



CITY OF FORT WORTH

Taking Control - Peak Flow Management At Village Creek Water Reclamation Facility

January 27, 2017

MCCARTHY



FORT WORTH



**CDM
Smith**

CPY

CMAR Process

- **Constructability**

- Design Assist for Complex Projects
- Early Contractor Involvement within the Community
- Ability to coordinate difficult and complex work procedures
- Not every job is suitable for CMAR delivery

- **Schedule**

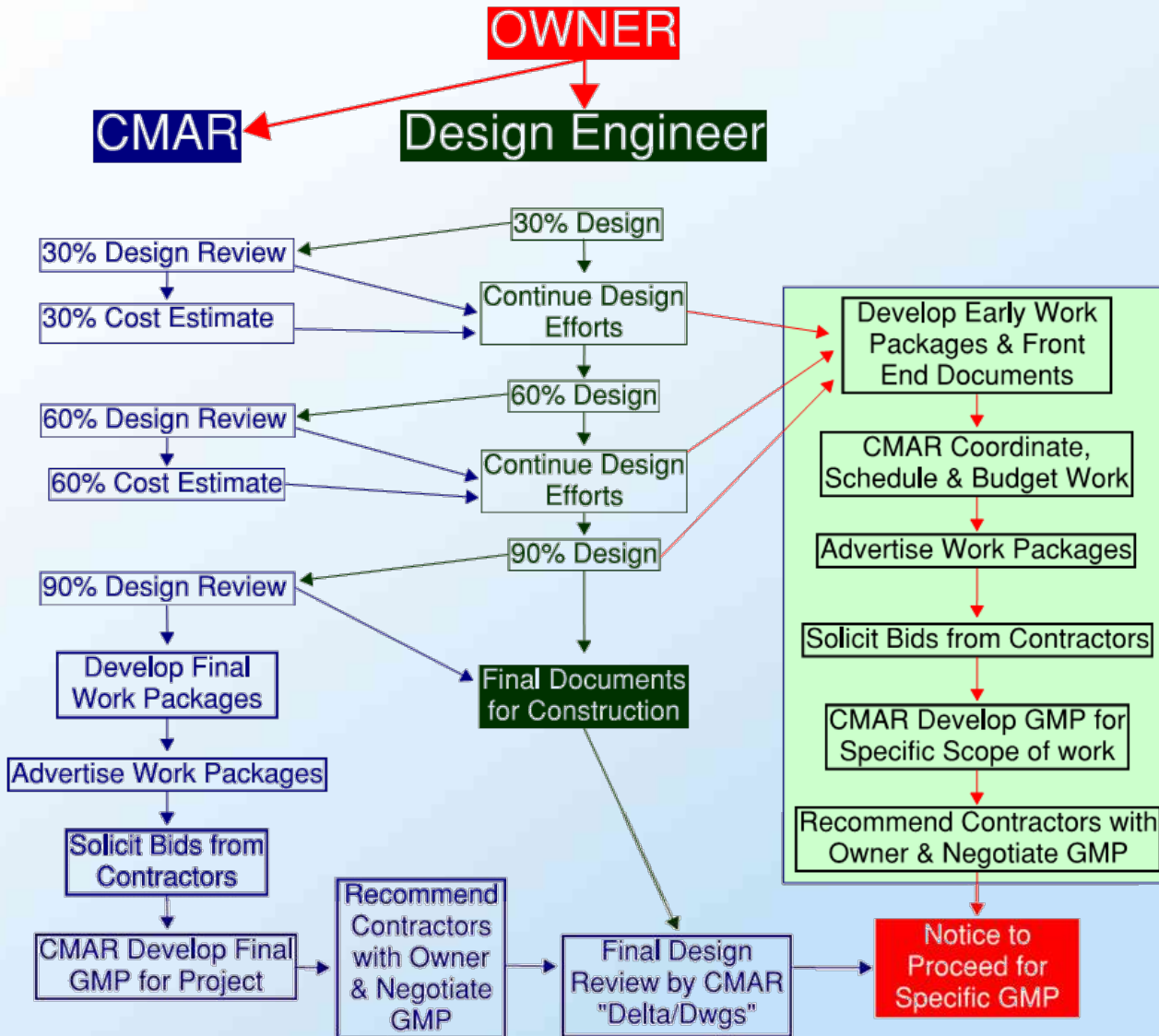
- Provide Early Start with certain work packages
- Potentially Start prior to completion of 100% Design
 - Early Works packages during design
 - » Concrete, SUE, Plant Tie In's

- **Cost Certainty**

- Manage the budget during design – Trend Log
- Collaborative Effort to Solve Problems within Budget
- Provide Cost Certainty for a “No Change Orders” budget



CMAR Process



CMAR

- **Village Creek Peak Flow Management Facility Contract Process**
 - GMP1 (Guaranteed Maximum Price)
 - Work Package #1 - Underground Pipeline Identification
 - Work Package #2 - Concrete Structures
 - CMAR Support and General Conditions
 - GMP2 (Guaranteed Maximum Price)
 - Work Package #3 - Earthwork Modifications to the Basin
 - Work Package #4 - Underground Piping
 - Work Package #5 - Misc. Mechanical Improvements
 - Work Package #6 - Electrical & Instrumentation
 - CMAR Support and General Conditions
 - Owner Allowances for Un-designed Work
 - Seeding & Irrigation of Turf at the Basin
 - Permanent Dewatering Wells
 - 36" Drain Tie in at PEPS #2
 - HRC Interior & Exterior Wall repairs
 - General Owners Allowance



CMAR Benefits

- **Constructability**
 - Market Input throughout Design Process
 - Alternative technologies and processes
 - Specialized Subcontractors Engaged Early on for Success
 - Multiple Underground Subcontractors were engaged early
 - Minimal Plant Impact
 - Continual Planning with Plant Operations during design
 - Reroute underground lines through minimally invasive areas
 - Avoid plant levee and major power lines – Alternate Bids

CMAR Benefits

- **Schedule**
 - Early Work Packages
 - Site Utility Investigation
 - Start progress on the project without completed design
 - Open Items can be delayed for further design/cost analysis
 - HRC Cracks
 - Polymer Feed System
 - Dewatering System
 - Basin Electrical
 - 36" Alternate Route – Tie in to existing PEPS2

CMAR Benefits

- **Cost Certainty**

- Budgeting Trends
- All major work hard bid
- Maintain Competition through Self-perform bids
- “No Change Orders”
- Project is currently trending to return money at the end of the Project

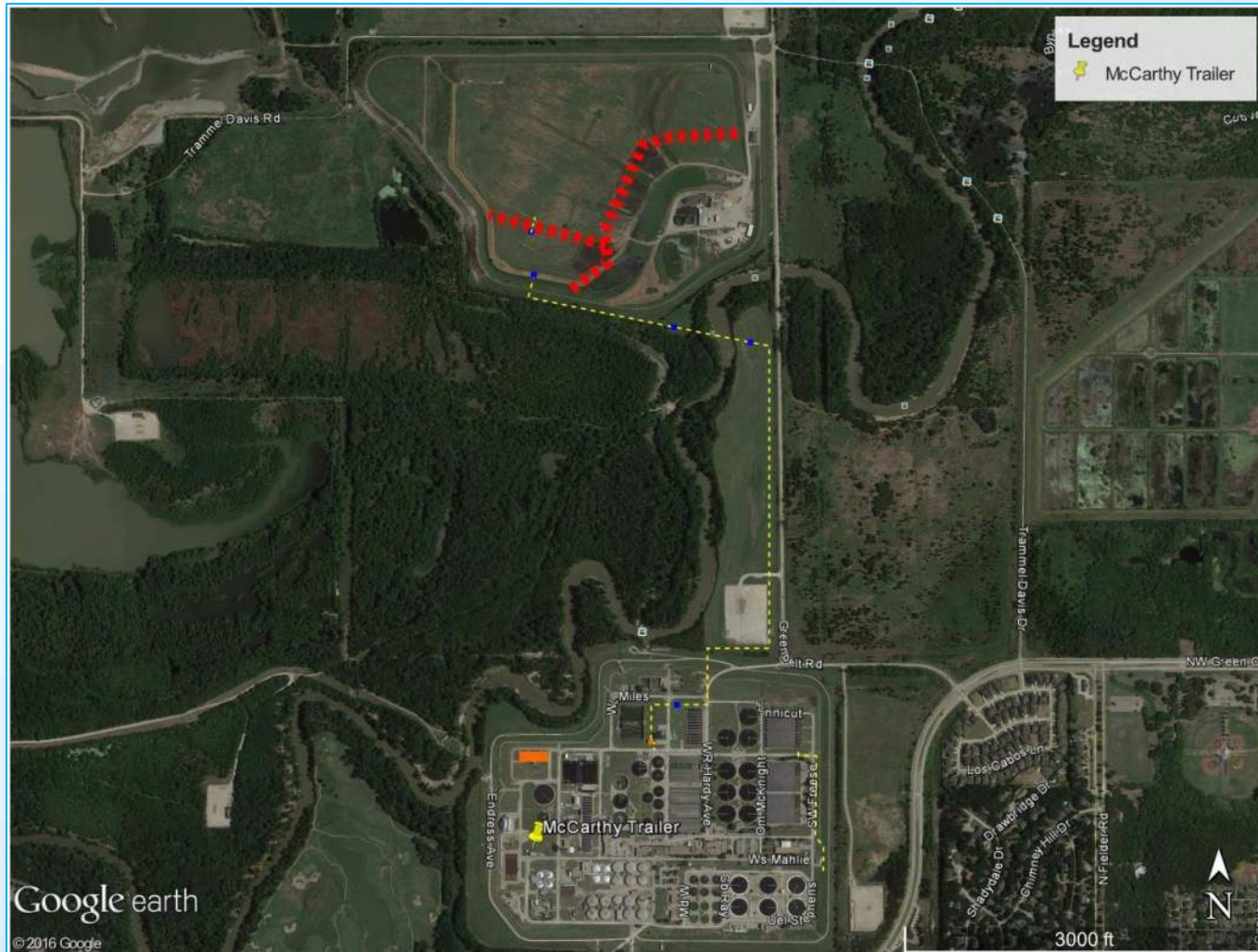


CMAR Benefits

- **Trending of the Budget**
- **Help with the Hard Decisions**
 - Budget Change from 30% to 60%
 - Multiple Cost Savings Packages to choose from
Project Team needed to cut \$8m - \$10m to get into Budget
 - » Concrete Paving in the Basin
 - Follow on savings of Moisture Conditioning, Underdrain, etc..
 - » Eliminate Multiple Levee's in the Basin
 - » Eliminate Redundant equipment to be added in the HRC
 - » Switched Pipeline size from 96" to 84"
 - Innovation
 - » Levee Overflow Protection – Saved the Team approx. \$140k
 - » Basin Dewatering System – Trending towards savings of \$60k-\$100k
 - » Basin Electrical System – Savings of \$40k
 - » 36" Reroute – Savings of \$30k



Project Layout



Work Package #1 – Conflict Identification

- **February 2016 – April 2016**
- **Locate potential conflicts along the proposed pipeline routes**
 - Prior to design completion
 - Provide utility mapping and verification
- **Hydro-Vac Truck operation**



Work Package #2 - Concrete Structures

- **Construction of the following structures:**
 - 84" Meter Vault
 - Siphon Boxes Z & ZZ
 - Basin Inlet Structure
 - Levee Drain Structure
- **Box 00 Modifications**
 - 2ea 84" Sluice Gates
- **HRC Modifications**
 - 1ea 36" Sluice Gate



Work Package #3 - Earthwork

- **July 2016 – September 2017**
- **Demolition of sprinkler system and dewatering wells.**
- **Excavation of Levee Floor**
 - 4-6' Unsuitable Material Layer
- **Levee Construction**
 - Over-excavation, levee toe-in, core and clay cap.
- **48" FRP Drain-line**
 - Installed at the intermediate levee
 - Ties into Levee Drain Structure



Work Package #4 - Pipeline

- **July 2016 – March 2017**
- **6400 LF of 84" Fiber Reinforced Pipeline**
 - Tie-in to existing concrete structures
 - Open-Cut river crossing at the Trinity with RipRap Protection
 - Two levee penetrations (Plant & Peak Flow Basin)
 - Installation of Flow Meter
 - Testing and Commissioning
- **91 LF 72" Pipe**
 - Ties into an existing line and gate at Box 00
 - Installed under critical utilities
- **1420 LF of 36" Pipe**
 - Redesigned during construction to fit plant needs
- **6" Reclaimed Water Line at the Basin**





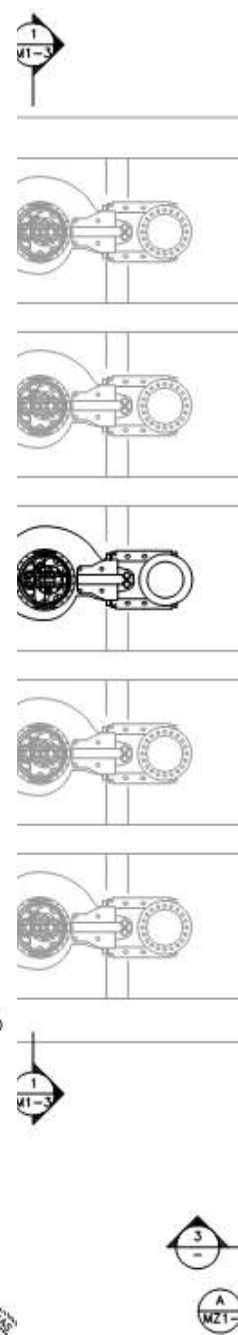
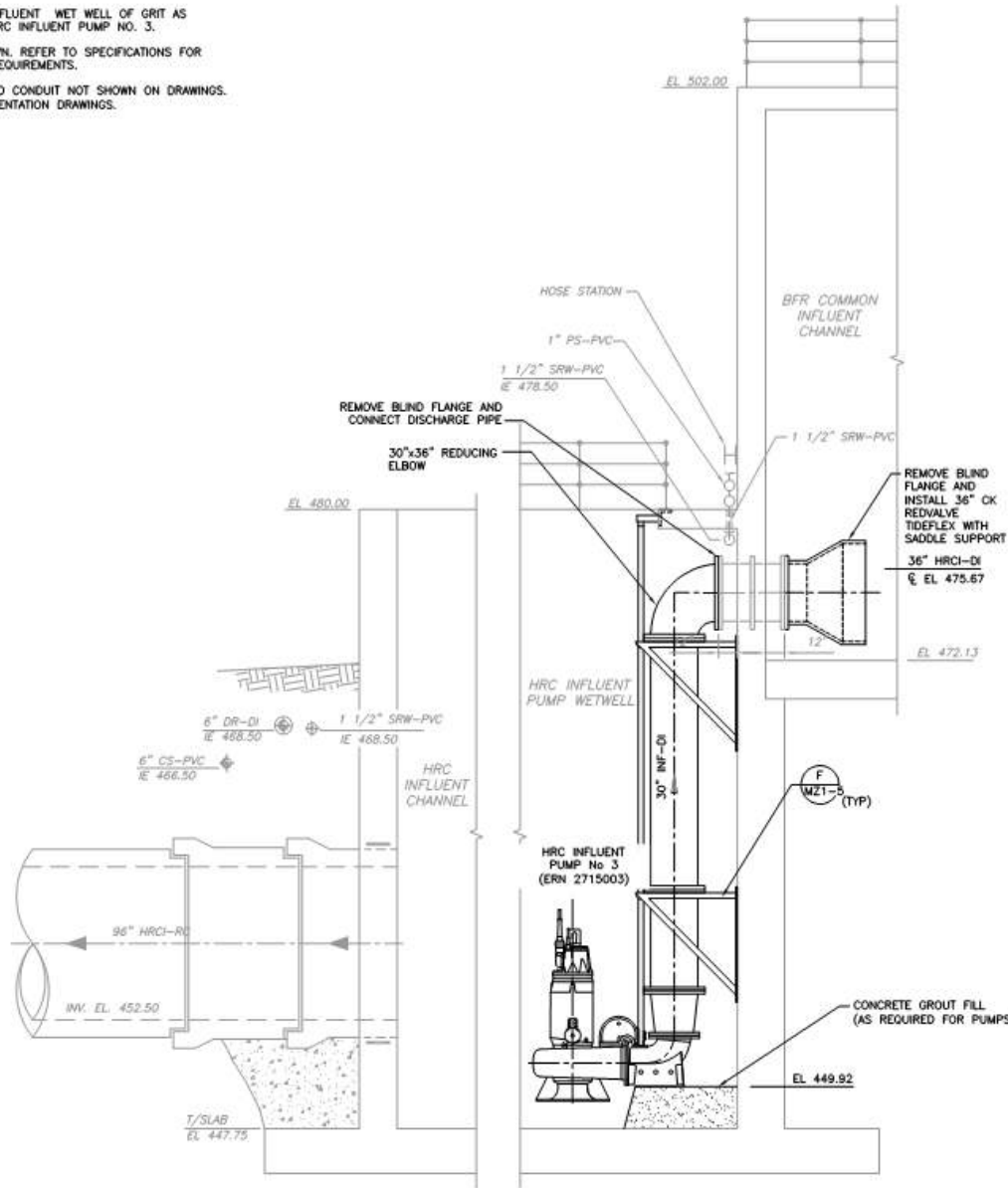
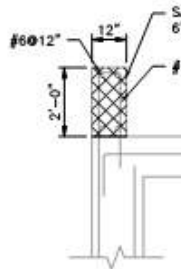
Work Package #5 - Miscellaneous Mechanical

- **October 2016 to May 2017**
- **HRC Upgrades**
 - Influent Pump
 - Duckbilled Check Valve
 - Ferric Sulfate Piping and Pump
 - Knee Wall Demolition
 - Polymer Feed System

HRC INFLUENT WET WELL OF GRIT AS
NEW HRC INFLUENT PUMP NO. 3.

SHOWN, REFER TO SPECIFICATIONS FOR
ING REQUIREMENTS.

NT AND CONDUIT NOT SHOWN ON DRAWINGS.
STRUMENTATION DRAWINGS.



HRC FACILITY
SECTION 2
1/4" = 1'-0"





Work Package #6 - Instrumentation and Electrical

- **Termination and landing of control and electrical**
- **Installation of level sensors, meter vault wall packs, basin lights and Aeration Basin Flow Meters**
- **Duct bank installation including power to basin dewatering wells and structures**
- **PCSS Services**
- **Coordination with AES Programmer (CDM Smith)**
- **System Startup**



Work Package #7 - Seeding and Revetment

- **Seeding and Revetment**
 - Approximately 80 Acres of Disturbed areas
 - Temporary and Permanent Seeding
 - Soil Retention Blankets on all Slopes
- **HydroTurf Revetment**
 - Turf and Hydrobinder





Questions?

