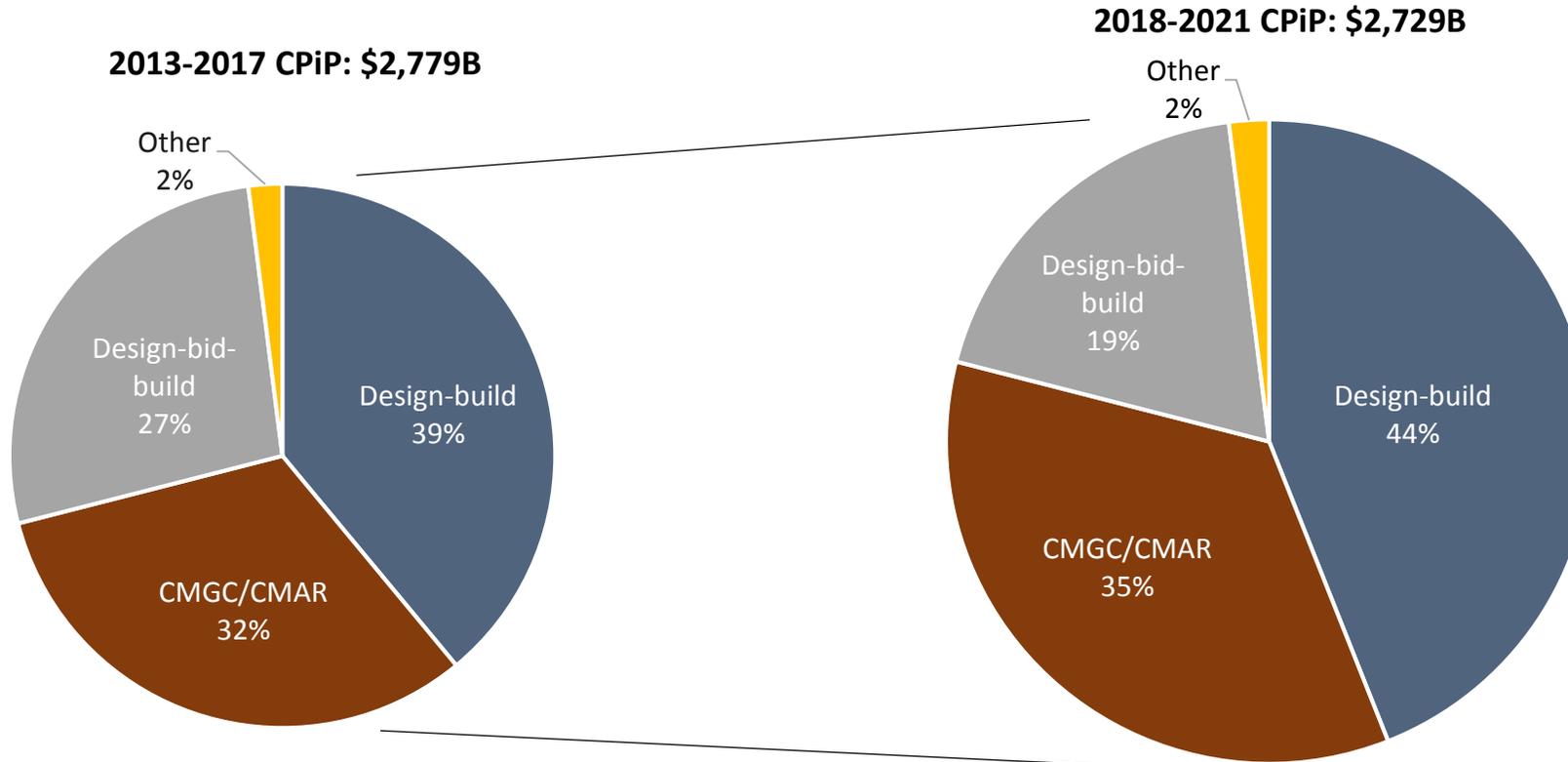
Improved scheduling

Risk Mitigation(i.e., price
escalation)

Design-build is anticipated to continue to gain market share over the 2018-2021 period.

Distribution of delivery method utilization

Source(s): FMI analysis of multiple sources – June 2018



- Dissatisfaction with the adversarial nature and limitations of design-bid-build as well as increasingly challenging project characteristics and demands has resulted in greater interest in and use of design-build and other alternative delivery methods.
- Negative project Owner experience and perceptions of design-bid-build are most influenced by limited opportunity for innovation, lack of a fast-track process and higher risk profile for the project Owner.

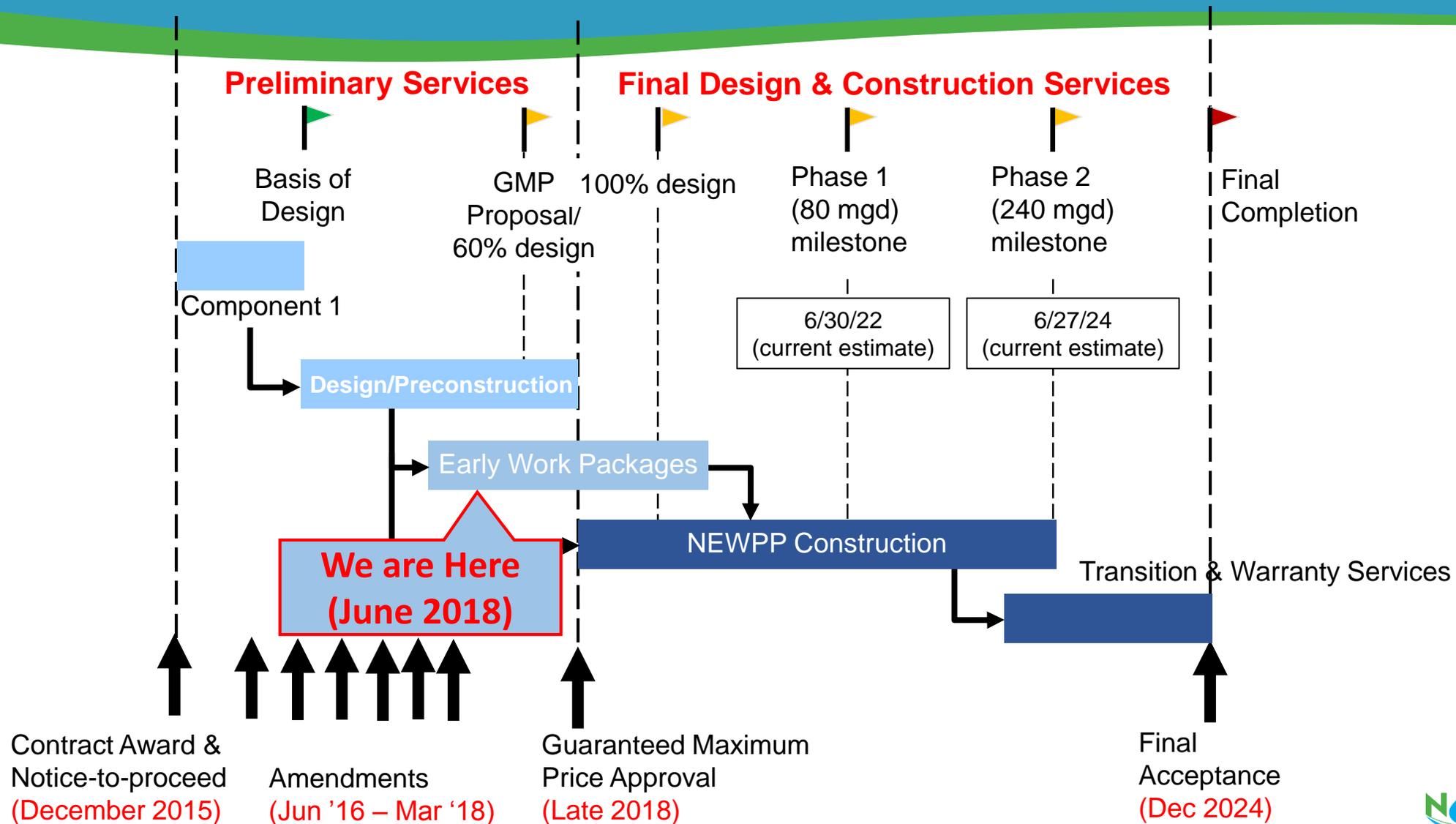
**Other includes EPC and IPD*

***CMGC/CMAR, design-bid-build and Other percentages are based on estimated utilization across construction spending.*



Project Status

Project is mid-way through Preliminary Services phase



Design & procurement ongoing



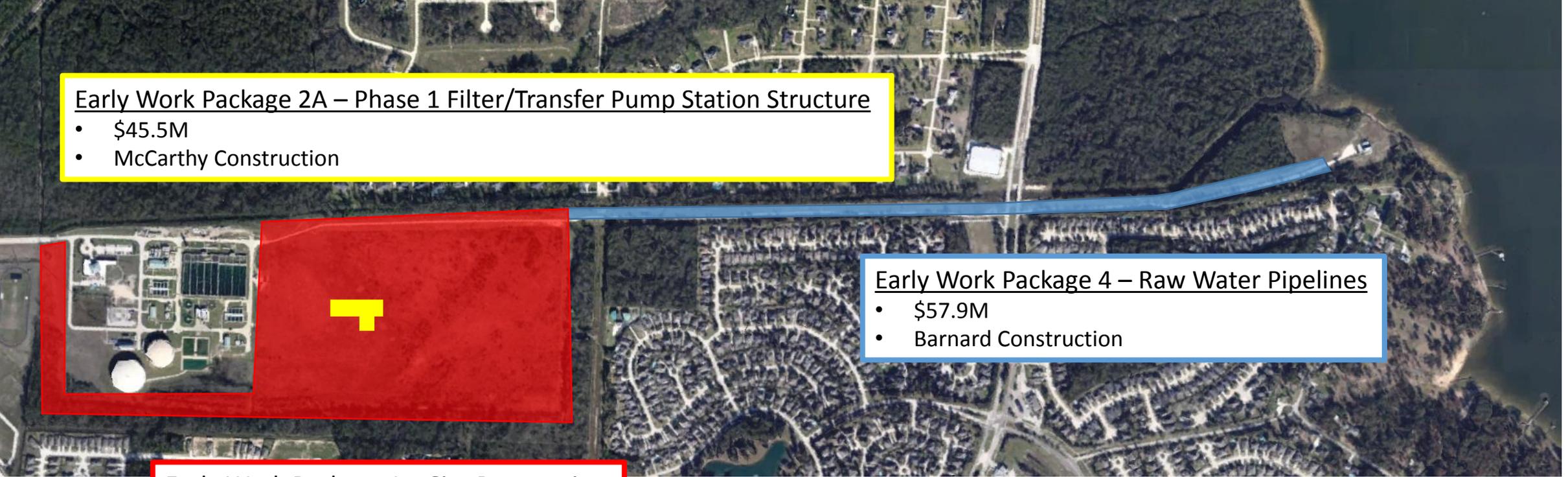
Design

- 60% design of Intake Pump Station submitted
- 60% Balance of Plant design to be submitted mid-June

Procurement

- Ongoing subcontractor & supplier procurements
- **Early Work Package 6 includes:**
 - Intake Pump Station
 - Pretreatment Module
 - Deep Pipes within Facility
 - Equalization Basins
 - Equipment

Early Work Package overview



Early Work Package 2A – Phase 1 Filter/Transfer Pump Station Structure

- \$45.5M
- McCarthy Construction

Early Work Package 4 – Raw Water Pipelines

- \$57.9M
- Barnard Construction

Early Work Package 1 – Site Preparation

- \$ 37.3M
- Lazer, Emerald, Others

Early Work Package 1 – Site preparation



Site clearing, construction roads, stormwater controls, etc.



Construction trailers almost ready for occupancy

Early Work Package 4 – Raw Water Pipelines Construction



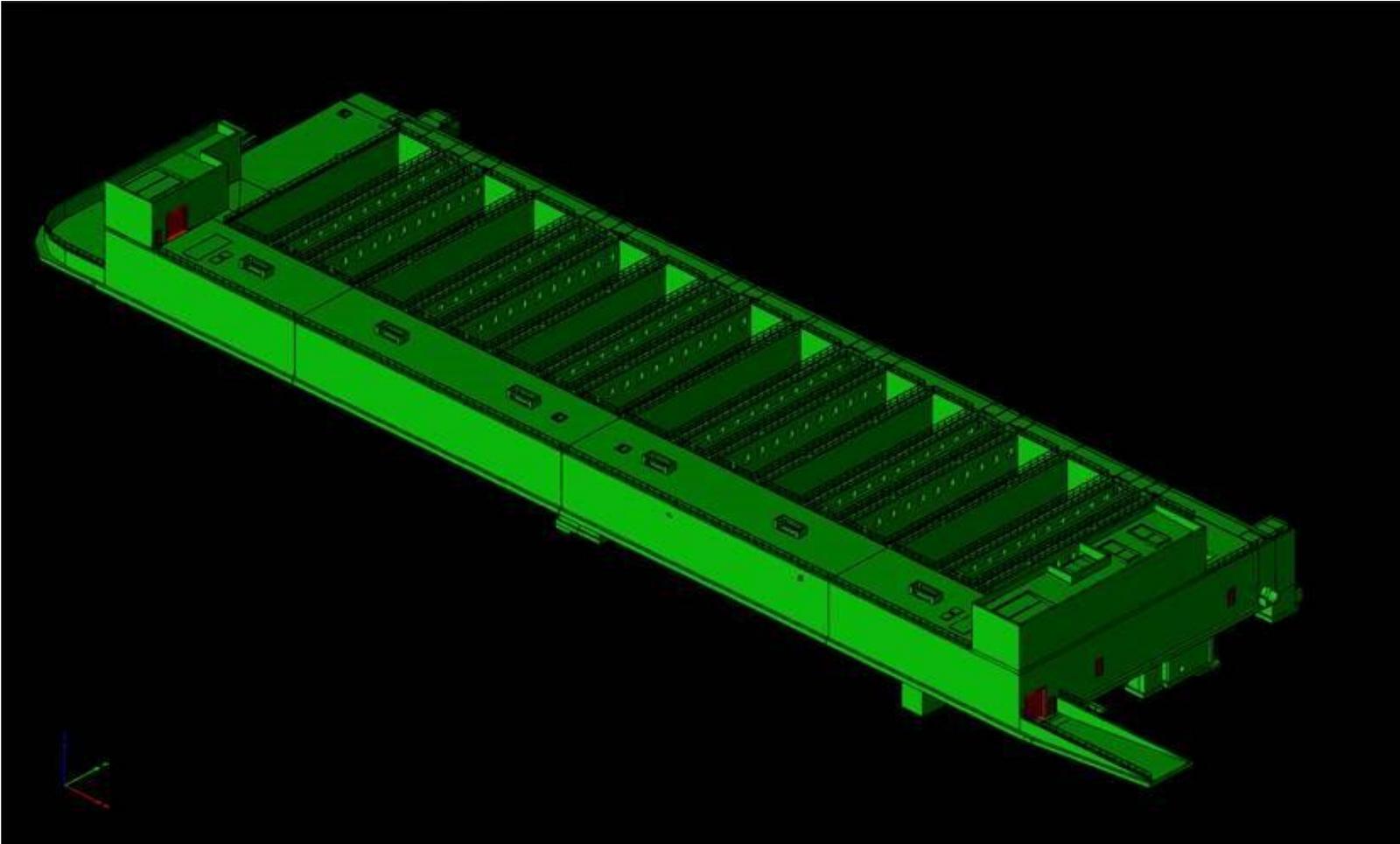
Pile driving for tunnels under West Lake Houston Parkway

Corridor cleared for pipeline construction



108" raw water pipes ready for installation

Early Work Package 2A – Phase 1 Filters & Transfer Pump Station Structures

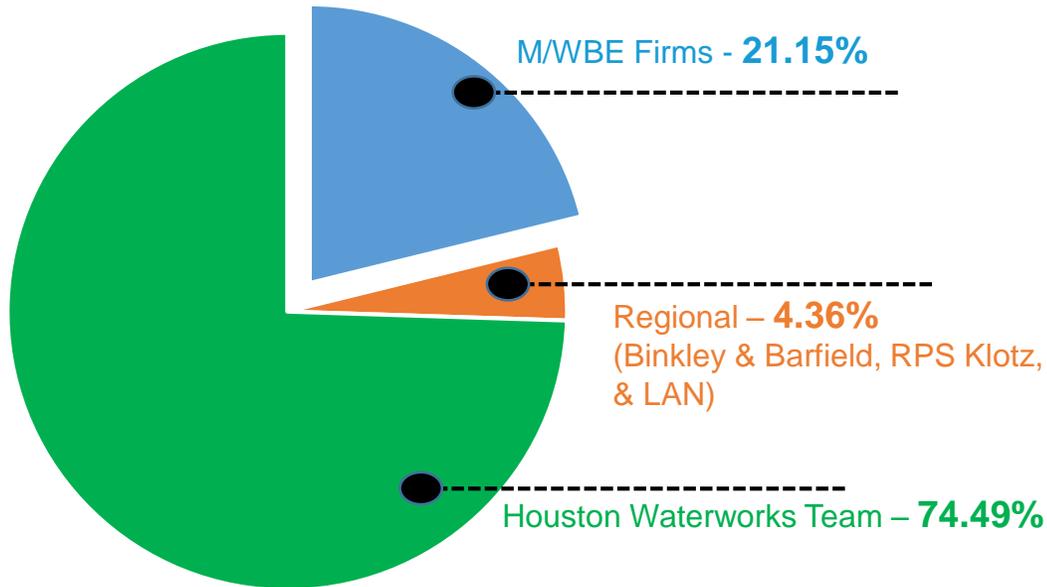


Ongoing Activities

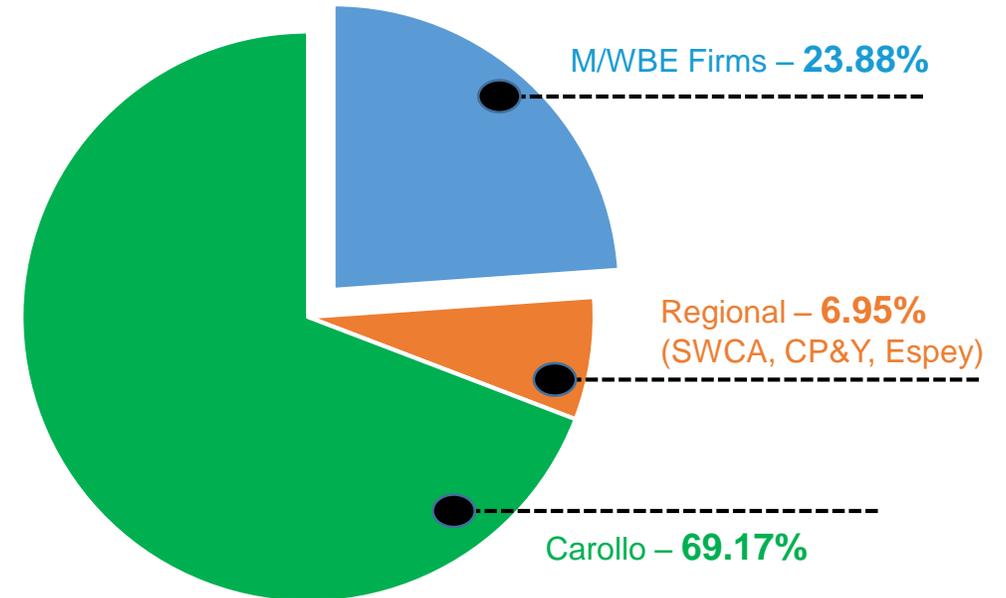
- Mobilization
- Excavation
- Shop drawing submittal & review

M/WBE Participation – Design (as of May 2018)

Design-Builder Subconsultant Participation

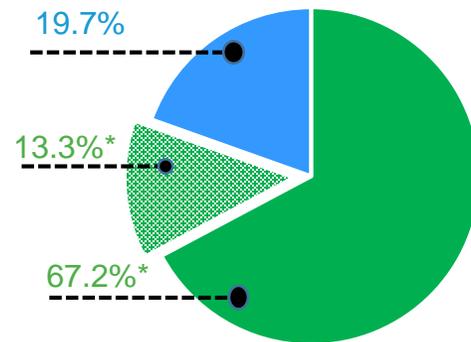


Project Advisor/Technical Consultant Subconsultant Participation



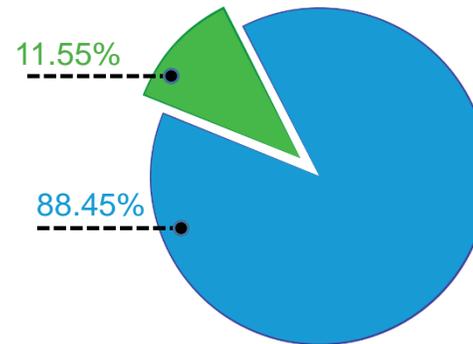
MWSBE Participation – Construction (as of May 2018)

MWSBE Participation for EWP 1 (\$13.8M of \$17.18M direct construction cost)



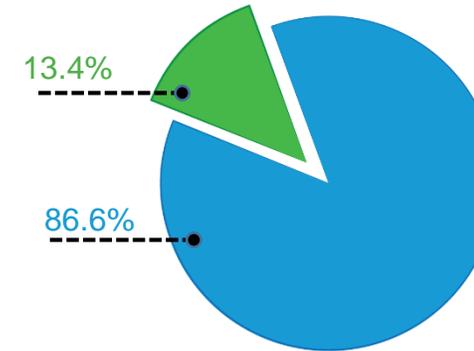
- Balance of Work
- M/WBE Firms include Landtech, Fence Master, Lazer and Emerald

MWSBE Participation for EWP 2A (\$3.8M of \$35.5M direct construction cost)



- Balance of Work
- M/WBE Firms include Rebar Reinforcement Placers, Cohen Industrial Supply, and C&B Waterworks, Inc.

MWSBE Participation for EWP 4 (\$4.3M of \$32.2M direct construction cost)



- Balance of Work
- M/WBE Firms include Republic Traffic Safety, J. Simmons, Fierro Group, Z Logistics, M&D Foundation, AGS Consultants, All Steel

*80.5% Commitment of which 13.3% paid through May 2018 & 67.2% remaining to be paid

Upcoming Requests for Council Action

Action	Approx. Date	Amount
Approve Legal Services Appropriation	July 2018	\$154,000
Approve Houston Waterworks Team Contract Amendment 7 – Early Work Package #6	July-Aug 2018	Approx. \$230M
Approve Houston Waterworks Team Contract Amendment 8 – GMP for Balance of Plant	Late 2018	TBD
Approve Project Advisor/Technical Consultant Appropriation		TBD



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