Washington State Patrol

2022 Supplemental Request

September 2021

Property Management Division
Facilities Management Section

JAY INSLEE
Governor

JOHN R. BATISTE
Chief

STATE OF WASHINGTON
WASHINGTON STATE PATROL
Washington State Patrol Headquarters • PO Box 42600 • Olympia WA 98504-2600 • www.wsp.wa.gov

September 13, 2021

Mr. David Schumacher
Office of Financial Management
PO Box 43113
Olympia WA 98504-3113

Subject: Washington State Patrol 2022 Supplemental Capital Budget Request

We are pleased to submit the Washington State Patrol's (WSP) 2022 Supplemental Capital Budget Request for your information and consideration.

This request, if enacted, will provide for the WSP's essential needs in meeting its core missions.

Please contact me with any questions you may have related to this request.

Sincerely,

CHIEF JOHN R. BATISTE

JRB:clh
Enclosures
cc: Mr. Brian W. Bottoms, Property Management Division
Mr. Walter R. Hamilton, Budget and Fiscal Services
Assistant Chief Scott A. McCoy, Commercial Vehicle Enforcement Bureau
Captain Chris D. Old, Property Management Division

2021-2023 CAPITAL BUDGET REQUEST NARRATIVE

Historic Authority Statement

Established in 1921, the Washington State Patrol operates under the authority of Revised Code of Washington (RCW) 43.43.010, which created the Agency, and RCW 43.43.030, which gives full police powers to the officers of the department.

The Washington State Patrol (WSP) began formal assistance to other police agencies with the passage of RCW 43.43.500. This statute created the Washington State Crime Information Center. Other statutorily required services include the following:

- The Narcotics Section operates under RCW 43.43.600.
- The State Crime Laboratory serves all non-federal police agencies in the state and operates under RCW 43.43.670.
- State Fire Protection Services operates within the Washington State Patrol under RCW 48.48 and 43.43.930.
- The Drug Control Assistance Unit (DCAU) was created by the Legislature in 1970 with the passage of RCW 43.43.600 and 43.43.660. This unit has been renamed the Narcotics Section of the Investigative Assistance Division.
- The Identification and Criminal History Section was established by the 1972 Legislature through RCW 43.43.700. The Section is the repository for criminal history record information and State Department of Corrections activity based on fingerprint identification. RCW 68.50.310 established the dental identification system as a repository for dental records of missing and unidentified persons. The Section also maintains a central registry of sex and kidnapping offenders as authorized by RCW 9.94A.155.
- The Legislature expanded the use of criminal history records to include background checks by public and private sector employers through the Criminal Records Privacy Act (RCW 10.97), Private Sector Act (RCW 43.43.815), and Child and Adult Abuse Information Act (RCW 43.43.830-845).
- The Child and Adult Abuse Information Act was amended by the 2005 and 2006 Legislatures, removing the responsibility for the Section to maintain and furnish information related to dependency and protection proceedings concerning abuse or exploitation of children or vulnerable adults.
- The Washington Crime Information Center (WACIC), authorized by RCW 43.43.510, contains electronic files of stolen and wanted vehicles, outstanding warrants, missing and unidentified persons, stolen property, protection orders, sex offender registry information and other files of general assistance to law enforcement agencies. A Central Computerized Enforcement Service System (ACCESS), authorized by RCW 43.43.785, consolidates criminal justice service programs within the WSP.
- The Collision Records Section, authorized by RCW 46.52.030, receives reports of vehicles and drivers involved in collisions resulting in injury or death, or property damage in an amount established by the WSP.
- RCW 43.105.330 established the State Interoperability Executive Committee (SIEC) and its role in providing oversight to the State's wireless communications. The Chief of the Washington State Patrol and the State Fire Marshal are required by statute to sit on the SIEC.
- RCW 43.43.035 and 43.43.037 mandate the responsibility of the safety of the Governor, the Governor's family, the Lieutenant Governor, and for the security and protection of the Legislature.
- The Washington State Patrol Organized Crime Intelligence Unit (CIU) was created by the Legislature in 1973 with the passage of RCW 43.43.850. RCW 43.43.850 through 43.43.864 defines "organized crime" as "activities that are conducted and carried on by members of an

organized, disciplined association engaged in supplying illegal goods and services, and/or engaging in criminal activities in contravention of the laws of this state or of the United States".

- The Missing and Unidentified Persons Unit/Missing Children Clearinghouse (MCC) was established in 1985 under authority of RCW 13.60.010. The objective is to maintain and operate a toll-free 24-hour telephone hotline. The MCC distributes information to local law enforcement agencies, school districts, the Department of Social and Health Services, and the general public regarding missing children. This office also maintains a regularly updated computerized link with national and other statewide missing person systems or clearinghouses.
- The WSP Missing and Exploited Children Task Force (MECTF) was created by the Legislature in 1999 with the passage of RCW 13.60.100. This multi-agency task force assists law enforcement, state and federal agencies, and the proper custodial parent(s) or guardian(s) by conducting investigations on missing, abducted and exploited children through referrals, on-site assistance, case management, and training.
- The Washington State Patrol Criminal Proceeds Unit (Special Narcotics Enforcement Unit) was created by the Legislature in 1989 with the passage of RCW 43.43.655. The Criminal Proceeds Unit's responsibilities include the investigation of criminal narcotic profiteering investigations, training of undercover narcotic agents, and coordination of federal, state, and local inter-jurisdictional narcotic investigations.
- Known as the Teekah Lewis Act, a multi-agency task force within the Washington State Patrol responds to requests from local law enforcement on missing and exploited children. The task force is authorized to assist agencies through case management and referral, technical assistance, personnel training, and coordination among local, state, interstate, and federal law enforcement agencies under Chapter 13.60 RCW.
- The Western States Information Network (WSIN) was established in 1981 by the U.S. Department of Justice through Congressional appropriation for the establishment of regional intelligence systems throughout the United States. The purpose of this initiative is to form partnerships between the federal government and local law enforcement. To achieve this goal, WSIN responds to the needs of its member agencies located in five western states (Alaska, California, Hawaii, Oregon, and Washington) by providing a broad range of criminal intelligence information, analytical products, and services in support of gang, narcotic, and Uniform Crime Reporting (UCR) Part 1 criminal investigations and prosecutions.
- The Criminal Investigations Division (CID), formerly known as the Traffic Investigation Division, operates and receives its authority under RCW 43.43.030. CID was formed on January 1, 1982 as part of the Investigative Services Bureau (ISB).
- The Fuel Tax Evasion Unit has Legislative authority under RCW 82.42.100, RCW 82.36 and RCW 82.38, to investigate fuel tax evasion.
- The Human Resources Division operates under the authority of RCW 41.06, 41.08, WAC Chapters 357 and 358, along with Collective Bargaining Agreements with WSPTA, WSPSTA, WSPLA, WFSE, WPEA, Local 17, and the Coalition.
- The Budget and Fiscal Services Division derives its authority from RCW 43.88: State Budgeting, Accounting and Reporting System (frequently referred to as the Budget and Accounting Act). This statute provides authority and direction for the appropriation, allotment, expenditure, accounting, and reporting of state funding provided for WSP activities. It also defines powers, duties and fiscal responsibilities of Agency officers. The 18th Amendment of the Washington State Constitution (Article 2, Section 40) authorizes and restricts use of Highway Funds (State Patrol Highway Account), which comprise over seventy percent of the WSP budget. The 11th Amendment to the Constitution (Article 8, Section 4) provides authority for the Agency to incur costs subject to appropriations by law.
- RCW 46.61.470 (2) authorizes highway speed enforcement from an aircraft, using a timing device to control speed on Washington's highway system.

- RCW 46.61.506 provides the authority for the State Toxicologist to approve instrumentation and protocols related evidential breath alcohol analysis and evidential blood analysis and other competent evidence in determining whether a person was under the influence of intoxicating liquor or any drug.
- The Fire Protection Bureau's Inspection Program has statutory authority to adopt and enforce fire safety standards as outlined in RCW's 18.120.130 (Boarding Homes), 18.46.110 (Birthing Centers), 18.51.140 (Nursing Homes), 70.41.080 (Hospitals), 71.12.485 (Private Establishments), and 74.15.150 (Child Day Care Centers). The Licensing Program has statutory authority to regulate and provide management oversight of Fire Sprinkler Contractors and their employees per RCW 18.160 and the Fireworks Industry per RCW 70.77.
- The Mobilization Section coordinates statewide fire service resources to support local firefighting efforts as required in RCW43.43.961. The Data Collection Unit gathers data for the National Fire Information Reporting System (NFIRS). NFIRS is the nationally recognized standard for reporting fire related incidents. Fire agencies electronically document their incident experience and report the information in accordance with RCW 48.48.065. The Publication Education Unit performs the daily management of the Youth Risk Watch Program, Juvenile Fire Setter Intervention Program, and the Fire prevention Education Program. They also develop and implement the Firework Safety Education Campaign, as provided by RCW 70.77 and funded through licensing fees.
- The Hazardous Materials Unit provides hazardous materials training to first responders throughout the State of Washington. As directed in RCW 70.136.030, the Washington State Patrol is designated as the Incident Command agency at any hazardous materials incident on or along any state route or interstate freeway corridor, as well as within any jurisdiction that has not designated an incident command agency.
- Although not mandated by statute, the Governor's Committee on Homeland Security, Washington Association of Sheriffs and Police Chiefs, WSP, and the Federal Bureau of Investigation (FBI) recognized the need for development of a useful anti-terrorism intelligence fusion center. In 2003, Washington Joint Analytical Center (WAJAC) was established with the FBI in Seattle, as a central point (fusion center) for all terrorism-related tips collected by Patrol Officers and Detectives throughout the State. The WAJAC is currently supervised by a WSP Investigative Assistance Division Lieutenant and FBI supervisor. It was renamed in 2008 to the Washington State Fusion Center (WSFC).

Agency Missions and Goals

The Washington State Patrol makes a difference every day, enhancing the safety and security of our state by providing the best in public safety services. The Washington State Patrol achieves their mission of providing and improving the safety and security of the public through the highest standards of professionalism, accountability and continuous performance improvement. The Washington State Patrol is dedicated to providing and enhancing the safety and security of every public citizen through a core of skilled, well trained and professional work force.

Goal 1	Make Washington roadways and ferries safe for the efficient transit of people and goods.
Goal 2	Reduce our citizens' vulnerability to fire, crime, terrorism, and natural hazards.
Goal 3	Meet the growing need for law enforcement, forensic, investigative, and other public safety services statewide.
Goal 4	Leverage technology to enhance and sustain business processes, public safety infrastructure and statewide emergency communications interoperability.
Goal 5	Provide critical leadership, tools and resources to foster an ethical, innovative, knowledgeable, and diverse workforce.

Facilities Summary and Assessment

The Washington State Patrol manages over 200 public safety facilities across the state to meet the Agency's mission and goals. Most of these are complex, special purpose installations, designed and operated to perform specific functions for the Agency. Such facilities include district offices, detachment offices, commercial vehicle enforcement weigh stations, crime labs, training academies, and communication resources that total more than one million square feet of space under roof and many hundreds of acres of associated grounds.

As the business needs within these facilities have become more complex, the systems and equipment within the facilities have also increased in complexity. The WSP has been a good steward of its assets and takes every measure to keep aging systems and equipment in operation. Albeit, the Agency maintains a tradition of measured capital requests that address only the most pressing Agency needs. This approach is consistent with the limited amounts available through the State Patrol Highway Account (SPHA) where 70 percent of the funds for Agency operations and assets originate.

The Agency partitions the state into eight (8) geographic locations, or Districts, for traffic control and enforcement operations. Each district has a headquarters building and several detachment offices, with three (3) to four (4) working groups assigned to each location. Districts vary in size across the state, resulting in a significant geographic challenge to the facilities and maintenance operations. The majority of these offices were constructed from 1950 to 1980, requiring greater maintenance and system replacements as each facility continues to approach the end of its useful life. As of this year, the average State Patrol owned facility has been in service over 35 years.

Co-locations with other state agencies are reviewed on an annual basis to maximize facility operating efficiencies and associated expenditures. Examples of past efficiencies include the Sunnyside Detachment relocation to the Prosser Scale facility plus the Human Resource Division relocation from Lacey to the Capital Campus Headquarters. The recently created Commercial Vehicle Enforcement Bureau focuses interest on the enforcement of commercial vehicle regulations in Washington, which for decades has been a statutory part of the Agency's mission. Activities in this bureau (which were at the divisional level of the Agency previously) direct new resources on motor carrier safety in addition to straightforward permit, weight, height, width, brake condition and axel spacing concerns that have traditionally been the Agency's responsibility.

Support for local and state law enforcement agencies is given by the Washington State Patrol's forensic, fingerprint and toxicology laboratories. Furthermore, these facilities require specialized equipment as an integral part of the laboratory services provided. The laboratories at Cheney, Kennewick, Vancouver, Tacoma and South Seattle have significantly increased the need for maintenance level support of these newer and larger State Patrol facilities. Previously, maintenance requirements and costs for some of these facilities were absorbed as lease costs for the forensic laboratories located in Spokane (now relocated to Cheney), Kelso (now relocated to Vancouver) and Seattle (now relocated to South Seattle.) In addition, the demand for services continues to increase incrementally with advances in technology. The Agency will be unable to keep up with this need in the future without the expansion of existing locations and the addition of new facilities. The Seattle, Tacoma and Kennewick laboratories have reached the physical and operational limits of their locations. Regardless of that reality, the chronic scarcity of state resources for capital expansion has made the desire for creation of a third regional crime laboratory in the Richland area seem impractical. As a result, preliminary plans for such a facility, which were completed in September of 2008, have been shelved in favor of conceptualization for a consolidated replacement for Tacoma, Seattle and the Olympia Latent Prints Labs in the Tacoma area.

Statewide Agency voice and data communication systems continue to rely upon strategically located radio transmission equipment sites to provide the Agency with an interoperable statewide emergency communications system. This system provides voice communication for the Washington State Patrol, the Department of Fish and Wildlife, the Department of Transportation, the State Lottery Commission, the Washington State Gambling Commission, the FBI and other critical local, state and federal law enforcement agencies. The Agency has developed co-location agreements with private and public entities for communication tower partnerships in response to recommendation #8 of the 1998 report by the Joint Legislative Audit Review Committee. The agency continues to seek such partnerships.

Two (2) training academies operated by the Agency provide primary, advanced and specialized training in support of the Agency's mission. The first is the Shelton Training Academy, which provides critical law

enforcement and other related training for both commissioned and non-commissioned personnel. In addition, the facility is used by other law enforcement agencies, including forces from other states. The Shelton academy includes an administrative building; classrooms; dormitories; a drive training course used for training in high speed pursuit maneuvers; a skidpan (used to train emergency vehicle operators how to maintain high speed control on slick surfaces); a firearm training range; a K-9 training facility; a kitchen/dining hall; maintenance and automotive repair buildings; and a multipurpose building which houses three (3) offices, a classroom, a gymnasium for tactical and physical training, and a training tank with necessary aquatic training equipment. The campus is heavily utilized and will require increased maintenance in the future to preserve the quality training currently being provided.

A master plan for the entire facility should be completed, to identify and coordinate overall Agency training needs into the future.

The second Agency campus is the Washington State Fire Training Academy, located near North Bend, which provides training for firefighters and public safety professionals from local, state and federal governments, as well as private fire brigades and the marine industry. This is a unique training facility due to its ability to burn Class A fuels (wood) and Class B fuels (gasoline, diesel and aviation fuels) and consists of several burn props and buildings specifically designed to provide live fire simulation training for beginning and advanced first responders and firefighters. These props are supported by a training waste water recovery system that protects the environment from contamination and provides for sustainable levels of water consumption.

The Fire Training Academy (FTA) also provides training courses with simulation props for hazardous material spill cleanup, corrective actions and control operations. This facility is provided with an administrative building; three (3) classrooms; an instructor resource building and dormitories; a dining hall/meeting room; a domestic water well and drinking water purification building; a training water pump house; a vehicle maintenance and storage facility; three (3) water storage ponds; a structure containing equipment to refill fire extinguishers and a medical assistance building. The facility's environmental obligations are supported by a comprehensive stormwater collection and treatment system operating under an approved National Pollution Discharge Elimination System (NPDES) permit. The most recent capital projects completed at the FTA include a sanitary system and new dormitory.

Many aspects of the FTA academy have deteriorated and are approaching the ends of their useful lives. The centerpiece training prop at the FTA, the six-story burn training building is at the end of its life, costing as much or more to keep operating as would the construction of a new, more state-of-the-art replacement over its expected life. In addition, there are several modular buildings used for teaching and administrative purposes that have experienced significant structural decay. These building will need replacement soon and because of their construction, remodeling will not be an option. Construction documents for a new Burn Building have been completed and we are currently working with King County on a new Special Use Permit for the first phase of construction.

A Fire Training Academy Master Plan, completed in 2013 has validated preservation, improvements and expansions at the facility through the 2027-2029 biennium. These recommendations are reflected in this summary. The Fire Training Academy Master Plan has proved to provide good results for planning infrastructure improvements and program expansions. Similar master planning efforts are in store for the WSP Academy, a law enforcement training center in Mason County, and for district operations around the state starting with the District 2 Headquarters at Bellevue. Operating and maintenance recommendations will be a key part of all of the master planning described above.

Current Capital Focus

Significant increases in the responsibilities and operations of all areas of public security and safety programs amplify the requirements for capital investments to support the maintenance of Agency facilities.

The public safety focus of the WSP is directed toward two primary activities: highway safety and law enforcement; plus fire protection and preparedness. A major aspect of the fire preparedness focus is the operation of the Agency's Fire Training Academy near North Bend in east King County. This 52 acre facility is now over 30 years old and is suffering from age and intensive use. Capital underspending in the past has created the need to increase the request for generic repairs on campus to $250,000 in the

upcoming biennium. Other projects identified in the Master Plan will enter the planning and design phases during subsequent periods as a result of delayed requests.

As for the highway safety/law enforcement activities of the Agency, continued preservation and repair of existing infrastructure is necessary. In addition, significant effort continues with HVAC modernization and energy conservation to reduce operating costs; plus generator replacement to reduce the cost of mechanical repairs and improve reliability. Weigh stations, a significant use of funds in the past, will start to be funded through sharing of federal resources with WSDOT. District facilities, however, continue to need repairs to exterior systems such as roofing, siding, and pavement.

2021-2023 Capital Budget Request

For the 2021-2023 Capital Budget Request, the Washington State Patrol proposed the following additions and/or improvements:

General Fund (State Building Construction Account)

1. Fire Training Academy, Burn Building Refractory and Structural Repairs
2. Fire Training Academy, Emergency Preservation and Repair
3. Fire Training Academy, Access Road – Fish Passage Mandate
4. Fire Training Academy, ARFF – Large Plane Prop
5. Vancouver Crime Laboratory, Roof Replacement
6. Seattle Crime Laboratory, Air Compressor Replacement
7. Cheney Crime Laboratory, HVAC Retro Commission
8. Kennewick Crime Laboratory, Facility and Security Upgrade
9. Crime Laboratories, UPS Replacements

Transportation Fund (State Patrol Highway Account)

1. Statewide Patrol Mission Emergency Preservation and Repair
2. Patrol Mission Building Roof Repairs/Replacements (three locations statewide)
3. Fuel Tank Decommissioning (three locations statewide)
4. Patrol Mission Infrastructure Generator Replacement (seven locations statewide)
5. Marysville District Office - Domestic and Fire Water Systems
6. HVAC Replacements (five locations statewide)
7. Patrol Mission Building Exterior Envelope Preservation (five locations statewide)
8. Olympia Detachment and Latent Prints Pre-Design

Future Capital Budget Request Summary

For future Capital Budget requests, the Washington State Patrol plans to request the following additions and/or improvements based on the Agency's 10-year plan for General Fund Expenditures and 16-year plan for projects funded through the Transportation Account:

2021-2023 Biennium

General Fund

- *Fire Training Academy, Emergency Preservation and Repair: Construction*
- Fire Training Academy, completion of Burn Building Structures: Construction
- Fire Training Academy, campus emergency power generator: Construction
- Fire Training Academy, Multi-Services Complex: Predesign
- Crime Laboratory I-5 Corridor Consolidated Facility: Predesign

Transportation Fund

- *Statewide Emergency Preservation and Repair: Construction*
- *Statewide Roof Replacement: Construction*
- *Statewide Exterior Preservation: Construction*
- *Statewide Emergency Generator Replacement: Construction*
- *Statewide HVAC Replacement: Construction*
- *Statewide Pavement Preservation: Construction*
- Olympia Detachment: Construction
- Bellevue District Headquarters, Expansion: Bid Documents
- Shelton Academy, Master Plan: Design
- Shelton Academy, Kitchen/Dining Hall Addition: Predesign
- Shelton Academy, Firearms Training Center: Predesign

Future Capital Spending Plan

The increasing demand for public safety and security requires an increase in capital investment to support the Agency's mission. Capital Budget Requests from General and Transportation Funds will include the following asset improvements in subsequent biennia:

2023-2025 Biennium

General Fund

- *Fire Training Academy, Emergency Preservation and Repair*
- Fire Training Academy, Multi-Services Complex: Bid Documents
- Fire Training Academy, Utility and Illumination Upgrades: Design/Construction
- Crime Laboratory I-5 Corridor Consolidated Facility: Bid Documents

Transportation Fund

- *Statewide Emergency Preservation and Repair: Construction*
- *Statewide Roof Replacement: Construction*
- *Statewide Exterior Preservation: Construction*
- *Statewide Emergency Generator Replacement: Construction*
- *Statewide HVAC Replacement: Construction*

- *Statewide Pavement Preservation: Construction*
- Bellevue District Headquarters, Expansion: Construction
- Shelton Academy, Kitchen/Dining Hall Addition: Bid Documents
- Shelton Academy, Firearms Training Center: Bid Documents
- Shelton Academy, EVOC Expansion: Predesign

2025-2027 Biennium

General Fund

- *Minor Works Emergency Preservation and Repair*
- Fire Training Academy, Multi-Services Complex: Construction
- Fire Training Academy, Aircraft Rescue Facility Upgrade: Predesign
- Fire Training Academy, Marine Training Prop Upgrades: Predesign
- Crime Laboratory I-5 Corridor Consolidated Facility: Construction

Transportation Fund

- *Statewide Emergency Preservation and Repair: Construction*
- *Statewide Roof Replacement: Construction*
- *Statewide Exterior Preservation: Construction*
- *Statewide Emergency Generator Replacement: Construction*
- *Statewide HVAC Replacement: Construction*
- *Statewide Pavement Preservation: Construction*
- Shelton Academy, Kitchen/Dining Hall Addition: Construction
- Shelton Academy, Firearms Training Center: Construction
- Shelton Academy, EVOC Classroom: Bid Documents
- Shelton Academy, Administrative Building: Predesign

2027-2029 Biennium

General Fund

- *Minor Works Emergency Preservation and Repair*
- Fire Training Academy, Aircraft Rescue Facility Upgrade: Bid Documents
- Fire Training Academy, Marine Training Prop Upgrades: Bid Documents
- Fire Training Academy, Arson Investigation Classroom: Predesign
- Fire Training Academy, Hazardous Material Training Center Upgrades: Predesign

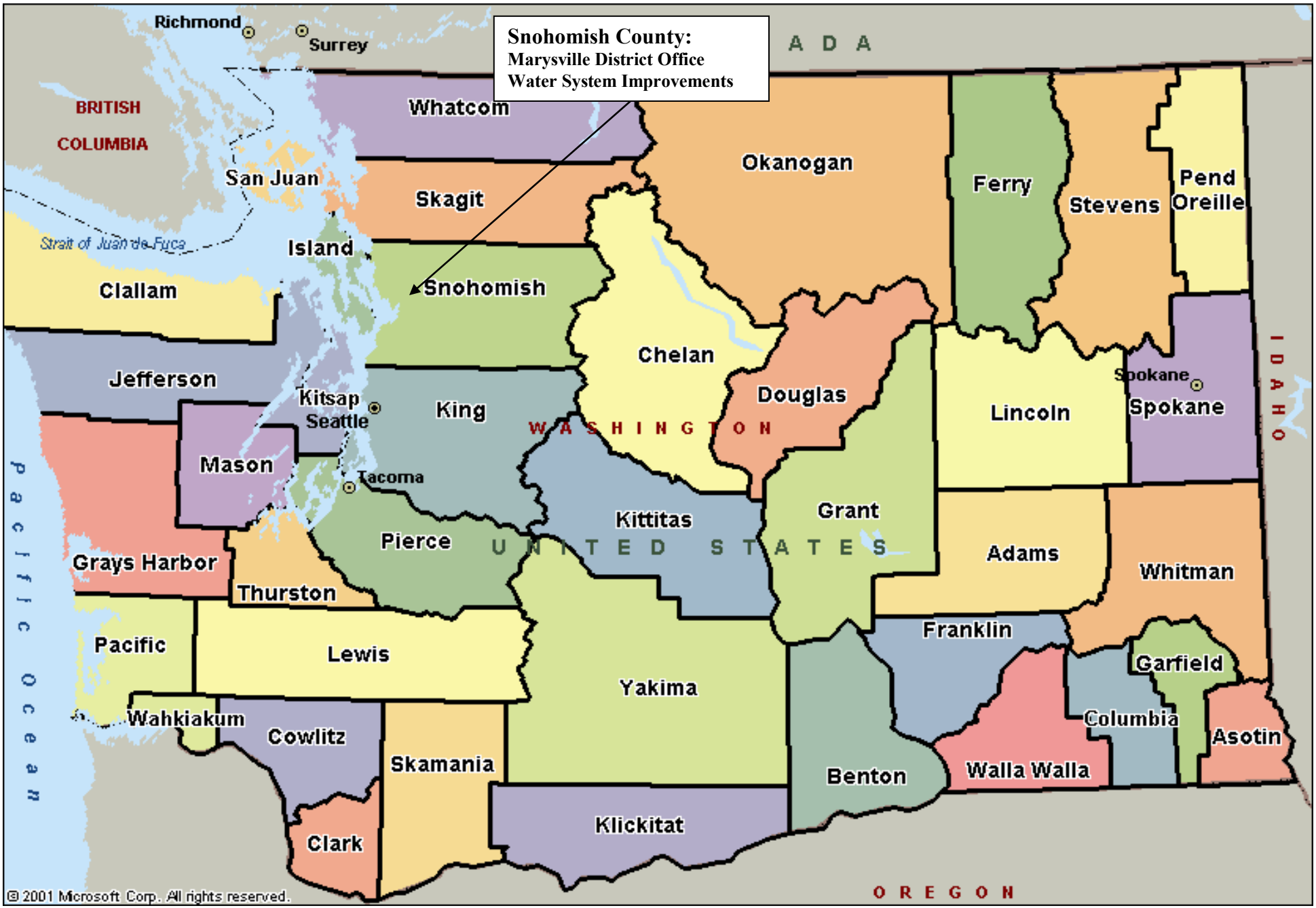
Transportation Fund

- *Statewide Emergency Preservation and Repair: Construction*
- *Statewide Roof Replacement: Construction*
- *Statewide Exterior Preservation: Construction*
- *Statewide Emergency Generator Replacement: Construction*

- *Statewide HVAC Replacement: Construction*
- *Statewide Pavement Preservation: Construction*
- Shelton Academy, EVOC Classroom: Construction
- Shelton Academy, Administrative Building: Bid Documents

Washington State Patrol

2022 Supplemental Capital Budget Request Projects Map



Allyson Brooks Ph.D., Director
State Historic Preservation Officer

August 20, 2020

Brian Bottoms
Washington State Patrol
Facilities Section Manager

In future correspondence please refer to:
Project Tracking Code: 2020-08-05263
Re: Washington State Patrol 2021-2023 Biennium Budget Request

Dear Brian Bottoms:

Thank you for contacting the Washington State Department of Archaeology and Historic Preservation (DAHP). The above referenced project has been reviewed on behalf of the State Historic Preservation Officer (SHPO) under provisions of Governor's Executive Order 05-05 (GEO 05-05). We have reviewed the materials you provided for the Washington State Patrol Capital Programs Projects for the 2021-2023 Biennium.

Should projects in the list you provided become obligated with Washington State Capital Funding and include either of the following activities, we will request a related EZ form to initiate consultation with DAHP under GEO 05-05:

- Ground disturbing activities: EZ-1 form; and/or
- Alterations to the interior or exterior of buildings or structures 45 years in age or older: EZ-2 form.

If neither other above activities related to a project, consultation with DAHP is not required.

These comments are based on the information available at the time of this review and on behalf of the SHPO in conformance with GEO 05-05. Also, we appreciate receiving copies of any correspondence or comments from concerned tribes and other parties that you receive as you consult under the requirements of GEO 05-05. Should additional information become available, our assessment may be revised.

Finally, please note that in order to streamline our responses, DAHP requires that Resource documentation (HPI, Archaeology sites, TCP) and reports be submitted electronically. Correspondence must be emailed in PDF format to the appropriate compliance email address. For more information about how to submit documents to DAHP please visit: https://dahp.wa.gov/project-review. To assist you in conducting a cultural resource survey and inventory effort, DAHP has developed Guidelines for Cultural Resources Reporting. You can view or download a copy from our website.

Thank you for the opportunity to review and comment. Please ensure that the DAHP Project Number (a.k.a. Project Tracking Code) is shared with any hired cultural resource consultants and is attached to any communications or submitted reports. If you have any questions, please feel free to contact me.

Sincerely,

OFM

225 - Washington State Patrol
Capital FTE Summary
2021-23 Biennium

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Version: 08 Transportation Capital

Report Number: CBS004
Date Run: 8/25/2020 11:46AM

FTEs by Job Classification

	Authorized Budget			
	2019-21 Biennium		2021-23 Biennium	
Job Class	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**
Architect 1			0.5	0.5
Construction Coodinator 4			0.3	0.3
Construction Coordinator 2			1.5	1.5
Facilities Section Manager			0.3	0.3
Mechanical Engineer 3			0.5	0.5
Total FTEs			**3.1**	**3.1**

Narrative

WSP has maintained a Capital Projects group within the Property Management Division for many years. Historically the funding has been included in the Operational Budget due to the reality of one common fund source for the original transportation related projects. With the inclusion of the Forensic Laboratory Services Bureau and the Fire Protection Bureau in the last decade, the workload has shifted to a higher percentage role for projects funded by the State Building Construction Account.

OFM

Capital FTE Summary

2021-23 Biennium

*

Report Number: CBS004
Date Run: 8/25/2020 11:46AM

Parameter	Entered As	Interpreted As
Biennium	2021-23	2021-23
Agency	225	225
Version	08-A	08-A
Include Page Numbers	Y	Yes
For Word or Excel	N	N
User Group	Agency Budget	Agency Budget

2021-2023 Maintenance Backlog Reduction Plan

The Washington State Patrol (WSP) is responsible for maintaining over two hundred buildings, which include:

- Crime Labs
- District Office Buildings
- Two Training Academies
- Detachments Offices
- Commercial Truck Scales & Inspection Facilities
- Radio Communications Sites
- Administrative Office Buildings
- Maintenance Facilities

Each site has unique challenges and requirements. Crime Labs have specialized HVAC systems to ensure scientist safety. District Offices include storage areas for evidence with unique ventilation requirements. Both academies have specialized facilities and equipment that experience unique conditions and stresses during training events. Truck scales incur the wear and tear of heavy loaded trucks on a routine basis. High mountain-top communication sites endure extreme weather conditions. Even administrative office buildings have special security requirements to protect both agency employees and the public. Most sites have emergency back-up power, supplied by agency-owned generating equipment. Many offices and detachments house 24 hour-a-day operations.

Strategic Plan:

Beginning in 2005, WSP began a systematic approach to performing facility assessments. This approach includes a periodic determination of the age of serviceable components at each facility. In cases of incomplete documentation, detailed inspections were performed to validate current conditions against the perceived condition. In the 2005-2007 Capital Budget Request, WSP increased the number and scope of the minor works projects and began to address the most critical issues.

In 2007-2011, WSP presented a larger Capital Budget Request, although available State Patrol Highway Account funding was limited. In addition, the general fund requests have increased. Only the highest priority projects were funded.

In 2013, Master Planning was initiated at the agency's Fire Training Academy near North Bend with good results for planning infrastructure improvements and program expansions. Similar master planning efforts are in store for the WSP Academy, a law enforcement training center in Mason County. Operating and maintenance recommendations will be a key part in the creation of master plans.

All capital projects proposed for this biennium are oriented to preservation and backlog reduction. In the 2021-2023 biennium Capital Budget Request, WSP continues with minor works projects, which address aging roofs, emergency power, and HVAC systems.

Projects funded in the previous biennium are proceeding as planned and within budget.

OFM

225 - Washington State Patrol
Capital Project Request

2021-23 Biennium

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Version: 13 2022 Supplemental Trans Budget

Report Number: CBS002
Date Run: 8/20/2021 9:24AM

Project Number: 30000232
Project Title: Marysville District Office - Water System Improvements

Description

Starting Fiscal Year: 2020
Project Class: Preservation
Agency Priority: 1

Project Summary

Supplemental funding to complete the domestic and fire water system connection at our Marysville District Office.

Project Description

This project was delayed based on spending freeze requirements due to the Covid -19 pandemic. We had originally planned to contract this project a year earlier based on our construction schedule. Delaying this project a year has negatively affected the budget due to high material costs and construction escalation. We are requesting $607,000 to complete this project. The Marysville District Office is located on Tulalip tribal lands, and the Marysville water systems transferring into their ownership and domain to the Quil Ceda Village (QCV). The fire suppression system for the campus is over 25 years old and exceeded its life expectancy requiring substantial upgrades and improvements to meet current fire code and serviceability.

This request will enable the agency to connect to the new QCV water line for both domestic and fire water systems, demolish the existing water storage and fire pumping system, and correct water suppression system problems, see engineering report. This work will be completed within the 2019-2021 biennium.

This work will provide the campus to have a constant, consistent and reliable water system for both the domestic and fire systems while reducing our overhead for maintenance and operations of the existing systems. There are no other alternatives as the existing domestic water line is to be abandoned and we will be required to connect to the new water line. This project is consistent with the agency goal to "Sustain and Enhance Agency Infrastructure and Business Processes" and is supported in the Capital Projects section of the agency's 2014-2019 Strategic Plan.

Location

City: Marysville **County:** Snohomish **Legislative District:** 038

Project Type

Infrastructure Preservation (Minor Works)

Growth Management impacts

This project will not create any impacts.

Funding

Acct Code	Account Title	Estimated Total	Expenditures Prior Biennium	Current Biennium	2021-23 Fiscal Period Reapprops	2021-23 Fiscal Period New Approps
081-1	WSP Highway Account-State	607,000				607,000
	Total	**607,000**	**0**	**0**	**0**	**607,000**

Acct Code	Account Title	Future Fiscal Periods 2023-25	2025-27	2027-29	2029-31
081-1	WSP Highway Account-State				
	Total	**0**	**0**	**0**	**0**

225 - Washington State Patrol
Capital Project Request

2021-23 Biennium

*

Version: 13 2022 Supplemental Trans Budget

Report Number: CBS002
Date Run: 8/20/2021 9:24AM

Project Number: 30000232
Project Title: Marysville District Office - Water System Improvements

Operating Impacts

No Operating Impact

Narrative

The improvements identified in this work will not change the operational or staffing associated with this facility.

OFM

Capital Project Request

2021-23 Biennium

*

Parameter	Entered As	Interpreted As
Biennium	2021-23	2021-23
Agency	225	225
Version	13-A	13-A
Project Classification	*	All Project Classifications
Capital Project Number	30000232	30000232
Sort Order	Project Priority	Priority
Include Page Numbers	Y	Yes
For Word or Excel	N	N
User Group	Agency Budget	Agency Budget
User Id	*	All User Ids

As the current Capital Budget Request was developed, projects were identified that would have the greatest impact on the agency's goals, given the limited fund balances anticipated:

- Make Washington roadways and ferries safe for the efficient transit of people and goods;
- Reduce our citizens' vulnerability to fire, crime, terrorism, and natural hazards;
- Meet the growing need for law enforcement, forensic, investigative and other public services statewide;
- Leverage technology to enhance and sustain business processes, public safety infrastructure and statewide communications.

The WSP has prepared a Capital Budget Request, which is focused on preservation and maintenance backlog reduction. Future biennia will require more for building envelopes, paving, and energy efficiency. Those projects advanced for consideration herein were prioritized based on immediate need for facility preservation, life safety, and maintenance of continuing operations.

Maintenance Backlog:

As the accompanying list shows, the agency has identified millions of dollars in ongoing capital maintenance issues that will require expenditures over the next 10 years. The agency's facility inventory completed in the 2011-2013 biennium has enabled more WSP locations to be assessed and repaired.

The majority of current facilities and infrastructure are being minimally maintained and repairs are prioritized based on life safety and continuity of operations. It is imperative to assess serviceable components at each facility to determine lifecycle replacement estimates and to adequately build those estimates into a comprehensive maintenance reduction plan. It is important to note that deferred maintenance items impact more than just agency readiness, but also impact other rehabilitative and site improvement needs such as energy, accessibility, functionality, and safety.

As WSP continues to work with the Facility Inventory System (FIS) and sustainability reporting, preservation and recapitalization efforts will be discussed in support of future capital requests and related maintenance backlog reduction plans.

Project Priorities:

The projects identified by timing of projected failure are prioritized as follows:

1. Employee Safety
2. Mission Delivery
3. Asset Protection
4. Energy Performance

Maryville Domestic and Fire System

Consultant Services Remaining

KPFF Remaining Agreement		$	35,516
KPFF Additional Services		$	12,000
Krazen Materials Testing		$	2,780
	Total	**$**	**50,296**

Base Bid

Contractor Bid Price		$	789,168
Tulalip Tribe TERO Fee 1.75 %		$	14,056
Award Construction Base Bid + Tero Fee 1.75%		$	803,224
Marysville Tulalip Sales Tax 9.3%		$	74,700
Contingency 10%		$	80,322
	Total	**$**	**958,246**

Alternates

Alt 1 Well Decommission		$	79,889
Alt 2 Nitrogen System Vin Bldg.		$	13,920
Alt 3 Replace Fire Control Panel		$	145,252
	Total	**$**	**239,061**

Grand Total	**$**	**1,247,603**
Remaining Funds	$	640,000
Supplemental Funding Needed	**$**	**607,603**

WSP FIRE & WATER SYSTEM IMPROVEMENTS

MARYSVILLE, WASHINGTON

State Project # 2016-478 G (1-1)

Feasibility Study

June 27, 2017

Prepared for:

State of Washington
Department of Enterprise Services (DES)

Prepared by:

Clinton D. Pierpoint

Consulting Engineers
612 Woodland Square Loop SE, Suite 100
Lacey, WA 98503
(360) 292-7230
(360) 292-7231 FAX

STATE OF WASHINGTON DEPARTMENT OF ENTERPRISE SERVICES
WSP Fire & Water System Improvements Study
STATE PROJECT NO. 2016-478 G (1-1)

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APPENDICES

1.0 EXECUTIVE SUMMARY

KPFF Consulting Engineers (KPFF) has prepared this report to determine the feasibility of upgrading the fire suppression system at the Washington State Patrol (WSP) District #7 Headquarters facility in Marysville, Washington. KPFF has retained the services of Allen Engineering to provide fire protection engineering evaluations of the existing fire suppression system.

The WSP facility is office space for the northern Puget Sound region and includes a full-service laboratory and the district's communication center. The three (3) buildings on-site are a main administrative building (~21,370 square feet), vehicle inspection building (~5,220 square foot), and utility outbuilding (~700 square foot). The buildings and associated fire suppression systems were constructed in 1993.

The buildings reportedly have a history of leaking, sprinkler pipe repairs, and corrosion. Conditions were confirmed during site walkthrough on March 30, 2017. Additional observations revealed incomplete automatic sprinkler coverage, outdated seismic restraint, and apparent incomplete maintenance and testing of fire protection systems.

The project site is located at 2700 116th Street NE, and is on Tulalip Tribe land within Section 8, Township 30 North, and Range 5 East. Locator and Vicinity maps have been included for reference in Appendices A and B, respectively.

2.0 SCOPE OF WORK

KPFF has been retained by WSP to evaluate the potential for upgrading the fire suppression system at the WSP District #7 Headquarters. Scope of work included coordination with local authorities to determine feasibility of extending a nearby watermain to the site for fire suppression, evaluation of existing building's fire sprinkler systems, evaluation of existing Fire Alarm Control Unit (FACU), development of design recommendations based on the findings of this study, and a cost estimate for recommended improvements.

KPFF worked with Tulalip Tribal officials to determine the feasibility of extending their watermain to the project site. Work also included review of the Tribal water supply to provide adequate pressure and flow for fire suppression and evaluation of the potential for abandoning existing fire pumps and on-site cistern. Allen Engineering evaluated the fire suppression system of the three (3) buildings, determined the feasibility of replacing existing FACU, developed recommendations based on above-noted evaluation and reviews of records and codes, and prepared report summarizing their results. Evaluation was performed by Travis Allen, licensed fire protection engineer, and Roger Niebuhr, certified fire sprinkler technician with Western States Fire Protection Co., on May 17, 2017 and May 18, 2017. Allen Engineering Sprinkler System Assessment, dated June 26, 2017 is included for reference in Appendix C.

3.0 EXISTING CONDITIONS

3.1 SITE FIRE SUPPRESSION SYSTEM

The sprinkler system located in the WSP facility administrative building includes both a single 3-inch dry pipe fire sprinkler system (dry system) and a single 4-inch wet pipe fire sprinkler system (wet system). Portions of the administrative building's dry system have been replaced due to pipe failures. The sprinkler system for the WSP facility vehicle inspection building consists of only a single 4-inch pipe fire sprinkler system (dry system). Sprinkler systems were installed in 1993 by Royal Fire Protection, Inc. and utilize Schedule 10 black steel feed mains and Schedule 40 black steel branch lines. Size of the sprinkler supply line to the facility buildings are 6 inches.

An underground cistern and two (2), 25 horsepower fire pumps, supply water for all facility fire protection systems, including fire hydrants. Fire pumps are located in the WSP facility utility outbuilding. One fire pump is rated at 750 gpm at 100 psi and supplies the on-site automatic sprinkler systems. The other fire pump supplies the hydrant system via an 8-inch main, and does not have a nameplate. Further review of flow test information indicated an estimated rating of approximately 750 gpm at 35 psi. WSP facility utility outbuilding also houses two (2), ¾ horsepower jockey pumps, one for each facility fire supply line. The cistern is located below grade and adjacent to the utility outbuilding. Outbuilding is also source for irrigation water, and is fed from an on-site well.

The outbuilding has wood roof and lacks automatic sprinkler protection. Outbuilding conditions are not code compliant. Additionally, there is evidence of standing water in fire pump room, suggesting inadequate floor drainage. See Figure 1 – Existing Fire Pumps at Outbuilding.

Figure 1 – Existing Fire Pumps at Outbuilding

Domestic water for WSP facility administrative and inspection buildings were originally drawn from cistern. Project site's domestic water system was re-configured to connect to the Quil Ceda Village (QCV) water system off of 27th Avenue several years ago. Little water is drawn from the cistern during winter months. Additionally, there are no circulation pumps to turn the water over in the cistern. After connection to QCV water system for fire suppression is established, the cistern will be abandoned or removed.

3.2 SITE WATER UTILITIES

WSP is currently a City of Marysville water utility customer. City system feeds the QCV water system, which is the water utility purveyor in the immediate vicinity of the project site. There are two (2) existing 18-inch watermains that terminate near project site. Closest watermain to project site is located on Quil Ceda Boulevard. Site's existing domestic system currently ties into watermain off of 27th Avenue. The 27th Avenue watermain is asbestos-concrete pipe and will be abandoned in 2020.

4.0 SUMMARY OF ALLEN ENGINEERING ASSESSMENT

4.1 FIRE SPRINKLER SYSTEM

Interior pipe investigation of each of the three (3) facility sprinkler systems was conducted on May 17, 2017 and May 18, 2017. Moderate signs of corrosion were observed in the administrative building's dry system due to improper pipe drainage. Wet system piping in the administrative building was observed to be in very good condition with minor signs of rust. However, the wet system lacks a means of venting which is required by NFPA 13 for all new wet pipe sprinkler systems. External investigation showed minor signs of corrosion on the outside of the piping.

Existing dry system at the facilities vehicle inspection building showed significant amounts of corrosion due to improper pipe drainage and maintenance. Significant tuberculation was observed and pin hole leaks and failures will likely occur in the future.

Both the administrative and vehicle inspection buildings contain dry pendent sprinklers which are 24 years old. NFPA 25 requires that these types of sprinklers be replaced every 10 years. Furthermore, ceiling access hatches are typically provided to take measurements and replace the sprinklers. However, access hatches were not required nor provided in 1993 when the fire protection systems were initially installed.

Client provided an Annual Fire Sprinkler and Fire Pump Inspection Report, dated 2015, which notes both fire pumps and controllers require servicing, and the jockey pump supplying fire sprinklers is inoperable. The extent of standing water in the utility outbuilding as noted previously, signs of corrosion on pumps and controllers, and lack of recorded routine maintenance, indicate fire pumps and controllers are in need of replacement. Depending on whether or not the Quil Ceda Boulevard watermain is extended, it is recommended that these devices are either replaced or abandoned altogether, in addition to adding sprinkler protection and fixing water infiltration problems in outbuilding.

Allen Engineering Sprinkler System Assessment, dated June 26, 2017 is included for further reference in Appendix C.

4.2 FIRE ALARM SYSTEM

Existing facility fire alarm system consists of an Edwards EST Model LSS1 FACU with spot smoke detection, manual pull stations, and partial coverage by audible/visible devices. Unit is a conventional, non-addressable, 4-zone FACU, and is no longer supported by the manufacturer. Conventional alarm systems are still allowed by code for systems or devices that are replacing existing equipment; however, there are advantages to using an addressable fire alarm system.

These benefits are discussed in further detail in the Allen Engineering Sprinkler System Assessment, dated June 26, 2017 in Appendix C.

5.0 DESIGN RECOMMENDATIONS

5.1 COORDINATION WITH LOCAL JURISDICTIONS

The WSP facility is a City of Marysville water utility customer. However, the City does not operate the water utilities in the immediate vicinity of the project site. QCV is the water purveyor for the project site. QCV is a consolidated borough established in 2001 by the Tulalip Tribes. QCV operates its water district and has a separate utility department from the other utilities under the supervision of the Tulalip Tribes. Although the WSP facility is located outside the boundary limits of the borough, QCV water district is the closest water purveyor to project site.

City system feeds the QCV water system through a single point of connection located near the boundary line between City and Tribal lands. As such, City meters water usage of Tulalips Tribes and WSP facility separately. City bills Tulalip Tribes for water usage but deducts the amount WSP facility uses. City then charges WSP facility directly for use. The City acknowledged discussions regarding modifying method of billing payments, but no new approaches have been taken to date.

On June 13, 2017, KPFF held a conference call with QCV water district managers Lukas Reyes and Jereme Gobin. Lukas and Jereme agreed the most feasible route for the watermain extension to the project site would be from Quil Ceda Boulevard. QCV provided fire flow and pressure information for the Quil Ceda Boulevard main. It is assumed the existing 18-inch watermain can provide adequate fire flow and pressure for the facilities fire suppression system requirement. Agreed-upon route would go through grass area immediately south of the Tulalip Market Chevron store, located at 2832 116th Street NE. Conceptual layout of the recommended extension of the Quil Ceda Boulevard main has been included for reference in Appendix D.

Lukas and Jereme identified the watermain off 27th Avenue as asbestos-concrete pipe that the water district is planning to abandon in 2020. As a condition to extend the Quil Ceda Boulevard main, WSP facility is required to install a new domestic connection to the proposed extension. QCV has plans for future development in the forested area southeast of the project site. New domestic service will have to be installed at the same time as the watermain extension to minimize any conflicts with new utilities when plans for development in that area are submitted.

QCV indicated that Capital Improvement Charges (CIC) would apply to this project and need to be paid to QCV for domestic service at the time of connection. These charges are based on City of Marysville CIC rates. A Tribal Employment Rights Ordinance (TERO) fee of 1.75% is also applicable.

The permitting process for this project will be dynamic because separate applications will have to be submitted to separate departments. Following conversations with Julia Gold, Planning Manager for the Tulalip Tribes Planning Department, a grading permit is required to be submitted to the Tulalip Tribes Utilities Department for any construction activities involving trenching. It was also indicated that a separate water service application will need to be submitted to the QCV Utility Department. Both permits should cover the recommended improvements to facilitate the extension of the Quil Ceda Boulevard watermain.

5.2 REQUIRED DOMESTIC SERVICE CONNECTION

As indicated by QCV water district managers, the asbestos-concrete watermain off 27th Avenue currently supplying the site's existing domestic line will be abandoned in 2020. Regardless of how the site's fire suppression improvements are ultimately carried out, it is inevitable that WSP facility will need to establish another source for domestic water. WSP will be required to establish a new domestic service connection with the QCV water system before the existing main supplying the site is abandoned in 2020. KPFF has determined the following two (2) options to ensure WSP does not experience any interruptions in their domestic water supply:

1) The first and most feasible option is to provide a new domestic service to the project site when the fire supply line is extended from Quil Ceda Boulevard. The domestic water service improvements would coincide with the other recommended site and fire suppression improvements. Construction of the site improvements would need to be completed before the existing 27th Avenue main is abandoned. The project costs associated with this option are included in Option A – Quil Ceda Boulevard (QCB) Main Extension, Abandon Outbuilding, dated June 27, 2017 in the Rough Order of Magnitude (ROM) found in Appendix E.

2) The second option is to establish the new domestic connection near the existing connection off 27th Avenue at the intersection with Magazine Road. QCV managers indicated during the June 13, 2017 meeting that there is potential for the new domestic service to connect to the QCV water system in the same general vicinity of the existing connection. This option is only considered feasible if the Quil Ceda Boulevard watermain is not extended. If the watermain is not extended from Quil Ceda Boulevard, KPFF recommends that WSP facility establish the new domestic connection at the location previously specified by QCV to ensure that the project site has an uninterrupted water supply. The project costs associated with this option are included in Option B – Quil Ceda Boulevard (QCB) Main Extension, Improve Outbuilding, dated June 27, 2017 in the Rough Order of Magnitude (ROM) found in Appendix E.

5.3 FIRE SUPPRESSION SYSTEM

Existing facility fire sprinkler systems are in operable condition, but have components that are in need of repair, replacement, and upgrades to improve code compliance, fire protection performance, long-term durability, and maintenance. Allen Engineering recommends that the following improvements be made:

- Replace all dry pipe sprinkler system components in the WSP facility administrative (except the south canopy) and vehicle inspection buildings with one of the following two options:
    - Schedule 40 galvanized steel piping, pitched to drain, with a standard air compressor.
    - Schedule 10 black steel pipe (galvanized for exterior piping), pitched to drain, with a nitrogen generator to reduce the corrosion rate.
- Replace all existing dry pendent sprinkler heads with dry pendent sprinklers of the concealed type; include access to dry pendent sprinklers located in suspended ceilings per NFPA 25 regulations.
- Extend automatic sprinkler protection to all non-sprinklered areas.
- Convert the administrative building's north entry vestibule/lobby/reception area to a wet system.

- Install a manual or automatic vent to the wet pipe sprinkler system, plumbed to an accessible exterior location.
- If the QCV water main is not extended, replace fire pumps and controllers, and correct lack of automatic sprinkler and water infiltration problems in the utility outbuilding.
- Replace the existing conventional FACU with an addressable fire alarm panel.

5.4 WATERMAIN EXTENSION

Extension of the nearby Quil Ceda Boulevard main allows for the abandonment of the underground cistern currently supplying the fire sprinkler systems and fire pumps. In addition, both fire pumps are in need of service according to the 2015 Fire System Inspection Report provided by client. KPFF recommends that the following improvements be made:

- Abandon utility outbuilding.
- Abandon or remove existing cistern.
- Extend watermain from Quil Ceda Boulevard to eastern WSP facility property line.
- Install new fire line connections from extended watermain to existing 6-inch and 8-inch fire protection supply lines.
- Install new domestic service connection from extended watermain to existing service at south side of the utility outbuilding.

Conceptual layout of the recommended Quil Ceda Boulevard watermain extension improvements has been included for reference in Appendix D. Approximate locations of existing utilities are also shown in the conceptual design.

6.0 PROJECT COST ESTIMATE

A ROM, dated June 27, 2017 has been included for reference in Appendix E. ROM is broken down into three (3) separate options. Option A – Quil Ceda Boulevard (QCB) Main Extension, Abandon Outbuilding, includes the recommended improvements to extend the Quil Ceda Boulevard main, abandon the utility outbuilding, and upgrade the site's fire suppression systems. Option B – Quil Ceda Boulevard (QCB) Main Extension, Improve Outbuilding, includes the recommended improvements to improve the utility outbuilding in lieu of extending the Quil Ceda Boulevard main, upgrade the site's fire suppression systems, and establish a new domestic connection off 27th Avenue. Options A and B include code-required improvements and recommended improvements to the fire suppression system. Option C only includes the cost estimate for establishing a new domestic connection off 27th Avenue. In the event that the fire suppression system upgrades are not constructed, a new domestic service connection will still be required before the year 2020.

7.0 CONCLUSION

This report summarizes the results of all observations and tests detailing discrepancies discovered, recommended corrective action, and cost savings for upgrading the fire suppression system at the Washington State Patrol (WSP) District #7 Headquarters facility in Marysville, Washington.

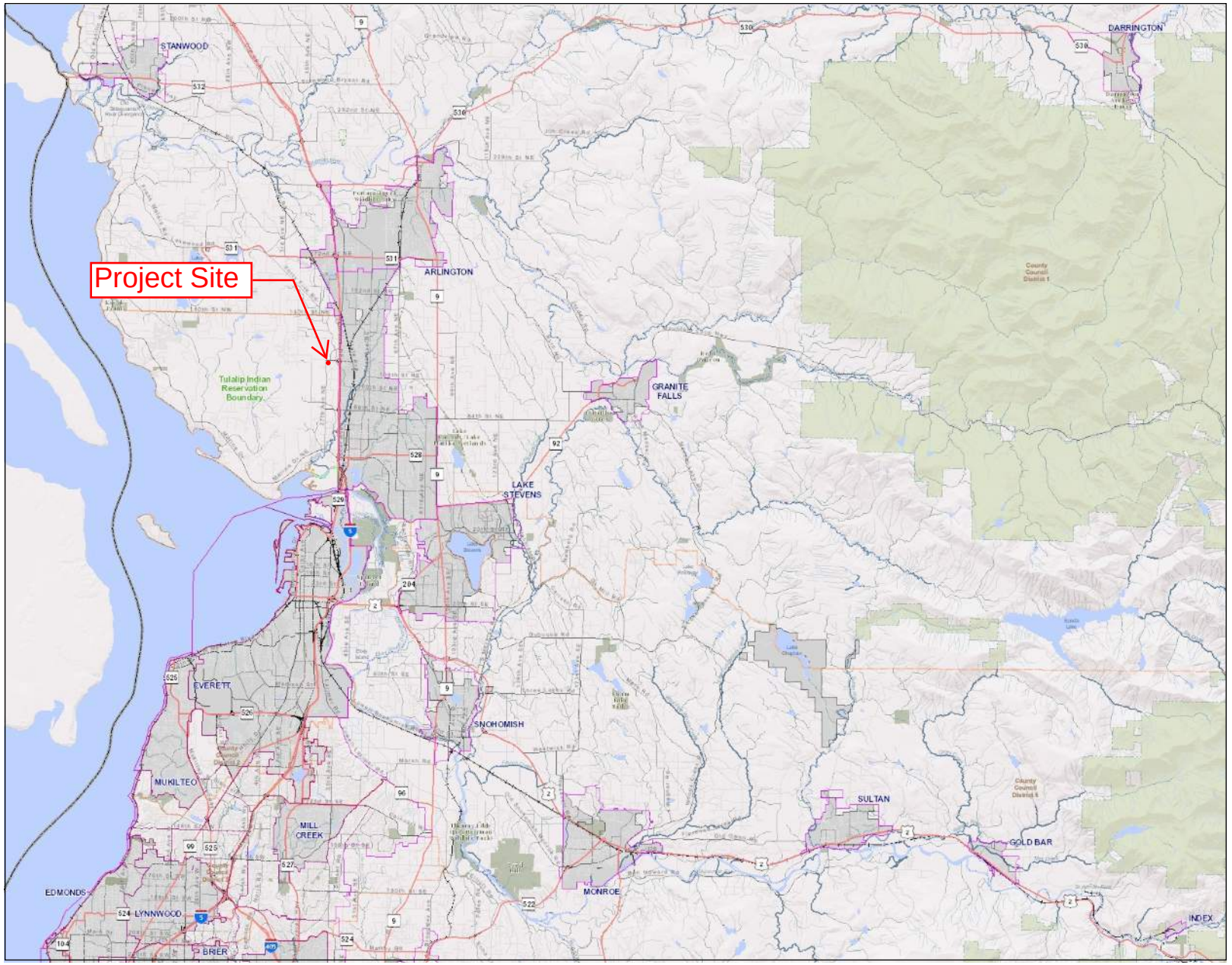
APPENDIX A

Locator Map

Snohomish County, Washington
PDS MAP PORTAL

WSP District #7 HQ Locator Map

6/1/2017



Legend

- Tulalip Indian Reservation Boundary

1: 320,000

10.1 0 5.05 10.1 Miles

Projection: NAD_1983_StatePlane_Washington_North_FIPS_4601_Feet
Planning and Development Services, Snohomish County

Notes

This map was automatically generated using Geocortex Essentials.

APPENDIX B

Vicinity Map


Project Site
KRUSE JUNCTION
KRUSE
Quil Ceda Blvd
116th St NE
27th Ave NE
202
Seattle Premium Outlets
Tulalip Resort Casino
Marysville Pilchuck High School
51st Ave NE
Shoultes Rd
100th St NE
5
N
Google

APPENDIX C

Allen Engineering Sprinkler System Assessment

Allen Engineering

Engineering Your Success

Washington State Patrol

District 7
Marysville, WA

Sprinkler System Assessment

June 26, 2017

Prepared for:

KPFF
612 Woodland Square Loop SE, Suite 100
Lacey, WA 98503

Table of Contents

1.0 EXECUTIVE SUMMARY

Allen Engineering has been retained by KPFF to provide fire protection engineering services associated with the fire protection evaluation of the Washington State Patrol District 7 – Marysville Headquarters facility. The State Patrol District 7 Headquarters, located in Marysville WA, is office space for the Northern Puget Sound Region and includes a full-service laboratory and the district's communication center. This evaluation covers the approximately 21,370 square foot Administrative Building, the approximately 5,220 square foot Vehicle Inspection Building, and a small (~700 square foot) fire pump-house. All buildings are single story and were constructed in 1993, with the exception of an approximately 2,500 square foot addition to the original Administration Building.

The buildings reportedly have had a history of leaking sprinkler pipe repairs, as was observed, and corrosion. In addition, the initial site walk-through on March 30, 2017, revealed incomplete automatic sprinkler coverage, inadequate seismic restraint, and incomplete maintenance and testing of fire protection systems.

The fire alarm system was also found to be no longer supported by the manufacturer.

2.0 PURPOSE & SCOPE

The Washington State Patrol District 7 Headquarters is responsible for the Northern Puget Sound Region, covering from the King/Snohomish County line to the Canadian Border, to the top of the Cascades through the San Juan Islands. They serve Snohomish, Skagit, Island, and Whatcom Counties, and have jurisdictional responsibility for San Juan County, assisting the San Juan County Sheriff when requested. Field Operations Bureau personnel include 131 commissioned personnel and nine support staff. In addition, the district is home to a full-service Crime Laboratory and Communications Center.

The Administrative Building is provided with a single dry pipe fire sprinkler system ("dry system") and a single wet pipe fire sprinkler system ("wet system") that were installed when the building was originally constructed. The Vehicle Inspection Building is provided with a single dry system. All fire protection systems, including the fire hydrants, are supplied via a buried water storage tank and two electric fire pumps. One fire pump is rated at 750 gpm at 100 psi and supplies the on-site automatic sprinkler systems. The other fire pump supplies the hydrant system and does not have a nameplate; however, review of flow test information indicates an estimated rating of approximately 750 gpm at 35 psi. The water storage tank is supplied from an on-site well.

The buildings have a history of sprinkler pipe repairs and scale build-up and the WSP facilities management has suspected there may be deterioration in the piping. Since sprinkler piping will rust and corrode from the inside out, the extent of deterioration cannot be determined from exterior observations alone. The purpose of this evaluation was to conduct an internal inspection of feed mains and branch lines to determine the presence and level of sludge, scale, and/or corrosion in the piping. Rust is a type of corrosion which happens to iron and its alloys.

When iron reacts with water or the moist air, iron oxides are formed and cause the material to corrode and rust. It is caused by oxidation and moisture and not by chemicals. This happens when impure iron comes in contact with water or moist air and oxygen or other oxidants, such as acids, and forms rust.

The interior investigation involved separation of piping at fittings and couplings to directly observe the interior of the pipe. An external review and inspection of the fire sprinkler systems and evaluation of protection coverage were also conducted. An evaluation of the replacement of the existing fire alarm control unit (FACU) was also conducted.

The results of the evaluation and review of inspection, testing, and maintenance records have resulted in the identification of repairs and upgrades necessary to improve the reliability and longevity of the system so that it can continue to protect the facility for the foreseeable future.

It is noted that dry pipe systems are typically used in unheated areas such as parking garages, attics, and warehouses. Both dry systems at this location include coverage of heated and unheated spaces. New fire sprinkler technology exists in the form of nitrogen generator systems which can significantly reduce corrosion in dry pipe systems. Nitrogen generator systems fill the dry system piping with a minimum of 98% nitrogen, creating a nearly oxygen-free environment that inhibits corrosion in steel pipe.

To evaluate and assess the condition of the piping, interior pipe investigations were performed on all three systems in accordance with NFPA 25, Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems. Interior inspections of feed mains and branch lines were performed to determine the presence and level of sludge, scale, and/or corrosion in the piping. This involved separating the piping at fittings and couplings to directly observe the interior of the pipe.

The evaluation was performed by Travis Allen, a licensed fire protection engineer (FPE) with Allen Engineering PLLC, and Roger Niebuhr, a certified fire sprinkler technician with Western States Fire Protection Co. , on May 17th and 18th, 2017. Assistance was provided by Eugene Vovkulin and Ken Parish, with the Washington State Patrol.

3.0 EXISTING FIRE SYSTEM DESCRIPTIONS

3.1 Administrative Building

The Administrative Building is served by two sprinkler systems. A 4-inch wet system serves the majority of the building (including the mechanical penthouse). A 3-inch dry system serves the courtyard area, entrance canopies, and vestibule of the building. A portion of the dry system piping (running over an electronics area) has been replaced due to pipe failures. Portions of the dry system main between the riser and the office corridor as well as the entire south courtyard have been replaced due to pipe failures.

The original sprinkler systems were installed in 1993 by Royal Fire Protection, Inc. and utilize Schedule 10 black steel feed mains (2½-inch through 4-inch diameter) and Schedule 40 black steel branch lines (2-inch diameter and smaller). The Schedule 10 piping is joined with roll-grooved couplings and fittings. Branch lines are joined with threaded cast iron fittings. As-built drawings are dated 10/01/1993. However, system modifications have occurred over the years since the initial installation, for which documentation could not be provided.

Both sprinkler systems are fed from a 6-inch water supply connection from the underground main, supplied by the fire pump and tank serving the site. The dry system incorporates a 3-inch dry pipe valve (Tyco Model DPV-1 DN80) which is not the original valve and is provided with a standard air compressor located in the adjacent boiler room. Hydraulic design information on the dry system is not available. The wet system incorporates a 4-inch check valve (Firematic Model CVB1) with main drain and pressure gauges. The As-Built drawings indicate that the wet system is designed to deliver 0.10 gpm/sq.ft. over a 1539 sq.ft. area.

Non-sprinklered rooms include the communications center, communications equipment room, and the electronic services room. Sprinkler protection is also omitted from a portion of the front entrance vestibule, conference room 122 closets, electronics repair booth, and the fire pump room.

3.2 Vehicle Inspection Building

The Vehicle Inspection Building is served by a single dry system. A 4-inch dry system serves the courtyard area, entrance canopy and vestibule of the building. The sprinkler system was installed in 1993 by Royal Fire Protection, Inc and utilizes Schedule 10 black steel feed mains (2½-inch and 4-inch diameter) and Schedule 40 black steel branch lines (2½-inch diameter and smaller). The Schedule 10 piping is joined with roll-grooved couplings and fittings. Branch lines are joined with threaded cast iron fittings. As-built drawings are dated 10/01/1993.

This sprinkler system is fed from a 6-inch water supply connection from the underground main supplied by the fire pump and tank serving the site. The dry system incorporates a 4-inch dry pipe valve (Firematic Model D) which appears to be the original valve and is provided with a riser mounted air compressor. The As-Built drawings indicate that the dry system is sized in accordance with Ordinary Hazard Pipe Schedule.

4.0 FIRE SYSTEM INSPECTION RESULTS

On May 17 and May 18, 2017, an interior pipe investigation of each of the 3 sprinkler systems was conducted. An external review of the fire protection systems identified that several pieces of piping on the dry systems have been replaced over the years. The majority of this replacement appears to have occurred on piping larger than 2½-inch, which is Schedule 10 piping. If the 2½-inch and 4-inch feed mains were Schedule 40 piping instead of Schedule 10, the piping would have a longer service life due to the greater wall thickness. For example, for 4-inch diameter pipe, the wall thickness of Schedule 40 (0.237 inch) is nearly twice that of Schedule 10 (0.120 inch).

Additionally, earthquake sway bracing was observed to deficient based on current standards, which would be expected as the system was installed in 1993. Riser bracing wall attachments were observed to be separating from the walls of all three systems as shown below in Figure 1:

Figure 1. Administration Building and Vehicle Inspection Building Riser Braces. *The photo on the left is the attachment of the Administration Building riser sway bracing and the photo on the right is the Vehicle Inspection Building riser brace. Both braces appear to have pulled from their attachment to the wall.*

Several of the drain valves were found to discharge water, indicating that portions of the system may not have been fully drained since its last test and inspection.

All systems were returned to full automatic service prior to leaving the site on May 17th and May 18th and the fire alarm system was placed in normal operation.

4.1 Administration Building

The Administration Building was examined on May 17th starting at the 3-inch dry pipe valve which was opened and inspected. This is not the original dry pipe valve. The amount of corrosion observed was not considered excessive or detrimental to its operation. At the south entrance canopy near the Crime Lab, a 2½-inch grooved elbow fitting was removed and the interior of the pipe was found to have a significant amount of sludge, scale, and corrosion, indicative of pitting corrosion (Figure 2 on the following page). Loose scale was observed within the interior of the piping. Approximately half of the piping circumference exhibited the corrosion indicating the piping was not properly drained of water for an extended period(s) of time. The extent of deposits could obstruct a sprinkler head from flowing properly. The level of sediment could be removed by pipe flushing with water per NFPA 25. However, this flushing could remove attached scale resulting in pin-hole leaks.

Figure 2. Administration Building Dry System. *Both photos above are of the interior of the feed main supplying the south entrance canopy. This piping exhibited moderate sludge, scale, and scale build up on the bottom half of the pipe, indicative of water ponding due to poor drainage.*

A sprinkler riser nipple was removed at the front entrance and examined. The 1-inch riser nipple was found to be in good condition with minor oxidation of the interior of the piping, as shown below in Figure 3. The exterior of the piping exhibited rust spots, however, these were observed to be around the perimeter of the piping as is typical of exterior rust as opposed to interior corrosion through the pipe wall thickness. In addition, this piping is Schedule 40 piping. The greater thickness of the smaller diameter piping (Schedule 40) means there is a lower risk of pipe failure compared to the larger diameter Schedule 10 piping.

Figure 3. Administration Building Dry System. *The photo on the left is the interior of a riser nipple supplying a sprinkler head covering the exterior canopy of the main north entrance and exhibits only minor rust. The photo on the left is the exterior branch line exhibiting minor exterior corrosion.*

Finally, a section of galvanized branch line under the south entrance canopy was inspected by removing a 1½-inch end cap. The interior of the piping was observed to be in excellent condition with no apparent corrosion.

In addition to the above noted interior inspections, it was evident that several sections of this dry system had been replaced since the original installation. There are portions of galvanized steel pipe and newer black steel pipe. With the exception of the south entrance canopy, the replacements appear to all be piping that was 2½-inch or larger piping, which was Schedule 10 piping, as opposed to the thicker walled Schedule 40 piping.

The 4-inch wet system covering the administration building was then investigated beginning at the riser manifold. The system was drained and the end cap of the riser manifold was removed. The piping was observed to be in excellent condition with no indications of rust. A 1-inch branch line in the rooftop Mechanical Room 201 was then inspected by separating the branch line at an elbow. No indication of corrosion was observed. A sprinkler head in the Motorcycle Storage Room 140 was removed and found to exhibit no indications of corrosion. Finally, a 2½-inch end cap was removed from the Crime Lab coffee room and inspected. This portion of the system is in the original 1992 building. This piping was also found to be in very good condition with only minor points of rust (See Figure 4).

Figure 4. Administration Building Wet System. *The photo on the left is the main riser manifold and exhibits no corrosion. The photo on the right is of the original 1992 cross main in the Crime Lab and exhibits minor rust spots on the interior.*

4.2 Vehicle Inspection Building

The Vehicle Inspection Building was examined on May 18th starting with the removal of a cross main end cap in one of the smaller inspection bays. A 2½-inch end cap was removed from the piping and the interior was examined. Only moderate rust was observed, with the exception of the end of the pipe where deterioration of the end of the piping is occurring due to long term

exposure to water ponding condition. The amount of corrosion observed was not considered excessive or detrimental to the system's operation.

A 3½-inch feed main along the south wall of the main inspection bay was accessed by removing a grooved elbow fitting and the interior of the pipe was found to have extensive corrosion. The extent of deposits could obstruct a sprinkler head from flowing properly. This system should be considered impaired until flushing and/or replacement of piping is conducted. Water was observed ponding in the bottom of the pipe, indicating insufficient pipe slope to drain. Rust was observed for the entire circumference of the piping and including visible tubercles as shown in Figure 5, below.

Figure 5. Vehicle Inspection Building Dry System. *The photos above are of the 3½-inch feed main in the drive-through vehicle inspection bay. Both photos exhibit significant corrosion.*

Due to the significant corrosion encountered, an additional inspection point was accessed. A 2½-inch grooved elbow in a small inspection bay was removed to access the feed main. This portion of the piping is fitted with a manual drain. The interior of the pipe was found to have extensive corrosion. The extent of deposits could obstruct a sprinkler head from flowing properly. This system should be considered impaired until flushing and/or replacement of piping is conducted. Water was observed ponding in the bottom of the pipe, indicating insufficient pipe slope to drain. Rust was primarily observed for the bottom half of the pipe, with scale and visible tubercles occurring in the bottom 1/3rd of the piping as shown in Figure 6 on the following page.

Figure 6. Vehicle Inspection Building Dry System. *The photos above are of the 2½-inch feed main in the small inspection bay. Both photos exhibit significant corrosion.*

Additional deficiencies in the sprinkler protection for the Vehicle Inspection Building includes the use of direct-drop pendent sprinkler heads for the office space. These sprinkler drops do not incorporate a return bend arrangement required for raw water sources as shown in Figure 7 below. As such, accumulation of water and debris can occur within the drop. The extent of such was not investigated. Pendent sprinkler heads beneath the exterior trailer bay on the east end of the building were observed to have varying degrees of corrosion and are in need of replacement.

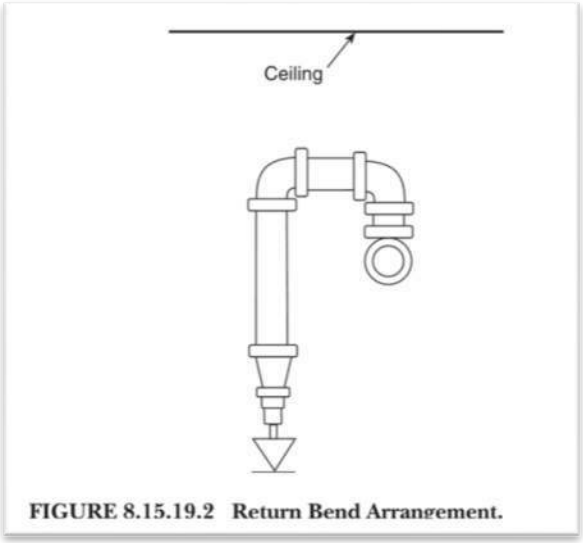


Figure 7. Return Bend Arrangement. *NFPA 13 Figure 8.15.19.2 demonstrating a return bend arrangement.*

5.0 EXISTING FIRE SYSTEM EVALUATION

After a thorough investigation of the two dry sprinkler and one wet sprinkler systems, the following conclusions have been made:

The 2015 Annual Fire Sprinkler and Fire Pump inspection report is the latest report provided by the owner. The report identifies deficiencies in the fire pump systems and all three fire sprinkler systems. In particular, the fire protection inspection report notes that both fire pumps and controllers need to be serviced and that the jockey pump for the fire pump supplying the fire sprinklers was not operating. The fire protection inspection report for the Vehicle Inspection Building dated 12/7/2015 noted "*The grooved couplings on the dry riser are currently leaking, and the dry valve is failing and should be replaced soon. The dry system control valve handle is bent and will also need to be replaced. All dry heads are over 10 years old and will need to be replaced or tested per NFPA standards.*" A copy of the report is attached.

The fire pump room is not equipped with adequate floor drainage as standing water was observed on the floor (See Figure 8 below). Additionally, this room has a wood roof and is not protected with automatic sprinkler protection. Both conditions are not code compliant.

Figure 8. Fire Pump Room. *Standing water was observed in the fire pump room, due to the lack of required floor drains. Additionally, significant corrosion of the base of both fire alarm control panels and fire pump supports was observed.*

The remaining service life of the original fire pump equipment could not be estimated, nor could the full extent of repairs required to bring the system up to code be determined. The extent of obvious water ponding in the room, corrosion to the pumps and controllers, and lack of recorded routine maintenance indicates a high likelihood that replacement of the fire pumps and controllers would be necessary. If a connection to the utility public water system is not provided, it is recommended that the fire pumps and controllers be replaced in addition to correcting lack of sprinkler protection and water infiltration problems.

Dry sprinkler heads are provided in both the Administrative Building and the Vehicle Inspection Building. NFPA 25 requires dry pendent sprinklers to be replaced every 10 years, and these sprinklers are now 24 years old and due for replacement. The requirement for a periodic replacement started with the 2002 edition of NFPA 25. To facilitate periodic replacement, it would be ideal to have access hatches next to each dry pendent sprinkler installed in a hard lid or non-removable ceiling. Unfortunately, since the sprinkler system was installed in 1993, ceiling access hatches were not required nor provided. Access hatches are needed to take measurements and replace the dry pendent sprinklers.

The Administration Building and Vehicle Inspection Building feature typical mixed-use office space utilizing both open ceiling and suspended ceiling systems. The Administration Building dry system exhibited significant corrosion and apparent lack of adequate drainage. Due to the history of leaks and this observed condition, it is recommended to replace the existing dry system, with the exception of the south entrance canopy which has been recently replaced with galvanized piping and was found to be in good condition. A nitrogen generator system is also recommended for this system, as described below in Section 5.1, in lieu of the current air compressor. Additionally, the existing entry vestibule/ lobby/ reception area is conditioned space served by this dry system. This area should be converted and supplied by the existing wet system.

The existing wet system was found to be in good condition. The only improvement recommended at this time is to add a wet system air vent as described below in Section 5.2.

The existing Vehicle Inspection Building dry system exhibited significant corrosion due to the apparent lack of adequate drainage and maintenance. Significant tuberculation was observed and pin hole leaks and failures will likely occur in the future. Additionally, the pendent sprinkler heads in the office area are installed such that water cannot be drained out of the drops, which creates a corrosive environment between the air and water interface. Due to the history of leaks and this observed condition, it is recommended to replace the entire existing dry system. A nitrogen generator system is also recommended for this system in lieu of the current air compressor.

The dry pendent sprinklers installed are greater than 10 years old. There are no access hatches in the hard lid ceilings that permit removal and replacement of the sprinklers per NFPA 25.

5.1 Nitrogen Generator System

Dry pipe fire sprinkler systems contain abundant oxygen (air is composed of 78% nitrogen and 21% oxygen) from the air compressor. Oxidation occurs when oxygen reacts with metals, such as steel pipe. This oxidation of the metal is what leads to the orange/red corrosion (rust) that is seen in fire sprinkler pipes and ultimately can lead to leaks. Nitrogen, on the other hand, is a stable element. It is an inert gas, which means it does not react with metals. Thus, no oxidation or rust occurs from the interaction of nitrogen and metal.

The installation of a nitrogen generator system would improve the longevity of the dry systems by significantly reducing the corrosion rate in the interior of the piping. Dry pipe systems with nitrogen generators reduce corrosion by filling the piping with nitrogen in lieu of ordinary air. In the absence of oxygen, steel piping will not corrode by oxidation. A nitrogen generator system will reduce operations and maintenance costs by significantly reducing corrosion and future pin hole leak repairs. The installation of nitrogen generators for dry pipe systems are standard practice at military (DoD) facilities where it is important to reduce corrosion and improve the longevity and reliability of fire protection systems.

5.2 Wet System Air Vent

The 2016 Edition of *NFPA 13 Standard for the Installation of Sprinkler Systems* requires a means of venting all new wet pipe sprinkler systems. The intent of the requirement is to provide a means for removing trapped oxygen that could fuel corrosion, and that the valve is operated after each drain-and-fill event. In addition to providing a cost effective corrosion control solution, an automatic vent installed on a wet pipe fire sprinkler system will also decrease water delivery time and reduce false water flow alarms.

Adding a manual or automatic vent to a wet pipe sprinkler system is the most cost effect method for reducing corrosion activity and thereby reducing the amount of debris and corrosion by-product present in the system. Further, including an automatic vent eliminates the possibility of human error should the manual vent not be used properly during system filling. A single vent will not eliminate corrosion completely, but the relationship between corrosion and volume of trapped oxygen in a sprinkler system is linear: when you eliminate 50% of the trapped oxygen in a system, you will reduce corrosion activity by 50%.

6.0 FIRE ALARM SYSTEM EVALUATION

The existing fire alarm system consists of an Edwards EST Model LSS1 Fire Alarm Control Unit (FACU) with spot smoke detection and manual pull stations and partial coverage by audible/visible devices. The FACU is a conventional, non-addressable, 4-zone FACU. It annunciates locally and is not monitored remotely. The fire alarm system does not extend to the fire pumps or the Vehicle Inspection Building, with the exception of monitoring waterflow at the Vehicle Inspection Building.

Non-sprinklered rooms including the communications center, communications equipment room, and electronic services room are provided with smoke detection. Manual pull stations

are provided at most building exits; however, they were omitted from the exit to the south entrance. Notification devices are provided for some common areas including the electronics repair, partial coverage in the communications center, partial coverage for building corridors, detective's large room, and the crime lab.

The current FACU is no longer supported by the manufacturer.

Conventional alarm systems are still allowed by the fire code for systems or devices that are replacing existing equipment. However, there are several important advantages to utilizing an addressable fire alarm system as is being recommended.

Every device connected to the addressable system has its own unique address. When a fire is detected, the device's address shows up on the main control panel, telling you exactly which device has been activated. This will enable you to find the exact location of a fire and extinguish them quickly.

With a conventional system, there is no way of pinpointing the exact location of the fire. However, by wiring a building into different zones, you can get a general idea of where the fire is. For instance, the Administration Building has two smoke detector zones dividing the building in half. Zone 1 is the east half and Zone 2 is the west half. So if a fire occurs in Zone 1, you know that the fire is somewhere in the east half of the building.

From a maintenance standpoint, a conventional system doesn't identify you of any maintenance issues. With addressable systems, two levels of warning are available, a maintenance alert, and a trouble signal. And they're available for each separate detector, sensor, or device. There's also a technology called drift compensation. This keeps the detector operating in the proper range. As the detector ages or environmental changes occur, the control panel adjusts to maintain the detector's UL acceptable operating level—unlike a conventional system—where a dirty detector may keep creeping up on its threshold level, eventually causing false alarms.

The Fire Code (International Fire Code with State Amendments) does not require a complete fire alarm system for this occupancy. However, supervision of the fire protection systems is required by the Fire Code. Further, when a fire system is installed, it shall be in accordance with the Fire Code and referenced NFPA standards. As described above, the notification system does not provide complete coverage. The Fire Code requires that such systems or portion of the system shall be provided with signage stating "NON-REQUIRED SYSTEM." Signage shall be durable and permanent in nature, with contrasting color and background, and with lettering of not less than 1 inch in height. The location of such signage shall be approved by the Authority Having Jurisdiction.

NFPA 72, *the National Fire Alarm Code* governs the installation of fire alarm systems. With regard to required versus non-required fire alarm systems, the Fire Alarm Code states that "*The features for a nonrequired system shall be established by the system designer on the basis of the*

goals and objectives intended by the system owner. Nonrequired protected premises systems and components shall meet the requirements of the Fire Code."

Regardless of whether or not some code requires a fire alarm system, it must be installed in accordance with the requirements of the National Fire Alarm Code. The Code allows for a partial fire alarm system or selective detection coverage, but in all cases, it should be determined who would take the responsibility for making those decisions.

7.0 RECOMMENDED DESIGN CONCEPT AND PROJECT SCOPE

The fire sprinkler systems are in an operable condition but have components that are in need of repair, replacement, and upgrades to improve code compliance, fire protection performance, long-term durability, and maintenance. The recommended design and project scope is as follows:

1. Replace all dry pipe sprinkler piping, mains, branch lines, and sprinkler heads throughout the Administration Building, except for the south canopy. The existing system piping that has not been recently replaced is significantly corroded due to poor drainage and maintenance.
2. Replace all dry pipe valves, sprinkler piping, mains, branch lines, and sprinkler heads throughout the Vehicle Inspection Building.
3. One of two options should be followed for replacing the dry pipe sprinkler systems:
    a. Dry pipe sprinkler systems should utilize Schedule 40 galvanized steel pipe throughout and utilize a standard air compressor **or**
    b. All new piping installed should utilize Schedule 10 black steel pipe (except for exterior piping which shall be galvanized) and utilize a nitrogen generator to improve corrosion resistance, maintenance, and longevity to the piping.
4. All sprinkler piping shall be pitched to drain and provided with properly signed and identified drain valves per NFPA 13.
5. All existing dry pendent sprinkler heads should be replaced with new dry pendent sprinklers with the same design characteristics, except the sprinklers located under the exterior eaves should be concealed type sprinklers for protection against wind-blown debris.
6. Where dry pendent sprinklers are located in hard lid and non-removable (suspended) ceilings, either permanent access hatches or removal/reinstallation of the ceiling is needed to permit sprinklers to be inspected, measured, ordered, and replaced as part of the project, as well as for future periodic inspection/replacement per NFPA 25.
7. Extend automatic wet sprinkler protection to all non-sprinklered areas. Non-sprinklered areas include the Administration Building's communications center, communications equipment room, and electronic services room. Sprinkler protection is also omitted from a portion of the front entrance vestibule, conference room 122 closets, and electronics repair booth.
8. The Administration Building's north entry vestibule/lobby/reception area is conditioned space served by the dry system. This area should be converted and supplied by the existing wet system.

9. A manual or automatic vent should be added to the wet pipe sprinkler system and plumbed to an accessible exterior location.
10. If a connection to the utility public water system is not provided, it is recommended that the fire pumps and controllers be replaced in addition to correcting lack of automatic sprinkler protection and water infiltration problems.
11. In light of the fact that the existing fire alarm control unit (FACU) is no longer serviceable, it is recommended to be replaced.
    a. If the fire alarm panel is replaced, it should be replaced with an addressable fire alarm panel and the notification devices throughout the Administration Building should be changed to ADA compliant addressable devices. The intent of the current coverage is not clear as some areas have full coverage, such as the crime lab and electronics testing room, and other areas have partial or no coverage. Additional notification devices should be provided for all conference room areas, which currently lack such.
    b. The fire alarm system should be identified with a placard stating NON-REQUIRED SYSTEM.

8.0 COST ESTIMATES

The following Rough Order of Magnitude (ROM) has been provided for the associated work identified above:

Fire Sprinkler System

- Administration Building Wet System improvements
  Items 7 and 8 ..... $7,700
- Administration Building Dry System
  With Standard Air Compressor- Items 1, 3a, 4, 5, 6 ..... $52,600
  With Nitrogen System- Items 1, 3b, 4, 5, 6 ..... $71,100
- Vehicle Inspection Building Dry System
  With Standard Air Compressor- Items 2, 3a, 4, 5, 6 ..... $77,200
  With Nitrogen System- Items 2, 3b, 4, 5, 6 ..... $90,700

Fire Pump

- Fire Pump Room Improvements
  Demo existing equipment $40,000
  Provide drainage/seal building from water intrusion ... $15,000
  Install Sprinkler protection..... $15,000
  Install two new fire pumps and controllers $140,000

Fire Alarm System

- Administration Building
  Replace existing Fire Alarm System- Item 11a, 11b $16,000

9.0 CONCLUSION

Allen Engineering has prepared this inspection and evaluation of the fire sprinkler system and fire alarm system at the WSP District 7 Headquarters. This report documents the observations and provides recommended corrective action to help ensure the longevity, reliability and serviceability of the fire sprinkler and fire alarm systems.

Please contact me at 425-954-2050 or by e-mail at Travis@AllenFPE.com with any questions or for clarification of the information presented in this report.

Prepared by:
Allen Engineering, PLL

Travis E. Allen, P.E.
Member

06/26/2017

Attachments

1. APPENDIX A - Inspection Forms
2. APPENDIX B - Nitrogen Generation Technology

APPENDIX A
Inspection Forms

BURNS FIRE PROTECTION SYSTEMS, INC.
DESIGN INSTALLATION MAINTENANCE FABRICATION

To: Eugene Vovkulin WSP 12/07/2015

RE: 2015 Annual Fire Sprinkler and Fire Pump inspection report detail

Eugene –

Thank you for choosing Burns Fire Protection Systems, Inc. for the maintenance for the WSP Marysville location.

Below I have listed out the details on the deficiencies, also included in this email are the individual reports for each system.

WSP Inspection building:

- Several grooved coupling on the dry riser is leaking and will need to be replaced soon.
- Dry valve at inspection shop is failing and will need to be replaced soon.
- Dry system control valve handle at inspection shop is bent and should be replaced, valve functions ok but handle is bent.
- All dry heads are over 10 yrs. old and will need to be replaced

WSP Main Building:

- There are no fire sprinkler heads in the following rooms/areas-
  - Server Room at the office
  - Electronic Room
  - Conference room 122 closets
- Room 150 the fire sprinkler heads are 9' off the wall and will need to be relocated to be brought into compliance

Fire Pump – Sprinkler System Pump:

- The sprinkler jockey pump is not working and will need to be repaired by a Fire Pump service technician or electrician.
- Recommend fire pump and controller be service by fire pump technician (Dave's Pumps is who we use)

Fire Pump – Fire Hydrant Pump:

- Jockey pump very noisy and needs to be repaired or replaced.
- Recommend fire pump and controller be serviced by fire pump technician (Dave's pumps is who we use)

All the above deficiencies will need to be corrected to be brought into compliance with NFPA standards.

Thank you again for choosing Burns Fire Protection Systems for your fire sprinkler needs. Please contact Keith Kyle (425-239-2698) to discuss the above deficiencies.

Keith Kyle
President BFPS, Inc.
Keith@BurnsFire.com

Confidence Testing Company

B.F.P.S. INC CONFIDENCE TESTING

Confidence Test Report

Name B.F.P.S INC

Address PO Box 1110

Phone 425-388-0124

360-691-2704 (fax)

DATE: 12/7/2015 Test Frequency [X] Annual [ ] BI Annual [ ] Quarterly

Property Information

Name: W.S.P. Main Building

Address: 2700 116th St. NE

Marysville, WA 98271

Telephone 360-561-0826

EMAIL ADDRESS: eugene.volvkulin@wsp.wa.gov

Responsible Person: Eugene Vovkulin

Title & Signature Owner Rep.

Testing Company Information

Name: B.F.P.S. LLC

Address: P.O. Box 1110 Granite Falls, WA 98253

Technician: Keith Kyle

Telephone: 425-388-0124

Sprinkler Manufacture: Star 1 Tyco

Sprinkler Model: SSV-2 KY 3231

This system has been properly inspected for reliability to cover the items listed in this report and is consistent with NFPA Fire Sprinkler maintenance standards.

Signature:

Monitoring Agency

Name: In house Monitoring

Telephone

Account #

Time system put on hold:

Time put back on-line:

Problems Found: There are no heads in: Electronic Room - Server Room at the office - Conference Room 122 in the closets.

The room adjecent to Room 155 the heads are spaced 9' off the wall and will need to be moved per NFPA standards.

Corrections Made: None at this time

Signature of Tester:

MAILING Address: P.O. Box 1110, Granite Falls, WA 98252

The items on the checklists below shall be inspected and tested. This list does not constitute all of the required inspecting and testing of the fire and life safety system. Refer to the Washington State Fire Department Fire code for inspecting and testing requirements.

CONFIDENCE TEST REPORT – FIRE SPRINKLER

Property Name, Address, Building # W.S.P. Main Building

Date of Test: 12/7/15

Dry System Test

System #: 1 of 2 **Protected Area:** Covered canopies at exterior

Trip test WET___DRY_X__ conducted – system tripped in	Dry Trip SEC.	N/A	☐	Yes	☒	No ☐
Alarm switches, supervisory switches tested satisfactorily		N/A	☐	Yes	☒	No ☐
Main drain valve size 1.25" inches	Static Pressure: Fire Pump psi					
Air compressor refills system in 30 Minutes						
No of Aux Drains 2	All auxiliary drains emptied	N/A	☐	Yes	☒	No ☐
Trip test (wet) done every three years	yes	N/A	☐	Yes	☒	No ☐
Time for water to reach inspectors test valve:	N/A Sec.	N/A	☒	Yes	☐	No ☐
Alarm line valve left in open position		N/A	☐	Yes	☒	No ☐
Heat activation devices tested on pre-action: and deluge systems		N/A	☒	Yes	☐	No ☐
Air pressure at time of trip 14						

Wet System test

System #: 2 of 2 **Protected Area:** Heated areas of building

Flow test conducted – flow pressure	____ psi	N/A	☐	Yes	☒	No ☐
All flow switches, supervisory switches and alarm bell tested satisfactorily		N/A	☐	Yes	☒	No ☐
IPI (internal Pipe inspection) FDC Backflush (every 5 years)		N/A	☐	Yes	☒	No ☐
Main drain valve size 2	Static Pressure Fire Pump psi					

GENERAL

Have there been any changes to the occupancy since the last inspection?		N/A	☐	Yes	☐	No ☒
Hydraulic name plate in place (calculate systems)		N/A	☐	Yes	☒	No ☐
System sprinkler heads inspected for proper placement and damage		N/A	☐	Yes	☒	No ☐
Fast response heads less than 20 years old		N/A	☐	Yes	☒	No ☐
Standard response heads less than 50 years old		N/A	☐	Yes	☒	No ☐
Dry type heads less than 10 years old	1992	N/A	☒	Yes	☐	No ☐
Spare sprinkler heads available		N/A	☐	Yes	☒	No ☐
Sprinkler head wrench available		N/A	☐	Yes	☒	No ☐
All valves operated through the full range of motion and restored to normal		N/A	☐	yes	☒	No ☐
Valves sealed and supervised		N/A	☐	Yes	☒	No ☐
Signs provided on valves		N/A	☐	Yes	☒	No ☐
Fire department connection caps in place and secure		N/A	☐	Yes	☒	No ☐
Gauges checked by calibrated gauge or replaced in 5 years	Mar-13	N/A	☐	Yes	☒	No ☐

City static water pressure Fire Pump PSI

Confidence Testing Company

Name B.F.P.S INC

Address PO Box 1110

Phone 425-388-0124

B.F.P.S. INC CONFIDENCE TESTING

Confidence Test Report

360-691-2704 (fax)

DATE: 12/7/2015 Test Frequency [X] Annual [ ] Bi Annual [ ] Quarterly

Property Information

Name: W.S.P. Inspection Building

Address: 2700 116th St. NE

Marysville, WA 98271

Telephone 360-561-0826

EMAIL ADDRESS:

Responsible Person: Tracy Boyer

Title & Signature Owner Rep.

Testing Company Information

Name: B.F.P.S. LLC

Address: P.O. Box 1110 Granite Falls, WA 98253

Technician: Keith Kyle

Telephone: 425-388-0124

Sprinkler Manufacture: Star / Tyco

Sprinkler Model: SSU-2 / TY3231

Signature:

This system has been properly inspected for reliability to cover the items listed in this report and is consistent with NFPA Fire Sprinkler maintenance standards.

Monitoring Agency

Name: In house Monitoring

Telephone

Account #

Time system put on hold:

Time put back on-line:

Problems Found: The grooved couplings on the dry riser are currently leaking, and the dry valve is failing and should be replaced soon. The dry system control valve handle is bent and will also need to be replaced. All dry heads are over 10 years old and will need to be replaced or tested per NFPA standards.

Corrections Made: None at this time

Signature of Tester:

MAILING Address: P.O. Box 1110, Granite Falls, WA 98252

B

The items on the checklists below shall be inspected and tested. This list does not constitute all of the required inspecting and testing of the fire and life safety system. Refer to the Washington State Fire Department Fire code for inspecting and testing requirements.

CONFIDENCE TEST REPORT – FIRE SPRINKLER

Property Name, Address, Building # W.S.P. Vehicle inspection building

Date of Test: 12/7/15

Dry System Test

System #: yes **Protected Area:** Entire Building

Trip test WET___DRY_x__ conducted – system tripped in	Dry Trip SEC.	N/A ☐	Yes ☒	No ☐
Alarm switches, supervisory switches tested satisfactorily		N/A ☐	Yes ☒	No ☐
Main drain valve size 2" inches	Static Pressure: Fire Pump psi			
Air compressor refills system in 30 Minutes				
No of Aux Drains 1	All auxiliary drains emptied yes	N/A ☐	Yes ☒	No ☐
Trip test (wet) done every three years yes		N/A ☐	Yes ☒	No ☐
Time for water to reach inspectors test valve: N/A Sec.		N/A ☒	Yes ☐	No ☐
Alarm line valve left in open position		N/A ☐	Yes ☒	No ☐
Heat activation devices tested on pre-action: and deluge systems		N/A ☒	Yes ☐	No ☐
Air pressure at time of trip 14				

Wet System test

System #: NA **Protected Area:** NA

Flow test conducted – flow pressure _____ psi	N/A ☐	Yes ☐	No ☐
All flow switches, supervisory switches and alarm bell tested satisfactorily	N/A ☐	Yes ☐	No ☐
Main drain valve size _____ Static Pressure _____ psi			

GENERAL

Have there been any changes to the occupancy since the last inspection?	N/A ☐	Yes ☐	No ☒
Hydraulic name plate in place (calculate systems)	N/A ☐	Yes ☐	No ☒
System sprinkler heads inspected for proper placement and damage	N/A ☐	Yes ☒	No ☐
IPI (internal pipe inspection) & FDC Backflush (every 5 years)	N/A ☐	Yes ☒	No ☐
Fast response heads less than 20 years old	N/A ☐	Yes ☒	No ☐
Standard response heads less than 50 years old	N/A ☐	Yes ☒	No ☐
Dry type heads less than 10 years old 1992	N/A ☐	Yes ☐	No ☒
Spare sprinkler heads available	N/A ☐	Yes ☒	No ☐
Sprinkler head wrench available	N/A ☐	Yes ☒	No ☐
All valves operated through the full range of motion and restored to normal	N/A ☐	yes ☒	No ☐
Valves sealed and supervised	N/A ☐	Yes ☒	No ☐
Signs provided on valves	N/A ☐	Yes ☒	No ☐
Fire department connection caps in place and secure	N/A ☐	Yes ☒	No ☐
Gauges checked by calibrated gauge or replaced in 5 years Mar-13	N/A ☐	Yes ☒	No ☐

City static water pressure Fire Pump PSI

TEGRIS Fire™
Email | support@tegrisfire.com
5202 Olympic Drive NW Suite 202
Gig Harbor, WA 98335
Phone +1 888.880.2467
www.tegrisfire.com

FIRE PUMP INSPECTION REPORT (One System Per Report)	Today's Date: 12/07/2015 [redacted]
	Inspected Date: 12/07/2015
☑ Service Test ☐ Repairs	Due Date:
System Location : 2700 Sprinklers System Pump Coverage Area : Fire Sprinklers Both Buildings	Certification Given : RED ☐ YELLOW ☐ WHITE ☐

Occupant Information	**Responsible Person**
Bldg Name: WSP	Name: Eugene Vovkulin
Address: 2700 116th St NE Marysville, WA 98271-9425	Address: Phone : 360-561-0826
	Email: eugene.vovkulin@wsp.wa.gov

INSPECTION AND TESTING CONTRACTOR INFORMATION

Contractor Information	**Inspector/Tester Information**
Company Name: Burns Fire Protection Systems, INC.	Name: Keith Kyle
Phone: 425-388-0124	Phone#: 425-239-2698
Address: PO Box 1110 Granite Falls, WA 98252	CERTIFICATIONS
Email: info@burnsfire.com	State Certification: 8694-0309-6
State Contractor License #: 603-487-812	National/NICET: 135462
License #: BFPSLL*929MA	Other Cert: TYPE:

MONITORING INFORMATION

Central Station Monitoring? ☐ Y ☑ N	
Monitoring Company: n/a	Phone #:
System Make:	System Model:

DEFICIENCY / CORRECTION DETAILS

Any Deficiencies Found? ☑ Y ☐ N		Any Deficiencies Remaining? ☐ Y ☐ N		
Deficiency Found	Comments	Corrected?	Correction Date :	Corrected By:
Sprinkler jocky pump is not working	Needs repair	no		

NOTES

Authority Review Notes? ☐ Y ☐ N

Inspection Company Remarks? ☑ Y ☐ N

Recommend that the fire pump be serviced by a fire pump tech.

Refer to the local and state standards for a complete description of the inspection, testing, and maintenance requirements. The inspection results provided in this report are based only on the system's current ability to operate and shall not be construed as an evaluation of the system's performance capabilities to adequately protect the property. Information in this report may or may not include possible performance concerns and should not be considered all inclusive. It is solely the property owner's responsibility to determine if a separate investigation should be done to ensure the system will perform as designed and that the property is adequately protected. It is also the property owner's responsibility to maintain the system, property and any possible environmental conditions that may affect the system's operability and performance.

SYSTEM FUNCTIONALITY

Power:	⊘ Electric ○ Diesel/Natural Gas	
Pump Make:	Patterson	
Pump Model:	Cent. split case	
Starting Amperage Leg 1:	amps	⊘ N/A
Starting Amperage Leg 2:	amps	⊘ N/A
Starting Amperage Leg 3:	amps	⊘ N/A
Running Amperage Leg 1:	amps	⊘ N/A
Running Amperage Leg 2:	amps	⊘ N/A
Running Amperage Leg 3:	amps	⊘ N/A
Was electric pump run for a minimum 10 minutes?	⊘ Yes ○ No	○ N/A
Was 10 Minute Battery Start test conducted on each battery?	○ Yes ○ No	⊘ N/A

Diesel Pump / Natural Gas Pump N/A

Diesel fuel tank at least 2/3 full?	○ Yes ○ No	○ N/A
Batteries fully charged?	○ Yes ○ No	○ N/A
Oil level full?	○ Yes ○ No	○ N/A
Coolant level full?	○ Yes ○ No	○ N/A
Antifreeze protection adequate?	○ Yes ○ No	○ N/A
Fuel filter/strainer serviced?	○ Yes ○ No	○ N/A
Was diesel pump run for a minimum 30 minutes?	○ Yes ○ No	○ N/A

Pump Controller/s

Fire pump controller in service?	⊘	Yes	○	No	○	N/A
Controller voltage:	460 VDC				○	N/A
Interrupting-Capacity:	amps				○	N/A
Jockey pump controller in service?	⊘	Yes	○	No	○	N/A

Pump Test

Pump in service on inspection?	⊘	Yes	○	No		
Pump starts from pressure drop?	○	Yes	○	No	○	N/A
Cut-in Pressure:					psi ○	N/A
Cut-out Pressure:					psi ○	N/A
Was 300 GPM flow conducted?	○	Yes	○	No		
Static pressure:	2				psi ○	N/A
Discharge pressure:	105				psi ○	N/A
Suction pressure:	1				psi ○	N/A
Hose size:	N/A				inches	
Tip size:	N/A				inches	
Hose length:	N/A				ft	
Pitot reading:					psi ○	N/A
Flow:	GPM				○	N/A
Churn suction pressure:	1				psi ○	N/A
Churn discharge pressure:	105				psi ○	N/A
Has pump been tested weekly?	○	Yes	○	No	○	N/A
Jockey pump tested?	○	Yes	⊘	No	○	N/A
Shaft seals dripping water properly (1 drop per second)?	⊘	Yes	○	No	○	N/A
Pressure relief valve checked for proper operation?	⊘	Yes	○	No	○	N/A
Fire pump connected to fire alarm panel?	○	Yes	⊘	No	○	N/A
Suction screens inspected and cleared?	⊘	Yes	○	No	○	N/A
Pressure gauges replaced or calibrated every 5 years?	⊘	Yes	○	No	○	N/A
Routine maintenance is performed and records kept?	⊘	Yes	○	No	○	N/A

Transfer Switch

Power failure simulated during peak flow for automatic transfer switch activation?	⊘	Yes	○	No	○	N/A
Connection made to alternate source?	○	Yes	○	No	○	N/A
Emergency manual starting means operated without power?	○	Yes	○	No	○	N/A
Date of last gauge replacement or calibration:	(MM-DD-YYYY)				○	N/A

INSPECTOR'S DECLARATION	
☑	By checking here you are certifying, under penalty of perjury, that you are a valid agent of your company representing that the company maintains all the necessary licenses and/or certifications to perform this service for this system in this jurisdiction AND THAT the company has properly inspected this system consistent with state and local standards AND THAT the system has been properly tagged or labeled and the property owner or responsible person has been notified of the inspection results, the system status, and any corrective actions.

AUTHORITY SYSTEM INFORMATION

Annual Test of Fire Pump Assembly (page 3)

Pump # Sprinkler System

	Churn	50%	100%	150%	
Suction	1	1	1	1	
Discharge	105	99	92	75	
Pitot Flow Meter	N/A	500 GMP	800 GPM	1000 GPM	

TEGRIS Fire™
Email | support@tegrisfire.com
5202 Olympic Drive NW Suite 202
Gig Harbor, WA 98335
Phone +1 888.880.2467
www.tegrisfire.com

FIRE PUMP INSPECTION REPORT (One System Per Report)	Today's Date: 12/07/2015 [redacted]
	Inspected Date: 12/07/2015
☑ Service Test ☐ Repairs	Due Date:
System Location : 2700 Fire Hydrant Pump Coverage Area : Fire Sprinklers Both Buildings	Certification Given : RED ☐ YELLOW ☐ WHITE ☐

Occupant Information	**Responsible Person**
Bldg Name: WSP	Name: Eugene Vovkulin
Address: 2700 116th St NE Marysville, WA 98271-9425	Address: Phone : 360-561-0826
	Email: eugene.vovkulin@wsp.wa.gov

INSPECTION AND TESTING CONTRACTOR INFORMATION

Contractor Information	**Inspector/Tester Information**
Company Name: Burns Fire Protection Systems, INC.	Name: Keith Kyle
Phone: 425-388-0124	Phone#: 425-239-2698
Address: PO Box 1110 Granite Falls, WA 98252	CERTIFICATIONS
Email: info@burnsfire.com	State Certification: 8694-0309-6
State Contractor License #: 603-487-812	National/NICET: 135462
License #: BFPSLL*929MA	Other Cert: TYPE:

MONITORING INFORMATION

Central Station Monitoring? ☐ Y ☑ N	
Monitoring Company: n/a	Phone #:
System Make:	System Model:

DEFICIENCY / CORRECTION DETAILS

Any Deficiencies Found? ☑ Y ☐ N		Any Deficiencies Remaining? ☐ Y ☐ N		
Deficiency Found	Comments	Corrected?	Correction Date :	Corrected By:
Sprinkler jocky pump is very noisy	Needs repair	no		

NOTES

Authority Review Notes? ☐ Y ☐ N
Inspection Company Remarks? ☑ Y ☐ N
Jockey pump needs repair or replaced; electrician was working on it when BFPS tech left the building

Refer to the local and state standards for a complete description of the inspection, testing, and maintenance requirements. The inspection results provided in this report are based only on the system's current ability to operate and shall not be construed as an evaluation of the system's performance capabilities to adequately protect the property. Information in this report may or may not include possible performance concerns and should not be considered all inclusive. It is solely the property owner's responsibility to determine if a separate investigation should be done to ensure the system will perform as designed and that the property is adequately protected. It is also the property owner's responsibility to maintain the system, property and any possible environmental conditions that may affect the system's operability and performance.

SYSTEM FUNCTIONALITY

Power:	∅ Electric	○ Diesel/Natural Gas			
Pump Make:	Patterson				
Pump Model:	Cent. split case				
Starting Amperage Leg 1:	amps			∅	N/A
Starting Amperage Leg 2:	amps			∅	N/A
Starting Amperage Leg 3:	amps			∅	N/A
Running Amperage Leg 1:	amps			∅	N/A
Running Amperage Leg 2:	amps			∅	N/A
Running Amperage Leg 3:	amps			∅	N/A
Was electric pump run for a minimum 10 minutes?	∅ Yes	○ No	○ N/A		
Was 10 Minute Battery Start test conducted on each battery?	○ Yes	○ No	∅ N/A		

Diesel Pump / Natural Gas Pump N/A

Diesel fuel tank at least 2/3 full?	○ Yes	○ No	○ N/A
Batteries fully charged?	○ Yes	○ No	○ N/A
Oil level full?	○ Yes	○ No	○ N/A
Coolant level full?	○ Yes	○ No	○ N/A
Antifreeze protection adequate?	○ Yes	○ No	○ N/A
Fuel filter/strainer serviced?	○ Yes	○ No	○ N/A
Was diesel pump run for a minimum 30 minutes?	○ Yes	○ No	○ N/A

Pump Controller/s

Fire pump controller in service?	⊘	Yes	○	No	○	N/A
Controller voltage:	480 VDC				○	N/A
Interrupting-Capacity:	60HZ amps				○	N/A
Jockey pump controller in service?	⊘	Yes	○	No	○	N/A

Pump Test

Pump in service on inspection?	⊘	Yes	○	No		
Pump starts from pressure drop?	⊘	Yes	○	No	○	N/A
Cut-in Pressure:	25			psi	○	N/A
Cut-out Pressure:	45			psi	○	N/A
Was 300 GPM flow conducted?	⊘	Yes	○	No		
Static pressure:	Tank 1 psi			psi	○	N/A
Discharge pressure:	45			psi	○	N/A
Suction pressure:	1			psi	○	N/A
Hose size:	Flow meter			inches		
Tip size:	N/A			inches		
Hose length:	N/A			ft		
Pitot reading:				psi	⊘	N/A
Flow:	1000 GPM				○	N/A
Churn suction pressure:	1			psi	○	N/A
Churn discharge pressure:	45			psi	○	N/A
Has pump been tested weekly?	⊘	Yes	○	No	○	N/A
Jockey pump tested?	⊘	Yes	○	No	○	N/A
Shaft seals dripping water properly (1 drop per second)?	⊘	Yes	○	No	○	N/A
Pressure relief valve checked for proper operation?	⊘	Yes	○	No	○	N/A
Fire pump connected to fire alarm panel?	○	Yes	⊘	No	○	N/A
Suction screens inspected and cleared?	⊘	Yes	○	No	○	N/A
Pressure gauges replaced or calibrated every 5 years?	⊘	Yes	○	No	○	N/A
Routine maintenance is performed and records kept?	⊘	Yes	○	No	○	N/A

Transfer Switch

Power failure simulated during peak flow for automatic transfer switch activation?	⊘	Yes	○	No	○	N/A
Connection made to alternate source?	○	Yes	○	No	⊘	N/A
Emergency manual starting means operated without power?	○	Yes	○	No	⊘	N/A
Date of last gauge replacement or calibration:	12-07-2015 (MM-DD-YYYY)				○	N/A

INSPECTOR'S DECLARATION	
☑	By checking here you are certifying, under penalty of perjury, that you are a valid agent of your company representing that the company maintains all the necessary licenses and/or certifications to perform this service for this system in this jurisdiction AND THAT the company has properly inspected this system consistent with state and local standards AND THAT the system has been properly tagged or labeled and the property owner or responsible person has been notified of the inspection results, the system status, and any corrective actions.

AUTHORITY SYSTEM INFORMATION

Annual Test of Fire Pump Assembly (page 3)

Pump # Fire Hydrant Pump

	Churn	50%	100%	150%	
Suction	2	1	1	1	
Discharge	45	41	37	32	
Pitot Flow Meter	N/A	500 GPM	800 GPM	1000 GPM	

APPENDIX B

Nitrogen Generation Technology

Understanding Nitrogen Generation Technology

By Scott Bodemann & Jimmy O'Connor
South-Tek Systems, LLC. | Wilmington, NC
commercialsales@southteksystems.com | 910.332.4173

Since the 1950s, Nitrogen generation technology has been adopted by a wide range of industries. The technology mechanically separates Nitrogen from the air we breathe, which is comprised of 20.9% Oxygen, 1.1% Argon/Helium/other and 78% Nitrogen. Since Nitrogen is a safe non-flammable (inert) and non-corrosive gas its utilized in applications at facilities such as food packaging plants, restaurants, oil and gas platforms, laboratories and various industrial factories. Similarly, Nitrogen technology is now increasingly used in fire protection for inhibiting corrosion and freezing within dry and preaction sprinkler systems. Specific to the application of Nitrogen in fire protection is the design of the Nitrogen generator and overall configuration of the system which ensures that 98% pure Nitrogen is equally distributed and constantly maintained throughout a sprinkler system.

Configuring the Nitrogen Generation System for Fire Protection

If designed and maintained properly, a Nitrogen generation system will maximize the service life of black or galvanized steel pipe. To follow is a discussion of the key components, which include an air compressor, air dryer package, Nitrogen generator, Nitrogen receiver tank, gas purging device and Nitrogen purity sensor.

Air Compressor and Air Dryer Package

The air compressor package serves two main purposes. The first is the ability to restore normal air pressure within the fire protection system in thirty minutes per NFPA 13. Second, it must provide ultra clean and dry air to the Nitrogen generator. To ensure proper air filtration, the air compressor should include an after-cooler to reduce moisture and lower the temperature of the air, as well as a particulate and coalescing filtration package to separate residual particulate, moisture and oil. In addition, an air receiver tank is recommended to prevent the air compressor from short cycling. The tank should include a timer drain to collect and release any residual oil and water build-up, and should be routed to a floor drain. In general, oil-bathed air compressors are preferred over oil-less because they have greater longevity, longer warranties and lower maintenance costs.

Following the air compressor, an air dryer package should be installed to squeeze out any remaining moisture, which lowers the dew point of the air prior to it feeding the Nitrogen generator. The air dryer not only maximizes the longevity of the Nitrogen generator, but assists in lowering the dew point of the Nitrogen entering the fire protection system. The two most common technologies are the regenerative and refrigerated air dryers. Regenerative dryers yield a lower dew point than refrigerated dryers because they contain desiccant material, which absorbs a greater amount of moisture. However,

regenerative dryers require more extensive maintenance, since the desiccant material and solenoids need to be frequently replaced. Also, if not properly maintained, these dryers can cause the air compressor to work harder, placing more strain on the pump and motor. For those reasons, many prefer to utilize a refrigerated air dryer. Refrigerated dryers are virtually maintenance free and, depending on the installation environment, they usually last between five and fifteen years. Also, unlike regenerative dryers, refrigerated dryers do not restrict air flow and therefore do not place any additional demand on the air compressor.

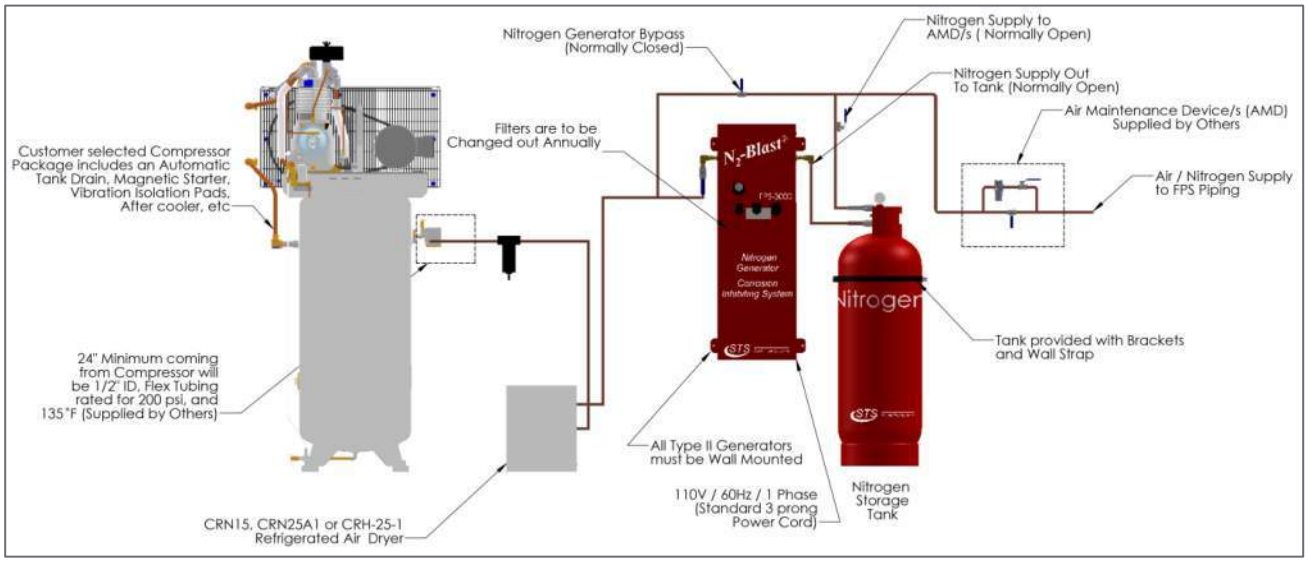
Nitrogen Generation System

As with the air compressor and air dryer package, it is also imperative that the proper engineering has been invested into the design of the Nitrogen generator. The separation of Nitrogen from the air is an intricate process since Nitrogen molecules are very minute, having a diameter of approximately 3.6 angstroms or *0.00000001417* of an inch. Thus, an experienced manufacturer places a great amount of emphasis on such design considerations as air flow patterns, air temperature, filtration, operating and delivery pressures and purity versus volume in order to ensure the Nitrogen generator is capable of reaching its full potential lifecycle. Features such as an air bypass alarm, leak detection system, Nitrogen receiver tank and auto purge system are key indicators of a Nitrogen generator carefully designed to avoid unnecessary runtime and maximize the life of components such as solenoid valves and pressure switches. Moreover, those features dually benefit the fire protection system by ensuring 98% Nitrogen purity throughout the sprinkler piping. Before choosing a manufacturer, be sure that they can provide references attesting to significant longevity from their Nitrogen generators.

Membrane and Pressure Swing Adsorption Technologies

Although Nitrogen generators are fairly complex in design, they require very little maintenance due to the nature of the mechanical separation processes. The two main technologies available are Membrane and Pressure Swing Adsorption (PSA), which both offer a mechanical means of separating the Nitrogen from the air, at a relatively low pressure. Membrane utilizes a filtration process, while PSA employs an absorption method to abstract the Oxygen molecules, allowing the Nitrogen to be captured and sent into the fire protection system. If designed properly and serviced according to the manufacturer's recommendations, Membrane and PSA technologies can yield the recommended 98% Nitrogen purity for upwards of fifteen (Membrane) and twenty-five years (PSA), respectively.

Depending upon the Nitrogen generation technology that is utilized, the air in (i.e. the feed air coming from the air compressor) to Nitrogen out ratios are 3:1 (Membrane) and 2.25:1 (PSA). For this reason, it is standard to size the air compressor package so that it is capable of restoring normal air pressure



Typical Nitrogen Generation System Layout Drawing

within the fire protection system in thirty minutes per NFPA 13. Once the sprinkler system is brought up to supervisory pressure, an "air bypass valve" is closed and another valve is opened to allow for Nitrogen to begin supervising the fire protection system. This sequence of operation permits the use of the most cost-effective Nitrogen generator with a minimal footprint. Regarding the installation of the Nitrogen generator, equipment utilizing Membrane technology should be wall-mounted, whereas those utilizing PSA technology should be enclosed within a cabinet that is four inches or greater above floor level. This ensures that any water drainage within the riser room does not create a potential issue with the electrical within the Nitrogen generator. Furthermore, it is important to always consult the manufacturer of the equipment in order to determine which model Nitrogen generator to utilize (based on the total gallons of sprinkler pipe capacity).

Air Bypass Alarm

It is important to include an air bypass alarm when designing a system. This will notify the building operator if air is entering the fire protection system instead of Nitrogen. This could be the result of a maintenance technician that had switched over to supervisory air while servicing the Nitrogen generator, but forgot to switch the system back to Nitrogen. An air bypass alarm will notify the building monitoring panel so that the correction can be made prior to the sprinkler pipe experiencing corrosion.

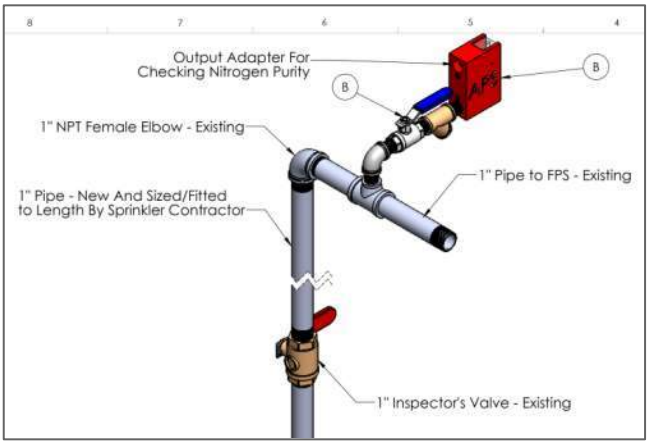
Leak Detection System

Another key feature is the leak detection system, which will monitor the runtime of the Nitrogen generator. Often times, leaks within the sprinkler piping go unnoticed and the supervisory air compressor or Nitrogen generator run constantly to keep up with the excessive demand. Consequently, more operating hours are placed on the equipment, jeopardizing its longevity. An effective leak detection system proactively monitors *runtime* and will alarm prior to the added stress being placed on the equipment. This type of system is not to be mistaken for one that only monitors pressure via a low air alarm or pressure switch, which will only react after there has been a catastrophic failure with the supervisory equipment.

Nitrogen Receiver Tank

Every Nitrogen generation system should be designed with a Nitrogen receiver tank, which is sized in proportion to the Nitrogen generator (typically ranging from 28 – 80 gallons). The tank is installed between the Nitrogen generator and Air Maintenance Device/s, creating a "buffer" (similar to an air receiver tank), which eliminates the short cycling of the Nitrogen generator. A Nitrogen receiver tank is required because there is usually not enough capacity within the piping between the Nitrogen generator and Air Maintenance Device/s to create a sufficient buffer. With the addition of the Nitrogen receiver tank, the solenoids, pressure switches and other vital system components enjoy much greater longevity. Additionally, the Nitrogen receiver tank allows supervisory pressure to be maintained for a short period of time while basic annual maintenance is being completed on the Nitrogen generator. This prevents the facility from having to go into a fire watch procedure during this time.

Auto Purge System



Typical AutoPurge System Layout Drawing

Since compressed air is utilized for the initial supervisory fill, most all manufacturers provide an air vent or auto purge system. This device displaces air from within the sprinkler piping, allowing Nitrogen to fill the system in short time (typically 2 – 4 weeks). As Fick's law of diffusion demonstrates, Nitrogen will disperse very rapidly throughout the sprinkler piping. Upon introduction to the fire protection system (near the valve), Nitrogen will immediately begin to evenly distribute and the Nitrogen purity concentration will rise throughout the system. The auto purge system contains an engineered calibrated orifice similar to the one located within an air maintenance device. In essence, an auto purge system creates a minute leak so that fresh Nitrogen can constantly cycle throughout the fire protection system. Fick's Law is verified by Computational Fluid Dynamics (CFD) modeling, which shows that only a single auto purge system is required per dry or preaction system. While the auto purge systems can be located anywhere along the sprinkler piping, most prefer to mount them as far from the valve as possible to confirm (for peace of mind) that Nitrogen is fully blanketed throughout the fire protection system. Also, because the auto purge system's leak rate is merely a few liters per minute, the Nitrogen generator and air compressor only experience a couple additional minutes of runtime per day. A properly designed auto purge system is a *tunable* device that calibrates the purge rate based on the capacity of the individual fire protection system. This ensures that the added runtime of the Nitrogen generator is minimal.

Purity Monitoring

There are a few different types of technology available to confirm 98% or greater Nitrogen purity concentration has been achieved. The least expensive option is a hand held Nitrogen purity sensor, which will manually connect to an auto purge system and obtain a purity reading within seconds. For hands-free, digital monitoring and logging of historical data, a manifold with a programmable logic controller (PLC) is a better option. These devices will automatically monitor the Nitrogen purity concentration within each zone of the fire protection system every 24 hours. If the Nitrogen purity concentration has been achieved within a given zone, the manifold will close the auto purge system. These devices are provided with a dry contact and analog outputs to tie into the Building Monitoring Panel. Additionally, the manifold has Ethernet capabilities which make remote access via a laptop or even a cell phone possible.

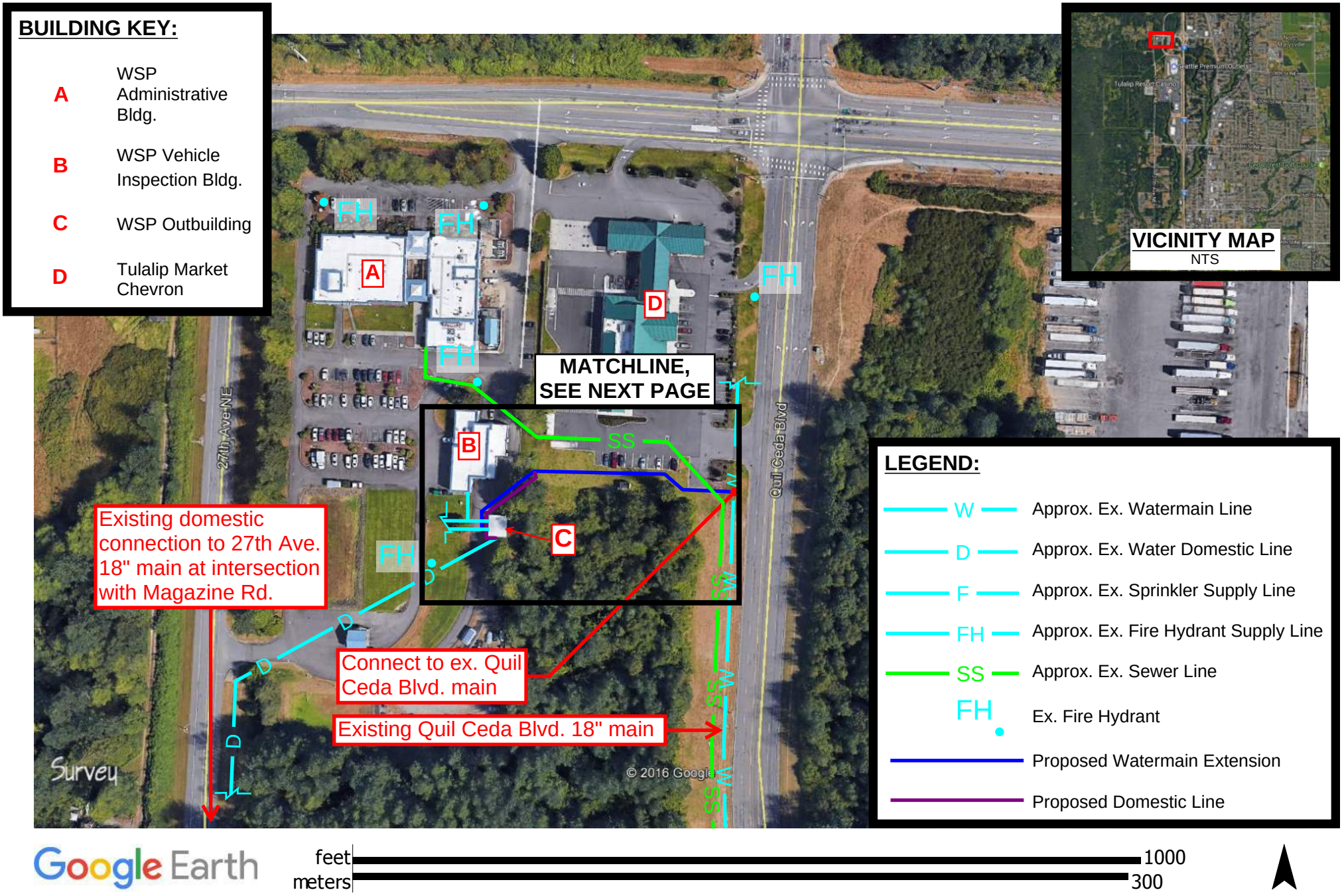
Value Engineering

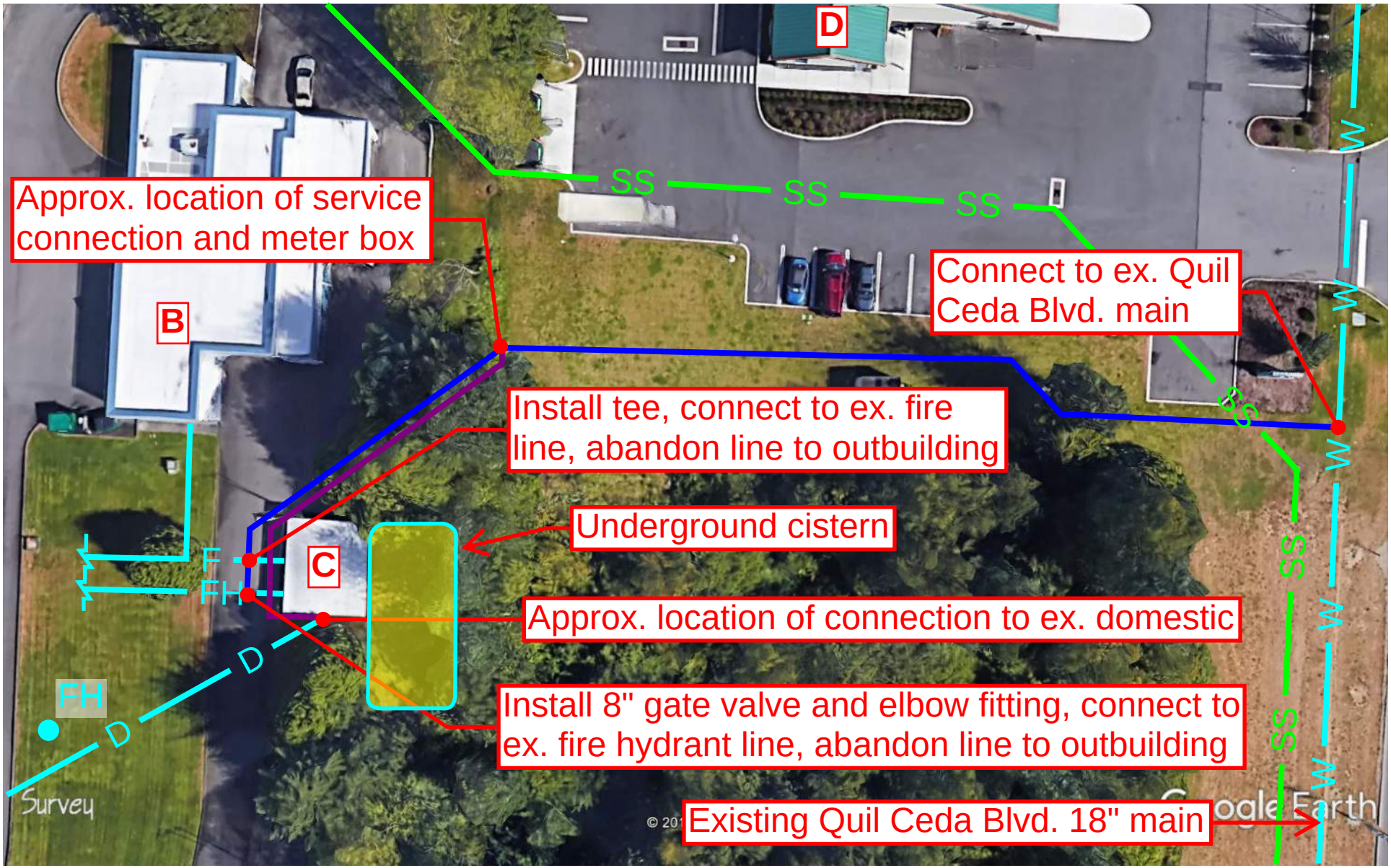
Recent studies show that utilizing 98% supervisory Nitrogen can significantly extend the pipe service lives of black and galvanized steel.[1] And as more and more facilities uncover corrosion in their dry and preaction systems, the demand for Nitrogen generators will continue to grow. It has never been as important as it is now to understand the key components and features that make up a *dependable Nitrogen generator designed specifically for fire protection*. If designed properly, a Nitrogen generator will ensure 98% Nitrogen purity throughout the fire protection system and provide years of trouble-free operation. For this reason, it is equally important to work with a manufacturer that has proven technology and will be available long into the future to support their product.

[1] Van Der Schijff, O.J. & Bodemann, S.C. NACE Paper 2846 “Corrosion of Piping in Dry and Preaction Fire Sprinkler Systems: Interim Results of Long Term Corrosion Testing Under Compressed Air and Nitrogen Supervision”, NACE Corrosion 2013 International Conference – Paper, No. 2846 – 2013.

APPENDIX D

Conceptual Watermain Extension Design


BUILDING KEY:
A WSP Administrative Bldg.
B WSP Vehicle Inspection Bldg.
C WSP Outbuilding
D Tulalip Market Chevron
VICINITY MAP
NTS
MATCHLINE, SEE NEXT PAGE
Existing domestic connection to 27th Ave. 18" main at intersection with Magazine Rd.
Connect to ex. Quil Ceda Blvd. main
Existing Quil Ceda Blvd. 18" main
27th Ave NE
Quil Ceda Blvd
Survey
© 2016 Google
LEGEND:
W Approx. Ex. Watermain Line
D Approx. Ex. Water Domestic Line
F Approx. Ex. Sprinkler Supply Line
FH Approx. Ex. Fire Hydrant Supply Line
SS Approx. Ex. Sewer Line
FH Ex. Fire Hydrant
Proposed Watermain Extension
Proposed Domestic Line
Google Earth
feet 1000
meters 300


Approx. location of service connection and meter box
Connect to ex. Quil Ceda Blvd. main
Install tee, connect to ex. fire line, abandon line to outbuilding
Underground cistern
Approx. location of connection to ex. domestic
Install 8" gate valve and elbow fitting, connect to ex. fire hydrant line, abandon line to outbuilding
Existing Quil Ceda Blvd. 18" main
B
C
D
SS
W
FH
Survey
Google Earth
feet
meters
200
80

APPENDIX E

Rough Order of Magnitude Cost Estimate

WSP District #7 HQ Fire & Water System Improvement Study

ENGINEER'S ESTIMATE OF PROBABLE COST FOR SITE WORK

KPFF Consulting Engineers

Opt. A - QCB Main Extension, Abandon Outbuilding

6/27/2017

PROPOSAL ITEMS

Item	Description	Quant./Units	Unit	Unit Cost	Total
	UTILITIES				
1	Water Main, 10" Ductile Iron	400	LF	$ 100	$ 40,000
2	Water Main Butterfly Valve, 18"	1	EA	$ 10,000	$ 10,000
3	Connection to Existing 18" Water Main	1	EA	$ 7,500	$ 7,500
4	Water Main Gate Valve, 10"	2	EA	$ 1,700	$ 3,400
5	Fitting w/Thrust Blocking	11	EA	$ 400	$ 4,400
6	Water Domestic, 3" PVC	140	LF	$ 60	$ 8,400
7	Connection to Existing Water	2	EA	$ 2,300	$ 4,600
8	Surface Restoration (Landscaped Area)	1	LS	$ 5,000	$ 5,000
9	Erosion Control	1	LS	$ 3,000	$ 3,000
				UTILITIES SUBTOTAL	$ 86,300
	OUTBUILDING				
10	Demolish Interior	1	LS	$ 40,000	$ 40,000
11	Removal of Contruction Debris/Cleaning	1	LS	$ 16,000	$ 16,000
12	Paint Exterior	1	LS	$ 2,500	$ 2,500
				OUTBUILDING SUBTOTAL	$ 58,500
	FIRE SYSTEM - CODE COMPLIANT IMPROV.				
13	Admin. Bldg. Wet System	1	LS	$ 7,700	$ 7,700
14	Admin. Bldg. Dry System w/Std. Air Compress.	1	LS	$ 52,600	$ 52,600
15	Veh. Insp. Bldg. Dry System w/Std. Compress.	1	LS	$ 77,200	$ 77,200
16	Replace Ex. Fire Alarm System	1	LS	$ 16,000	$ 16,000
				FIRE SYSTEM - CODE COMPLIANT IMPROV. SUBTOTAL	$ 153,500
	FIRE SYSTEM - RECOMMENDED IMPROV.				
17	Admin. Bldg. Dry System w/Nitrogen System	1	LS	$ 18,500	$ 18,500
18	Veh. Insp. Bldg. Dry System w/Nitrogen System	1	LS	$ 13,500	$ 13,500
				FIRE SYSTEM - RECOMMENDED IMPROV. SUBTOTAL	$ 32,000
	PROJECT FEES				
19	Water Service Plan Review Fee	1	LS	$ 300	$ 300
20	Grading Permit Fee	1	LS	$ 50	$ 50
21	Water Connection Fee (3x3)	1	LS	$ 3,500	$ 3,500
22	Capital Improv. Charge - Office Use	26,590	SF	$ 1.99	$ 52,914
23	Capital Improv. Charge - Warehouse Use	700	SF	$ 0.65	$ 455
				PROJECT FEES SUBTOTAL	$ 57,219

NOTE:

*Items #1 & 6 includes trenching, bedding, backfill, pipe, and chlorination and testing

**Item #21 includes meter setter and meter

WSP District #7 HQ Fire & Water System Improvement Study

ENGINEER'S ESTIMATE OF PROBABLE COST FOR SITE WORK

KPFF Consulting Engineers

Opt. A - QCB Main Extension, Abandon Outbuilding (cont.)

6/27/2017

PROPOSAL ITEMS

Item	Description	Quant./Units	Unit	Unit Cost	Total
	ALT 1 - ABANDON IN-PLACE CISTERN				
24	Abandon In-Place Underground Cistern	1	LS	$ 15,000	$ 15,000
				ALT 1 SUBTOTAL	$ 15,000
25				Contingency (20%)	$ 69,060
26				Engineering Design Fees (20%)	$ 69,060
27				Mobilization (10%)	$ 34,500
28				Sales Tax (9.1%)	$ 31,422
29				TERO Fee (1.75%)	$ 6,043
				SUBTOTAL	$ 210,085
				TOTAL (w/ALT 1)	$ 612,604
	ALT 2 - REMOVE CISTERN				
30	Remove Underground Cistern	1	LS	$ 25,000	$ 25,000
				ALT 2 SUBTOTAL	$ 25,000
31				Contingency (20%)	$ 71,060
32				Engineering Design Fees (20%)	$ 71,060
33				Mobilization (10%)	$ 35,500
34				Sales Tax (9.1%)	$ 32,332
35				TERO Fee (1.75%)	$ 6,218
				SUBTOTAL	$ 216,170
				TOTAL (w/ALT 2)	$ 628,689

NOTE:

*Item #24 includes puncturing the cistern bottom, filling cistern with dirt, and closing supply line

**Items #25-29 only apply to items #1-18 & 24

***Item #30 includes excavating around the cistern, removing cistern and concrete, and backfilling

****Items #31-35 only apply to items #1-18 & 30

WSP District #7 HQ Fire & Water System Improvement Study

ENGINEER'S ESTIMATE OF PROBABLE COST FOR SITE WORK

KPFF Consulting Engineers

Opt. B - No QCB Main Extension, Improve Outbuilding

6/27/2017

PROPOSAL ITEMS

Item	Description	Quant./Units	Unit	Unit Cost	Total
	UTILITIES				
1	Connection to Existing Water Main	1	EA	$ 7,500	$ 7,500
2	Fitting w/Thrust Blocking	2	EA	$ 400	$ 800
3	Water Domestic, 3" PVC	150	LF	$ 60	$ 9,000
4	Connection to Existing Water	1	EA	$ 2,300	$ 2,300
5	Surface Restoration (Landscaped Area)	1	LS	$ 3,000	$ 3,000
6	Erosion Control	1	LS	$ 2,000	$ 2,000
				UTILITIES SUBTOTAL	$ 24,600
	OUTBUILDING				
7	Provide Drainage/Sealing from Water Instrusion	1	LS	$ 15,000	$ 15,000
8	Install Sprinkler Protection	1	LS	$ 15,000	$ 15,000
9	Install Two Fire Pumps and Controllers	1	LS	$ 140,000	$ 140,000
				OUTBUILDING SUBTOTAL	$ 170,000
	FIRE SYSTEM - CODE COMPLIANT IMPROV.				
10	Admin. Bldg. Wet System	1	LS	$ 7,700	$ 7,700
11	Admin. Bldg. Dry System w/Std. Air Compress.	1	LS	$ 52,600	$ 52,600
12	Veh. Insp. Bldg. Dry System w/Std. Compress.	1	LS	$ 77,200	$ 77,200
13	Replace Ex. Fire Alarm System	1	LS	$ 16,000	$ 16,000
				FIRE SYSTEM - CODE COMPLIANT IMPROV. SUBTOTAL	$ 153,500
	FIRE SYSTEM - RECOMMENDED IMPROV.				
14	Admin. Bldg. Dry System w/Nitrogen System	1	LS	$ 18,500	$ 18,500
15	Veh. Insp. Bldg. Dry System w/Nitrogen System	1	LS	$ 13,500	$ 13,500
				FIRE SYSTEM - RECOMMENDED IMPROV. SUBTOTAL	$ 32,000
	PROJECT FEES				
16	Water Service Plan Review Fee	1	LS	$ 300	$ 300
17	Grading Permit Fee	1	LS	$ 50	$ 50
18	Water Connection Fee (3x3)	1	LS	$ 3,500	$ 3,500
19	Capital Improv. Charge - Office Use	26,590	SF	$ 1.99	$ 52,914
20	Capital Improv. Charge - Warehouse Use	700	SF	$ 0.65	$ 455
				PROJECT FEES SUBTOTAL	$ 57,219
21				Contingency (20%)	$ 76,020
22				Engineering Design Fees (20%)	$ 76,020
23				Mobilization (10%)	$ 38,000
24				Sales Tax (9.1%)	$ 34,589
25				TERO Fee (1.75%)	$ 6,652
				SUBTOTAL	$ 231,281
				TOTAL	$ 668,600

NOTE:

*Item #3 includes trenching, bedding, backfill, pipe, and chlorination and testing

**Item #18 includes meter setter and meter

***Items #21-25 only apply to items #1-15

WSP District #7 HQ Fire & Water System Improvement Study

ENGINEER'S ESTIMATE OF PROBABLE COST FOR SITE WORK

KPFF Consulting Engineers

Opt. C - New 27th Ave. Domestic Connection

6/27/2017

PROPOSAL ITEMS

Item	Description	Quant./Units	Unit	Unit Cost	Total
	UTILITIES				
1	Connection to Existing Water Main	1	EA	$ 7,500	$ 7,500
2	Fitting w/Thrust Blocking	2	EA	$ 400	$ 800
3	Water Domestic, 3" PVC	150	LF	$ 60	$ 9,000
4	Connection to Existing Water	1	EA	$ 2,300	$ 2,300
5	Surface Restoration (Landscaped Area)	1	LS	$ 3,000	$ 3,000
6	Erosion Control	1	LS	$ 2,000	$ 2,000
				UTILITIES SUBTOTAL	$ 24,600
	PROJECT FEES				
7	Water Service Plan Review Fee	1	LS	$ 300	$ 300
8	Grading Permit Fee	1	LS	$ 50	$ 50
9	Water Connection Fee (3x3)	1	LS	$ 3,500	$ 3,500
10	Capital Improv. Charge - Office Use	26,590	SF	$ 1.99	$ 52,914
11	Capital Improv. Charge - Warehouse Use	700	SF	$ 0.65	$ 455
				PROJECT FEES SUBTOTAL	$ 57,219
12				Contingency (20%)	$ 4,920
13				Engineering Design Fees (20%)	$ 4,920
14				Mobilization (10%)	$ 2,500
15				Sales Tax (9.1%)	$ 2,239
16				TERO Fee (1.75%)	$ 431
				SUBTOTAL	$ 15,009
				TOTAL	$ 96,828

NOTE:

*Item #3 includes trenching, bedding, backfill, pipe, and chlorination and testing

**Item #9 includes meter setter and meter

***Items #12-16 only apply to utilities subtotal