File No. EA2022-124

CITY OF RICHLAND
Determination of Non-Significance

Description of Proposal: Ben Franklin Transit – Queensgate Transit Hub - to consist of a new section of road for bus access, pedestrian improvements, lighting installation and the construction of bus shelters and an "operator comfort building."

Proponent: Ben Franklin Transit
Attn: Kevin Sliger
1000 Columbia Park Trail
Richland, WA 99352

Location of Proposal: The project site is located at/near 691 Windmill Road, Richland, Washington.

Lead Agency: City of Richland

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

( ) There is no comment for the DNS.

(**X**) This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for fourteen days from the date of issuance.

( ) This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

Responsible Official: Mike Stevens
Position/Title: Planning Manager
Address: 625 Swift Blvd., MS #35, Richland, WA 99352
Date: September 20, 2022
Comments Due: October 5, 2022

Signature _____

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization, or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements that do not contribute meaningfully to the analysis of the proposal.

A. Background

1. Name of proposed project, if applicable:

   Ben Franklin Transit – Queensgate Transit Hub

2. Name of applicant:

   City of Richland – Ben Franklin Transit

3. Address and phone number of applicant and contact person:

1000 Columbia Park Trail
Richland, WA 99352-4798
Kevin Sliger: (509) 734-5107

4. Date checklist prepared:

June 21, 2022

5. Agency requesting checklist:

City of Richland Public Works Department – Ben Franklin Transit

6. Proposed timing or schedule (including phasing, if applicable):

Project construction is expected to begin fall 2022

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Other than additional land development potential in the general area from others, no future expansions are expected at this time.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- ***Phase I ESA – Queensgate Hub prepared by GeoEngineers, Inc. (2020)***
- ***Cultural Resources Survey – Historical Research Associates, Inc. (2020)***
- ***Wetland Delineation – RH2 Engineering (2017)***

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

A wetland mitigation plan will be submitted to the City of Richland for impacts to jurisdictional waters.

10. List any government approvals or permits that will be needed for your proposal, if known.

- ***A Nationwide Permit (NWP) 14 Linear Transportation Projects (NWS-2021-952) was issued on October 21, 2021***
- ***Ecology NPDES General Stormwater Construction permit***
- ***Grading Permit (City of Richland)***

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

A new section of road for bus access (Ben Franklin Transit) will be constructed between Windmill Road and Columbia Park Trail, to the west of the Southwest Richland Park and Ride lot. This section of road will include pedestrian improvements, lighting installation and the construction of bus shelters and an "operator comfort building."

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Project site is located between Windmill Road and Columbia Park Trail, to the west of the Southwest Richland Park and Ride lot (legal description: United States Geological Survey, 7.5-minute Badger Mountain and Richland, Washington topographic quadrangle map dated 2014. Southwest quarter of the Northwest quarter of Section 22, Township 9 North, Range 28 East, Willamette Meridian).

B. Environmental Elements

1. Earth

a. General description of the site:

(circle one): ***Flat***, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

Slopes leading to wetlands areas (west and south of project area) that are approximately 6 to 8 feet deep.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them, and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Surface gravels underlain by brown, silty sand with occasional gravel (Based on GeoEngineers recent geotechnical explorations).

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No, Washington DNR identified the area as having very low/low to moderate liquefaction susceptibility with no mapped landslides.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Approximately 1 acre of land will be impacted for the proposed development. Up to 380 square feet of wetland (drainage ditch) would be impacted by the project from development of a new arch culvert spanning the onsite ditch. The purpose for grading is to create a drivable surface that matches surrounding land uses. Grading will likely consist of excavation and removal of soil to reach the appropriate grade for road, sidewalk, bridge, and building foundations. Fill materials will likely come

from local/regional stock for gravel foundation bedding sources while other fill, as required, will likely be sourced from on-site borrow/redistribution.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The site will need to be cleared prior to construction. However, proper erosion and sediment control best management practices (BMPs) will be implemented in accordance with Ecology's August 2019 Stormwater Management Manual for Eastern Washington (August 2019 SMMEW).

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

It is estimated that 63 percent of the site will be covered with impervious surfaces following construction.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Contractor will be responsible for erosion control BMPs. These will be employed in accordance with the August 2019 SMMEW for soil disturbance to limit erosion and sediment during construction. BMPs (i.e., silt fencing) will be consistent with standards set by the EPA and recommendations from Ecology, as outlined in the 2019 SMMEW.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Emissions generated from this project include those from diesel engines associated with heavy equipment necessary to construct the project. Dust may also be generated during construction. Quantities are unknown, but dust control measures will be implemented by spraying surfaces with water during dry conditions as needed.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no known off-site sources of emissions or odor that have the potential to affect the proposed project. Additionally, Benton County is not listed as a non-attainment area for any criteria pollutants.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

During and after construction, it will be necessary that all equipment used complies with federal emissions standards. Idling times will be minimized by shutting equipment off when not in use and construction equipment will be maintained and properly tuned in accordance with manufacturer specifications. It will be the

responsibility of the contractor to use properly licensed heavy machinery and equipment.

Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered as necessary during dusty conditions. Visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers, as necessary. The use of dry power sweeping will be prohibited.

3. Water

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes. A ditch with wetlands (Wetland A) is located along the southern border of the project area, adjacent to the north side of Columbia Park Trail.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, up to 380 square feet of wetlands would be disturbed by development of the new arch culvert over the ditch. Correspondence with the City of Richland indicates a wetland mitigation plan will be required for the project.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Approximately 45.15 cubic yards (cy) of material will be excavated and removed from the ditch in preparation of the culvert placement and wingwall construction. This area will then be filled with about 41.5 cy of 12-inch cobbles to provide a stabilized base of the swale.

Up to 380 square feet within the wetland area will be affected. Avoidance and minimization/reduction of direct impacts to the wetland will be accomplished by placing foundations and wingwalls outside of the ordinary high-water mark. The existing wetland mitigation area to the east of the proposed crossing will be avoided.

Approximately 782 square feet of emergent wetland will be created as part of the mitigation for loss of 380 square feet of wetland.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No, existing drainage channels will be maintained but no surface water withdrawals will be required for this proposed project.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The proposed project is located outside the mapped 100-year floodplain (Flood Insurance Rate Map 470 dated July 19, 1982).

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No waste materials will be discharged to surface waters as a result of the proposed project.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No groundwater will be withdrawn from for the purpose of drinking water as a result of the proposed project.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any. Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged to the ground as a result of the proposed project.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

During construction, stormwater will be retained within the project boundary to prevent offsite migration of sediment-laden water. Runoff generated on site will be treated using stormwater BMPs consistent with standards set by the EPA and the recommendations from Ecology. (2019 SMMEW).

Following construction, stormwater runoff is anticipated to be primarily from precipitation and will be managed through a combination of bio-infiltration and dry wells in accordance with local, state, and federal regulations.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No waste materials are expected to enter ground or surface waters as a result of the project. However, there is the possibility of equipment failure that could discharge oils, hydraulic or other fluids to the ground surface. In the event this was to occur, the contractor would immediately address the issue by limiting the discharge, consolidating the materials and then have them properly removed and disposed of offsite in accordance with local, state, and federal regulations.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The area of the project site has been significantly changed over the years with new infrastructure. However, the drainage patterns associated with the site would be maintained and or new drainage features to control runoff would be developed. Avoidance measures will be implemented, where possible to reduce impacts to on-site wetlands. Bio-infiltration swales and/or drywells (as an example) may be used to offset surface runoff patterns.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

A National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit (CSWGP) will be obtained by the contractor prior to construction at the proposed project. Construction and operation activities would comply with all permit conditions. A Stormwater Pollution Prevention Plan (SWPPP) would also be required, prepared, and implemented by the contractor prior to initiating site-disturbing activities. As part of the permit, a temporary erosion sediment control (TESC) plan will be developed. Construction techniques will utilize BMPs such as those described in the Washington State Department of Transportation (WSDOT) Standards and Specifications for Road, Bridge, and Municipal Construction and Ecology's Storm Water Management Manual for Eastern Washington (SWMMEW), Publication Number 18-10-044 dated August 2019. Appropriate erosion control measures will be implemented at the appropriate locations on site and adjusted daily as site objectives change in response to weather conditions.

Potential spills will be handled and disposed of in a manner that does not contaminate the surrounding area. Adequate materials and procedures to respond to unanticipated weather conditions or accidental releases of materials (sediment, petroleum hydrocarbons, etc.) will be available on site. The Spill Prevention, Control, and Countermeasure (SPCC) Plan will also ensure the proper management of oil, gasoline and solvents used in the operation and maintenance of construction equipment and that equipment remain free of external petroleum-based products prior to entering the work area and during construction, and for making any necessary repairs prior to returning the equipment to operation in the work area. Throughout construction, the contractor will maintain adjacent paved areas free of visible soil, sand, or other debris. If stockpiled on or offsite, or if rain is expected, soil and aggregate materials will be covered with secured plastic sheeting and runoff shall be diverted around them.

Source control will be implemented for the proposed drywells at the project site. Following construction, BMPs will be implemented for bio-infiltration swales and drywells constructed at the project site for stormwater management.

4. Plants

a. Check the types of vegetation found on the site:

____ deciduous tree: alder, maple, aspen, other
____ evergreen tree: fir, cedar, pine, other
_X__ shrubs
_X__ grass
____ pasture
____ crop or grain
____ Orchards, vineyards, or other permanent crops.
_X_ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Weed and invasive species vegetation removal will occur on the southern section of the site, within and along the 2:1 slopes adjacent to Wetland A. In addition, approximately 380 square feet of wetland vegetation will be removed within the ordinary high-water mark of the ditch. Furthermore, non-native Russian thistle (Salsola kali) and kochia (Bassia scoparia) will be removed from the wetland buffer north of the ditch. However, avoidance measures will be implemented to protect wetland habitat.

c. List threatened and endangered species known to be on or near the site.

No federally listed threatened and endangered (T&E) species are expected to be located at the site. A review of the Washington Priority Habitats and Species (PHS) Maps indicates the Keene Creek Wetlands are situated offsite, south of Columbia Park Trail. No other PHS listings were identified at the site or surrounding areas.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Landscaping will consist of native emergent wetland species and shrubs within the newly created wetland area (782 square feet). Native upland trees and shrubs will be utilized on slopes adjacent to the newly created wetland area. The bioswale located partially within the upland buffer will also contain native trees and native seed mix. The remaining upland buffer enhancement will be seeded with native seed mixes.

A planting plan has been developed as part of the wetland mitigation plan for the project. Plantings will be irrigated permanently or until sufficiently established.

e. List all noxious weeds and invasive species known to be on or near the site.

According to the Washington State Noxious Weed Data Viewer, saltcedar (Class B Quarantine) and Ravenna grass (Class B) have been identified in the area of the site.

5. Animals

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Field mouse, thrush, sparrows, songbirds, crow's nests, and deer scat have been observed at the site.

b. List any threatened and endangered species known to be on or near the site.

No T&E species are expected to be present at the site based on information obtained from the US Fish and Wildlife Service (USFWS) and PHS online mapping data.

c. Is the site part of a migration route? If so, explain.

The site is located within the Pacific Flyway. Migratory bird species may utilize the project site at various times of the year. However, the site does not have rare or unique habitat, wildlife corridors, fish-bearing rivers and streams, lakes, ponds.

d. Proposed measures to preserve or enhance wildlife, if any:

Wetlands habitat at the site will be preserved and/or properly mitigated, depending on the final design.

e. List any invasive animal species known to be on or near the site.

No invasive animal species are known to be located on or in the area of the site.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Petroleum will be used to fuel buses and carpool vehicles accessing the site. Electricity will be used following completion of the construction to power lighting associated with the final project.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

Adjacent properties are largely already developed and/or are under construction. The project is not expected to affect potential use of solar energy by these properties because of the fact that no building structures of relatively significant height are not planned.

b. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The proposed project includes increased access to public transportation, in an effort to reduce carbon emissions.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

A review of regulatory records provided by Environmental Data Resources (EDR) indicates there are no hazardous waste or leaking underground storage tank (UST) sites on or near the proposed work locations.

1) Describe any known or possible contamination at the site from present or past uses.

There is no known contamination at the site from past or present uses.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

No existing hazardous chemicals or conditions are expected to affect the proposed project.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

The Contractor is responsible for maintaining an SPCC Plan. During construction, potential spills of hazardous material, fuels, lubricants, cooling fluid or hydraulic fluid from vehicles or construction equipment during construction could occur. However, BMPs will be established to contain such potential spills during construction.

4) Describe special emergency services that might be required. Emergency services that may be required during construction include access to medical facilities in the area. These facilities likely include the following:

No special emergency services will be needed for the proposed project construction. Current health facility (emergency hospital needs) infrastructure should be more than sufficient to handle emergency events if they are to occur. Traffic control measures will also be implemented to provide consideration for emergency vehicle access.

The local health facility near the proposed project:
Kadlec Medical Center: Emergency Room (Approximately 3.5 miles)

888 Swift Blvd
Richland, WA 99352

5) Proposed measures to reduce or control environmental health hazards, if any:

The Contractor will be required to provide all personnel with personal protective equipment (PPE) and comply with all work-site safety requirements. The construction contractor will also be required to prepare a SPCC Plan for this project. Any potential spills will be handled and disposed of in a manner that does not contaminate the surrounding area. Adequate materials and procedures to respond to unanticipated weather conditions or accidental releases of materials (sediment, petroleum hydrocarbons, etc.) will be available on site. The SPCC Plan will also ensure the proper management of oil, gasoline and solvents used in the operation and maintenance of construction equipment and that equipment remain free of external petroleum-based products prior to entering the work area and during construction, and for making any necessary repairs prior to returning the equipment to operation in the work area. Throughout construction, the contractor will maintain adjacent paved areas free of visible soil, sand, or other debris. If stockpiled on or offsite, or if rain is expected, soil and aggregate materials will be covered with secured plastic sheeting and runoff shall be diverted around them.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Land uses surrounding the project site are commercial, undeveloped and/or under construction. Interstate 182 is also situated north of the project site. The freeway was audible during the site visit. Additional noise mainly related to daily traffic use appears to be the main source of noise in the general area.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

The construction phase of the proposed project would require the use of heavy equipment and would represent a direct impact from temporary increases in ambient noise levels. These noise levels could be audible in adjacent areas, including residences and parks, although it would be intermittent and temporary. The temporary increase in construction noise levels would only occur during the construction phase and only during daylight hours between 7:00 am and 6:00 pm (WAC 173-60-040). The loudest equipment would likely be graders (89 decibels [dB]); jackhammers (89 dB); and dozers (82 dB).

Following completion of construction, transit center operations would represent a long-term direct, but relatively minor source of additional road noise within the immediate area of the site. Additional noise may be generated from bus and other vehicular traffic.

3) Proposed measures to reduce or control noise impacts, if any:

During construction, the following measures will be implemented:

- ***Enclosures, temporary noise barriers, noise dampening maps, and other similar methods may be used to shield construction noise.***
- ***Hours of construction will generally be between 7:00 am and 6:00 pm, Monday through Friday, unless otherwise specified.***
- ***Mobile noise-generating equipment (e.g., generators, compressors, etc.) will be located as far as possible from residential areas.***
- ***Vehicle and equipment idling will be limited.***
- ***The lowest noise-generating equipment, or electrically powered equipment will be used, when possible.***
- ***Equipment will be maintained and checked to ensure property functioning noise control devices (e.g., mufflers and engine enclosures) are operable.***

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Current use of site is undeveloped. East-adjacent property is used for Southwest Richland Park and Ride parking lot and the west-adjacent property is undeveloped. Columbia Park Trail roadway is situated adjacent to the south of the site. The proposal is not anticipated to change land uses on nearby properties.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

Aerial photographs of the site to 1948 do not indicate agricultural uses or forest lands in the project area.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The proposal is not expected to affect nearby wineries in the area. No commercial or non-passenger vehicles are planned to use the adjacent winery road. The proposal is not anticipated to be affected by winery operations in the vicinity of the site.

c. Describe any structures on the site.

There are no structures at the site.

d. Will any structures be demolished? If so, what?

There are no structures currently on the proposed project site.

e. What is the current zoning classification of the site?

The proposed project site is zoned: C-2 - Retail Business.

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation is identified as: Commercial.

g. If applicable, what is the current shoreline master program designation of the site?

There is no shoreline designation for the proposed project site.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Wetland A is classified as a jurisdictional wetland by the City of Richland.

i. Approximately how many people would reside or work in the completed project?

No people will reside in the completed project area. Transit workers will be present at the project area on a daily basis at various times based on the transit routes established. The proposed project site will not be their permanent place of work.

j. Approximately how many people would the completed project displace?

No people will be displaced as a result of the proposed project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not Applicable because people will not be displaced as part of the proposed project.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The proposed project will be completed in accordance with all current and future zoning regulations and City of Richland land use plans.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

There are no agricultural or forested lands at the proposed project site. Working vineyards in the vicinity of the project site will not be impacted by the project.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

Not applicable because this is a transit project. Therefore, no housing units will be provided as a result of the project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

Not applicable because this is a transit project. Therefore, no housing units will be provided as a result of the project.

c. Proposed measures to reduce or control housing impacts, if any:

No measures are proposed to reduce or control housing impacts because this is a transit project. Therefore, no housing units will be provided as a result of the project.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Maximum building height is not defined but is not anticipated to exceed 15 feet. This includes bus stop comfort shelters for inclement weather conditions. Exterior building materials are not currently decided.

b. What views in the immediate vicinity would be altered or obstructed?

The design and location of the transit center would not conflict with the surroundings and will be completed in accordance with City of Richland zoning requirements.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Construction screening may be used, as needed, to mitigate temporary impacts to aesthetics during preparation, grading, and construction of the new transit center.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Additional exterior light may be produced from lighting at the new transit center and from buses using the center during low-light hours. This would primarily occur during hours of bus operations. Overhead safety parking and roadway lights will

also be included in the design. These lights will be shielded and directed downward to prevent glare.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No safety hazards are anticipated from exterior illumination. This project is not expected to contribute to glare or additional light to the extent it would create a safety hazard or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

No offsite sources of light or glare are expected to affect the proposed project.

d. Proposed measures to reduce or control light and glare impacts, if any:

No measures are proposed to reduce or control light and glare impacts at this time other than standard street light shielding and downward projection of the lighting.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Bike lanes and sidewalks are located on adjacent streets (Queensgate Drive and Columbia Park Trail). The proposed project is not expected to impact the bike lanes or sidewalks.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The proposed project may temporarily displace pedestrian and bike traffic during construction but will not displace any existing recreational uses following completion of the proposed project.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No significant measures are proposed to reduce or control impacts at this time. The completed project will add two crosswalks for pedestrians upon completion.

13. Historic and cultural preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

The Cultural Resources Inventory developed for the project by Historical Research Associates, Inc. (HRA) indicated no National Register of Historic Places (NRHP)-eligible properties have been recorded within one mile of the area of potential effect (APE), and no historic-period architectural resources are located within parcels immediately adjacent to the APE.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts,

or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

The Cultural Resources Inventory developed for the project indicated there are no previously recorded archaeological sites directly within the APE. The location does not fit current models for major village locations or major cemetery locations

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

A cultural resources assessment was completed by HRA in 2020 for the site.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

No avoidance or minimization measures are proposed at this time. An inadvertent discovery plan should be in place in the event that archaeological resources are identified during construction activities.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Columbia Park Trail and Windmill Road currently will be maintained to serve the area. New roadway will be constructed between these two existing roads for the primary purpose of public transit project operations proposed under this application.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The area is currently served by the Ben Franklin Transit service. SW Richland Park and Ride is located adjacent (east) to the proposed project area. Two bus stops are also located along Columbia Park Trail, south adjacent to the proposed project area.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

No additional parking spaces are anticipated for the completed project nor will parking spaces be eliminated for the proposed project. The adjacent parking lot previously developed will serve the purpose to support the transit system.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The northern terminus of the project area will include reworking the existing cul de sac at the west end of Windmill Road. The southern terminus of the project area will

have a driveway which connects to Columbia Park Trail. These will be planned public improvements.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The proposed project will not use or occur within the immediate vicinity of water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The new roadway will be used strictly for public transportation related to the local transit system. No commercial or non-passenger vehicles are planned to use the road. It is anticipated at this time that buses will run through the proposed project area on an average of 124 times per day.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The Ben Franklin Transit project includes a new roadway to be constructed between Windmill Road and Columbia Park Trail, to the west of the Southwest Richland Park and Ride lot. Working vineyards to the east of the project area along Columbia Park Trail should not incur any significant interference to the movement of agricultural and forest products.

h. Proposed measures to reduce or control transportation impacts, if any:

Traffic control will be designed and implemented in accordance with WSDOT and local standards. Construction will be coordinated with the City of Richland and Ben Franklin Transit to ensure transit disruptions are minimal, access is provided to local businesses, and traffic is maintained. The proposed project is being designed in an effort to reduce traffic load through public transit options.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The proposed project will add public transportation options for people in an effort to reduce traffic congestion.

b. Proposed measures to reduce or control direct impacts on public services, if any.

A traffic control plan would address construction detours, traffic flow, and emergency access during construction. However, the proposed project will add public transportation options for people in an effort to reduce future traffic congestion.

16. Utilities

a. Circle utilities currently available at the site:
electricity, natural gas, water, ***refuse service***, telephone, sanitary sewer, septic system, other _____.

d. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electric and stormwater utilities will be installed. The comfort building will also require municipal water and sanitary sewer connections. Services will be provided through direct coordination with the City of Richland and the local power company which services the area.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Kevin J. Sliger

Name of signee Kevin Sliger

Position and Agency/Organization Planner - Ben Franklin Transit

Date Submitted: 6-28-22

BEN FRANKLIN TRANSIT

QUEENSGATE TRANSIT HUB

120 COLUMBIA PARK TRAIL
RICHLAND, WA 99352

PERMIT SUBMITTAL

JUNE 24, 2022

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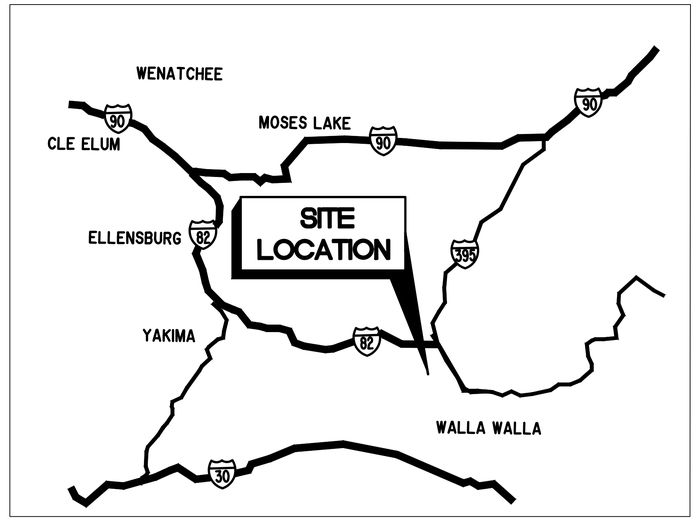

VICINITY MAP
NTS

SITE MAP
NTS

INDEX OF DRAWINGS

SHT. No.	DWG. No.	REV	TITLE
GENERAL:			
1	G.01		COVER SHEET
2	G.02		INDEX OF DRAWINGS
CIVIL:			
3	C.01		CIVIL ABBREVIATIONS AND LEGEND
4	C.02		TESC AND STORMWATER NOTES
5	C.03		TRAFFIC CONTROL PLAN
6	C.04		RIGHT OF WAY PLAN
7	C.05		TEMPORARY SEDIMENT AND EROSION CONTROL PLAN
8	C.06		DEMOLITION PLAN
9	C.07		ALIGNMENT PLAN AND PROFILE
10	C.08		GRADING PLAN
11	C.09		SITE PLAN
12	C.10		PAVING PLAN
13	C.11		TYPICAL SECTIONS
14	C.12		TYPICAL SECTIONS
15	C.13		CONCRETE PAVEMENT JOINT DETAIL
16	C.14		DRIVEWAY DETAIL
17	C.15		DRIVEWAY DETAIL
18	C.16		DRIVEWAY DETAIL
19	C.17		GRADING DETAIL
20	C.18		DRAINAGE PLAN AND PROFILE
21	C.19		SIDEWALK INLET DETAIL
22	C.20		BIOSWALE DETAIL
23	C.21		STORMWATER BIOFILTRATION DETAIL
24	C.22		CULVERT ALIGNMENT AND PROFILE
25	C.23		CULVERT WINGWALL PROFILES
26	C.24		UTILITY PLAN
27	C.25		UTILITY PLAN
28	C.26		PAVEMENT MARKING AND SIGNAGE PLAN
LANDSCAPE:			
29	L.01		PLANTING PLAN AND DETAILS
30	L.02		NOT USED
WETLAND MITIGATION			
31	W.01		WETLAND MITIGATION PLAN
32	W.02		PLANTING PLAN
33	W.03		PLANTING DETAILS

SHT. No.	DWG. No.	REV	TITLE
ARCHITECTURAL:			
34	A.01		SHEET INDEX, GENERAL INFORMATION & CODE SUMMARY
35	A.11		OVERALL SITE PLAN
36	A.12		CONCRETE JOINTING PLAN AND DETAILS
37	A.13		SITE DETAILS
38	A.21		COMFORT BUILDING – FLOOR PLAN, SLAB PLAN, & ISOMETRIC
39	A.22		COMFORT BUILDING – ROOF PLAN AND REFLECTED CEILING PLAN
40	A.23		SHELTER / CANOPY – FLOOR PLAN AND SLAB PLAN
41	A.24		SHELTER / CANOPY – ROOF PLAN AND REFLECTED CEILING PLAN
42	A.31		COMFORT BUILDING – CROSS SECTIONS
43	A.32		SHELTER / CANOPY – CROSS SECTION
44	A.41		COMFORT BUILDING – EXTERIOR ELEVATIONS
45	A.42		COMFORT BUILDING – EXTERIOR ELEVATIONS
46	A.43		COMFORT BUILDING – HPL LAYOUT
47	A.45		SHELTER / CANOPY – EXTERIOR ELEVATIONS
48	A.51		COMFORT BUILDING – INTERIOR ELEVATIONS
49	A.61		COMFORT BUILDING – WALL SECTIONS
50	A.62		COMFORT BUILDING – WALL SECTIONS
51	A.71		COMFORT BUILDING DETAILS – BUILDING ENVELOPE
52	A.72		COMFORT BUILDING DETAILS – BUILDING ENVELOPE
53	A.73		COMFORT BUILDING DETAILS – BUILDING ENVELOPE
54	A.74		COMFORT BUILDING DETAILS – GATE AND METAL PANELS
55	A.75		COMFORT BUILDING DETAILS – GATE AND METAL PANELS
56	A.76		COMFORT BUILDING DETAILS – ROOF
57	A.77		COMFORT BUILDING DETAILS – LIGHTING AND SIGNAGE
58	A.79		COMFORT BUILDING DETAILS – ACCESSIBILITY
59	A.81		SHELTER / CANOPY DETAILS –
60	A.82		SHELTER / CANOPY DETAILS –
61	A.83		SHELTER / CANOPY DETAILS –
62	A.84		SHELTER / CANOPY DETAILS – LIGHTING
63	A.91		SCHEDULES
STRUCTURAL:			
64	S.01		STRUCTURAL NOTES AND DRAWING LIST
65	S.02		STRUCTURAL NOTES
66	S.03		STRUCTURAL ABBREVIATIONS AND SYMBOLS
67	S.04		STATEMENT OF SPECIAL INSPECTIONS
68	S.05		STATEMENT OF SPECIAL INSPECTIONS
69	S.06		STATEMENT OF SPECIAL INSPECTIONS
70	S.21		STRUCTURAL FOUNDATION AND FRAMING PLAN – COMFORT BUILDING
71	S.22		STRUCTURAL FOUNDATION AND FRAMING PLAN – SHELTER CANOPY
72	S.41		CONCRETE AND FOUNDATION DETAILS
73	S.51		STEEL DETAILS
74	S.81		COLD FORM FRAMING DETAILS
75	S.82		COLD FORM FRAMING DETAILS
76	S.83		COLD FORM FRAMING DETAILS

SHT. No.	DWG. No.	REV	TITLE
MECHANICAL:			
77	M.01		ABBREVIATIONS
78	M.02		SYMBOLS
79	M.03		GENERAL NOTES
80	M.21		1ST FLOOR PLAN – HVAC
81	M.22		1ST FLOOR PLAN – PIPING
82	M.62		DETAILS
83	M.81		SCHEDULES
84	M.82		SCHEDULES
ELECTRICAL			
85	E.01		ELECTRICAL GENERAL NOTES & ABBREVIATIONS
86	E.02		ELECTRICAL SYMBOLS AND LEGEND
87	E.11		ELECTRICAL SITE PLAN
88	E.21		ELECTRICAL LIGHTING PLAN
89	E.22		ELECTRICAL POWER PLAN
90	E.71		ELECTRICAL DETAILS AND SCHEDULES
91	E.81		ELECTRICAL ONE-LINE DIAGRAM
92	FA.21		FIRE ALARM PLAN
COMMUNICATION:			
93	IT.11		COMMUNICATION SITE PLAN
94	IT.71		COMMUNICATION DETAILS
95	IT.81		COMMUNICATION SCHEDULE

Know what's **below** **Call** before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JS
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
JOB No. :2000677
SCALE: –

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INDEX OF DRAWINGS

DRAWING: G.02
SHEET: 2 OF 95

CIVIL ABBREVIATIONS:

#	NUMBER	PVC	POLYVINYL CHLORIDE
@	AT	PVI	POINT OF VERTICAL INTERSECTION
ACP	ASPHALT CONCRETE PAVEMENT	PVT	POINT OF VERTICAL TANGENCY
AD	AREA DRAIN	R, RAD	RADIUS
APPROX	APPROXIMATE	RJ	RESTRAINED JOINT
ASSY	ASSEMBLY	RPPA	REDUCED PRESSURE PRINCIPLE ASSEMBLY
BC/BOC	BOTTOM OF CURB		
BRC	BIORETENTION CELL	RPM	RAISED PAVEMENT MARKING
BW	BOTTOM OF WALL	RR	RAILROAD
CB	CATCH BASIN	RT	RIGHT
CI	CURB INLET	R/W, ROW	RIGHT-OF-WAY
CIP	CAST IN PLACE	S	SOUTH
℄	CENTERLINE	SD	STORM DRAIN
CL	CLASS	SDMH	STORM DRAIN MANHOLE
CO	CLEANOUT/ CURB OPENING	SDP	STORM DRAIN PIPE
CONC	CONCRETE	SHT	SHEET
CONT'D	CONTINUED	SS	SANITARY SEWER
CRPL	CEDAR RIVER PIPELINE	SSCO	SANITARY SEWER CLEANOUT
CTR	CENTER	SSMH	SANITARY SEWER MANHOLE
DEPT	DEPARTMENT	STA	STATION
DI	DUCTILE IRON	STD	STANDARD
DIA, ø, D	DIAMETER	STL	STEEL
DOM	DOMESTIC	TB	THRUST BLOCK
DWG	DRAWING	TC/TOC	TOP OF CURB
E	EAST	TD	TRENCH DRAIN
EA	EACH	TOP	TOP OF PIPE
EG	EXISTING GRADE	TW	TOP OF WALL
EJ	EXPANSION JOINT	TYP	TYPICAL
EL	ELEVATION	V, VERT	VERTICAL
EP	EDGE OF PAVEMENT	W	WATER/WEST
ESC	EROSION AND SEDIMENTATION CONTROL	W/	WITH
EX, EXIST	EXISTING	WM	WATER METER/WATER MAIN
EVSE	ELECTRIC VEHICLE SUPPLY EQUIPMENT	WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
FDC	FIRE DEPARTMENT CONNECTION		
FG	FINISHED GRADE		
FH	FIRE HYDRANT		
FHA	FIRE HYDRANT ASSEMBLY		
FL	FLOW LINE, FLANGE		
FO	FIBER OPTIC		
FOIC	FURNISHED BY OWNER INSTALLED BY CONTRACTOR		
FOIO	FURNISHED BY OWNER INSTALLED BY OWNER		
FS	FIRE SERVICE		
G/L	GRADE LINE		
GV	GATE VALVE		
H, HORIZ	HORIZONTAL		
HMA	HOT MIX ASPHALT		
IE	INVERT ELEVATION		
IRR	IRRIGATION		
LF	LINEAR FOOT/FEET		
LT	LEFT		
LTF	LENGTH TO FIT		
MAX	MAXIMUM		
MECH	MECHANICAL		
MH	MANHOLE		
MIN	MINIMUM		
MJ	MECHANICAL JOINT		
MT	MAIN TRACK		
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES		
N	NORTH		
NAD 83/91	NORTH AMERICAN DATUM OF 1983 W/ 1991 ADJUSTMENT		
NAVD-88	NORTH AMERICAN VERTICAL DATUM OF 1988		
NGVD-29	NATIONAL GEODETIC VERTICAL DATUM OF 1929		
NIC	NOT IN CONTRACT		
NTS	NOT TO SCALE		
OC	ON CENTER		
OPP	OPPOSITE		
PC	POINT ON CURVE		
PCCP	PORTLAND CONCRETE CEMENT PAVEMENT		
PE	PLAIN END		
PG	PLATFORM GRADE		
PI	POINT OF INTERSECTION		
P℄	PROPERTY LINE		
POC	POINT OF CONNECTION		
PR	PROPOSED		
PRC	POINT OF REVERSE CURVATURE		
PSE	PUGET SOUND ENERGY		
PT	POINT OF TANGENCY		

811 Know what's **below** **Call** before you dig

LEGEND:

- MAJOR CONTOUR (5 FT INTERVAL)
- MINOR CONTOUR (1 FT INTERVAL)
- FILL LIMITS (F)
- CUT LIMITS (C)
- TOP OF SLOPE (TB)
- TOE OF SLOPE (TS)
- PROPOSED RIGHT-OF-WAY
- ROW/PROPERTY LINE
- EASEMENT LINE
- GRADE BREAKLINE
- SLOPE
- CONCRETE CURB AND GUTTER
- CONCRETE CURB
- ART CURB
- CONCRETE INLET, CHANNEL, AND GRATE
- CURB INLET
- CURB OPENING
- WHEEL STOP
- REMOVE AS NOTED
- SAWCUT LINE
- POWER LINE (P)
- WATER LINE (W)
- SANITARY SEWER LINE (SS)
- STORM DRAIN/SEWER (SD)
- FORCE MAIN (FM)
- VINYL COATED CHAIN LINK FENCE
- SILT FENCE
- GUARDRAIL
- CLEARING & GRUBBING LIMITS. (C&G)
- CONSTRUCTION LIMITS.
- PERPENDICULAR CURB RAMP
- CURB RAMP
- SIGN
- BIKE LANE
- SHARROW
- DIRECTIONAL ARROWS
- ACCESSIBLE SIGN
- TRANSITION COUPLING

- GATE VALVE
- REDUCER
- THRUST BLOCK
- FIRE DEPARTMENT CONNECTION
- FIRE HYDRANT
- WATER METER
- BOLLARD
- CATCH BASIN TYPE 2
- CATCH BASIN TYPE 1 OR 1L
- AREA DRAIN
- SANITARY SEWER MANHOLE
- CLEANOUT
- STREAMBED COBBLES
- PCC PAVEMENT FOR HEAVY VEHICLE TRAFFIC
- CONCRETE SIDEWALK
- HMA PAVEMENT FOR HEAVY VEHICLE TRAFFIC
- HMA PAVEMENT FOR LIGHT VEHICLE TRAFFIC
- HMA PAVEMENT FOR DRIVEWAY ACCESS
- TEMPORARY PLATFORM POROUS PAVEMENT
- GRAVEL SURFACING
- LANDSCAPING
- BIOSWALE/BIORETENTION CELL
- GRIND AND OVERLAY
- REMOVE ASPHALT CONCRETE PAVEMENT
- REMOVE ASPHALT CONCRETE SIDEWALK
- REMOVE CEMENT CONCRETE PAVEMENT
- REMOVAL AS NOTED
- PARKING LOT AND TRANSIT CENTER CONSTRUCTION
- WETLAND
- BUILDING DEMO
- CONSERVATION EASEMENT AREA

EXISTING LEGEND:

- FOUND CASE MONUMENT
- FOUND MONUMENT AS NOTED
- POWER POLE (P)
- POWER TRANSFORMER (P)
- POWER VAULT
- ANCHOR
- LIGHT POLE
- STREET LIGHT
- SIDEWALK LIGHT BOLLARD
- WATER METER (W)
- WATER VAULT (W)
- 1.5" DIA. IRRIGATION VALVE (IRR)
- WATER VALVE (W)
- FIRE HYDRANT
- WATER SPIGOT
- STORM DRAIN MANHOLE
- CATCH BASIN
- GAS VALVE (G)
- GAS METER (G)
- TELEPHONE PEDESTAL (T)
- SANITARY SEWER MANHOLE (S)
- SANITARY SEWER CLEANOUT (CO)
- AIR CONDITIONING UNIT (AC)
- NOT ABLE TO LOCATE UTILITY
- HANDICAP PARKING
- SIGN
- BOLLARD
- WOOD POST
- 6" X 6" WOOD POST OVERHANG SUPPORT
- 3" X 3" METAL POST OVERHANG SUPPORT

- PROPERTY LINE
- RIGHT OF WAY LINE
- SANITARY SEWER LINE (SS)
- STORM DRAIN LINE (SD)
- UNDERGROUND TELEPHONE LINE (TC)
- UNDERGROUND POWER LINE (P)
- WATER LINE (W)
- GAS LINE (G)
- OVERHEAD UTILITY (P)
- FENCE AS NOTED
- EDGE OF GRAVEL
- EDGE OF PAVEMENT
- DRIPLINE
- LANDSCAPE
- VEGETATION EDGE
- BUILDING OVERHANG
- RETAINING WALL

- DECIDUOUS TREE
- CONIFER TREE
- BUSH
- HEDGE
- SHRUB (SHRUB)
- ROCK
- ASPHALT (ASPH)
- CONCRETE WALK (CW)
- CONCRETE (CONC)
- DRIVEWAY (DWY)
- LANDSCAPE (LSCAPE)
- CATCH BASIN (CB)
- STORM DRAIN MANHOLE (SDMH)
- SANITARY SEWER MANHOLE (SSMH)

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JS
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. : 2000677
S C A L E: –

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CIVIL
ABBREVIATIONS AND LEGEND

DRAWING: C.01
SHEET: 3 OF 90

STORM DRAINAGE NOTES:

1. STORM PIPES SHALL BE PER THE PLANS. BEDDING AND BACKFILL SHALL BE AS SHOWN IN THE STANDARD DETAILS.

2. THE FOOTING DRAINAGE SYSTEM AND THE ROOF DOWNSPOUT SYSTEM SHALL NOT BE INTERCONNECTED AND SHALL SEPARATELY CONVEY COLLECTED FLOWS TO THE CONVEYANCE SYSTEM OR TO ON-SITE STORMWATER FACILITIES.

3. PRIOR TO FINAL INSPECTION AND ACCEPTANCE OF STORM DRAINAGE WORK, PIPES AND STORM DRAIN STRUCTURES SHALL BE CLEANED AND FLUSHED. ANY OBSTRUCTIONS TO FLOW WITHIN THE STORM DRAIN SYSTEM, (SUCH AS RUBBLE, MORTAR AND WEDGED DEBRIS), SHALL BE REMOVED AT THE NEAREST STRUCTURE. WASH WATER OF ANY SORT SHALL NOT BE DISCHARGED TO THE STORM DRAIN SYSTEM OR SURFACE WATERS.

4. ENDS OF EACH STORM DRAIN STUB AT THE PROPERTY LINE SHALL BE CAPPED AND LOCATED WITH AN 8' LONG 2" X 4" BOARD, EMBEDDED TO THE STUB CAP AND EXTENDING AT LEAST 3 FEET ABOVE GRADE, AND MARKED PERMANENTLY "STORM". A COPPER 12 GA. LOCATE WIRE FIRMLY ATTACHED. THE STUB DEPTH SHALL BE INDICATED ON THE MARKER.

5. ALL GRATES IN ROADWAYS SHALL BE DUCTILE IRON, BOLT-LOCKING, VANED GRATES PER THE STANDARD DETAILS. STRUCTURES IN TRAFFIC LANES OUTSIDE OF THE CURB LINE WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH ROUND, BOLT-LOCKING FRAMES AND SOLID COVERS. OFF-STREET STRUCTURES WHICH DO NOT COLLECT RUNOFF SHALL BE FITTED WITH BOLT-LOCKING SOLID COVERS.

6. VEGETATION/LANDSCAPING IN THE DETENTION POND, BIORETENTION FACILITY, VEGETATED ROOF AND/OR DRAINAGE SWALE(S) ARE AN INTEGRAL PART OF THE RUNOFF TREATMENT SYSTEM FOR THE PROJECT. SUCH DRAINAGE FACILITIES WILL NOT BE ACCEPTED UNTIL PLANTINGS ARE ESTABLISHED.

7. ALL NEW MANHOLES SHALL HAVE A MINIMUM INSIDE DIAMETER OF 48 INCHES AND SHALL CONFORM TO THE STANDARD DETAILS. ALL NEW CATCH BASINS SHALL CONFORM TO THE STANDARD DETAILS.

8. STORM STUB STATIONS ARE REFERENCED FROM NEAREST DOWNSTREAM MANHOLE/ CATCH BASIN.

9. ALL TESTING AND CONNECTIONS TO EXISTING MAINS SHALL BE DONE IN THE PRESENCE OF THE CITY'S INSPECTOR.

10. ALL PUBLIC STORM DRAINS SHALL BE AIR TESTED AND HAVE A VIDEO INSPECTION PERFORMED PRIOR TO ACCEPTANCE (SEE #17 BELOW). STORM MAIN CONSTRUCTED WITH FLEXIBLE PIPE SHALL BE DEFLECTION TESTED WITH A MANDREL PRIOR TO ACCEPTANCE.

11. STORM STUBS SHALL BE TESTED FOR ACCEPTANCE AT THE SAME TIME THE STORM MAIN IS TESTED.

12. ALL MANHOLES/ CATCH BASINS IN UNPAVED AREAS SHALL INCLUDE A CONCRETE SEAL AROUND ADJUSTMENT RINGS PER STANDARD DETAILS.

13. ALL STORM MAIN EXTENSIONS WITHIN THE PUBLIC RIGHT-OF-WAY OR IN EASEMENTS MUST BE "STAKED" BY A SURVEYOR LICENSED IN WASHINGTON STATE FOR "LINE AND GRADE" AND CUT SHEETS PROVIDED TO THE CITY'S INSPECTOR, PRIOR TO STARTING CONSTRUCTION.

14. STORM DRAINAGE MAINLINES, STUBS AND FITTINGS SHALL BE CONSTRUCTED USING THE SAME PIPE MATERIAL AND MANUFACTURER. CONNECTIONS BETWEEN STUBS AND THE MAINLINE WILL BE MADE WITH A TEE FITTING. TEE FITTING SHALL BE FROM SAME MANUFACTURER AS PIPE. CUT-IN CONNECTIONS ARE ONLY ALLOWED WHEN CONNECTING A NEW STUB TO AN EXISTING MAINLINE.

STORM DRAINAGE NOTES (CONT'D):

15. MANHOLES, CATCH BASINS AND VAULTS ARE CONSIDERED TO BE PERMIT-REQUIRED CONFINED SPACES. ENTRY INTO THESE SPACES SHALL BE IN ACCORDANCE WITH CHAPTER 296-809 WAC.

16. PLACEMENT OF SURFACE APPURTENANCES (MH LIDS, VALVE LIDS, ETC.) IN TIRE TRACKS OF TRAFFIC LANES SHALL BE AVOIDED WHENEVER POSSIBLE.

17. THE CONTRACTOR SHALL PERFORM A VIDEO INSPECTION AND PROVIDE A DIGITAL COPY OF THE VIDEO INSPECTION FOR THE CITY'S REVIEW. THE VIDEO SHALL PROVIDE A MINIMUM OF 480 X 640 RESOLUTION AND COVER THE ENTIRE LENGTH OF THE APPLICABLE PIPE. THE CAMERA SHALL BE MOVED THROUGH THE PIPE AT A UNIFORM RATE (≤ 30 FT/MIN), STOPPING WHEN NECESSARY TO ENSURE PROPER DOCUMENTATION OF THE PIPE CONDITION. THE VIDEO SHALL BE TAKEN AFTER INSTALLATION AND CLEANING TO INSURE THAT NO DEFECTS EXIST. THE PROJECT WILL NOT BE ACCEPTED UNTIL ALL DEFECTS HAVE BEEN REPAIRED.

18. NOT USED.

19. ALL CONCRETE STRUCTURES (VAULTS, CATCH BASINS, MANHOLES, OIL/WATER SEPARATORS, ETC.) SHALL BE VACUUM TESTED.

20. MANHOLES, CATCH BASINS AND INLETS IN EASEMENTS SHALL BE CONSTRUCTED TO PROVIDE A STABLE, LEVEL GRADE FOR A MINIMUM RADIUS OF 2.5 FEET AROUND THE CENTER OF THE ACCESS OPENING TO ACCOMMODATE CONFINED SPACE ENTRY EQUIPMENT.

21. TOPS OF MANHOLES/ CATCH BASINS WITHIN PUBLIC RIGHT-OF-WAY SHALL NOT BE ADJUSTED TO FINAL GRADE UNTIL AFTER PAVING.

22. CONTRACTOR SHALL ADJUST ALL MANHOLE/ CATCH BASIN RIMS TO BE FLUSH WITH FINAL FINISHED GRADES, UNLESS OTHERWISE SHOWN.

23. DURING CONSTRUCTION, CONTRACTOR SHALL INSTALL, AT ALL CONNECTIONS TO EXISTING DOWNSTREAM MANHOLES/CATCH BASINS, SCREENS OR PLUGS TO PREVENT FOREIGN MATERIALS FROM ENTERING EXISTING STORM DRAINAGE SYSTEM. SCREENS OR PLUGS SHALL REMAIN IN PLACE THROUGHOUT THE DURATION OF THE CONSTRUCTION AND SHALL BE REMOVED ALONG WITH COLLECTED DEBRIS AT THE TIME OF FINAL INSPECTION AND IN THE PRESENCE OF THE CITY'S INSPECTOR.

24. NOT USED.

25. MINIMUM COVER OVER STORM DRAINAGE PIPE SHALL BE 2 FEET, UNLESS OTHERWISE SHOWN.

26. REDIRECT SHEET FLOW, BLOCK DRAIN INLETS AND/OR CURB OPENINGS IN PAVEMENT AND INSTALL FLOW DIVERSION MEASURES TO PREVENT CONSTRUCTION SILT LADEN RUNOFF AND DEBRIS FROM ENTERING EXCAVATIONS AND FINISH SURFACES FOR BIORETENTION FACILITIES AND PERMEABLE PAVEMENTS.

27. WHERE AMENDED SOILS, BIORETENTION FACILITIES, AND PERMEABLE PAVEMENTS ARE INSTALLED, THESE AREAS SHALL BE PROTECTED AT ALL TIMES FROM BEING OVER COMPACTED.

TEMPORARY EROSION AND SEDIMENT CONTROL NOTES:

1. APPROVAL OF THIS ESC PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G., SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.)

2. THE IMPLEMENTATION OF THIS ESC PLAN AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC BMPS IS THE RESPONSIBILITY OF THE APPLICANT UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED AND VEGETATION/LANDSCAPING IS ESTABLISHED.

3. CLEARLY FLAG THE BOUNDARIES OF THE CLEARING LIMITS SHOWN IN THIS PLAN IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE APPLICANT FOR THE DURATION OF CONSTRUCTION.

4. CONSTRUCT THE ESC BMPS SHOWN ON THIS PLAN IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VOILATE APPLICABLE WATER STANDARDS.

5. THE ESC BMPS SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, UPGRADE THESE ESC BMPS AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE SITE.

6. THE APPLICANT SHALL INSPECT THE ESC BMPS DAILY AND MAINTAIN THEM AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONALITY.

7. INSPECT AND MAINTAIN THE ESC BMPS ON INACTIVE SITES A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A MAJOR STORM EVENT (24-HOUR STORM EVENT WITH A 10-YEAR OR GREATER RECURRENCE INTERVAL).

8. AT NO TIME SHALL THE SEDIMENT EXCEED 60 PERCENT OF THE SUMP DEPTH OR HAVE LESS THAN 6 INCHES OF CLEARANCE FROM THE SEDIMENT SURFACE TO THE INVERT OF THE LOWEST PIPE. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEARNING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.

9. INSTALL STABILIZED CONSTRUCTION ENTRANCES AT THE BEGINNING OF CONSTRUCTION AND MAINTAIN FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY: JDC | DESIGNED BY: JS
CHECKED BY: ZRG | APPROVED BY: RJL
DATE: 06/17/2022
JOB No. : 2000677
SCALE: –

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QUEENSGATE TRANSIT HUB

TESC AND STORMWATER NOTES

DRAWING: C.02
SHEET: 4 OF 90

GENERAL NOTES:

1. ALL SIGNS SHALL BE BLACK ON ORANGE UNLESS OTHERWISE NOTED.
2. CONTRACTOR TO PROVIDE TEMPORARY SIGNAGE THAT FOLLOW MUTCD STANDARDS.

LEGEND:

WORK ZONE

CHANNELIZING DEVICE

FLAGGING STATION

℄ COLUMBIA PARK TRAIL

℄ QUEENSGATE DRIVE

ROAD WORK AHEAD 36" 36" W20-1

SIDEWALK CLOSED AHEAD 24" x 12"

100'

10.0' MIN

WORK ZONE

SIDEWALK CLOSED AHEAD 24" x 12" B/W

17.7'

FLAGGING STATION FOR INGRESS/EGRESS FOR DURATION ON CONSTRUCTION

WORK ZONE FOR UTILITY WORK WITHIN WINDMILL ROAD RIGHT OF WAY

14.0'

19.0'

MAINTAIN EXISTING DRIVEWAY ACCESS

24.0'

50.0'

FLAGGING STATION FOR INGRESS/EGRESS FOR DURATION ON CONSTRUCTION

50.0'

W20-7A 36" 36"

BUS STOP CLOSED DURING DURATION OF CONSTRUCTION

BE PREPARED TO STOP 36" 36" W20-7B

BFT STOP CLOSED SIGN

SIDEWALK CLOSED AHEAD 24" x 12"

ROAD WORK AHEAD 36" 36" W20-1

SIDEWALK CLOSED AHEAD 24" x 12"

ONE LANE ROAD AHEAD 48" 48" W20-4

℄ WINDMILL ROAD

100'

ROAD WORK AHEAD 36" 36" W20-1

℄ COLUMBIA PARK TRAIL

PAVERS

13+00

14+00

15+00

16+

Know what's below Call before you dig

100% SUBMITTAL

N

0 25 50 100

1 inch = 50 feet

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1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"=50'

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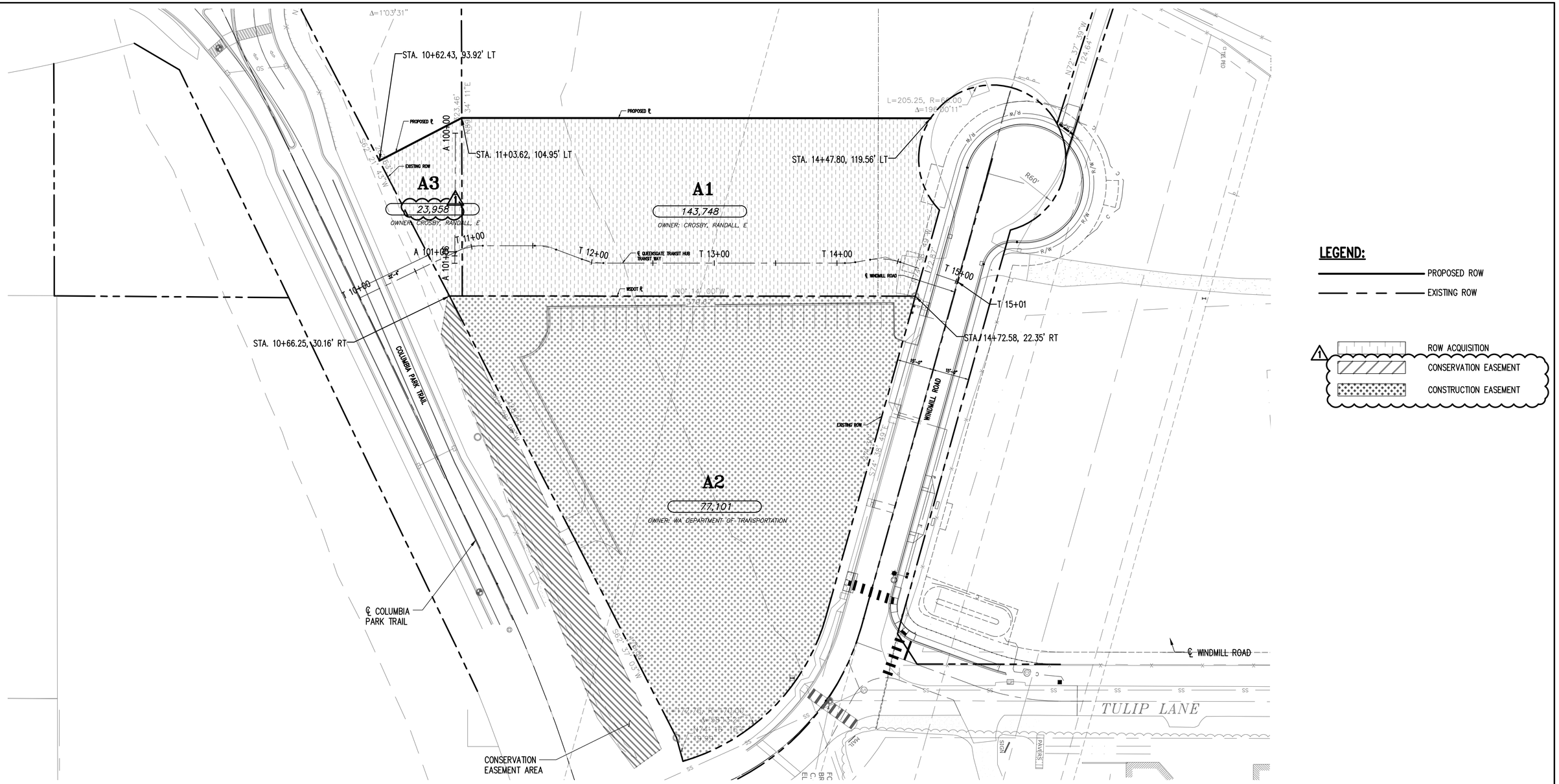
CIVIL
TRAFFIC CONTROL PLAN

DRAWING: C.03

SHEET: 5 OF 97



LEGEND:

- PROPOSED ROW
- EXISTING ROW
- ROW ACQUISITION
- CONSERVATION EASEMENT
- CONSTRUCTION EASEMENT

ROW ACQUISITION

PARCEL ID	PARCEL #	OWNER	LOT AREA (SF)	ROW AQUISITION (SF)	CONSTRUCTION EASEMENT (SF)
A1	122982020003001	CROSBY, RANDALL E	143,748	54,590	–
A2	122982020004001	WSDOT	77,101	–	77,101
A3	122982020003008	CROSBY, RANDALL E	23,958	5,415	–

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

0 20 40 80
1 inch = 40 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
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DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"= 20'

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QUEENSGATE TRANSIT HUB

CIVIL
RIGHT OF WAY PLAN

DRAWING: C.04
SHEET: 6 OF 97

Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-RW.dwg jonc Jun 20, 2022 - 8:08am

PROPERTY LINE

STA. 10+40.41, 92.51' LT

STA. 11+03.71, 102.90' LT

STA. 14+47.45, 117.22' LT

STA. 14+78.23, 49.47' LT

A 100+00

T 11+00

A 101+00

A 101+06

T 12+00

T 13+00

℄ QUEENSGATE TRANSIT HUB
TRANSIT WAY

T 14+00

T 15+00

T 15+01

WSDOT ℄

STA. 11+77.33, 45.14' RT

STA. 14+58.03, 31.76' RT

PROTECT
EXISTING HYDRANT

STA. 14+67.98, 58.27' RT

STA. 11+38.07, 90.01' RT

STA. 10+29.93, 96.38' RT

℄ COLUMBIA
PARK TRAIL

CONSERVATION
EASEMENT AREA

COLUMBIA PARK TRAIL

WINDMILL ROAD

℄ WINDMILL ROAD

20.0'

20.0'

65.0'

GENERAL NOTES:

1. SEE GRADING DRAWING C.08 FOR ADDITIONAL DETAILS.

CONSTRUCTION NOTES:

1. STORM DRAIN INLET PROTECTION PER STD I-40.20-00
2. HIGH VISIBILITY FENCE PER WSDOT STD I-10.10-01
3. SILT FENCE PER COR STD S16
4. STABILIZED CONSTRUCTION ENTRANCE PER WSDOT STD I-80.10-02

LEGEND:

CONSTRUCTION LIMITS

HIGH VISIBILITY FENCE

SILT FENCE

Know what's **below**
Call before you dig

100% SUBMITTAL

0 10 20 40
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"= 20'

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CIVIL
TEMPORARY SEDIMENT AND EROSION CONTROL PLAN

DRAWING: C.05
SHEET: 7 OF 97

Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-EC.dwg
jonc
Jun 20, 2022 - 8:12am

PROPERTY LINE

CLEAR AND GRUB LIMITS

EXISTING WETLAND BUFFER

EXISTING ROW

STA. 12+78.15, 25.70' LT
BEGIN REMOVE EXISTING CURB

REMOVE EXISTING HMA

REMOVE EXISTING SIDEWALK

REMOVE EXISTING CURB AND GUTTER

A 100+00

A 101+00

A 101+06

T 10+00

T 11+00

T 12+00

T 13+00

T 14+00

T 15+00

℄ QUEENSGATE TRANSIT HUB TRANSIT WAY

WSDOT ℄

CLEAR AND GRUB LIMITS

PROTECT IN PLACE

REMOVE EX. PARKING STRIPING

STA. 11+85.83, 62.12' RT
BEGIN REMOVE EXISTING CURB

REMOVE EXISTING HMA

STA. 11+85.86, 74.15' RT
END REMOVE EXISTING CURB

1

STA. 13+82.61, 21.36' LT
END REMOVE EXISTING CURB

STA. 13+96.20, 32.89' RT
BEGIN REMOVE EXISTING CURB

REMOVE EXISTING HMA

PROTECT IN PLACE

STA. 14+82.28, 47.82' LT
END REMOVE EXISTING CURB

REMOVE EXISTING HMA

REMOVE EXISTING CURB AND GUTTER

REMOVE EXISTING SIDEWALK

15+01

COLUMBIA PARK TRAIL

WINDMILL ROAD

℄ COLUMBIA PARK TRAIL

CONSERVATION EASEMENT AREA

℄ WINDMILL ROAD

GENERAL NOTES:

1. SEE UTILITY PLANS FOR ALL REMOVALS OR RELOCATES.
2. SEE DRAINAGE SHEETS FOR ALL DRAINAGE REMOVALS OR RELOCATES.
3. PROTECT ALL EXISTING UTILITIES.

LEGEND:

- C&G — CLEARING AND GRUBBING LIMITS
- REMOVE CEMENT CONCRETE CURB AND GUTTER
- SAWCUT LIMITS
- REMOVE EX. CEMENT CONCRETE SIDEWALK
- REMOVE EX. HMA

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

N

0 10 20 40
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677

SCALE: 1"= 20'

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QUEENSGATE TRANSIT HUB

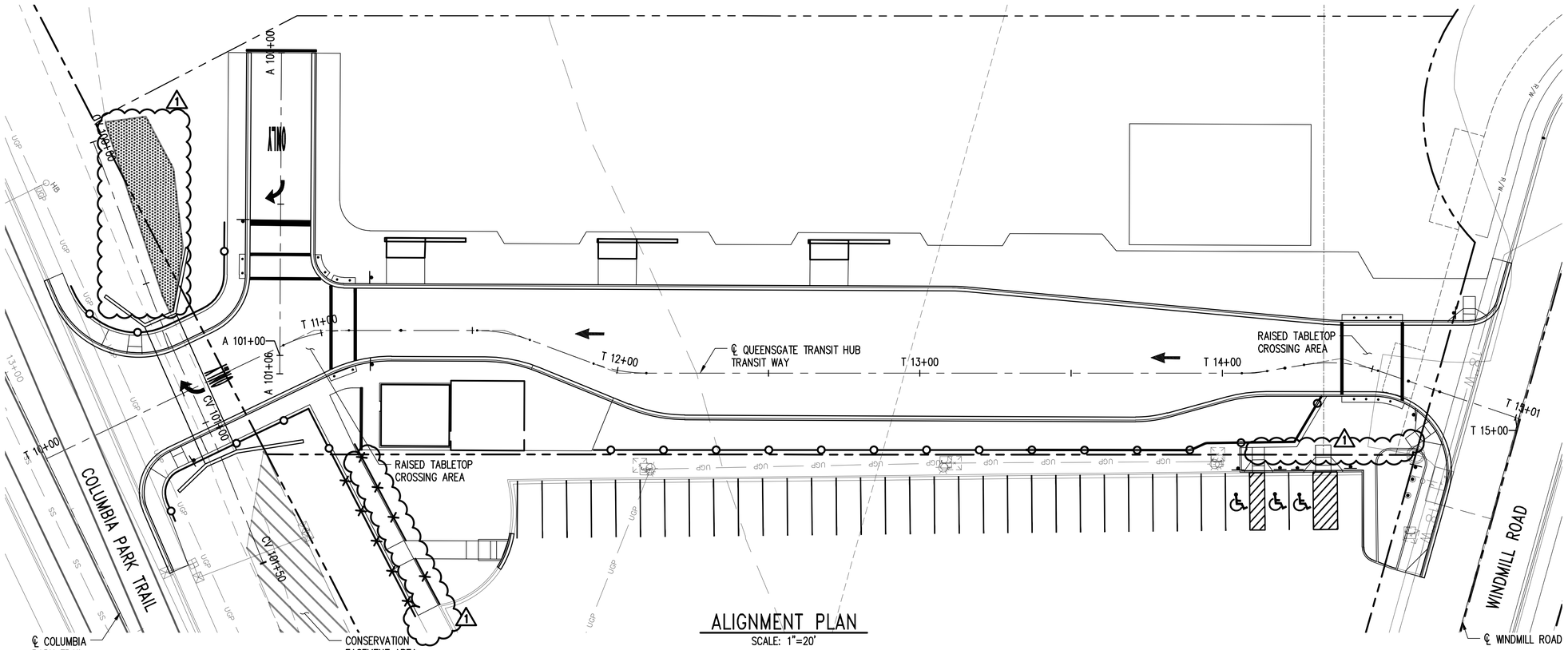
CIVIL
DEMOLITION PLAN

DRAWING: C.06

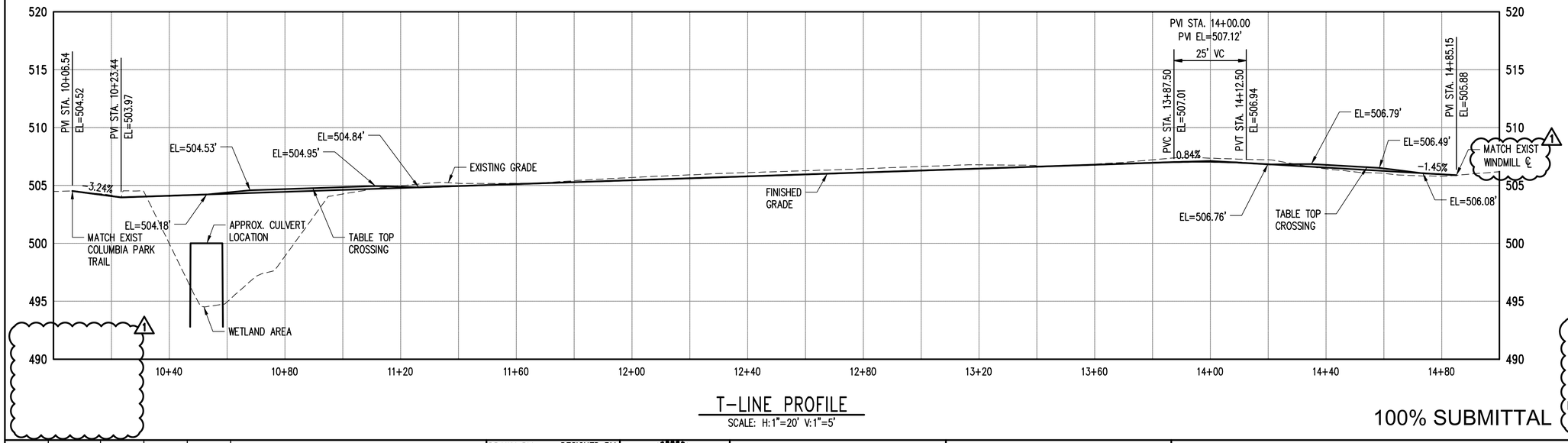
SHEET: 8 OF 97

GENERAL NOTES:

1. FOR DRIVEWAY DETAILS, SEE DRAWINGS C.14 – C.16.
2. FOR CULVERT PLAN AND DETAILS, SEE DRAWINGS C.22 & C.23.
3. FOR GRADING PLAN, SEE DRAWING C.08.



ALIGNMENT PLAN
SCALE: 1"=20'



T-LINE PROFILE
SCALE: H:1"=20' V:1"=5'

100% SUBMITTAL

811 Know what's below Call before you dig

0 10' 20' 40'
1 inch = 20 ft. HORZ
0 2.5' 5' 10'
1 inch = 5 ft. VERT

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. : 2000677
S C A L E: AS NOTED

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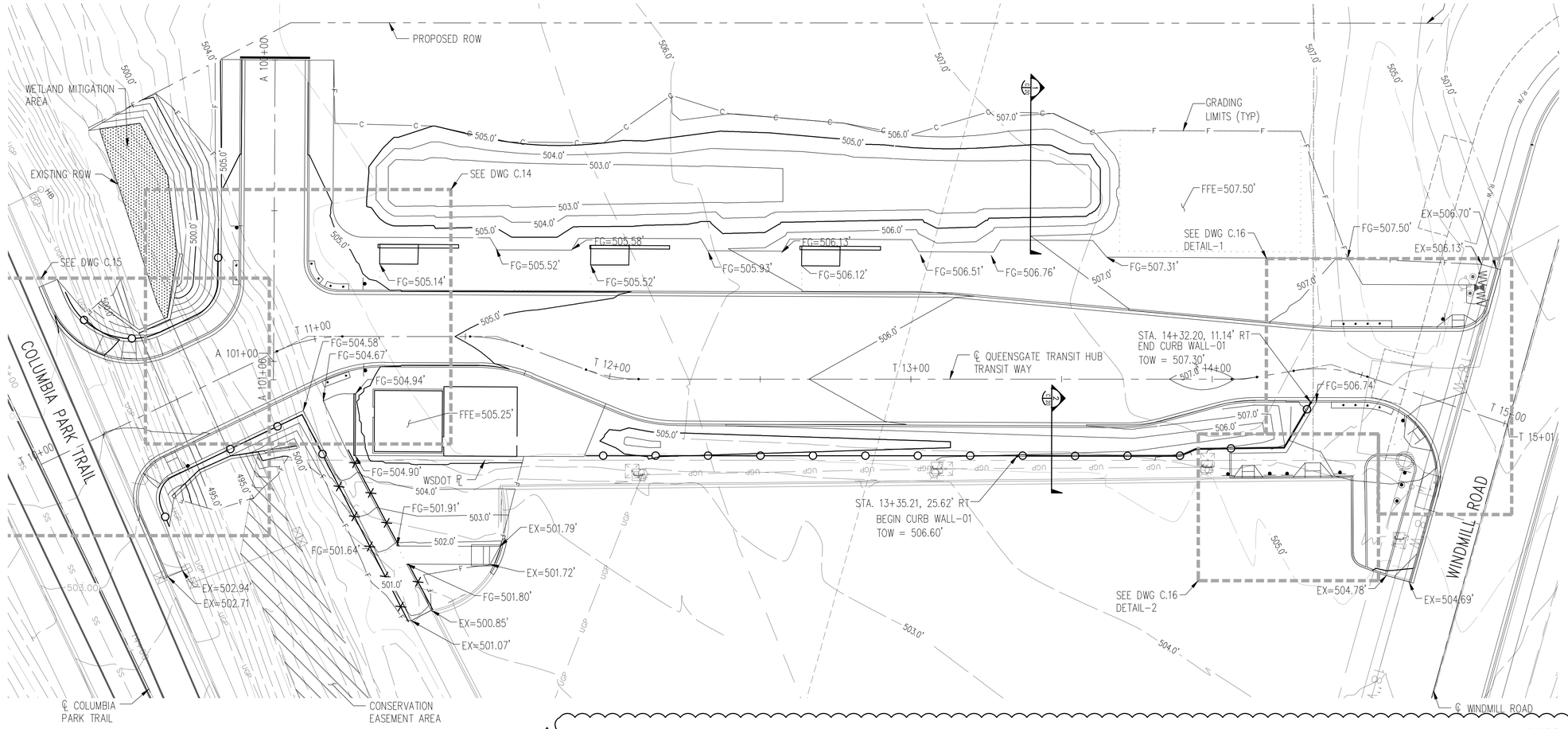
CIVIL
ALIGNMENT PLAN AND PROFILE

DRAWING: C.07
SHEET: 9 OF 97

Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-CA.dwg jonc Jun 20, 2022 - 8:14am



GENERAL NOTES:

1. FOR DRIVEWAY DETAILS, SEE DRAWINGS C.14 TO C.16.
2. FOR CULVERT PLAN AND DETAILS, SEE DRAWINGS C.22 & C.23.
3. FOR DRAINAGE PLAN AND DETAILS, SEE DRAWINGS C.18 – C.20.

LEGEND:

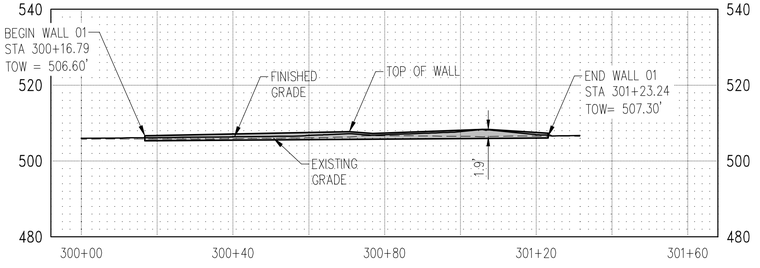
——C—— CUT LIMITS

——F—— FILL LIMITS

1

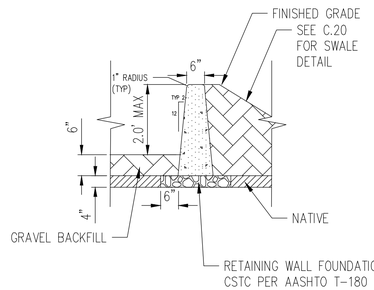
EARTHWORK QUANTITIES	
TOTAL EX. INCL. HAUL	1,015 CY
GRAVEL BORROW INCL HAUL	410 CY
EMBANKMENT COMPACTION	410 CY
FOR PERMITTING PROCESS ONLY	

1



CURB WALL 01 PROFILE

SCALE: H: 1"=20' V: 1"=20'



CURB WALL 01 DETAIL

SCALE: NTS

CURB WALL 01 NOTES

1. CONCRETE SHALL BE AIR-ENTRAINED, 6 SACK, COMMERCIAL CONCRETE.
2. HANDRAIL OR FENCING INSERTS SHALL BE INCORPORATED INTO THE WALL DESIGN, AS REQUIRED AND FLUSH TO THE TOP OF THE WALL AT DESIGNATED SPACING.
3. BACKFILL BEHIND CURB WALLS IN LANDSCAPED AREAS SHALL BE PLACED IN 6" MAX HORIZ LAYERS AND COMPACTED TO 85% MAX DENSITY PER AASHTO T-180. BACKFILL IN FRONT OF WALLS SHALL BE COMPACTED TO 92% MAX DENSITY.
4. BACKFILL SHALL NOT BE PLACED UNTIL THE CONCRETE HAS ATTAINED 90% OF ITS DESIGN STRENGTH AND CURED FOR AT LEAST 14-DAYS.

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

0 10 20 40
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

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CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"= 20'

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BEN FRANKLIN TRANSIT
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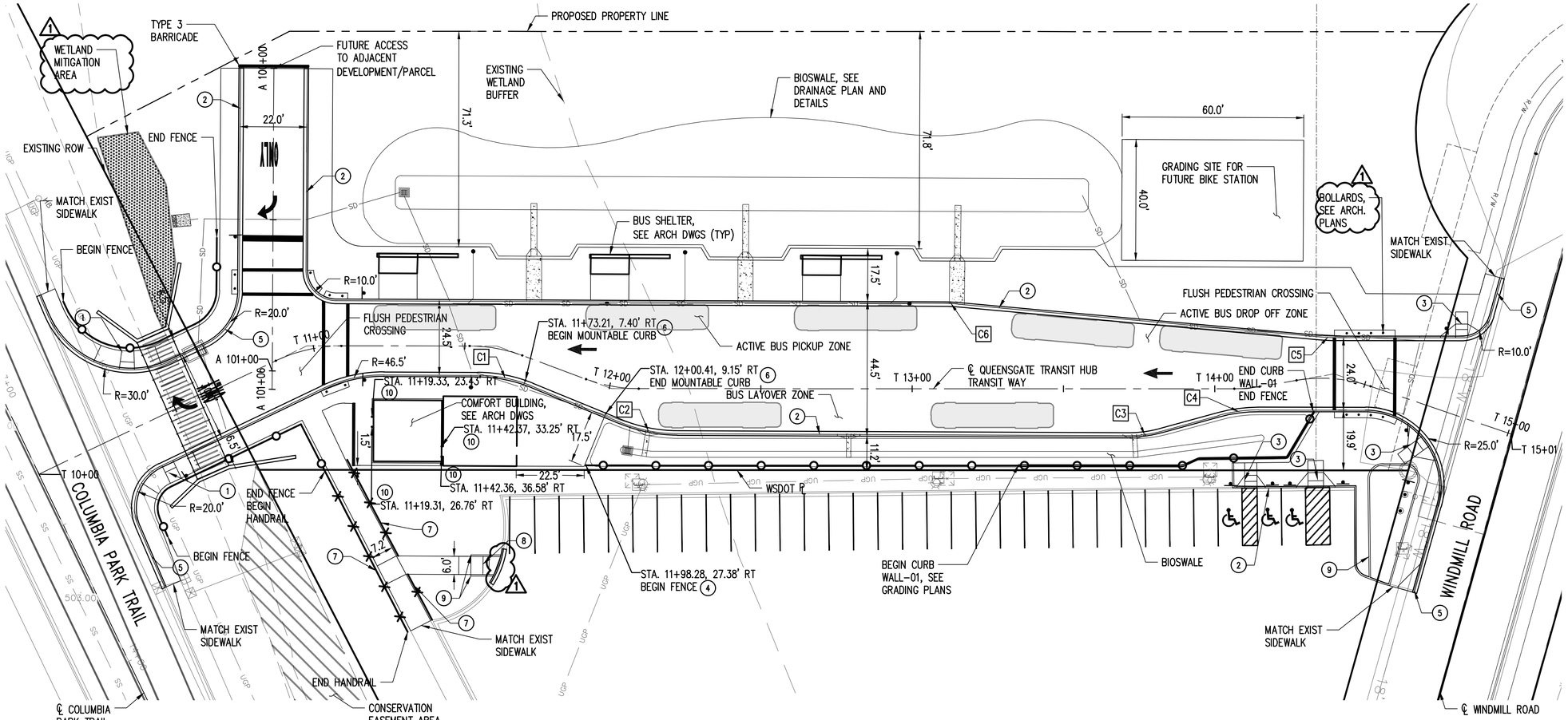
CIVIL
GRADING PLAN

DRAWING: C.08
SHEET: 10 OF 97



CURVE 1	TC EL	BC EL
PC STA 11+54.79, 9.65' RT	505.08	505.30
1/2		
PT STA 11+75.84, 8.43' RT	505.38	504.88
Δ= 12°29'9" R= 48.00 L= 10.46'		

CURVE 2	TC EL	BC EL
PC STA 12+04.70, 11.48' RT	505.77	505.27
1/2		
PT STA 12+22.30, 14.91' RT	505.37	504.87
Δ= 22°01'00" R= 50.00' L= 19.20'		

CURVE 3	TC EL	BC EL
PC STA 13+71.34, 15.56' RT	507.11	506.61
1/2		
PT STA 13+82.09, 14.13' RT	507.21	506.71
Δ= 15°35'04" R= 40.00' L= 10.88'		

CURVE 4	TC EL	BC EL
PC STA 14+01.29, 8.87' RT	507.11	506.61
1/2		
PT STA 14+13.49, 7.66' RT	506.89	506.39
Δ= 15°22'00" R= 50.00' L= 13.41'		

CURVE 5	TC EL	BC EL
PC STA 14+35.35, 13.63' LT	506.57	506.07
1/2		
PT STA 14+38.89', 13.56' LT	506.56	506.06
Δ= 5°09'24" R= 50.00' L= 4.50'		

CURVE 6	TC EL	BC EL
PC STA 13+10.70, 28.21' LT	505.92	505.42
1/2		
PT STA 13+15.00, 28.00' LT	505.95	505.45
Δ= 4°56'20" R= 50.00' L= 4.31'		

GENERAL NOTES:

1. FOR DRIVEWAY DETAILS, SEE DRAWINGS C.12 – C.14.
2. FOR BIOSWALE DETAILS, SEE DRAWING C20.
3. CURB HEIGHTS ARE 6" UNLESS OTHERWISE NOTED.
4. SEE DRIVEWAY DETAILS FOR ADDITIONAL CURVE DATA.

CONSTRUCTION NOTES:

1. CONSTRUCT CURB RAMP 1A PER COR ST-05
2. CONSTRUCT INTEGRAL CURB, SEE PAVING DETAILS
3. CONSTRUCT CURB RAMP 2B PER COR ST-04
4. INSTALL CHAIN LINK FENCE TYPE 4 PER WSDOT L-20.10-03
5. CONSTRUCT CURB, GUTTER AND SIDEWALK PER COR ST-01
6. CONSTRUCT MOUNTABLE CURB PER WSDOT STD F-10.62-02
7. CONSTRUCT PEDESTRIAN RAILING
8. CONSTRUCT CURB RAMP PER COR ST-06
9. CONSTRUCT PEDESTRIAN CURB PER WSDOT STD F-10.12-04
10. CONSTRUCT 6.0" CURB WITH EXPANSION JOINT ADJACENT TO COMFORT BUILDING, SEE C.17. DOOR BLOCK OUTS MUST MATCH ARCHITECTURAL PLANS.

LEGEND:

- CHAIN LINK FENCE
- PEDESTRIAN HANDRAIL
- TYPE 3 BARRICADE PER WSDOT STD PLAN K-80.20-00

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100% SUBMITTAL

0 10 20 40
1 inch = 20 feet

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S C A L E: 1"= 20'

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BEN FRANKLIN TRANSIT
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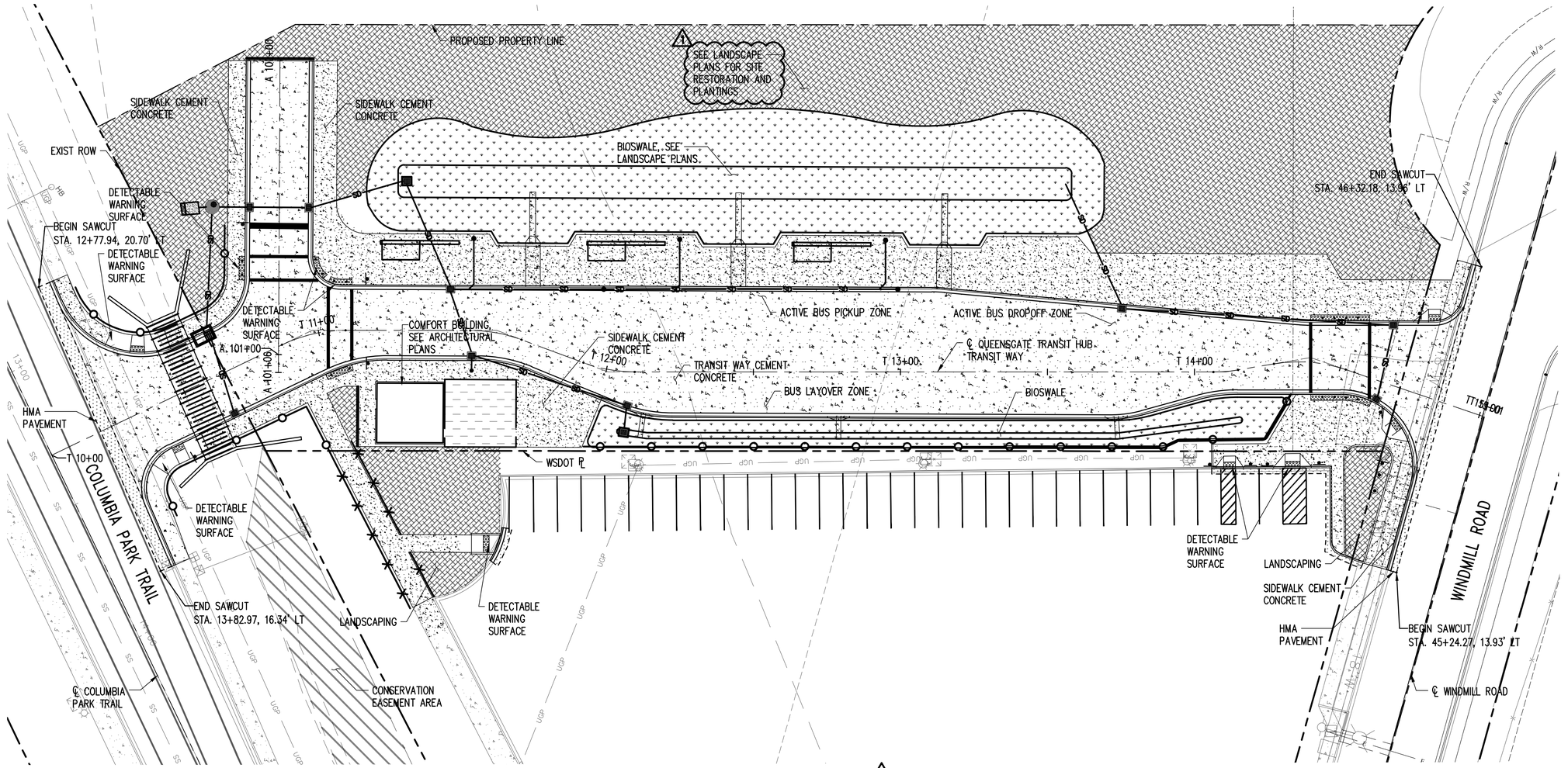
CIVIL
SITE PLAN

DRAWING: C.09
SHEET: 11 OF 97



GENERAL NOTES:

1. FOR TYPICAL SECTIONS, SEE DRAWINGS C.11 & C.12 .
2. ALL CURBS ARE 6" UNLESS OTHERWISE NOTED.
3. SEE ARCHITECTURAL SITE PLAN FOR SIDEWALK JOINTING PLAN AND DETAILS.

LEGEND:

- PCC PAVEMENT FOR HEAVY VEHICLE TRAFFIC
- CONCRETE SIDEWALK
- LANDSCAPE, SEE LANDSCAPE PLANS
- HMA CL 1/2" PG 64-28
- DETECTABLE WARNING SURFACE
- CRUSHED SURFACE BASE COURSE
- WETLAND CONSERVATION AREA
- BIOINFILTRATION SWALE

1

PROPOSED PROJECT AREAS		AREA (SQFT)	AREA SUBTOTALS (SQFT)	TOTAL AREA (SQFT)
PERVIOUS AREAS	PERVIOUS AREAS (RANGE LAND WITH POOR VEGETATION)	18,550	31,425	64,800
	PERVIOUS AREAS (SWALE AND LAWN)	12,875		
IMPERVIOUS AREAS	SIDEWALK (NON-POLLUTION GENERATING)	12,325	33,375	
	PAVEMENT (POLLUTION GENERATING)	17,350		
	BUILDINGS (NON-POLLUTION GENERATING)	3,700		

Know what's below Call before you dig

100% SUBMITTAL

N

0 10 20 40
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
JOB No. :2000677
SCALE: 1"= 20'

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CIVIL
PAVING PLAN

DRAWING: C.10
SHEET: 12 OF 97

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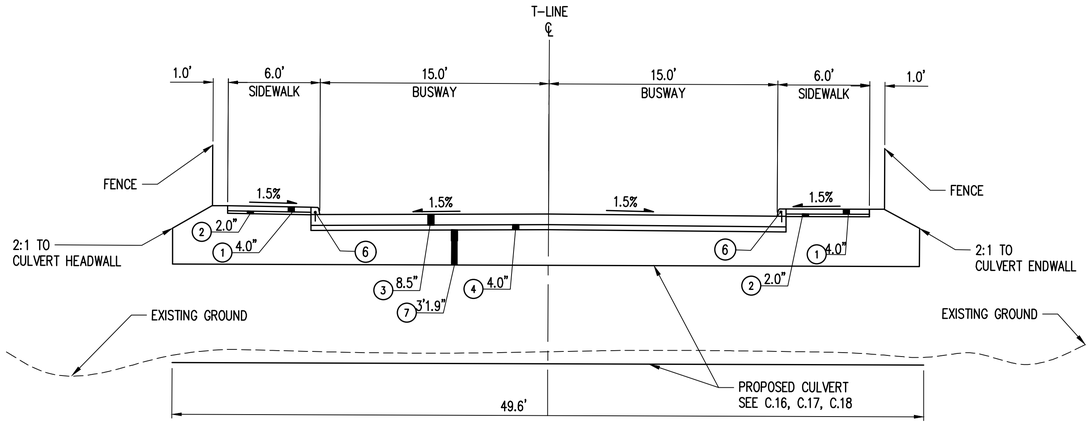
jonc
Jun 20, 2022 - 8:18am



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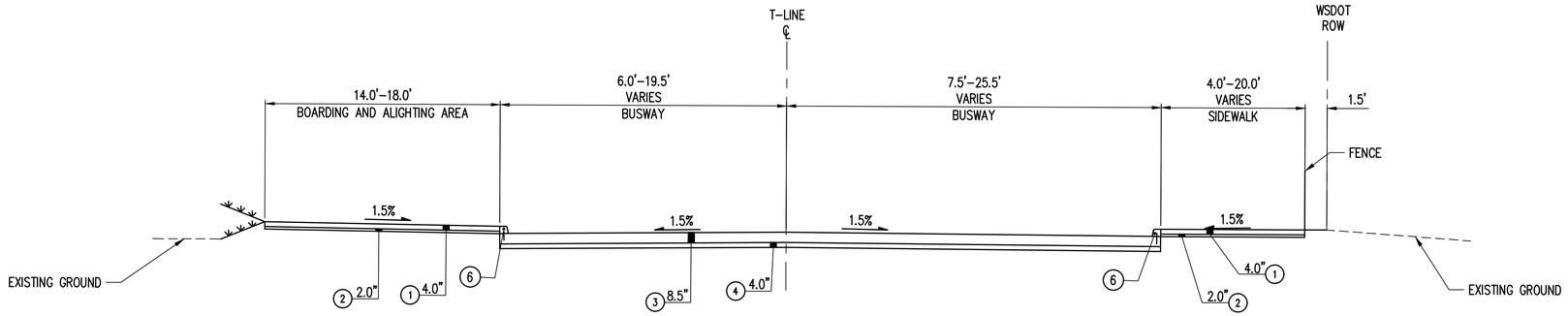
T 10□□□□0 T□ T 10□□□00



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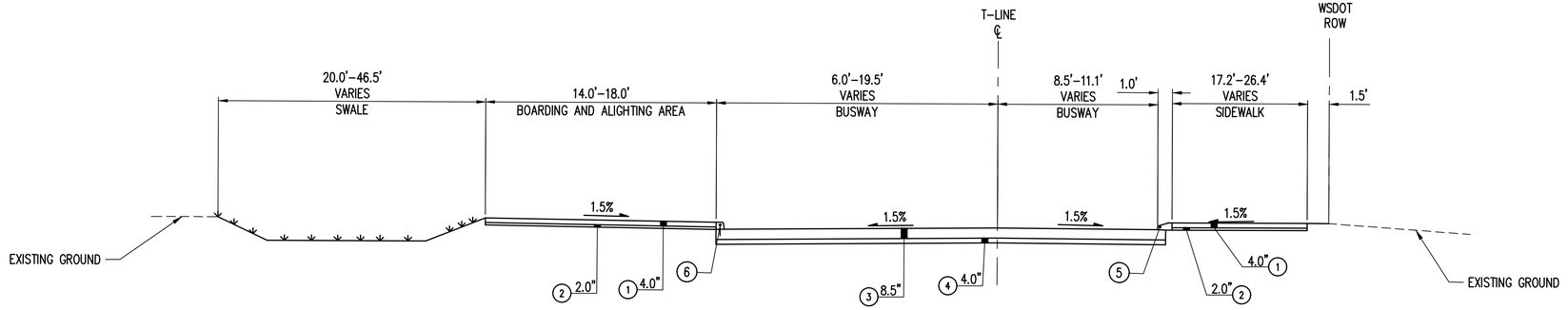
□TS

T 10□□□00 T□ T 11□□□□1

T 1□□□1□□1 T□ T 1□□□□00



□U□□□S□AT□ TRA□SIT □ A□

□TS

T 11□□□□1 T□ T 1□□00□1

GENERAL NOTES:

1. SEE DRAWING A.12 FOR PLATFORM CONCRETE JOINTING AND DETAILS

CONSTRUCTION NOTES:

1. CONC. SIDEWALK PER CITY OF RICHLAND STD–01
2. CRUSHED SURFACE TOP COARSE
3. PCC BUSWAY
4. CRUSHED SURFACE BASE COURSE
5. PRECAST SLOPED MOUNTABLE CURB PER WSDOT STD PLAN F–10.62–02
6. CONC. CURB PER CITY OF SEATTLE STD PLAN 410C
7. STRUCTURAL BACKFILL

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"= 5'

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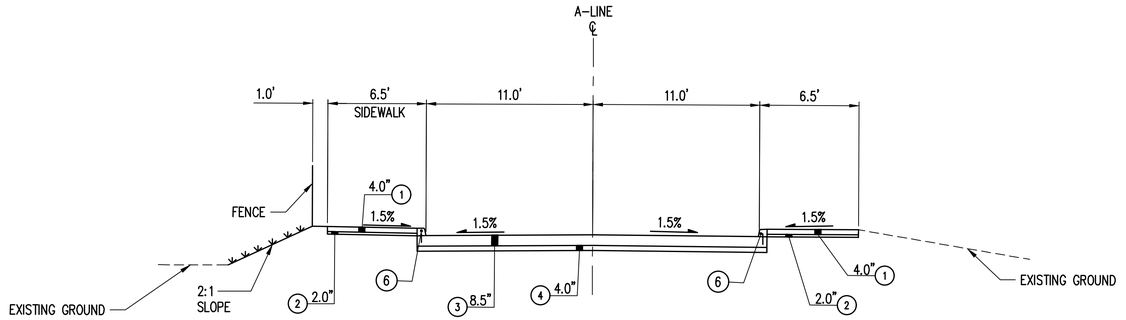
QUEENSGATE TRANSIT HUB

CIVIL
TYPICAL SECTIONS

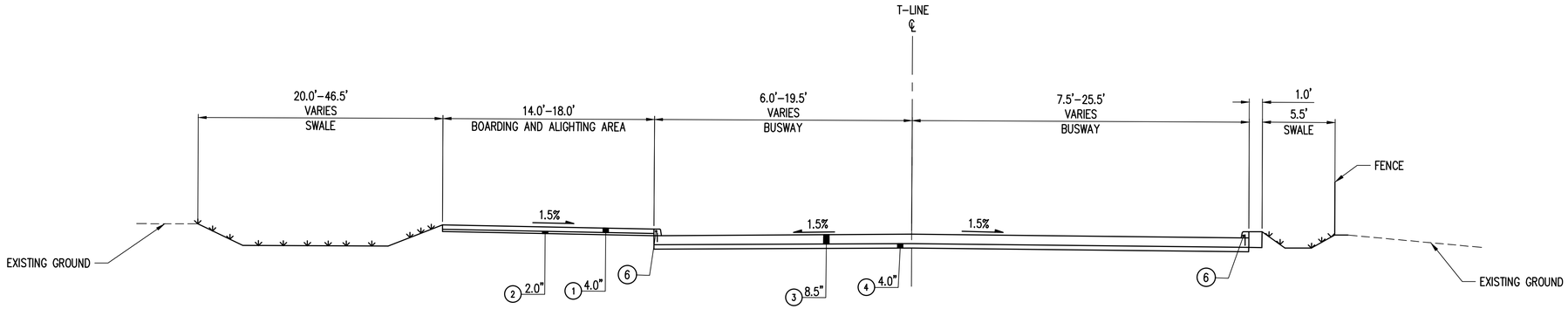
DRAWING: C.11
SHEET: 13 OF 90



DEVELOPMENT DRIVEWAY

NTS

A 100+00.00 TO A 100+82.30



QUEENSGATE TRANSIT WAY

NTS

T 12+00.41 TO T 13+71.81

GENERAL NOTES:

1. SEE DRAWING A.12 FOR PLATFORM CONCRETE JOINTING AND DETAILS

CONSTRUCTION NOTES:

1. CONC. SIDEWALK PER CITY OF RICHLAND STD-01
2. CRUSHED SURFACE TOP COARSE
3. PCC BUSWAY
4. CRUSHED SURFACE BASE COURSE
5. PRECAST SLOPED MOUNTABLE CURB PER WSDOT STD PLAN F-10.62-02
6. CONC. CURB PER CITY OF SEATTLE STD PLAN 410C

90% PERMIT SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JES
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DATE 07/16/2021
JOB No. :2000677
SCALE: 1"= 5'

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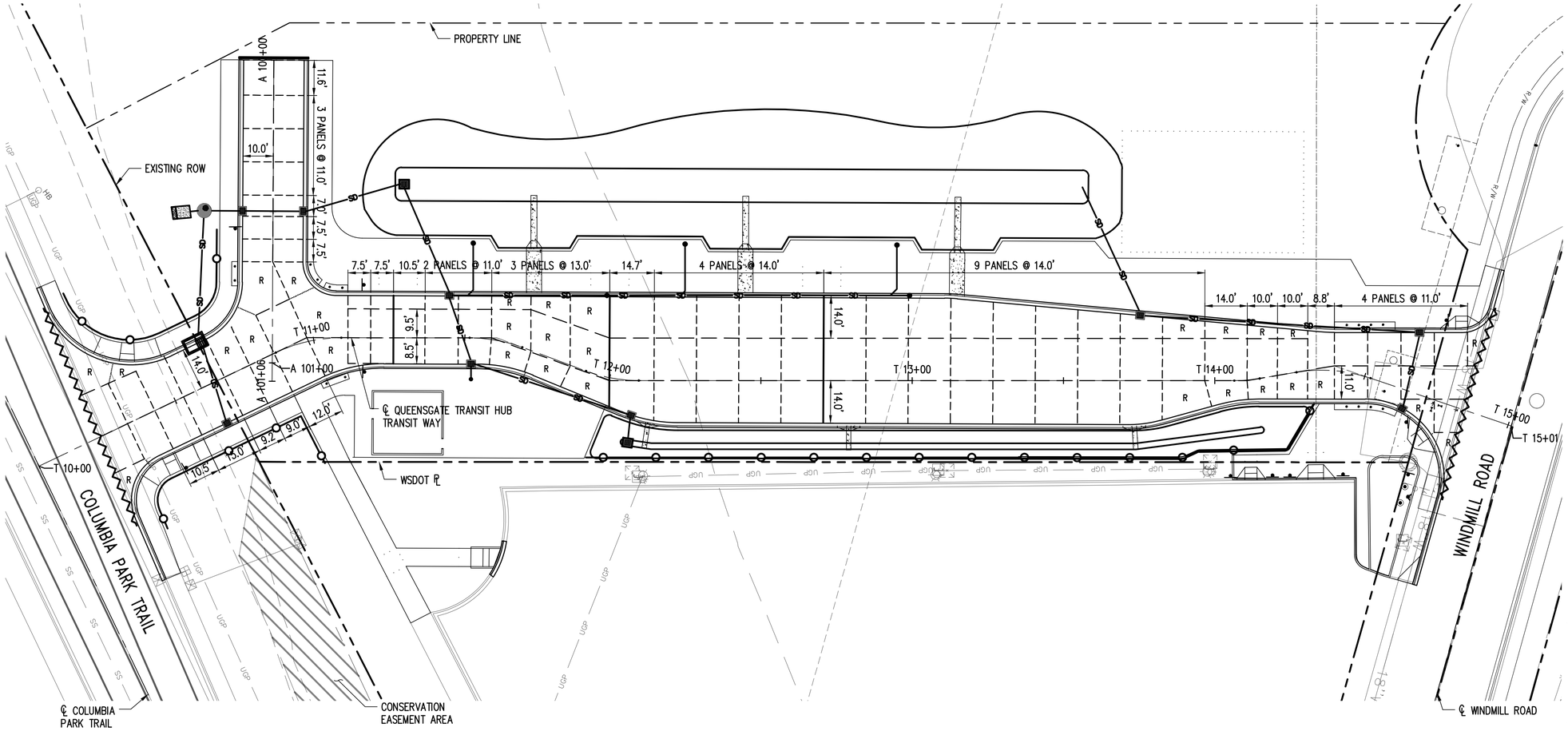
CIVIL
TYPICAL SECTIONS

DRAWING: C.12
SHEET: 14 OF 90



GENERAL NOTES:

1. JOINTS SHALL BE IN ACCORDANCE WITH WSDOT STANDARD PLANS A40.00, A40.10 AND A40.15. JOINT SPACING SHALL BE 15'-0" MAX, NOT TYPICAL, AS SHOWN IN A40.10.
2. ALL TRANSVERSE CONTRACTION JOINTS MUST BE CONTINUOUS THROUGH CURB. CURB JOINTS SHALL BE COINCIDENT WITH PANEL JOINTS. EXPANSION JOINT FILLER MUST BE FULL DEPTH AND EXTENDED THROUGH CURB. JOINTS SHALL BE PERPENDICULAR TO CURBS/PANEL EDGES FOR A MINIMUM LENGTH OF 1.5'.
3. ANGLES OF JOINTS LESS THAN 60 DEGREES SHALL NOT BE PERMITTED.
4. UTILITY RIMS AND STRUCTURE LOCATIONS MAY VARY, FIELD VERIFY AND PLACE ISOLATION JOINTS IN ACCORDANCE WITH WSDOT STANDARD PLAN A40.15.
5. SEE ARCHITECTURAL SITE PLAN FOR SIDEWALK JOINTING PLAN.
6. SEE PAVING AND GRADING DETAILS FOR JOINTING DETAILS.

LEGEND:

- LONGITUDINAL CONTRACTION/CONSTRUCTION JOINT
- TRANSVERSE CONTRACTION/CONSTRUCTION JOINT
- HMA TRANSITION DETAIL, SEE WSDOT STD PLAN A-40.10
- R — REINFORCED PANEL, #4 @ 12" OC EV
- ISOLATION JOINT
- UNREINFORCED LONGITUDINAL CONTRACTION JOINT

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

N

0 10 20 40
1 inch = 20 feet

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1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

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J O B No. :2000677
S C A L E: 1"= 20'

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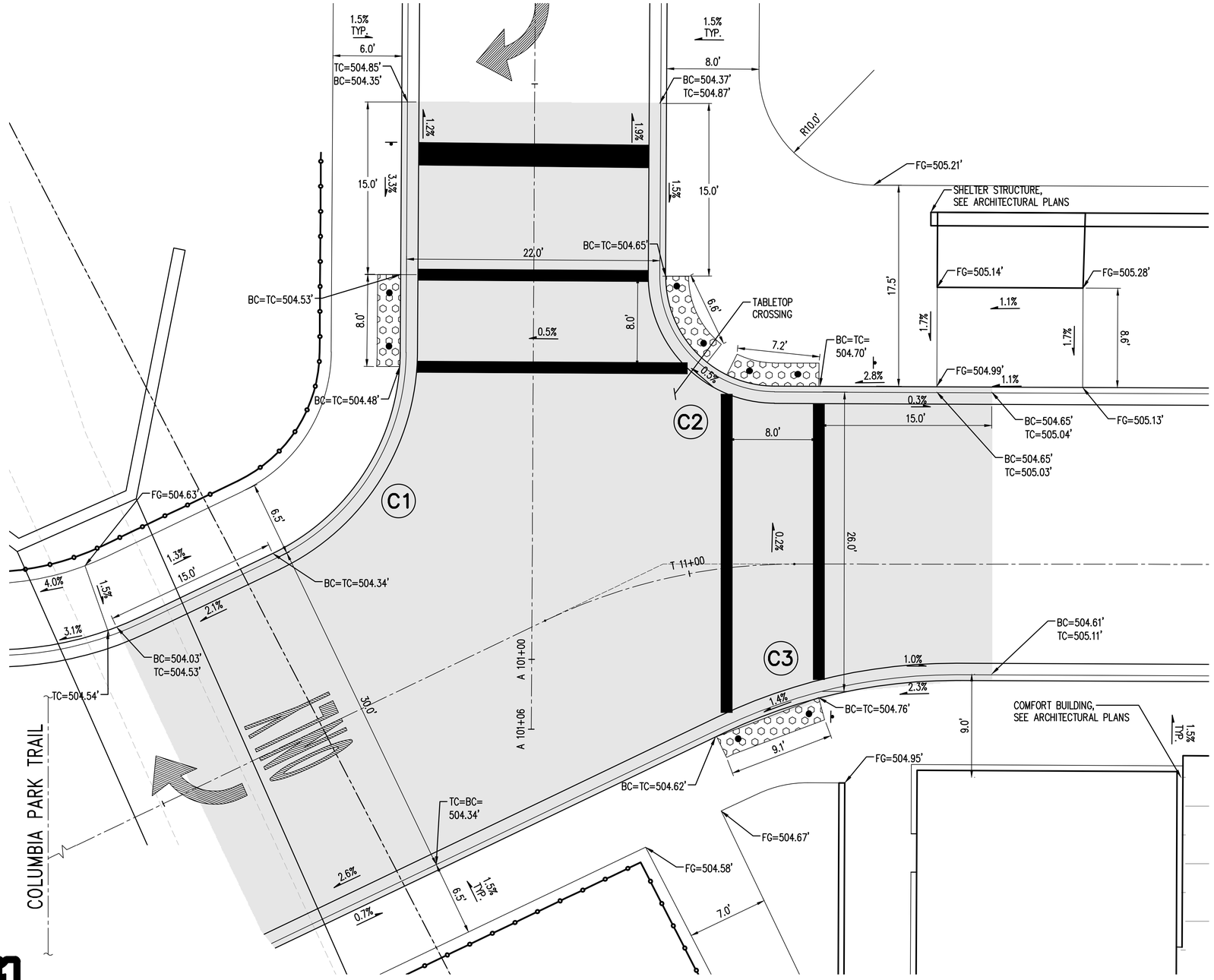
CIVIL
CONCRETE PAVEMENT JOINT DETAIL

DRAWING: C.13
SHEET: 15 OF 97



SOUTH TABLE TOP CROSSING DETAIL

SCALE: 1" = 5'

1 / C.08

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C1	PC	10+67.97, 14.99' LT.	504.33	Δ= 64°03'28" R=20.00' T=12.50' L=22.35'
	1/4	10+73.49, 15.76' LT.	504.39	
	1/2	10+78.58, 18.03' LT.	504.41	
	3/4	10+82.85, 21.61' LT.	504.46	
	PT	10+85.96, 26.23' LT.	504.48	

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C2	PC	11+01.43, 25.91 LT.	504.64	Δ= 90°21'20" R=10.00' T=10.06' L=15.77'
	1/4	11+01.53, 22.00' LT.	504.65	
	1/2	11+02.73, 18.47' LT.	504.65	
	3/4	11+04.96, 15.95' LT.	504.66	
	PT	11+07.86, 14.97' LT.	504.66	

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C3	PC	11+00.27, 13.71' RT.	504.62	Δ= 27°47'52" R=46.50' T=11.50' L=22.56'
	1/4	11+07.56, 12.09' RT.	504.70	
	1/2	11+13.38, 10.58' RT.	504.77	
	3/4	11+18.95, 9.72' RT.	504.74	
	PT	11+24.58,9.55' RT	504.69	

Know what's below **Call** before you dig

100% SUBMITTAL

N

0 2.5' 5' 10'
1 inch = 5 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
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DATE 06/17/2022
JOB No. :2000677
SCALE: AS SHOWN

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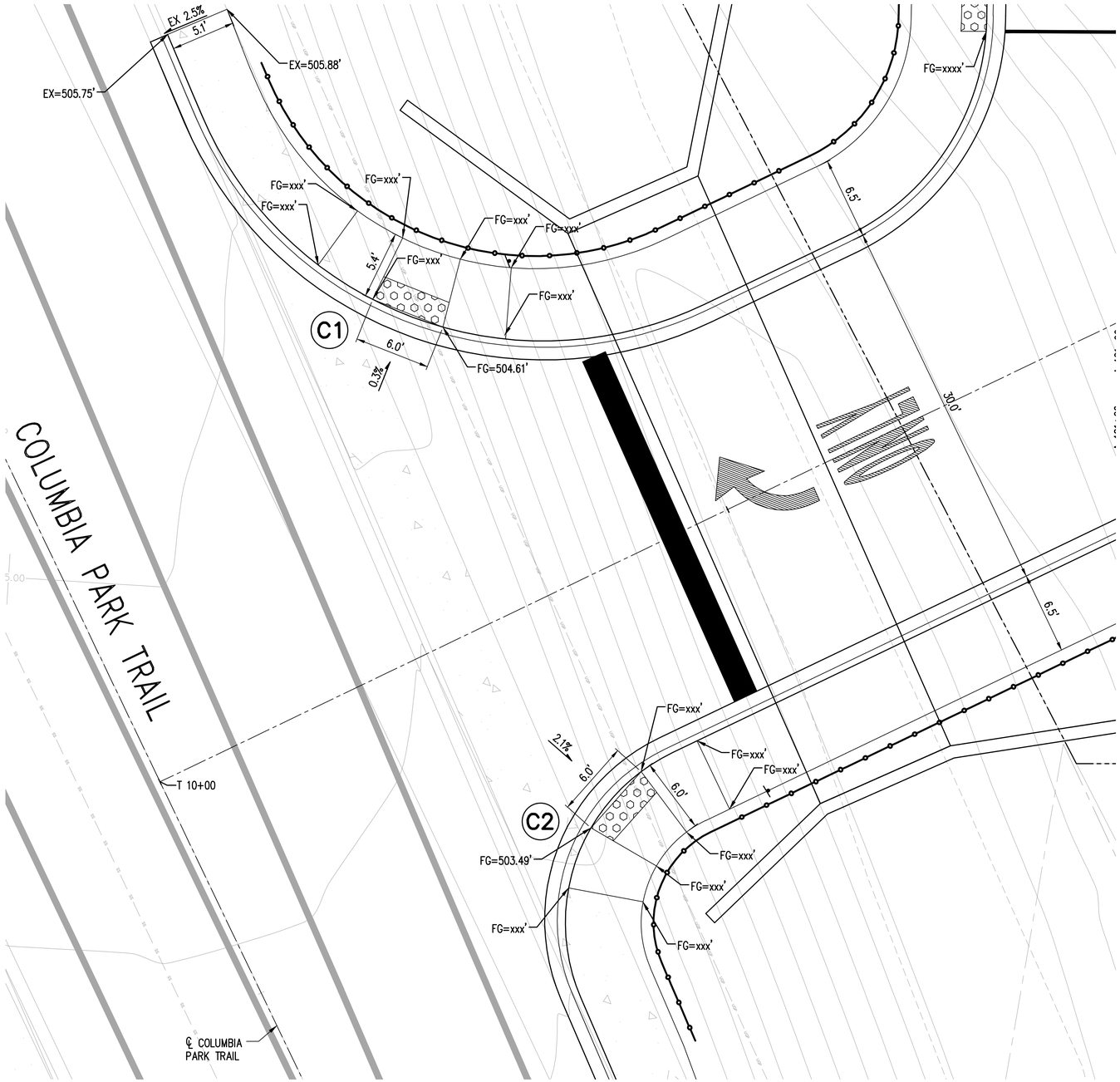
CIVIL
DRIVEWAY DETAIL

DRAWING: C.14
SHEET: 16 OF 97



SOUTH DRIVEWAY DETAIL

SCALE: 1" = 5'

1

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C1	PC	10+25.37, 46.23' LT.	505.09	Δ= 83°45'59" R=30.00' T=26.90' L=43.86'
	1/4	10+27.29, 34.38' LT	504.81	
	1/2	10+33.70, 24.22' LT.	504.53	
	3/4	10+43.58, 17.39' LT.	504.25	
	PT	10+55.34, 14.99' LT.	504.08	

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C2	PC	10+22.25, 29.39' RT.	502.99	Δ= 87°30'35" R=15.00' T=14.36' L=22.91'
	1/4	10+23.56, 23.85' RT.	503.19	
	1/2	10+26.84, 19.19' RT.	503.39	
	3/4	10+31.62, 16.10' RT.	503.60	
	PT	10+37.24, 15.01' RT.	503.80	

100% SUBMITTAL

N

0 2.5' 5' 10'
1 inch = 5 feet

NO.	DATE	BY	CHD.	APPR.	REVISION

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J O B No. :2000677

REGISTERED PROFESSIONAL ENGINEER — STATE OF WASHINGTON — 24080 — ROLAND J. LIMMEROTH

S C A L E: 1"= 5'

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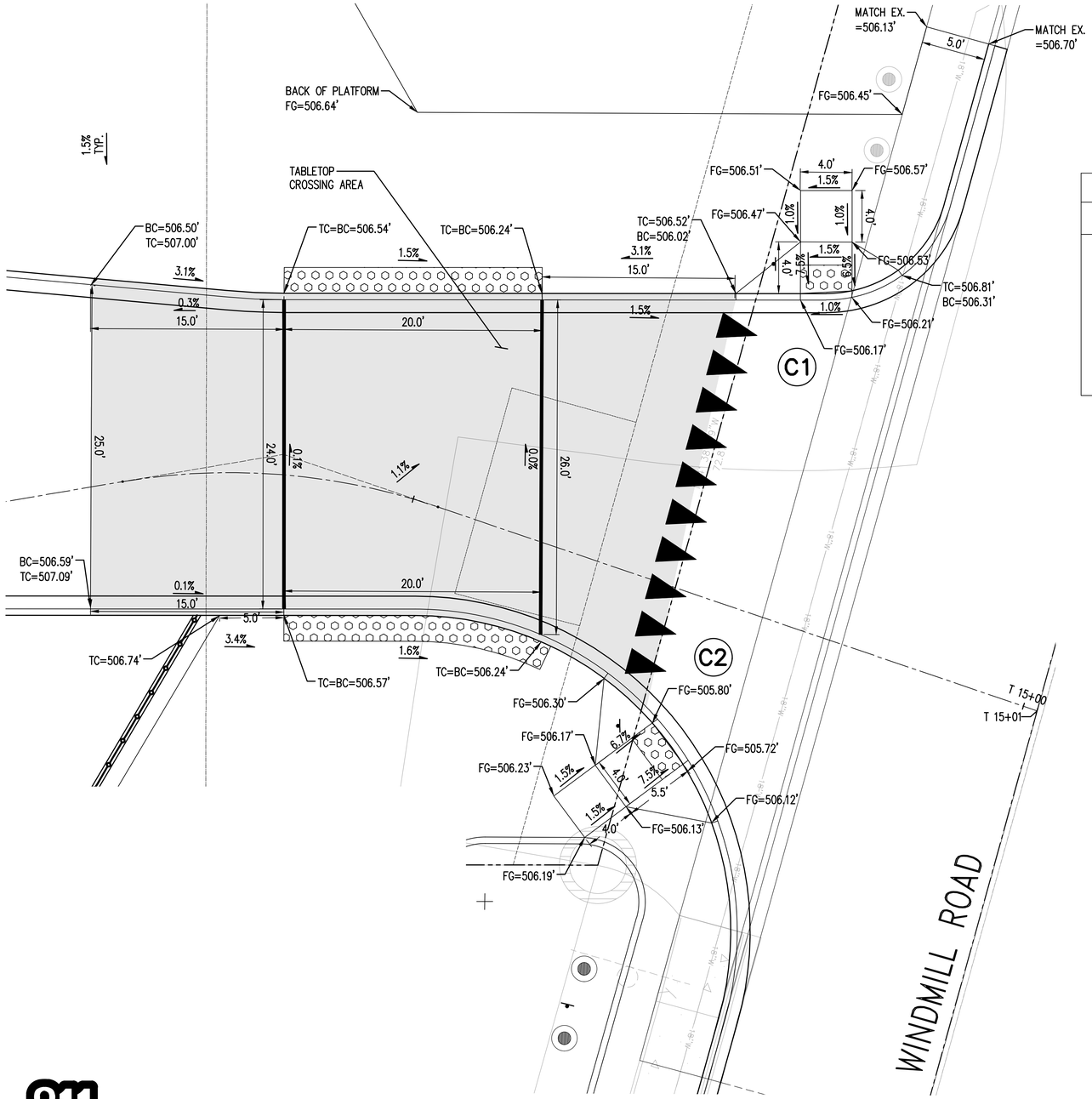
CIVIL
DRIVEWAY DETAIL

DRAWING: C.15
SHEET: 17 OF 90



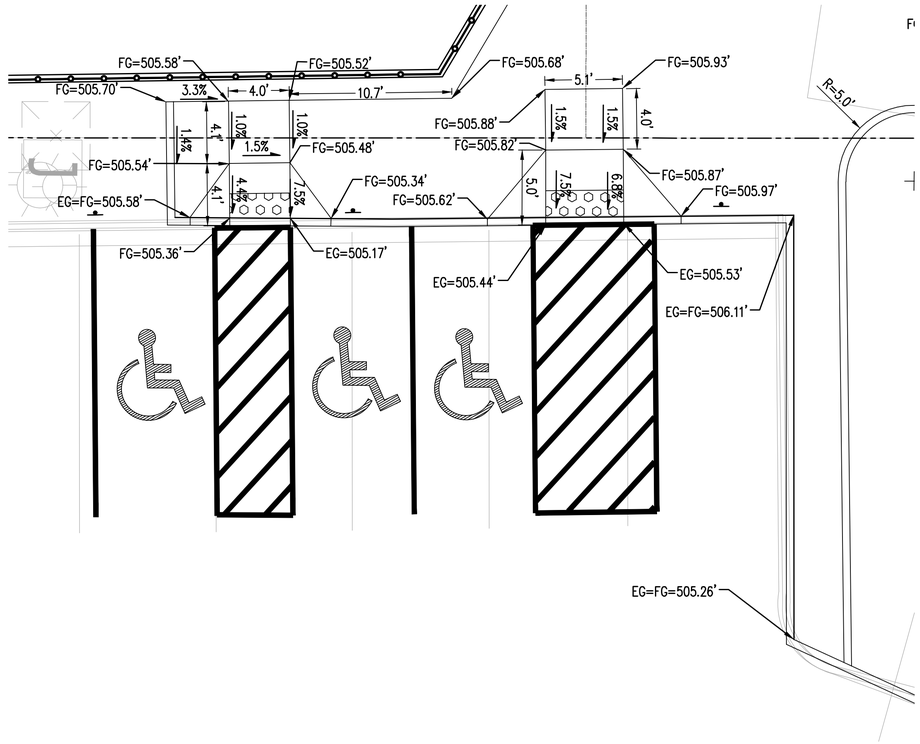
NORTH TABLETOP CROSSING AND DRIVEWAY DETAIL

1

SCALE: 1" = 5'

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C1	PC	14+75.36, 24.91' LT.	506.67	Δ= 74°29'4" R=10.00' T=7.60' L=13.00'
	1/4	14+78.22, 26.43' LT.	506.54	
	1/2	14+80.44, 28.78' LT.	506.31	
	3/4	14+81.79, 31.73' LT.	506.39	
	PT	14+82.13, 34.94' LT.	506.54	

CURB RETURN TABLE				
	POINT	STATION, OFFSET	ELEVATION AT FLOW LINE	CURVE GEOMETRY
C2	PC	14+52.90, 8.06' RT.	506.44	Δ= 105°36'27" R=25.00' T=32.94' L=46.08'
	1/4	14+64.27, 6.96' RT.	506.21	
	1/2	14+74.94, 11.02' RT.	505.77	
	3/4	14+82.69, 19.41' RT.	505.55	
	PT	14+85.9, 30.37' RT.	504.68	



PARKING AREA DETAIL

2

SCALE: 1" = 5'

100% SUBMITTAL

0 2.5' 5' 10'

1 inch = 5 feet

Know what's below
Call before you dig

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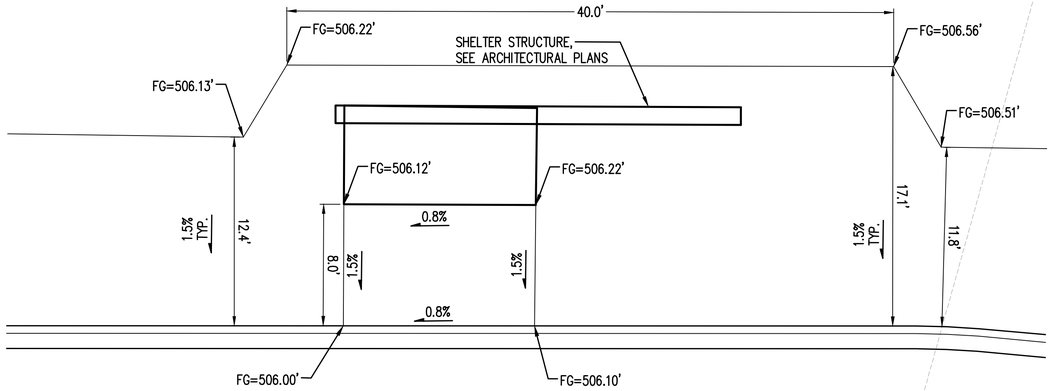
CIVIL
DRIVEWAY DETAIL

DRAWING: C.16
SHEET: 18 OF 90

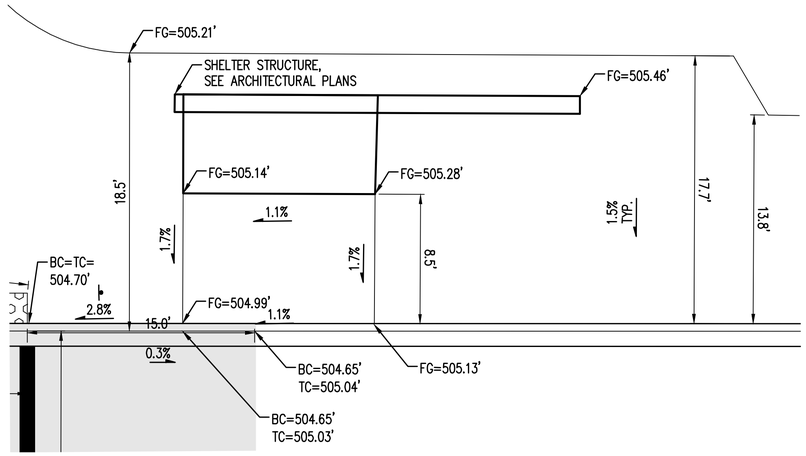
May 20, 2022 - 12:03pm jonc Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-PD.dwg



SOUTH BOARDING AREA

SCALE: 1" = 5'

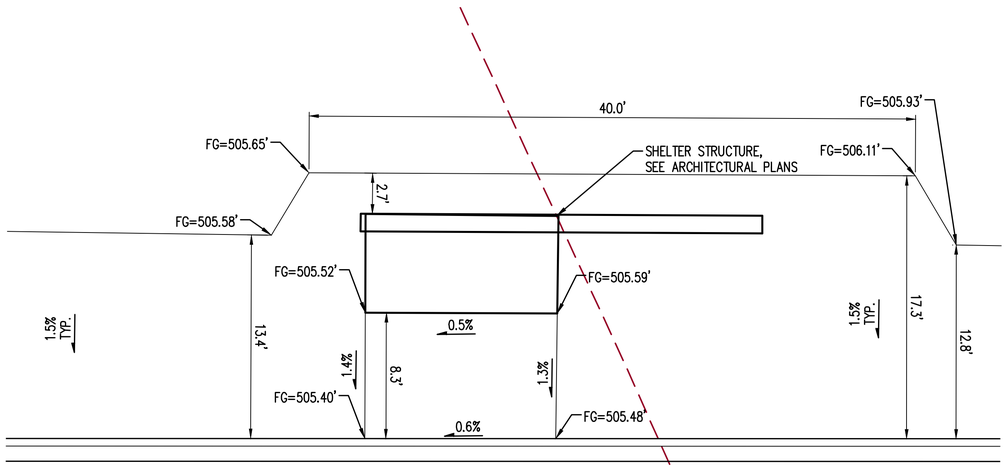
1 C.08



NORTH BOARDING AREA

SCALE: 1" = 5'

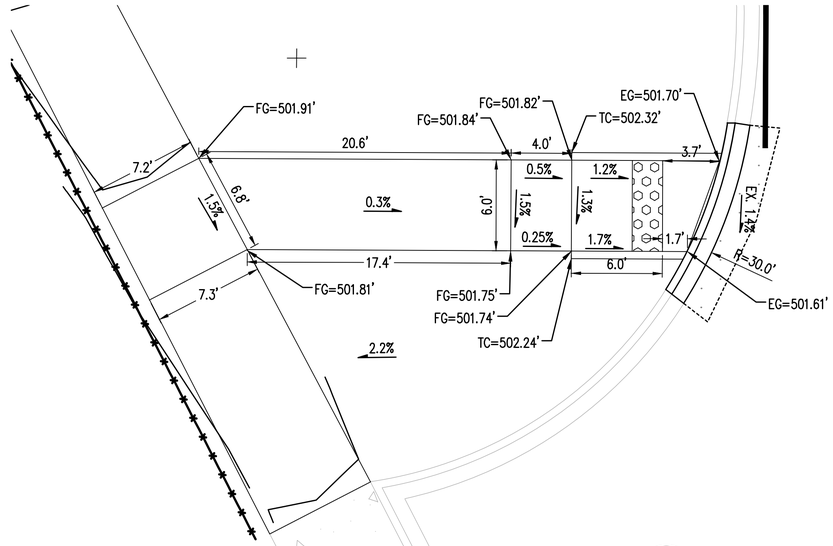
3 C.08



CENTRAL BOARDING AREA

SCALE: 1" = 5'

2 C.08



PARKING AREA DETAIL

SCALE: 1" = 5'

4 C.08

100% SUBMITTAL

0 2.5' 5' 10'
1 inch = 5 feet

Know what's below
Call before you dig

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
JOB No. :2000677
SCALE: AS SHOWN

DONALD J. LIMBOCKER, STATE OF WASHINGTON, 24080, REGISTERED PROFESSIONAL ENGINEER

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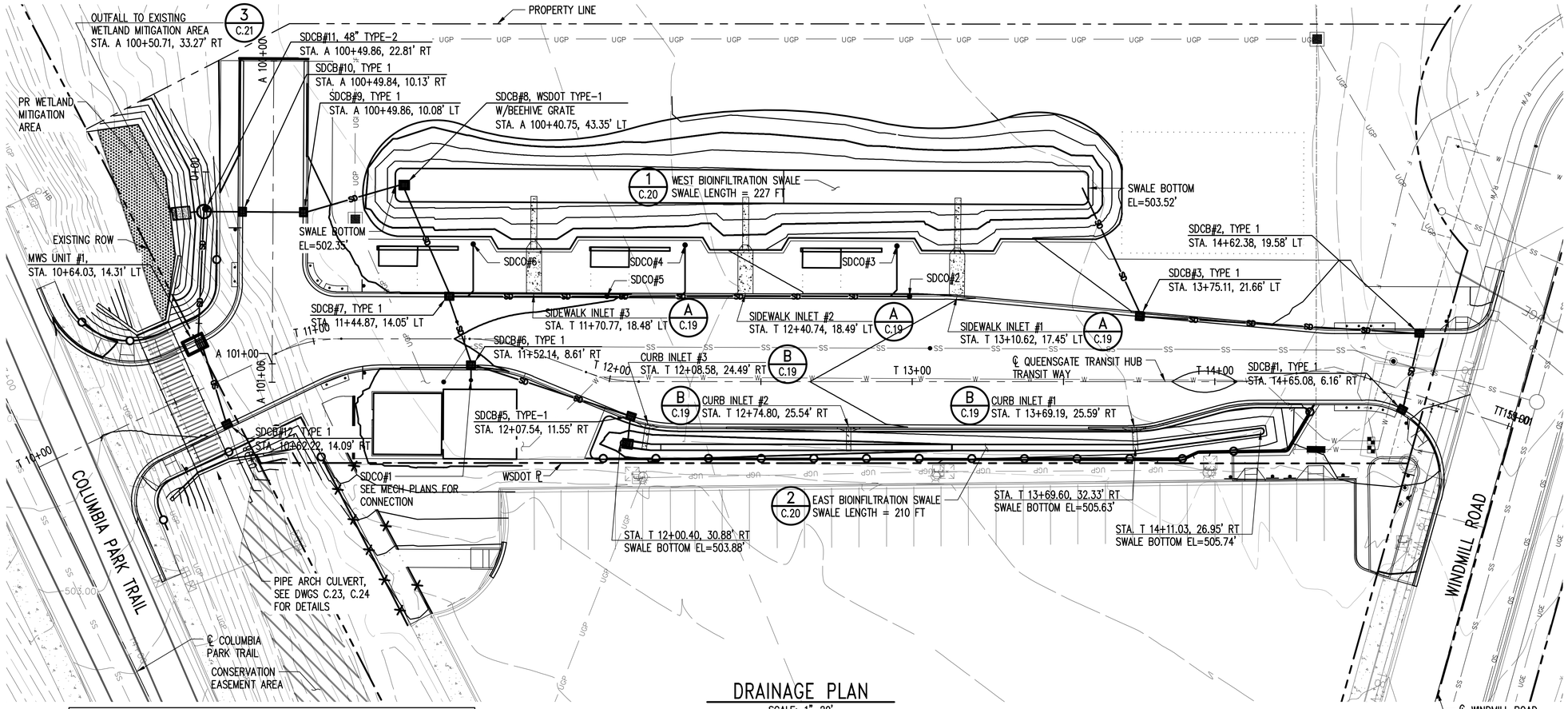
GRADING DETAIL

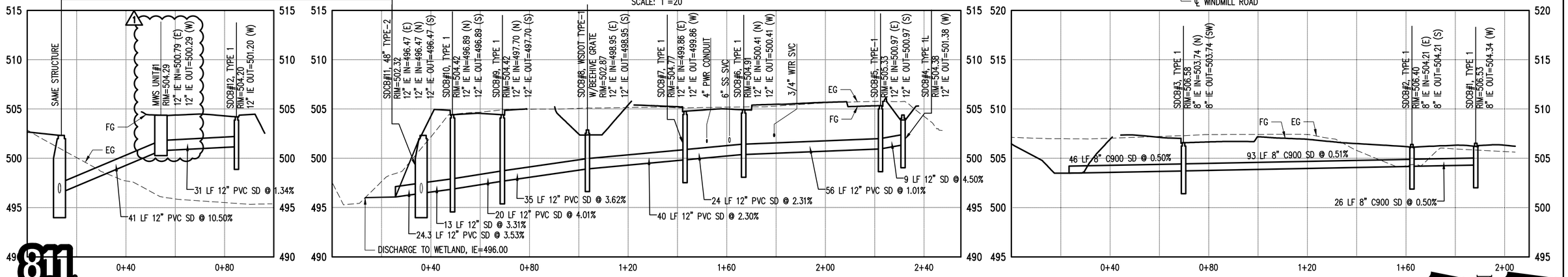
DRAWING: C.17
SHEET: 19 OF 95

Jun 15, 2022 - 1:21pm jonc Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-PD.dwg



DRAINAGE PLAN

SCALE: 1"=20'



DRAINAGE PROFILE

SCALE: H: 1"=20' V: 1"=5'

GENERAL NOTES:

1. FOR ABBREVIATIONS AND LEGENDS, SEE DRAWING C.01.
2. FOR PAVING PLAN, SEE DRAWING C.10.
3. FOR GRADING PLAN, SEE DRAWING C.08.
4. FOR DRAINAGE DETAILS, SEE DRAWINGS C.18 THRU C.21.

LEGEND:

- CB TYPE-1 PER CITY OF RICHLAND STD PLAN S11
- CB TYPE-2 PER CITY OF RICHLAND STD PLAN S13
- WSDOT CB TYPE-1 PER WSDOT STD PLAN B-5.0-03
- SD PROPOSED STORM DRAIN PIPE
- STORM DRAIN CLEANOUT

ROOF DRAIN CLEANOUT TABLE		
#	STA/OFFSET	IE ELEV
CO1	STA T 11+49.99, 10.09' RT	500.76'
CO2	STA T 12+99.11, 28.12' LT	502.14'
CO3	STA T 12+94.94, 44.78' LT	502.57'
CO4	STA T 12+24.94, 45.08' LT	501.53'
CO5	STA T 11+89.59, 25.84' LT	500.64'
CO6	STA T 11+52.30, 31.29' LT	500.48'

Know what's below Call before you dig

100% SUBMITTAL

1 inch = 20 ft. HORZ

1 inch = 5 ft. VERT

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES | CHECKED BY ZRG | APPROVED BY RJL | DATE 06/17/2022 | J O B No. :2000677 | S C A L E: 1"= 20'

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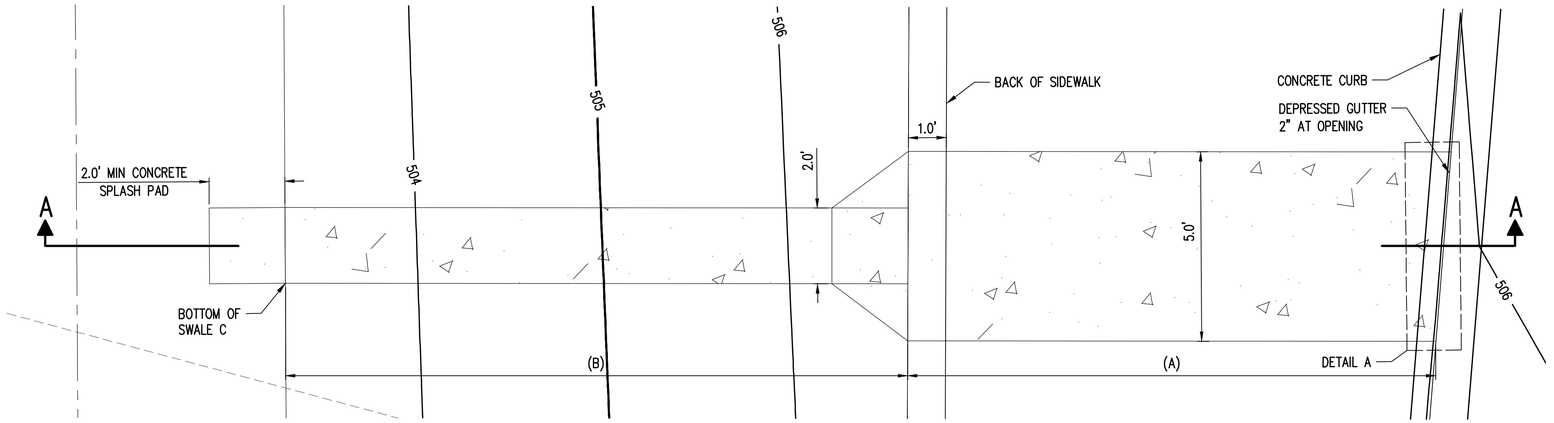
DRAINAGE PLAN

DRAWING: C.18

SHEET: 20 OF 97

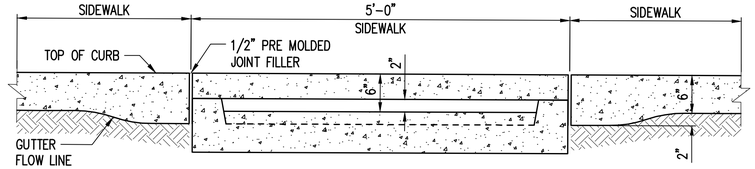
Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\design\BFT-DR.dwg jonc Jun 20, 2022 - 8:42am



SIDEWALK INLET ENLARGED PLAN

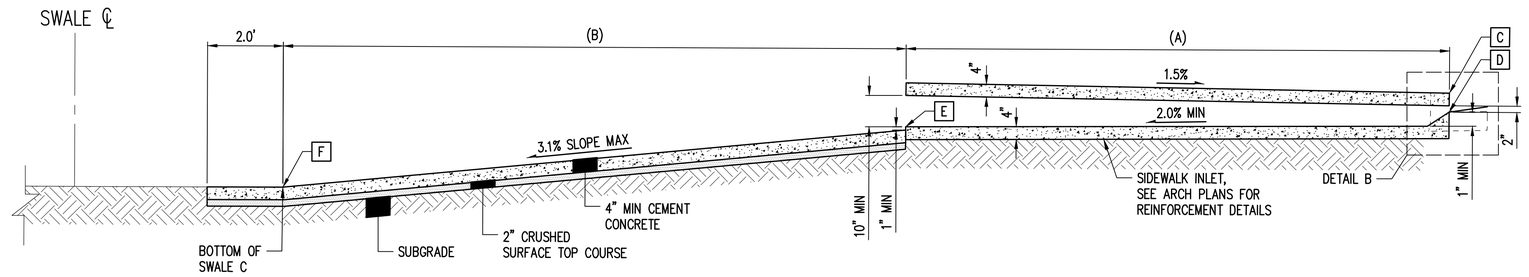
SCALE: 1"=2'

A / C.18



DETAIL A

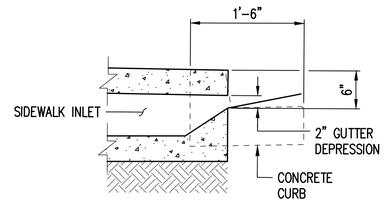
SCALE: NTS



SECTION A-A

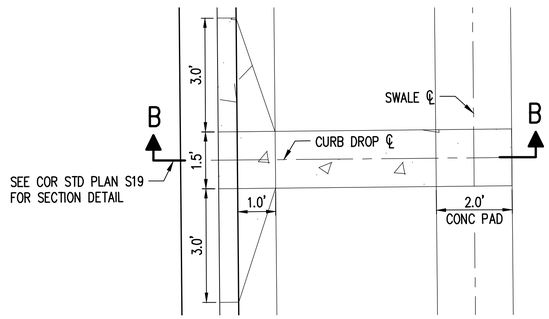
SCALE: 1"=2'

SIDEWALK INLET TABLE						
INLET #	DIMENSIONS (FT)		ELEVATIONS (FT)			
	(A)	(B)	C	D	E	F
1	14.10	16.40	506.44	505.77	505.41	503.28
2	14.10	15.70	504.84	505.17	504.81	502.93
3	15.00	15.10	505.35	504.68	504.30	502.58



DETAIL B

SCALE: NTS



CURB INLET ENLARGED PLAN

SCALE: 1"=2'

B / C.18

811 Know what's below Call before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

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DATE 06/17/2022
JOB No. :2000677
SCALE: AS SHOWN

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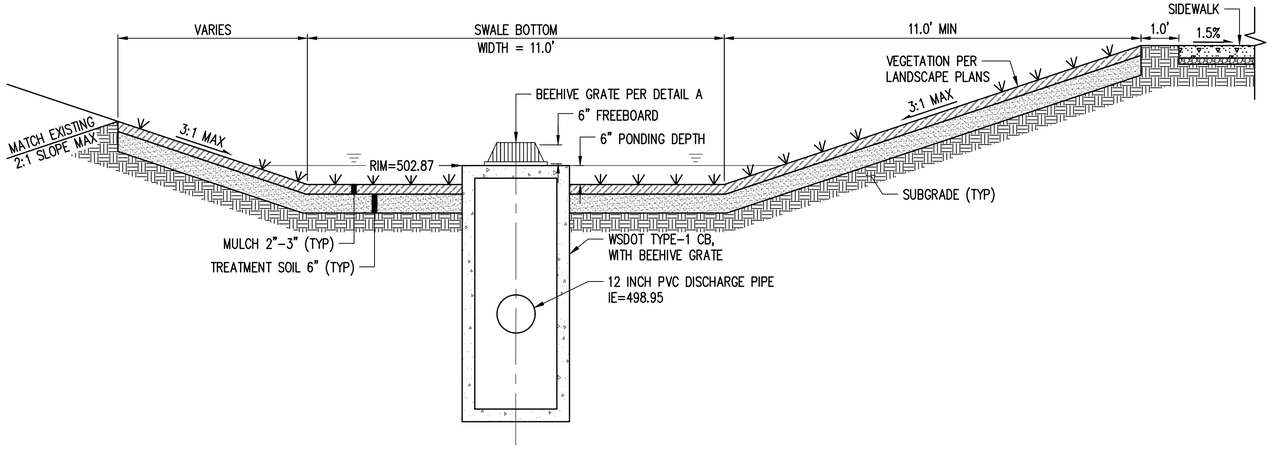
SIDEWALK INLET DETAIL

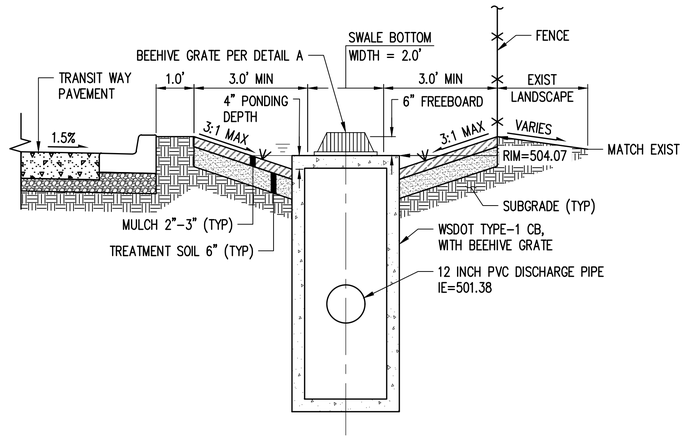
DRAWING: C.19
SHEET: 21 OF 95



WEST BIOSWALE SECTION

SCALE: 1"=2'

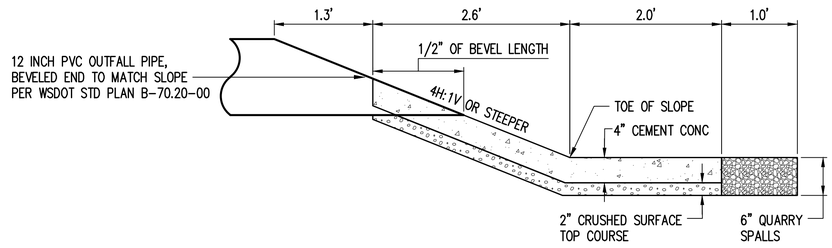
1 / C.18



EAST BIOSWALE SECTION

SCALE: 1"=2'

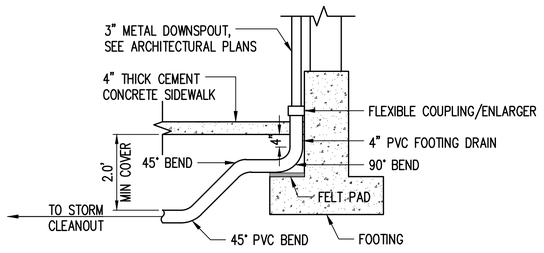
2 / C.18



OUTFALL PROTECTION

SCALE: 1"=1'

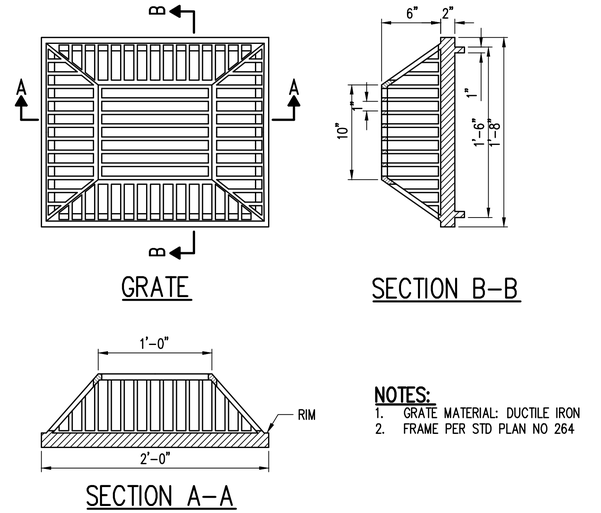
3 / C.18



ROOF DOWNSPOUT CONNECTION FOR BUS SHELTER

SCALE: 1"=2'

4 / C.18



NOTES:

1. GRATE MATERIAL: DUCTILE IRON
2. FRAME PER STD PLAN NO 264

DETAIL A: BEEHIVE GRATE

SCALE: NTS

A / C.18

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
JOB No. :2000677
SCALE: AS SHOWN

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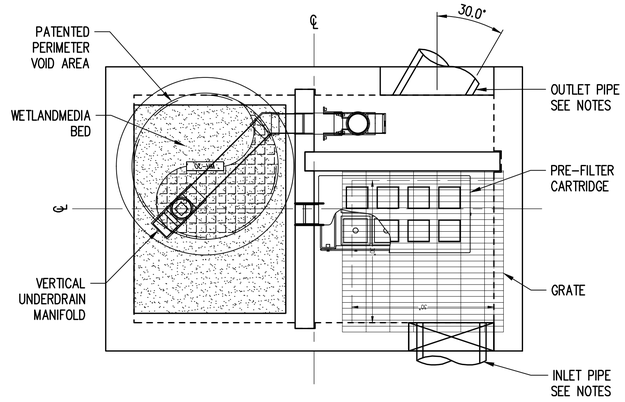
BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

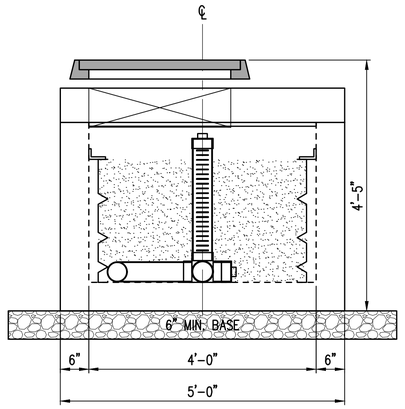
CIVIL
BIOSWALE DETAIL

DRAWING: C.20

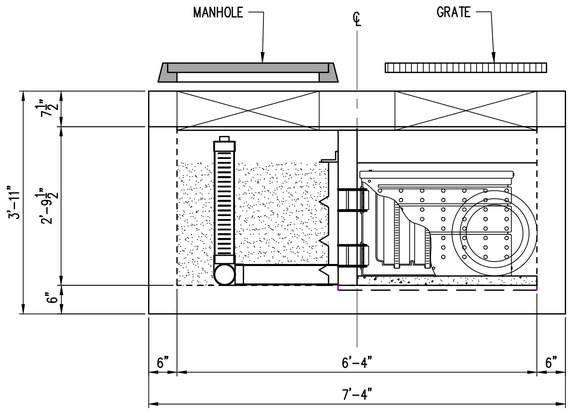
SHEET: 22 OF 95



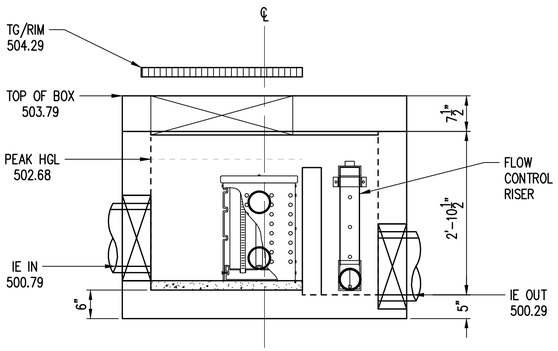
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

GENERAL NOTES

1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT MANUFACTURER.

INSTALLATION NOTES

1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURER'S SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE TO VERIFY PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
3. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE. (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL GAPS AROUND PIPES SHALL BE SEALED WATER TIGHT WITH A NON-SHRINK GROUT PER MANUFACTURER'S STANDARD CONNECTION DETAIL AND SHALL MEET OR EXCEED REGIONAL PIPE CONNECTION STANDARDS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. DRIP OR SPRAY IRRIGATION REQUIRED ON ALL UNITS WITH VEGETATION.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING MODULAR WETLANDS FOR ACTIVATION OF UNIT. MANUFACTURES WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A MODULAR WETLANDS REPRESENTATIVE.

TREATMENT REQUIRED			
VOLUME BASED (CF)		FLOW BASED (CFS)	
		0.0539 (1)	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			0.5469
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE	500.79	N/K	12"
OUTLET PIPE		N/K	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	504.29	504.29	504.29
SURFACE LOAD	LOAD LEVEL 4 (ASTM C1802)		
FRAME & COVER	30" x 30"	ø30"	N/A
WETLAND MEDIA VOLUME (CY)			0.7839
ORIFICE SIZE (DIA. INCHES)			4 EA ø0.65"

TREATMENT FLOW (CFS)	0.0539 (1)
OPERATING HEAD (FT)	2.1
PRETREATMENT LOADING RATE (GPM/SF)	2.1
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

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NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. : 2000677
S C A L E: NTS

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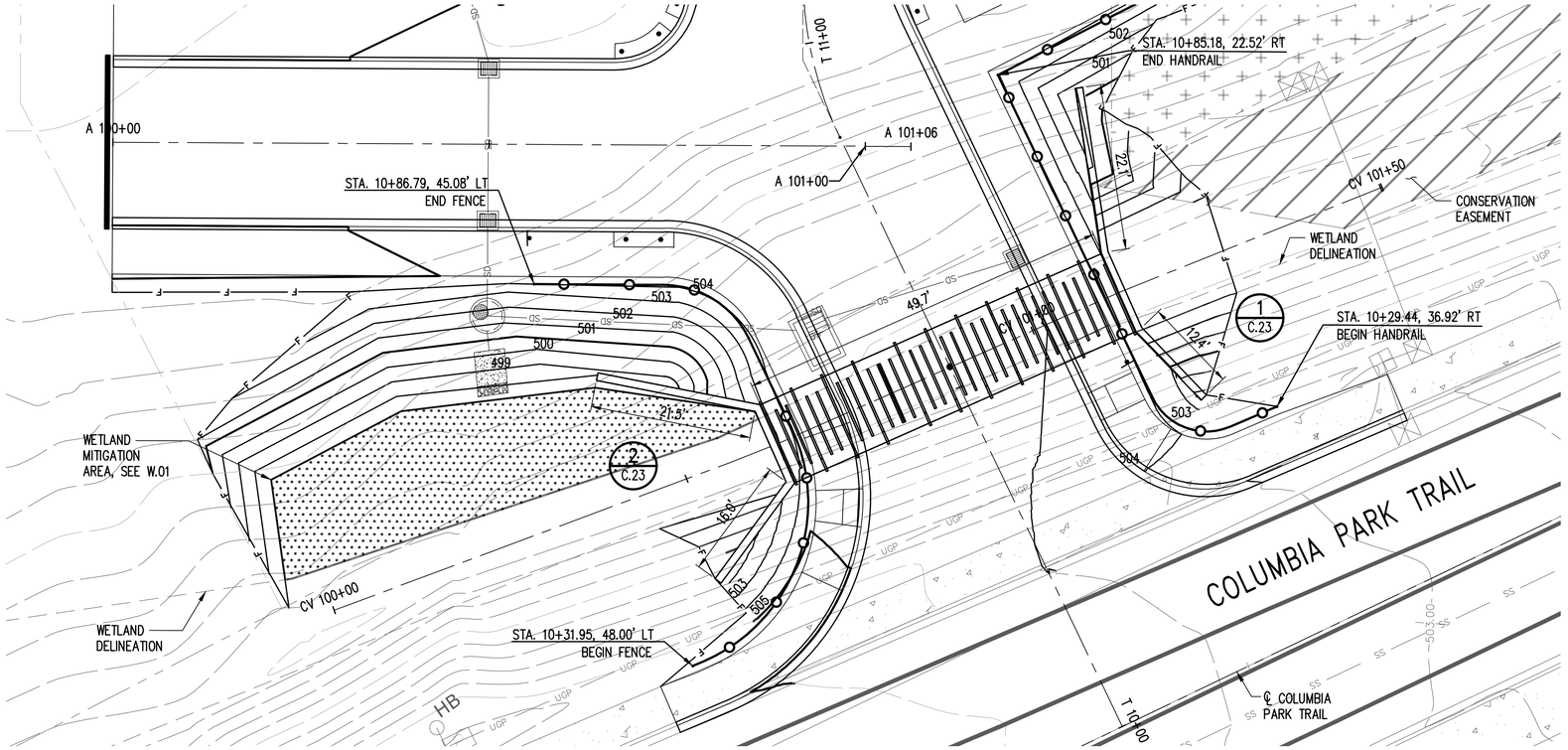
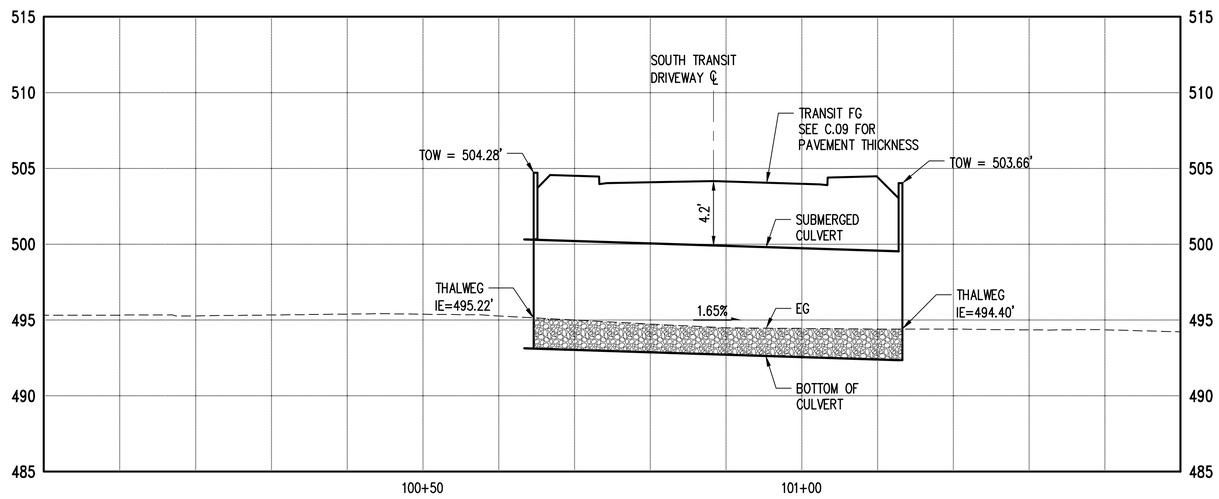
CIVIL
STORMWATER BIOINFILTRATION DETAIL (1)
(MODULAR WETLAND SYSTEM)

DRAWING: C.21
SHEET: 23 OF 95



CULVERT ALIGNMENT
1"=10'



CULVERT CL PROFILE
SCALE: H: 1"=10' V: 1"=5'

GENERAL NOTES:

1. FOR ABBREVIATIONS AND LEGENDS, SEE DRAWING G.03.
2. FOR PAVING PLAN, SEE DRAWING C.10.
3. FOR GRADING PLAN, SEE DRAWING C.08.
4. FOR CULVERT DETAILS, SEE DRAWINGS C22 AND C.23.

CULVERT TABLE		
DESCRIPTION	ALIGNMENT	STATION
CULVERT ENDWALL	CV LINE	101+13.44
CENTER OF CULVERT	CV LINE	100+87.63
CULVERT HEADWALL	CV LINE	100+61.94
CULVERT NORTH EDGE	T-LINE	10+58.58
CULVERT SOUTH EDGE	T-LINE	10+47.28
CENTER OF CULVERT	T-LINE	10+52.99
KEY CULVERT CL ELEVATIONS		
	HEADWALL STA 100+61.94	HEADWALL STA 100+61.94
25 YR WATER LEVEL	494.49	493.70
THALWEG	495.22	494.40
B/CULVERT	493.14	492.35
T/CULVERT LID	500.32	499.53
T/WALL	504.71	503.66

N

0 5 10 20
1 inch = 10 ft. HORZ
0 2.5 5 10
1 inch = 5 ft. VERT

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: AS SHOWN

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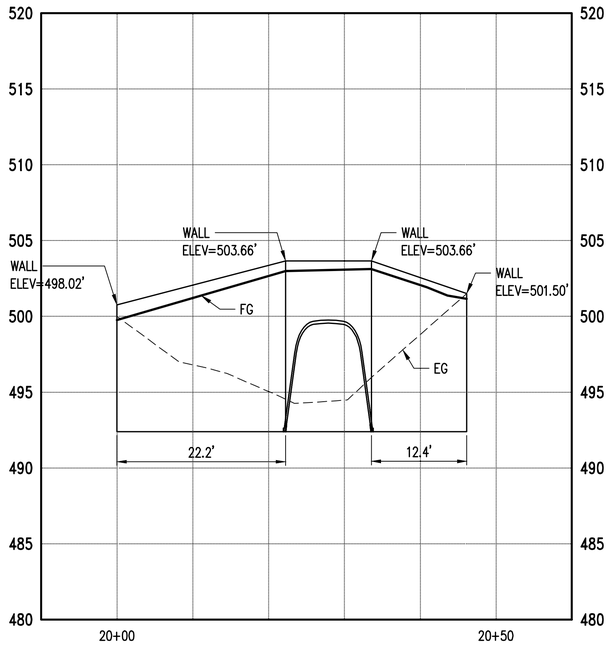
CIVIL
CULVERT ALIGNMENT AND PROFILE

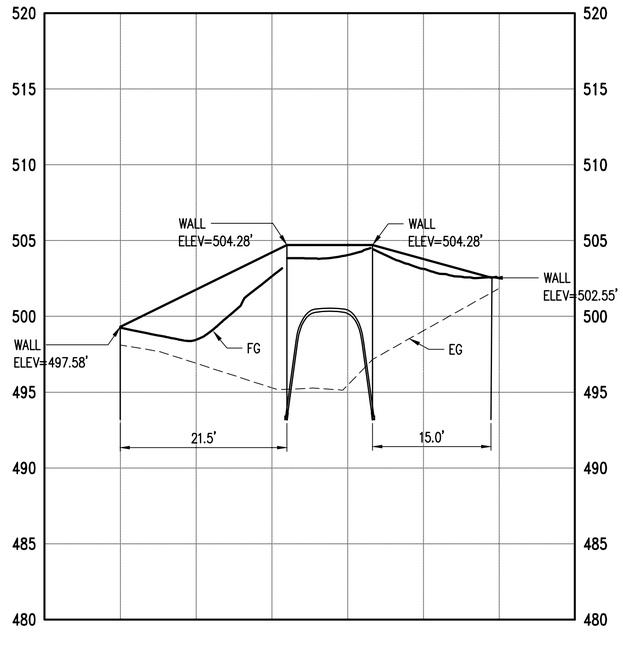
DRAWING: C.22
SHEET: 24 OF 97

Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-DD.dwg
jonc
Jun 20, 2022 - 8:12am



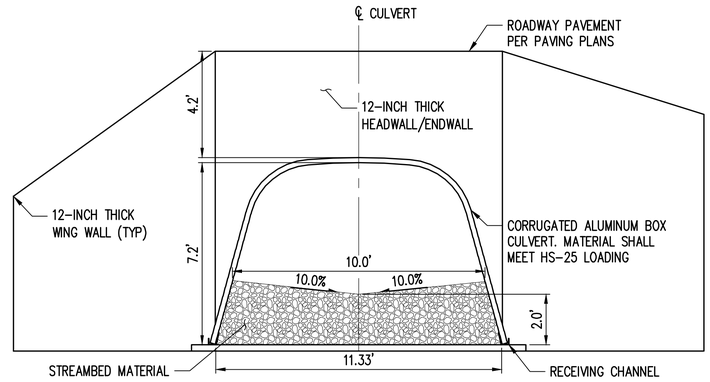
WINGWALL PROFILE EAST (1)

SCALE: H: 1"=10' V: 1"=5'



WINGWALL PROFILE WEST (2)

SCALE: H: 1"=10 V: 1"=5'



NOTES:

- VOID SPACES TO BE FILLED WITH STREAMBED SEDIMENT PER WSDOT STANDARD SPEC 9-03.11(1)
- STREAMBED MATERIAL SHALL BE 12-INCH COBBLES PER WSDOT STANDARD SPEC 9-03.11(2)
- PLATE THICKNESS, RIB SPACING, END TREATMENT AND CULVERT FOUNDATION SHALL BE PER MANUFACTURER'S SPECIFICATIONS AND DETAILS

CULVERT DETAIL

SCALE: NTS

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100% SUBMITTAL

0 5 10 20
1 inch = 10 ft. HORZ

0 2.5 5 10
1 inch = 5 ft. VERT

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY MRV | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: AS SHOWN

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CIVIL
CULVERT WINGWALL PROFILES

DRAWING: C.23
SHEET: 25 OF 95

NEW V11B VAULT BASE AND V11 STL LID, SEE ELECTRIC PLANS

PROPERTY LINE

EXISTING ROW

NEW VT11B VAULT AND VT11C2 TRANSFORMER LID, SEE ELECTRIC PLANS

SITE ELECTRICAL SERVICE, SEE ELECTRICAL PLANS

5.0'

NEW V11 VAULT, SEE ELECTRIC PLAN

EXIST ROW

A 101+00

A 101+06

T 11+00

A 101+00

T 12+00

T 13+00

T 14+00

T 15+00

T 15+01

T 16+00

CONNECT 6" SS AT EXIST CO, IE=494.80
CONTRACTOR TO FIELD VERIFY AND NOTIFY ENGINEER OF ANY DISCREPANCY

2" WATER SERVICE LINE PER COR STD DETAIL W-02

1" WATER METER ASSY PER COR STD DETAIL W-03

PROTECT EX. 18" WATERMAIN

6" SS CO PER COR STD DETAIL S-09
RIM=506.10
IE=497.88

6" SS PVC

1 1/2" W (DOM)

SEE SHEET 26 FOR PROFILE

TRANSIT WAY

CONNECT TO EX. ELECTRIC, CONTRACTOR TO FIELD VERIFY AND NOTIFY ENGINEER OF ANY DISCREPANCY

PROPOSED ELECTRICAL VAULT CONNECT TO EX. ELECTRIC CONTRACTOR TO FIELD VERIFY AND NOTIFY ENGINEER OF ANY DISCREPANCY

COMFORT BLDG AND ELECTRICAL YARD

1 1/2" WATER POC SEE MECH PLANS FOR CONTINUATION

6" SS CO PER COR STD DETAIL S-09
RIM=505.28
IE=501.90
SEE MECH PLANS FOR CONTINUATION

PROPERTY LINE

DOUBLE CHECK VALVE ASSEMBLY PER COR ST W-20

1" W FOR IRRIGATION, TO BE CONTRACTOR BID AND DESIGNED

1" WATER METER ASSY PER COR STD DETAIL W-03

EXIST FH ASSY PROTECT IN PLACE

WINDMILL ROAD

COLUMBIA PARK TRAIL

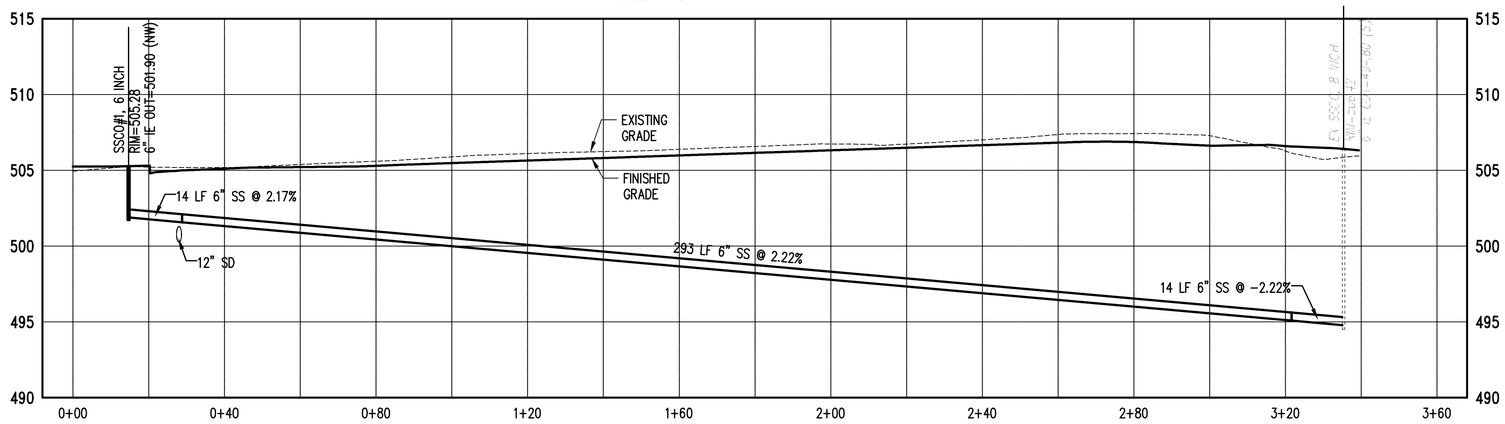
503.00

℄ COLUMBIA PARK TRAIL

CONSERVATION EASEMENT AREA

℄ WINDMILL ROAD

UTILITY PLAN
SCALE: 1"=20'



6" SEWER PROFILE
SCALE: H: 1"=20' V: 1"=5'

GENERAL NOTES:

1. FOR DRAINAGE PLAN & PROFILES, SEE DRAWING C.18.
2. FOR ELECTRICAL SITE PLAN, SEE DRAWING E.11.
3. FOR MEP CONNECTIONS TO COMFORT BUILDING, SEE DRAWING M.22.
4. IRRIGATION TO BE CONTRACTOR DESIGNED AND BID.

Know what's below Call before you dig

100% SUBMITTAL

0 10 20 40
1 inch = 20 ft. HORZ
0 2.5 5 10
1 inch = 5 ft. VERT

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"= 20'

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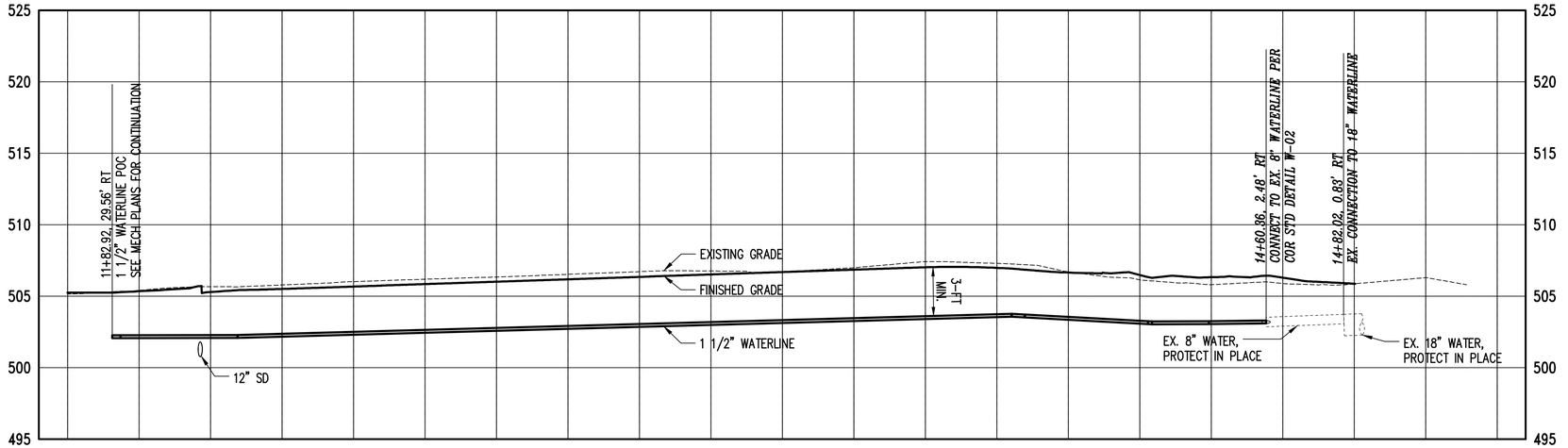
CIVIL
UTILITY PLAN & PROFILE

DRAWING: C.24
SHEET: 26 OF 97

Jun 20, 2022 - 8:17am jonc Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-UT.dwg



1 1/2" WATER PROFILE

SCALE: H: 1"=20' V: 1"=5'

GENERAL NOTES:

1. FOR DRAINAGE PLAN & PROFILES, SEE DRAWING C.14.
2. FOR ELECTRICAL SITE PLAN, SEE DRAWING E.11.
3. FOR MEP CONNECTIONS TO COMFORT BUILDING, SEE DRAWING M.22.

Know what's below
Call before you dig

100% SUBMITTAL

0 10 20 40
1 inch = 20 ft. HORZ
0 2.5 5 10
1 inch = 5 ft. VERT

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
JOB No. :2000677
SCALE: 1"= 20'

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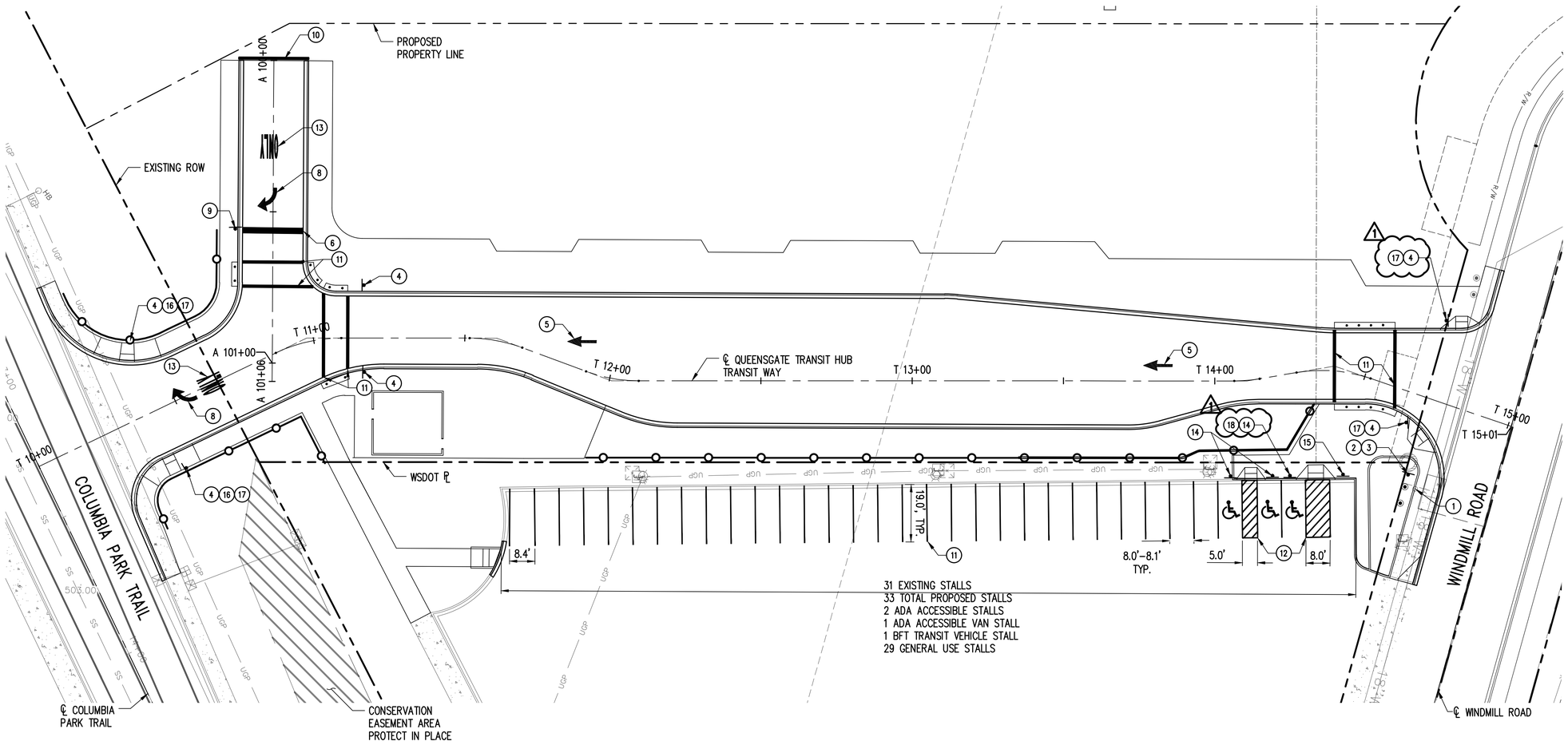
CIVIL
UTILITY PLAN & PROFILE

DRAWING: C.25
SHEET: 27 OF 95

Jun 15, 2022 - 1:29pm jonc Z:\2000001-2009999\2000677 BFT TO 12 Queensgate FD\CADD\Design\BFT-UT.dwg



GENERAL NOTES:

1. ALL IMPACTED SIGNAGE ASSUMED FOR REPLACEMENT.
2. SEE ARCHITECTURAL PLANS FOR BUS ZONE SIGNAGE.

CONSTRUCTION NOTES:

1. REPLACE AND RELOCATE EXISTING SIGN
2. TYPICAL SIGN POST PER COR ST-23
3. CITY OF RICHLAND STREET SIGN, D3-1
4. DO NOT ENTER SIGN, R5-1, 42"X30"
5. TYPE 1S TRAFFIC ARROW PER WSDOT M-24.40-02
6. WHITE 12" STOP LINE PER WSDOT STD PLAN M-15.10-01
7. TRAFFIC LANES PER WSDOT M-80.30-00
8. TYPE 2SR (RIGHT) TRAFFIC ARROW PER WSDOT M-24.40-02
9. STOP SIGN, R1-1 30"X30"
10. TYPE 3 BARRICADE PER WSDOT STD PLAN K-80.20-00
11. 12" PLASTIC WHITE WIDE LINE PER DIMENSION SHOWN
12. CONSTRUCT ACCESSIBLE STALLS PER WSDOT STD PLAN M-17.10-02
13. ONLY TRAFFIC LETTERS PER WSDOT STD M-80.30-00
14. ACCESSIBLE PARKING SIGN, R7-8 18"X9"
15. BEN FRANKLIN TRANSIT VEHICLE ONLY SIGN, 18"X9"
16. WRONG WAY, R5-1a, 36"X24"
17. EXCEPT TRANSIT, SPECIAL, 30"X6"
18. VAN ACCESSIBLE, R7-8a, 18"X9"

Know what's below Call before you dig

100% SUBMITTAL

0 10 20 40
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JES	ZRG	RJL	SECOND PERMIT REVIEW

DRAWN BY JDC | DESIGNED BY JES
CHECKED BY ZRG | APPROVED BY RJL
DATE 06/17/2022
J O B No. :2000677
S C A L E: 1"= 20'

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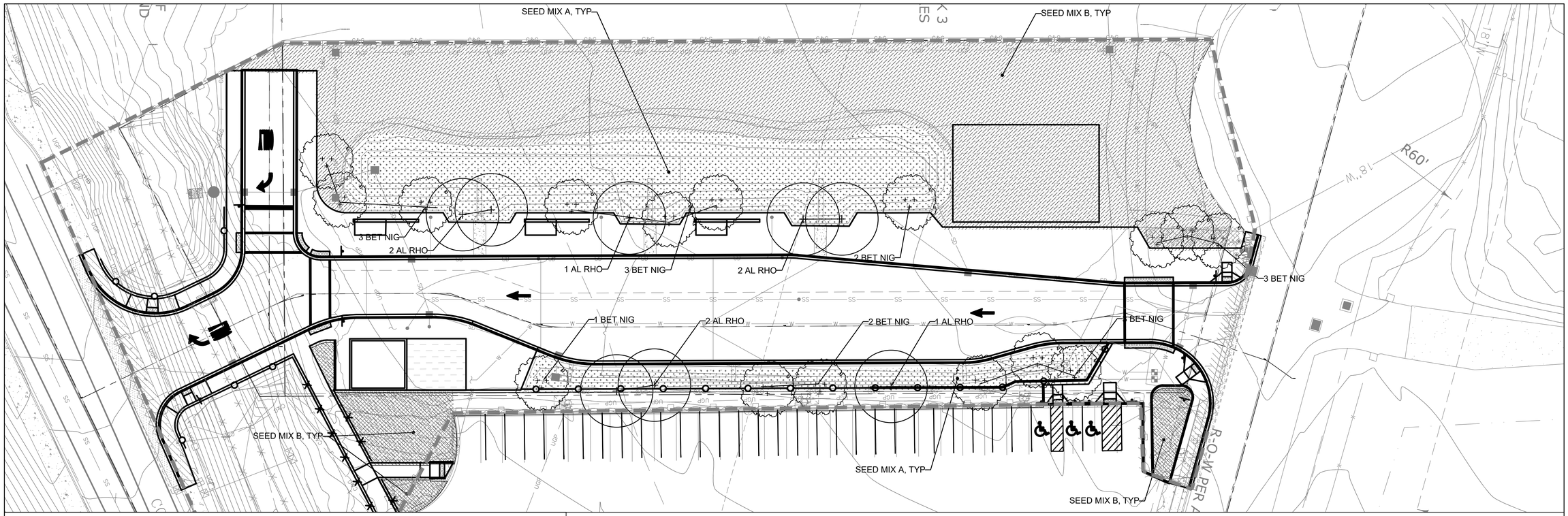
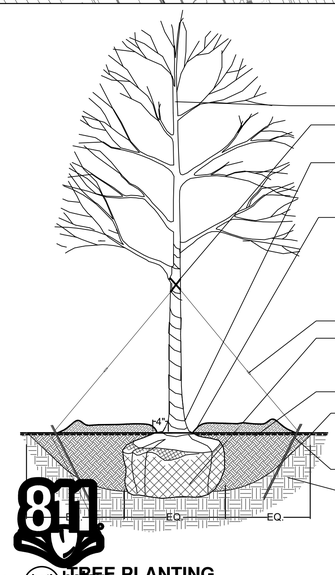
CIVIL
PAVEMENT MARKING AND SIGNAGE PLAN

DRAWING: C.26
SHEET: 28 OF 97





811 Know what's below. Call before you dig

TREE PLANTING

Scale: NTS

PLANT SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING	COMMENTS
DECIDUOUS TREES						
AL RHO	8	Alnus rhombifolia	White Alder	1 1/3" cal.	As shown	
BET NIG	16	Betula nigra	River Birch	1 1/3" cal.	As shown	

100% SUBMITTAL

0 10' 20' 40'
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	WT	JB	CJ	SECOND PERMIT REVIEW

DRAWN BY KR-A | DESIGNED BY RL
CHECKED BY RL | APPROVED BY CO
DATE 06/17/2022 ~~05/16/22~~
JOB No. : 2000677

SCALE: 1"=20'

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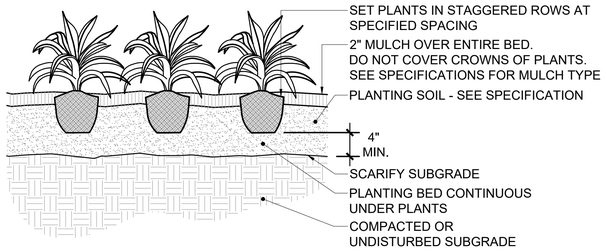
BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

LANDSCAPE PLANTING PLAN

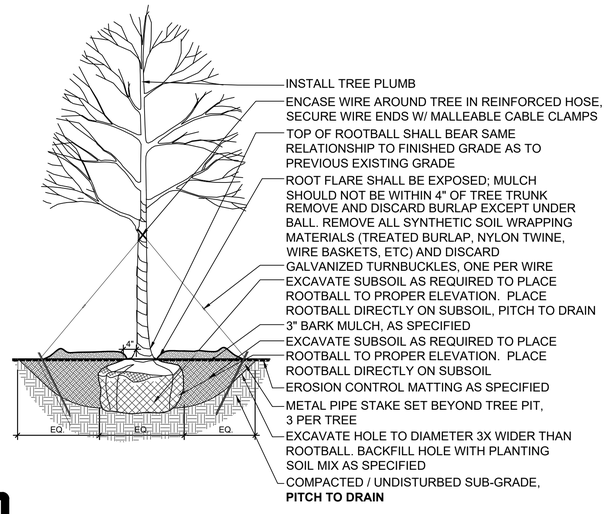
DRAWING: L.01

SHEET: 29 OF 97

Jun 17, 2022 - 1:07pm wyatt.turner \\useast2.ibigroup.com\J\BO\123037_BFT_Queensgate\7.0_Production\7.03_Design\05_Landscape\Sheets\L-100_wyatt.dwg



1 SHRUB AND ORNAMENTAL GRASS PLANTING
Scale: NTS



2 TREE PLANTING
Scale: NTS

811 Know what's **below** **Call** before you dig

100% SUBMITTAL

0 10' 20' 40'
1 inch = 20 feet

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	WT	JB	CJ	SECOND PERMIT REVIEW

DRAWN BY DESIGNED BY
CHECKED BY APPROVED BY
DATE 06/17/2022
J O B No. : 2000677
S C A L E:

6/17/22

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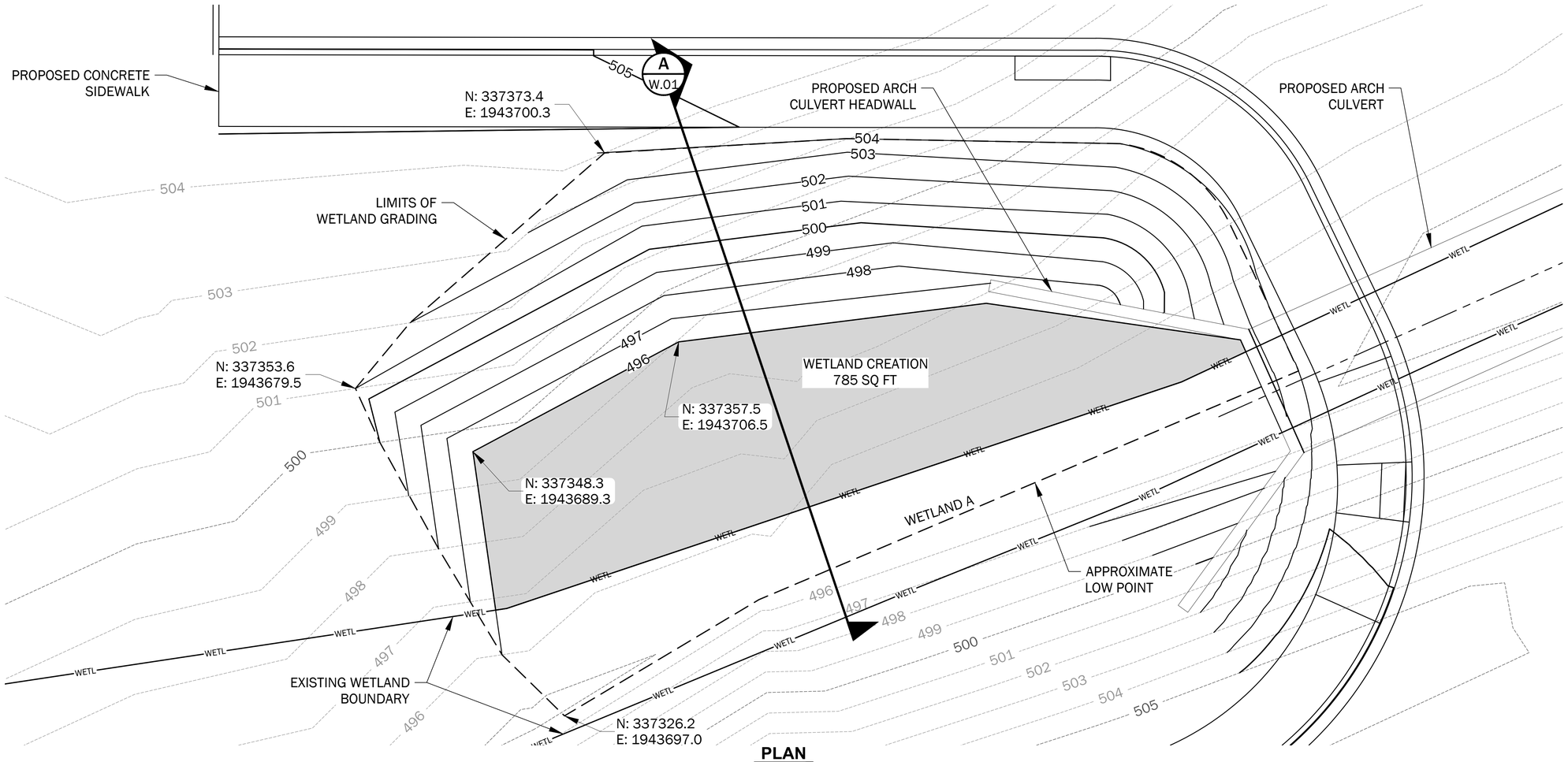
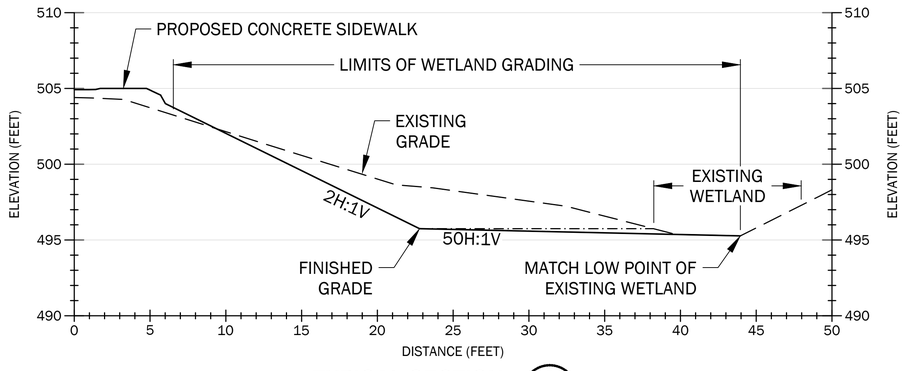
LANDSCAPE
PLANTING DETAILS

DRAWING: L.02
SHEET: 30 OF 97



PLAN



TYPICAL SECTION A
SCALE: 1"=5' W.01

Know what's below Call before you dig

100% SUBMITTAL

RYAN S. CARNIE — STATE OF WASHINGTON — 28457 — REGISTERED PROFESSIONAL ENGINEER
6/22/2022

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY: HCM | DESIGNED BY:
CHECKED BY: | APPROVED BY:
DATE: 06/22/2022
JOB No. : 2000677
SCALE:

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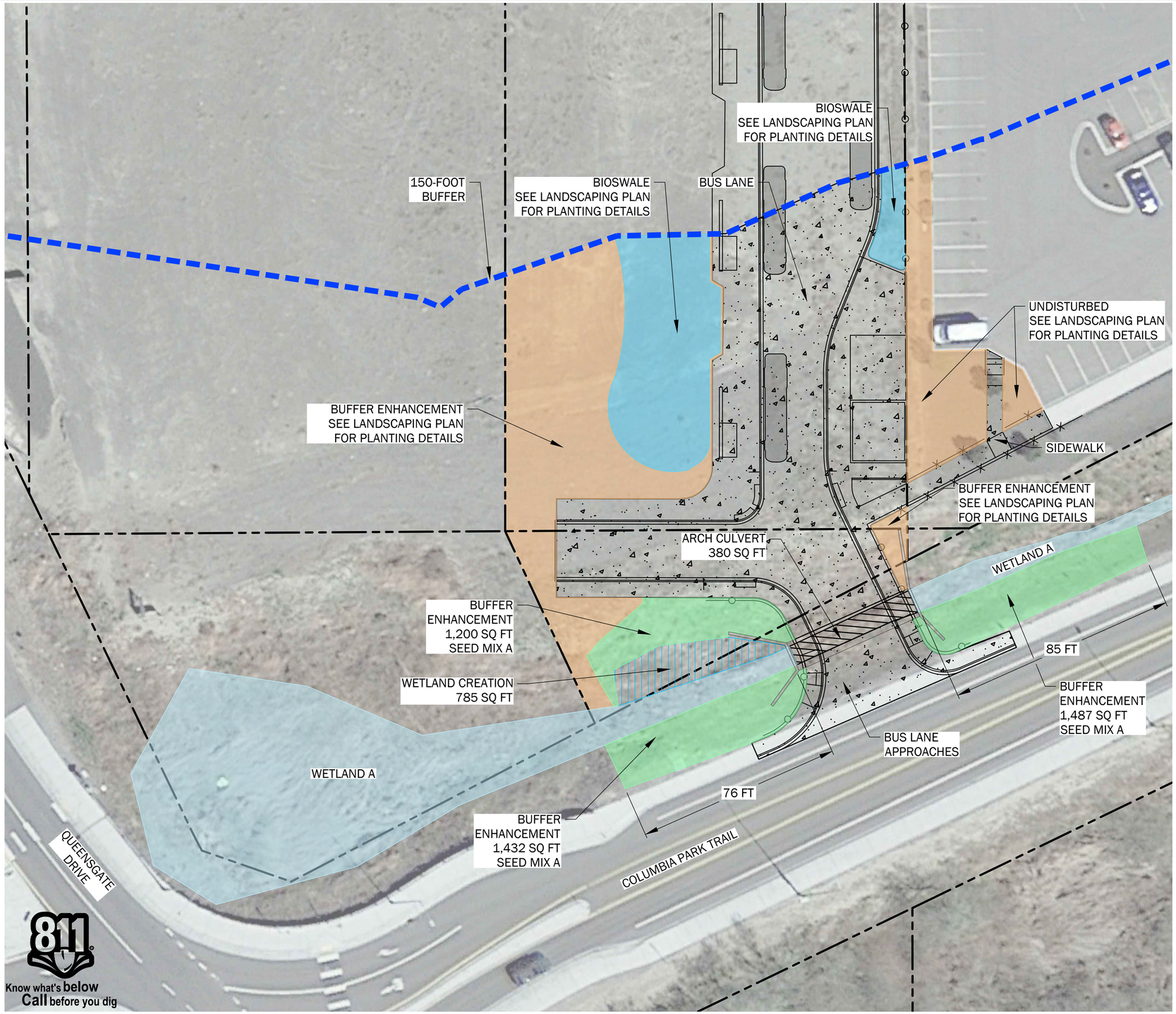
GeoEngineers
WWW.GEOENGINEERS.COM

BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

WETLAND MITIGATION PLAN

DRAWING: W.01
SHEET: 29 OF 90



NOTES:
REFER TO SHEETS xxx THROUGH xxx FOR PROPOSED BUS LANE APPROACHES, ARCH CULVERT, BUS LANE CONCRETE PAVING, CONCRETE SIDEWALK AND ASSOCIATED CURB AND DESIGN AND DETAILS.

N

0 20 40
GRAPHIC SCALE IN FEET

RYAN S. CARNIS
STATE OF WASHINGTON
22457
REGISTERED
PROFESSIONAL ENGINEER
6/22/2022

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY: HCM | DESIGNED BY:
CHECKED BY: | APPROVED BY:
DATE: 06/22/2022
JOB No. : 2000677
SCALE:

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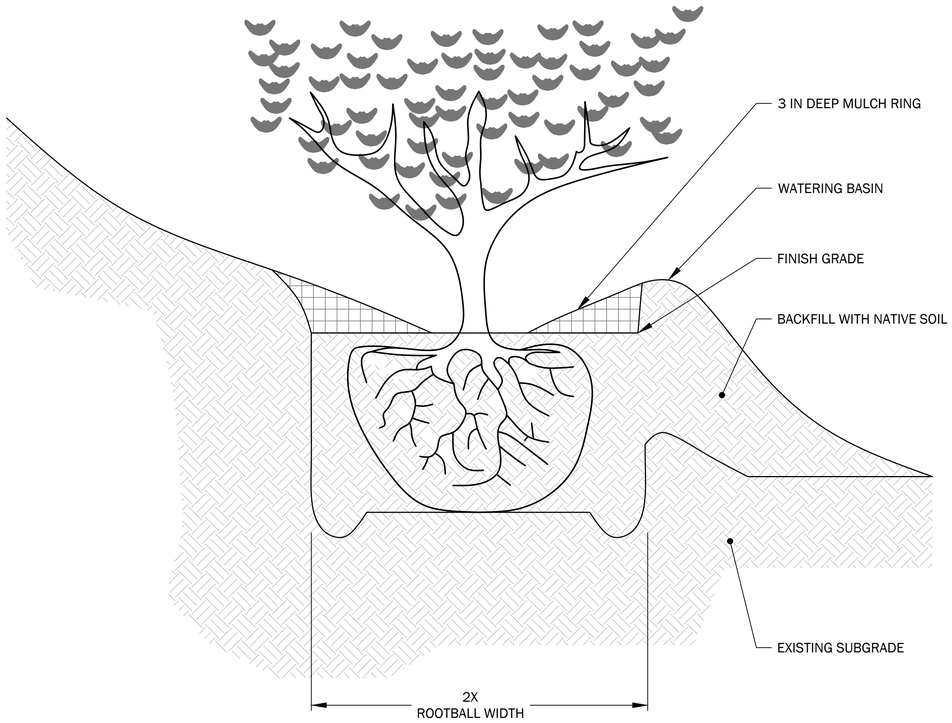
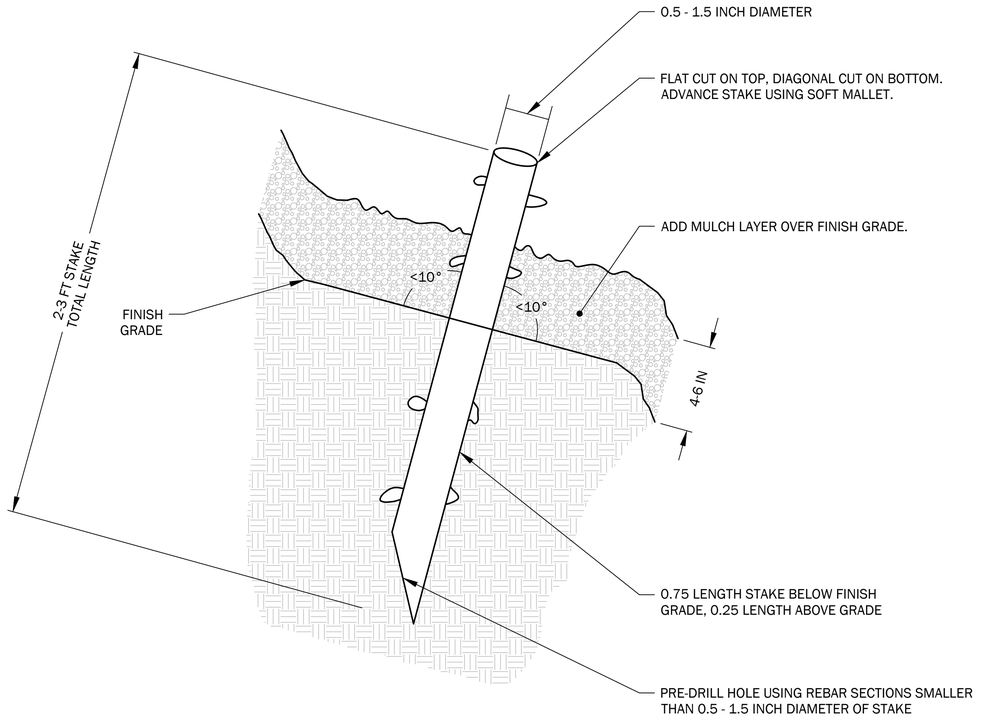
PLANTING PLAN

DRAWING: W.02
SHEET: 30 OF 90



PLANTING TREE/SHRUB ON SLOPES 3H:1V AND STEEPER DETAIL 1

SCALE: NOT TO SCALE -



PLANTING LIVE STAKES ON SLOPES 3H:1V AND STEEPER DETAIL 2

SCALE: NOT TO SCALE -

PLANTING AREA	"SIZE OF PLANTING AREA (SQUARE FEET)"	COMMON NAME	SCIENTIFIC NAME	CONTAINER SIZE	"RECOMMENDED ON-CENTER SPACING (FEET)"	NUMBER TO BE INSTALLED
WETLAND CREATION	785	HARDSTEM BULRUSH	*SCIRPUS ACUTUS*	PLUG	3	95
		WATER SEDGE	*CATREX AQUITALIS*	PLUG	3	95
		PACIFIC WILLOW	*SALIX LASIANDRA*	5 GALLON	10	6
		RED-OSIER DOGWOOD	*CORNUS SERICEA*	2 GALLON	6	6
"BUFFER ENHANCEMENT (2:1 SLOPES ADJACENT TO SOUTH OF WETLAND A)"	2,919	QUAKING ASPEN	*POPULUS TREMULOIDES*	5 GALLON	10	15
		BITTER CHERRY	*PRUNUS EMARGINATA*	5 GALLON	10	15
		WESTERN SERVICEBERRY	*AMELANCHIER ALNIFOLIA*	2 GALLON	6	30
		WOOD'S ROSE	*ROSA WOODSII*	2 GALLON	6	30
		SNOWBERRY	*SYMPHORICARPOS ALBUS*	2 GALLON	6	30
BUFFER ENHANCEMENT (2:1 SLOPE ADJACENT TO NORTH OF NEW WETLAND CREATION)	1,200	WESTERN SERVICEBERRY	*AMELANCHIER ALNIFOLIA*	2 GALLON	6	10
		WOOD'S ROSE	*ROSA WOODSII*	2 GALLON	6	10
		SNOWBERRY	*SYMPHORICARPOS ALBUS*	2 GALLON	6	10
BIOSWALE	3,427	AS SPECIFIED IN LANDSCAPE PLANS				

PLANTING NOTES:
PLANTING ACTIVITIES SHOULD OCCUR AFTER SITE GRADING IS COMPLETE AND BE TIMED AS FOLLOWS:

1. CLEAR INVASIVE AND NON-NATIVE SPECIES, STOCKPILE USEABLE HYDRIC SOILS, AND REMOVE DEBRIS AS NEEDED.
2. EXCAVATE MITIGATION AREA; RE-GRADE AND AMEND AREA WITH CLEAN SOILS AS NEEDED. REPLACE HYDRIC TOPSOIL AT THE FINISH ELEVATION THROUGHOUT WETLAND HABITATS.
3. CONDUCT THE WETLAND PLANTING IMMEDIATELY AFTER SOIL AMENDMENTS ARE PLACED AND IN CONJUNCTION WITH THE CLEARING AND REMOVAL OF DEBRIS. THIS WILL MINIMIZE RE-GROWTH OF INVASIVE SPECIES IN NEWLY OPENED OR CLEARED AREAS.
4. ALL PLANTING SHALL BE RANDOM (HAND LAID OUT, NOT BY STRING LINE) TO EMULATE A NATURAL PATTERN OF GROWTH. TREE SPECIES WILL BE IN GROUPS OF 1 AND RANDOMLY PLACED WITHIN THE DESIGNATED SECTION. SHRUB AND HERBACEOUS SPECIES SHALL BE PLANTED IN GROUPS OF THREES (I.E. 3 ROSES SHALL BE GROUPED TOGETHER, 3 SNOWBERRY SHALL BE GROUPED TOGETHER).
5. IDEALLY, PLANTING SHOULD BE CONDUCTED IN THE EARLY SPRING OR LATE FALL DURING THE DORMANT SEASON. STAGING AREAS FOR PLANTS SHOULD OCCUR IN UPLAND AREAS AND NOT WITHIN THE WETLAND.
6. WOOD OR BARK MULCH SHOULD BE APPLIED AROUND EACH NEWLY INSTALLED PLANT. THE WOOD OR BARK MULCH SHOULD BE APPROXIMATELY 3-INCHES HIGH. MAKE SURE THE MULCH IS 1 TO 2 INCHES AWAY FROM THE STEM OF THE INSTALLED PLANT.
7. INSTALL TREE GUARDS AS NEEDED AROUND NEWLY INSTALLED VEGETATION TO DISCOURAGE GRAZING/ BROWSING BY DEER AND RODENTS.
8. IRRIGATE NEWLY PLANTED AREAS AS NEEDED.
9. CONDUCT REGULAR MAINTENANCE AND MONITORING AS DESCRIBED IN THE "MAINTENANCE, MONITORING AND CONTINGENCY" SECTION OF THE REPORT.
10. NATIVE UPLAND GRASS SEED "MIX A" WILL BE HYDROSEEDED OR BROADCAST BETWEEN PLANTINGS IN THE SLOPED SOUTH BUFFER AREAS AT 20 LBS/ACRE.
11. NATIVE UPLAND GRASS SEED "MIX B" WILL BE HYDROSEEDED OR BROADCAST IN THE SLOPED NORTH BUFFER AND FLAT BUFFER ENHANCEMENT AREAS AT 30 LBS/ACRE.
12. NATIVE SEED (MIX A AND B) WILL BE HYDROSEEDED OR BROADCAST AS SPECIFIED IN THE BIOSWALE.

100% SUBMITTAL

811 Know what's below Call before you dig

RYAN S. CARNIE STATE OF WASHINGTON 22457 REGISTERED PROFESSIONAL ENGINEER 6/22/2022

NO.	DATE	BY	CHD.	APPR.	REVISION

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PLANTING DETAILS

DRAWING: W.03

SHEET: 31 OF 90

ABBREVIATIONS

ALUM	ALUMINUM
BF	BARRIER FREE
CR	CARD READER
CB	CATCH BASIN
CJ	CONTROL JOINT
CG	CORNER GUARD
CL	CENTER LINE
COL	COLUMN
COMM	COMMUNICATION
CONC	CONCRETE
CT	CERAMIC TILE
DIA	DIAMETER
DWGS	DRAWINGS
ELEC	ELECTRICAL
EQ	EQUAL
EQUIP	EQUIPMENT
EXT	EXTERIOR
FRR	FIRE RESISTANCE RATING
FD	FLOOR DRAIN
FL	FLOOR
F.O.	FACE OF
FOF	FACE OF FINISH
FOS	FACE OF STUD
GA	GAUGE
GALV	GALVANIZED
GI	GALVANIZED IRON
GR-	GUARDRAIL TYPE
GWB	GYPSUM WALL BOARD
HPL	HIGH PRESSURE LAMINATE
HSS	HOLLOW STRUCTURAL STEEL
INSUL	INSULATED/INSULATION
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
O/	OVER
O.C.	ON CENTER
O.H.	OPPOSITE HAND
PART	PARTITION
PDD	PER DELEGATED DESIGN
PL	PROPERTY LINE
PREF	PRE-FINISHED
PT	PORCELAIN TILE
PTD	PAINTED
R	RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REQ'D	REQUIRED
RM	ROOM
RO	ROUGH OPENING
ROW	RIGHT OF WAY
RTPI	REAL TIME PASSENGER INFO.
SF	SQUARE FOOT
SG	SPANDREL GLAZING
SA	SELF ADHERED
SS	SOLID SURFACE
SIM	SIMILAR
SPECS	SPECIFICATIONS
STOR	STORAGE
STRUC	STRUCTURAL
TH	THICK
T.O.	TOP OF
TYP	TYPICAL
U/S	UNDERSIDE
VIF	VERIFY IN FIELD
W/	WITH
WC	WASHROOM
WD	WOOD

CODE SUMMARY

APPLICABLE BUILDING CODES

2018 WASHINGTON STATE BUILDING CODE
2018 WASHINGTON STATE FIRE CODE
2018 WASHINGTON STATE ENERGY CODE - COMMERCIAL PROVISIONS
2018 WASHINGTON STATE MECHNICAL CODE
AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG)
NATIONAL ELECTRIC CODE 2020 OF WASHINGTON (NEC)
2018 WASHINGTON STATE PLUMBING CODE (IPC)
OCCUPATIONAL SAFETY AND HEALTH STANDARDS (OSHA) 29FR PART 1910
CURRENT EDITION
ANSI 117.1 2009

ZONING

C-2 - RETAIL BUSINESS

SHELTER

OCCUPANCY CLASSIFICATION:

OCCUPANCY B (IBC 303.1.1) ASSEMBLY - TRANSIT WAITING

CONSTRUCTION TYPE:

TYPE IIB NON-COMBUSTIBLE

UNSPRINKLERED 9500 SF ALLOWABLE

SECTION 1004: OCCUPANT LOAD (OL)
BUSINESS ASSEMBLY AREA

MAXIMUM FLOOR AREA ALLOWANCE PER OCCUPANT: 5 SF/OCCUPANT
ENCLOSED SHELTER: 60 SF/5 = 12 OCC
COVERED PLATFORM: 70 SF/5 = 14 OCC

PLATFORM CROSS SLOPE NOT EXCEEDING 2% MAX: 2% MAX PROVIDED
SLOPE PARALLEL TO ROADWAY SHALL BE SAME AS ROADWAY SEE CIVIL PROFILE DRAWING

ACCESSIBLE PATH OF TRAVEL:

ACCESSIBLE PATH OF TRAVEL AS INDICATED ON PLAN IS A BARRIER-FREE ACCESS ROUTE WITHOUT ANY ABRUPT LEVEL CHANGES EXCEEDING 1/2" IF BEVELED AT 1:2 MAX SLOPE, OR VERTICAL LEVEL CHANGES NOT EXCEEDING 1/4" MAX, AND AT LEAST 48" IN WIDTH. SURFACE IS STABLE, FIRM, AND SLIP RESISTANT. CROSS SLOPE DOES NOT EXCEED 2% AND SLOPE IN THE DIRECTION OF TRAVEL IS LESS THAN 5%, UNLESS OTHERWISE INDICATED. ACCESSIBLE PATH OF TRAVEL SHALL BE MAINTAINED FREE OF OVERHANGING OBSTRUCTIONS TO 80" MINIMUM, AND PROTRUDING OBJECTS GREATER THAN 4" PROJECTION FROM WALL AND ABOVE 27" AND LESS THAN 80"

COMFORT BUILDING

OCCUPANCY CLASSIFICATION:

OCCUPANCY B: BUSINESS AREAS PER IBC 303.1.1
OCCUPANT LOAD: 1/150 SF GROSS

CONSTRUCTION TYPE II-B UNSPRINKLERED 23000 SF ALLOWABLE
ACTUAL BUILDING AREA:
ENCLOSED: 645 SF/150 = 5 OCC
YARD: 530 SF/150 = 4 OCC

1 HOUR FIRE RESISTANCE RATING REQUIRED ON EASTERN WALL, 1'-9" AWAY FROM PROPERTY LINE

No. OF STORIES:
ALLOWED 3
ACTUAL 1

APPLICABLE ACCESSIBILITY GUIDELINES ANSI 117.1

SECTION 4.1.2: ACCESSIBLE SITES & EXTERIOR FACILITIES NEW CONSTRUCTION (NC). ALL NC SITES ARE REQUIRED TO COMPLY WITH

SECTION 4.3 ACCESSIBLE ROUTE.

SECTION 4.2 SPACE ALLOWANCE & REACH RANGE
PASSAGE WIDTH: 32"MIN AT 1 POINT OR 36"MIN CONT ALONG PATH SIDE REACH: 9"MIN 54"MAX

SECTION 4.3 ACCESSIBILE ROUTE

WIDTH OF ACCESSIBLE ROUTE: 36" MIN
PASSING SPACE (FOR 2 WHEELCHAIRS):
60"MIN AT INTERVAL OF >200FT
SINGLE WHEELCHAIR = 32"MIN AT 1 POINT OR 36"MIN CONT ALONG PATH
SINGLE STATIONARY WHEELCHAIR = 30"X48"
HEAD ROOM: 80"MIN
CHANGES IN LEVEL (ALONG AN ACCESSIBLE ROUTE): SHALL ALSO COMPLY WITH 4.5.2 CHANGES IN LEVEL

SECTION 4.9 HANDRAILS

SECTION 4.29 DETECTABLE WARNINGS
(AS REQUIRED BY SECTIONS 4.1 MIN REQUIREMENTS AND 4.7 CURB RAMPS)
DETECTABLE WARNINGS ON WALKING SURFACES

SECTION 4.33 ASSEMBLY AREAS
PLACEMENT OF WHEELCHAIR LOCATIONS

ADAAG CHAPTER 10: TRANSPORTATION FACILITIES

SECTION 10.2 BUS STOPS AND TERMINALS
SECTION 10.3 FIXED FACILITIES AND STATIONS

Room & Unit Tags

Room Name
10101

Room Name
150 sf

Door Tag

101

Window Tag

101

Wall Tags

W?

Keynote Tag

Floor Tags

F? F? F? F?

Furniture Tag

XX XX

Ceiling Tags

1i

Electrical Tags

XX XX

Roof Tags

R?

Mechanical Tags

XX

Finish Tags

?

Plumbing Tag

XX

Equipment Tag

XX

Section Marker

1 A101 Ref

Elevation Marker

1 1 A101 1 1

Grid

XX

North Arrow

Elevation Datum Marker

Level -00' 00"

Titlemark

1 A101 View Name
Scale: 1/8" = 1'-0"

1 A101 View Name
Scale: NTS

Revision Tags

X

Photo Reference Tags

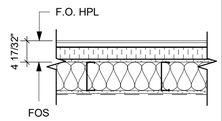
SHEET

0 2' 4' 8'

EXTERIOR WALL ASSEMBLIES

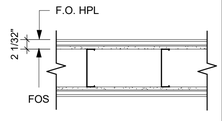
WA

UL # U425
1 HOUR RATED



WALL TYPE A
- ARCHITECTURAL HIGH PRESSURE LAMINATE BOARD (3/8")
- 1" VENTILATED ALUMINUM FURRING O/THERMAL BREAK CLIP SYSTEM
- 2.5" ROCKWOOL SEMI RIGID INSULATION R-10
- MOISTURE BARRIER
- 5/8" DENSGLASS TYPE X - SUREBOARD SHEAR PANELS WHERE OCCURS
- 6" STUD FRAMING @ 16" O.C. WITH 6" MINERAL FIBER INSULATION IN STUD SPACE R-19
- AIR/VAPOUR BARRIER
- 5/8" TYPE X GYPSUM BOARD, ABUSE RESISTANT SUREBOARD SHEAR PANELS WHERE OCCURS
- CONC. STEM WALL AT BOTTOM
- FINISH AND BASE PER SCHEDULE

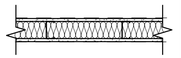
WA1



WALL TYPE A1
- ARCHITECTURAL HIGH PRESSURE LAMINATE BOARD (3/8")
- 1" VENTILATED METAL FURRING
- MOISTURE BARRIER
- 5/8" DENSGLASS - SUREBOARD SHEAR PANELS WHERE OCCUR
- 8" STUD FRAMING @ 16" O.C.
- 5/8" DENSGLASS - SUREBOARD SHEAR PANELS WHERE OCCUR
- MOISTURE BARRIER (WATERPROOF MEMBRANE)
- 1" VENTILATED METAL FURRING
- ARCHITECTURAL HIGH PRESSURE LAMINATE BOARD (3/8")
- CONC. STEM WALL AT BOTTOM

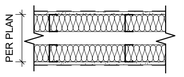
INTERIOR WALL ASSEMBLIES

WB



WALL TYPE B
- FINISH AND BASE PER SCHEDULE
- 5/8" GYPSUM BOARD ABUSE RESISTANT
- 3-5/8" METAL STUD FRAMING @ 16" O.C. W/ SOUND INSULATION
- 5/8" GYPSUM BOARD ABUSE RESISTANT
- FINISH AND BASE PER SCHEDULE

WB2



WALL TYPE B2 - DOUBLE WALL
- FINISH AND BASE PER SCHEDULE
- 5/8" GYPSUM BOARD ABUSE RESISTANT
- 3-5/8" METAL STUD FRAMING @ 16" O.C. W/ SOUND INSULATION
- AIR GAP PER PLAN
- 3-5/8" METAL STUD FRAMING @ 16" O.C. W/ SOUND INSULATION
- 5/8" GYPSUM BOARD ABUSE RESISTANT
- FINISH AND BASE PER SCHEDULE

CEILING TYPES

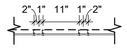
C1

EXPOSED STRUCTURE - TO PAINT
- SEE SCHEDULE

C2

GYP. BOARD ON METAL STUD
- 2 1/2" 24GA GI METAL STUD AT 16" O.C. W/ HANGARS TO ROOF FRAMING AT 48" O.C.
- 5/8" GYPSUM BOARD
- FINISH PER SCHEDULE

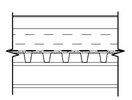
C3



WOOD-LOOK HPL PLANKS
- 1" (SHELTER) OR 6" (COMFORT BUILDING) METAL FURRING CHANNEL
- ARCHITECTURAL HIGH PRESSURE LAMINATE BOARD (10 mm) PLANKS, 8 mm JOINT AROUND EACH PLANK

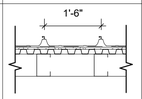
ROOF ASSEMBLIES

R1



ROOF TYPE R1
- TPO SINGLE PLY ROOFING MEMBRANE
- 1/4" COVER BOARD
- TAPERED INSULATION SLOPED TO DRAIN
- 7" RIGID INSULATION R40
- AIR/VAPOUR BARRIER
- 5/8" GLASS MAT SHEATHING
- 9/16" METAL ROOF DECK (SEE STRUCTURAL DRAWINGS)
- PAINT PER SCHEDULE (UNLESS AT CEILING TYPE C3)
- COLD FORMED METAL ROOF JOISTS - EXPOSED (SEE STRUCTURAL DWGS)

R2



ROOF TYPE R2
- STANDING SEAM ROOF - SEAMS @ 18" O.C.
- HIGH TEMPERATURE PEEL AND STICK WATERPROOF MEMBRANE
- 5/8" GLASS MAT SHEATHING
- 9/16" METAL ROOF DECK (SEE STRUCTURAL DRAWINGS)
- COLD FORMED METAL ROOF JOISTS (REFER TO STRUCTURAL DRAWINGS)

FOR BUILDINGS ONLY
10759
REGISTERED ARCHITECT
CRAIG ROTHENBURGER
STATE OF WASHINGTON

GENERAL NOTES

1. DO NOT SCALE DRAWINGS.
2. THE CONTRACTOR SHALL SITE VERIFY THE SURVEY INFORMATION PRIOR TO PROCEEDING WITH THE WORK. FAILURE TO REPORT ANY DISCREPANCIES SHALL CONSTITUTE ACCEPTANCE OF THE SITE CONDITIONS.
3. ALL EXPOSED CAST-IN-PLACE CONCRETE SHALL BE ARCHITECTURAL CONCRETE - SMOOTH FINISH WITH CONCRETE SEALER, UNLESS NOTED OTHERWISE.
4. THE CONTRACTOR SHALL REVIEW THE DRAWINGS FOR SCOPE OF DEMOLITION AND NEW WORK, INCLUDING ALL DISCIPLINES, AND SHALL COORDINATE WITH NEW WORK DRAWINGS FOR EXACT EXTENT OF DEMOLITION.
5. SCOPE OF WORK SHALL NOT BE LIMITED TO THAT SHOWN ON THE DRAWINGS AND SHALL INCLUDE WORK REQUIRED TO ELIMINATE ALL EXISTING, ABANDONED OR REDUNDANT COMPONENTS, AND TO FACILITATE PROPER EXECUTION OF THE WORK.
6. ALL DIMENSIONS, INCLUDING EXISTING DIMENSIONS AND SETTING-OUT GEOMETRIES, SHALL BE SITE VERIFIED BY THE CONTRACTOR PRIOR TO PROCEEDING WITH THE WORK. FOR BUILDING SETTING-OUT REFER TO DRAWINGS A.01.
7. REMOVAL AND DISPOSAL OF HAZARDOUS MATERIALS SHALL BE IN ACCORDANCE WITH LOCAL REGULATIONS AND AUTHORITIES HAVING JURISDICTION.
8. UNLESS NOTED OTHERWISE, MAKE GOOD ALL AREAS DISTURBED BY EXCAVATION AND/OR INSTALLATION OF CIVIL, MECHANICAL AND ELECTRICAL SERVICES. REFER TO CIVIL, MECHANICAL, AND ELECTRICAL DRAWINGS.
9. THE CONTRACTOR SHALL COOPERATIVELY COORDINATE WITH THE WORK OF OTHER CONTRACTORS UNDER SEPARATE CONTRACT(S) WITH THE OWNER.

SHEET INDEX - ARCHITECTURE

06-17-2022 PLAN CHECK RESUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	06/17/2022	CD	SB	CR	SECOND PERMIT REVIEW

DRAWN BY RR | DESIGNED BY CR
CHECKED BY CR | APPROVED BY CR
DATE 06/17/2022
J O B No. : 2000677
S C A L E : As indicated

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BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

SHEET TITLE
ARCHITECTURE
SHEET INDEX, GENERAL INFORMATION & CODE SUMMARY

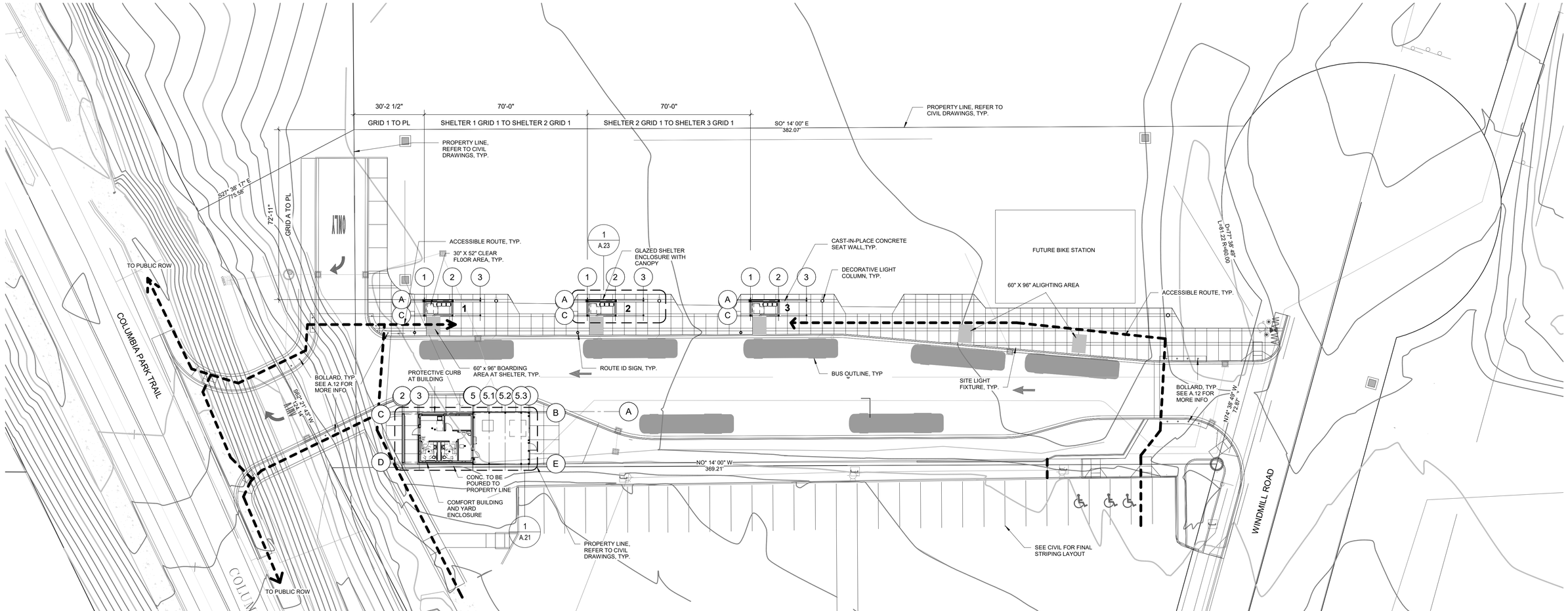
SHEET
A.01
SHEET 34 OF 97

SITE PLAN LEGEND

- SITE LIGHTING, SEE ELECTRICAL
- ACCESSIBLE ROUTE

SITE PLAN NOTES:

1. REFER TO GRADING AND DRAINAGE PLANS FOR STORMWATER IMPROVEMENTS.
2. REFER TO CIVIL SITE PLAN FOR CURB, SIDEWALK, AND STRIPING DESIGN INFO.
3. SEE ELECTRICAL PLANS FOR POWER SERVICE CONNECTION DESIGN INFO.
4. REFER TO ITS PLANS FOR COMMUNICATIONS SERVICE CONNECTION DESIGN INFO.
5. REFER TO UTILITY PLANS FOR UTILITY CONNECTION DESIGN INFO.
6. REFER TO TRAFFIC PLANS FOR SIGNAGE AND STRIPING DESIGN.
7. REFER TO CIVIL DRAWINGS FOR FINISH GRADING PLAN.



1 A.11 OVERALL SITE PLAN
Scale: 3/64" = 1'-0"

0 8' 16' 32'

FOR BUILDINGS ONLY
10759 REGISTERED ARCHITECT
CRAIG ROTHENBURGER
STATE OF WASHINGTON

06-17-2022 PLAN CHECK RESUBMITTAL

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S C A L E: As indicated

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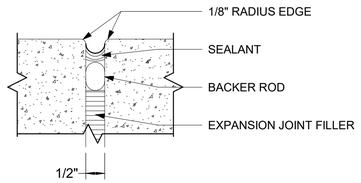
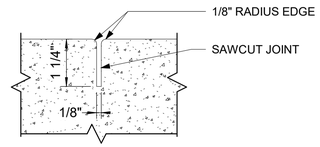
QUEENSGATE TRANSIT HUB

SHEET TITLE
ARCHITECTURE
OVERALL SITE PLAN

SHEET
A.11
SHEET 35 OF 97



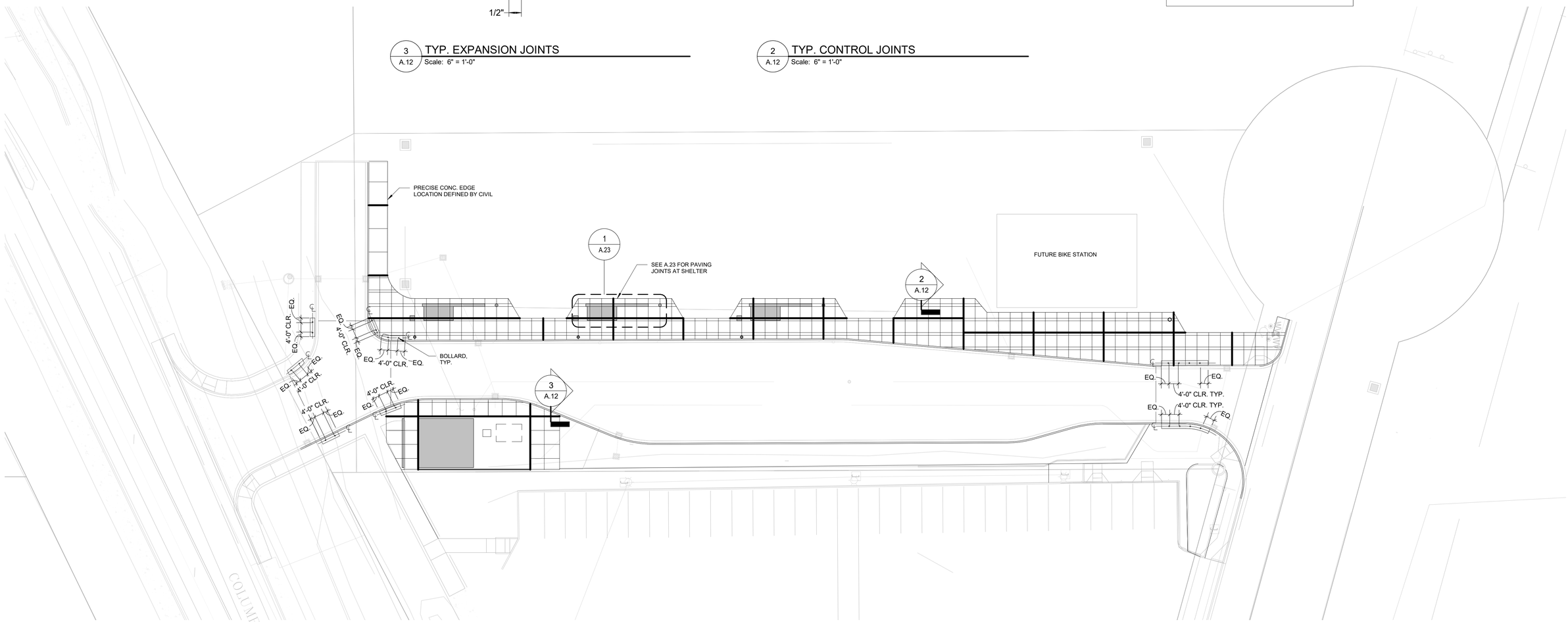
3 A.12 TYP. EXPANSION JOINTS
Scale: 6" = 1'-0"



2 A.12 TYP. CONTROL JOINTS
Scale: 6" = 1'-0"

JOINTING PLAN LEGEND

- EXPANSION JOINT
- SAWCUT CONTROL JOINT



1 A.12 CONCRETE JOINTING PLAN
Scale: 3/64" = 1'-0"

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0 8' 16' 32'

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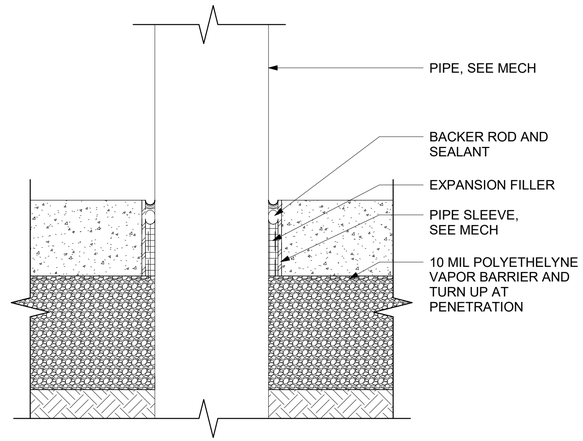
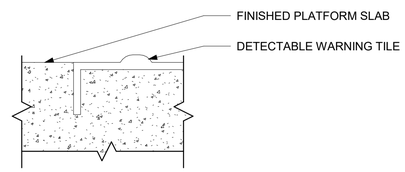
SHEET TITLE
ARCHITECTURE
CONCRETE JOINTING PLAN AND DETAILS

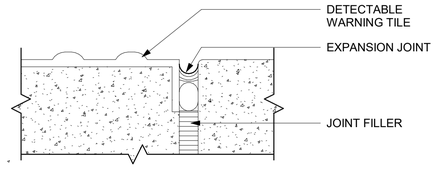
SHEET
A.12
SHEET 36 OF 97



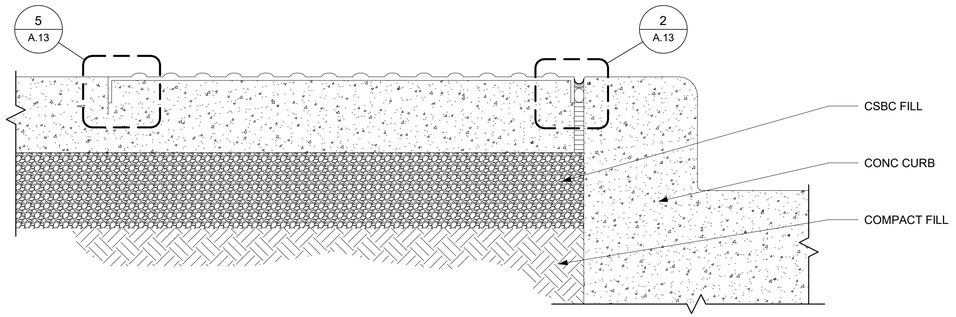
6 A.13 PIPE PENETRATION DETAIL
Scale: 3" = 1'-0"



5 A.13 TACTILE WARNING STRIP TRANSITION
Scale: 6" = 1'-0"



2 A.13 TACTILE WARNING STRIP TRANSITION AT CURB
Scale: 6" = 1'-0"



4 A.13 TACTILE WARNING STRIP
Scale: 3" = 1'-0"

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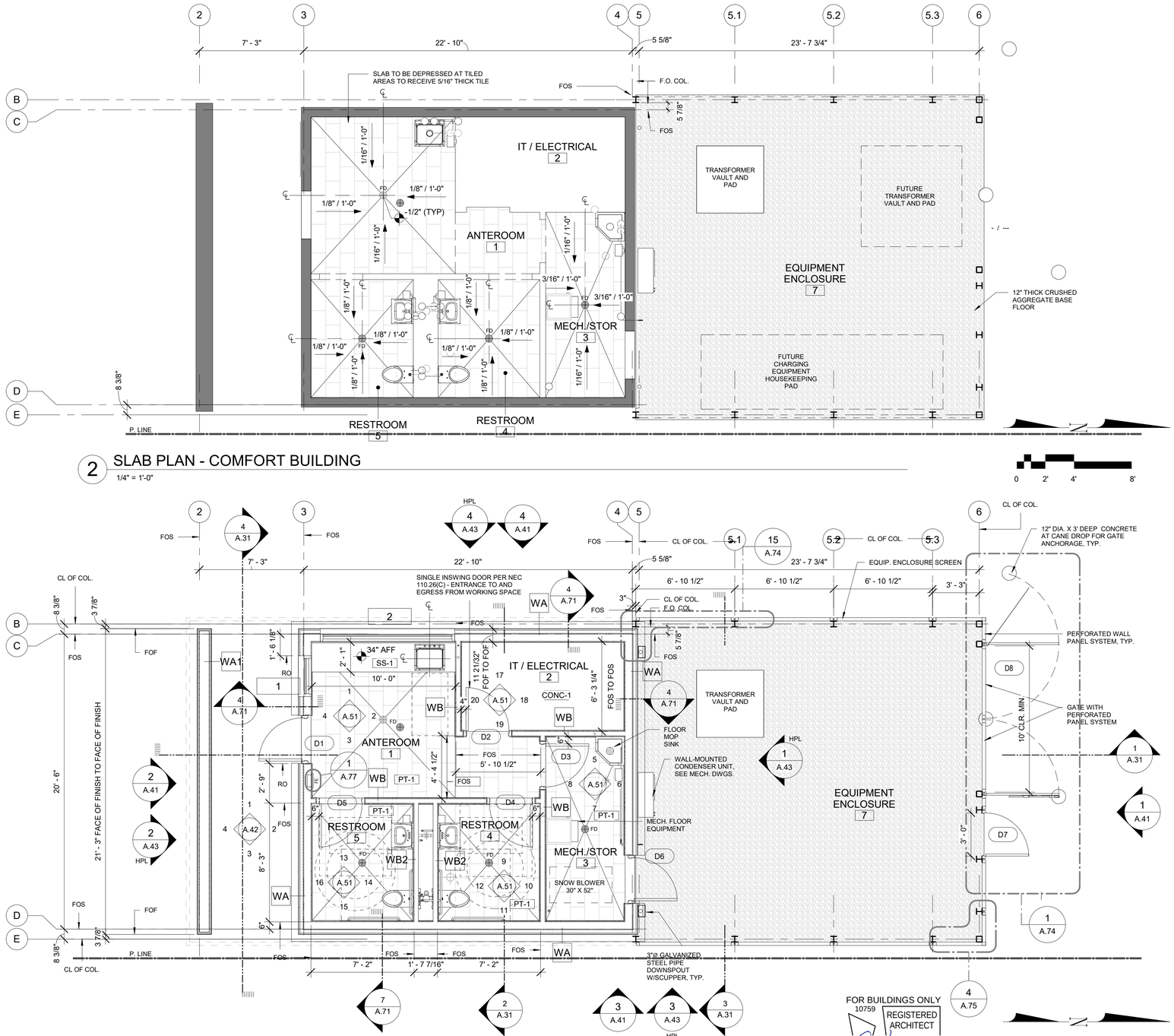
SHEET TITLE
ARCHITECTURE
SITE DETAILS

SHEET
A.13
SHEET 37 OF 97



2 SLAB PLAN - COMFORT BUILDING

1/4" = 1'-0"

0 2' 4' 8'

1 FLOOR PLAN - COMFORT BUILDING

1/4" = 1'-0"

0 2' 4' 8'

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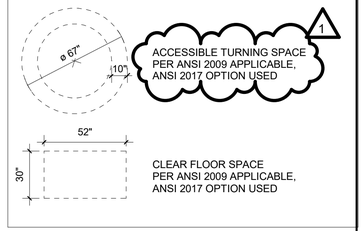
GENERAL NOTES:

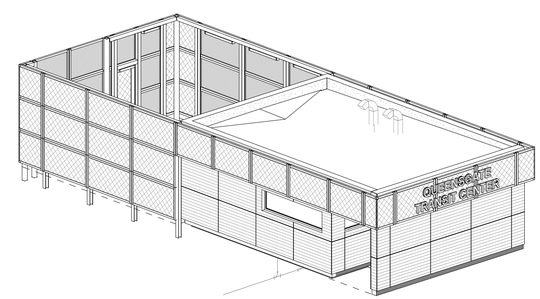
1. EMPLOYEE USE ONLY, NOT A PUBLIC ACCOMODATION.
2. MATERIALS WHICH ARE IN SIMILAR LOCATIONS ARE NOT NOTED AT EVERY OCCURRENCE.
3. SEE FINISH PLANS, REFLECTED CEILING PLANS, INTERIOR ELEVATIONS, AND FINISH LEGEND FOR ADDITIONAL FINISH INFORMATION.
4. DIMENSIONS SHOWN ARE TO FACE OF STUD, FACE OF FINISH, OR CENTERLINE OF COLUMN OR GRID LINE UNLESS NOTED OTHERWISE.
5. FLOOR SURFACES SHALL NOT SLOPE IN EXCESS OF 2%.
6. FLOOR SURFACES SHALL SLOPE TOWARDS FLOOR DRAIN MIN. 1%.
7. REFER TO STRUCTURAL FOUNDATIONS, FLOOR SLAB AND HOUSKEEPING PAD DETAILS.
8. REFER TO MECHANICAL AND PLUMBING FOR HVAC AND PLUMBING EQUIPMENT, ELECTRICAL EQUIPMENT AND LIGHTING.
10. SEAL ALL ELECTRICAL BOXES AT EXTERIOR WALL WITH PUTTY PADS, FOAM GASKETS, AND SEALANT.
11. SEAL AROUND ALL EXTERIOR WALL PENETRATIONS WITH SPRAY POLYURETHANE FOAM.
12. SEE SHEET A.71 FOR WALL TYPES

FLOOR PLAN LEGEND



MATERIALS / FINISHES	
Key Value	Keynote Text

CONC-1	SEALED CONCRETE
PT-1	PORCELAIN TILE
SS-1	SOLID SURFACE COUNTERTOP



3 ISOMETRIC - COMFORT BUILDING

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S C A L E: 1/4" = 1'-0"

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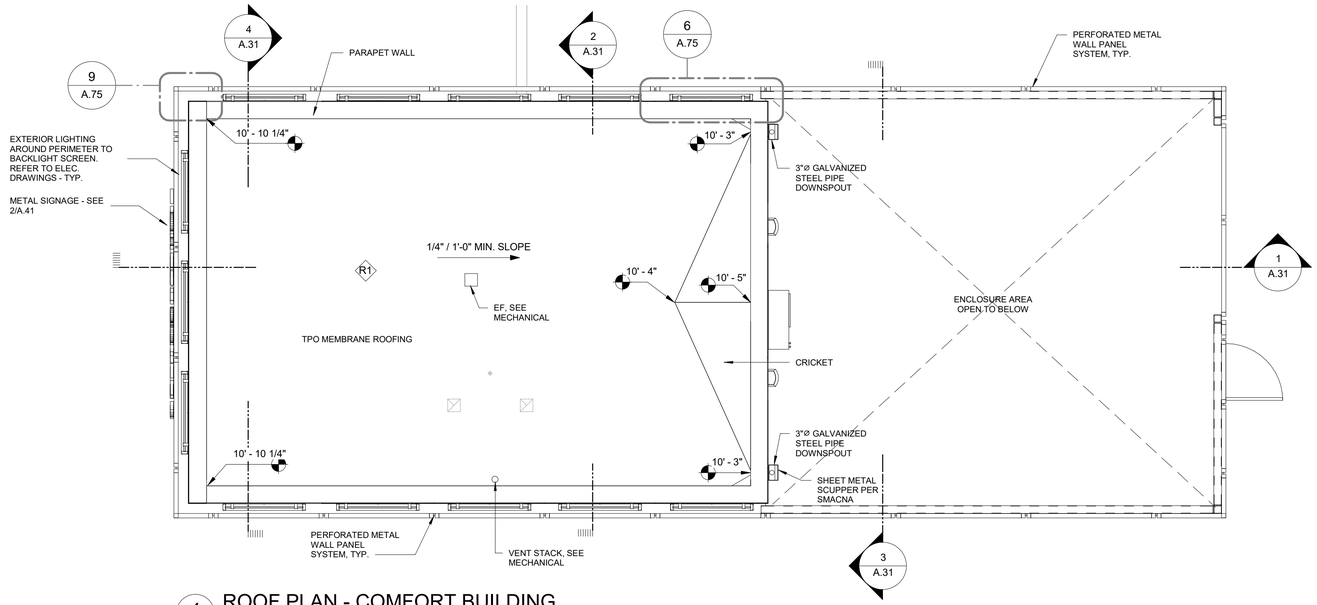
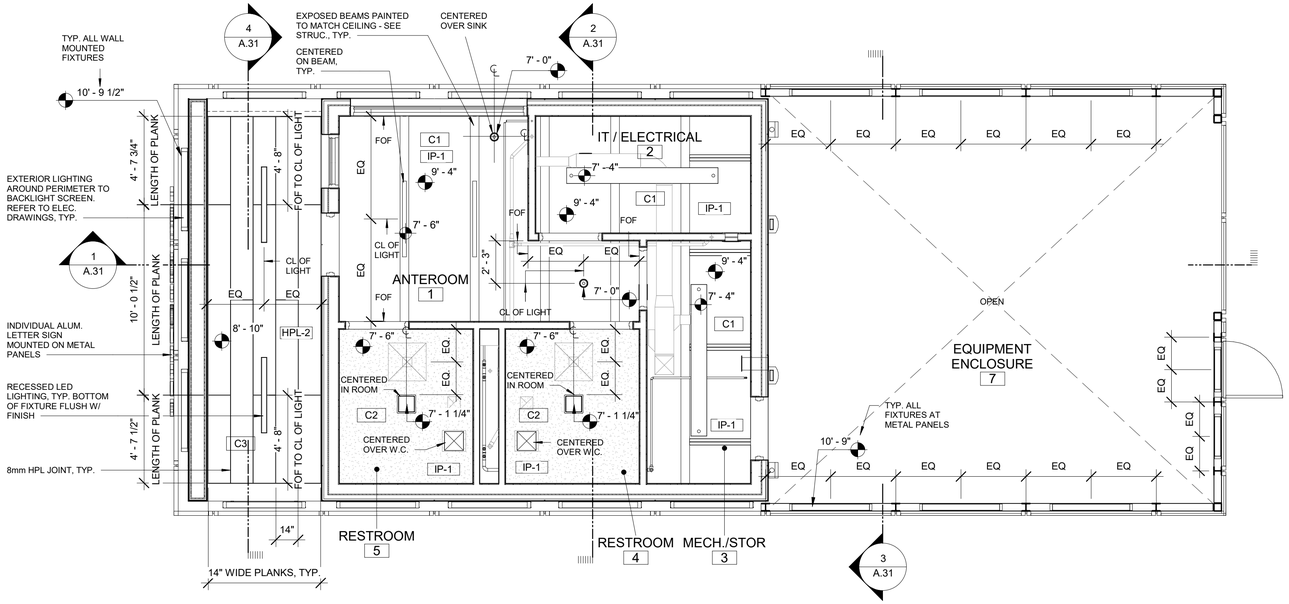
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - FLOOR PLAN, SLAB PLAN & ISOMETRIC

SHEET
A.21
SHEET 38 OF 97



1 ROOF PLAN - COMFORT BUILDING

1/4" = 1'-0"



2 CEILING PLAN - COMFORT BUILDING

1/4" = 1'-0"

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CEILING PLAN LEGEND

GYP. BOARD

LIGHTING FIXTURES - SEE ELEC. DWGS. FOR MORE INFO

MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-2	HIGH PRESSURE LAMINATE, WOOD-LOOK
IP-1	INTERIOR PAINT (FIELD)

0 2' 4' 8'

0 2' 4' 8'

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S C A L E: 1/4" = 1'-0"

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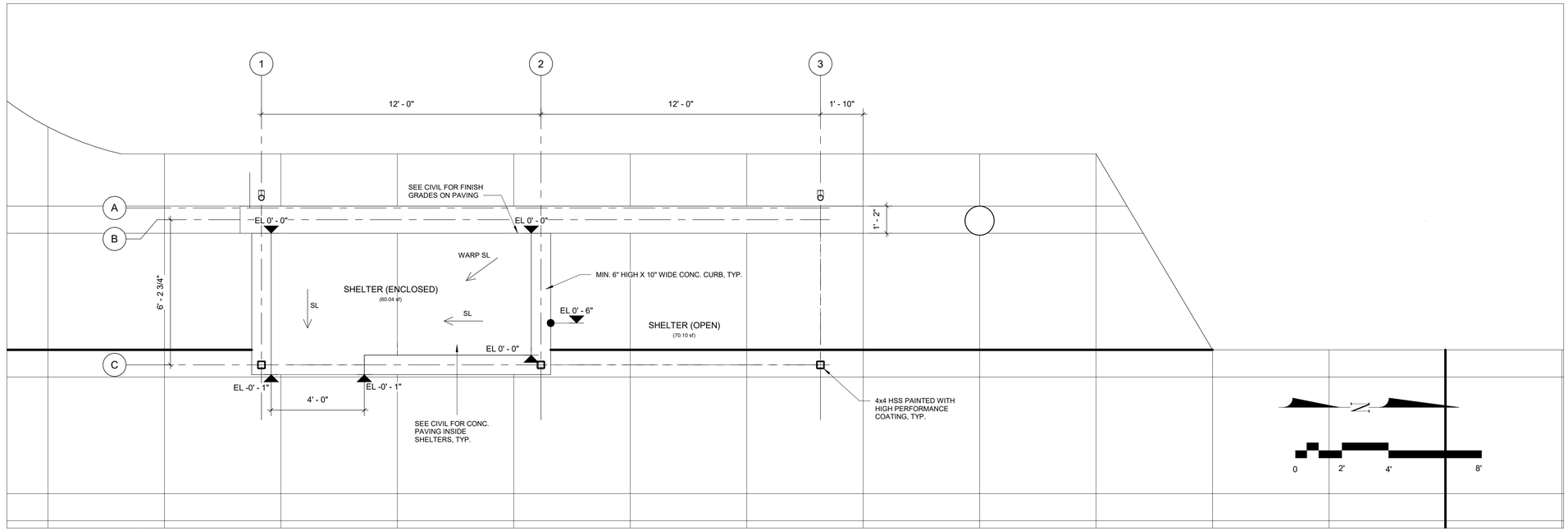
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - ROOF PLAN AND REFLECTED CEILING PLAN

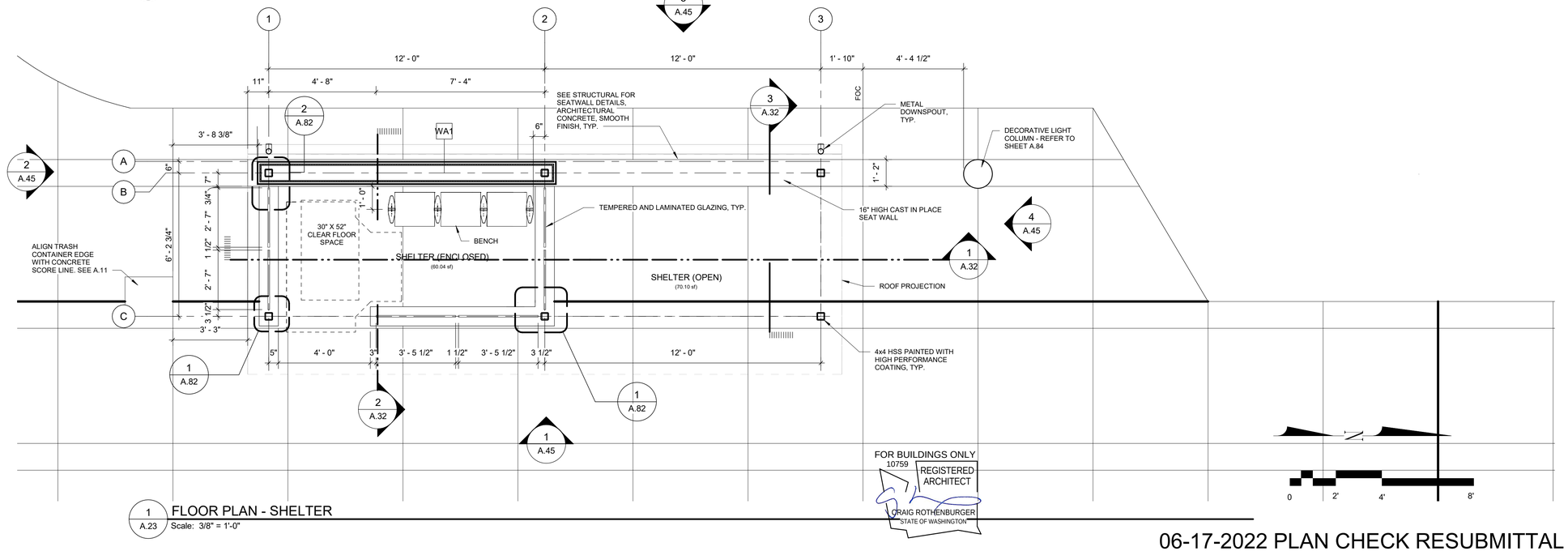
SHEET
A.22
SHEET 39 OF 97

NOTE: SEE STRUCTURAL FOR CONCRETE BENCH DETAIL



2 / A.23 SLAB PLAN - SHELTER

Scale: 3/8" = 1'-0"



1 / A.23 FLOOR PLAN - SHELTER

Scale: 3/8" = 1'-0"

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S C A L E: 3/8" = 1'-0"

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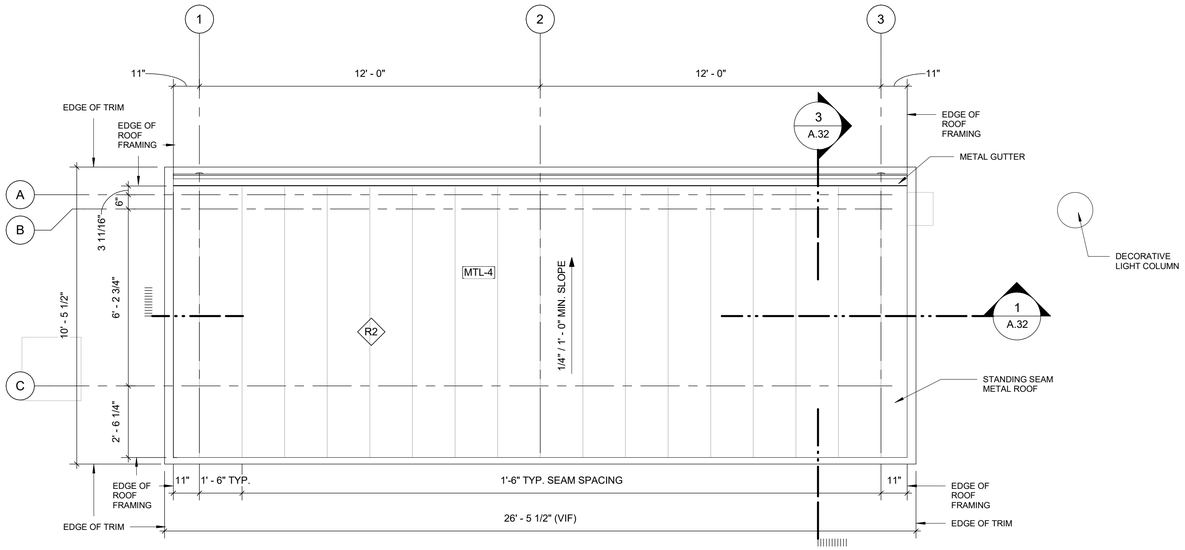
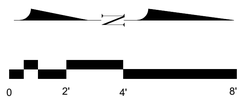
SHEET TITLE
ARCHITECTURE
SHELTER / CANOPY - FLOOR PLAN AND SLAB PLAN

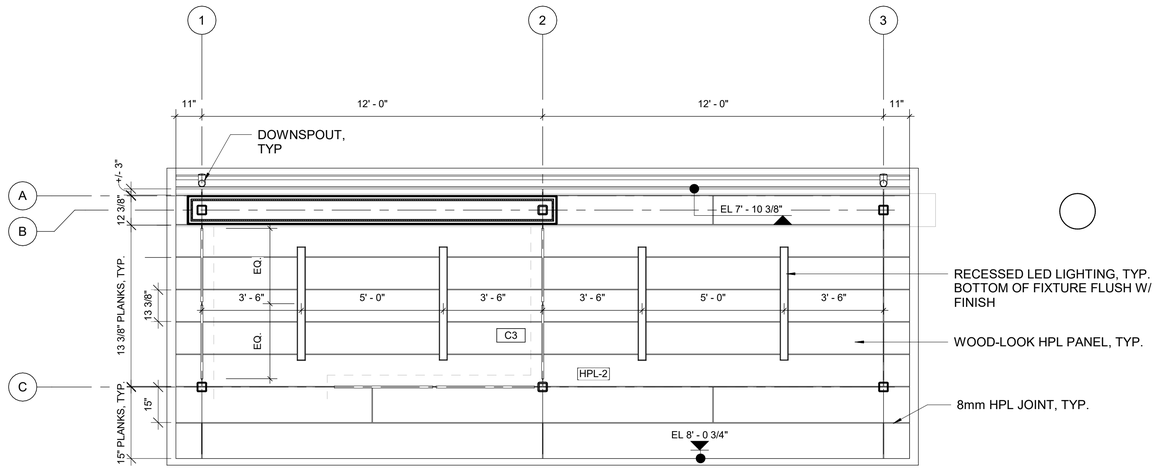
SHEET
A.23
SHEET 40 OF 97

MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-2	HIGH PRESSURE LAMINATE, WOOD-LOOK
MTL-4	SILICONIZED POLYESTER

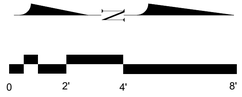


2 A.24 ROOF PLAN - SHELTER
Scale: 3/8" = 1'-0"





1 A.24 REFLECTED CEILING PLAN - SHELTER
Scale: 3/8" = 1'-0"



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S C A L E: 3/8" = 1'-0"

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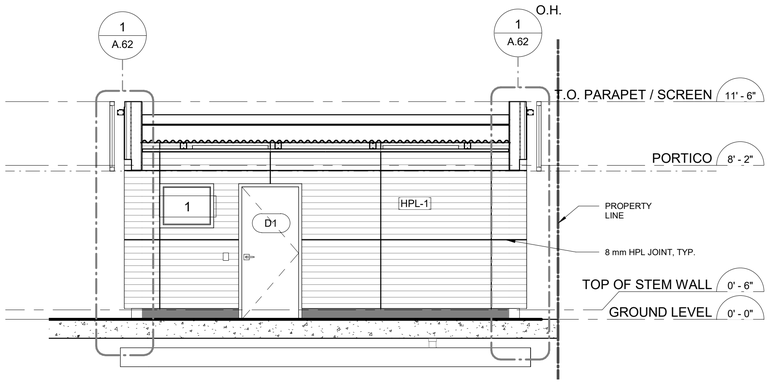
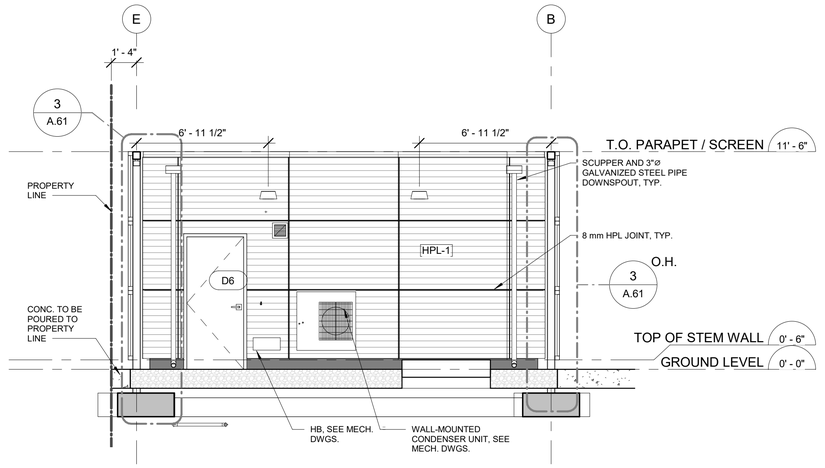
SHEET TITLE
ARCHITECTURE
SHELTER / CANOPY - ROOF PLAN AND REFLECTED CEILING PLAN

SHEET
A.24
SHEET 41 OF 97

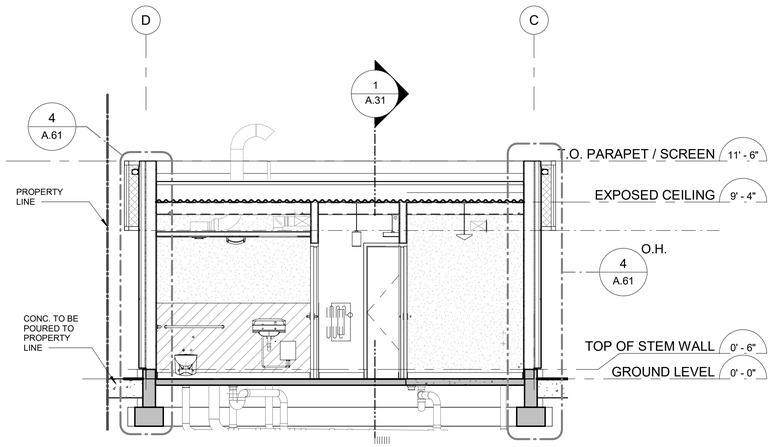
MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-1	HIGH PRESSURE LAMINATE, PRINTED



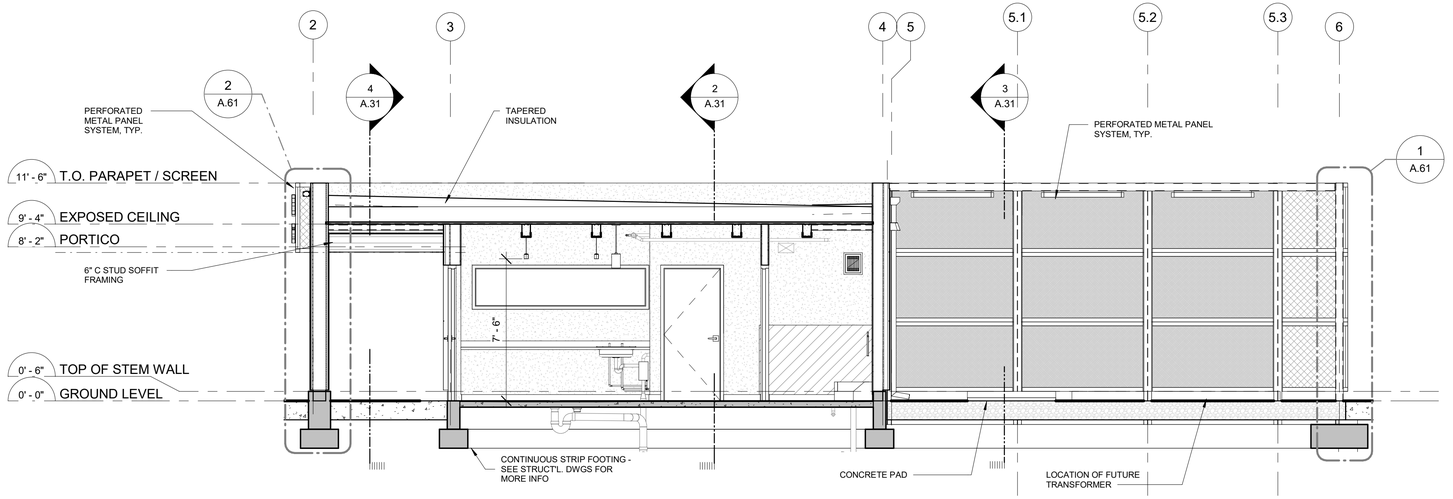
4 SECTION 4 - COMFORT BUILDING
1/4" = 1'-0"



3 SECTION 3 - COMFORT BUILDING
1/4" = 1'-0"



2 SECTION 2 - COMFORT BUILDING
1/4" = 1'-0"



1 SECTION 1 - COMFORT BUILDING
1/4" = 1'-0"

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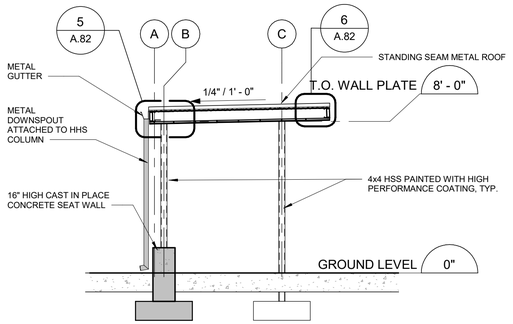
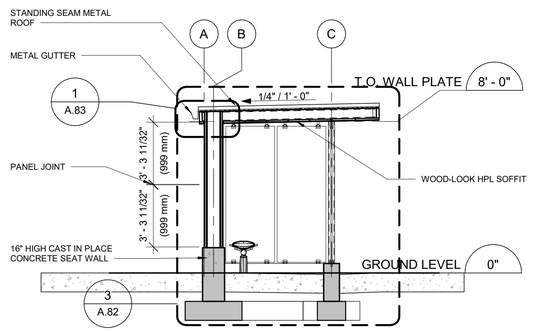
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - CROSS SECTIONS

SHEET
A.31
SHEET 42 OF 97

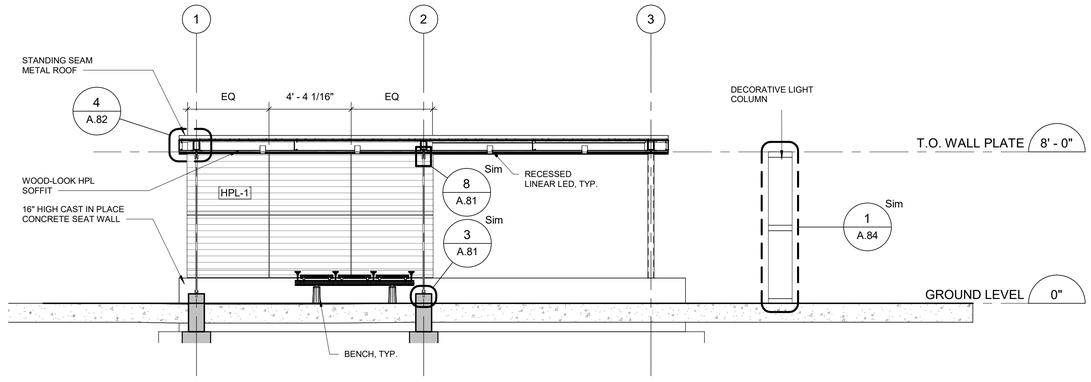
MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-1	HIGH PRESSURE LAMINATE, PRINTED



3 A.32 SECTION 3 - SHELTER
Scale: 1/4" = 1'-0"



2 A.32 SECTION 2 - SHELTER
Scale: 1/4" = 1'-0"



1 A.32 SECTION 1 - SHELTER
Scale: 1/4" = 1'-0"

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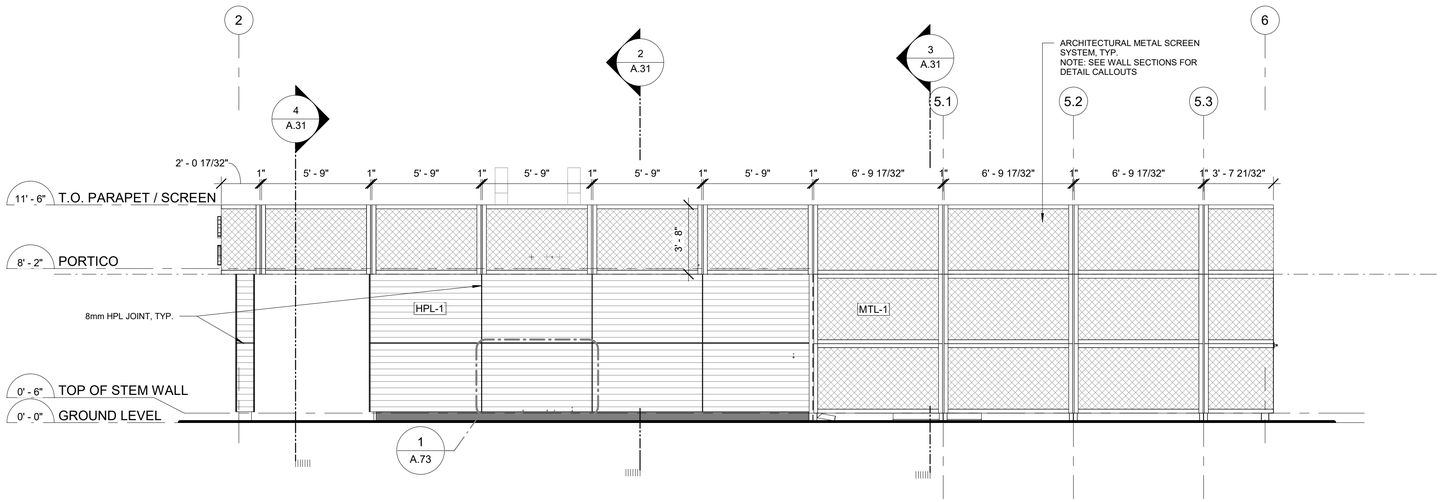
SHEET TITLE
ARCHITECTURE
SHELTER / CANOPY - CROSS SECTIONS

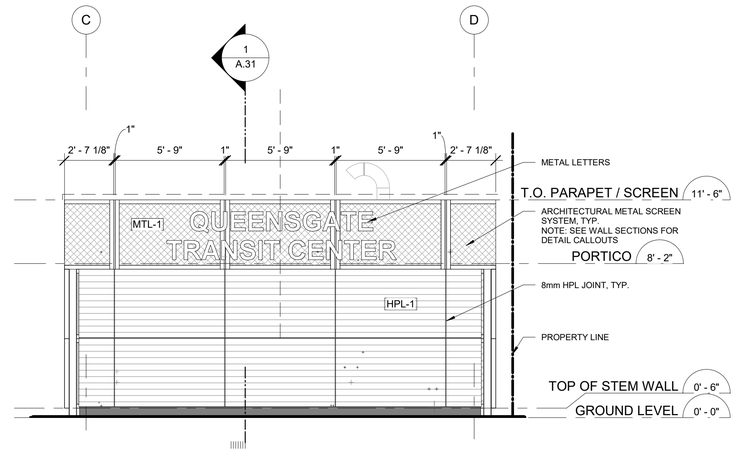
SHEET
A.32

MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-1	HIGH PRESSURE LAMINATE, PRINTED
MTL-1	POWDER COAT
MTL-3	HIGH PERFORMANCE COATED STEEL



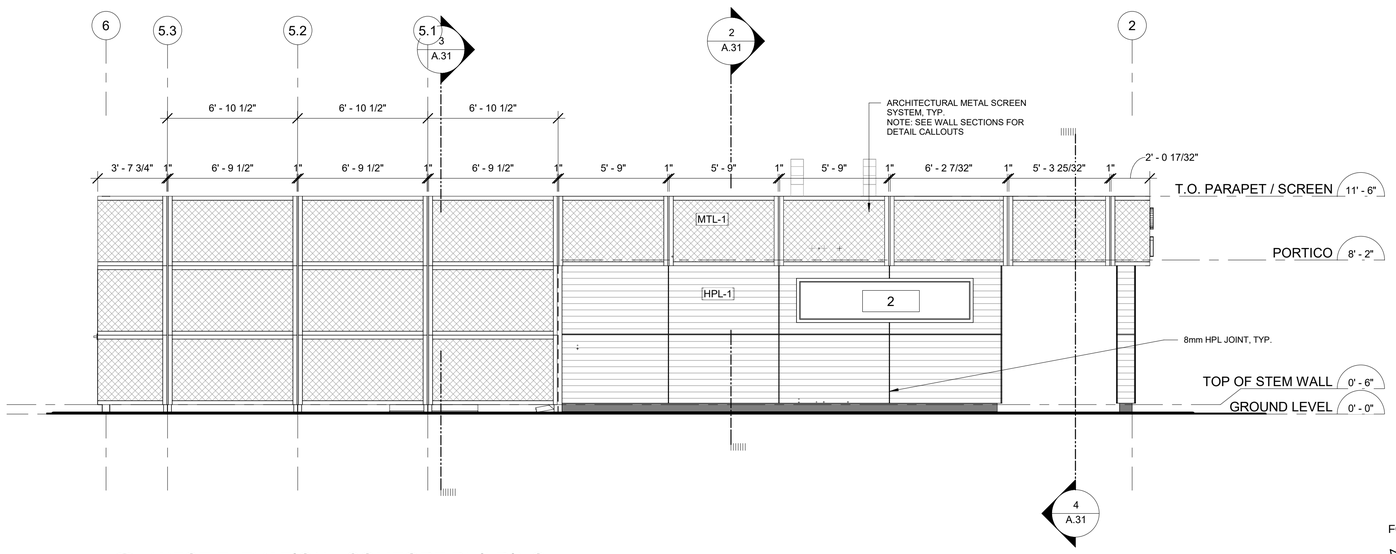
3 EAST ELEVATION - COMFORT BUILDING

1/4" = 1'-0"



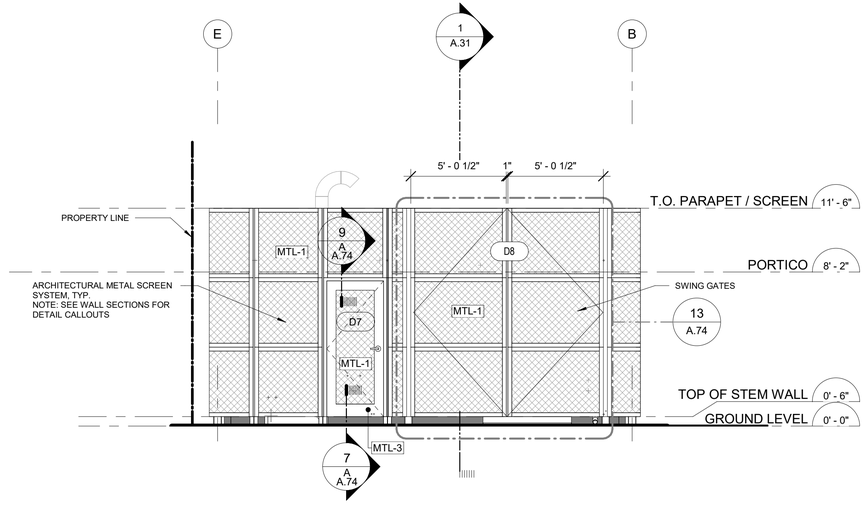
2 SOUTH ELEVATION - COMFORT BUILDING

1/4" = 1'-0"



4 WEST ELEVATION - COMFORT BUILDING

1/4" = 1'-0"



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1 NORTH ELEVATION - COMFORT BUILDING

1/4" = 1'-0"

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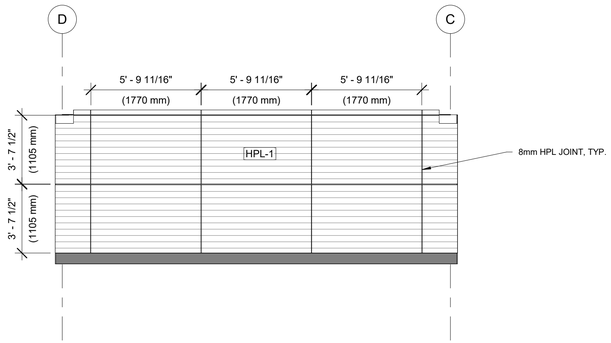
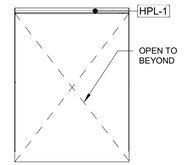
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - EXTERIOR ELEVATIONS

SHEET
A.41
SHEET 44 OF 97

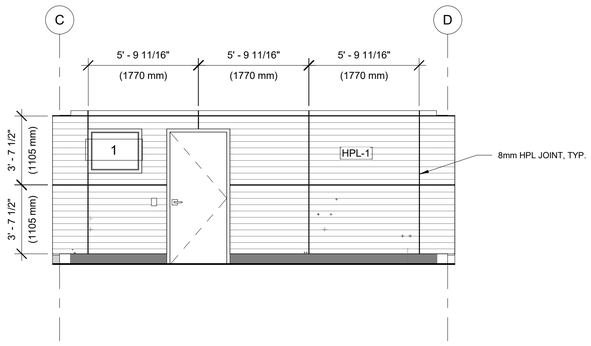
MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-1	HIGH PRESSURE LAMINATE, PRINTED



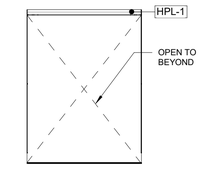
4 SOUTH PORTICO ELEVATION - COMFORT BUILDING
1/4" = 1'-0"



3 EAST PORTICO ELEVATION - COMFORT BUILDING
1/4" = 1'-0"



2 NORTH PORTICO ELEVATION - COMFORT BUILDING
1/4" = 1'-0"



1 WEST PORTICO ELEVATION - COMFORT BUILDING
1/4" = 1'-0"

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REGISTERED ARCHITECT
CRAIG ROTHENBURGER
STATE OF WASHINGTON

06-17-2022 PLAN CHECK RESUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	06/17/2022	CD	SB	CR	SECOND PERMIT REVIEW

DRAWN BY: CD
DESIGNED BY: SB
CHECKED BY: SB
APPROVED BY: CR
DATE: 07/30/2021
JOB No. : 2000677
SCALE: 1/4" = 1'-0"

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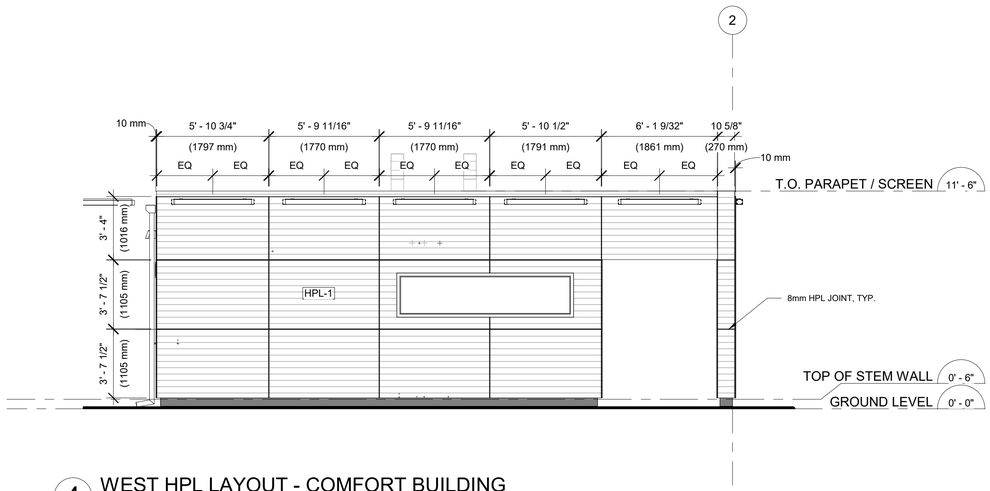
BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

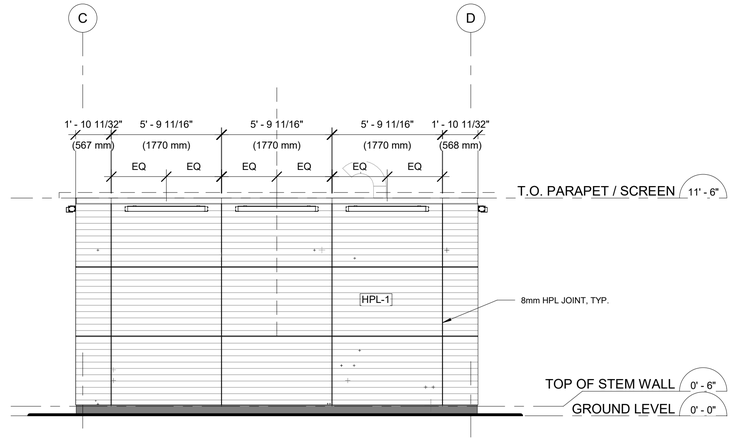
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - EXTERIOR ELEVATIONS

SHEET
A.42
SHEET 45 OF 97

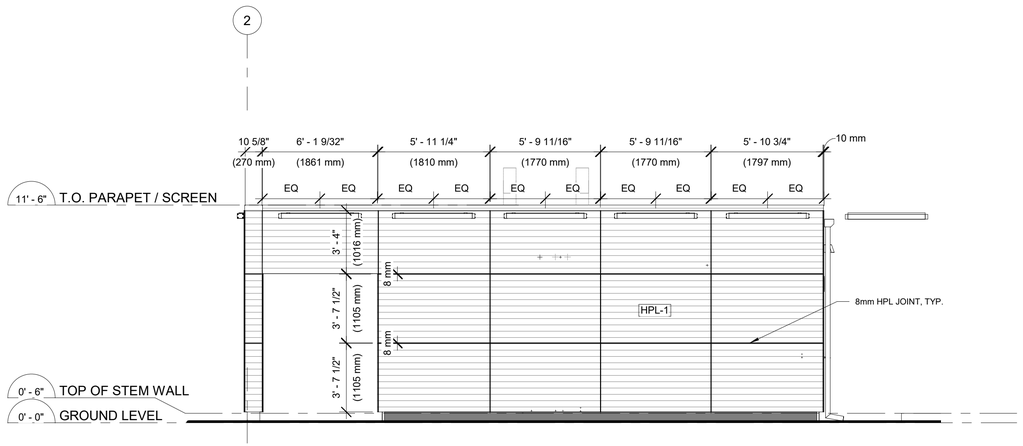
MATERIALS / FINISHES	
Key Value	Keynote Text
HPL-1	HIGH PRESSURE LAMINATE, PRINTED



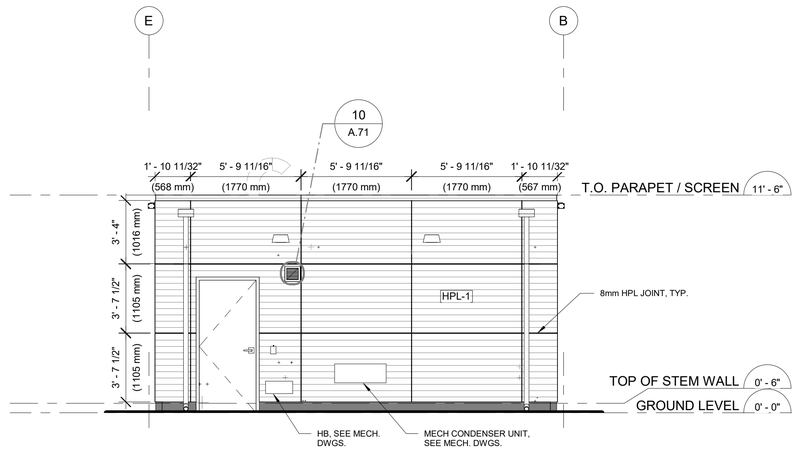
4 WEST HPL LAYOUT - COMFORT BUILDING
1/4" = 1'-0"



2 SOUTH HPL LAYOUT - COMFORT BUILDING
1/4" = 1'-0"



3 EAST WALL HPL LAYOUT - COMFORT BUILDING
1/4" = 1'-0"



1 NORTH HPL LAYOUT - COMFORT BUILDING
1/4" = 1'-0"

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J O B No. : 2000677

S C A L E: 1/4" = 1'-0"

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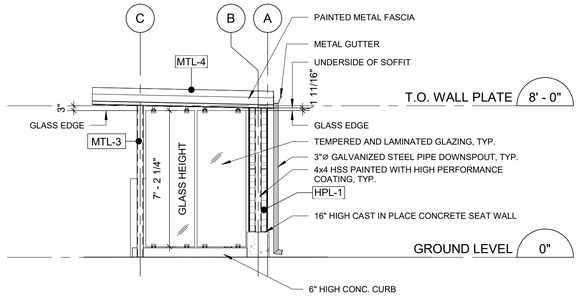
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - HPL LAYOUT

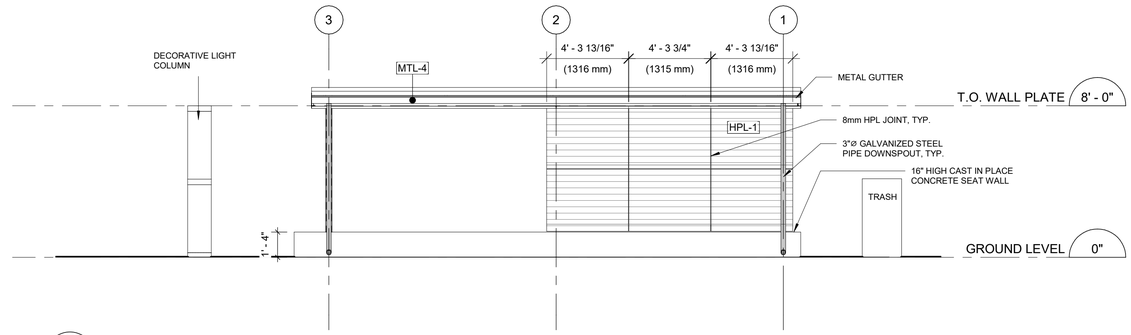
SHEET
A.43
SHEET 46 OF 97

MATERIALS / FINISHES.	
Key Value	Keynote Text

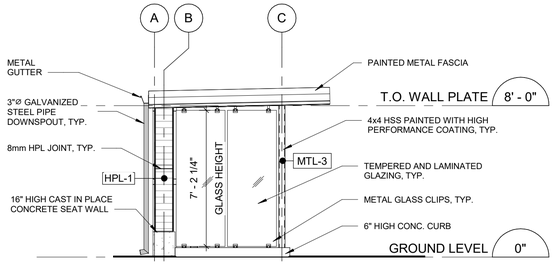
HPL-1	HIGH PRESSURE LAMINATE, PRINTED
MTL-3	HIGH PERFORMANCE COATED STEEL
MTL-4	SILICONIZED POLYESTER



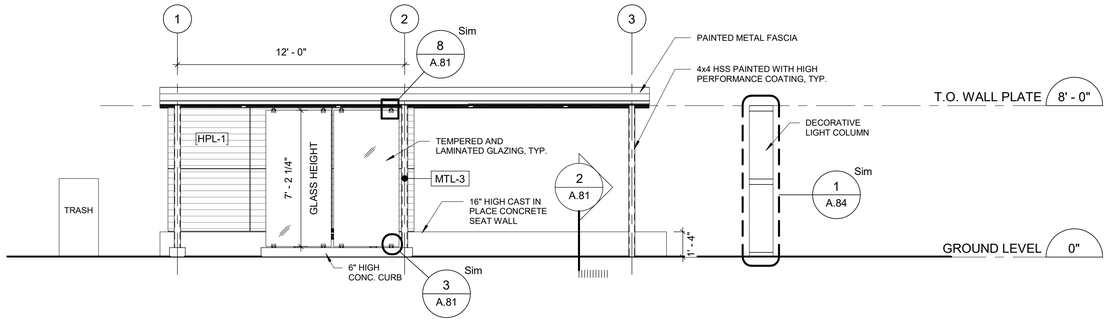
4 A.45 NORTH ELEVATION - SHELTER
Scale: 1/4" = 1'-0"



3 A.45 WEST ELEVATION - SHELTER
Scale: 1/4" = 1'-0"



2 A.45 SOUTH ELEVATION - SHELTER
Scale: 1/4" = 1'-0"



1 A.45 EAST ELEVATION - SHELTER
Scale: 1/4" = 1'-0"

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CRAIG ROTHENBURGER
STATE OF WASHINGTON

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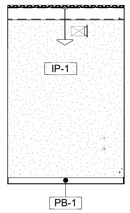
SHEET TITLE
ARCHITECTURE
SHELTER / CANOPY - EXTERIOR ELEVATIONS

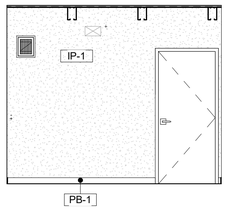
SHEET
A.45

MATERIALS / FINISHES	
Key Value	Keynote Text
FRP-1	FIBERGLASS REINFORCED PLASTIC
IP-1	INTERIOR PAINT (FIELD)
IP-2	INTERIOR PAINT (ACCENT)
PB-1	PORCELAIN TILE BASE
SS-1	SOLID SURFACE COUNTERTOP

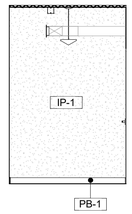
NOTE: SEE A.79 FOR TOILET ACCESSORIES AND MOUNTING HEIGHTS, TYPICAL.



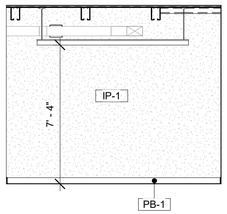
20 IT / ELECTRICAL - 1B
1/4" = 1'-0"



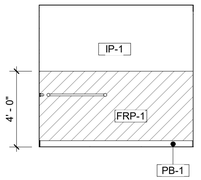
19 IT / ELECTRICAL - 1A
1/4" = 1'-0"



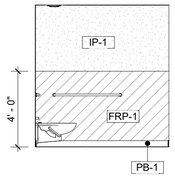
18 IT / ELECTRICAL - 1D
1/4" = 1'-0"



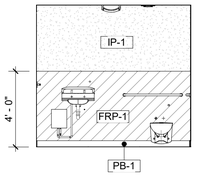
17 IT / ELECTRICAL - 1C
1/4" = 1'-0"



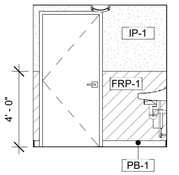
16 RESTROOM 5 - 1A
1/4" = 1'-0"



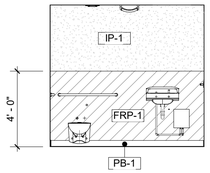
15 RESTROOM 5 - 1D
1/4" = 1'-0"



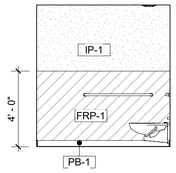
14 RESTROOM 5 - 1C
1/4" = 1'-0"



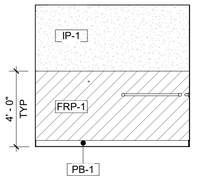
13 RESTROOM 5 - 1B
1/4" = 1'-0"



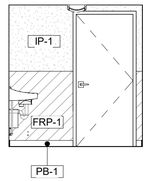
12 RESTROOM 4 - 1C
1/4" = 1'-0"



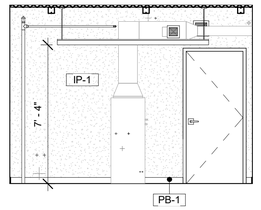
11 RESTROOM 4 - 1B
1/4" = 1'-0"



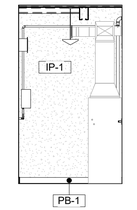
10 RESTROOM 4 - 1A
1/4" = 1'-0"



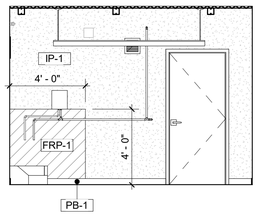
9 RESTROOM 4 - 1D
1/4" = 1'-0"



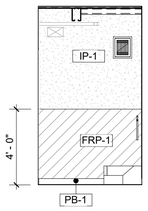
8 MECH./STOR - 1C
1/4" = 1'-0"



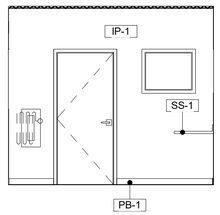
7 MECH./STOR - 1B
1/4" = 1'-0"



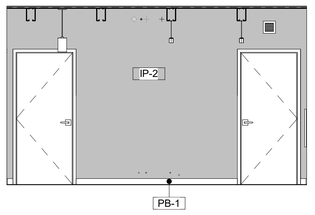
6 MECH./STOR - 1A
1/4" = 1'-0"



5 MECH./STOR - 1D
1/4" = 1'-0"



4 ANTEROOM - 1A
1/4" = 1'-0"



3 ANTEROOM - 1D
1/4" = 1'-0"

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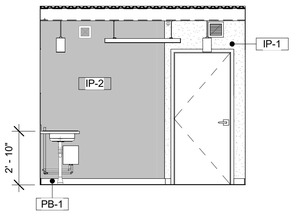
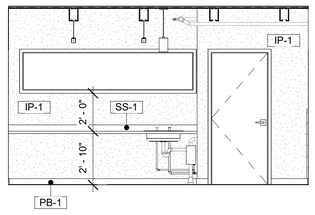


2 ANTEROOM - 1C
1/4" = 1'-0"



1 ANTEROOM - 1B
1/4" = 1'-0"

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S C A L E: 1/4" = 1'-0"

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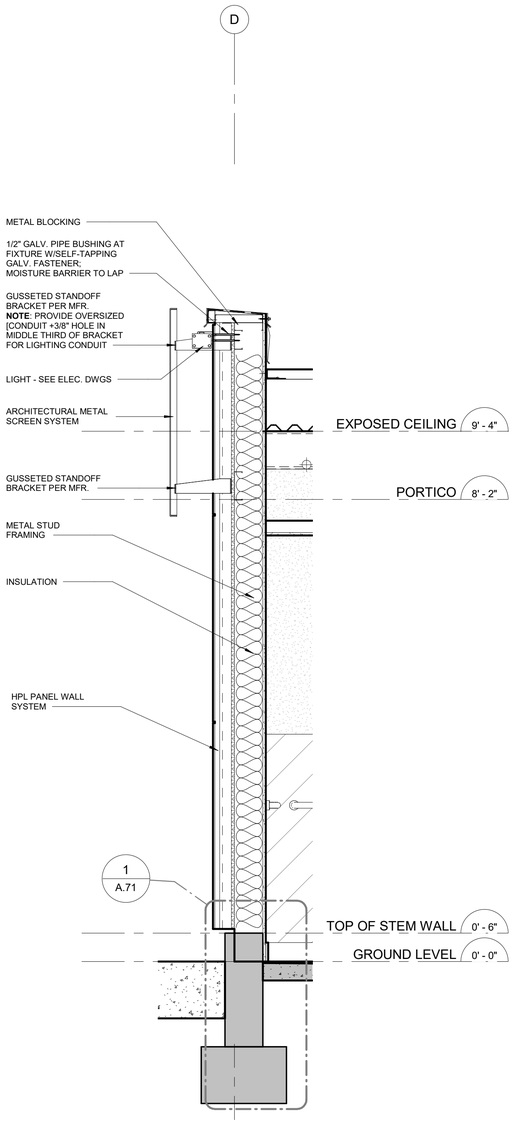
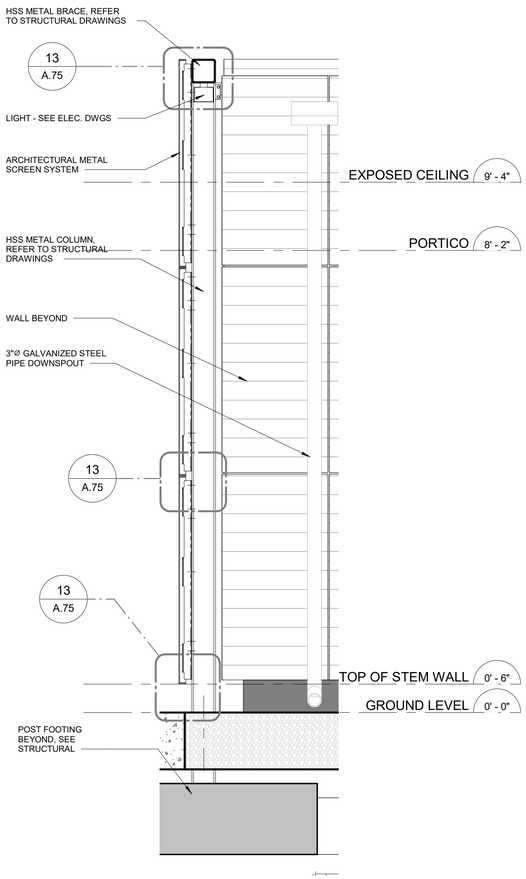
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - INTERIOR ELEVATIONS

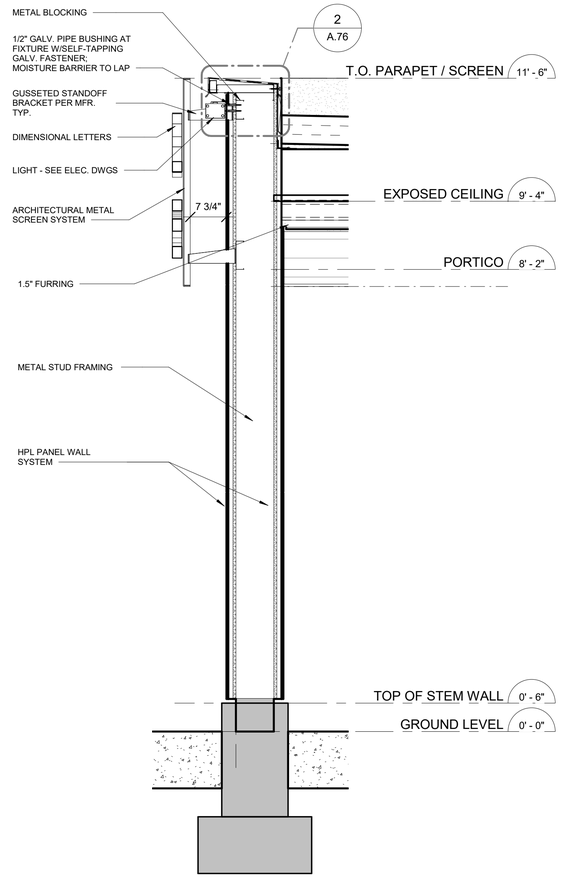
SHEET
A.51



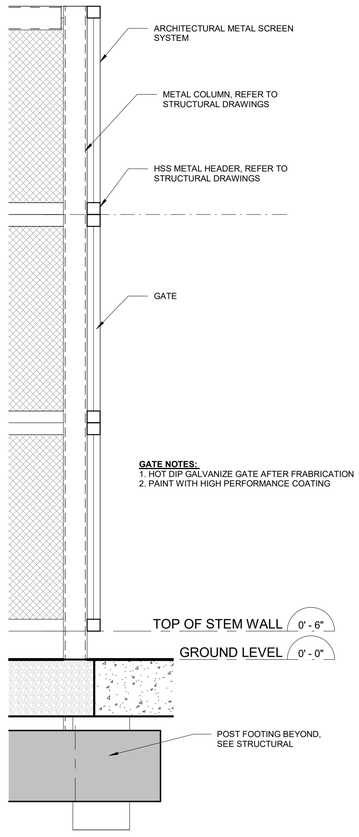
4 WALL SECTION 4
3/4" = 1'-0"



3 WALL SECTION 3
3/4" = 1'-0"



2 WALL SECTION 2
3/4" = 1'-0"



1 WALL SECTION 1
3/4" = 1'-0"

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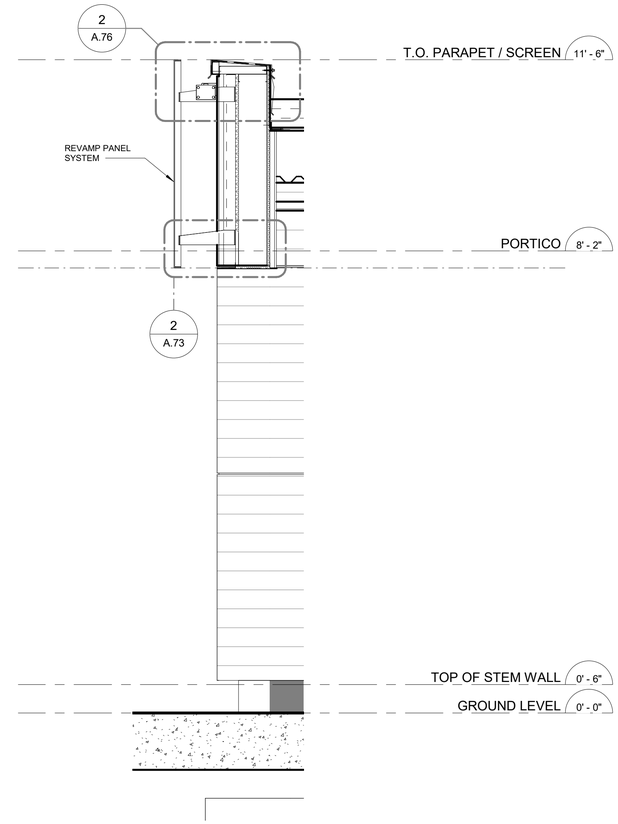
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - WALL SECTIONS

SHEET
A.61
SHEET 49 OF 97



1 WALL SECTION 5
3/4" = 1'-0"

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CHECKED BY: Checker
APPROVED BY: Approver
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JOB No. : 2000677
SCALE: 3/4" = 1'-0"

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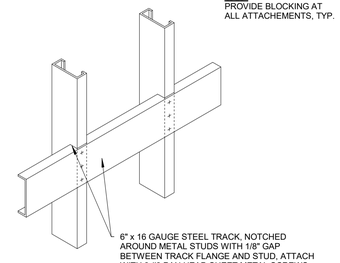
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING - WALL SECTIONS

SHEET
A.62
SHEET 50 OF 97

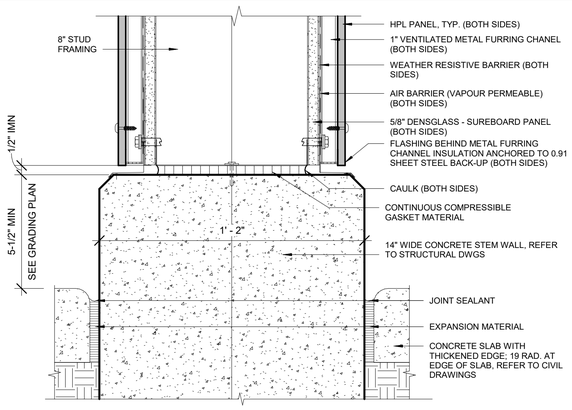


NOTE:
PROVIDE BLOCKING AT ALL ATTACHEMENTS, TYP.

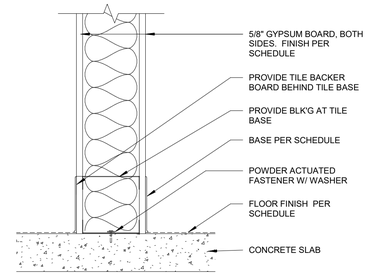
6" x 16 GAUGE STEEL TRACK, NOTCHED AROUND METAL STUDS WITH 1/8" GAP BETWEEN TRACK FLANGE AND STUD, ATTACH WITH 3 #8 PAN HEAD SHEET METAL SCREWS AT EACH STUD

METAL STUD FRAMING

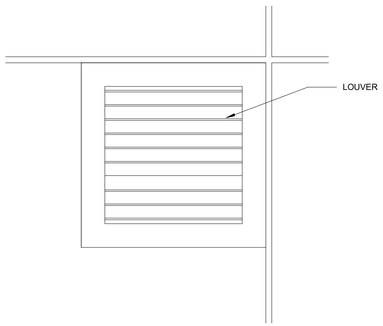
9 BLOCKING
1" = 1'-0"

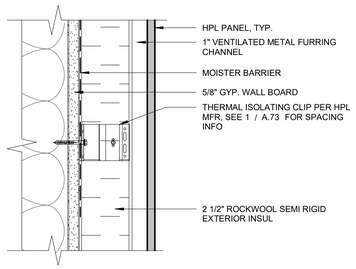


6 EXTERIOR WALL (TYPE WA1) - BOTTOM
3" = 1'-0"

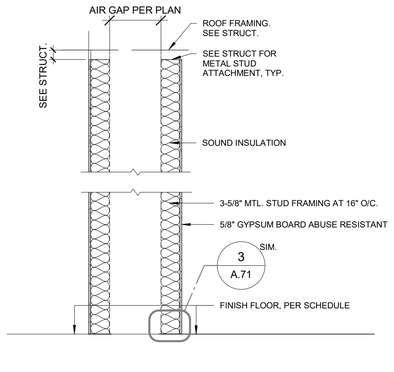


3 INT. WALL BASE ATTACHMENT
1 1/2" = 1'-0"

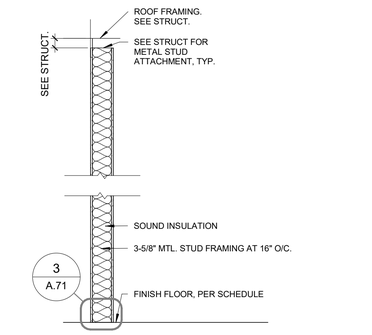




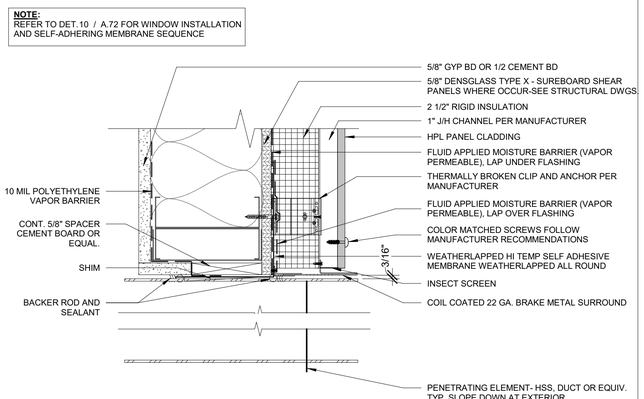
8 HPL ATTACHMENT AT INSUL. WALL
3" = 1'-0"



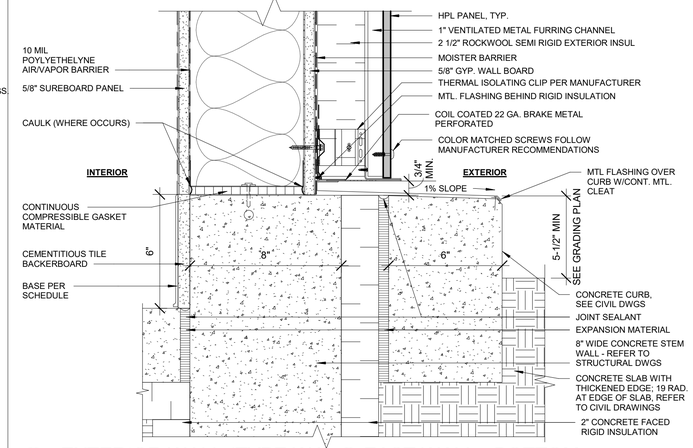
5 WALL TYPE WB2 - INTERIOR WALLS
1/2" = 1'-0"



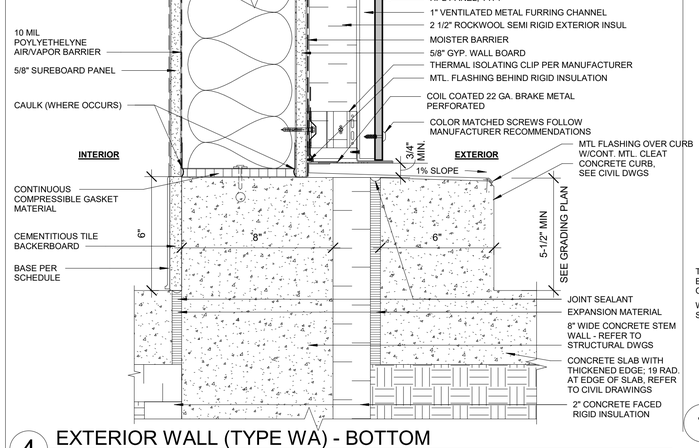
2 WALL TYPE WB - INTERIOR WALL
1/2" = 1'-0"



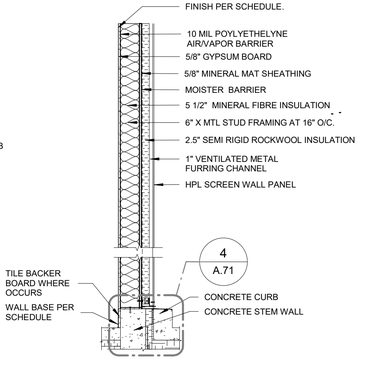
10 EXTERIOR WALL PENETRATION SECTION
3" = 1'-0"



7 EXTERIOR WALL (TYPE WA) @ EAST WALL - BOTTOM
3" = 1'-0"



4 EXTERIOR WALL (TYPE WA) - BOTTOM
3" = 1'-0"



1 WALL TYPE A - EXTERIOR WALL
1/2" = 1'-0"

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CHECKED BY SS | APPROVED BY CR
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J O B No. : 2000677

S C A L E : As indicated

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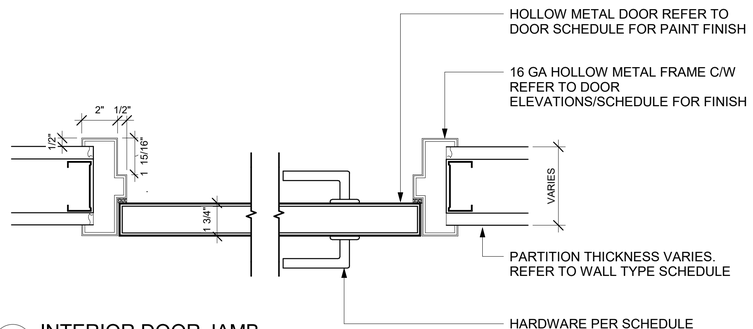
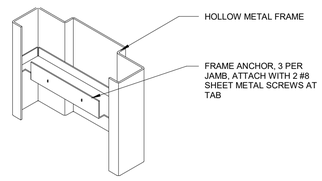
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - BUILDING ENVELOPE

SHEET
A.71
SHEET 51 OF 97



12 INTERIOR DOOR JAMB

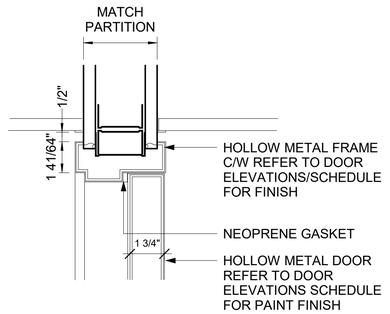
3" = 1'-0"



FRAME ANCHOR - METAL STUD

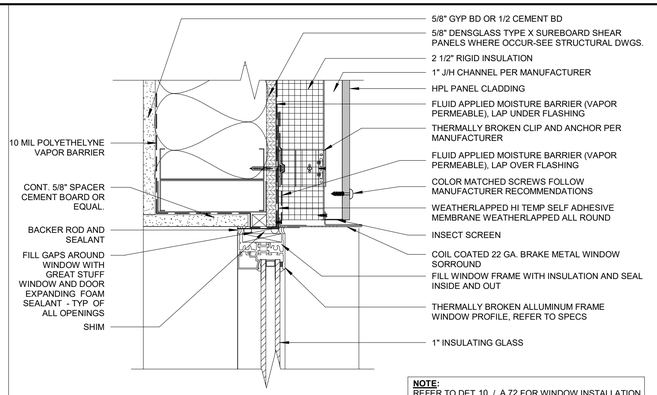
9 FRAME ANCHOR - HOLLOW METAL

1" = 1'-0"



6 INTERIOR DOOR HEADER

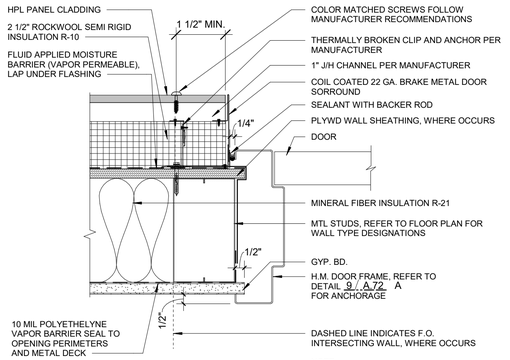
3" = 1'-0"



NOTE:
REFER TO DET.10 / A.72 FOR WINDOW INSTALLATION AND SELF-ADHERING MEMBRANE SEQUENCE

3 EXTERIOR WINDOW HEADER

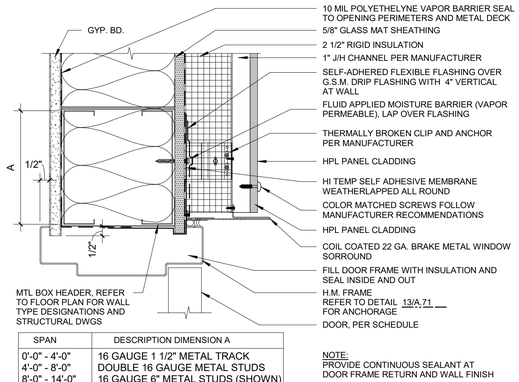
3" = 1'-0"



NOTE:
PROVIDE CONTINUOUS SEALANT AT DOOR FRAME RETURN AND WALL FINISH

11 EXT. DOOR - HOLLOW METAL - JAMB

3" = 1'-0"

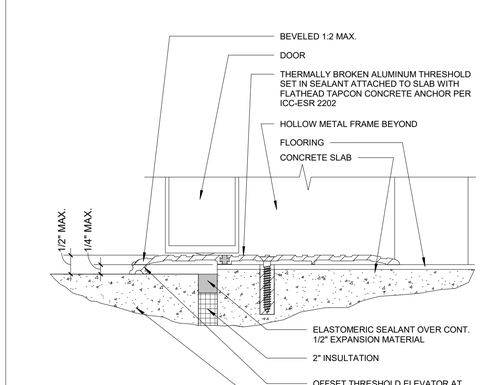


SPAN	DESCRIPTION DIMENSION A
0'-0" - 4'-0"	16 GAUGE 1 1/2" METAL TRACK
4'-0" - 8'-0"	DOUBLE 16 GAUGE METAL STUDS
8'-0" - 14'-0"	16 GAUGE 6" METAL STUDS (SHOWN)
14'-0" - 20'-0"	14 GAUGE 8" METAL STUDS (SIM)

NOTE:
PROVIDE CONTINUOUS SEALANT AT DOOR FRAME RETURN AND WALL FINISH

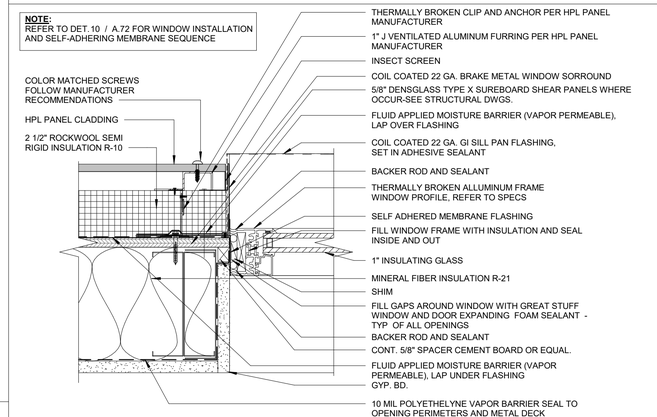
8 EXT. DOOR - HOLLOW METAL - HEAD

3" = 1'-0"



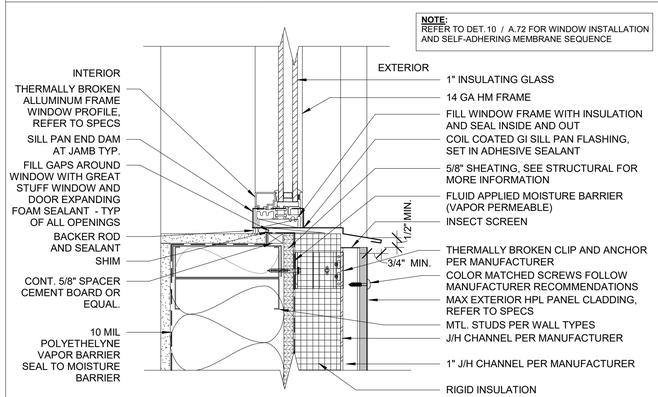
5 THRESHOLD - ALUMINUM - CONCRETE SLAB

6" = 1'-0"



2 EXTERIOR WINDOW JAMB

3" = 1'-0"



DETAIL A: ENSURE POSITIVE DRAINAGE AT THE SILL OF THE ROUGH OPENING BY INSTALLING THE SPECIFIED 1-PIECE SILL DAM, CUT TO FIT THE WIDTH OF THE OPENING. SET THE SILL DAM 38mm FROM THE INTERIOR EDGE OF THE OPENING.

DETAIL B: CLEAN AND DRY ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INCLUDING THE WALL SHEATHING BELOW THE OPENING. PROVIDE A CONTINUOUS HORIZONTAL STARTER STRIP OF SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE LONG ENOUGH TO EXTEND 300mm PAST EACH SIDE OF THE OPENING. PEEL A PORTION OF THE FILM FROM THE BACK OF THE MEMBRANE LEAVING THE BOTTOM 100mm OF FILM INTACT, AND APPLY THE MEMBRANE TO THE WALL SHEATHING 38mm BELOW THE OPENING. USE A RUBBER ROLLER TO ENSURE A TIGHT SEAL, MINIMIZING WRINKLES AND ENSURING FULL ADHESION TO SUBSTRATES. DO NOT ADHERE THE BOTTOM 100mm OF THE OF SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE STARTER STRIP TO THE WALL SHEATHING.

DETAIL C: CLEAN AND DRY ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INCLUDING SILL, JAMBS, WALL SHEATHING AND PREVIOUSLY-APPLIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE. PEEL THE FILM FROM THE BACK OF THE MEMBRANE AND SET MEMBRANE INTO OPENING. ENSURE FULL AND CONTINUOUS COVERAGE OF THE SILL AND SILL DAM. EXTEND MEMBRANE MINIMUM 200mm ONTO THE JAMBS AND MINIMUM 100mm ONTO THE PREVIOUSLY-APPLIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE STARTER STRIP BELOW. USE A RUBBER ROLLER TO ENSURE A TIGHT SEAL, MINIMIZING WRINKLES AND ENSURING FULL ADHESION TO SUBSTRATES.

DETAIL D: PRIOR TO INSTALLING THE JAMB MEMBRANES, INSTALL THE SILL FLASHING IN THE OPENING AS PER WINDOW MANUFACTURER'S REQUIREMENTS. ENSURE FLASHING HAS MINIMUM 25mm END DAMS FOLDED (NOT CUT) ON BOTH ENDS. CLEAN AND DRY ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INCLUDING SILL END DAMS, JAMBS, WALL SHEATHING AND PREVIOUSLY-APPLIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE. PEEL THE FILM FROM THE BACK OF THE MEMBRANE AND SET MEMBRANE INTO OPENING. ENSURE FULL AND CONTINUOUS COVERAGE OF THE JAMBS. EXTEND MEMBRANE MINIMUM 100mm ABOVE THE OPENING AND MINIMUM 100mm ONTO THE PREVIOUSLY-APPLIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE BELOW. ENSURE THE JAMB MEMBRANES LAP OVER THE END DAMS OF THE SILL FLASHING. USE A RUBBER ROLLER TO ENSURE A TIGHT SEAL, MINIMIZING WRINKLES AND ENSURING FULL ADHESION TO SUBSTRATES.

DETAIL E: CLEAN AND DRY ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INCLUDING HEAD, WALL SHEATHING AND PREVIOUSLY-APPLIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE. PEEL THE FILM FROM THE BACK OF THE MEMBRANE AND SET MEMBRANE INTO OPENING. ENSURE FULL AND CONTINUOUS COVERAGE OF THE HEAD. EXTEND MEMBRANE MINIMUM 50mm BEYOND THE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANES PREVIOUSLY-APPLIED AT THE JAMBS. USE A RUBBER ROLLER TO ENSURE A TIGHT SEAL, MINIMIZING WRINKLES AND ENSURING FULL ADHESION TO SUBSTRATES.

DETAIL F: INSTALL WINDOW AS PER WINDOW MANUFACTURER'S INSTRUCTIONS. WINDOW SETTING BLOCKS MAY BE REQUIRED BY THE WINDOW MANUFACTURER, AND SHOULD BE INSTALLED USING AN ADHESIVE PRODUCT THAT IS COMPATIBLE WITH THE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE AT THE SILL, RATHER THAN MECHANICALLY FASTENED.

DETAIL G: INSTALL HEAD FLASHING ABOVE THE WINDOW C/W MINIMUM 100mm VERTICAL LEG. ENSURE FLASHING HAS MINIMUM 25mm END DAMS FOLDED (NOT CUT) ON BOTH ENDS. CLEAN AND DRY ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INCLUDING VERTICAL LEG OF FLASHING. PREVIOUSLY-APPLIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE AND WALL SHEATHING. PEEL THE FILM FROM THE BACK OF THE MEMBRANE AND APPLY HORIZONTALLY, COVERING THE VERTICAL LEG OF THE FLASHING. EXTEND MEMBRANE MINIMUM 50mm BEYOND THE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANES PREVIOUSLY-APPLIED AT THE HEAD. USE A RUBBER ROLLER TO ENSURE A TIGHT SEAL, MINIMIZING WRINKLES AND ENSURING FULL ADHESION TO SUBSTRATES

DETAIL H: CLEAN AND DRY ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE AND INSTALL THE SPECIFIED SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE HORIZONTALLY BEGINNING AT THE BOTTOM OF WALL AND PROCEEDING UPWARD IN SEQUENCE, LAPPING EACH COURSE AS REQUIRED TO PROVIDE POSITIVE WATER SHEDDING. TO INSTALL SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE BELOW THE WINDOW, INSERT THE NEW COURSE OF SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE UP IN BEHIND THE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INSTALLED IN 'DETAIL B'. PEEL THE REMAINING FILM FROM THE BACK OF THE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE INSTALLED IN 'DETAIL B' AND APPLY, USING A RUBBER ROLLER TO ENSURE A TIGHT SEAL, MINIMIZING WRINKLES AND ENSURING FULL ADHESION TO SUBSTRATES. CONTINUE TO LAP AND APPLY HORIZONTAL COURSES OF SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE IN SEQUENCE UP THE F.O. THE WALL.

NOTES:
SEQUENCING TO BE READ IN CONJUNCTION WITH TYPICAL WINDOW DETAILS.
PRIME ALL SURFACES TO RECEIVE SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE WITH A COMPATIBLE PRIMER PRODUCT FROM SAME MANUFACTURER AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION REQUIREMENTS.

10 WINDOW INSTALLATION - SELF-ADHERING MEMBRANE SEQUENCE

1 : 50

NOTE:
REFER TO DET.10 / A.72 FOR WINDOW INSTALLATION AND SELF-ADHERING MEMBRANE SEQUENCE

1 EXTERIOR WINDOW SILL

3" = 1'-0"

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J O B No. : 2000677
SCALE: As indicated

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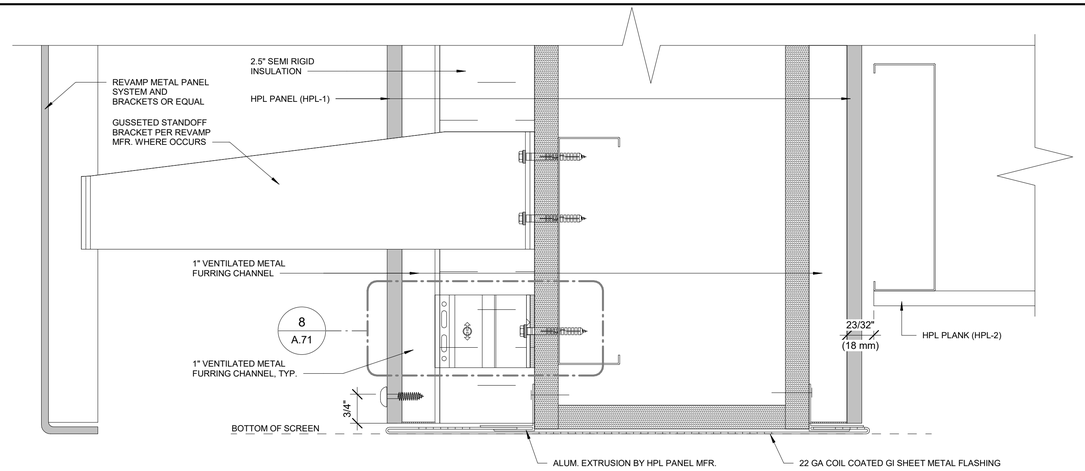
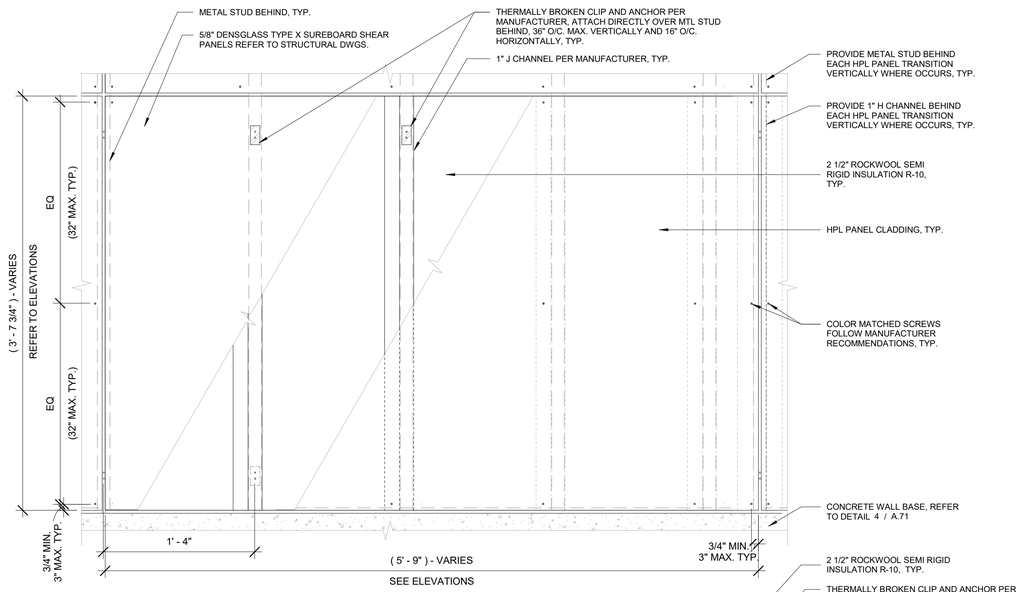
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - BUILDING ENVELOPE

SHEET
A.72
SHEET 52 OF 97



2 BOTTOM OF OVERHEAD WALL AT PORTICO

6" = 1'-0"



1 HPL EXTERIOR WALL SUPPORT ATTACHMENT

1 1/2" = 1'-0"

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APPROVED BY Approver
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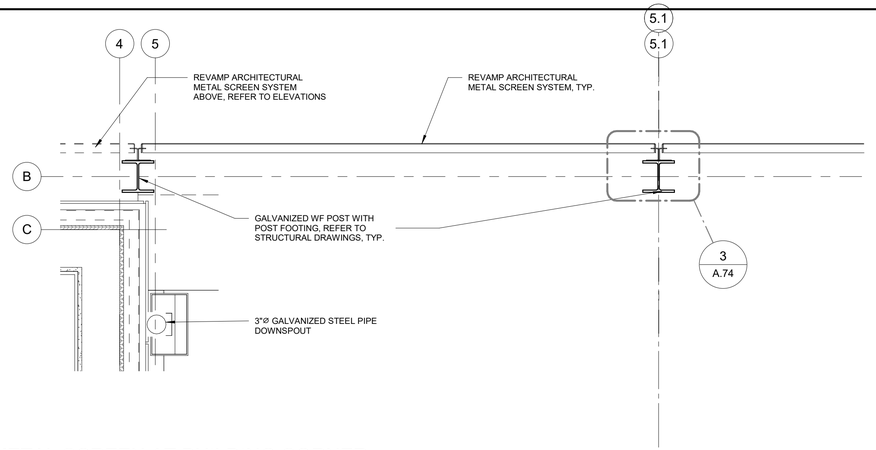
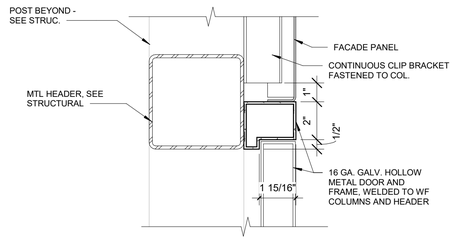
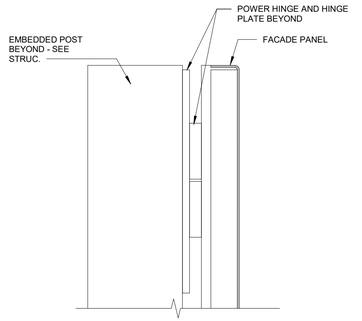
SHEET
A.73
SHEET 53 OF 97



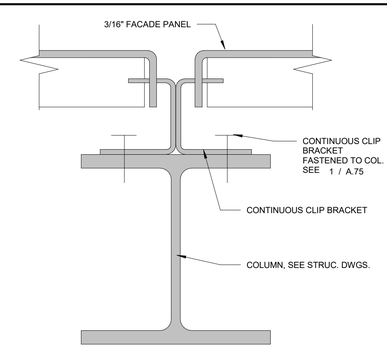
15 METAL SCREEN AT BUILDING CORNER
1" = 1'-0"



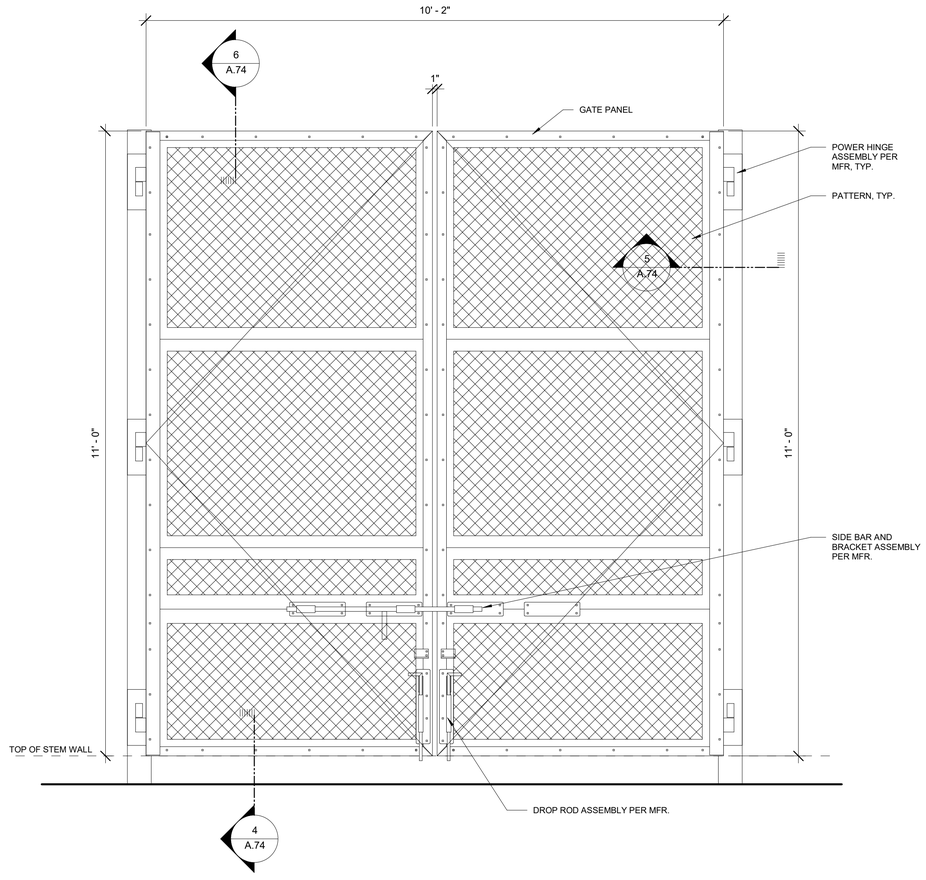
9 MAN GATE AT YARD ENCLO. - HEADER
3" = 1'-0"



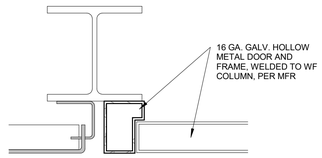
6 GATE AT YARD ENCLOSURE - TOP
3" = 1'-0"



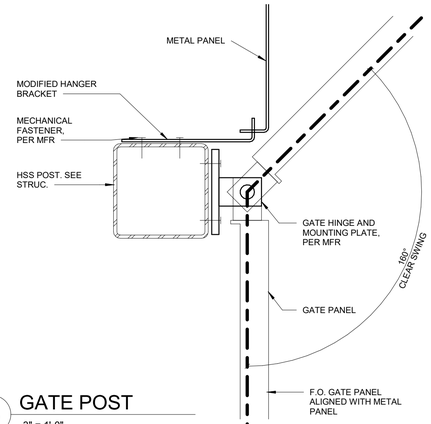
3 METAL PANEL AT COLUMN - PLAN
6" = 1'-0"



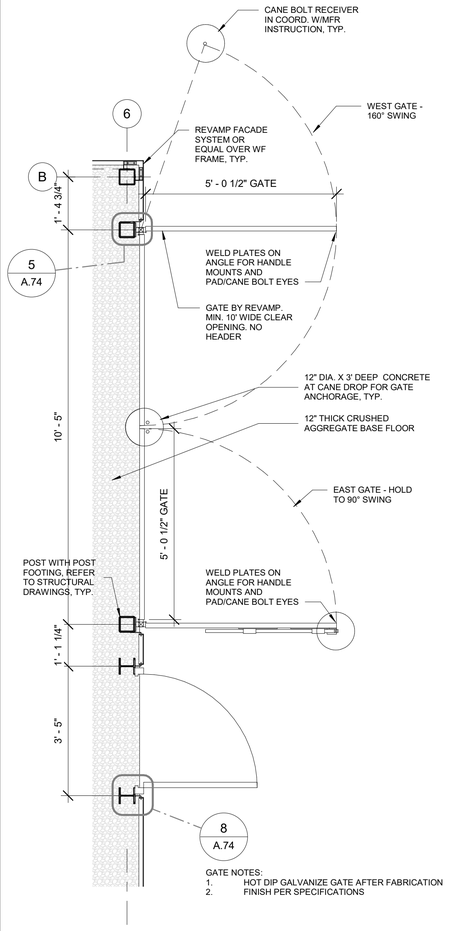
13 GATE ELEVATION
3/4" = 1'-0"



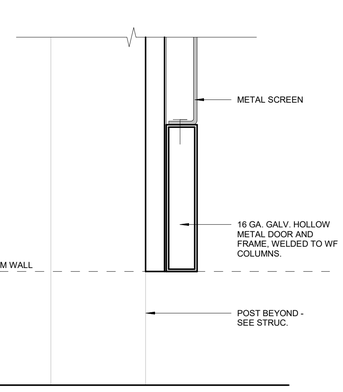
8 MAN GATE AT YARD ENCLO. - JAMB
3" = 1'-0"



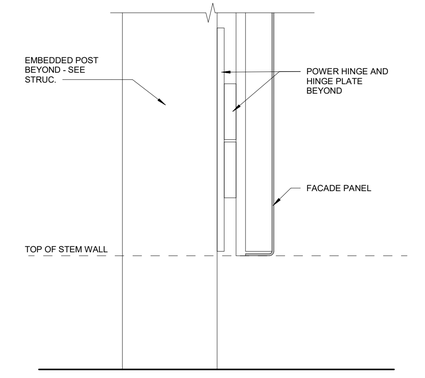
5 GATE POST
3" = 1'-0"



1 ENLARGED GATE PLAN
1/2" = 1'-0"



7 MAN GATE AT YARD ENCLO. - BOTTOM
3" = 1'-0"



4 GATE AT YARD ENCLOSURE - AT GRADE
3" = 1'-0"

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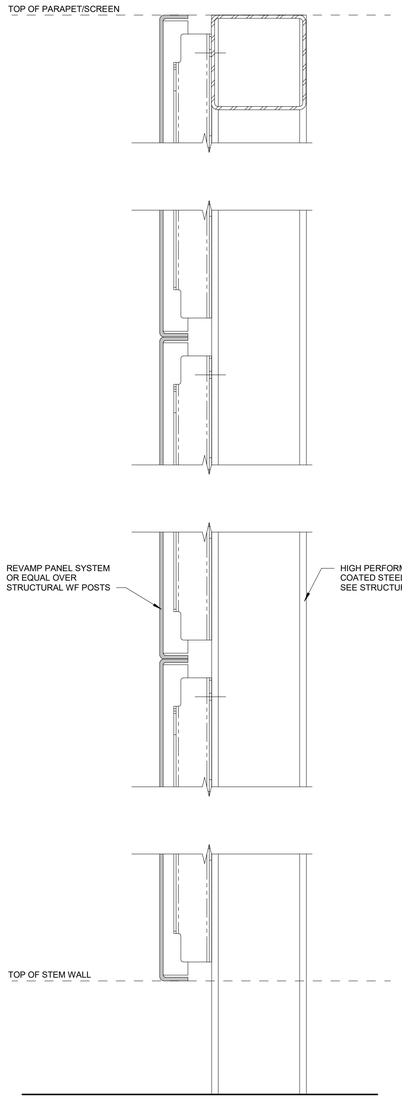
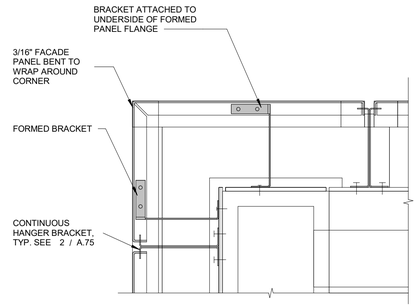
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - REVAMP OR EQUAL GATE AND METAL PANELS

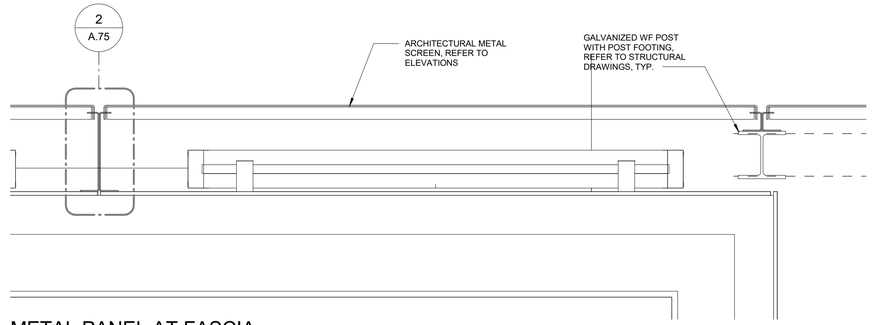
SHEET
A.74
SHEET 54 OF 97



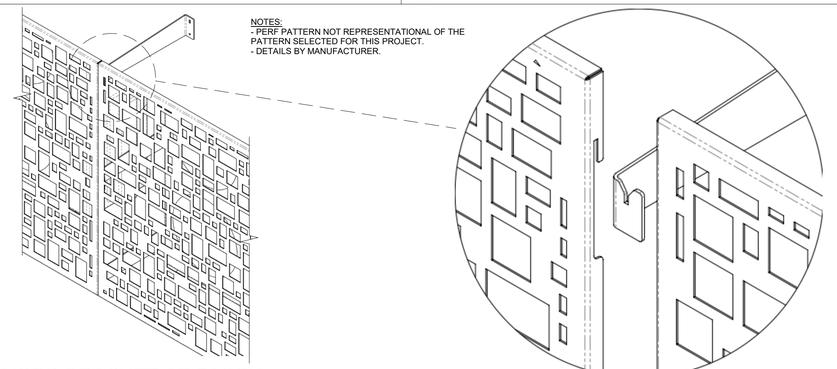
13 PERF PANEL SECTION THRU HORIZ. JOINTS
3" = 1'-0"



9 METAL PANEL AT FASCIA - CORNER
1 1/2" = 1'-0"

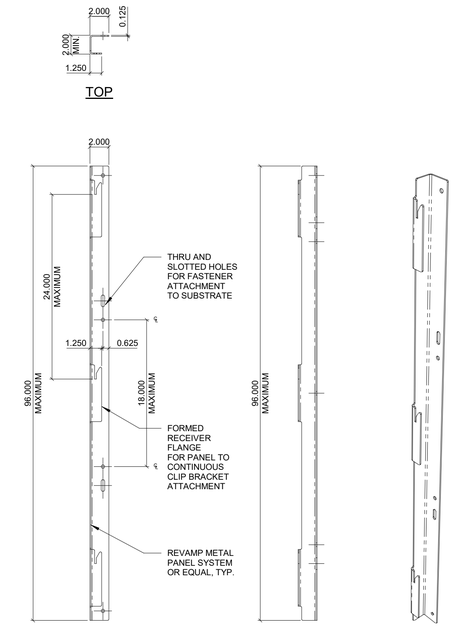


6 METAL PANEL AT FASCIA
1 1/2" = 1'-0"



2 HANGER BRACKET AT FASCIA
1/2" = 1'-0"

4 PERF PANEL AT CORNER COLUMN - PLAN
3" = 1'-0"



NOTE:
- DETAILS BY MANUFACTURER.

1 CONTINUOUS CLIP BRACKET
A.75 Scale: NTS

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06-17-2022 PLAN CHECK RESUBMITTAL

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DATE 07/30/2021
J O B No. : 2000677
S C A L E: As indicated

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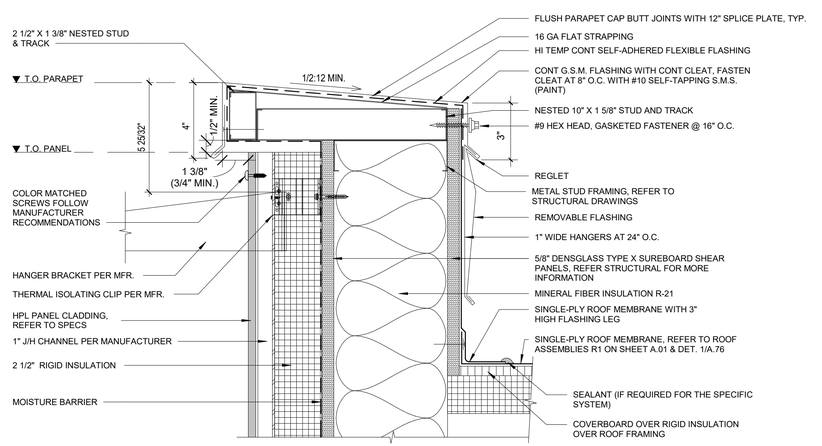
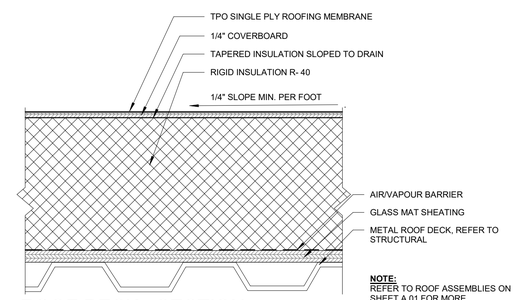
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - REVAMP OR EQUAL GATE AND METAL PANELS

SHEET
A.75
SHEET 55 OF 97

NOTE:
IF TPO IS USED TO WRAP UP AND OVER PARAPET IN LIEU OF HI TEMP SELF ADHERED BUTY FLEXIBLE FLASHING, ROOF BOARD SHEATING IS REQUIRED UNDER IT.



2 TOP OF PARAPET AND ROOF TO WALL
3" = 1'-0"



NOTE:
REFER TO ROOF ASSEMBLIES ON SHEET A.01 FOR MORE INFORMATION

1 ROOF DECK - SECTION
3" = 1'-0"

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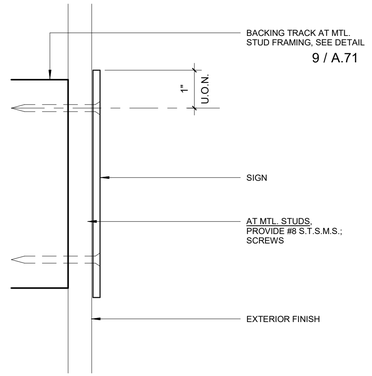
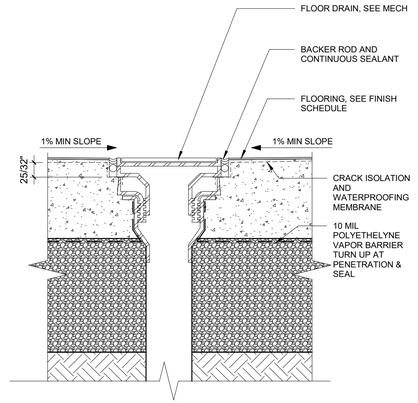
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - ROOF

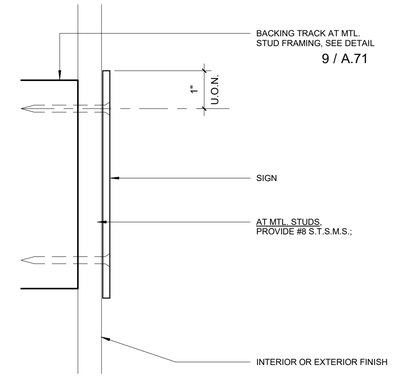
SHEET
A.76
SHEET 56 OF 97



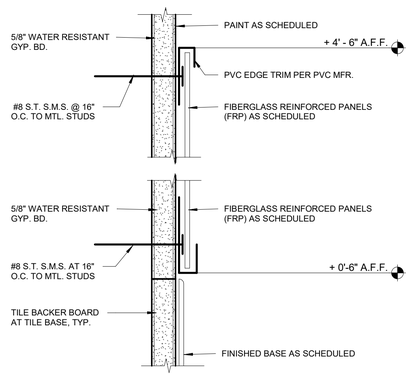
7 SIGN - EXTERIOR SIGNAGE ANCHORAGE
6" = 1'-0"



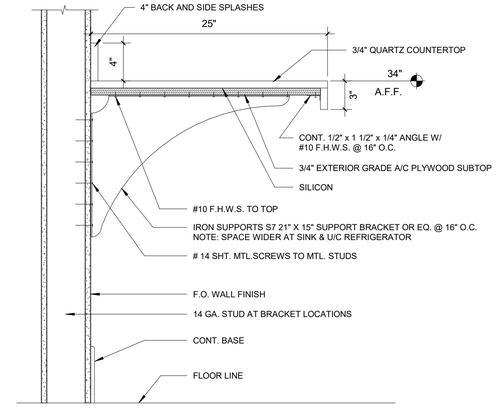
6 FLOOR DRAIN DETAIL
3" = 1'-0"



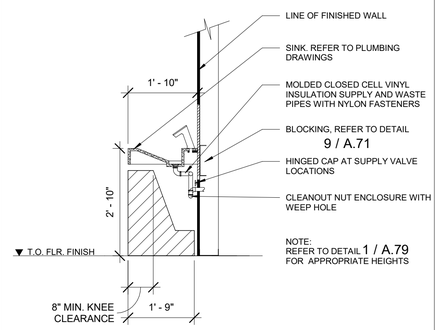
4 SIGN - INTERIOR SIGNAGE ANCHORAGE
6" = 1'-0"



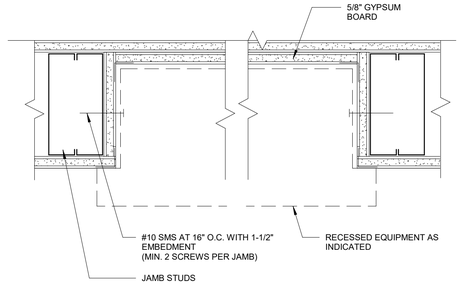
5 WALL - FRP - SECTION
6" = 1'-0"



2 COUNTER - SUPPORT - STEEL ANGLE DOWN
1 1/2" = 1'-0"



3 SINK IN COUNTER
1/2" = 1'-0"



1 RECESSED EQUIPMENT
3" = 1'-0"

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SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - INTERIOR

SHEET
A.77
SHEET 57 OF 97

1. ALL SIGNS AND PLAQUES TO BE 1/4" THICK.
2. RAISE ALL SYMBOLS AND LETTERS 1/32" ABOVE SIGN/ PLAQUE SURFACE U.O.N.
3. CONTRAST BETWEEN SIGN AND SIGN CONTENT SHALL BE 70% MIN. AND HAVE A NON-GLARE FINISH.
4. CONTRAST BETWEEN SIGN AND MOUNTING SURFACE SHALL BE 70% MINIMUM.
5. REFER TO DOOR ELEVATION FOR TYP. SIGNAGE LOCATION
6. GRADE 2 DOTS SHALL BE DOMES RAISED. SHALL COMPLY WITH

MEASUREMENT RANGE	MINIMUM IN INCHES MAXIMUM IN INCHES
Dot Base Diameter	0.059(1.5 mm) to 0.063(1.6 mm)
Distance Between Two Dots In the Same Cell[1]	0.100(2.5 mm)
Distance Between Corresponding Dots In Adjacent Cells[1]	0.300(7.6 mm)
Dot Height	0.025(0.6 mm) to 0.037(0.9 mm)
Distance Between Corresponding From One Cell Directly Below	0.395(10 mm) to 0.400(10.2 mm)

1. Measured From Center to Center

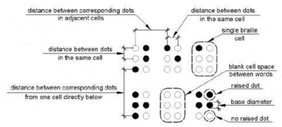
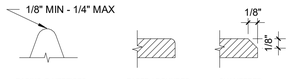


Figure 703.3.1
Braille Measurement

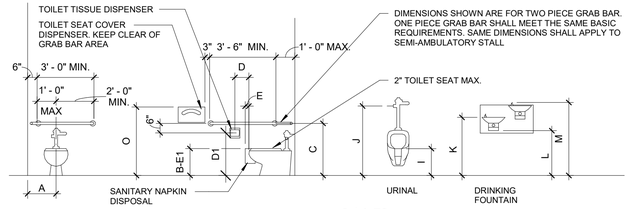
1

7. SIGNAGE SHALL COMPLY WITH IBC E109.2.2.
8. EDGES AND VERTICES SHALL COMPLY WITH IBC E109.2.2.
EDGES SHALL BE EASED OR ROUNDED AT 1/16 INCH (1.59 MM) MINIMUM, OR CHAMFERED AT 1/8 INCH (3.2 MM) MAXIMUM. VERTICES SHALL BE RADIUSED BETWEEN 1/8 INCH (3.2 MM) MINIMUM AND 1/4 INCH (6.4 MM) MAXIMUM.



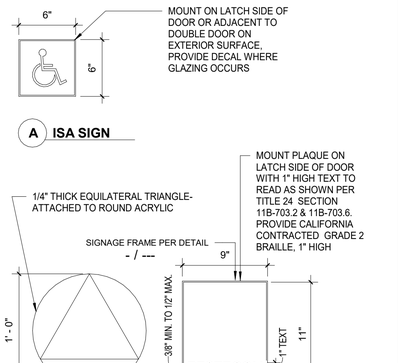
9. WHERE GLAZING OCCURS ADJACENT TO STRIKE SIDE OF DOOR, ADHERE SIGNAGE TO GLAZING AND PROVIDE "BLANK-OFF" PANEL ON OPPOSITE SIDE OF GLAZING.
10. SIGNAGE ANCHORAGE AT WALL (NO FRAME), REFER TO DETAIL 9 / A.71
11. ROOM NAMES AND NUMBERING SHALL BE DETERMINED BY THE OWNER DURING THE CONSTRUCTION SUBMITTAL PROCESS.
12. TACTILE CHARACTERS ON SIGNS SHALL BE LOCATED 48" MIN. A.F.F. OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE LOWEST BRAILLE TACTILE CHARACTER AND 60" MAX. A.F.F. OR GROUND SURFACE, MEASURED FROM THE BASELINE OF THE HIGHEST TACTILE CHARACTER.
13. SIGNS AND IDENTIFICATION SHALL BE FIELD INSPECTED AFTER INSTALLATION AND APPROVED BY THE ENFORCING AGENCY PRIOR TO THE ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY PER APPENDIX CHAPTER 1, SECTION 110.2, OR FINAL APPROVAL WHERE NO CERTIFICATE OF OCCUPANCY IS ISSUED. THE INSPECTION SHALL INCLUDE, BUT NOT BE LIMITED TO, VERIFICATION THAT BRAILLE DOTS AND CELLS ARE PROPERLY SPACED AND THE SIZE, PROPORTION AND TYPE OF RAISED CHARACTERS ARE IN COMPLIANCE WITH THESE REGULATIONS.

5 SIGN - SIGNAGE NOTES
12" = 1'-0"

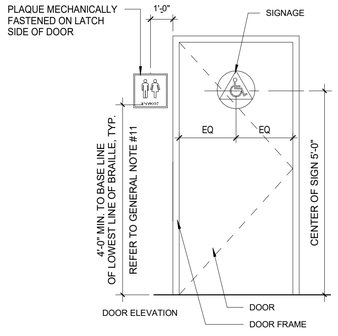


NOTES:
1. NOT ALL FIXTURES/ ACCESSORIES SHOWN APPLY TO THIS PROJECT.
2. HEIGHTS INDICATED ON INTERIOR ELEVATIONS TAKE PRECEDENCE OVER HEIGHTS SHOWN HERE.
3. FIXTURES/ ACCESSORIES SHOWN ARE AT HEIGHTS ACCESSIBLE TO PERSONS WITH DISABILITIES.
4. MOUNTING HEIGHTS FOR ABLE BODIED PERSONS SHALL BE DETERMINED BY RECOMMENDATIONS FROM THE MANUFACTURER. UNLESS NOTE OTHERWISE.
5. WATER CLOSET FLUSH VALVE SHALL BE ORIENTED ON THE APPROACH SIDE OF ACCESSIBLE TOILET.
6. FOR DIMENSIONS INDICATED BY A LETTER REFER TO DETAIL 1 / A.79
7. MOUNT GRAB BARS 36" ABOVE FINISHED FLOOR AT TANK TYPE TOILETS. ALLOW 6" CLEAR TO GRAB BAR.
8. AT ACCESSIBLE LOCATIONS, MOUNT CENTERLINE OF ELECTRIC HANDRYER PUSH BUTTOM AT +40" A.F.F.; AT STANDARD LOCATIONS, CENTERLINE OF PUSH BUTTON SHALL BE +44" A.F.F.

6 ACCESSIBLE MOUNTING HEIGHTS AND LOCATIONS
1/4" = 1'-0"



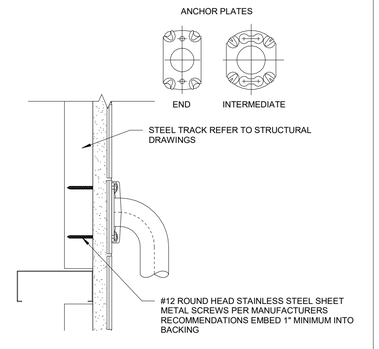
A ISA SIGN



NOTES:
1. FOR SIGNAGE NOTES REFER TO DETAIL - / ---

B TOILET/RESTROOM RM ID SIGN

4 SIGN - ADA SIGNAGE
1 1/2" = 1'-0"

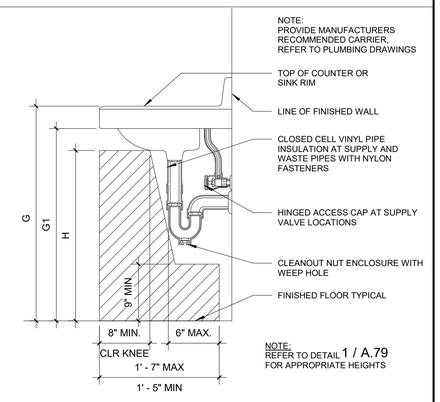


METAL BACKING

2 GRAB BAR MOUNTING
3" = 1'-0"

ID	DESCRIPTION	ADULT
A	FROM WALL TO CENTERLINE OF TOILET	16" - 18"
B	TOILET SEAT HEIGHT (TO TOP OF SEAT)	17" - 19"
C	GRAB BAR HEIGHT	33" - 36" TOP
D	TOILET TISSUE DISPENSER TO TOILET	7" - 9" ℄
D1	TOILET TISSUE DISPENSER OTHER HEIGHT	18" MIN.
E	SANITARY NAPKIN DISPOSAL TO TOILET	12" MAX.
E1	SANITARY NAPKIN DISPOSAL FROM FLOOR TO TOP	19" - 31"
F	DISPENSER OR MIRROR TO REFLECTIVE SURFACE OVER SINK/LAV.	40" MAX.
G	LAVATORY/ SINK HEIGHT	34" MAX.
G1	LAVATORY APRON CLEARANCE	29" MIN.
H	KNEE CLEARNCE	27" MIN.
I	URINAL RIM HEIGHT	17" MAX.
J	URINAL FLUSH HANDLE HEIGHT	44" MAX.
K	DRINKING FOUNTAIN BUBBLER HEIGHT	36" MAX.
L	DRINKING FOUNTAIN KNEE CLEARANCE	27" MIN.
M	D.F. BUBBLER HEIGHT (STANDING UNIT)	38" - 43"
N	BABY CHANGING TABLE	34" MAX.
O	TOP OF SEAT COVER DISPENSER	48"

1 MOUNTING HEIGHTS
1/4" = 1'-0"



3 ACCESSIBLE LAVATORY - WALL MOUNT
1" = 1'-0"

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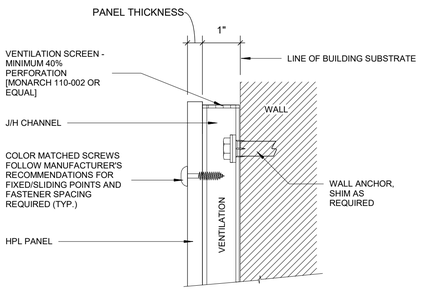
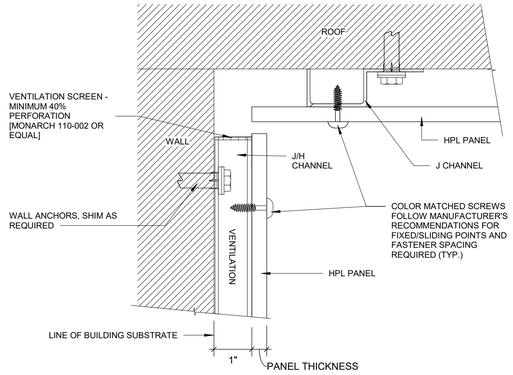
SHEET TITLE
ARCHITECTURE
COMFORT BUILDING DETAILS - ACCESSIBILITY

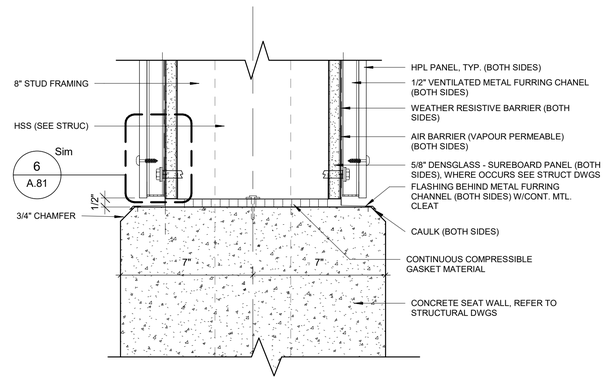
SHEET
A.79
SHEET 58 OF 97



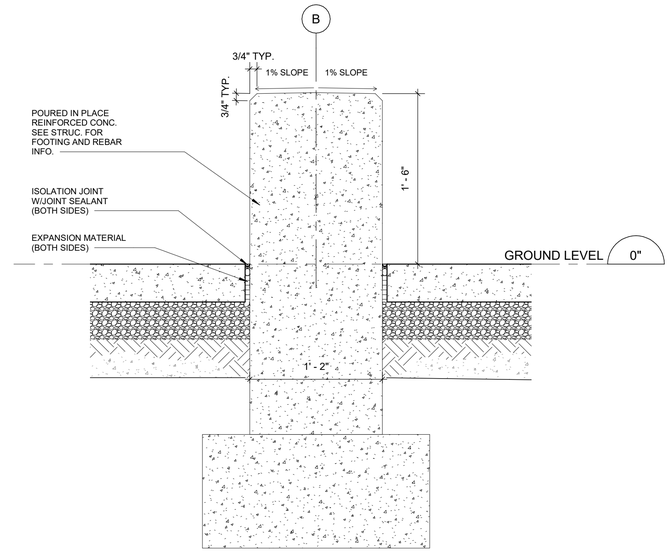
10 A.81 HPL TOP CONDITION - SECTION
Scale: 6" = 1'-0"



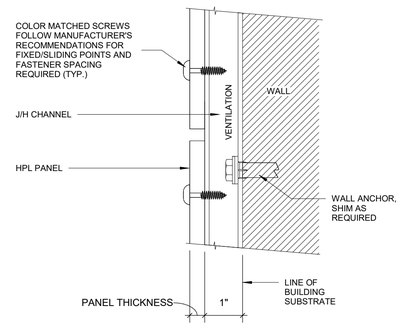
7 A.81 HPL WALL TO SOFFIT CONDITION - SECTION
Scale: 6" = 1'-0"



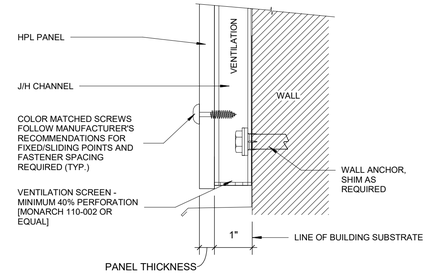
4 A.81 BASE OF CLADDING WALL AT SEAT WALL
Scale: 3" = 1'-0"



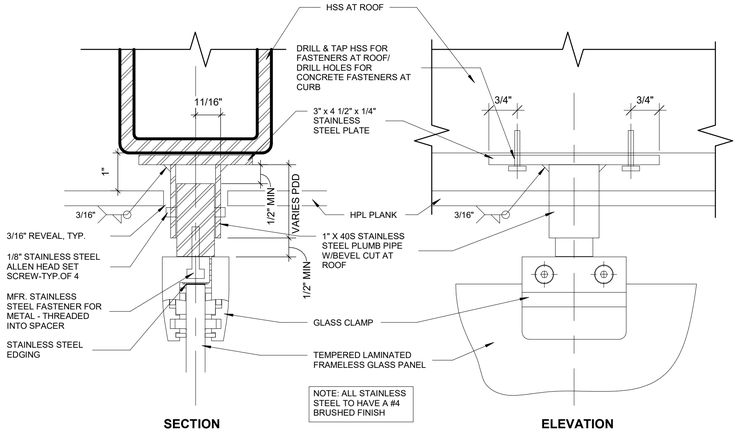
2 A.81 CONC. SEAT WALL
Scale: 1 1/2" = 1'-0"



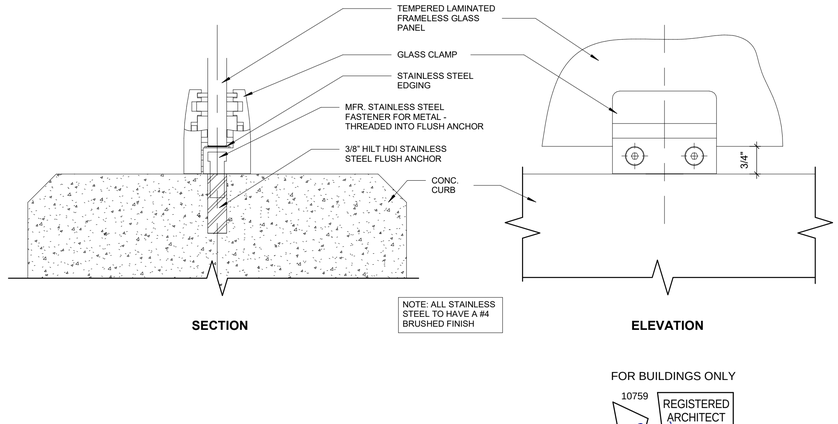
9 A.81 HPL HORIZONTAL JOINT CONDITION - SECTION
Scale: 6" = 1'-0"



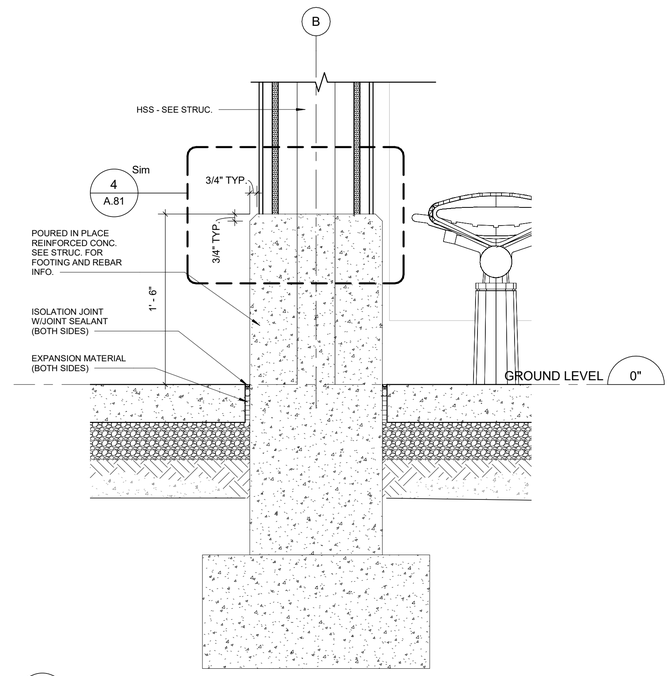
6 A.81 HPL BOTTOM CONDITION - SECTION
Scale: 6" = 1'-0"



8 A.81 CUSTOM FABRICATED STAINLESS STEEL PIPE BRACKET
Scale: 6" = 1'-0"



3 A.81 CUSTOM FABRICATED STAINLESS STEEL GLASS CLIP
Scale: 6" = 1'-0"



1 A.81 BASE OF SHELTER WALL
Scale: 1 1/2" = 1'-0"

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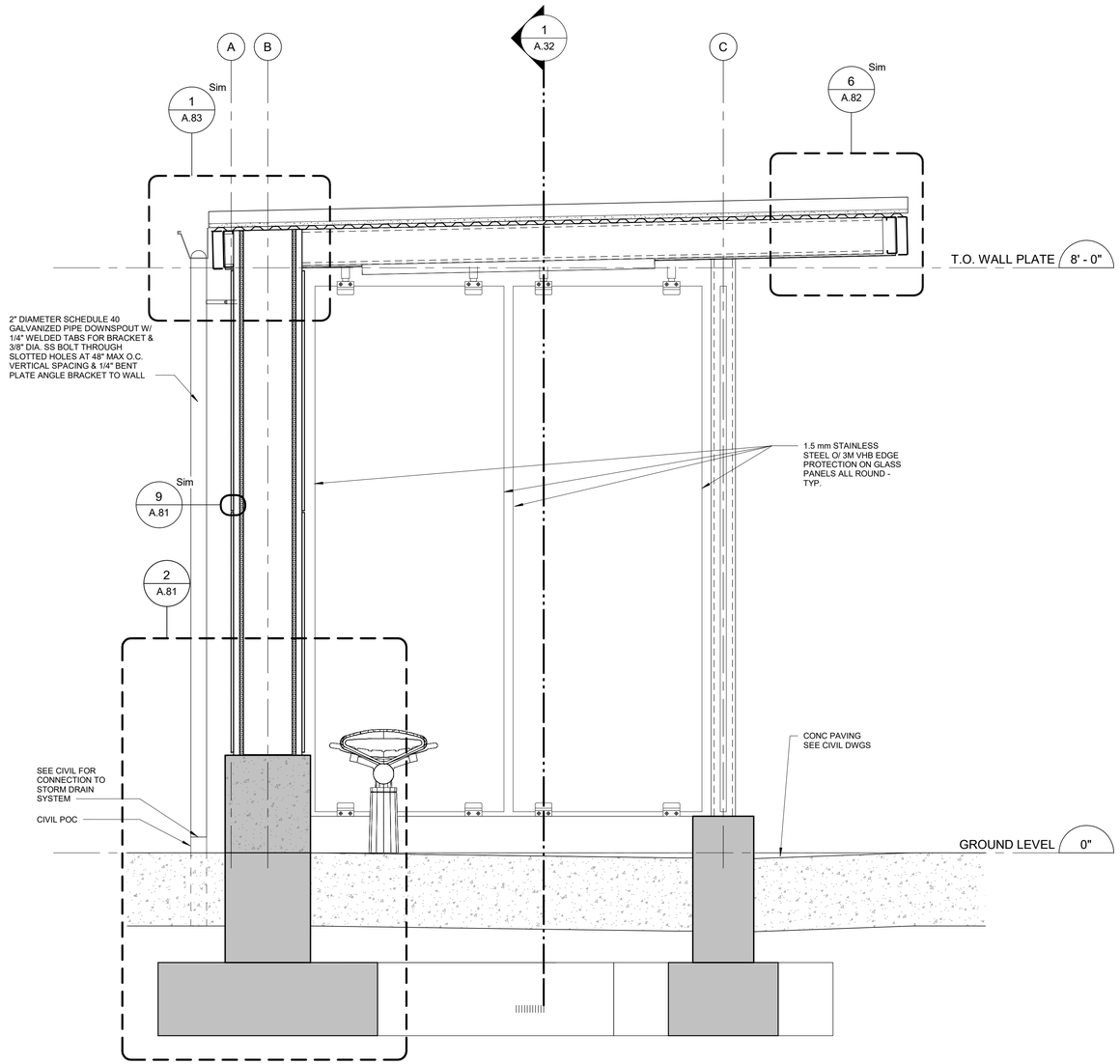
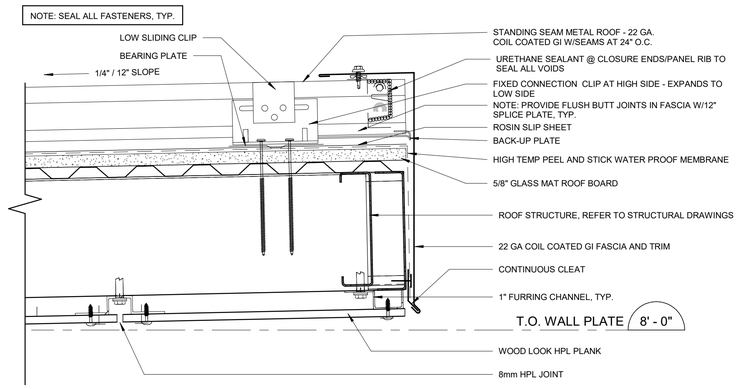
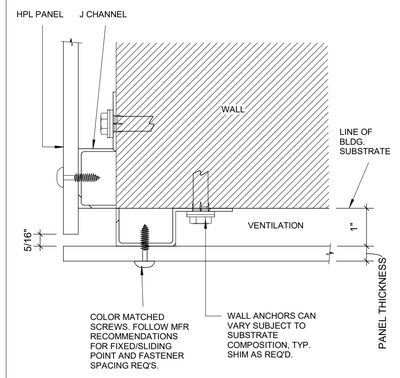
SHEET 59 OF 97



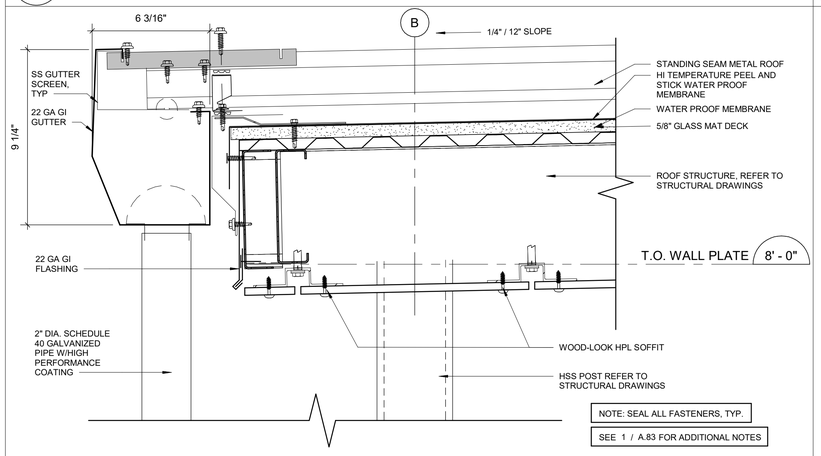
3 A.82 SHELTER WALL SECTION
Scale: 1" = 1'-0"



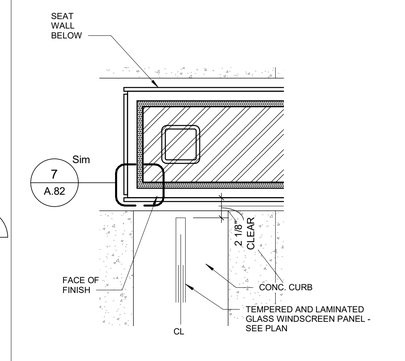
6 A.82 STANDING SEAM METAL ROOF - HIGH EVE
Scale: 3" = 1'-0"



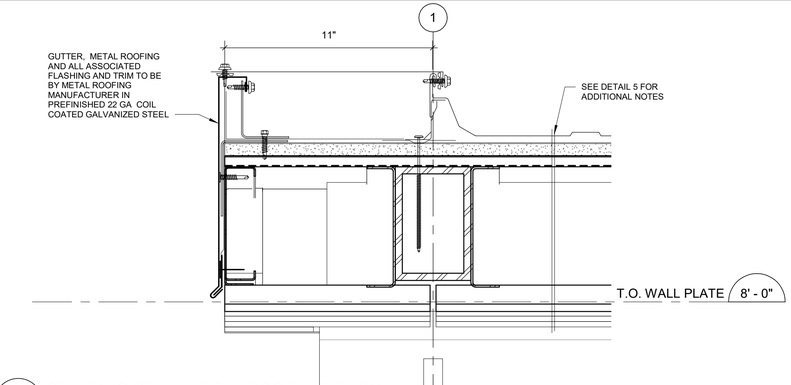
7 A.82 HPL EXT. CORNER CONDITION - PLAN
Scale: 6" = 1'-0"



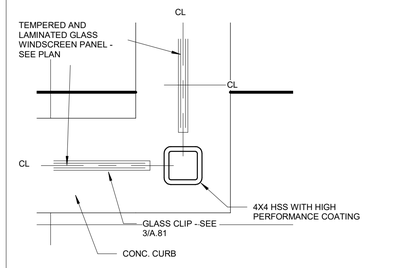
5 A.82 STANDING SEAM METAL ROOF - AT GUTTER
Scale: 3" = 1'-0"



2 A.82 CORNER POST - REAR
Scale: 1 1/2" = 1'-0"



4 A.82 STANDNG SEAM METAL ROOF - AT FASCIA
Scale: 3" = 1'-0"



1 A.82 CORNER POST - FRONT
Scale: 1 1/2" = 1'-0"

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10759 REGISTERED ARCHITECT
CRAIG ROTHENBURGER
STATE OF WASHINGTON

06-17-2022 PLAN CHECK RESUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
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CHECKED BY CR | APPROVED BY CR
DATE 7/30/2021
J O B No. : 2000677
S C A L E : As indicated

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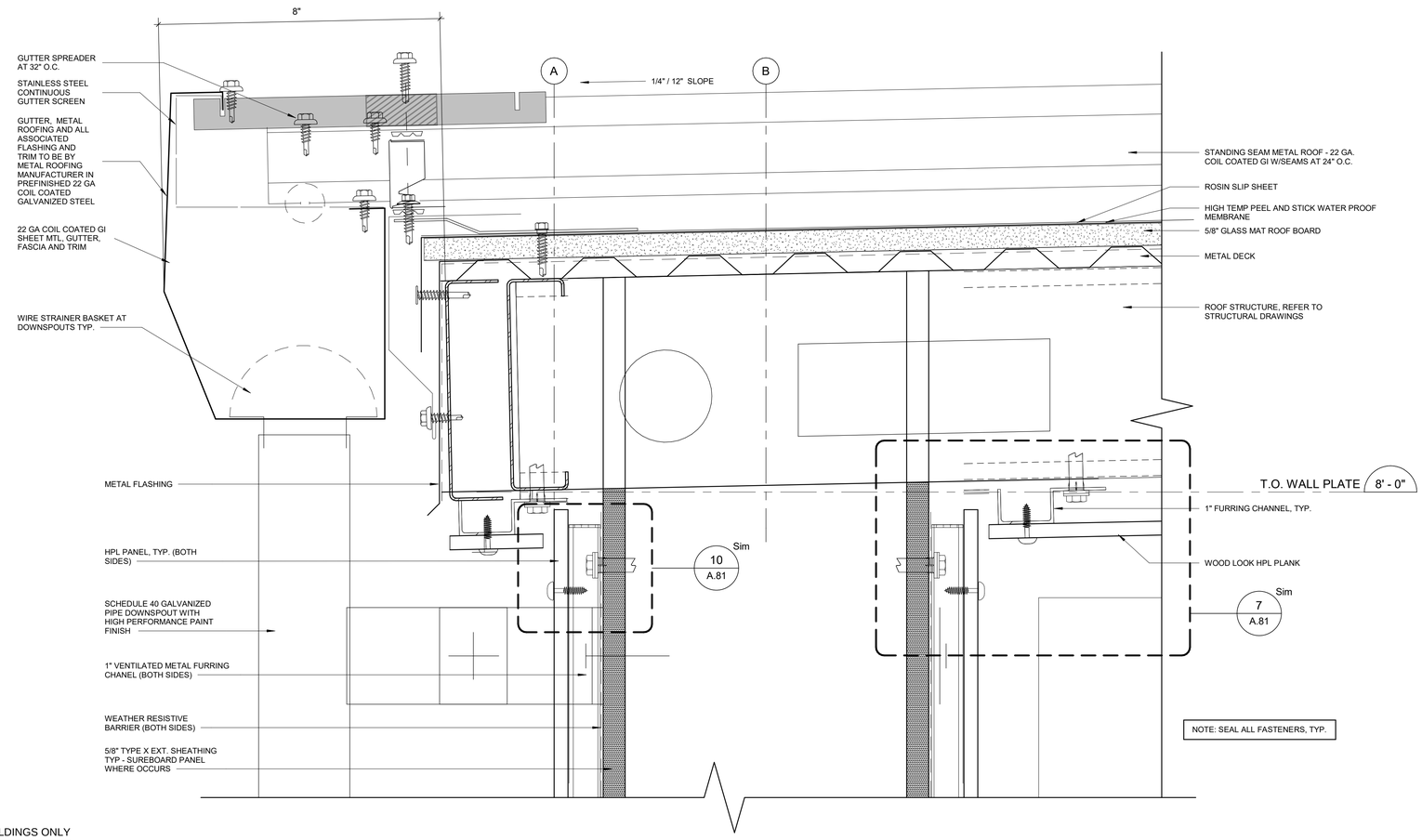
SHEET TITLE
ARCHITECTURE
SHELTER / CANOPY DETAILS

SHEET
A.82
SHEET 60 OF 97



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1 / A.83 STANDING SEAM METAL ROOF - AT GUTTER / TOP OF WALL
Scale: 6" = 1'-0"

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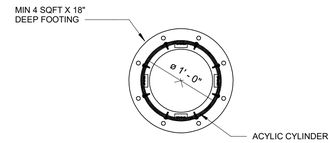
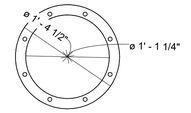
SHEET
A.83
SHEET 61 OF 97

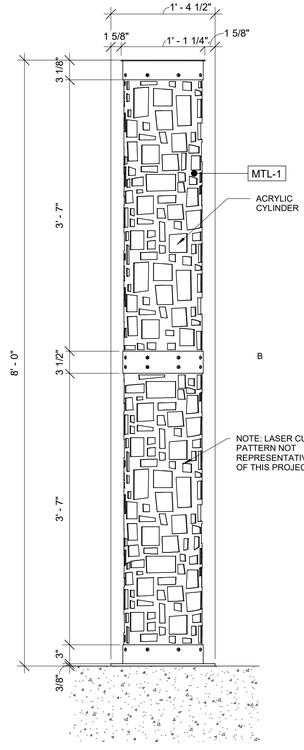


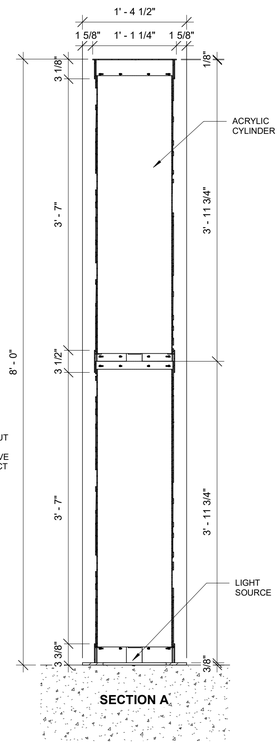
HORIZONTAL SECTION B



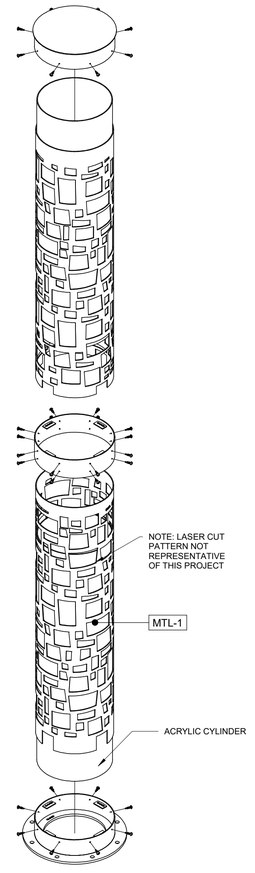
PLAN

A





SECTION A



1 / A.84 DECORATIVE LIGHT COLUMN BY REVAMP OR EQUAL

Scale: 1" = 1'-0"

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SHEET TITLE
ARCHITECTURE
SHELTER / CANOPY DETAILS - LIGHTING

SHEET
A.84
SHEET 62 OF 97

ABBREVIATIONS

MATERIAL ABBREVIATIONS LISTED BELOW APPLIES TO THIS SHEET ONLY AND TAKE PRECEDENCE OVER THOSE ABBREVIATIONS LISTED ON SHEET A.01. REFER TO SHEET A.01 FOR ABBREVIATIONS NOT LISTED BELOW.

FLOOR MATERIAL DESIGNATIONS
PT - PORCELAIN TILE
CONC - CONCRETE

BASE MATERIAL DESIGNATIONS
PB - PORCELAIN COVED TILE BASE
RB - RUBBER BASE

WALL MATERIAL DESIGNATION
GWB - GYPSUM WALL BOARD
FRP - FIBERGLASS-REINFORCED PLASTIC

CEILING MATERIAL DESIGNATION
GWB - GYPSUM WALL BOARD

FINISH DESIGNATIONS
LPL - LOW-PRESSURE LAMINATE (MELAMINE)
INT - INTEGRAL
IP - INTERIOR PAINT
TG - TEMPERED GLASS
MTL - METAL

DOOR FRAME DESIGNATION
HM - HOLLOW METAL
ALUM - ALUMINUM

ROOM - GENERAL NOTES

1. REFER TO SPECIFICATION SECTION 09 06 00 (COLORS AND FINISHES) FOR MATERIAL AND FINISH INFORMATION AND COLOR SCHEDULE.
2. WHERE MORE THAN ONE WALL FINISH IS INDICATED, REFER TO INTERIOR ELEVATIONS.
3. PAINT ACCESS PANELS, LOUVERS, GRILLES, ETC. TO MATCH ADJACENT FINISH. ACCESS PANELS IN CERAMIC TILE SHALL BE STAINLESS STEEL.
4. WHERE MORE THAN ONE CEILING FINISH MATERIAL IS INDICATED IN A ROOM, REFER TO REFLECTED CEILING PLAN FOR EXTENT AND LAYOUT OF EACH TYPE OF MATERIAL.
5. GYPSUM BOARD IN CONCEALED SPACES TO HAVE LEVEL-1 FINISH.
6. THE FINISH FLOOR TRANSITION BETWEEN SPACES IS TO OCCUR AT THE "STRIKE-SIDE" OF THE DOORWAY IN THE DIRECTION OF DOOR SWING, UNLESS OTHERWISE NOTED ON FLOOR PLAN. OPENINGS WITHOUT DOORS SHALL BE AS INDICATED ON FLOOR PLANS.
7. INTERIOR WALL & CEILING FINISHES SHALL COMPLY WITH SECTION 803.
8. INTERIOR FLOOR FINISHES SHALL COMPLY WITH SECTION 804.
9. THERMAL & ACOUSTICAL INSULATION SHALL COMPLY WITH SECTION 720.
10. EXPOSED BRICK TO REMAIN AS IS.

ROOM SCHEDULE REMARKS

1. REFER TO INTERIOR ELEVATIONS FOR ELEVATIONS, WALLS, AND FINISHES NOT NOTED IN THE ROOM FINISH SCHEDULE.
2. ALL FINISH FLOORING SHALL BE FIRM, STABLE, AND SLIP RESISTANT.

DOOR SCHEDULE REMARKS

1. RATED DOOR UNDERCUT SHALL NOT EXCEED MAX. ALLOWABLE PER NFPA 80.
2. UNLESS SPECIFICALLY PERMITTED BY SECTION 1010.1.9, EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF KEY OR SPECIAL KNOWLEDGE OR EFFORT.

ROOM FINISH SCHEDULE

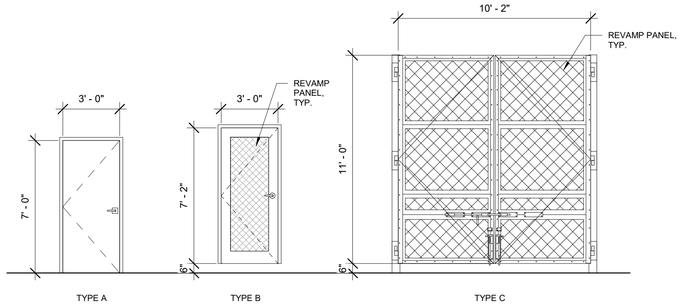
No.	ROOM NAME	FLOOR M1	FLOOR F1	BASE M1	BASE F1	NORTH M1	NORTH F1	EAST M1	EAST F1	SOUTH M1	SOUTH F1	WEST M1	WEST F1	CEILING M1	CEILING F1	REMARKS	No.
1	ANTEROOM	PT-1		PB-1		GWB	IP-1/IP-2	GWB	IP-2	GWB	IP-1	GWB	IP-1	/	IP-1		1
2	IT / ELECTRICAL	CONC		RB-1		GWB	IP-1	GWB	IP-1	GWB	IP-1	GWB	IP-1	/	IP-1		2
3	MECH./STOR	PT-1		PB-1		GWB	IP-1/FRP-1	GWB	IP-1	GWB	IP-1	GWB	IP-1/FRP-1	/	IP-1		3
4	RESTROOM	PT-1		PB-1		GWB	IP-1/FRP-1	GWB	IP-1/FRP-1	GWB	IP-1/FRP-1	GWB	IP-1/FRP-1	GWB	IP-1		4
5	RESTROOM	PT-1		PB-1		GWB	IP-1/FRP-1	GWB	IP-1/FRP-1	GWB	IP-1/FRP-1	GWB	IP-1/FRP-1	GWB	IP-1		5
7	EQUIPMENT ENCLOSURE	GRAVEL	/	/	/	MTL-1	/	MTL-1	/	HPL-1	/	MTL-1	/	/	/		7

DOOR & FRAME SCHEDULE

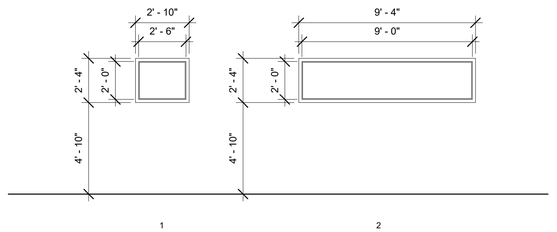
No.	Location	Door Type	Door Width	Door Height	Door Thickness	Panel Material	Panel Finish	Frame Material	Frame Finish	Fire Rating (minutes)	Hardware	Comments
D1	ANTEROOM	A	3' - 0"	7' - 0"	0' - 2"	HM	MTL-3	HM	MTL-3	NA	<-->	
D2	IT / ELECTRICAL	A	3' - 0"	7' - 0"	0' - 2"	HM	MTL-3	HM	MTL-3	NA	<-->	
D3	MECHANICAL / STORAGE	A	3' - 0"	7' - 0"	0' - 2"	HM	MTL-3	HM	MTL-3	NA	<-->	
D4	RESTROOM	A	3' - 0"	7' - 0"	0' - 2"	HM	MTL-3	HM	MTL-3	NA	<-->	
D5	RESTROOM	A	3' - 0"	7' - 0"	0' - 2"	HM	MTL-3	HM	MTL-3	NA	<-->	
D6	ANTEROOM	A	3' - 0"	7' - 0"	0' - 2"	HM	MTL-3	HM	MTL-3	NA	<-->	
D7	EQUIPMENT ENCLOSURE	B	3' - 0"	7' - 2"	0' - 2"	HM	MTL-1	HM	MTL-1	NA		PANEL INSERT BY METAL PANEL MFR.
D8	EQUIPMENT ENCLOSURE	C	10' - 2"	11' - 0"	0' - 1 1/2"	STEEL	MTL-1					SWING GATES BY METAL PANEL MFR.

WINDOW SCHEDULE

MARK	FRAME	FINISH	WIDTH	HEIGHT	SILL HEIGHT
1	ALUM	MTL-3	2' - 10"	2' - 4"	4' - 10"
2	ALUM	MTL-3	9' - 4"	2' - 4"	4' - 10"



DOOR TYPES
1/4" = 1'-0"



WINDOW TYPES
1/4" = 1'-0"

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STATE OF WASHINGTON

06-17-2022 PLAN CHECK RESUBMITTAL

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SHEET TITLE: ARCHITECTURE SCHEDULES

SHEET A.91
SHEET 63 OF 97

STRUCTURAL NOTES

DESIGN LOADS

ALL DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE INTERNATIONAL BUILDING CODE (IBC), 2018 EDITION, AS AMENDED BY THE CITY OF RICHLAND.

ROOF SNOW LOAD
THE ROOF SNOW LOAD IS DETERMINED USING CHAPTER 7 OF ASCE 7 IN ACCORDANCE WITH IBC SECTION 1608 AND WITH THE FOLLOWING FACTORS:

MINIMUM DESIGN LOAD 25 PSF (RAIN ON SNOW) WITHOUT DRIFT

P_g =	20 PSF	C_e =	1.0
I_s =	1	C_t =	1.0 (COMFORT BLDG), 1.2 (SHELTER CANOPY)
P_f =	20 PSF	C_s =	1.0

SEISMIC LOADS
THE SEISMIC FORCE-RESISTING SYSTEM (SFRS) USED TO RESIST EARTHQUAKE AND WIND LOADS FOR THE COMFORT BUILDING IS COMPRISED OF LIGHT FRAME (COLD-FORMED STEEL) WALLS WITH SHEAR PANELS DESIGNED IN ACCORDANCE WITH THE PROVISIONS OF AISI S400 "NORTH AMERICAN STANDARD FOR SEISMIC DESIGN OF COLD-FORMED STEEL STRUCTURAL SYSTEMS." THE SFRS USED TO RESIST EARTHQUAKE AND WIND LOADS FOR THE SHELTER CANOPIES ARE A COMBINATION OF STEEL ORDINARY CANTILEVER COLUMN SYSTEMS AND STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE DESIGNED IN ACCORDANCE WITH AISC 341 "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS" AND AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" RESPECTIVELY. EARTHQUAKE DESIGN IS BASED ON THE EQUIVALENT LATERAL FORCE PROCEDURE IN ASCE 7 SECTION 12.8 WITH THE FOLLOWING FACTORS:

	COMFORT BUILDING	SHELTER CANOPY
SITE CLASS D	h_n = 14 FT	h_n = 10 FT
RISK CATEGORY II	T = 0.14 SECONDS	T = 0.14 SECONDS
SEISMIC DESIGN CATEGORY C	R = 2.0	R = 1.25
I_e = 1.0	Ω = 2.5	Ω = 1.25
S_s = 0.424 g	ρ = 1.0	ρ = 1.0
S_1 = 0.162 g	C_s = 0.25	C_s = 0.4
S_{DS} = 0.50 g	V = C_sW = 9.3 KIPS	V = C_sW = 3.0 KIPS
S_{D1} = 0.20 g		
T_L = 16 SECONDS		

WIND LOADS
WIND LOAD IS DETERMINED USING CHAPTERS 26-31 OF ASCE 7 IN ACCORDANCE WITH IBC SECTION 1609 WITH THE FOLLOWING FACTORS:

RISK CATEGORY II		K_{zt} =	1.0
EXPOSURE CATEGORY C		K_d =	1.0
V	= 110 MPH	G_{cpi} =	+/- 0.18 (COMFORT BUILDING)
V_{asd}	= 85 MPH		+/- 0.00 (SHELTER CANOPY)

DESIGN WIND PRESSURES FOR DETERMINING FORCES ON COMPONENTS AND CLADDING SHALL BE DETERMINED USING CHAPTER 30 OF ASCE 7 IN ACCORDANCE WITH IBC SECTION 1609 BY THE WASHINGTON STATE REGISTERED PROFESSIONAL ENGINEER WHO IS RESPONSIBLE FOR THE DESIGN OF SUCH ELEMENTS, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

STORY DRIFTS
THE MAXIMUM LATERAL DISPLACEMENTS WITH RESPECT TO THE LEVEL BELOW (STORY DRIFTS) ARE AS FOLLOWS:

SEISMIC:
INELASTIC STORY DRIFT = 2% OF STORY HEIGHT
ELASTIC STORY DRIFT = INELASTIC STORY DRIFT DIVIDED BY C_d/I_e, WHERE C_d/I_e = 2.0 AT COMFORT BUILDING AND 1.25 AT SHELTER CANOPIES

WIND:
STORY DRIFT = 0.5% OF STORY HEIGHT

SOIL LOADS

ALLOWABLE SOIL-BEARING PRESSURE	2500 PSF DL + LL
	3300 PSF DL + LL + SEISMIC/WIND
RETAINING WALLS	35 PCF (EQUIVALENT FLUID PRESSURE) UNRESTRAINED
	55 PCF (EQUIVALENT FLUID PRESSURE) RESTRAINED

GENERAL NOTES

SUBMITTALS
SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO ANY FABRICATION OR CONSTRUCTION FOR ALL STRUCTURAL ITEMS, INCLUDING THE FOLLOWING: CONCRETE REINFORCEMENT, EMBEDDED STEEL ITEMS, STRUCTURAL STEEL, STEEL DECK, AND CLADDING PANELS.

IF THE SHOP DRAWINGS DIFFER FROM OR ADD TO THE DESIGN OF THE STRUCTURAL DRAWINGS, THEY SHALL BEAR THE SEAL AND SIGNATURE OF THE WASHINGTON STATE REGISTERED PROFESSIONAL ENGINEER WHO IS RESPONSIBLE FOR THE DESIGN.

DEFERRED SUBMITTALS
PER IBC SECTION 107.3.4.1, DRAWINGS AND CALCULATIONS FOR THE DESIGN AND FABRICATION OF ITEMS THAT ARE DESIGNED BY OTHERS SHALL BEAR THE SEAL AND SIGNATURE OF THE WASHINGTON STATE REGISTERED PROFESSIONAL ENGINEER WHO IS RESPONSIBLE FOR THE DESIGN AND SHALL BE SUBMITTED TO THE ENGINEER AND THE BUILDING DEPARTMENT FOR REVIEW PRIOR TO FABRICATION. DEFERRED SUBMITTALS INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

EQUIPMENT ANCHORAGE
SEISMIC DESIGN OF NONSTRUCTURAL COMPONENTS
ALTERNATE ANCHORS (WHEN ALTERNATE ANCHORS ARE PROPOSED)
CLADDING PANELS

NONSTRUCTURAL COMPONENTS
DESIGN, DETAILING AND ANCHORAGE OF ALL NONSTRUCTURAL COMPONENTS SHALL BE IN ACCORDANCE WITH IBC SECTION 1613, ASCE 7 CHAPTER 13, AND THE PROJECT SPECIFICATIONS. NONSTRUCTURAL COMPONENTS DESIGNED BY OTHERS SHALL NOT INDUCE TORSIONAL LOADING INTO SUPPORTING STRUCTURAL MEMBERS WITHOUT ADDITIONAL BRACING OF THOSE MEMBERS TO ELIMINATE TORSIONAL FORCES. TORSIONAL BRACING SHALL BE DESIGNED BY THE NONSTRUCTURAL COMPONENT DESIGNER AND APPROVED BY THE ENGINEER.

DESIGN, DETAILING AND CONSTRUCTION OF ALL NONSTRUCTURAL COMPONENTS WHICH ATTACH TO STRUCTURE SHALL ACCOMMODATE CONSTRUCTION TOLERANCES AS ESTABLISHED BY THE STRUCTURAL SPECIFICATIONS. ANY NONSTRUCTURAL COMPONENTS WHICH ATTACH TO MORE THAN ONE LEVEL OF THE STRUCTURE SHALL ALSO ACCOMMODATE THE FOLLOWING RELATIVE MOVEMENTS BETWEEN LEVELS WITHOUT DAMAGE TO THE NONSTRUCTURAL COMPONENTS:

VERTICAL DEFLECTION OF ±1/2 INCH DUE TO VARIABLE LIVE LOADS
ELASTIC STORY DRIFT PER "STORY DRIFT" SECTION ABOVE

IN ADDITION, NONSTRUCTURAL COMPONENTS ATTACHED TO MORE THAN ONE LEVEL SHALL ACCOMMODATE AN INELASTIC STORY DRIFT PER "STORY DRIFT" SECTION ABOVE WITHOUT CREATING A LIFE SAFETY HAZARD.

INSPECTION
SPECIAL INSPECTION PER IBC CHAPTER 17 SHALL BE PERFORMED BY AN APPROVED TESTING AGENCY AS INDICATED IN THE STATEMENT OF SPECIAL INSPECTIONS AND TESTING. ALL PREPARED SOIL-BEARING SURFACES SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF REINFORCING STEEL. SOIL COMPACTION SHALL BE SUPERVISED BY AN APPROVED TESTING AGENCY OR GEOTECHNICAL ENGINEER.

SPECIAL CONDITIONS
CONTRACTOR SHALL VERIFY ALL LEVELS, AND DIMENSIONS IN THE FIELD BEFORE PROCEEDING. CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES OR FIELD CHANGES PRIOR TO INSTALLATION OR FABRICATION. IN CASE OF DISCREPANCIES BETWEEN THE EXISTING CONDITIONS AND THE DRAWINGS, THE CONTRACTOR SHALL OBTAIN DIRECTION FROM THE ARCHITECT BEFORE PROCEEDING.

CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SAFETY PRECAUTIONS AND THE METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES REQUIRED TO PERFORM THE WORK.

SOILS
SEE THE GEOTECHNICAL REPORT BY GEOENGINEERS, DATED JULY 8, 2021, FOR MORE COMPLETE INFORMATION. EARTHWORK MATERIAL, BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL REPORT. BACKFILL BEHIND WALLS SHALL NOT BE PLACED BEFORE THE WALLS AND SUPPORTING SLABS ACHIEVE 28 DAY CONCRETE STRENGTH OR THE WALLS ARE TEMPORARILY BRACED. ALL TOPSOIL ORGANICS AND LOOSE SURFACE SOIL SHALL BE REMOVED FROM BENEATH FILL SUPPORTING CONCRETE SLABS OR PAVING.

CONCRETE

CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF IBC CHAPTER 19.

CONCRETE MIXTURES
CONCRETE MIXTURES SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

CONCRETE MIXTURES

f'c (PSI)	TEST AGE (DAYS)	EXPOSURE CLASS F	S	W	C	USE
3,000	28	F0	S0	W0	C0	INTERIOR SLAB-ON-GRADE
4,500	28	F2	S0	W0	C1	FOUNDATIONS

CONCRETE MIXTURES SHALL CONFORM TO THE MOST STRINGENT REQUIREMENTS FOR EXPOSURE CLASSES SPECIFIED IN THE TABLE ABOVE AND ACI 318 TABLE 19.3.2.1.

WATER-REDUCING ADMIXTURES MAY BE INCORPORATED IN CONCRETE MIX DESIGNS, BUT SHALL CONFORM TO ASTM C 494, AND BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. CaCl2 OR OTHER WATER-SOLUBLE CHLORIDE ADMIXTURES SHALL NOT BE USED.

WATER/CEMENTITIOUS MATERIALS RATIO SHALL BE MEASURED BY WEIGHT AND SHALL BE BASED ON THE TOTAL CEMENTITIOUS MATERIAL. WATER/CEMENTITIOUS MATERIALS RATIO AND WATER CONTENT SHALL BE DETERMINED BY THE SUPPLIER BASED ON STRENGTH REQUIREMENTS AND SHALL NOT EXCEED THE MAXIMUM WATER/CEMENTITIOUS MATERIAL RATIO AND/OR WATER CONTENT IN ACI 318 TABLE 19.3.2.1 FOR THE EXPOSURE CLASSES LISTED.

FIELD-MEASURED SLUMP SHALL CONFORM TO THE SUBMITTED CONCRETE MIX DESIGN. TOLERANCE OF SLUMP SHALL CONFORM TO ASTM C 94.

ALL CONCRETE SUBJECT TO EXPOSURE CLASSES F1, F2 OR F3 SHALL BE AIR ENTRAINED. AIR-ENTRAINING AGENTS SHALL CONFORM TO ASTM C 260. THE AMOUNT OF ENTRAINED AIR SHALL BE ACCORDING TO ACI 318 TABLE 19.3.3.1 WITH A FIELD TOLERANCE OF ±1.5 PERCENT BY VOLUME. THE AMOUNT OF ENTRAINED AIR SHALL BE MEASURED IN THE FIELD AT THE DISCHARGE FROM THE TRUCK.

THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS FOR APPROVAL 2 WEEKS PRIOR TO PLACING ANY CONCRETE. THE MIX DESIGN SHALL BE IN CONFORMANCE WITH ACI 318, CHAPTER 19. THE SUBMITTAL SHALL INDICATE WHERE EACH CONCRETE MIX IS TO BE USED ON THE PROJECT, AS WELL AS THE MAXIMUM AGGREGATE SIZE OF EACH MIX. MAXIMUM AGGREGATE SIZE SHALL CONFORM TO THE PROJECT SPECIFICATIONS.

CURING
IF THE AIR TEMPERATURE WILL EXCEED 75 DEGREES F WITHIN 48 HOURS OF PLACING CONCRETE, A MOIST CURE SHALL BE APPLIED TO THE CONCRETE FOR A PERIOD OF 36 HOURS AFTER FINISHING CONCRETE SURFACES. REFER TO THE PROJECT SPECIFICATIONS FOR COLD-WEATHER AND OTHER CURING REQUIREMENTS.

REINFORCING STEEL

DEFORMED BARS	ASTM A 615, GRADE 60

REINFORCING SHALL BE SUPPORTED AS SPECIFIED BY THE PROJECT SPECIFICATIONS AND THE CRSI MANUAL OF STANDARD PRACTICE. REINFORCING STEEL SHALL BE DETAILED IN ACCORDANCE WITH ACI STANDARD OF PRACTICE AS OUTLINED IN ACI 315, "GUIDE TO PRESENTING REINFORCING STEEL DESIGN DETAILS".

LAP ALL REINFORCING BARS AS NOTED ON THE DRAWINGS. WHERE SPLICE LENGTH IS NOT SHOWN, USE TYPE Lb (Lbt FOR TOP BARS) SPLICE PER DEVELOPMENT AND SPLICE LENGTH SCHEDULE.

REINFORCING STEEL SHALL HAVE PROTECTION AS FOLLOWS, UNLESS NOTED OTHERWISE:

USE		COVER
NONSTRUCTURAL SLAB-ON-GRADE		PER DETAILS
FOOTING	BOTTOM BARS	3" (CAST AGAINST EARTH)
	TOP BARS	1 1/2"
	SIDE BARS	2"

WELDING OF REINFORCING, WHERE APPROVED BY THE ENGINEER, SHALL BE PERFORMED USING LOW HYDROGEN ELECTRODES AND PREHEATED IN ACCORDANCE WITH AWS D1.4, REINFORCING STEEL WELDING CODE. WELDERS AND WELDING PROCEDURES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS D1.4. MATERIALS SHALL CONFORM TO THE FOLLOWING:

REINFORCING BARS TO BE WELDED	ASTM A 706, GRADE 60, LOW ALLOY
WELDING ELECTRODES	E80XX

NONSHRINK GROUT
BASE PLATE GROUT SHALL BE NONSHRINK TYPE WITH MINIMUM f'c = 8,000 PSI. ALL OTHER NONSHRINK GROUT SHALL HAVE MINIMUM f'c = 5,000 PSI.

ANCHORS

POST-INSTALLED ANCHORS
WHERE INDICATED ON THE DRAWINGS, PROVIDE POST-INSTALLED ANCHORS PER THE FOLLOWING TABLE. USE OF ALTERNATE PRODUCTS IS SUBJECT TO THE APPROVAL OF THE ENGINEER. SUBMIT PROPOSED ANCHORS TO THE ARCHITECT WITH AN ICC-ES OR IAPMO UES REPORT VALID FOR THE 2018 IBC.

ANCHORS IN CONCRETE

ANCHOR TYPE	APPROVED ANCHOR(S)	EVALUATION REPORT
ADHESIVE	HILTI HIT-HY 200	ICC-ES ESR-3187
MECHANICAL	HILTI KWIK BOLT TZ	ICC-ES ESR-1917
MECHANICAL	HILTI KWIK HUS EZ	ICC-ES ESR-3027

ADHESIVE REINFORCING DOWEL MATERIALS

ADHESIVE REINFORCING DOWELS (ARD)	ASTM A 615, GRADE 60
THREADED ARD	ASTM F 1554, GRADE 36 (CARBON STEEL)
	ASTM A193 B8M CLASS 1 (STAINLESS)

ANCHOR EMBEDMENT DEPTHS LISTED SHALL BE CONSIDERED EFFECTIVE EMBEDMENT DEPTHS AS DEFINED IN THE ICC-ES OR IAPMO UES EVALUATION REPORTS. PROVIDE ANCHOR LENGTH AND HOLE PER EVALUATION REPORT TO ACCOMMODATE THE EFFECTIVE EMBEDMENT SPECIFIED IN THESE DRAWINGS. SEE DETAIL 10/S.41 .

MECHANICAL AND ADHESIVE ANCHORS SHALL BE ZINC PLATED CARBON STEEL UNLESS NOTED OTHERWISE. MECHANICAL AND ADHESIVE ANCHORS EXPOSED TO WEATHER SHALL BE STAINLESS STEEL.

DO NOT DAMAGE EXISTING REINFORCEMENT. IF LOCATION OF REINFORCEMENT IS UNKNOWN, SCAN FOR EXISTING REINFORCING STEEL PRIOR TO DRILLING.

USE OF ALTERNATE PRODUCTS, OR OF POST-INSTALLED ANCHORS AT LOCATIONS NOT SHOWN IN THESE DRAWINGS, IS SUBJECT TO THE APPROVAL OF THE ENGINEER. SUBMIT PROPOSED ANCHORS TO THE ENGINEER WITH AN ICC-ES OR IAPMO UES REPORT VALID FOR THE 2018 IBC AND DOCUMENTATION SHOWING THAT THE ALTERNATE PRODUCTS PROVIDE EQUIVALENT CAPACITY FOR ALL CONDITIONS IN THIS PROJECT. SUBMITTED ICC-ES AND IAPMO UES REPORTS SHALL DEMONSTRATE THAT THE ANCHORS ARE SUITABLE FOR USE IN CRACKED CONCRETE WHERE ANCHORS RESIST SEISMIC LOADS, SUBMITTED ICC-ES AND IAPMO UES REPORTS SHALL DEMONSTRATE THAT THE ANCHORS ARE SUITABLE FOR THE RESISTANCE OF SEISMIC LOADS. DOCUMENTATION OF CAPACITY FOR ALTERNATE PRODUCTS MUST BE INCLUDED AS A DEFERRED SUBMITTAL.

ADHESIVES SHALL NOT BE INSTALLED PRIOR TO THE CONCRETE REACHING AN AGE OF 21 DAYS AS REQUIRED BY ACI 318.

DRAWING LIST

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

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CHECKED BY: RMB | APPROVED BY: TRH
DATE: 06/17/2022
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STRUCTURAL NOTES - CONTINUED

STRUCTURAL STEEL

REFERENCE SPECIFICATIONS

STRUCTURAL STEEL	AISC 360 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS"
HIGH STRENGTH BOLTS	RCSC "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS"
WELDING	AWS D1.1, TYPICAL AWS D1.3 FOR STEEL DECK AND COLD-FORMED FRAMING AWS PREQUALIFIED JOINT DETAILS
WELDER CERTIFICATION	WASHINGTON ASSOCIATION OF BUILDING OFFICIALS (WABO)
STEEL DECKING	ANSI/SDI RD "STANDARD FOR STEEL ROOF DECK" AISI S100 "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS"

STEEL MATERIALS

PLATES (PL), BARS	ASTM A 36 TYPICAL
WIDE FLANGE (W)	ASTM A992
ANGLES (L), CHANNELS (C AND MC)	ASTM A 36
STRUCTURAL TUBES (HSS)	ASTM A 500, GRADE C
STRUCTURAL BOLTS	ASTM F 3125, GRADE A 325
ANCHOR RODS	ASTM F 1554, GRADE 36 UNLESS NOTED OTHERWISE
THREADED RODS	ASTM A 36, UNLESS NOTED OTHERWISE
WELDING ELECTRODES	70 KSI, LOW HYDROGEN, TYPICAL

STRUCTURAL STEEL DESIGN, FABRICATION AND ERECTION SHALL CONFORM TO THE REQUIREMENTS OF IBC CHAPTER 22. ALL MEMBERS ARE TO BE ERECTED WITH NATURAL MILL CAMBER OR INDUCED CAMBER UP, UNLESS OTHERWISE NOTED ON THE PLANS. SUBSTITUTION OF MEMBER SIZES OR STEEL GRADE WILL NOT BE ALLOWED WITHOUT PRIOR APPROVAL BY THE ARCHITECT. A MINIMUM OF TWO BOLTS IS REQUIRED FOR ALL BEAM CONNECTIONS. ALTERNATIVE CONNECTIONS TO THOSE SHOWN ON THESE DRAWINGS WILL REQUIRE PRIOR APPROVAL BY THE ARCHITECT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ERECTION AIDS AND JOINT PREPARATIONS THAT INCLUDE, BUT ARE NOT LIMITED TO, ERECTION ANGLES, LIFT HOLES AND OTHER AIDS, WELDING PROCEDURES, REQUIRED ROOT OPENINGS, ROOT FACE DIMENSIONS, GROOVE ANGLES, BACKING BARS, COPES, SURFACE ROUGHNESS VALUES, AND UNEQUAL PARTS.

PROTECTION OF STEEL
STRUCTURAL STEEL AND CONNECTIONS, INCLUDING PLATES AND OTHER STEEL ITEMS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN COMPLIANCE WITH ASTM A 123 AND BE PAINTED ACCORDING TO THE ARCHITECT. ALL FIELD WELDS ON GALVANIZED MATERIAL SHALL BE COATED WITH BRUSH APPLIED ZINC-RICH PAINT COMPLYING WITH THE SPECIFICATIONS PRIOR TO PAINT TOUCHUP.

ALL COATINGS ARE TO FOLLOW THE SPECIFICATIONS AND PRODUCT MANUFACTURER'S INSTRUCTIONS.

WELDING
ALL WELDING SHALL BE IN CONFORMANCE WITH AISC AND AWS STANDARDS, AND SHALL BE PERFORMED BY WABO CERTIFIED WELDERS. ONLY WELDS THAT ARE PREQUALIFIED, AS DEFINED BY AWS, OR QUALIFIED BY TESTING SHALL BE USED. SHOP DRAWINGS SHALL SHOW ALL WELDING WITH AWS A2.4 SYMBOLS. WELDS SHOWN ON THE DRAWINGS ARE MINIMUM SIZES. INCREASE WELD SIZE TO AWS MINIMUM SIZES BASED ON THICKNESS. MINIMUM WELD SIZE SHALL BE 3/16-INCH, UNLESS NOTED OTHERWISE. THE WELDS SHOWN ARE FOR THE FINAL CONNECTIONS. FIELD WELD SYMBOLS ARE SHOWN WHERE FIELD WELDS ARE REQUIRED BY THE STRUCTURAL DESIGN. WHERE FIELD WELD IS NOT INDICATED, THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING IF A WELD SHOULD BE SHOP OR FIELD-WELDED IN ORDER TO FACILITATE THE STRUCTURAL STEEL ERECTION.

STEEL DECK

1 STEEL DECK SHALL CONFORM TO ASTM A 653. GALVANIZED COATING SHALL CONFORM TO ASTM A 924, G90. STEEL DECK SHALL CONFORM TO THE FOLLOWING:

f_y (PSI)	USE
80,000 MINIMUM	NONCOMPOSITE STEEL ROOF DECK

MINIMUM DECK GAUGES ARE SHOWN ON PLANS AND ARE BASED ON 3-SPAN, UNSHORED CONDITIONS. HEAVIER DECK GAUGES MAY BE REQUIRED FOR CONDITIONS OTHER THAN THESE, DEPENDING ON MANUFACTURER'S AND CONTRACTOR'S LAYOUT. DECK SUPPLIER SHALL VERIFY DECK GAUGES AND CAPACITIES BASED ON ACTUAL DECK LAYOUT AND SPAN CONDITIONS INCLUDING A 8 PSF SUPERIMPOSED DEAD LOAD ALLOWANCE FOR THE STEEL ROOF DECK. DEVIATIONS IN DECK GAUGES FROM THOSE SHOWN SHALL BE SUBMITTED TO THE ENGINEER, ALONG WITH A VALID ICC REPORT FOR APPROVAL PRIOR TO SHOP DETAILING.

CONTRACTOR SHALL PROVIDE CLOSURE PLATES, FLASHING, AND ALL MISCELLANEOUS COLD-FORMED FRAMING NECESSARY TO COMPLETE THE WORK. THE MINIMUM BEARING SHALL BE 2 INCHES.

NONCOMPOSITE STEEL ROOF DECK
STEEL ROOF DECK SHALL BE OF THE SIZE AND GAUGE SHOWN ON THE PLANS OR AN APPROVED EQUAL. STEEL ROOF DECK FASTENING SHALL BE AS SHOWN ON THE PLANS. THE MINIMUM END LAP SHALL BE 2 INCHES CENTERED OVER SUPPORTS.

SUSPENDED CEILINGS, LIGHT FIXTURES, PIPES, DUCTS, MECHANICAL OR ELECTRICAL EQUIPMENT, OR OTHER UTILITIES SHALL NOT BE SUPPORTED BY THE NONCOMPOSITE STEEL ROOF DECK WITHOUT APPROVAL OF THE ENGINEER.

HOLES OR COMBINATIONS OF HOLES IN NONCOMPOSITE STEEL ROOF DECK, WHICH CUT TWO WEBS WHICH ARE CLOSER THAN 24 INCHES ON CENTER IN ANY DECK SPAN, MAY REQUIRE DECK REINFORCEMENT AND REQUIRE DIRECTION FROM THE ENGINEER.

COLD-FORMED STEEL, LOAD-BEARING

REFERENCE STANDARDS
- IBC CHAPTER 22, SECTIONS 2210 AND 2211.
- AISI S100 "NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS"
- AISI S240 "NORTH AMERICAN STANDARD FOR COLD-FORMED STEEL STRUCTURAL FRAMING"
- AISI S400 "NORTH AMERICAN STANDARD FOR SEISMIC DESIGN OF COLD-FORMED STEEL STRUCTURAL SYSTEMS"

SUBMITTALS
SUBMIT PRODUCT DATA AND PROOF OF ICC-ES OR IAPMO-UES APPROVAL FOR FRAMING MEMBERS, FASTENERS, AND CONNECTION HARDWARE VALID FOR THE 2018 IBC. ALTERNATE MATERIALS WITH EQUIVALENT SIZE, SHAPE, STRENGTH AND STIFFNESS SHALL BE SUBJECT TO REVIEW AND APPROVAL BY THE ARCHITECT.

FRAMING MEMBERS
COLD-FORMED STEEL FRAMING MEMBERS SHALL BE OF THE SIZE, SHAPE, AND GRADE AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH THE STEEL STUD MANUFACTURER'S ASSOCIATION ICC EVALUATION REPORT ESR-3064P.

MATERIALS

STUDS AND TRACK	ASTM A 1003, TYPE H 54 MIL AND THICKER, GRADE 50
ROOF JOISTS AND RIM TRACK	54 MIL AND THICKER, GRADE 50
MISCELLANEOUS SHAPES (STRIPS, SHEETS, ANGLES, BRIDGING)	ASTM A 653, GRADE 50
SHEAR WALL SHEATHING	SUREBOARD WITH 27 MIL STEEL BACKING MINIMUM OR APPROVED EQUAL
SHEET METAL SCREWS FRAMING FASTENERS SHEAR WALL FASTENERS FLOOR AND ROOF DIAPHRAGM FASTENERS	ASTM C 1513 GRABBER WAFER HEAD GRABBER BUGLE HEAD GRABBER PAN OR HEX HEAD
WELDING ELECTRODES	70 KSI, USE LOW HYDROGEN WHEN WELDING TO STRUCTURAL STEEL

SHEET METAL SCREWS
FASTENERS SHALL BE SELF-DRILLING AND SHALL EXTEND THROUGH THE CONNECTION WITH A MINIMUM OF 3 EXPOSED THREADS.

WELDING
WELDING OF COLD-FORMED STEEL SHALL CONFORM TO AWS D1.3 AND SHALL BE PERFORMED BY AWS CERTIFIED WELDERS.

GALVANIZING
GALVANIZE ALL MEMBERS ACCORDANCE WITH ASTM A 653, G60, UNO.

COLD-FORMED STEEL ANCHORS TO CONCRETE AND STEEL
WHERE INDICATED ON THE DRAWINGS, PROVIDE ANCHORS PER THE FOLLOWING TABLE. USE OF ALTERNATE PRODUCTS IS SUBJECT TO THE APPROVAL OF THE ENGINEER. SUBMIT PROPOSED ANCHORS TO THE ENGINEER WITH AN ICC-ES OR IAPMO UES REPORT VALID FOR THE 2018 IBC. REFERENCE THE ANCHORS SECTION FOR ADDITIONAL REQUIREMENTS.

COLD-FORMED STEEL ANCHORS TO CONC AND STEEL

APPLICATION	PRODUCT	DIAMETER	LENGTH	MIN EDGE DISTANCE	MIN SPACING	EVALUATION REPORT
PAF TO STEEL	HILTI X-S16P8TH	0.145"	FULL STEEL PENETRATION (3/16" MIN)	1/2"	1"	ICC-ES ESR-1752
CONCRETE SCREW ANCHOR	SIMPSON TITEN HD	3/8"	2 1/2"	2 3/4"	3"	ICC-ES ESR-2713

STUD PUNCHOUTS
STUD PUNCHOUTS SHALL BE SPACED 24" OC AT MINIMUM. THE FIRST PUNCHOUT SHALL BE A MINIMUM OF 10" AWAY FROM THE ENDS OF EACH STUD.

BUNDLED STUDS
TWO STUDS IN A BOXED CONFIGURATION, OR STUD GROUPS OF 3 OR MORE MEMBERS, SHALL BE SHOP WELDED WITH 1/8" FLARE GROOVE WELDS x 1/2" LONG, BOTH SIDES AT 12" OC.

INSULATION
PROVIDE INSULATION IN BOXED OR BUILT-UP FRAMING MEMBERS.

COLD-FORMED STEEL JOISTS
JOISTS ARE ASSUMED TO HAVE FULL LATERAL SUPPORT WITH DECKING ATTACHED TO THE COMPRESSION FLANGE. JOIST ENDS MUST BE BRACED BY RIM TRACK OR BLOCKING. MINIMUM 3 1/2" JOIST BEARING WIDTH AT WALLS. ADD WEB STIFFENER IF BEARING WIDTH IS LESS THAN 3 1/2".

ERECTION
1. EACH JOIST AND WALL STUD SHALL BE IN VERTICAL ALIGNMENT OVER THE ENTIRE BUILDING HEIGHT.
2. STUDS SHALL BE SEATED INTO THE TOP AND BOTTOM TRACKS WITH LESS THAN 1/16" GAP BETWEEN THE END OF THE STUD AND THE WEB OF THE TRACK.
3. HANDLING AND LIFTING OF PREFABRICATED PANELS SHALL NOT CAUSE PERMANENT DISTORTION TO ANY MEMBER.

FIELD CUTS AND NOTCHES
FIELD CUTS OR NOTCHES OF ANY KIND ARE NOT PERMITTED IN LOAD-BEARING COLD-FORMED STEEL MEMBERS. IF A FIELD CUT IS REQUIRED, THE CONTRACTOR SHALL RECEIVE DIRECTION FROM THE ENGINEER PRIOR TO CUTTING.

PERMANENT WALL BRIDGING
WALL BRIDGING AND BRIDGING ANCHORAGE SHOWN IN THESE DRAWINGS SHALL BE CONSIDERED AS PERMANENT. THIS BRIDGING MUST BE IN PLACE PRIOR TO APPLYING AXIAL LOAD TO STUDS.

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	JBB	RMB	TRH	SECOND PERMIT REVIEW

DRAWN BY: DYL | DESIGNED BY: RMB
CHECKED BY: RMB | APPROVED BY: TRH
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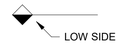
STRUCTURAL ABBREVIATIONS

AB	ANCHOR BOLT
ADD'L	ADDITIONAL
ADH	ADHESIVE
ADJ	ADJUSTABLE
AESS	ARCHITECTURALLY EXPOSED STRUCTURAL STEEL
AFF	ABOVE FINISH FLOOR
AGG	AGGREGATE
ANCH	ANCHOR
ARCH	ARCHITECTURAL
ARD	ADHESIVE REINFORCING DOWEL
B/	BOTTOM OF
BLDG	BUILDING
BLKG	BLOCKING
BM	BEAM
BN	DIAPHRAGM BOUNDARY NAILING
BOT	BOTTOM
BRG	BEARING
BTWN	BETWEEN
CDF	CONTROLLED DENSITY FILL
CFS	COLD-FORMED STEEL
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION OR CONTROL JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CTR	CENTER
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DEMO	DEMOLISH
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DKG	DECKING
DN	DOWN
DWG	DRAWING
DWL	DOWEL
EA	EACH
EF	EACH FACE
EL	ELEVATION
ELECT	ELECTRICAL
EN	PANEL EDGE NAILING
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EW	EACH WAY
EX	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F	FAHRENHEIT
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FINISH FLOOR
FIN	FINISH
FLG	FLANGE
FLR	FLOOR
FOC	FACE OF CONCRETE
FOS	FACE OF STUD
FS	FAR SIDE
FT	FEET
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GEN	GENERAL
GR	GRADE
GWB	GYPSUM WALL BOARD
HGR	HANGER
HK	HOOK
HORIZ	HORIZONTAL
HP	HIGH POINT
HSS	HOLLOW STRUCTURAL SECTION
IBC	INTERNATIONAL BUILDING CODE
ID	INSIDE DIAMETER
IF	INSIDE FACE
IN	INCH
INFO	INFORMATION
INT	INTERIOR
JT	JOINT
K	KIP (1,000 LBS.)
KSF	KIPS PER SQUARE FOOT
LF	LINEAL FOOT
LFH	LONG FACE HORIZONTAL
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LNGT	LONGITUDINAL
LP	LOW POINT
MAX	MAXIMUM
MECH	MECHANICAL
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MOM	MOMENT
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NS	NONSHRINK
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
P	POST
PAF	POWER ACTUATED FASTENER
PC	PIECE
PC	PILE CAP
PEN	PENETRATION
PJP	PARTIAL JOINT PENETRATION
PL	PLATE
PLWD	PLYWOOD
PNL	PANEL
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
R	RADIUS
RD	ROOF DRAIN
REINF	REINFORCING
REM	REMAIN(DER)
REQ'D	REQUIRED
RND	ROUND
RO	ROUGH OPENING
RTN	RETURN
SC	SLIP CRITICAL
SCHED	SCHEDULE
SECT	SECTION
SFRS	SEISMIC FORCE-RESISTING SYSTEM
SHT	SHEET
SHTG	SHEATHING
SIM	SIMILAR
SOG	SLAB-ON-GRADE
SP	SPACE
SPEC	SPECIFICATION
SQ	SQUARE
SST	STAINLESS STEEL
ST	SUSTAINED TENSION ANCHOR
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STRUCT	STRUCTURAL
SUPP	SUPPORT
SYM	SYMMETRICAL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
T/	TOP OF
TB	TABLE
THK	THICK(NESS)
THRU	THROUGH
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
UT	ULTRASONIC TESTING
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	W-SHAPE
W/	WITH
W/O	WITHOUT
WD	WOOD
WHS	WELDED HEADED STUD
WP	WORK POINT

STRUCTURAL DRAWING SYMBOLS

CONCRETE SYMBOLS

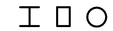


STEPPED FOOTING

CONCRETE WALL ABOVE OR PASSING THRU LEVEL

PARTIAL HEIGHT CONCRETE WALL

STEEL SYMBOLS



STEEL COLUMN ABOVE OR PASSING THRU THIS LEVEL

STEEL COLUMN BELOW THIS LEVEL

STEEL IN CROSS SECTION

COLD-FORM FRAMING SYMBOLS

STEEL SHEET AND GYPSUM BOARD COMPOSITE PANEL

BEAM / GIRDER / JOIST

WALL BELOW THIS LEVEL WITH HEADER BELOW

WALL ABOVE THIS LEVEL

WALL BELOW THIS LEVEL

GENERAL SYMBOLS

GRID BUBBLE

SURFACE - SLOPE UP

SURFACE - STEPPED

SURFACE - SLOPE DOWN

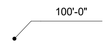
SURFACE - SLOPE TWO WAYS

UNDISTURBED SOIL, COMPACTED SOIL, BACKFILL, OR ANY PREPARED SUBGRADE. SEE SPECIFICATIONS FOR TYPE OF MATERIAL AND PREPARATION METHOD.

NORTH ARROW

STANDARD SECTION CUTS

ELEVATION OF WALL OR FRAME



SPOT ELEVATION: TOP OF PLYWOOD, TOP OF CONCRETE, TOP OF STEEL

TOP OF CONCRETE ELEVATION

TOP OF STEEL ELEVATION

REFERENCE ELEVATION. REFER TO PLAN UNLESS NOTED OTHERWISE.

ELEVATION OF LEVEL

WORKPOINT

DIRECTION OF DOWNWARD SLOPE

DIRECTION OF SPAN

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY: DYL | DESIGNED BY: RMB
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STATEMENT OF STRUCTURAL SPECIAL INSPECTIONS AND TESTING

TABLE 1 - REQUIRED GEOTECHNICAL SPECIAL INSPECTIONS

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REFERENCE	INSPECTION: CODE OR STANDARD REFERENCE	INSPECTION: FREQUENCY (NOTE 6): CONTINUOUS	INSPECTION: FREQUENCY (NOTE 6): PERIODIC	REMARKS
SOILS					
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	TB 1705.6 1705.6	GEOTECHNICAL REPORT	-	X	BY THE GEOTECHNICAL ENGINEER
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.			-	X	
PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.			-	X	
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.			X	-	
PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.			-	X	

TABLE 2 - REQUIRED STRUCTURAL SPECIAL INSPECTIONS

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REFERENCE	INSPECTION: CODE OR STANDARD REFERENCE	INSPECTION: FREQUENCY (NOTE 6): CONTINUOUS	INSPECTION: FREQUENCY (NOTE 6): PERIODIC	REMARKS
FABRICATION					
INSPECTION IN FABRICATION SHOP	1704.2.5	-	-	-	WHERE FABRICATION OF STRUCTURAL, LOAD-BEARING OR LATERAL LOAD-RESISTING MEMBERS OR ASSEMBLIES IS BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS SHALL BE AS REQUIRED BY TABLE 2 AND AS REQUIRED ELSEWHERE IN THE STATEMENT OF SPECIAL INSPECTIONS. REFERENCE SECTION 1704.2.5.1 FOR APPROVED FABRICATOR EXCEPTION.
CONCRETE					
INSPECT REINFORCEMENT, INCLUDING EMBEDMENTS, AND VERIFY PLACEMENT.	TB 1705.3(1) 1705.3 1908.4	ACI 318: 20, 25.2-25.3, 26.6.1-26.6.3, 26.8, 26.13.3; AISC 360: N5.7	-	X	TOLERANCE AND REINFORCING PLACEMENT PER ACI 318: 26.6
INSPECTION OF REINFORCING STEEL WELDING	TB 1705.3(2) 1705.3.1	ACI 318: 26.6.4 AWS D1.4: 7	-	-	EXCEPT AS NOTED OTHERWISE
MATERIAL VERIFICATION OF WELD FILLER METALS	1705.3.1		-	X	MANUFACTURER'S CERTIFIED TEST REPORTS
VERIFYING USE OF PROPER WELDING PROCEDURE SPECIFICATIONS			-	X	COPY OF WELDING PROCEDURE SPECIFICATIONS
VERIFYING WELDER QUALIFICATIONS			-	X	COPY OF QUALIFICATION CARDS
VERIFY WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.	TB 1705.3 (2.a)		-	X	CERTIFIED MILL TEST REPORTS
INSPECT SINGLE PASS FILLET WELDS, MAXIMUM 5/16"	TB 1705.3 (2.b)	AWS D1.4 ACI 318: 26.6.4	-	X	-
INSPECT ALL OTHER WELDS	TB 1705.3 (2.c)		X	-	ALL WELDS VISUALLY INSPECTED PER AWS D1.4: 7.5
INSPECT ANCHORS CAST IN CONCRETE	WAC 51-50-1705	ACI 318 17.8.2; AISC 360: N5.7	-	X	ALL ANCHORS SHALL BE VISUALLY INSPECTED
INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS:					
ADHESIVE ANCHORS AND ADHESIVE REINFORCING DOWELS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	TB 1705.3 (4.a)	ACI 355.4 ICC/IAPMO EVALUATION REPORT ACI 318: 17.8.2.4, 26.13.3	X	-	REFER TO ANCHOR CALLOUTS FOR SUSTAINED TENSION (ST) DESIGNATION
MECHANICAL ANCHORS, ADHESIVE ANCHORS, AND ADHESIVE REINFORCING DOWELS NOT DEFINED ABOVE.	TB 1705.3 (4.b)	ACI 355.4 ICC/IAPMO EVALUATION REPORT ACI 318: 17.8.2, 26.13.3	-	X (NOTE 7)	ALL ANCHORS SHALL BE VISUALLY INSPECTED
VERIFY USE OF REQUIRED DESIGN MIX.	TB 1705.3(5) 1705.3 1904 1908.2 1908.3	ACI 318: 19, 26.4.3-26.4.4, 26.13.3	-	X	-
PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	TB 1705.3(6) 1908.10	ASTM C 172 ASTM C 31 ACI 318: 26.4, 26.12	X	-	-
INSPECT CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	TB 1705.3(7) 1705.3 1908.6-8	ACI 318: 26.5, 26.13.3	X	-	-
VERIFY CURING METHOD AND DURATION OF CURING FOR EACH MEMBER.	-	ACI 318: 26.13.3.3(b)	-	X	-
VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	TB 1705.3(8) 1705.3 1908.9	ACI 318: 26.5.3-26.5.5, 26.13.3	-	X	-
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	TB 1705.3(12) 1705.3	ACI 318: 26.11.1.2(b)	-	X	-

SYSTEM OR MATERIAL	INSPECTION: IBC CODE REFERENCE	INSPECTION: CODE OR STANDARD REFERENCE	INSPECTION: FREQUENCY (NOTE 8): OBSERVE	INSPECTION: FREQUENCY (NOTE 8): PERFORM	REMARKS
STEEL					
INSPECTION TASKS PRIOR TO WELDING:					
WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE	1705.2	AISC 360: TB N5.4-1 AISC 360: N5.4	-	X	-
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE			-	X	-
MATERIAL IDENTIFICATION (TYPE/GRADE)	1705.2	AISC 360: TB N5.4-1 AISC 360: N5.4	X	-	-
WELDER IDENTIFICATION SYSTEM			X	-	-
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY): JOINT PREPARATION, DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL), CLEANLINESS (CONDITION OF STEEL SURFACES), TACKING (TACK WELD QUALITY AND LOCATION), BACKING TYPE AND FIT (IF APPLICABLE)			X	-	-
CONFIGURATION AND FINISH OF ACCESS HOLES			X	-	-
FIT-UP OF FILLET WELDS: DIMENSIONS (ALIGNMENT, GAPS AT ROOT), CLEANLINESS (CONDITION OF STEEL SURFACES), TACKING (TACK WELD QUALITY AND LOCATION), BACKING TYPE AND FIT (IF APPLICABLE)			X	-	-
CHECK WELDING EQUIPMENT			-	-	FABRICATOR OR ERECTOR SHALL OBSERVE
INSPECTION TASKS DURING WELDING:					
USE OF QUALIFIED WELDERS	1705.2	AISC 360: TB N5.4-2 AISC 360: N5.4	X	-	-
CONTROL AND HANDLING OF WELDING CONSUMABLES: PACKAGING, EXPOSURE CONTROL			X	-	-
NO WELDING OVER CRACKED TACK WELDS			X	-	-
ENVIRONMENTAL CONDITIONS: WIND SPEED WITHIN LIMITS, PRECIPITATION AND TEMPERATURE			X	-	-
WPS FOLLOWED: SETTINGS ON WELDING EQUIPMENT, TRAVEL SPEED, SELECTED WELDING MATERIALS, SHIELDING GAS TYPE/FLOW RATE, PREHEAT APPLIED, INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.), PROPER POSITION (F, V, H, OH)			X	-	-
WELDING TECHNIQUES: INTERPASS AND FINAL CLEANING, EACH PASS WITHIN PROFILE LIMITATIONS, EACH PASS MEETS QUALITY REQUIREMENTS			X	-	-
INSPECTION TASKS AFTER WELDING:					
WELDS CLEANED	1705.2	AISC 360: TB N5.4-3 AISC 360: N5.4	X	-	-
SIZE, LENGTH AND LOCATION OF WELDS			-	X	-
WELDS MEET VISUAL ACCEPTANCE CRITERIA: CRACK PROHIBITION, WELD/BASE-METAL FUSION, CRATER CROSS SECTION, WELD PROFILES, WELD SIZE, UNDERCUT, POROSITY			-	X	-
ARC STRIKES			-	X	-
K-AREA			-	X	-
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)			-	X	-
REPAIR ACTIVITIES			-	X	-
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER			-	X	-
INSPECTION TASKS PRIOR TO BOLTING:					
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	1705.2	AISC 360: TB N5.6-1 AISC 360: N5.6	-	X	-
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS			X	-	-
PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)			X	-	-
PROPER BOLTING PROCEDURE FOR JOINT DETAIL			X	-	-
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS			X	-	-
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED			X	-	-
PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS			X	-	-

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STATEMENT OF STRUCTURAL SPECIAL INSPECTIONS AND TESTING

INSPECTION TASKS DURING BOLTING:					
FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	1705.2	AISC 360: TB N5.6-2 AISC 360: N5.6	X	-	-
JOINT BROUGHT TO SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION			X	-	-
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING			X	-	-
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES			X	-	-
INSPECTION TASKS AFTER BOLTING:					
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	1705.2	AISC 360: TB N5.6-3	-	X	-
INSPECTION OF FABRICATED AND ERECTED STEEL FRAMES:					
VERIFICATION OF COMPLIANCE WITH CONSTRUCTION DOCUMENT DETAILS, INCLUDING MEMBER AND COMPONENT LOCATIONS, BRACING, STIFFENERS, AND PROPER APPLICATION OF JOINT DETAILS.	-	AISC 360: N5.7	-	X	-

SYSTEM OR MATERIAL	TESTING				REMARKS
	IBC CODE REFERENCE	CODE OR STANDARD REFERENCE	FREQUENCY		
			CONTINUOUS	PERIODIC	
STEEL DECK					
INSPECTION OR EXECUTION TASKS PRIOR TO DECK PLACEMENT:					
VERIFY COMPLIANCE OF MATERIALS (DECK AND ALL DECK ACCESSORIES) WITH CONSTRUCTION DOCUMENTS, INCLUDING PROFILES, MATERIAL PROPERTIES, AND BASE METAL THICKNESS	1705.2.2	SDI QA/QC: APP. 1	-	X	-
DOCUMENT ACCEPTANCE OR REJECTION OF DECK AND DECK ACCESSORIES			-	X	-
INSPECTION OR EXECUTION TASKS AFTER DECK PLACEMENT:					
VERIFY COMPLIANCE OF DECK AND ALL DECK ACCESSORIES INSTALLATION WITH CONSTRUCTION DOCUMENTS	1705.2.2	SDI QA/QC: APP. 1	-	X	-
VERIFY DECK MATERIALS ARE REPRESENTED BY THE MILL CERTIFICATIONS THAT COMPLY WITH THE CONSTRUCTION DOCUMENTS			-	X	-
DOCUMENT ACCEPTANCE OR REJECTION OF INSTALLATION OF DECK AND DECK ACCESSORIES			-	X	-
INSPECTION OR EXECUTION TASKS PRIOR TO WELDING:					
WELDING PROCEDURE SPECIFICATIONS AVAILABLE (WPS)	1705.2.2	SDI QA/QC: APP. 1	X	-	-
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE			X	-	-
MATERIAL IDENTIFICATION (TYPE/GRADE)			X	-	-
CHECK WELDING EQUIPMENT			X	-	-
INSPECTION OR EXECUTION TASKS DURING WELDING:					
USE OF QUALIFIED WELDERS	1705.2.2	SDI QA/QC: APP. 1	X	-	-
CONTROL AND HANDLING OF WELDING CONSUMABLES			X	-	-
ENVIRONMENTAL CONDITIONS (WIND SPEED, MOISTURE, TEMPERATURE)			X	-	-
WPS FOLLOWED			X	-	-
INSPECTION OR EXECUTION TASKS AFTER WELDING:					
VERIFY SIZE AND LOCATION OF WELDS, INCLUDING SUPPORT, SIDELAP, AND PERIMETER WELDS	1705.2.2	SDI QA/QC: APP. 1	-	X	-
WELDS MEET VISUAL ACCEPTANCE CRITERIA			-	X	-
VERIFY REPAIR ACTIVITIES			-	X	-
DOCUMENT ACCEPTANCE OR REJECTION OF WELDS			-	X	-
INSPECTION OR EXECUTION TASKS PRIOR TO MECHANICAL FASTENING:					
MANUFACTURER INSTALLATION INSTRUCTIONS AVAILABLE FOR MECHANICAL FASTENERS	1705.2.2	SDI QA/QC: APP. 1	X	-	-
PROPER TOOLS AVAILABLE FOR FASTENER INSTALLATION			X	-	-
PROPER STORAGE FOR MECHANICAL FASTENERS			X	-	-
INSPECTION OR EXECUTION TASKS DURING MECHANICAL FASTENING:					
FASTENERS ARE POSITIONED AS REQUIRED	1705.2.2	SDI QA/QC: APP. 1	X	-	-
FASTENERS ARE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS			X	-	-
INSPECTION OR EXECUTION TASKS AFTER MECHANICAL FASTENING:					
CHECK SPACING, TYPE, AND INSTALLATION OF SUPPORT FASTENERS, SIDELAP FASTENERS, AND PERIMETER FASTENERS	1705.2.2	SDI QA/QC: APP. 1	-	X	-
VERIFY REPAIR ACTIVITIES			-	X	-
DOCUMENT ACCEPTANCE OR REJECTION OF MECHANICAL FASTENERS			-	X	-

SYSTEM OR MATERIAL	INSPECTION				REMARKS
	IBC CODE REFERENCE	CODE OR STANDARD REFERENCE	FREQUENCY (NOTE 6)		
			CONTINUOUS	PERIODIC	
COLD-FORMED STEEL FRAMING					
MATERIAL VERIFICATION OF WELDING CONSUMABLES	-	AISI S100: APP. A E2a	-	X	MANUFACTURER'S CERTIFIED TEST REPORTS
VERIFYING USE OF PROPER WPS			-	X	COPY OF WELDING PROCEDURE SPECIFICATIONS
VERIFYING WELDER QUALIFICATIONS			-	X	COPY OF QUALIFICATION CARDS
WELDED FRAMING CONNECTIONS	-	AWS D1.3: 6	-	X	ALL WELDS VISUALLY INSPECTED PER AWS D1.3: 6.1

TABLE 3 - REQUIRED STRUCTURAL TESTING

SYSTEM OR MATERIAL	TESTING				REMARKS
	IBC CODE REFERENCE	CODE OR STANDARD REFERENCE	FREQUENCY		
			CONTINUOUS	PERIODIC	
GEOTECHNICAL					
FILL IN-PLACE DENSITY OR PREPARED SUBGRADE DENSITY	1705.6	VARIES; MINIMUM PER IBC APPENDIX J107.5	-	X	BY THE GEOTECHNICAL ENGINEER
MATERIAL VERIFICATION		VARIES: CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS	-	X	BY THE GEOTECHNICAL ENGINEER
CONCRETE					
COMPOSITE SAMPLES		ASTM C 172 ACI 318: 26.12	ONE SAMPLE FOR EA 150 CY NOR LESS THAN 5,000 SQ FT OF SLABS AND WALLS, ONE SET PER DAY MIN		OBTAIN WHEN FRESH CONCRETE IS PLACED FOR EACH MIX DESIGN USED
CONCRETE STRENGTH, UNO		ASTM C 39 ACI 318: 26.12	EACH SAMPLE: 1 CYL - 7 DAYS 3 CYL - TEST AGE 1 CYL - HOLD		(NOTE 9) REFER TO GENERAL NOTES FOR TEST AGE. FOR 6 BY 12-INCH CYLINDERS, 2 CYLINDERS AT TEST AGE IS PERMITTED. CYL = CYLINDER
			EACH SAMPLE: 1 CYL - FIELD CURED, TEST PRIOR TO TENDON STRESSING 3 CYL - TEST AGE 1 CYL - HOLD		
CONCRETE SLUMP		ASTM C 143	ONE TEST PER COMPOSITE SAMPLE		AT POINT OF PLACEMENT
CONCRETE AIR CONTENT		ASTM C 231	ONE TEST PER COMPOSITE SAMPLE		MIN ONE PER DAY
CONCRETE TEMPERATURE		ASTM C 1064	ONE TEST PER COMPOSITE SAMPLE		ONE TEST PER HOUR WHEN AIR TEMP IS BELOW 40 DEG F OR ABOVE 80 DEG F
STEEL					
RADIOGRAPHIC (RT) MAGNETIC PARTICLE (MT) AND ULTRASONIC (UT) TESTING OF WELDS	AISC 360 N5.5	RT- AWS D1.1: 6.16 MT- AWS D1.1: 6.14.4 UT- AWS D1.1: 6.13 & 6.14.3	PER DRAWINGS		ALL CJP WELDS IN MATERIALS 5/16" OR GREATER REQUIRE UT TESTING

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STATEMENT OF SPECIAL INSPECTIONS

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STATEMENT OF STRUCTURAL SPECIAL INSPECTIONS AND TESTING

STATEMENT OF SPECIAL INSPECTION AND TESTING NOTES:

1. SPECIAL INSPECTIONS SHALL CONFORM TO CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE (IBC) AND THE REFERENCE CODES AND STANDARDS LISTED IN NOTE 2. REFER TO TABLES 1 AND 2 FOR SPECIAL INSPECTION AND TABLES 3 AND 4 FOR TESTING REQUIREMENTS.

2. REFERENCE CODES AND STANDARDS ARE AS FOLLOWS:

   IBC 2018
   ACI 318-14
   AWC SDPWS 2015
   AWS CURRENT EDITION
   ASTM CURRENT EDITION
   AISC 360-16
   RCSC 2014
   SDI QA/QC-2017

3. SPECIAL INSPECTIONS AND ASSOCIATED TESTING SHALL BE PERFORMED BY AN APPROVED QUALIFIED TESTING AND INSPECTING AGENCY MEETING THE REQUIREMENTS OF ASTM E 329 (MATERIALS), ASTM D 3740 (SOILS), ASTM C 1077 (CONCRETE), AND ASTM E 543 (NON-DESTRUCTIVE). THE TESTING AND INSPECTING AGENCY SHALL FURNISH TO THE ARCHITECT A COPY OF THEIR SCOPE OF ACCREDITATION. SPECIAL INSPECTORS SHALL BE CERTIFIED BY THE BUILDING OFFICIAL. WELDING INSPECTORS SHALL BE QUALIFIED PER SECTION 6.1.4.1.1 OF AWS D1.1.

4. THE SPECIAL INSPECTOR SHALL OBSERVE THE INDICATED WORK FOR COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CONTRACTOR FOR CORRECTION AND NOTED IN THE INSPECTION REPORTS. ISSUES REQUIRING IMMEDIATE CORRECTIVE ACTIONS OR ENGINEERING INPUT ARE TO BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY UPON DISCOVERY.

5. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS FOR EACH INSPECTION TO THE BUILDING OFFICIAL, ENGINEER, ARCHITECT, CONTRACTOR, AND OWNER. THE TESTING AND INSPECTING AGENCY SHALL SUBMIT A FINAL REPORT STATING THAT THE WORK REQUIRING SPECIAL INSPECTION WAS INSPECTED AND IS IN CONFORMANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS AND THAT ALL DISCREPANCIES NOTED IN THE INSPECTION REPORTS HAVE BEEN CORRECTED.

6. CONTINUOUS SPECIAL INSPECTION: SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS PRESENT WHEN AND WHERE THE WORK TO BE INSPECTED IS BEING PERFORMED. PERIODIC SPECIAL INSPECTION: SPECIAL INSPECTION BY THE SPECIAL INSPECTOR WHO IS INTERMITTENTLY PRESENT WHERE THE WORK TO BE INSPECTED HAS BEEN OR IS BEING PERFORMED.

7. WHERE PERIODIC INSPECTION IS ALLOWED IN ACCORDANCE WITH THE ANCHOR ICC/IAPMO EVALUATION REPORT, INSPECTIONS SHALL BE AS FOLLOWS:
   - FOR ALL ANCHORS, PRIOR TO CONCEALMENT, VERIFY: ANCHOR TYPE, ANCHOR DIMENSIONS, ANCHOR SPACING AND EDGE DISTANCE.
   - FOR EACH ANCHOR TYPE AND SIZE, INSPECTOR SHALL BE ONSITE TO CONTINUOUSLY INSPECT A MINIMUM OF THE FIRST 10 ANCHORS INSTALLED BY EACH INSTALLER FOR CONFORMANCE WITH ICC/IAPMO EVALUATION REPORT. PROVIDED ALL ANCHORS ARE INSTALLED CORRECTLY PER MANUFACTURERS INSTRUCTIONS, PROVIDE PERIODIC INSPECTION ON A MINIMUM OF 10% OF THE NEXT 1000 ANCHORS BY EACH INSTALLER AND A MINIMUM OF 5% OF THE REMAINING ANCHORS BY EACH INSTALLER. INSPECTIONS SHALL OCCUR A MINIMUM OF ONCE PER WEEK AT A RANDOM TIME WHILE ANCHOR INSTALLATION IS ONGOING. ANY NON-COMPLIANCE ISSUES SHALL RESET THE INSPECTION REQUIREMENTS TO TEN (10) CONTINUOUS INSPECTIONS. NON-COMPLIANT ANCHORS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER OF RECORD FOR REVIEW AND SHALL BE BROUGHT INTO COMPLIANCE BY EITHER TESTING OR RE-INSTALLATION.
   - INSPECTION REPORTS SHALL IDENTIFY NAMES OF INSTALLERS.
   - SPECIAL INSPECTOR SHALL PROVIDE DOCUMENTATION AT THE END OF ANCHOR INSTALLATIONS STATING THAT THE MINIMUM NUMBER OF ANCHORS WERE INSPECTED.

8. OBSERVE: OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS.
   PERFORM: PERFORM THESE TASKS FOR EACH ELEMENT.

9. INDICATED CONCRETE TESTING MEETS MINIMUM REQUIREMENTS FOR STRUCTURAL TESTING TO BE PROVIDED BY THE APPROVED QUALIFIED TESTING AND INSPECTING AGENCY. ADDITIONAL TESTING FOR CONSTRUCTION CONSIDERATIONS ARE NOT INDICATED AND SHALL BE DETERMINED BY THE CONTRACTOR AND PROVIDED AT CONTRACTOR'S EXPENSE.

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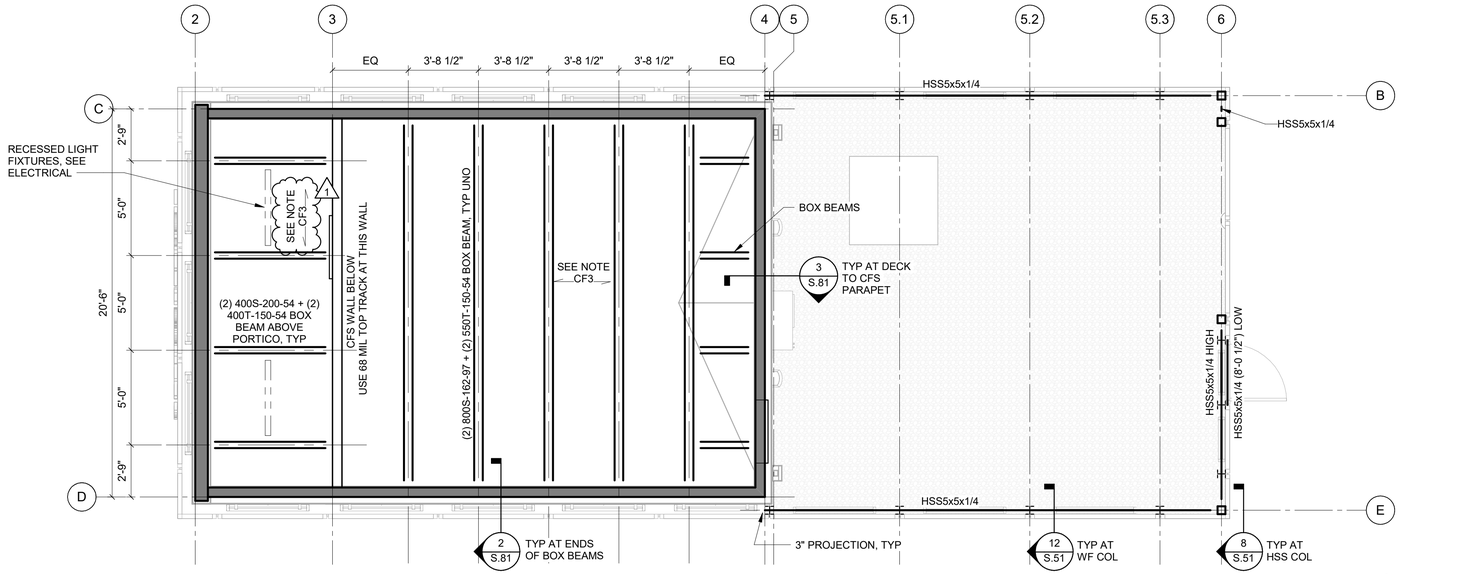
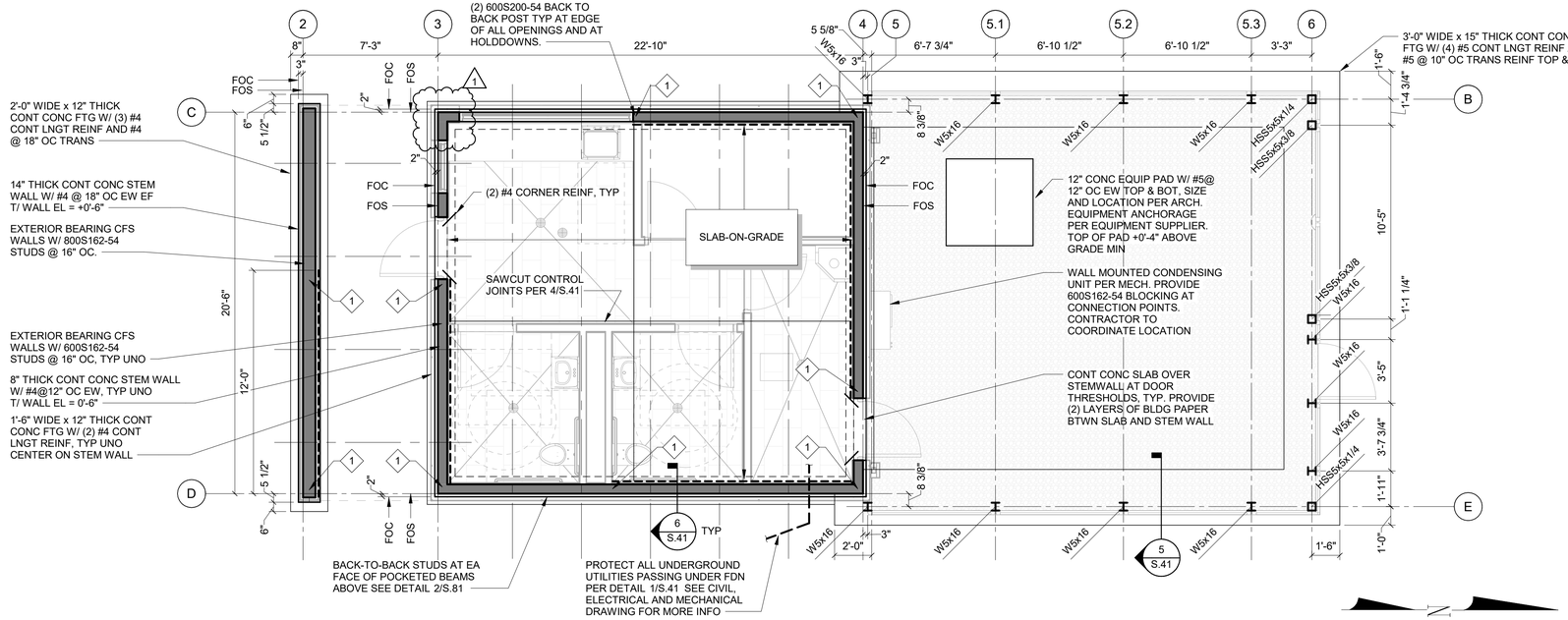


2 ROOF FRAMING PLAN - COMFORT BUILDING

1/4" = 1'-0"



1 FOUNDATION PLAN - COMFORT BUILDING

1/4" = 1'-0"

GENERAL PLAN NOTES:

G1. REFERENCE DRAWINGS:
- S.0X - STRUCTURAL NOTES, SPECIAL INSPECTION SCHEDULE, SYMBOLS AND ABBREVIATIONS
- S.4X - TYPICAL CONCRETE AND FOUNDATION DETAILS
- S.5X - TYPICAL STEEL DETAILS
- S.8X - TYPICAL COLD-FORMED STEEL DETAILS

G2. HSS4x4x1/4 — INDICATES COLUMN ABOVE

FOUNDATION PLAN NOTES:

F1. TOP OF SLAB-ON-GRADE SHALL BE 0'-0" THIS LEVEL, UNO. BOTTOM OF FOOTING SHALL BE -2'-6" THIS LEVEL, UNO.

F2. REFERENCE ELEVATION 0'-0" CORRESPONDS TO AN ACTUAL ELEVATION OF 505'-03". SEE CIVIL PLANS FOR MORE INFORMATION.

F3. SLAB-ON-GRADE SHALL BE 5" THICK WITH #4 @ 14" OC EW, UNO. BASE FOR SLAB-ON-GRADE SHALL CONSIST OF VAPOR RETARDER OVER 6" COMPACTED GRAVEL FILL. SEE ARCH FOR SLAB SLOPES, DEPRESSIONS AND CURBS.

STEEL ROOF FRAMING PLAN NOTES:

S1. TOP OF STEEL AT EQUIPMENT YARD ENCLOSURE SHALL BE 11'-6" THIS LEVEL, UNO. (+X'-X") DENOTES TOP OF STEEL ELEVATION RELATIVE TO TOP OF LEVEL 1 FLOOR SLAB

1 S2. PROVIDE WEEP HOLES IN CLOSED STEEL SHAPES AS NEEDED FOR GALVANIZATION FILL WEEP HOLES AND GRIND WELD SMOOTH PRIOR TO PAINTING.

COLD-FORMED FRAMING PLAN NOTES:

CF1. SEE THE ARCHITECTURAL DRAWINGS FOR WALL TYPES AND FOR NON-BEARING WALL LOCATIONS.

CF2. BOTTOM OF DECK SHALL BE 9'-4" THIS LEVEL, UNO.

CF3. ROOF CONSTRUCTION SHALL BE 1 5/16" 22 GAUGE VERCOR STEEL DECK (OR APPROVED EQUAL), 3-SPAN MINIMUM. FASTEN TO SUPPORTS USING #12 SCREWS WITH A 36-4 CONNECTION PATTERN. USE #12 SCREWS AT 12" ON CENTER SPACING FOR SIDELAP CONNECTIONS

CF4. DIMENSIONS SHOWN ARE TO FACE OF STUD, UNO.

CF5. 1 — INDICATES HOLD-DOWN PER 5/S.83.

CF6. INDICATES COLD-FORMED STEEL SHEAR WALL ABOVE. SHEATHING PER DETAIL 10/S.81.

CF7. INDICATES COLD-FORMED STEEL BEARING OR EXTERIOR WALL.

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STRUCTURAL FOUNDATION & FRAMING PLAN – COMFORT BUILDING

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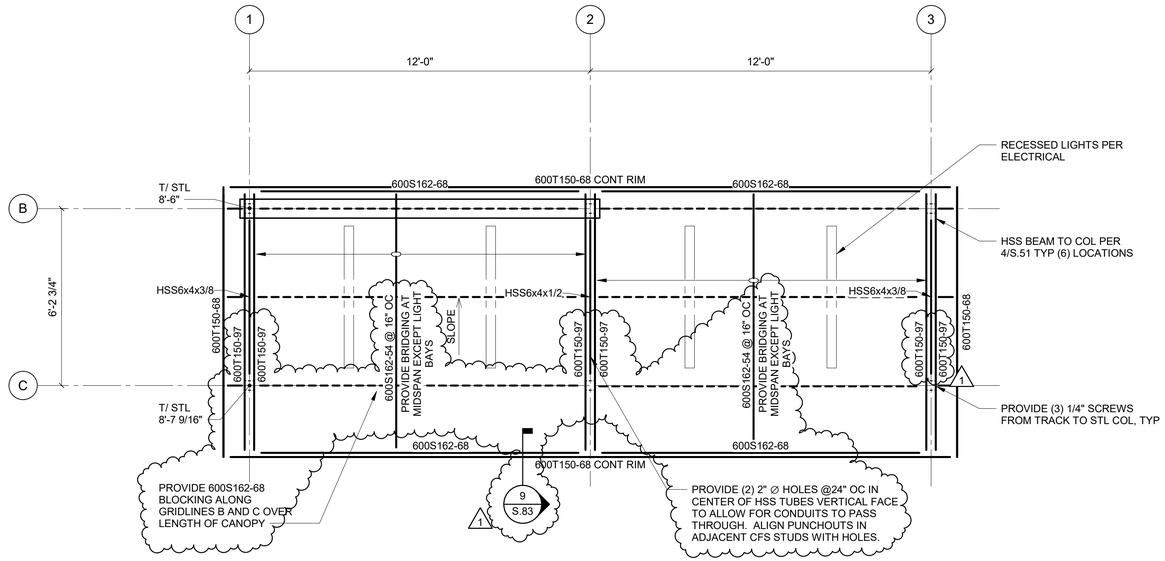


1 ROOF FRAMING PLAN - SHELTER CANOPY

3/8" = 1'-0"

0 4' 8' 16'

1/4 inch = 1 foot

GENERAL PLAN NOTES:

G1. REFERENCE DRAWINGS:
- S.0X - STRUCTURAL NOTES, SPECIAL INSPECTION SCHEDULE, SYMBOLS AND ABBREVIATIONS
- S.4X - TYPICAL CONCRETE DETAILS
- S.5X - TYPICAL STEEL DETAILS
- S.8X - TYPICAL COLD-FORMED STEEL DETAILS

G2. HSS4x4x3/8 INDICATES COLUMN ABOVE.

G3. SHELTER CANOPY DESIGN SHOWN APPLIES TO ALL SHELTER LOCATIONS. SEE CIVIL DRAWINGS FOR PLAN LOCATION OF EACH SHELTER.

FOUNDATION PLAN NOTES:

F1. REFERENCE ELEVATION 0'-0" CORRESPONDS TO ACTUAL ELEVATIONS AS FOLLOWS:

NORTH SHELTER: 506'-1"
CENTRAL SHELTER 505'-6"
SOUTH SHELTER 505'-2"

SEE CIVIL PLANS FOR MORE INFORMATION ON ACTUAL SITE GRADING AND HARDSCAPE NOT SHOWN.

STEEL ROOF FRAMING PLAN NOTES:

S1. TOP OF STEEL SLOPES UNIFORMLY BETWEEN ELEVATIONS SHOWN.

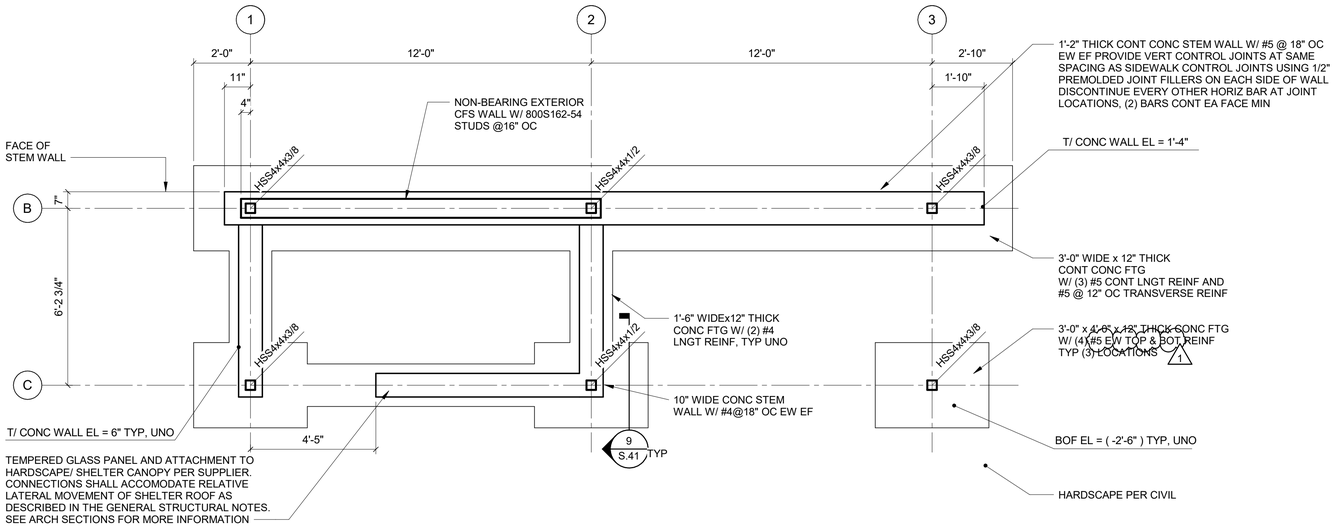
COLD-FORMED FRAMING PLAN NOTES:

CF1. SEE THE ARCHITECTURAL DRAWINGS FOR WALL TYPES AND FOR NON-BEARING WALL LOCATIONS.

CF2. ROOF CONSTRUCTION SHALL BE 9/16" 22 GAUGE VERCOR STEEL DECK (OR APPROVED EQUAL), 3-SPAN MINIMUM. FASTEN TO SUPPORTS USING #12 SCREWS WITH A 36-4 CONNECTION PATTERN. USE #12 SCREWS AT 12" ON CENTER SPACING FOR SIDELAP CONNECTIONS.

CF3. DIMENSIONS SHOWN ARE TO FACE OF STUD, UNO.

CF4. PROVIDE A MINIMUM OF FOUR BAYS OF 600S162-54 BLOCKING PERPINDICULAR TO THE TOP OF EACH STEEL COLUMN. BLOCKING MAY BE OMITTED WHERE STEEL BEAM FRAMES IN PERPENDICULAR TO COLUMN.



2 FOUNDATION PLAN - BUS SHELTER CANOPY

3/8" = 1'-0"

0 4' 8' 16'

1/4 inch = 1 foot

100% SUBMITTAL

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1	6/17/22	JBB	RMB	TRH	SECOND PERMIT REVIEW

DRAWN BY: DYL | DESIGNED BY: RMB
CHECKED BY: RMB | APPROVED BY: TRH
DATE: 06/17/2022
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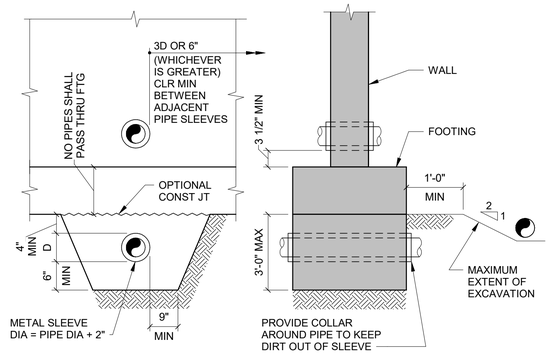
FOUNDATION AND FRAMING PLAN – SHELTER CANOPY

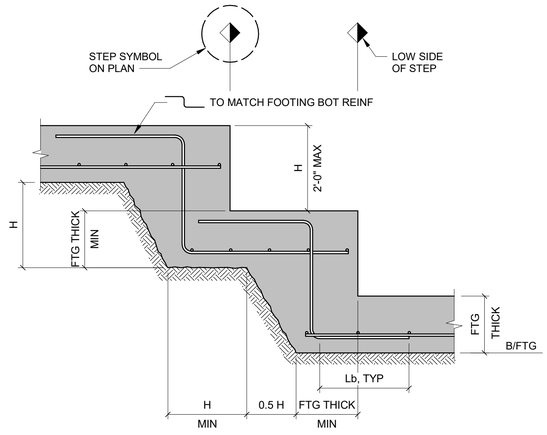
SHEET
S.22
SHEET: 71 OF 97



NOTES:
1. STEP FOOTING PER TYPICAL STEPPED FOOTING DETAIL AS REQUIRED TO SATISFY THESE CONDITIONS.
2. GENERAL CONTRACTOR TO COORDINATE EXACT DEPTH AND LOCATION OF PIPE.
3. "D" SHALL NOT EXCEED 8".

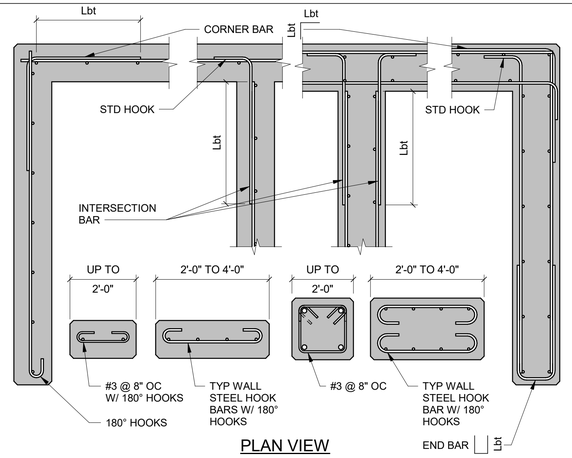
1 TYP DETAIL OF PIPE AT FOOTINGS

NO SCALE



2 TYP STEPPED FOOTING DETAIL

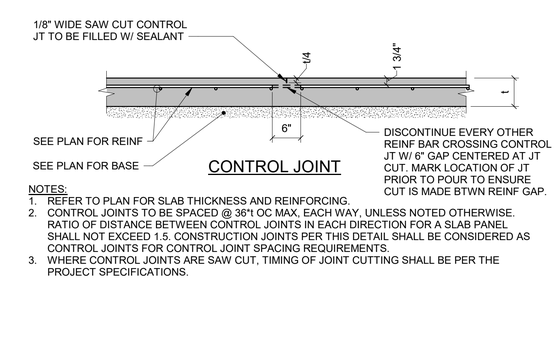
NO SCALE



PLAN VIEW

3 TYP CONCRETE WALL DETAILS

NO SCALE

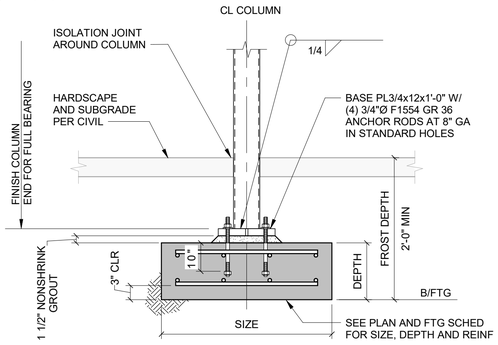


CONTROL JOINT

NOTES:
1. REFER TO PLAN FOR SLAB THICKNESS AND REINFORCING.
2. CONTROL JOINTS TO BE SPACED @ 36*t OC MAX, EACH WAY, UNLESS NOTED OTHERWISE. RATIO OF DISTANCE BETWEEN CONTROL JOINTS IN EACH DIRECTION FOR A SLAB PANEL SHALL NOT EXCEED 1.5. CONSTRUCTION JOINTS PER THIS DETAIL SHALL BE CONSIDERED AS CONTROL JOINTS FOR CONTROL JOINT SPACING REQUIREMENTS.
3. WHERE CONTROL JOINTS ARE SAW CUT, TIMING OF JOINT CUTTING SHALL BE PER THE PROJECT SPECIFICATIONS.

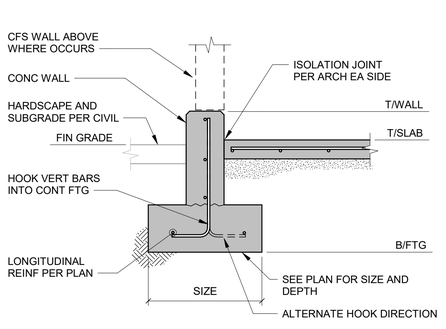
4 TYP SOG CONTROL JOINTS

NO SCALE

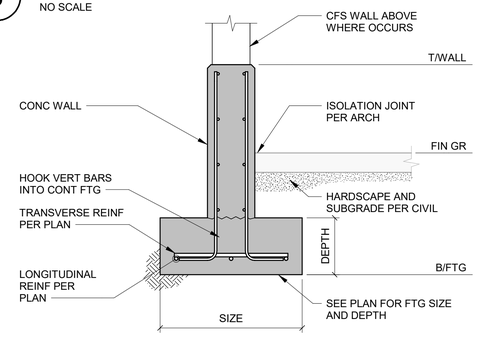


5 TYP COL BASE PLATE AT COMFORT BUILDING

NO SCALE



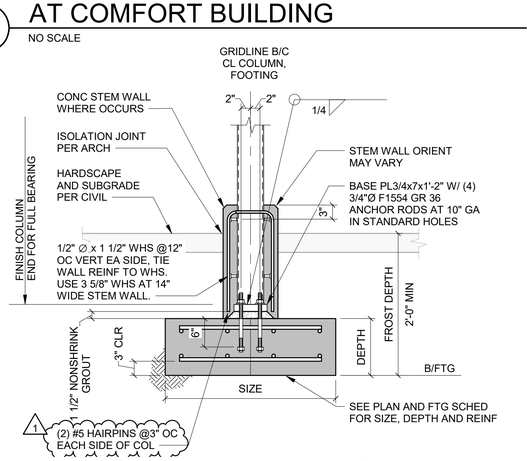
WALLS WITH SINGLE LAYER REINFORCING



WALLS WITH DOUBLE LAYER REINFORCING

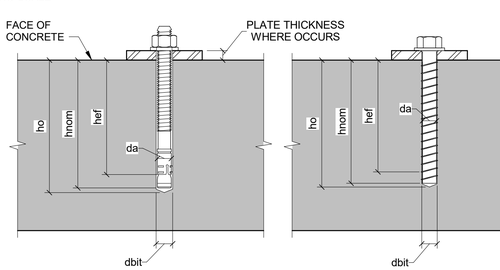
6 TYP EXTERIOR CONCRETE WALL FOOTING

NO SCALE



9 TYP COL BASE PLATE AT SHELTER

NO SCALE



EXPANSION ANCHOR | SCREW ANCHOR | THREADED ADHESIVE REINFORCING DOWEL | ADHESIVE REINFORCING DOWEL (ARD)

NOTES:
1. REFER TO STRUCTURAL NOTES FOR APPROVED ANCHOR(S) AND EVALUATION REPORT(S).

ABBREVIATIONS

hef	=	EFFECTIVE EMBEDMENT PER DRAWINGS
hnom	=	NOMINAL EMBEDMENT REQUIRED TO ACHIEVE EFFECTIVE EMBEDMENT PER EVALUATION REPORT. FOR EXPANSION ANCHORS, THIS APPLIES TO THE CONDITION PRIOR TO APPLICATION OF TORQUE.
ho	=	MINIMUM HOLE DEPTH PER EVALUATION REPORT
da, db	=	DIAMETER OF ANCHOR/BAR PER DRAWINGS
dbit	=	DIAMETER OF DRILL BIT PER EVALUATION REPORT

10 TYPICAL POST-INSTALLED ANCHORS

NO SCALE

f'_c = 3,000 PSI
f_y = 60,000 PSI

SIZE	Ld	Ldt	Lb	Lbt	Ldh
#4	22 (33)	28 (43)	28 (43)	37 (56)	11
#5	27 (41)	36 (53)	36 (53)	46 (69)	14
#6	33 (49)	43 (64)	43 (64)	56 (83)	16
#7	48 (72)	62 (93)	62 (93)	81 (121)	19
#8	55 (82)	71 (107)	71 (107)	93 (139)	22
#9	62 (93)	80 (120)	80 (120)	104 (157)	25
#10	70 (104)	90 (136)	90 (136)	118 (176)	28
#11	77 (116)	100 (151)	100 (151)	131 (196)	31

NOTES:
1. USE THE LENGTHS IN THIS SCHEDULE, UNLESS NOTED OTHERWISE.
2. USE LENGTH IN ( ) WHEN BAR COVER IS db OR LESS OR BAR CLEAR SPACING IS 2db OR LESS.
3. A TOP BAR IS A HORIZONTAL BAR WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW IT.

ABBREVIATIONS

db = BAR DIAMETER
Ld = TENSION DEVELOPMENT LENGTH
Ldt = TENSION DEVELOPMENT LENGTH FOR A TOP BAR
Lb = CLASS B LAP SPLICE LENGTH, 1.3 Ld
Lbt = CLASS B LAP SPLICE LENGTH FOR A TOP BAR, 1.3 Ldt
Ldh = TENSION DEVELOPMENT LENGTH FOR A STANDARD HOOK

12 DEVELOPMENT AND SPLICE LENGTH SCHEDULE

NO SCALE

100% SUBMITTAL

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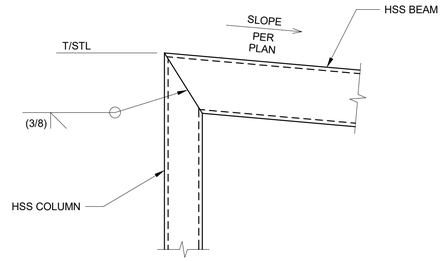
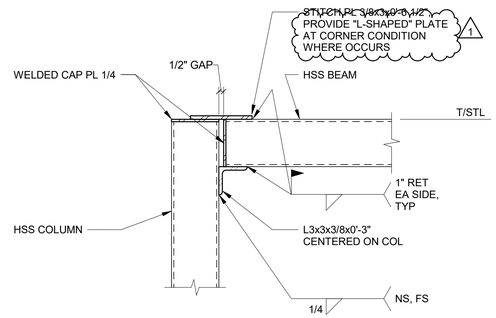
CONCRETE AND FOUNDATION DETAILS

SHEET
S.41
SHEET: 72 OF 97



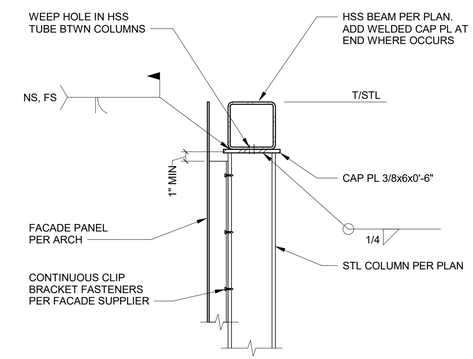
4 HSS PORTAL FRAME CONN AT SHELTER

1 1/2" = 1'-0"



8 TYP HSS BEAM TO HSS COL

1 1/2" = 1'-0"



12 TYP HSS BEAM TO WF COL

1 1/2" = 1'-0"

100% SUBMITTAL

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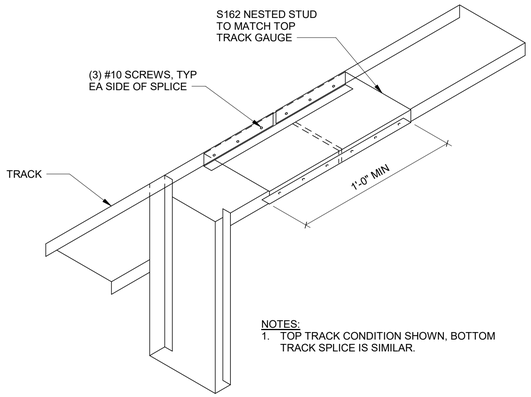
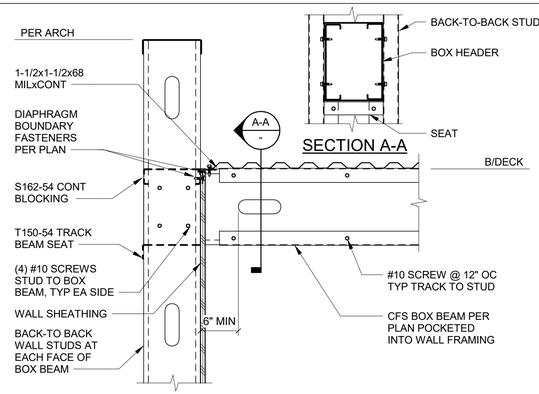
SHEET
S.51
SHEET: 73 OF 97

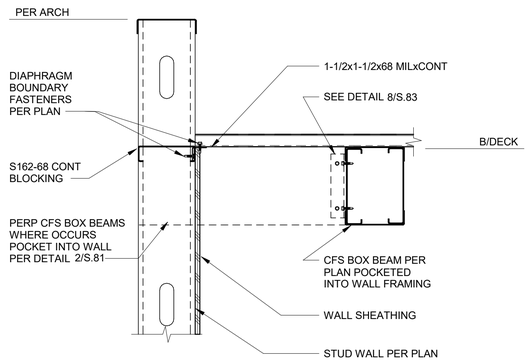


NOTES:
1. TOP TRACK CONDITION SHOWN, BOTTOM TRACK SPLICE IS SIMILAR.

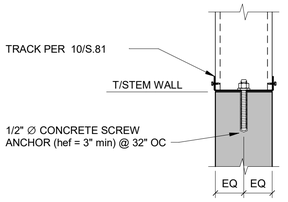
1 TYP TRACK SPLICE
NO SCALE



2 TYP EXTERIOR BEARING WALL - FRAMING PERPENDICULAR
NO SCALE

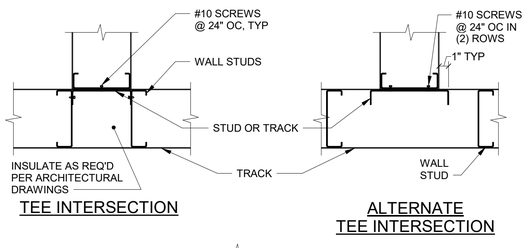


3 TYP EXTERIOR SHEAR WALL - FRAMING PARALLEL
NO SCALE



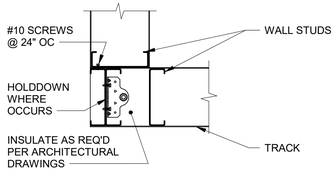
NOTES:
1. FILL GAPS BETWEEN TRACK AND STEM WALL WITH STEEL OR LOAD BEARING PLASTIC SHIMS. SHIMS SHALL BE LOCATED DIRECTLY BENEATH ALL STUDS AND PLACED WITH FIRM AND FULL BEARING. SHIMS SHALL BE POSITIVELY ATTACHED TO THE BOTTOM TRACK. SHIM PRODUCT DATA SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR APPROVAL PRIOR TO INSTALLATION.
2. IN LOCATIONS WHERE THE GAP BETWEEN THE BOTTOM OF THE TRACK AND THE TOP OF STEM WALL OR SLAB EXCEEDS 1/4", THE GAP SHALL BE FILLED WITH FLUID GROUT. A 3/4" DIA HOLE CENTERED IN TRACK WIDTH SHALL BE DRILLED AT 4'-0" OC MAX TO ENSURE SOLID GROUTING BENEATH THE TRACK.
3. WHERE THE GAP BETWEEN THE BOTTOM OF THE TRACK AND THE TOP OF STEM WALL OR SLAB EXCEEDS 1", CONTACT THE ENGINEER FOR ALTERNATIVE PROCEDURES.

4 TYP BOTTOM TRACK CONNECTION
NO SCALE



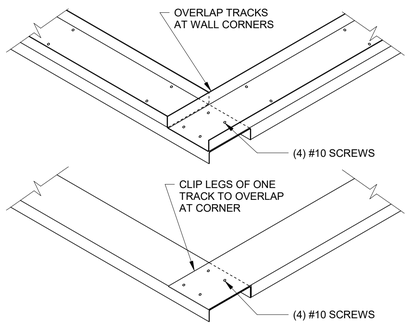
TEE INTERSECTION

ALTERNATE
TEE INTERSECTION



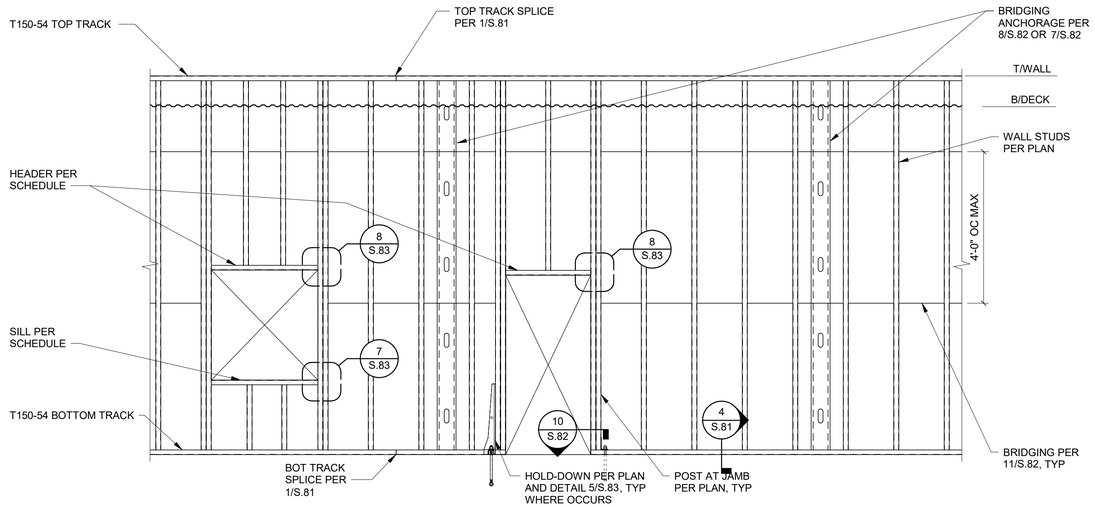
CORNER

5 TYP STUD CORNER FRAMING
NO SCALE



NOTES:
1. WALL STUDS ABOVE AND BELOW NOT SHOWN FOR CLARITY.

9 TYP TRACK LAP AT CORNERS
NO SCALE



WINDOW OPENINGS | DOOR OPENINGS | TYPICAL WALL

10 TYP STEEL STUD WALL ELEVATIONS
NO SCALE

TYPICAL WALL HEADER AND SILL SCHEDULE		
MAX ROUGH OPENING WIDTH	HEADER	SILL
6'-0"	600S250-54 + (2) 600T150-54	600T150-54
10'-0"	(2) 800S162-54 + (3) 600T150-54	600S162-54 + (2) 600T150-54

TYPICAL STUD FASTENING SCHEDULE		
LOCATION	FASTENERS	NOTES
STUD-TO-TRACK	#10 SCREWS EACH FLANGE	FLANGE WIDTH S200 OR LESS
	(2) #10 SCREWS EACH FLANGE	FLANGE WIDTH S250 OR GREATER
BACK-TO-BACK STUDS	(2) #10 SCREWS @ 24" OC, 2" GAUGE	WEB FASTENING

NOTES:
1. AT WALL CORNERS, SEE 5/S.81 FOR STUD FRAMING AND 9/S.81FOR TRACK INTERSECTION.
2. PROVIDE DEFLECTION TRACK AT TOP OF NON-BEARING WALLS TO JOIST FRAMING OR DECK.
3. SEE ARCHITECTURAL DRAWINGS FOR NON-STRUCTURAL WALL TYPES.
4. ALL BUILT-UP HEADER AND SILL MEMBERS SHALL BE CONTINUOUS OVER THE FULL OPENING WIDTH. ALL BUILT-UP POST MEMBERS SHALL BE CONTINUOUS OVER THE FULL STUD HEIGHT.
5. TRACK SHALL MATCH STUD WIDTH UNLESS NOTED OTHERWISE.
6. WALLS DESIGNATED AS SHEAR WALLS SHALL BE SHEATHED ON THE INTERIOR FACE OF STUD USING A STEEL SHEET AND GYPSUM BOARD COMPOSTIE PRODUCT HAVING A MINIMUM STEEL SHEET THICKNESS OF 0.027". PANELS SHALL BE FASTENED USING #8 SCREWS AT 6" ON CENTER AT PANEL EDGES AND AT 12" OC AT INTERMEDIATE SUPPORTS. PROVIDE 1 1/2" x 54 MIL PANEL BLOCKING AT HORIZONTAL PANEL JOINTS. STAGGER PANEL JOINTS IF ORIENTING PANELS HORIZONTALLY. PANELS LESS THAN 12 INCHES WIDE ARE NOT PERMITTED.
7. ROOF JOISTS NOT SHOWN FOR CLARITY.

10 TYP STEEL STUD WALL ELEVATIONS
NO SCALE

100% SUBMITTAL

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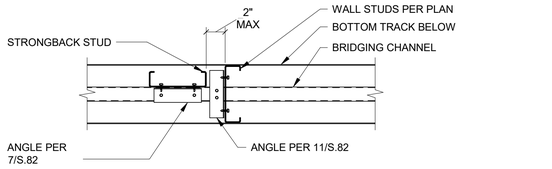
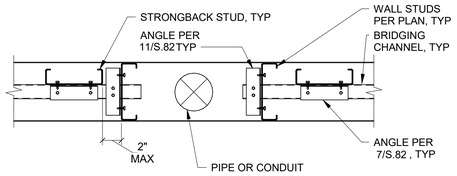
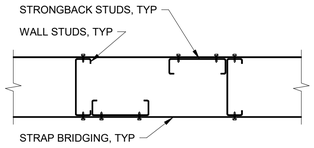
SHEET
S.81
SHEET: 74 OF 97



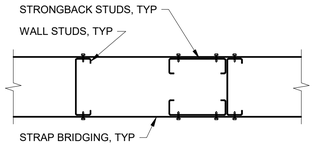
SECTION A - TYPICAL



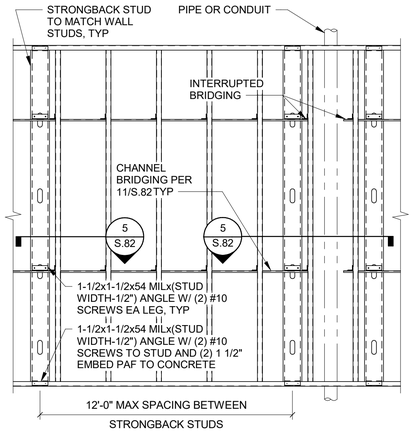
SECTION B - AT INTERRUPTED BRIDGING

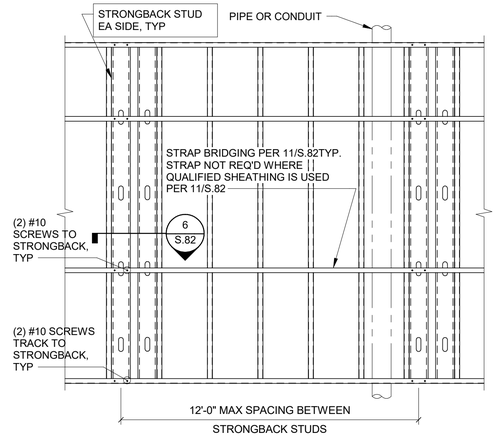


SECTION A - TYPICAL



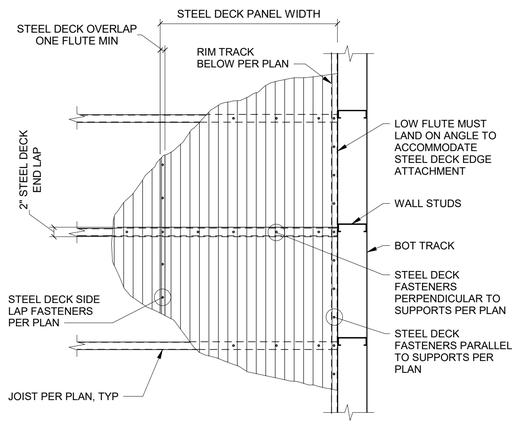
SECTION A - ALTERNATE





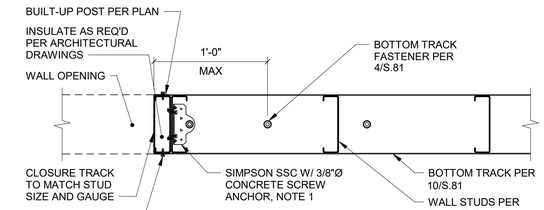
5 BRIDGING ANCHORAGE DETAIL

NO SCALE

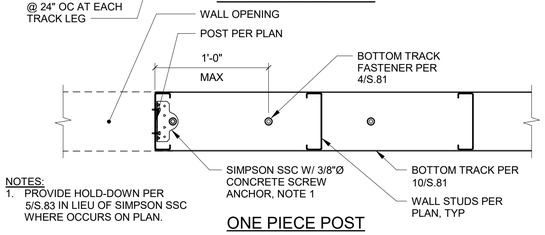


6 BRIDGING ANCHORAGE DETAIL

NO SCALE



THREE PIECE POST

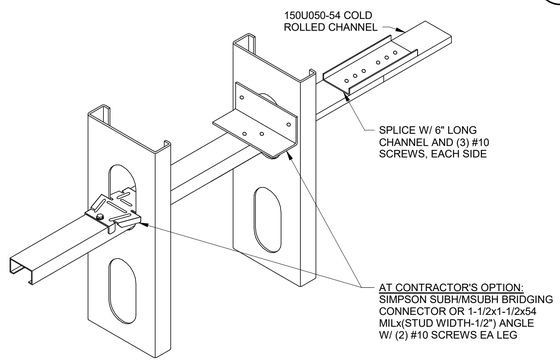


NOTES:
1. PROVIDE HOLD-DOWN PER 5/S.83 IN LIEU OF SIMPSON SSC WHERE OCCURS ON PLAN.

ONE PIECE POST

7 TYP CHANNEL BRIDGING ANCHORAGE

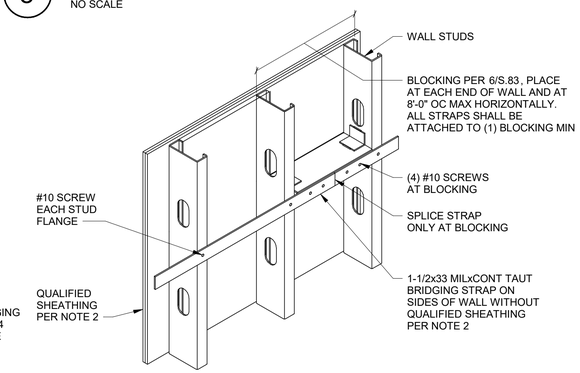
NO SCALE



TYPE 1 BRIDGING - COLD-ROLLED CHANNEL

8 TYP STRAP BRIDGING ANCHORAGE

NO SCALE



TYPE 2 BRIDGING - STRAP

NOTES:
1. AT THE CONTRACTOR'S OPTION TYPE 1 OR 2 BRIDGING MAY BE USED.
2. QUALIFIED SHEATHING SHALL BE CONSIDERED TO BE FULL HEIGHT STEEL BACKED COMPOSITE GWB. QUALIFIED SHEATHING MUST BE INSTALLED PRIOR TO ERECTING FLOOR OR ROOF FRAMING ABOVE.
3. TYPE 1 BRIDGING IS NOT ALLOWED AT STUDS WIDER THAN 6".

9 TYP ROOF/FLOOR DIAPHRAGM FASTENING

NO SCALE

10 TYP EXTERIOR WALL POST AT JAMB

NO SCALE

11 TYP COLD-FORMED STUD BRIDGING

NO SCALE

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY: DYL | DESIGNED BY: RMB
CHECKED BY: RMB | APPROVED BY: TRH
DATE: 06/17/2022
JOB No. : 2000677
SCALE: AS NOTED

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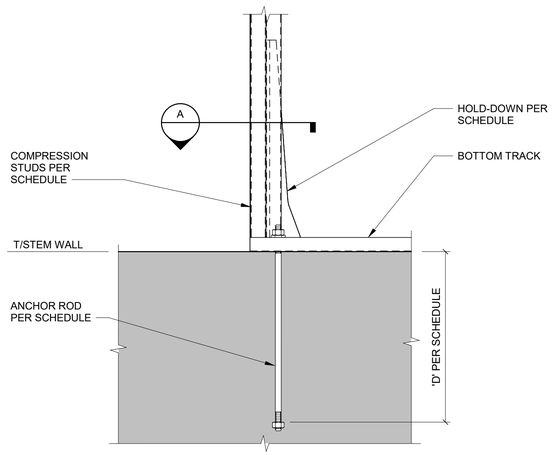
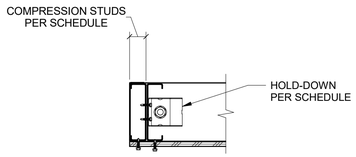
STRUCTURAL

COLD-FORMED FRAMING DETAILS

SHEET
S.82
SHEET: 75 OF 97

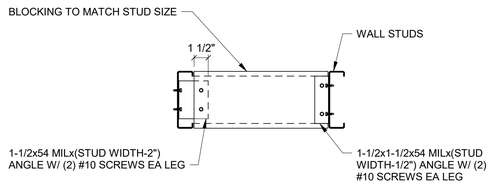




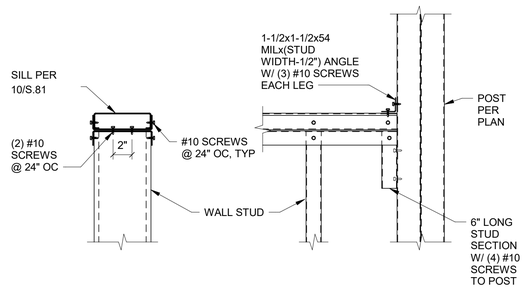
SECTION A

HOLD-DOWN SCHEDULE

TYPE MARK	SIMPSON MODEL #	ANCHOR ROD Ø	D	COMPRESSION STUDS
1	S/HDU6	5/8"Ø	12	(2) 54 MIL STUDS, BACK-TO-BACK
-	-	-	-	-
-	-	-	-	-

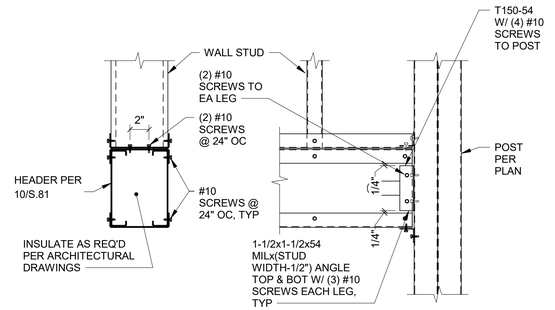


NOTES:
1. ALTERNATE ANGLE CLIP POSITION ABOVE AND BELOW BLOCKING IN ADJACENT STUD BAYS AS REQUIRED TO AID CONSTRUCTABILITY OF ANGLE CLIP FASTENERS.



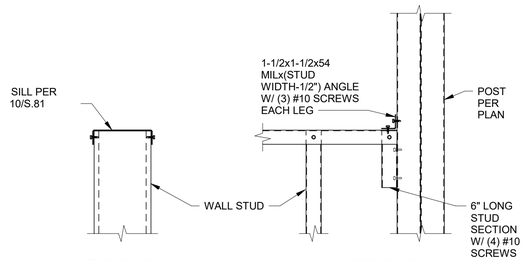
THREE PIECE SILL SECTION

THREE PIECE SILL JAMB CONNECTION



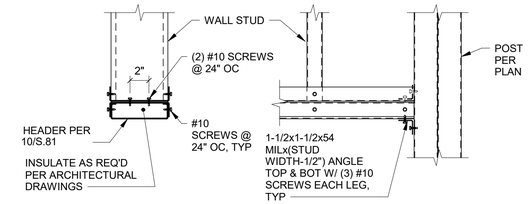
FIVE PIECE HEADER SECTION

FIVE PIECE HEADER JAMB CONNECTION



ONE PIECE SILL SECTION

ONE PIECE SILL JAMB CONNECTION



THREE PIECE HEADER SECTION

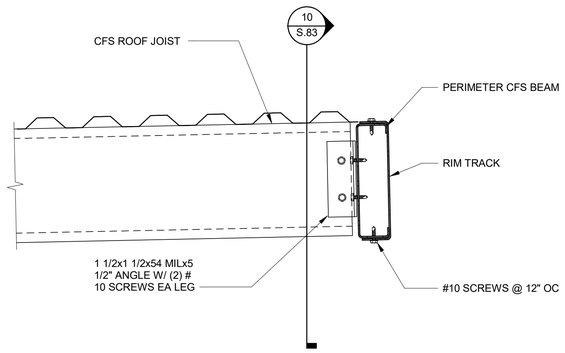
THREE PIECE HEADER JAMB CONNECTION

5 HOLD-DOWN AT FOUNDATION
NO SCALE

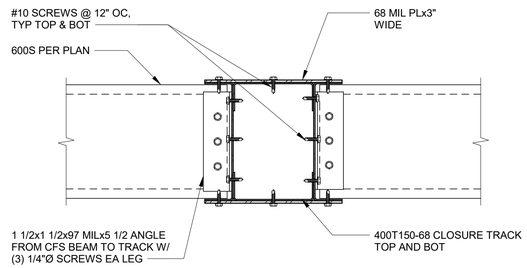
6 BLOCKING DETAIL
NO SCALE

7 TYP WALL SILL
NO SCALE

8 TYP WALL HEADER
NO SCALE



9 SHELTER RIM
3" = 1'-0"



10 SHELTER ROOF FRAMING DETAIL
3" = 1'-0"

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
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COLD-FORMED FRAMING DETAILS

SHEET
S.83
SHEET: 76 OF 97

ABBREVIATIONS

AAV	AUTOMATIC AIR VENT
ABC	ABOVE BOTTOM CHORD
ABDN	ABANDONED
ABV	ABOVE
AC	AIR COMPRESSOR
AC	ACCESS COVER
AC	AFTER COOLER
ACC	AIR COOLED CONDENSER
ACC	ACCUMULATOR
ACCH	AIR COOLED CHILLER
ACFM	ACTUAL CUBIC FEET PER MINUTE
ACST	ACOUSTICAL
ACU	AIR CONDITIONING UNIT
AD	AIR DRYER
ADD	ADDENDUM
ADJ	ADJACENT
ADJT	ADJUSTABLE
ADMIN	ADMINISTRATIVE
AF	AIR FILTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
ALTV	ALTITUDE VALVE
AMB	AMBIENT
AMPS	AMPERES
ANC	ANCHOR
APNL	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ARRG'T	ARRANGEMENT
AS	AIR SEPARATOR
ASR	AUTOMATIC SPRINKLER RISER
ASSOC	ASSOCIATION / ASSOCIATES
ATTEN	ATTENUATOR
AVG	AVERAGE
BA	BALL VALVE
BBC	BELOW BOTTOM CHORD
BBD	BOTTOM BLOWDOWN
BC	BOTTOM CHORD OF TRUSS
BCS	BLACK CARBON STEEL
BDD	BACK DRAFT DAMPER
BETW	BETWEEN
BF	BLIND FLANGE
BF	BUTTERFLY VALVE
BFDW	BOILER FEEDWATER
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
BG	BLAST GATE
BHP	BRAKE HORSEPOWER
BLDG	BUILDING
BLWDN	BLOW DOWN
BM	BEAM
BOD	BOTTOM OF DUCT
BOP	BOTTOM OF PIPE
BOS	BOTTOM OF STEEL
BOT	BOTTOM
BPV	BACK PRESSURE VALVE
BR	BRINE
BRCG	BRACING
BRKT	BRACKET
BS	BLOW-OFF SILENCER
BSMT	BASEMENT
BTU	BRITISH THERMAL UNIT
BTUH	BRITISH THERMAL UNIT PER HOUR
BULL	BULLETIN
BV	BLOW OFF VALVE
BW	BUTT WELD
BY ARCH	BY ARCHITECTURAL TRADES
C	CENTIGRADE
C/C	CENTER TO CENTER
CA	COMPRESSED AIR
CAD	COMPRESSED AIR DRYER
CAI	COMPRESSED AIR INTAKE
CAIH	COMPRESSED AIR INTAKE HOOD
CAU	CAUSTIC
CAV	CONSTANT AIR VOLUME
CB	CATCH BASIN
CCW	COUNTER CLOCKWISE
CF	CUBIC FEET
CFH	CUBIC FEET PER HOUR

ABBREVIATIONS

CFM	CUBIC FEET PER MINUTE
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CHEM	CHEMICAL
CHKD PL	CHECKERED PLATE
CHPP	CHILLED WATER PRIMARY PUMP
CHSP	CHILLED WATER SECONDARY PUMP
CHWR	CHILLED WATER RETURN
CHWS	CHILLED WATER SUPPLY
CI	CAST IRON
CISP	CAST IRON SOIL PIPE
CIWP	CAST IRON WATER PIPE
CJ	CONSTRUCTION JOINT
CK	CHECK VALVE
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR
CM	CENTIMETER
CO	CARBON MONOXIDE
CO	CLEAN OUT
CO2	CARBON DIOXIDE
COL	COLUMN
COMP	COMPRESSOR
CONC	CONCRETE
COND	CONDENSER (CONDENSATION)
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUATION (CONTINUOUS)
CONTR	CONTRACT(OR)
CP	CONTROL PANEL
CP	CENTIPOISE
CPLG	COUPLING
CPVC	CHLORINATED POLYVINYL CHLORIDE
CS	CARBON STEEL
CT	COOLING TOWER
CTR	CENTER
CTWR	COOLING TOWER WATER RETURN
CTWS	COOLING TOWER WATER SUPPLY
CU	COPPER
CUH	CABINET UNIT HEATER
CV	CONTROL VALVE
Cv	FLOW COEFFICIENT
CW	CITY WATER
CW	CLOCKWISE
CWR	COOLING WATER RETURN
CWS	COOLING WATER SUPPLY
CY	CUBIC YARD
CYL	CYLINDER
D&T	DRIP AND TRAP
DAP	ACID DRAIN PUMP
DB	DRY BULB TEMPERATURE
dB	DECIBEL
DCW	DOMESTIC COLD WATER
DEG	DEGREE
DEG C	DEGREE CENTIGRADE
DEG F	DEGREE FAHRENHEIT
DEPT	DEPARTMENT
DES	DESIGN
DET	DETAIL
DEX	DIESEL ENGINE EXHAUST
DF	DRINKING FOUNTAIN
DG	DOOR GRILLE
DHW	DOMESTIC HOT WATER
DHWR	DOMESTIC HOT WATER RETURN
DI	DUCTILE IRON
DIA	DIAMETER
DIAPH	DIAPHRAGM
DIFF	DIFFUSER
DIM	DIMENSION
DISCH	DISCHARGE
DIST	DISTILLED WATER
DM	DIAPHRAGM VALVE
DN	DOWN
DP	DIFFERENTIAL PRESSURE
DPR	DAMPER
DPS	DIFFERENTIAL PRESSURE SWITCH
DR	DRAIN
DS	DISCHARGE SILENCER
DS	DOWN SPOUT
DSP	DUPLEX SUMP PUMP
DV	DIAPHRAGM VALVE
DWG	DRAWING
DWH	DOMESTIC WATER HEATER

ABBREVIATIONS

EA	EACH
EAT	ENTERING AIR TEMPERATURE
EBH	ELECTRIC BASEBOARD HEATER
ED	EQUIPMENT DRAIN
EF	EXHAUST FAN
EFF	EFFICIENCY
EFL	EFFLUENT
EG	EXHAUST GRILLE
EHC	ELECTRIC HEATING COIL
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC(AL)
ELL	ELBOW
EMER	EMERGENCY SHOWER AND EYEWASH
EMS	EMERGENCY SHOWER
EMW	EMERGENCY EYE WASH
ENCL	ENCLOSURE
ENT	ENTERING
EQ	EQUAL
EQPT	EQUIPMENT
ER	EXHAUST REGISTER
ESP	EXTERNAL STATIC PRESSURE
EST	ESTIMATED
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EWT	ENTERING WATER TEMPERATURE
EXH	EXHAUST
EXP	EXPANSION
EXST	EXISTING
EXT	EXTERIOR
F	FAHRENHEIT
F/F	FACE TO FACE
FA	FIRE ALARM
FAI	FRESH AIR INTAKE
FAT	FINAL AIR TEMPERATURE
FC	FAIL CLOSED
FCU	FAN COIL UNIT
FD	FLOOR DRAIN
FDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINAL FILTER
FHC	FIRE HOSE CABINET
FHR	FIRE HOSE RACK/REEL
FHV	FIRE HOSE VALVE
FIN	FINISH
FIXT	FIXTURE
FL	FLOOR
FLEX	FLEXIBLE CONNECTOR
FLEX CONN	FLEXIBLE CONNECTOR
FLG	FLANGE
FO	FAIL OPEN
FP	FAN POWERED
FP	FILTER PRESS
FP	FIRE PROTECTION
FPM	FEET PER MINUTE
FPRF	FIREPROOF
FPT	FEMALE PIPE THREAD
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FLOW SWITCH
FT	FEET
FTG	FITTING
FTG	FOOTING
FTHD	FEET OF HEAD
FTR	FIN TUBE RADIATION
FUT	FUTURE
FV	FOOT VALVE
GA	GAGE
GA	GATE VALVE
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACT(OR)
GCS	GALVANIZED CARBON STEEL
GD	GLOBE DIAPHRAGM
GENL	GENERAL
GL	GLOBE VALVE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRADE
GRL	GRILLE
H	HEIGHT
HB	HOSE BIBB

ABBREVIATIONS

HC	HEATING COIL
HCP	HANDICAPPED
HD	HEAD
HDGAF	HOT DIPPER GALVANIZED AFTER FABRICATION
HEPA	HIGH EFFICIENCY PARTICULATE AIR FILTER
Hg	MERCURY
HGR	HANGER
HGT	HEIGHT
HH	HOSE HYDRANT
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HO	HUB OUTLET
HORIZ	HORIZONTAL
HP	HIGH POINT
HP	HIGH PRESSURE
HP	HORSEPOWER
HR	HOSE REEL
HTCP	HEAT TRACE CONTROL PANEL
HV	HEATING AND VENTILATING
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HVU	HEATING AND VENTILATING UNIT
HWH	HOT WATER HEATER
HYD	HYDRANT
Hz	HERTZ
I&C	INSTRUMENTATION AND CONTROLS
IA	INSTRUMENT AIR
ICFM	INITIAL CUBIC FEET PER MINUTE
ID	INSIDE DIAMETER
IE	INVERT ELEVATION
IH	INTAKE HOOD
IN	INCH(ES)
IN WC	INCHES WATER COLUMN
IN WG	INCHES WATER GAUGE
INC	INCORPORATED
INSUL	INSULATION
INTR	INTERIOR
INV	INVERT
ITC	INSPECTOR TEST CONNECTION
IW	INDUSTRIAL WASTE
JC	JANITOR CLOSET
K	KIPS
KG	KNIFE GATE
kPa	KILOPASCALS
KS	KITCHEN SINK
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
KW	KILOWATT
KWH	KILOWATT-HOUR
L	LENGTH
L/A	RELIEF AIR
LAB	LABORATORY
LAV	LAVATORY
LB	POUND
LBS	POUNDS
LDB	LEAVING DRY BULB
LG	LENGTH
LH	LEFT HAND
LIN	LINEAR
LO	LOCKOUT
LP	LOW POINT
LP	LOW PRESSURE
LPM	LITERS PER MINUTE
LVA	LEAVING AIR
LVG	LEAVING
LVR	LOUVER
LWB	LEAVING WET BULB
LWT	LEAVING WATER TEMPERATURE
M	METER
MACH	MACHINE
MATL	MATERIAL
MAU	MAKE-UP AIR UNIT
MAV	MANUAL AIR VENT
MAX	MAXIMUM
MBH	THOUSAND BTU PER HOUR
MC	MIST COLLECTOR

ABBREVIATIONS

MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER
MDPR	MANUAL DAMPER
MECH	MECHANICAL
MEZZ	MEZZANINE
MFG	MANUFACTURING
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MK	MARK
MM	MILLIMETER
MO	MOTOR OPERATED
MOLWT	MOLECULAR WEIGHT
MPT	MALE PIPE THREAD
MTD	MOUNTED
MUA	MAKE UP AIR
MV	MIXING VALVE
MW	MILL WATER
N2	NITROGEN
NC	NOISE CRITERIA
NC	NORMALLY CLOSED
ND	NECK DIAMETER
ND	NEEDLE VALVE
NEC	NATIONAL ELECTRIC CODE
NG	NATURAL GAS
NGM	NATURAL GAS METER
NIC	NOT IN CONTRACT
NK	NECK
NO	NORMALLY OPEN
NO	NUMBER
NOM	NOMINAL
NORM	NORMAL
NPSH	NET POSITIVE SUCTION HEAD
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OAD	OUTSIDE AIR DAMPER
OAI	OUTSIDE AIR INTAKE
OBD	OPPOSING BLADE DAMPER
OD	OUTSIDE DIAMETER
OPER	OPERATOR
OPNG	OPENING
OPP	OPPOSITE
ORD	OVERFLOW ROOF DRAIN
OS&Y	OUTSIDE STEM AND YOKE
OXY	OOO
OXY	OXYGEN
OZ	OUNCE
P	PUMP
P&ID	PIPING & INSTRUMENTATION DIAGRAM
PA	PIPE ANCHOR
PD	PRESSURE DIFFERENTIAL
PD	PRESSURE DROP
PDP	PRESSURE DEW POINT
PDR	PROCESS DRAIN
PDS	PRESSURE DIFFERENTIAL SWITCH
PE	POLYETHYLENE
PEN	PENETRATION
PERF	PERFORATED
PG	PIPE GUIDE
PG	PRESSURE GAUGE
PH	PHASE
PI	PRESSURE INDICATOR
PIV	POST INDICATOR VALVE
PL	PLATE
PL	PLUG VALVE
PNL	PANEL
POC	POINT OF CONNECTION
POU	POINT OF USE
PP	POWER PANEL
PREFAB	PREFABRICATED
PRESS	PRESSURE
PRI	PRIMARY
PROJ	PROJECT
PRV	PRESSURE REDUCING VALVE
PRV	PRESSURE RELIEF SAFETY VALVE
PS	PIPE SUPPORT
PS	PRESSURE SWITCH

ABBREVIATIONS

PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PSIA	POUNDS PER SQUARE INCH, ABSOLUTE
PSID	POUNDS PER SQUARE INCH, DIFFERENTIAL
PSIG	POUNDS PER SQUARE INCH, GAUGE
PT	POINT
PT	PRESSURE TRANSMITTER
PTFE	POLYTETRAFLUROETHYLENE
PVC	POLYVINYL CHLORIDE
PVDF	POLYVINYLIDENE FLUORIDE PLASTIC
PWR	POWER
QD	QUICK DISCONNECT
QDD	QUICK DISCONNECT, DRY
R or RAD	RADIUS
R or RSR	RISER
R/A	RETURN AIR
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RAR	RETURN AIR REGISTER
RC	ROOF CONDUCTOR
RCP	REINFORCED CONCRETE PIPE
RD	ROOF DRAIN
RECIRC	RECIRCULATED
RED	REDUCER / REDUCTION
REF	REFERENCE/REFIGERATOR
REG	REGISTER
REQD	REQUIRED
RF	RAISED FACE
RF	RETURN FAN
RFGT	REFRIGERANT
RFGV	REFRIGERANT VENT
RH	RELATIVE HUMIDITY
RH	RIGHT HAND
RHH	ROOF HOSE HOUSE
RM	ROOM
RPBP	REDUCED PRESSURE BACKFLOW PREVENTER
RPM	REVOLUTIONS PER MINUTE
RS	ROOF SUMP
RTN	RETURN
RTU	ROOF TOP UNIT
RV	ROOF VENT
RV	RELIEF VALVE
S	SLOPE
S/A	SUPPLY AIR
SA	SUPPLY AIR
SA	SURGE ARRESTOR
SAG	SUPPLY AIR GRILLE
SAN	SANITARY
SAR	SUPPLY AIR REGISTER
SAT	SATURATION
SCFM	STANDARD CUBIC FEET PER MINUTE
SCH	SCHEDULE
SCR	SCREW
SCV	SECTIONAL CONTROL VALVE
SD	SMOKE DETECTOR
SD	SUPPLY DIFFUSER
SEC	SECOND
SECT	SECTION
SEP	SEPARATE
SF	SUPPLY FAN
SHR	SHOWER
SHT	SHEET
SIM	SIMILAR
SLV	SLEEVE
SP	SPECIFIC
SP	STATIC PRESSURE
SPECS	SPECIFICATIONS
SQ	SQUARE
SQ FT	SQUARE FOOT
SQ YD	SQUARE YARD
SS	SERVICE SINK
SS	STRUCTURAL STEEL
SSF	SIDESTREAM FILTER
SSH	SAFETY SHOWER & EYE WASH
SST	STAINLESS STEEL

ABBREVIATIONS

SSU	SECOND SAYBOLT UNIVERSAL
ST	STEAM TRAP
ST	STORM DRAINAGE
ST(O)	STORM DRAINAGE (OVERFLOW)
STA	STATION
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STM	STEAM
STOR	STORAGE
STR	STRAINER
STRU	STRUCTURAL
SUBST	SUBSTATION
SURF	SURFACE
SV	SMOKE VENT
SYS	SYSTEM
T	TANK
T/A	TRANSFER AIR
TBD	TO BE DETERMINED
TC	TOP CHORD
TDH	TOTAL DYNAMIC HEAD
TEMP	TEMPERATURE
THD	THREAD
THK	THICK
TI	TEMPERATURE INDICATOR
TOD	TOP OF DUCT
TOF	TOP OF FOOTING
TOS	TOP OF STEEL
TRV	THERMO/TEMP RELIEF VALVE
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UG	UNDERGROUND
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UR	URINAL
V	VENT
V	VOLT(AGE)
VA	VALVE
VAC	VACUUM
VAC	VOLTS ALTERNATING CURRENT
VAV	VARIABLE AIR VOLUME
VCD	VOLUME CONTROL DAMPER (MANUAL)
VCP	VITRIFIED CLAY PIPE
VD	VOLUME DAMPER
VEL	VELOCITY
VENT	VENTILATOR
VERT	VERTICAL
VEST	VESTIBULE
VFD	VARIABLE FREQUENCY DRIVE
VISC	VISCOSITY
VOL	VOLUME
VTR	VENT THRU ROOF
W	WASTE
W	WIDTH (WIDE)
W/	WITH
W/O	WITHOUT
WB	WET BULB
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WF	WASH FOUNTAIN
WFS	WATER FLOW SWITCH
WG	WATER GAUGE
WH	WALL HYDRANT
WH	WATER HEATER
WHA	WATER HAMMER ARRESTOR
WL	WATER LEVEL
WM	WATER METER
WOG	WATER OIL OR GAS
WOM	WOMEN'S
WSP	WORKING STEAM PRESSURE
WT	WEIGHT
WW	WELL WATER
XP	EXPLOSION PROOF
YD	YARD

MECH DWG LIST

Sheet Number	Sheet Name
M.01	ABBREVIATIONS
M.02	SYMBOLS
M.03	GENERAL NOTES
M.21	1ST FLOOR PLAN – HVAC
M.22	1ST FLOOR PLAN – PIPING
M.62	DETAILS
M.81	SCHEDULES
M.82	SCHEDULES

811 Know what's **below** **Call** before you dig

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1	6/17/22	WT	AF	PL	SECOND PERMIT REVIEW

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BEN FRANKLIN TRANSIT
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SHEET TITLE: MECHANICAL ABBREVIATIONS

DRAWING: M.01

SHEET: 77 OF 97

HVAC/DUCTWORK SYMBOLS

SINGLE LINE	DESCRIPTION	DOUBLE LINE
	EXISTING DUCTWORK	
	EXISTING DUCTWORK TO BE DEMOLISHED UNLESS OTHERWISE NOTED TO BE ABANDONED IN PLACE	
	NEW DUCTWORK	
	FUTURE DUCTWORK	
	SUPPLY DUCT UP	
	SUPPLY DUCT DOWN	
	RETURN DUCT UP	
	RETURN DUCT DOWN	
	ROUND DUCT UP	
	ROUND DUCT DOWN	
	SPIN-IN CONNECTION WITH VOLUME DAMPER	
	BRANCH DUCT TAKEOFF	
	BRANCH DUCT TAKEOFF FROM BOTTOM OF DUCT	
	BRANCH DUCT TAKEOFF FROM TOP OF DUCT	
	DUCTWORK TRANSITION	
	RECTANGULAR TO ROUND DUCTWORK TRANSITION	
DN	DUCT OFFSET WITH DIRECTION NOTED	UP
	DUCT END	
	DUCT BREAK (SQ OR RND)	RND SQ
	RECTANGULAR MITERED ELBOW WITH TURNING VANES	
	ROUND OR RECTANGULA R RADIUS ELBOW	
	INDOOR TWO-WAY SPLIT WITH TURNING VANES	

SINGLE LINE	DESCRIPTION	DOUBLE LINE
	FLEXIBLE DUCT (MAX LENGTH: 5'-0")	
	VAV BOX	
	VAV BOX w/ REHEAT	
	MANUAL DAMPER	
	MOTORIZED DAMPER	
	DUCT HUMIDIFIER	
FD	FIRE DAMPER IN HORIZONTAL RUN	FD
FD	FIRE DAMPER IN VERTICAL RUN	FD
SD	SMOKE DAMPER IN HORIZONTAL RUN	SD
SD	SMOKE DAMPER IN VERTICAL RUN	SD
FSD	FIRE/SMOKE DAMPER IN HORIZONTAL RUN	FSD
FSD	FIRE/SMOKE DAMPER IN VERTICAL RUN	FSD
SD	SMOKE DETECTOR (DUCT MOUNTED)	SD

- FAN (SEE SCHEDULE FOR TYPE)
- UNIT HEATER (SEE SCHEDULE FOR TYPE)
- SUPPLY GRILLE/REGISTER/DIFFUSER
- SUPPLY GRILLE/REGISTER/DIFFUSER (ROUND)
- RETURN OR EXHAUST GRILLE
- DIFFUSER BLANK
- SIDEWALL SUPPLY OR RETURN GRILLE/REGISTER/DIFFUSER
- SUPPLY AIR FLOW ARROW
- RETURN/EXHAUST AIR FLOW ARROW
- T THERMOSTAT
- H HUMIDISTAT
- S MANUAL SWITCH
- CO2 CO2 SENSOR
- SP STATIC PRESSURE SENSOR
- PD PRESSURE DIFFERENTIAL SENSOR
- TS TEMPERATURE SENSOR
- FS FLOW SWITCH

PIPING/PLUMBING SYMBOLS

- EXISTING PIPING
- EXISTING PIPING TO BE DEMOLISHED UNLESS OTHERWISE NOTED TO BE ABANDONED IN PLACE
- SYS NEW PIPING (SEE PIPING SYSTEM LINE CODES THIS DRAWING)
- FUTURE PIPING
- PIPE DOWN
- PIPE UP
- PIPE AT 45 DEG DROP
- PIPE BRANCH DOWN
- PIPE BRANCH UP
- UNION
- FLANGE WITH ORIFICE PLATE
- CONCENTRIC REDUCER
- ECCENTRIC REDUCER
- PIPE BREAK
- HEAT TRACE
- PIPE ANCHOR
- PIPE GUIDE
- EJ EXPANSION JOINT
- FLOW ARROW
- PIPE HANGER
- FLEXIBLE CONNECTION
- END CAP (THREADED)
- END CAP (WELDED)
- FLANGED CONNECTION
- BLIND FLANGE
- BALL VALVE
- BALL VALVE - 3 WAY
- BALANCING VALVE
- BUTTERFLY VALVE
- CHECK VALVE - SWING
- CHECK VALVE - LIFT (NON-SLAM)
- CIRCUIT SETTER
- GATE VALVE
- GLOBE VALVE
- MULTIPURPOSE VALVE (TRIPLE DUTY) (SHUTOFF/CHECK/BALANCE)
- NEEDLE VALVE
- PLUG VALVE
- REFRIGERANT VALVE
- ANGLE VALVE
- PRESSURE RELIEF VALVE
- VALVE IN RISER
- PRESSURE REGULATING VALVE (SELF CONTAINED)
- PRESSURE REGULATING VALVE (SELF CONTAINED-PILOT OPERATED)
- BACKPRESSURE REGULATING VALVE (SELF CONTAINED)
- M 2-WAY CONTROL VALVE
- M 3-WAY CONTROL VALVE
- S SOLENOID VALVE
- P-TRAP
- RUNNING TRAP
- RUNNING TRAP WITH CLEANOUT
- CO HORIZONTAL CLEANOUT
- CO CLEANOUT UP THROUGH FLOOR
- FD / RD / RD(O) FLOOR DRAIN OR ROOF DRAIN OR ROOF DRAIN (OVERFLOW)
- HO HUB OUTLET
- FUNNEL DRAIN / OPEN DRAIN

- HOSE BIBB / WALL HYDRANT
- HOSE ADAPTER
- BFP BACKFLOW PREVENTER (REDUCED PRESSURE ZONE OR DOUBLE CHECK TYPE)
- EEW / ES / EEW&S EMERGENCY EYE WASH OR EMERGENCY SHOWER OR EMERGENCY EYE WASH & SHOWER
- TP / CDW TRAP PRIMER
- CDW/HDW WATER HAMMER ARRESTOR
- PUMP (SEE SCHEDULE FOR TYPE)
- PUMP (SEE SCHEDULE FOR TYPE)
- PUMP SUCTION DIFFUSER
- DRAIN
- Y-STRAINER WITH BLOWDOWN
- BASKET STRAINER - SIMPLEX
- BASKET STRAINER - DUPLEX
- T STEAM OR COMPRESSED AIR TRAP
- AUTO AIR VENT TO DRAIN
- MANUAL AIR VENT TO DRAIN
- TI TEMPERATURE INDICATOR (WITH THERMOWELL)
- STEM THERMOMETER (WITH THERMOWELL)
- TT TAP FOR TEMPERATURE TRANSMITTER (WITH THERMOWELL)
- PT TAP FOR PRESSURE TRANSMITTER
- FT / LT TAP FOR FLOW OR LEVEL TRANSMITTER (INSERTION TYPE ELEMENT WITH 2-1/2" FULL PORT BALL VALVE)
- TAP FOR TEST POINT (TEMPERATURE OR PRESSURE)
- PI PRESURE INDICATOR
- CG COMPOUND GAUGE (PRESSURE/VACUUM)
- FM FLOW METER - INLINE (SEE SPEC FOR TYPE)

FIRE PROTECTION SYMBOLS

- AUTOMATIC SPRINKLER RISER (ASR) - WET
- AUTOMATIC SPRINKLER RISER (ASR) - DRY
- AUTOMATIC SPRINKLER RISER (ASR) - DELUGE
- AUTOMATIC SPRINKLER RISER (ASR) - PREACTION
- SPRINKLER HEAD - UPRIGHT
- SPRINKLER HEAD - PENDENT
- SPRINKLER HEAD - DRY PENDENT
- SPRINKLER HEAD - CEILING FLUSH MOUNTED
- SPRINKLER HEAD - SIDE WALL MOUNTED
- SIAMESE CONNECTION
- S AREA SMOKE DETECTOR
- P PULL STATION
- F.S. FLASHING STROBE
- A ALARM BELL
- FIRE HOSE CABINET / HOSE REEL - SURFACE MOUNTED
- FIRE HOSE CABINET / HOSE REEL - RECESSED
- ROOF HOSE HOUSE
- ALARM CHECK VALVE
- FS SPRINKLER SYSTEM FLOW SWITCH

MISCELLANEOUS SYMBOLS

EQUIPMENT IDENTIFIER — P-1 — EQUIPMENT ABBREVIATION / EQUIPMENT NUMBER PER SCHEDULE

EQUIPMENT IDENTIFIER — P-1 — EQUIPMENT ABBREVIATION / EQUIPMENT NUMBER PER SCHEDULE

SECTION MARKER AND ARROW — 1A / M-1 — SECTION NUMBER / SHEET NUMBER WHERE SECTION IS FOUND OR CUT FROM

DETAIL MARKER — 1A / M-1 — DETAIL NUMBER / SHEET NUMBER WHERE DETAIL IS FOUND OR REFERENCED FROM

ENLARGED PLAN MARKER — 1A / M-1 — ENLARGED PLAN NUMBER / SHEET NUMBER WHERE ENLARGED PLAN IS FOUND OR REFERENCED FROM

- POINT OF NEW CONNECTION TO EXISTING CONSTRUCTION
- MATCH LINE
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL/ CONTROL SIGNAL

NOT ALL SYMBOLS ARE APPLICABLE IN THIS PROJECT

100% SUBMITTAL

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NO.	DATE	BY	CHD.	APPR.	REVISION
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SHEET TITLE: MECHANICAL SYMBOLS

DRAWING: M.02

GENERAL NOTES

FIT-UP/START-UP RELATED ITEMS

1 WHERE ALTERNATE DESIGN BASE PRODUCTS ARE APPROVED FOR INSTALLATION, SUBMIT SHOP DRAWINGS OF PROPOSED INSTALLATION. PROVIDE REQUIRED DESIGN AND ANCILLARY EQUIPMENT MODIFICATION AND SUPPLEMENTATION, AT NO ADDITIONAL COST TO OWNER
2 COORDINATE FINAL EQUIPMENT CONNECTION STYLES, TYPES, SIZES AND LOCATIONS WITH REVIEWED/CERTIFIED SHOP DRAWINGS AND AS-BUILT CONDITIONS. PROVIDE NECESSARY SIZE REDUCTION OR INCREASE AND CONNECTION TYPE AS REQUIRED BY THE PURCHASED EQUIPMENT. PIPING ARRANGEMENTS SHALL NOT IMPOSE NON-DESIGN LOADS ON EQUIPMENT CONNECTIONS: PROVIDE ADDITIONAL SUPPORT WORK AS REQUIRED TO MEET MANUFACTURER'S LIMITS
3 MAINTAIN CLEARANCE REQUIREMENTS OF EQUIPMENT MANUFACTURER'S, OWNER STANDARDS, NATIONAL ELECTRICAL CODE (NEC), APPLICABLE FEDERAL, STATE AND LOCAL CODES, AND REGULATIONS
4 COORDINATE PIPING AND DUCTWORK ROUTING TO ENSURE A 4'-0" MINIMUM CLEARANCE ON BOTH SIDES OF ELECTRICAL BUS DUCTS, AND 4'-0" MINIMUM FRONT AND SIDE ACCESS CLEARANCES TO ELECTRICAL PANELS
5 MAINTAIN MIN. 6'-9" HEADROOM CLEARANCE FOR PIPING, CONDUIT AND DUCTWORK PASSING OVER CATWALKS
6 DO NOT ROUTE MECHANICAL WORK BELOW ANYWHERE THAT WILL OBSTRUCT THE FUNCTIONS OF MONORAILS, HATCHES OR TRAP DOORS
7 DO NOT ROUTE MECHANICAL WORK IN ELECTRICAL SUBSTATIONS UNLESS SERVING ELECTRICAL SUBSTATIONS
8 WHEN ROUTING MECHANICAL WORK BELOW OR ADJACENT TO ELECTRICAL SUBSTATIONS, COORDINATE WITH ELECTRICAL TRADES
9 LOCATE THERMOSTATS 48" ABOVE FLOOR, UNLESS OTHERWISE NOTED
10 FIT BUTTERFLY VALVES WITH STRAIGHT RUN OF PIPE SUCH THAT VALVE DISC DOES NOT ENTER ADJACENT FITTINGS OR EQUIPMENT. LOCATE THERMOWELLS SO AS TO PREVENT VIBRATION OR INTERFERENCE WITH VALVE OPERATION
11 PROVIDE MANUAL AND AUTOMATIC AIR VENTS AND VACUUM BREAKERS AT PIPING HIGH-POINTS AND WHERE NECESSARY TO PRECLUDE PIPING SYSTEM/COMPONENT OR OPERATING FAILURE DUE TO AIR BINDING, VACUUM COLLAPSE OR WATER HAMMER
12 PROVIDE TRASH HANDLING FULL PORT BALL DRAIN VALVES WITH NIPPLE AND CAP AT PIPING LOW-POINTS AND AT BASE OF RISERS
13 PROVIDE TEMPORARY OR PERMANENT PIPING, HOSE, VALVES, FILTERS/STRAINERS, PRESSURE AND TEMPERATURE GAUGES, FLOW AND OTHER INSTRUMENTATION, FOR PURGING, CLEANING, FLUSHING, DISINFECTING, TESTING, START UP AND OPERATION, WHETHER SUFFICIENTLY INDICATED IN THE DOCUMENTS OR NOT. AFTER CLEANING/FLUSHING, REMOVE TEMPORARY FILTER/STRAINER ELEMENTS AND CLEAN STRAINERS
14 PROVIDE APPROVED DOUBLE CONTAINMENT OR LIPPED, SAFELY DRAINED, 16 GAGE GALVANIZED SHEET DRIP PANS UNDER MECHANICAL ITEMS LOCATED OVER ANY BUS DUCT OR ELECTRICAL EQUIPMENT
15 PROVIDE 16 GAGE GALVANIZED SHEET METAL HEAT SHIELDS AT ALL POINTS WHERE A HOT PIPE, FLUE STACK, HEATING AIR, OR RADIANT HEAT IS DIRECTED AT AN ELECTRICAL BUS DUCT, CABLE TRAY, CONTROL PANEL OR HEAT SENSITIVE CONSTRUCTION SURFACE OR EQUIPMENT
16 PROVIDE WATER HAMMER ARRESTERS AT RAPID ACTION FLOW CONTROL DEVICES AND AT PLUMBING FIXTURES, PER MANUFACTURER'S INSTRUCTIONS AND PLUMBING & DRAINAGE INSTITUTE STANDARD PDI-WH-201
17 PROVIDE INSULATION ON SURFACE, WHERE TEMPERATURE COULD BURN, FOR PERSONNEL PROTECTION WITHIN 8'-0" OF ALL OPERATING LEVELS
18 PROVIDE ENERGY LOCKOUT/TAGOUT PROVISIONS FOR SYSTEMS WHERE REQUIRED BY OSHA, OWNER'S STANDARDS, AND WHERE INDICATED ON DRAWINGS. COMPLY WITH MOST STRINGENT REQUIREMENTS
19 REFER TO SUPPLEMENTARY PROJECT SPECIFIC NOTES FOR ADDITIONAL REQUIREMENTS
20 FOR EXHAUST FAN DISCHARGES, PLUMBING VENTS AND FLUES, MAINTAIN A MINIMUM OF 20'-0" HORIZONTALLY FROM, OR 4'-0" (2'-0" FOR PLUMBING VENTS) VERTICALLY ABOVE OUTDOOR AIR INTAKES AND 30'-0" FROM COOLING TOWERS

GENERAL CONDITIONS AND COORDINATION RELATED ITEMS

1 THE DRAWINGS AND SPECIFICATIONS ARE PRODUCED REPRESENTING WORK TO BE DONE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES. THE LOCAL CODE AUTHORITY, OR THE AUTHORITY HAVING JURISDICTION, HAS THE AUTHORITY TO INTERPRET CODE REQUIREMENTS IN ITS JURISDICTION. THESE INTERPRETATIONS MAY VARY FROM INFORMATION PRESENTED IN THE DOCUMENTS. THE CONTRACTOR SHALL INFORM THE OWNER'S REPRESENTATIVE AND THE ARCHITECT-ENGINEER OF THE DIFFERENCES AND SHALL PROCEED WITH THE WORK ONLY UPON RECEIVING THEIR AGREEMENT WITH THE LOCAL CODE AUTHORITY'S INTERPRETATION.
2 SEAL ALL EXTERIOR WALL PENETRATIONS WEATHER TIGHT.
3 BIDDER (CONTRACTOR) SHALL VISIT THE SITE, EXAMINE AND VERIFY CONDITIONS UNDER WHICH THE WORK SHALL BE CONDUCTED AND ACCOUNT FOR FIELD CONDITIONS AND DIMENSIONAL CONSIDERATIONS IN ALL BIDS SUBMITTED.
4 SOME STANDARD SYMBOLS, ABBREVIATIONS AND DETAILS INDICATED IN CONTRACT DOCUMENTS WILL NOT BE APPLICABLE TO THIS SPECIFIC CONTRACT ISSUE.
5 CONTRACTOR SHALL REVIEW ALL OF THE DOCUMENTS, INCLUDING SPECIFICATION, OF INTERFACING TRADES AND CONTRACTS PRIOR TO BIDDING AND COMMENCEMENT OF WORK TO ENSURE COMPLETE COORDINATION OF FINISHED WORK.
6 BEFORE AWARD OF CONTRACT, IF THERE ARE QUESTIONS ABOUT INTENT, CLARITY, APPLICATION OF NOTES, OR WORK SHOWN OR SPECIFIED, OR IF CONFLICTING DIRECTIONS ARE FOUND IN THE DOCUMENTS, REQUEST WRITTEN CLARIFICATION FROM THE ARCHITECT/ENGINEER. ANY CLARIFICATION PROVIDED AFTER CONTRACT AWARD SHALL BE AT NO ADDITIONAL COST TO OWNER.
7 CONFIRM THAT EXISTING SYSTEMS ARE INACTIVE AND PURGED BEFORE TAPPING INTO THEM, UNLESS OTHERWISE DIRECTED.
8 SCHEDULE AND COORDINATE UTILITY SHUTDOWNS AND DEMOLITION WORK WITH OWNER.
9 DO NOT INTERFERE WITH OWNER'S OPERATIONS. SCHEDULE PLANNED SHUTDOWNS WITH OWNER'S WRITTEN APPROVAL, AT LEAST ONE WEEK IN ADVANCE. PROCEED WITH WORK ONLY AFTER RECEIPT OF THIS WRITTEN AUTHORIZATION.
10 COMPLY WITH OWNER'S CORPORATE STANDARDS AND ALL APPLICABLE LOCAL STANDARDS, CODES AND REGULATIONS.
11 SILICONE-CONTAINING PRODUCTS SHALL NOT BE BROUGHT ONTO OR USED IN ANY PRODUCT ON THIS SITE WITHOUT WRITTEN PERMISSION OF THE OWNER.
12 COORDINATE AND SCHEDULE EXTENT OF ANY DEMOLITION WORK WITH OWNER.
13 DEMOLITION WORK SHALL BE COMPLETED TO THE EXTENT INDICATED OR SPECIFIED AND AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
14 DEMOLISHED MATERIALS, UNLESS OTHERWISE DIRECTED, BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE PROMPTLY REMOVED FROM THE SITE BEFORE THE END OF EACH WORKDAY. OWNER RETAINED SALVAGED EQUIPMENT SHALL BE PROPERLY PROTECTED FOR REUSE OR CRATED FOR PROTECTION AND DELIVERED TO OWNER'S SITE STORAGE (ANY HAZARDOUS MATERIAL SHALL BE PROPERLY DISPOSED OF PER ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES).
15 REFER TO TRUSS SPACE ALLOCATION DETAIL FOR ROUTING OF MECHANICAL AND ELECTRICAL WORK. THE ALLOCATION SHALL BE ADHERED TO UNLESS OTHERWISE NOTED ON DRAWINGS. EXCEPTIONS SHALL REQUIRE SPECIFIC WRITTEN APPROVAL BY THE ARCHITECT/ENGINEER. NOTE THAT ELECTRIC LIGHT POSITIONS TAKE PRECEDENCE OVER MECHANICAL ITEMS IN ANY AND ALL LOCATIONS FOR AREAS WITH OR WITHOUT CEILINGS; THE CONTRACTOR SHALL COORDINATE AS REQUIRED. IF THERE IS NO APPARENT SOLUTION TO A SPECIFIC COORDINATION ISSUE, CONTACT THE ARCHITECT-ENGINEER FOR A RESOLUTION.
17 COORDINATE AND PERFORM WORK BASED ON REVIEWED CERTIFIED SHOP DRAWINGS, FIELD CHECKS OF INSTALLED WORK AND LATEST REVISION OF CONTRACT DOCUMENTS, INCLUDING ALL INTERFACING DISCIPLINE DRAWINGS, BEFORE PROCEEDING WITH PROCUREMENT, DETAILING, FABRICATION OR INSTALLATION. THE REVIEW OF A SHOP DRAWING IS INTENDED TO ASSIST THE CONTRACTOR VERIFY THEIR INTERPRETATION OF THE DOCUMENTS.
18 FIELD CHECK AND COORDINATE WORK WITH CONTRACT DOCUMENTS AND ALL OTHER TRADES FOR: INVERT ELEVATIONS, ELEVATION ROUTING, SPACE PRIORITIES, DIMENSIONS AND CLEARANCES TO ENSURE THAT NO CODE CONFLICT OR INTERFERENCE WITH OTHER WORK OCCURS. LACKING SUCH COORDINATION, CORRECTIVE WORK ACCEPTABLE TO OWNER SHALL BE DONE BY THE CONTRACTOR, WITHIN SCHEDULE, AT NO ADDITIONAL COST.
19 COORDINATE PURCHASED EQUIPMENT CONCRETE PAD AND ROOF CURB LOCATIONS, SIZES, AND CONSTRUCTION REQUIREMENTS, WITH REVIEWED AND CERTIFIED SHOP DRAWINGS AND ARCHITECTURAL AND STRUCTURAL TRADES.
20 REFER TO AND COORDINATE WITH ARCHITECTURAL DRAWINGS FOR LOCATION AND PROPER FLASHING OF ROOF CURBS AND SUPPORTS.
21 REFER TO AND COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF DIFFUSERS, REGISTERS AND GRILLES. COORDINATE THE LOCATION OF FIRE PROTECTION SPRINKLER HEADS WITH THESE ITEMS.
22 REFER TO APPLICABLE CODES, AS WELL AS CIVIL, MECHANICAL AND ARCHITECTURAL DRAWINGS AND SPECIFICATIONS, FOR BUILDING SURFACES PENETRATION AND SEALING REQUIREMENTS.
23 FIRE STOP AND SEAL ALL FIRE RATED PARTITION AND FLOOR PENETRATIONS IN COORDINATION WITH ARCHTIECTURAL TRADES. PROVIDE WATER STOPS AS PART OF THIS WORK INCLUDING PROVISION OF DAMS AROUND ALL FLOOR PENETRATIONS.
24 DO NOT ROUTE ANY PIPING, DUCTWORK OR EQUIPMENT WITHIN THE "DEDICATED ELECTRICAL SPACE" PER NATIONAL ELECTRICAL CODE (NEC).
25 DO NOT ROUTE ANY PIPING, DUCTWORK OR EQUIPMENT WITHIN ANY CRANE TRAVEL OR MAINTENANCE AREAS OR ZONES.
26 BEFORE PENETRATING EXISTING CONCRETE OR SOIL SURFACES, CONSULT WITH ALL LOCAL UTILITIES PROGRAMS FOR THE AREA OF WORK AND VERIFY LOCATION OF ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES BY USE OF 'ELECTRONIC' OR SIMILAR NON-INVASIVE DETECTOR DEVICES. IF POTENTIAL INTERFERENCES ARE DISCOVERED, PROPOSE ALTERNATE ROUTING AND ASSOCIATED COSTS TO OWNER AND ARCHITECT/ENGINEER FOR APPROVAL BEFORE PROCEEDING.
27 ALL CURBS FOR EQUIPMENT, ROOF OPENINGS, ETC. SHALL BE PROVIDED BY ARCHITECTURAL UNLESS NOTED OTHERWISE. SEE ARCHITECTURAL DRAWINGS FOR LOCATION AND DETAILS OF CURBS. SEE SECTION 077200, ROOF ACCESSORIES, AND 055000, METAL FABRICATIONS, FOR ASSOCIATED SPECIFICATIONS. COORDINATE CONSTRUCTION AND PLACEMENT OF CURBS AND ROOF OPENINGS WITH APPROVED MECHANICAL EQUIPMENT SHOP DRAWINGS.
28 LOCATE ALL VENTILATION AIR (OUTSIDE AIR) INTAKES AWAY FROM EXHAUST AIR, VENTS AND ALL OTHER POSSIBLE CONTAMINANTS PER ALL APPLICABLE CODES.
29 ROUTE ALL DUCTWORK AND PIPING TO CLEAR ALL INTERFERENCES INCLUDING GUSSET PLATES, ETC., COORDINATE WITH ALL TRADES.

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GENERAL NOTES

30 CONTRACTOR TO ENSURE THAT ALL PRESCRIBED PROCESS EQUIPMENT CLEARANCES ARE COORDINATED WITH APPROVED EQUIPMENT SHOP DRAWINGS IN ADVANCE OF FABRICATION AND PLACEMENT OF ANY DUCTWORK, PIPING, ETC. ANY POTENTIAL INTERFERENCES SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHTECT/ENGINEER OF RECORD IMMEDIATELY.
31 CONTRACTOR TO ENSURE THAT ALL CRANE MANUFACTURER RECOMMENDED AND REQUIRED CLEARANCES BE MAINTAINED DURING ROUTING OF PIPING, SHEET METAL, EQUIPMENT, ETC., BASED ON FINAL APPROVED CRANE AND EQUIPMENT SHOP DRAWINGS. ANY POTENTIAL CLEARANCE DEVIATION SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHTECT/ENGINEER OF RECORD IMMEDIATELY.
32 BOTTOM OF DUCT AND BOTTOM OF PIPE ELEVATIONS SHOWN ON PLANS ARE FOR GENERAL REFERENCE PURPOSES ONLY. THEY REPRESENT THE INITIAL RECOMMENDED HEIGHTS BASED ON DESIGN INTENT DRAWINGS. CONTRACTOR SHALL CONFIRM ALL PIPE, EQUIPMENT, DUCTWORK, CONTROLS, ACCESSORY ELEVATIONS WITH OTHER TRADES, FIELD CONDITIONS, FINAL PURCHASED MANUFACTURER'S INSTALLATION AND OPERATIONS MANUALS, AND FINAL COORDINATED SHOP DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR ENSURING ALL PIPING, DUCTWORK AND EQUIPMENT MEETS CODE CLEARANCES, OWNER CLEARANCE REQUIREMENTS AND CRANE CLEARANCE REQUIREMENTS, AS APPLICABLE.

HVAC RELATED ITEMS

1 DO NOT SUPPORT DUCTWORK FROM TOP CHORD OF JOIST AND JOIST GIRDER
2 DUCT ROUTES SHOWN ARE SCHEMATIC IN NATURE. FIELD VERIFY ROUTING AND CONNECTION POINTS AND PROVIDE WORK AS REQUIRED BY FIELD CONDITIONS. CRITICAL ROUTING LOCATIONS ARE DIMENSIONED FROM COLUMN CENTERLINES ON PLANS
3 DUCTWORK FLOW DIAGRAMS MAY NOT INDICATE ALL CONNECTIONS, DAMPERS, DEVICES REQUIRED BY PHYSICAL LAYOUT, ROUTING OR BY EQUIPMENT MANUFACTURER. REFER TO PLANS, SECTIONS, DETAILS, SPECIFICATIONS AND REVIEWED/CERTIFIED SHOP DRAWINGS. WHERE CONFLICT BETWEEN CONTRACT DOCUMENTS IS PERCEIVED, REQUEST ARCHITECT-ENGINEER INTERPRETATION PRIOR TO FABRICATION AND INSTALLATION
4 PROVIDE ACCESS DOORS OR CONTROL EXTENSIONS AS MAY BE REQUIRED TO ALLOW ADJUSTMENT OF ALL CONTROL DEVICES SUCH AS VOLUME DAMPERS, ETC
5 DIMENSIONS SHOWN ON DRAWINGS FOR ALL DUCTWORK ARE INSIDE CLEAR
6 RETURN AIR DUCTWORK IN RETURN AIR PLENUM SHALL BE THERMALLY INSULATED WHERE INDICATED ON CONTRACT DOCUMENTS
7 RETURN AIR DUCTWORK TO AIR CONDITIONING UNIT, EXPOSED TO MECHANICAL EQUIPMENT ROOM ENVIRONMENT, SHALL BE INSULATED
8 INSULATE AND VAPOR SEAL ALL OUTSIDE AIR INTAKE DUCTWORK FROM ROOF CURB OR WALL LOUVER TO AHU
9 PROVIDE FIRE DAMPERS, SMOKE DAMPERS AND COMBINATION FIRE AND SMOKE DAMPERS IN ALL RATED SURFACE PENETRATIONS AS REQUIRED BY APPLICABLE CODE(S). ADDITIONALLY, PROVIDE ADJACENT ACCESS DOORS AS REQUIRED FOR SERVICING THE DEVICE. SEE ARCHITECTURAL DRAWINGS FOR THE APPLICABLE SURFACE RATING
10 FLEXIBLE DUCT CONNECTORS SHALL BE INSTALLED IN ACCESSIBLE AREAS ONLY. MAXIMUM ALLOWABLE FLEX DUCT IS 5'-0" TOTAL LENGTH. SUPPORT TO AVOID SAGGING OR KINKING
11 PROVIDE 1 SET SPARE FILTERS FOR ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT PER SPECIFIED REQUIREMENTS

INSTRUMENTATION RELATED ITEMS

1 LOCATE PRESSURE AND TEMPERATURE GAUGES SUCH THAT THEY ARE READABLE FROM THE OPERATING FLOOR LEVEL. OTHERWISE, PROVIDE REMOTE ELEMENT READING INSTRUMENTS MOUNTED ON A 16-GAGE GALVANIZED GAUGE BOARD, READABLE FROM OPERATING FLOOR. REFER TO SPECIFICATIONS, FLOW DIAGRAMS AND VALVE/EQUIPMENT SCHEDULES FOR SYSTEM PRESSURE AND TEMPERATURE OPERATING RANGES. SELECT INSTRUMENTS TO OPERATE IN MIDDLE THIRD OF SYSTEM OPERATING RANGE, UNLESS INDICATED OTHERWISE. MARK PRESSURE GAUGES CALIBRATED FOR ELEVATION
2 INSTALL FLOW-MEASURING DEVICES WITH A MINIMUM STRAIGHT RUN OF PIPING CONSISTING OF 10 DIAMETERS UPSTREAM AND 5 DIAMETERS DOWNSTREAM OF DEVICE. CONTRACTOR SHALL COORDINATE AND PROVIDE FOR ANY ADDITIONAL REQUIREMENTS OF DEVICE MANUFACTURER
3 PROVIDE PROPERLY GRADUATED TEST GAUGES AND THERMOMETERS WITH RANGES AS REQUIRED FOR SERVICE

INSULATION RELATED ITEMS

1 INSULATE AND SECTIONALLY VAPOR SEAL SURFACES WHERE FLUID TEMPERATURES LESS THAN 65 DEGF CAN OCCUR. MAINTAIN VAPOR BARRIER CONTINUITY SECTIONAL SEALS BETWEEN JOINTS TO COLD SURFACE: ON MAXIMUM 24-FOOT CENTERS, AT CHANGES OF DIRECTION, INTERFACES, CONNECTIONS, PENETRATIONS AND DEVICES
2 EXTEND VALVE STEMS AND DAMPER OPERATORS BEYOND INSULATION AS REQUIRED AND MAINTAIN VAPOR BARRIER CONTINUITY
3 IN WEATHER-EXPOSED LOCATIONS, INSTALL INSULATED PIPING VALVES WITH THE STEM DOWN OR AT 4 O'CLOCK POSITION, WHERE SAFETY/OPERATING AND OTHER CONDITIONS GOVERN
4 REPAIR EXISTING PIPE INSULATION DAMAGED DURING WORK AND MAINTAIN VAPOR SEAL INTEGRITY. ISOLATE WITH VAPOR BARRIER, NEW WORK FROM OLD WORK
5 WRAP WATER SUPPLIES AND P-TRAP UNDER SINKS ACCORDING TO ADA CODE.

PIPING RELATED ITEMS

1 PIPE ROUTES SHOWN ARE SCHEMATIC IN NATURE. FIELD VERIFY ROUTING, AND CONNECTION POINTS AND INSTALL WORK AS REQUIRED BY FIELD CONDITIONS. MAJOR VARIATIONS FROM THAT WHICH IS INDICATED ON THE DRAWINGS SHALL BE APPROVED BY THE ARCHITECT-ENGINEER
2 PIPING FLOW DIAGRAMS MAY NOT INDICATE ALL CONNECTIONS, VALVES, DRAINS, VENTS, PIPING SPECIALTIES, AND OTHER DEVICES OR EQUIPMENT REQUIRED BY PHYSICAL LAYOUT, ROUTING OR BY EQUIPMENT MANUFACTURER FOR A COMPLETE, PROPERLY FUNCTIONING, CODE COMPLIANT AND OPERATING SYTSEMS. COORDIANTE AND PROVIDE AS REQUIRED. SEE I&C DRAWINGS AND DETAILS FOR ADDITIONAL REQUIREMENTS. REFER TO PLANS, SECTIONS, DETAILS, SPECIFICATIONS AND REVIEWED/CERTIFIED SHOP DRAWINGS. WHERE CONTRACT DOCUMENTS CONFLICT, REQUEST ARCHITECT-ENGINEER INTERPRETATION
3 PROVIDE MINIMUM FOUR-INCH HIGH, EPOXY PROTECTED, CONCRETE HOUSEKEEPING PADS UNDER MECHANICAL EQUIPMENT, UNLESS SPECIFICALLY STATED AS OMITTED OR INDICATED AS A DIFFERENT DEPTH. VARIATIONS MAY BE ACCEPTABLE DUE TO THE REQUIREMENTS OF THE MOUNTING, GROUTING, ELEVATION OF EQUIPMENT BEING INSTALLED. COORDINATE PAD LOCATION AND SIZES WITH REVIEWED/CERTIFIED SHOP DRAWINGS AND ALL RELATED TRADES
4 TAP BRANCH-PIPING CONNECTIONS FROM TOP OF MAIN FOR ALL SERVICES EXCEPT CLOSED LOOP CHILLED WATER, HEATING HOT WATER, OR AS SPECIFICALLY INDICATED ON DRAWINGS
5 VALVES LOCATED IN TRUSS SPACE SHALL BE SAFELY REACHABLE AND OPERABLE FROM A CATWALK, SERVICE PLATFORM, OR LIFT DEVICE. ROUTE AND ARRANGE PIPING AND VALVING, AND PROVIDE U-JOINTED, TWO-BEARING SUPPORTED, VALVE HANDWHEEL EXTENSION RODS, AS REQUIRED TO MEET THIS CRITERIA
6 INSTALL LOOSE TRIM FURNISHED WITH EQUIPMENT, AND IF NECESSARY, SUPPLEMENT WITH LIKE QUALITY TRIM FOR A COMPLETE, PROPERLY FUNCTIONING AND OPERATING SYSTEM. REFER TO REVIEWED/CERTIFIED SHOP DRAWINGS
7 PROVIDE MANUAL CHAIN OPERATOR FOR EXTENDED/SUPPORTED STEM VALVES SIZED 3" AND LARGER, EXCEPT FOR DEAD-END VALVES, IN EQUIPMENT SPACES AND WHERE INDICATED, WHICH CANNOT BE REACHED FROM NORMAL OPERATING LEVEL. PROVIDE CHAINS TO WITHIN 4'-0" ABOVE FLOOR, UNLESS OTHERWISE INDICATED ON DRAWINGS. OFFSET CHAINS THAT FALL IN AISLE WAYS, OVER EQUIPMENT OR OTHERWISE CAUSE OBSTRUCTION, AND SECURE TO NEAREST COLUMN, ANCHOR OR WALL
8 DO NOT OBSTRUCT STRUCTURE DOORS OR FURNISHED EQUIPMENT ACCESS DOORS, HATCHES, COVERS OR PANELS WITH PIPING, CONDUIT OR DUCT
9 ROUTE DRAIN, VENT, RELIEF, AND SERVICE PIPING TO AND FROM EQUIPMENT, AS DIRECTED BY EQUIPMENT MANUFACTURER. TEST, FLUSH AND FILL AS REQUIRED FOR A COMPLETE OPERATING SYSTEM
11 ROUTE SAFE FLUIDS VENT DISCHARGE AND DRAIN PIPING TO NEAREST HUB OUTLET OR FLOOR DRAIN. ROUTE BELOW FINISHED FLOOR WHEN CROSSING AISLES
12 ROUTE SAFE FLUIDS HIGH ELEVATION SOURCED AUTOMATIC AND MANUAL DEVICE VENTS TO NEAREST COLUMN AND TERMINATE 4'-0" AFF. TERMINATE WITH PLUGGED END BALL VALVE (BA)
13 ROUTE SCREEN TERMINATED FUEL GAS VENTS TO ATMOSPHERE PER APPLICABLE CODES/STANDARDS/REGULATIONS/UNDERWRITER'S REQUIREMENTS WITHOUT PRODUCING ADJACENT/DOWNWIND HAZARDS
14 ROUTE AND SIZE VENTS FROM NATURAL GAS REGULATORS THROUGH ROOF OR WALL PER APPLICABLE CODE AND MANUFACTURER'S RECOMMENDATIONS
15 ROUTE HAZARDOUS FLUIDS VENTS, INCLUDING REFRIGERANT VENTS, TO ATMOSPHERE PER APPLICABLE CODES/STANDARDS/REGULATIONS/UNDERWRITER'S REQUIREMENTS WITHOUT PRODUCING ADJACENT/DOWNWIND HAZARDS
16 PROVIDE 16 GAGE GALVANIZED STEEL SAFETY SPLASH COVERS OVER DRAINS WHERE STEAM CONDENSATE BLOWDOWN OCCURS
17 PROVIDE SECURED SPLASH BLOCKS FOR ROOF-MOUNTED EQUIPMENT DRAIN POINTS. CONFIRM WITH OWNER AND APPLICABLE CODES THAT FLUID IS ALLOWED TO BE ROUTED TO ROOF DRAINS
18 DO NOT SUPPORT PIPING FROM TOP CHORD OF JOIST AND JOIST GIRDER
19 CONTRACTOR SHALL COORDINATE AND SIZE ALL REFRIGERANT LIQUID AND SUCTION LINES WITH MANUFACTURER BASED ON ROUTING BETWEEN EQUIPMENT, AND PROVIDE SIZE AND QUANTITY OF LINES AS REQUIRED TO MEET SYSTEM CAPACITY AND CONTROL AS SPECIFIED
20 PROVIDE ACCESS DOORS AS MAY BE REQUIRED TO ALL VALVES, CLEAN-OUTS AND OTHER DEVICES IN WALLS AND CEILINGS
21 INDOOR AND OUTDOOR FUEL GAS APPLIANCE PRESSURE REGULATORS AND GAS TRAIN ASSEMBLIES SHALL BE VENTED TO THE OUTSIDE ATMOSPHERE AT A MINIMUM DISTANCE OF 15'-0" FROM ANY MECHANICAL OR GRAVITY AIR INTAKE OPENINGS. PROVIDE MEANS TO PREVENT WATER FROM ENTERING THE VENT AND BLOCKAGE DUE TO INSECTS AND FOREIGN MATTER. SIZE VENTS PER THE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS AND DO NOT COMBINE WITH ANY OTHER VENT. CONFIRM PROPOSED VENTING WITH LOCAL CODE AUTHORITIES

GENERAL NOTES

PLUMBING RELATED ITEMS

1 COORDINATE LOCATION OF FLOOR DRAINS, HUB OUTLETS, ETC., WITH APPROVED EQUIPMENT SHOP DRAWINGS, ALL OTHER TRADES AND ASSOCIATED HOUSEKEEPING PADS IN ORDER TO ELIMINATE INTERFERENCES AND TRIP HAZARDS DUE TO DRAIN PIPING IN WALKING SPACES
2 THE PLUMBING DRAWINGS ARE SCHEMATIC IN NATURE AND SHOW THE GENERAL LAYOUT OF THE PLUMBING SYSTEM. PLUMBING CONTRACTOR TO VERIFY WITH FIELD CONDITIONS, EXACT LOCATIONS OF PLUMBING SYSTEMS.
3 PROVIDE REQUIRED, ACCESSIBLE, SURE SEAL TRAPS TO MEET SITE APPLICABLE CODES AND AS IDENTIFIED ON DRAWINGS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS
3 FIELD CHECK AND COORDINATE WORK WITH CONTRACT DOCUMENTS AND OTHER TRADES FOR: INVERT ELEVATIONS, ELEVATION ROUTING, SPACE PRIORITIES, DIMENSIONS AND CLEARANCES TO ENSURE THAT NO CODE CONFLICT OR INTERFERENCE WITH OTHER WORK OCCURS. LACKING SUCH COORDINATION, CORRECTIVE WORK ACCEPTABLE TO OWNER SHALL BE DONE BY THE CONTRACTOR, WITHIN SCHEDULE, AT NO ADDITIONAL COST.
4 PRIOR TO PURCHASING AND INSTALLING, THE SIZE, QUANTITY AND LOCATION OF ALL HEAT TRACING SYSTEM PANELS SHALL BE CONFIRMED WITH FIELD CONDITIONS AND THE ELECTRICAL DESIGN DRAWINGS
6 ALL HORIZONTAL SANITARY AND STORM LINE SHALL BE SLOPED DOWN IN THE DIRECTION OF FLOW IN ACCORDANCE WITH ALL CURRENT CODES & STANDARDS UNLESS NOTED OTHERWISE
7 DO NOT ROUTE DRAIN PIPING ACROSS FLOOR/AISLE OR OTHER WALKWAY SURFACES, UNLESS SPECIFICALLY NOTED
8 CONTRACTOR SHALL PROVIDE NECESSARY PIPE FITTINGS AND ADJUST ROUTING SUCH THAT PIPING IS HIGH IN STEEL AND CLEAR OF ELECTRICAL BUS WAY. CONTRACTOR SHALL PROVIDE PIPE FITTINGS AND ADJUST ROUTING SUCH THAT THERE IS NO FITTINGS, VALVE TAKE OFF OR OTHER POSSIBLE LEAK SOURCE WITHIN 5'-0" OF EITHER SIDE OF ELECTRICAL.
9 PIPING SHALL NOT BE INSTALLED OVER ELECTRICAL EQUIPMENT.
10 NO EQUIPMENT SHALL BE LOCATED DIRECTLY ABOVE WALLS.
11 RUN NEW WASTE PIPES AS CLOSE AS POSSIBLE TO UNDERSIDE OF FLOOR SLAB AND VENT PIPING AS CLOSE AS POSSIBLE TO SLAB ABOVE.
12 PLUMBING CONTRACTOR TO BE RESPONSIBLE FOR COORDINATION, VERIFICATION, AND CONNECTION OF ALL UTILITIES TO SITE UTILITY STUB-OUTS. REFERENCE ASSOCIATED ARCHITECTURAL, ELECTRICAL, MECHANICAL, STRUCTURAL, KITCHEN AND CIVIL DRAWINGS FOR RELATED INFORMATION.
13 INSTALL SHUT-OFF VALVES AND PIPING UNIONS AT EACH PIECE OF EQUIPMENT, PLUMBING FIXTURES, AND BRANCHES TO FIXTURE GROUPS. VALVES SHALL BE LOCATED IN AN ACCESSIBLE LOCATION, OR ACCESS PANELS PROVIDED AS NECESSARY.
14 INSTALL VACUUM BREAKERS AT ALL THREADED HOSE CONNECTIONS AND AT ALL CONNECTIONS WHERE CROSS-CONTAMINATION COULD OCCUR, UNLESS OTHER BACKFLOW PREVENTION METHOD IS SHOWN.
15 PROVIDE ACOUST-O-PLUMB PIPE CLAMPS ON ALL DOMESTIC WATER PIPES 1" AND SMALLER IN SIZE. REFER TO FLOOR PLANS AND RISER DIAGRAMS.
16 SEAL ALL EXTERIOR WALL AND ROOF PENETRATIONS WATER TIGHT.
17 VERIFY EXACT LOCATIONS OF HVAC EQUIPMENT WITH MECHANICAL DRAWINGS. VERIFY PRIOR TO ANY INSTALLATION THAT THERE IS SUFFICIENT SPACE IN WALLS, CHASES AND CEILING CAVITIES FOR PLUMBING SYSTEM PIPING, VENTS, EQUIPMENT, ETC.
18 CAULK AROUND ALL PLUMBING FIXTURES. CAULK COLOR TO MATCH FIXTURE COLOR.
19 FIRESTOP ALL PENETRATIONS THRU FIRE-RATED ASSEMBLIES. REFER TO SPECIFICATIONS AND ARCHITECTURAL DRAWINGS.
20 ALL SANITARY SEWER /STORM PIPING 4" AND LARGER SHALL BE INSTALLED AT 1/8" PER FT. MINIMUM. ALL SANITARY SEWER PIPING 3" AND SMALLER SHALL BE INSTALLED AT 1/4" PER FT. MINIMUM. SANITARY PIPING FROM HIGH EFFICIENCY/LOW-FLOW WATER CLOSETS AND URINALS SHALL BE INSTALLED AT 1/4" PER FT. MINIMUM.
21 IF APPLICABLE, SIPHONIC CONTRACTOR SHALL PROVIDE A COMPLETE DESIGNED AND INSTALLED SIPHONIC TYPE ROOF DRAINAGE SYSTEM PER ALL APPLICABLE CODES AND STANDARDS. SIPHONIC DRAWINGS ARE CONCEPTUAL ONLY!!! FINAL/ACTUAL DESIGN PROVIDED BY THE SIPHONIC CONTRACTOR.
22 PROVIDE BUILDING DRAIN WITH CLEANOUTS AT THE BASE OF EACH VERTICAL WASTE STACK; CLEANOUT SHALL BE A WALL CLEANOUT OR FLOOR CLEANOUT, BROUGHT UP TO FINISHED GROUND LEVEL OR TO THE BASEMENT FLOOR LEVEL, AS REQUIRED BY CODE.
23 PROVIDE FLOOR CLEANOUT WHERE BUILDING DRAIN EXITS THE BUILDING, WITHIN 5 FT OF THE EXTERIOR WALL. PROVIDE ADDITIONAL YARD CLEANOUT ON BUILDING DRAIN WITHIN 5 FT OF EXTERIOR WALL, AS REQUIRED.
24 ROUTE DRAIN, VENT, RELIEF, AND SERVICE PIPING TO AND FROM EQUIPMENT, AS DIRECTED BY EQUIPMENT MANUFACTURER. TEST, FLUSH AND FILL AS REQUIRED FOR A COMPLETE OPERATING SYSTEM.
25 CLEANOUTS SHALL BE INSTALLED AT EVERY CHANGE OF DIRECTION OVER 45 DEGREES, AT 100'-0" INTERVALS OF HORIZONTAL RUNS FOR OVERHEAD AND UNDERGROUND PIPING, UNLESS OTHERWISE SHOWN OR REQUIRED BY CODE.
26 INSULATE UNDERSIDE OF ROOF DRAIN SUMP AND FIRST VERTICAL STORM LINE.
27 INSULATE ALL NON VERTICAL PORTION OF STORM CONDUCTOR LINES.
28 GENERAL CONTRACTOR SHALL NOTIFY OWNER/OWNER'S REPRESENTATIVE PRIOR TO SHUTDOWN OF ANY SERVICE AFFECTING AREAS OUTSIDE OF SPACE UNDER CONTRACT.
29 FOR RENOVATION WORK IN BUILDINGS CONTAINING POST-TENSION SLABS, ALL NEW CORES SHALL BE COORDINATED WITH EXISTING POST-TENSION SLAB. CONTRACTOR SHALL X-RAY ALL PROPOSED CORE LOCATIONS TO ENSURE THAT NEW CORES FALL BETWEEN POST-TENSION BANDS.

SEISMIC DESIGN FOR NON-STRUCTURAL COMPONENTS

1 FOR ALL DESIGNS INVOLVING SEISMIC DESIGN CATEGORIES C THRU F, REFER TO ASCE (AMERICAN SOCIETY OF CIVIL ENGINEERS) / SEI (STRUCTURAL ENGINEERING INSTITUTE) 7-10, AND IBC 2012 CHAPTER 16 FOR GUIDELINES.

SUPPORT RELATED ITEMS

1 PROVIDE SUPPLEMENTARY (MISCELLANEOUS) PRIME PAINTED STEEL FOR SUPPORT, SWAY BRACING, CROSS-BRACING, AND ANCHORAGE OF PIPING, DUCTWORK, ASSOCIATED EQUIPMENT AND ANCILLARIES, IN ACCORDANCE WITH REQUIREMENTS OF THE CONTRACT DOCUMENTS, IN ORDER TO MEET SITE SEISMIC AND SYSTEM SPECIFIC INSTALLATION AND OPERATING CONDITIONS. COORDINATE SUPPLEMENTARY (MISCELLANEOUS) STEEL WITH PRIMARY (BUILDING OR TRESTLE) STRUCTURAL STEEL WORK
2 SUPPORT, BRACE, CROSS-BRACE, GUIDE AND ANCHOR AS REQUIRED SO TO IMPOSE NO PIPE/DUCT/EQUIPMENT LOAD OR MOMENT ON ANY EQUIPMENT FLANGE OR FLEXIBLE CONNECTION. DAMPEN SYSTEM TO CONTROL AND LIMIT SYSTEM AND STRUCTURE MOTION AS A RESULT OF REACTION FORCES GENERATED BY SYSTEM FLUID/AIR FLOW, INCLUDING PURGING, TESTING AND OPERATION
3 DO NOT WELD TO, CUT OR DRILL BUILDING STEEL
4 DO NOT WELD SUPPLEMENTARY (MISCELLANEOUS) STEEL TO BUILDING STEEL WITHOUT PRIOR WRITTEN APPROVAL OF PROPOSED DETAIL BY THE DESIGNING STRUCTURAL ENGINEER. WELDING TO SUPPLEMENTARY STEEL IS PERMITTED
5 USE APPROVED BEAM CLAMPS. C-CLAMPS ARE PROHIBITED
6 DO NOT HANG SUPPORTS FROM TOP CHORD OF JOIST AND JOIST GIRDER
7 CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT, PIPING AND DUCTWORK SUPPORTED BY LONG SPAN AND CAMBERED STEEL, CONFIRMING THAT EXPANSION COMPENSATION IS ADEQUATE

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DRAWN BY: S.K. DESIGNED BY: N.H.
CHECKED BY: N.H. APPROVED BY: J.F.
DATE: 06/17/2022
JOB No.: 2000677

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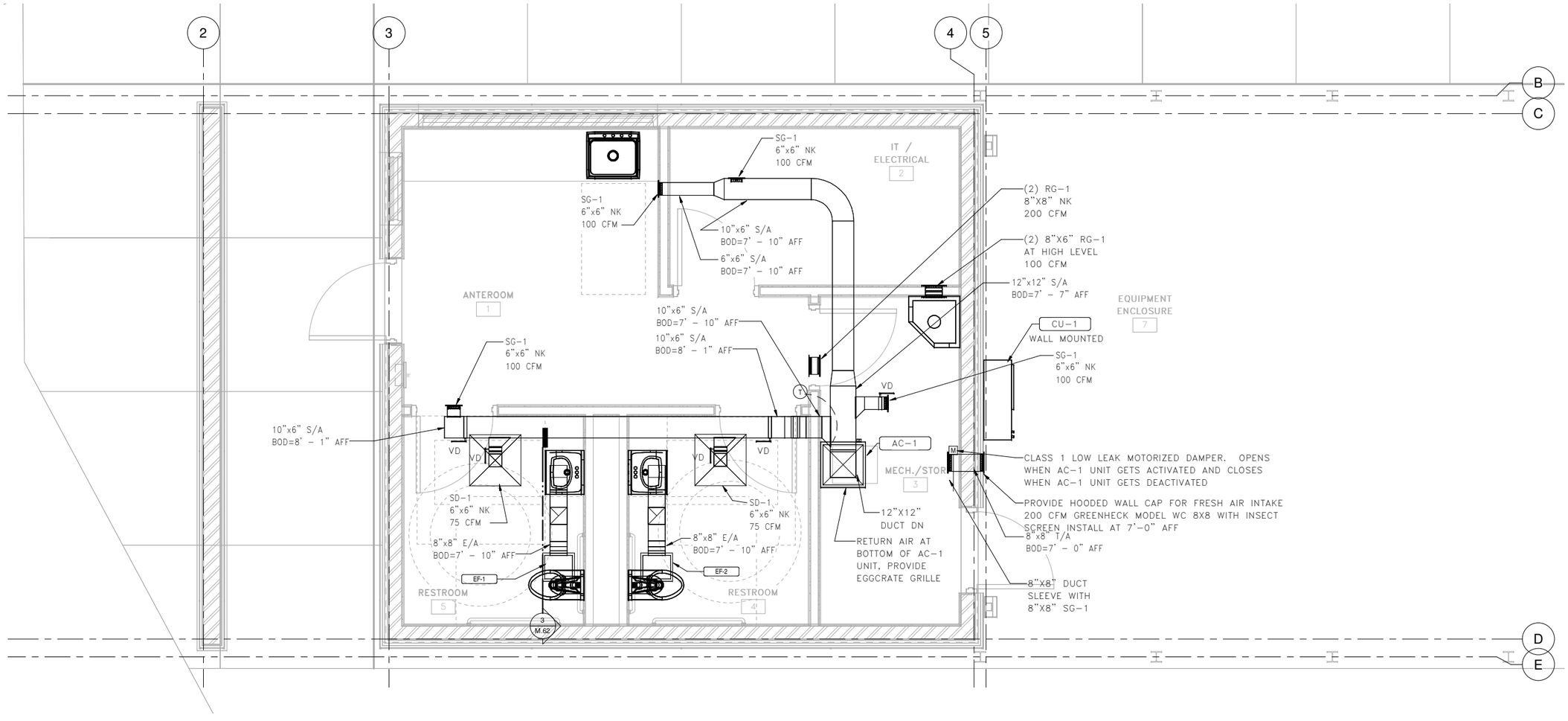
SHEET TITLE
MECHANICAL
GENERAL NOTES

DRAWING: M.03



1 FIRST FLOOR PLAN - HVAC

SCALE: 1/2" = 1'-0"

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SCALE: 1/2" = 1'-0"

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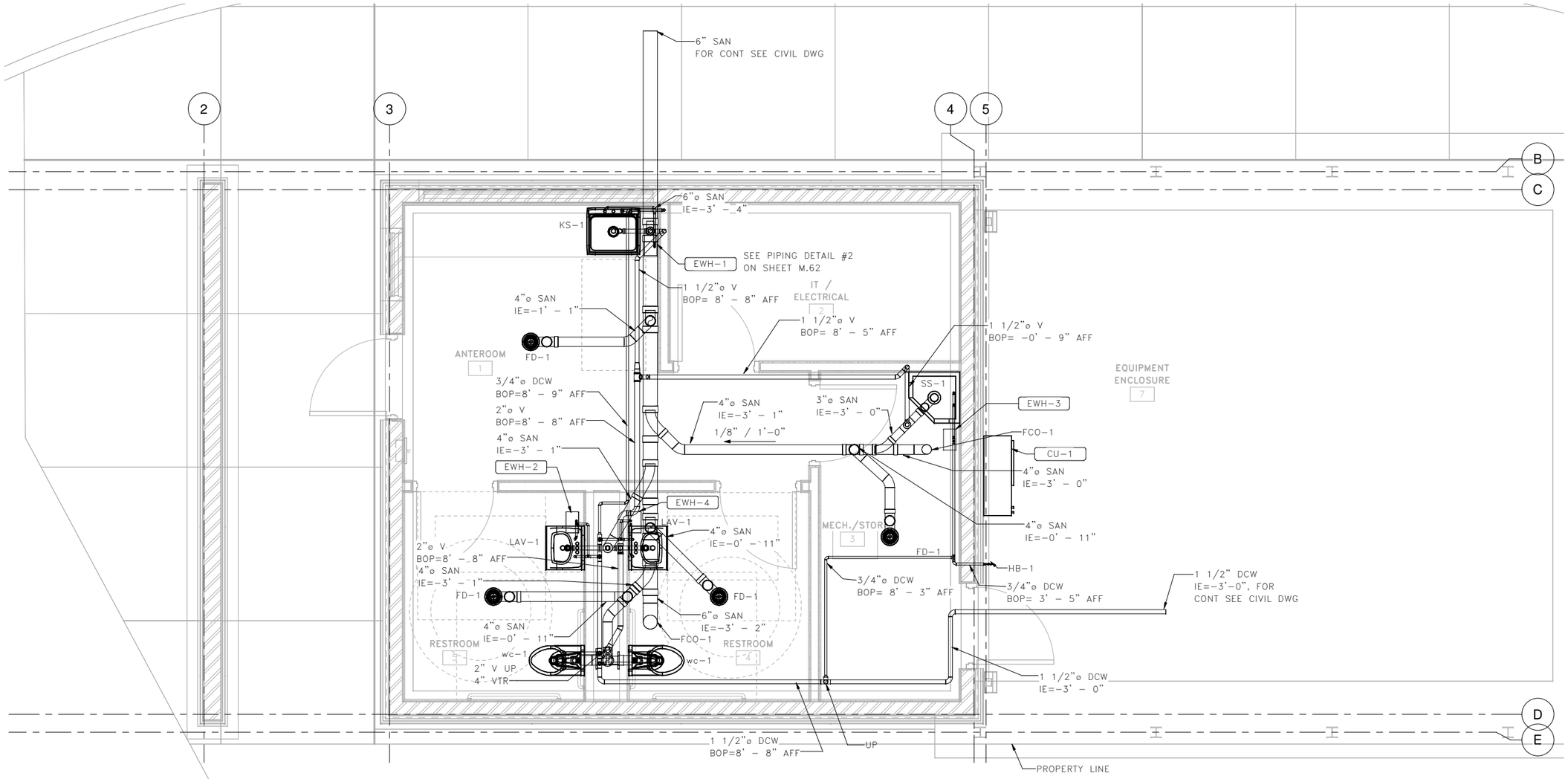
SHEET TITLE
MECHANICAL
1ST FLOOR PLAN - HVAC

DRAWING: M.21

SHEET: 80 OF 97



1 FIRST FLOOR PLAN - PIPING

SCALE: 1/2" = 1'-0"

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SCALE: 1/2" = 1'-0"

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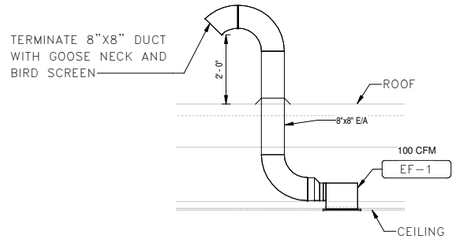
SHEET TITLE
MECHANICAL
1ST FLOOR PLAN - PIPING

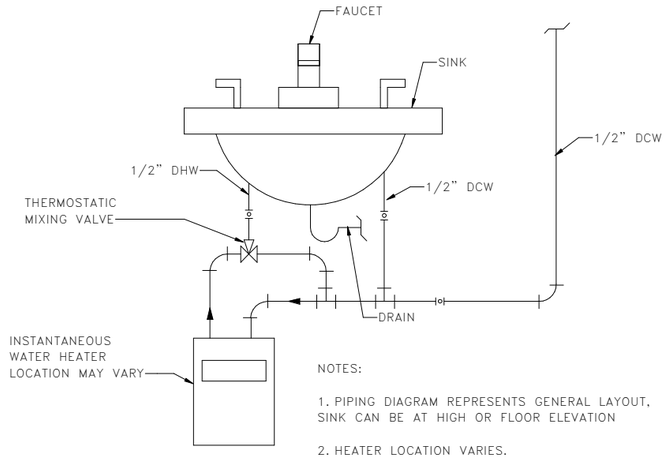
DRAWING: M.22

SHEET: 81 OF 97



3 SECTION LOOKING NORTH AT EF-1

NTS



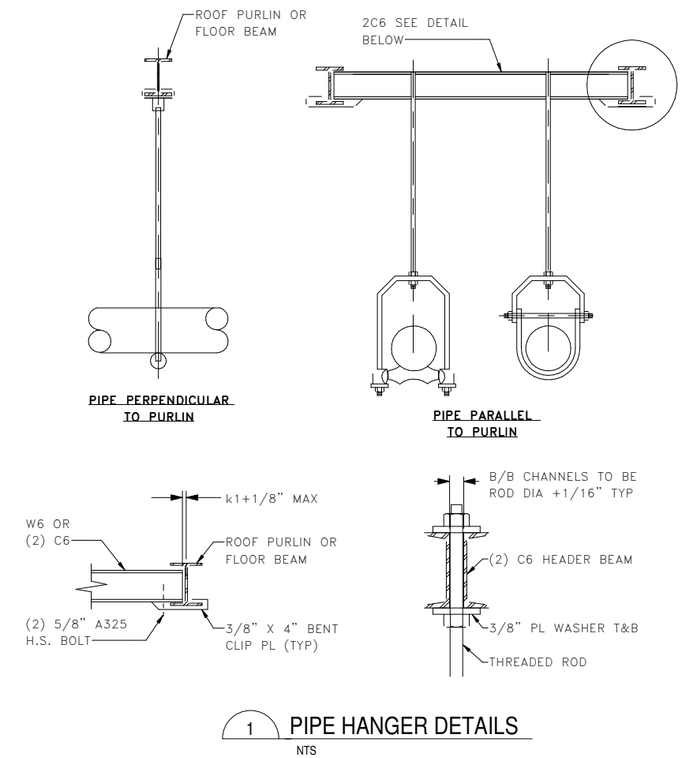
NOTES:

1. PIPING DIAGRAM REPRESENTS GENERAL LAYOUT, SINK CAN BE AT HIGH OR FLOOR ELEVATION

2. HEATER LOCATION VARIES.

2 INSTANTANEOUS WATER HEATER PIPING DIAGRAM (EWH)

NTS



1 PIPE HANGER DETAILS

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SHEET TITLE: MECHANICAL DETAILS

DRAWING: M.62

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	USE	MIN. CW (IN)	MIN HW (IN)	MIN W/SAN (IN)	MIN V (IN)	SPECIFICATION OPTIONS
CO	CLEANOUT	OUTSIDE THE BUILDING	--	--	SEE PLAN	--	ZURN ZN1400, SIZE SAME AS PLAN PIPE SIZE, MATERIAL SAME AS PIPE MATERIAL. ADJUSTABLE, POLISHED BRONZE COVER, BRASS CLOSURE PLUG.
FCO-1	FLOOR CLEANOUT	GENERAL USE	--	--	SEE PLAN	--	ZURN 1400 SERIES
FD-1	FLOOR DRAIN	FOR GENERAL USE	--	--	4"	2"	SIOUX CHIEF "FINISHLINE" 5 1/2" FLOOR DRAIN: 832-350DNR WITH POLISHED NICKEL BRONZE TOP. PROVIDE WITH INTEGRAL DEEP DRUM P TRAP AND TRAP SEAL BY SURESEAL. SIZE AS INDICATED ON PLANS. PROVIDE SEAL TRAP SIMILAR TO SURE SEAL.
HB-1	HOSE BIBB	GENERAL - FREEZEPROOF	3/4"	--	--	--	FROST PROOF 1/4 TURN WITH AUTOMATIC DRAIN INTEGRAL VACUUM BREAKER AND DUAL CHECK VALVE SIMILAR TO JR SMITH 5619. LOCKABLE NUT
KS-1	SINK - KITCHEN	KITCHEN	1/2"	1/2"	1 1/2"	1-1/2"	ADA, ELKAY MODEL LRAD2521R, SINGLE BOWL, 18 GAUGE TYPE 304 STAINLESS STEEL, SELF RIMMING BOWL, 25"L X 21.25"W, 6.5" DEEP, FULLY UNDERCOATED. SINGLE HOLE ADA FAUCET. PROVIDE THERMOSTATIC MIXING VALVE. PROVIDE FOOD WASTE GRINDER INSINKERATOR EVOLUTION ESSENTIALS 120 VOLT, 3/4 HP. GOOSENECK TOUCHLESS FAUCET VANDAL RESISTANT AERATOR. ADA KOHLER MODEL K-13472 CP. 0.5 GPM, INFRARED BATTERY OPERATED.
LAV-1	LAVATORY	TOILET ROOMS - ADA	1/2"	1/2"	1-1/2"	1-1/2"	AMERICAN STANDARD "LUCERN" 0355.027 ADA COMPLIANT, WALL HUNG @ 34" AFF. WHITE, 20.5"X18". WITH TOUCHLESS FAUCET. HARD WIRED 605B.205 WITH POWER KIT PK00.HAC. OPTIONAL MIXING VALVE 605XTMV1070. CHROME STRAINER AND TRAP.
SS-1	SERVICE SINK	FLOOR MOUNTED - JANITOR CLOSET	1/2"	1/2"	3"	1-1/2"	FIAT TSBC1610 24"X24"X12" STOCKTON TERRAZZO MOP BASIN, FLOOR SET, FAUCET: CHICAGO 835-RCF VACUUM BREAKER SPOUT WITH PAIL HOOK & WALL BRACE DOME STRAINER. PROVIDE FIAT MODEL 832-AA HOSE & BRACKET, FIAT MODEL 886-CC MOP RACK & SPLASH GUARD.
WC-1	WATER CLOSET	TOILET ROOMS - ADA	1"	--	4"	2"	ADA COMPLIANT. AMERICAN STANDARD "AFWALL MILLENIUM FLOWISE 1.28GPF "MODEL 3351.101 WITH SELECTRONIC FLUSH VALVE 606B.121 WITH POWER SUPPLY & PK00.HAC OPTION

SPLIT SYSTEM AIR CONDITIONING UNIT (INDOOR) SCHEDULE

MARK	LOCATION	CFM	RATED COOLING CAPACITY (BTU/HR)	RATED HEATING CAPACITY (BTU/HR)	SEER	MOTOR HP	ELECTRICAL					CFM/SQ.FT.	SQ.FT./TON	SIZE (L X W X H)	WEIGHT (LBS)	DESIGN BASIS MFR	DESIGN BASIS MODEL NO.
							MCA (AMPS)	MOP (AMPS)	VOLT	PHASE	HZ						
AC-1	MECH ROOM	600 CFM	24000	28000	21	--	4.1	20.0	208	1	60	2.5	160	21.625" X 21" X 54.25"	141	MITSUBISHI ELECTRIC	PVA-A24AA7

SPLIT SYSTEM AIR CONDITIONING NOTES

1 DISCONNECT SWITCH BY ELECTRICAL TRADE
2 PROVIDE WITH 2" THICK REPLACEABLE BOTTOM FILTER
3 PROVIDE 7-DAY PROGRAMMABLE TAMPER PROOF THERMOSTAT
4 FURNACES, CONDENSING UNITS, AND EVAPORATOR COILS SHALL BE OF THE SAME MANUFACTURER.

SPLIT SYSTEM AIR CONDITIONING NOTES

5 INSTALL PER MANUFACTURER RECOMMENDATION
6 PROVIDE FLOOR MOUNTED SUPPORT FOR VERTICAL INSTALLATION OF THE UNIT AND ACCESS TO FILTER AT THE BOTTOM OF THE UNIT
7 RETURN AIR AT BOTTOM OF UNIT.

CONDENSING UNIT (OUTDOOR)-AIR COOLED SCHEDULE

MARK	SYSTEM SERVED	LOCATION	CAPACITY (TONS)	SEER	COMPRESSOR REFRIG. TYPE	ELECTRICAL DATA					DESIGN BASIS MFR	DESIGN BASIS MODEL NO.	OPERATING WEIGHT (LBS)	REFERENCE DRAWING NO.	REMARKS
						TOTAL (KW)	MCA	MOP	VOLT	PHASE					
CU-1	AC-1	WALL MOUNTED	2	21	R410A	4.0	19.0	26.0	208	1	MITSUBISHI ELECTRIC	PUZ-A24NHA7-BS	153	M.21	

CONDENSING UNIT AIR COOLED NOTES

1 DISCONNECT SWITCH SHALL BE BY ELECTRICAL TRADE.
2 WALL MOUNTED. INSTALL PER MANUFACTURER RECOMMENDATION.
3 PROVIDE REFRIGERANT PIPING. SIZE AND INSTALL PER MANUFACTURER RECOMMENDATION.

FAN SCHEDULE

MARK	AREA SERVED	LOCATION	TYP	CFM @ 70 °F	TOTAL ESP (IN WC)	FAN RPM	BHP	DRIVE	MOTOR						DESIGN BASIS MFR	DESIGN BASIS MODEL NO.	ROOF OPENING (IN)	OPERATING WEIGHT (LBS)
									FAN HP (MIN)	VOLT	HZ	PHASE	MOTOR ENCLOSURE	MOTOR CONTROL				
EF-1	RESTROOM 5	CEILING	CENTRIFUGAL	100 CFM	0.25	1100	0.01	DIRECT	1/30	120	60	1		CONT	GREENHECK	SP-A125	N/A	17
EF-2	RESTROOM 4	CEILING	CENTRIFUGAL	100 CFM	0.25	1100	0.01	DIRECT	1/30	120	60	1		CONT	GREENHECK	SP-A125	N/A	17

FAN NOTES

1 DISCONNECT SWITCH AND STARTER BY ELECTRICAL TRADE
2 PROVIDE SUPPORT PER MANUFACTURER'S RECOMMENDATION. PROVIDE DUCT ROOF FLASHING. COORDINATE WITH ARCHITECTURAL TRADE.
3 FAN RUNS CONTINUOUSLY

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SHEET TITLE: MECHANICAL SCHEDULES

DRAWING: M.81

DIFFUSER-REGISTERS-GRILLES SCHEDULE

MARK	TYPE	CFM	NOMINAL NECK SIZE (IN)	NOMINAL FACE SIZE	DESIGN BASIS MODEL NO.	DESIGN BASIS MFR	REFERENCE DRAWING NO.	REMARKS
RG-1	RETURN	SEE DWGS	SEE DWGS	SEE DWGS	350FL	Titus	M.21	LESS DAMPER
SD-1	SUPPLY	SEE DWGS	SEE DWGS	24"X24"	PAS	TIITUS	M.21	
SG-1	SUPPLY	SEE DWGS	SEE DWGS	SEE DWGS	300FL	TIITUS	M.21	

DIFFUSER-REGISTERS-GRILLES NOTES

1 ALUMINUM GRILLES, REGISTERS AND DIFFUSERS SHALL HAVE ETCHED AND ACRYLIC FINISH.
2 PROVIDE OPPOSED BLADE DAMPERS WITH ALL GRILLES, REGISTERS AND DIFFUSERS UNLESS OTHERWISE NOTED
3 COORDINATE FRAME STYLE WITH ARCHITECTURAL DRAWINGS

ELECTRIC WATER HEATER (INSTANTANEOUS) SCHEDULE

MARK	AREA SERVED	LOCATION	ELECTRICAL DATA			DESIGN BASIS MFR	DESIGN BASIS MODEL NO.	REF DWG NO.	REMARKS
			TOTAL (KW)	VOLT	PHASE				
EWH-1	ANTEROOM	UNDER KITCHEN SINK	8.3	208	1	EEMAX	EX8208	M.22	SEE NOTES
EWH-2	REST ROOM	UNDER LAVATORY SINK	4.1	208	1	EEMAX	EX4208	M.22	SEE NOTES
EWH-3	MECH ROOM	NEAR SERVICE SINK	8.3	208	1	EEMAX	EX8208	M.22	SEE NOTES
EWH-4	REST ROOM	UNDER LAVATORY SINK	4.1	208	1	EEMAX	EX4208	M.22	SEE NOTES

ELECTRIC WATER HEATER NOTES

1 DISCONNECT SWITCH BY ELECTRICAL TRADE
2 UNIT TO HAVE NON-FUSED DISCONNECT
3 PROVIDE THERMOSTATIC MIXING VALVE

ELECTRIC WATER HEATER NOTES

4 REFER TO DETAIL PROVIDED ON M.62
5 INSTALL UNIT IN COMPLIANCE WITH ADA REQUIREMENTS WHEN APPLICABLE

811 Know what's **below** **Call** before you dig

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SHEET TITLE: MECHANICAL SCHEDULES

DRAWING: M.82

SHEET: 84 OF 97

ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)
A	AMPERE
AC	ABOVE COUNTER
ACLG	ABOVE CEILING
ADO	AUTOMATIC DOOR OPENER
AF	AMP FRAME
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMP	AMPERE
AMPL	AMPLIFIER
ANNUN	ANNUNCIATOR
APPROX	APPROXIMATELY
AQ-STAT	AQUASTAT
ARCH	ARCHITECT, ARCHITECTURAL
AS	AMP SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAUGE
BATT	BATTERY
BD	BOARD
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
C	CONDUIT
CAB	CABINET
CAT	CATALOG
CATV	CABLE TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
COMB	COMBINATION
CMPR	COMPRESSOR
CONN	CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUATION OR CONTINUOUS
CONTR	CONTRACTOR
CONV	CONVECTOR
CP	CIRCULATING PUMP
CRT	CATHODE-RAY TUBE
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP	DOMESTIC WATER CIRCULATING PUMP
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DN	DOWN
DPR	DAMPER
DS	SAFETY DISCONNECT SWITCH
DT	DOUBLE THROW
DWG	DRAWING
EC	ELECTRICAL CONTRACTOR
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EP	ELECTRIC PNEUMATIC
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXIST	EXISTING
EXH	EXHAUST
EXP	EXPLOSION PROOF
FA	FIRE ALARM
FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL
FACP	FIRE ALARM CONTROL PANEL
FCU	FAN COIL UNIT
FIXT	FIXTURE
FLR	FLOOR
FLUOR	FLUORESCENT
FU	FUSE
FUDS	FUSED SAFETY DISCONNECT SWITCH
GA	GAUGE
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTOR
GND	GROUND
GRS	GALVANIZED RIGID STEEL (CONDUIT)
GYP BD	GYPSUM BOARD
HOA	HANDS-OFF-AUTOMATIC SWITCH
HORIZ	HORIZONTAL
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HT	HEIGHT
HTG	HEATING
HTR	HEATER
HV	HIGH VOLTAGE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
I/W	INTERLOCK WITH
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT-AMPERE
KVAR	KILOVOLT-AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATE OR LOCATION
LT	LIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
MAX	MAXIMUM
MAG.S	MAGNETIC STARTER
MC	MOMENTARY CONTACT
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MFS	MAIN FUSED DISCONNECT SWITCH
MH	MANHOLE
MIC	MICROPHONE
MIN	MINIMUM
MISC	MISCELLANEOUS
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MSP	MOTOR STARTER PANELBOARD
MSBD	MAIN SWITCHBOARD
MT	MOUNT
MT.C	EMPTY CONDUIT
MTS	MANUAL TRANSFER SWITCH
MTR	MOTOR, MOTORIZED
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
N.O.	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OH	OVERHEAD
OL	OVERLOADS
PA	PUBLIC ADDRESS
PB	PULL BOX OR PUSHBUTTON
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PF	POWER FACTOR
PH	PHASE
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PR	PAIR
PRI	PRIMARY
PROJ	PROJECTION
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE (CONDUIT)
PWR	POWER
QUAN	QUANTITY
RCPT	RECEPTACLE
REQD	REQUIRED
RM	ROOM
RSC	RIGID STEEL CONDUIT
RTU	ROOF TOP UNIT
SC	SURFACE CONDUIT
SEC	SECONDARY
SHT	SHEET
SIM	SIMILAR
S/N	SOLID NEUTRAL
SPEC	SPECIFICATION
SPKR	SPEAKER
SP	SPARE
SR	SURFACE RACEWAY
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
S/S	STOP/START PUSHBUTTONS
STA	STATION
STD	STANDARD
SURF	SURFACE MOUNTED
SW	SWITCH
SWBD	SWITCHBOARD
SYM	SYMMETRICAL
SYS	SYSTEM
TEL	TELEPHONE
TEL/DATA	TELEPHONE/DATA
TERM	TERMINAL
TL	TWIST LOCK
TR	TAMPER RESISTANT
T-STAT	THERMOSTAT
TTC	TELEPHONE TERMINAL CABINET
TV	TELEVISION
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UT	UNDERGROUND TELEPHONE
UTIL	UTILITY
UV	ULTRAVIOLET
V	VOLT
VA	VOLT-AMPERES
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATT
W/	WITH
WG	WIRE GUARD
WH	WATER HEATER
W/O	WITHOUT
WP	WEATHERPROOF
XFMR	TRANSFORMER
XFR	TRANSFER

∠	ANGLE
@	AT
▲	DELTA
'	FEET
"	INCHES
#	NUMBER
Ø	PHASE
C	CENTER LINE
P	PLATE

ELECTRICAL SHEET INDEX

ELECTRICAL SYMBOL NOTES

D3 / 1d — THE LIGHTING FIXTURE TYPE IS INDICATED BY AN UPPER CASE LETTER. THE CIRCUIT DESIGNATION IS INDICATED BY A NUMBER. THE SWITCH DESIGNATION IS INDICATED BY A LOWER CASE LETTER.

EXAMPLE 1: LIGHTING FIXTURE TYPE "A" IS CONNECTED TO CIRCUIT 12 AND CONTROLLED BY SWITCH "b".

D6D/I / 2ab — EXAMPLE 2: THE FIXTURE TYPE SHOWN AS A NUMERATOR INDICATES ALL LIGHTING FIXTURES IN THE ROOM OR SPACE ARE THE SAME TYPE. THE CIRCUIT NUMBER AND SWITCH DESIGNATION SHOWN AS A DENOMINATOR INDICATES ALL LIGHTING FIXTURES IN THE ROOM OR SPACE ARE CONNECTED TO THE SAME CIRCUIT, CONTROLLED BY THE SAME SWITCHES, CENTER/OUTBOARD MULTILEVEL SWITCHING.

E1 / 1 — EXIT LIGHTS. STEM INDICATES WALL MOUNTING. NO STEM INDICATES CEILING MOUNTING. SHADED AREA INDICATES ILLUMINATED FACE(S). ARROW INDICATES DIRECTIONAL ARROW ON ILLUMINATED FACE(S). THE CIRCUIT DESIGNATION IS INDICATED BY A NUMBER. EXAMPLE: THE WALL MOUNTED EXIT LIGHT TYPE "E1" WITH SINGLE FACE AND DIRECTIONAL ARROW IS CONNECTED TO CIRCUIT 14.

<unnamed>d — DEVICES. THE CIRCUIT DESIGNATION IS INDICATED BY A NUMBER. THE SWITCH DESIGNATION IS INDICATED BY A LOWER CASE LETTER. EXAMPLE: SPLIT DUPLEX RECEPTACLE IS CONNECTED TO CIRCUIT 16 AND ONE RECEPTACLE OUTLET IS CONTROLLED BY SWITCH "c".

d — THE CONTROL DEVICE DESIGNATION IS INDICATED BY A LOWER CASE LETTER. EXAMPLE: SINGLE POLE SWITCH "d" TO CONTROL LIGHTING FIXTURES INDICATED BY "d".

D / ab — WALL BOX DIMMER WITH SIZE AS INDICATED AT DEVICE. EXAMPLE: 600 WATT WALL BOX DIMMER TO CONTROL LIGHTING FIXTURES INDICATED BY "e". SEE SPECIFICATIONS FOR WATTAGE IF NOT INDICATED.

<unnamed> — SPECIAL CONNECTIONS. THE EQUIPMENT IS INDICATED BY A NUMBER IN A CIRCLE. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE LOAD DESCRIPTION AND TYPE OF CONNECTION. THE CIRCUIT DESIGNATION IS INDICATED BY NUMBER(S) ADJACENT TO THE SYMBOL. EXAMPLE: EQUIPMENT NO. 1; 3 PHASE CONNECTION TO CIRCUITS 1, 3, 5.

PANELBOARDS. PANELBOARD DOORS MAY BE SHOWN TO INDICATE OPENING SIDE OF RECESSED PANELBOARDS. SEE PANELBOARD IDENTIFICATION FOR DESIGNATION CODES.

FLOOR CLEARANCE AREA

MOTOR CONNECTIONS. THE MOTOR IS INDICATED BY A NUMBER WITHIN OR CHARACTERS ADJACENT TO THE MOTOR SYMBOL. SEE THE MOTOR AND EQUIPMENT SCHEDULE FOR THE MOTOR DESCRIPTION AND ELECTRICAL REQUIREMENTS.

T1 — TRANSFORMERS. THE TRANSFORMER TYPE IS INDICATED BY A NUMBER FOLLOWING THE UPPER CASE LETTER "T". SEE THE TRANSFORMER SCHEDULE OR THE SINGLE LINE DIAGRAM FOR THE TRANSFORMER DESCRIPTION AND REQUIREMENTS. EXAMPLE: TRANSFORMER TYPE "T1".

CONDUIT IN CEILING, FLOOR OR WALL AS REQUIRED BY FIELD CONDITIONS

#12 — CONDUIT SHOWN WITHOUT SLASH MARKS SHALL CONTAIN 2 # 12 CONDUCTORS IN 3/4" CONDUIT UNLESS SPECIFIC EQUIPMENT REQUIRES A DIFFERENT SIZE.

#10 — CONDUIT SHOWN SHALL CONTAIN 1 # 10 CONDUCTOR PER PHASE IN 3/4" CONDUIT UNLESS A CONDUCTOR AND CONDUIT SIZE IS SHOWN ADJACENT.

LP4N-102 / 1, 3, 5 — HOME RUN TO BRANCH CIRCUIT PANELBOARD. THE PANELBOARD DESIGNATION IS SHOWN ADJACENT TO THE HOME RUN ARROW AS A NUMERATOR AND THE CIRCUIT DESIGNATION IS SHOWN AS THE DENOMINATOR. CIRCUIT BREAKER SIZES (AMPS/NUMBER OF POLES) ARE SHOWN IN THE PANELBOARD SCHEDULE WITH THE CORRESPONDING PANELBOARD AND CIRCUIT DESIGNATION. EXAMPLE: HOME RUN TO PANELBOARD LP4N-102; CIRCUITS 1, 3, 5.

GRAPHICAL REPRESENTATION OF PHASING, TYPICAL FOR ALL SYMBOLS.

EXISTING TO REMAIN

EXISTING TO BE REMOVED

NEW

ITEM TO BE REMOVED

AREA NOT IN CONTRACT

REVISION NUMBER - SHOWN ON PLANS

— NUMBER OF DETAIL ON SHEET
— NUMBER OF SHEET WHERE DETAIL APPEARS

1 — KEYED NOTE (SEE SCHEDULE)

GENERAL ELECTRICAL NOTES

A. ALL CONDUCTORS OPERATING AT 50 VOLTS OR GREATER SHALL BE IN RACEWAY. ALL RACEWAY WITHIN THE STRUCTURE AND FLOOR SLAB SHALL BE METAL. UNDERGROUND RACEWAY OUTSIDE THE STRUCTURE SHALL BE PVC.

B. ALL LOW VOLTAGE CABLES OR CONDUCTORS OPERATING AT LESS THAN 50 VOLTS SHALL BE IN METAL RACEWAY WHERE INSTALLED WITHIN WALLS OR INACCESSIBLE SPACES. LOW VOLTAGE CABLES MAY BE RUN IN CABLE TRAY WHERE NOTED. LOW VOLTAGE CABLES MAY BE RUN IN CABLE SUPPORT HOOKS ABOVE ACCESSIBLE CEILINGS WHERE NOTED.

C. ALL LOW VOLTAGE CABLES OR CONDUCTORS OPERATING AT LESS THAN 50 VOLTS SHALL BE IN METAL RACEWAY. LOW VOLTAGE CABLES MAY BE RUN IN CABLE TRAY WHERE NOTED.

D. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND DETAILS. ARCHITECTURAL ELEVATIONS AND DETAILS TAKE PRECEDENCE OVER LOCATIONS SHOWN ON ELECTRICAL DRAWINGS. SEE ARCHITECTURAL ELEVATIONS FOR LOCATIONS OF ELECTRICAL DEVICES AT PATIENT BED HEADWALLS.

E. VERIFY LOCATIONS AND ROUGH-IN REQUIREMENTS OF ALL OWNER FURNISHED EQUIPMENT PRIOR TO ROUGH-IN.

F. CONDUIT AND WIRE SHALL NOT BE INSTALLED BELOW FLOOR SLAB UNLESS INDICATED ON PLAN BY DASHED CONDUIT.

G. CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN ON DRAWINGS EXCEPT FOR ITEMS LISTED IN NOTE G.

H. FURNISH AND INSTALL CONDUIT FROM BACK BOXES FOR THE FOLLOWING DEVICES INTO THE ACCESSIBLE CEILING SPACE IN THE CORRIDOR, UNLESS NOTED OTHERWISE:

3/4"C	TELEPHONE OUTLETS
3/4"C	INFORMATION OUTLETS
3/4"C	FIRE ALARM DEVICES

SPECIFIC CODE NOTES

FIRE PROTECTION REQUIREMENTS

A. PENETRATIONS IN WALLS REQUIRING PROTECTED OPENINGS MUST BE FIRESTOPPED WITH AN APPROVED MATERIAL.

1. CONDUITS MAY PENETRATE WALLS OR PARTITIONS, PROVIDED THEY ARE FIRE-STOPPED.
2. OPENINGS FOR STEEL ELECTRICAL BOXES NOT EXCEEDING 16 SQUARE INCHES ARE PERMITTED PROVIDED OPENINGS DO NOT AGGREGATE MORE THAN 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL OR PARTITION.
3. OUTLET BOXES ON OPPOSITE SIDES OF WALLS OR PARTITIONS MUST BE SEPARATED BY A HORIZONTAL DISTANCE OF 24 INCHES.

B. LIGHT FIXTURES AND OTHER APPARATUS SUPPORTED BY THE ACOUSTICAL CEILING GRID MUST MEET THE REQUIREMENTS OF NEC SECTION 410.16, MEANS OF SUPPORT.

C. RECESSED LIGHTING FIXTURES INSTALLED IN FIRE RATED CEILING ASSEMBLIES SHALL BE FIRE RATED FIXTURES BEARING THE UL FIRE RATED LABEL. FIXTURES SHALL BE INSTALLED IN ACCORDANCE WITH THE UL FIRE RESISTANCE DIRECTORY, AND SHALL INCLUDE A FIRE RATED ENCLOSURE INSTALLED OVER THE FIXTURE THAT MEETS THE REQUIREMENTS OF THE UL FIRE RESISTANCE DIRECTORY.

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SHEET TITLE: ELECTRICAL GENERAL NOTES & ABBREVIATIONS

DRAWING: E.01

ELECTRICAL SYMBOL LEGEND

SYMBOL	DESCRIPTION
	SURFACE LIGHT (TYPE DENOTED)
	WALL MOUNTED FLOODLIGHT (TYPE DENOTED)
	RECESSED LIGHT (TYPE DENOTED)
	POLE MOUNTED LIGHT (TYPE DENOTED)
	LIGHT COLUMN FIXTURE
	SURFACE LINEAR LIGHT (TYPE DENOTED)
	SUSPENDED OR PENDANT LIGHT (TYPE DENOTED)
	RECESSED LINEAR LIGHT (TYPE DENOTED)
	STRIP LIGHT (TYPE DENOTED)
	TRACK AND TRACK LIGHT (TYPES DENOTED)
	EMERGENCY BATTERY LIGHT (TYPE DENOTED)
	EXIT SIGN (TYPE DENOTED)
	LIGHT FIXTURE ON (EM) LIFE SAFETY BRANCH
	LIGHT FIXTURE ON (EM) CRITICAL BRANCH
	LIGHT ON CORD REEL (TYPE DENOTED)
	LIGHTING CHANNEL WIRE (TYPE DENOTED)
S	SINGLE POLE SW.
S^2	2 POLE SINGLE THROW SW.
S^3	3-WAY SW.
S^4	4-WAY SW.
S^K	KEYED SW.
S	SW. W/PILOT
S^D	DIMMER SWITCH
S^{OS}	OCCUPANCY SENSOR SWITCH
S^{MC}	MOMENTARY CONTACT SWITCH
S^T	TIMER SWITCH
S^{TD}	TIME DELAY SWITCH
	PUSH BUTTON
	SINGLE RECEPT.
	DUPLEX RECEPT.
	SPLIT DUPLEX RECEPT.
	ISOLATED GROUND RECEPT (DUPLEX SHOWN)
	RECEPT ON EMERGENCY CKT (DUPLEX SHOWN)
	FOURPLEX RECEPT.
	FOURPLEX RECEPTACLE ON EMERGENCY CIRCUIT
	240 VOLT RECEPT.
	FLOOR RECEPT. (DUPLEX SHOWN)
	RECEPT ON DROP CORD (DUPLEX SHOWN)
	RECEPT ON CORD REEL (DUPLEX SHOWN)

SYMBOL	DESCRIPTION
	MULTIOUTLET ASSEMBLY (TYPE DENOTED)
	CLOCK (TYPE DENOTED)
P	POWER POLE (OPEN OFFICE STYLE)
	SURGERY SERVICE COLUMN
	STATIC GROUND RECEPTACLE (TYPE DENOTED)
	LIGHTNING PROTECTION AIR TERMINAL
	LIGHTNING PROTECTION CONDUCTOR SPLICE
	GROUND ROD (PLAN VIEW)
P	UTILITY SERVICE POWER POLE (SITE) SPECIAL RECEPT. OR CONN. (SEE SCHEDULE)
J	JUNCTION BOX
PB	PULL BOX
	CIRCUIT BREAKER PANEL
	POWER OR DISTRIBUTION PANEL
	TRANSFORMER (TYPE DENOTED)
	MOTOR (SEE SCHEDULE)
M	COMB. MOTOR STARTER (FUSED)
	SAFETY DISC. SW. (NON-FUSED)
	SAFETY DISC. SW. (FUSED)
	BUS DUCT WITH PLUG IN DISCONNECT (FUSED)
R	RELAY
	ENCLOSED CIRCUIT BREAKER
	PRESSURE SWITCH
	FLOAT SWITCH
	OCCUPANCY SENSOR - TYPE DENOTED
	LIGHT LEVEL SENSOR - TYPE DENOTED
PC	PHOTOCELL
TC	TIME CONTROL SWITCH (TIME SWITCH)
H	HUMIDISTAT
T	THERMOSTAT
	SOLENOID VALVE
	HALFTONE SYMBOL INDICATES EXISTING
	DASHED SYMBOL INDICATES REMOVED

SYMBOL	DESCRIPTION
	TELEPHONE OUTLET (TYPE DENOTED)
W	WALL TELEPHONE OUTLET (TYPE DENOTED)
	INFORMATION OUTLET (TYPE DENOTED)
	WIRELESS ACCESS POINT
	TELEVISION OUTLET
	BELL
	BUZZER
	CHIME
D	DOOR SIGNAL - APT. UNIT
SP	SPEAKER (WALL OR CEILING MT.)
SP	HORN TYPE SPEAKER
V	VOLUME CONTROL
MC	MICROPHONE OUTLET
	ANTENNA
F	FIRE ALARM HORN W/STROBE (CANDELAS)
F	FIRE ALARM BELL
F	FIRE ALARM BELL W/STROBE (CANDELAS)
F	FIRE ALARM CHIME W/STROBE (CANDELAS)
F	FIRE ALARM STROBE (CANDELAS)
FS	FIRE ALARM SPEAKER W/STROBE (CANDELAS)
	FIRE ALARM REMOTE ANNUNCIATOR
2	SMOKE DETECTOR (TYPE DENOTED)
	HEAT DETECTOR (TYPE & TEMP DENOTED)
	LINEAR HEAT DETECTOR
	DUCT SMOKE DETECTOR (TYPE DENOTED)
	REMOTE TEST/STATUS STATION
	FLAME DETECTOR (TYPE DENOTED)
	GAS DETECTOR (TYPE DENOTED)
F	F.A. PULLSTATION (TYPE DENOTED)
Z	F.A. ZONE ADDRESSABLE MODULE
I	F.A. INDIVIDUAL ADDRESSABLE MODULE
	F.A. DOOR HOLDER
	F.A. DOOR CLOSER
FR	FIRE ALARM SHUT DOWN RELAY
	SPRINKLER FLOW SWITCH
	SPRINKLER VALVE TAMPER SWITCH
	SPRINKLER LEVEL SWITCH
	SPRINKLER PRESSURE SWITCH
	SPRINKLER TEMPERATURE SWITCH
	END OF LINE RESISTOR

SYMBOL	DESCRIPTION
ES	ELECTRIC STRIKE
ML	MAGNETIC LOCK
CL	COMBINATION LOCK
DC	DOOR CONTACTS
CR	CARD READER
	KEYPAD
MD	MOTION DETECTOR (TYPE DENOTED)
E	NURSE CALL EMERG. STATION
B	NURSE CALL CODE BLUE EMERG. STATION
D	NURSE CALL DUTY STATION
S	NURSE CALL STAFF STATION
E^2	NURSE CALL SINGLE PATIENT STATION
E^2	NURSE CALL DUAL PATIENT STATION
DL^1	NURSE CALL DOME LIGHT (2 LAMP)
C	COMMUNICATIONS HANDHOLE
L	LIGHTING HANDHOLE
P	POWER HANDHOLE

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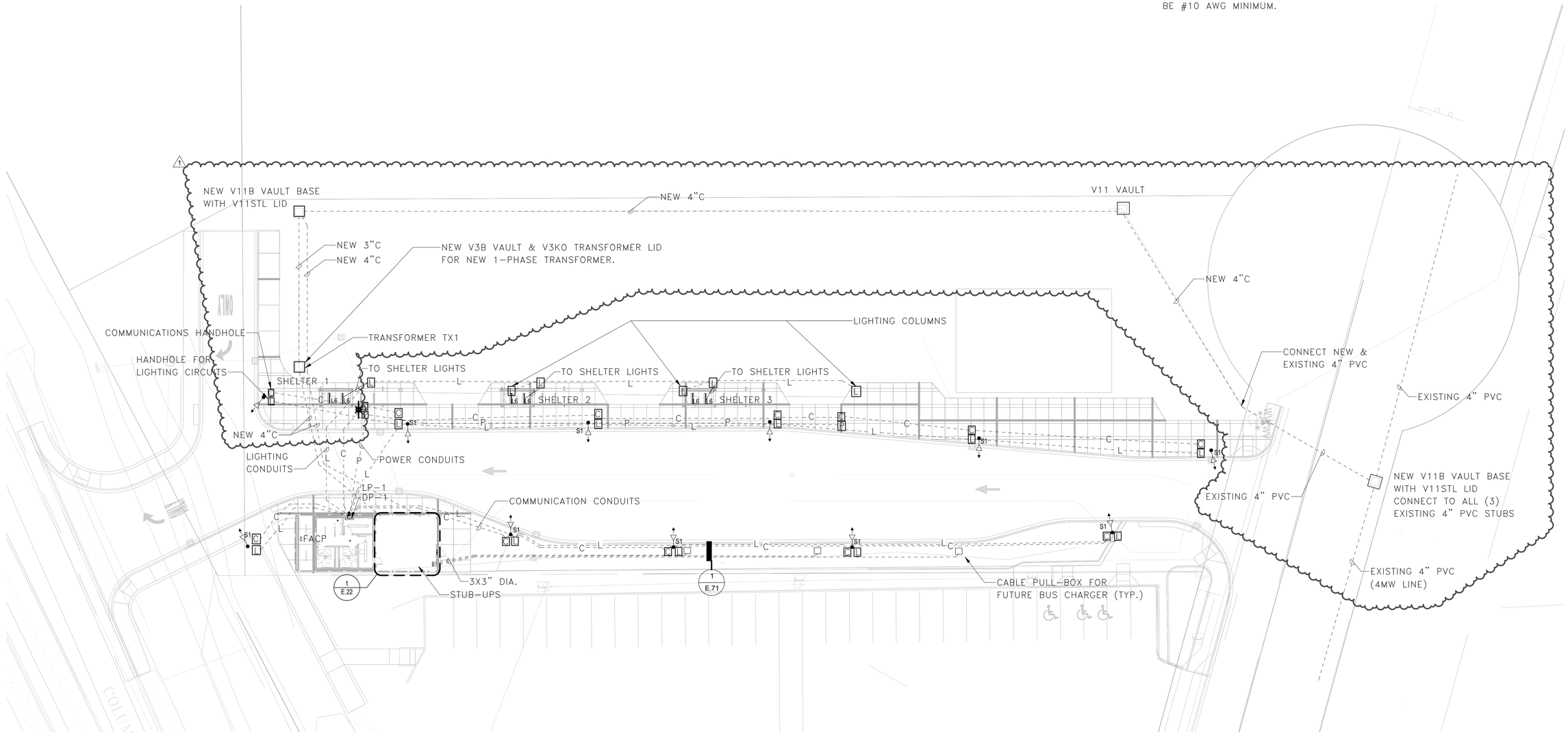
SHEET TITLE: ELECTRICAL SYMBOLS AND LEGEND

DRAWING: E.02

SITE PLAN GENERAL NOTES

1. ALL LIGHTING AND POWER CONDUCTORS SHALL BE INSTALLED BETWEEN 24" (MINIMUM) AND 36" (MAXIMUM) BELOW FINISHED GRADE.
2. ALL COMMUNICATIONS CONDUIT AND CABLES SHALL BE INSTALLED 36" (MINIMUM) BELOW FINISHED GRADE.
3. ALL CONDUCTORS FOR EXTERIOR LIGHTING AND POWER CIRCUITS SHALL BE #10 AWG MINIMUM.



1 E.11 ELECTRICAL SITE PLAN
Scale: 1" = 20'-0"

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SHEET TITLE
ELECTRICAL SITE PLAN

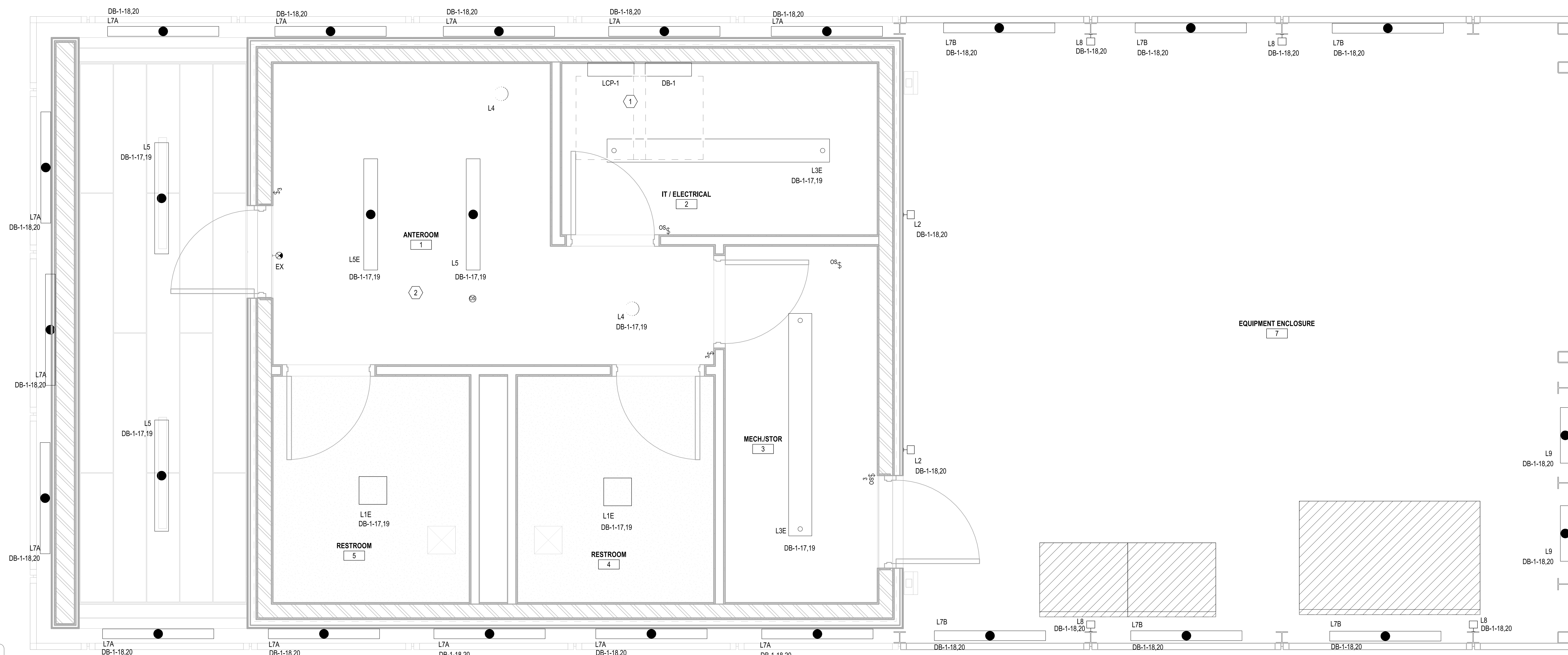
DRAWING: E.11

KEYNOTES

1. EXTEND LIGHTING CONTROL WIRING AND CONDUIT FROM THE LIGHTING CONTROL PUSHBUTTON STATION TO PARKING LIGHTING.
2. FURNISH AND INSTALL OCCUPANCY SENSORS ON CEILING TO AUTOMATICALLY CONTROL THE NORMAL LIGHTING IN THIS ENCLOSURE SEGMENT, AS INDICATED.

LIGHTING GENERAL NOTES

1. REFER TO SHEET E.01 FOR ELECTRICAL ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO SHEET E.02 FOR SYMBOL LIST.
3. REFER TO SHEET E.21 FOR LIGHTING FIXTURE SCHEDULE AND LIGHTING CONTROL SYSTEM.
4. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN AND/OR ROOM FINISH SCHEDULE AND VERIFY LIGHT FIXTURE TYPE FOR THE CEILING CONSTRUCTION PRIOR TO ORDERING THE FIXTURES. PROVIDE FIXTURES THAT ARE COMPATIBLE WITH THE CEILING SYSTEM.
5. CONTRACTOR SHALL PROVIDE A "HOT" WIRE TIED AHEAD OF LOCAL SWITCHING AND THE LIGHTING CONTROL PANEL RELAYS FOR THE LEADS TO EMERGENCY UL924 RELAYS AND EXIT LIGHTS.
6. OCCUPANCY CONTROLS SHALL BE WIRED SUCH THAT ALL GENERAL ROOM LIGHTING IS CONTROLLED.
7. PROVIDE A DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT.
8. IN GENERAL, DEVICES AT LOWER HEIGHTS SHALL BE STACKED DIRECTLY BELOW DEVICES AT HIGHER ELEVATIONS. PROVIDE CONDUIT OFFSET IF NECESSARY.



1 E.21 LIGHTING PLAN 1/2" = 1'-0"

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BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

SHEET TITLE
ELECTRICAL LIGHTING PLAN

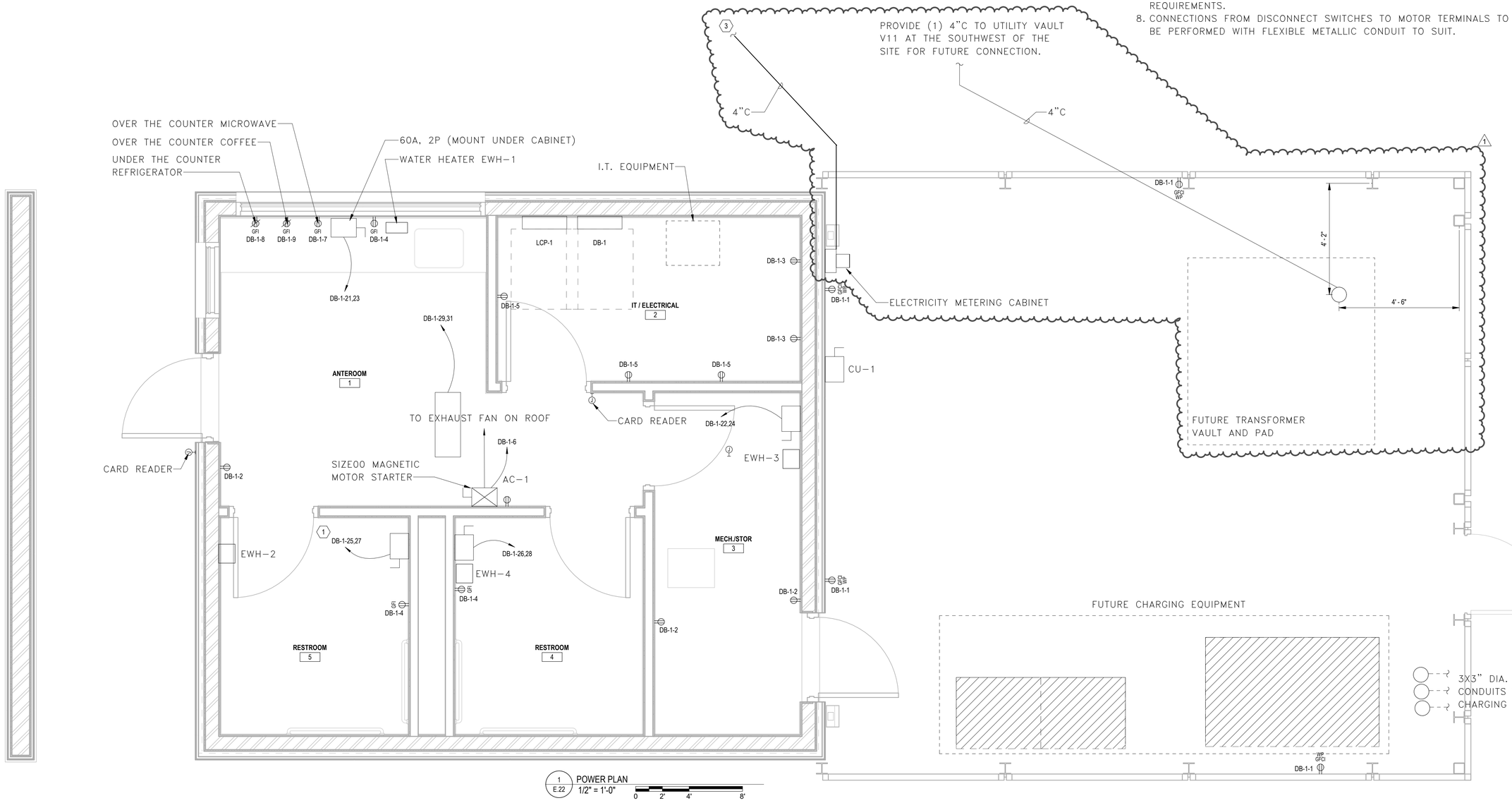
DRAWING:
E.21

KEYNOTES

1. INTERLOCK EF-1 STARTER WITH TOILET ROOM OCCUPANCY SENSOR.
2. PROVIDE EXOTHERMIC WELD CONNECTIONS.
3. ELECTRICAL SERVICES BY OTHERS. EXACT POINT OF CONNECTION TO BE COORDINATED ON SITE.

POWER GENERAL NOTES

1. REFER TO SHEET E.01 FOR ELECTRICAL ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO SHEET E.02 FOR SYMBOL LIST.
3. REFER TO SHEET E.81 FOR ELECTRICAL ONE-LINE DIAGRAM(S).
4. ALL JUNCTION BOXES IN WALKWAYS TO BE SPECIFIED WITH TRAFFIC RATED NON-SKIN LIDS.
5. PROVIDE GROUNDING TO PANELS AND EQUIPMENT PER NEC 250 REQUIREMENTS.
6. CONTRACTOR TO COORDINATE EXACT LOCATION OF EQUIPMENT ON SITE.
7. ARC FLASH LABELS TO BE PROVIDED ACCORDING TO NFPA-70E REQUIREMENTS.
8. CONNECTIONS FROM DISCONNECT SWITCHES TO MOTOR TERMINALS TO BE PERFORMED WITH FLEXIBLE METALLIC CONDUIT TO SUIT.



1 / E.22 POWER PLAN
1/2" = 1'-0"
0 2' 4' 8'

Know what's **below** **Call** before you dig

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NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	B.C.	E.P.	K.S.	SECOND PERMIT REVIEW

DRAWN BY: B.C. | DESIGNED BY: E.P.
CHECKED BY: E.P. | APPROVED BY: K.S.
DATE: 06/17/2022
J O B No. : 2000677
S C A L E: 1/2" = 1'-0"

PHILLIP J. CAVALERI — STATE OF WASHINGTON — REGISTERED ENGINEER — 6/17/22

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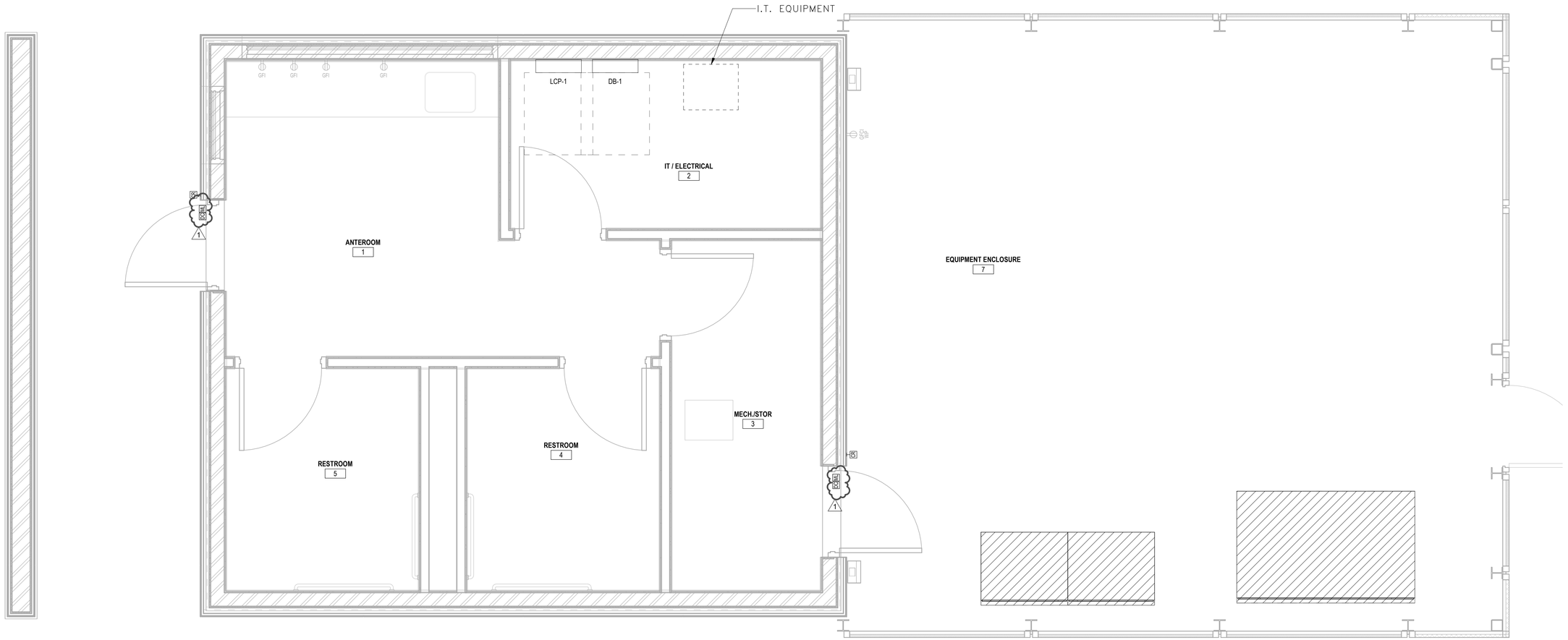
BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

SHEET TITLE
ELECTRICAL POWER PLAN

DRAWING: E.22



1 / E.23 DOOR ACCESS CONTROL PLAN
Scale: 1/2" = 1'-0"

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DATE: 06/17/2022
JOB No. : 2000677

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SCALE: 1/2" = 1'-0"

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BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

SHEET TITLE
ELECTRICAL DATA PLAN

DRAWING: E.23

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	Finish	MOUNTING	LAMP	Color Temperature (CCT)	VOLT	Watts	MFR	Model	NOTE
L1E	1' X 1' FLAT PANEL		SURFACE	LED	4000 K	240 V	29 W	LITHONIA	SWP1212-NODIM-25W-40K-277	
L2	OUTDOOR LED		WALL	LED	4000 K	240 V	26 W	LITHONIA	ARC2 LED P2 40K MVOLT	
L3E	CLX LED STRIP LIGHT 96",		SURFACE	LED	4000 K	240 V	67 W	LITHONIA	CLX_L96_10000LM_SEF_WDL_MVOLT_40K_80CRI_CRLRW96	EMERGENCY BATTERY BACKUP
L4	ROUND RECESSED LED		RECESSED	LED	4000 K	240 V	12 W	GOTHAM	EVO4CC 40/15 AR MWD LSS MVOLT	--
L5	4' STRIP LED		SURFACE	LED	4000 K	240 V	33 W	CORONET	LS2 LED-4-40-LTG1-UNV	
L5E	4' STRIP LED		SURFACE	LED	4000 K	240 V	33 W	CORONET	LS2 LED-4-40-LTG1-UNV-EM 277V	EMERGENCY BATTERY BACKUP
L6	1' X 4' RECESSED LIGHT		RECESSED	LED	4000 K	120 V	15 W	PINNACLE	EV3-WET-40-4-IND-FL-277	--
L7A	4' LED WALLWASH FIXTURE		SURFACE	LED	4000 K	240 V	26 W	AXIS	WBWLED-500-90-40-S-4-277	
L7B	4' LED WALLWASH FIXTURE		SURFACE	LED	4000 K	240 V	26 W	AXIS	WBSLED-500-90-40-S-4-277	
L8	LED FLOODLIGHT		WALL	LED	4000 K	240 V	28 W	KENALL	OLMF-p1_40K-240-DDB-HP1 7	
L9	2' LED WALLWASH FIXTURE		SURFACE	LED	4000 K	240 V	15 W	AXIS	WBSLED-500-90-40-S-2-277	
S1	20' LIGHT POLE		POLE	LED	4000 K	240 V	115 W	ANP LIGHTING	BVP2001P117LD4NT340K	HOLOPHANE ARCHITECTURAL POLE SITELINK SERIES. POLE SHALL HAVE SPERATE RACEWAYS FOR LINE AND LOW VOLTAGE WIRING.

Branch Panel: DB-1

Location: IT / ELECTRICAL 2
Supply From:
Mounting: SURFACE
Enclosure: NEMA 1

Volts: 120/240
Phases: 1
Wires: 3

A.I.C. Rating: 10,000 AMPS SYMMETRICAL
Mains Type: MAIN CB
Mains Rating: 200.0 A
MCB Rating: 200.0 A

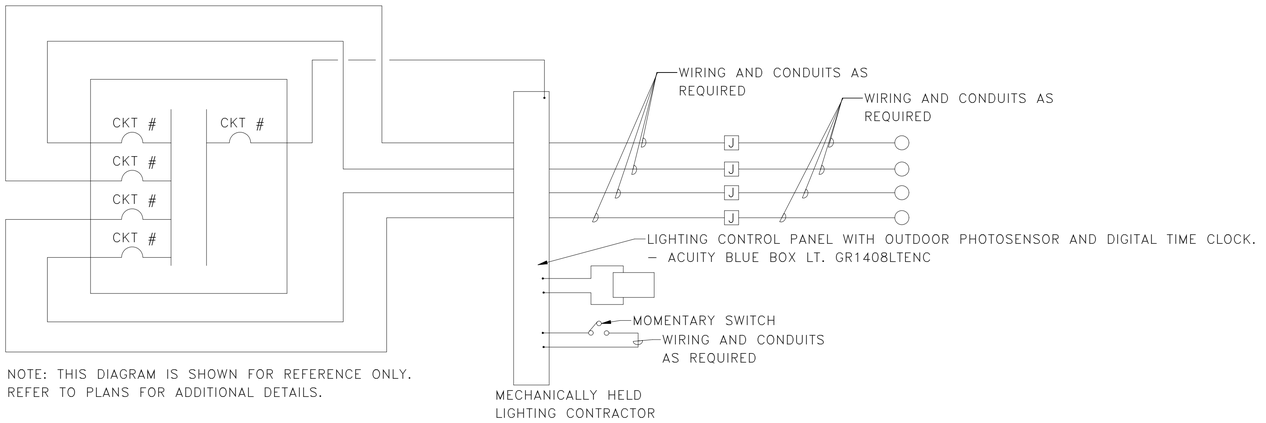
Notes:

CKT	Circuit Description	Trip	Poles	A		B		Poles	Trip	Circuit Description	CKT
DB-1-1	OUTDOOR REC	20.0 A	1	720 VA	720 VA			1	20.0 A	REC 1,3	DB-1-2
DB-1-3	REC IT EQUIPMENT	20.0 A	1			360 VA	540 VA	1	20.0 A	REC 4,5	DB-1-4
DB-1-5	REC 2	20.0 A	1	540 VA	60 VA			1	20.0 A	EF-1	DB-1-6
DB-1-7	MICROWAVE	20.0 A	1			2200 VA	600 VA	1	20.0 A	REFRIGERATOR	DB-1-8
DB-1-9	COFFEE / REC	20.0 A	1	6000 VA	0 VA			1	20.0 A	Spare	DB-1-10
DB-1-11	Spare	20.0 A	1			0 VA	0 VA	1	20.0 A	Spare	DB-1-12
DB-1-13	Spare	20.0 A	1	0 VA	0 VA			1	20.0 A	Spare	DB-1-14
DB-1-15							0 VA	1	20.0 A	Spare	DB-1-16
DB-1-17	INDOOR LIGHTS	20.0 A	2	200 VA	349 VA			2	20.0 A	OUTDOOR LIGHTS	DB-1-18
DB-1-19	--	--	--			200 VA	349 VA	--	--	--	DB-1-20
DB-1-21	EWH-1	20.0 A	2	4150 VA	4150 VA			2	20.0 A	EWH-3	DB-1-22
DB-1-23	--	--	--			4150 VA	4150 VA	--	--	--	DB-1-24
DB-1-25	EWH-2	20.0 A	2	2050 VA	2050 VA			2	20.0 A	EWH-4	DB-1-26
DB-1-27	--	--	--			2050 VA	2050 VA	--	--	--	DB-1-28
DB-1-29	AC-1	20.0 A	2	450 VA	0 VA			1	20.0 A	Spare	DB-1-30
DB-1-31	--	--	--			450 VA	0 VA	1	20.0 A	Spare	DB-1-32
DB-1-33	Spare	20.0 A	1	0 VA	0 VA			1	20.0 A	Spare	DB-1-34
DB-1-35	Spare	20.0 A	1			0 VA	0 VA	1	20.0 A	Spare	DB-1-36
DB-1-37	Spare	20.0 A	1	0 VA	0 VA			1	20.0 A	Spare	DB-1-38
DB-1-39	ACCESS CONTROL PANEL	20.0 A	1			100 VA	0 VA	1	20.0 A	Spare	DB-1-40
DB-1-41	FACP	20.0 A	1	0 VA	0 VA			1	20.0 A	Spare	DB-1-42
				Total Load:		21427 VA		17187 VA			
				Total Amps:		178.6 A		143.2 A			

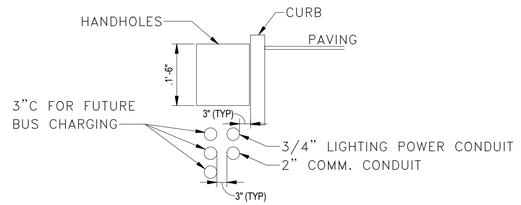
Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
Other	100 VA	100.00%	100 VA		
				Total Conn. Load:	12855 VA
				Total Est. Demand:	12284 VA
				Total Conn. Current:	53.6 A
				Total Est. Demand Current:	51.2 A

Notes:



2 E.71 TYPICAL LIGHTING CONTROL WIRING DIAGRAM
Scale: 1/16" = 1'-0"



1 E.71 CONDUIT ROUTING ELEVATION
Scale: NTS

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DATE: 06/17/2022
JOB No. : 2000677

PHILIP LINALES — STATE OF WASHINGTON — 6/17/22

SCALE: As indicated

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BEN FRANKLIN TRANSIT
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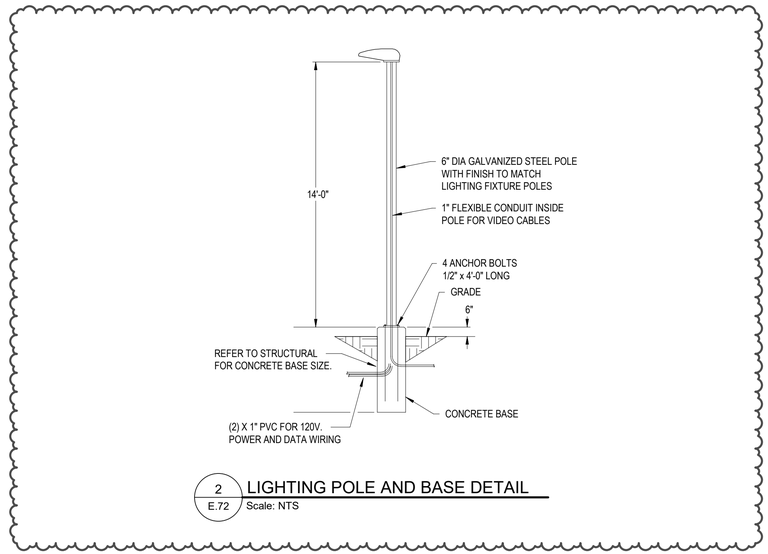
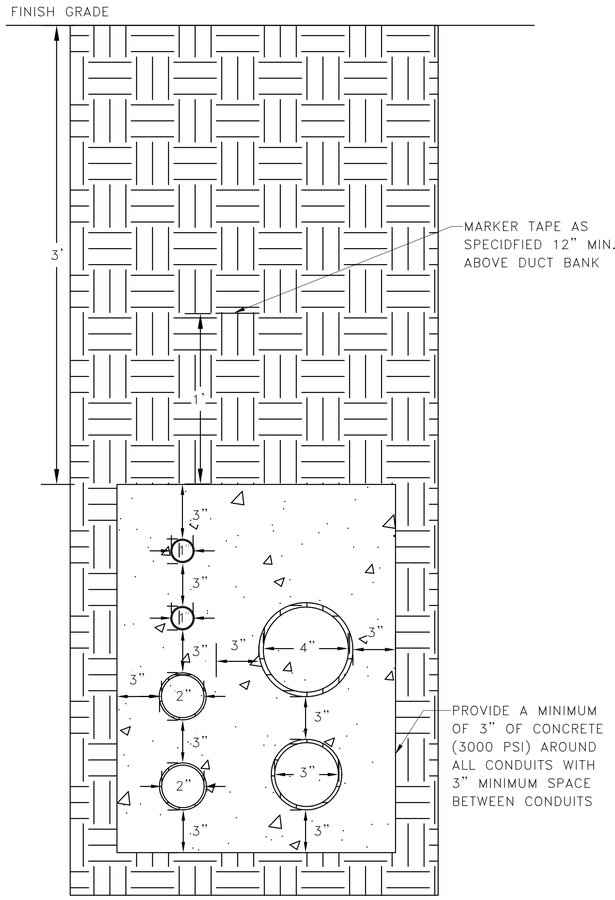
SHEET TITLE: ELECTRICAL DETAILS & SCHEDULES

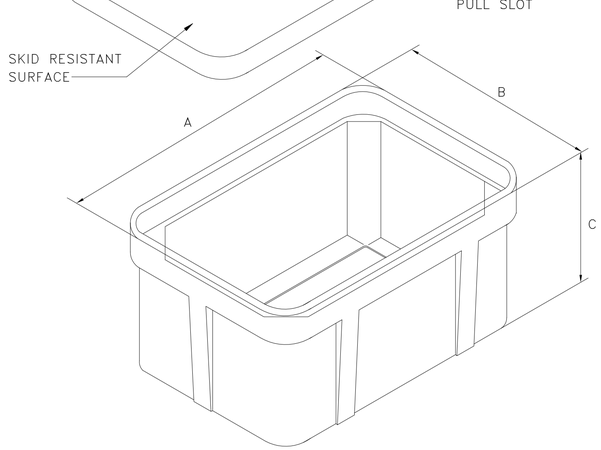
DRAWING: E.71



2 E.72 LIGHTING POLE AND BASE DETAIL
Scale: NTS



3 E.72 UTILITY DUCTBANK DETAIL
Scale: NTS



NOTES:
A. UTILITY BOX TO BE MANUFACTURED BY STRONGWELL, QUAZITE OR APPROVED EQUAL.
B. BOX TO BE CONSTRUCTED OF POLYMER CONCRETE WITH NOMINAL DIMENSIONS AS INDICATED.
C. TOP OF BOX TO BE LABELED PER TABLE (BELOW).
D. INSTALL IN GROUND PER MANUFACTURER RECOMMENDATIONS.

	A	B	C	LABEL
BUS CHARGING	24"	18"	12"	HIGH VOLTAGE
COMMUNICATION	18"	11"	12"	COMMUNICATION
POWER/LIGHTING	18"	11"	12"	POWER

1 E.72 PRECAST HANDHOLE DETAIL
Scale: 1/8" = 1'-0"

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DATE 06/17/2022
J.O.B. No. : 2000677

PHILIP LADALEE — STATE OF WASHINGTON — REGISTERED ARCHITECT — 6/17/22

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BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

SHEET TITLE
ELECTRICAL DETAILS

DRAWING: E.72
SHEET: 92 OF 97

SINGLE LINE GENERAL NOTES

A OVERCURRENT DEVICES OF ENTIRE DISTRIBUTION SYSTEM SHALL MEET STATED FAULT CURRENT VALUES WITH FULLY RATED EQUIPMENT.

B CONDUCTOR LENGTHS INDICATED ON THE SINGLE LINE DIAGRAM ARE FOR FAULT CURRENT CALCULATIONS ONLY. ACTUAL LENGTH SHALL BE DETERMINED BY FIELD CONDITIONS AND ACTUAL ROUTES OF FEEDERS.

C REFER TO DISTRIBUTION PANEL SCHEDULES FOR ADDITIONAL REQUIREMENTS. WHERE A DISCREPANCY EXISTS BETWEEN EQUIPMENT ON THE SINGLE LINE DIAGRAM AND THE DETAILED SCHEDULES, THE ITEM OR ARRANGEMENT WITH BETTER QUALITY, GREATER QUANTITY, OR HIGHER COST SHALL BE USED.

D ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.

E REFER TO THE MOTOR AND SPECIAL CONNECTION SCHEDULE FOR ALL FEEDERS DESIGNATED "EQ".

F GROUNDING ELECTRODE CONDUCTORS SIZES ARE NOT INDICATED ON THE SINGLE LINE DIAGRAM. REFER TO POWER DRAWING E.22.

CONDUIT AND WIRE SCHEDULE

FEEDER TYPE	COPPER CONDUCTORS		CONDUIT SIZE			
	Ø & N	GND	2Ø+N+GND	3Ø+GND	3Ø+N+GND	3Ø+2N+2GND
20	#12	#12	16 (1/2")	16 (1/2")	16 (1/2")	21 (3/4")
30	#10	#10	16 (1/2")	16 (1/2")	21 (3/4")	21 (3/4")
40	#8	#10	21 (3/4")	21 (3/4")	27 (1")	27 (1")
55	#6	#10	27 (1")	27 (1")	27 (1")	27 (1")
70	#4	#8	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")
85	#3	#8	35 (1 1/4")	35 (1 1/4")	35 (1 1/4")	41 (1 1/2")
95	#2	#8	35 (1 1/4")	35 (1 1/4")	41 (1 1/2")	41 (1 1/2")
110	#1	#6	41 (1 1/2")	41 (1 1/2")	41 (1 1/2")	53 (2")
150	#1/0	#6	41 (1 1/2")	41 (1 1/2")	53 (2")	53 (2")
175	#2/0	#6	53 (2")	53 (2")	53 (2")	63 (2 1/2")
200	#3/0	#6	53 (2")	53 (2")	53 (2")	63 (2 1/2")
230	#4/0	#4	53 (2")	53 (2")	63 (2 1/2")	63 (2 1/2")
255	250 kCM	#4	63 (2 1/2")	63 (2 1/2")	63 (2 1/2")	78 (3")
285	300 kCM	#4	63 (2 1/2")	78 (3")	78 (3")	78 (3")
310	350 kCM	#3	78 (3")	78 (3")	78 (3")	91 (3 1/2")
335	400 kCM	#3	78 (3")	78 (3")	78 (3")	91 (3 1/2")
380	500 kCM	#3	78 (3")	78 (3")	91 (3 1/2")	103 (4")
510	(2) 250 kCM	(2) #1	(2) 63 (2 1/2")	(2) 63 (2 1/2")	(2) 78 (3")	(2) 78 (3")
570	(2) 300 kCM	(2) #1	(2) 63 (2 1/2")	(2) 63 (2 1/2")	(2) 78 (3")	(2) 91 (3 1/2")
620	(2) 350 kCM	(2) #1	(2) 78 (3")	(2) 78 (3")	(2) 78 (3")	(2) 91 (3 1/2")
760	(2) 500 kCM	(2) #1/0	(2) 78 (3")	(2) 78 (3")	(2) 91 (3 1/2")	(2) 103 (4")
1005	(3) 400 kCM	(3) #2/0	(3) 78 (3")	(3) 78 (3")	(3) 78 (3")	(3) 91 (3 1/2")
1240	(4) 350 kCM	(4) #3/0	(4) 78 (3")	(4) 78 (3")	(4) 78 (3")	(4) 91 (3 1/2")
1260	(3) 600 kCM	(3) #3/0	(3) 91 (3 1/2")	(3) 91 (3 1/2")	(3) 103 (4")	(3) 129 (5")
1675	(5) 400 kCM	(5) #4/0	(5) 78 (3")	(5) 78 (3")	(5) 91 (3 1/2")	(5) 103 (4")
1680	(4) 600 kCM	(4) #4/0	(4) 91 (3 1/2")	(4) 91 (3 1/2")	(4) 103 (4")	(4) 129 (5")
2010	(6) 400 kCM	(6) 250 kCM	(6) 78 (3")	(6) 78 (3")	(6) 91 (3 1/2")	(6) 103 (4")
2100	(5) 600 kCM	(5) 250 kCM	(5) 91 (3 1/2")	(5) 91 (3 1/2")	(5) 103 (4")	(5) 129 (5")
2520	(6) 600 kCM	(6) 350 kCM	(6) 91 (3 1/2")	(6) 91 (3 1/2")	(6) 103 (4")	(6) 129 (5")
2660	(7) 500 kCM	(7) 350 kCM	(7) 91 (3 1/2")	(7) 91 (3 1/2")	(7) 91 (3 1/2")	(7) 129 (5")
3040	(8) 500 kCM	(8) 400 kCM	(8) 91 (3 1/2")	(8) 91 (3 1/2")	(8) 91 (3 1/2")	(8) 129 (5")
4275	(8) 750 kCM	(8) 500 kCM	(8) 103 (4")	(8) 103 (4")	(8) 129 (5")	(8) 129 (5")
EQ	EQUIPMENT FEEDER - REFER TO ELECTRICAL EQUIPMENT SCHEDULE					

200 - 4 - 1G FEEDER DESIGNATION

GROUND CONDUCTORS:
(0) - NO GROUND
(1G)- EQUIPMENT GND OR ISOLATED GND
(2G)- EQUIPMENT GND AND ISOLATED GND
SYSTEM DESCRIPTION:
(3) - 1Ø, 3W OR 3Ø, 3W
(4) - 3Ø, 4W
(5) - 3Ø, 5W (2 NEUTRALS)
CONDUCTOR AMPACITY:
(SEE FEEDER SCHEDULE)

GENERAL NOTES:

A. THE ABOVE FEEDER SCHEDULE IS A SCHEDULE OF TYPICAL FEEDERS AND SOME SIZES MAY NOT BE UTILIZED.

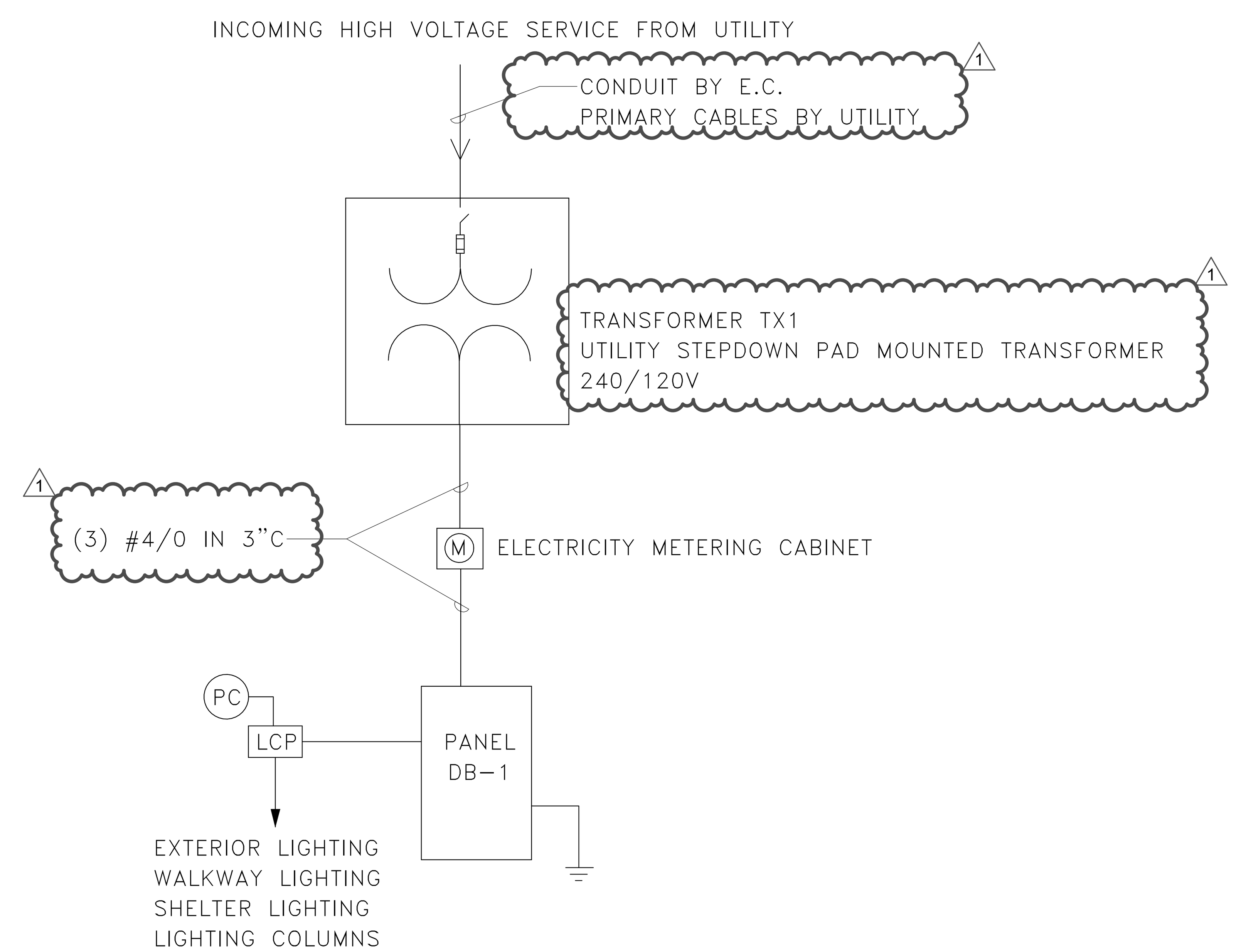
B. ALL CONDUCTOR AMPACITIES ARE BASED ON TABLE 310-15(b)(16) OF THE NEC FOR COPPER CONDUCTOR TYPE THW/THWN.

C. FEEDER SIZES SHOWN ON THE RISER DIAGRAM INDICATE FEEDER AMPACITIES AND DO NOT NECESSARILY CORRESPOND TO CIRCUIT BREAKER AMPACITIES. CERTAIN FEEDERS MAY BE SIZED FOR THE DERATION FACTORS REQUIRED BY CODE AND/OR ARE OVERSIZED FOR VOLTAGE DROP.

D. WHERE MULTIPLE CONDUITS AND CONDUCTORS ARE INDICATED FOR A SINGLE FEEDER, EACH CONDUIT SHALL CONTAIN 1 PARALLEL PHASE, NEUTRAL, AND GROUND CONDUCTORS INDICATED.

E. CONDUIT ABOVE GRADE INDOORS SHALL BE EMT. CONDUIT ABOVE GRADE OUTDOORS SHALL BE GALVANIZED IMC OR RMC. CONDUIT BELOW GRADE SHALL BE PVC WITH GALVANIZED RMC ELBOWS. CONDUIT SIZE INDICATED IS MINIMUM SIZE REGARDLESS OF CONDUIT TYPE.

F. CONDUITS SIZED LARGER THAN INDICATED SHALL BE PERMITTED FOR RUNS WITH UP TO (4) 90° ELBOWS, OR FOR PULLING LONGER RUNS.



3
E.81
ONE-LINE DIAGRAM
Scale: 1/8" = 1'-0"

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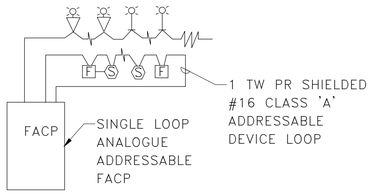
SHEET TITLE
ELECTRICAL ONE-LINE DIAGRAM

DRAWING:
E.81



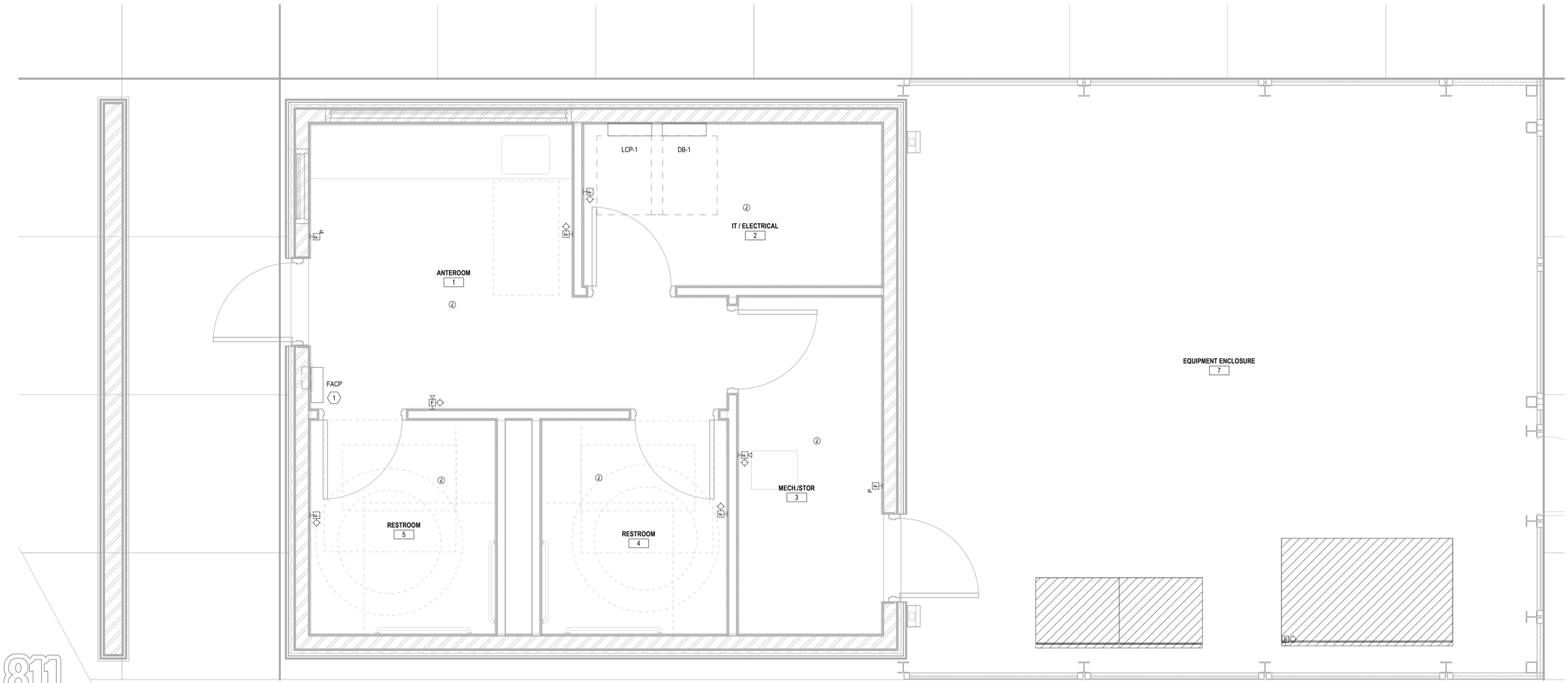
2 / FA.21 FIRE ALARM RISER DIAGRAM
Scale: 1/8" = 1'-0"

KEYNOTES

1. PROVIDE A SINGLE LOOP ANALOG ADDRESSABLE FIRE ALARM CONTROL PANEL.

FIRE ALARM GENERAL NOTES

1. REFER TO SHEET E.01 FOR ELECTRICAL ABBREVIATIONS AND GENERAL NOTES.
2. REFER TO SHEET E.02 FOR SYMBOL LIST.
3. REFER TO SHEET FA.21 FOR FIRE ALARM DETAILS & RISER DIAGRAM.
4. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT OF THE WORK. THE CONTRACTOR SHALL PROVIDE ALL PULL BOXES, JUNCTION BOXES, AND INCIDENTAL MATERIALS AND LABOR FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM.
5. PROVIDE WIRING PER MANUFACTURER'S APPROVED SHOP DRAWINGS.
6. CONTRACTOR SHALL VERIFY ON THE PLANS THE QUANTITIES AND LOCATIONS OF DEVICES REQUIRED FOR COMPLETE AND OPERATIONAL SYSTEM.
7. IN GENERAL, DEVICES AT A LOWER HEIGHT SHALL BE STACKED DIRECTLY BELOW DEVICES AT A HIGHER HEIGHT. PROVIDE CONDUIT OFFSET AS NECESSARY.



1 / FA.21 FIRE ALARM PLAN
1/2" = 1'-0"
0 2' 4' 8'

Know what's **below** **Call** before you dig

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DRAWN BY: B.C. | DESIGNED BY: E.P.
CHECKED BY: E.P. | APPROVED BY: K.S.
DATE: 06/17/2022
JOB No.: 2000677

SCALE: As indicated

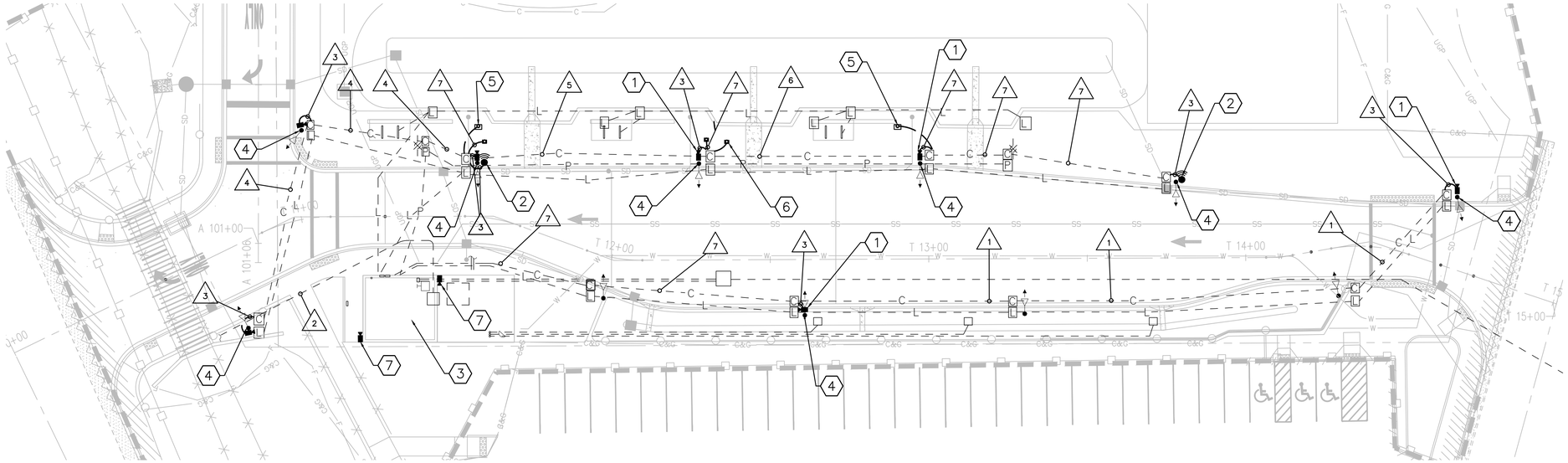
kpff
1601 5th Avenue, Suite 1600
Seattle, WA 98101
206.622.5822
www.kpff.com

IBI GROUP
801 Second Avenue – Suite 1000
Seattle WA 98104 USA
tel 206 521 9091 fax 206 521 9095
ibigroup.com

BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

SHEET TITLE: FIRE ALARM PLAN

DRAWING: FA.21



1 / IT.11 COMMUNICATIONS SITE PLAN
Scale: 1" = 20'-0"

0 10 20
SCALE IN FEET

⚠ WIRE NOTES

RUN NO.	CONDUCTOR
1	2-MMFO
2	12-MMFO
3	1-CAT6A
4	10-MMFO
5	8-MMFO
6	6-MMFO
7	4-MMFO

CONSTRUCTION NOTE ⟨#⟩

1. INSTALL P3717–PLE CCTV CAMERA ON LUMINAIRE POLE, SEE IT.71 FOR ADDITIONAL REQUIREMENTS.
2. INSTALL WIRELESS ACCESS POINT. SEE DETAIL IT.71
3. INSTALL COMMUNICATIONS RACK INSIDE BUILDING. SEE DETAIL IT.71
4. INSTALL GIGABIT POE FIBER MEDIA CONVERTER IN LUMINAIRE POLE
5. INSTALL JUNCTION BOX AND 2" CONDUIT STUB UP FOR FUTURE TICKET VENDING MACHINE
6. INSTALL JUNCTION BOX AND 2" CONDUIT STUB UP FOR FUTURE EMERGENCY PHONE
7. INSTALL CCTV CAMERA ON BUILDING, SEE ARCHITECTURAL MOUNTING DETAILS AND ELECTRICAL PLANS FOR FURTHER DETAIL.

SITE PLAN GENERAL NOTES

1. SEE ELECTRICAL PLANS FOR POWER, MAINLINE CONDUIT AND JUNCTION BOX INSTALLATION.

LEGEND

- CCTV CAMERA
- WIRELESS ACCESS POINT
- (FUTURE) TICKET VENDING MACHINE
- COMMUNICATION HANDHOLE (SEE ELECTRICAL PLANS)
- ---C--- COMMUNICATION CONDUIT (SEE ELECTRICAL PLANS)

811 Know what's below Call before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	WT	AF	PL	SECOND PERMIT REVIEW

DRAWN BY | DESIGNED BY
CHECKED BY | APPROVED BY
DATE 06/17/2022
JOB No. :2000677
SCALE:

PHILIP LANGNER STATE OF WASHINGTON REGISTERED 6/17/22

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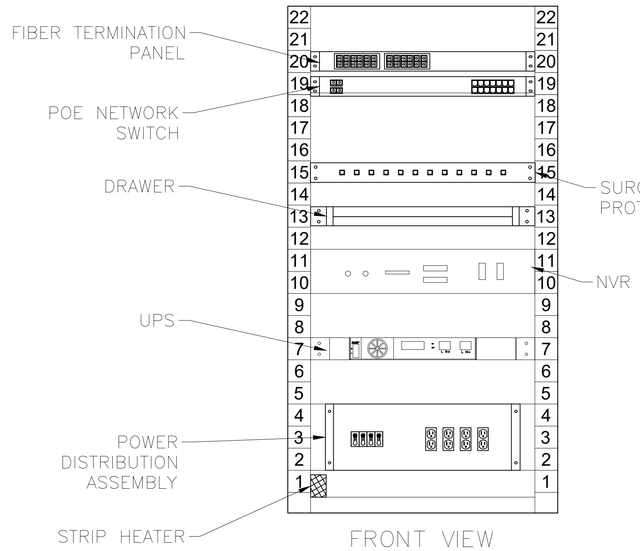
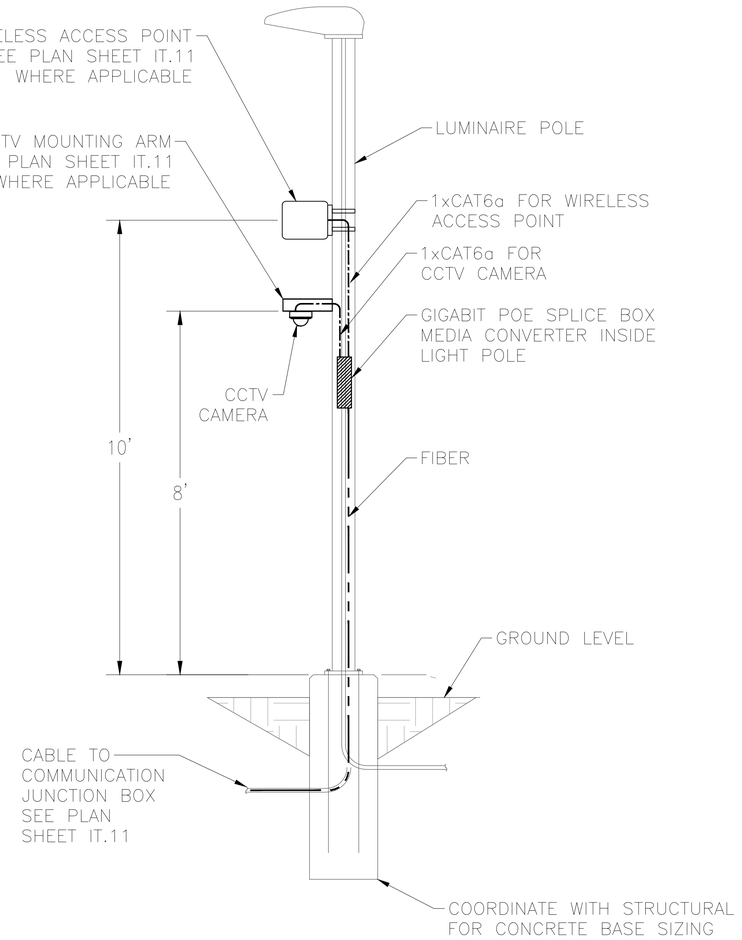
BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

COMMUNICATION SITE PLAN

DRAWING: IT.11
SHEET: 95 OF 97



1 IT.71 COMMUNICATIONS RACK INSIDE BUILDING - DETAIL
Scale: NTS



2 IT.71 LUMINAIRE POLE DETAIL
W/ CCTV AND WIRELESS ACCESS POINT
Scale: NTS

SEE ELECTRICAL PLANS FOR POWER TO MEDIA CONVERTER

LEGEND

——— - - ——— FIBER OPTIC CABLE

—·—·—·—·—·— CAT6a CABLE

GENERAL NOTES:

1. SEE ELECTRICAL PLAN E.72 FOR ELECTRICAL CONNECTIONS TO LUMINAIRE POLE AND RTPID.

Know what's below Call before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	WT	AF	PL	SECOND PERMIT REVIEW

DRAWN BY | DESIGNED BY
CHECKED BY | APPROVED BY
DATE 06/17/2022
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SCALE: NTS

6/17/22

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BEN FRANKLIN TRANSIT
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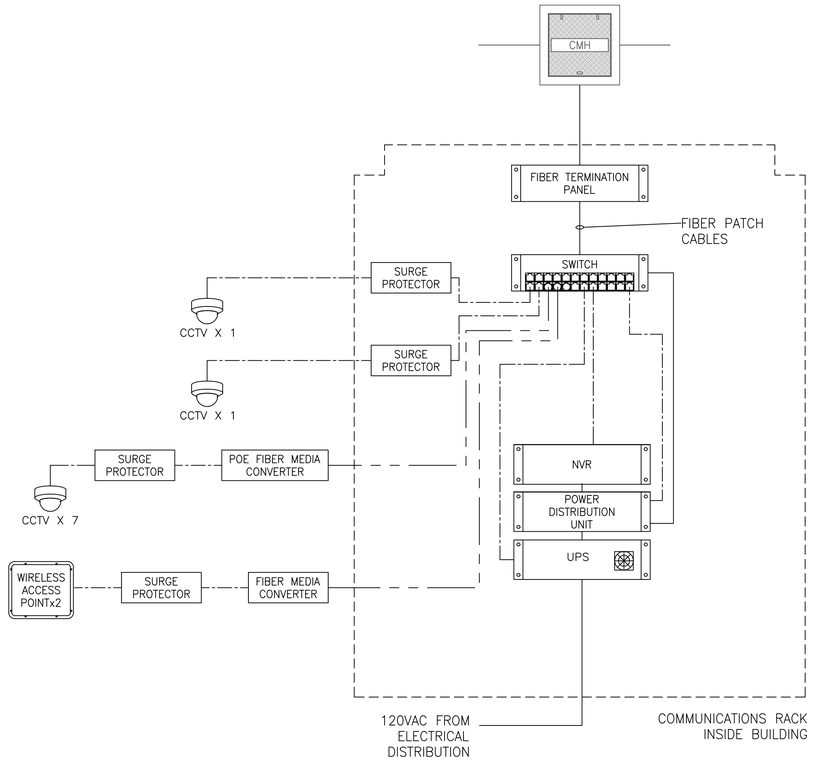
COMMUNICATION DETAILS

DRAWING: IT.71

SHEET: 96 OF 97



1 / IT.81 COMMUNICATIONS SCHEMATIC
Scale: NTS

LEGEND

- FIBER OPTIC CABLE
- CAT6a CABLE
- POWER CABLE
- HDMI CABLE

Know what's **below** **Call** before you dig

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION
1	6/17/22	WT	AF	PL	SECOND PERMIT REVIEW

DRAWN BY | DESIGNED BY
CHECKED BY | APPROVED BY
DATE 06/17/2022
JOB No. :2000677
SCALE: NTS

6/17/22

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COMMUNICATION SCHEMATIC

DRAWING: IT.81

SHEET: 97 OF 97

DEPARTMENT OF ECOLOGY
State of Washington

Notice of Intent

Construction Stormwater General Permit

Application Type: [X] **New** [ ] **Renewal** **Permit Number:** **NOI:** 38698

I. Contact Information

Permittee

Honorific: **First Name:** Kevin **Last Name:** Sliger

Organization Name: Ben Franklin Transit **Title:**

Mailing Address: 1000 Columbia Park Trl

City: Richland **State:** WA **Zip Code:** 99352-4851

Email: ksliger@bft.org

Primary Phone: 509-734-5107 **Secondary Phone:**

UBI Number: 601798539

Site Contact

Honorific: **First Name:** Kevin **Last Name:** Sliger

Organization Name: Ben Franklin Transit **Title:**

Mailing Address: 1000 Columbia Park Trl

City: Richland **State:** WA **Zip Code:** 99352-4851

Email: ksliger@bft.org

Primary Phone: 509-734-5107 **Secondary Phone:**

UBI Number: 601798539

Site Owner

Honorific: **First Name:** Kevin **Last Name:** Sliger

Organization Name: Ben Franklin Transit **Title:**

Mailing Address: 1000 Columbia Park Trl

City: Richland **State:** WA **Zip Code:** 99352-4851

Email: ksliger@bft.org

Primary Phone: 509-734-5107 **Secondary Phone:**

UBI Number: 601798539

II. Electronic Discharge Monitoring Reporting

You must submit monthly discharge monitoring reports using Ecology's Electronic Discharge Monitoring Reporting (WQWebDMR) system. To sign up for WQWebDMR, or to register a new site, go to ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits, and click on the "Construction Stormwater" link. You will find information on WQWebDMR under the "WQWebDMR and PARIS" link on the right-hand side. If you are unable to submit your DMRs electronically, you may contact Ecology to request a waiver. Ecology will generally only grant waiver requests to those permittees without internet access. Only a permittee or representative, designated in writing, may request access to or a waiver from WQWebDMR. To have the ability to use the system immediately, you must submit the Electronic Signature Agreement with your application. If you have questions on this process, contact Ecology's WQWebDMR staff at WQWebPortal@ecy.wa.gov or 360-407-7097.

III. Site Information

Site Project Name: Queensgate Transit Center

Street Address or Location Description: 673 Windmill Rd

City: Richland **County:** Benton **Zip Code:** 99352

Latitude: 46.252808 **Longitude:** -119.300749

Type of Construction Activity:

- [ ] Residential
- [X] Commercial
- [ ] Industrial
- [ ] Highway or Road (city, county, state)
- [X] Utilities (specify):
- [ ] Other (specify):

Site Acreage

Total site/project size: 1.39 acres

Total disturbed area: 1.39 acres

Total area of soil disturbance for your site/project over the life of the project. Include grading, equipment staging, excavation, borrow pit, material storage areas, dump areas, haul roads, side-cast areas, off-site construction support areas, and all other soil disturbance acreage associated with the project.

Will 1,000 cubic yards or more of poured concrete or recycled concrete be used over the life of the project? [ ] Yes [X] No

Estimated project start date: 7/20/2022 **Estimated project completion date:** 1/31/2024

Other Permits

None

IV. Existing Site Conditions

1. Are you aware of contaminated soils on this site? [ ] Yes [X] No

2. Are you aware of groundwater contamination located within the site boundary? [ ] Yes [X] No

3. If you answered yes to question 1 or 2, will any contaminated soils be distrubed or will any contaminated groundwater be discharged due to the proposed construction activity? [ ] Yes [ ] No

If yes, please provide detailed information (as known and readily available) on the nature and extent of the contamination (concentrations, locations, and depth) as well as pollution prevention and/or treatment Best Management Practices (BMPs) proposed to control the discharge of soil and/or groundwater contaminants in stormwater. This should include information that would be included in related portions of the Stormwater Pollution Prevention Plan (SWPPP) that describe how contaminated and potentially contaminated construction stormwater and dewatering water will be managed. You may attach this information separately, if needed

V. Stormwater Pollution Prevention Plan (SWPPP)

You must develop a SWPPP prior to starting construction. Do not submit your SWPPP with your application. If you answered yes to the questions in Part IV, please submit the information that would be included in related portions of the SWPPP that describe how contaminated and potentially contaminated construction stormwater and dewatering water will be managed.

VI. Best Management Practices (BMPs)

You must use the BMPs listed in the Stormwater Management Manual for Western Washington or the Stormwater Management Manual for Eastern Washington or other manuals approved by Ecology. Alternatively, you may use demonstrably equivalent BMPs on the basis of permit condition S9.C.4. If you intend to use a BMP at your site that is not included in these manuals, but that you believe meets the definition of a demonstrably equivalent BMP, you must notify the appropriate regional office. (See Definitions in the Construction Stormwater General Permit).*

http://ecology.wa.gov/Regulations-Permits/Permits-certifications/Stormwater-general-permits/Construction-stormwater-permit#contacts

**Note that if you receive permit coverage without indicating the preference for a demonstrably equivalent BMP and later decide to use one, you must provide Ecology with notice of the selection of an equivalent BMP no less than 60 days before the intended use of the equivalent BMP.*

VII. Discharge/Receiving Water Information

If your project includes dewatering, you must include dewatering plans and discharge locations in your site Stormwater Pollution Prevention Plan.

Location of Discharge into Surface Waterbody

Outfall Number	Outfall Description	Surface Waterbody Name	Outfall Type	Latitude	Longitude
001	Ditch	CID Main Canal	Surface Water Body	46.252233	-119.300677

VIII. State Environmental Policy Act (SEPA)

This Notice of Intent (NOI) is incomplete and cannot be approved until the applicable SEPA requirements under Chapter 197-11 WAC are met.

Who is the SEPA lead agency on your site? City of Richland

Has the SEPA lead agency issued a final decision on your checklist? ☐ Yes ☒ No ☐ Exempt

If No: The NOI is incomplete. Ecology will hold the application until a final SEPA decision is made or the Construction Stormwater NOI public comment period ends, whichever is later. **You must notify Ecology once the lead agency has issued a determination.**

If Yes: Type of SEPA decision issued:

Date of final SEPA decision:

Date when all SEPA-related comment & appeal periods ended or will end:

If Exempt:

- ☐ Watershed Restoration & Fish Habitat Enhancement Exemption (RCW 43.21C.0382).
- ☐ Infill Development Exemption (RCW 43.21C.229).
- ☐ Planned Action Exemption (RCW 43.21C.031).
- ☐ Categorical Exemption. Under what section of the SEPA Rule (WAC 197-11-800) is it exempt?

  Section: _____

IX. Public Notice

You must publish a public notice at least **once** a week for **two** consecutive weeks with **seven days** between publications, in at least a **single** newspaper of general circulation in the county in which the facility is located. Ecology cannot grant permit coverage sooner than the end of the 30-day public comment period, which begins on the date of the **second** public notice.

Newspaper Name	First Public Notice Date	Second Public Notice Date
Tri-City Herald	3/28/2022	4/4/2022

X. Site Map

Include the site map from your Stormwater Pollution Prevention Plan. Please do not provide large-scale site plans, copies should be on 11X17 paper or smaller.

XI. Certification of Permittees

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Permittee Signature

Date

Application Id:	38698	**Certification Received:** *(Ecology use)*	
Facility/Site Name:	Queensgate Transit Center	**Permit Number:** *(Ecology use)*	
Facility Address:	673 Windmill Rd Richland, WA 99352	**Facility County:**	Benton
Permittee Name:	Kevin Sliger	**Permittee Title:**	
Permittee Email:	ksliger@bft.org	**Permittee Phone:**	5097345107
Permittee Address:	1000 Columbia Park Trl Richland, WA 99352-4851	**Company Name:**	Ben Franklin Transit
Disturbed Acreage:	1.39		

Certification of Permittee

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Kevin T. Sliger / Ben Franklin Transit — Printed Name / Company

Planner — Title

Kevin T. Sliger — Signature of Permittee *

03.23.22 — Date

* Federal regulations require this application is signed by one of the following:
A. For a corporation: By a responsible corporate officer, of at least the level of vice president.
B. For a partnership or sole proprietorship: By a general partner or the proprietor, respectively.
C. For a municipality, state, federal, or other public facility: By either a principal executive officer or ranking elected official.

Please print, sign and mail this form to the following address:

Department of Ecology
ATTN: Water Quality Program, Construction Stormwater P.O. Box 47696|Olympia, WA 98504-7696

Geotechnical Engineering Evaluation

Proposed Ben Franklin Transit
Queensgate Transit Hub
Richland, Washington

for
KPFF

July 8, 2021

GeoEngineers
Earth Science + Technology

Geotechnical Engineering Evaluation

Proposed Ben Franklin Transit
Queensgate Transit Hub
Richland, Washington

for
KPFF

July 8, 2021

GeoEngineers

523 East Second Avenue
Spokane, Washington 99202
509.363.3125

Geotechnical Engineering Evaluation

Proposed Ben Franklin Transit
Queensgate Transit Hub
Richland, Washington

File No. 2557-007-00

July 8, 2021

Prepared for:

KPFF
421 West Riverside Avenue, Suite 902
Spokane, Washington 99201

Attention: Brandon Blankenagel, PE

Prepared by:

GeoEngineers, Inc.
523 East Second Avenue
Spokane, Washington 99202

Erik J. Arnson, PE, LG
Senior Engineer

Teresa A. Dugger, PE
Associate

7/8/2021

EJA:TAD:tjh

Table of Contents

LIST OF FIGURES

APPENDICES

1.0 INTRODUCTION

This report presents the results of our geotechnical engineering evaluation at the site of the proposed Ben Franklin Transit Queensgate Transit Hub (Transit Hub) Project in Richland, Washington. The project site is located at an existing park and ride located west of the intersection of Windmill Road and Columbia Park Trail, approximately as shown in Vicinity Map, Figure 1. Project improvements are proposed on the west side of the existing park and ride. The approximate project area in relation to existing site features is provided in the Site Plan, Figure 2.

Our understanding of the project is based on our communications with, and conceptual drawings provided by, KPFF. We understand the proposed Transit Hub will extend the existing park and ride facilities to the west by adding a bus lane connecting Columbia Park Trail to Windmill Road, a bus pullout area for passenger loading and unloading, and associated improvements. The associated improvements will result in the need for an arched bridge/culvert spanning over the existing swale that separates the park and ride facility from Columbia Park Drive. We also understand the foundations for the proposed arched bridge/culvert will be located above the ordinary high water mark and set back sufficiently to avoid disturbance of defined wetlands.

Other improvements might include a: pedestrian crossing; portland cement concrete (PCC) passenger platform with curb and gutter; PCC sidewalk; structures such as a passenger 'comfort buildings' and shelters; light poles; signage; and reconstruction of an existing cul-de-sac at the north end of Windmill Road to improve traffic flow. We understand that Ben Franklin Transit will be purchasing the land for the improvements from the existing owner of the adjacent undeveloped lot.

Grading plans and foundations loads were not available at the time of this report. However, we anticipate site improvements will be constructed at or near existing site grades to match existing improvements. We also anticipate that the proposed passenger shelter(s) or other similar structures will be lightly loaded and that the proposed arch bridge/culvert will be heavily loaded.

2.0 SCOPE OF SERVICES

The scope of services for this geotechnical engineering evaluation was presented in the signed Agreement for Subconsultant Services between KPFF and GeoEngineers, Inc. (GeoEngineers), dated July 16, 2020. The purpose of our geotechnical engineering services was to provide recommendations for design and construction of the specific geotechnical aspects of the project based on site exploration, laboratory testing and engineering analyses. Our Scope of Services is summarized below:

- Review in-house literature including geologic maps, soils data and previous geotechnical site evaluations completed near the project site.
- Mark our proposed boring locations and contact the one-call underground utility notification system.
- Exploration of soil conditions underlying the site by drilling three borings.
- Laboratory testing.
- Provide a report containing recommendations for the following:

- Site preparation and fill placement;
- Design and construction of conventional shallow foundations for the arch bridge/culvert and passenger shelters;
- Design and construction of a concrete slab-on-grade;
- Lateral soil bearing pressures for design of foundations for proposed light poles;
- Pavement layer thickness design and recommendations for heavy-duty hot mix asphalt (HMA) or PCC pavement;
- Geotechnical seismic design criteria; and
- Surface and subsurface drainage, as appropriate.

3.0 SITE CONDITIONS

3.1. Literature Review

3.1.1. Geologic Setting

The Washington State Department of Natural Resources (DNR) Open File Report 94-8 titled "Geologic Map of the Richland 1:100,000 Quadrangle, Washington" (Reidel and Fecht 1994) maps the surficial geology underlying the site as (*Qfs*$_2$) Outburst flood deposits, silt and sand (Pleistocene). The outburst flood deposits are described as: lacustrine (lake) silt and fine sand, and fluvial (river) coarse to fine sand; deposited by outburst floods glacial Lake Missoula and other ice-margin lakes; age estimated at 200,000 years old.

3.1.2. Soil Survey Review

The United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) provides online soil data through the Web Soil Survey. The Web Soil Survey maps the upper 5 feet of the surficial soil at the site as Quincy loamy sand, 2 to 15 percent slopes (*QuD*). This soil formed on terraces in eolian (wind deposited) sands. Near-surface conditions typically include loamy (silty) sand to a depth of about 9 inches and loamy fine sand to a depth of 60 inches below the ground surface (bgs). The NRCS generally characterizes the soil as having a: low susceptibility to frost action; moderate risk of corrosion to uncoated steel; low risk of corrosion to concrete; and is excessively drained (Hydrologic Soil Group A).

3.2. Surface Conditions

The proposed Transit Hub improvements are located along the west margin of the existing park and ride on the west side of the intersection of Windmill Road and Columbia Park Trail. The existing park and ride area is generally triangular and approximately 2 acres in size. The parking area is accessed by vehicles from Windmill Road via two curb cuts. The parking area is surfaced with asphalt concrete pavement (ACP) and contains landscaped islands and borders separated from the parking area by PCC curb and gutter. PCC sidewalk is located on the north and south sides of the lot adjacent to the existing roads. Luminaires are located along the three sides of the parking area. A foot bridge crossing a drainage swale between the park and ride and Columbia Park Trail is located on the south side. The parking area is graded so that stormwater runoff flows across the surface of the parking area to the swale.

The proposed improvements will extend the facility to the west approximately 56 feet into an existing undeveloped lot. The portion of the lot that will be improved is near the same grade as the park and ride area and is surfaced with crushed rock occasionally mixed with crushed ACP. Weeds and bushes are

growing through the surfacing in isolated locations. The existing drainage swale also continues west along the south side of the portion of the lot to be improved. The topography of both the existing park and ride area and the proposed improvement area is generally flat, except for the drainage swale along the south side of the site.

3.3. Subsurface Exploration Program

We explored soil conditions at the proposed Queensgate Transit Hub site on July 21, 2020, by drilling three borings (B-1 through B-3) to about 15 feet bgs. The borings were completed with a truck-mounted, hollow-stem auger drill rig owned and operated by GeoEngineers. The approximate locations of the borings relative to existing site features are shown on Figure 2.

Representative samples of soil collected from the explorations were returned to our laboratory for examination and testing. Detailed descriptions of our site exploration and laboratory testing programs, along with exploration logs and laboratory test results, are presented in Appendix A.

3.4. Subsurface Conditions

3.4.1. General

Subsurface conditions encountered at the locations of our explorations were consistent with the previously referenced geologic and soil survey descriptions. At the ground surface, we encountered about 3 inches of crushed rock surfacing at each boring location. Below the crushed rock surfacing, we encountered an upper unit of loose to dense silty fine sand (Soil Group Classification – SM) to a depth of approximately 3½ feet bgs. The upper silty sand in borings B-1 and B-2 also contained occasional gravel.

Below the silty sand, we encountered loose to dense fine sand with silt (Soil Group Classification – SP-SM) to a depth of about 10 to 11 feet, except in boring B-2 where it extended to the depth explored of 15 feet bgs. We characterize the sand with silt as having low to moderate strength and compressibility, a moderate to high permeability, and a low to moderate susceptibility to changes in moisture content.

Below the sand with silt in borings B-1 and B-3, we again encountered silty sand (SM) to the depth explored of 15 feet bgs in these two borings. We characterize both the upper and lower silty sand units as having low to moderate strength and compressibility, low permeability and high susceptibility to changes in moisture content.

Laboratory testing on representative soil samples, including three sieve analyses and four percent fines (silt- and clay-sized soil particles passing the US No. 200 sieve) determinations, indicate the fines content of the silty sand (SM) samples tested ranged from about 18 to 30 percent with the moisture content ranging from about 6 to 26 percent. The fines content of the sand with silt (SP-SM) samples tested ranged between about 8 and 9 percent while the moisture content ranged from about 4 to 21 percent. Please see the Logs of Borings in Appendix A for details.

3.5. Groundwater Conditions

We did not encounter groundwater in borings B-1 or B-2 within the depths explored of 15 feet bgs. However, wet soil samples were recovered in boring B-3, located nearest to the swale, at a depth of about 10½ feet bgs at the time of exploration. Surface water was observed ponded in the swale bottom at the time of exploration. The elevation of the surface of the ponded water was close to the elevation the wet soil samples

were recovered from boring B-3. As such, in our opinion, the groundwater encountered in boring B-3 likely is perched groundwater seeping from the swale and not the local groundwater table.

Based on a review of water well logs available on the Washington State Department of Ecology (Ecology) Well Log Viewer within about a ½ mile of the site, the local groundwater table generally is similar to the surface elevation of the water flowing in the Columbia River. Given the elevation of the site above the river, we do not anticipate the local groundwater table will be encountered during construction. However, the elevations and extent of groundwater will vary seasonally, generally being highest in the spring and early summer months, and from year to year.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1. General

Based on the results of our site exploration, laboratory testing and engineering analyses, we believe site soil conditions are generally suitable for support of conventional shallow spread foundations, hardscape and pavements, provided the recommendations in the following sections are followed. A summary of some of the geotechnical-related conditions and issues associated with design and construction of the proposed improvements at the site include the following.

- On-site soil is moderately to highly sensitive to moisture which could limit the use of such soil for structural fill depending on its moisture content at the time of construction.
- While we did not encounter a regional groundwater table in our explorations. We did encounter perched groundwater in boring B-3 at about 11½ feet bgs during drilling.
- Site soils are suitable for support of shallow spread footings, pavement and hardscape if prepared as recommended in this report.
- The surficial silty sand (SM) unit is highly susceptible to changes in moisture content which might impact earthwork depending on the time of construction.
- On-site infiltration of stormwater is feasible using swales or other shallow infiltration methods.

These geotechnical issues and other considerations are discussed in greater detail, and conclusions and recommendations for the geotechnical aspects of the project are presented in the following sections.

4.2. Site Preparation and Earthwork

4.2.1. Initial Preparation

We anticipate initial site preparations will include clearing of brush, and stripping of surface vegetation, such as sod, and other organic matter, if present. Root wads from bushes should be grubbed and removed. Stripping depths should be sufficient to remove sod and topsoil, if present, and localized zones of other soil with more than about 15 percent organic matter (by volume) that might be present in areas of the site that were not explored.

Active underground utilities should be excavated and relocated outside of improvement areas. The resulting excavations and voids should be backfilled with structural fill, as defined in the following section. Abandoned underground utilities should be excavated and removed or abandoned in place by backfilling

them with lean concrete or grout. Cleared, stripped and grubbed material should be removed and disposed of off-site in accordance with local, state and federal regulations. Actual stripping depths should be determined by the Geotechnical Engineer-of-Record (Engineer) or their appointed representative based on field observations at the time of construction.

4.2.2. Grading and Excavations

Preliminary grading plans for the proposed Transit Hub were not available at the time of this report. However, we anticipate site improvements will be constructed at or near existing site grades to match existing improvements. As such, grade changes likely will be in the range of plus or minus 1 to 2 feet.

We did encounter perched groundwater in boring B-3 near the same elevation as surface water ponded in the existing swale to the south. Provided the swale is dry during construction or excavation in the vicinity of the swale is no deeper than the elevation of surface water in the swale, it is our opinion that perched groundwater is unlikely to have an impact on construction.

Given the relatively consistent subsurface conditions we encountered, we anticipate excavations at the site will generally encounter about 3 to 4 feet of silty sand with occasional gravel overlying sand with silt to a depth of about 10 to 11 feet or more bgs. As stated, the soil contains a notable amount of fines and is moderately to highly moisture sensitive. The soil will be difficult to densify if the soil moisture content is more or less than the optimum moisture content by about 2 to 4 percentage points. Accordingly, earthwork during wet weather should be avoided. Weather considerations are discussed in Section 4.4.

In our opinion, site soil within the proposed Transit Hub area can be excavated using appropriately sized, conventional, excavating equipment and procedures capable of excavating in and around silt, sand and gravel soil. If earthwork activities cause excessive subgrade disturbance after stripping or initial grading activities, removal of the disturbed soil and replacement with structural fill might be necessary. Given the sensitivity of the site soil to moisture, disturbance to a greater depth should be expected if site preparation work is conducted during periods of wet weather. All excavations to repair disturbed areas should be backfilled with structural fill, as defined Section 4.4 .

4.2.3. Subgrade Preparation

After initial site preparation and grading activities are complete within the proposed Transit Hub area, the sandy soil exposed at pavement, slab-on-grade and/or hardscape subgrade, or at foundation working subgrade, should be compacted. This recommendation includes areas where structural fill will be required to establish proposed subgrade for pavement sections, slab-on-grade and hardscape.

The soil at subgrade or working subgrade should be compacted to at least 95 percent of the maximum dry density (MDD) within the upper 12-inch zone. The MDD should be determined by ASTM D1557 (modified Proctor) laboratory test procedure. If the exposed natural soil is not near optimum moisture content, scarification of the upper 12 inches of the soil and careful moisture-conditioning might be required to adjust the soil moisture content to near optimum for compaction.

We recommend that GeoEngineers evaluate the condition of the subgrade at the time of construction to determine if it is consistent with the soil encountered in our explorations at the site. Any soil encountered at subgrade that is loose, wet or otherwise unsuitable, such as because it cannot be compacted to the

specified criteria, should be removed to a depth of 2 feet below subgrade or firm bearing, whichever is less, and replaced with structural fill placed as recommended in Section 4.3.

4.2.4. Excavation Slopes

Temporary excavation (cut) slopes will be necessary during underground utility installation and foundation construction for the proposed improvements. Excavations deeper than 4 feet should be shored or sloped at stable inclinations if workers are required to enter such excavations. Temporary slopes and shoring for utility excavations must conform to the provisions of Title 296 Washington Administrative Code (WAC), Part N, "Excavation, Trenching and Shoring."

In our opinion, site soil classifies as Type C for excavation purposes (Chapter 296-155-664 WAC). The maximum allowable temporary slope for Type C soil is 1.5H:1V (horizontal:vertical) for simple excavations less than 20 feet deep located above the groundwater table or seepage zones. This guidance is based on our assumption all surface loads are kept a minimum distance of at least one-half the depth of the cut away from the top of the slope. Flatter slopes will be necessary if surface loads are imposed above the cuts a distance equal to or less than one-half the depth of the cut.

Regardless of the soil type encountered in the excavation, shoring, trench boxes or sloped sidewalls will be required under the Washington Industrial Safety and Health Administration (WISHA) regulation. While this report describes certain approaches to excavation, the contract documents should specify the constructor is responsible for selecting excavation methods, monitoring the excavations for safety and providing shoring, as required, to protect personnel.

Permanent fill slopes will be required if an embankment is used to cross the existing swale on the south side of proposed Transit Hub. We recommend a maximum inclination of 2H:1V for permanent cut and fill slopes. Surface drainage should be directed away from slope faces. Slopes should be seeded as soon as possible to encourage the development of a vegetative cover or otherwise protected. Some minor raveling of the slope face could occur with time until a vegetation cover is established or protection is placed.

4.3. Structural Fill

4.3.1. General

Soil used to support foundations, floor slabs, hardscape and pavements are classified as structural fill for the purposes of this report. Structural fill material requirements vary depending upon its use as described below. Structural fill, whether on-site soil or imported, should be free of debris, organic material, frozen soil and particles larger than 4 inches in maximum dimension.

4.3.2. Use of On-site Soil

The suitability of on-site soil for use as structural fill depends on soil gradation and/or moisture content at the time of compaction. As stated, the silty sand (SM) soil encountered at the site contains more than 12 percent fines (by weight) and is highly moisture sensitive. The sand with silt (SP-SM) soil tested contains about 8 to 9 percent fines and is moderately moisture sensitive.

While these soils may be used as structural fill, in our opinion, they will require careful moisture conditioning, either wetting or drying, to achieve the specified compaction levels. Such moisture conditioning might require extra time on the contractor's part and likely will not be possible during wet

weather conditions. If the contractor decides to use site soil as structural fill, the contractor does so at their own risk.

If site soil is unsuitable for use as structural fill based on moisture content, it may be used for non-structural applications such as landscaping.

4.3.3. Imported Structural Fill

The specifications referred to in the following subsections are from the Washington State Department of Transportation (WSDOT) *2020 Standard Specifications for Road, Bridge and Municipal Construction (M41-10)* and are distinguished by being presented in *italics*. Imported structural fill should meet the WSDOT *Standard Specifications* referenced below unless otherwise approved by the Engineer:

- Utility Trenches – Imported structural fill placed to backfill utility trenches outside of structure areas should meet the criteria described in *Section 9-03.15 Native Materials for Trench Backfill* or *Section 9-03.19 Bank Run Gravel for Trench Backfill*. Alternatively, material meetings the criteria in *Section 9-03.14(3) Common Borrow* may be used with the additional provision that the maximum particle dimension does not exceed 3 inches.
- General Structural Fill -- Imported structural fill placed below foundations, floor slabs (except for the capillary break layer), pavements and hardscape should consist of a well-graded sand or sand and gravel mixture with less than about 10 percent fines. The following gradations generally meet these criteria:
    - *Section 9-03.14(1) Gravel Borrow*.
    - *Section 9-03.14(2) Select Borrow*, with the added criteria of being well-graded.
    - *Section 9-03.17 Foundation Material Class A and B*.

  "Gravel Borrow" and "Select Borrow" will be suitable for use as structural fill during dry weather conditions only. If structural fill is placed during wet weather, the fines content of the structural fill should be less than 5 percent. Other gradations may be used if they meet the general criteria stated above and are approved by GeoEngineers.
- Base Course – Imported structural fill used as base course for pavements should consist of Crushed Surfacing Base Course (CSBC) and Crushed Surfacing Top Course (CSTC) meeting criteria in *Section 9-03.9(3)*.
- Capillary Break – Imported structural fill placed as capillary break material below floor slabs should consist of 1½-inch-minus free-draining crushed gravel with negligible sand or silt. Material in conformance with *Section 9 03.1(4) C, Grading No. 57* generally meets these criteria. Alternative gradations may be used if approved by the Engineer.

4.3.4. Fill Placement and Compaction Criteria

Structural fill should be placed in loose lifts not exceeding 8 inches in thickness (or a thickness compatible with the compaction equipment used, not to exceed 8 inches) and mechanically compacted to a firm condition. Each lift should be conditioned to the proper moisture content and compacted to the specified density before placing subsequent lifts. We recommend structural fill be compacted to the following criteria based on the ASTM D 1557 laboratory test procedure:

- Soil used as structural fill placed within proposed structure limits, regardless of depth below floor subgrade or foundation grade, should be compacted to at least 95 percent of the previously mentioned MDD.
- Structural fill placed adjacent to and within a distance of 2.5D of foundation elements (where D is the embedded depth of the foundation element) which are designed to resist lateral loads should be compacted to at least 92 percent of the MDD, unless a higher degree of compaction is required as outlined in this report.
- Structural fill in pavement areas and below exterior hardscapes, including utility trench backfill, should be compacted to at least 90 percent of the MDD, except the upper 2 feet of fill below final subgrade should be compacted to a minimum 95 percent of the MDD.
- Structural fill placed as capillary break for floor slabs and crushed rock base for hardscape should be compacted to at least 92 percent of the MDD.
- Base course for pavements should be compacted to at least 95 percent of the MDD.
- Non-structural fill, such as fill placed in landscaped areas, should be compacted to at least 85 percent of the MDD, with the exception that compaction should not exceed 85 percent for fill placed within stormwater swales. In areas intended for future development, a higher degree of compaction should be considered to reduce the settlement potential of the fill soil.

We recommend GeoEngineers be on site during earthwork operations to observe site preparation and structural fill placement. Soil conditions should be evaluated by in-place density tests, visual evaluation, probing and proof-rolling of the structural fill and recompacted on-site soil, as it is prepared, to check for compliance with contract documents and recommendations in this report. Structural fill that consists of material too granular for ASTM D1557 testing should be compacted using method or performance specifications, as determined by GeoEngineers.

4.4. Weather Considerations

As stated previously, the on-site soil is moisture sensitive. As the moisture content of the soil increases, the strength decreases. During wet weather, as the soil approaches saturation, it becomes soft and muddy. Performing earthwork in these conditions will lead to disturbance of near-surface soil. During dry weather, the on-site soil should be less susceptible to disturbance and provide better support for construction equipment. In addition, drying of soil that is above its optimum moisture content is most effective during extended periods of warm, dry weather.

The wet weather season generally begins in November and continues through May in eastern Washington. However, periods of wet weather may occur during any time of year. If wet weather earthwork is unavoidable, we recommend that the following steps be taken if surficial soil conditions begin to deteriorate:

- Stop earthwork activities during and immediately after periods of heavy precipitation.
- Grade the ground surface in and around the work area so that areas of ponded water do not develop, and water does not enter and collect in excavations and trenches.
- Accumulated water should be removed from the work area in accordance with the project Stormwater Pollution Prevention Plan (SWPPP).

- Areas of uncompacted soil should be sealed by rolling with a smooth-drum roller before precipitation occurs.
- Construction traffic should be restricted to specific areas of the site, preferably areas that are not susceptible to disturbance.
- Construction activities should be scheduled so that the length of time that soil is exposed to moisture is reduced to the extent practical.

4.5. Foundations

4.5.1. General

In our opinion, shallow spread foundations are suitable for support of proposed pedestrian shelter and arched bridge/culvert structures given the subsurface conditions we encountered in our explorations at the site.

4.5.2. Foundation Grade Preparation

Based on the results of our geotechnical engineering evaluation, we anticipate that soil exposed at foundation grade for the pedestrian shelter structures could consist of loose to dense silty fine sand (SM). In our opinion, the silty fine sand is suitable for support of proposed pedestrian shelter structures if compacted. As such, we recommend foundation grade(s) or working foundation grade(s) for these structures be prepared as recommended in Section 4.2.3 before placing forms and reinforcement for concrete or structural fill, as necessary.

We recommend the proposed arched bridge extend to and be supported on the underlying sand with silt (SP-SM) unit, located approximately 3½ feet bgs in our borings. We further recommend foundation grade(s) or working foundation grade(s) for the proposed arch bridge/culvert also be prepared as recommended in Section 4.2.3.

As stated in Section 4.2.3, we recommend soil at foundation that is loose, wet or otherwise unsuitable be removed to a depth of 2 feet below foundation grade or firm bearing, whichever is less, and replaced with structural fill. We further recommend that the limits of excavation below foundations to remove such soil should extend horizontally beyond all sides of the footing a distance equal to the depth of excavation below proposed foundation grade. We recommend that GeoEngineers evaluate the condition of foundation grade(s) or working foundation grade(s) at the time of construction to determine if it is consistent with the soil encountered in our explorations at the site.

4.5.3. Foundation Design

We recommend individual (column) and continuous (wall) footings be designed with minimum dimensions of 24 and 16 inches, respectively. We also recommend proposed exterior foundations or foundations below unheated areas be constructed at a minimum depth of at least 24 inches below the nearest adjacent exterior finished grade to protect against frost heave and in accordance with local building code requirements. Interior foundations in heated areas and located at least 5 feet from exterior walls may bear at a depth of 18 inches below interior finished grade.

Footings bearing on the natural sand unit or structural fill placed over such soil, and prepared as previously described, may be designed using an allowable soil bearing pressure of 2,500 pounds per square foot (psf)

for support of dead plus long-term live loads. These recommended allowable soil bearing pressures may be increased by one-third to account for short-term live loads such as those induced by wind and seismic conditions.

4.5.4. Settlement

Based on our understanding that foundation loads for the proposed pedestrian shelters will be generally light, we estimate settlement of footings designed and constructed as recommended herein, should be less than about 1 inch. Settlement should occur essentially as loads are applied. Loose soil not removed from footing excavations or disturbance of soil at foundation grade during construction could result in larger settlements than estimated.

We were not able to estimate settlement for the proposed arch bridge/culvert because the foundation loads were not available when we prepared this report. We will review the estimated dead and live loads provided by KPFF for the proposed arch bridge/culvert once they are developed. This information will allow us to evaluate potential settlement of the structure and provide recommendations for settlement mitigation if estimated settlement is excessive.

4.5.5. Lateral Resistance

4.5.5.1. *Passive Earth Pressure and Frictional Resistance*

The soil pressure available to resist lateral foundation loads is a function of the frictional resistance against the foundation base and the passive resistance which can develop on the face of below-grade elements of the structure as those elements move horizontally into the soil. For foundations bearing on the compacted natural sand unit or structural fill prepared as recommended, the allowable frictional resistance may be computed using a coefficient of friction of 0.3 applied to vertical dead load forces for the contact between footing and the natural sand soil or structural fill. The allowable passive resistance on the face of footings or other embedded foundation elements may be computed using an equivalent fluid density of 220 pounds per cubic foot (pcf), triangular distribution, for the natural sand soil or structural fill.

4.5.5.2. *Active / At-Rest Earth Pressure*

Subsurface walls, such as for culverts, that are allowed to yield during backfilling (active soil pressure condition) may be designed to resist lateral earth pressures based on an equivalent fluid density of 35 pcf, triangular distribution, if the ground surface behind the wall is level for a distance equal to at least two times the wall height. Rigid retaining walls (at-rest soil pressure condition) may be designed using an equivalent fluid density of 55 pcf, provided the ground surface is level for a distance equal to at least two times the wall height. These values are based on an internal angle of friction of 28 degrees and a moist unit weight of 120 pcf for the on-site sand units. These values also assume there will be no hydrostatic forces on subsurface walls because the proposed arched bridge will be constructed above the ordinary high water level, as discussed at the beginning of this report.

Surcharge loads, such as for vehicle traffic, are additive to lateral soil pressures and should be included as part of the arch bridge design. We should be consulted if additional surcharge loads, beyond traffic loads, are expected to impose additional lateral pressures on subsurface walls, or if the ground surface behind walls will slope up or down away from the wall.

4.5.6. Pole Foundations

The project includes construction of new luminaires at the proposed Transit Hub for public safety. We used WSDOT standard luminaire (light standard) foundations as the basis for our recommendations. Alternatively, City of Richland standards may be used at the designers' discretion. We recommend using the allowable passive lateral earth pressure (resistance) provided in Section 4.5.5 for other design methods.

WSDOT light standards consist of 3-foot-diameter round shafts. The foundations designs are shown in WSDOT Standard Plan J-1b. The standard foundations depth is 8 feet in site soils that are assumed to have a minimum 1,500 psf allowable lateral bearing pressure. Per Table 17-2 of the WSDOT *2019 Geotechnical Design Manual*, 1,500 psf corresponds to a standard penetration test (SPT) N-value (uncorrected for overburden) of about 10 blows per foot.

The subsurface soil encountered in our borings generally meet the minimum 10 blows per foot N-value (1,500 psf average allowable lateral bearing pressure) over their depth except for a loose zone from about 3 to 6 feet bgs. We recommend unsuitable soil, such as the loose soil from about 3 to 6 feet bgs, be removed to firm bearing and replaced with structural fill (for open excavation installation methods) or foundations extend below such soil and into firm bearing soil (for drilled shaft foundation installation methods). It is our opinion that structural fill placed and compacted as recommended in Section 4.3 will provide the minimum 1,500 psf average allowable lateral bearing pressure.

4.6. Slab-on-Grade Support

Slab-on-grade or mat foundations, if utilized, may be supported on-grade structures provided the subgrade soil has been prepared as recommended in the Section 4.2.3 of this report. We recommend the slab be designed using a modulus of vertical subgrade reaction (k) of 220 pounds per cubic inch (pci) for surface compacted natural sand soil or structural fill.

4.7. Seismic Considerations

The 2019 WSDOT *Geotechnical Design Manual* recommends using the International Building Code (IBC) for design of buildings and similar structures. However, it is possible the culvert or arched bridge will be designed following American Association of State Highway Transportation Officials (AASHTO) design procedures. For both the IBC and AASHTO approaches, spectral response acceleration is estimated by classifying the site based on the average soil properties below the site to a depth of 100 feet. Based on subsurface conditions encountered in our explorations and our understanding of the geologic conditions in the site vicinity, in our opinion, the site may be characterized as Class D for either the IBC or AASHTO design procedures.

4.8. Pavements

4.8.1. General

In our opinion, pavement sections may be supported on-grade provided the subgrade consists of at least 1 foot of compacted natural sand soil or structural fill placed over such soil, as described in Section 4.2.3.

4.8.2. Material Specifications

We recommend pavement materials conform to applicable sections of the WSDOT Standard Specifications.

4.8.3. Frost Heave Protection

For frost heave to occur, three elements must be present: (1) extended periods of freezing temperatures; (2) a source of water, particularly shallow groundwater situated within about 5 to 8 feet of ground surface; and (3) frost susceptible soil. Subgrade soils most susceptible to frost heave include silt, clay and silty sand and gravel.

Based on the results of our subsurface evaluation, near-surface soil conditions include about 3 feet of silty sand overlying sand with silt. The NRCS classifies the Quincy loamy sand soil at the site as having a low susceptibility to frost action. In addition, we did not encounter groundwater within 10 feet of existing site grade. Therefore, it is our opinion that proposed pavements at the site have a low susceptible to frost heave.

If the pavement section subgrade is sloped to promote drainage, as discussed below, and regular maintenance is performed to fill potholes and seal cracks to prevent water infiltrating the pavement section, it is our opinion that subgrade overexcavation and replacement to mitigate against frost heave should not be necessary.

4.8.4. Drainage

Long-term performance of pavements is influenced significantly by drainage conditions beneath the pavement sections. As stated above, saturation of subgrade soil that is moisture sensitive can lead to pavement damage through loss of support of the pavement section or by freezing and heaving the pavement section. The potential for damage caused by water infiltrating the pavement section can be reduced by providing positive drainage. Positive drainage can be accomplished by crowning the subgrade with a minimum 2 percent cross slope and establishing grades to promote drainage.

4.8.5. Pavement Design Criteria

We completed pavement section design for the proposed drive and pullout lanes in general accordance with procedures in the *AASHTO Guide for Design of Pavement Structures 1993* using the computer program WinPAS. The estimate of daily bus traffic at the proposed Transit Hub used in our pavement design was developed by Ben Franklin Transit and provided by KPFF. We used this data to calculate the number of bus passes over the pavement each year based on the hours of operation for weekdays and weekends, less holidays. The estimated traffic data used in our analyses is summarized in Table 1, Traffic Data. **If the proposed vehicle type, number of trips per day and/or traffic patterns change, we should be notified so we can review our analysis and revise our recommended pavement section, if appropriate.**

TABLE 1. TRAFFIC DATA

Days[1]	Buses per Hour	Hours Operated	Days per Week	Buses per Week	Weeks per Year	Buses per Year
Monday to Friday	6	16	5	480	52	24,960
Saturday	6	15	1	90	52	4,680
					Total	29,640

Notes: [1]Ben Franklin Transit does not operate on Sunday or Holidays.

Equivalent Single Axle Loads (ESALs) were calculated for a 30-year lifespan of the project with a 2 percent growth rate based on buses with single axle loads of 12 kips in the front and 26 kips in the rear. We used

AASHTO guidelines to estimate design parameters for our analyses. The design data used in our analyses are presented in Table 2, Design Data.

TABLE 2. DESIGN DATA

Design Assumption	HMA	PCC
Design Life, years	30	30
Growth Rate, percent	2	2
Soil Resilient Modulus, psi (CBR value of 16)	13,000	13,000
Reliability, percent	90	90
Standard Deviation	0.45	0.35
Modulus of Elasticity (psi)	-	4,700,000
Modulus of Rupture (psi)	-	700
Modulus of Subgrade Reaction (psi/in)	-	225
Load Transfer Coefficient	-	3.2
Initial Serviceability Index, Po	4.2	4.2
Terminal Serviceability Index, Pt	2.25	2.25
ESALs	5,408,000	5,638,000
Materials Structural Coefficient – HMA	0.42	-
Materials Structural Coefficient – CSBC	0.12	-
Materials Drainage Coefficient – HMA	1.0	1.0
Materials Drainage Coefficient – CSBC	1.0	1.0

Notes: psi = pounds per square inch

4.8.6. Pavement Sections

Based on the estimated traffic data and our analyses, our recommended pavement section is presented in Table 3, Recommended Pavement Section.

TABLE 3. RECOMMENDED PAVEMENT SECTION

Section	HMA Thickness (inches)	PCC Thickness (inches)	CSBC Thickness (inches)
HMA Pavement Section	6	-	8.5
PCC Pavement Section	-	8.5	4

4.9. Site Drainage and Stormwater Management

4.9.1. Temporary Drainage

The surficial silty sand soil (SM) at the site has a low permeability which might lead to excessive runoff and some local ponding of water in excavations during construction, depending on the construction schedule. Accordingly, site excavations should be provided with appropriate ditches and sumps to keep the exposed areas as free from standing water as possible. Some pumping from sumps might be necessary during wet

weather. Temporary ditches, sumps and pumps also might be required to temporarily dewater excavations during construction. Also, site grading should be used to direct surface water away from excavations.

4.9.2. Stormwater Considerations

4.9.2.1. *General*

We recommend that all surfaces be sloped to drain away from proposed structures and hardscape areas at a slope of 2 percent for a minimum distance of 10 feet. Pavement surfaces and open spaces should be sloped such that surface runoff is collected and routed to suitable discharge points.

4.9.2.2. *Site Criteria*

We recommend evaluating the feasibility of stormwater management via infiltration at the site by considering site suitability criteria (SSC) in accordance with the 2019 WSDOT *Highway Runoff Manual* (HRM). The criteria that should be evaluated during siting and design of infiltration facilities include:

- Setback requirements. Stormwater management/disposal facilities must be set back from drinking water wells, septic drain fields, springs, foundations, native growth protection easements and slopes.
- Seepage analysis and control. Infiltration of stormwater is not allowed on or upgradient of a contaminated site where infiltration of even clean water can cause contaminants to mobilize.
- Groundwater protection areas. Infiltration facilities should not be used if there is a potential for violating Ecology Groundwater Quality Standards.
- Depth to bedrock, groundwater or impermeable layer. The base of all infiltration basins or trench systems must be greater than or equal to 5 feet above the seasonal high-water mark, bedrock (or hardpan), or other low-permeability layer.
- Soil infiltration rate. For runoff treatment infiltration facilities, the maximum final infiltration rate is 3.0 inches per hour.
- Drawdown time. Infiltration facilities in eastern Washington must drain within 72 hours after flow has ceased.
- Soil physical and chemical suitability for treatment. Consider soil texture and design infiltration rates, along with the physical and chemical characteristics, to determine whether the soil is adequate for removing the target pollutants.

4.9.2.3. *Infiltration Methods*

Based on the results of our literature review, subsurface explorations at the site, laboratory testing and engineering analyses, it is our opinion the silty sand soil (SM) is suitable for stormwater infiltration via swales but not for infiltration via drywells. However, in our opinion, the sand with silt unit (SP-SM) we encountered about 3½ feet below the upper silty sand unit in our borings is suitable for limited infiltration via single-depth/barrel drywells.

4.9.2.4. *Swales*

As noted previously, NRCS mapping of surficial soil in the project vicinity indicates the site is underlain by Quincy loamy sand soil. Furthermore, the NRCS classifies the Quincy soil as Hydrologic Group A. Typically, Group A soils are characterized by surface infiltration rate of greater than 0.3 inches per hour (in/hr).

We also estimated the saturated hydraulic conductivity (K_{sat}) of the site soil using Appendix 4D, Section 4.1 *K_{sat} Based on Soil Gradation* of the HRM and the results of our laboratory grain-size analyses of a soil sample collected from boring B-1 at about 1 to 2½ feet bgs in the silty sand unit (SM). Our calculations resulted in an estimated K_{sat} of about 2 in/hr.

However, in our opinion, roadside swales at the site likely will have a "High" potential for biofouling and a "Low" degree of long-term maintenance/performance monitoring. Per Table 4D-2 *Infiltration rate reduction factors to account for biofouling and siltation effects for ponds* (Massman 2003a) of the HRM for the above conditions, an infiltration rate reduction factor of 0.2 should be applied. As such, we recommend an infiltration rate of **0.4 in/hr** be used for swale design. The infiltration rate applies to infiltration through swale bottoms.

During construction of swales, the contractor should be especially careful to avoid inadvertent compaction of soil at proposed swale bottom grade. To maximize the swale efficiency, final preparation of the swale should involve scarification or disking to loosen exposed soil within the bottom limits of the swale.

4.9.2.5. *Drywells*

In our opinion, double-depth/barrel drywells likely will penetrate through the sand with silt target soil into the lower silty sand layer at a depth of about 10 feet bgs, reducing their effectiveness. Single-depth/barrel drywells should still be situated within the silt with sand target soil at a depth of about 6 feet bgs and allow for a proper separation between the bottom of the drywell and the less permeable soil unit. Drywells should be spaced at least 30 feet apart.

We estimated the outflow capacity of a single-depth/barrel (6 feet deep) drywell using procedures outlined in the HRM and the results of our laboratory grain-size analyses. We recommend using a design outflow rate presented in Table 4.

TABLE 4. DRYWELL EXFILTRATION METHOD SUMMARY

Boring No.	Approximate Depth Range (ft)	Soil Type	Percent Fines	WSDOT Hydraulic Conductivity K		Safety Factor	Single-Depth Drywell Ultimate Exfiltration Rate (cfs)	Single-Depth Drywell Allowable Exfiltration Rate (cfs)
				cm/sec	in/hr			
B-3	8.5-10	SP-SM	9.4	1.35E-02	19.2	2.0	0.19	0.1

Notes:

cm/sec = centimeters per second; in/hr = inches per hour; cfs = cubic feet per second; ft = foot;

NA = not applicable, soil is not suitable for drywells

The above-referenced outflow rates are based on the condition that drywells are hydraulically connected to the sand (SP-SM) unit. If the silty sand unit is present within most of the drywell excavation, the drywell will not function as designed and alternative measures should be undertaken to mitigate against poor long-term performance.

In our opinion, drywells at the site likely will have a "High" potential for siltation and a "Low" degree of long-term maintenance/performance monitoring. As such, we applied a conservative safety factor to the ultimate exfiltration rate to estimate the allowable exfiltration rate. The safety factor accounts for siltation and plugging may reduce the equivalent saturated hydraulic conductivity values of the facilities by an order

of magnitude or more. This will result in a corresponding reduction in infiltration rate. The fine sand with silt (SP-SM) at the site, in our opinion, if especially susceptible to siltation and plugging.

5.0 LIMITATIONS

We have prepared this report for KPFF for the proposed Queensgate Transit Hub Project in Richland, Washington. KPFF may distribute copies of this report to Ben Franklin Transit and Ben Franklin Transit's authorized agents and regulatory agencies as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations, and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled "Report Limitations and Guidelines for Use" for additional information pertaining to use of this report.

FIGURES

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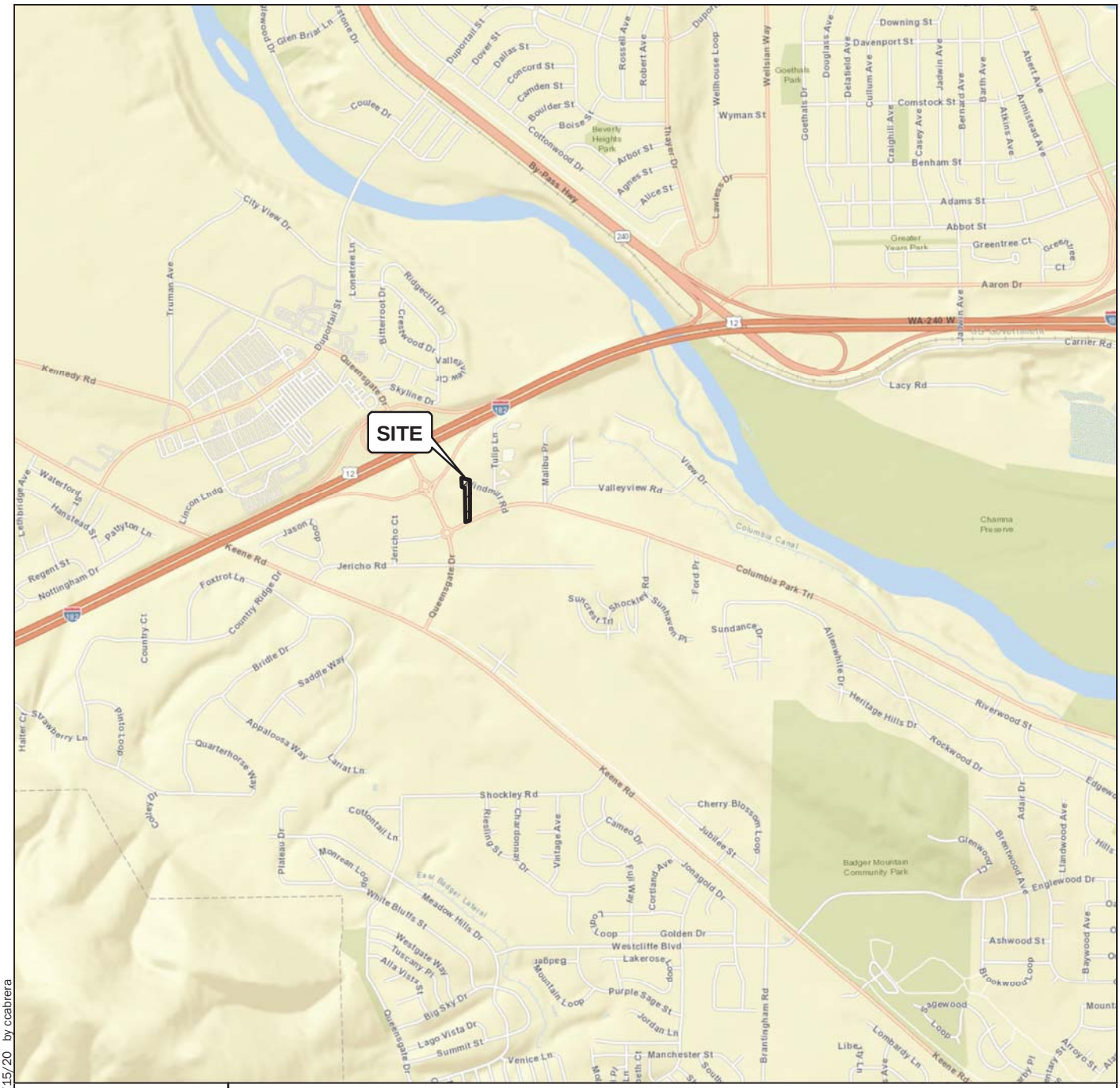

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Vicinity Map

Queensgate Transit Hub
Richland, Washington

GeoEngineers

Figure 1

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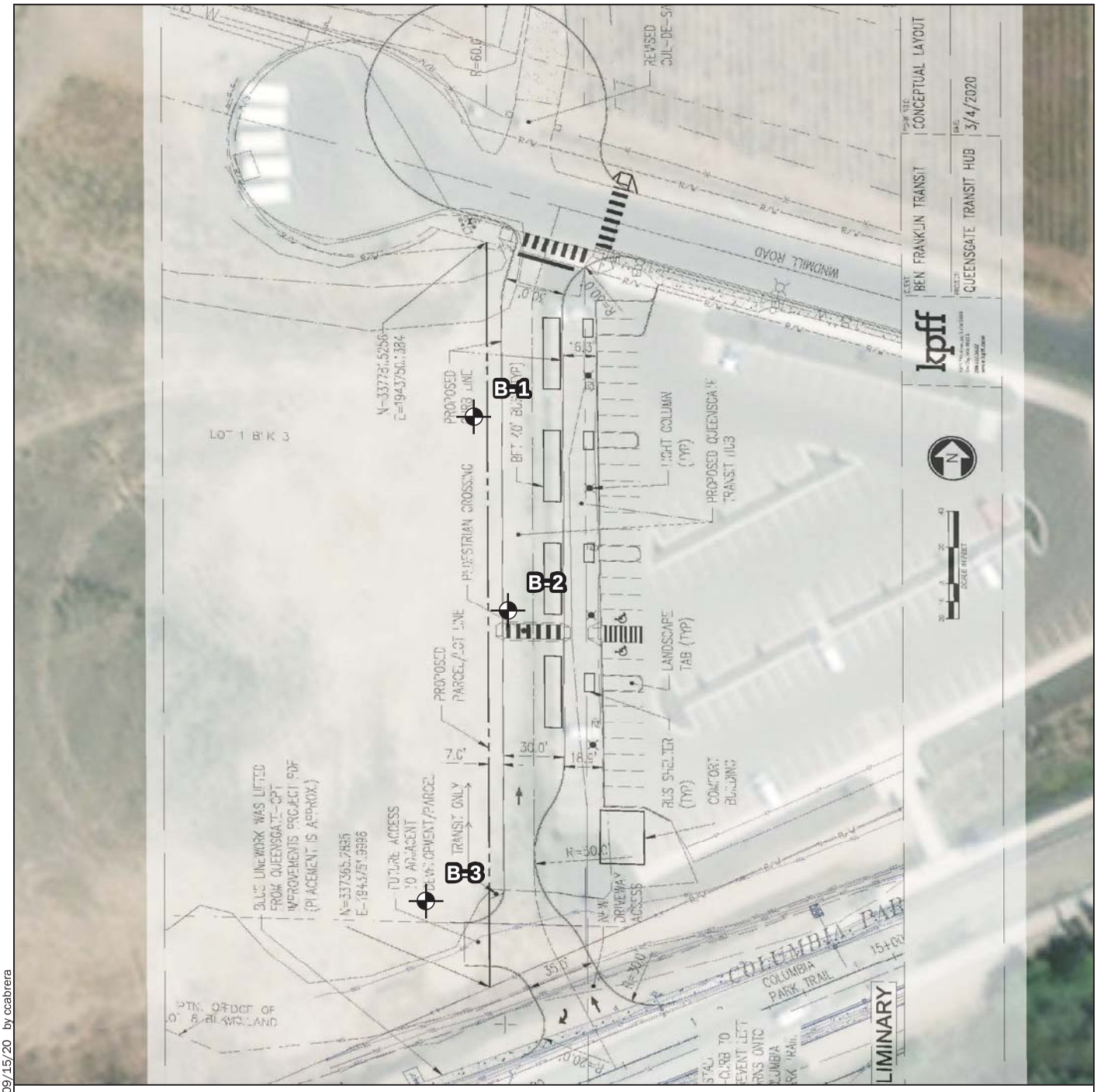

Legend

B-1 Boring Number and Approximate Location

80 0 80

Feet

N

W E

S

Notes:

1. The locations of all features shown are approximate.
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Data Source: Map overlay provided by KPFF, Imagery provided by ESRI

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

Site Plan

Queensgate Transit Hub
Richland, Washington

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Figure 2

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APPENDICES

GeoEngineers

APPENDIX A
Field Explorations and Laboratory Testing

APPENDIX A
FIELD EXPLORATIONS AND LABORATORY TESTING

Field Explorations

Soil conditions at the site were explored on July 21, 2020, by completing three borings (B-1 through B-3), each to a depth of about 15 feet below the existing ground surface using a truck-mounted, CME-75 hollow-stem auger drill rig owned and operated by GeoEngineers. The approximate locations of these borings are shown in the Site Plan, Figure 2.

Samples of soil encountered in the borings were obtained at approximate 2½-foot-depth intervals using either a 2-inch, outside-diameter, standard split-spoon sampler, or a 2.4-inch, inside-diameter, California-type split barrel sampler. The samplers were driven into the soil using a 140-pound hammer, falling 30 inches on each blow. The number of blows required to drive the samplers each of three, 6-inch increments of penetration were recorded in the field. The sum of the blow counts for the last two, 6-inch increments of penetration for the California-style sampler were converted to approximate ASTM D 1586-08A Standard Penetration Test (SPT) N-values. The conversion of California sampler blow counts to approximate SPT N-values was made using the Lacroix-Horn Equation (ASTM SPT-523, 1973). The approximate N-values are shown in the "Remarks" section of the boring logs. A bulk soil sample also was collected from the upper 2 feet at the location of boring B-2 for laboratory testing.

The explorations were continuously monitored by GeoEngineers' field staff who examined and classified the soil encountered and obtained representative samples of each. Soil encountered in the explorations was classified in general accordance with ASTM D 2488 (visual-manual procedure) and the classification chart listed in Key to Exploration Logs, Figure A-1. Logs of the explorations are presented in Logs of Borings, Figures A-2 through A-4. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials, or their characteristics change, although these changes might be gradual.

Locations of the explorations were selected by GeoEngineers based on a preliminary site plans provided by KPFF titled "Queensgate Transit Hub," dated March 4, 2020. The planned boring locations were established in the field by our representative using GISPro Software on an iPad using available satellites with GPS and/or triangulation from cell towers. The final boring locations were refined in the field by pacing and taping from known site features shown on the site plan. The exploration locations should be considered accurate to the degree implied by the method used.

Laboratory Testing

Representative soil samples were selected for laboratory tests to evaluate select geotechnical engineering characteristics of the site soil to confirm or revise our field classification. Soil samples obtained from the explorations were visually classified in the field and/or in our laboratory using the Unified Spoil Classification System (USCS) and ASTM classification methods. ASTM test method D 2488 (Practice for Description and Identification of Soils) was used in the field to visually classify the soil samples, while ASTM D 2487 (Classification of Soils for Engineering Purposes) was used to classify the soil based on laboratory tests results. These classification procedures are described in Figure A-1 and incorporated in the exploration logs shown in Figures A-2 through A-4.

The test procedures were performed in general accordance with the applicable ASTM test procedures ("in general accordance" means certain local and common descriptive practices and methodologies have been followed). The laboratory soil testing program is summarized in Table A-1, Summary of Laboratory Testing.

TABLE A-1. SUMMARY OF LABORATORY TESTING

Standard Test Method for:	Test Method Designation	Total Tests Performed	Results Location
Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis	ASTM C 136	3	Presented in Figure A-5 and in the applicable logs in the 'Fines Content (%)' column.
Laboratory Determination of Moisture Content and Density (Unit Weight) of Soil Specimens	ASTM D 3550	3	Presented in the applicable exploration logs in the 'Moisture Content, %' column and in the 'Remarks' column as 'DD = (pcf)'.
Determining the Amount of Material Finer than 75-µm (No. 200) Sieve in Soils by Washing	ASTM D 1140	4	Presented in the applicable exploration logs in the 'Fines Content (%)' column.
Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3 (2,700 kN-m/m3))	ASTM D 1557	1	Presented in Figure A-6.
Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils	ASTM D 1883	1	Presented in Figure A-7.

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
MORE THAN 50% RETAINED ON NO. 200 SIEVE	SAND AND SANDY SOILS	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS
				SP	POORLY-GRADED SANDS, GRAVELLY SAND
	MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
MORE THAN 50% PASSING NO. 200 SIEVE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

ADDITIONAL MATERIAL SYMBOLS

SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
	AC	Asphalt Concrete
	CC	Cement Concrete
	CR	Crushed Rock/ Quarry Spalls
	SOD	Sod/Forest Duff
	TS	Topsoil

Groundwater Contact

Measured groundwater level in exploration, well, or piezometer

Measured free product in well or piezometer

Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

Sampler Symbol Descriptions

2.4-inch I.D. split barrel

Standard Penetration Test (SPT)

Shelby tube

Piston

Direct-Push

Bulk or grab

Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point load test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

Key to Exploration Logs

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Figure A-1

Drilled Start 7/21/2020 End 7/21/2020	Total Depth (ft) 15	Logged By MAM Checked By EJA	Driller GeoEngineers, Inc.	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 512 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Truck-mounted CME-75	
Easting (X) 1943755 Northing (Y) 337688		System Datum WA State Plane South NAD83 (feet)		Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0						CR	Approximately 3 inches of gray fine to coarse gravel with silt and sand (medium dense, moist) (crushed rock)			
510		15	15		1 %F		SM	Brown silty fine sand with occasional gravel (medium dense, moist)	7	23	
		16	21		2 SA		SP-SM	Brown fine sand with silt (loose to medium dense, moist)	4	8	Approximate SPT N-value is 8
	5										
505		16	14		3						
		18	20		4						Approximate SPT N-value is 8
	10										
		18	23		5		SM	Brown silty fine to medium sand (medium dense, moist)			
500											
		16	37		6 MD		SM	Dark brown silty fine sand (medium dense, moist)	26		Approximate SPT N-value is 15 DD=98 pcf
	15										

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

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Log of Boring B-1

GeoEngineers

Project: Queensgate Transit Hub
Project Location: Richland, Washington
Project Number: 2557-007-00

Figure A-2
Sheet 1 of 1

Drilled Start 7/21/2020 End 7/21/2020	Total Depth (ft) 15	Logged By MAM Checked By EJA	Driller GeoEngineers, Inc.	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 511 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Truck-mounted CME-75	
Easting (X) 1943774 Northing (Y) 337584		System Datum WA State Plane South NAD83 (feet)		Groundwater not observed at time of exploration	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0						CR	Approximately 3 inches of gray fine to coarse gravel with silt and sand (loose, dry) (crushed rock)			
510		16	25		1 MD; SA		SM	Brown silty fine sand with occasional gravel (medium dense, moist)	7	30	Bulk sample from approximately ½ to 2 feet %F=35%; MC=9% Approximate SPT N-value is 10 DD=95 pcf
	5	18	8		2		SP-SM	Brown fine sand with silt (loose to medium dense, moist)			
505		17	50		3 %F				5	8	Approximate SPT N-value is 21
		18	26		4						
	10										
500		17	52		5						Approximate SPT N-value is 21
		16	29		6						
	15										

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

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Log of Boring B-2

GeoEngineers

Project: Queensgate Transit Hub
Project Location: Richland, Washington
Project Number: 2557-007-00

Figure A-3
Sheet 1 of 1

Drilled Start 7/21/2020 End 7/21/2020	Total Depth (ft) 15	Logged By MAM Checked By EJA	Driller GeoEngineers, Inc.	Drilling Method Hollow-stem Auger	
Surface Elevation (ft) 504 Vertical Datum NAVD88		Hammer Data Autohammer 140 (lbs) / 30 (in) Drop		Drilling Equipment Truck-mounted CME-75	
Easting (X) 1943730 Northing (Y) 337428		System Datum WA State Plane South NAD83 (feet)		See "Remarks" section for groundwater observed	

Notes:

Elevation (feet)	Depth (feet)	FIELD DATA: Interval Recovered (in)	Blows/foot	Collected Sample	Sample Name Testing	Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
	0						CR	Approximately 3 inches of gray fine to coarse gravel with silt and sand (loose, moist) (crushed rock)			
		14	12		1 %F		SM	Brown silty fine sand (medium dense, moist)	6	18	
500		16	22		2		SP-SM	Brown fine sand with silt (loose to dense, moist)			Approximate SPT N-value is 9
	5										
		0	31		3						
495		16	51		4 SA				21	9	Approximate SPT N-value is 21
	10						SM	Brown silty fine sand (medium dense to dense, moist)			
		14	31		5			Becomes wet			Groundwater observed at approximately 11½ feet below ground surface during drilling
490		18	65		6 MD				22		Approximate SPT N-value is 27 DD=109 pcf
	15										

Note: See Figure A-1 for explanation of symbols.
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

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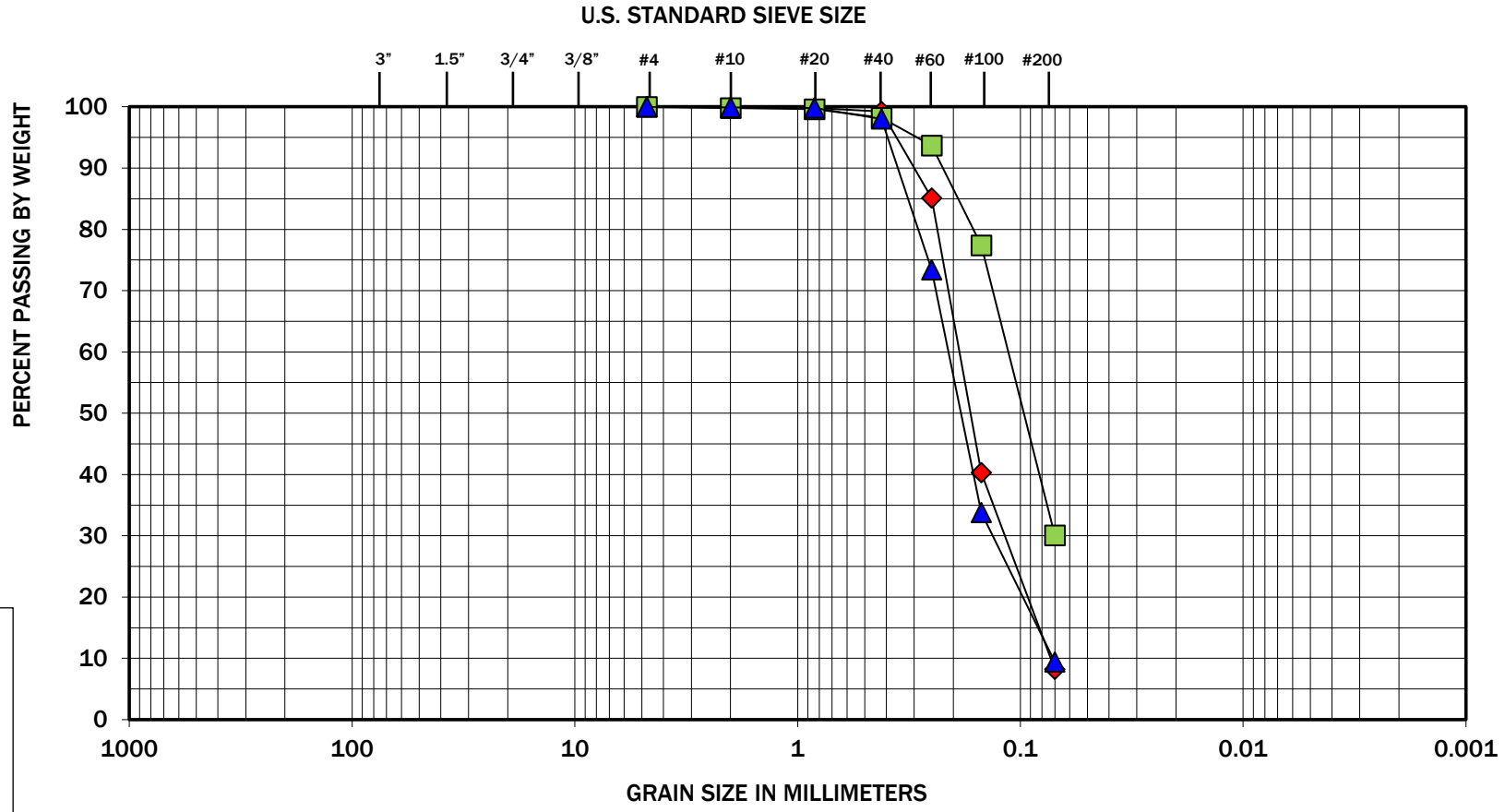
Log of Boring B-3

GeoEngineers

Project: Queensgate Transit Hub
Project Location: Richland, Washington
Project Number: 2557-007-00

Figure A-4
Sheet 1 of 1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Boring Number	Depth (feet)	Moisture (%)	Soil Description
◆	B-1	3½ - 5	4	Poorly graded fine sand with silt (SP-SM)
■	B-2	1 – 2½	7	Silty fine sand (SM)
▲	B-3	8½ - 10	21	Poorly graded fine sand with silt (SP-SM)
●				

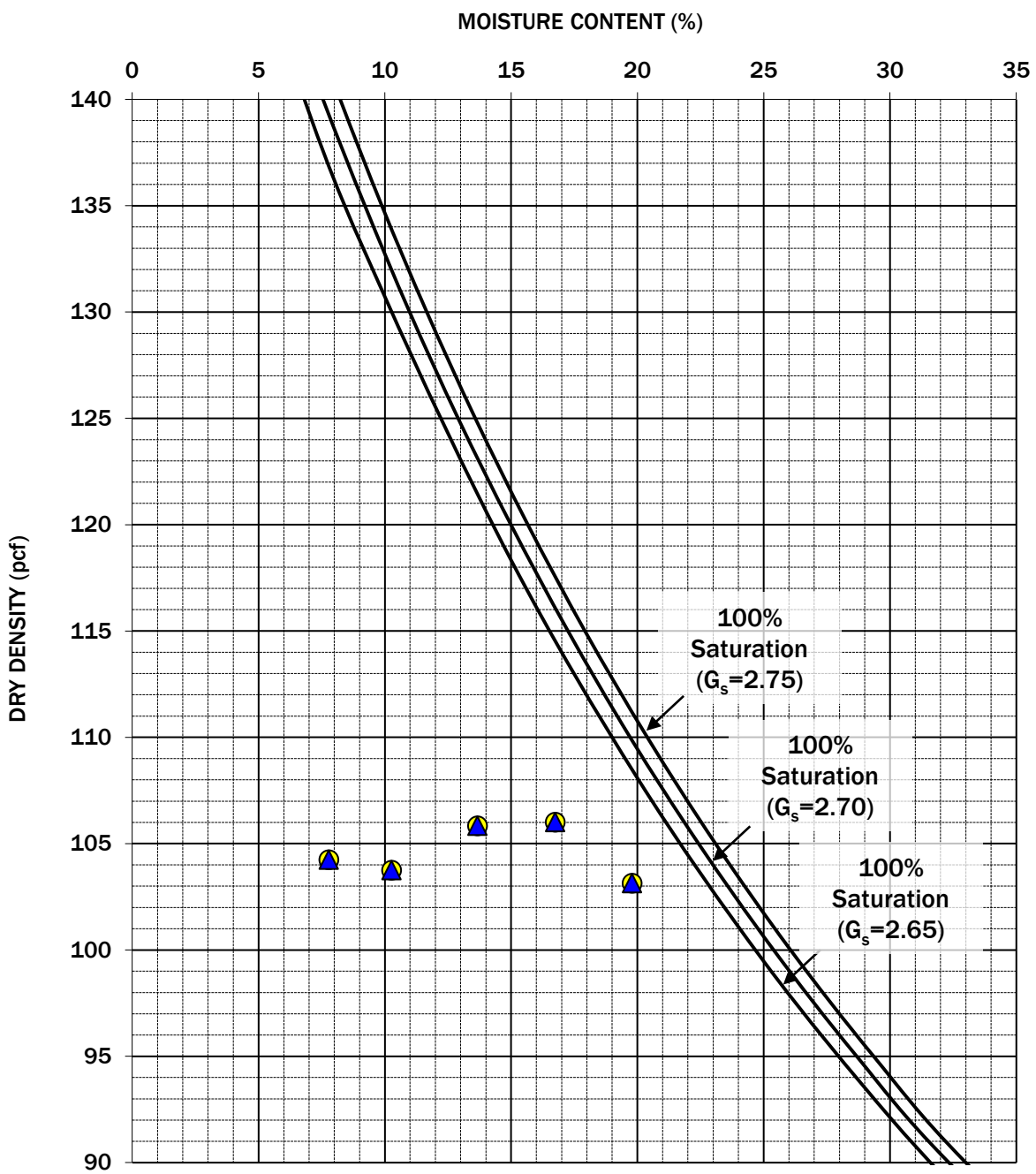
The grain size analysis results were obtained in general accordance with ASTM D 6913.

GeoEngineers

Figure A-5

Queensgate Transit Hub
Richland, Washington

Sieve Analysis Results



Symbol	Boring Number	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Dry Density (pcf)
▲ Corrected / ○ Uncorrected	B-2	½ – 2	Silty fine sand	15	107

The Proctor results were obtained in general accordance with ASTM D 1557, Method B.

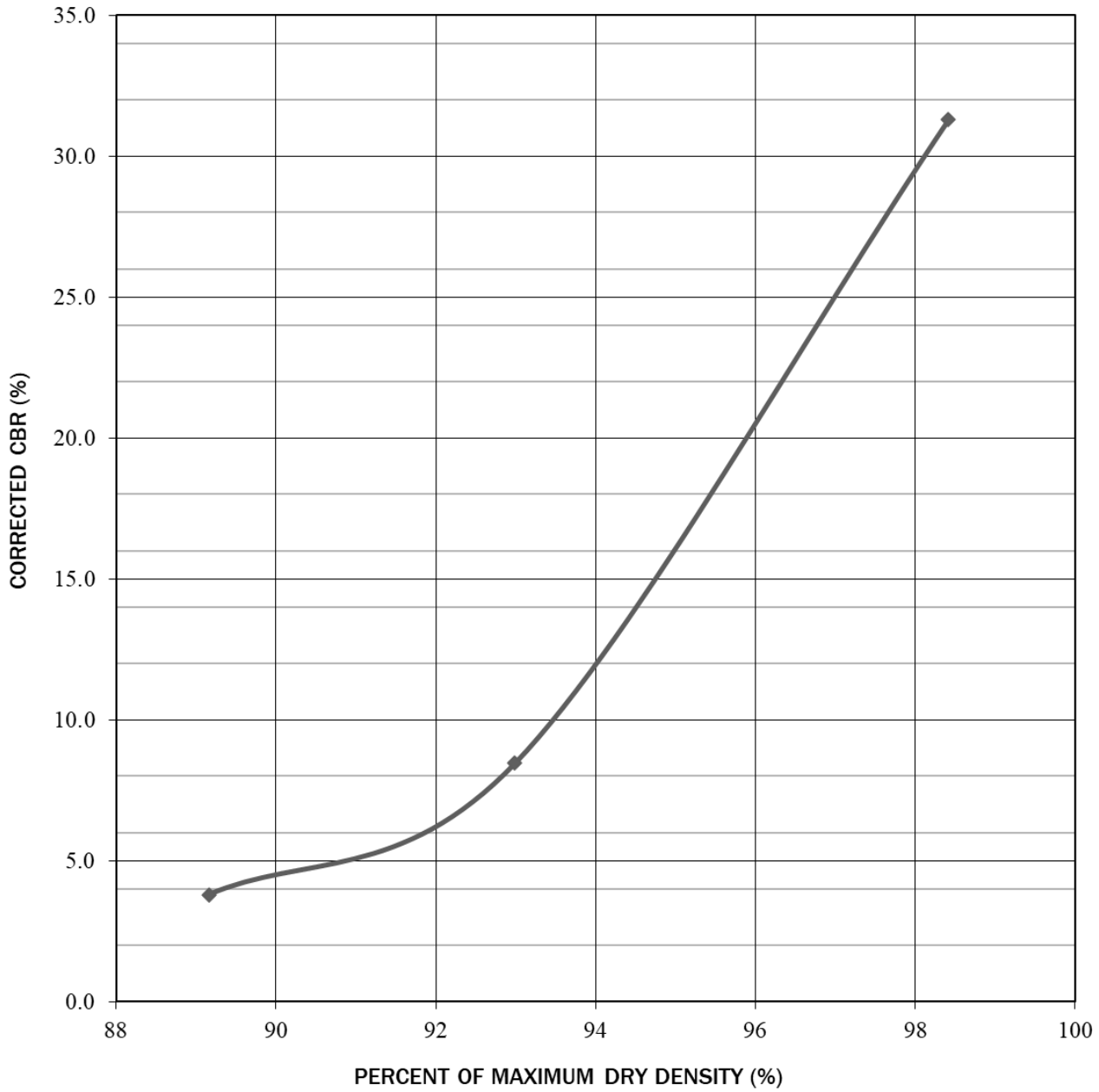
Compaction Test Results

Queensgate Transit Hub
Richland, Washington

GeoEngineers

Figure A-6

2557-007-00 Date Exported 09/03/2020



Exploration Number	Depth (feet)	Compaction Test Method	Soil Description	Optimum Moisture (%)	Maximum Dry Density (pcf)
B-5	½ - 2	D1557, A	Gray silty fine sand	15	107

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

The California Bearing Ratio was obtained in general accordance with ASTM D 1883.

California Bearing Ratio Test Results

Queensgate Transit Hub
Richland, Washington

GeoEngineers

Figure A-7

2557-007-00 Date Exported: 09/08/2020

APPENDIX B
Report Limitations and Guidelines for Use

APPENDIX B
REPORT LIMITATIONS AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory "limitations" provisions in its reports. Please confer with GeoEngineers if you need to know more how these "Report Limitations and Guidelines for Use" apply to your project or site.

Geotechnical Services are Performed for Specific Purposes, Persons and Projects

This report has been prepared for KPFF and for the Project specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with KPFF dated July 16, 2020, and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors

This report has been prepared for the proposed Queensgate Transit Hub Project in Richland, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;

1 Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.

- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

Environmental Concerns are Not Covered

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

Subsurface Conditions Can Change

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical and Geologic Findings are Professional Opinions

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

Geotechnical Engineering Report Recommendations are Not Final

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

Do Not Redraw the Exploration Logs

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable, but separating logs from the report can create a risk of misinterpretation.

Give Contractors a Complete Report and Guidance

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to conduct additional study to obtain the specific types of information they need or prefer.

Contractors are Responsible for Site Safety on Their Own Construction Projects

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as

they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

Information Provided by Others

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.

GeoEngineers

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EAST WENATCHEE

ISSAQUAH

RICHLAND

TACOMA

OREGON LOCATIONS

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MAIN OFFICE
6500 SW Macadam Ave. Suite 125
Portland, OR 97239

MEDFORD

December 27, 2017

Ms. Julie West
City of Richland
Public Works Department
505 Swift Boulevard, MS-26
Richland, WA 99352

Sent via: Email

Subject: Revised

Wetland Delineation and Compensatory Mitigation Plan for Queensgate Drive – Columbia Park Trail Improvements Project

Dear Julie:

This letter serves to document environmental investigations and describe wetland habitat for the City of Richland's (City) Queensgate Drive – Columbia Park Trail Improvements Project (Project). This letter has been updated from the previous May 12, 2017, and December 4, 2017 versions, primarily to report anticipated Project impacts, proposed compensatory wetland mitigation, and initial regulatory review of the mitigation concept.

The Project proposes roadway and pedestrian improvements along a portion of Queensgate Drive, Columbia Park Trail, and Keene Road. Located in the southwest area of the City, the Project will improve Queensgate Drive from south of the Interstate 182 (I-182) off-ramp south to Keene Road, including Columbia Park Trail within 500 feet east and west of Queensgate Drive (Section 22, Township 09, Range 28E).

DOCUMENTS REVIEWED

Northeast of the Queensgate Drive and Columbia Park Trail intersection, the Tulip Lane Park and Ride (P&R) was recently constructed by Ben Franklin Transit. RH2 Engineering, Inc., (RH2) completed wetland delineations for the Tulip Lane P&R in May 2014. Data associated with this work was reviewed prior to RH2's March 2017 site investigations for the Project, along with site-specific data and resources, including the following.

- City of Richland. Geological Sensitive Areas Map. January 2017. Accessed March 15, 2017, from https://www.ci.richland.wa.us/departments/community-development-services/development-services/imaps-disclaimer/gis-maps.

- U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS). Web Soil Survey. Accessed February 22, 2017, from https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.
- U.S. Fish and Wildlife Service (USFWS). National Wetlands Inventory (NWI). Wetlands Mapper V2. Accessed February 22, 2017, from https://www.fws.gov/wetlands/data/mapper.html.
- Washington Department of Fish and Wildlife (WDFW). Mapping for Priority Habitats and Species (PHS), and Fish Passage:

  Accessed February 22, 2017, from http://wdfw.wa.gov/mapping/phs/

  Accessed February 28, 2017, from http://apps.wdfw.wa.gov/salmonscape/
- Washington State Department of Ecology (Ecology). Water Quality Mapping:

  Water Quality Improvement Projects (TMDLs), WRIA 37: Lower Yakima, Accessed March 9, 2017, from http://www.ecy.wa.gov/programs/wq/tmdl/TMDLsbyWria/tmdl-wria37.html

  Washington State Water Quality Atlas, Accessed March 13, 2017, from https://fortress.wa.gov/ecy/waterqualityatlas/map.aspx

Attachment A includes maps from the reviewed data sources.

The City's Sensitive Areas Map does not show any wetlands, streams, or other sensitive areas in the project location.

The USFWS NWI data shows a linear riverine wetland north of the Columbia Park Trail and Queensgate Drive intersection, flowing from the west, and eventually draining to the Columbia Canal northeast of the Project.

The NRCS data shows the northern Project area is within the Quincy loamy sand, 2 to 15 percent slopes soil, and the southern Project area is within the Warden very fine sandy loam, 0 to 2 and 2 to 8 percent slopes soils.

WDFW mapping shows a PHS polygon depicting the Keene Creek Wetland aquatic habitat, mapped southeast of the intersection of Queensgate Drive and Columbia Park Trail. Salmonscape mapping shows the same intermittent stream depicted in the NWI data.

Ecology has an active total maximum daily load (TMDL) for the Lower Yakima River for DDT and Turbidity, and a TMDL under development for Toxics for the entire Yakima River system.

PROJECT OVERVIEW

The City is proposing roadway and pedestrian improvements (i.e., expansion of roadway, addition of curbs and gutters, addition of pedestrian features, etc.) along Queensgate Drive and Columbia Park Trail, including construction of a two-lane roundabout at this intersection, and addition of a right-hand turn lane on Keene Road at the Queensgate Drive intersection. The Project will extend Columbia Park Trail from Queensgate Drive to Jericho Court. Sidewalk (standard 5-foot width) and pedestrian path (12 feet wide) are proposed along Queensgate Road and Columbia Park Trail. Construction of the Project is scheduled for summer 2017.

METHODOLOGY USED

RH2 visited the Project site March 7, and 8, 2017, to complete an environmental investigation, including wetland delineations and ratings for identified wetland habitat. Methodology used to delineate and characterize wetlands and critical areas on the site is listed below.

- Brinson, Mark M. *A Hydrogeomorphic Classification for Wetlands*. 1993. U.S. Army Corps of Engineers (USACE) Publication (Pub.) WRP-DE-4.
- City of Richland Municipal Code (RMC). January 2017. Sensitive Areas. Chapter 22.10.
- Cowardin, Lewis M., et al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. USFWS Pub. FWS/OBS-79/31.
- Hruby, T. 2014. *Washington State Wetland Rating System for Eastern Washington: 2014 Update*. Publication No. 14-06-030. Olympia, WA: Washington State Department of Ecology.
- U.S. Army Corps of Engineers. 1987. *Corps of Engineers Wetland Delineation Manual*. Pub. Y-87-1.
- U.S. Army Corps of Engineers. 2008. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (Version 2.0). Publication ERDC/EL TR-08-28.

CRITICAL AREAS EXISTING CONDITIONS

General

Most of the Project alignment is existing asphalt roadway. Queensgate Drive and Columbia Park Trail are both classified as Minor Arterial roadways, and Keene Road is a Principal Arterial (Richland Street Functional Classification Map, January 2017). Adjacent to the project roadways, land is either undeveloped; graded, vacant lots; or commercial properties (**Attachment B**).

Streams

East of Queensgate Drive, north of Columbia Park Trail, a depressional wetland is present with flows to the east channelizing into an undefined stream channel before entering a culvert at Windmill Road. The stream shows up as an intermittent, non-fish bearing stream on WDFW's SalmonScape database. The intermittent and non-fish classification was confirmed during field investigations by RH2. Flow from this wetland/stream, as well as flow from the depressional wetland south of Columbia Park Trail, head northeast by way of culverts before eventual drainage to the Columbia Canal.

Wetlands

During RH2's site investigation, three wetlands were identified, delineated, and characterized in the Project vicinity (**Attachment C**). Wetlands identified are concentrated near the intersection of Queensgate Drive and Columbia Park Trail. Wetland habitat was not identified in the southern portion of the Project (Jericho Road south to Keene Road).

<u>Vegetation</u>

Wetland A is northeast of the intersection of Queensgate Drive and Columbia Park Trail. The wetland contains multiple hydrogeomorphic classes, depressional, and riverine, and was rated as a depressional

wetland. The Cowardin classification of Wetland A is palustrine emergent and forested. Dominant vegetation observed in Wetland A includes Russian olive, hardstem bulrush, and common cattail.

Wetland B is southeast of the intersection of Queensgate Drive and Columbia Park Trail. The wetland is predominantly a depressional hydrogeomorphic class and was rated as such. The Cowardin classification of Wetland B is palustrine emergent and forested. Dominant vegetation observed in Wetland B includes Russian olive, common cattail, Reed canarygrass, and hardstem bulrush.

Wetland C is located west of the intersection of Queensgate Road and Columbia Park Trail. The wetland is a slope hydrogeomorphic class and was rated accordingly. The Cowardin classification of Wetland C is palustrine emergent. Dominant vegetation in Wetland C includes annual rabbitsfoot grass and chairmaker's bulrush. The City surveyed wetland boundaries following RH2's fieldwork, a map of which is included in **Attachment C**.

Based on a review of the Washington State Department of Natural Resources (DNR) Natural Heritage data, as well as site investigations by RH2, the wetlands observed near the Project site do not support locally important, priority, or state or federally listed plant species.

Soils

The primary soil unit underlying the entire subject parcel is Quincy loamy sand, 2 to 15 percent slopes (north of Jericho Road), and Warden fine sandy loam, 0 to 2 and 2 to 8 percent slopes (south of Jericho Road). The Quincy soil series consists of excessively drained, course-textured soils, formed under grass, sagebrush, and rabbitbrush. A typical soil profile is dark-brown to dark grayish-brown loamy sand to a depth of 60 inches or more. Permeability is very rapid in the Quincy soil series. The Warden soil series consists of well-drained, medium-textured soils on uplands, formed under bunch grasses. A typical soil profile is dark-brown to dark grayish-brown silt loam surface layer to 9 inches, underlain by a dark grayish-brown silt loam subsoil to a depth of about 19 inches. The sub-stratum is brown to grayish-brown silt loam extending to a depth of 60 inches or more. Permeability is moderate in the Warden soil series.

Test pits dug within wetland habitat in the Project vicinity were all located with the Quincy loamy sand, 2 to 15 percent slopes soil unit. Test pits dug in Wetlands A and B contained a 1- to 4-inch-thick layer of brown to very dark-brown loam to sandy loam, underlain by an olive to dark yellowish brown loamy sand subsoil. The subsoil contained common to many, coarse, distinct to prominent redoximorphic (redox) concentrations. Test pits dug in Wetland C contained a surface layer of muck underlain by black sandy loam with many, coarse, prominent redox concentrations. Test pits were dug to about 16 inches, so substratum layers were not documented. Sandy redox was the predominant primary hydric soil indicator. Hydrogen sulfide odor was also prevalent in Wetland C test pits.

Hydrology

Soil saturation and the water table within the upper 12 inches of the soil profile was also observed in wetland test pits. Additional indicators of wetland hydrology observed include marks of ponding on Russian olive trees in/near the wetland edge, areas of ponded surface water, and hydrogen sulfide odor (the first two being more prevalent in Wetlands A and B, and the latter in Wetland C).

The hydrology source for Wetland C appears to originate from a culvert draining upland areas starting from the northwest corner of the Jericho Road and Queensgate Drive intersection. Flows from this culvert are contained within a roadside ditch along the west side of Queensgate Road before draining into Wetland C. Wetland C flows via culvert under Queensgate Drive and drains into Wetland A. Wetland A then flows east toward its culvert outlet at Windmill Road.

The hydrology source for Wetland B originates from a large wetland complex north of Keene Road (east of the area proposed for improvement by the Project). This wetland complex is referred to as the Keene Creek Wetland habitat in WDFW PHS data. Flows generally head north from Keen Road into Wetland B, which drains into a culvert near the intersection of Windmill Road and Columbia Park Trail. Flows from Wetland A and B travel northeast toward Columbia Canal; however, these areas were outside of the Project study area, so additional detail is unknown.

Wildlife

The following wildlife or indications of use were observed: field mouse; thrush; sparrows; songbirds; crow's nests; and deer scat. No amphibian calls or evidence were observed on the site. Based on a review of the WDFW PHS and Salmonscape data, as well as site investigations by RH2, the wetlands observed near the Project site do not support locally important, priority, or state or federally listed fish or wildlife.

Categorization

Classification of wetland habitat and required buffer widths based on the City's code are summarized in **Table 1**.

Table 1. Wetlands Identified Near the Project

Wetland or Stream Full Name and Location	Abbreviation	Size (acres)	Cowardin Class	Hydrogeomorphic Class	Ecology Rating	Buffer Width (ft) per City code[1]
Wetland northeast of the intersection of Queensgate Drive and Columbia Park Trail	Wetland A	0.46	Emergent, scrub-shrub, forested	Depressional	III	150
Wetland southeast of the intersection of Queensgate Drive and Columbia Park Trail	Wetland B	9.6	Emergent, forested	Depressional	III	150
Small wetland west of Queensgate Drive	Wetland C	0.03	Emergent	Slope	IV	50

[1] Buffers were determined based on RMC Table 22.10.110(C) and Table 22.10.110(D), assuming the proposed project is a high impact land use.

Functional Wetland Assessment

The functional assessment of wetland habitat described below is based on wetland ratings completed for wetlands in the Project vicinity using Ecology's 2014 *Wetland Rating System for Eastern Washington*. Ecology's system is designed to provide a rapid, qualitative rating of wetland functions to assess wetlands based on their sensitivity to disturbance, their rarity, their ability to be replaced, and the functions they provide. For rating purposes, wetland functions are divided into water quality, and hydrologic and habitat functions. Each function is then further assessed by site potential, landscape potential, and a value rating. **Table 2** provides a summary of the wetland functions based on these ratings. Wetland rating data are contained in **Attachment D**.

Table 2. Rapid Functional Assessment for Wetlands Near the Project

Function	Qualitative Rating of Function		
	Wetland A	Wetland B	Wetland C
Water Quality Functions			
Site Potential to Improve Water Quality	Moderate	Moderate	Low
Landscape Potential to Support Water Quality Functions	Moderate	Moderate	Moderate
Value Rating for the Water Quality Improvement	High	High	High
Hydrologic Functions			
Site Potential to Perform Hydrologic Functions	Low	Moderate	Low
Landscape Potential to Support Hydrologic Functions	High	High	Moderate
Value Rating for the Hydrologic Functions	Low	Low	Low
Habitat Functions			
Site Potential to Provide Habitat	Moderate	Moderate	Low
Landscape Potential to Support Habitat Functions	Low	Low	Low
Value Rating for Habitat Functions	Moderate	Moderate	Moderate
Total Rating Score	17	18	14
Wetland Category based on Functions	III	III	IV

Overall, wetlands provide floodwater storage and attenuation of peak flows, and recharge of groundwater. Wetlands also help to retain sediments and pollutants. Wetland habitat buffers provide noise and visual screening, recruitment of large woody debris and organic matter, maintain water temperatures, provide habitat, filter pollutants, and other functions.

The approximately 0.46-acre Wetland A and 9.6-acre Wetland B have very similar functions, due to similar vegetative structures and hydrologic characteristics, and both are rated as Category III. The approximately 0.03-acre Wetland C, on the other hand, is much smaller, lacks vegetative structural diversity, and functions as a slope. As a result, Wetland C rates as a Category IV.

Water Quality Functions

Wetlands A and B possess moderate site potential to improve water quality due to intermittently flowing outlets, and persistent, ungrazed vegetation covering greater than two-thirds of their areas. The landscape potential to support the water quality functions that are provided by these wetlands is moderate due to proximity to roadways and development, which can generate pollutants. The value rating for the water quality improvement provided to society from these wetlands is high. Although these wetlands do not discharge to a waterbody on the 303(d) list for water quality impairment, several TMDL projects are in effect for the watershed of which they are a part: the Lower Yakima River TMDL for turbidity and the pesticide DDT; and the Yakima River TMDL for toxics (currently under development).

Wetland C has a moderate slope and greater than half of its area is dense, uncut, herbaceous plants, giving it a moderate site potential to improve water quality functions. It has a moderate landscape potential to improve water quality due to pollutants generated on the adjacent roadway. Located in the same subbasin as Wetlands A and B, Wetland C also has a high value for water quality improvement.

Hydrologic Functions

Wetlands A and B have a low and moderate potential, respectively, to perform hydrologic functions. While both are drained by intermittently flowing outlets, Wetland B has a greater water storage potential as evidenced by high marks of seasonal ponding. They both provide a high landscape potential to support hydrologic functions due to their proximity to runoff-producing impervious surfaces and the high intensity of human land uses in their contributing basins. These wetlands drain to the Columbia Canal and no downstream flooding problems are known; thus, the hydrologic functions of Wetlands A and B have low value to society.

Slope wetlands generally have lower hydrologic functioning due to their lack of storage potential. This is especially true for Wetland C, which rates low for its potential to reduce flooding and erosion, and value to society. It receives a moderate rating for landscape potential to support the hydrologic functions of the site due to its potential to slow flows from runoff produced by surrounding impervious surfaces and compacted lawn areas.

Habitat Functions

Wetlands A and B both provide a moderate potential for habitat functions. The units possess a moderate amount of plant structure (emergent, scrub-shrub, and/or forested areas) that is relatively interspersed to provide habitat for several different niches of wildlife species. These wetlands also contain special habitat features that increase the potential usage by wildlife species, such as amphibians. They both have a low landscape potential to support the habitat functions. Located within the City, much of the adjacent land uses are high intensity residential and commercial areas, and there is very little accessible habitat. The habitat provided by these wetlands is of moderate value to society based on their proximity to, or status as, a biodiversity area/corridor.

Wetland C has only one vegetation class and no habitat interspersion, giving it a low site potential to provide habitat. Its proximity to Wetlands A and B means that it also has a low landscape potential to support habitat functions of the site and a moderate value to society.

PROJECT IMPACTS AND MITIGATION

The City recently updated its Critical Areas Code (CAC)(Chapter 22.10). Except for isolated Category III and IV wetlands less than 1,000 square feet (sf), impacts to wetlands and their buffers are regulated per the CAC. Impacts within wetlands (and waters of the state) are not only regulated by the local jurisdiction, but also by state and federal laws, including the Washington Hydraulic Code, and Sections 401 and 404 of the Clean Water Act (CWA).

Based on discussions with the City, RH2 understands that the project design has been completed to avoid and minimize work within adjacent site wetlands to the maximum extent practicable. Such avoidance and minimization measures have included shifting the intersection improvements; adjusting the grading profile to reduce fill within wetland habitat; and installing a retaining wall and fencing to further reduce fill of wetland habitat. Consequently, the Project will completely avoid impacts to Wetland B and significantly minimize impacts to Wetland A.

Despite these avoidance and minimization measures, the Project will involve unavoidable impacts to on-site wetlands resulting from grading, filling, and excavation necessary for expansion of the roadway, construction of the roundabout, and drainage improvements. The following impacts are anticipated.

- Permanent impact of 0.01 acres of Wetland A, a Category III wetland, resulting from fill and clearing to construct the roadway and reconfigure the stormwater drainage outfall.
- Permanent impact of 0.03 acres of Wetland C, a Category IV wetland, resulting from fill to construct the roadway.

The area of impact for Wetland A is surrounding the existing stormwater outfall culvert. A small portion of the wetland will be permanently filled to construct the roadway improvements; however, proposed mitigation activities will re-establish and enhance other areas of Wetland A, thereby compensating for these impacts.

The entirety of Wetland C will be filled and thereby permanently impacted to construct the Project. Wetland C is a low-functioning emergent wetland. Being a slope wetland, the opportunity it provides for hydrologic functions is low. Vegetative cover in Wetland C is limited to emergents, significantly restricting the wetland's potential habitat functions. Additionally, being within the road right-of-way, this wetland is regularly mowed to maintain roadway stormwater drainage flows. The main function being provided by Wetland C is water quality and some water storage, as the position of this wetland in the landscape, and its vegetative cover, do provide some opportunity for water quality improvement and hydrologic storage prior to draining downslope.

The City allows for alteration of wetlands or their buffers subject to the criteria in RMC 22.10.120(A). All adverse impacts to wetland functions and values shall be mitigated per the following sequence:

1. Avoid the impact all together;
2. Minimize the impact by limiting its magnitude;
3. Rectify the impact through restoration, rehabilitation, etc.;
4. Reduce the impact over time by preservation and maintenance operations;
5. Compensate for the impact by replacing resources or environments; and
6. Monitor the impact and take appropriate corrective measures.

Optimally, required compensatory mitigation should be completed on site, per preference expressed in the City code.

With the recent update of the CAC, the City's replacement ratios, depicted in **Table 3**, generally follow the recommended mitigation ratio for eastern Washington, which are outlined in the joint guidance document, *Wetland Mitigation in Washington State* (Ecology, USACE, and the U.S. Environmental Protection Agency, 2006).

Table 3. Mitigation Ratios for Eastern Washington (Taken from RMC 22.10.130(C))

Category and Type of Wetland Impacts	Reestablishment or Creation (R/C)	Rehabilitation Only (RH)	R/C and RH	R/C and Enhancement (E)	E Only
All Category IV	1.5:1	3:1	1:1 R/C and 1:1 RH	1:1 R/C and 2:1 E	6:1
All Category III	2:1	4:1	1:1 R/C and 2:1 RH	1:1 R/C and 4:1 E	8:1
Category II	3:1	6:1	1:1 R/C and 4:1 RH	1:1 R/C and 8:1 E	12:1
Category I based on score for functions	4:1	8:1	1:1 R/C and 6:1 RH	1:1 R/C and 12:1 E	16:1
Category I natural heritage site	Not considered possible	Case-by-case	R/C not considered possible	R/C not considered possible	Case-by-case

To compensate for the permanent loss of 0.01 acres of Category III wetland (Wetland A), and the permanent loss of 0.03 acres of Category IV wetland (Wetland C), RH2 proposes compensatory wetland mitigation combining re-establishment or creation (R/C) and enhancement (E) of Wetland A. **Table 4** details the proposed project mitigation approach to achieve the ratios listed in **Table 3**. The proposed Wetland Mitigation Plan is included in **Attachment E**.

Table 4. Proposed Project Wetland Mitigation

Wetland Name	Wetland Type	Impact Area (ac/sf)	Target Mitigation Ratio	Target Mitigation Area to Meet Ratios (ac/sf)	R/C Area Proposed for Mitigation (ac/sf)	E Area Proposed for Mitigation (ac/sf)
Wetland A	Cat. III	0.01/436	1:1 R/C and 4:1 E	0.01/436 R/C and 0.04/1,744 E	0.01/450	0.04/1,750
Wetland C	Cat. IV	0.03/1,307	1:1 R/C and 2:1 E	0.03/1,307 R/C and 0.06/2,614 E	0.03/1,330	0.06/2,800
			Total:	0.04/1,743 R/C and 0.10/4,358 E	0.04/1,780	0.10/4,550

The proposed mitigation approach presents the opportunity to compensate for the permanent loss of the low-functioning Wetland C and the small impact area to Wetland A. Compensation through both creation of additional wetland habitat and enhancement of the existing Wetland A will uplift functions of the larger Wetland A system and the larger Keene Creek drainage system, of which Wetland C is a part. In accordance with the City's CAC and the national mandate of "no net loss," the proposed mitigation approach compensates for the loss of wetland acreage and functions by creating additional wetland and enhancing wetland and wetland buffer habitat in the same drainage basin.

MITIGATION GOALS AND STANDARDS

Mitigation Goals

The following goals are guiding these mitigation efforts.

- Ensure no net loss of wetland habitat, functions, or values. To this end, mitigate for lost wetland acreage (totaling 0.04 acres) by re-establishing/creating and enhancing existing wetland habitat (totaling 0.10 acres).
- Re-establishment/creation at a 1:1 ratio for permanent wetland impacts to Wetlands A and C is intended to increase wetland acreage and functions of the Wetland A system. Approximately 0.04 acres of wetland habitat will be created adjacent to the existing Wetland A boundary.

Wetland creation is expected to increase the area of Wetland A, as well as the wetland's water quality, hydrologic, and habitat functions.

- Enhancement, at a ratio of 4:1 for permanent impacts of Wetland A and 2:1 for permanent impacts of Wetland C, will be completed adjacent to Wetland A. Enhancement activities are intended to augment wetland water quality, and hydrologic and habitat functions and values.

General Planting Notes

Planting shall be completed by a local landscape contractor with at least 5 years of experience in native plant and sensitive areas restoration. The landscape contractor shall be responsible for coordinating a pre-planting meeting, successful plant installation, City acceptance post-planting, and care of the site for a 1-year plant establishment period. Following the plant establishment period, the City will assume care of the site.

Planting Schedule and Warranty

Planting shall occur between September 1st and November 15th, preferably to minimize transplant shock and supplemental care for new plantings. Water-in all newly planted and transplanted plant stock immediately following installation and in sufficient quantity thereafter to establish plantings.

The contractor shall handle and care for all transplanted plants and plant stock stored onsite for longer than 1 week. This includes, but is not limited to, watering plants, and protecting plants from damage by elements, vandalism, etc.

The contractor shall warrant all plant materials to remain healthy and alive for a period of 1 year following successful installation acceptance. During this period, ensure plants are maintained, watered, and replaced, as needed, to ensure their establishment on the site and survival.

Plant procurement, handling and storage, and installation shall be subject to City/engineer review, direction, and approval, as well as per the Wetland Mitigation Plan and technical specifications.

Mitigation Sequencing

Mitigation shall be completed in the following sequence.

1. The contractor shall secure all plant material, topsoils, mulch, and other planting installation materials prior to beginning work on the mitigation plan. Submit bid nursery sheet and soil/mulch details to the City for approval.
2. The contractor shall notify the City 72 hours in advance of anticipated mitigation activities, and arrange for a pre-construction meeting with the City and assigns. The approved plans, specifications, and permit conditions will be reviewed to ensure that all parties involved understand the intent of the construction documents, specifications, site environmental constraints, permits, sequences, and inspection requirements.
3. Within the wetland mitigation area, clear Russian olive (*Elaeagnus angustifolia*) trees and saplings. Clear saplings (less than 3.5-inch diameter) by digging (shovel, hoe, or small excavator) root systems. Clear larger trees (greater than 3.5-inch diameter) by extracting root system with an excavator or backhoe. Remove all above-ground and root systems completely offsite and dispose. Soils excavated in areas containing Russian olive shall not be reused for

backfill in other areas of the site. Russian olive plant parts, seeds, roots, etc. are highly invasive, and shall be disposed offsite properly to prevent infestation of other areas. All Russian olive trees cleared for both intersection project improvements and wetland mitigation activities shall be handled per the above instructions.

4. Retain all healthy, native trees and shrubs present within areas to be planted for wetland mitigation. Vegetation to be retained shall be protected from removal, trampling, or other impacts during construction. Clear grass and emergent groundcover in areas to be graded and/or planted. Remove above-ground plant parts and root mass and dispose offsite. Clearing is preferred in the low-flow season (July 15th to September 30th). The contractor shall avoid the use of mechanized equipment in the wetland mitigation area to the extent practicable.
5. Contractor shall manually clear trash and debris from the entirety of Wetland A as part of these mitigation activities. Dispose of all trash offsite.
6. Grade proposed wetland creation areas per the plan. Divert all wetland water flow around work areas during grading work.
7. Install topsoil in areas to be planted in accordance with the topsoil detail provided. till the lower 4 inches of topsoil into the upper 4 inches of native soils.
8. If the contractor is utilizing an above-ground irrigation system, install system and ensure it is fully functional prior to plant installation.
9. Contractor shall install plant material using the specified plants and planting details. Planting shall be completed by hand, per the on-site direction of the consulting biologist or City. Any deviations from the planting plan must be approved by the City prior to installation.

   Planting in clusters of three to five plants is shown and preferred in the mitigation area to mimic natural systems and facilitate maintenance of the mitigation area to establish replacement plantings and out-compete invasive species. Planting locations should be modified as needed to accommodate existing native vegetation.

   All plantings shall be thoroughly watered-in following installation. Water plants no less than twice a week for 15 minutes during the first week of installation. Watering shall continue at a rate sufficient to ensure plantings become established until fall rains can provide sufficient water for new plantings.

   Install arborist mulch watering basins around planted vegetation as shown in planting details.

   The contractor shall label installed plantings with metal identification tags, or the equivalent. One in four of each plant species will be labeled throughout the mitigation area.
10. Seed all mitigation areas and those areas disturbed by construction, including those not specifically shown to be planted, using the specified seed mix in Division 8-01 of the Specifications.
11. The contractor shall notify the City upon completion of plant installation to arrange for an inspection of the mitigation area. Any corrections, substitutions, or missing items will be addressed in writing to the contractor along with a schedule to address those items.
12. The contractor shall warrant all plant material to remain healthy and alive and shall maintain the site in accordance with the approved plans, specifications, and permit conditions for the plant

establishment period. During this period, the contractor shall ensure maintenance activities are carried out per the Maintenance Plan. Following the initial plant establishment period, the City will assume responsibility for site maintenance.

Irrigation

The contractor shall design and install a temporary, above-ground irrigation system to provide supplemental water to proposed plant material for a minimum of 2 years following installation. The contractor shall work with the City to design this system. The irrigation system shall provide head-to-head coverage of the entire wetland mitigation area and a minimum of 1-inch of water per week throughout the dry season. It is the responsibility of the contractor to modify the duration and frequency of supplemental watering to ensure plant survival during the first year. The City will assume maintenance and operation of the irrigation system following the first year. Temporary irrigation may cease after the second year, provided plantings are established.

PERFORMANCE MEASURES AND STANDARDS

Performance standards are used to quantify whether the **Mitigation Goals and Standards** listed above are being met. Monitoring of the site will occur for a period of 6 years, unless the site meets the standards of success sooner or unless monitoring is required for a longer duration by the regulatory agencies issuing permits for the Project. Performance of the site, in accordance with the below measures, will be assessed in permanent monitoring plots for the entire monitoring period. Monitoring requirements and descriptions of permanent plots are described below in the **Monitoring Program** section.

Survival of Installed Trees and Shrubs

- Performance Measure (Year 1): There will be 100 percent survival of installed trees and shrubs. If all dead tree and shrub plantings are replaced, this performance measure will be met.
- Performance Standard (Year 5 or final year of monitoring): There will be 80 percent survival of installed trees and shrubs.

Percent Cover

- Performance Measure (Year 3): Aerial cover of native woody species (planted and volunteer) will be at least 20 percent in the mitigation area.
- Performance Measure (Year 4): Aerial cover of native woody species will be at least 40 percent in the mitigation area.
- Performance Standard (Year 5 or final year of monitoring): Aerial cover of native woody species will be at least 60 percent in the mitigation area.

Native Species Diversity

- Performance Measure (Years 3 through 5): At a minimum, a total of three native tree and shrub species will be established in the mitigation area. A particular species only has to be established in one plant community, and desirable volunteers can be counted to satisfy this requirement.

- Performance Measure (all years): No single woody species will dominate any one vegetation community (i.e., achieving more than 70 percent aerial cover).
- Performance Standard (Year 5 or final year of monitoring): A total of four native tree and shrub species will be established in the mitigation area.

Wetland Hydrology

- Performance Measure (all years): In the existing Wetland A and within all intended wetland areas (i.e., re-established wetland areas adjacent to Wetland A), wetland hydrology will remain. Soils will be saturated or the water table will be present within 12 inches of the surface for at least 12.5 percent of the growing season in years of normal rainfall.
- Performance Standard (Year 5 or final year of monitoring): The Wetland A boundary will be delineated using currently approved methods by the USACE and Ecology. The designated establishment and existing Wetland A areas combined will contain at least 0.50 acres (0.46 acres of existing Wetland A and proposed 0.04 acres of created wetland adjacent to Wetland A).

Non-native and Invasive Species

- Performance Measure (all years): County-listed Class A and B noxious weeds (listed online at the Washington State Noxious Weed Control Board, Benton County Noxious Weed List), non-native blackberries (e.g., *Rubus armenicus* and *R. laciniatus*), Scotch broom (*Cytisus scoparius*), thistles (e.g., *Cirsium arvense* and *C. vulgare*), non-native knotweeds (*Polygonum cuspidatum*, *P. polystachyum*, *P. sachalinense*, and *P. bohemicum*), Reed canarygrass (*Phalaris arundinacea*), and Russian olive (*Elaeagnus angustifolia*) will not exceed 20 percent aerial cover at the mitigation site.
- Performance Standard (Year 5 or final year of monitoring): County-listed Class A and Class B noxious weeds and non-native blackberries, Scotch broom, thistles, non-native knotweeds, Reed canarygrass, and Russian olive will not exceed 20 percent aerial cover at the mitigation site.

MAINTENANCE PROGRAM

The maintenance program will be the responsibility of the contractor for the plant establishment period. The City will assume responsibility of the maintenance program thereafter. To achieve performance standards and ensure success of the mitigation plantings, maintenance activities shall continue for the duration of the 6-year monitoring period.

Maintenance activities shall be performed quarterly during the first 2 years to ensure plantings become established, noxious and invasive species are controlled, and any problems encountered are addressed shortly after being identified. Subsequent maintenance shall be performed at least twice annually, but possibly more often depending on the needs of the site. Frequency of maintenance activities shall be determined by the City, depending on the results of monitoring activities, and in coordination with the regulatory agencies performing review. During each site visit, the following maintenance activities shall be performed.

- Remove all non-native, invasive, and noxious vegetation, including County-listed Class A and B weeds, Russian olive, Reed canarygrass, thistles, knotweeds, etc. Remove above-ground plant parts and root mass to the maximum extent possible. All removal of vegetation is to be

completed manually or using light-duty mechanized equipment (i.e., mowing or a weed whacker) without the use of herbicides. Protect all mitigation plantings during invasive species removal. It is recommended that all plantings be flagged during the first monitoring visit to ensure they can be identified and protected during maintenance activities. All removed plant parts shall be taken from the mitigation area and disposed offsite. Trimming and control of invasive plant species will be especially prudent for the first 2 years of the monitoring and maintenance program.

- Remove all litter and garbage from Wetland A and the mitigation area.
- Replace damaged or missing structures, such as tree staking, tree protectors, etc.
- Replace/augment mulch to maintain a minimum 4-inch height and 3-foot diameter around all plantings.
- Replant uprooted plants, right leaning plants, and generally care for struggling plants.
- Replace dead plant material. Replacement plantings shall be in-kind unless otherwise specified by the City. Replacement plantings shall be installed during the dormant period.
- Inspect the operation of temporary irrigation and replace components, as needed. Temporary irrigation is anticipated to be removed after 2 years.

Due to the proximity to sensitive areas, the following normal maintenance activities shall be excluded for this site.

- Only approved organic fertilizers are permissible, if necessary.
- Only approved aquatic herbicides are permissible, if necessary. Aquatic herbicides may be necessary for the control of Russian olive on the site; however, this method should be used only as a last resort following other methods, and should be completed under the care and direction of a licensed applicator.
- No dumping is allowed in the mitigation area. All materials used or removed during maintenance activities shall be disposed offsite.

Upon completion of the monitoring period and acceptance by the regulatory agencies, the maintenance program shall be reduced to the removal of litter and debris, the removal of non-native or invasive species, and repair of materials. It is anticipated that City staff will carry on maintenance activities following program completion.

MONITORING PROGRAM

Monitoring of the mitigation area will begin the first growing season following installation approval, and shall continue for a period of 6 years, unless required to be longer by the regulatory agencies. Monitoring activities shall occur annually, preferably in the spring, to allow for reporting and maintenance activities to occur in the summer. The results of the monitoring activities shall be communicated to the City, Ecology, and the USACE via an annual report. Proposed monitoring methods will include the following activities.

- At the first monitoring site visit, and as needed thereafter, flag all mitigation plant materials for easy identification and protection during maintenance activities.

- Visually record mitigation site progress. Establish a minimum of three photopoint locations to capture the entire mitigation area. Collect a minimum of two photos per photopoint during each monitoring site visit. Include photos with monitoring reports. Record photopoint locations on a monitoring plan map included with monitoring reports.
- Report on plant survival, diversity, vigor, aerial coverage, etc. Reporting shall be completed to detail the mitigation site's success in general, as well as to assess the site's success in meeting the performance measures and standards. Establish up to three 50-foot linear transects that will adequately assess percent cover of plants in the mitigation area. Include mitigation plantings, native and non-native recruitments, and noxious and invasive species in aerial cover calculations. Percent cover calculations will be reported, along with associated data forms, in monitoring reports. Transect locations will be recorded on a monitoring plan map included with monitoring reports.
- Report on noxious and invasive species control and provide recommendations for continued maintenance activities specific to such species, especially Russian olive, Reed canarygrass, and thistles.
- Report on any dead or dying specimens and provide recommendations for replacement, as necessary. Replace all dead plant material within 30 days of discovery.
- Report on site hydrology, including extent of inundation and saturation in the mitigation area, Wetland A, and culvert inputs/outlets, etc.
- Report on buffer conditions (e.g., surrounding land use, human use, etc.).
- Report on wildlife use of the mitigation site or surrounding areas.
- Report on soils, including texture, soil color, redoximorphic features, etc.
- Report on hardscapes, including condition of staking, etc.
- Include any receipts for off-site dumping, replaced structural repair, or other materials associated with monitoring and maintenance activities.

If any of the standards of success are not being met, City staff shall be notified within the monitoring reports and provided with a list of applicable activities to bring the site into compliance.

CONTINGENCIES

A contingency plan involves identifying areas of failure of the mitigation plan and outlining corrective actions that could be taken. If monitoring results indicate that any of the performance standards are not being met, it may be necessary to implement all or part of the contingency plan. Careful attention to maintenance and establishment of replacement plantings is essential to ensuring that problems do not arise. Should any part of the mitigation site fail to meet the criteria for success, a contingency plan will be developed on a case-by-case basis to address the problem at hand. Contingency plans shall be approved by and implemented with oversight from the City. Contingency activities may include, but are not limited to, the following.

- Replace plants lost to vandalism, drought, disease, or pest infestation, as necessary, to satisfy performance measures and standards.

- Should a particular plant species continue to fail on the site (15-percent mortality rate or greater), replace with a similar, native species that would be better suited to site conditions.
- Should a particular woody plant species become a nuisance on the site (i.e., establishing over 70 percent aerial cover in any one plant community), measures shall be taken to selectively trim or remove individual species.
- If monitoring determines that Russian Olive or another non-native or invasive plant species continue to be or becomes a nuisance on the site (i.e., interfering with the establishment of mitigation plantings and/or exceeding the performance measures for invasive species), measures shall be taken to control and remove these species. Methods can include manual, mechanical, or chemical means, so long as they are pre-approved by the City and conducted using environmentally conscious and licensed methods.
- Adjust supplemental irrigation and timing as needed to suit mitigation plantings, (i.e., if plants appear dry in the supplemental watering phase despite prescribed watering, increase watering to accommodate plant needs).
- Seed or reseed areas with approved, native grass mixture, as necessary, if erosion/sedimentation occurs in one area.

CONCLUSION

This document is intended for review by the City, USACE, and Ecology to inform these agencies of the existing conditions associated with jurisdictional wetland habitat at the Queensgate-Columbia Park Trail Intersection Reconstruction Project site, anticipated Project impacts, and proposed compensatory wetland mitigation. This letter report has been prepared to comply with the current laws regulating these habitats. The work completed in preparing this letter report has conformed to the standard of care employed by wetland professionals. No other representation or warranty is made or implied. RH2 appreciates the opportunity to assist the City on this project. Should you have any additional needs, contact me at (425) 951-5436 or apettibone@rh2.com.

Sincerely,

RH2 ENGINEERING, INC.

Alicia Pettibone
Wetland and Environmental Scientist

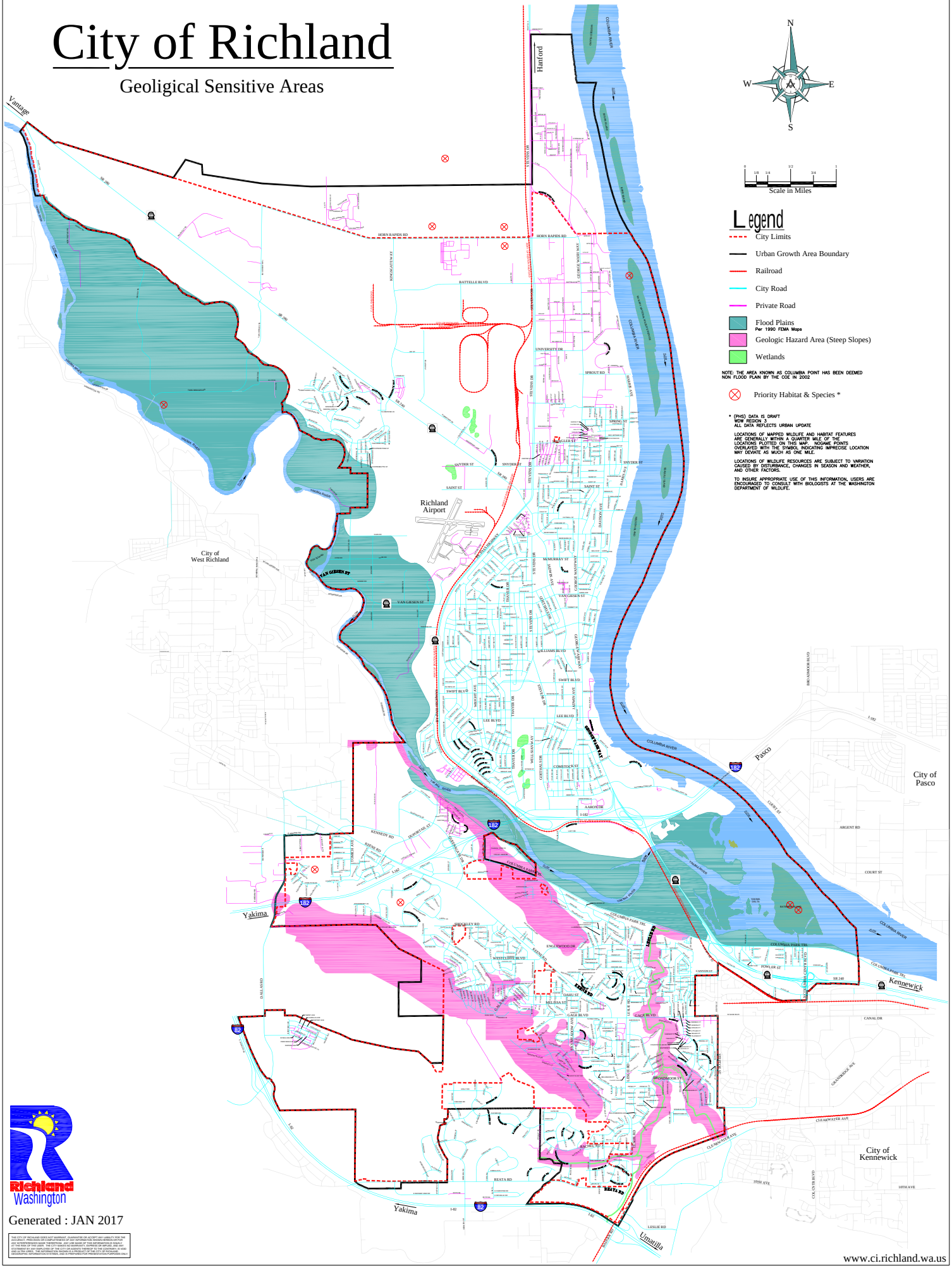
AP/sp

Enclosures: Attachment A – Background Environmental Data
Attachment B – Site Photographs
Attachment C – Wetland Delineation Map and Data Forms
Attachment D – Wetland Rating Summary and Maps
Attachment E – Wetland Mitigation Plan

ATTACHMENT A – BACKGROUND ENVIRONMENTAL DATA

City of Richland

Geoligical Sensitive Areas

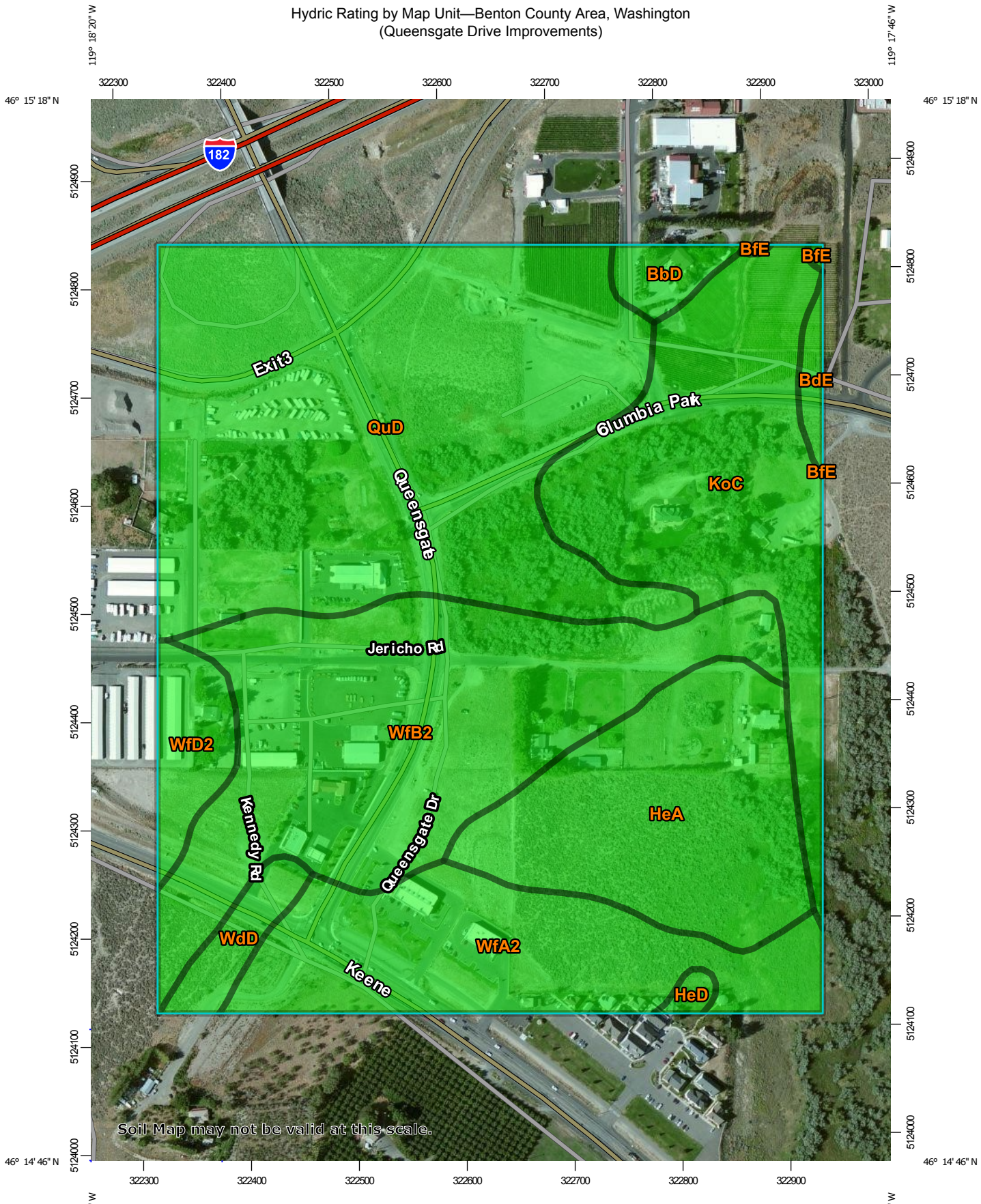


Richland Washington

Generated : JAN 2017

www.ci.richland.wa.us

Hydric Rating by Map Unit—Benton County Area, Washington
(Queensgate Drive Improvements)



Map Scale: 1:4,780 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 50 100 200 300

Feet
0 200 400 800 1200

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Benton County Area, Washington
Survey Area Data: Version 12, Sep 8, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 6, 2010—Oct 17, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Benton County Area, Washington (WA605)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
BbD	Burbank loamy fine sand, 2 to 15 percent slopes	0	1.4	1.3%
BdE	Burbank loamy fine sand, basalt substratum, 0 to 30 percent slopes	0	0.7	0.7%
BfE	Burbank rocky loamy fine sand, basalt substratum, 0 to 30 percent slopes	0	0.1	0.1%
HeA	Hezel loamy fine sand, 0 to 2 percent slopes	0	13.6	12.5%
HeD	Hezel loamy fine sand, 2 to 15 percent slopes	0	0.4	0.3%
KoC	Koehler loamy fine sand, 0 to 8 percent slopes	0	16.2	14.9%
QuD	Quincy loamy sand, 2 to 15 percent slopes	0	35.4	32.6%
WdD	Warden silt loam, 8 to 15 percent slopes	0	1.8	1.7%
WfA2	Warden very fine sandy loam, 0 to 2 percent slopes, eroded	0	13.1	12.1%
WfB2	Warden very fine sandy loam, 2 to 8 percent slopes, eroded	0	23.0	21.2%
WfD2	Warden very fine sandy loam, 8 to 15 percent slopes, eroded	0	2.8	2.6%
Totals for Area of Interest			**108.7**	**100.0%**

Description

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Rating Options

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

U.S. Fish and Wildlife Service

National Wetlands Inventory

Queensgate Drive Delineations

February 22, 2017

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
PRIORITY HABITATS AND SPECIES REPORT

SOURCE DATASET: PHSPlusPublic Query ID: P170222155142
REPORT DATE: 02/22/2017 3.51

Common Name Scientific Name Notes	Site Name Source Dataset Source Record Source Date	Priority Area Occurrence Type More Information (URL) Mgmt Recommendations	Accuracy	Federal Status State Status PHS Listing Status	Sensitive Data Resolution	Source Entity Geometry Type
Wetlands	KEENE CREEK WETLAND PHSREGION 901750	Aquatic Habitat N/A http://www.ecy.wa.	1/4 mile (Quarter	N/A N/A PHS LISTED	N AS MAPPED	WA Dept. of Fish and Wildlife Polygons

WDFW Test Map

February 22, 2017

PHS Report Clip Area

PT

LN

POLY

AS MAPPED

SECTION

QTR-TWP

TOWNSHIP

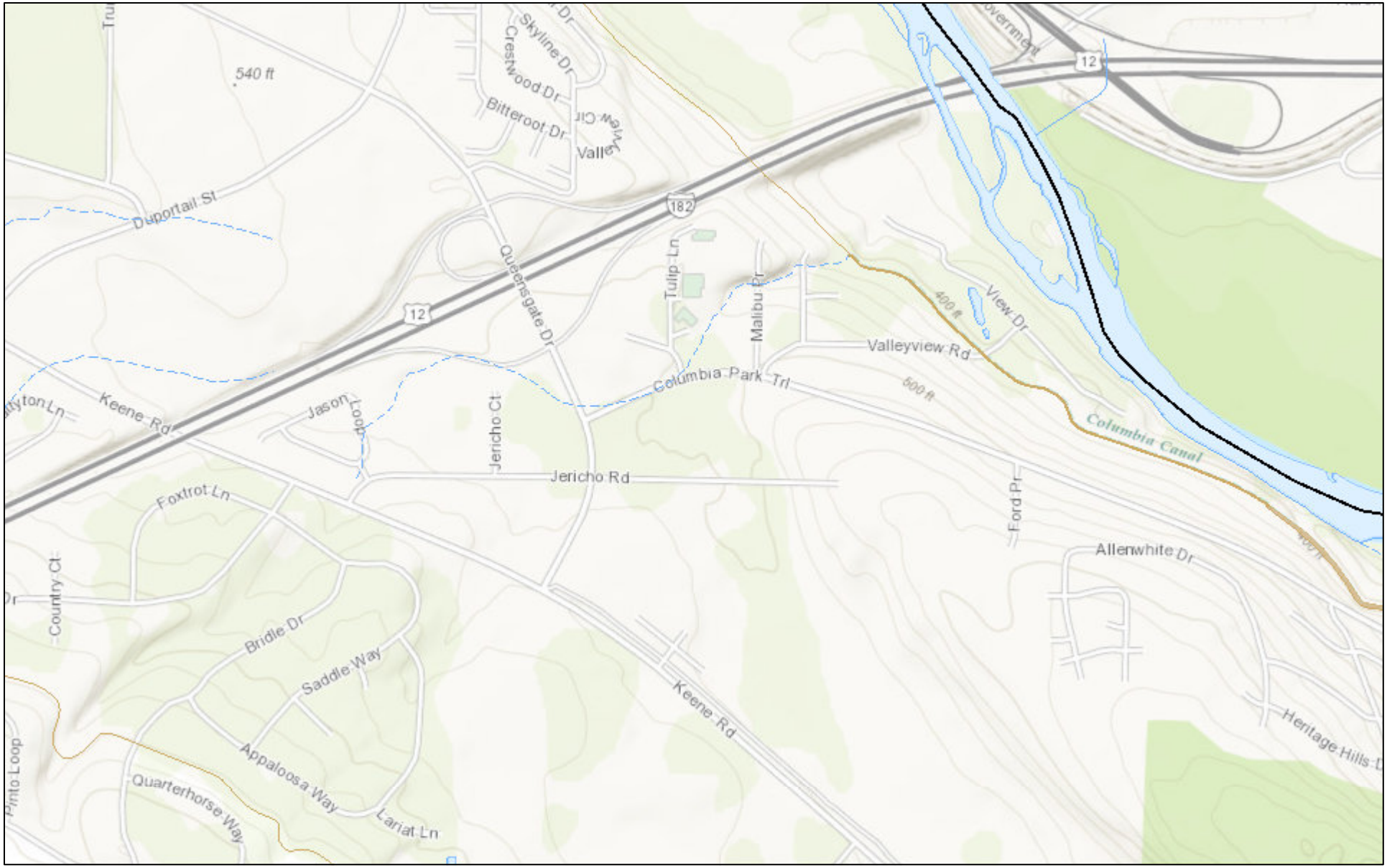
1:19,842

0 0.15 0.3 0.6 mi

0 0.275 0.55 1.1 km

Washington Fish and Wildlife
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus

Queensgate/CPT Wetland Delineations



February 28, 2017

All SalmonScape Species

1:18,056

0 0.15 0.3 0.6 mi

0 0.25 0.5 1 km

USGS/NHD
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO,

ATTACHMENT B – SITE PHOTOGRAPHS

Site Photographs — Queensgate/Columbia Park Trail Improvements — City of Richland

Environmental Investigation and Wetland Delineations March 2017

Emergent vegetation in the interior of Wetland B, near the intersection of Queensgate Drive and Jericho Road, facing north.

The invasive Russian olive (*Eleagnus angustifolia*), and presence of dumped trash, are characteristic of Wetlands A and B. Wetland B, facing north, is pictured here.

The small slope wetland, Wetland C, is delineated with pink flagging, view facing southeast.

Mowed cattails line the outlet of Wetland C, a 24-inch culvert. The culvert crosses beneath Queensgate Drive to Wetland A, contributing to its hydrology.

The proposed alignment of the Columbia Park Trail extension, view to the west. The road is proposed to extend west from its existing intersection with Queensgate Drive to meet Jericho Court.

Site Photographs — Queensgate/Columbia Park Trail Improvements — City of Richland

Wetland A near the intersection of Queensgate Drive and Columbia Park Trail, view facing northwest

View of Wetland A, facing west, from the Ben Franklin Transit Park & Ride.

Ponded water in Wetland A, view facing north.

ATTACHMENT C – WETLAND DELINEATION MAP AND DATA FORMS

WETLAND DELINEATION SURVEY
SEC 22, T. 9 N., R. 28 E., W.M.

POINTS

5133	337221.287	1943421.734	0 WETLAND STAKE NO 2C
5134	337238.722	1943413.172	0 WETLAND STAKE NO 3C
5135	337241.433	1943407.402	0 WETLAND STAKE NO 4C
5136	337231.385	1943404.208	0 WETLAND STAKE NO 5C
5137	337198.619	1943418.277	0 WETLAND STAKE NO 6C
5138	337175.621	1943429.638	0 WETLAND STAKE NO7C
5139	337151.764	1943437.727	0 WETLAND STAKE NO 8C
5140	337147.516	1943443.177	0 WETLAND STAKE NO 9C
5141	337150.112	1943451.269	0 WETLAND STAKE NO 10C
5142	337166.803	1943445.161	0 WETLAND STAKE NO 11C
5143	337207.771	1943429.26	0 WETLAND STAKE NO 12C
5144	337212.128	1943429.281	0 WETLAND STAKE NO 13C
5145	337215.748	1943427.613	0 WETLAND STAKE NO 1C
5146	337223.759	1943403.114	0 WETLAND TEST PIT NO 1C
5147	337218.502	1943414.445	0 WETLAND TEST PIT NO 2C
5148	337377.168	1943821.203	0 WETLAND FLAG NO 1A
5149	337366.141	1943790.161	0 WETLAND FLAG NO 2A
5150	337345.246	1943745.758	0 WETLAND FLAG NO 3A
5151	337354.611	1943748.392	0 WETLAND FLAG NO 14A
5152	337275.039	1943592.938	0 WETLAND FLAG NO 6A
5228	337335.376	1943691.908	0 WETLAND FLAG NO 13A
5229	337316.724	1943675.512	0 WETLAND FLAG NO 4A
5235	337323.984	1943617.925	0 WETLAND FLAG NO 12A
5252	337342.632	1943575.352	0 WETLAND FLAG NO 11A
5253	337276.183	1943518.59	0 WETLAND FLAG NO 8A
5255	337278.909	1943511.832	0 WETLAND TEST PIT 1A
5256	337285.94	1943520.263	0 WETLAND TEST PIT 2A
5271	337349.775	1943530.953	0 WETLAND FLAG NO 10A
5276	337259.839	1943806.464	0 WETLAND FLAG NO 1B
5282	337229.966	1943750.675	0 WETLAND TEST PIT NO 2B
5284	337230.701	1943756.834	0 WETLAND FLAG NO 2B
5289	337181.25	1943694.099	0 WETLAND FLAG NO 3B
5298	337134.791	1943598.855	0 WETLAND FLAH NO 4B
5299	337062.963	1943603.944	0 WETLAND FLAH NO 5B
5301	336984.799	1943612.123	0 WETLAND FLAG NO 6B
5305	336851.622	1943630.649	0 WETLAND FLAG NO B7
5310	336799.483	1943649.756	0 WETLAND FLAG NO B8
5311	336776.524	1943683.761	0 WETLAND FLAG NO B9
5312	336767.794	1943733.213	0 WETLAND FLAG NO B10
5313	337298.149	1943631.068	0 WETLAND FLAG NO B5
5319	337275.448	1943593.529	0 WETLAND FLAG NO 6A
5332	337260.991	1943542.107	0 WETLAND FLAG NO 7A
5336	337310.353	1943509.681	0 WETLAND FLAG NO 9A
5393	337187.794	1943747.754	0 WETLAND TEST PIT NO 1B

NOTES

1. R□2 □ONDU□TED A WETLAND DELINEATION SURVEY AROUND T□E INTERSE□TION O□ QUEENSGATE DR. □ □OLUMBIA PAR□ TRAIL ON 8□7□17 □ 8□8□17. □LAGGING AND STA□ES WERE USED TO DELINEATE T□E WETLAND LIMITS
2. STANDING OR □LOWING WATER WAS OBSERVED AT EA□□ WETLAND DESIGNATION. WILDLI□E PRESEN□E WAS □IG□LY VISIBLE.
3. T□E WETLAND AREAS DESIGNATED BY R□2 MEANDER WIT□IN □ITY RIG□T O□ WAY AND PRIVATE PROPERTY.
4. PREVIOUS WETLAND DELINEATION SURVEY BY R□2.

DATUM

□ORI□ONTAL□WGS84 □SINGLE BASE □ROM RI□□□ VERTI□AL□NAVD88

□IELD SURVEY

S□ALE□1" □ 40□

BRANDIN JOSEPH LOPEZ
STATE OF WASHINGTON
36781
REGISTERED
PROFESSIONAL LAND SURVEYOR

SURVEYORS CERTIFICATE

I BRANDIN □ LOPE□□A PRO□ESSIONAL LAND SURVEYOR REGISTERED IN T□E STATE O□ WAS□INGTON□□EREBY □ERTI□Y T□IS MAP IS T□E RESULT O□ AN A□TUAL □IELD SURVEY □ONDU□TED BY ME OR UNDER MY DIRE□TION AND T□E DIMENSIONS AND ELEVATIONS ARE □ORRE□T AS S□OWN.

QUEENSGATE DR. & COLUMBIA PARK TRAIL IMPROVEMENTS

1 OF 1

DRAWN: B.LOPEZ P.L.S. ~ SURVEYED BY ~ B.JL ~ FILE ~ O:\DRIVE.QUEENSGATE DR. IMPROVEMENTS ~ DATE: 03_28_2017 ~


QUEENS GATE DR IMPROVEMENTS
City of Richland
RHZ DELINEATION
FIELD MAP
3/7-3/8/17
PREVIOUS RHZ DELINEATION - 2014
WETLAND A
14 flags
2 test pits
PREVIOUS RHZ DELINEATION - 2014
TPA1
TPA2
TPB
TPB1
TPB2
TPC1
TPC2
WETLAND B
10 flags
2 test pits
WETLAND C
13 flags
2 test pits
WETLAND CONTINUES SOUTHEAST
Google earth
500 ft
N

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Queensgate Drive / CPT Improvements City/County: Richland / Benton Sampling Date: 3/7/17

Applicant/Owner: City of Richland State: WA Sampling Point: A1

Investigator(s): Alicia Pettibone and Emily Caba Section, Township, Range: Sec. 22 T09 R28E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 8

Subregion (LRR): B Lat: 46.2519° N Long: 119.3018° W Datum: WGS84

Soil Map Unit Name: Quincy loamy sand, 2-15% slopes NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10' x 60' rad)	Absolute % Cover	Dominant Species?	Indicator Status
1. Russian olive (Elaeagnus angustifolia)	20	Y	FAC
2.			
3.			
4.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: 10' x 20')			
1. Elaeagnus angustifolia	65	Y	FAC
2.			
3.			
4.			
5.			
	65 = Total Cover		
Herb Stratum (Plot size: 5' x 5')			
1. Scirpus acutus	50	Y	OBL
2. Cirsium arvense	10	N	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR 3/2	100					loam	decaying organics
2-16	10 YR 4/4	65	10 YR 4/1	30	D	M	loamy sand	decaying organics distinct, many mottles
			7.5 YR 5/6	5	C	M		distinct, common mottles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ✓ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ✓ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): 12"

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 11"

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Queensgate Drive / CPT Improvements City/County: Richland / Benton Sampling Date: 3/7/17

Applicant/Owner: City of Richland State: WA Sampling Point: A2

Investigator(s): Alicia Pettibone and Emily Coba Section, Township, Range: S 27 T09 R28E

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): none Slope (%): 2

Subregion (LRR): B Lat: 46.2520°N Long: 119.3018°W Datum: WGS 84

Soil Map Unit Name: Quincy loamy sand, 2 to 15 % slopes NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10' x 60')	Absolute % Cover	Dominant Species?	Indicator Status
1. Elaeagnus angustifolia	20	Y	FAC
2.			
3.			
4.			
	20	= Total Cover	
Sapling/Shrub Stratum (Plot size: 10' x 30')			
1. Elaeagnus angustifolia	30	Y	FAC
2.			
3.			
4.			
5.			
	30	= Total Cover	
Herb Stratum (Plot size: 5' x 5')			
1. Scirpus acutus	100	Y	OBL
2. Cirsium arvense	30	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	130	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-1	10 YR 2/2	100					loam	
1-16	10 YR 4/4	60	2.5 Y 4/1	30	D	M	loamy sand	many, prominent mottles
			7.5 YR 4/6	10	C	M, PL		common, distinct mottles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ✓ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): 9

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 6

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Queensgate CPT Improvements City/County: Richland / Benton Sampling Date: 3/8/17

Applicant/Owner: Richland State: WA Sampling Point: B1

Investigator(s): Alicia Pettibone and Emily Coba Section, Township, Range: S 22 T 09 R 28E

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): B Lat: 46.2516° N Long: 119.3010° W Datum: WGS84

Soil Map Unit Name: Quincy loamy sand, 7-15% slopes NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Elaeagnus angustifolia	90	Y	FAC
2.			
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1. Elaeagnus angustifolia	10	Y	FAC
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Festuca pratensis	2	Y	FACU
2. (Schedonorus)			
3.			
4.			
5.			
6.			
7.			
8.			
	2	= Total Cover	
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
		= Total Cover	

% Bare Ground in Herb Stratum 98 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: B1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	5Y 3/2	100					loamy sand	black decaying organics, 30% ro
4-14	2.5Y 3/1	60	10 YR 4/4	40	C	M	loamy sand	prominent many coarse mottles

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)(**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 10

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 6

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Queensgate CPT Improvements City/County: Richland / Benton Sampling Date: 3/8/17

Applicant/Owner: City of Richland State: WA Sampling Point: B2

Investigator(s): Alicia Pettigrew and Emily Cosza Section, Township, Range: S 22 T 09 R 28 E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 20

Subregion (LRR): B Lat: 46.2519°N Long: 119.3009°W Datum: WGS 84

Soil Map Unit Name: Quincy NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Elaeagnus angustifolia	90	Y	FAC
2.			
3.			
4.			
	90	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15')			
1.			
2.			
3.			
4.			
5.			
	____	= Total Cover	
Herb Stratum (Plot size: 5')			
1. Schedonorus pratensis	10	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	10	= Total Cover	
Woody Vine Stratum (Plot size: —)			
1.			
2.			
	____	= Total Cover	

% Bare Ground in Herb Stratum 90 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks:

SOIL

Sampling Point: B2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10 YR 4/3	100					sandy loam	10% roots + decaying organics
4-16	2.5 Y 4/2	95	10 YR 4/4	5	C	M	sandy loam	5% roots Common, distinct, coarse concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 16

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 14

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Queensgate Dive / CPT Improvements City/County: Richland / Benton Sampling Date: 3/7/17

Applicant/Owner: City of Richland State: WA Sampling Point: C1

Investigator(s): Alicia Pettibone and Emily Cole Section, Township, Range: S 22 T09 R28E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): B Lat: 46.2518° N Long: 119.3022° W Datum: WGS84

Soil Map Unit Name: Quincy loamy sand, 2-15% slopes NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 5')			
1. Polygonum monspeliensis	100	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks:

SOIL

Sampling Point: C1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/2	100					sandy loam	40% roots
6-16	5Y 2.5/1	85	10YR 4/6	15	C	M	sandy loam	coarse matrix, distinct, common, draining organics @ bottom of pit

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

Doesn't qualify as sandy redox because redox features start below 6" of surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): 12

Saturation Present? (includes capillary fringe) Yes ✓ No _____ Depth (inches): 10

Wetland Hydrology Present? Yes ✓ No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Queensgate Drive / CPT Improvements City/County: Richland / Benton Sampling Date: 3/7/17

Applicant/Owner: City of Richland State: WA Sampling Point: C2

Investigator(s): Alicia Pettibone and Emily Cobb Section, Township, Range: S22 T09 R28E

Landform (hillslope, terrace, etc.): slight depression Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): B Lat: 46.2518° N Long: 119.3022° W Datum: WGS84

Soil Map Unit Name: Quincy loamy sand, 2-15% slopes NWI classification: —

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓ No _____	
Wetland Hydrology Present?	Yes ✓ No _____	

Remarks:
Mowing evident

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Polypogon monspeliensis	10	N	FACW
2. Schoenoplectus americanus	85	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	95 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 5 % Cover of Biotic Crust 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: C2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1"	10 YR 4/4	100					Muck	
1-14	5Y 2.5/1	80	10 YR 4/6	20	C	M	sandy loam	many, prominent, coarse concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ✓ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No ___ Depth (inches): 6

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 4

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

<1" surface water within foot of pit

ATTACHMENT D – WETLAND RATING SUMMARY AND MAPS

Wetland name or number A

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland A (Queensgate) Date of site visit: 3/8/17

Rated by Alicia Pothibore and Emily Cobb Trained by Ecology? ✓ Yes ___ No Date of training 10/2016

HGM Class used for rating Depressional Wetland has multiple HGM classes? ✓ Y ___ N

NOTE: Form is not complete without the figures requested (*figures can be combined*).

Source of base aerial photo/map Google earth

OVERALL WETLAND CATEGORY III (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 22-27

___ **Category II** – Total score = 19-21

✓ **Category III** – Total score = 16-18

___ **Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H M (L)	H (M) L	
Landscape Potential	H (M) L	(H) M L	H M (L)	
Value	(H) M L	H M (L)	H (M) L	TOTAL
Score Based on Ratings	7	5	5	17

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
None of the above	N/A

Wetland name or number A

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	2
Location of outlet (*can be added to map of hydroperiods*)	D 1.1, D 4.1	2
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	2
Map of the contributing basin	D 5.3	6/7
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	8
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	9
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	10

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number A

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

NO – go to 2 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   ___The water leaves the wetland **without being impounded**.

NO – go to 3 YES – The wetland class is **Slope**

NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

NO - go to 4 YES – The wetland class is **Riverine**

NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number A

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality		Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?		
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet Wetland has an intermittently flowing outlet Wetland has a highly constricted permanently flowing outlet Wetland has a permanently flowing, unconstricted, surface outlet	 points = 5 (points = 3) points = 3 points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)*	YES = 3 (NO = 0)	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area	 (points = 5) points = 3 points = 1 points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland Area seasonally ponded is ¼ - ½ total area of wetland Area seasonally ponded is < ¼ total area of wetland	 points = 3 (points = 1) points = 0	1
Total for D 1	Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12- 16 = H** ✓ **6- 11 = M** ___ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?		
D 2.1. Does the wetland receive stormwater discharges?	(Yes = 1) No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants?	(Yes = 1) No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland?	Yes = 1 (No = 0)	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____	Yes = 1 (No = 0)	0
Total for D 2	Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?		
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list?	Yes = 1 (No = 0)	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]?	(Yes = 1) No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)?	(Yes = 2) No = 0	2
Total for D 3	Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number A

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 8 Wetland has an intermittently flowing outlet — points = 4 Wetland has a highly constricted permanently flowing outlet — points = 4 Wetland has a permanently flowing unconstricted surface outlet — points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 6 The wetland is a headwater wetland — points = 4 Seasonal ponding: 1 ft - < 2 ft — points = 4 Seasonal ponding: 6 in - < 1 ft — points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils — points = 0	0
Total for D 4 — Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12-16 = H** ___ **6-11 = M** ✓ **0-5 = L** *Record the rating on the first page*

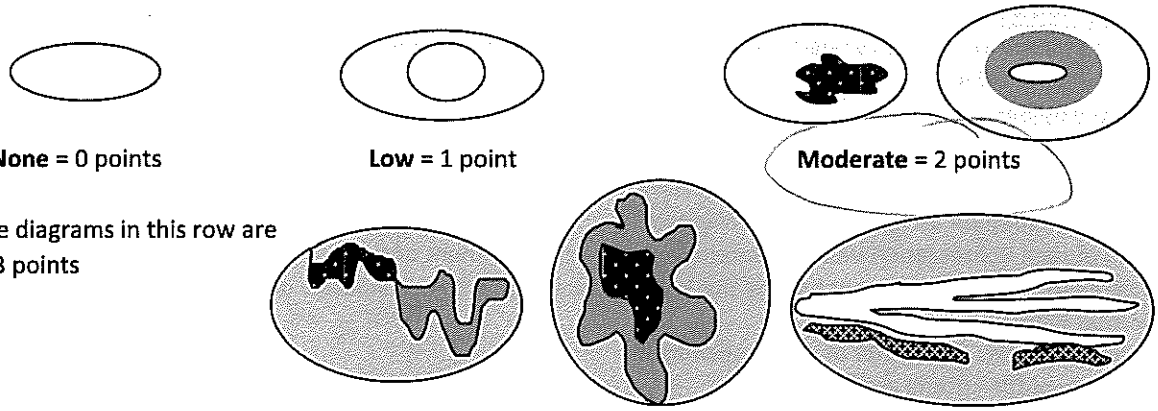
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?		
D 5.1. Does the wetland receive stormwater discharges?	Yes = 1 No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff?	Yes = 1 No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses?	Yes = 1 No = 0	1
Total for D 5	Add the points in the boxes above	3

Rating of Landscape Potential If score is: ✓ **3 = H** ___ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?		
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland — points = 2 Surface flooding problems are in a sub-basin farther down-gradient — points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0		0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan?	Yes = 2 No = 0	0
Total for D 6	Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** ✓ **0 = L** *Record the rating on the first page*

Wetland name or number A

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed ____Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ____Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover __✓__Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover __✓__Scrub-shrub (areas where shrubs have >30% cover) __✓__Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	2
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? *Answer YES for Lake Fringe wetlands.* Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* Yes = 3 No = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species 5 Scirpus, typha, ~~russian olive~~, water starwort willow, tree Scoring: > 9 species: points = 2 4-9 species: points = 1 < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points Riparian braided channels with 2 classes	Figure 1 2

Wetland name or number A

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ✓ Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ✓ Cattails or bulrushes are present within the wetland. ___ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ✓ Emergent or shrub vegetation in areas that are permanently inundated/ponded. ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ___ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	3
Total for H 1 — Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **15-18 = H** ✓ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 0.5 = 0.5 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 7 + [(% moderate and low intensity land uses)/2] 17 = 24 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	0
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is: ___ **4-9 = H** ___ **1-3 = M** ✓ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	1

Rating of Value If score is: ___ **2 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

✓ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian:** The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.* — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes – Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes – Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number A

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils.* Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2**	**Cat. I**
SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3**	**Cat. I**
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4**	**Cat. II**
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Wetland name or number B

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland B (Queensgate) Date of site visit: 3/8/17

Rated by Alicia Pettibone and Emily Cohen Trained by Ecology? ✓ Yes ___ No Date of training 10/2016

HGM Class used for rating Depressional Wetland has multiple HGM classes? ___ Y ✓ N

NOTE: Form is not complete without the figures requested (*figures can be combined*).

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY III (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 22-27

___ **Category II** – Total score = 19-21

✓ **Category III** – Total score = 16-18

___ **Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H (M) L	H (M) L	H (M) L	
Landscape Potential	H (M) L	(H) M L	H M (L)	
Value	(H) M L	H M (L)	H (M) L	TOTAL
Score Based on Ratings	7	6	5	18

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	N/A

Wetland name or number B

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	1
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	3
Location of outlet *(can be added to map of hydroperiods)*	D 1.1, D 4.1	3
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	3
Map of the contributing basin	D 5.3	6/7
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	8
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	9
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	10

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number B

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 2 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   ___The wetland is on a slope (*slope can be very gradual*),
   ___The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   ___The water leaves the wetland **without being impounded**.

   NO - go to 3 YES – The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 YES – The wetland class is **Riverine**

   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number B

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number B

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 5 Wetland has an intermittently flowing outlet — points = 3 Wetland has a highly constricted permanently flowing outlet — points = 3 Wetland has a permanently flowing, unconstricted, surface outlet — points = 1	3
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > $^2/_3$ of area — points = 5 Wetland has persistent, ungrazed, vegetation from $^1/_3$ to $^2/_3$ of area — points = 3 Wetland has persistent, ungrazed vegetation from $^1/_{10}$ to < $^1/_3$ of area — points = 1 Wetland has persistent, ungrazed vegetation < $^1/_{10}$ of area — points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland — points = 3 Area seasonally ponded is ¼ - ½ total area of wetland — points = 1 Area seasonally ponded is < ¼ total area of wetland — points = 0	1
Total for D 1 — Add the points in the boxes above	9

Rating of Site Potential If score is: ___ **12- 16 = H** ✓ **6- 11 = M** ___ **0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source_____ Yes = 1 No = 0	0
Total for D 2 — Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___ **3 or 4 = H** ✓ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality *(answer YES if there is a TMDL for the drainage or basin in which the wetland is found)*? Yes = 2 No = 0	2
Total for D 3 — Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number B

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 8 Wetland has an intermittently flowing outlet — points = 4 (circled) Wetland has a highly constricted permanently flowing outlet — points = 4 Wetland has a permanently flowing unconstricted surface outlet — points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	4
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding — points = 6 The wetland is a headwater wetland — points = 4 Seasonal ponding: 1 ft - < 2 ft — points = 4 (circled) Seasonal ponding: 6 in - < 1 ft — points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils — points = 0	4
Total for D 4 — Add the points in the boxes above	8

Rating of Site Potential If score is: ___ **12-16 = H** ✓ **6-11 = M** ___ **0-5 = L** *Record the rating on the first page*

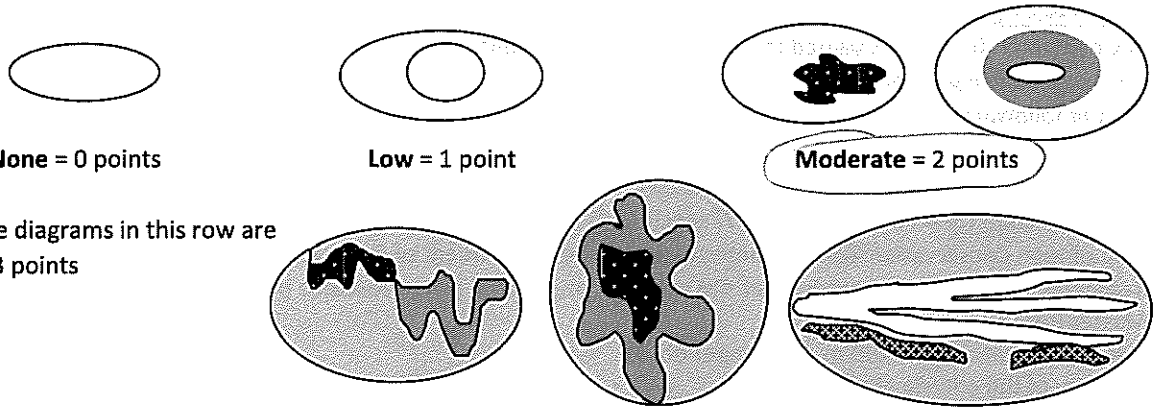
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? Yes = 1 (circled) No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 (circled) No = 0	1
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? Yes = 1 (circled) No = 0	1
Total for D 5 — Add the points in the boxes above	3

Rating of Landscape Potential If score is: ✓ **3 = H** ___ **1 or 2 = M** ___ **0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland — points = 2 Surface flooding problems are in a sub-basin farther down-gradient — points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ — points = 0 There are no problems with flooding downstream of the wetland — points = 0 (circled)	0
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0 (circled)	0
Total for D 6 — Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** ✓ **0 = L** *Record the rating on the first page*

Wetland name or number B

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed ____Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ____Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover __✓__Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ____Scrub-shrub (areas where shrubs have >30% cover) __✓__Forested (areas where trees have >30% cover) 4 or more checks: points = 3 3 checks: points = 2 2 checks: points = 1 1 check: points = 0	1
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 (No = 0)	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? *Answer YES for Lake Fringe wetlands.* Yes = 3 points & go to H 1.4 (No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* Yes = 3 (No = 0)	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft². D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species 6-8 Scoring: > 9 species: points = 2 (4-9 species: points = 1) < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points Riparian braided channels with 2 classes	Figure 1 2

Wetland name or number B

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* ✓ Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ✓ Cattails or bulrushes are present within the wetland. ___ Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ✓ Emergent or shrub vegetation in areas that are permanently inundated/ponded. ___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ___ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	3
Total for H 1 — Add the points in the boxes above	7

Rating of Site Potential If score is: ___ **15-18 = H** ✓ **7-14 = M** ___ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 60 = 60 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 7 + [(% moderate and low intensity land uses)/2] 17 = 24 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	1
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 (No = 0)	0
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is: ___ **4-9 = H** ___ **1-3 = M** ✓ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	1

Rating of Value If score is: ___ **2 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

✓ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number B

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.* — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes – Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes – Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number B

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils.* Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2**	**Cat. I**
SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3**	**Cat. I**
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4**	**Cat. II**
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	N/A

Wetland name or number C

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland C (Queensgate) Date of site visit: 3/7-3/8/17

Rated by Alicia Pettibone Emily Cobb, RH2 Trained by Ecology? ✓ Yes ___ No Date of training 10/2016

HGM Class used for rating Slope Wetland has multiple HGM classes? ___ Y ✓ N

NOTE: Form is not complete without the figures requested (*figures can be combined*).

Source of base aerial photo/map Google Earth

OVERALL WETLAND CATEGORY IV (based on functions ✓ or special characteristics ___)

1. Category of wetland based on FUNCTIONS

___ **Category I** – Total score = 22-27

___ **Category II** – Total score = 19-21

___ **Category III** – Total score = 16-18

✓ **Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H M (L)	H M (L)	H M (L)	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	(H) M L	H M (L)	H (M) L	TOTAL
Score Based on Ratings	6	4	4	14

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	II III
Alkali	I
Wetland of High Conservation Value	I
Bog and Calcareous Fens	I
Old Growth or Mature Forest – slow growing	I
Aspen Forest	I
Old Growth or Mature Forest – fast growing	II
Floodplain forest	II
(None of the above)	N/A

Wetland name or number C

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	5
Hydroperiods	H 1.2, H 1.3	n/a
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	5
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants *(can be added to figure above)*	S 4.1	5
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	5
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	8
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	9
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	10

Wetland name or number C

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO - go to 2 **YES** – The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   ✓The wetland is on a slope (*slope can be very gradual*),
   ✓The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   ✓The water leaves the wetland **without being impounded**.

   NO - go to 3 YES – The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number 2

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

If you are still unable to determine which of the above criteria apply to your wetland, or if you have ***more than 2 HGM classes*** *within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number C

SLOPE WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of average slope of wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance)* Slope is 1% or less — points = 3 Slope is > 1% - 2% — points = 2 Slope is > 2% - 5% — points = 1 (circled) Slope is greater than 5% — points = 0	1
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or tureorganic *(use NRCS definitions)*: Yes = 3 No = 0 (circled)	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 (circled) Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	3
Total for S 1 — Add the points in the boxes above	4

Rating of Site Potential If score is: ___ **12 = H** ___ **6-11 = M** ✓ **0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function at the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 (circled) No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0 (circled)	0
Total for S 2 — Add the points in the boxes above	1

Rating of Landscape Potential If score is: ✓ **1-2 = M** ___ **0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly to a stream, river, or lake that is on the 303(d) list (*within 1 mi*)? Yes = 1 No = 0 (circled)	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list.* Yes = 1 (circled) No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which wetland is found*)? Yes = 2 (circled) No = 0	2
Total for S 3 — Add the points in the boxes above	3

Rating of Value If score is: ✓ **2-4 = H** ___ **1 = M** ___ **0 = L** *Record the rating on the first page*

Wetland name or number C

SLOPE WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion	Points (only 1 score per box)
S 4.0. Does the site have the potential to reduce flooding and erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	0

Rating of Site Potential If score is: ___ **1 = M** ✓ **0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses that generate excess surface runoff? Yes = 1 No = 0	1

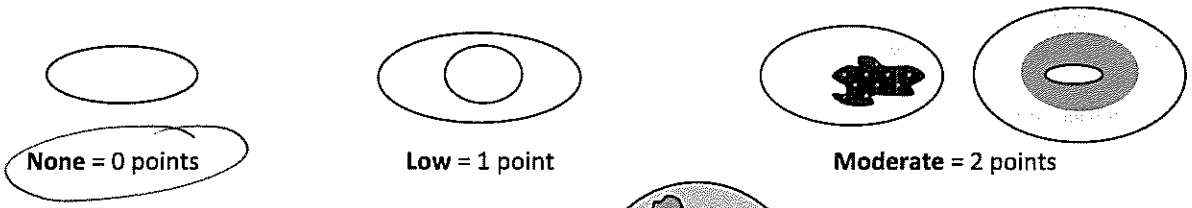
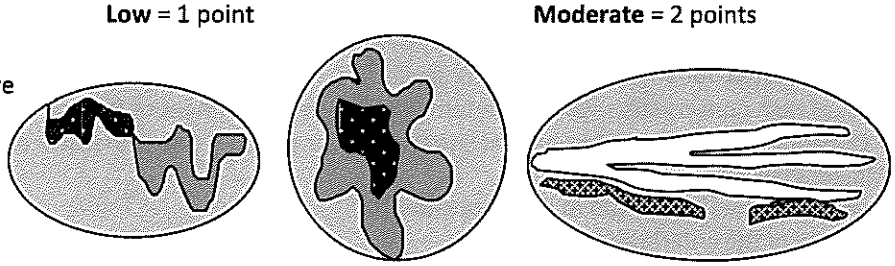
Rating of Landscape Potential If score is: ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has surface flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2. Has the site been identified as important for flood storage and flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	0

Rating of Value If score is: ___ **2-4 = H** ___ **1 = M** ✓ **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number C

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed ____Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover __✓__Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover ____Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover ____Scrub-shrub (areas where shrubs have >30% cover) 4 or more checks: points = 3 ____Forested (areas where trees have >30% cover) 3 checks: points = 2 2 checks: points = 1 (1 check: points = 0)	0
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 (No = 0)	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***Answer YES for Lake Fringe wetlands.*** Yes = 3 points & go to H 1.4 (No) = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No.* Yes = 3 (No) = 0	0
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species 3 Scoring: > 9 species: points = 2 4-9 species: points = 1 (< 4 species: points = 0)	0
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  (**None** = 0 points) **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure 5 0

Wetland name or number C

H 1.6. Special habitat features	
Check the habitat features that are present in the wetland. The number of checks is the number of points. ____Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. ____Cattails or bulrushes are present within the wetland. ____Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. ____Emergent or shrub vegetation in areas that are permanently inundated/ponded. ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity __✓__ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	1
Total for H 1 — Add the points in the boxes above	1

Rating of Site Potential If score is: ___ **15-18 = H** ___ **7-14 = M** ✓ **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 0 + [(% moderate and low intensity land uses)/2] 1 = 1 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 (<10% of 1km Polygon — points = 0)	0
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 7 + [(% moderate and low intensity land uses)/2] 17 = 24 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 (Undisturbed habitat 10 - 50% and > 3 patches — points = 1) Undisturbed habitat < 10% of Polygon — points = 0	1
H 2.3. Land use intensity in 1 km Polygon: (> 50% of Polygon is high intensity land use — points = (- 2)) Does not meet criterion above — points = 0	-2
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* Yes = 3 (No = 0)	0
Total for H 2 — Add the points in the boxes above	-1

Rating of Landscape Potential If score is: ___ **4-9 = H** ___ **1-3 = M** ✓ **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 — It has 3 or more priority habitats within 100 m (see Appendix B) — It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) — It is mapped as a location for an individual WDFW species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — (points = 1) Site does not meet any of the criteria above — points = 0	1

Rating of Value If score is: ___ **2 = H** ✓ **1 = M** ___ **0 = L** *Record the rating on the first page*

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

✓ **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Wetland name or number C

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool.* — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes – Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes – Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ⅔ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes – **Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number C

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils.* Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2**	**Cat. I**
SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3**	**Cat. I**
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4**	**Cat. II**
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	N/A


Figure 1
FO
EM
S/S
FO
EM
S/S
EM
FO
EM
FO
FO
EM
EM
FO
Google earth
N
100 m

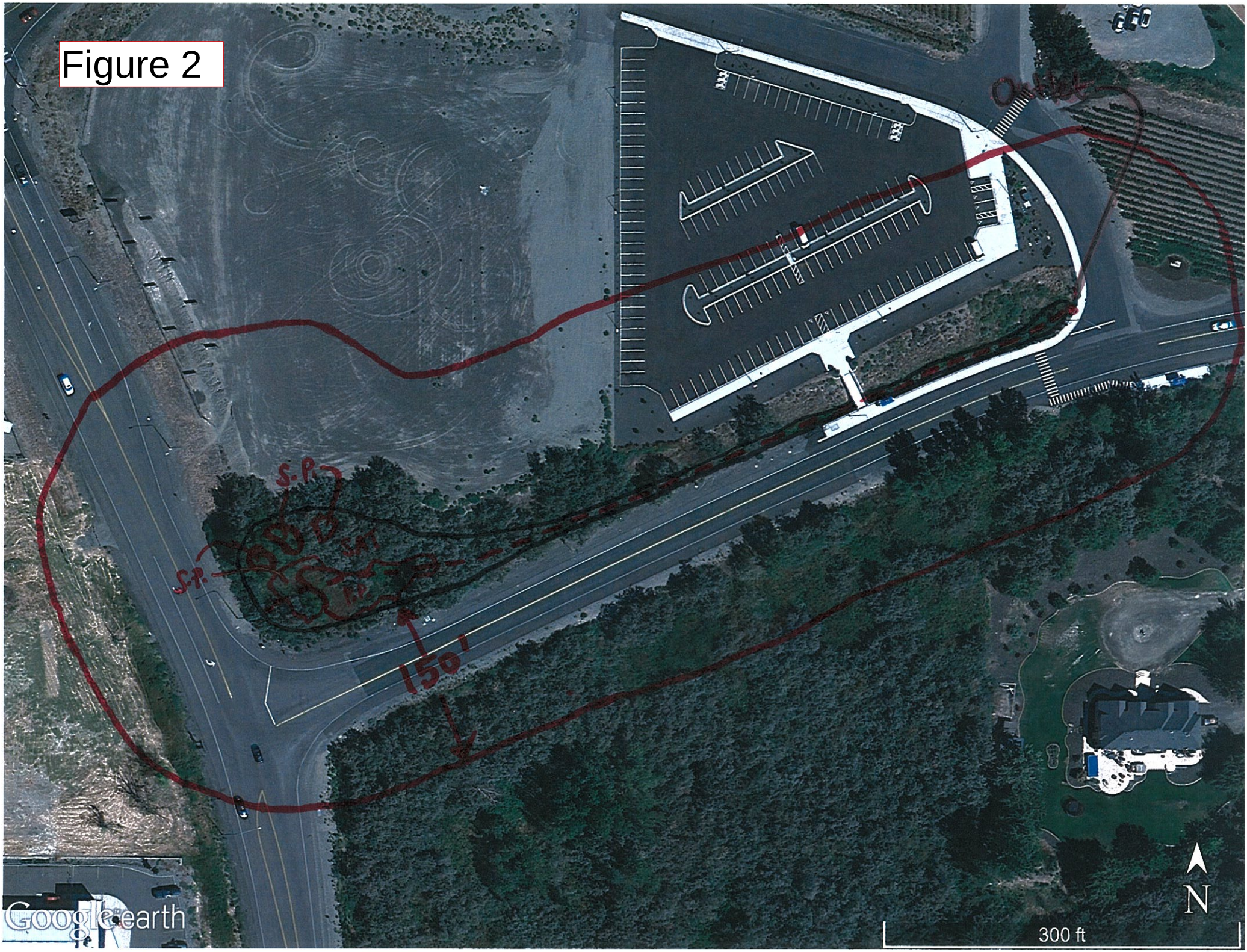


Figure 2
Outlet
S.P.
S.P.
150'
N
300 ft
Google earth


Figure 3
Outlet
PP
SP
PP
Set.
Possible edges
SP
PP
≠150'
Inlet
Google earth
N
600 ft

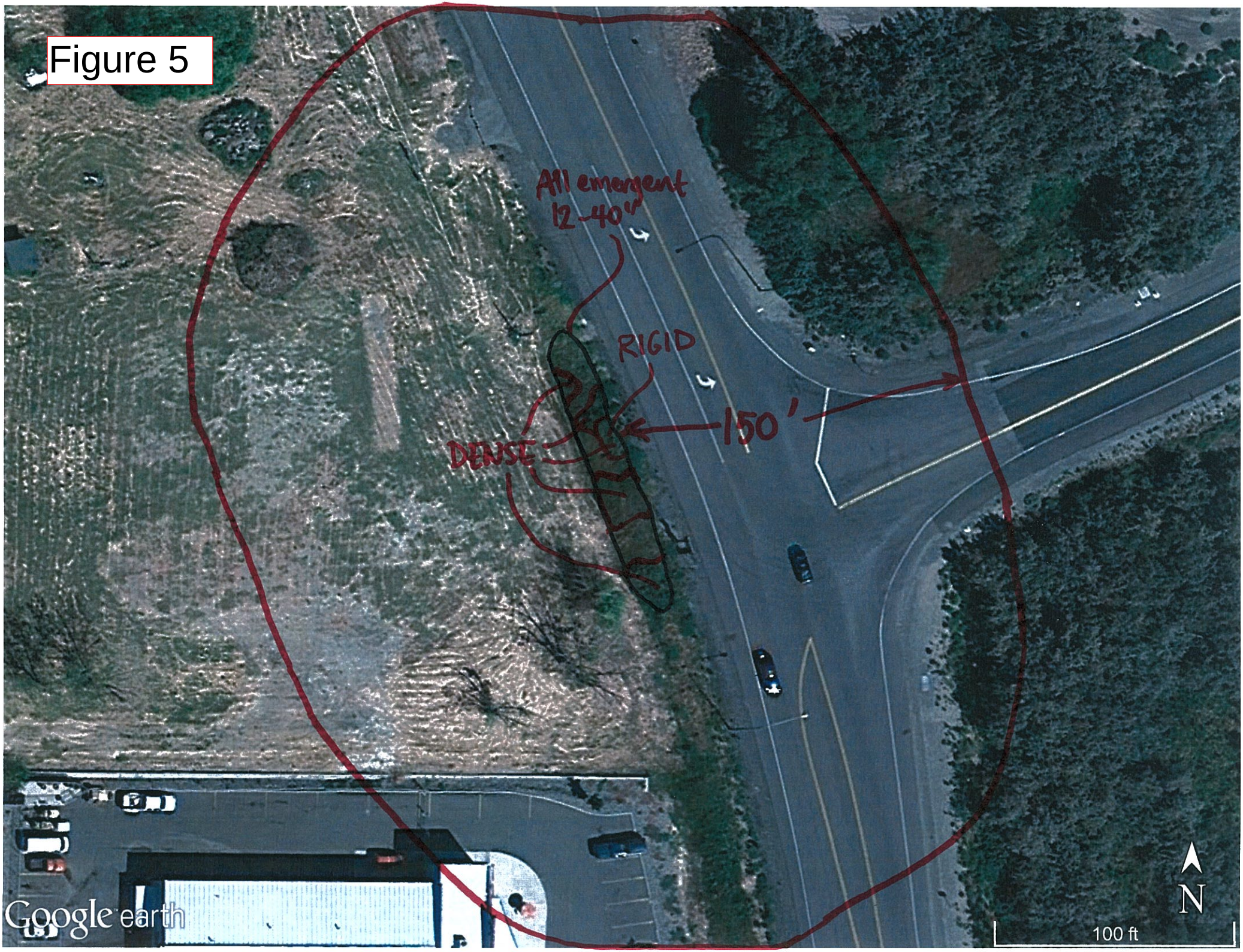


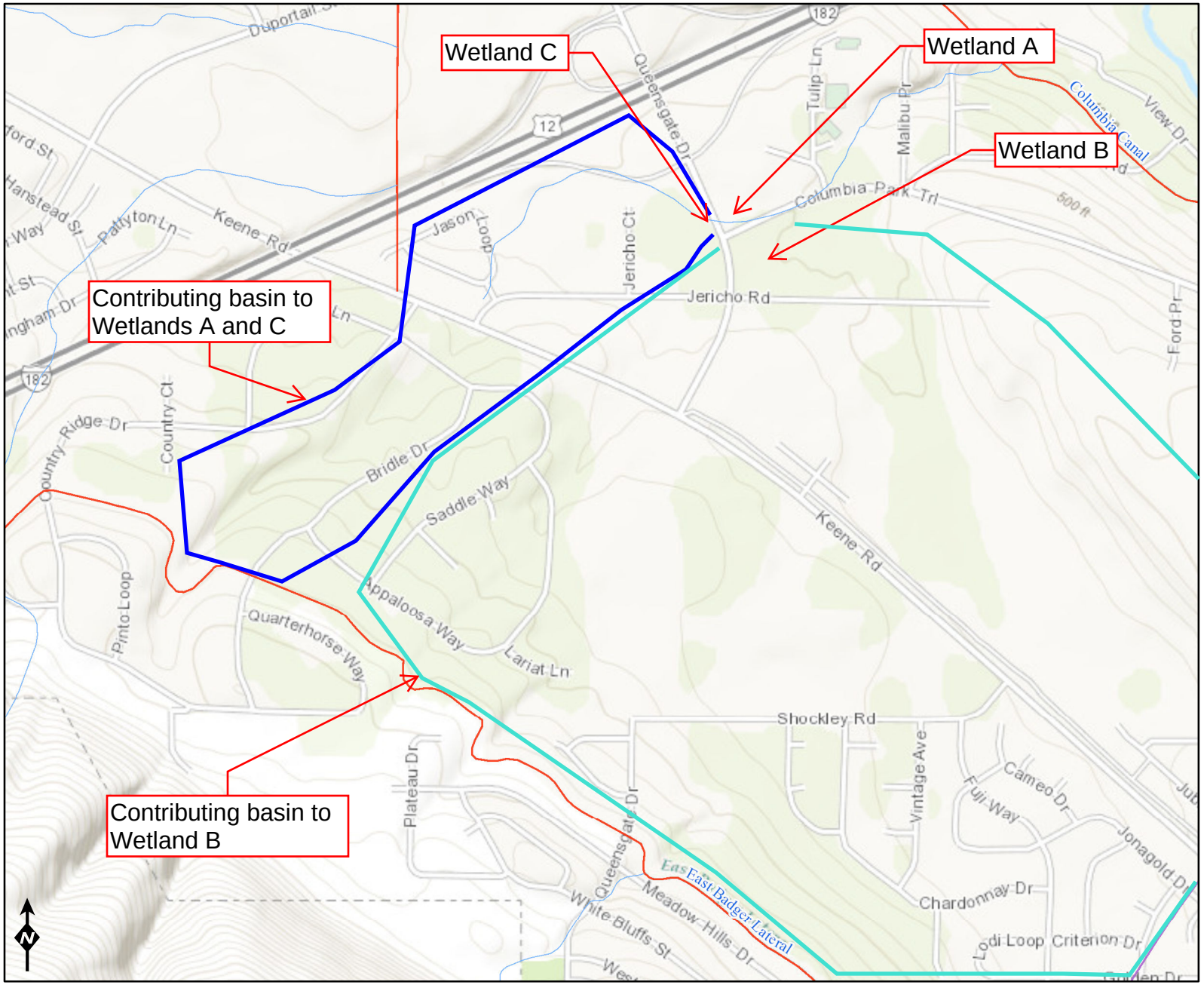
Figure 5
All emergent
12-40"
RIGID
DENSE
150'
N
100 ft
Google earth


Figure 6
Wetland B Contributing basin
Wetlands A/C Contributing Basin
Google earth
3000 ft
N

March 9, 2017

Figure 7

Water Quality Atlas Map



Assessed Waters/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

- NHD Stream/River
- Sub-Watershed (12 digit HUC)

Miles
0 0.125 0.25 0.5

DEPARTMENT OF ECOLOGY
State of Washington

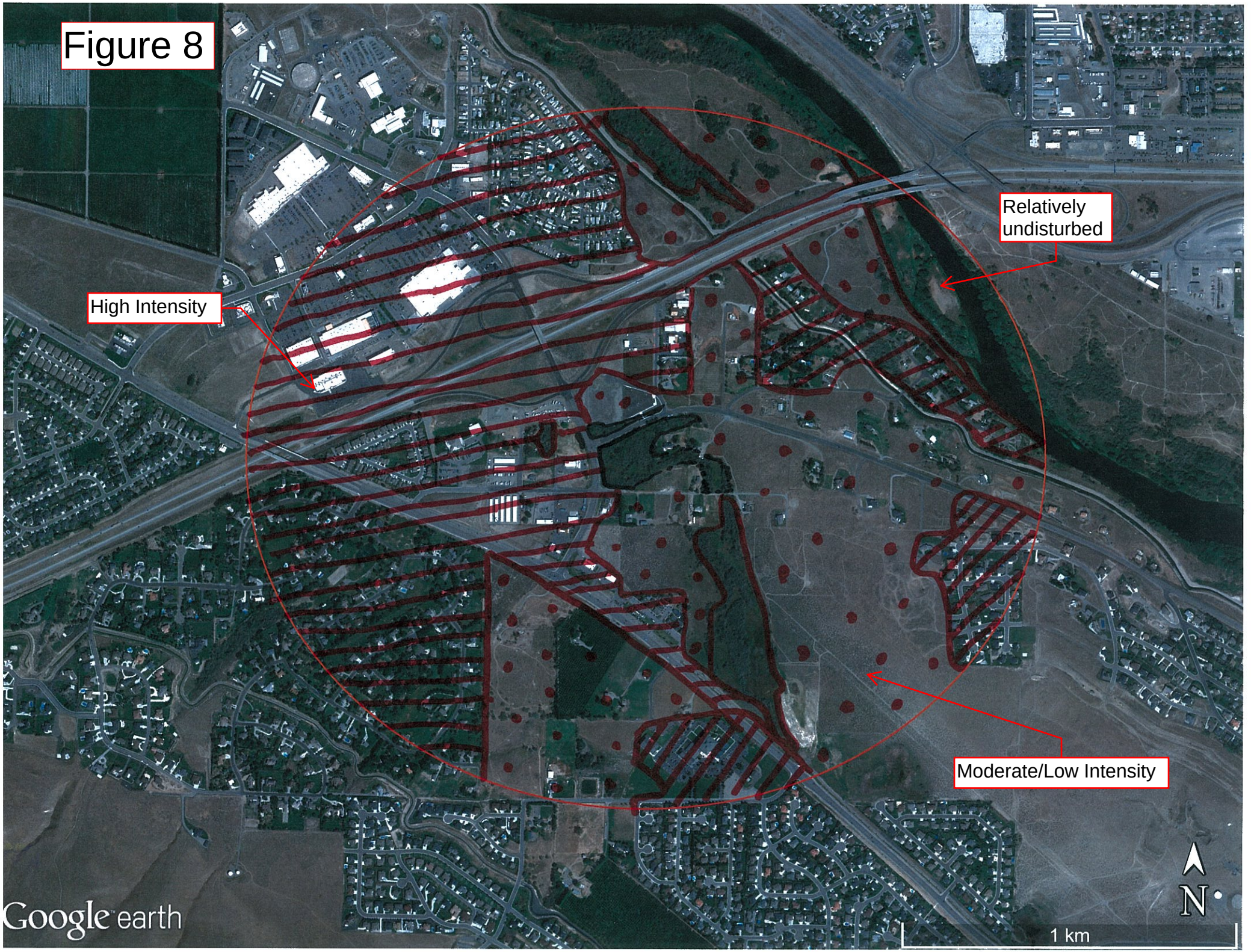
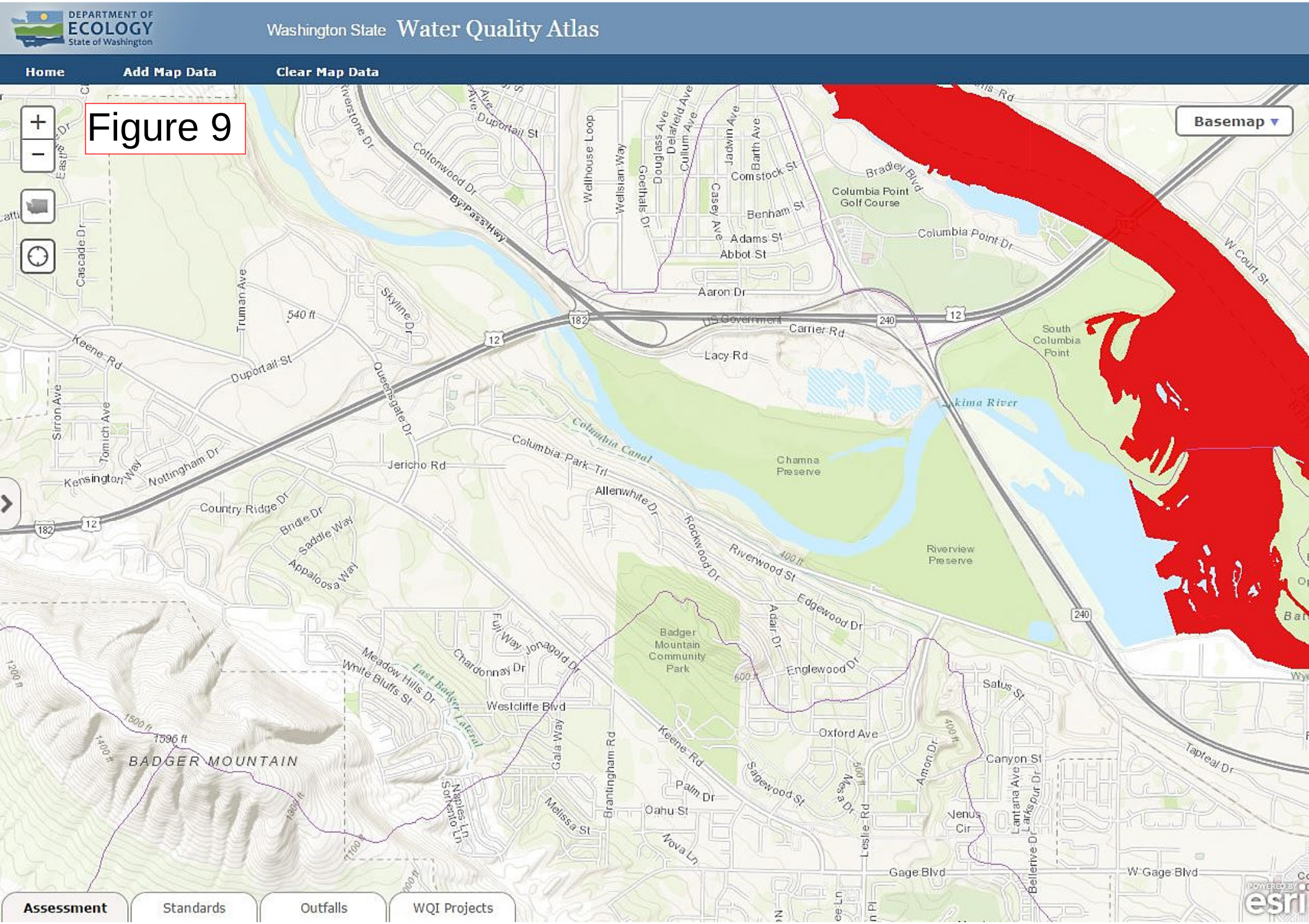


Figure 8
Relatively undisturbed
High Intensity
Moderate/Low Intensity
Google earth
N
1 km

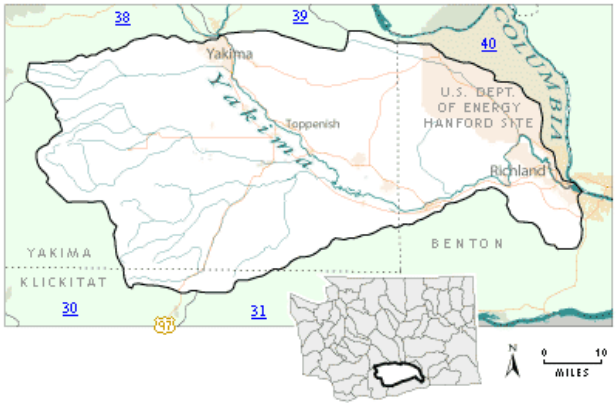

DEPARTMENT OF ECOLOGY
State of Washington
Washington State Water Quality Atlas
Home
Add Map Data
Clear Map Data
Figure 9
Basemap
Columbia Point Golf Course
Bradley Blvd
Columbia Point Dr
W Court St
Comstock St
Benham St
Adams St
Abbot St
Aaron Dr
Carrier Rd
Lacy Rd
South Columbia Point
Yakima River
Columbia Park Trl
Columbia Canal
Chamna Preserve
Riverview Preserve
Allenwhite Dr
Rockwood Dr
Riverwood St
Edgewood Dr
Englewood Dr
Adair Dr
Badger Mountain Community Park
Oxford Ave
Satus St
Canyon St
Tapteal Dr
Jericho Rd
Country Ridge Dr
Bridle Dr
Saddle Way
Appaloosa Way
Kensington Way
Nottingham Dr
Tomich Ave
Sirron Ave
Keene Rd
Duportail St
Truman Ave
Skyline Dr
Queensgate Dr
Cottonwood Dr
By-Pass Hwy
Wellhouse Loop
Wellsian Way
Douglass Ave
Delafield Ave
Cullum Ave
Jadwin Ave
Barth Ave
Casey Ave
Goethals Dr
Cascade Dr
Easterly Dr
Riverstone Dr
Fuji Way
Jonagold Dr
Chardonnay Dr
Meadow Hills Dr
White Bluffs St
East Badger Lateral
Westcliffe Blvd
Gala Way
Brantingham Rd
Melissa St
Naples Ln
Sorrento Ln
Palm Dr
Oahu St
Nova Ln
Sagewood St
Leslie Rd
Amon Dr
Venus Cir
Lantana Ave
Larkspur Dr
Bellerive Dr
Gage Blvd
W Gage Blvd
BADGER MOUNTAIN
1596 ft
1500 ft
1400 ft
1300 ft
1200 ft
1100 ft
540 ft
600 ft
400 ft
182
12
240
Assessment
Standards
Outfalls
WQI Projects
esri

Water Quality Improvement Projects (TMDLs)

WRIA 37: Lower Yakima

The following table lists overview information and links to specific water quality improvement projects (including total maximum daily loads, or TMDLs) for this water resource inventory area (WRIA). Please use links (where available) for more information on a project.

Yakima River basin project index:



www.ecy.wa.gov/programs/wq/tmdl/yakima_wq/index.html

Counties

- Benton
- Klickitat
- Yakima

Waterbody Name	Pollutant(s)	Status**	TMDL Lead
Granger Drain	Fecal Coliform	EPA approved Has an implementation plan	Greg Bohn 509-454-4174
Griffin Lake	Total Phosphorus	Under development	Terry Wittmeier 509-574-3991
Yakima River, Mid Basin Tributaries	Fecal Coliform Moxie Drain Wide Hollow Cowiche Creek	Under development	Greg Bohn 509-454-4174
	Temperature Moxie Drain Wide Hollow	Under development	Laine Young 509-575-2642
Yakima River	Toxics	Under development	Jane Creech 509-454-7860
Yakima River, Lower	DDT Turbidity	EPA approved	Jane Creech 509-454-7860

*** Status** will be listed as one of the following: Approved by EPA, Under Development or Implementation. No status means project work has not yet started.*

For more information about WRIA 37:

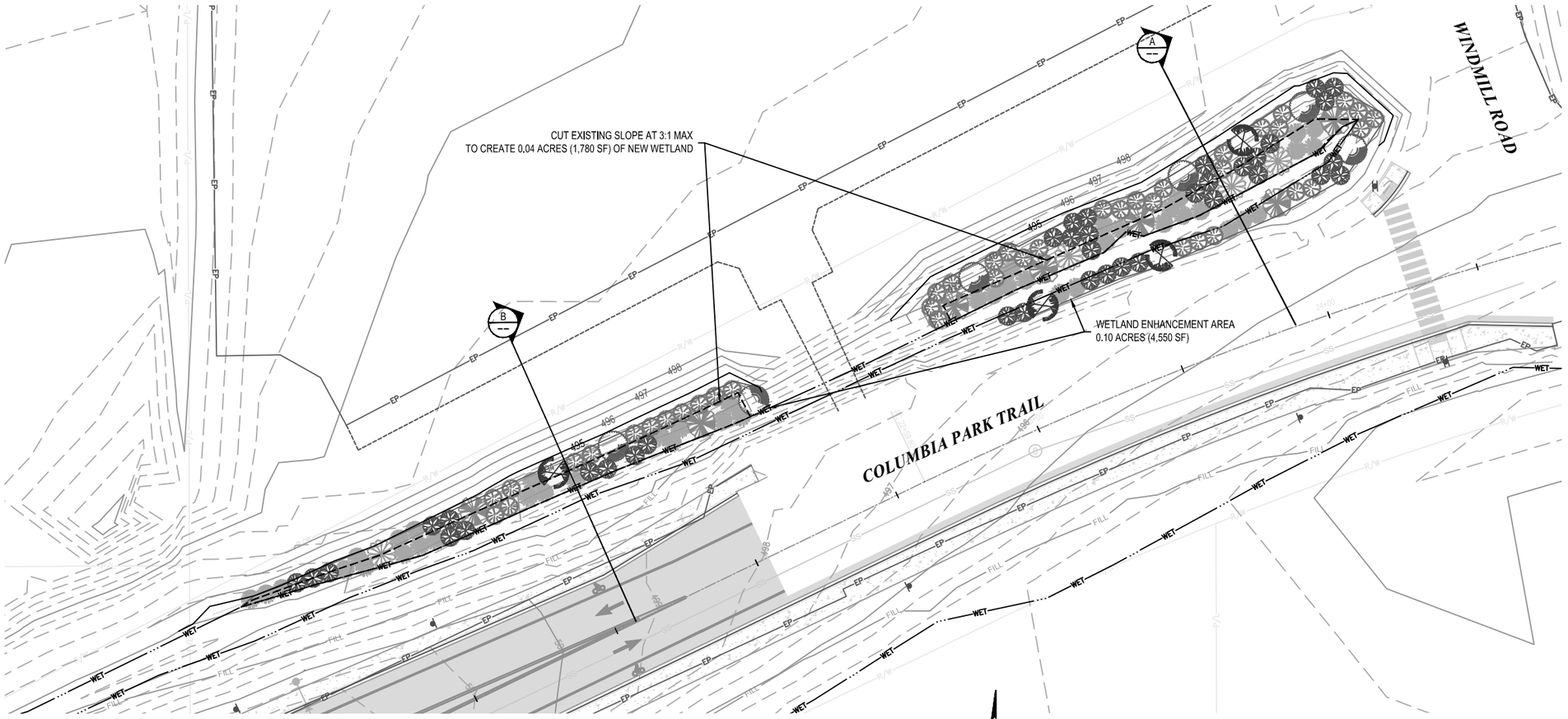
- Waterbodies in WRIA 37 - using the Water Quality Assessment Query Tool
- Watershed Information for WRIA 37

* The Department of Ecology and other state resource agencies frequently use a system of 62 "Water Resource Inventory Areas" or "WRIAs" to refer to the state's major watershed basins.

Back to top of page

Last updated December 2013

ATTACHMENT E – WETLAND MITIGATION PLAN



PROPOSED MITIGATION PLAN

1" = 20'

MITIGATION GOALS

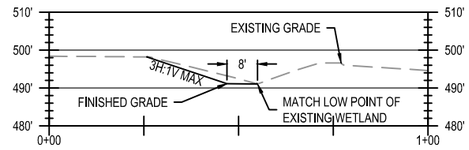
THE FOLLOWING GOALS ARE GUIDING THESE MITIGATION EFFORTS.

- ENSURE NO NET LOSS OF WETLAND HABITAT, FUNCTIONS, OR VALUES. TO THIS END, MITIGATE FOR LOST WETLAND ACREAGE (TOTALING 0.04 ACRES) BY RE-ESTABLISHING/CREATING ADJACENT TO AND ENHANCING EXISTING WETLAND HABITAT (TOTALING 0.10 ACRES).
- RE-ESTABLISHMENT/CREATION AT A 1:1 RATIO FOR PERMANENT WETLAND IMPACTS TO WETLANDS A AND C IS INTENDED TO INCREASE WETLAND ACREAGE AND FUNCTIONS OF THE WETLAND A SYSTEM. APPROXIMATELY 0.04 ACRES OF WETLAND HABITAT WILL BE CREATED ADJACENT TO THE EXISTING WETLAND A BOUNDARY. WETLAND CREATION IS EXPECTED TO INCREASE THE AREA OF WETLAND A, AS WELL AS THE WETLAND'S WATER QUALITY, HYDROLOGIC, AND HABITAT FUNCTIONS.
- ENHANCEMENT, AT A RATIO OF 4:1 FOR PERMANENT IMPACTS OF WETLAND A AND 2:1 FOR PERMANENT IMPACTS OF WETLAND C, WILL BE COMPLETED ADJACENT TO WETLAND A. ENHANCEMENT ACTIVITIES ARE INTENDED TO AUGMENT WETLAND WATER QUALITY, AND HYDROLOGIC AND HABITAT FUNCTIONS AND VALUES.

GENERAL NOTES

CONTRACTOR TO PREVENT FILL OR DREDGE WITHIN EXISTING WETLAND BOUNDARY TO CONSTRUCT PROPOSED WETLAND MITIGATION. ALL WORK SHALL FOLLOW THIS PLAN AND THE WETLAND MITIGATION NOTES AND DETAILS (DWG NO. G9).

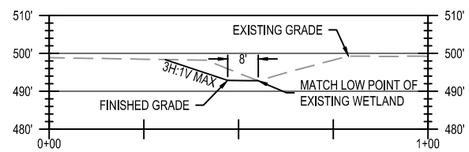
WETLAND ENHANCEMENT AREA (~4,550 SF)							
SYMBOL	COMMON NAME	SCIENTIFIC NAME	QTY	SIZE	SPACING	MATURE HEIGHT	PLANTING NOTES
TREES							
	QUAKING ASPEN	*POPULOUS TREMULOIDES*	4	5 GAL.	10 FT O.C.	TO 50 FT	PLANT IN LOCATIONS SHOWN, ADJUSTING FOR EXISTING TREES, AS NEEDED.
	PACIFIC WILLOW	*SALIX LASIANDRA*	4			TO 50 FT	
	BITTER CHERRY	*PRUNUS EMARGINATA*	6			TO 50 FT	
	SITKA WILLOW	*SALIX SITCHENSIS*	7			TO 25 FT	
SHRUBS							
	WESTERN SERVICEBERRY	*AMELANCHIER ALNIFOLIA*	41	2 GAL.	6 FT O.C.	TO 20 FT	PLANT IN LOCATIONS SHOWN, ADJUSTING FOR EXISTING TREES, AS NEEDED.
	MACKENZIE'S WILLOW	*SALIX PROLIXA*	43			TO 20 FT	
	RED OSIER DOGWOOD	*CORNUS SERICEA SSP. 'STOLONIFERA'*	37			TO 10 FT	



GRADING SECTION A PROFILE

H: 1" = 20', V: 1" = 20'

A



GRADING SECTION B PROFILE

H: 1" = 20', V: 1" = 20'

B

SIGNED: 01/18/18

RH2 ENGINEERING, INC.
www.rh2.com
Bellevue, WA 1.800.720.8052
114 Columbia Point Drive, Suite C

CITY OF RICHLAND
QUEENSGATE DR - COLUMBIA PARK TRAIL IMPROVEMENTS

WETLAND MITIGATION PLAN

JOB NO.: 717.029
CLIENT: RIC
FILENAME: QUEEN-P-MITLDWG
DATE: Jan 18, 2018
PLOT DATE: Jan 24, 2018
DESIGNED: EEC
REVIEWED: ALP

REVISIONS

NO.	DATE	DESCRIPTION	BY	REVIEW

SCALE: AS SHOWN

0" 1" 2"

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: G8

SHEET NO.: ##### / #####

MITIGATION PLANTING NOTES

GENERAL PLANTING NOTES:
PLANTING SHALL BE COMPLETED BY A LOCAL LANDSCAPE CONTRACTOR WITH AT LEAST 5 YEARS OF EXPERIENCE IN NATIVE PLANT AND SENSITIVE AREAS RESTORATION. THE LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING A PRE-PLANTING MEETING, SUCCESSFUL PLANT INSTALLATION, CITY ACCEPTANCE POST-PLANTING, AND CARE OF THE SITE FOR THE A ONE-YEAR PLANT ESTABLISHMENT PERIOD. FOLLOWING THE PLANT ESTABLISHMENT PERIOD, THE CITY WILL ASSUME CARE OF THE SITE.

PLANTING SCHEDULE AND WARRANTY:
PLANTING SHALL OCCUR BETWEEN SEPTEMBER 1 AND NOVEMBER 15, PREFERRABLY TO MINIMIZE TRANSPLANT SHOCK AND SUPPLEMENTAL CARE FOR NEW PLANTINGS. WATER-IN ALL NEWLY PLANTED AND TRANSPLANTED PLANT STOCK IMMEDIATELY FOLLOWING INSTALLATION AND IN SUFFICIENT QUANTITY THEREAFTER TO ESTABLISH PLANTINGS.
THE CONTRACTOR SHALL HANDLE AND CARE FOR ALL TRANSPLANTED PLANTS AND PLANT STOCK STORED ON-SITE FOR LONGER THAN ONE WEEK. THIS INCLUDES, BUT IS NOT LIMITED TO, WATERING PLANTS, AND PROTECTING PLANTS FROM DAMAGE BY ELEMENTS, VANDALISM, ETC.
THE CONTRACTOR SHALL WARRANT ALL PLANT MATERIALS TO REMAIN HEALTHY AND ALIVE FOR A PERIOD OF ONE YEAR FOLLOWING SUCCESSFUL INSTALLATION ACCEPTANCE. DURING THIS PERIOD, ENSURE PLANTS ARE MAINTAINED, WATERED, AND REPLACED, AS NEEDED, TO ENSURE THEIR ESTABLISHMENT ON THE SITE AND SURVIVAL.
PLANT PROCUREMENT, HANDLING AND STORAGE, AND INSTALLATION SHALL BE SUBJECT TO OWNER/ENGINEER REVIEW, DIRECTION, AND APPROVAL, AS WELL AS PER THE WETLAND MITIGATION PLAN AND THE TECHNICAL SPECIFICATIONS.

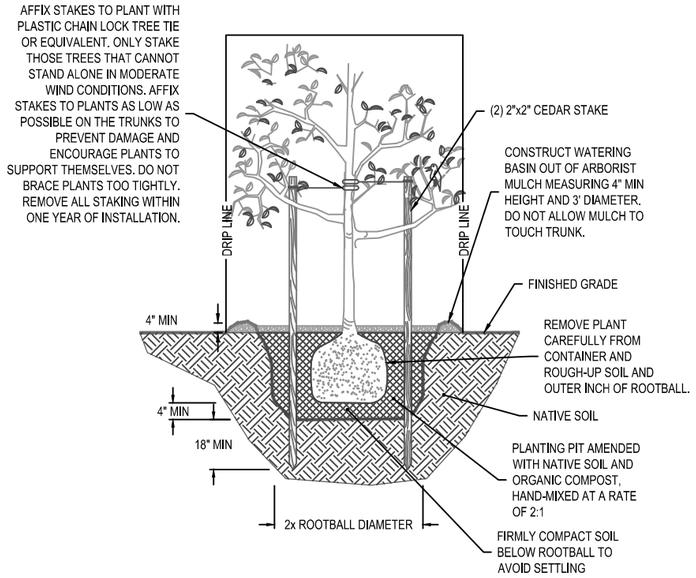
MITIGATION SEQUENCING:
MITIGATION SHALL BE COMPLETED IN THE FOLLOWING SEQUENCE:

1. THE CONTRACTOR SHALL SECURE ALL PLANT MATERIAL, TOPSOILS, MULCH, AND OTHER PLANTING INSTALLATION MATERIALS PRIOR TO BEGINNING WORK ON THE MITIGATION PLAN. SUBMIT BID NURSERY SHEET AND SOIL/MULCH DETAILS TO THE CITY FOR APPROVAL.
2. THE CONTRACTOR SHALL NOTIFY THE CITY 72 HOURS IN ADVANCE OF ANTICIPATED MITIGATION ACTIVITIES, AND ARRANGE FOR A PRE-CONSTRUCTION MEETING WITH THE CITY AND ASSIGNS. THE APPROVED PLANS, SPECIFICATIONS, AND PERMIT CONDITIONS WILL BE REVIEWED TO ENSURE THAT ALL PARTIES INVOLVED UNDERSTAND THE INTENT OF THE CONSTRUCTION DOCUMENTS, SPECIFICATIONS, SITE ENVIRONMENTAL CONSTRAINTS, PERMITS, SEQUENCES, AND INSPECTION REQUIREMENTS.
3. WITHIN THE WETLAND MITIGATION AREA, CLEAR RUSSIAN OLIVE (ELAEAGNUS ANGUSTIFOLIA) TREES AND SAPLINGS. CLEAR SAPLINGS (LESS THAN 3.5-INCH DIAMETER) BY DIGGING (SHOVEL, HOE, OR SMALL EXCAVATOR) ROOT SYSTEMS. CLEAR LARGER TREES (GREATER THAN 3.5-INCH DIAMETER) BY EXTRACTING ROOT SYSTEM WITH AN EXCAVATOR OR BACKHOE. REMOVE ALL ABOVE-GROUND AND ROOT SYSTEMS COMPLETELY OFFSITE AND DISPOSE. SOILS EXCAVATED IN AREAS CONTAINING RUSSIAN OLIVE SHALL NOT BE REUSED FOR BACKFILL IN OTHER AREAS OF THE SITE. RUSSIAN OLIVE PLANT PARTS, SEEDS, ROOTS, ETC. ARE HIGHLY INVASIVE, AND SHALL BE DISPOSED OFFSITE PROPERLY TO PREVENT INFESTATION OF OTHER AREAS. ALL RUSSIAN OLIVE TREES CLEARED FOR BOTH INTERSECTION PROJECT IMPROVEMENTS AND WETLAND MITIGATION ACTIVITIES SHALL BE HANDLED PER THE ABOVE INSTRUCTIONS.
4. RETAIN ALL HEALTHY, NATIVE TREES AND SHRUBS PRESENT WITHIN AREAS TO BE PLANTED FOR WETLAND MITIGATION. VEGETATION TO BE RETAINED SHALL BE PROTECTED FROM REMOVAL, TRAMPLING, OR OTHER IMPACTS DURING CONSTRUCTION. CLEAR GRASS AND EMERGENT GROUNDCOVER IN AREAS TO BE GRADED AND/OR PLANTED. REMOVE ABOVE-GROUND PLANT PARTS AND ROOT MASS AND DISPOSE OFFSITE. CLEARING IS PREFERRED IN THE LOW-FLOW SEASON (JULY 15TH TO SEPTEMBER 30TH). THE CONTRACTOR SHALL AVOID THE USE OF MECHANIZED EQUIPMENT IN THE WETLAND MITIGATION AREA TO THE EXTENT PRACTICABLE.
5. CONTRACTOR SHALL MANUALLY CLEAR TRASH AND DEBRIS FROM THE ENTIRETY OF WETLAND A AS PART OF THESE MITIGATION ACTIVITIES. DISPOSE OF ALL TRASH OFFSITE.
6. GRADE PROPOSED WETLAND CREATION AREAS PER THE PLAN. DIVERT ALL WETLAND WATER FLOW AROUND WORK AREAS DURING GRADING WORK.
7. INSTALL TOPSOIL IN AREAS TO BE PLANTED IN ACCORDANCE WITH THE TOPSOIL DETAIL PROVIDED. TILL THE LOWER 4 INCHES OF TOPSOIL INTO THE UPPER 4 INCHES OF NATIVE SOILS.
8. IF THE CONTRACTOR IS UTILIZING AN ABOVE-GROUND IRRIGATION SYSTEM, INSTALL SYSTEM AND ENSURE IT IS FULLY FUNCTIONAL PRIOR TO PLANT INSTALLATION.
9. CONTRACTOR SHALL INSTALL PLANT MATERIAL USING THE SPECIFIED PLANTS AND PLANTING DETAILS. PLANTING SHALL BE COMPLETED BY HAND, PER THE ON-SITE DIRECTION OF THE CONSULTING BIOLOGIST OR CITY. ANY DEVIATIONS FROM THE PLANTING PLAN MUST BE APPROVED BY THE CITY PRIOR TO INSTALLATION.
   PLANTING IN CLUSTERS OF 3 TO 5 PLANTS IS SHOWN AND PREFERRED IN THE MITIGATION AREA TO MIMIC NATURAL SYSTEMS AND FACILITATE MAINTENANCE OF THE MITIGATION AREA TO ESTABLISH REPLACEMENT PLANTINGS AND OUT-COMPETE INVASIVE SPECIES. PLANTING LOCATIONS SHOULD BE MODIFIED AS NEEDED TO ACCOMMODATE EXISTING NATIVE VEGETATION.
   ALL PLANTINGS SHALL BE THOROUGHLY WATERED-IN FOLLOWING INSTALLATION. WATER PLANTS NO LESS THAN TWICE A WEEK FOR 15 MINUTES DURING THE FIRST WEEK OF INSTALLATION. WATERING SHALL CONTINUE AT A RATE SUFFICIENT TO ENSURE PLANTINGS BECOME ESTABLISHED UNTIL FALL RAINS CAN PROVIDE SUFFICIENT WATER FOR NEW PLANTINGS.
   INSTALL ARBORIST MULCH WATERING BASINS AROUND PLANTED VEGETATION AS SHOWN IN PLANTING DETAILS.
   THE CONTRACTOR SHALL LABEL INSTALLED PLANTINGS WITH METAL IDENTIFICATION TAGS, OR THE EQUIVALENT. ONE IN FOUR OF EACH PLANT SPECIES WILL BE LABELED THROUGHOUT THE MITIGATION AREA.
10. SEED ALL MITIGATION AREAS AND THOSE AREAS DISTURBED BY CONSTRUCTION, INCLUDING THOSE NOT SPECIFICALLY SHOWN TO BE PLANTED, USING THE SPECIFIED SEED MIX. SEE SPECIFICATIONS (DIV. 8-01).
11. THE CONTRACTOR SHALL NOTIFY THE CITY UPON COMPLETION OF PLANT INSTALLATION TO ARRANGE FOR AN INSPECTION OF THE MITIGATION AREA. ANY CORRECTIONS, SUBSTITUTIONS, OR MISSING ITEMS WILL BE ADDRESSED IN WRITING TO THE CONTRACTOR ALONG WITH A SCHEDULE TO ADDRESS THOSE ITEMS.
12. THE CONTRACTOR SHALL WARRANT ALL PLANT MATERIAL TO REMAIN HEALTHY AND ALIVE AND SHALL MAINTAIN THE SITE IN ACCORDANCE WITH THE APPROVED PLANS, SPECIFICATIONS, AND PERMIT CONDITIONS FOR THE PLANT ESTABLISHMENT PERIOD. DURING THIS PERIOD, THE CONTRACTOR SHALL ENSURE MAINTENANCE ACTIVITIES ARE CARRIED OUT PER THE MAINTENANCE PLAN. FOLLOWING THE INITIAL PLANT ESTABLISHMENT PERIOD, THE CITY WILL ASSUME RESPONSIBILITY FOR SITE MAINTENANCE.

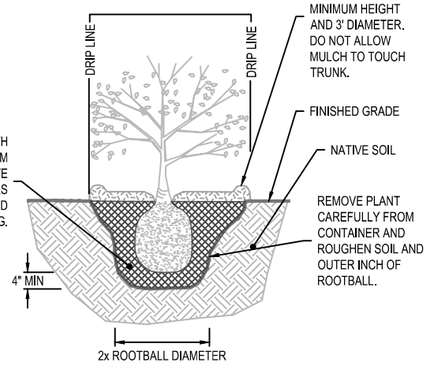
IRRIGATION:
THE CONTRACTOR SHALL DESIGN AND INSTALL A TEMPORARY, ABOVEGROUND IRRIGATION SYSTEM TO PROVIDE SUPPLEMENTAL WATER TO PROPOSED PLANT MATERIAL FOR A MINIMUM OF 2 YEARS FOLLOWING INSTALLATION. THE CONTRACTOR SHALL WORK WITH THE CITY TO DESIGN THIS SYSTEM. THE IRRIGATION SYSTEM SHALL PROVIDE HEAD-TO-HEAD COVERAGE OF THE ENTIRE WETLAND MITIGATION AREA AND A MINIMUM OF ONE-INCH OF WATER PER WEEK DURING THE DRY SEASON. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO MODIFY THE DURATION AND FREQUENCY OF SUPPLEMENTAL WATERING TO ENSURE PLANT SURVIVAL DURING THE FIRST YEAR. THE CITY WILL ASSUME MAINTENANCE AND OPERATION OF THE IRRIGATION SYSTEM FOLLOWING THE FIRST YEAR. TEMPORARY IRRIGATION MAY CEASE AFTER THE 2ND YEAR PROVIDED PLANTINGS ARE ESTABLISHED.

MAINTENANCE:
THE CONTRACTOR SHALL WARRANT PLANT MATERIAL FOR A PERIOD OF ONE YEAR, INCLUDING PERFORMING QUARTERLY MAINTENANCE (E.G., WATERING, PRUNING, TRIMMING, REMOVAL OF LITTER, REPLACEMENT OF MULCH, STAKING OF TREES, ETC.) NEEDED TO FOSTER ESTABLISHMENT AND SURVIVAL OF INSTALLED PLANTINGS AND GROUNDCOVER. MAINTENANCE AND CARE INSTRUCTIONS ARE PROVIDED IN THE MAINTENANCE PROGRAM WITHIN THE QUEENSGATE CPT WETLAND TECHNICAL MEMORANDUM (RH2, DECEMBER 2017 OR AS REVISED)(SEE SPECIFICATIONS). MAINTENANCE ACTIVITIES ARE EXPECTED TO BE PERFORMED ON THIS SITE FOR A PERIOD OF 6 YEARS TO MEET PERMIT CONDITIONS. FOLLOWING THE INITIAL ONE-YEAR MAINTENANCE BY THE CONTRACTOR, THE CITY OR ITS ASSIGNS WILL PERFORM MAINTENANCE ACTIVITIES PER THE MAINTENANCE PROGRAM AND THE APPROVED PERMIT CONDITIONS.

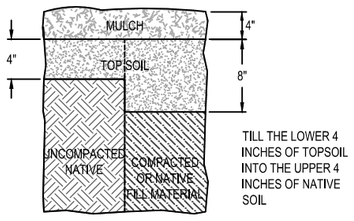
MONITORING:
MONITORING OF THE MITIGATION AREA SHALL OCCUR PER THE MONITORING PROGRAM OUTLINED IN THE QUEENSGATE CPT WETLAND TECHNICAL MEMORANDUM (RH2, DECEMBER 2017 OR AS REVISED)(SEE SPECIFICATIONS), AS WELL AS THE APPROVED PERMIT CONDITIONS. MONITORING ACTIVITIES ARE EXPECTED TO BE PERFORMED ON THIS SITE FOR A PERIOD OF 6 YEARS TO MEET PERMIT CONDITIONS. THE CITY OR ITS ASSIGNS WILL COMPLETE MONITORING ACTIVITIES.



DECIDUOUS TREE PLANTING DETAIL
NOT TO SCALE



SHRUB PLANTING DETAIL
NOT TO SCALE



TOPSOIL REQUIREMENTS FOR TREE AND SHRUB BEDS
NOT TO SCALE

SIGNED: 01/18/18

RH2 ENGINEERING, INC.
www.rh2.com
Richland, WA 1.800.720.8052
114 Columbia Point Drive, Suite C

CITY OF RICHLAND
QUEENSGATE DR - COLUMBIA PARK TRAIL IMPROVEMENTS

WETLAND MITIGATION NOTES AND DETAILS

REVISIONS			
NO.	DATE	DESCRIPTION	BY
			REVIEW

ENGINEER: EEC
REVIEWED: ALP
SAVE DATE: Jan 18, 2018
PLOT DATE: Jan 24, 2018
CLIENT: RIC
FILENAME: QUEEN-PMITL.DWG
JOB NO.: 717.029

SCALE: AS SHOWN
0" 1" 2"
DRAWING IS FULL SCALE WHEN BAR MEASURES 2"

DWG NO.: G9
SHEET NO.: #### of ####

Compensatory Mitigation Plan

Queensgate Transit Hub Improvements
Richland, Washington

for
KPFF Consulting Engineers

June 23, 2022

GeoEngineers

Compensatory Mitigation Plan

Queensgate Transit Hub Improvements
Richland, Washington

for
KPFF Consulting Engineers

June 23, 2022

GeoEngineers

523 East Second Avenue
Spokane, Washington 99202
509.363.3125

Compensatory Mitigation Plan

Queensgate Transit Hub Improvements
Richland, Washington

File No. 2557-007-03

June 23, 2022

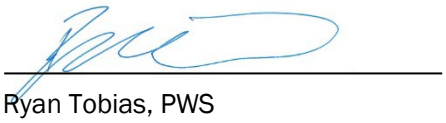
Prepared for:

KPFF Consulting Engineers
421 West Riverside Avenue, Suite 902
Spokane, Washington 99201

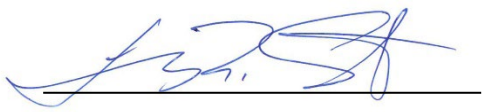
Attention: Brandon Blankenagel, PE

Prepared by:

GeoEngineers, Inc.
523 East Second Avenue
Spokane, Washington 99202
509.363.3125



Ryan Tobias, PWS
Senior Biologist



Jason Scott, FP-C
Associate

RMT:JRS:mls

Table of Contents

LIST OF FIGURES

APPENDICES

ACRONYMS AND ABBREVIATIONS

bgs – below ground surface

CWA – Clean Water Act

Ecology - Washington State Department of Ecology

EPA - Environmental Protection Agency

ESA - Endangered Species Act

FEMA - Federal Emergency Management Agency

ft^2 – square feet

HPA – Hydraulic Project Approval

HUC - Hydrologic Unit Code

JARPA - Joint Aquatic Resources Permit Application

KPFF – KPFF Consulting Engineers

lbs/acre – pounds per acre

NPDES - National Pollution Discharge Elimination System

NWP – Nationwide Permit

OHWM - ordinary high-water mark

PHS - Priority Habitats and Species

RMC – Richland Municipal Code

SEPA - State Environmental Policy Act

SWMMEW - Stormwater Management Manual for Eastern Washington

SWPPP - Stormwater Pollution Prevention Plan

TESC - Temporary Erosion and Sediment Control

USACE - United States Army Corps of Engineers

USGS - United States Geological Survey

WDFW - Washington State Department of Fish and Wildlife

WRIA – Water Resource Inventory Area

1.0 INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) was contracted by KPFF Consulting Engineers (KPFF) to develop a mitigation plan to compensate for unavoidable impacts to wetlands and wetland buffers associated with proposed improvements at the Ben Franklin Transit Queensgate Hub in Richland, Washington. The project site is located at an existing park and ride west of the intersection of Windmill Road and Columbia Park Trail (Figure 1, Vicinity Map).

1.1. Site Description

The project site is situated in Section 22, Township 9 North, Range 28 East of the Willamette Meridian. It is located within Water Resource Inventory Area (WRIA) 37 (Lower Yakima) and within Hydrologic Unit Code (HUC) 17030003.

The proposed Transit Hub improvements are located along the west margin of the existing park and ride, east of the Columbia Park Trail/Queensgate Drive roundabout. The site includes a drainage swale, identified as Wetland A, and a portion of tax parcel 122982020003001 (Benton County 2022). Upland slopes immediately north of the wetland are vegetated, beyond which is a flat, largely undeveloped graveled area with remnant asphalt pieces and sparse non-native upland vegetation. The slope adjacent to the south of Wetland A is vegetated, beyond which, is paved roadway (Columbia Park Trail).

2.0 PROJECT DESCRIPTION, PURPOSE AND NEED

The proposed Transit Hub will extend the existing park and ride facilities to the west by adding a bus lane that connects Columbia Park Trail to Windmill Road; bus pullout area for passenger loading and unloading; and associated improvements. The improvements will require an arched bridge/culvert spanning over the existing swale that separates the park and ride facility from Columbia Park Drive. The foundations and wingwalls for the proposed arched bridge/culvert will be located above the ordinary high-water mark (OHWM) and set back sufficiently to avoid wetlands delineated by RH2 Engineering, Inc. (RH2 2017a). However, the proposed arched culvert will span approximately 380 square feet (ft^2) of Wetland A.

The purpose of this mitigation plan is to outline proposed development plans, document development measurers to avoid and minimize impacts to wetlands (swale) and buffers, and present proposed measures to restore wetland and buffer areas anticipated to experience impacts from the project. The site footprint is limited, resulting in challenges for design and on-site mitigation, as opportunities for wetland creation and buffer enhancement are minimal. This plan provides feasible alternatives based on these constraints, allowing for wetland creation and buffer enhancement opportunities in a highly disturbed urban environment.

2.1. Regulatory Requirements

The proposed project requires authorization from state and federal agencies. In addition, local (city of Richland) authorizations will be needed prior to development of the project.

2.1.1. Federal and State Regulations

The Joint Aquatic Resources Permit (JARPA) application for the project was submitted to the U.S. Army corps of Engineers (USACE) on September 21, 2021. A Nationwide Permit (NWP) 14 for Linear Transportation

Projects was issued on October 20, 2021, for the project (Appendix A). As part of the NWP, USACE indicated no Clean Water Act (CWA) Section 401 Water Quality Certification would be needed from the Washington State Department of Ecology (Ecology). Moreover, due to the small size of the project (less than 1,000 ft^2), no wetland mitigation is required from state and federal authorities. However, Ecology will require National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit coverage. Permit submittal for NPDES coverage is underway and will be managed by the applicant.

2.1.2. City of Richland Regulations

The city of Richland (City) wetland mitigation regulations largely emulate USACE and Ecology requirements. However, Richland Municipal Code (RMC) Title 22.10, Article III, regulates wetland mitigation within city limits, regardless of the size of impact. As such, the City requires wetland and buffer mitigation for the project. In addition, the City has submitted a State Environmental Policy Act (SEPA) checklist review for the project.

2.1.2.1. City of Richland Stormwater Regulations

In addition to the wetland and buffer requirements outlined above, RMC 22.10.125 regulates stormwater runoff into wetlands. Specifically, discharge of stormwater runoff into a wetland must be adequately mitigated to protect the functions and values of the wetland. Surface flow to Wetland A is currently provided entirely by direct drainage of stormwater from adjacent roadways, ditches, and parking lots; as well as a 30-inch stormwater line originating under Queensgate Drive to the west, and an 18-inch stormwater line from Windmill Road to the north. The proposed stormwater design for the project will incorporate an overflow from an infiltration swale receiving parking lot stormwater into Wetland A. As such, functions and values of Wetland A will not be modified by the project, as it will continue to receive hydrology from the existing sources of stormwater.

3.0 BASELINE CONDITIONS

The site is a northeasterly flowing stormwater drainage swale and adjacent uplands. A paved park and ride and sparsely graveled parking areas are situated approximately 20 feet beyond the vegetated buffer to the north of the site. An approximate 12-foot vegetated buffer is situated adjacent to the south of the swale, beyond which, is the paved Columbia Park Trail, which parallels the site. A wetland delineation was completed by RH2 (2017a) for the roundabout at the Queensgate Drive/Columbia Park Trail intersection, which indicated the swale at the site was part of a larger wetland, identified in the report as Wetland A. It was estimated at approximately 0.46 acres in size and was ranked by RH2 as a Category III wetland. Primary hydrologic input to the site is from stormwater discharge from developed areas to the west, as well as adjacent parking areas and roadways. Surface flow from Wetland A discharges to a culvert under Windmill Road to the east of the site. The swale was classified by RH2 (2017a) as an intermittent, non-fish bearing stream.

GeoEngineers visited the site in July and October 2020, as well as July 2021 to observe wetland characteristics at the proposed arch culvert location. Baseline conditions, specifically relevant to this mitigation plan, are discussed below. Photographs taken during this field assessment are provided in Appendix B, Site Photographs.

3.1. Wetlands and Buffers

Wetland A is an artificially created drainage swale that developed from stormwater conveyance following development in the area in the 1980's. The roundabout at Queensgate Boulevard/Columbia Park Trail, west of the site, was completed in 2018. Impacts to Wetland A, associated with the roundabout construction, were largely avoided. However, a permanent impact of 0.01 acres of Wetland A resulted from fill and clearing to construct the roadway and reconfigure the stormwater drainage outfall. Compensatory mitigation was completed downstream (northeast) of the proposed arch culvert, which included enhancement of 0.1 acres of wetland and creation of 0.04 acres of wetland in the swale (RH2 2017b).

Wetland A was classified by RH2 (2017a) as a 0.46 acre (20,038 ft^2), palustrine scrub-shrub and emergent Category III depressional wetland. Vegetation at Wetland A is dominated by bulrush (*Scirpus articulates*), Canada thistle (*Cirsium arvense*), and cattail (*Typha latifolia*). According to RMC, Section 22.10.080, Category III wetlands greater than 1,000 ft^2 (0.02 acres) in size are regulated as a critical area by the City (2021). Category III wetlands with a high level of proposed land use have a 150-foot buffer (RMC Table 22.10.110(D)) (Appendix C, Sheet W.01).

The immediate adjacent upland areas (approximately 20 feet north and 12 feet south of Wetland A) contain upland vegetation. However, these buffer areas are dominated by non-native species including Russian thistle (*Salsola kali*), cheatgrass (*Bromus tectorum*), tumblemustard (*Sisymbrium altissimum*), kochia (*Bassia scoparia*), and prickly lettuce (*Lactuca serriola*), among others. The majority of the 150-foot buffer north of Wetland A and beyond the vegetated area is highly degraded, with imported gravels, asphalt, paved parking, and partially vegetated areas dominated by Russian Thistle and kochia. The 150-foot buffer south of the vegetated area is largely comprised of paved roadway (Columbia Park Trail), which parallels Wetland A.

4.0 WETLAND AND BUFFER IMPACTS

The project will result in permanent impacts to habitat within Wetland A and the associated buffer. Within the proposed wetland impact area, habitat functions are moderate to low with significant disturbance. Buffer habitat conditions within proposed impact areas, as described above, are highly disturbed with impervious surfaces, imported gravel, asphalt pieces, and sparse non-native vegetation.

4.1. Permanent Impacts

Permanent impacts are illustrated on Sheet W.01 in Appendix C, Wetland Mitigation Drawings, discussed in further detail below, and summarized in Table 1. Permanent impacts to approximately 380 ft^2 of Wetland A are anticipated from construction of the arch culvert over the swale (Appendix C, Sheet W.01). Approximately 45.15 cubic yards (cy) of material will be excavated and removed from the swale in preparation of the culvert placement and wingwall construction. This area will then be filled with about 41.5 cy of 12-inch cobbles to provide a stabilized base of the swale

Approximately 785 ft^2 of upland buffer, adjacent to and north of Wetland A, will be replaced with the creation of new emergent wetland. In addition, approximately 12,668 ft^2 of permanent impact to Wetland A buffer will occur from placement of the concrete wingwalls and paved bus lanes for the new crossing. About 1,745 ft^2 of permanent impact to the buffer will result from development of the south approach from Columbia Part Trail to the south of Wetland A. This will include fill behind the wingwalls and roadway

pavement that will permanently shade the buffer. Furthermore, approximately 608 ft^2 of permanent impact will occur from a new sidewalk planned north of Wetland A.

Additional permanent impact to Wetland A buffers will include 3,427 ft^2 of infiltration swale in the disturbed graveled buffer area north of the wetland. This impact to the existing degraded buffer area is anticipated to be beneficial, as it will allow for buffer enhancement and opportunities to establish additional native vegetation and stormwater infiltration within the buffer.

TABLE 1. PROPOSED WETLAND/BUFFER IMPACTS AND MITIGATION RATIOS

Habitat Type	Type of Impact	Functional Impact	Area (ft^2)	Proposed Mitigation	Proposed Mitigation Ratio[1]	Proposed Mitigation Area (ft^2)
Wetland	Fill and shading (permanent)	Reduction in solar input and permanent loss of wetland function	380	Wetland creation in adjacent upland buffer	2:1 (Creation)	785
		TOTAL	**380**		**TOTAL**	**785**
Buffer	Fill (permanent) – wingwalls + paved surfaces for bus lane	Permanent loss of buffer function	12,668	Buffer enhancement	0.5:1	6,894
	Fill and shading (permanent) - approach	Reduction in solar input and permanent loss of buffer function	1,745	Buffer enhancement	1:1	1,707
	Fill (permanent) – new sidewalk	Loss of buffer function	608	Buffer enhancement	3.5:1	2,184
	Removal (permanent) – buffer habitat removed for new wetland	Loss of buffer function	785	Buffer enhancement	1.9:1	1,432
		TOTAL	**15,806**		**TOTAL**	**12,217**
Bioswale	Bioswale (permanent) – north of wetland	Creation of new bioswale with native vegetation	3,427	The bioswale will be an enhancement component	1:1	3,427
		TOTAL	**3,427**		**TOTAL**	**3,427**

Notes:

[1] Wetland mitigation ratio based on RMC Table 22.10.130(C) Mitigation Ratios for Eastern Washington. There are no buffer mitigation ratios specified in the RMC.

4.2. Temporary Impacts

Temporary impacts to Wetland A and associated buffer are expected to be minimal. The majority of equipment access will occur from disturbed paved and graveled areas within the buffer. Minor grading may be required to prepare the entry workspace. No trees will be removed as a result of the project.

4.3. Construction Sequence and Equipment List

A general outline of the construction sequence anticipated for the proposed work for the project is provided below. Construction sequencing may change based on final designs.

Mobilization and Site Preparation

- Mobilize to site.
- Establish site survey control and project layout staking.
- Install Erosion Control BMPs in accordance with the site stormwater pollution prevention plan (SWPPP), to be developed in accordance with the Ecology (2019) Stormwater Management Manual for Eastern Washington (SWMMEW).
- Remove non-native vegetation in upland work zones, including the Wetland A buffer.

Arch Culvert Construction

- The existing prism will be graded to prepare for the construction. All work outside sediment removal and cobble placement in Wetland A will occur above the OHWM.
- Approximately 45.15 cy of sediment will be excavated and removed from the swale in preparation of the culvert placement and wingwall construction. Fill quantities are anticipated to be approximately 26.56 cy for gravel borrow (fill inside the wingwalls) and 41.5 cy for swale base material.
- Concrete footings will be poured for wingwalls and the culvert.
- Wingwalls will be placed (outside the OHWM). Soil will be backfilled and graded behind the wingwalls.
- An 11.3-foot-wide by 7.2-foot-tall arched culvert will be placed over the swale and anchored to the footings.
- The channel within the OHWM (Wetland A) will be filled with 12-inch cobbles.
- Approximately 4 feet of fill will be placed over the culvert in preparation for the new bus lane.

Wetland Mitigation

- The upland area adjacent to the north of Wetland A will be cleared of vegetation.
- Approximately 80 cy of soil will be excavated for wetland creation. The mitigation area will be graded to meet Wetland A elevations.
- The mitigation area will be planted with native emergent species.
- The new stormwater overflow from the infiltration swale will be directed to the mitigation area with energy dissipation at discharge location.
- Upland areas will be re-planted with native shrub and tree species.

Restoration

- Once all disturbed ground is permanently stabilized and seeded, temporary erosion and sediment control (TESC) BMPs will be removed including but not limited to, temporary construction entrances and access roads, silt fencing, and straw wattles.
- During the dormant season following site grading, native shrubs and trees will be installed at the site per the attached mitigation drawings (Appendix C, Sheet W.03).

4.4. Impact Avoidance and Minimization Sequencing

The project follows guidelines for mitigation sequencing (avoidance, minimization, and compensation) outlined in joint guidance prepared by Ecology, United States Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA) (Ecology et. al., 2006a and 2006b). In addition, the project will follow RMC Section 22.10.120 for wetland alteration and mitigation. This requires mitigation actions to occur in the following priority sequence (City of Richland 2021):

1. Avoiding the impact by not taking a certain action or parts of actions or moving the action.
2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation by using appropriate technology and engineering, or by taking affirmative steps to avoid or reduce adverse impacts.
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
4. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
5. Compensating for the impact by replacing or providing substitute resources or environments. Preference shall be given to measures that replace the impacted functions on site or in the immediate vicinity of the impact. However, alternative compensatory mitigation within the watershed that addresses limiting factors or identifies critical needs based on watershed or comprehensive resource management plans may be authorized.
6. Monitoring the adverse impact and taking appropriate corrective measures.

These criteria are sequentially applied to a proposed project to guide its design with the goal of minimizing impacts on critical areas. This section addresses avoidance and specific measures to minimize potential impacts that may occur within the wetland and associated buffer as a result of the proposed project.

4.4.1. Avoidance

The arch culvert and associated wingwalls were designed to avoid direct impacts to jurisdictional waters below the OHWM, to the extent practicable. In addition, the previous compensatory wetland mitigation area, developed during the 2018 construction of the Queensgate Boulevard/Columbia Park Trail roundabout, will be avoided entirely.

Disturbance will be limited to those areas necessary for construction, which will be identified on site plans and marked on the site before construction begins. Native shrubs and emergent vegetation will be preserved to the extent possible.

4.4.2. Minimization

The new arch culvert will require spanning Wetland A. Although footings, wingwalls, and the culvert itself will be set outside the OHWM, the span for the new bus lane will cross and cover the wetland. In addition, approximately 380 ft^2 of channel below the OHWM will be filled with 12-inch cobbles, resulting in a permanent impact. However, unavoidable impacts have been minimized where possible.

Wetland and stream habitat was surveyed and identified on project maps prior to completing the design. This allowed designers to avoid aquatic critical areas and associated buffers where possible. In-water work will be limited to the minimal amount necessary to span the wetland and provide a stable channel.

4.4.3. Rectifying Temporary Impacts

Some temporary and permanent impacts to aquatic habitats and buffers could not be avoided or minimized completely. In general, minimal temporary impacts will be fully rectified by restoring affected habitat with native vegetation. Baseline conditions in most temporary impact areas are degraded due to impervious surfaces, imported gravel fill, remnant asphalt, and encroachment of invasive species (e.g., Russian thistle, tumblemustard, etc.). Therefore, the net effect of temporary clearing and subsequent restoration is anticipated to be an enhancement with overall improvement in vegetation structure and function.

Permanent impacts resulting from fill, conversion, and/or shading cannot be rectified and will be compensated through wetland creation and buffer enhancement.

4.4.4. Compensation for Permanent Impacts

Permanent impacts to Wetland A and the buffer will be compensated through creation of wetland and buffer enhancement. Creation of approximately 785 ft^2 of new wetland adjacent to Wetland A and upstream from the new arch culvert is proposed to compensate for fill and shading of 380 ft^2 of wetland from the new crossing.

Approximately 12,217 ft^2 of buffer habitat will be enhanced through removal and control of invasive species and planting native species. This will include planting native shrubs and trees adjacent to Wetland A and seeding flat terrain north of Wetland A with an upland native seed mix. This enhancement is anticipated to improve habitat opportunities at the site that are not available elsewhere in the surrounding, highly developed landscape. In addition, development of approximately 3,427 ft^2 of infiltration swale within the disturbed graveled area of the 150-foot buffer will provide additional native plantings in an area currently dominated by kochia and Russian thistle.

4.4.5. Construction Best Management Practices

Permitting conditions are expected to include requirements that control temporary impacts to the project area and surrounding vicinity. TESC measures, such as straw wattles or silt fencing, will be utilized during the project to control stormwater generated on the project site. Appropriate TESC measures will be selected and implemented properly, such that it is expected that no sediment laden runoff will leave the site.

The contractor will install TESC BMP measures prior to project initiation, as needed. TESC BMP measures will be inspected, maintained, and augmented if necessary. After completion of the project, TESC controls will be removed from the area for off-site disposal. The contractor will produce a SWPPP that will address spill prevention, fuel storage, if needed and erosion control.

Equipment staging and/or materials storage will be limited to non-vegetated surfaces, or previously impacted graveled areas, and will be located outside of wetland areas. Waste materials will be transported off site and for disposal in accordance with applicable regulations. Equipment used for this project shall be free of external petroleum-based products while the work is performed around the water. Equipment shall be checked daily for leaks, and necessary repairs shall be completed prior to commencing work activities within or above Waters of the State and/or Waters of the U.S. Heavy equipment shall be washed free of deleterious material prior to commencement of work. Adequate materials and procedures to respond to unanticipated weather conditions or accidental releases of materials (sediment, petroleum hydrocarbons, etc.) will be available on-site. A Spill Prevention Control and Countermeasure (SPCC) Plan will be prepared and implemented by the contractor. The plan will be site-specific and cover the project scope of work.

4.4.6. Monitoring

Following project completion, disturbed areas will be protected from erosion by revegetation in accordance with the approved landscape and erosion control plans. Revegetated areas will be monitored for success in accordance with the environmental permit conditions, which are anticipated to include vegetation monitoring over a minimum 5-year period.

5.0 PROPOSED MITIGATION

Unavoidable wetland and wetland buffer impacts associated with the Queensgate Transit Hub improvements will be compensated through creation of new wetland habitat and enhancement of buffer habitat adjacent to Wetland A (Appendix C, Sheet W.01).

5.1. Goals and Objectives

The following are mitigation goals and objectives to achieve compensation for temporary impacts to wetland and buffer habitat from the project.

The mitigation goals for the project are:

- Create wetland habitat at a mitigation ratio of 2:1 to compensate for loss of habitat due to the new arch culvert span.
- Enhance wetland buffer habitat disturbed during construction with native grasses/herbaceous plants, shrubs, and trees.
- Enhance areas of low habitat function within the Wetland A buffer by removing non-native and invasive plants and planting native vegetation in the bioinfiltration swale.

Based on the stated goals above, the mitigation plan objectives are:

- Create approximately 785 ft^2 of new wetland area by decreasing grade elevation and planting native vegetation within a portion of the existing buffer area, providing additional hydrology and wetland habitat. Establish native wetland plants, per Sheets W.02 and W.03 (Appendix C).
- Enhance temporary impact areas of the Wetland A buffer by restoring grades, stabilizing, and seeding with native seed mixes and installing native species within disturbed areas, per Sheets W.02 and W.03 (Appendix C).

- Enhance the degraded graveled areas within the Wetland A buffer by planting by native species in the biorientation swale, per Sheets W.02 and W.03 (Appendix C).
- Increase cover and diversity of native plant species within the wetland and buffer mitigation areas by installing native shrub and emergent plant species.
- Plant native upland trees to increase cover and shading in the buffer immediately adjacent to Wetland A. Flat terrain north of Wetland A within the 150-foot buffer will be seeded with a native upland seed mix.

5.2. Mitigation Ratios

Proposed mitigation ratios are based on joint agency guidance (Ecology et al. 2021; City of Richland 2021) and RMC Table 22.10.130(C). Proposed disturbance areas within Wetland A are dominated by cattail, reed canary grass, and bulrush. The buffer north of Wetland A, which will be impacted by creation of new wetland, is dominated by upland species, the majority of which are non-native plants.

The proposed mitigation ratio for wetland creation at the site is 2:1. The RMC does not have established mitigation ratios for buffers. However, mitigation ratios ranging from 0.5:1 to 3.5:1 are proposed for areas permanently impacted the new bus lane, approaches, sidewalk, and wingwalls. In addition, approximately 3,427 ft^2 of new infiltration swale will be installed within the 150-foot buffer, which will enhance the area currently degraded by gravel fill and non-native Russian thistle. Overall upland buffer enhancement (12,217 ft^2) and bioswale enhancement (3,427 ft^2) will result in 15,664 ft^2 of enhancement within the Wetland A buffer, translating to nearly a 1:1 buffer enhancement ratio for the project.

5.3. Mitigation Work Plan

Proposed mitigation for anticipated project impacts includes creation of approximately 785 ft^2 of new wetland from upland areas adjacent to the north of Wetland A. Enhancement will also occur in the adjacent Wetland A buffer to compensate for temporary losses of non-native vegetation. All efforts will be made to minimize impacts to wetland and buffer features.

As illustrated in Table 1, the proposed area of disturbance is 380 ft^2 of Wetland A and 15,806 ft^2 of associated buffer. Wetland A was assessed with low to moderate habitat quality, as it is comprised of a stormwater conveyance ditch that contains non-native species. The buffer is largely comprised of non-native vegetation, paved parking/roads, gravel fill, and remnant asphalt. The proposed mitigation actions to create new wetland at a 2:1 ratio, increasing water retention upstream of the new arch culvert, and planting native vegetation will have an overall net benefit to Wetland A. In addition, enhancement of approximately 12,217 ft^2 of degraded buffer, along with the addition of 3,427 ft^2 of new infiltration swale (15,664 ft^2 of new vegetated habitat) is expected to have an overall net benefit once vegetation is established.

The following is a summary of anticipated disturbance areas and proposed planting activities at the site (see Appendix C, Sheets W.02 and W.03):

5.3.1. Wetland Creation

- Creation of 785 ft^2 of new wetland adjacent to and within the Wetland A buffer.

- Wetland A: up to 380 ft^2 of instream habitat in Wetland A will be disturbed from excavation of sediment, filling with 12-inch cobbles, and permanent shading from the new bus lane. This permanent loss of wetland will be compensated through creation of 785 ft^2 of new wetland adjacent to and connected with Wetland A and within the current buffer. The new wetland will be stabilized and seeded with native plantings (Appendix C, Sheet W.03).

5.3.2. Wetland Buffer Enhancement

- Enhancement of wetland buffers areas by revegetating with native species and reduction in impervious surfaces.
  - An area of approximately 785 ft^2 within the Wetland A buffer will be disturbed by creation of new wetland. This incorporates the impacts to Wetland A discussed above and represents the compensation for permanent wetland impacts. Buffer enhancement will occur on the adjacent sloped areas south of Wetland A. The slopes adjacent to Wetland A will be planted with native shrubs and trees and will be seeded between the shrubs and trees with a native upland seed mix. Approximately 1,432 ft^2 of sloped buffer adjacent to Wetland A will be enhanced at a 1.9:1 ratio by stabilizing with native plantings and seeding with a native upland seed mix (Appendix C, Sheets W.02 and W.03).
  - About 12,668 ft^2 of Wetland A buffer will be permanently impacted from placement of concrete wingwalls and paving the new bus lane. The buffer will be enhanced at an approximate 0.5:1 ratio to compensate for this loss of degraded habitat. The enhanced buffer area will be stabilized and seeded with a native upland seed mix (Appendix C, Sheets W.02 and W.03).
  - Approximately 1,745 ft^2 of Wetland A buffer will be permanently impacted from the approach of the new bus lane south of the arch culvert crossing. This includes permanent fill behind the wingwalls and roadway that will permanently shade the buffer. Compensation for this loss will include enhancement at an approximate 1:1 ratio to compensate for loss of degraded habitat. This section of buffer enhancement includes the sloped areas immediately adjacent to the south of Wetland A. The slopes adjacent to Wetland A will be planted with native shrubs and trees and will be seeded between the shrubs and trees with a native upland seed mix (Appendix C, Sheets W.02 and W.03).
  - Approximately 608 ft^2 of Wetland A buffer will be permanently impacted from development of a new sidewalk. Compensation for this loss will include enhancement at an approximate 3.5:1 ratio to compensate for loss of degraded habitat. The enhanced buffer area will be stabilized and seeded with a native upland seed mix (Appendix C, Sheets W.02 and W.03).
  - Approximately 3,427 ft^2 of new vegetated infiltration swale will be developed within the disturbed graveled buffer area. The enhanced infiltration swale area will be planted with native trees and seeded with a native wetland/upland mix (Appendix C, Sheets W.02 and W.03).

5.3.3. Site Restoration

Site restoration and stabilization of disturbed ground for planting and/or seeding will consist of the following:

- Grading the site to pre-project/design elevations in areas of excavation (e.g., wingwall installation areas, bus lane and approaches, sidewalk, etc.). The top 12 inches of topsoil will be stockpiled separately and placed on top when the buffer areas are backfilled with site soils.
- Stabilizing and seeding in areas of disturbed ground with native emergent cover by hydroseeding and/or applying straw mulch with seed.
- Applying 3 inches of wood chip mulch within shrub and tree planting areas. Wood mulch shall not touch plant stems and will be separated from installed plant stems by at least 3 inches.

- Restoration of upland buffers will include planting trees and shrubs on the sloped areas adjacent to the north and south of Wetland A. Flat areas to the north within the 150-foot buffer will be seeded with a native upland seed mix.

5.3.4. Planting Design

The planting plan (Appendix C, Sheet W.03) includes a potential list of plant species to be installed within the mitigation areas. Native species selections may be refined to provide a high level of diversity in species composition and vegetative community structure as well as appropriate species for varying hydroperiods and inundation depths throughout the wetland/buffer areas.

Plantings will be installed after the new bus lane and arch culvert are constructed in accordance with the following general sequencing:

- Invasive and non-native species and debris, if remaining, will be removed.
- Planting areas will be amended with organic compost as needed.
- Staging area for plants will occur in upland areas and not within wetlands.
- Plants will be installed immediately after soil amendments are placed to reduce re-growth of invasive species in newly cleared areas; if planting cannot occur immediately after clearing/grading, the area will be temporarily stabilized using a hydroseed mix appropriate to the hydrology of the mitigation area.
- Plants will be installed during the dormant season (typically between September 1 and November 15) to improve survival. Plant materials used at the mitigation site shall be grown in the Columbia Basin and obtained from a reputable local native plant nursery.
- Plants will be installed at recommended spacing intervals identified in Sheet W.03 (Appendix C).
- Guards will be installed around newly installed tree and shrub species not naturally resistant to herbivory to discourage grazing/browsing by deer and rodents.
- Water/irrigate newly planted areas as needed, especially during the first summer and especially if plants have been installed outside of the dormant season.
- Regular maintenance and monitoring will be completed throughout the monitoring period.
- Upland buffer enhancement areas will be seeded with native Seed Mixes A and B, as described in Table 2 below:

TABLE 2. UPLAND BUFFER SEED MIXES

Common Name	Scientific Name	Percent	Location	Application Rate
Seed Mix A[1]				
Inland saltgrass	*Disticlis spicata*	Custom mix, as specified by BFI	Bioinfiltration swale and slopes adjacent to the south of Wetland A. Spread between plantings as shown in Planting Plan (Sheet W.03)	30 lbs/acre
Great Basin wildrye	*Elymus cinerus*			
Hard fescue	*Festuca ovina*			

Common Name	Scientific Name	Percent	Location	Application Rate
Seed Mix B[2]				
Bluebunch wheatgrass	*Pseudoroegneria spicata*	33	All other buffer enhancement areas at the site	20 lbs/acre
Bottlebrush squirreltail	*Elymus elymoides*	8		
Indian ricegrass	*Oryzopsis hymenoides*	20		
Needle-and-thread grass	*Hesperostipa comata*	6		
Sand dropseed	*Sporobolus cryptandrus*	6		
Sandberg's bluegrass	*Poa secunda*	12		
Thickspike wheatgrass	*Elymus lanceolatus*	15		

Notes:

[1] Seed mix A is a custom mix provided by BFI Native Seeds in Moses Lake, Washington

[2] Seed mix B is the Mid-Columbia Sandy Siters Mix provided by BFI Native Seeds in Moses Lake, Washington

lbs/acre = pounds per acre

5.4. Mitigation Area Monitoring

The mitigation area will be monitored for a period of 6 years, with monitoring events occurring after construction (Year-0) and the following years though Year 5. The area shall be monitored by transects or monitoring stations that represent at least 5 percent of the restored area.

Observations to be recorded during each monitoring event will include the following, as specified in RMC 22.10.160:

- Individual plant counts during the Year-0, Year-1, and Year-2 monitoring events, by species, of native plants along each transect/within each monitoring station.
- Estimated combined total percent aerial cover of all native plant species (visual estimate) within each transect/station during monitoring events for Years 2, 3, and 5.
- Condition of native plants along each transect/within each station (alive, stressed, or dead).
- Estimated cover of invasive plant species along each transect/within each station.
- Observation of wildlife or signs of wildlife use.
- Observations of damage to the restoration plantings and maintenance needs.
- Photographs of each transect/station.

Plant counts data collected during the Year-0 event will be used as a baseline to compare with data collected during the Year-0, Year-1 and Year-2 monitoring events. Survival of the restoration plantings will be identified by comparing Year 0 counts to counts documented during subsequent monitoring years.

5.4.1. Performance Standards

Survival and percent aerial cover statistics generated from data collected during monitoring events will be compared to performance standards to check if the site is meeting the goals and objectives of the restoration plan.

Performance standards for the site are described below, in accordance with RMC 22.10.160:

- **Survival of Installed Trees and Shrubs**
  - Performance Measure (Year 1): There will be 100 percent survival of installed trees and shrubs. If all dead tree and shrub plantings are replaced, this performance measure will be met.
- **Percent Cover**
  - Performance Measure (Year 3): Aerial cover of native trees and shrubs (planted and volunteer) will be at least 10 percent in the mitigation area.
  - Performance Measure (Year 4): Aerial cover of native trees and shrubs will be at least 25 percent in the mitigation area.
  - Performance Standard (Year 5 or final year of monitoring): Aerial cover of native trees and shrubs will be at least 40 percent in the mitigation area.
- **Native Species Diversity**
  - Measure (Years 3 through 5): Cover of native wetland herbaceous plant species (planted and volunteer) will be at least 25 percent.
  - Performance Measure (all years): No single woody species will dominate any one vegetation community (i.e., achieving more than 70 percent aerial cover).
- **Wetland Hydrology**
  - Performance Measure (all years): In the existing Wetland A and within all intended wetland areas (i.e., created wetland area adjacent to Wetland A), wetland hydrology will remain. Soils will be saturated, or the water table will be present within 12 inches of the surface for at least 12.5 percent of the growing season in years of normal rainfall.
  - Performance Standard (Year 5 or final year of monitoring): The Wetland A boundary will be delineated using currently approved methods by the agencies. Wetland A will be approximately 0.48 acres in size (combined 0.46 acres of existing Wetland A and proposed 0.02 acres (785 ft^2) of created wetland adjacent to Wetland A).
- **Non-native and Invasive Species**
  - Invasive, exotic, and undesirable species (County-listed Class A and B noxious weeds) will be controlled such that competition from such plants is inhibiting successful establishment/growth of desirable plant species.

Monitoring reports with a photographic log will be submitted by October 30 after the Year-0 event and subsequent years through Year 5. After the Year-1 event and again after the Year-2 event, all observed dead plants will be replaced. If the percent aerial cover performance standards are not met during the Year-2, -3 or -5 events, additional plants will be installed throughout the planting areas to achieve the aerial cover performance standard. Maintenance needs such as trash removal, vandalism, invasive species removal and watering of plants will also be noted in the monitoring report.

5.4.2. Contingency Plan

If the project fails to meet the performance standards discussed above, a contingency plan will be prepared for review by the City and applicable regulatory agencies. The proposed mitigation plan can fail if certain unfavorable factors occur. For example, flooding or drought, destructive human activities at or adjacent to the site, improperly implemented maintenance practices and/or disease may have a negative effect on newly planted vegetation. Monitoring notes should include observations regarding these and other possible problems that may have occurred over the monitoring period. As problems are recorded, suggestions and possible solutions should be forwarded to the City and the agencies as a component of the monitoring reports.

If, in the judgment of the monitoring biologist, alternative plant species are needed to improve survival, the selection of alternative species will be made and submitted to the City and the agencies for approval prior to implementation.

6.0 CONCLUSION

In accordance with mitigation sequencing, siting and design the Queensgate Transit Hub Project has avoided and minimized wetland impacts to the greatest extent practicable. No loss of wetland functions and values are anticipated as a result of the project. However, completion of the proposed project is anticipated to result in 380 ft^2 of unavoidable permanent impacts to Wetland A and 15,806 ft^2 of permanent buffer impacts.

These impacts will be mitigated by compensating for permanent impacts through wetland creation and buffer enhancement. The mitigation plan presented in this report reflects the preferred mitigation alternative at a conceptual level for the purpose of permit review and approval by regulatory agencies. Upon regulatory approval and receipt of permits, conceptual mitigation will be incorporated into detailed design plans for the project as it is advanced to the final design. The creation and enhancement areas will be monitored for a period of 5 years, with monitoring events occurring after construction (Year 0) and subsequent years through Year 5.

7.0 LIMITATIONS

GeoEngineers has prepared this compensatory mitigation plan in general accordance with the scope and limitations of our proposal. Within the limitations of scope, schedule and budget, our services have been executed in accordance with the generally accepted practices for compensatory mitigation plans in this area at the time this report was prepared. No warranty or other conditions expressed or implied should be understood.

This report has been prepared for the exclusive use of KPFF, authorized agents, and regulatory agencies following the described methods and information available at the time of the work. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. The information contained herein should not be applied for any purpose or project except the one originally contemplated.

The applicant is advised to contact all appropriate regulatory agencies (local, state, and federal) prior to design or construction of any development to obtain necessary permits and approvals.

8.0 REFERENCES

Benton County 2022. Assessor's Office, Kennewick, Washington.

City of Richland 2021. Ordinance No. 16-21: An Ordinance of the City of Richland Amending Chapter 22.10 of the Richland Municipal Code Related to Critical Areas.

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Washington State Department of Ecology (Ecology), U.S. Army Corps of Engineers (USACE) Seattle District, and U.S. Environmental Protection Agency (EPA) Region 10, 2006. Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance (Version 1). Publication No. 06-06-011a.

Washington State Department of Ecology (Ecology), U.S. Army Corps of Engineers (USACE) Seattle District, and U.S. Environmental Protection Agency (EPA) Region 10 2021. Wetland Mitigation in Washington State–Part 1: Agency Policies and Guidance (Version 2). Washington State Department of Ecology Publication #21-06-003.

FIGURES

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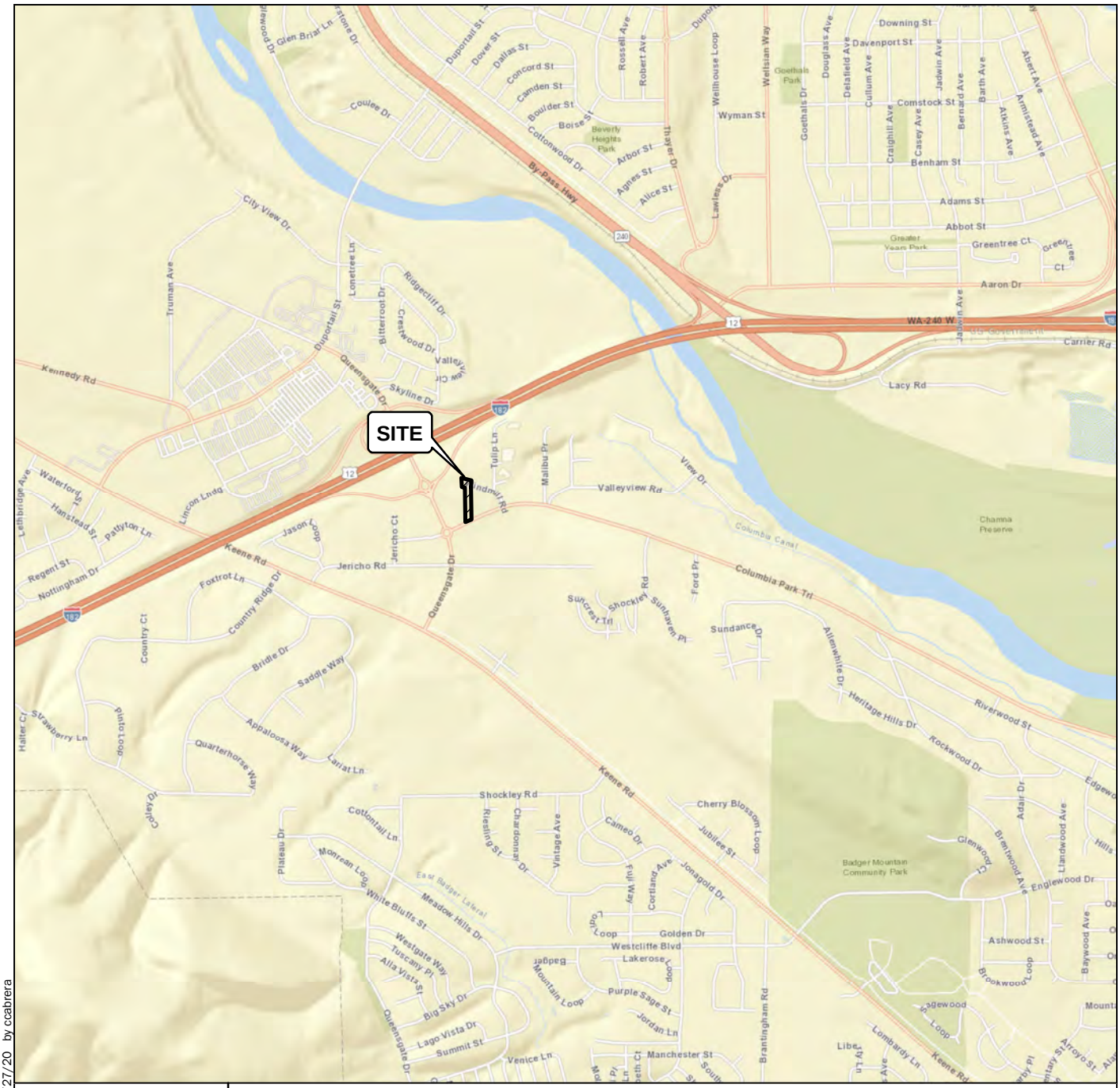

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2,000 0 2,000

Feet

Vicinity Map

Ben Franklin Transit – Queensgate Hub
Richland, Washington

GeoEngineers

Figure 1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2016

Projection: NAD 1983 StatePlane Washington South FIPS 4602 Feet

P:\2\2557007\GIS\MXD\2557007700_F01_VicinityMap.mxd Date Exported: 07/27/20 by ccabrera

APPENDICES

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APPENDIX A
Nationwide Permit (NWO) 14—NWS-2021-952

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

Regulatory Branch October 20, 2021

Mr. Kevin Sliger
City of Richland
1000 Columbia Park Trail
Richland, Washington 99352

Reference: NWS-2021-952
City of Richland
(Ben Franklin Transit-
Queensgate Transit Hub)

Dear Mr. Sliger:

We have reviewed your application to excavate 47 cubic yards of wetland and place 42 cubic yards of fill material over 380 square feet of wetland to construct a road culvert crossing to improve bus route circulation in Richland, Benton County, Washington. Based on the information you provided to us, Nationwide Permit (NWP) 14, Linear Transportation Projects (Federal Register January 6, 2017, Vol. 82, No. 4), authorizes your proposal as depicted on the enclosed drawings dated October 4, 2021.

In order for this authorization to be valid, you must ensure the work is performed in accordance with the enclosed *NWP 14, Terms and Conditions.*

We have reviewed your project pursuant to the requirements of the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act and the National Historic Preservation Act. We have determined this project complies with the requirements of these laws provided you comply with all of the permit general and special conditions.

The authorized work complies with the Washington State Department of Ecology's (Ecology) Water Quality Certification (WQC) requirement for this NWP. No further coordination with Ecology for WQC is required.

You have not requested a jurisdictional determination for this proposed project. If you believe the Corps does not have jurisdiction over all or portions of your project you may request a preliminary or approved jurisdictional determination (JD). If one is requested, please be aware that we may require the submittal of additional information to complete the JD and work authorized in this letter may not occur until the JD has been completed.

Our verification of this 2017 NWP authorization is valid until March 18, 2022, unless the NWP is modified, reissued, or revoked prior to that date. If the authorized work for the 2017 NWP authorization has not been completed by that date and you have commenced or are under contract to commence this activity before March 18, 2022, you will have until March 18, 2023, to complete the activity under the enclosed terms and conditions of this NWP. Failure to comply with all terms and conditions of this NWP verification invalidates this authorization and could result in a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act. You must also obtain all local, State, and other Federal permits that apply to this project.

You are cautioned that any change in project location or plans will require that you submit a copy of the revised plans to this office and obtain our approval before you begin work. Deviating from the approved plans could result in the assessment of criminal or civil penalties.

Upon completing the authorized work, you must fill out and return the enclosed *Certificate of Compliance with Department of the Army Permit*. Thank you for your cooperation during the permitting process. We are interested in your experience with our Regulatory Program and encourage you to complete a customer service survey. These documents and information about our program are available on our website at www.nws.usace.army.mil, select "Regulatory Branch, Permit Information" and then "Contact Us." If you have any questions, please contact me at david.j.moore@usace.army.mil or (206) 316-3166.

Sincerely,

David Moore, Project Manager
Regulatory Branch

Enclosures

APPENDIX B
Site Photographs

View northeast of Wetland A at the site

View west toward Wetland A and immediate buffer to the south at the site

Site Photographs – July 2020

Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

Figure B-1

2557-007-03 Date Exported: 06/15/22

View southeast toward Wetland A and buffer dominated by non-native vegetation

View southwest toward Wetland A and buffer dominated by non-native vegetation

View north toward proposed swale area and buffer dominated by Russian thistle

View northeast toward buffer dominated by non-native vegetation

Site Photographs – July 2021

Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

Figure B-2

2557-007-03 Date Exported: 06/15/22

Imported gravels north of the 150-foot buffer north of Wetland A.

Piles of imported gravel north of the 150-foot buffer north of Wetland A

Site Photographs – July 2020

Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

Figure B-3

2557-007-03 Date Exported: 06/15/22

Asphalt pieces and Russian thistle in the 150-foot buffer north of Wetland A.

Gravel, tire tracks, and sparse vegetation in the 150-foot buffer north of Wetland A

Site Photographs – July 2020

Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

Figure B-4

2557-007-03 Date Exported: 06/15/22

Columbia Park Trail comprises the majority of the 150-foot buffer south of Wetland A

View west of 150-foot buffer south of Wetland A

Site Photographs – July 2020

Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

Figure B-5

2557-007-03 Date Exported: 06/15/22

Drainage Culvert piping located to the east of the project area, along Columbia Park Trail. Southwest Richland Park and Ride pictured in the background.

Typical City of Richland stormwater outfall (located west of the site)

Site Photographs – July 2020

Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

Figure B-6

2557-007-03 Date Exported: 06/15/22

Culvert outflow of Wetland A under Windmill Road east of the site.

Stormwater inflow into Wetland A

Site Photographs – October 2020

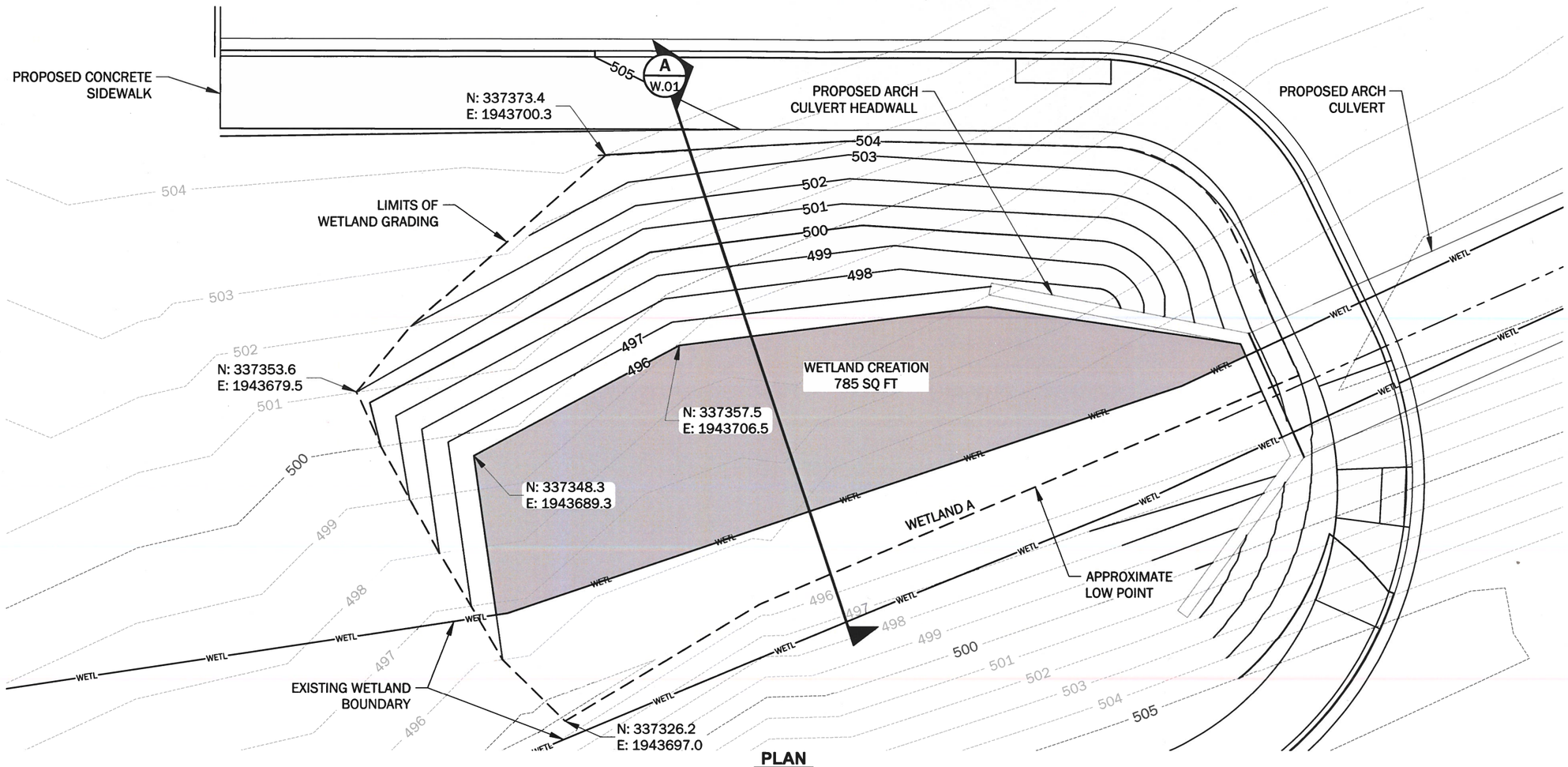
Queensgate Transit Hub Improvements
Richland, Washington

GeoEngineers

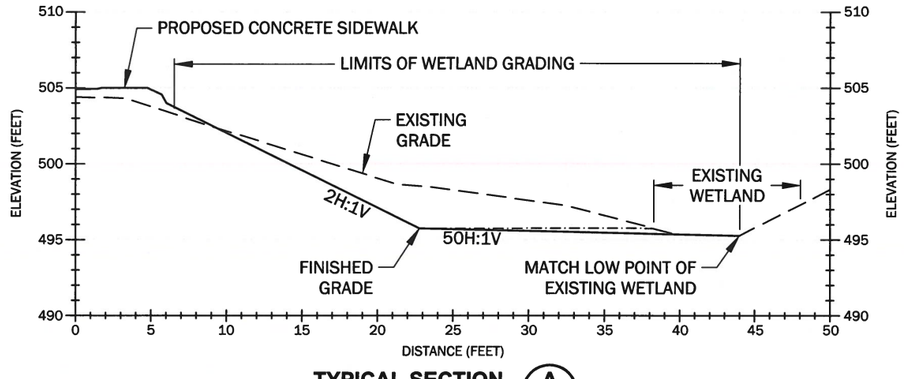
Figure B-7

2557-007-03 Date Exported: 06/15/22

APPENDIX C
Wetland Mitigation Drawings



PLAN



TYPICAL SECTION A
SCALE: 1"=5' W.01

Know what's below Call before you dig

100% SUBMITTAL

RYAN S. CARNIE
STATE OF WASHINGTON
52457
REGISTERED PROFESSIONAL ENGINEER
6/22/2022

NO.	DATE	BY	CHD.	APPR.	REVISION

DRAWN BY: HCM | DESIGNED BY:
CHECKED BY: | APPROVED BY:
DATE: 06/22/2022
JOB No. : 2000677
SCALE:

kpff
1601 5th Avenue, Suite 1600
Seattle, WA 98101
206.622.5822
www.kpff.com

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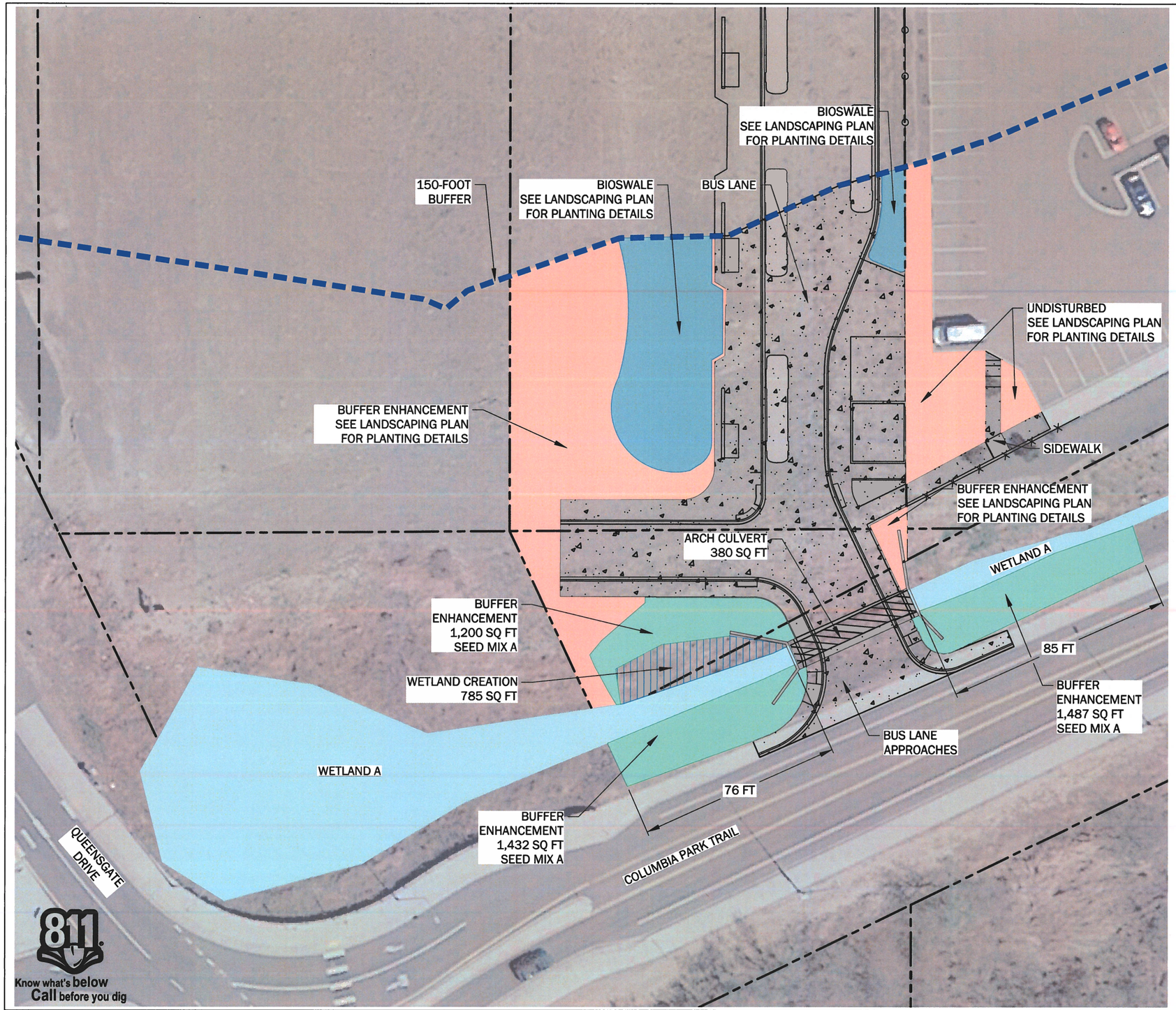
BEN FRANKLIN TRANSIT
QUEENSGATE TRANSIT HUB

WETLAND MITIGATION PLAN

DRAWING: W.01
SHEET: 29 OF 90



NOTES:
REFER TO SHEETS xxx THROUGH xxx FOR PROPOSED BUS LANE APPROACHES, ARCH CULVERT, BUS LANE CONCRETE PAVING, CONCRETE SIDEWALK AND ASSOCIATED CURB AND DESIGN AND DETAILS.

N

0 20 40
GRAPHIC SCALE IN FEET

RYAN S. CARNIE
STATE OF WASHINGTON
52457
REGISTERED
PROFESSIONAL ENGINEER
6/22/2022

100% SUBMITTAL

NO.	DATE	BY	CHD.	APPR.	REVISION

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PLANTING PLAN

DRAWING: W.02
SHEET: 30 OF 90

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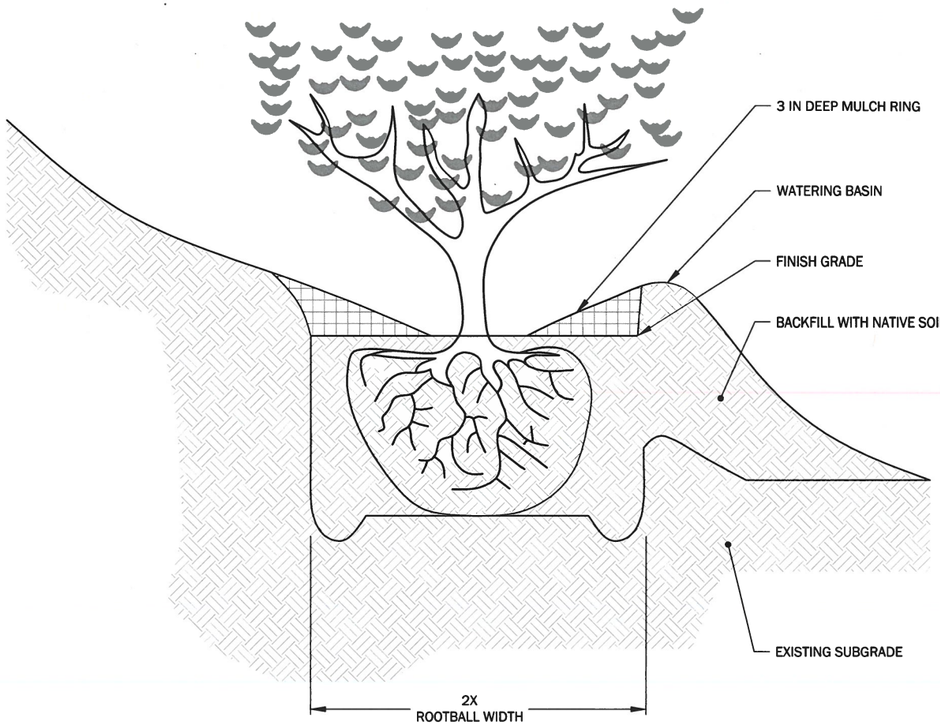
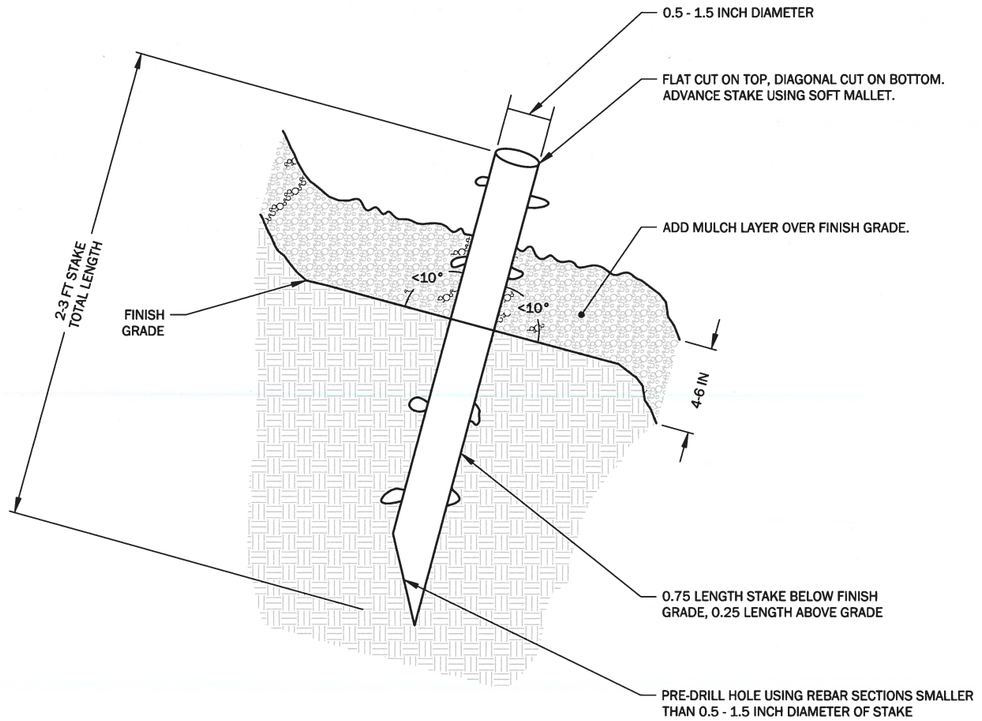


PLANTING TREE/SHRUB ON SLOPES 3H:1V AND STEEPER DETAIL 1

SCALE: NOT TO SCALE -



PLANTING LIVE STAKES ON SLOPES 3H:1V AND STEEPER DETAIL 2

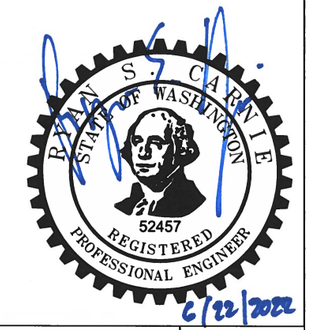
SCALE: NOT TO SCALE -

PLANTING AREA	"SIZE OF PLANTING AREA (SQUARE FEET)"	COMMON NAME	SCIENTIFIC NAME	CONTAINER SIZE	"RECOMMENDED ON-CENTER SPACING (FEET)"	NUMBER TO BE INSTALLED
WETLAND CREATION	785	HARDSTEM BULRUSH	*SCIRPUS ACUTUS*	PLUG	3	95
		WATER SEDGE	*CATREX AQUITALIS*	PLUG	3	95
		PACIFIC WILLOW	*SALIX LASIANDRA*	5 GALLON	10	6
		RED-OSIER DOGWOOD	*CORNUS SERICEA*	2 GALLON	6	6
"BUFFER ENHANCEMENT (2:1 SLOPES ADJACENT TO SOUTH OF WETLAND A)"	2,919	QUAKING ASPEN	*POPULUS TREMULOIDES*	5 GALLON	10	15
		BITTER CHERRY	*PRUNUS EMARGINATA*	5 GALLON	10	15
		WESTERN SERVICEBERRY	*AMELANCHIER ALNIFOLIA*	2 GALLON	6	30
		WOOD'S ROSE	*ROSA WOODSII*	2 GALLON	6	30
		SNOWBERRY	*SYMPHORICARPOS ALBUS*	2 GALLON	6	30
BUFFER ENHANCEMENT (2:1 SLOPE ADJACENT TO NORTH OF NEW WETLAND CREATION)	1,200	WESTERN SERVICEBERRY	*AMELANCHIER ALNIFOLIA*	2 GALLON	6	10
		WOOD'S ROSE	*ROSA WOODSII*	2 GALLON	6	10
		SNOWBERRY	*SYMPHORICARPOS ALBUS*	2 GALLON	6	10
BIOSWALE	3,427	AS SPECIFIED IN LANDSCAPE PLANS				

PLANTING NOTES:
PLANTING ACTIVITIES SHOULD OCCUR AFTER SITE GRADING IS COMPLETE AND BE TIMED AS FOLLOWS:

1. CLEAR INVASIVE AND NON-NATIVE SPECIES, STOCKPILE USEABLE HYDRIC SOILS, AND REMOVE DEBRIS AS NEEDED.
2. EXCAVATE MITIGATION AREA; RE-GRADE AND AMEND AREA WITH CLEAN SOILS AS NEEDED. REPLACE HYDRIC TOPSOIL AT THE FINISH ELEVATION THROUGHOUT WETLAND HABITATS.
3. CONDUCT THE WETLAND PLANTING IMMEDIATELY AFTER SOIL AMENDMENTS ARE PLACED AND IN CONJUNCTION WITH THE CLEARING AND REMOVAL OF DEBRIS. THIS WILL MINIMIZE RE-GROWTH OF INVASIVE SPECIES IN NEWLY OPENED OR CLEARED AREAS.
4. ALL PLANTING SHALL BE RANDOM (HAND LAID OUT, NOT BY STRING LINE) TO EMULATE A NATURAL PATTERN OF GROWTH. TREE SPECIES WILL BE IN GROUPS OF 1 AND RANDOMLY PLACED WITHIN THE DESIGNATED SECTION. SHRUB AND HERBACEOUS SPECIES SHALL BE PLANTED IN GROUPS OF THREES (I.E. 3 ROSES SHALL BE GROUPED TOGETHER, 3 SNOWBERRY SHALL BE GROUPED TOGETHER).
5. IDEALLY, PLANTING SHOULD BE CONDUCTED IN THE EARLY SPRING OR LATE FALL DURING THE DORMANT SEASON. STAGING AREAS FOR PLANTS SHOULD OCCUR IN UPLAND AREAS AND NOT WITHIN THE WETLAND.
6. WOOD OR BARK MULCH SHOULD BE APPLIED AROUND EACH NEWLY INSTALLED PLANT. THE WOOD OR BARK MULCH SHOULD BE APPROXIMATELY 3-INCHES HIGH. MAKE SURE THE MULCH IS 1 TO 2 INCHES AWAY FROM THE STEM OF THE INSTALLED PLANT.
7. INSTALL TREE GUARDS AS NEEDED AROUND NEWLY INSTALLED VEGETATION TO DISCOURAGE GRAZING/ BROWSING BY DEER AND RODENTS.
8. IRRIGATE NEWLY PLANTED AREAS AS NEEDED.
9. CONDUCT REGULAR MAINTENANCE AND MONITORING AS DESCRIBED IN THE "MAINTENANCE, MONITORING AND CONTINGENCY" SECTION OF THE REPORT.
10. NATIVE UPLAND GRASS SEED "MIX A" WILL BE HYDROSEEDED OR BROADCAST BETWEEN PLANTINGS IN THE SLOPED SOUTH BUFFER AREAS AT 20 LBS/ACRE.
11. NATIVE UPLAND GRASS SEED "MIX B" WILL BE HYDROSEEDED OR BROADCAST IN THE SLOPED NORTH BUFFER AND FLAT BUFFER ENHANCEMENT AREAS AT 30 LBS/ACRE.
12. NATIVE SEED (MIX A AND B) WILL BE HYDROSEEDED OR BROADCAST AS SPECIFIED IN THE BIOSWALE.

100% SUBMITTAL



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DRAWN BY HCM | DESIGNED BY | CHECKED BY | APPROVED BY | DATE 06/22/2022 | JOB No. : 2000677 | SCALE:

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PLANTING DETAILS

DRAWING: W.03

SHEET: 31 OF 90

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