

# Alternative Structural Technologies Inc.

CPUC Certified Diverse Firm

## Statement of Qualifications

### Who We Are:

AST is an experienced, industry recognized, CPUC Certified, Diverse utility contractor that specializes in the restoration and repair of concrete, timber and steel civil structures. Our main focus is in supporting the power industry with an emphasis in hydroelectric infrastructure repair and restoration in a wide range of applications, including; scheduled outage, live asset and emergency response scenarios. Our scope of project activities range from maintenance items through major structural restoration and retrofit requirements. AST is extremely experienced in working safely and efficiently within powerhouse hydraulic structures, water conveyance structures, dam structures and tunnels. AST is an ongoing client of the PG&E Safety Training Academy and is a signatory employer with the IBEW local 1245.

*"We've worked with A.S.T on several structural repair, patching, leak mitigation, and grouting/void filling projects. The A.S.T crews are professional and extremely flexible. I appreciate their extensive knowledge of specialized repair products and real-world, practical experience. They provide a lot of value by assisting with selection of the most appropriate repair product to meet the project objective in the given conditions."*

*-Darren A. Mack, Principal Engineer SAGE Engineers, Inc.*

*"Carlton Engineering has worked with and alongside AST for over 15 years on a variety of projects and have always been impressed with their ability to assess a project's needs, produce a scope that works and execute the repair on time and on budget. Mr. Evans has a wealth of knowledge in the concrete restoration market derived from many different experiences, condition assessments and successful repairs and brings that experience to bear for his clients every time. We look forward to a continued association with AST and many more successful projects."* -Alan Carlton, President, Carlton Engineering

### Our Areas of Expertise:

- o Pressure grouting.
- o Epoxy injection.
- o Cementitious Patching.
- o Carbon fiber structural reinforcement.
- o Concrete surface restoration
- o Tailrace restoration and repair.
- o Structural steel fabrication and installation

### Technical Services:

- o In-place Concrete Testing / ASTM / ACI
- o Concrete repair scope specification
- o In-place Corrosion Evaluation / ASTM
- o Inspection / Walkdown / Data Collection
- o Pre-project planning support.

### Safety Training:

- o Registered PICS Contractor
- o Confined Space and respirator fit tested personnel
- o PG&E "Safety at Heights" certified personnel
- o PG&E "Flume Safety" certified personnel
- o CPR and First Aid certified personnel



## HYDRO WATER CONVEYANCE CANAL

Contract Value \$380,000.00

### TECHNICAL STABILIZATION GROUTING

A 750 foot long section of large, in-ground concrete canal had uplifted due to unforeseen ground water pressures that resulted in poor bearing and support of the structure. Technical pressure grouting was selected to restore stability and repair voiding of the substrate. Grout injection was performed under very low pressure and specific controls to protect the canal from further uplift during the grouting work. Technical apparatus and controls to closely monitor and control the canals position and elevation while grouting were developed by AST and its associate engineer, Carlton Engineering for this project. Approximately 5000 bags of stabilization grout were placed by ultra low pressure injection. Canal elevations were maintained at the target change of 1/4 inch.

#### Features of work:

- Method development and work execution plan
- Rapid NDT data collection of void areas utilizing ultrasound and radar
- Mapping of void areas including void volume and locations
- Fabrication of specialized grouting equipment and hardware
- Rapid specification and acquisition of grout materials
- Core drilling
- Grout injection
- Concrete patching (Structural)
- Expansion joint correction and resealing
- Environmental protection controls
- Public safety and access control













## HYDRO POWERHOUSE PRV LINE REPLACEMENT

Contract Value: \$410,000.00

### Discussion of project:

A 20” heavy steel discharge pipe, located within a hydro generation tail race discharge chamber had failed. This line is critical to the operation of the unit and directs extreme water discharge forces as part of the emergency shutdown pressure relief system. The discharge piping was built into the concrete infrastructure of the underground chamber, making removal and replacement extremely complex. Access was difficult as the chamber exists below and is open to river flow, which required river isolation and protection of the chamber work area. A combination of robotic demolition, dental hand demolition, steel fabrication and structural grouting and structural patching techniques were utilized to complete the work, as well as the installation of an isolation bulkhead and water redirection facilities.

### Features of work:

The work requirements included the following items:

- Provide site safety in compliance with active powerhouse guidelines
- Set up and maintain permitted confined space protocols
- Set up and maintain dust protections
- Selective dental demolition of concrete and steel sections
- Rigging and removal of existing demolished materials
- Structural grouting and section replacement of demolished areas, including concrete and steel sections
- Structural grouting
- Injection of steel cladding with structural epoxy resin
- Quality control verification
- Technical assistance, method development and repair recommendations













Anchor Lower Level Outlet Liner  
Contract Value \$320,000.00

Discussion of project:

The prime contractor was tasked with inserting a 52” diameter steel liner tube through the base of the dams existing 54” diameter lower level outlet tube. AST was tasked with developing a specification and methods to perform the required work within the confined space of the liner. After engineering approval, the tube was placed into position. AST forces then came into the project to structurally anchor the original liner into the dam and then structurally anchor the new liner to the original tube. A combination of metallic pressure grouting, high angle core drilling, shear pin fabrication and installation, in addition to epoxy injection were utilized to complete the work. Multiple shifts were utilized to maintain schedule requirements with much of the work completed under tunnel lighting.

Features of work:

The work requirements included the following items:

- Site inspection, evaluation and repair recommendations
- Develop scope in conjunction with customer engineering staff
- Make final position adjustments to liner
- High strength grout injection to fill annular bearing spaces
- Shop fabricate high strength shear pins
- In situ diamond core drilling at high angles
- Pattern drill liner in-place with magnetic base rotary broach
- Field welding of pins into steel liner
- Quality control verification
- Technical closing report





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## Elevated Steel Box Flume

### Discussion of project:

Mechanical joints within the elevated 255' x 10' x 10' steel box sections had begun to leak. Upon inspection, AST determined that critical fastening hardware had failed and caused the joints to subsequently leak. AST brought the structural team from Carlton Engineering to provide a comprehensive analysis on the root cause of the failures and worked with them in developing several repair scenarios that addressed corrections to the structure as well as repair of the failed joints. Initial repairs included dewatering, modification and rebuilding of the joint sole plates and sealants and refastening with new high grade hardware.

### Features of work:

The work requirements included the following items:

- Dewatering and area isolation
- Site inspection, evaluation and repair recommendations
- Develop scope in conjunction associate engineers
- Heavy hardware replacement
- Steel fabrication
- Strip, modify and rebuild existing joint seals
- In situ magnetic base milling
- Quality control verification
- Technical closing report

