PLANNING COMMISSION MEETING

Tuesday, January 8, 2019, 7:00 PM

Fairview City Hall – Council Chambers, 2nd Floor
1300 NE Village Street, Fairview, OR 97024

MEETING AGENDA

REVISED – NOTE NEW 7:00 PM START TIME and UPDATED AGENDA

1. **CALL TO ORDER:** 7:00 p.m.

2. **PUBLIC HEARINGS**

   a. **File Number 2018-76-DR-VAR**

   Due to commissioner availability, this public hearing will be opened and immediately continued to Tuesday, January 22

   City of Fairview Public Works Maintenance Facility (48 1st Street)
   Type III Quasi-Judicial Procedure

   Summary: The proposed project is a new Fairview Public Works Maintenance Facility at its current location. The proposed facility redevelopment includes removal of the two existing buildings and replacement with one 10,147 sq. ft. office, vehicle storage and shop building. The existing well pump houses and fence surrounding the site will be retained. The proposed redevelopment will also include construction of sidewalks along 1st Street and Main Street, and new landscaping around the perimeter of the site. The applicant is requesting a Class C Variance to reduce the percentage of required landscaping.

   Applicable Fairview Municipal Code Criteria:
   FMC 19.400 Administration of Land Use and Development Review
   FMC 19.413 Procedures
   FMC 19.424 Site Design Review – Application Review Procedure
   FMC 19.425 Site Design Review – Application Submission Requirements
   FMC 19.426 Site Design Review – Approval Criteria
   FMC 19.30 Residential (R) District
   FMC 19.108 Community Service/Parks Overlay
   FMC 19.162 Access and Circulation
   FMC 19.163 Landscaping, Street Trees, Fences and Walls
   FMC 19.164 Vehicle and Bicycle Parking
   FMC 19.165 Public Facilities Standards
   FMC 19.520 Variances

b. File Number 2018-79-TA
Flood Management Code Amendments
Type IV Legislative Procedure

Summary: The City is required to update its flood code regulations to comply with the National Flood Insurance Program. Amended chapters of the Fairview Municipal Code include FMC 16.06 Flood Damage Prevention and FMC 19.105 Floodplain Overlay.

Applicable Fairview Municipal Code Criteria:
FMC 19.205 Amendments
FMC 19.413 Procedures
FMC 19.470 Land Use District Map & Text Amendments

3. ADJOURNMENT

NEXT PLANNING COMMISSION MEETING: TUESDAY, JANURAY 22, 2019

Planning Commission hearings are broadcast live on Comcast Cable Channel 30 and Frontier FiOs Channel 38. Replays of the meeting are shown on Saturday at 12:30pm and Monday at 2:00pm following the original broadcast date. Meetings are also available for viewing on the MetroEast website. Further information is available on our web page at www.fairvieworegon.gov or by calling Devree Leymaster, City Recorder, 503-674-6224.

The meeting location is wheelchair accessible. A request for an interpreter for the hearing impaired or for other accommodations for person with disabilities should be made at least 48 hours before the meeting to: Devree Leymaster, 503-674-6224.

PLANNING COMMISSION STAFF REPORT
TYPE III SITE DESIGN REVIEW
FINDINGS AND STAFF RECOMMENDATION

Date of Report:	December 31, 2018
Staff Contact:	Sarah Selden, Senior Planner seldens@ci.fairview.or.us 503-674-6242
Application Number:	2018-76-DR-VAR
Property Owner:	City of Fairview
Applicant:	LRS Architect / Paul Boundy
Site Address:	48 1st Street, Fairview, OR 97024
Parcel Number/Tax ID:	1N3E27CB-03700, 800, 900
Proposal:	New Public Works Maintenance Facility for the City of Fairview at its current location. The proposed facility redevelopment includes removal of the two existing buildings and replacement with one 10,147 sq. ft. office, vehicle storage and shop building. The existing well pump houses and fence surrounding the site will be retained. The proposed redevelopment will also include construction of sidewalks along 1st Street and Main Street, and new landscaping around the perimeter of the site. The applicant is requesting a Class C Variance to reduce the percentage of required landscaping.
Recommendation:	Approval with Conditions

Exhibits:

A. Applicant's Narrative & Written Materials
1. Applicant Narrative
2. Preliminary Stormwater Report

B. Plans/Drawings
1. Cover Sheet
2. Existing Conditions
3. Demolition Plan
4. Site Plan
5. Grading Plan
6. Utility Plan
7. Landscape Plan
8. Demo Site Plan
9. Architectural Site Plan
10. Overall Floor Plan
11. Exterior Elevations

C. Department Referral Comments
1. Gresham Fire Comments
2. Multnomah County Transportation Comments

I. BACKGROUND & EXISTING CONDITIONS

Address/Location: 48 1st Street, Fairview, OR 97024

Acreage: 0.67 Acres (29,078 SF)

Comprehensive Plan: Public / Low Density Residential

Zoning Designation: Residential (R)

Zoning Overlays: Community Service Park Overlay

Surround Land Use: North & East: Residential
South: City of Fairview Heslin House
West: Fairview Elementary School

Streets/Classification: 1st Street and Main Street are Local roadways, and NE 223rd/Fairview Ave. is a Major Collector

Application Narrative:
The project consists of the removal and replacement of the Public Works Maintenance Facility that will serve as operational headquarters for the City of Fairview. Currently, there are two well pump houses existing on site as well as an exposed well, which are to be protected and remain on site. The two building complex will be consolidated as one unified building that will operate as the hub of operations with approximately 10,147 SF of office and vehicle storage/shops area.

The vehicle storage and shops area will act as a double volume space with the potential for a future mezzanine storage space to be constructed above the shops portion. The lower volume space will have crew and conference areas to support the administrative staff; office space for the various operations staff and supervisors; restrooms, showers, and locker rooms; and lunchroom and kitchen facilities. The larger volume contains an enclosed and conditioned shop space; three pass through semi-conditioned vehicle bays; and two enclosed vehicle and equipment storage bays accessed from the fenced yard area.

Access to the property will occur in two places along Main and 1st Street. The primary pedestrian access to the Operations building is along 1st Street, 35 feet north of the Main Street intersection. Public Works' vehicles will enter and exit the secured area at the existing vehicle-gated entrance along Main Street as well as through the pass through bays along 1st Street. There is an existing secondary vehicle gate along the alley to the north of the site. This access is to be used only in the event of an emergency.

The building exterior will utilize a palette of materials to correspond with the residential environment and in accord with the elementary school located across 1st Street. The building will maintain a solid color for the overall elevations and transition to a different metal panel material at the windows and entries to provide visual relief. The scheme uses two colors in a variety of profiles, ranging from a smooth to a box-rib pattern. This serves to reduce the building's scale and introduce a shift in pattern over the long facades. Vision glazing is insulated clear glass set in aluminum frames. The roofs are constructed of standing seam metal panels pitched to 2 foot of rise over 12 feet of run with overhangs to provide shading from summer solar heat gain.

Entries to the facility are accentuated by storefront entries with relites that face 1st Street along public facade and the fleet yard. The entrance is recessed at the street entry which serves to break the horizontal distance of the front elevation to a more pedestrian scale.

Landscaping will utilize native-species to enhance the pedestrian access ways along the right-of-way. Due to the nature of the site, the landscaping in the yard area will be kept to a minimum to allow for optimal access for maintenance trucks.

Existing Site Conditions:
The site is currently developed with the Public Works Maintenance Facility, built in 1949 with two structures housing office, vehicle storage and shop area located on the west side of the property. The east side of the property is developed as the maintenance yard and will be maintained largely as-is. This area contains two well pump houses and an exposed well serving the municipal water supply; the yard provides space for large vehicles and equipment to service the wells. The site is entirely paved and graveled, there is no landscaping, and limited pedestrian facilities. A security fence encloses the site along Main Street, 223rd Avenue and the alley.

Aerial view of site looking northeast.

Existing building from corner of 1st and Main.

Proposed Development Site (3 taxlots)

Taxlots

City of Fairview
1300 NE Village Street
Fairview, OR 97024
(503) 665-7929
www.fairvieworegon.gov

Print Date: 12/31/2018
Printed By: seldens

1 inch = 54 feet

This map is for informational purposes only and the City cannot accept responsibility for any errors, omissions, or positional inaccuracy. This map is provided "AS-IS".

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II. NOTICES & REFERRALS

Application Date:	November 6, 2018
Application Deemed Complete:	December 17, 2018
Public Hearing Date:	January 8, 2018
Public Notice Date/Type:	December 19, 2018: Notice mailed to Property Owners and residents within 250 ft. December 21, 2018: Notice in Outlook December 31, 2018: Notice Posted to Site
Referrals:	Gresham Fire Multnomah County Transportation City of Fairview Public Works

III. APPLICABLE CRITERIA

This Type III application process requires a planning commission decision subject to the following requirements of the Fairview Municipal Code (FMC) Title 19:

- Application Review Procedures
    - FMC 19.400 Administration of Land Use & Development Review
    - FMC 19.412 Description of Permit Procedures
    - FMC 19.413 Procedures
- Land use Districts
    - FMC 19.30 Residential District
    - FMC 19.108 Community Service/Parks Overlay
- Design Standards
    - FMC 19.162 Access and Circulation
    - FMC 19.163 Landscaping, Street Trees, Fences, and Walls
    - FMC 19.164 Vehicle and Bicycle Parking
- Exceptions to Code Standards
    - FMC 19.520 Variances

IV. APPLICATION REVIEW PROCEDURE FINDINGS

Chapter 19.400 Administration of Land Use Review

19.400.030 Time limit on land use decisions for approval.

Unless otherwise specified in the decision or elsewhere in this title, an approved land use decision shall expire two years from date of final decision.

FINDINGS: If approved, this approval shall expire two (2) years from the date of final decision.

Chapter 19.413 Procedures

19.413.030 Type III procedure (quasi-judicial).

Type III decisions are made by the planning commission after a public hearing. Appeals of Type III decisions are reviewed and decided by the city council.

A. Public Notification. Notice of the public hearing shall be mailed to the property owner and applicant, if different, and to all property owners within 250 feet of the outer boundaries of the site, not less than 20 days prior to the date of the hearing. Notice must also be provided in a public news paper at least 20 days prior to the hearing date. In addition, a sign indicating the date of the public hearing, shall be posted on the subject property not less than 10 days prior to the date of the hearing. Notice must also be provided at least 20 days prior to the scheduled hearing to any neighborhood or community organization recognized by the city whose boundaries include the subject property.

FINDINGS: Notice was provided as outlined on page 6 of this report.

C. Public Hearing. The planning commission conducts a public hearing and renders a decision on the matter including findings, conclusions, and conditions, if necessary, consistent with FMC 19.412.070.

FINDINGS: A planning commission hearing on the application is scheduled for January 8, 2019.

The city shall approve, approve with conditions, or deny an application for a conditional use or to enlarge or alter a conditional use based on findings of fact with respect to each of the following standards and criteria.

V. LAND USE DISTRICT FINDINGS

Chapter 19.108 Community Service/Parks Overlay

19.108.010 Uses.
The following community service/parks uses and those of a similar nature may be permitted in any zoning district when approved at a public hearing by the planning commission. The district is to be applied only to public property (lands owned by public agencies) or utilities.

A. Government building or use.
B. Park, playground, athletic or recreational use.
C. Open space and green way.
D. Library.
E. School, private, parochial or public educational institution.
F. Power substation or other public utility building or use.
G. Telecommunications facilities where permitted.

FINDINGS: The Community Service/Parks Overlay is currently applied to the site. The Public Works Maintenance Facility is permitted under "A. Government building or use." No changes are proposed to the existing use or operations of the facility. This standard is met.

Chapter 19.30 Residential (R) District
19.30.010 Purpose.
A. The residential district is intended to promote the livability, stability and improvement of the city's neighborhoods…

19.30.020 Permitted land uses.
A. Permitted Uses. The land uses listed in Table 19.30.020.A are permitted in the residential district, subject to the provisions of this chapter.

Table 19.30.020.A
Land Uses and Building Types Permitted in the Residential District

Zones and Overlays	Residential
v. Community services/parks	X(CU)*

* *Subject to standards in FMC 19.30.110, Special standards for certain uses.*

FINDINGS: The Community Service/Parks overlay has already been applied to this site, and therefore, the permitted uses in the overlay apply to this site. In

addition, the development is subject to the Special Standards for Certain Uses in FMC 19.30.110. This standard is met.

19.30.030 Building setbacks.

A. Front Setbacks.

2. Residential Commercial Buildings.

a. A minimum front setback is not required, except as necessary to comply with the vision clearance standards in FMC 19.162.020.

b. A maximum setback of 10 feet is required. This standard is met when a minimum of 50 percent of the front building elevation is placed 10 feet or closer to the front property line. On parcels with more than one building, this standard applies to the largest building. Exception: The setback may be increased when an expanded sidewalk, outdoor seating area, plaza, pocket park, or town square is provided between the building and front property line.

3. Public and Institutional Buildings. The standards in subsection (A)(2) of this section (residential commercial buildings) shall also apply to public and institutional buildings, except that the maximum setback standard in subsection (A)(2)(b) shall not be required for buildings that do not receive the public (e.g., buildings used solely for storage or housing mechanical equipment, and similar uses).

FINDINGS: The building's front is oriented to 1st Street. The code requires no minimum setback and a 10 ft. maximum setback. The proposed building is sited with a 0 ft. front setback. This standard is met.

B. Rear Setbacks. The minimum rear setback shall be 15 feet for street-access lots, and two feet for alley-access lots (for accessory structures).

FINDINGS: The rear edge of the property is located along NE 223rd Avenue. The proposed building has a setback of over 90 ft. This standard is met.

C. Side Setbacks. The minimum side setback shall be five feet on interior side yards, and 10 feet on street corner yards;…

FINDINGS: The proposed street side yard setback is 10 ft. along Main Street. The proposed interior side setback along the alley is 5 ft. This standard is met.

19.30.040 Lot area and dimensions.
19.30.060 Residential density and building size.

FINDINGS: No new lots are being created, and no residential development is proposed. These standards do not apply.

19.30.070 Maximum lot coverage.

A. Maximum Lot Coverage. The following maximum lot coverage standards shall apply to all, subject to the maximum building size standards in FMC 19.30.060:

5. Residential commercial and public/institutional uses: 85 percent.

FINDINGS: The proposed lot coverage is 10,154 sq. ft. This is 34.9% of the 29,078 sq. ft. lot. This standard is met.

19.30.080 Building height.

A. Building Height Standard. Buildings within the residential district shall be no more than 35 feet or two and one-half stories in height, whichever is less. Building height within the multifamily housing district and for residential commercial buildings may be up to 45 feet or four stories. Building height may be restricted to less than these maximums when necessary to comply with the building height transition standard in subsection C of this section.

FINDINGS: The proposed building height is 23 ft. to the midpoint, and 27 ft. to the highest eave. This standard is met for both the 45 ft. and 35 ft. height limit.

19.30.090 Building orientation.

B. B. Applicability. This section applies to: single-family detached housing (except for flag lot development); attached townhomes which are subject to site design review (three or more attached units); multifamily housing; residential commercial buildings; and public and institutional buildings, except that the standard shall not apply to public and institutional buildings which do not receive the public (e.g., buildings used solely for storage or for housing mechanical equipment; and similar uses.)

FINDINGS: The Public Works Maintenance Facility does not receive the public. This standard does not apply.

19.30.100 Design standards.

A. Purpose. The architectural standards are intended to provide detailed, human-scale design, while affording flexibility to use a variety of building styles.

B. Applicability. This section applies to all of the following types of buildings, and shall be applied during site design review:

3. Public and institutional buildings;

C. Standards. All buildings which are subject to this section shall comply with all of the following standards…

1. Building Form. The continuous horizontal distance (i.e., as measured from end-wall to end-wall) of individual buildings shall not exceed 120 feet. All buildings shall incorporate design features such as offsets, balconies, projections, window reveals, or similar elements to preclude large expanses of uninterrupted building surfaces, as shown in the above figure. Along the vertical face of a structure, such features shall occur at a minimum of every 35 feet, and on each floor shall contain at least two of the following features:

a. Recess (e.g., deck, patio, courtyard, entrance or similar feature) that has a minimum depth of five feet;

b. Extension (e.g., floor area, deck, patio, entrance, or similar feature) that projects a minimum of two feet and runs horizontally for a minimum length of four feet; and/or

c. Offsets or breaks in roof elevation of two feet or greater in height.

FINDINGS: The longest horizontal distance of any building wall is 135 ft. along the front facade. The following design elements serve to preclude large expanses of wall surface:

Recesses: The front building entry is recessed 3 ft.

Extension: The office and shop portion of the building extends 2 feet closer to the front property line than the vehicle storage area of the building. The office/shop portion of the building measures 51 ft. in width

Offsets/breaks in rood elevation: The building mass is also broken up by an 8 ft. offset in roof elevation between these two portions of the building.

The design provides at least two of the required features. This standard is met.

2. *Eyes on the Street. All building elevations visible from a street right-of-way shall provide doors, porches, balconies, and/or windows. A minimum of 60 percent of front (i.e., street-facing) elevations, and a minimum of 30 percent of side and rear building elevations shall meet this standard. "Percent of elevation" is measured as the horizontal plane (lineal feet) containing doors, porches, balconies, terraces and/or windows. The standard applies to each full and partial building story.*

FINDINGS: Along the front elevation facing 1st Street, doors and windows occupy 81 lineal feet/ 60 percent of the facade width, meeting the minimum 60 percent required. Along the side elevation facing Main Street, windows occupy 35 lineal feet/51 percent of the facade width, exceeding the 30 percent required. While the rear elevation facing the interior yard is not highly visible from the street, it also provides windows and doors along 48 percent of the lineal width of the facade, exceeding the 30 percent minimum required. This standard is met.

3. *Detailed Design. All buildings shall provide detailed design along all elevations (i.e., front, rear and sides). Detailed design shall be provided by using at least three of the following architectural features on all elevations, as appropriate for the proposed building type and style (may vary features on rear/side/front elevations):*

    a. *Dormers;*
    b. *Gables;*
    c. *Recessed entries;*
    d. *Covered porch entries;*
    e. *Cupolas or towers;*
    f. *Pillars or posts;*
    g. *Eaves (minimum six-inch projection);*
    h. *Off-sets in building face or roof (minimum 16 inches);*
    i. *Window trim (minimum four inches wide);*
    j. *Bay windows;*
    k. *Balconies;*
    l. *Decorative patterns on exterior finish (e.g., scales/shingles, wainscoting, ornamentation, and similar features);*
    m. *Decorative cornices and rooflines (e.g., for flat roofs);*
    n. *An alternative feature providing visual relief, similar to options in subsections (C)(3)(a) through (m) of this section.*

Findings: The Detailed Design standard is met through the following architectural features:

Building wall	Detailed design features
Front	Recessed entry, off-set in roof, decorative metal pattern
Rear	Off-set in roof, eaves, decorative patterns
Street side (south)	Off-set in roof, eaves, decorative patterns
Alley side (north)	Off-set in facade wall, eaves, decorative patterns

19.30.110 Special standards for certain uses.

F. Community Services/Parks. Public and institutional uses (as listed in Table 19.30.020.A) are allowed in the residential district subject to the following land use standards, which are intended to control the scale of these developments and their compatibility with nearby residences:

> *1. Development Site Area. The maximum development site area shall be eight acres, except that this standard shall not apply to parks and open space uses. Larger developments may be approved as a conditional use, in accordance with Chapter 19.440 FMC, Conditional Use Permits, or as part of a master planned development, in accordance with Chapter 19.450 FMC.*

FINDINGS: The site area is 0.67 acres. This standard is met.

> *2. Vehicle Areas and Trash Receptacles. All vehicle areas (i.e., parking, drives, storage, etc.) and trash receptacles shall be oriented away from adjacent residences to the greatest extent practicable, and shall be screened with an evergreen hedge or solid fence or wall of not less than six feet in height.*

FINDINGS: Vehicle storage and maintenance areas will be located inside the building, and parking will located behind the building along NE 223rd Ave. The parking area is enclosed with an existing 6-8 ft. tall sight-obscuring fence. This standard is met.

VI. DESIGN STANDARDS FINDINGS

Chapter 19.162 Access and Circulation

19.162.010 Purpose.

The purpose of this chapter is to ensure that developments provide safe and efficient access and circulation, for pedestrians and vehicles. FMC 19.162.020 provides standards for vehicular access and circulation. FMC 19.162.030 provides standards for pedestrian access and circulation. Standards for transportation improvements are provided in Chapter 19.165 FMC.

FMC 19.162.020 Vehicular Access and circulation

B. Applicability. This section shall apply to all public streets within the city and to all properties that abut these streets.

FINDINGS: This section applies to the subject development. The development site is located adjacent to 1st and Main streets, identified as local streets Fairview in the Fairview Transportation System Plan, and NE 223rd Ave., identified as a Neighborhood Collector and under Multnomah County's jurisdiction. Multnomah County Transportation has reviewed the proposal and comments are provided as Exhibit C-2. Multnomah County has found that the development will not result in a transportation impact, and therefore no dedication or improvements are required in the 223rd Avenue right-of way.

C. Access Permit Required. Access to a public street requires an access permit in accordance with the following procedures:

1. Permits for access to city streets shall be subject to review and approval by the city engineer based on the standards contained in this chapter, and the provisions of the transportation standards.

FINDINGS: Access is currently provided, and no additional permits are required. The existing maintenance facility receives access from 1st and Main streets. No changes are proposed to the Main Street access, serving the rear of the building, parking area and well facilities. Along 1st Street, the redeveloped facility will include a new driveway serving three vehicle bays, and construction of curbed sidewalks, reducing the overall width of vehicle access into the site from 1st Street.

D. Traffic Study Requirements. The city may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements.

FINDINGS: A traffic study was not required to determine access, circulations, or other transportation improvements, because no changes are proposed to the current operations or number of trips.

E. Conditions of Approval. The city may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street. When obtaining access to off-street parking areas (both to and from), backing onto a public street shall not be permitted, except for single-family dwellings.

F. Access Options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods.

FINDINGS: Subsections E-F address access options and opportunities to close or consolidate access points to ensure safe and efficient street access. No new access points are proposed, and the reconstructed access along 1st Street will comply with Public Facilities standards for driveway widths.

G. Access Spacing. Access spacing ensures safe connections to local and arterial streets. Driveway accesses shall be separated from other driveways and street intersections in accordance with the following standards and procedures:

1. Local Streets. A minimum of 50 feet separation (as measured from the sides of the driveway/street) shall be required on local streets (i.e., streets not designated as collectors or arterials), except as provided in subsection (G)(3) of this section.

FINDINGS: The existing access to the maintenance yard from Main Street is located 52'-6" from NE 223rd Ave., and no changes are proposed to this driveway. The new driveway on 1st Street will be constructed 75'-6" from the intersection with Main Street. This standard is met.

H. Number of Access Points. Reducing the number of access points on a street provides pedestrians fewer obstructions, fewer points at which automobile traffic crosses the sidewalk, and fewer opportunities for conflicts between through traffic and vehicles using access points….The number of street access points for multiple-family, commercial, industrial,

and public/institutional developments shall be minimized to protect the function, safety and operation of the street(s) and sidewalk(s) for all users. Shared access may be required, in conformance with subsection I of this section in order to maintain the required access spacing, and minimize the number of access points.

FINDINGS: The site has frontage on three streets and one alley. Access is limited to two of the abutting streets. As discussed above, no changes are proposed to the Main Street driveway, and the 1st Street driveway will be narrowed to reduce impervious area and improve safety. This standard is met.

I. Shared Driveways...
The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The city shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes in accordance with the following standards:

1. *Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street…*
2. *Access easements (i.e., for the benefit of affected properties) shall be recorded for all shared driveways…*
3. *Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, parcel configuration, and similar conditions) prevent extending the street/driveway in the future.*

FINDINGS: Due to development site size constraints and the need for direct access into the maintenance yard to service the wells, two driveways will be maintained. Due to the site's location, surrounding development pattern and uses, no opportunities exist to share access with abutting sites.

FMC 19.162.020.J-K address street connectivity and do not apply to this application.

L. Driveway Openings. All driveway openings must comply with the "Standard Specifications for Public Works Construction," pages 53 – 55. Driveway openings or curb cuts shall be within the minimum width necessary to provide the required number of vehicle travel lanes (10 feet for each travel lane). The following standards (i.e., as measured where the front property line meets the sidewalk or right-of-way) are required to

provide adequate site access, minimize surface water runoff, and avoid conflicts between vehicles and pedestrians:

4. *Access widths for all other uses shall be based on 10 feet of width for every travel lane, except that driveways providing direct access to parking spaces shall conform to the parking area standards in Chapter 19.164 FMC, Vehicle and Bicycle Parking.*

5. *Driveway Aprons. Driveway aprons (when required) shall be constructed of concrete and shall be installed between the street right-of-way and the private drive, as shown above. Driveway aprons shall conform to ADA standards for sidewalks and pathways, which require a continuous route of travel that is a minimum of three feet in width, with a cross slope not exceeding two percent.*

FINDINGS: The new driveway apron on 1st Street will be constructed of concrete, and the existing concrete driveway apron on Main Street will be retained.

Condition of Approval: All driveway openings shall be constructed to meet Fairview Public Works specifications including conforming to ADA standards.

M. *Fire Access and Parking Area Turnarounds. A fire equipment access drive shall be provided for any portion of an exterior wall of the first story of a building that is located more than 150 feet from an existing public street or approved fire equipment access drive. Parking areas shall provide adequate aisles or turnaround areas for service and delivery vehicles so that all vehicles may enter the street in a forward manner. For requirements related to cul-de-sacs, please refer to Chapter 19.165 FMC.*

FINDINGS: Gresham Fire has reviewed the proposal and provided comments as Exhibit C-1. Access to the building is available from 1st Street and Main Street within 150 ft. of all points of the building. Hydrants are located at the southeast corner of 1st and Main and on the east side of NE 223rd, within 400 feet of all points of the building.

Condition of Approval: Prior to issuance of building permits, the applicant shall submit a Fire Access and Water Supply page that complies with all Gresham Fire requirements outlined in Exhibit C-1.

N. *Vertical Clearances. Driveways, private streets, aisles, turnaround areas and ramps shall have a minimum vertical clearance of 13 feet 6 inches for their entire length and width.*

O. Vision Clearance. No signs, structures or vegetation in excess of three feet in height shall be placed in "vision clearance areas," as shown above.

FINDINGS: All vision clearance dimensions are met as shown on the Architectural Site Plan (Exhibit B-9).

P. Construction. The following development and maintenance standards shall apply to all driveways and private streets, except that the standards do not apply to driveways serving one single-family detached dwelling:

1. Surface Options. Driveways, parking areas, aisles, and turnarounds may be paved with asphalt, concrete or comparable surfacing, or a durable nonpaving material may be used to reduce surface water runoff and protect water quality. Paving surfaces shall be subject to review and approval by the city engineer.

FINDINGS: All driveways and aprons will be paved with concrete. The existing gravel yard behind the building will be maintained as gravel to support the well maintenance activities. The gravel yard is maintained regularly by Public Works staff and has been found to be a durable material well-suited to the operational needs in the yard. The Public Works Director has approved of maintaining gravel in the existing graveled area. This standard is met.

2. Surface Water Management. When a paved surface is used, all driveways, parking areas, aisles and turnarounds shall have on-site collection or infiltration of surface waters to eliminate sheet flow of such waters onto public rights-of-way and abutting property. Surface water facilities shall be constructed in conformance with city standards.

FINDINGS: The Preliminary Stormwater Report (Exhibit A-2) finds that the existing site is entirely impervious. Stormwater from the site is currently conveyed from the site through multiple catch basins that drain into a public stormwater system in the adjacent alley. Stormwater is treated mechanically with filters. Two new on-site storm lines will convey roof runoff to the existing storm lines.

Condition of Approval: Prior to issuance of building permits, a final stormwater management plan is required showing the site complies with the 2016 Portland Stormwater Management Manual. Surface water facilities shall be constructed in conformance with city standards.

19.162.030 Pedestrian access and circulation.

The standards presented in this code provide standards for safe, connected and user-friendly pedestrian connections and pathways that join neighborhoods and buildings within a development.

A. Pedestrian Access and Circulation. To ensure safe, direct and convenient pedestrian circulation, all developments, except single-family detached housing (i.e., on individual lots), shall provide a continuous pedestrian and/or multi-use pathway system…

1. Continuous Pathways. The pathway system shall extend throughout the development site, and connect to all future phases of development, adjacent trails, public parks and open space areas whenever possible. The developer may also be required to connect or stub pathway(s) to adjacent streets and private property, in accordance with the provisions of FMC 19.162.020, Vehicular access and circulation, and the transportation standards in Chapter 19.165 FMC.

FINDINGS: A 5 ft. wide concrete sidewalk is will be constructed along 1st and Main streets, connecting to the existing sidewalks along the site's NE 223rd frontage, and to adjacent sidewalks along the Fairview Elementary and Heslin House frontage. The City will be further extending the sidewalk along 1st Street from the site's northern edge to Depot Street. This standard is met.

2. Safe, Direct, and Convenient Pathways. Pathways within developments shall provide safe, reasonably direct and convenient connections between primary building entrances and all adjacent streets, based on the following definitions:

a. "Reasonably direct" means a route that does not deviate unnecessarily from a straight line or a route that does not involve a significant amount of out-of-direction travel for likely users.

b. "Safe and convenient" means bicycle and pedestrian routes that are reasonably free from hazards and provide a reasonably direct route of travel between destinations.

c. For commercial, industrial, mixed use, public, and institutional buildings, the "primary entrance" is the main public entrance to the building. In the case where no public entrance exists, street connections shall be provided to the main employee entrance.

FINDINGS: The main entrance to the building, located on 1st Street, is connected to the public sidewalk by a concrete walkway. This standard is met.

3. *Connections within Development. For all developments subject to site design review, pathways shall connect all building entrances to one another. In addition, pathways shall connect all parking areas, storage areas, recreational facilities and common areas (as applicable), and adjacent developments to the site, as applicable.*

FINDINGS: The proposed Public Works Facility consists of a single building on a small site with one primary entrance and several secondary entrances. All entries along the front facade will have pedestrian connections via the 1st Street Sidewalk.

4. *Street Connectivity. Pathways (for pedestrians and bicycles) shall be provided at or near midblock where the block length exceeds the length required by FMC 19.162.020. Pathways shall also be provided where cul-de-sacs or dead-end streets are planned, to connect the ends of the streets together, to other streets, and/or to other developments, as applicable. Pathways used to comply with these standards shall conform to all of the following criteria:*

FINDINGS: The block does not exceed the maximum dimensions, and no new streets are planned. This standard does not apply.

5. *Connections to Other Facilities. Proposed pathways shall be located to provide access to existing or planned commercial services and other neighborhood facilities, such as schools, shopping areas and park and transit facilities. To the greatest extent possible, access shall be reasonably direct, providing a route or routes that do not deviate unnecessarily from a straight line or that do not involve a significant amount of out-of-direction travel.*

FINDINGS: The development site is bound by three public streets and one public alley. Extension of the public sidewalk will provide connections to nearby facilities. This standard is met.

B. *Design and Construction. Pathways shall conform to all of the standards in subsections (B)(1) through (B)(5) of this section:*

1. *Vehicle/Pathway Separation. Where pathways are parallel and adjacent to a driveway or street (public or private), they shall be raised six inches and curbed, or separated from the*

driveway/street by a five-foot minimum strip with bollards, a landscape buffer, or other physical barrier. If a raised path is used, the ends of the raised portions must be equipped with curb ramps.

FINDINGS: New sidewalks in the right-of-way will be raised six inches and curbed, and built to meet City of Fairview construction specifications. This standard is met.

2. Housing/Pathway Separation…

FINDINGS: No housing is proposed. This standard does not apply.

3. Crosswalks. Where pathways cross a parking area, driveway, or street ("crosswalk"), they shall be clearly marked with contrasting paving materials, humps/raised crossings.

FINDINGS: The site plan proposes an asphalt surface with a striped crosswalk connecting the ADA parking space to the concrete patio and rear building entry.

Condition of Approval: Prior to issuance of permits, revise the site plan to show compliance with the requirement for contrasting paving materials to delineate the pathway crossing the parking area.

4. Pathway Surface. Pathway surfaces shall be concrete, asphalt, brick/masonry pavers, or other durable surface, at least six feet wide, and shall conform to ADA requirements. Multi-use paths (i.e., for bicycles and pedestrians) shall be the same materials, at least 10 feet wide. (See also Chapter 19.165 FMC, Transportation Standards for public, multi-use pathway standard.)

FINDINGS: Pathways connecting the public sidewalk and building will be constructed of concrete. This standard is met.

5. Accessible Routes. Pathways shall comply with the Americans with Disabilities Act, which requires accessible routes of travel.

Condition of Approval: Prior to the issuance of building permits, site development plans must comply with applicable ADA requirements.

Chapter 19.163 Landscaping, Street Trees, Fences and Walls

19.163.010 Purpose.

The purpose of this chapter is to promote community health, safety and welfare by protecting natural vegetation, and setting development standards for landscaping, street trees, fences and walls.

19.163.020 Landscape conservation.
19.163.025 Existing landscaping.

FINDINGS for 19.163.020 and 19.163.025: There is no existing landscaping on the site, therefore these sections do not apply.

19.163.030 New landscaping.

A. Applicability. This section shall apply to all developments requiring site design review, and other developments with required landscaping.

FINDINGS: The development requires landscaping and this section applies.

B. Landscaping Plan Required. A landscape plan is required at the time of design review or other pertinent applications. All landscape plans shall conform to the requirements in FMC 19.420.020 (E), Landscape plans.

FINDINGS: A landscape plan with the required information has been provided as Exhibit B-7. This standard is met.

C. Landscape Area Standards. The minimum percentage of required landscaping equals:

1. Residential Districts: twenty percent of the site.

FINDINGS: The total site is 29,078 sq. ft. Twenty percent of the site equates to 5,816 sq. ft. of required landscaping. Due to the unique public facility use within the residential district and constrained site area, the applicant is requesting a Class C variance to reduce the amount of required landscaping to 2,051 sq. ft., which equates to seven percent of the site. See pages 40-43 for findings on the Class C Variance.

D. Landscape Materials. This section provides guidelines that ensure significant vegetation growth and establishment using a variety of size specifications and coverage recommendations.

Landscape materials include trees, shrubs, ground cover plants, nonplant ground covers, and outdoor hardscape features, as described below:

1. Native Vegetation. Native vegetation shall be preserved or planted where practicable.

2. Plant Selection. A combination of deciduous and evergreen trees, shrubs and ground covers shall be used for all planted areas, the

selection of which shall be based on local climate, exposure, water availability, and drainage conditions. As necessary, soils shall be amended to allow for healthy plant growth.

3. *Non-native, invasive plants, as per FMC 19.164.020(B), shall be prohibited.*

FINDINGS: The draft landscape plan (Exhibit B-7) includes a planting area between the back of sidewalk and the building or property fence, along all street frontages and the majority of the alley frontage. Five Paperbark Maple street trees are proposed along the 1st Street frontage and four along the Main Street frontage, all located in the right-of-way between the sidewalk and building. This is an approved street tree species for Fairview. No trees are proposed along 223rd due to the shallow depth and location of a stormwater line in the planting strip behind the sidewalk. A condition is proposed to plant grasses or shrubs that will not cause root damage to the storm line. Landscape beds with shrubs are proposed along the building, consisting of Skyrocket Juniper, Crimson Pygmy Dwarf Japanese Barberry, and Goldmound Spirea.

Condition of Approval: Prior to issuance of building permits, the applicant shall update the landscape plan to include one additional Paperbark Maple tree on the east side of the Main Street driveway, and to include shrubs and/or grasses along 223rd Avenue that will reach a mature height of at least three. Native plants are encouraged to be added to the mix of shrubs where practicable.

4. *Hardscape features (i.e., patios, decks, plazas, etc.) may cover up to 15 percent of the required landscape area. Swimming pools, sports courts and similar active recreation facilities may not be counted toward fulfilling the landscape requirement.*

FINDINGS: The site includes a small patio area adjacent to the building in the rear yard. The patio does not exceed 15% of the landscape area provided; see findings for FMC 19.520 for the Class C Variance to minimum landscape area.

5. *Nonplant Ground Covers. Bark dust, chips, aggregate or other nonplant ground covers may be used, but shall cover no more than five percent of the area to be landscaped. "Coverage" is measured based on the size of plants at maturity or after five years of growth, whichever comes sooner.*

CONDITION OF APPROVAL: Nonplant ground covers shall cover no more than 5% of the landscaped areas.

6. Tree Size. Trees shall have a minimum caliper size of 1.5 inches or greater, or be six feet or taller, at time of planting.

FINDINGS: The proposed Paperbark Maple trees are 1.5 inches in diameter at time of planting. This standard is met.

7. Shrub Size. Shrubs shall be planted from one-gallon containers or larger.

FINDINGS: Shrubs are proposed in containers ranging from one to five gallons in size. This standard is met.

8. Ground Cover Size. Ground cover plants shall be sized and spaced so that they grow together to cover a minimum of 80 percent of the underlying soil within three years.

FINDINGS: No ground cover plants are proposed.

9. Significant Vegetation…

FINDINGS: There is no significant vegetation on site.

10. Stormwater Facilities. Stormwater facilities (e.g., detention/retention ponds and swales) shall be landscaped with water tolerant, native plants.

FINDINGS: No stormwater ponds or swales are proposed.

E. Landscape Design Standards. The landscape design standards provide guidelines within setback areas, parking areas, etc.

All yards, parking lots and required street tree planter strips shall be landscaped in accordance with the provisions of this chapter….

1. Yard Setback Landscaping. Landscaping shall satisfy the following criteria:

a. Provide visual screening and privacy within side and rear yards; while leaving front yards and building entrances mostly visible for security purposes;

b. Use shrubs and trees as windbreaks, as appropriate;

c. Retain natural vegetation, as practicable;

d. Define pedestrian pathways and open space areas with landscape materials;

e. Provide focal points within a development, such as signature trees (i.e., large or unique trees), hedges and flowering plants;

f. Use trees to provide summer shading within common open space areas, and within front yards when street trees cannot be provided;

g. Use a combination of plants for year-long color and interest;

h. Use landscaping to screen outdoor storage and mechanical equipment areas, and to enhance graded areas such as berms, swales and detention/retention ponds.

FINDINGS: The proposed landscape plan includes shrubs in front of the building (in the right-of-way landscape strip) and along the Main Street side of the building (in the side yard and right-of-way). The remainder of the side and rear yards are enclosed within a secure fenced area; new landscaping around these yards will consist of grass, trees, and shrubs or grasses (as conditioned) and be located in the right-of-way landscape strip. This standard is met.

2. Parking Areas. A minimum of five percent of the combined area of all parking areas, as measured around the perimeter of all parking spaces and maneuvering areas, shall be landscaped. Such landscaping shall consist of an evenly distributed mix of shade trees with shrubs and/or ground cover plants. "Evenly distributed" means that the trees and other plants are distributed around the parking lot perimeter and between parking bays to provide a partial canopy. At a minimum, one tree per five parking spaces total shall be planted to create a partial tree canopy over and around the parking area. All parking areas with more than 20 spaces shall include landscape islands with trees to break up the parking area into rows of not more than 12 contiguous parking spaces. All landscaped areas shall have minimum dimensions of four feet by four feet to ensure adequate soil, water, and space for healthy plant growth.

FINDINGS: A total of four surface parking spaces will be provided on the site. This number of spaces does not trigger the requirement for tree planting or landscape islands.

3. Buffering and Screening Required. Buffering and screening are required under the following conditions:

a. Parking/Maneuvering Area Adjacent to Streets and Drives. Where a parking or maneuvering area is adjacent and parallel to a street or driveway, a decorative wall (masonry or similar quality material), arcade, trellis, evergreen hedge, or similar screen shall be established parallel to the street or driveway…

FINDINGS: The proposed parking spaces are located within the maintenance yard to serve staff. They will be screened by the existing 6-ft. tall fence, and new landscaping will be planted along the exterior of the fence to provide additional screening. This standard is met.

b. Parking/Maneuvering Area Adjacent to Building. Where a parking or maneuvering area, or driveway, is adjacent to a building, the area shall be separated from the building by a raised pathway, plaza, or landscaped buffer no less than four feet in width….

FINDINGS: Parking and maneuvering is not located adjacent to the building.

c. Screening of Mechanical Equipment, Outdoor Storage, Service and Delivery Areas, and Automobile-Oriented Uses. All mechanical equipment, outdoor storage and manufacturing, and service and delivery areas, shall be screened from view from all public streets and residential districts.

FINDINGS: All outdoor equipment, storage, and delivery areas are screened by the existing 6 ft. tall fence. This standard is met.

19.163.040 Street trees.
The guidelines provided in this section promote healthy street trees and adequate canopy cover to provide shade, reduce stormwater runoff, and improve the appearance of a development.

Street trees shall be planted for all developments that are subject to land division or site design review. Requirements for street tree planting strips are provided in

Chapter 19.165 FMC, Public Facility Standards. Planting of unimproved streets shall be deferred until the construction of curbs and sidewalks. Street trees shall conform to the following standards and guidelines:

A. Soil Preparation, Planting and Care. The developer shall be responsible for planting street trees, including soil preparation, ground cover material, staking, and temporary irrigation for two years after planting. The developer shall also be responsible for tree care (pruning, watering, fertilization, and replacement as necessary) during the first two years after planting.

B. Assurances. The city shall require the developer to provide a performance and maintenance bond in an amount determined by the city engineer, to ensure the planting of the tree(s) and care during the first two years after planting.

C. Growth Characteristics. Trees shall be selected based on growth characteristics and site conditions, including available space, overhead clearance, soil conditions, exposure, and desired color and appearance. The following should guide tree selection:

1. Provide a broad canopy where shade is desired.

2. Use low-growing trees for spaces under utility wires.

3. Select trees which can be "limbed-up" where vision clearance is a concern.

4. Use narrow or "columnar" trees where awnings or other building features limit growth, or where greater visibility is desired between buildings and the street.

5. Use species with similar growth characteristics on the same block for design continuity.

6. Avoid using trees that are susceptible to insect damage, and avoid using trees that produce excessive seeds or fruit.

7. Select trees that are well adapted to the environment, including soil, wind, sun exposure, and exhaust. Drought-resistant trees should be used in areas with sandy or rocky soil.

8. Select trees for their seasonal color, as desired.

9. Use deciduous trees for summer shade and winter sun.

FINDINGS: The applicant is proposing Paperbark Maple trees as the street tree species. This tree species reaches a mature height of 25 ft. and canopy spread of 20 ft. and provides fall color. There are overhead power lines along Main Street, and this tree is appropriate for planting under power lines. This standard is met.

D. Caliper Size. The minimum caliper size at planting shall be 1.5 inches, based on the American Association of Nurserymen Standards.

FINDINGS: The Landscape Plan indicates the street trees will be 1.5 inches in diameter at time of planting. This standard is met.

E. Spacing and Location. Street trees shall be planted within existing and proposed planting strips, and in sidewalk tree wells on streets without planting strips. Street tree spacing shall be based upon the type of tree(s) selected and the canopy size at maturity. In general, trees shall be spaced no more than 30 feet apart, except where planting a tree would conflict with existing trees, retaining walls, utilities and similar physical barriers.

FINDINGS: The applicant is proposing trees at intervals less than 30 feet along 1st Street and the west end of the Main Street frontage.

Condition of Approval: Prior to issuance of building permits, the applicant shall update the landscape plan to include one additional Paperbark Maple tree on the east side of the Main Street driveway.

F. Maintenance and Irrigation. The use of drought-tolerant plant species is encouraged, and may be required when irrigation is not available. Irrigation shall be provided for plants that are not drought-tolerant. If the plantings fail to survive, the property owner shall replace them with an equivalent specimen (i.e., evergreen shrub replaces evergreen shrub, deciduous tree replaces deciduous tree, etc.). All other landscape features required by this code shall be maintained in good condition, or otherwise replaced by the owner.

FINDINGS: The proposed tree is drought tolerant. This standard is met.

G. Additional Requirements. Additional buffering and screening may be required for specific land uses, as identified by Article II of this title, and the city may require additional landscaping through the conditional use permit process.

FINDINGS: Screening requirements in the General Industrial zone are addressed elsewhere in this report. A conditional use permit is not required for this application.

19.163.050 Fences and walls.
The fences and walls section provides height limits for construction of new walls. The guidelines prevent walls that reduce pedestrian connectivity and sight clearance. The standards also provide guidelines relating to maintenance.

The following standards shall apply to all fences and walls:

A. General Requirements. All fences and walls shall comply with the standards of this section…

B. Dimensions.

1. The maximum allowable height of fences and walls is six feet, as measured from the lowest grade at the base of the wall or fence, except that retaining walls and terraced walls may exceed six feet when permitted as part of a site development approval, or as necessary to construct streets and sidewalks. A building permit is required for walls exceeding six feet in height, in conformance with the Uniform Building Code.

2. The height of fences and walls within a front yard setback shall not exceed four feet (except decorative arbors, gates, etc.), as measured from the grade closest to the street right-of-way.

3. Walls and fences to be built for required buffers shall comply with FMC 19.163.030.

4. Fences and walls shall comply with the vision clearance standards of FMC 19.162.020.

FINDINGS: No changes are proposed to fencing around the site. The existing fence surrounding the majority of the property will remain on site at 6 feet height. The criterion is met.

C. Maintenance.

D. Fences – Recreational Courts.

E. Swimming Pool Fences.

FINDINGS: Subsections C-E do not apply.

F. Barbed Wire Fencing. Barbed wire fencing may be permitted for property zoned commercial or industrial when the wire is employed on the top of any other type of fencing, and when the barbed wire is a minimum of six feet above the finished ground surface. Standard barbed wire fencing may be used to enclose property which is zoned agricultural.

FINDINGS: There is barbed wire fencing on the current fence; see also findings for subsection H.

G. Electrically Charged or Sharp Pointed Fencing.

H. Critical Facility Security Fences. Notwithstanding subsections (B)(2), (F), and (G) of this section, a facility that is located in any zoning district which is deemed a critical facility for the public health and safety, emergency management or homeland security purposes may include installation of fencing as follows:

1. A facility subject to this provision includes but is not limited to water or sewer pump station, well, public works yard, emergency management and other communications facilities, public safety facilities, flood control structures, public and private utility installations, or water tower or other facility deemed to be a similar use under Chapter 19.480 FMC.

2. Security fencing may not exceed six feet in height surrounding all or a portion of the facility, except that barbed wire, razor wire or other similar measure designed to impede access may be added to the top of a fence not less than six feet in height.

3. The vertical dimension of security measures such as barbed wire located along the top of a fence shall not exceed 18 inches.

4. The combined height of a fence and additional security measures may not exceed seven and one-half feet in height.

FINDINGS: The public Works Maintenance Facility is considered a critical facility due to the well. The existing fence complies with the standard above, and no changes are proposed.

Chapter 19.164 Vehicle and Bicycle Parking

19.164.020 Applicability.

All developments subject to site design review Chapter 19.420 FMC, including development of parking facilities, shall comply with the provisions of this chapter.

FINDINGS: Site design review is required as part of this application and this chapter applies.

19.164.030 Vehicle parking standards.

A. The minimum number of required off-street vehicle parking spaces (i.e., parking that is located in parking lots and garages and not in the street right-of-way) shall be determined based on the standards in Table 19.164.030.A.

FINDINGS: *Table 19.164.030.A Vehicle Parking – Minimum Standards Option* states that *"Where a use is not specifically listed in this table, parking requirements shall be determined by finding that a use is similar to those listed in terms of parking needs."* The Maintenance Facility does not receive the public or generate trips beyond emplolyees coming and going between the facility and their field work. Staff finds that this use is most similar to the "Public Utilities" use listed in the parking table. The new building will include space for parking the Maintenance vehicle fleet, along with five additional spaces available for employee parking. Four additional surface parking spaces in the maintenance yard will provide additional employee parking, including one ADA accessible space for use as needed. This standard is met.

Type of Use	Parking Ratio	Number of Employees	Number of Fleet Vehicles
Public Utilities (Gas, Water, Telephone, Etc.), Not Including Business Offices.	One space per each employee on the largest shift, plus one space per company vehicle.	8	10
Total number of spaces required			**18**
Total number of spaces proposed			**15 interior + 4 exterior = 19**

B. Credit for On-Street Parking.

1. The credit for on-street parking allows a reduction of one off-street parking space for every one on-street parking space adjacent to the development if deemed appropriate by the city.

FINDINGS: The applicant is not seeking credit for on street parking.

C. Parking Location and Shared Parking.

1. Location. Vehicle parking is allowed only on approved parking shoulders (streets), within garages, carports and other structures, or on driveways or parking lots that have been developed in conformance with this code. Specific locations for parking are indicated in Article II of this title for some land uses (e.g., the requirement that parking be located to side or rear of buildings,

with access from alleys, for some uses). (See also Chapter 19.162 FMC, Access and Circulation.)

FINDINGS: Vehicle parking will be supplied within the structure and in the maintenance yard behind the building. This standard is met.

2. Off-Site Parking…

3. Mixed Uses...

4. Shared Parking…

FINDINGS: These standards do not apply.

5. Availability of Facilities. Owners of off-street parking facilities may post a sign indicating that all parking on the site is available only for residents, customers and/or employees, as applicable. Signs shall conform to the standards of Chapter 19.170 FMC, Sign Regulations.

FINDINGS: Parking spaces are in secure locations and will only be accessible to employees.

D. Maximum Number of Parking Spaces…

FINDINGS: Among the list of uses, which differs from the list of uses for Minimum Standards, the Maintenance Facility is most similar to a Light Industrial use, which has no maximum number of spaces.

E. Parking Management…

FINDINGS: Parking issues that would warrant a management plan are not anticipated.

F. Parking Stall Standard Dimensions and Compact Parking Spaces. All off-street parking stalls shall be improved to conform to city standards for surfacing, stormwater management and striping, and provide dimensions in accordance with the following table. Disabled person parking shall conform to the standards and dimensions of this chapter. The number of compact parking spaces shall not exceed 40 percent of all parking spaces provided on site.

Minimum Parking Space and Aisle Dimensions

Angle (A)	***Type***	***Width (B)***	***Curb Length (C)***	***1-Way Aisle Width (D)***	***2-Way Aisle Width (D)***	***Stall Depth***
90°	*Standard* *Compact* *Disabled*	*9 ft.* *7 ft. 6 in.*	*9 ft.* *7 ft. 6 in.*	*24 ft.* *22 ft.*	*24 ft.* *24 ft.*	*19 ft.* *15 ft.*

FINDINGS: The applicant proposes four standard spaces in the yard, all with 9 ft. by 19 ft. dimensions. One of the four spaces will be a paved ADA accessible space. The remainder of the yard will be maintained with its current gravel surface.

G. Variances. Developments may request exceptions to the parking standards; see FMC 19.520.030(A)(4).

FINDINGS: The applicant is not requesting a parking variance.

H. Disabled Person Parking Spaces. The following parking shall be provided for disabled persons, in conformance with the Americans with Disabilities Act (ADA)

FINDINGS: A parking area 1-25 vehicle spaces requires one ADA accessible space, which must be van accessible with a minimum 96 inch access aisle. The proposed ADA space has an access aisle that is 108 ft. in width. This standard is met.

I. In parking lots three acres and larger intended for use by the general public….

FINDINGS: The lot is not for use by the public. This standard does not apply.

19.164.040 Bicycle parking standards.
All uses which are subject to site design review shall provide bicycle parking, in conformance with the following standards, which are evaluated during site design review:

A. Number of Bicycle Parking Spaces. A minimum of two bicycle parking spaces per use is required for all uses with greater than 10 vehicle parking spaces….

FINDINGS: While the facility accommodates more than 10 vehicles, only 9 spaces are designated for employee parking use, and the remainder are allocated to the maintenance fleet. This standard does not apply.

Chapter 19.165 Public Facilities Standards

19.165.010 Purpose and applicability.

A. Purpose. The purpose of this chapter is to provide planning and design standards for public and private transportation facilities and utilities. Streets are the most common public spaces, touching virtually every parcel of land…

B. When Standards Apply. Unless otherwise provided, the standard specifications for construction, reconstruction or repair of transportation facilities, utilities and other public improvements within the city shall occur in accordance with the standards of this chapter...

C. Standard Specifications. The city engineer shall establish standard construction specifications consistent with the design standards of this chapter and application of engineering principles. They are incorporated in this code by reference.

D. Conditions of Development Approval. No development may occur unless required public facilities are in place or guaranteed, in conformance with the provisions of this code. Improvements required as a condition of development approval that require a dedication of property for a public use, when not voluntarily accepted by the applicant, shall be roughly proportional to the impact of development. Findings in the development approval shall indicate how the required improvements are roughly proportional to the impact of the proposed development on public facilities.

E. Rough Proportionality Report. Where the applicant objects to the imposition of any applicable development standard under this chapter that required a dedication of property for a public use, the applicant must provide a rough proportionality report justifying an alternative level of improvements including:…

FINDINGS: Public right-of-way improvements are required for Main Street and 1st Street adjacent to the site. No right-of-way dedications are required. The applicant has not objected to the imposition of any standards in this section.

19.165.025 Transportation improvements.

A. Development Standards. No development shall occur unless the development has frontage or approved access to a public street, in conformance with the provisions of Chapter 19.162 FMC, Access and Circulation, and the following standards are met:

1. *Streets within or adjacent to a development shall be improved in accordance with the transportation system plan and the provisions of this chapter;*

2. *Development of new streets, and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance with this section, and public streets shall be dedicated to the applicable city, county or state jurisdiction;*

3. *New streets and drives connected to a collector or arterial street shall be paved; and*

4. *The city may accept a future improvement guarantee (e.g., owner agrees not to remonstrate (object) against the formation of a local improvement district in the future) in lieu of street improvements if one or more of the following conditions exist…*

FINDINGS: The development has access to 1st and Main streets. Street improvements to City standards are required. No new streets are proposed and a non-remonstrance is not required.

Condition of Approval: Prior to final occupancy, 1st Street and Main Street shall be improved in accordance with the transportation system plan and other provisions of FMC 19.165 Public Facilities Standards. This will include installation of a new 5 ft. wide sidewalk along each street, in accordance with the local residential street cross section.

B. Variances….
C. Creation of Rights-of-Way for Streets and Related Purposes…
D. Creation of Access Easements…
E. Street Location, Width and Grade…

Findings for B-E: No new streets or access easements are proposed, and no variances are requested to the transportation standards. These standards do not apply.

F. Minimum Rights-of-Way and Street Sections. Street rights-of-way and improvements shall be the widths as required in the "Standards" section of the Fairview transportation system plan. A variance shall be required to vary the standards found in the Fairview transportation system plan.

FINDINGS: The 2016 Transportation System Plan (TSP) requires a 49-50 ft. wide right-of-way for local residential streets. The existing right-of-way width is 60 ft. on both 1st Street and Main Street, which is adequate space to construct street

improvements to city standards. The standard cross section includes a 28 ft. paved roadway, which is exceeded on Main Street in order to provide left and right turn lanes from Main onto NE 223rd Ave. The Main Street frontage includes a curb and asphalt pathway extending from the curb to the edge of the existing building; this wraps around the corner onto the southern end of 1st Street and includes an ADA ramp at the corner. The asphalt pathway will be replaced with a concrete sidewalk consistent with the TSP cross section and other sidewalks in Historic Fairview, and extended along the full Main Street and 1st Street frontage.

G. Traffic Signals and Neighborhood Traffic Management.

FINDINGS: The new facility is not associated with an increase in trips or operational changes at the site, therefore no additional traffic management is required. The intersection of Main and 1st has crosswalks across all roads to serve pedestrians.

H. Future Street Plan and Extension of Streets.
I. Street Alignment and Connections.

FINDINGS: No new streets are proposed. This standard does not apply.

J. Sidewalks, Planter Strips, Bicycle Lanes. Sidewalks, planter strips, and bicycle lanes shall be installed in conformance with applicable provisions of the transportation system plan, the Comprehensive Plan, and adopted street plans. Maintenance of sidewalks, curbs, and planter strips is the continuing obligation of the adjacent property owner. All work must comply with the city of Fairview public works construction standards.

FINDINGS: Sidewalks and landscape strips will be installed as described earlier in this report. Bike lanes are not part of the cross section for local residential streets.

Condition of Approval: Prior to final occupancy, sidewalks and landscaping in the right-of-way must be installed to adopted street standards and public works specifications.

K. Internal Pathways….

FINDINGS: No internal pathways are proposed outside of the public right-of-way. A sidewalk will connect the 1st Street sidewalk to the primary building entrance, and will comply with Public Works Standard Specifications.

L-O and Q-W

FINDINGS: These standards apply to the creation or widening of streets, and do not apply to this proposal.

P. Curbs, Curb Cuts, Ramps, and Driveway Approaches. Concrete curbs, curb cuts, wheelchair, bicycle ramps and driveway approaches shall be constructed in accordance with standards specified in Chapter 19.162 FMC, Access and Circulation.

FINDINGS: All new *curbs, curb cuts, ramps, and driveway approaches shall be designed and constructed to comply with the standards in FMC 19.162 Access and Circulation.*

X. Mail Boxes. Plans for mail boxes to be used shall be approved by the United States Postal Service (USPS).

FINDINGS: All mail is received at Fairview City Hall, and no new mail boxes are proposed.

Y. Streetlight Standards. Streetlights shall be installed in accordance with city standards.

FINDINGS: The property is located within the mid-county lighting district and is subject to district standards.

Condition of Approval: Prior to final occupancy the applicant shall meet the street light requirements of mid-county lighting district.

19.165.030 Public use areas.

Findings: Dedication of new public use areas is not required as part of the development. This standard does not apply.

19.165.040 Sanitary sewer and water service improvements.
The sanitary sewer and water service improvements ensure adequate sanitary sewer services to new developments.

Findings: The existing facility is served by sanitary sewer and water, and no improvements are required to serve the new building.

19.165.050 Storm drainage.
The storm drainage section requires developers to accommodate and treat stormwater runoff from buildings and parking lots.

A. General Provisions. The city shall issue a development permit only where adequate provisions for stormwater and flood water runoff have been made.

B. Accommodation of Upstream Drainage. Culverts and other drainage facilities shall be large enough to accommodate potential runoff from the entire upstream drainage area, whether inside or outside the development. Such facilities shall be subject to review and approval by the city engineer.

C. Effect on Downstream Drainage. Where it is anticipated by the city engineer that the additional runoff resulting from the development will overload an existing drainage facility, the city may deny approval of the development permit unless provisions have been made for improvement of the potential condition or until provisions have been made for storage of additional runoff caused by the development in accordance with city standards.

D. Easements. Where a development is traversed by a watercourse, drainage way, channel or stream, there shall be provided a stormwater easement or drainage right-of-way conforming substantially with the lines of such watercourse and such further width as will be adequate for conveyance and maintenance.

Condition of Approval: Prior to the issuance of building permits the applicant shall provide the city with a final stormwater management plan demonstrating compliance with the 2016 Portland Stormwater Management Manual.

19.165.060 Utilities.

The utilities section provides standards regarding electric lines and cable. Many types of utilities now must be installed underground for safety and aesthetic purposes.

A. Underground Utilities. All utility lines including, but not limited to, those required for electric, communication, lighting and cable television services and related facilities shall be placed underground, except for surface-mounted transformers, surface-mounted connection boxes and meter cabinets which may be placed above ground, temporary utility service facilities during construction, and high capacity electric lines operating at 50,000 volts or above. The following additional standards apply to all new subdivisions, in order to facilitate underground placement of utilities:

B. Easements. Easements shall be provided for all underground utility facilities.

C. Exception to Undergrounding Requirement. The standard applies only to proposed subdivisions. An exception to the undergrounding requirement may be granted due to physical constraints, such as steep topography, sensitive lands, Chapter 19.106 FMC, or existing development conditions.

Findings: No changes are proposed to electric or cable utility lines as part of the new facility.

19.165.070 Easements.
The easements section provisions reserve adequate space for utilities.

FINDINGS: New utility easements dedicated to the City of Fairview are not required for this development.

19.165.080 Construction plan approval and assurances.
The construction plan approval portion ensures the completion of a development by a builder.

No public improvements, including sanitary sewers, storm sewers, streets, sidewalks, curbs, lighting, parks, or other requirements, shall be undertaken except after the plans have been approved by the city, permit fee paid, and permit issued.

Condition of Approval: Prior to issuance of permits, the City of Fairview Public Works Department shall approve all public improvement plans.

19.165.090 Installation.

A. Conformance Required. Improvements installed by the developer either as a requirement of these regulations or at his/her own option, shall conform to the requirements of this chapter, approved construction plans, and to improvement standards and specifications adopted by the city.

B. Adopted Installation Standards. The Standard Specifications for Public Works Construction, Oregon Chapter APWA shall be a part of the city's adopted installation standard(s); other standards may also be required upon recommendation of the city engineer.

C. Commencement. Work shall not begin until the city has been notified in advance.

D. Resumption. If work is discontinued for more than one month, it shall not be resumed until the city is notified.

E. City Inspection. Improvements shall be constructed under the inspection and to the satisfaction of the city. The city may require minor changes in typical sections and details if unusual conditions arising during construction warrant such changes in the public interest. Modifications requested by the developer shall be subject to land use review under Chapter 19.415 FMC, Modifications to Approved Plans and Conditions of Approval. Any monuments that are disturbed before all improvements are completed by the subdivider shall be replaced prior to final acceptance of the improvements.

F. Engineer's Certification and As-Built Plans. A registered civil engineer shall provide written certification in a form required by the city that all improvements, workmanship and materials are in accord with current and standard engineering and construction practices, conform to approved plans and conditions of approval, and are of high grade, prior to city acceptance of the public improvements, or any portion thereof, for operation and maintenance. The developer's engineer shall also provide three sets (one mylar, one electronic, one paper copy) of "as-built" plans, in conformance with the city engineer's specifications, for permanent filing with the city.

Condition of Approval: The applicant agrees to comply with all regulations and requirements of the Fairview City Code which are current on this date, except where variance or deviation from such regulation and requirements have been specifically approved by formal Planning Commission action as documented by the records of this decision and/or the associated Conditions of Approval.

19.520.040 Class C variances.

A. Purpose. The purpose of this section is to provide standards for variances which exceed the Class A and Class B variance criteria in this article. Class C variances may be granted if the applicant shows that, owing to special and unusual circumstances related to a specific property, the literal application of the standards of the applicable land use district would create a hardship to development which is peculiar to the lot size or shape, topography, sensitive lands, or other similar circumstances related to the property over which the applicant has no control, and which are not applicable to other properties in the vicinity (e.g., the same land use district); except that no variances to "permitted uses" shall be granted.

B. Applicability.

1. The variance standards are intended to apply to individual platted and recorded lots only.

2. An applicant who proposes to vary a specification standard for lots yet to be created through a subdivision process may not utilize the Class C variance procedure.

3. A variance shall not be approved which would vary the "permitted uses" of a land use district.

FINDINGS: The development site consists of three recorded lots, and therefore the standards apply and variance opportunity is available for the proposal.

C. Approvals Process and Criteria.

1. Class C variances shall be processed using a Type III procedure, using the approval criteria in subsection (C)(2) of this section. In addition to the application requirements contained in this code, the applicant shall provide a written narrative or letter describing his/her reasoning for the variance, why it is required, alternatives considered, and compliance with the criteria in subsection (C)(2) of this section.

FINDINGS: The Class C Variance request is being reviewed concurrently with the Site Design Review application. The applicant has provided a narrative that addressed the need for a variance to reduce the amount of landscaping on the site. The applicant's response is found on pages 36-40 of Exhibit A-1. This standard is met.

2. The city shall approve, approve with conditions, or deny an application for a variance based on finding that all of the following criteria are satisfied:

a. The proposed variance will not be materially detrimental to the purposes of this code, to any other applicable policies and standards, and to other properties in the same land use district or vicinity;

FINDINGS: The Public Works Maintenance Facility has existed at this location since 1949. It was sited here due to its central location in the city and also as a result of the favorable aquifer accessibility. Reduction or elimination of landscaping would not be detrimental to the neighborhood as the majority of unenclosed space on the site is screened from public view due the sensitive nature of the source of a public water supply and the associated restrictions placed on such facilities by Homeland Security. Areas visible to the public are proposed to be landscaped. This standard is met.

b. A hardship to development exists which is peculiar to the lot size or shape, topography, sensitive lands, or other similar circumstances related to the property over which the applicant has no control, and which are not applicable to other properties in the vicinity (e.g., the same land use district);

FINDINGS: The Public Works Maintenance Facility is unique within the Residential/Community Service Parks zone, with operational and site development needs more similar to a light industrial use than park, government office, school, or residential use. The 20% landscaping requirement aligns well with these typical uses in the zone, for which outdoor spaces serve recreational and aesthetic purposes. The Public Works Maintenance Facility is unique for its use in this zoning district generally, and for the wells located on the site that must be maintained in their present location. The well facilities include two pump houses and one well head that must be designed around.

The wells were located at this site due to the presence of desirable aquifer conditions, and is subject to regular maintenance and operational activities using large pieces of equipment such as semi-trucks, drill rigs, cranes and well rehabilitation equipment. The dimensions of the maintenance yard are established by the existing perimeter fence and the new building, which has been sited to meet minimum required setbacks. The site is very constrained to accommodate well operations in the maintenance yard, along, with office, vehicle storage and shop building area.

Maintenance for the wells requires large clear areas and adequate turning radii for the trucks to be able to navigate the site and perform necessary tasks. Therefore, the planted areas in the interior of the yard have been kept to a minimum to meet these requirements. Landscaping is provided along the interior perimeter of the yard at the alley and to the west of Main Street driveway. This standard is met.

c. The use proposed will be the same as permitted under this title and city standards will be maintained to the greatest extent that is reasonably possible while permitting reasonable economic use of the land;

FINDINGS: No changes are proposed to the existing use, which is permitted in the R/CSP zone. All of the code standards are proposed to be maintained. This standard is met.

d. Existing physical and natural systems, such as but not limited to traffic, drainage, natural resources, and parks will not be adversely affected any more than would occur if the development occurred as specified by the subject code standard;

FINDINGS: Reducing the landscaping area inside the sight-obscuring fence will not adversely impact the surrounding area. This standard is met.

e. The hardship is not self-imposed; and

FINDINGS: The Public Works Maintenance facility must be maintained at its current location, and the site constraints (wells and size of development site) and pre-existing. This standard is met.

f. The variance requested is the minimum variance which would alleviate the hardship.

FINDINGS: The applicant has examined site design and landscaping options and found that their proposal is the maximum amount of landscaped area / minimum variance feasible to meet the operational needs of the site. This standard is met.

VII. CONCLUSION AND RECOMMENDATIONS

STAFF RECOMMENDATION

Staff finds that the proposed application will meet the requirements of the City Code as conditioned, and recommends approval of the Site Design Review and Class C Variance application

PLANNING COMMISSION ALTERNATIVES

1. Approve the application based on the findings of compliance with City regulations and conditions of approval.
2. Modify the findings, reasons, or conditions, and approve the request as modified.
3. Deny the application based on the Commission's findings
4. Continue the Public Hearing to a date certain if more information is needed.

CONDITIONS OF APPROVAL

A. General Requirements

1. The approval for application 2018-76-DR-VAR shall become null and void after two (2) years if construction activities have not commenced.

2. A right-of-way permit is required for any utility work completed in the public right-of-way.

3. Any signs on the site must obtain a sign permit and comply with FMC 19.170.

4. The applicant agrees to comply with all regulations and requirements of the Fairview City Code which are current on this date, except where variance or deviation from such regulation and requirements have been specifically approved by formal

Planning Commission action as documented by the records of this decision and/or the associated Conditions of Approval.

5. Nonplant ground covers shall cover no more than 5% of the landscaped areas.

B. Prior to Building Permits

1. Prior to issuance of building permits, the applicant shall submit a Fire Access and Water Supply page that complies with all Gresham Fire requirements outlined in Exhibit C-1.

2. Prior to issuance of building permits, a final stormwater management plan is required showing the site complies with the 2016 Portland Stormwater Management Manual. Surface water facilities shall be constructed in conformance with city standards.

3. Prior to issuance of permits, revise the site plan to show compliance with the requirement for contrasting paving materials to delineate the pathway crossing the parking area.

4. Prior to issuance of building permits, the applicant shall update the landscape plan to include one additional Paperbark Maple tree on the east side of the Main Street driveway, and to include shrubs and/or grasses along 223rd Avenue that will reach a mature height of at least three. Native plants are encouraged to be added to the mix of shrubs where practicable.

5. Prior to the issuance of building permits, site development plans must comply with applicable ADA requirements.

6. Prior to issuance of permits, the City of Fairview Public Works Department shall approve all public improvement plans.

C. PRIOR TO OCCUPANCY

1. Prior to final occupancy, 1st Street and Main Street shall be improved in accordance with the transportation system plan and other provisions of FMC 19.165 Public Facilities Standards. This will include installation of a new 5 ft. wide sidewalk along each street, in accordance with the local residential street cross section.

2. All driveway openings shall be constructed to meet Fairview Public Works specifications including conforming to ADA standards.

3. Prior to final occupancy, sidewalks and landscaping in the right-of-way must be installed to adopted street standards and public works specifications.

4. Prior to final occupancy the applicant shall meet the street light requirements of mid-county lighting district.

EXHIBIT A-1

CITY OF FAIRVIEW
Public Works Department
48 1st Street
Fairview, OR 97024

FAIRVIEW PUBLIC WORKS

Maintenance Center

Site Design Review

Revised 12.14.18

P&C Construction

LRS ARCHITECTS

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IV. Exhibits (Complies with Section 12.50.800)

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2. Sheet C0.1 Civil Existing Conditions Plan (1”=10’)
3. Sheet C0.2 Civil Demolition Plan (1”=10’)
4. Sheet C1.0 Civil Site Plan (1”=10’)
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7. Sheet L100 Landscaping Plan (1”=10’)
8. Sheet AD001 Architectural Site Demo Plan (1”=10’)
9. Sheet A101 Architectural Site Plan-Improved (1" =10')
10. Sheet A201 Overall Floor Plan (1/8”=1’-0”)
11. Sheet A501 Exterior Elevations (1/8”=1’-0”)

I. Project Team

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II. Project Description

The proposed project is located on a 0.67-acre parcel of land bounded to the south by Main Street, NE 223rd Avenue to the east, and on the west by 1st Street. It is zoned as R/CSP, Residential with Commercial Service Parks Overlay zone.

The project consists of the removal and replacement of the Public Works Maintenance Facility that will serve as operational headquarters for the City of Fairview. Currently, there are two well pump houses existing on site as well as an exposed well, which are to be protected and remain on site.

The two building complex will be consolidated as one unified building that will operate as the hub of operations with approximately 10,147 SF of office and vehicle storage/shops area. The vehicle storage and shops area will act as a double volume space with the potential for a future mezzanine storage space to be constructed above the shops portion. The lower volume space will have crew and conference areas to support the administrative staff; office space for the various operations staff and supervisors; restrooms, showers, and locker rooms; and lunchroom and kitchen facilities.

The larger volume contains an enclosed and conditioned shop space; three pass through semi-conditioned vehicle bays; and two enclosed vehicle and equipment storage bays accessed from the fenced yard area.

Access to the property will occur in two places along Main and 1st Street. The primary pedestrian access to the Operations building is along 1st Street, 35 feet north of the Main Street intersection. Public Works' vehicles will enter and exit the secured area at the existing vehicle-gated entrance along Main Street as well as through the pass through bays along 1st Street. There is an existing secondary vehicle gate along the alley to the north of the site. This access is to be used only in the event of an emergency.

The building exterior will utilize a palette of materials to correspond with the residential environment and in accord with the elementary school located across 1st Street. The building will maintain a solid color for the overall elevations and transition to a different metal panel material at the windows and entries to provide visual relief. The scheme uses two colors in a variety of profiles, ranging from a smooth to a box-rib pattern. This serves to reduce the building's scale and introduce a shift in pattern over the long facades. Vision glazing is insulated clear glass set in aluminum frames. The roofs are constructed of standing seam metal panels pitched to 2 foot of rise over 12 feet of run with overhangs to provide shading from summer solar heat gain.

Entries to the facility are accentuated by storefront entries with relites that face 1st Street along public facade and the fleet yard. The entrance is recessed at the street entry which serves to break the horizontal distance of the front elevation to a more pedestrian scale.

Landscaping will utilize native-species to enhance the pedestrian access ways along the right-of-way. Due to the nature of the site, the landscaping in the yard area will be kept to a minimum to allow for optimal access for maintenance trucks.

Zoning: R/CSP, Residential Community Service Parks Overlay

Legal Description of the Site: Tax Map 1N3E27CB, Tax Lots 03700, 03800, 03900

Proposed Use: A Public Works Facility that includes Administration and Operations, Shops, Storage, and Fleet Maintenance.

Land Use Process to Date:

- Pre-App was held on June 28, 2018; (Compliance with Section 19.412.010).

III. Land Use – Community Development Code

Section 19.30.000 R Residential District

19. 30.020 Permitted Land Uses

A. Permitted Uses. The land uses listed in Table 19.30.020.A are permitted in the residential district, subject to the provisions of this chapter. Only land uses which are specifically listed in Table 19.30.020.A, and land uses which are approved as "similar" to those in Table 19.30.020.A, may be permitted. The land uses identified with a "CU" in Table 19.30.020.A require conditional use permit approval prior to development or a change in use, in accordance with Article IV of this title.

B. Determination of Similar Land Use. Similar use determinations shall be made in conformance with the procedures in Chapter 19.480 FMC.

Table 19.30.020.A
Land Uses and Building Types Permitted in the Residential District

OTHER	u. Home occupations and temporary uses	X***	X***	X***	X***	X***	X***
	v. Community services/parks	X (CU)*	X (CU)*	X (CU)*	X (CU)*	X (CU)*	X (CU)*

<u>Compliance Statement:</u> The proposed public works facility is an approved use in the R zone as "Community Services/Parks" (Table 19.30.020A). The criterion is met.

19.30.030 Building Setbacks

19.30.030.A.3: Public and Institutional Buildings

Front Yard Setbacks: Not Required

<u>Compliance Statement:</u> Since the site is located on a street corner yard, the property line along 1st Street is considered "front yard" as determined in the Pre-App Conference conducted June 28, 2018. The criterion is met.

Side Yard Setbacks: 5 feet on interior side yards, 10 feet on street corner yards.

<u>Compliance Statement:</u> Along the southeast property line, at Main Street (corner yard), the setback is 10'-0". The property is bounded to the northwest by an alley with a site setback of 5'-0". The criteria are met.

Rear Yard Setbacks: 15 feet

<u>Compliance Statement</u>: Since the 1st Street property line is considered the "front yard", the northeast edge of the site along 223rd Avenue meets the "rear yard" requirements. All setbacks and standards are listed below.

Setback Summary	***Code Minimum***	***Actual***	***Adjacent Zoning***
Front (SW)	***0'-0"***	***0'-0"***	***Residential Community Service Parks (R/CSP)***
Side (NW)	***5'-0"***	***5'-0"***	***Residential (R-7.5)***
Side (SE)	***10'-0"***	***10'-0"***	***Residential Community Service Parks (R/CSP)***
Rear (NE)	***15'-0"***	***15'-0"***	***Residential (R-7.5)***

Maximum lot coverage: None – Public and Institutional Use

19.30.070 Maximum lot coverage

A. Maximum Lot Coverage. The following maximum lot coverage standards shall apply to all, subject to the maximum building size standards in FMC 19.30.060:

5. Residential commercial and public/institutional uses: 85 percent.

<u>Compliance Statement:</u> The site consists of 29,078 SF or 0.67 acres. The area for the building on the site is 10,154 SF.

The ratio of buildings to site is 10,154/ 29,078, or 34.9%. Residential commercial and public/institutional uses have a maximum lot coverage of 85% (19.30.070). The criterion is met.

19.30.080 Building Height

Maximum building height:

1. Buildings within Residential District: 35 feet or 2.5 stories
2. Residential commercial buildings: 45 feet or 4 stories

<u>Compliance Statement:</u> The tallest structure anticipated for the development is the one-story Vehicle Storage of the Maintenance Center. It will be approximately 27 feet to the highest eave. The criterion is met, regardless of building classification.

19.30.100 Design Standards

Building Form:

The continuous horizontal distance (i.e., as measured from end-wall to end-wall) of individual buildings shall not exceed 120 feet. All buildings shall incorporate design features such as offsets, balconies, projections, window reveals, or similar elements to preclude large expanses of uninterrupted building surfaces, as shown in the above figure. Along the vertical face of a structure, such features shall occur at a minimum of every 35 feet, and on each floor shall contain at least two of the following features:

a. Recess (e.g., deck, patio, courtyard, entrance or similar feature) that has a minimum depth of five feet;

b. Extension (e.g., floor area, deck, patio, entrance, or similar feature) that projects a minimum of two feet and runs horizontally for a minimum length of four feet; and/or

c. Offsets or breaks in roof elevation of two feet or greater in height.

Compliance Statement: ***The Maintenance Center includes a 2'-0" building extension along the office/shops portion, which acts to divide the building volume and break the continuous horizontal distance along the main façade. There is also an approximate 8'-0" break in roof elevation providing visual relief and lessens the scale of the building. A three-foot recess at the main pedestrian entry along with a myriad of window reveals provide a sense of human scale to the building as it responds to the residential urban context. The criteria are met.***

Eyes on the Street:

All building elevations visible from a street right-of-way shall provide doors, porches, balconies, and/or windows. A minimum of 60 percent of front (i.e., street-facing) elevations, and a minimum of 30 percent of side and rear building elevations shall meet this standard. "Percent of elevation" is measured as the horizontal plane (lineal feet) containing doors, porches, balconies, terraces and/or windows. The standard applies to each full and partial building story.

Compliance Statement:

Percent of elevation required- front elevation (SW): 135'-0" x 0.60 = 81'-0"
Front Elevation Openings: 81'-0" – criterion met.

Percent of elevation required- side elevation (SE): 68'-0" x 0.30 = 20'-5"
Side Elevation Openings: 35'-0" – criterion met.

Detailed Design:

All buildings shall provide detailed design along all elevations (i.e., front, rear and sides). Detailed design shall be provided by using at least three of the following architectural features on all elevations, as appropriate for the proposed building type and style (may vary features on rear/side/front elevations):

a. Dormers;

b. Gables;

c. Recessed entries;

d. Covered porch entries;

e. Cupolas or towers;

f. Pillars or posts;

g. Eaves (minimum six-inch projection);

h. Off-sets in building face or roof (minimum 16 inches);

i. Window trim (minimum four inches wide);

j. Bay windows;

k. Balconies;

l. Decorative patterns on exterior finish (e.g., scales/shingles, wainscoting, ornamentation, and similar features);

m. Decorative cornices and rooflines (e.g., for flat roofs);

n. An alternative feature providing visual relief, similar to options in subsections (C)(3)(a) through (m) of this section.

<u>Compliance Statement:</u> There are multiple design elements that are implemented within the building design. These are used to keep in line with the function of the building as a maintenance/shop center for the city while still responding to the residential context and the newly designed elementary school.

Front Elevation (SW) – use of recessed entry, off-set in roof, and decorative metal pattern – criterion met.
Side Elevation (SE) – use of decorative patterns, offset in roof, eaves – criterion met.

Side Elevation (NW) – use of decorative patterns, eaves, offset in building face – criterion met.
Rear Elevation (NE) – use of decorative patterns, offset in roof, eaves – criterion met.

19.30.110 Special Standards for Certain Uses

19.30.110.F Community Services/Parks

Public and institutional uses (as listed in Table 19.30.020.A) are allowed in the residential district subject to the following land use standards, which are intended to control the scale of these developments and their compatibility with nearby residences:

1. Development Site Area. The maximum development site area shall be eight acres, except that this standard shall not apply to parks and open space uses.

Compliance Statement: ***The proposed site development area is 0.67 acres – criterion met.***

2. Vehicle Areas and Trash Receptacles. All vehicle areas (i.e., parking, drives, storage, etc.) and trash receptacles shall be oriented away from adjacent residences to the greatest extent practicable, and shall be screened with an evergreen hedge or solid fence or wall of not less than six feet in height.

Compliance Statement: ***Trash Receptacles are to be located within the vehicle storage area of the maintenance center – criterion met.***

19.30.100.G Accessory Uses and Structures

Accessory uses and structures are of a nature customarily incidental and subordinate to the principal use or structure on the same lot, except for accessory dwelling units. Typical accessory structures in the residential district include detached garages, sheds, workshops, greenhouses and similar structures.

Compliance Statement: ***There are two existing well pump houses located on site within the fence yard area beyond setback requirements – criterion met.***

19.162 Access and Circulation

A. Intent and Purpose. The intent of this section is to manage vehicle access to development through a connected street system, while preserving the flow of traffic in terms of safety, roadway capacity, and efficiency. Access shall be

managed to maintain an adequate “level of service” and to maintain the “functional classification” of roadways as required by the city’s transportation system plan. Major roadways, including highways, arterials, and collectors, serve as the primary system for moving people and goods. “Access management” is a primary concern on these roads. Local streets and alleys provide access to individual properties. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function. This section attempts to balance the right of reasonable access to private property with the right of the citizens of the city and the state of Oregon to safe and efficient travel. It also requires all developments to construct planned streets (arterials and collectors) and to extend local streets.

To achieve this policy intent, state and local roadways have been categorized in the transportation system plan by function and classified for access purposes based upon their level of importance and function (see Chapter 19.165 FMC). Regulations have been applied to these roadways for the purpose of reducing traffic accidents, personal injury, and property damage attributable to access systems, and to thereby improve the safety and operation of the roadway network. This will protect the substantial public investment in the existing transportation system and reduce the need for expensive remedial measures. These regulations also further the orderly layout and use of land, protect community character, and conserve natural resources by promoting well-designed road and access systems and discouraging the unplanned subdivision of land.

B. Applicability. This section shall apply to all public streets within the city and to all properties that abut these streets.

C. Access Permit Required. Access to a public street requires an access permit in accordance with the following procedures:

1. Permits for access to city streets shall be subject to review and approval by the city engineer based on the standards contained in this chapter, and the provisions of the transportation standards. An access permit may be in the form of a letter to the applicant, or it may be attached to a land use decision notice as a condition of approval. In either case, an access permit will be reviewed consistent with the procedures required for the complementary development permit. If no development permit is requested, the access permit shall be reviewed consistent with a Type III process.

2. Permits for access to state highways shall be subject to review and approval by the Oregon Department of Transportation (ODOT), except when ODOT has delegated this responsibility to the city or Multnomah County. In that case, the city or county shall determine whether access is granted based on its adopted standards.

3. Permits for access to county highways shall be subject to review and approval by Multnomah County, except where the county has delegated this responsibility to the city, in which case the city shall determine whether access is granted based on adopted county standards.

D. Traffic Study Requirements. A traffic study must be provided for any proposed development that includes more than 10 dwellings or generates at

least 100 vehicle trips per day. The traffic study shall include those adjacent intersections that will receive more than 50 vehicle trips per day.

E. Conditions of Approval. The city may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street. When obtaining access to off-street parking areas (both to and from), backing onto a public street shall not be permitted, except for single-family dwellings.

F. Access Options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods. These methods are “options” to the developer/subdivider, unless one method is specifically required by “Special Standards for Certain Uses.” A minimum of 10 feet per lane is required.

1. Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.

2. Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., “shared driveway”). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.

3. Option 3. Access is from a public street adjacent to the development parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing.

4. Subdivisions Fronting onto an Arterial Street. New residential subdivisions fronting onto an arterial street shall be required to provide alleys or secondary (local or collector) streets for access to individual lots. When alleys or secondary streets cannot be constructed due to topographic or other physical constraints, access may be provided by consolidating driveways for clusters of two or more lots (e.g., includes flag lots and mid-block lanes).

5. Double-Frontage Lots. When a lot has frontage onto two or more streets, access shall be provided first from the street with the lowest classification. For example, access shall be provided from a local street before a collector or arterial street. Except for corner lots, the creation of new double-frontage lots shall be prohibited in the residential district, unless topographic or physical constraints require the formation of such lots. When double-frontage lots are permitted in the residential district, a landscape buffer with trees and/or shrubs and ground cover not less than 20 feet wide shall be provided between the back yard fence/wall and the sidewalk or street; maintenance shall be assured by the owner (i.e., through homeowners association, etc.).

<u>Compliance Statement:</u> The site maintains its existing vehicle access points along 1st and Main Street. The main vehicle storage entrance is maintained along 1st Street with an revised drive apron to accommodate the 3-bay vehicle entrance. There is an existing vehicle gate located along Main Street, which acts as a secondary entrance to the maintenance yard. The yard drive entry is located 52'-6" from the edge of the right-of-way along 223rd Avenue. The site does not consist of more than 10 dwelling nor does it receive more than 50 vehicle trips per day. The criteria are met.

G. Access Spacing. Access spacing ensures safe connections to local and arterial streets. Driveway accesses shall be separated from other driveways and street intersections in accordance with the following standards and procedures:

1. Local Streets. A minimum of 50 feet separation (as measured from the sides of the driveway/street) shall be required on local streets (i.e., streets not designated as collectors or arterials), except as provided in subsection (G)(3) of this section

2. Arterial and Collector Streets. Access spacing on collector and arterial streets, and at controlled intersections (i.e., with four-way stop sign or traffic signal) shall be determined based on the policies and standards contained in the city's transportation system plan. Access to Interstate 84 is subject to the jurisdiction of ODOT.

3. Special Provisions for All Streets. Direct street access may be restricted for some land uses, in conformance with the provisions of Chapters 19.20 through 19.155 – Land Use Districts. For example, access consolidation, shared access, and/or access separation greater than that specified by subsections (G)(1) and (G)(2) of this section may be required by the city, county or ODOT for the purpose of protecting the function, safety and operation of the street for all users. (See subsection I of this section.) Where no other alternatives exist, the permitting agency may allow construction of an access connection along the property line farthest from an intersection. In such cases, directional connections (i.e., right in/out, right in only, or right out only) may be required.

<u>Compliance Statement:</u> Driveway access along 1st street is 75'-6" from intersection along Main Street. Existing driveway access along Main Street is 52'-6" from the intersection along 223rd Avenue. Criterion met.

H. Number of Access Points. Reducing the number of access points on a street provides pedestrians fewer obstructions, fewer points at which automobile traffic crosses the sidewalk, and fewer opportunities for conflicts between through traffic and vehicles using access points.

For single-family (detached and attached), two-family, and three-family housing types, one street access point is permitted per lot, when alley access cannot otherwise be provided; except that two access points may be permitted for two-family and three-family housing on corner lots (i.e., no more than one access per street), subject to the access spacing standards in subsection G of this section. The number of street access points for multiple-family, commercial, industrial, and public/institutional developments shall be minimized to protect the

function, safety and operation of the street(s) and sidewalk(s) for all users. Shared access may be required, in conformance with subsection I of this section in order to maintain the required access spacing, and minimize the number of access points.

I. Shared Driveways. Shared driveways serve to reduce impermeable surfaces, reduce visual blight associated with large expanses of pavement, and provide more linear curb space for on-street parking.

The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The city shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes in accordance with the following standards:

1. Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street. When shared driveways or frontage streets are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway or street temporarily ends at the property line, but may be extended in the future as the adjacent parcel develops. "Developable" means that a parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).

2. Access easements (i.e., for the benefit of affected properties) shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.

3. Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, parcel configuration, and similar conditions) prevent extending the street/driveway in the future.

Compliance Statement: ***The site has maintained the minimal number of vehicle access points to enter the site by utilizing the existing vehicle gate entries along Main Street and the alley. Three vehicle bays can be accessed from 1st Street through a shared driveway to reduce the amount of impermeable surface. The criteria are met.***

L. Driveway Openings. All driveway openings must comply with the "Standard Specifications for Public Works Construction," pages 53 – 55. Driveway openings or curb cuts shall be within the minimum width necessary to provide the required number of vehicle travel lanes (10 feet for each travel lane). The following standards (i.e., as measured where the front property line meets the sidewalk or right-of-way) are required to provide adequate site access, minimize surface water runoff, and avoid conflicts between vehicles and pedestrians:

5. Driveway Aprons. Driveway aprons (when required) shall be constructed of concrete and shall be installed between the street right-of-way and the private drive. Driveway aprons shall conform to ADA standards for sidewalks and pathways, which require a continuous route

of travel that is a minimum of three feet in width, with a cross slope not exceeding two percent.

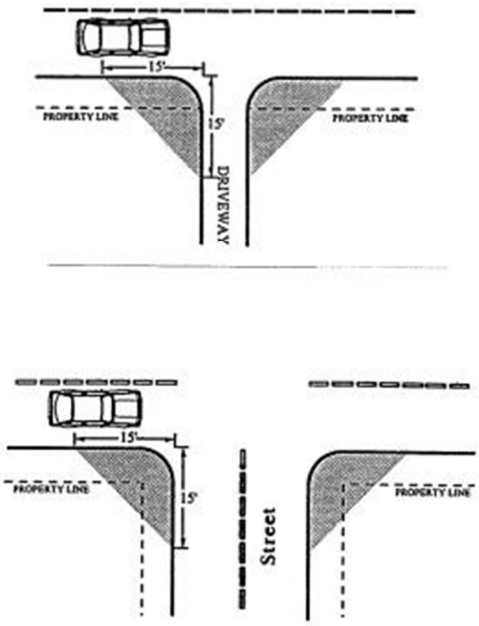
<u>Compliance Statement:</u> New driveway apron along 1st street complies with design standards for City of Fairview "Standard Specifications for Public Works Construction". Criterion met.

M. Fire Access and Parking Area Turnarounds. A fire equipment access drive shall be provided for any portion of an exterior wall of the first story of a building that is located more than 150 feet from an existing public street or approved fire equipment access drive. Parking areas shall provide adequate aisles or turnaround areas for service and delivery vehicles so that all vehicles may enter the street in a forward manner. For requirements related to cul-de-sacs, please refer to Chapter 19.165 FMC.

N. Vertical Clearance. Driveways, private streets, aisles, turnaround areas and ramps shall have a minimum vertical clearance of 13 feet 6 inches for their entire length and width.

O. Vision Clearance. No signs, structures or vegetation in excess of three feet in height shall be placed in "vision clearance areas," as shown above. The city engineer upon finding that more sight distance is required may increase the minimum vision clearance area (i.e., due to traffic speeds, roadway alignment, etc.).

Figure 19.162.020.O – Vision Clearance Areas



<u>Compliance Statement</u>: The Maintenance Center is to be located so that no exterior wall is located more than 150 feet from an existing public street or approved fire equipment access drive. The planned driveways and ramps all have sufficient vertical clearance to meet the city standards. The proposed building is located beyond required 15 foot distance for vision clearance at the adjacent street intersection. The criteria are met.

P. Construction. The following development and maintenance standards shall apply to all driveways and private streets, except that the standards do not apply to driveways serving one single-family detached dwelling:

1. Surface Options. Driveways, parking areas, aisles, and turnarounds may be paved with asphalt, concrete or comparable surfacing, or a durable nonpaving material may be used to reduce surface water runoff and protect water quality. Paving surfaces shall be subject to review and approval by the city engineer.

2. Surface Water Management. When a paved surface is used, all driveways, parking areas, aisles and turnarounds shall have on-site collection or infiltration of surface waters to eliminate sheet flow of such waters onto public rights-of-way and abutting property. Surface water facilities shall be constructed in conformance with city standards.

3. Driveway Aprons. When driveway approaches or “aprons” are required to connect driveways to the public right-of-way, they shall be paved with concrete surfacing.

<u>Compliance Statement:</u> The new driveway approach from 1St Street is to be paved to reduce surface water runoff. The driveway apron connecting the driveway will be paved concrete and coincide with the plan for the new sidewalk extension along 1st Street. The existing yard will remain as a durable gravel lot. Due to the nature of the Public Works Facility, there is a necessity for maintenance activities that need to occur on the existing wellheads located in rear of site. As a result, the gravel surface provides the optimal functionality which has been well maintained for many years by the City Public Works Department. The criterion is met.

19.162.030 Pedestrian Access and Circulation

The standards presented in this code provide standards for safe, connected and user-friendly pedestrian connections and pathways that join neighborhoods and buildings within a development.

A. Pedestrian Access and Circulation. To ensure safe, direct and convenient pedestrian circulation, all developments, except single-family detached housing (i.e., on individual lots), shall provide a continuous pedestrian and/or multi-use pathway system. (Pathways only provide for pedestrian circulation. Multi-use pathways accommodate pedestrians and bicycles.) The

system of pathways shall be designed based on the standards in subsections (A)(1) through (5) of this section:

1. Continuous Pathways. The pathway system shall extend throughout the development site, and connect to all future phases of development, adjacent trails, public parks and open space areas whenever possible. The developer may also be required to connect or stub pathway(s) to adjacent streets and private property, in accordance with the provisions of FMC 19.162.020, Vehicular access and circulation, and the transportation standards in Chapter 19.165 FMC.

2. Safe, Direct, and Convenient Pathways. Pathways within developments shall provide safe, reasonably direct and convenient connections between primary building entrances and all adjacent streets, based on the following definitions:

c. For commercial, industrial, mixed use, public, and institutional buildings, the "primary entrance" is the main public entrance to the building. In the case where no public entrance exists, street connections shall be provided to the main employee entrance

B. Design and Construction. Pathways shall conform to all of the standards in subsections (B)(1) through (B)(5) of this section:

1. Vehicle/Pathway Separation. Where pathways are parallel and adjacent to a driveway or street (public or private), they shall be raised six inches and curbed, or separated from the driveway/street by a five-foot minimum strip with bollards, a landscape buffer, or other physical barrier. If a raised path is used, the ends of the raised portions must be equipped with curb ramps.

2. Housing/Pathway Separation. Pedestrian pathways shall be separated a minimum of five feet from all residential living areas on the ground floor, except at building entrances. Separation is measured as measured from the pathway edge to the closest dwelling unit. The separation area shall be landscaped in conformance with the provisions of Chapter 19.163 FMC, Landscaping, Street Trees, Fences and Walls. No pathway/building separation is required for commercial, industrial, public, or institutional uses.

3. Crosswalks. Where pathways cross a parking area, driveway, or street ("crosswalk"), they shall be clearly marked with contrasting paving materials, humps/raised crossings.

4. Pathway Surface. Pathway surfaces shall be concrete, asphalt, brick/masonry pavers, or other durable surface, at least six feet wide, and shall conform to ADA requirements. Multi-use paths (i.e., for bicycles and pedestrians) shall be the same materials, at least 10 feet wide. (See also Chapter 19.165 FMC, Transportation Standards for public, multi-use pathway standard.)

5. Accessible Routes. Pathways shall comply with the Americans with Disabilities Act, which requires accessible routes of travel.

<u>Compliance Statement:</u> New sidewalk is to be installed in the right-of-way surrounding the site along 1st and Main Street. This will be in conjunction with the city's plan to fully develop the right-of-way along 1st Street. The main pedestrian entrance to the Maintenance Center will be accessed by a paved walkway that connects to the sidewalk system along 1st street – criterion met.

19.163 Landscaping, Street Trees, Fences and Walls

19.163.025 Existing Landscaping

B. Construction. All areas of significant vegetation shall be protected prior to, during, and after construction. Grading and operation of vehicles and heavy equipment is prohibited within significant vegetation areas, except as approved by the city for installation of utilities or streets. Such approval shall only be granted after finding that there is no other reasonable alternative to avoid the protected area, and any required mitigation is provided in conformance with Chapter 19.105 FMC, Floodplain Overlay and Chapter 19.106 FMC, Natural Resource Regulations.

<u>Compliance statement:</u> Due to the nature of the site usage, there is no existing landscaping located on the lot therefore conservation will not be required – criterion met.

19.163.030 New Landscaping

A. Applicability. This section shall apply to all developments requiring site design review, and other developments with required landscaping.
B. Landscaping Plan Required. A landscape plan is required at the time of design review or other pertinent applications. All landscape plans shall conform to the requirements in FMC 19.420.020 (E), Landscape plans.
C. Landscape Area Standards. The minimum percentage of required landscaping equals:

1. Residential districts: 20 percent of the site.
2. Town center commercial district: five percent of the site.
3. General industrial district: 10 percent of the site.
4. Light industrial district: 10 percent of the site.
5. Corridor commercial district: five percent of the site.
6. Neighborhood commercial district: 10 percent of the site.

D. Landscape Materials. This section provides guidelines that ensure significant vegetation growth and establishment using a variety of size specifications and coverage recommendations.
Landscape materials include trees, shrubs, ground cover plants, nonplant ground covers, and outdoor hardscape features, as described below:

1. Native Vegetation. Native vegetation shall be preserved or planted where practicable.

2. Plant Selection. A combination of deciduous and evergreen trees, shrubs and ground covers shall be used for all planted areas, the selection of which shall be based on local climate, exposure, water availability, and drainage conditions. As necessary, soils shall be amended to allow for healthy plant growth.

3. Non-native, invasive plants, as per FMC 19.164.020(B), shall be prohibited.

4. Hardscape features (i.e., patios, decks, plazas, etc.) may cover up to 15 percent of the required landscape area. Swimming pools, sports courts and similar active recreation facilities may not be counted toward fulfilling the landscape requirement.

5. Nonplant Ground Covers. Bark dust, chips, aggregate or other nonplant ground covers may be used, but shall cover no more than five percent of the area to be landscaped. “Coverage” is measured based on the size of plants at maturity or after five years of growth, whichever comes sooner.

6. Tree Size. Trees shall have a minimum caliper size of 1.5 inches or greater, or be six feet or taller, at time of planting.

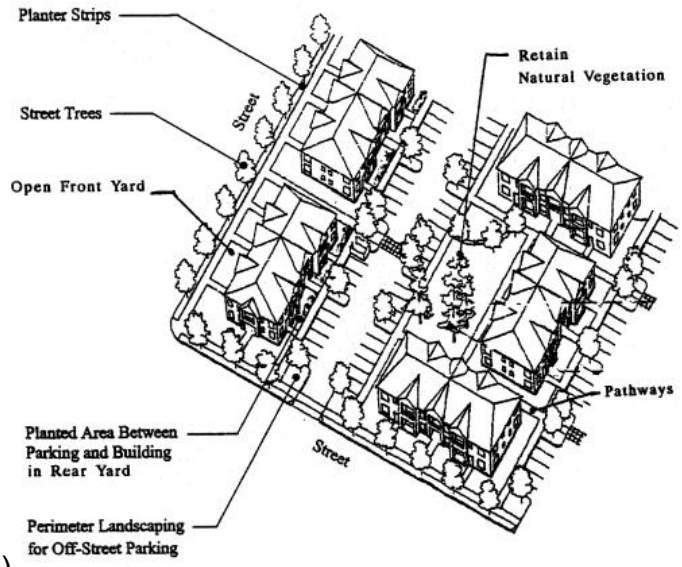
7. Shrub Size. Shrubs shall be planted from one-gallon containers or larger.

8. Ground Cover Size. Ground cover plants shall be sized and spaced so that they grow together to cover a minimum of 80 percent of the underlying soil within three years.

9. Significant Vegetation. Significant vegetation preserved in accordance with FMC 19.163.020 may be credited toward meeting the minimum landscape area standards. Credit shall be granted on a per square foot basis. The street tree standards of FMC 19.163.040 may be waived when trees preserved within the front yard provide the same or better shading and visual quality as would otherwise be provided by street trees.

10. Stormwater Facilities. Stormwater facilities (e.g., detention/retention ponds and swales) shall be landscaped with water tolerant, native plants.

Figure 19.163.030 – Landscape Areas in a Multiple-Family Development



(Typical)

E. Landscape Design Standards. The landscape design standards provide guidelines within setback areas, parking areas, etc.
All yards, parking lots and required street tree planter strips shall be landscaped in accordance with the provisions of this chapter. Landscaping shall be installed with development to provide erosion control, visual interest, buffering, privacy, open space and pathway identification, shading and wind buffering, based on the following standards:

1. Yard Setback Landscaping. Landscaping shall satisfy the following criteria:

a. Provide visual screening and privacy within side and rear yards; while leaving front yards and building entrances mostly visible for security purposes;

b. Use shrubs and trees as windbreaks, as appropriate;

c. Retain natural vegetation, as practicable;

d. Define pedestrian pathways and open space areas with landscape materials;

e. Provide focal points within a development, such as signature trees (i.e., large or unique trees), hedges and flowering plants;

f. Use trees to provide summer shading within common open space areas, and within front yards when street trees cannot be provided;

g. Use a combination of plants for year-long color and interest;

h. Use landscaping to screen outdoor storage and mechanical equipment areas, and to enhance graded areas such as berms, swales and detention/retention ponds.

2. Parking Areas. A minimum of five percent of the combined area of all parking areas, as measured around the perimeter of all parking spaces and maneuvering areas, shall be landscaped. Such landscaping shall consist of an evenly distributed mix of shade trees with shrubs and/or ground cover plants. “Evenly distributed” means that the trees and other plants are distributed around the parking lot perimeter and between parking bays to provide a partial canopy. At a minimum, one tree per five parking spaces total shall be planted to create a partial tree canopy over and around the parking area. All parking areas with more than 20 spaces shall include landscape islands with trees to break up the parking area into rows of not more than 12 contiguous parking spaces. All landscaped areas shall have minimum dimensions of four feet by four feet to ensure adequate soil, water, and space for healthy plant growth.

3. Buffering and Screening Required. Buffering and screening are required under the following conditions:

a. Parking/Maneuvering Area Adjacent to Streets and Drives. Where a parking or maneuvering area is adjacent and parallel to a street or driveway, a decorative wall (masonry or similar quality material), arcade, trellis, evergreen hedge, or similar screen shall be established parallel to the street or driveway. The required wall or screening shall provide breaks, as necessary, to allow for access to the site and sidewalk by pedestrians via pathways. The design of the wall or screening shall also allow for visual surveillance of the site for security. Evergreen hedges used to comply with this standard shall be a minimum of 36 inches in height at maturity, and shall be of such species, number and spacing to

provide the required screening within one year after planting. Any areas between the wall/hedge and the street/driveway line shall be landscaped with plants or other ground cover. All walls shall be maintained in good condition, or otherwise replaced by the owner.

b. Parking/Maneuvering Area Adjacent to Building. Where a parking or maneuvering area, or driveway, is adjacent to a building, the area shall be separated from the building by a raised pathway, plaza, or landscaped buffer no less than four feet in width. Raised curbs, bollards, wheel stops, or other design features shall be used to protect buildings from being damaged by vehicles. When parking areas are located adjacent to residential ground-floor living space, a landscape buffer is required to fulfill this requirement.

c. Screening of Mechanical Equipment, Outdoor Storage, Service and Delivery Areas, and Automobile-Oriented Uses. All mechanical equipment, outdoor storage and manufacturing, and service and delivery areas, shall be screened from view from all public streets and residential districts. Screening shall be provided by one or more of the following: decorative wall (i.e., masonry or similar quality material), evergreen hedge, non-see-through fence, or a similar feature that provides a non-see-through barrier. Walls, fences, and hedges shall comply with the vision clearance requirements and provide for pedestrian circulation, in accordance with Chapter 19.162 FMC, Access and Circulation. (Ord. 6-2001 § 1)

Compliance Statement: ***Landscaping for the project will be designed to meet the requirements of this section. Trees will be installed along pedestrian walkways to reduce the scale of the building and meet necessary area requirements. See section 19.520.020 in regards to Class C Variance application. Due to the nature of the site as a primary operations facility for the City of Fairview, the site needs to be maximized for efficient use of well trucks and fleet.***

There are three existing wells located on site, in which the maintenance trucks need to maneuver around. The turning radii of the trucks will required large clear areas to be able to navigate the site and perform necessary tasks. Therefore, the landscape requirements are required to be kept to a minimum along the perimeter of the yard to meet these requirements. There is an existing 6-foot fence which lines the perimeter of the rear yard and screens the site from public view.

A reduction in landscape area is requested to allow for the project to meet the City's needs for landscaping while still allowing the site to optimally function for daily activities. The landscape plan is included in application indicating compliant landscape materials per city standards. Landscaping is provided along the interior perimeter of the yard at the alley and along Main Street. Landscape improvements to the city right-of-way along 1st and Main Street is also included in the scope of the project. The criteria are met.

19.163.040 Street trees

The guidelines provided in this section promote healthy street trees and adequate canopy cover to provide shade, reduce storm water runoff, and improve the appearance of a development.
Street trees shall be planted for all developments that are subject to land division or site design review. Requirements for street tree planting strips are provided in Chapter 19.165 FMC, Public Facility Standards. Planting of unimproved streets shall be deferred until the construction of curbs and sidewalks. Street trees shall conform to the following standards and guidelines:

A. Soil Preparation, Planting and Care. The developer shall be responsible for planting street trees, including soil preparation, ground cover material, staking, and temporary irrigation for two years after planting. The developer shall also be responsible for tree care (pruning, watering, fertilization, and replacement as necessary) during the first two years after planting.

B. Assurances. The city shall require the developer to provide a performance and maintenance bond in an amount determined by the city engineer, to ensure the planting of the tree(s) and care during the first two years after planting.

C. Growth Characteristics. Trees shall be selected based on growth characteristics and site conditions, including available space, overhead clearance, soil conditions, exposure, and desired color and appearance. The following should guide tree selection:

1. Provide a broad canopy where shade is desired.
2. Use low-growing trees for spaces under utility wires.
3. Select trees which can be “limbed-up” where vision clearance is a concern.
4. Use narrow or “columnar” trees where awnings or other building features limit growth, or where greater visibility is desired between buildings and the street.
5. Use species with similar growth characteristics on the same block for design continuity.
6. Avoid using trees that are susceptible to insect damage, and avoid using trees that produce excessive seeds or fruit.
7. Select trees that are well adapted to the environment, including soil, wind, sun exposure, and exhaust. Drought-resistant trees should be used in areas with sandy or rocky soil.
8. Select trees for their seasonal color, as desired.
9. Use deciduous trees for summer shade and winter sun.

D. Caliper Size. The minimum caliper size at planting shall be 1.5 inches, based on the American Association of Nurserymen Standards.

E. Spacing and Location. Street trees shall be planted within existing and proposed planting strips, and in sidewalk tree wells on streets without planting strips. Street tree spacing shall be based upon the type of tree(s) selected and the canopy size at maturity. In general, trees shall be spaced no more than 30 feet apart, except where planting a tree would conflict with existing trees, retaining walls, utilities and similar physical barriers.

F. Maintenance and Irrigation. The use of drought-tolerant plant species is encouraged, and may be required when irrigation is not available. Irrigation shall be provided for plants that are not drought-tolerant. If the plantings fail to survive, the property owner shall replace them with an equivalent specimen (i.e., evergreen shrub replaces evergreen shrub, deciduous tree replaces deciduous tree, etc.). All other landscape features required by this code shall be maintained in good condition, or otherwise replaced by the owner.

G. Additional Requirements. Additional buffering and screening may be required for specific land uses, as identified by Article II of this title, and the city may require additional landscaping through the conditional use permit process. (Ord. 6-2001 § 1)

Compliance Statement: ***Street trees will be provided along 1st and Main Street. Due to Multnomah County utilities located just below ground surface along 223rd Avenue, landscaping will be minimized so that it does not interfere with county needs. As the Public Works Department of the City of Fairview, the street trees will be kept maintained by the Public Works team. The criteria are met.***

19.163.050 Fences and walls

The fences and walls section provides height limits for construction of new walls. The guidelines prevent walls that reduce pedestrian connectivity and sight clearance. The standards also provide guidelines relating to maintenance. The following standards shall apply to all fences and walls:

A. General Requirements. All fences and walls shall comply with the standards of this section. The city may require installation of walls and/or fences as a condition of development approval, in accordance with conditional use permits or site design review. Walls built for required landscape buffers shall comply with FMC 19.163.030.

B. Dimensions.

1. The maximum allowable height of fences and walls is six feet, as measured from the lowest grade at the base of the wall or fence, except that retaining walls and terraced walls may exceed six feet when permitted as part of a site development approval, or as necessary to construct streets and sidewalks. A building permit is required for walls exceeding six feet in height, in conformance with the Uniform Building Code.

2. The height of fences and walls within a front yard setback shall not exceed four feet (except decorative arbors, gates, etc.), as measured from the grade closest to the street right-of-way.

3. Walls and fences to be built for required buffers shall comply with FMC 19.163.030.

4. Fences and walls shall comply with the vision clearance standards of FMC 19.162.020.

C. Maintenance. For safety and for compliance with the purpose of this chapter, walls and fences required as a condition of development approval shall be maintained in good condition, or otherwise replaced by the owner.

<u>Compliance Statement:</u> The existing fence surrounding the majority of the property will remain on site at 6 feet height. The criterion is met.

19.164 Vehicle and Bicycle Parking

19.164.030 Vehicle Parking Standards

A. The minimum number of required off-street vehicle parking spaces (i.e., parking that is located in parking lots and garages and not in the street right-of-way) shall be determined based on the standards in Table 19.164.030.A. There is no minimum number of off-street parking spaces required in the town center commercial district; however, the "maximum parking" standards of this chapter apply.

Table 19.164.030.A

Vehicle Parking – Minimum Standards Option

The number of required off-street vehicle parking spaces shall be determined in accordance with the following standards. Off-street parking spaces may include spaces in garages, carports, parking lots, and/or driveways so long as vehicles are not parked in a vehicle travel lane (including emergency or fire access lanes), public right-of-way, pathway or landscape area. Credit shall be allowed for "on-street parking," as provided in FMC 19.164.030(B). Parking ratios are based on spaces per 1,000 square feet of gross leasable area unless

Industrial Uses:

Public Utilities (Gas, Water, Telephone, Etc.), Not Including Business Offices. One space per each employee on the largest shift, plus one space per company vehicle.

B. Credit for On-Street Parking.

1. The credit for on-street parking allows a reduction of one off-street parking space for every one on-street parking space adjacent to the development if deemed appropriate by the city.

2. On-Street Parking Credit. The amount of off-street parking required shall be reduced by one off-street parking space for every uncommitted on-street parking space adjacent to the development. On-street parking shall follow the established configuration of existing on-street parking, except that angled parking may be allowed for some streets, where permitted by city standards. The following constitutes an on-street parking space:

a. Parallel parking, each 24 feet of uninterrupted curb;

b. Fifty-degree diagonal, each with 12 feet of curb;

c. Ninety-degree (perpendicular) parking, each with 10 feet of curb;

d. Curb space must be connected to the lot which contains the use;

e. Parking spaces that would not obstruct a required clear vision area, nor any other parking that violates any law or street standard; and

f. On-street parking spaces credited for a specific use may not be used exclusively by that use, but shall be available for general public use at all times. No signs or actions limiting general public use of on-street spaces is permitted.

C. Parking Location and Shared Parking.

1. Location. Vehicle parking is allowed only on approved parking shoulders (streets), within garages, carports and other structures, or on driveways or parking lots that have been developed in conformance with this code. Specific locations for parking are indicated in Article II of this title for some land uses (e.g., the requirement that parking be located to side or rear of buildings, with access from alleys, for some uses). (See also Chapter 19.162 FMC, Access and Circulation.)

2. Off-Site Parking. Except for single-family dwellings, the vehicle parking spaces required by this chapter may be located on another parcel of land, provided the parcel is within 500 feet walking distance of the use it serves. The distance from the parking area to the use shall be measured from the nearest parking space to a building entrance, following a sidewalk or other pedestrian route. The right to use the off-site parking must be evidenced by a recorded deed, lease, easement, or similar written instrument.

3. Mixed Uses. If more than one type of land use occupies a single structure or parcel of land, the total requirements for off-street vehicle parking shall be the sum of the requirements for all uses, unless it can be shown that the peak parking demands are actually less (i.e., the uses operate on different days or at different times of the day). In that case, the total requirements shall be reduced accordingly.

4. Shared Parking. Required parking facilities for two or more uses, structures, or parcels of land may be satisfied by the same parking facilities used jointly, to the extent that the owners or operators show that the need for parking facilities does not materially overlap (e.g., uses primarily of a daytime versus nighttime nature), and provided that the right of joint use is evidenced by a recorded deed, lease, contract, or similar written instrument establishing the joint use.

5. Availability of Facilities. Owners of off-street parking facilities may post a sign indicating that all parking on the site is available only for residents, customers and/or employees, as applicable. Signs shall conform to the standards of Chapter 19.170 FMC, Sign Regulations.

D. Maximum Number of Parking Spaces. The number of parking spaces provided shall not exceed the standards in the following table:

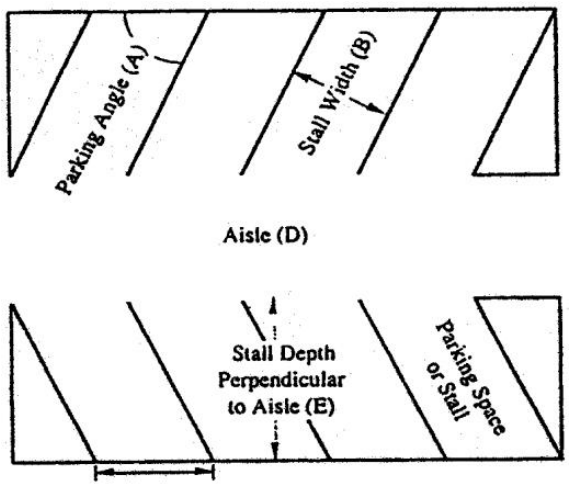
Use	Maximum in Transit/Ped. Areas	Maximum in All Other Areas
Light Industrial	none	none

<u>Compliance Statement:</u> The proposed Public Works Maintenance Center contains 5 vehicle storage bays which can accommodate 3 vehicles each, for a total of 15 cars. The Public Works fleet currently consists of 10 vehicles with 8 permanent fleet workers. The parking within the vehicle storage bays along with the three proposed parking spaces in the gravel yard would meet the needs for the facility.

E. Parking Management. The planning director may require a parking management plan for development of any use that requires more than 10 parking spaces based on the minimum parking spaces provided in Table 19.164.030.A. The parking management plan shall be prepared by a qualified parking or traffic consultant or certified engineer and should include the following:

1. Defining a study area and time period necessary to evaluate parking supply and demand in the area consistent with the planning period for the city's transportation system plan.
2. Surveying the capacity of the parking supply options in the study area such as shared parking, transit stations or other high-efficiency parking management alternatives.
3. Defining a study area and time period necessary to evaluate parking supply and demand in the area consistent with the planning period for the city's transportation system plan.
4. Surveying the capacity of the parking supply options in the study area such as shared parking, transit stations or other high-efficiency parking management alternatives.

F. Parking Stall Standard Dimensions and Compact Parking Spaces. All off-street parking stalls shall be improved to conform to city standards for surfacing, stormwater management and striping, and provide dimensions in accordance with the following table. Disabled person parking shall conform to the standards and dimensions of this chapter. The number of compact parking spaces shall not exceed 40 percent of all parking spaces provided on site.
Figure 19.164.030.F – Parking Stall Standard Dimensions and Compact Car Parking



90°	Standard Compact Disabled	9 ft. 7 ft. 6 in.	9 ft. 7 ft. 6 in.	24 ft. 22 ft.	24 ft. 24 ft.	19 ft. 15 ft.

H. Disabled Person Parking Spaces. The following parking shall be provided for disabled persons, in conformance with the Americans with Disabilities Act (Figure 19.164.030.H):

Figure 19.164.030.H – Disabled Person Parking Spaces

Minimum Number of Accessible Parking Spaces
ADA Standards for Accessible Design 4.1.2 (5)

Total Number of Parking spaces Provided (per lot)	Total Minimum Number of Accessible Parking Spaces (60" & 96" aisles)	Van Accessible Parking Spaces with min. 96" wide access aisle	Accessible Parking Spaces with min. 60" wide access aisle
	Column A		
1 to 25	1	1	0
26 to 50	2	1	1
51 to 75	3	1	2
76 to 100	4	1	3
101 to 150	5	1	4
151 to 200	6	1	5
201 to 300	7	1	6
301 to 400	8	1	7
401 to 500	9	2	7
501 to 1000	2% of total parking provided in each lot	1/8 of Column A*	7/8 of Column A**
1001 and over	20 plus 1 for each 100 over 1000	1/8 of Column A*	7/8 of Column A**

* one out of every 8 accessible spaces ** 7 out of every 8 accessible parking spaces

<u>Compliance Statement:</u> There are 3 off-street parking stalls provided on site for the fleet. The parking stalls are to be located in the gravel lot in the rear of the site along 223rd Avenue. Since there are 1 to 25 parking spaces provided, one of the parking stalls will be required to be accessible. The

paved ADA stall is to be located near the yard entrance to the building – see site plan. The criteria are met.

19.164.040 Bicycle parking standards

All uses which are subject to site design review shall provide bicycle parking, in conformance with the following standards, which are evaluated during site design review:

A. Number of Bicycle Parking Spaces. A minimum of two bicycle parking spaces per use is required for all uses with greater than 10 vehicle parking spaces. The following additional standards apply to specific types of development:

1. Multifamily Residences. Every residential use of four or more dwelling units shall provide bicycle parking spaces according to the following standards:

a. Short-term bicycle parking shall be provided at a ratio of one bicycle space for every 10 vehicle parking spaces and shall be located within 30 feet of the main entrance to the building, in a location that is easily accessible for bicycles.

b. Long-term bicycle parking shall be provided at a ratio of one bicycle space per dwelling unit. Sheltered bicycle parking spaces may be located within a garage, storage shed, basement, utility room or similar area. In those instances in which the residential complex has no garage or other easily accessible storage unit, the bicycle parking spaces may be sheltered from sun and precipitation under an eave, overhang, an independent structure, or similar cover.

2. Commercial Retail, Office, and Institutional Developments. Commercial retail, office, and institutional developments shall provide bicycle parking spaces according to the following standards:

a. Short-term bicycle parking shall be provided at a ratio of one bicycle space for every 10 vehicle parking spaces and shall be located within 50 feet of the main entrance to the building, in a location that is easily accessible for bicycles.

b. Long-term bicycle parking shall be provided at a ratio of one bicycle space per employee.

3. Schools. Elementary and middle schools, both private and public, shall provide one bicycle parking space for every eight students and employees. High schools shall provide one bicycle parking space for every five students and employees. All spaces shall be long-term spaces sheltered under an eave, overhang, independent structure, or similar cover.

4. Colleges and Trade Schools. Colleges and trade schools shall provide one bicycle parking space for every eight motor vehicle spaces plus one space for every dormitory unit. Fifty percent of the bicycle parking spaces shall be sheltered under an eave, overhang, independent structure, or similar cover.

5. Town Center Commercial District. Within the town center commercial district, bicycle parking for customers shall be provided along

the street at a rate of at least one space per use. Individual uses shall provide their own parking, or spaces may be clustered to serve up to six bicycles. Bicycle parking spaces shall be located in front of the stores along the street, either on the sidewalks or in specially constructed areas such as pedestrian curb extensions. Inverted “U” style racks are recommended. Bicycle parking shall not interfere with pedestrian passage, leaving a clear area of at least 36 inches between bicycles and other existing and potential obstructions. Customer spaces may or may not be sheltered. When provided, sheltered parking (within a building, or under an eave, overhang, or similar structure) shall be provided at a rate of one space per 10 employees, with a minimum of one space per store.

6. Multiple Uses. For buildings with multiple uses (such as a commercial or mixed use center), bicycle parking standards shall be calculated by using the total number of motor vehicle parking spaces required for the entire development. A minimum of one bicycle parking space for every 10 motor vehicle parking spaces is required.

B. Exemptions. This section does not apply to single-family, two-family, and three-family housing (attached, detached or manufactured housing), home occupations, agriculture and livestock uses, or other developments with fewer than eight vehicle parking spaces.

C. Location and Design. Bicycle parking shall be conveniently located with respect to both the street right-of-way and at least one building entrance (e.g., no farther away than the closest parking space). It should be incorporated whenever possible into building design and coordinated with the design of street furniture when it is provided. Street furniture includes benches, streetlights, planters and other pedestrian amenities.

D. Visibility and Security. Bicycle parking should be visible to cyclists from street sidewalks or building entrances, so that it provides sufficient security from theft and damage.

E. Options for Storage. Bicycle parking requirements for long-term and employee parking can be met by providing a bicycle storage room, bicycle lockers, racks, or other secure storage space inside or outside of the building.

F. Lighting. Bicycle parking shall be at least as well lit as vehicle parking for security.

G. Reserved Areas. Areas set aside for bicycle parking shall be clearly marked and reserved for bicycle parking only.

H. Hazards. Bicycle parking shall not impede or create a hazard to pedestrians. Parking areas shall be located so as to not conflict with vision clearance standards (Chapter 19.162 FMC, Access and Circulation). (Ord. 2-2017 § 1 (Exh. A); Ord. 6-2001 § 1)

Compliance Statement: ***The facility currently accommodates 8 vehicles. The requirement for one bicycle space for every 10 vehicles does not apply. The criterion is not applicable.***

Chapter 19.165 Public Facility Standards

19.165.025 Transportation improvements

A. Development Standards. No development shall occur unless the development has frontage or approved access to a public street, in conformance with the provisions of Chapter 19.162 FMC, Access and Circulation, and the following standards are met:

1. Streets within or adjacent to a development shall be improved in accordance with the transportation system plan and the provisions of this chapter;

2. Development of new streets, and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance with this section, and public streets shall be dedicated to the applicable city, county or state jurisdiction;

3. New streets and drives connected to a collector or arterial street shall be paved; and

4. The city may accept a future improvement guarantee (e.g., owner agrees not to remonstrate (object) against the formation of a local improvement district in the future) in lieu of street improvements if one or more of the following conditions exist:

a. A partial improvement may create a potential safety hazard to motorists or pedestrians;

b. Due to the developed condition of adjacent properties it is unlikely that street improvements would be extended in the foreseeable future and the improvement associated with the project under review does not, by itself, provide increased street safety or capacity, or improved pedestrian circulation;

c. The improvement would be in conflict with an adopted capital improvement plan; or

d. The improvement is associated with an approved land partition on property zoned residential and the proposed land partition does not create any new streets.

B. Variances. Variances to the transportation design standards in this section may be granted by means of a Class B variance, as governed by Article V of this title, Exceptions to Code Standards. A variance may be granted under this provision only if a required improvement is not feasible due to topographic constraints or constraints posed by sensitive lands Chapter 19.106 FMC.

C. Creation of Rights-of-Way for Streets and Related Purposes. Streets shall be created through the approval and recording of a final subdivision or partition plat; except the city may approve the creation of a street by acceptance of a deed; provided, that the street is deemed essential by the city council for the purpose of implementing the transportation system plan, and the deeded right-of-way conforms to the standards of this code. All deeds of dedication shall be in a form prescribed by the city engineer and shall name “the public” as grantee.

D. Creation of Access Easements. The city may approve an access easement established by deed when the easement is necessary to provide for access and circulation in conformance with Chapter 19.162 FMC, Access and

Circulation. Setback standards do not permit conflicting structures to be built in public easements.

E. Street Location, Width and Grade. Except as noted below, the location, width and grade of all streets shall conform to the transportation system plan, and an approved street plan or subdivision plat. Street location, width and grade shall be determined in relation to existing and planned streets, topographic conditions, public convenience and safety, and in appropriate relation to the proposed use of the land to be served by such streets:

1. Street grades shall be approved by the city engineer in accordance with the design standards in subsection O of this section; and

2. Where the location of a street is not shown in an existing street plan (see subsection H of this section), the location of streets in a development shall either:

a. Provide for the continuation and connection of existing streets in the surrounding areas, conforming to the street standards of this chapter, or

b. Conform to a street plan adopted by the planning commission, if it is impractical to connect with existing street patterns because of particular topographical or other existing conditions of the land. Such a plan shall be based on the type of land use to be served, the volume of traffic, the capacity of adjoining streets and the need for public convenience and safety.

F. Minimum Rights-of-Way and Street Sections. Street rights-of-way and improvements shall be the widths as required in the “Standards” section of the Fairview transportation system plan. A variance shall be required to vary the standards found in the Fairview transportation system plan. Where a range of width is indicated, the width shall be determined by the decision-making authority based upon the following factors:

1. Street classification in the transportation system plan;
2. Anticipated traffic generation;
3. On-street parking needs;
4. Sidewalk and bikeway requirements based on anticipated level of use;
5. Requirements for placement of utilities;
6. Street lighting;
7. Minimize drainage, slope, and sensitive lands impacts, as identified by Chapter 19.106 FMC;
8. Street tree location, as provided for in Chapter 19.163 FMC;
9. Protection of significant vegetation, as provided for in Chapter 19.163 FMC;
10. Safety and comfort for motorists, bicyclists, and pedestrians;
11. Street furnishings (e.g., benches, lighting, bus shelters, etc.), when provided;
12. Access needs for emergency vehicles; and
13. Transition between different street widths (i.e., existing streets and new streets), as applicable.

G. Traffic Signals and Neighborhood Traffic Management.

1. Traffic management features, such as traffic circles, curb extensions, narrow residential streets, and special paving, may be used to slow traffic in neighborhoods and areas with high pedestrian traffic.

2. Traffic signals shall be required with development when traffic signal warrants are met, in conformance with the Highway Capacity Manual and Manual of Uniform Traffic Control Devices. The location of traffic signals shall be noted on approved street plans. Where a proposed street intersection will result in an immediate need for a traffic signal, a signal meeting approved specifications shall be installed. The developer's cost and the timing of improvements shall be included as a condition of development approval.

3. Preferred neighborhood traffic management tools are detailed in the Fairview transportation system plan.

H. Future Street Plan and Extension of Streets.

1. A future street plan shall be filed by the applicant in conjunction with an application for a subdivision in order to facilitate orderly development of the street system. The plan shall show the pattern of existing and proposed future streets from the boundaries of the proposed land division and shall include other parcels within 500 feet surrounding and adjacent to the proposed land division. The street plan is not binding; rather it is intended to show potential future street extensions with future development.

2. Streets shall be extended to the boundary lines of the parcel or tract to be developed, when the city council determines that the extension is necessary to give street access to, or permit a satisfactory future division of, adjoining land. The point where the streets temporarily end shall conform to subsections (H)(2)(a) through (d) of this section:

a. These extended streets or street stubs to adjoining properties are not considered to be cul-de-sacs since they are intended to continue as through streets when the adjoining property is developed.

b. A barricade (e.g., fence, bollards, boulders or similar vehicle barrier) shall be constructed at the end of the street by the subdivider and shall not be removed until authorized by the city or other applicable agency with jurisdiction over the street. The cost of the barricade shall be included in the street construction cost.

c. Temporary turnarounds (e.g., hammerhead or bulb-shaped configuration) shall be constructed for stub streets over 150 feet in length.

d. In the case of dead-end stub streets that will connect to streets on adjacent sites in the future, notification that the street is planned for future extension shall be posted on the stub street until the street is extended and shall inform the

public that the dead-end street may be extended in the future.

I. Street Alignment and Connections.

1. Mixed-use and residential development proposed on sites five acres or greater must submit a site plan that identifies conceptual street connections that are consistent with the transportation system plan.

2. Staggering of streets making “T” intersections at collectors and arterials shall not be designed so that jogs of less than 300 feet on such streets are created, as measured from the centerline of the street.

3. Spacing between local street intersections shall have a minimum separation of 125 feet, except where more closely spaced intersections are designed to provide an open space, pocket park, common area or similar neighborhood amenity. This standard applies to four-way and three-way (offset) intersections.

4. All local and collector streets which abut a development site shall be extended within the site to provide through circulation unless the applicant demonstrates that extension is prevented by environmental or topographical constraints, existing development patterns or compliance with other standards in this code. This exception applies when it is not possible to redesign or reconfigure the street pattern to provide required extensions. Land is considered topographically constrained if the slope is greater than 15 percent for a distance of 250 feet or more. In the case of environmental or topographical constraints, the mere presence of a constraint is not sufficient to show that a street connection is not possible. The applicant must show why the environmental or topographic constraint precludes some reasonable street connection.

5. Proposed streets or street extensions shall be located to provide direct access to existing or planned commercial services and other neighborhood facilities, such as schools, shopping areas and parks and transit facilities.

6. In order to promote efficient vehicular and pedestrian circulation throughout the city, the design of subdivisions and alignment of new streets shall conform to the following standards in Chapter 19.162 FMC, Access and Circulation. The maximum block length shall not exceed:

a. Five hundred thirty feet in the residential district;

b. Two hundred feet in the town center commercial district, except as provided by FMC 19.65.050, Block layout and building orientation;

c. Not applicable to the general industrial district;

d. Seven hundred feet in the light industrial district, except as required for commercial developments subject to Chapter 19.80 FMC;

e. Three hundred feet in the corridor commercial district;

f. Three hundred feet in the neighborhood commercial district.

7. A variance to street spacing standards may be granted pursuant to FMC 19.520.030 (Class B variances) when resources are present that

are mapped on the Natural Resources Map, where street spacing can be achieved at a minimum of 800 feet and no greater than 1,200 feet.

8. Exceptions to the standards in this subsection may be granted when:

a. Habitat quality or the length of the crossing required prevents a full street connection, pursuant to Chapter 19.106 FMC;

b. An access way is provided at or near midblock, in conformance with the provisions of Chapter 19.162 FMC.

J. Sidewalks, Planter Strips, Bicycle Lanes. Sidewalks, planter strips, and bicycle lanes shall be installed in conformance with applicable provisions of the transportation system plan, the Comprehensive Plan, and adopted street plans. Maintenance of sidewalks, curbs, and planter strips is the continuing obligation of the adjacent property owner. All work must comply with the city of Fairview public works construction standards.

K. Internal Pathways. Pathways shall be at least five feet in unobstructed width and shall be constructed to sidewalk standards found in Standard Specifications for Public Works Construction, or according to Multnomah County or ODOT standards as applicable. The property owner shall keep a minimum of five feet of the pathway width clear of both permanent and temporary obstructions (e.g., utility poles, sandwich signs). Maintenance of internal pathways is the continuing obligation of the property owner or adjacent property owner. All work must comply with the city of Fairview public works construction standards.

L. Intersection Angles. Streets shall be laid out so as to intersect at an angle as near to a right angle as practicable, except where topography requires a lesser angle or where a reduced angle is necessary to provide an open space, pocket park, common area or similar neighborhood amenity. In addition, the following standards shall apply:

1. Streets shall have at least 25 feet of tangent adjacent to the right-of-way intersection unless topography requires a lesser distance;

2. Intersections which are not at right angles shall have a minimum corner radius of 20 feet along the right-of-way lines of the acute angle; and

3. Right-of-way lines at intersection with arterial streets shall have a corner radius of not less than 20 feet.

M. Existing Rights-of-Way. Whenever existing rights-of-way adjacent to or within a tract are of less than standard width, additional rights-of-way shall be provided at the time of subdivision or development, subject to the provision of FMC 19.165.025 (C).

N. Cul-de-Sacs. A dead-end street shall be no more than 200 feet long, shall not provide access to greater than eight dwelling units, and shall only be used when environmental or topographical constraints, existing development patterns, or compliance with other standards in this code preclude street extension and through circulation:

1. All cul-de-sacs shall terminate with a circular turnaround. Circular turnarounds shall have a radius of no less than 25 feet, and not more than a radius of 40 feet (i.e., from center to edge of pavement); except that turnarounds may be larger when they contain a landscaped island or

parking bay in their center. When an island or parking bay is provided, there shall be a fire apparatus lane of 20 feet in width; and

2. The length of the cul-de-sac shall be measured along the centerline of the roadway from the near side of the intersecting street to the farthest point of the cul-de-sac.

O. Grades and Curves. Grades shall not exceed 10 percent on arterials, 12 percent on collector streets, or 12 percent on any other street (except that local or residential access streets may have segments with grades up to 15 percent for distances of no greater than 250 feet), and:

1. Centerline curve radii shall not be less than 700 feet on arterials, 500 feet on major collectors, 350 feet on minor collectors, or 100 feet on other streets; and

2. Streets intersecting with a minor collector or greater functional classification street, or streets intended to be posted with a stop sign or signalization, shall provide a landing averaging five percent or less. Landings are that portion of the street within 20 feet of the edge of the intersecting street at full improvement.

P. Curbs, Curb Cuts, Ramps, and Driveway Approaches. Concrete curbs, curb cuts, wheelchair, bicycle ramps and driveway approaches shall be constructed in accordance with standards specified in Chapter 19.162 FMC, Access and Circulation.

Q. Streets Adjacent to Railroad Right-of-Way. Wherever the proposed development contains or is adjacent to a railroad right-of-way, a street approximately parallel to and on each side of such right-of-way at a distance suitable for the appropriate use of the land shall be created. New railroad crossings and modifications to existing crossings are subject to review and approval by Oregon Department of Transportation.

R. Development Adjoining Arterial Streets. Where a development adjoins or is crossed by an existing or proposed arterial street, the development design shall separate residential access and through traffic, and shall minimize traffic conflicts. The design shall include one or more of the following:

1. A parallel access street along the arterial with a landscape buffer separating the two streets;

2. Deep lots abutting the arterial or major collector to provide adequate buffering with frontage along another street. Double-frontage lots shall conform to the buffering standards in FMC 19.163.030;

3. Screen planting at the rear or side property line to be contained in a non-access reservation (e.g., public easement or tract) along the arterial;

4. Other treatment suitable to meet the objectives of this subsection; or

5. If a lot has access to two streets with different classifications, primary access shall be from the lower classification street, in conformance with Chapter 19.162 FMC.

S. Alleys, Public or Private. Alleys shall conform to the standards in the Fairview transportation system plan. While alley intersections and sharp changes in alignment shall be avoided, the corners of necessary alley intersections shall have a radius of not less than 12 feet.

T. Private Streets. Private streets shall not be used to avoid connections with public streets. Gated communities (i.e., where a gate limits access to a development from a public street) are prohibited. Design standards for private streets shall conform to the provisions of the Fairview transportation system plan.

U. Street Names. No street name shall be used which will duplicate or be confused with the names of existing streets in Multnomah County, except for extensions of existing streets. Street names, signs and numbers shall conform to the established pattern in the surrounding area, except as requested by emergency service providers.

V. Survey Monuments. Upon completion of a street improvement and prior to acceptance by the city, it shall be the responsibility of the developer's registered professional land surveyor to provide certification to the city that all boundary and interior monuments shall be reestablished and protected.

W. Street Signs. The city, county or state with jurisdiction shall install all signs for traffic control and street names. The cost of signs required for new development shall be the responsibility of the developer. Street name signs shall be installed at all street intersections. Stop signs and other signs may be required.

X. Mail Boxes. Plans for mail boxes to be used shall be approved by the United States Postal Service.

Y. Streetlight Standards. Streetlights shall be installed in accordance with city standards.

Z. Street Cross-Sections. All street cross-sections must comply with the Standard Specifications for Public Works Construction pages 40-51. The final lift of asphalt or concrete pavement shall be placed on all new constructed public roadways prior to final city acceptance of the roadway and within one year of the conditional acceptance of the roadway unless otherwise approved by the city engineer. The final lift shall also be placed no later than when 90 percent of the structures in the new development are completed or one year from the commencement of initial construction of the development, whichever is less. All work must comply with public works construction standards.

1. Sub-base and leveling course shall be of select crushed rock;
2. Surface material shall be of Class C or B asphaltic concrete;
3. The final lift shall be Class C asphaltic concrete as defined by APWA standard specifications; and
4. No lift shall be less than one and one-half inches in thickness.

(Ord. 2-2017 § 1 (Exh. A); Ord. 3-2012 § 6; Ord. 6-2001 § 1)

<u>Compliance Statement:</u> The Access and Circulation requirements as highlighted in Chapter 19.162 and mentioned above have been met per the site design. The upgrade to the Public Works Maintenance Facility will include the development of the right-of-way just outside the extents of the property line per city standards. The proposed upgrade will include new landscaping to be planted along 1st and Main Street. Since the nature of the site is less than 5 acres with no street subdivisions, there will not be a need for a site plan showing street alignment and connections. The development of new curbs, driveway approaches, and grades will comply with the standards indicated in Chapter 19.162.

19.165.040 Sanitary sewer and water service improvements

The sanitary sewer and water service improvements ensure adequate sanitary sewer services to new developments.

A. Sewers and Water Mains Required. Sanitary sewers and water mains shall be installed to serve each new development and to connect developments to existing mains in accordance with the city's construction specifications and the applicable Comprehensive Plan policies.

B. Sewer and Water Plan Approval. Development permits for sewer and water improvements shall not be issued until the city engineer has approved all sanitary sewer and water plans in conformance with city standards.

C. Oversizing. Proposed sewer and water systems shall be sized to accommodate additional development within the area as projected by the Comprehensive Plan. The developer shall be entitled to system development charge credits for the oversizing.

D. Permits Denied. Development permits may be restricted by the city where a deficiency exists in the existing water or sewer system which cannot be rectified by the development and which if not rectified will result in a threat to public health or safety, surcharging of existing mains, or violations of state or federal standards pertaining to operation of domestic water and sewerage treatment systems. Building moratoriums shall conform to the criteria and procedures contained in ORS 197.505 to 197.520. (Ord. 6-2001 § 1)

Compliance Statement: ***The scope of the project does not include any public sanitary sewer and water service improvements. The criterion is not applicable.***

19.165.050 Storm Drainage

The storm drainage section requires developers to accommodate and treat stormwater runoff from buildings and parking lots.

A. General Provisions. The city shall issue a development permit only where adequate provisions for stormwater and floodwater runoff have been made.

B. Accommodation of Upstream Drainage. Culverts and other drainage facilities shall be large enough to accommodate potential runoff from the entire upstream drainage area, whether inside or outside the development. Such facilities shall be subject to review and approval by the city engineer.

C. Effect on Downstream Drainage. Where it is anticipated by the city engineer that the additional runoff resulting from the development will overload an existing drainage facility, the city may deny approval of the development permit unless provisions have been made for improvement of the potential condition or until provisions have been made for storage of additional runoff caused by the development in accordance with city standards.

D. Easements. Where a development is traversed by a watercourse, drainage way, channel or stream, there shall be provided a stormwater easement or drainage right-of-way conforming substantially with the lines of such

watercourse and such further width as will be adequate for conveyance and maintenance. (Ord. 6-2001 § 1)

Compliance Statement: ***The scope of the project does not include any public storm drainage improvements. The criterion is not applicable.***

19.165.060 Utilities

The utilities section provides standards regarding electric lines and cable. Many types of utilities now must be installed underground for safety and aesthetic purposes.

A. Underground Utilities. All utility lines including, but not limited to, those required for electric, communication, lighting and cable television services and related facilities shall be placed underground, except for surface-mounted transformers, surface-mounted connection boxes and meter cabinets which may be placed above ground, temporary utility service facilities during construction, and high capacity electric lines operating at 50,000 volts or above. The following additional standards apply to all new subdivisions, in order to facilitate underground placement of utilities:

1. The developer shall make all necessary arrangements with the serving utility to provide the underground services. Care shall be taken to ensure that all above ground equipment does not obstruct vision clearance areas for vehicular traffic;
2. The city reserves the right to approve the location of all surface-mounted facilities;
3. All underground utilities, including sanitary sewers and storm drains installed in streets by the developer, shall be constructed prior to the surfacing of the streets; and
4. Stubs for service connections shall be long enough to avoid disturbing the street improvements when service connections are made.

B. Easements. Easements shall be provided for all underground utility facilities.

C. Exception to Undergrounding Requirement. The standard applies only to proposed subdivisions. An exception to the undergrounding requirement may be granted due to physical constraints, such as steep topography, sensitive lands, Chapter 19.106 FMC, or existing development conditions. (Ord. 3-2012 § 6; Ord. 6-2001 § 1)

Compliance Statement: ***The scope of the project does not include any public utilities improvements. The criterion is not applicable.***

Chapter 19.520 Variances

19.520.040 Class C variance

A. Purpose. ***The City of Fairview seeks a variance to reduce the required landscape for the new public works shop, which exceeds the Class A and Class B variance criteria in article 19.420. The site is constrained and must be accessible for large vehicles, major construction***

equipment, and other work associated with maintaining the critical infrastructure of the city. The storage area of the site is not accessible to the public, is screened from the public view, and is required to be secured due to the presence of a critical water supply source. The City intends to upgrade the screening and buffering of the site, but needs to limit the landscape on the site to an absolute minimum to allow for the required uses of the site. The landscape proposed for the site is shown on the landscape plan and is limited to the perimeter where impacts to operations are minimal. The total area proposed for landscape is 2,051 SF. This is 2,051 SF more than the existing landscape area. This is an area that has very specific uses, is not accessible or visible to the public and therefore this request has no impact on any other lot or property in the city.

Class C variances may be granted if the applicant shows that, owing to special and unusual circumstances related to a specific property, the literal application of the standards of the applicable land use district would create a hardship to development which is peculiar to the lot size or shape, topography, sensitive lands, or other similar circumstances related to the property over which the applicant has no control, and which are not applicable to other properties in the vicinity (e.g., the same land use district); except that no variances to "permitted uses" shall be granted.

Compliance Statement: ***This site meets this description perfectly, and is unique amongst all other properties in the city. The site is secured, not accessible to the public, and contains critical drinking water infrastructure that is required to be protected at all times. The current design has been proposed to provide assurances that the equipment and facilities can be accessed, maintained and serviced at all times. Flexibility is key in this area of the facility, as large trucks and equipment need unobstructed access to perform their required activities effectively. This use is unique in the R/CSP zone. The well was located at this site due to the presence of desirable aquifer conditions, and is subject to regular maintenance and operational activities using large pieces of equipment such as semi-tricks, drill rigs, cranes and well rehabilitation equipment. The site is very constrained and any landscape contributes to the constraint on effective operation and maintenance of the three wells on the site.***

B. Applicability.

1. The variance standards are intended to apply to individual platted and recorded lots only.

Compliance Statement: ***This site meets this criterion.***

2. An applicant who proposes to vary a specification standard for lots yet to be created through a subdivision process may not utilize the Class C variance procedure.

<u>Compliance Statement:</u> The criterion is not applicable. This is an existing lot.

3. A variance shall not be approved which would vary the "permitted uses" of a land use district.

<u>Compliance Statement:</u> There are no proposed changes to the uses of this site.

C. Approvals Process and Criteria.

1. The City offers the following reasoning for the variance, which would be commensurate and complying with the requirements of subsection (C)(2):

a. The proposed variance will not be materially detrimental to the purposes of this code, to any other applicable policies and standards, and to other properties in the same land use district or vicinity.

<u>Compliance Statement:</u> This site is unique in its type and functions as a public works facility primarily serving as a groundwater source for the city water system and as a storage yard and depot for various pieces of equipment. This is an existing, well-established use of this property that has been sited (circa 1949) for its centrally located position in the city and also as a result of the favorable aquifer accessibility. Reduction or elimination of landscaping would not be detrimental to the neighborhood as the site is intentionally screened from public view due the sensitive nature of the source of a public water supply and the associated restrictions placed on such facilities by Homeland Security.

b. A hardship to development exists which is peculiar to the lot size or shape, topography, sensitive lands, or other similar circumstances related to the property over which the applicant has no control, and which are not applicable to other properties in the vicinity:

<u>Compliance Statement:</u> This site contains two active groundwater wells that are critical to the needs of the city. Due to this criticality, the site has to be secure and as such is surrounded by a fence to prevent unauthorized access. These wells are located in the northeast corner (Well 9) and almost dead center (Well 5) and have associated building adjacent that make the site additionally constrained for access. The site also currently houses the existing public works shop, which is being replaced due to seismic deficiencies. As the

primary base for all the city's critical infrastructure, this site is unique in its location, application, and needs, and is also undersized for its overall function therefore every square foot of area that is available is currently in use.

c. The use proposed will be the same as permitted under this title and city standards will be maintained to the greatest extent that is reasonably possible while permitting reasonable economic use of the land.

Compliance Statement: ***There is no change of use proposed for this site. The water wells have to be available for continuous service and therefore there are no feasible options to change this use of this property.***

d. Existing physical and natural systems, such as but not limited to traffic, drainage, natural resources, and parks will not be adversely affected any more than would occur if the development occurred as specified by the subject code standard.

Compliance Statement: ***There are no changes to this use and reducing the landscape area will not adversely impact traffic, drainage, natural resources, or parks. The site is not visible, intentionally, from the street as the site contains critical infrastructure that is to be protected and monitored.***

e. The hardship is not self-imposed.

Compliance Statement: ***The city is required to provide critical services to its citizens. Without this facility, those efforts would be compromised. The city is requesting the site design to support this effort, to provide efficient services. Without this design, those services would be similarly compromised due to lack of efficiencies and access to the critical facilities.***

f. The variance requested is the minimum variance, which would alleviate the hardship.

Compliance Statement: ***The city has examined the needs for this upgrade to our public works facility and found that it is the minimum required to allow for the provision of effective, efficient services to serve the citizens of Fairview. The site is constrained and there are no feasible options to include additional landscape areas. It should be noted that the perimeter of the site***

will be landscaped, and although the right-of-way traditionally is not included in the landscape calculations, in this particular application, not only does the perimeter provide more screening for the site, but it also provides an enhancement to the local aesthetics.

EXHIBIT A-2

Fairview Public Works

PRELIMINARY STORMWATER REPORT & CALCULATIONS

48 1st Street
Fairview, Oregon

Date: October 26, 2018

The information contained in this report was prepared by
and under the supervision of the undersigned:

Dustin Elmore, PE
AAI Engineering
4875 S.W. Griffith Drive
Suite 300
Beaverton, Oregon
PH 503.620.3030 FX 503.620.5539
EMAIL: dustine@aaieng.com

AAI Project Number: A18125.10

Fairview Public Works

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I. Project Summary 1

II. Stormwater Design 1

III. Conveyance Calculations 2

IV. Engineering Conclusion 2

Appendices

Appendix A

Existing Conditions

Appendix B

As-builts and Contech Submittal

Appendix C

Site Plan

Appendix D

Utility Plan

Fairview Public Works

I. Project Summary

This report has been prepared to outline the existing and proposed on-site stormwater conditions for the Fairview Public Works project. This report is based off of field observation, as-builts and existing survey.

The project is located at 48 1st Street, Fairview, OR 97024 and is located adjacent to Main Street, 223rd Avenue, and Fairview Elementary School. The site is currently occupied by the City of Fairview Public Works department consisting of multiple building structures, well houses, and space for the Public Works vehicles.

The total existing site area is 29,107 SF (0.67 Acres) and has been determined to be entirely impervious. The existing storm system consists of multiple catch basins, conveyance piping that outfall into flow control manholes, and a public stormwater treatment system downstream located within the adjacent alley. The public system downstream has been determined to be a Contech CDS system that provides treatment for runoff from the existing site.

See Appendix A – Existing Conditions and Appendix B – As Builts and Contech Submittal

The proposed improvements on-site include the addition of a Public Works facility, approximately 10,155 SF. After the completion of this project, the total impervious area on site will reduced to a total of 26,766 SF (0.61 Acres) and 2,341 SF (0.06 Acres) of pervious area.

Due to a reduction in impervious area, existing catch basins will be preserved, reused, and all roof runoff will be conveyed and outfall into the public system. The stormwater impact to the public system will be lessened following the completion of this project. Additional information and calculations will be provided for the permit submittal verifying the implications of this project to the public system along with conveyance calculations assuring that the site meets stormwater requirements within the City of Fairview.

See Appendix C – Site Plan and Appendix D – Utility Plans

II. Stormwater Design

The proposed improvements of this project will reduce the impact to the existing storm system that is serving this facility through a reduction in on-site impervious area, the addition of pervious/landscape area, and proper conveyance outfalling into the public system. Flow control for the site is assumed to be accomplished through the use of multiple existing flow control manholes located in the alley adjacent to the site.

Stormwater Calculations to be provided at permit submittal.

III. Conveyance Calculations

To be provided at permit submittal.

IV. Engineering Conclusion

Based on the information provided, the proposed site facilities will be adequately designed to manage the proposed development conditions and should be approved as designed.

EXHIBIT B-1

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

Site Design Review - 10.26.2018

LRS ARCHITECTS
720 NW Davis 503.221.1121
Suite 300 503.221.2077
Portland OR 97209 www.lrsarchitects.com

PRELIMINARY NOT FOR CONSTRUCTION

PROJECT SUMMARY

STREET ADDRESS: 48 1ST STREET, FAIRVIEW, OR 97024

PROJECT DESCRIPTION: THE PROJECT INCLUDES THE REPLACEMENT OF THE EXISTING OPERATIONS CENTER BUILDING. TWO EXISTING STRUCTURES ARE TO BE REMOVED AND REPLACED WITH ONE NEW BUILDING THAT INCLUDES OFFICE, VEHICLE STORAGE, AND SHOP SPACES.

APPLICABLE CODES:
2014 OREGON STRUCTURAL SPECIALTY CODE (OSSC)
2014 OREGON ENERGY EFFICIENCY SPECIALTY CODE
2014 OREGON FIRE CODE
2014 OREGON MECHANICAL SPECIALTY CODE
2017 OREGON ELECTRICAL SPECIALTY CODE
2017 OREGON PLUMBING SPECIALTY CODE
2010 ADA STANDARDS FOR ACCESSIBLE DESIGN
NATIONAL FIRE PROTECTION ASSOCIATIONI CODES AS APPLICABLE

STREET ADDRESS: 48 1ST STREET, FAIRVIEW, OR 97024

ZONING INFORMATION

ZONE: RESIDENTIAL COMMUNITY SERVICE PARKS (R/CSP)

TAX LOT #: 1N3E27CB-03700, 1N3E27CB-03800, 1N3E27CB-03900

HEIGHT LIMITATIONS: 35 ft or 2.5 STORIES (WHICHEVER IS LESS)

EXISTING SITE AREA: 29,078 SF (0.67 ACRES)

MAX LOT COVERAGE: PUBLIC/INSTITUTIONAL USE: 85% MAX
29,078 SF X .85 = 24,716 SF

PROVIDED: 10,154 SF (34.9%)

LANDSCAPE: 20% REQUIRED (RESIDENTIAL)
29,078 X 20% = 5,815.6 SF

CLASS C VARIANCE: REDUCTION IN LANDSCAPE AREA
PROVIDED 2,051 SF TOTAL

HARDSCAPING: MAY BE UP TO 15% OF REQ'D LANDSCAPE:
2051 SF X 15% = 307.6 SF
2051 - 307.6 = 1,743.4 SF

NON-PLANT COVER: MAY BE UP TO 5% OF REQ'D LANDSCAPE:
2051 SF X 5% = 102.6 SF
1743.4 - 102.6 = 1,640.8 SF (MINIMUM REQUIRED PLANT LANDSCAPING)

PROVIDED:
PLANT LANDSCAPING 1,641 SF
TOTAL LANDSCAPING 2,051 SF

DRAWING INDEX LEGEND

▫ ISSUED / DELETED
▪ REVISED ⊗ ISSUED FOR REFERENCE ONLY

Sheet Number	Sheet Name	SITE DESIGN REVIEW
C0.1	EXISTING CONDITIONS	▫
C0.2	CIVIL DEMOLITION PLAN	▫
C1.0	SITE PLAN	▫
C2.0	GRADING PLAN	▫
C3.0	UTILITY PLAN	▫
L001	LANDSCAPE PLAN	▫
AD001	DEMO SITE PLAN	▫
A001	ARCHITECTURAL SITE PLAN	▫
A201	OVERALL FLOOR PLAN	▫
A501	EXTERIOR ELEVATIONS	▫

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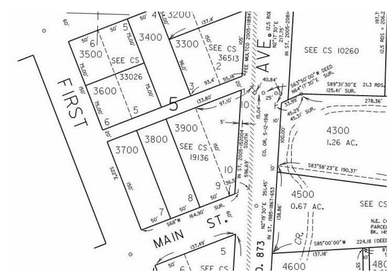
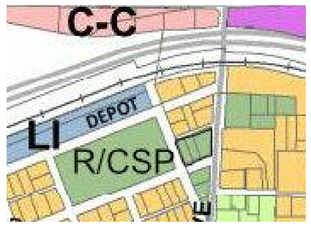
217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024



TAX LOT MAP



ZONING MAP

PROJECT SUMMARY

THE PROPOSED PROJECT IS LOCATED ON A 0.67 -ACRE PARCEL OF LAND CURRENTLY OWNED BY THE CITY FOR THEIR PUBLIC WORKS FACILITY. THE PROJECT INCLUDES REPLACEMENT OF THE EXISTING OPERATIONS CENTER BUILDING. TWO EXISTING STRUCTURES ARE TO BE REMOVED AND REPLACED WITH ONE NEW BUILDING THAT INCLUDES OFFICE, VEHICLE STORAGE, AND SHOP SPACES. THERE ARE TWO EXISTING PUMP HOUSES THAT ARE TO REMAIN ON SITE ALONG WITH AN EXISTING WELL THAT IS MAINTAINED BY THE PUBLIC WORKS DEPARTMENT.

DEFERRED SUBMITTALS

A. AUTOMATIC FIRE SUPPRESSION SYSTEM
B. FIRE ALARM SYSTEMS
C. SHELVING SYSTEMS AND STEEL STORAGE RACKS
D. IRRIGATION

PROJECT DIRECTORY

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SITE MAP

NOT TO SCALE

Plan North

VICINITY MAP

Plan North

DRAWN BY: MB
DATE CREATED: 07/09/13

SHEET:
CS
Site Design Review
10.26.2018

LRS Architects, Inc. ©2018

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EXHIBIT B-2

STORM SEWER DATA:

1 STORM SEWER MANHOLE
RIM=115.13'
IE 24"+/– STEEL (W)=110.21'
*NO VISIBLE OUT

2 STORM SEWER MANHOLE
RIM=117.09'
IE 8"+/– CPP (S)
IE 24"+/– CPP (SW)=110.44'
IE 24"+/– CPP (E)=110.54'

3 STORM SEWER MANHOLE
RIM=117.79'
IE 12"+/– CPP (S)=111.43'
IE 6"+/– PVC (S)=115.59'
IE 6"+/– PVC (SW)=111.29'
IE 18"+/– PVC (W)=111.47'
IE 12"+/– PVC (N)=111.41'

4 STORM SEWER MANHOLE
RIM=117.76'
IE 18"+/– PVC (W)=111.46'
IE 24"+/– CPP (E)=111.36'

5 STORM SEWER MANHOLE
RIM=117.69'
IE 12"+/– PVC (S)=111.61'
IE 18"+/– PVC (W)=111.59'
IE 18"+/– PVC (E)=111.44'

6 STORM SEWER CATCH BASIN
RIM=117.50'
IE 12"+/– PVC (N)=114.52'

7 STORM SEWER AREA DRAIN
RIM=117.70'

8 STORM SEWER MANHOLE
RIM=117.33'
IE 18"+/– PVC (W)=111.00'
IE 18"+/– PVC (N)=109.45'
IE 18"+/– PVC (E)=108.43'

9 STORM SEWER CATCH BASIN
RIM=116.48'

10 STORM SEWER MANHOLE
RIM=123.03'
IE 12"+/– PVC (S)=117.81'
IE 18"+/– CPP (SW)=114.65'
IE 12"+/– PVC (W)=117.21'
IE 12"+/– PVC (N)=114.21'
IE 12"+/– PVC (NE)=114.19'

11 STORM SEWER AREA DRAIN
RIM=122.52'

12 STORM SEWER TRENCH DRAIN
RIM=122.68'

13 STORM SEWER CATCH BASIN
RIM=122.67'
IE 6"+/– CMP (N)=121.35'

14 STORM SEWER AREA DRAIN
RIM=123.18'

15 STORM SEWER CLEANOUT
RIM=124.30'

16 STORM SEWER CATCH BASIN
RIM=122.28'
IE 6"+/– CMP (S)=120.87'
IE 6"+/– CMP (SW)=120.33'

17 STORM SEWER MANHOLE
RIM=121.05'
IE 12"+/– PVC (S)=115.09'
IE 12"+/– PVC (N)=115.05'

18 STORM SEWER CATCH BASIN
RIM=123.09'
IE 4"+/– CMP (W)=121.33'
IE 8"+/– PVC (E)=121.40'

19 STORM SEWER CLEANOUT
RIM=124.46'

20 STORM SEWER CATCH BASIN
RIM=124.80'
IE 4"+/– CMP (S)=123.32'

21 STORM SEWER AREA DRAIN
RIM=125.28'

SANITARY SEWER DATA:

1 SANITARY SEWER CLEANOUT
RIM=118.02'

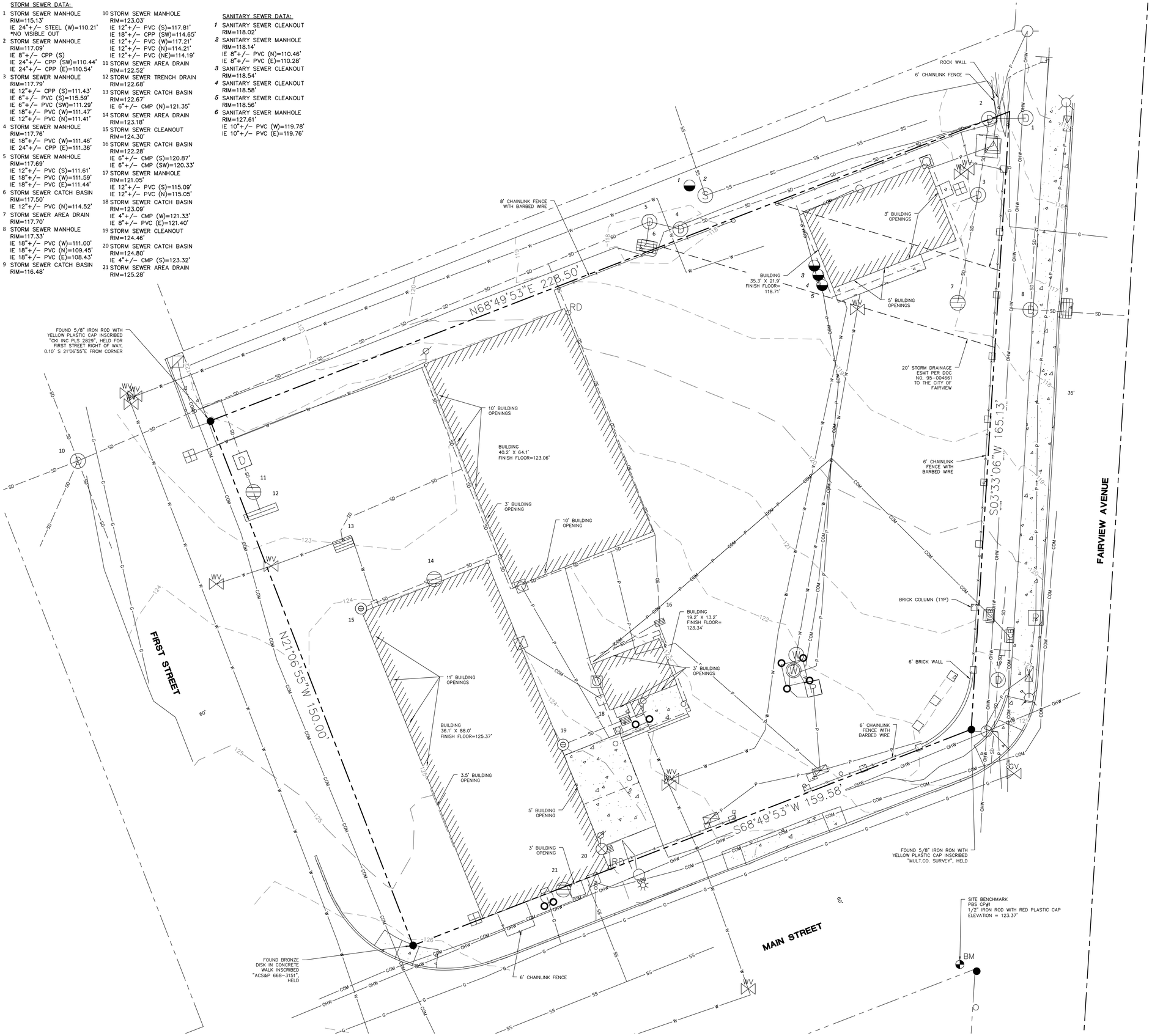
2 SANITARY SEWER MANHOLE
RIM=118.14'
IE 8"+/– PVC (N)=110.46'
IE 8"+/– PVC (E)=110.28'

3 SANITARY SEWER CLEANOUT
RIM=118.54'

4 SANITARY SEWER CLEANOUT
RIM=118.58'

5 SANITARY SEWER CLEANOUT
RIM=118.56'

6 SANITARY SEWER MANHOLE
RIM=127.61'
IE 10"+/– PVC (W)=119.78'
IE 10"+/– PVC (E)=119.76'



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Portland OR 97209 www.lrsarchitects.com

SURVEYOR NOTES

1. THE VERTICAL DATUM FOR THIS SURVEY IS NAVD88. SITE BENCHMARK: PBS CP #1

   N: 688853.63'

   E: 7706699.09'

   ELEVATION=123.37'

   DESCRIPTION: 1/2" IRON ROD WITH RED PLASTIC CAP INSCRIBED "PBS CONTROL" LOCATED AT THE SOUTHWEST CORNER OF FAIRVIEW AVENUE AND MAIN STREET.

   *ELEVATION WAS ESTABLISHED THROUGH GPS RTK OBSERVATIONS USING THE OREGON REAL-TIME GNSS NETWORK (ORGN).

2. THE BASIS OF BEARINGS FOR THIS SURVEY IS BASED ON THE ORGN.

   HORIZONTAL DATUM: NAD 83_2011

   STATE PLANE COORDINATES (OREGON NORTH ZONE 3601)

   DISTANCES SHOWN HEREON ARE GROUND DISTANCES.

3. THE UNDERGROUND UTILITIES SHOWN HEREON WERE BASED ON UTILITY LOCATE PAINT MARKS SUPPLIED BY THE OREGON UTILITY NOTIFICATION CENTER (PRE-SURVEY TICKET REQUESTS SUBMITTED ON 4/17/2018 AND PROCESSED AS TICKET NUMBERS 18094339 AND 18094383) AS WELL AS SURFACE EVIDENCE AND PRIVATE ASBUILT RECORDS. HOWEVER, LACKING EXCAVATION, THE EXACT LOCATION OF UNDERGROUND FEATURES CANNOT BE ACCURATELY, COMPLETELY AND RELIABLY DEPICTED. WHERE ADDITIONAL OR MORE DETAILED INFORMATION IS REQUIRED, THE CLIENT IS ADVISED THAT EXCAVATION MAY BE NECESSARY. ADDITIONALLY, CERTAIN UTILITIES ONSITE (WATER, SANITARY, STORM, GAS, ETC.) MAY NOT HAVE CONDUCTIBLE OR TRACEABLE LINES AND MAY BE PRESENT.

   *PRIVATE ON-SITE CONDUCTIBLE UTILITY LOCATES WERE PERFORMED BY MT. VIEW LOCATING SERVICES.

4. FINISH FLOOR ELEVATIONS WERE OBTAINED AT THE EXTERIOR DOOR OPENING OF EACH BUILDING. FINISH FLOOR ELEVATIONS ARE APPROXIMATE ONLY

LEGEND

- BM – DENOTES SITE BENCHMARK
- – DENOTES FOUND MONUMENT
- – DENOTES ASPHALT SURFACE
- – DENOTES CONCRETE SURFACE
- – DENOTES GRAVEL SURFACE
- – DENOTES EXISTING BUILDING AS NOTED
- – DENOTES ROAD CENTERLINE
- – DENOTES RIGHT OF WAY LINE
- – DENOTES PROPERTY/LOT LINE
- – DENOTES EASEMENT LINE
- – DENOTES FENCE LINE AS NOTED
- OHW – DENOTES OVERHEAD WIRE
- COM – DENOTES COMMUNICATIONS LINE
- G – DENOTES GAS LINE
- P – DENOTES POWER/SIGNAL LINE
- SD – DENOTES STORM DRAINAGE LINE
- SS – DENOTES SANITARY SEWER LINE
- W – DENOTES WATER LINE
- – DENOTES STORM DRAINAGE AREA DRAIN
- – DENOTES STORM DRAINAGE CATCH BASIN
- D – DENOTES STORM DRAINAGE VAULT
- D – DENOTES STORM DRAINAGE MANHOLE
- – DENOTES STORM DRAINAGE CLEANOUT
- RD – DENOTES ROOF DRAIN
- S – DENOTES SANITARY SEWER MANHOLE
- – DENOTES SANITARY SEWER CLEANOUT
- – DENOTES WATER METER
- W – DENOTES WATER MANHOLE
- – DENOTES WATER VALVE
- W – DENOTES WATER WELL HOUSE
- – DENOTES WATER SPIGOT
- – DENOTES GAS VALVE
- – DENOTES GAS METER
- P – DENOTES POWER/ELECTRICAL VAULT
- – DENOTES POWER/ELECTRICAL TRANSFORMER
- – DENOTES POWER JUNCTION BOX
- – DENOTES POWER METER
- – DENOTES POWER POLE
- – DENOTES POWER POLE W/ LIGHT
- – DENOTES STREET LIGHT/LIGHT POLE
- TCB – DENOTES TRAFFIC/SIGNAL JUNCTION BOX
- – DENOTES COMMUNICATIONS RISER AS NOTED
- – DENOTES UNKNOWN UTILITY RISER/STANDPIPE
- – DENOTES UNKNOWN UTILITY CLEANOUT
- – DENOTES BOLLARD
- – DENOTES SIGN
- – DENOTES BUILDING COLUMN
- – DENOTES GATE POST

NORTH

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 feet

CONSULTANT:

AAI afshan associates, inc.
ENGINEERING
4875 SW Griffith Drive | Suite 300 | Beaverton, OR | 97005
503.620.3030 tel. | 503.620.5539 fax | www.aaieng.com
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PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

EXISTING CONDITIONS

DRAWN BY: AFR

DATE ISSUED: OCTOBER 26, 2018

SHEET: C0.1

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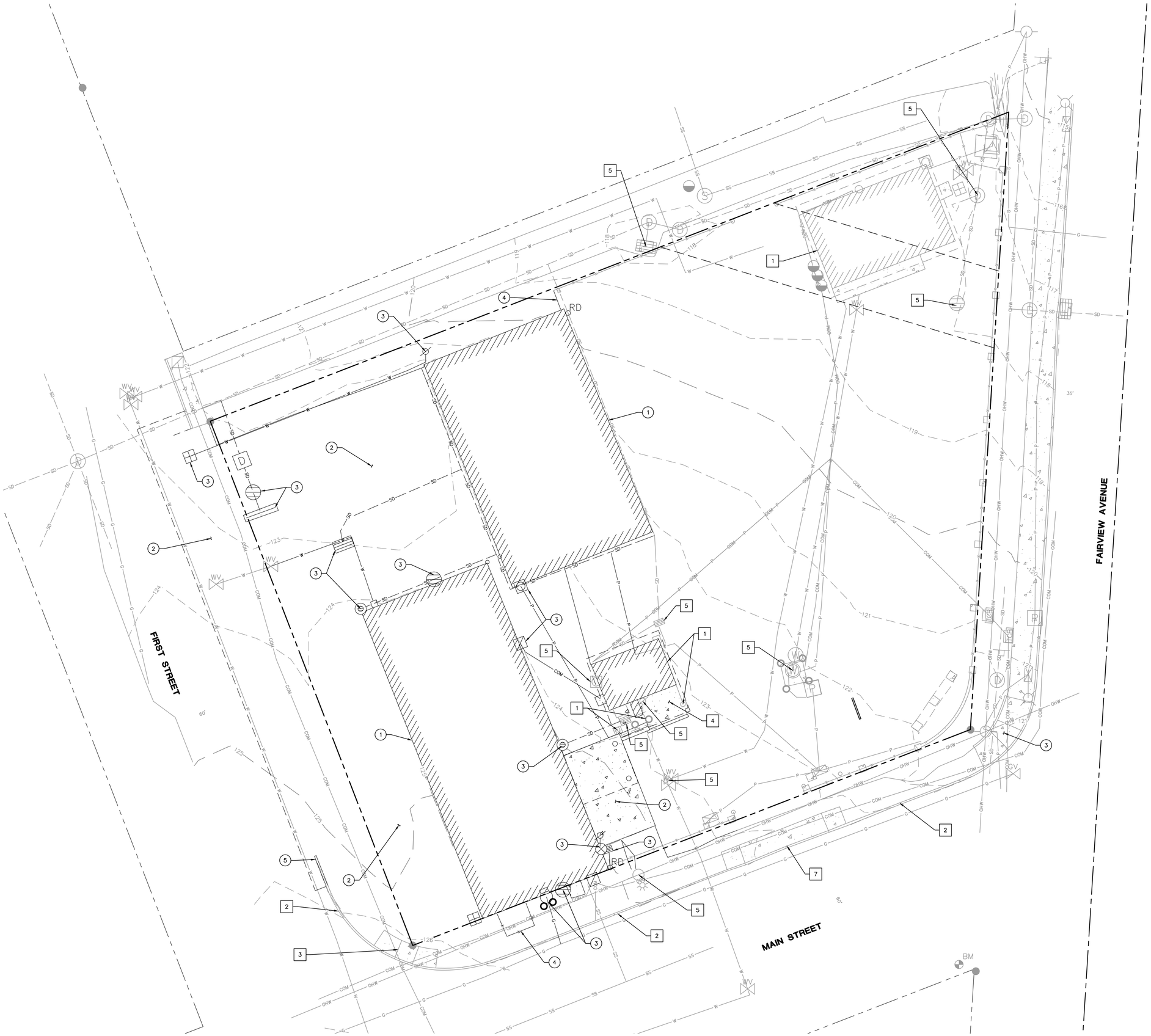

SHEET NOTES

1. CONTRACTOR MAY STAGE WITHIN LIMITS OF DEMOLITION.
2. REMOVE ALL SITE COMPONENTS AND RECYCLE COMPONENTS AS REQUIRED IN THE SPECIFICATIONS.
3. ALL TRADE LICENSES AND PERMITS NECESSARY FOR THE PROCUREMENT AND COMPLETION OF THE WORK SHALL BE SECURED BY THE CONTRACTOR PRIOR TO COMMENCING DEMOLITION.
4. THE CONTRACTOR SHALL PRESERVE AND PROTECT FROM DAMAGE ALL EXISTING RIGHT–OF–WAY SURVEY MONUMENTATION DURING DEMOLITION. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING AND PAYING FOR THE REPLACEMENT BY A LICENSED SURVEYOR OF ANY DAMAGED OR REMOVED MONUMENTS.
5. PROTECT ALL ITEMS ON ADJACENT PROPERTIES AND IN THE RIGHT OF WAY INCLUDING BUT NOT LIMITED TO SIGNAL EQUIPMENT, PARKING METERS, SIDEWALKS, STREET TREES, STREET LIGHTS, CURBS, PAVEMENT AND SIGNS. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ANY DAMAGED ITEMS TO ORIGINAL CONDITION.
6. PROTECT STRUCTURES, UTILITIES, SIDEWALKS, AND OTHER FACILITIES IMMEDIATELY ADJACENT TO EXCAVATIONS FROM DAMAGES CAUSED BY SETTLEMENT, LATERAL MOVEMENT, UNDERMINING, WASHOUT AND OTHER HAZARDS.
7. SAWCUT STRAIGHT LINES IN SIDEWALK, AS NECESSARY.
8. CONTRACTOR IS RESPONSIBLE TO CONTROL DUST AND MUD DURING THE DEMOLITION PERIOD, AND DURING TRANSPORTATION OF DEMOLITION DEBRIS. ALL STREET SURFACES OUTSIDE THE CONSTRUCTION ZONE MUST BE KEPT CLEAN.
9. PROTECT ALL EXISTING UTILITY STRUCTURES AND UNDERGROUND MAINS TO REMAIN.
10. PROTECT ALL EXISTING VEGETATION TO REMAIN.

X PROTECTION NOTES

1 PROTECT EXISTING STRUCTURE
2 PROTECT EXISTING CURB
3 PROTECT EXISTING SIDEWALK
4 PROTECT EXISTING SURFACE
5 PROTECT EXISTING UTILITY
6 PROTECT EXISTING FENCE
7 PROTECT EXISTING DRIVEWAY

X DEMOLITION NOTES

1 REMOVE EXISTING STRUCTURE
2 REMOVE EXISTING SURFACE
3 REMOVE EXISTING UTILITY
4 REMOVE EXISTING FENCE
5 REMOVE EXISTING CURB

NORTH

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 feet

EXHIBIT B-3

LRS ARCHITECTS
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REGISTERED PROFESSIONAL ENGINEER
58412
OREGON
CRAIG N. HARRIS
EXPIRES: 6/30/2019
PRELIMINARY

CONSULTANT:

AAI alphan associates, inc.
ENGINEERING
4875 SW Griffith Drive | Suite 300 | Beaverton, OR | 97005
503.620.3030 tel. | 503.620.5539 fax | www.aaieng.com
Project No. A18125.10

P&C Construction
2133 NW YORK ST
PORTLAND, OR 97210
T 503.665.0165
www.builtbypandc.com

PROJECT NUMBER: *217284*

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

DEMOLITION PLAN

DRAWN BY: AFR
DATE ISSUED: OCTOBER 26, 2018

SHEET: **C0.2**

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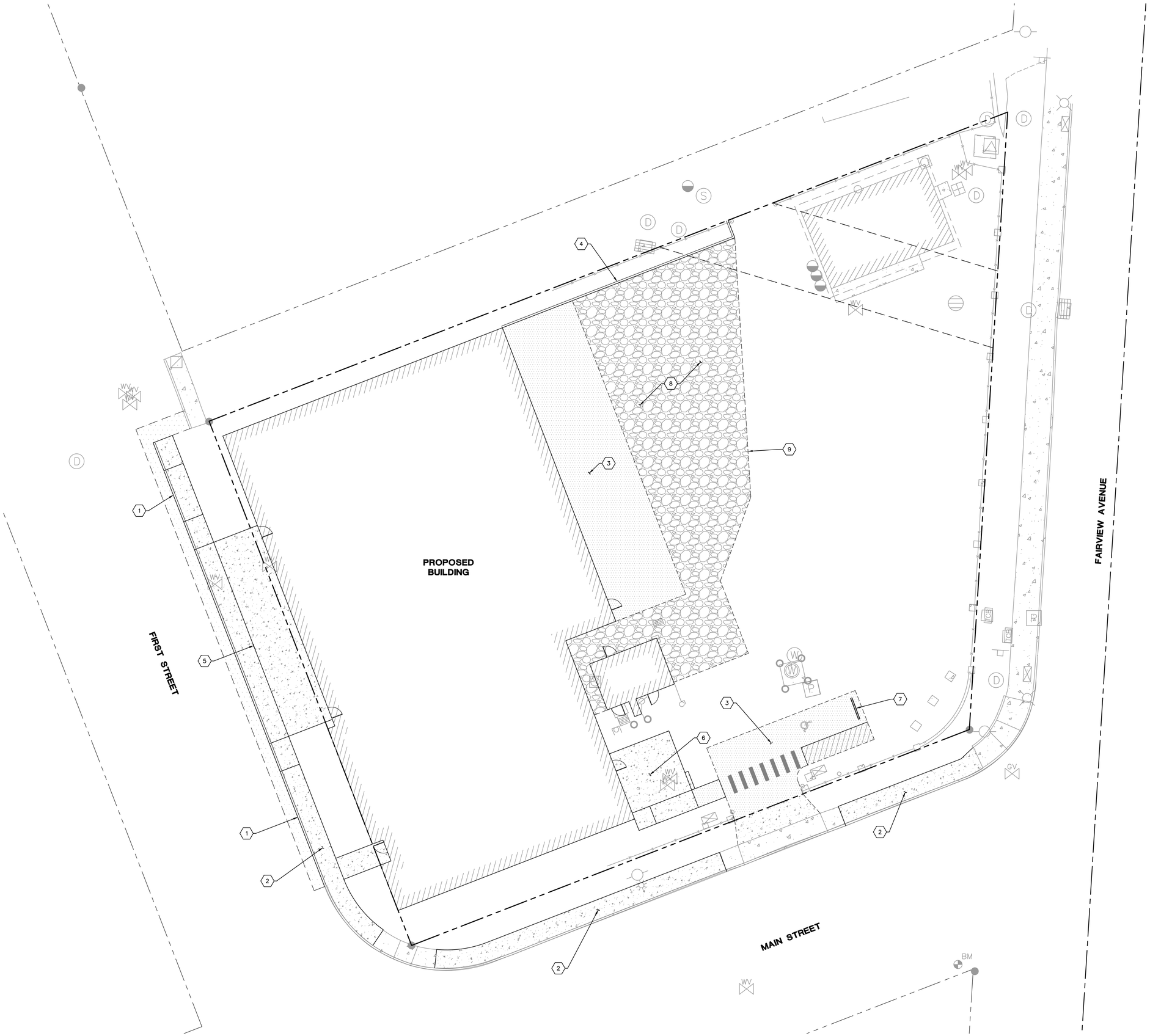
aBoss N:\Share N November F:\2018\A181251.10 - Fairview Public Works Civil\Civil Cad\Sheets\Demolish\A181251.C02.Demo.dwg

EXHIBIT B-4



SHEET NOTES

1. SEE ARCHITECTURAL PLANS FOR ADDITIONAL SITE INFORMATION.
2. THE CONTRACTOR SHALL HAVE A FULL SET OF THE CURRENT APPROVED CONSTRUCTION DOCUMENTS INCLUDING ADDENDA ON THE PROJECT SITE AT ALL TIMES.
3. THE CONTRACTOR SHALL KEEP THE ENGINEER AND JURISDICTION INFORMED OF CONSTRUCTION PROGRESS TO FACILITATE SITE OBSERVATIONS AT REQUIRED INTERVALS. 24-HOUR NOTICE IS REQUIRED.
4. NO HAZARD AREAS OR RESOURCE AREAS ARE KNOWN TO BE LOCATED ON THIS SITE.

(X) CONSTRUCTION NOTES

1 CONSTRUCT CURB
2 CONSTRUCT CONCRETE SIDEWALK
3 CONSTRUCT ASPHALT SURFACE
4 CONSTRUCT RETAINING WALL
5 CONSTRUCT DRIVEWAY
6 CONSTRUCT CONCRETE SURFACE
7 CONSTRUCT WHEELSTOP
8 GRAVEL SURFACE
9 EXISTING SURFACE CONNECTION POINT

LEGEND

PROPERTY LINE
EASEMENT LINE
CONCRETE SIDEWALK
ASPHALT SURFACE
GRAVEL SURFACE

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REGISTERED PROFESSIONAL ENGINEER 58412 OREGON CHRIS N. HARRIS EXPIRES: 6/30/2019
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CONSULTANT:

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PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

SITE PLAN

DRAWN BY: AFR
DATE ISSUED: OCTOBER 26, 2018

NORTH

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 feet

SHEET: **C1.0**

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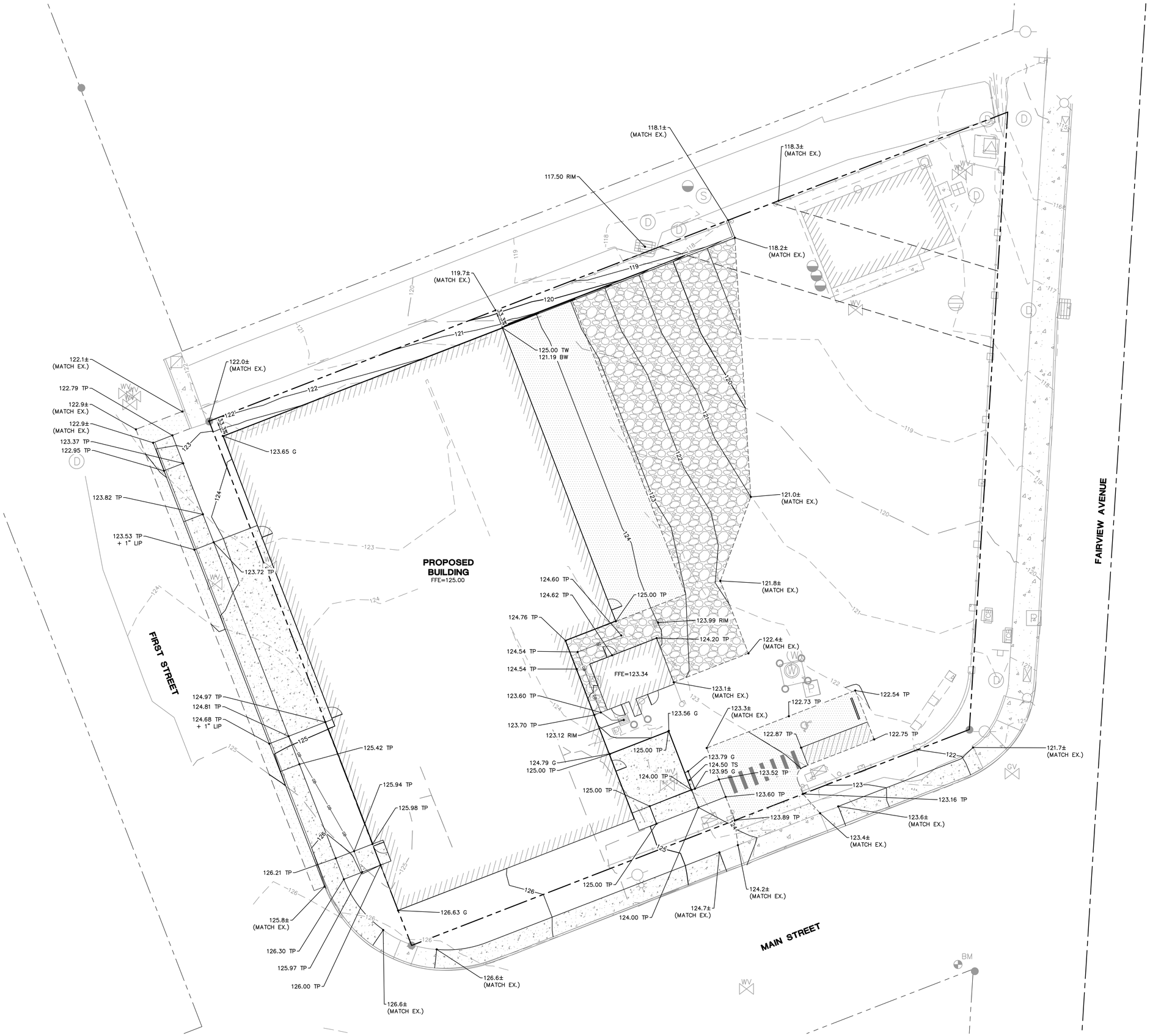

SHEET NOTES

1. CURB HEIGHTS ARE 6" UNLESS NOTED OTHERWISE.
2. LANDINGS ON ACCESSIBLE ROUTES SHALL NOT EXCEED 2% IN ANY DIRECTION.
3. ALL ACCESSIBLE ROUTES SHALL COMPLY WITH CURRENT ADA ACCESSIBILITY GUIDELINES FOR BUILDING AND FACILITIES (ADAAG).
4. ALL WALKWAYS FROM ACCESSIBLE UNITS ARE DESIGNED TO NOT REQUIRE HANDRAILS. THEREFORE, RAMPS WITH SLOPES STEEPER THAN 5.0% AND LESS THAN 8.33% SHALL NOT EXCEED 0.5' RISE OR 6.0' LENGTH.
5. FINISH GRADES ARE TO BE BROUGHT TO WITHIN 0.08 FT IN 10 FT OF THE GRADES SHOWN AT SUBGRADE AND TO WITHIN 0.03 FT IN 10 FT AT FINISH GRADE. CONTRACTOR TO ALLOW FOR PLACEMENT OF REQUIRED TOPSOIL IN ROUGH GRADING.
6. GRADING ELEVATIONS AS SHOWN ON SITE AND LANDSCAPE PLANS ARE FINISHED GRADE WHICH INCLUDES SUBGRADE SOIL, TOPSOIL, SOIL AMENDMENTS, ROCKERY AND RUNOFF PROTECTION CONTRACTOR IS RESPONSIBLE TO COORDINATE GRADING WITH BOTH EXCAVATOR AND LANDSCAPE CONTRACTOR.

GRADING LABEL LEGEND

CALLOUT — DESCRIPTION
- SPOT ELEVATION
- DESCRIPTION LISTED BELOW.

XX.XX XX

BW	BOTTOM OF WALL
EX	EXISTING GRADE
FFE	FINISHED FLOOR ELEVATION
FG	FINISH GRADE
G	GROUND
TC	TOP OF CURB
TP	TOP OF PAVEMENT
TW	TOP OF WALL
TS	TOP OF STEP

LEGEND

EXISTING CONTOUR MINOR	102
EXISTING CONTOUR MAJOR	100
PROPOSED CONTOUR MINOR	102
PROPOSED CONTOUR MAJOR	100
GRADE BREAK	GB

NORTH

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 feet

EXHIBIT B-5

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REGISTERED PROFESSIONAL ENGINEER 58412 OREGON CRAIG N. HARRIS
PRELIMINARY
EXPIRES: 6/30/2019

CONSULTANT:

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PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

GRADING PLAN

DRAWN BY: AFR
DATE ISSUED: OCTOBER 26, 2018

SHEET: C2.0

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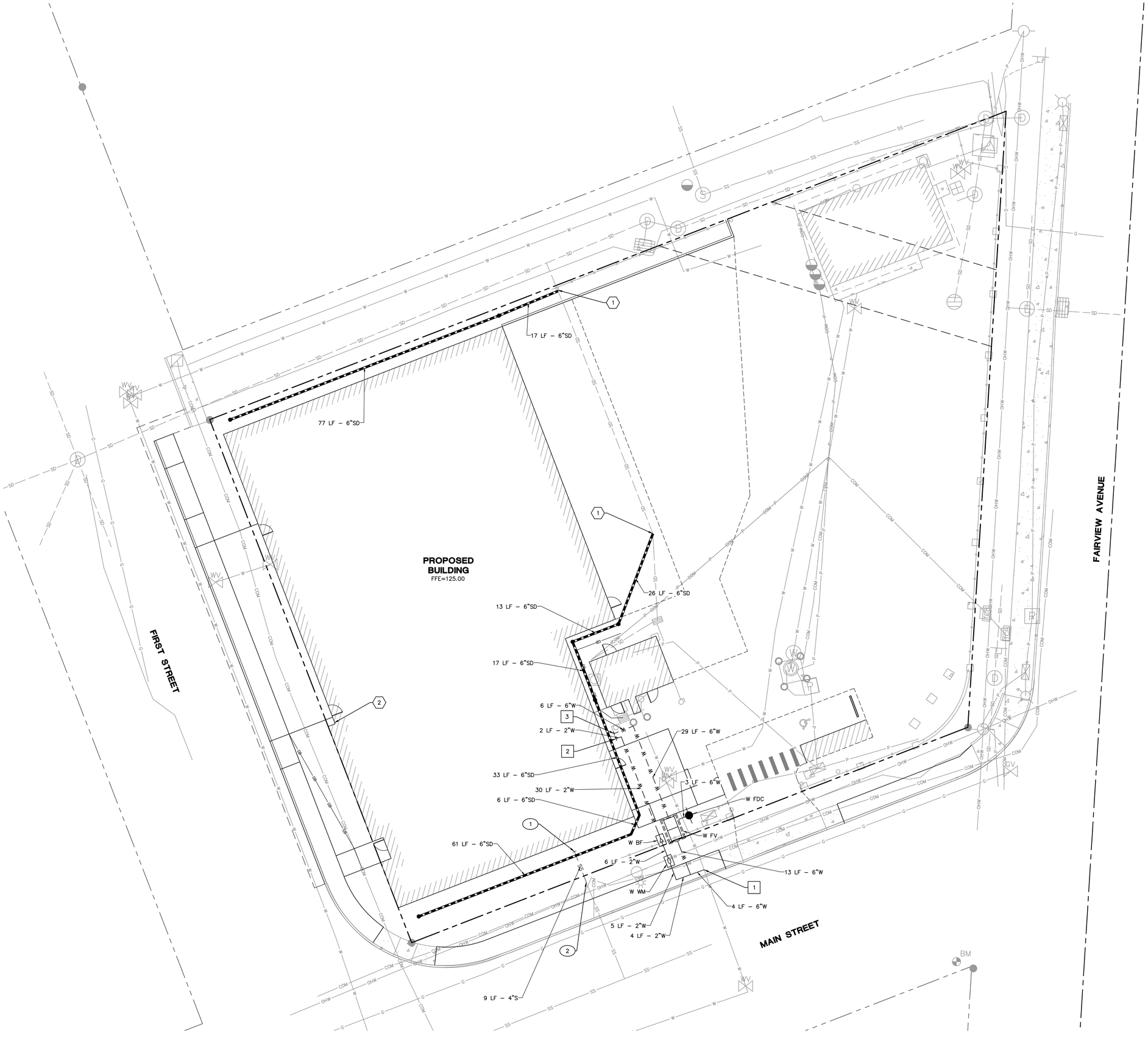
EXHIBIT B-6



SHEET NOTES

1. STRUCTURES HORIZONTAL LOCATIONS AND PIPE INVERTS ARE BASED ON THE CENTER OF THE STRUCTURE.
2. INSTALL THRUST BLOCKS ON FIRE AND WATER LINES
3. ALL SANITARY PIPING SHALL BE PVC 3034 OR APPROVED EQUAL UNLESS NOTED OTHERWISE.
4. THIS PLAN IS GENERALLY DIAGRAMMATIC. IT DOES NOT SHOW EVERY JOINT, BEND, FITTING, OR ACCESSORY REQUIRED FOR CONSTRUCTION.
5. CLEAN OUTS SHALL BE INSTALLED IN CONFORMANCE WITH UPC CHAPTER SEVEN, SECTION 707 AND SECTION 719. NOT ALL REQUIRED CLEAN OUTS ARE SHOWN.
6. DOMESTIC WATER AND FIRE LINES AND ACCESSORIES BETWEEN THE WATER METER AND THE BUILDING SHALL BE INSTALLED BY A LICENSED PLUMBER EMPLOYED BY A LICENSED PLUMBING CONTRACTOR.
7. UTILITIES WITHIN FIVE FEET OF A BUILDING SHALL BE CONSTRUCTED OF MATERIALS APPROVED FOR INTERIOR USE AS DESCRIBED IN THE CURRENT EDITION OF THE UPC.
8. INLETS AND OUTLETS TO ON-SITE MANHOLES SHALL HAVE FLEXIBLE CONNECTION NO CLOSER THAN 12" AND NO FARTHER THAN 36" FROM THE MANHOLE.

(X) SANITARY NOTES

1 BUILDING POINT OF CONNECTION

2 CONNECT TO EXISTING SANITARY LINE

[X] WATER NOTES

1 CONNECT TO EXISTING WATER LINE

2 DOMESTIC BUILDING POINT OF CONNECTION

3 FIRE BUILDING POINT OF CONNECTION

(X) STORM NOTES

1 CONNECT TO EXISTING STORM LINE

2 DOWNSPOUT TO BE ROUTED BELOW THE SLAB AND CONNECTED INTO DOWNSPOUT ACROSS BUILDING

LABEL LEGEND

PIPE LABELS

UTILITY LENGTH
UTILITY SIZE
UTILITY TYPE

XXLF – XX" XX

S=X.XX%
SLOPE (WHERE APPLICABLE)

STRUCTURE LABELS

UTILITY TYPE (FP=FIRE PROTECTION, S=SANITARY, SD=STORM DRAINAGE, W=WATER)
STRUCTURE TYPE CALLOUT (SEE BELOW)
ID NUMBER (WHERE APPLICABLE)

XX XX-XX
RIM=XX.XX
IE IN=XX.X
IE OUT=XX.X
STRUCTURE INFO (WHERE APPLICABLE)

STRUCTURE TYPES

CALLOUT	DESCRIPTION
CB	CATCH BASIN
WM	WATER METER
FDC	FIRE DEPARTMENT CONNECTION
FV	FIRE VAULT
BF	DOMESTIC BACKFLOW ASSEMBLY

LEGEND

SANITARY SEWER LINE	SS SS
WATER LINE	W W W
FIRE LINE	FP FP FP FP
FDC LINE	FDC FDC FDC
STORM LINE	
GAS LINE	G G G G G G
FDC	

NORTH

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 feet

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PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

UTILITY PLAN

DRAWN BY: AFR

DATE ISSUED: OCTOBER 26, 2018

SHEET: C3.0

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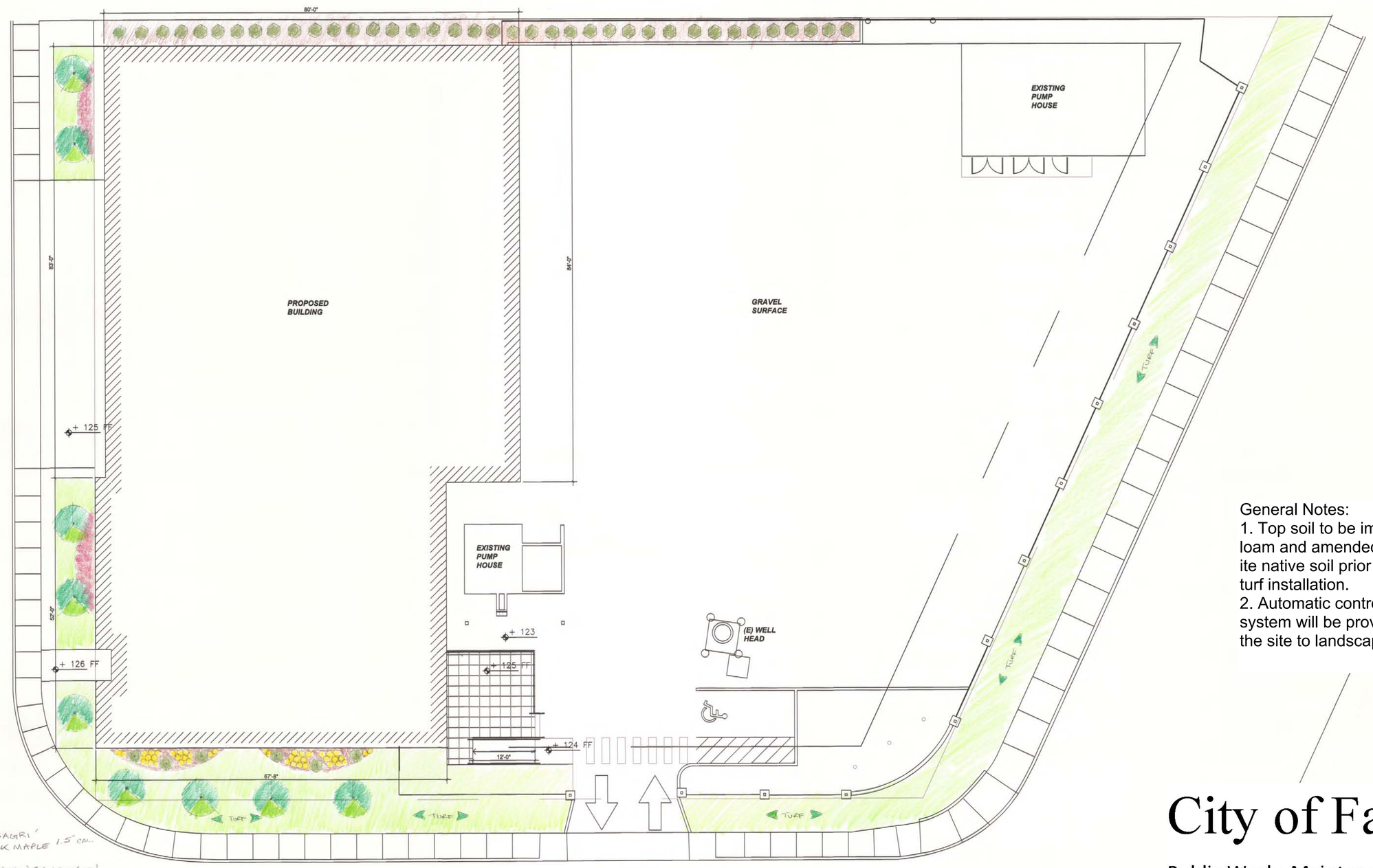
EXHIBIT B-7



General Notes:
1. Top soil to be imported sandy loam and amended to existing ons ite native soil prior tot all plant and turf installation.
2. Automatic controlled irrigation system will be provided throughout the site to landscaped area.

ACER GRISEUM 'KWBAGRI' FIREBURST PAPERBARK MAPLE 1.5" CAL.

JUNIPERUS SCOPULORUM 'SKYROCKET' SKYROCKET JUNIPER 5 GAL

BERBERIS THUNBERGII 'CRIMSON PYGMY' CRIMSON PYGMY DWARF JAPANESE BARBERRY 1 GAL

SPIREA JAPONICA 'GOLDMOUND' GOLDMOUND SPIREA 2 GAL

City of Fairview

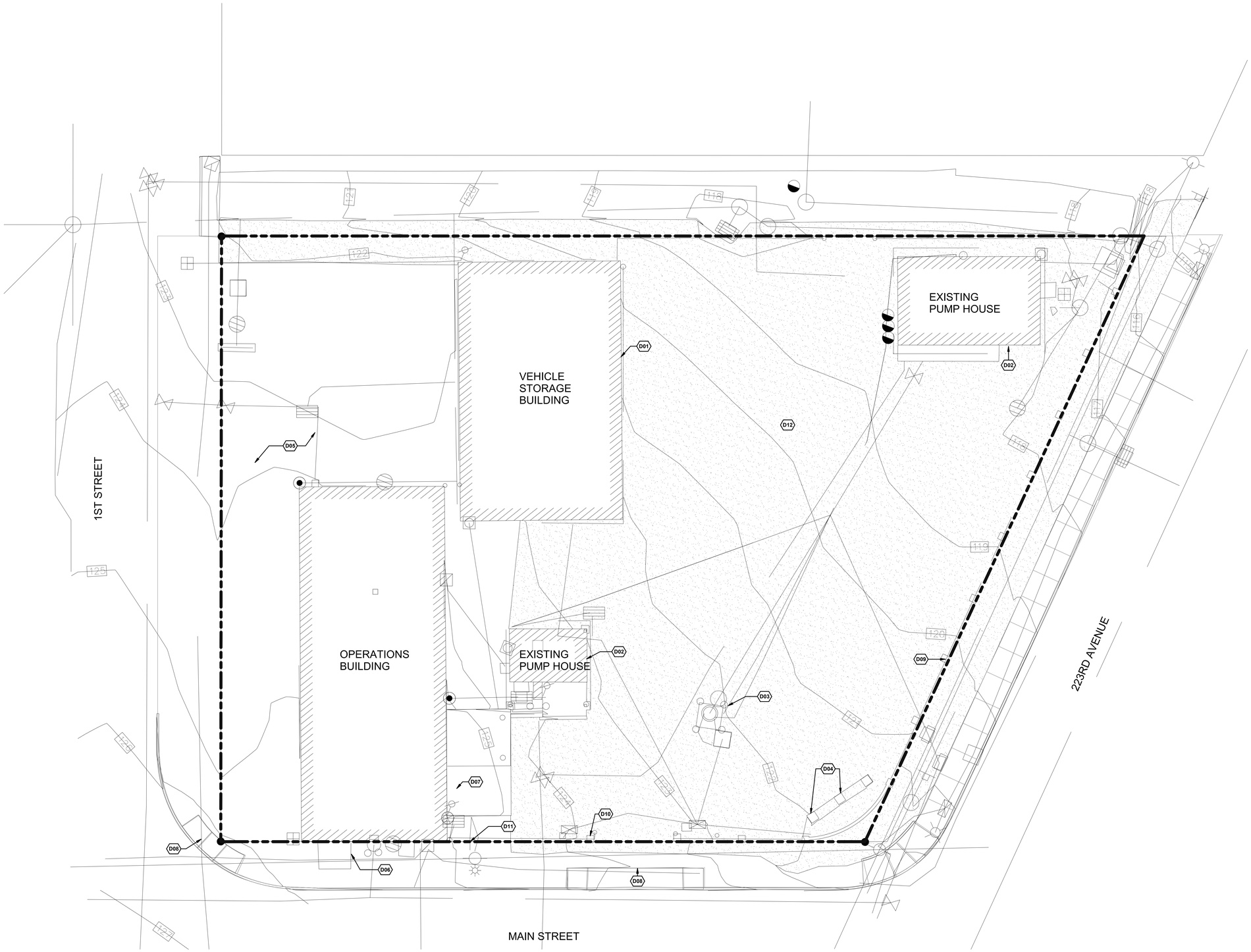
Public Works Maintenance Building

Landscape Detail

Drawn: Matt Hollenbeck

Date: 10/30/2018

EXHIBIT B-8



GENERAL NOTES

A. SITE INFORMATION IS BASED ON OWNERS SURVEY DATED **06.06.18** BY **PBS**.
B. ALL FINISH EXISTING FLOOR ELEVATIONS WERE BASED ON SURVEY DATED **06.06.18** BY **PBS**.
C. REFER TO CIVIL PLANS FOR MORE DEMOLITION INFORMATION.
D. COORDINATE WITH SURVEYOR DISCONNECTION OF ALL PRIVATE AND PUBLIC UTILITIES IF REQUIRED.
E. THIS DRAWING REFERENCES EXISTING CONDITIONS. EXISTING CONDITIONS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
F. TEMPORARY RELOCATE/CAP EXISTING UTILITIES AS REQUIRED TO FACILITATE INSTALLATION OF NEW WORK.
G. VERIFY LOCATION OF EXISTING UTILITIES - PROTECT FROM DAMAGE.

KEYNOTES

D01	BUILDING STRUCTURE TO BE REMOVED
D02	EXISTING PUMP HOUSE TO REMAIN
D03	EXISTING WELL TO REMAIN
D04	FLAG POLES TO PROTECTED AND REMAIN IN PLACE
D05	ASPHALT DRIVE APRON TO BE REMOVED
D06	TRASH ENCLOSURE FENCE TO BE REMOVED
D07	EXISTING CONCRETE PATIO TO BE REMOVED
D08	EXISTING SIDEWALK PAVEMENT TO REMAIN
D09	EXISTING FENCE TO REMAIN
D10	EXISTING VEHICLE GATE TO REMAIN
D11	EXISTING FENCE TO BE REMOVED AND RELOCATED WHERE REQUIRED
D12	GRAVEL SURFACE LOT TO REMAIN

LEGEND

- SITE EASEMENTS
- SITE SETBACKS
- SITE PROPERTY BOUNDARY
- EXISTING BUILDING
- EXISTING CONCRETE SIDEWALK
- ENTRY/EXIT ACCESS TO ACCESSIBLE MEANS OF EGRESS
- SITE POLE LIGHTING
- BOLLARD LIGHTING
- EXISTING SITE LIGHTING
- FIRE HYDRANT
- EXISTING FIRE HYDRANT

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PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:
DEMO SITE PLAN

KEY PLAN:

DRAWN BY: Author
DATE CREATED: 05/12/14

1. DEMO SITE PLAN

SCALE: 1" = 10'-0"

0 10' 20'

Plan North True North

SHEET:
AD001
Site Design Review
10.26.2018

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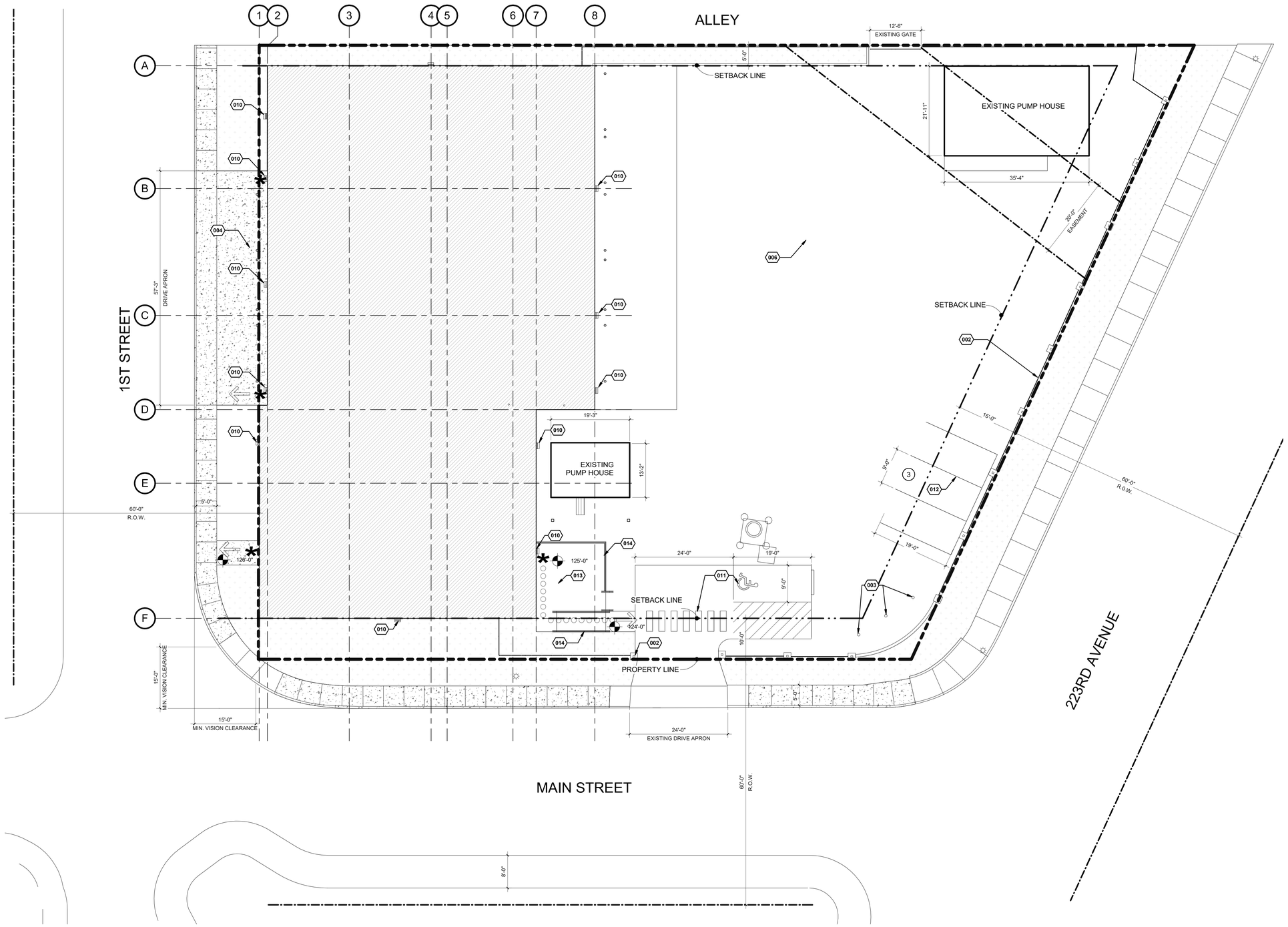
EXHIBIT B-9



1. OVERALL SITE PLAN

SCALE: 1" = 10'-0"

GENERAL NOTES

A. SITE INFORMATION IS BASED ON OWNERS SURVEY DATED **06.06.18** BY **PBS.**
B. ALL SURVEY INFORMATION INDICATING ALL EXISTING CONDITIONS ARE SHOWN FOR REFERENCE ONLY. EXISTING CONDITIONS TO BE FIELD VERIFIED BY CONTRACTOR PRIOR TO COMMENCEMENT OF WORK.
C. STREET, PARKING, DRIVE CUTS, AND/ OR PUBLIC RIGHT OF WAY INFORMATION ARE SHOWN FOR REFERENCE ONLY. SEE CIVIL DRAWINGS FOR DETAILED INFORMATION.
D. DIMENSIONS SHOWN ON THIS PLAN ARE FOR GENERAL LAYOUT OF THE BUILDINGS AND SITE ELEMENTS.
E. REFER TO THE LEGAL SURVEY (PROVIDED BY OTHERS) FOR PROPERTY LINE DIMENSIONS AND EXACT LOCATIONS OF EXISTING SITE ELEMENTS.
F. SEE CIVIL FOR TYPICAL DIMENSIONS UNO.
G. SEE CIVIL FOR GRADE ELEVATIONS.
H. TYPICAL CURB RADIUS IS 3'-0" AT ASPHALT SIDE OF CURB UNO.

KEYNOTES

002	EXISTING FENCE AND GATE
003	EXISTING FLAG POLES
004	NEW DRIVE APRON - SEE CIVIL
006	EXISTING GRAVEL SURFACE
010	WALL MOUNTED LIGHT FIXTURE
011	PROVIDE PAINT STRIPING & ADA SYMBOL AS REQUIRED AT NEW PAVED AREA
012	TYPICAL STAFF PARKING STALL
013	OUTDOOR STAFF PATIO AREA
014	HANDRAIL

LEGEND

- R.O.W.
- SITE SETBACKS
- SITE PROPERTY BOUNDARY
- PROPOSED BUILDING
- EXISTING BUILDING
- PROPOSED CONCRETE SIDEWALK
- LANDSCAPING
- EXISTING CONCRETE SIDEWALK
- SITE EGRESS PATH TO RIGHT OF WAY
- ENTRY/EXIT ACCESS TO ACCESSIBLE MEANS OF EGRESS
- R — RESTRICTED ENTRY NOT ON ACCESSIBLE ROUTE
- P — PUBLIC ENTRY ON ACCESSIBLE ROUTE
- SITE WALL MOUNT LIGHTING
- BOLLARD LIGHTING
- EXISTING SITE LIGHTING
- # — NO. OF PARKING SPACES IN GROUP
- TRAFFIC ARROW
- HYD — FIRE HYDRANT
- HYD — EXISTING FIRE HYDRANT
- FDC — FIRE DEPARTMENT CONNECTION
- 123' - 0" — SPOT GRADE ELEVATION
- F.F. 123' — FINISH FLOOR ELEVATION
- DS — DOWNSPOUT LOCATION

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CONSULTANT:

PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

ARCHITECTURAL SITE PLAN

KEY PLAN:

DRAWN BY: Author
DATE CREATED: 05/24/13

SHEET:

A001

Site Design Review
10.26.2018

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EXHIBIT B-10

GENERAL NOTES

A. SEE **A200** SERIES 1/8" SCALE PLANS FOR ADDITIONAL INFORMATION.
B. SITE INFORMATION FOR REFERENCE ONLY. SEE SITE PLANS.
C. ALL DIMENSIONS ARE TO FACE OF STUD UNO OR CENTER OF WINDOW OPENING, COLUMN, OR GRID. EXTERIOR DIMENSIONS ARE TO FACE OF FOUNDATION/FACE OF FRAMING. DIMENSIONS INDICATED AS "CLR MIN" ARE TO FACE OF FINISH.

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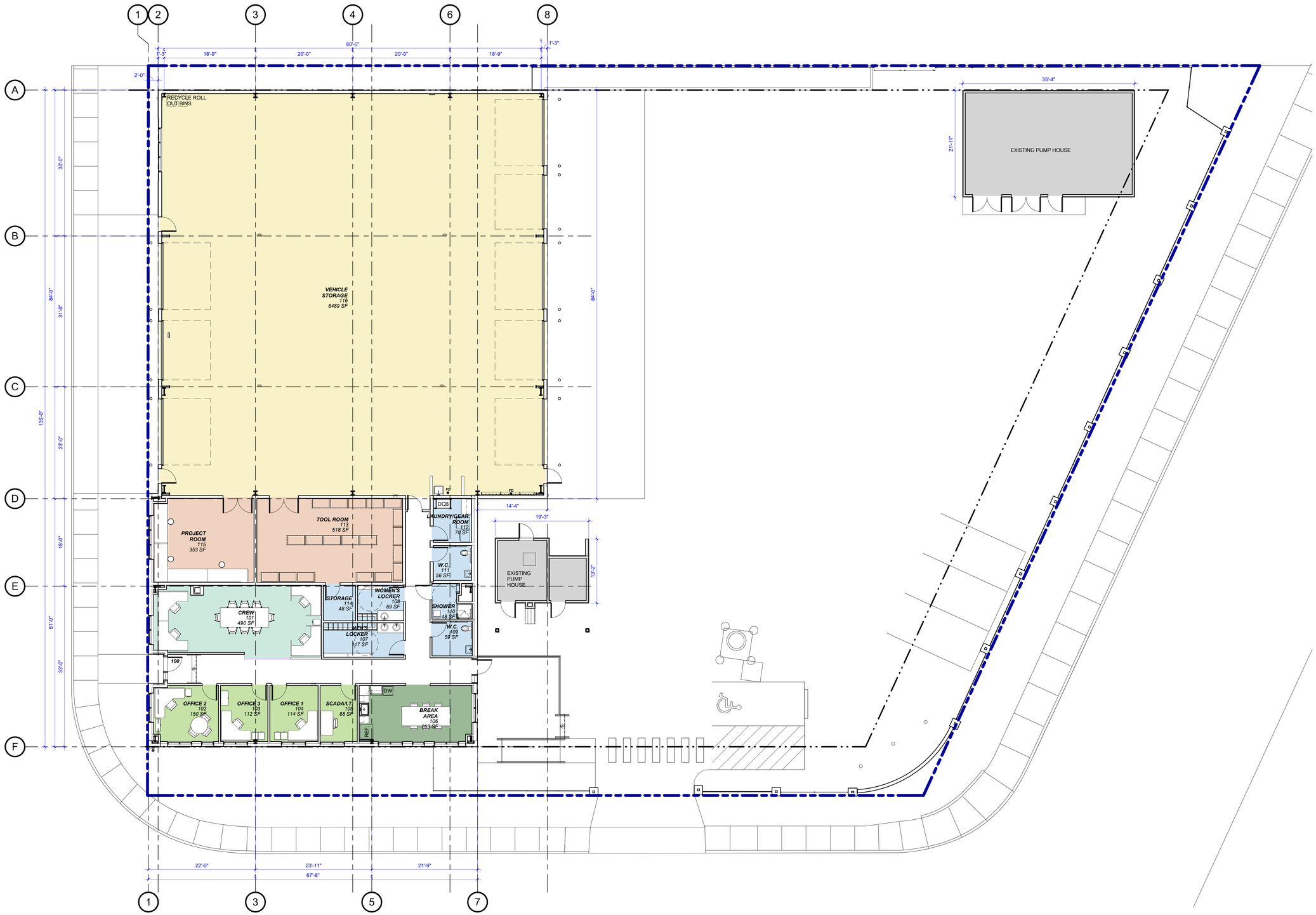

1. OVERALL FLOOR PLAN

SCALE: 1/8" = 1'-0"

10,154 SF

CONSULTANT:

PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:

OVERALL FLOOR PLAN

KEY PLAN:

DRAWN BY: Author
DATE CREATED: 10/26/18

SHEET:

A201

Design Development
12.20.2018

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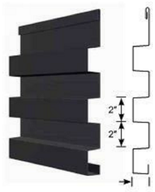
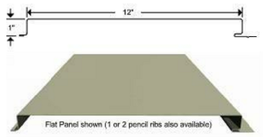
EXHIBIT B-11

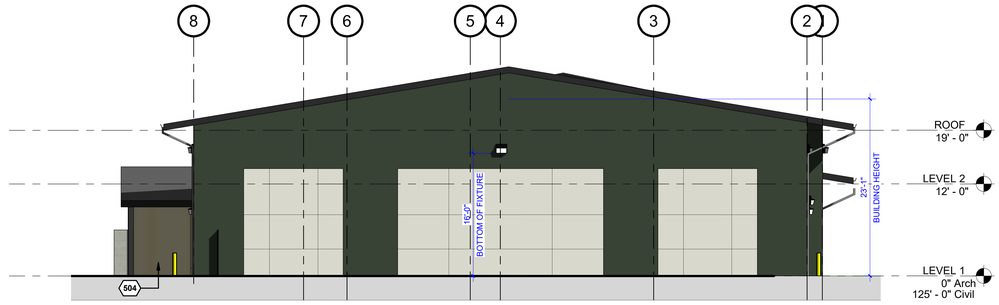
PANEL TYPES - MATERIAL BOARD



METAL PANEL TYPE A

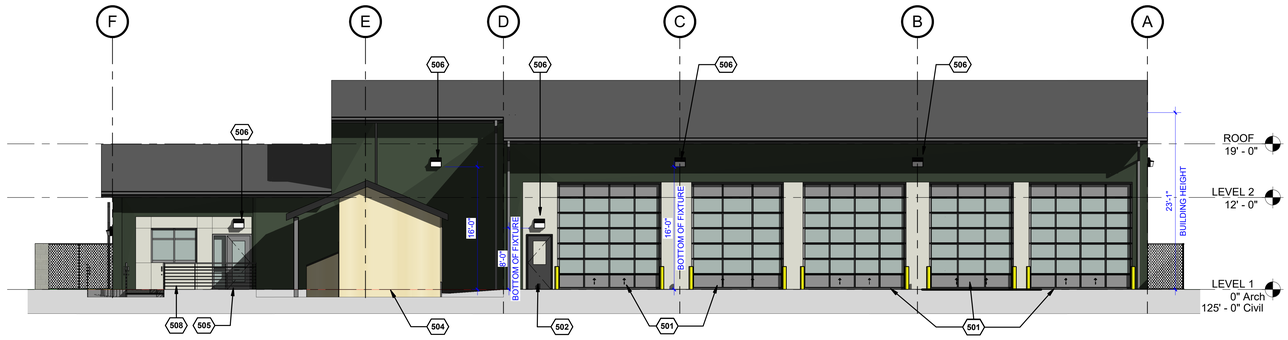


METAL PANEL TYPE B



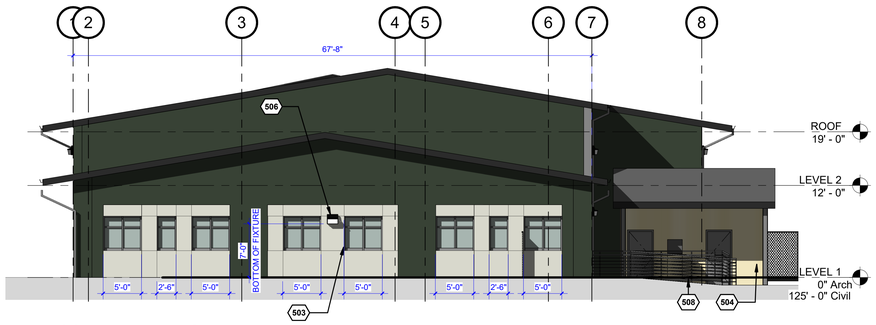
1. OVERALL NORTH ELEVATION

SCALE: 1/8" = 1-0"



2. OVERALL EAST ELEVATION

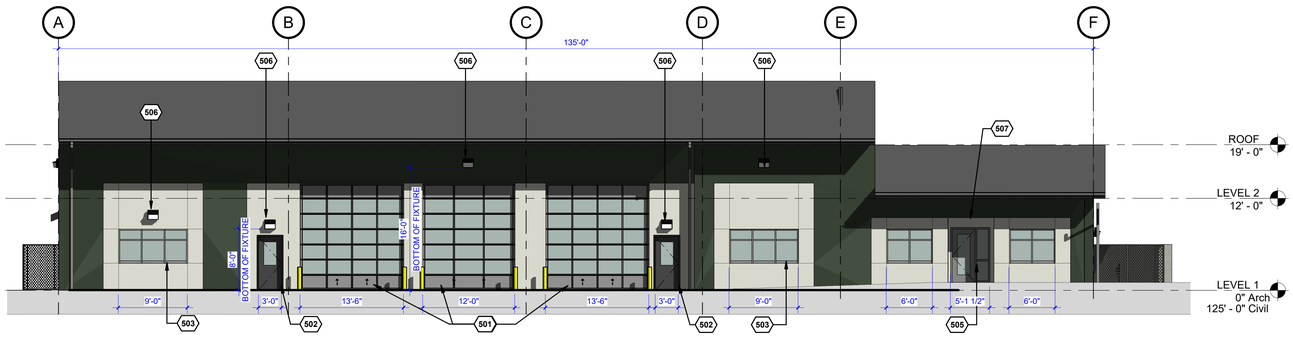
SCALE: 1/8" = 1-0"



3. OVERALL SOUTH ELEVATION

SCALE: 1/8" = 1-0"

EYES ON THE STREET: 67'-8" X 30% = 20'-3 1/2"
PROVIDED: 40'-0"



4. OVERALL WEST ELEVATION

SCALE: 1/8" = 1-0"

EYES ON THE STREET: 135'-0" X 60% = 81'-0"
PROVIDED: 82'-1 1/2"

GENERAL NOTES

A. SEE WALL SECTIONS FOR PARTIAL ELEVATIONS NOT SHOWN.
B. SEE 1/8" FLOOR PLANS FOR EXTERIOR DOOR AND WINDOW TYPES.
C. SEE DOOR AND WINDOW TYPES / SCHEDULES FOR ADDITIONAL INFORMATION.
D. PAINT ALL NON-NOTED MISCELLANEOUS ITEMS TO MATCH ADJACENT MATERIAL OR FINISH COLOR UNO
E. REFER TO RCP'S FOR FINISH MATERIALS OF SOFFIT AREAS.

KEYNOTES

501	SECTIONAL OVERHEAD DOORS
502	PAINTED METAL DOOR
503	WINDOW GLAZING SYSTEM
504	EXISTING PUMP HOUSE
505	STOREFRONT ENTRY SYSTEM
506	WALL MOUNTED EXTERIOR LIGHT FIXTURE, TYP.
507	RECESSED EXTERIOR SOFFIT LIGHT FIXTURE
508	HANDRAIL

LEGEND

- EXISTING SIDING
- METAL BUILDING PANEL TYPE A - MEDIUM TONE GREEN/GREY
- METAL BUILDING PANEL TYPE B - LIGHTER TONE BEIGE/GREY
- STANDING SEAM METAL ROOF

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CONSULTANT:

PROJECT NUMBER: 217284

FAIRVIEW PUBLIC WORKS

48 1ST STREET
FAIRVIEW, OR 97024

SHEET TITLE:
EXTERIOR ELEVATIONS

DRAWN BY: Author
DATE CREATED: 10/26/18

SHEET:
A501
Design Development
12.20.2018

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12/17/2018 8:09:11 AM

EXHIBIT C-1

Fairview File #: 18-76
Fairview Public Works Warehouse
FROM: Kyle Stuart, Gresham Fire (Kyle.Stuart@GreshamOregon.gov)
DATE: 12-28-2018
FIRE COMMENTS:

NOTE: Limited information at this time. All of the following will need to be provided on a separate FIRE ACCESS and WATER SUPPLY page with the building permit plans.

1. Provide fire flow per Oregon Fire Code Appendix B. The addition is currently shown as approximately ***10,147 square feet.*** If the building is of Type III-B construction, the fire flow required is ***1500 gpm at 20 psi for 2 hours*** with a 75% reduction for an NFPA 13 fire sprinkler system. ***OFC App B Table B105.1.***

2. A temporary address of 6" shall be provided at each construction entrance prior to the arrival of materials or workers. At time of final minimum 6" address signage will be required on the side of the building facing the address street. Address must be visible from both directions. ***OFC 505 & 3301***

3. A public or private fire hydrant is required to be within 250 feet of the main entrance driveway. The furthest point on each building shall be no more than 400 feet from a hydrant or 600ft when the building is equipped throughout with an automatic fire sprinkler system. Distances appear to be met, however, show on the building plans where the nearest existing and new hydrants are located. ***OFC Appendix C and 507***

4. Fire hydrant locations shall be identified by the installation of reflective markers. The markers shall be BLUE. They shall be located adjacent and to the side of the centerline of the access road way that the fire hydrant is located on. In case that there is no center line, then assume a centerline, and place the marker accordingly. ***OFC 508.5.4***

5. Each public or private fire hydrant used for fire flow for this property shall have a 5-inch **Storz** adapter with National Standard Threads installed on the 4 ½ -inch fire hydrant outlet. The adapter shall be constructed of high-strength aluminum alloy, have a Teflon coating on the seat and threads, and use a rubber gasket and two (2) set screws to secure it in place. The adapter shall be provided with an aluminum alloy pressure cap. The cap shall be attached to the hydrant barrel or Storz adapter with a cable to prevent theft of the cap. Adapter shall be Harrington HPHA50-45NHWCAP or equal approved by Gresham Fire.

6. Prior to applying for a building permit provide a fire flow test and report for each hydrant on site. The fire flow report will verify that the correct fire flow is available and

will be required to have been conducted within the last 12 months. ***OFC 507.3 & B-101.1***

7. All Fire Dept. Access Roads shall be drawn to scale and shown clearly on plans. The access roads shall be constructed and maintained prior to and during construction. The minimum width is 20' wide. ***OFC, 503.2.1 & D103.1***

8. Fire access roads must extend to within 150ft from the farthest portion of the building as the hose would lay. This appears to be met but distances need to be shown. ***OFC 503.1.1***

9. Required Fire Dept. Access Roads on site shall be designed to support an apparatus weighing 75,000 lb. gross vehicle weight. Provide an engineer's letter stating the access road meets those requirements at time of building permit submittal. ***OFC, Appendix D, Section D102.1***

10. The turning radius for all emergency apparatus roads shall be: 28' inside and 48' outside radius. ***OFC 503.2.1***

11. No Parking Fire Lane signage or curb marking will be required. Fire access roads 20' – 26' wide require the marking on both sides. Indicate on the building permit plans. I can email you our policy. ***OFC D 103.6***

Department of Community Services
Transportation Division
http://multco.us/transportation-planning

1620 SE 190th Avenue, Portland, Oregon 97233-5910 • Phone (503) 988-5050 • Fax (503) 988-3321

M E M O R A N D U M

TO: Sarah Selden, Senior Planner, City of Fairview
Eric Rutledge, Associate Planner, City of Fairview

CC: Joanna Valencia, AICP, Transportation Planning and Development Manager, Multnomah County

FROM: Scott Adams, AICP, Transportation Planner, Multnomah County

DATE: December 31, 2018

SUBJECT: **EP-2018-10604 (2018-76-DR-VAR), 48 1st St. Fairview, OR 97024**
City of Fairview Public Works Maintenance Facility
R160673, R160674, R160675

Multnomah County Transportation Planning and Development has reviewed the above referenced transportation planning review request and provides the following comments.

The comments provided in this memorandum are based on the preliminary project description provided in the transportation planning review proposal. While every effort has been made to identify all related standards and issues, additional issues may arise and other standards not listed may become applicable as more information becomes available.

The subject transportation planning review proposal consists of a new Fairview Public Works operations center that entails demolishing two existing buildings and constructing a new 10,321 SF building. The subject property is located on parcels R160673, R160674, and R160675; parcel R160675 has frontage on Fairview Ave. (NE 223rd Ave.), which is under the jurisdiction of Multnomah County and is functionally classified as a Major Collector road.

On the following pages, all references to *Multnomah County Design and Construction Manual* (MCDCM) use the acronym "MCDCM" and all references to *Multnomah County Road Rules* (MCRR) use the acronym "MCRR".

Transportation Impact

A transportation impact is defined in Multnomah County Road Rules (MCRR 3.000) as any new construction or alteration which increases the number of trips generated by a site by more than 20 percent, by more than 100 trips per day or by more than 10 trips in the peak hour. A minimum increase of 10 new trips per day is required to find a transportation impact.

Since there are no proposed changes to number of employees (8), the County finds no Transportation Impact at this time.

ROW Requirements

Existing Conditions

Fairview Ave. (NE 223rd Ave.). has 60' of right-of-way (ROW).

ROW Requirements

Major Collector roads require an 80' ROW (MCDCM, Table 2.2.2 Urban Collector Cross Sections)**. However, since no Transportation Impact has been found at this time, no ROW dedication is required.**

Stormwater Management

Per the project's October 26, 2018 stormwater report, site-generated stormwater will be directed into the City of Fairview's existing stormwater system. **Therefore, the County finds no impact to County stormwater system and has no further comments at this time.**

Mid-County Lighting District

Please contact Mid-County Lighting District to determine if street lights are required. The subject property is located within the Mid-County Street Lighting District and may require lights along the frontages. The applicant may need to develop street lighting design that is compliant with Mid-County Lighting District standards. Please contact Chet Hagen, Mid-County Street Lighting District Administrator, at chet.hagen@multco.us or 503-988-0164 for more information.

PLANNING COMMISSION STAFF REPORT
TYPE IV TEXT AMENDMENT
FINDINGS AND STAFF RECOMMENDATION

Date of Report: December 31, 2018

Staff Contact: Eric Rutledge, Associate Planner
rutledgee@ci.fairview.or.us
503-674-6205

Application Number: 2018-79-TA

Property Owner: N/A

Applicant: City of Fairview

Site Address: N/A

Proposal: Amend the City's flood code regulations to comply with the National Flood Insurance Program. Amended code chapters include FMC 16.05 Flood Damage Prevention and FMC 19.105 Floodplain Overlay.

Recommendation: Approval

Exhibits:

A. Ordinance
- A1 Draft Ordinance 2-2019
- A2 Draft Code Language (Chapter 16.05 and 19.105 combined into a new single chapter)

B. Supporting Materials
- B1 Updated Flood Insurance Rate Map (2/1/19)
- B2 Updated Flood Insurance Study (2/1/19)

C. Written Comments

C1	Email communication from DLCD
C2	DLCD/FEMA comments and revisions for FMC 16.05 Flood Damage Prevention
C3	DLCD/FEMA comments and revisions for FMC 19.105 Floodplain Overlay

I. NOTICES & REFERRALS

Application Date:	N/A
Application Deemed Complete:	N/A
Planning Commission Public Hearing Date:	January 9, 2019
City Council Hearing Date:	January 16, 2019
Referrals:	The draft code language has been reviewed by the Oregon Department of Land Conservation and Development on behalf of the Federal Emergency Management Agency. The Oregon Department of Land Conservation and Development was sent the required 35-day notice of public hearing and draft amendments on December 10, 2018.

II. APPLICABLE CRITERIA

- FMC 19.205 Amendments
- MC 19.413 Procedures
- FMC 19.470 Land Use District Map & Text Amendments

III. BACKGROUND

Issue

Floods are the nation's most common and costly natural disaster. The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP); a program intended to reduce the impact of flooding on public and private structures. The NFIP helps to reduce the impact of flooding on local communities by offering flood insurance to eligible property owners, renters, and businesses and providing emergency federal assistance during a flood disaster. The NFIP also requires local jurisdictions to adopt and enforce floodplain management regulations that meet or exceed federal standards. The purpose of this text amendment is to comply with updated federal standards.

FEMA has recently provided a new Flood Insurance Study (FIS), Flood Insurance Rate Map (FIRM), and revised code regulations for floodplain development. The FIS and FIRM are enacted automatically by FEMA, and the City is required to update flood regulations to meet or exceed the new requirements. The deadline for adoption is February 1, 2019.

Summary of Changes

FIS – The FIS is a compilation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. FEMA automatically updated the FIS report that contains detailed flood elevation data in flood profiles and data tables which will become effective on February 1, 2019. See Exhibit B2 – Flood Insurance Study.

FIRM – The FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and the risk premium zones applicable to the community. The City of Fairview is divided into six separate FIRM "panels", or smaller areas of the larger FIRM map. FEMA automatically updated four out of six FIRM panels, which will become effective on February 1, 2019. No significant changes were made to the FIRM since the last revision. See Exhibit B1 (updated FIRM panels 210, 214, 216, and 218).

Municipal Code – The Fairview Municipal Code is required to meet or exceed the flood regulations developed by FEMA. The City's flood regulations are currently located in two separate titles, Title 16 Environmental Regulations and Title 19 Development Code. The two chapters have been combined into a single chapter within the development code, and updated to meet the current federal standards.

FEMA requires that the definitions in the local flood code match verbatim the language in the federal regulations. A number of definitions were updated as part of this code revision. Other changes to the code include clarifying administrative rules, updating reporting requirements when new technical data is available, and other changes. See all proposed changes in Exhibit A2 (note – Exhibit A2 includes all changes to Chapter 19.105, including changes made by incorporating Chapter 16.05 into Chapter 19.105.

For a clearer understanding of the proposed changes on each chapter, see Exhibits C2 and C3. Small changes may have occurred between the separate chapters and the final merged chapter).

V. APPROVAL CRITERIA FINDINGS

Chapter 19.205 Amendments

19.205.010 Procedure.

A proposal to amend the zoning ordinance text or map may be initiated by the city council, the planning commission or a property owner who files an application with the city.

Amending the zoning ordinance text or map shall require a public hearing before both the planning commission and the city council. Mailed notice of hearing shall include the owners of the property within 250 feet of the subject parcel or parcels when the proposed amendment is site specific.

> **FINDINGS:** The application will be considered during a planning commission hearing on January 8, 2019 and a city council hearing on January 16, 2019. The proposed amendment is not site specific. This standard is met.

19.205.020 Criteria.

Approval of an ordinance text or map amendment shall be based on finding that it complies with the following criteria…

> **FINDINGS:** In addition to the legislative amendment criteria in FMC 19.413.040(G), the text amendment must also comply with the criteria in this section. Full staff findings on all applicable approval criteria is included below in the "Decision Making Criteria" section.

19.205.030 Limitation on reapplication.

No application of a property owner for an ordinance text or map amendment shall be considered within the one-year period immediately following a denial of a request for the same property, except the hearing body may permit a new application upon making a determination that it is warranted because of new evidence or a change in circumstances.

> **FINDINGS:** This section does not apply to the application. The application was initiated by the City and is not site specific.

19.205.040 Effective Dates.

An ordinance text or map amendment shall take effect 30 days after the date of approval, unless appealed or immediately where an emergency is declared to exist consistent with Section 33 of the City Charter.

FINDINGS: The ordinance must be passed by February 1, 2019 in order to maintain participation in the NFIP. The ordinance will be passed as an emergency to meet this deadline, consistent with Section 33 of the City Charter.

19.205.050 Notice of ordinance or plan amendments.
Type III decisions shall comply with the notice provisions of FMC 19.413.030. Type IV decisions shall comply with the provisions of FMC 19.413.040.

FINDINGS: Full findings on FMC 19.413.040 are included below.

Chapter 19.413 Procedures
19.413.040 Type IV procedures (legislative).

A. Type IV matters are considered initially by the planning commission with final decisions made by the city council. Type IV procedures apply to legislative matters and involve the following:

2. Development code text amendments.

FINDINGS: A development code text amendment is proposed and a Type IV application process is required.

B. Required Hearings. A minimum of two hearings, one before the planning commission, and one before the city council, are required for all Type IV applications, except annexations where only a hearing by the city council is required.

FINDINGS: The application will be considered during a planning commission hearing on January 8, 2019 and a city council hearing on January 16, 2019. This standard is met.

C. Public Notification Requirements. Notice of public hearings shall be given by the city in the following manner:

1. At least 30 days, but not more than 40 days, before the date of the first hearing on an ordinance that proposes to amend the comprehensive plan or any element thereof, or to adopt an ordinance that proposes to rezone property, a notice shall be prepared in conformance with ORS 227.175 and mailed to…

FINDINGS: A comprehensive plan amendment and/or rezone is not proposed. This noticing requirement does not apply.

2. *At least 10 days before the scheduled planning commission public hearing date, and 10 days before the city council hearing date, notice shall be published in a newspaper of general circulation in the city.*

FINDINGS: Notice will be published in the January 8, 2019 Gresham Outlook. Although 10-day newspaper notice deadline was not met, both newspaper posting will be published prior to the hearings. Notice of the regularly scheduled meetings was also published on the City's website.

3. *Metro and the Department of Land Conservation and Development (DLCD) shall be notified in writing of proposed Comprehensive Plan and development code amendments at least 35 days before the first public hearing at which public testimony or evidence will be received.*

FINDINGS: Notice was sent to DLCD on December 10, 2018 and to Metro on December 31, 2018. The Metro notice was sent after the 35-day deadline, however, comments may still be incorporated into the record and decision making process for for the city council hearing.

4. *Notifications for annexation shall follow the provisions of this chapter. The notice must be received by the Department of Land Conservation and Development no later than 35 days prior to the evidentiary hearing.*

FINDINGS: This standard does not apply.

Subsections D, E, F, G, H, and I

FINDINGS: Subsections D-F and H-I relate to application noticing and hearing procedures. The application was processed in accordance with these requirements and the public hearings will be held in accordance with the requirements.

Subsection G lists the legislative amendment decision making criteria. Full staff findings on the approval criteria are included below in the "Decision Making Criteria" section.

Chapter 19.470 Land Use District Map and Text Amendments
19.470.100 Purpose.

The purpose of this chapter is to provide standards and procedures for legislative and quasi-judicial amendments to this code and the land use district map…

19.470.200 Legislative amendments.
Legislative amendments are policy decisions made by city council. They are reviewed using the Type IV procedure in FMC 19.413.040.

FINDINGS: The application is for a legislative amendment and a final decision will be made by the city council using a Type IV procedure.

19.470.300 Quasi-judicial amendments…

FINDINGS: The application is not a quasi-judicial amendment and this section does not apply.

19.470.400 Conditions of approval.
A quasi-judicial decision may be for denial, approval, or approval with conditions. A legislative decision may be approved or denied.

FINDINGS: This section does not apply.

19.470.500 Record of amendments.
The city recorder shall maintain a record of amendments to the text of this code and the land use districts map in a format convenient for public use.

FINDINGS: An updated record of all amendments and the municipal code is kept with the City and is available for public use.

19.470.600 Transportation planning rule compliance.

A. When a development application includes a proposed comprehensive plan amendment or land use district change, the proposal shall be reviewed to determine whether it significantly affects a transportation facility consistent with OAR 660-012-0060…

FINDINGS: A comprehensive plan and/or land use district is not proposed. This standard does not apply.

Decision Making Criteria Findings

FMC 19.413.040(G) Decision Making Consideration (for legislative amendments). The recommendation by the planning commission and the decision by the city council shall be based on consideration of the following factors:

1. Statewide planning goals and guidelines.

FINDINGS: The proposed code language has been reviewed by the Oregon Department of Land Conservation and Development (DLCD), which administers the statewide planning goals and guidelines. The proposed code language is consistent with the goals and guidelines. See comments included as (Exhibits C1 – C3)

2. Comments from applicable federal or state agencies.

FINDINGS: The proposed changes are required by FEMA to continue participation in the NFIP. In order to expedite the review process, FEMA has delegated NFIP commenting and review authority to DLCD. The proposed changes were developed with DLCD to ensure compliance with state and federal regulations.

3. Applicable intergovernmental agencies.

FINDINGS: The application was routed to Metro on December 31, 2018. Comments will be incorporated into the record prior to the council hearing on January 16, 2019.

4. Applicable Comprehensive Plan policies.

FINDINGS: Chapter 7 of the Comprehensive Plan addresses natural hazard areas, including those related to flooding. Policy 1 states:

"Flood Plain Development: Development of flood plain areas will be in accordance with the National Flood Insurance Program guidelines, Metro's Title 3 of the Functional Plan, and the City's Flood Plain Ordinance."

The proposed text amendment will bring the City's flood plain regulations in conformance with national guidelines.

FMC 19.205.020 Criteria (for all amendments). Approval of an ordinance text or map amendment shall be based on finding that it complies with the following criteria:

A. The amendment will not interfere with the livability, development or value of other land in the vicinity of site-specific proposals when weighed against the public interest in granting the proposed amendment.

FINDINGS: The proposed text amendment applies to all properties of special flood hazard and is not site specific. This standard does not apply.

B. The amendment will not be detrimental to the general interests of the community.

FINDINGS: The proposed amendment will allow eligible Fairview residents, businesses, and property owners to purchase flood insurance and receive federal emergency assistance. The amendment will maintain an important natural disaster assistance program and will not be detrimental to the general interests of the community. This standard is met.

C. The amendment will not violate the land use designations established by the comprehensive land use plan and map or related text.

FINDINGS: As discussed above, the proposed amendment complies with Chapter 7 of the Comprehensive Plan which addresses natural hazard areas and flooding. The amendment does not change the underlying zone or allowed uses in those zones. This standard is met.

D. The amendment will place all property similarly situated in the area in the same zoning designation or in appropriate complementary designations without creating inappropriate "spot zoning."

FINDINGS: The proposed amendment will be applied to all properties with areas of special flood hazard. The text is not site specific and will not result in "spot zoning". This standard is met.

VI. CONCLUSION AND RECOMMENDATIONS

STAFF RECOMMENDATION

Staff recommends approving Ordinance 2-2019 based on the findings included in this report. The planning commission decision will be forwarded to city council for a final decision.

PLANNING COMMISSION ALTERNATIVES

1. Recommend City Council adoption of draft Ordinance 2-2019, with the findings included in the staff report dated December 31, 2018.

2. Recommend City Council adoption of Ordinance 2-2019, with modified planning commission findings.

3. Do not recommend City Council adoption of Ordinance 2-2019, with planning commission findings.

4. Continue the Public Hearing to if additional information is needed.

Exhibit A1

ORDINANCE
(02-2019)

AN ORDINANCE AMENDING FAIRVIEW MUNICIPAL CODE CHAPTERS 16.05 FLOOD DAMAGE PREVENTION AND 19.105 FLOODPLAIN OVERLAY IN ORDER TO CONTINUE PARTICIPATION IN THE NATIONAL FLOOD INSURANCE PROGRAM

WHEREAS, floods are the nation's most common and costly natural disaster; and

WHEREAS, the Federal Emergency Management Agency (FEMA) administers the voluntary National Flood Insurance Program (NFIP) in order to minimize the impact of flooding on local communities by offering affordable flood insurance and setting floodplain regulation standards; and

WHEREAS, the City of Fairview participates in the program to strengthen flood protection regulations and better prevent and respond to hazardous flood events; and

WHEREAS,FEMA has provided an updated Flood Insurance Study (FIS), Flood Insurance Rate Map (FIRM), and updated floodplain regulations; and

WHEREAS, the City is required to adopt and enforce floodplain regulations that match or exceed the federal regulations by February 1, 2019 in order continue participation in the National Flood Insurance Program; and

WHEREAS, the Oregon Department of Land Conservation and Development has reviewed the proposed changes on behalf of FEMA and concluded the changes comply with federal floodplain regulations; and

NOW, THEREFORE, THE CITY OF FAIRVIEW ORDAINS AS FOLLOWS:

Section 1 The City adopts the findings as set forth in the staff report dated December 31, 2018 (File No. 2018-79-TA) in support of the Ordinance 2-2019

Section 2 The City adopts Ordinance 2-2019 which removes Fairview Municipal Code Chapter 16.05 Flood Damage Prevention and amends Fairview Municipal Code Chapter 19.105 Floodplain Overlay to include the regulations in 16.05 and meet federal floodplain regulations of the NFIP (Exhibit A2)

Ordinance adopted by the City Council of the City of Fairview, this January day of 16, 2019.

_____

Mayor, City of Fairview

Exhibit A1

Brian Cooper

ATTEST

_____

City Recorder, City of Fairview
Devree Leymaster

_____

Date

Exhibit A2

Chapter 19.105

FLOODPLAIN OVERLAY

Sections:

19.105.010 Purpose.
19.105.020 Definitions.
19.105.0302~~0~~ General provisions.~~Area affected.~~
19.105.0430 Administration. ~~Compliance.~~
~~19.105.040 Procedures.~~
19.105.050 Permitted uses.
19.105.060 Conditional uses.
19.105.070 Prohibited uses.
19.105.0890 General standards for flood hazard reduction ~~Performance standards.~~
19.105.090 Variance and appeal procedure

19.105.010 Purpose.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas. (Ord. 6-2001 § 1)

19.105.020 Definitions.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted to give them their meaning in common usage and give these regulations their most reasonable application/scope.

As used in this chapter, unless the context requires otherwise:

A. "Appeal" means a request for a review of the interpretation of any provision of this ordinance or a request for a variance.

B. "Area of Shallow Flooding" means a designated AO or AH Zone on a community's Flood Insurance Rate Map (FIRM) with a 1 percent or greater annual chance of flooding to an average depth of 1 to 3 feet where a clearly defined channel does not exist, where the path of flooding is unpredictable, and where velocity flow may be evident. Such flooding is characterized by ponding or sheet flow.

C. "Area of Special Flooding Hazard" means the land in the flood plain within a community subject to a one percent 1 percent or greater chance of flooding in any given year. The area may be designated as Zone A on the Flood Hazard Boundary Map (FHBM). After detailed ratemaking has been completed in preparation for publication of flood insurance rate map, Zone A usually is refined into Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, or V. For purposes of these regulations, the term "special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard".

D. "Base Flood" means the flood having a one percent (1%) chance of being equaled or exceeded in any given year.

E. "Basement" means any area of a building having its floor sub-grade (below ground level) on all sides.

F. "Below-Grade Crawl Space" means an enclosed area below the base flood elevation in which the interior grade is not more than two feet (2') below the lowest adjacent exterior grade and the height - measured from the interior grade of the crawlspace to the top of the crawlspace foundation - does not exceed four feet (4') at any point.

G. "Breakaway Wall" means a wall not part of the structural support of a building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

H. "City" means the City of Fairview, Oregon.

I. "Council" or "City Council" means the Fairview City Council or such person(s) or entity(ies) designated by that body to perform the appeal or variance review functions given it buy the terms of this Chapter.

J. "Critical Facility" means a facility where a slight chance of flooding may be too great. Critical facilities include:
   1. Schools;
   2. Nursing homes;
   3. Hospitals;
   4. Police, fire and other emergency response installations; and
   5. Installations producing, using or storing hazardous materials or waste.

K. "Director" means the City's Community Development Director or designate.

L. "DEQ" means the Oregon Department of Environmental Quality.

M. "Development" means any man-made change to improved or unimproved real property, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials.

N. "DLCD" means the Oregon Department of Land Conservation and Development.

O. "Elevated Building" means, for insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

P. "Flood or Flooding" means:
   1. A general and temporary condition of partial or complete inundation of normally dry land areas from:
      a. The overflow of inland or tidal waters.
      b. The unusual and rapid accumulation or runoff of surface waters from any source.
      c. Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in paragraph (a)(2.) of this definition and are akin to a river of liquid and flowing mud

on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

2. The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (1)(a) of this definition.

Q. "Flood Insurance Rate Map (FIRM)" means an official map of a community, on which the Federal Insurance Administrator has delineated both the special flood hazard areas and the risk premium zones applicable to the community.

R. "Flood Insurance Study" means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards.

S. "Floodway" means the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (one foot (1')).

T. "Lowest Floor" means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of these regulations.

U. "Manufactured Dwelling" means a structure transportable in one or more sections built on a permanent chassis and designed for use with or without a permanent foundation when attached to required utilities. The term "manufactured dwelling" does not include a "recreational vehicle." The term "manufactured dwelling" is synonymous with the term "manufactured home".

V. "Manufactured Home Park or Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

W. "New Construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvement to such structures .

X. "Recreational Vehicle" means a vehicle which is:
1. Built on a single chassis;
2. 400 square feet or less when measured at the largest horizontal projection;
3. Designed to be self-propelled or permanently towable by a light duty truck; and
4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

Y. "Start of Construction" includes substantial improvement, and means the date the building permit was lawfully issued, provided the actual start of construction, repair, reconstruction,

rehabilitation, addition placement, or other improvement was within 180 days of the permit date. The actual start means either the first placement of permanent construction of a structure on construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. For a "substantial improvement", the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, whether or not that alteration affects the external dimensions of the building.

Z. "State Building Code" means the combined specialty codes.

AA. "Structure" means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured dwelling.

BB. "Substantial Damage" means damage of any origin sustained by a structure whereby the cost of restoring the structure to its before damaged condition would equal or exceed 50 percent (50%) of the market value of the structure before the damage occurred.

CC. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a structure, the cost of which equals or exceeds 50 percent (50%) of the market value of the structure before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not , however, include either:

1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or
2. Any alteration of a "historic structure", provided that the alteration will not preclude the structure's designation as a "historic structure".

DD. "Variance" means a grant of relief by a community from the terms of a floodplain management regulation.

EE. "Water Dependent" means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

~~19.105.020 Area affected.~~
~~This section shall apply to all areas designated as areas of special flood hazard by the federal insurance administration on its current flood hazard boundary map (FHBM), applicable to and including all areas within the boundaries of the city of Fairview or more current information such as Metro flood management maps, if demonstrated to be accurate. (Ord. 6-2001 § 1)~~

19.105.030 **General provisions.**

A. This Chapter applies to all areas of "special flood hazards" within the City as described in subsection (B) below.

B. The areas of "special flood hazard" are those areas identified by the Federal Insurance Administration in a report entitled "*The Flood Insurance Study for the Multnomah County, Oregon and Incorporated Areas*" (dated February 1, 2019) (hereinafter Study) along with accompanying FIRMs. Those documents are adopted by reference and declared to be part of this Chapter. A copy of the Maps and Study are on file in the Office of the Public Works Director. The best available information for flood hazard area identification shall be the basis for regulation until a new FIRM is issued.

C. No structure shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this Chapter. The City may seek any remedy lawfully available to it to effect compliance and in the event the City is compelled to seek judicial redress for violation(s) of this Chapter, the City shall be entitled to recover its reasonable attorneys and expert witness fees both at trial and on appeal.

D. This Chapter is not intended to repeal, abrogate, or impair existing easements, covenants or deed restrictions. Where these regulations and another local, state or federal law conflict, the more restrictive shall control.

E. If any section clause, sentence, or phrase of this Chapter is held to be invalid or unconstitutional, then said holding shall in no way affect the validity of the remaining portions hereof.

F. These regulations shall be considered minimum requirements, liberally construed in favor of the city, and not deemed to either limit or repeal any other powers granted the city by state or federal law or its inherent plenary powers.

G. The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of the city, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

~~**19.105.030 Compliance.**~~
~~No structure or land shall hereafter be constructed, located, extended, converted or altered without full compliance with the terms of Chapter 16.05 FMC. (Ord. 6-2001 § 1)~~

19.105.040 Administration.

A. Development Permit Required. A development permit shall be obtained prior to construction or development within any area of special flood hazard. The permit shall be for all structures and development.

B. Application for Development Permit. Application(s) for a development permit shall be on forms furnished by the city, submitted to the director and include plans in duplicate drawn to scale showing:

1. The nature, location, dimensions and elevations of the development area;
2. Existing and/or proposed structures;
3. Fill;
4. Storage of materials; and
5. Drainage facilities.
6. In addition to the foregoing, the following information is to be provided on the plans at the time application is made:
   a. Elevation of the lowest floor (including basement) of all structures in relation to mean sea level;
   b. Elevation in relation to mean sea level of flood-proofing in any structure;

c. Certification by a registered professional engineer or Oregon licensed architect that flood-proofing methods for nonresidential structure(s) meet the requirements set out in 19.105.080(A)(2); and

d. Description of the extent (if any) to which a watercourse may be altered as a result of the development.

C. Designation and Duties of Floodplain Administrator. The Director is hereby appointed to administer and implement this Chapter by granting or denying development permit applications with its provisions; duties include (but are not limited to) the following:

1. Review of all development permit applications and all resulting permits to ensure compliance with requirements imposed by this chapter;
2. Determine whether appropriate federal, state, and/or local regulatory permits have been obtained;
3. Maintain all records pertaining to the provisions of this chapter for public inspection;
4. Notify adjacent communities, DLCD, and other appropriate state and federal agencies prior to the alteration/relocation of a watercourse and cause the submission of evidence thereof to the Federal Insurance Administration as well as requiring that maintenance is provided within the altered or relocated portion of said watercourse so that the flood carrying capacity is not diminished;
5. Make interpretations as to the location of boundaries of special flood hazard areas (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal;
6. Determine if the proposed development is located in the floodway. If the proposed development is located in a floodway, ensure the appropriate provisions of 19.105.080 are met;
7. When base flood elevation data has not been provided (A and V Zones), the floodplain administrator shall obtain, review and reasonably utilize any base flood elevation and floodway data available from Federal, State, or other sources in order to administer 19.105.080;
8. Where base flood elevation data is provided through the Flood Insurance Study, FIRM, or otherwise, the Director shall obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basements and below-grade crawlspaces) of all new or substantially improved structures and whether the structure contains a basement; and

9. For all new or substantially improved flood-proofed structures where base flood elevation data is provided through the Flood Insurance Study, FIRM, or as required in this section :
   a. Verify and record the actual elevation (in relation to mean sea level); and
   b. Maintain flood-proofing certifications required by this section.

10. Provide to building officials the base flood elevation and freeboard applicable to any building requiring a building permit.

11. Review all development permit applications to determine if the proposed development qualifies as a substantial improvement under this chapter.

D. Requirement to Submit New Technical Data

1. Notify FEMA within six months of project completion when an applicant has obtained a Conditional Letter of Map Revision (CLOMR) from FEMA, or when development altered a watercourse, modified floodplain boundaries, or modified Base Flood Elevations. This notification shall be provided as a Letter of Map Revision (LOMR).
2. The applicant shall be responsible for preparing technical data to support the LOMR application and paying any processing application fees to FEMA.
3. Upon occurrence, notify the Administrator in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce flood plain management regulations for a particular area. In order that all FHBM's and FIRM's accurately represent the community's boundaries, include within such notification a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished flood plain management regulatory authority.

~~**19.105.040 Procedures.**~~
~~A development permit shall be obtained before construction or development begins within any area of special flood hazard. Requirements for the permit as well as specific and general standards are outlined in Chapter 16.05 FMC. (Ord. 6-2001 § 1)~~

19.105.050 Permitted uses.
The following uses are permitted outright in accordance with the specific and general standards outlined in this chapter:

A. Excavation and fill required to plant any new trees or vegetation.

B. Restoration or enhancement of floodplains, riparian areas, upland and streams. ~~(Ord. 6-2001 § 1)~~

19.105.060 Conditional uses.
The following uses are permitted conditionally in accordance with the specific and general standards outlined in this chapter:

A. All uses allowed in the base zone or existing flood hazard overlay zone. ~~(Ord. 6-2001 § 1)~~

19.105.070 Prohibited uses.
The following uses are not permitted:

A. Any use otherwise prohibited in the base zone or existing flood hazard overlay zone.

B. Any uncontained area of hazardous materials as defined by DEQ. ~~(Ord. 6-2001 § 1)~~

~~**19.105.090 Performance standards.**~~
~~A. Any development should maintain or increase the capacity of the flood management area.~~

~~B. All fill placed at or below design flood elevation shall be balanced with at least an equal amount of soil material removal.~~

~~C. Excavation of areas that would be filled with water in non-stormwater conditions is not to be counted as part of the floodplain balance referenced in subsection B of this section.~~

~~D. Temporary fills permitted during construction shall be removed in a timely manner. (Ord. 6-2001 § 1)~~

19.105.080 General standards for flood hazard reduction.

A. In all areas of special flood hazards, the following is required:
   1. Anchoring.
      a. All new construction and substantial improvement(s) shall be anchored to prevent flotation, collapse, or lateral movement of the structure; and
      b. All manufactured dwellings shall be anchored to prevent flotation, collapse, or lateral movement and installed using methods and practices designed to minimize flood damage. Anchoring methods may include, but are not limited to use of over-the-top or frame ties to ground anchors (*see*, FEMA's "Manufactured Home Installation in Flood Hazard Areas").

   2. Construction Materials and Methods.
      a. All new construction and substantial improvement(s) shall be constructed with materials and utility equipment resistant to flood damage;
      b. All new construction and substantial improvement(s) shall be constructed using methods and practices designed to minimize flood damage; and
      c. Electrical, heating, ventilation, plumbing, air-conditioning and other service equipment/facilities shall be designed and/or elevated or located to prevent water from entering or accumulating within the components during flooding.

   3. Utilities.
      a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
      b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters; and
      c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding consistent with rules adopted by DEQ.

   4. Subdivision Proposals.
      a. All subdivision proposals shall be consistent with the need to minimize flood damage;
      b. All subdivision proposals shall have public utilities/facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage;
      c. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and

d. Where base flood elevation data has not been provided nor available from an authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or 5 acres, whichever is less.

5. Review of Building Permits. Where elevation data is unavailable through the Flood Insurance Study, FIRM or other authoritative source, building permit applications shall be reviewed with the aim of promoting safety from flooding. Use of historical data, high water marks, photographs of past flooding, etc. should be used where available. Failure to elevate at least two feet (2') above grade in these zones may result in higher insurance rates.

6. AH Zone Drainage. Adequate drainage paths are required around structures on slopes to guide floodwaters around and away from proposed structures.

B. In areas of special flood hazard where base flood elevation data has been provided (Zones A1-30, AH, AE, A and V), the following requirements are to be met:

1. Residential Construction. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to a minimum of one foot (1') above the base flood elevation. Fully enclosed areas subject to flooding below the lowest floor are either prohibited or be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by an Oregon registered/licensed professional engineer or architect or meet or exceed the following minimum criteria:
   a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
   b. The bottom of all openings shall be no higher than one foot (1') above grade; and
   c. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
   d. If a building has more than one enclosed area below the lowest floor, each area shall be equipped with adequate flood openings.

2. Nonresidential Construction. New construction and/or substantial improvement of any commercial, industrial or other nonresidential structure shall either have the lowest floor, including basement, elevated at or above the base flood elevation or, together with attendant utility and sanitary facilities, shall:
   a. Be flood-proofed such that below the base flood level, the structure is watertight with walls substantially impermeable to the passage of water;
   b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
   c. Be certified by a Oregon registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans.

3. Elevated nonresidential structures. All elevated nonresidential structures not flood-proofed and with space below the lowest floor are either prohibited or must be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by

an Oregon registered/licensed professional engineer or architect or meet or exceed the following minimum criteria:

a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
b. The bottom of all openings shall be no higher than one foot (1') above grade; and
c. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
d. If a building has more than one enclosed area below the lowest floor, each area shall be equipped with adequate flood openings.

4. Persons flood-proofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot (1') below the flood-proofed level (e.g. a building flood-proofed to the base flood level will be rated as one foot (1') below.)

5. Manufactured Dwellings.
   a. Manufactured dwellings supported on solid foundation walls shall be constructed with flood openings that comply with 19.105.050(B)(1) above;
   b. The bottom of the longitudinal chassis frame beam shall be at or above the BFE;
   c. The manufactured dwelling shall be anchored to prevent flotation, collapse, and lateral movement during the base flood. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques), and;
   d. Electrical crossover connections shall be a minimum of 12 inches above BFE.

6. Recreational Vehicles.
   Recreational vehicles placed on sites in special flood hazard zones are required to:

   a. Be on the site for fewer than 180 consecutive days; and
   b. Be licensed and ready for highway use on its wheels or jacking system and attached to the site only by quick disconnect type utility and security devices; and
   c. Have no permanently attached additions; or, alternatively,
   d. Meet the requirements for manufactured dwellings in 19.105.080(B)(5) above, including but not limited to the elevation and anchoring requirements for manufactured dwellings.

7. Below-grade crawl spaces.
   Below-grade crawlspaces are allowed subject to standards found in FEMA's Technical Bulletin 11-01 "*Crawlspace Construction for Buildings Located in Special Flood Hazard Areas*":

   a. The building must be designed and anchored to resist flotation, collapse, and lateral movement as a result of hydrodynamic and/or hydrostatic loads, including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can be addressed through openings described below.
   b. Crawlspace construction is not allowed in areas with flood velocities greater than five feet (5') per second unless designed by an Oregon registered/licensed architect or professional engineer.
   c. The crawlspace is an enclosed area below the base flood elevation (BFE) and must have openings equalizing hydrostatic pressures by allowing the automatic

entry and exit of floodwaters with the bottom of each flood vent opening no more than one foot (1') above the lowest adjacent exterior grade.

d. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE. The recommended construction practice is to elevate the bottom of joists and all insulation above BFE.

e. Any building utility systems within the crawlspace must be elevated above BFE or designed so floodwaters cannot enter or accumulate within the system components. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters.

f. The interior grade of a crawlspace below the BFE must not be more than two feet (2') below the lowest adjacent exterior grade.

g. The height of the below-grade crawlspace measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall must not exceed four feet (4') at any point. The height limitation is the maximum allowable unsupported wall height according to the engineering analysis and building code requirements for flood hazard areas.

h. There must be a drainage system providing for removal of floodwaters from the interior area of the crawlspace such that the area is drained within a reasonable time after a flood event. The system will vary as a result of the site gradient and other drainage characteristics. Possible options include natural drainage through porous, well-drained soils and installation of drainage systems such as perforated pipes, drainage tiles, gravel or crushed stone top allow for drainage by gravity or mechanical means.

i. The velocity of floodwaters at the site should not exceed five feet (5') per second for any crawlspace. For velocities in excess of five feet (5') per second, other foundation types should be used.

For more detailed information refer to FEMA Technical Bulletin 11-01.

8. Floodway Not Established. Where a regulatory floodway has not been designated, no new construction, substantial improvement(s) or other development (including fill) is permitted within Zones A1-30 and AE on the City's FIRM, unless it is demonstrated that the cumulative effect(s) of the proposed development, when combined with other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot (1') at any point within the City.

9. Floodway Established. Located within areas of special flood hazard are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply to areas designated as floodways.

   a. No encroachments (including fill), new construction, substantial improvement(s) and other development shall occur unless certification by a registered professional civil engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that encroachments will not result in any increase in base flood or floodway elevations during a base flood discharge.

   b. If 19.105.080(B)(9)(a) above is satisfied, all new construction and substantial improvement(s) shall comply with all applicable flood hazard reduction provisions.

c. Manufactured dwellings may be located in floodways only under the following circumstances:
   i. If there is an existing manufactured dwelling, placement was permitted at the time of the original installation and its continued use is not a threat to life, health, property, or the general welfare of the public; or
   ii. A new manufactured dwelling is replacing an existing one where the original placement was permitted at the time and the replacement will not be a threat to life, health, property or the general welfare of the public; and
   iii. The location of the dwelling meets all the following:
      A. Demonstration that the manufactured dwelling and any accessory building(s), structure(s) or other improvement(s) will not result in any increase in flood levels during the occurrence of a base flood discharge;
      B. The replacement dwelling and any accessory building(s)/structure(s) are elevated so that the bottom of the longitudinal chassis frame beam is at or above the BFE;
      C. The replacement dwelling is placed, anchored and secured to a foundation support system designed by an Oregon professional engineer or architect and approved by the City;
      D. The replacement dwelling, its foundation supports and any accessory building(s)/structure(s) or property improvement(s) do not displace water so as to cause a rise in water level or divert water in a manner likely to cause erosion/damage to other properties;
      E. The replacement dwelling is appropriately zoned; and
      F. Location of the replacement dwelling will not violate any other local, state or federal law.

10. Shallow Flooding Areas.
The following restrictions apply in Shallow Flooding Areas:

a. New construction and substantial improvements of residential structures and manufactured homes shall have the lowest floor (including basement) elevated above the highest grade adjacent to the building, a minimum of one foot (1') above the depth number specified on the FIRM and at least two feet (2') if no depth number is specified.
b. New construction and substantial improvements of nonresidential structures shall either:
   i. Have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, one foot (1') or more above the depth number specified on the FIRM (at least two feet (2') if no depth number is specified); or
   ii. Together with attendant utility and sanitary facilities, be completely flood-proofed to or above that level such that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect.
c. Require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.
d. Recreational vehicles placed on sites must either:

i. Be on the site for fewer than 180 consecutive days, and

ii. Be fully licensed and ready for highway use, on its wheels or jacking system, is attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or

iii. Meet the elevation and anchoring requirements for manufactured dwellings set out above.

11. Critical Facilities.

a. Construction of new critical facilities shall, to the extent possible, be located outside the limits of the Special Flood Hazard Area (SFHA) (100-year floodplain).

b. Construction of new critical facilities shall be permissible within the SFHA if no feasible alternative site is available. Critical facilities constructed within the SFHA shall have the lowest floor elevated three feet above BFE or to the height of the 500-year flood, whichever is higher. Access to and from the facility should be protected to the height noted. Flood-proofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base flood elevation shall be provided to all critical facilities to the extent possible.

19.105.090 Variance and appeal procedure.

All variance requests are processed by the city according to the specifications set forth below.

A. The planning commission shall hear and decide requests for variances from the requirements of this chapter.

B. The city council shall hear and decide appeals when it is alleged there is an error in any requirement, decision or determination by the Planning Commission in the enfocement or administration of this chapter.

C. These aggrieved by a decision of the planning commission who have standing in the land use procedure may appeal such decision to the city council.

D. Generally, the only condition under which a variance from the elevation standard may be issued is for new construction and substantial improvements to be erected on a lot of one-half acre or less in size contiguous to and surrounded by lots with existing structures constructed below the base flood level, providing items listed in subsections (E)-(N) below have been fully considered. As the lot size increases the technical justification for issuing the variance increases.

E. In reviewing an application for variance to the floodplain standards, the planning commission shall consider all technical evaluations, all relevant factors, standards specified in other sections of this chapter, and:

1. The danger that materials may be swept onto other lands to the injury of others;
2. The danger to life and property due to flooding or erosion damage;
3. The susceptibility of any proposed development and its contents to flood damage and the impact of such damage on the owner(s) thereof;
4. The importance of services provided by the proposed development facility to the City and community;

5. The necessity to the facility of a waterfront location, where applicable;
6. The availability of alternative location(s) for the proposed use not subject to flooding or erosion damage;
7. The compatibility of the proposed use with existing and anticipated development;
8. The relationship of the proposed use to the comprehensive plan and flood plain management program for that area;
9. The safety of access to the property in times of flood for ordinary and emergency vehicles;
10. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and
11. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

F. Variances may be issued for reconstruction, rehabilitation, or restoration of structures listed in the National Register of Historic Places or the Statewide Inventory of Historic Properties, without regard to procedures set forth in this section.

G. Variances may not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.

H. Variances shall only be issued upon a determination that the variance is the minimum necessary, considering the flood hazard, to afford relief.

I. Variances will only be issued upon:

1. A showing of good and sufficient cause;
2. A determination that failure to grant the variance would result in exceptional hardship to the applicant; and
3. A determination that the granting of the variance will not result in increased flood heights, additional threat(s) to public safety, extraordinary public expense, creation of a nuisance, cause fraud on or victimization of the public nor otherwise conflict with existing local laws or regulations.

J. Variances as interpreted in the National Flood Insurance Program are based on the general zoning law principle that they pertain to a physical piece of property; they are not personal in nature and do not pertain to the structure, its inhabitants, economic or financial circumstances. They primarily address small lots in densely populated residential neighborhoods. As such, variances from the flood elevations should be quite rare.

K. Variances may be issued for nonresidential buildings in very limited circumstances to allow a lesser degree of floodproofing than watertight or dry-floodproofing, where it can be determined that such action will have low damage potential, complies with all other variance criteria except 19.105090(D) and otherwise complies with 19.105.080.

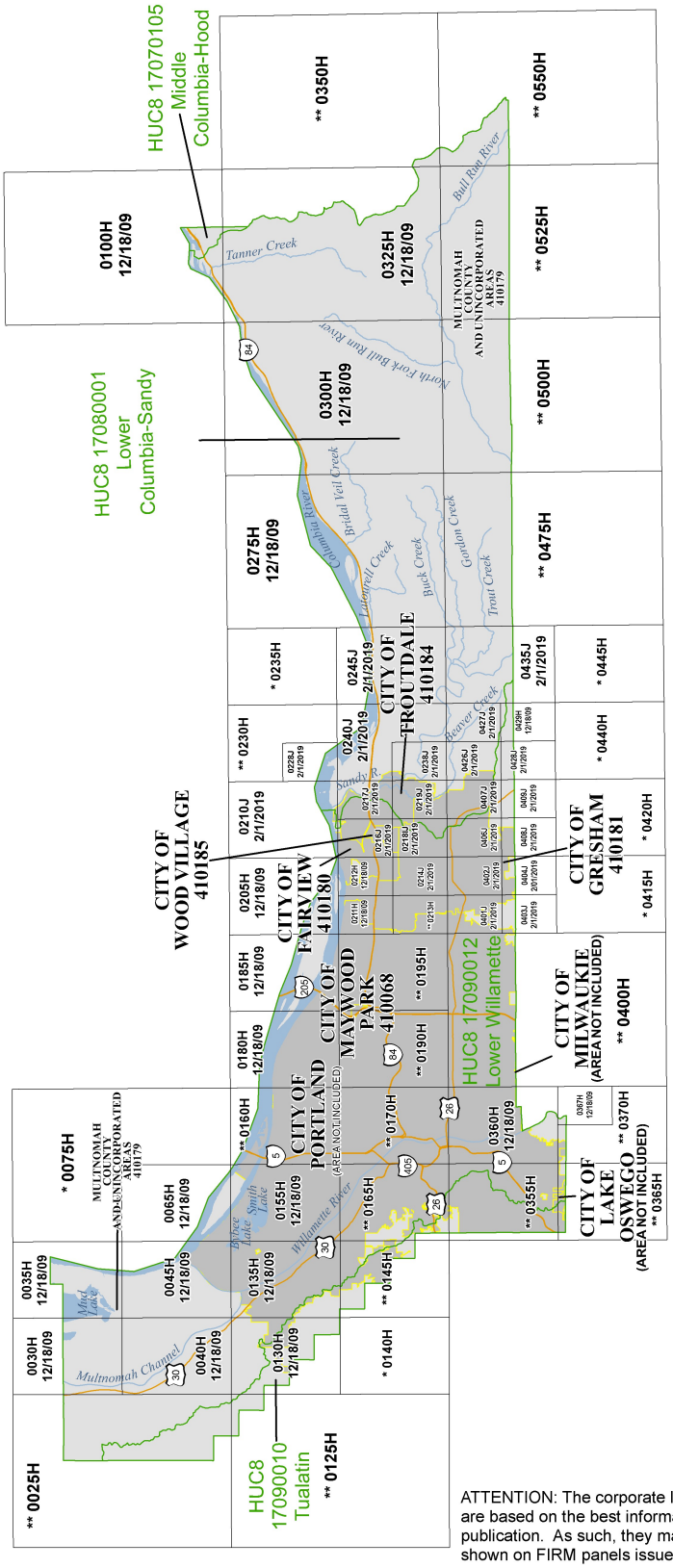
L. Any applicant to whom a variance is granted shall be given written notice that the structure will be permitted to be built with a lowest floor elevation below the base flood elevation and that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced lowest floor elevation.

Exhibit A2

M. Upon consideration of the factors of subsection (E) above, the planning commission may attach such conditions to the granting of variances as it deems necessary to further the purposes of this chapter.

N. The local floodplain administrator/Director shall maintain records of all appeal actions and report and variances to the Federal Insurance Administration upon request.

Exhibit B1



ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before February 1, 2019.

1 inch = 25,000 feet 1:300,000

0 7,000 14,000 28,000 42,000 56,000 Feet

Map Projection:
Universal Transverse Mercator Zone 10 North;
North American Datum 1983

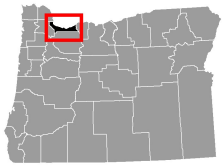
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY
** PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

COUNTY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

MULTNOMAH COUNTY, OREGON and Incorporated Areas

PANELS PRINTED:

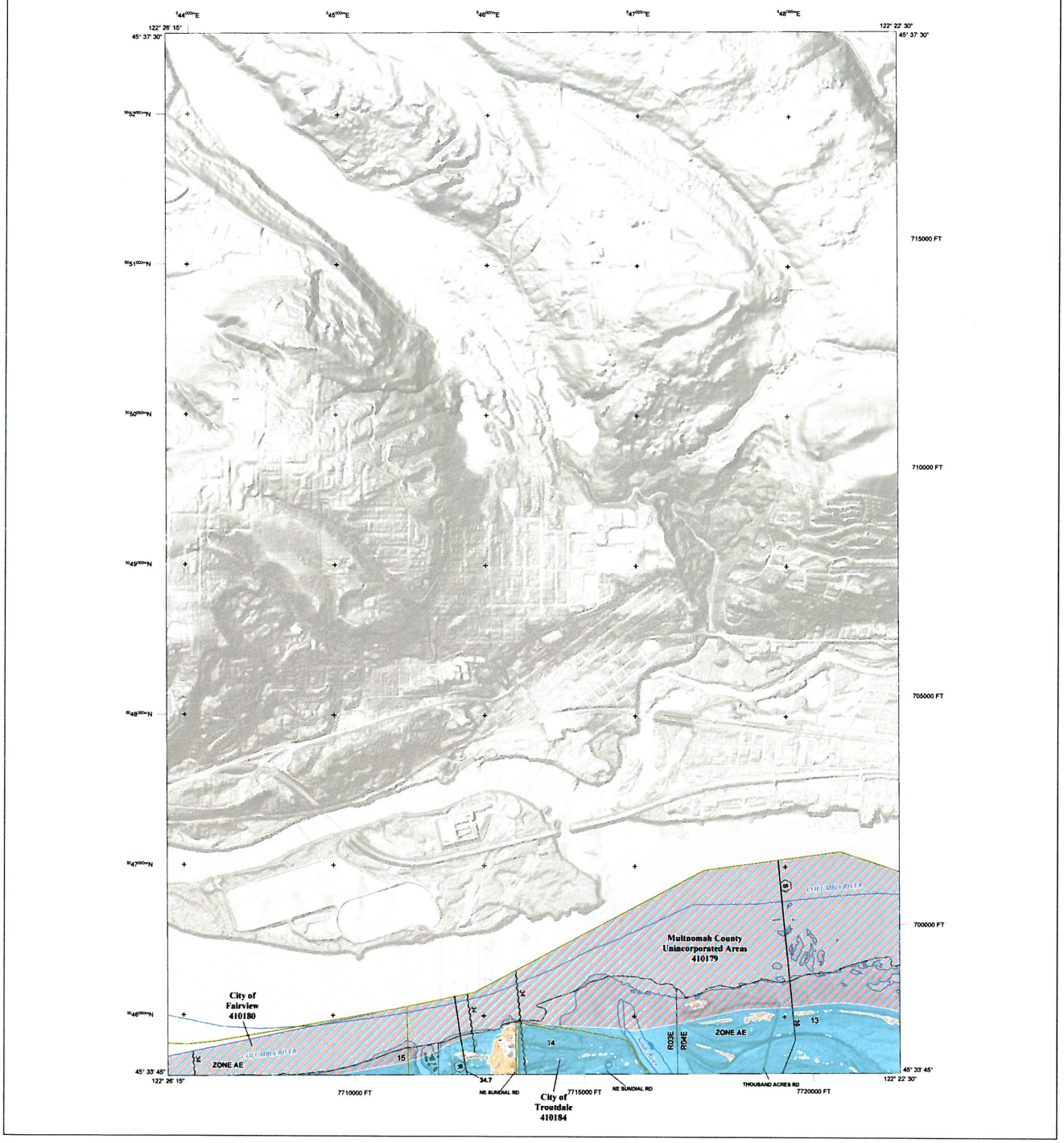
0030, 0035, 0040, 0045, 0065, 0100, 0130, 0135, 0155, 0180, 0185, 0205, 0210, 0211, 0212, 0214, 0216, 0217, 0218, 0219, 0228, 0238, 0240, 0245, 0275, 0300, 0325, 0360, 0367, 0401, 0402, 0403, 0404, 0406, 0407, 0408, 0409, 0426, 0427, 0428, 0429, 0435

FEMA

MAP NUMBER
41051CIND0B

MAP REVISED
February 1, 2019

Exhibit B1



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

	Without Base Flood Elevation (BFE) *Zone A, V, 499*
SPECIAL FLOOD HAZARD AREAS	**With BFE or Depth** *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
OTHER AREAS OF FLOOD HAZARD	**Area with Reduced Flood Risk due to Levee See Notes.** *Zone X*
	NO SCREEN **Areas Determined to be Outside the 0.2% Annual Chance Floodplain** *Zone X*
OTHER AREAS	**Area of Undetermined Flood Hazard** *Zone D*
	Channel, Culvert, or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike, or Floodwall
GENERAL STRUCTURES	**Non-accredited Levee, Dike, or Floodwall**
	E 18.2 17.8 **Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)**
	B **Coastal Transect**
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 **Base Flood Elevation Line (BFE)**
OTHER FEATURES	**Limit of Study**
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was developed and/or compiled in digital format by the Oregon Department of Geology and Mineral Industries (DOGAMI). Data sources include DOGAMI, Oregon Lidar Consortium, Bureau of Land Management, U. S. Geological Survey, and Metro. Base map information was rectified to 3-foot resolution lidar topographic data acquired on December 31, 2010, where available.

SCALE

Map Projection:
NAD 1983 UTM Zone 10N;
Western Hemisphere; Vertical Datum: NAVD 88

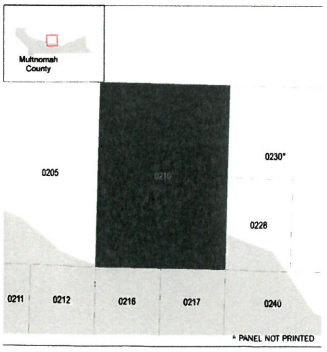
N

1 inch = 1,000 feet — 1:12,000

0 1,000 2,000 4,000 Feet

0 255 510 1,020 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

MULTNOMAH COUNTY, OREGON
and Incorporated Areas

PANEL **210** OF **550**

Panel Contains:

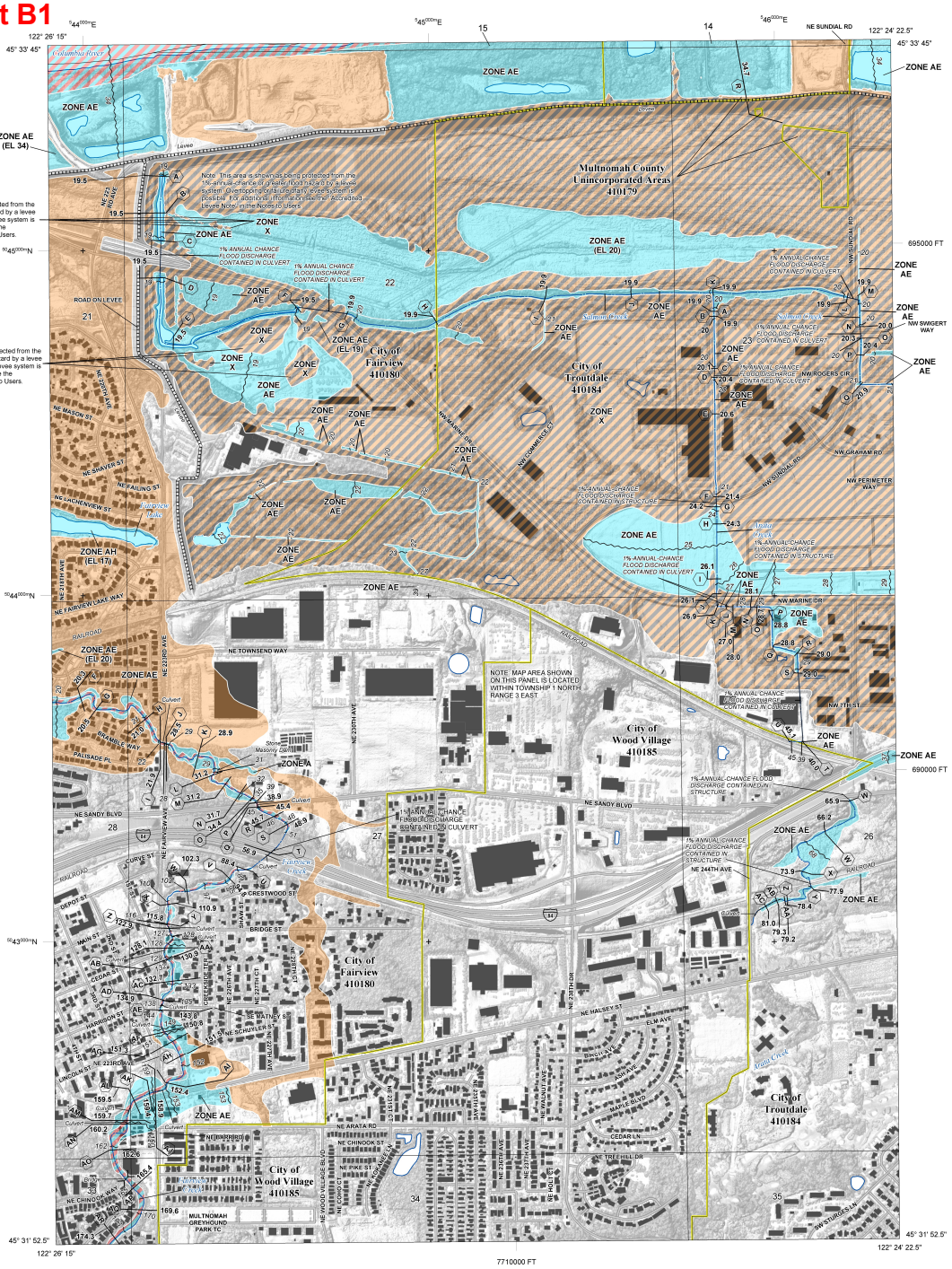
COMMUNITY	NUMBER	PANEL	SUFFIX
FAIRVIEW, CITY OF	410180	0210	J
MULTNOMAH COUNTY	410179	0210	J
TROUTDALE, CITY OF	410184	0210	J

VERSION NUMBER
2.4.2.1

MAP NUMBER
41051C0210J

EFFECTIVE DATE
FEBRUARY 1, 2019

Exhibit B1



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99* With BFE or Depth *Zone AE, AO, AH, VE, AR* Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X* Future Conditions 1% Annual Chance Flood Hazard *Zone X* Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
OTHER AREAS	NO SCREEN Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X* Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall Non-accredited Levee, Dike, or Floodwall E 18.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE) 8 Coastal Transect Coastal Transect Baseline Profile Baseline Hydrographic Feature 513 Base Flood Elevation Line (BFE)
OTHER FEATURES	Limit of Study Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was developed and/or compiled in digital format by the Oregon Department of Geology and Mineral Industries (DOGAMI). Data sources include DOGAMI, Oregon Lidar Consortium, Bureau of Land Management, U. S. Geological Survey, and Metro. Base map information was rectified to 3-foot resolution lidar topographic data acquired on December 31, 2010, where available.

ACCREDITED LEVEE NOTES TO USERS:

Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance-level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance, and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA Website at http://www.fema.gov/business/nfip/index.shtm.

SCALE

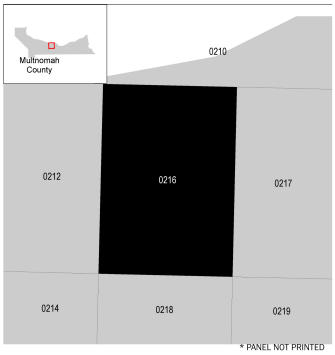
Map Projection:
NAD 1983 UTM Zone 10N;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

MULTNOMAH COUNTY, OREGON
and Incorporated Areas

PANEL **216** OF **550**

FEMA

Panel Contains:

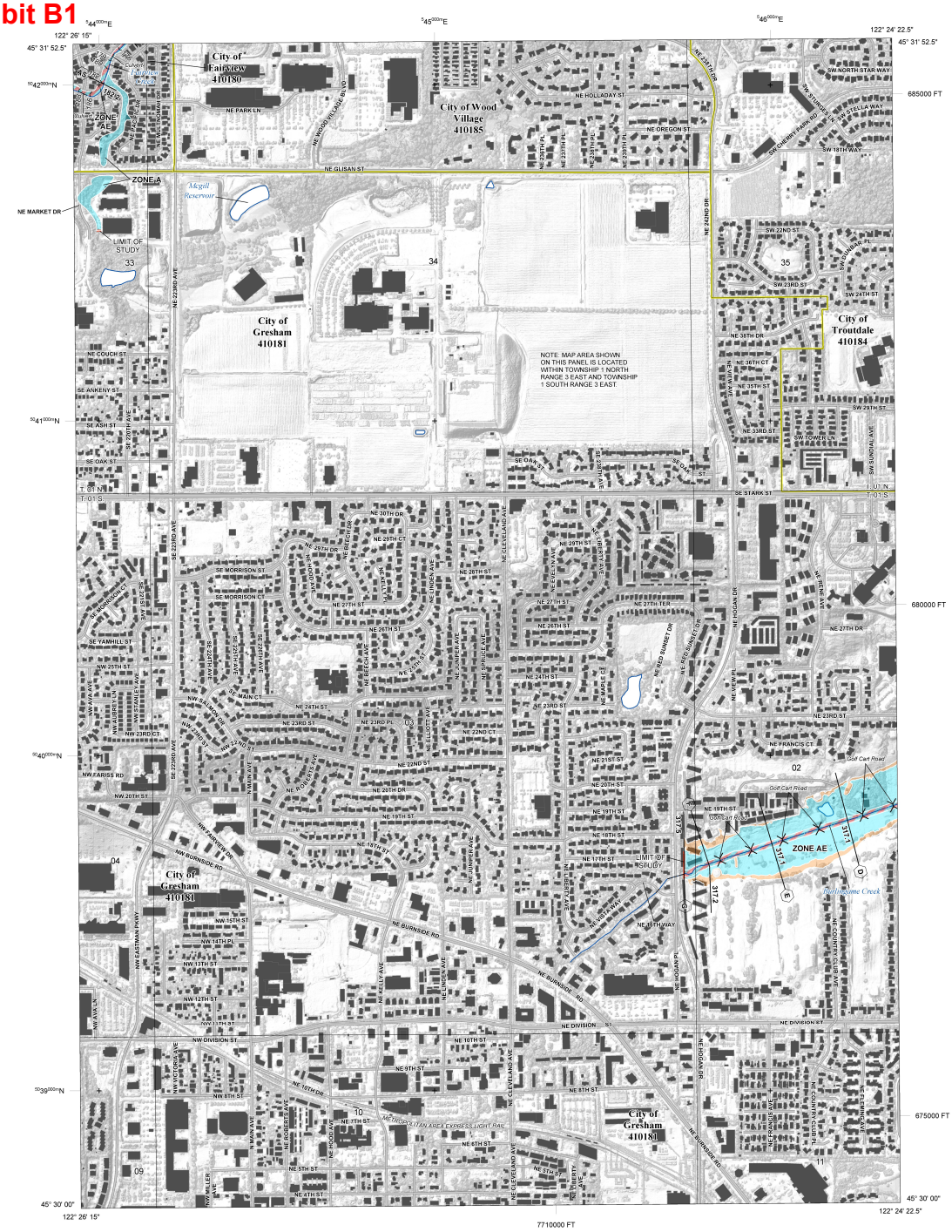
COMMUNITY	NUMBER	PANEL	SUFFIX
FAIRVIEW, CITY OF	410180	0216	J
MULTNOMAH COUNTY	410179	0216	J
TROUTDALE, CITY OF	410184	0216	J
WOOD VILLAGE, CITY OF	410185	0216	J

VERSION NUMBER
2.4.2.1

MAP NUMBER
41051C0216J

EFFECTIVE DATE
FEBRUARY 1, 2019

Exhibit B1



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
HTTP://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes. *Zone X*
OTHER AREAS	NO SCREEN Areas Determined to be Outside the 0.2% Annual Chance Floodplain *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert, or Storm Sewer
	Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall
	E 18.2 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	B Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 Base Flood Elevation Line (BFE)
OTHER FEATURES	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

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For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in the community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was developed and/or compiled in digital format by the Oregon Department of Geology and Mineral Industries (DOGAMI). Data sources include DOGAMI, Oregon Lidar Consortium, Bureau of Land Management, U. S. Geological Survey, and Metro. Base map information was rectified to 3-foot resolution lidar topographic data acquired on December 31, 2010, where available.

SCALE

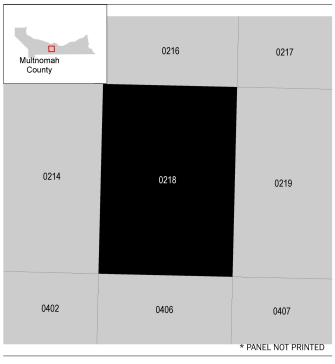
Map Projection:
NAD 1983 UTM Zone 10N;
Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 500 feet 1:6,000

0 500 1,000 2,000 Feet

0 125 250 500 Meters

PANEL LOCATOR



* PANEL NOT PRINTED

FEMA
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

MULTNOMAH COUNTY, OREGON
and Incorporated Areas

PANEL **218** OF **550**

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
FAIRVIEW, CITY OF	410180	0218	J
GRESHAM, CITY OF	410181	0218	J
TROUTDALE, CITY OF	410184	0218	J
WOOD VILLAGE, CITY OF	410185	0218	J

VERSION NUMBER
2.4.2.1

MAP NUMBER
41051C0218J

EFFECTIVE DATE
FEBRUARY 1, 2019

Exhibit B1

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) Report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS Report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study Report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study Report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study Report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane Zone (FIPS zone 3601). The **horizontal datum** was NAD 83, GRS 1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same vertical **datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, N/NGS12
National Geodetic Survey
SSMC-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713- 3242**, or visit its website at http://www.ngs.noaa.gov.

Base map information shown on this FIRM was derived from multiple sources. Base map files were provided in digital format by Multnomah County, City of Gresham, City of Portland, State of Oregon, and USDA. This information was compiled at various map scales during the time periods of 2010 - 2016.

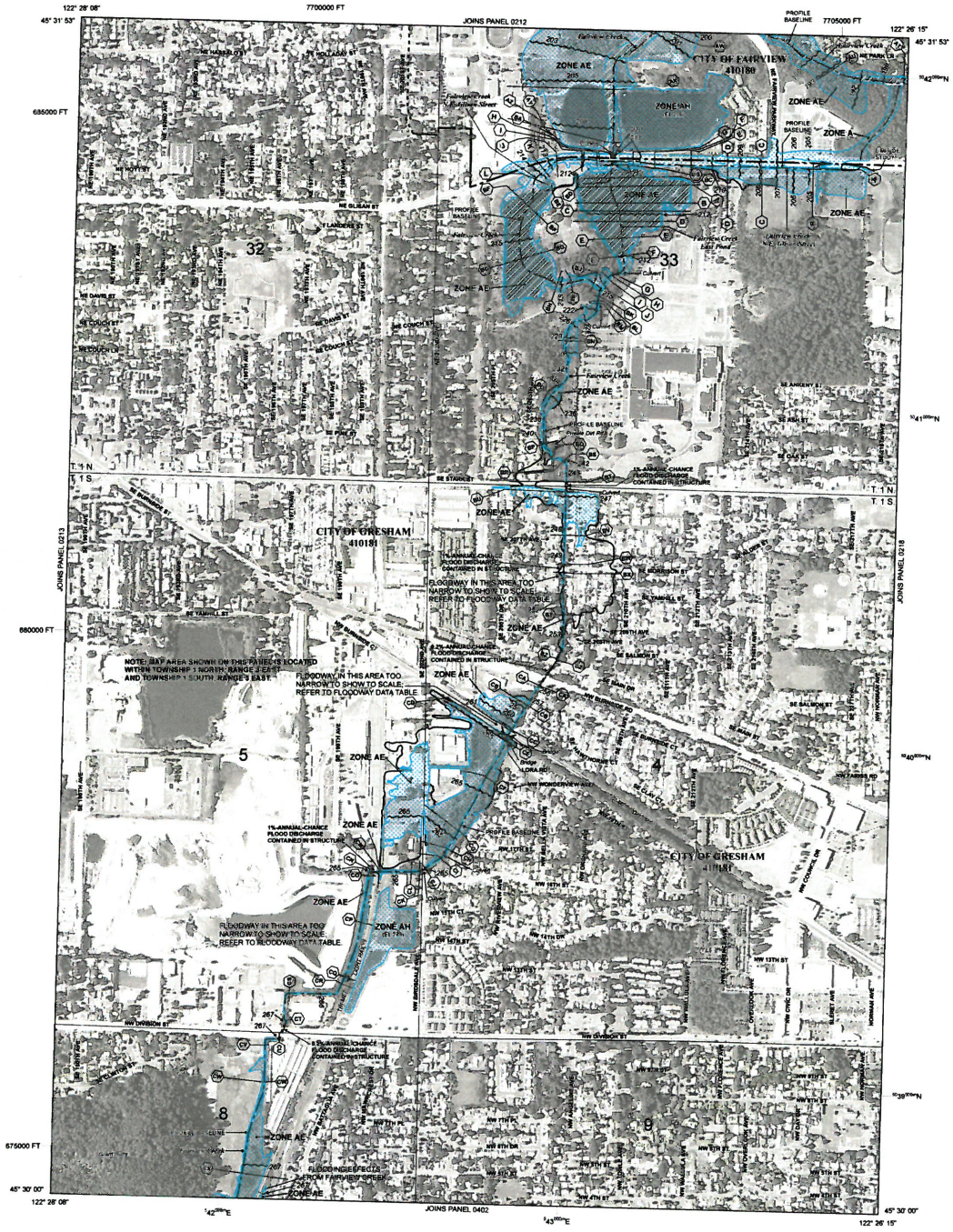
The **profile baselines** depicted on this map represent the hydraulic modeling baselines that match the flood profiles in the FIS report. As a result of improved topographic data, the **profile baseline**, in some cases, may deviate significantly from the channel centerline or appear outside the SFHA.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at http://msc.fema.gov.

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call the **FEMA Map Information eXchange (FMIX)** at 1 - 877 - FEMA - MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/business/nfip/.



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Areas formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% Annual Chance Floodplain Boundary

0.2% Annual Chance Floodplain Boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

(A)———(A)	Cross section line
(23)- - - - -(23)	Transect line
45° 02' 08", 93° 02' 12"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
3°00000' FT	5000-foot ticks: Oregon State Plane North Zone (FIPS Zone 3601), Lambert Conformal Conic projection
42000000 N	1000-meter Universal Transverse Mercator grid values, zone 10N
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel)
• M1.5	River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
December 18, 2006

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
December 21, 2018

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'

200 0 500 1000 FEET
150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0214J

FIRM

FLOOD INSURANCE RATE MAP

MULTNOMAH COUNTY, OREGON

AND INCORPORATED AREAS

PANEL 214 OF 550

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
FAIRVIEW, CITY OF	410180	0214	J
GRESHAM, CITY OF	410181	0214	J

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
41051C0214J

MAP REVISED
FEBRUARY 1, 2019

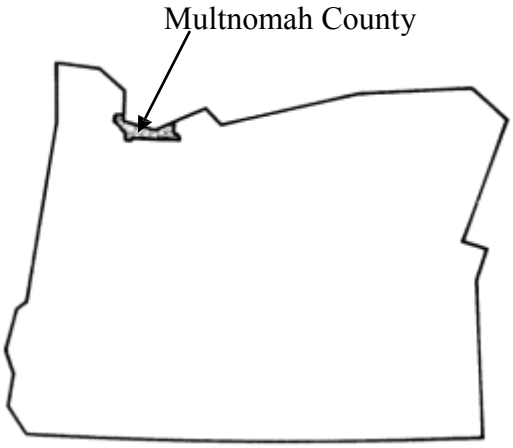
Federal Emergency Management Agency

Exhibit B2

FLOOD INSURANCE STUDY

Volume 1 of 2

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS



COMMUNITY NAME	COMMUNITY NUMBER
FAIRVIEW, CITY OF	410180
GRESHAM, CITY OF	410181
*MAYWOOD PARK, CITY OF	410068
MULTNOMAH COUNTY UNINCORPORATED AREAS	410179
TROUTDALE, CITY OF	410184
*WOOD VILLAGE, CITY OF	410185

*No Special Flood Hazard Data

REVISED: FEBRUARY 1, 2019

Federal Emergency Management Agency

Flood Insurance Study Number

41051CV001B

Exhibit B2

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

This preliminary FIS report does not include unrevised Floodway Data Tables or unrevised Flood Profiles. These Floodway Data Tables and Flood Profiles will appear in the final FIS report.

Initial Countywide FIS Effective Date: December 18, 2009
Revised Countywide Date: February 1, 2019

Exhibit B2

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Exhibit B2

EXHIBITS

Volume 2 – February 1, 2019

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PUBLISHED SEPARATELY

Exhibit 2 - Flood Insurance Rate Map Index
Flood Insurance Rate Map

Exhibit B2

FLOOD INSURANCE STUDY
MULTNOMAH COUNTY AND INCORPORATED AREAS

1.0 INTRODUCTION

1.1 Purpose of Study

This Flood Insurance Study revises and updates information on the existence and severity of flood hazards in the geographic area of Multnomah County, including the Cities of Fairview, Gresham, Maywood Park, Troutdale and Wood Village, Oregon; and the unincorporated areas of Multnomah County (referred to collectively herein as Multnomah County), and aids in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. This study has developed flood-risk data for various areas of the community that will be used to establish actuarial flood insurance rates and to assist the community in its efforts to promote sound floodplain management. Minimum floodplain management requirements for participation in the National Flood Insurance Program (NFIP) are set forth in the Code of Federal Regulations at 44 CFR, 60.3.

This Flood Insurance Study (FIS) revises and updates a previous FIS/Flood Insurance Rate Map for Multnomah County, Oregon. This information will be used by Multnomah County, Oregon to update existing floodplain regulations as part of the Regular Phase of the National Flood Insurance Program (NFIP). The information will also be used by local and regional planners to further promote sound land use and floodplain development.

Please note that the City of Portland is geographically located in Multnomah, Clackamas, and Washington Counties. The City of Portland is included in its own FIS report 410183V000B dated November 26, 2010. The cities of Milwaukie and Lake Oswego are covered in the Clackamas County FIS report dated January 18, 2019. The City of Maywood Park have no SFHA. This does not preclude futuredeterminations of Special Flood Hazard Areas (SFHA) that could be necessitated bychanged conditions affecting the community (i.e., annexation of new lands) for theavailability of new scientific or technical data about flood hazards.

In some states or communities, floodplain management criteria or regulations may exist that are more restrictive or comprehensive than the minimum Federal requirements. In such cases, the more restrictive criteria take precedence and the State (or other jurisdictional agency) will be able to explain them.

1.2 Authority and Acknowledgments

The sources of authority for this FIS are the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973.

Pre-Countywide Analyses

The hydrologic and hydraulic analyses for the initial study of the City of Gresham were performed by the U.S. Army Corps of Engineers (USACE), Portland District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement Nos. IAA-H-16-75 and IAA-H-7-76, Project Order Nos. 16 and 1, respectively. This work, which was completed in June 1977, covered all significant flooding sources affecting the City of Gresham. Additional analyses for this study were performed by the USACE, Portland District, for Multnomah County, Oregon. Information on Fairview Creek was incorporated into this study.

The hydrologic and hydraulic analyses for the unincorporated areas were performed by the U.S. Army Corps of Engineers (USACE), Portland District, for FEMA, under Inter-Agency Agreement Nos. IAA-H-16-75, IAA-H-7-76, and IAA-H-10-77, Project Order Nos. 14, 1, and 23, respectively. This study was completed in July 1980.

Hydraulic analyses for Johnson Creek were revised in January 1983 by the USACE, Portland District, to reflect channel improvements between River Miles 6.8 to 7.3. Hydrologic analyses within Multnomah County Drainage District No. 1 were revised in a July 1984 report titled Multnomah Drainage District No. 1 Hydrology Study (Fairview Recorder, 1983).

The hydrologic and hydraulic analyses for the City of Fairview were performed by the U.S. Army Corps of Engineers (USACE), Portland District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-E-1153, Project Order No. 1, Amendment No. 21. This study was completed in May 1985.

The hydrologic and hydraulic analyses of Sandy River and the lower reach of Beaver Creek within the City of Troutdale were performed by U.S. Army Corps of Engineers (USACE), Portland District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. IAA-EMW-E-1153, Project Order No. 1, Amendment No. 21. The analyses for the two upper reaches of Beaver Creek were performed by the USACE for the Flood Insurance Study for the City of Gresham, Oregon (2). This study was completed in November 1985. Hydrologic and hydraulic analyses for Sandy River and Beaver Creek that were performed by the U.S. Soil Conservation Service (SCS) in October 1977 (Fairview Recorder, 1983) were adjusted by the USACE to produce this study.

In 1985, additional USACE approximate analyses were added for Fairview Creek along the northern corporate limits of Gresham.

In 1988, the USACE revised the reach of Fairview Creek from a point located approximately 2,200 feet upstream of Barr Street upstream to NE. Glisan Street to

incorporate changes made in topography and removal of culverts and to model a split flow that would occur on the upstream side of and east of NE Glisan Street.

In 1988, the USACE performed a revised study to upgrade the approximate analysis for Fairview Creek to a detailed study for the reach from approximately 1,000 feet downstream of Northeast Glisan Street to about 2,400 feet upstream m of Southeast Division Street. The revised study was authorized under Inter-Agency Agreement No. EMW-E-2549, Project Order No. 9.

In 1995, the USACE revised the reach of Fairview Creek from Bridge Street to Fairview Lake. The hydraulic analysis was performed under Contract No. EMW-90-E-3286. The analysis supporting the revision was completed in June 1991.

In February 1996, the USACE revised a portion of Kelly Creek from the Mount Hood Community College (MHCC) dam upstream to Southeast Division Street. The revised analysis was performed by the USACE, Portland District, for FEMA, under Inter-Agency Agreement No. EMW-91-E-3529, Project Order No. 8A. The analysis supporting the revision was completed in June 1992.

The Beaver Creek study was revised on August 3, 1998 to add detailed flood information, including the adoption of a regulatory floodway, from just upstream of Jackson Park Road to approximately 200 feet downstream of Southeast Stark Street. The analyses supporting this revision were performed by the USACE, Portland District, for FEMA, under Contract No. EMW-94-E-4432, and was completed in April 1995.

The Kelly Creek study was revised on May 2, 2002 to show modifications to flood hazards along an approximate 3-mile reach from the crossing at NE Division Street upstream to approximately 600 feet upstream of 282nd Street. The hydrologic and hydraulic analyses for the restudy were performed by Odgen Beeman and Associates, Inc., for the Federal Emergency Management Agency (FEMA), under contract No. EMS-96-CO-0078-TA05. This study was completed in September 1998. Water-surface elevations immediately upstream of Kane Road and the Kelly Creek Storm Water Detention Facility were adjusted by FEMA in October 2000 utilizing data approved by the City of Gresham.

December 18, 2009
The Initial Countywide FIS Report

The countywide update was performed by WEST Consultants, Inc. for FEMA, under Contract No. EMS-2001-CO-0068 and was completed in August 2008 (FEMA, 2009).

This update combined the Flood Insurance Rate Maps and Flood Insurance Study reports for Multnomah County and incorporated communities into the countywide format. Under the countywide format, Flood Insurance Rate Map panels have been

produced using a single layout format for the entire area within the County instead of separate layout formats for each community. The single-layout format facilitates the matching of adjacent panels and depicts the flood-hazard area within the entire panel border, even in areas beyond a community's corporate boundary line. In addition, under the countywide format, this single Flood Insurance Study report provides all Flood Insurance Study information and data for the entire County area.

This Physical Map Revision

For this Physical Map Revision (PMR) base map information shown on the Flood Insurance Rate Map (FIRM)was derived developed and/or compiled in digital format by the Oregon Department of Geology and Mineral Industries (DOGAMI). Data sources include DOGAMI, Oregon Lidar Consortium, Oregon Geospatial Data Clearinghouse, Bureau of Land Management U.S. Geological Survey, Oregon Department of Transportation, Oregon Department of Fish and Wildlife, Metro, the City of Troutdale, and the City of Gresham. Base map information was rectified to 3-foot resolution lidar topographic data acquired in 2007, 2010, and 2011, where available.

This PMR includes a revision for the City of Gresham was performed by WEST Consultants, Inc. for the City of Gresham, under Contract No. 5237 and was completed in September 2012.

The City of Gresham study covers the geographic area of the City of Gresham and portions of unincorporated Multnomah County, Oregon, within the Urban Growth Boundary for the City of Gresham. The areas studied by detailed methods in the City of Gresham and unincorporated Multnomah County were selected with priority given to all known flood hazards and areas of projected development as of 2010. Table 2 was updated to reflect the streams studied in detail and their included segments.

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by the City of Gresham and FEMA. Table 3 was updated to reflect the streams and their included segments studied by approximate methods.

This PMR also includes a revision for the Lower Columbia -Sandy Watershed study performed by STARR under contract HSFE60-09-D-0370.

The Lower Columbia-Sandy Watershed study covers the geographic area within the Lower Columbia -Sandy HUC watershed. This study performed new detailed modeling on a portion of Beaver Creek, Burlingame Creek, Kelly Creek, Sandy River; new approximate modeling on Beaver Creek and Sandy River; and redelineation on a portion of Beaver Creek and Columbia River. Tables 2 and 3 were updated to reflect the updated segments.

1.3 Coordination

An initial meeting is held with representatives from FEMA, the community, and the study contractor to explain the nature and purpose of a FIS, and to identify the streams to be studied or restudied. A final meeting is held with representatives from FEMA, the communities, and the study contractor to review the results of the study.

The initial and final meeting dates for previous FIS reports for Multnomah County and its communities are listed in the following table:

Table 1 - Initial and Final CCO Meetings

Community	FIS Date	Initial Meeting	Final Meeting
Fairview, City of	September 1982	May 28, 1985 July 14, 1988	September 3,1986 April 19, 1990 April 28, 1994 May 5, 2016
Gresham, City of	March 5, 1975	July 14, 1988	July 13, 1978 December 14, 1989 May 3, 2001 July 30, 2013
Multnomah County, Unincorporated Areas	November 8, 1974	May 13, 1979	July 20, 1981 May 5, 2016
Troutdale, City of	September 1982	November 24, 1986	November 24, 1987 May 5, 2016

December 18, 2009
The Initial Countywide FIS Report

An initial community coordination meeting for Multnomah County was held on December 14, 2005. This meeting was attended by representatives of the, cities and county. State of Oregon, FEMA and WEST Consultants. The results of the study were reviewed at the final Consultation Coordination Officer (CCO) meeting held on November 18, 2008, and attended by representatives of City of Fairview, City of Gresham, City of Troutdale, Multnomah County, FEMA, Department of Land Conservation and Development and WEST Consultants. All problems raised at that meeting have been addressed in this study.

This Physical Map Revision

An initial community coordination meeting for the City of Gresham PMR was held on November 4, 2009. This meeting was attended by representatives of the City of Gresham, Multnomah County, and WEST Consultants. The results of the study were reviewed at the final Consultation Coordination Officer (CCO) meeting held on July 30, 2013 and attended by representatives of FEMA, the City of Gresham, Multnomah County and State of Oregon. All problems raised at that meeting have been addressed in this study.

The results of the Lower Columbia-Sandy Watershed study were reviewed at the final meeting held on May 5, 2016, and attended by representatives of FEMA, Multnomah County, and the cities of Troutdale, Gresham, and Portland. All issues and/or concerns raised at the meeting have been addressed.

2.0 AREA STUDIED

2.1 Scope of Study

This Flood Insurance Study covers the geographic area of Multnomah County, Oregon, including the incorporated communities listed in Section 1.1.

The areas studied by detailed methods were selected with priority given to all known flood hazards and areas of projected development or proposed construction through June 2013.

The limits of detailed study are indicated on the Flood Profiles (Exhibit 1) and on the FIRM (Exhibit 2).

The following streams were studied by detailed methods in this FIS report:

Table 2 – Limits of Detailed Study

Stream Name	Limits of Detailed Study
Beaver Creek	From confluence with Sandy River upstream to RM 3.6 Note: The reach of Beaver Creek from RM 3.3 (Cochrane Road) To RM 3.6 was studied by STARR in 2016.
Brick Creek	From confluence with Johnson Creek to approximately 700 feet upstream of Southeast 242nd Avenue.
Burlingame Creek	From confluence with Kelly Creek to NE Hogan Rd, studied by STARR in 2016

Exhibit B2

Table 2 – Limits of Detailed-Study (continued)

Stream Name	Limits of Detailed Study
Columbia River	From the Multnomah-Columbia County Limits to approximately RM 126.5
Fairview Creek	From its mouth upstream to RM 5.6 Note: The reach of Fairview Creek from approximately 1,000 feet downstream of Northeast Glisan Street to approximately 2,400 feet upstream of Southeast Division Street, a distance of approximately 2.6 miles, was restudied by the Corps in 1988. Note: The reach of Fairview Creek from Northeast Glisan Street to West Powell Boulevard., a distance of approximately 3.3 miles, was restudied by WEST Consultants, Inc. in 2012
Fairview Creek- East Pond	From its divergence from Fairview Creek to its confluence with Fairview Creek
Fairview Creek - Northeast Glisan Street Overflow	From upstream end of culvert at Northeast Glisan Street to its overflow of Northeast Glisan Street near the intersection of Northeast West Pond Drive
Hogan Creek	From Southeast Butler Road to Southeast 46th Drive
Johnson Creek	From the Multnomah-Clackamas County boundary near 82nd Avenue upstream to Southeast Pleasant Home Road Note: The reach of Johnson Creek from the City of Gresham Corporate Limits to the City of Gresham Urban Growth Boundary, a distance of approximately 8.0 miles was restudied by WEST Consultants, Inc. in 2012
Johnson Creek City Park Side Channel	From its divergence from Johnson Creek to its confluence with Johnson Creek.
Johnson Creek Telford Split Flow	From its divergence from Johnson Creek to its confluence with Johnson Creek
Kelley Creek	From City of Gresham Urban Growth Boundary to City of Gresham corporate limits
Kelly Creek	From confluence with Beaver Creek to approximately 1600 feet upstream of 282nd Avenue, restudied by STARR in 2016

Table 2 – Limits of Detailed-Study (continued)

Stream Name	Limits of Detailed Study
MacDonald Creek	From confluence with Johnson Creek to Multnomah/Clackamas County boundary
Multnomah Channel	From the Multnomah-Columbia County boundary to its divergence from the Willamette River
North Fork Johnson Creek	From confluence with Johnson Creek to Southeast 282nd Avenue
North Fork Johnson Creek Split Flow	From its divergence from North Fork Johnson Creek to it confluence with North Fork Johnson Creek
Ponding	Within Multnomah Drainage District No. 1
Sandy River	From its mouth to RM 6.17, restudied by STARR in 2016
Sunshine Creek	From confluence with Johnson Creek to Multnomah/Clackamas County boundary
Unnamed Tributary to Rock Creek	From the Multnomah - Washington County boundary near Germantown Road to a point approximately 0.5 miles east
Willamette River	From its mouth to the Multnomah/Clackamas County boundary

Approximate analyses were used to study those areas having a low development potential or minimal flood hazards. The scope and methods of study were proposed to, and agreed upon, by FEMA, Multnomah County and the incorporated communities listed in Section1.1. Table 3 lists the streams and their included segments studied by approximate methods:

Exhibit B2

Table 3. Approximate-Study Streams

Stream Name	Limits of Approximate Study
Arata Creek	Between the downstream corporate limits at Marine Drive and the upstream corporate limits (western edge) west of Arata School and the Edgefield McMenamins' golf course
Beaver Creek	From Troutdale Corporate limits to approximately 1350 feet upstream from Division Drive culvert
Brigman Creek	From confluence with Johnson Creek to upstream end of Persimmon Golf Course
Butler Creek	Individual areas in the following locations: upstream of Southwest 14th Drive, along Southwest Binford Lake Parkway, and within Butler Creek Park Note: The Reach of Butler Creek from its confluence with Johnson Creek to the northward extension of Rodlun Road was restudied by WEST Consultants, Inc. in 2012
Columbia River	From the Limit of detailed study to the Multnomah-Hood River County Boundary
Fairview Creek Right Bank Overflow	From its confluence with Fairview Creek to Northeast Glisan Street
Kelley Creek	From the City of Portland Corporate limits to 190th Avenue and from approximately 1,000 feet downstream of Northeast Kane Road to Northeast Kane Road. Note: The Reach of Kelley Creek between the City of Gresham corporate limits to the Multnomah/Clackamas County boundary was restudied by WEST Consultants, Inc. in 2012.
Kelley Creek – Tributary 1	From confluence with Kelley Creek to Multnomah/Clackamas County boundary
Kelley Creek – Tributary 2	From confluence with Kelley Creek Tributary 1 to approximately 400 feet upstream of City of Gresham corporate limits
Kelley Creek – Tributary 3	From confluence with Kelley Creek to approximately 2,000 feet upstream of Southeast 182nd Avenue
Kelley Creek – Tributary 4	From confluence with Tributary 3 to approximately 1,600 feet upstream of Southeast 182nd Avenue
McNutt Creek	From confluence with Johnson Creek to approximately 1,400 feet upstream of Southeast 252nd Avenue
Mitchell Creek	From its confluence with Kelley Creek to approximately 700 feet upstream of Baxter Road
Sandy River	From Dabney State Park to the Multnomah-Clackamas County boundary

Table 3. Approximate-Study Streams (continued)

Stream Name	Limits of Approximate Study
Small drainage area upstream of Kaiser Road	From approximately 600 feet upstream of its confluence with Unnamed Tributary to Rock Creek to its mouth
Unnamed Tributary to Johnson Creek	From Southwest 14th Drive to approximately 580 feet upstream of Southwest 14th Drive
Unnamed Tributary to the East of Fairview Creek	From its confluence with Fairview Creek to approximately 670 feet upstream from Northeast Glisan Street.

LOMR 06-10-B082P revised the hydraulic analysis and floodplain mapping for Fairview Creek from approximately 1,130 feet downstream to approximately 300 feet downstream of Fairview Avenue and from approximately 400 feet upstream to approximately 4,250 feet upstream of NE Barr Road. The effective date was March 28, 2007.

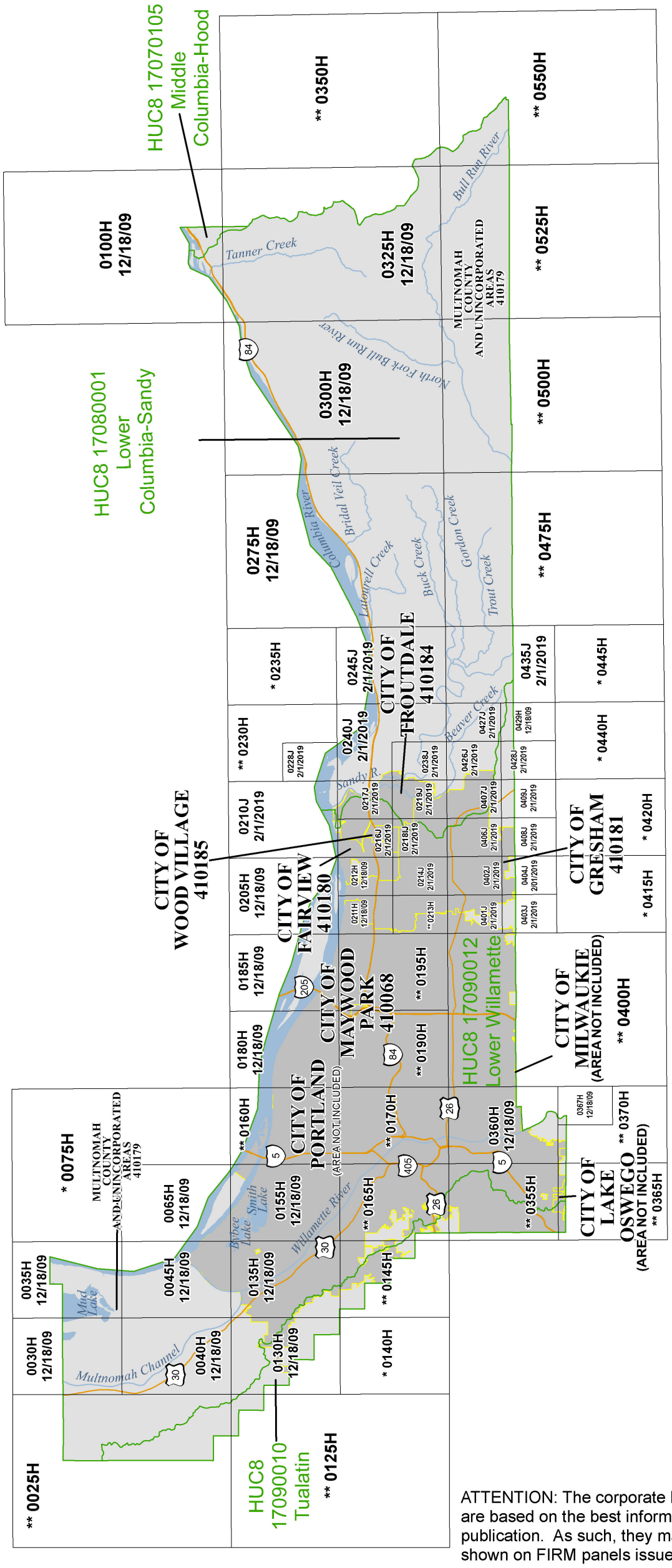
The following tabulation presents Letters of Map Change (LOMCs) incorporated into this countywide study:

LOMC	Case Number	Date Issued	Project Identifier
LOMR*	11-10-1884P	07/27/2012	Northwest East Wind Drive
LOMR*	15-10-0523P	10/28/2015	West Historic Columbia River Highway

*Letter of Map Revision (LOMR)

Figure 1: FIRM Panel Index

Exhibit B2



ATTENTION: The corporate limits shown on this FIRM Index are based on the best information available at the time of publication. As such, they may be more current than those shown on FIRM panels issued before February 1, 2019.

1 inch = 25,000 feet 1:300,000

0 7,000 14,000 28,000 42,000 56,000 Feet

Map Projection:
Universal Transverse Mercator Zone 10 North;
North American Datum 1983

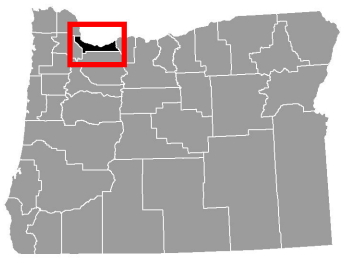
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT

HTTP://MSC.FEMA.GOV

SEE FLOOD INSURANCE STUDY FOR ADDITIONAL INFORMATION

* PANEL NOT PRINTED - AREA OUTSIDE COUNTY BOUNDARY
** PANEL NOT PRINTED - NO SPECIAL FLOOD HAZARD AREAS

COUNTY LOCATOR



NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP INDEX

MULTNOMAH COUNTY, OREGON and Incorporated Areas

PANELS PRINTED:

0030, 0035, 0040, 0045, 0065, 0100, 0130, 0135, 0155, 0180, 0185, 0205, 0210, 0211, 0212, 0214, 0216, 0217, 0218, 0219, 0228, 0238, 0240, 0245, 0275, 0300, 0325, 0360, 0367, 0401, 0402, 0403, 0404, 0406, 0407, 0408, 0409, 0426, 0427, 0428, 0429, 0435

FEMA

MAP NUMBER
41051CIND0B

MAP REVISED
February 1, 2019

Exhibit B2

Each FIRM panel may contain specific notes to the user that provide additional information regarding the flood hazard data shown on that map. However, the FIRM panel does not contain enough space to show all the notes that may be relevant in helping to better understand the information on the panel. Figure 2 contains the full list of these notes.

Figure 2 – FIRM Note to Users

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products, or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates, refer to Table 11 in this FIS Report.

To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620. The map is for use in administering the NFIP. It may not identify all areas subject to flooding, particularly from local drainage sources of small size. Consult the community map repository to find updated or additional flood hazard information.

BASE FLOOD ELEVATIONS: For more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables within this FIS Report. Use the flood elevation data within the FIS Report in conjunction with the FIRM for construction and/or floodplain management.

FLOODWAY INFORMATION: Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the FIS Report for this jurisdiction.

FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.
FLOOD CONTROL STRUCTURE INFORMATION: Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.3 "Non-Levee Flood Protection Measures" of this FIS Report for information on flood control structures for this jurisdiction.

PROJECTION INFORMATION: The projection used in the preparation of the map was Universal Transverse Mercator Zone 10 North. The horizontal datum was North American Datum 1983. Differences in datum,spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictionsmay result in slight positional differences in map features across jurisdiction boundaries. Thesedifferences do not affect the accuracy of the FIRM.

ELEVATION DATUM: Flood elevations on the FIRM are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/.

Local vertical monuments may have been used to create the map. To obtain current monument information, please contact the appropriate local community.

BASE MAP INFORMATION: Base map information shown on this FIRM was developed and/or compiled in digital format by the Oregon Department of Geology and Mineral Industries (DOGAMI). Data sources include DOGAMI, Oregon Lidar Consortium, Bureau of Land Management, U. S. Geological Survey, and Multnomah County GIS. Base map information was rectified to 3-foot resolution LIDAR topographic data acquired in 2002.

The map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map.

NOTES FOR FIRM INDEX

REVISIONS TO INDEX: As new studies are performed and FIRM panels are updated within Multnomah County, Oregon and Incorporated Areas, corresponding revisions to the FIRM Index will be incorporated within the FIS Report to reflect the effective dates of those panels. Please refer to Table 11 of this FIS Report to determine the most recent FIRM revision date for each community. The most recent FIRM panel effective date will correspond to the most recent index date.

FLOOD RISK REPORT: A Flood Risk Report (FRR) may be available for many of the flooding sources and communities referenced in this FIS Report. The FRR is provided to increase public awareness of flood risk by helping communities identify the areas within their jurisdictions that have the greatest risks. Although non-regulatory, the information provided within the FRR can assist communities in assessing and evaluating mitigation opportunities to reduce these risks. It can also be used by communities developing or updating flood risk mitigation plans. These plans allow communities to identify and evaluate opportunities to reduce potential loss of life and property. However, the FRR is not intended to be the final authoritative source of all flood risk data for a project area; rather, it should be used with other data sources to paint a comprehensive picture of flood risk.

Corporate limits shown on the map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after the map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Each FIRM panel contains an abbreviated legend for the features shown on the maps. However, the FIRM panel does not contain enough space to show the legend for all map features. Figure 2 shows the full legend of all map features. Note that not all of these features may appear on the FIRM panels in Multnomah County.

Figure 3 – FIRM Legend

SPECIAL FLOOD HAZARD AREAS: *The 1% annual chance flood, also known as the base flood or 100-year flood, has a 1% chance of happening or being exceeded each year. Special Flood Hazard Areas are subject to flooding by the 1% annual chance flood. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood. The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights. See note for specific types. If the floodway is too narrow to be shown, a note is shown.*

	Special Flood Hazard Areas subject to inundation by the 1% annual chance flood (Zones A, AE, AH, AO, AR, A99, V and VE)
Zone A	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. No base (1% annual chance) flood elevations (BFEs) or depths are shown within this zone.
Zone AE	The flood insurance rate zone that corresponds to the 1% annual chance floodplains. Base flood elevations derived from the hydraulic analyses are shown within this zone, either at cross section locations or as static whole-foot elevations that apply throughout the zone.
Zone AH	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the hydraulic analyses are shown at selected intervals within this zone.
Zone AO	The flood insurance rate zone that corresponds to the areas of 1% annual chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot depths derived from the hydraulic analyses are shown within this zone.
Zone AR	The flood insurance rate zone that corresponds to areas that were formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
Zone A99	The flood insurance rate zone that corresponds to areas of the 1% annual chance floodplain that will be protected by a Federal flood protection system where construction has reached specified statutory milestones. No base flood elevations or flood depths are shown within this zone.
Zone V	The flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations are not shown within this zone.
Zone VE	Zone VE is the flood insurance rate zone that corresponds to the 1% annual chance coastal floodplains that have additional hazards associated with storm waves. Base flood elevations derived from the coastal analyses are shown within this zone as static whole-foot elevations that apply throughout the zone.
	Regulatory Floodway determined in Zone AE.

Exhibit B2

OTHER AREAS OF FLOOD HAZARD	
	Shaded Zone X: Areas of 0.2% annual chance flood hazards and areas of 1% annual chance flood hazards with average depths of less than 1 foot or with drainage areas less than 1 square mile.
	Future Conditions 1% Annual Chance Flood Hazard – Zone X: The flood insurance rate zone that corresponds to the 1% annual chance floodplains that are determined based on future-conditions hydrology. No base flood elevations or flood depths are shown within this zone.
	Zone X Protected by Accredited Levee: Areas protected by an accredited levee, dike or other flood control structures. See Notes to Users for important information.
OTHER AREAS	
	Zone D (Areas of Undetermined Flood Hazard): The flood insurance rate zone that corresponds to unstudied areas where flood hazards are undetermined, but possible
NO SCREEN	Unshaded Zone X: Areas determined to be outside the 0.2% annual chance floodplain
FLOOD HAZARD AND OTHER BOUNDARY LINES	
	Flood Zone Boundary (white line)
	Limit of Study
	Jurisdiction Boundary
	Limit of Moderate Wave Action (LiMWA): Indicates the inland limit of the area affected by waves greater than 1.5 feet
GENERAL STRUCTURES	
Aqueduct *Channel* *Culvert* *Storm Sewer*	Channel, Culvert, Aqueduct, or Storm Sewer
Dam *Jetty* *Weir*	Dam, Jetty, Weir
	Levee, Dike or Floodwall accredited or provisionally accredited to provide protection from the 1% annual chance flood
	Levee, Dike or Floodwall not accredited to provide protection from the 1% annual chance flood.
Bridge	Bridge

Exhibit B2

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AND OTHERWISE PROTECTED AREAS (OPA): *CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas. See Notes to Users for important information.*	
CBRS AREA 09/30/2009	Coastal Barrier Resources System Area: Labels are shown to clarify where this area shares a boundary with an incorporated area or overlaps with the floodway.
OTHERWISE PROTECTED AREA 09/30/2009	Otherwise Protected Area
REFERENCE MARKERS	
22.0	River mile Markers
CROSS SECTION & TRANSECT INFORMATION	
B 20.2	Lettered Cross Section with Regulatory Water Surface Elevation (BFE)
5280 21.1	Numbered Cross Section with Regulatory Water Surface Elevation (BFE)
17.5	Unlettered Cross Section with Regulatory Water Surface Elevation (BFE)
8	Coastal Transect
	Profile Baseline: Indicates the modeled flow path of a stream and is shown on FIRM panels for all valid studies with profiles or otherwise established base flood elevation.
	Coastal Transect Baseline: Used in the coastal flood hazard model to represent the 0.0-foot elevation contour and the starting point for the transect and the measuring point for the coastal mapping.
513	Base Flood Elevation Line (shown for flooding sources for which no cross sections or profile are available)
ZONE AE (EL 16)	Static Base Flood Elevation value (shown under zone label)
ZONE AO (DEPTH 2)	Zone designation with Depth
ZONE AO (DEPTH 2) (VEL 15 FPS)	Zone designation with Depth and Velocity

Exhibit B2

BASE MAP FEATURES	
Missouri Creek	River, Stream or Other Hydrographic Feature
234	Interstate Highway
234	U.S. Highway
234	State Highway
234	County Highway
MAPLE LANE	Street, Road, Avenue Name, or Private Drive if shown on Flood Profile
RAILROAD	Railroad
	Horizontal Reference Grid Line
—	Horizontal Reference Grid Ticks
+	Secondary Grid Crosshairs
Land Grant	Name of Land Grant
7	Section Number
R. 43 W. T. 22 N.	Range, Township Number
$^{42}76^{000m}$E	Horizontal Reference Grid Coordinates (UTM)
365000 FT	Horizontal Reference Grid Coordinates (State Plane)
80° 16’ 52.5”	Corner Coordinates (Latitude, Longitude)

Table 4 is a list of the locations where FIRMs for Multnomah County can be viewed. Please note that the maps at these locations are for reference only and are not for distribution. Also, please note that only the maps for the community listed in the table are available at that particular repository. A user may need to visit another repository to view maps from an adjacent community.

Table 4 – Community Map Repositories

Community	Address	City	State	Zip Code
City of Fairview	City of Fairview Planning Department 1300 Northeast Village Street	Fairview	OR	97024
City of Gresham	City Hall Community Development Office 1333 Northwest Eastman Parkway	Gresham	OR	97030
City of Maywood Park	City Hall 10100 Northeast Prescott Street Suite 147	Gresham	OR	97220
Multnomah County (Unincorporated Areas)	Multnomah County Office of Land Use and Planning 1600 Southeast 190th Avenue	Portland	OR	97233
City of Troutdale	City Hall 219 East Historic Columbia River Highway	Troutdale	OR	97060
City of Wood Village	City of Wood Village City Hall 2055 NE 238th Drive	Wood Village	OR	97060

2.2 Community Description

The City of Fairview is located along the southern banks of the Columbia River, 10 miles due east of downtown Portland, in northern-central Multnomah County, in northwestern Oregon. Fairview is bordered by the City of Gresham to the south and west. To the east, Fairview is bordered by the Cities of Wood Village and Troutdale. The remainder of Fairview is bordered by unincorporated areas of Multnomah County.

Fairview was incorporated in 1908 and is primarily a residential community. Local Employment is limited to shops and businesses that serve area residents. Employment for the majority of Fairview residents is elsewhere in the Portland metropolitan area (Fairview, 1983).

The population of the city was 1,045 in 1970, 1,740 in 1983 and 1,975 in 1989 (Census 1989) of 2000, the population number was 7,561 (Census 2000).

The population of the city was 7,561 in 2000. As of 2010, the population number was 8,920 (US Cenus,2010).

The climate of Fairview is characterized by mild, wet winters and dry, warm summers. The average annual precipitation for the area is 45 inches. Average temperatures range from 38°F in January to 68°F in July (USACE 1978).

The surrounding area ranges from a busy metropolis west of the city to picturesque rural land to the south and east. The Columbia River lies to the north of the city. The area provides a wide choice of recreational opportunities, from fishing and backpacking to kite flying in the westerly winds that blow in from the Pacific Ocean.

Fairview Creek flows north from its source near Grants Butte, through Gresham and Fairview, and empties into Fairview Lake near the Columbia River. It drains rolling pastureland mixed with residential subdivisions. South of Fairview, Fairview Creek slopes gently as it passes through a thickly wooded area.

Multnomah County Drainage District No. 2 fronts the Columbia River approximately between 20th Avenue and Fairview Avenue. There is both agricultural and industrial development in its floodplain.

The Columbia River flows along the northern corporate limits of Gresham. Its flow is contained by the Multnomah Drainage District No. 1 levee. From its origin in Canada, the Columbia River flows over 1,100 miles to Fairview, while draining approximately 241,000 square miles of the western slope of the Continental Divide in the northwestern United States and southwestern Canada. The basin terrain varies from gently rolling farmland to high, timbered mountains.

The City of Gresham, a rapidly growing suburb of Portland, Oregon, is located to the east of Portland, along U.S. Highway 26 and Interstate Highway 84. It was incorporated in 1905. It is bordered on the northeast by the Cities of Fairview, Troutdale, and Wood Village. Gresham is bordered to the west by the City of Portland. Unincorporated areas of Multnomah County about the remaining corporate limits of Gresham, except the southernmost point where it borders Clackamas County. Gresham is located in central Multnomah County, in northwestern Oregon, on the left bank of the Columbia River. Gresham's population in 2000 was 90,205 as compared to 63,845 in 1989, 33,005 in 1980, 10,300 in 1970, and 3,944 in 1960 (Census, 1989).

The City of Gresham is located on a low divide between Johnson Creek, the Sandy River, and the Columbia River. Johnson Creek, a tributary of the Willamette River, flows east to west through the southern portions of the urbanized area of Gresham. Beaver, Kelly, and Burlingame Creeks flow into the Sandy River to the east, draining the eastern portion of Gresham where substantial residential development has

occurred. Fairview Creek, flowing northerly toward the Columbia River, drains the northern and central parts of Gresham. Butler Creek, a tributary of Johnson Creek, flows north draining the southwest section of Gresham.

The Columbia River flows along the northern corporate limits of Gresham. Its flow is contained by the Multnomah Drainage District No. 1 levee. Multnomah Drainage District No. 1 fronts the Columbia River along Marine Drive and Interlachen Lane. From its origin in Canada, the Columbia River flows more than 1,100 miles to Gresham, while draining approximately 241,000 square miles of the western slope of the Continental Divide in the northwestern United States and southwestern Canada. The basin terrain varies from gently rolling farmland to high, timbered mountains. Agricultural development exists along the floodplain within Gresham.

The major commercial development in the community has occurred along Powell Boulevard (U.S. Highway 26), with newer development occurring along Southeast Burnside Road. Residential development of various densities has occurred throughout the area. Land use along Johnson Creek is primarily residential.

The area consists of rolling benchlands and low hills. Vegetation varies from agricultural row crops and grain fields to the urban landscape associated with residential development; the steeper undeveloped terrain is covered with scattered fir and deciduous trees.

The soil of the study area is largely of the Powell silt loam variety, derived by the weathering of old, unconsolidated deposits of mixed origin. The soil has a rich brown, smooth-textured surface over afriable light-brown, gray-mottled subsoil. It is partly residual and partly transported in origin, with variable drainage rates (USDA, 1922).

The climate of Gresham is characterized by warm, dry summers and mild, wet winters. Temperatures are usually moderate, ranging from an average monthly minimum in January between 30°F and 35°F to an average summer maximum between 75°F and 80°F. The average annual precipitation is 45 inches with 80 percent occurring between October and March (PNRBC, 1969).

Multnomah County is in northwestern Oregon. It is bounded by Columbia River on the north, by the Tualatin Mountains on the west, and by the Cascade Mountain Range on the east. Along the southern county boundary, Johnson Creek flows westerly to Willamette River. Willamette River, as it flows northerly through Portland to join Columbia River, bisects western Multnomah County.

Multnomah County is bordered by Clark County, Washington, to the north, Skamania County, Washington, to the northeast, Hood River County to the east, Clackamas, County to the south, Washington County to the west, and Columbia County to the northwest. Encompassing nearly all of the Portland metropolitan area in its approximately 460 square miles, Multnomah County is the most populated and developed county in Oregon.

Since establishment of the county in 1854, its population has grown rapidly, from 338,241 in 1930 to 522,813 in 1960 (Census, 1951). In 1978, the population was estimated at 549,000 (Fairview City Recorder, 1983). In 2010, the population was at 735,334. Most of that population resides in Portland and its adjacent communities within the Willamette Valley of western Multnomah County. Eastern Multnomah County is sparsely settled. Portland, the county seat and the largest city in Multnomah County, had an estimated 2010 population of 583,776 (Census, 2010).

Columbia, Willamette, and Sandy Rivers are the largest rivers in Multnomah County. Columbia River, with its headwaters on the eastern slope of the Continental Divide in southwestern Canada, drains approximately 241,000 square miles. The basin terrain varies from steep mountain slopes to gently rolling farmland. Willamette and Sandy Rivers, with drainage areas of 11,200 and 502 squares miles, respectively, have their origin on the western slope of the Cascade Mountain Range. Willamette River originates in a steep, timbered, mountainous watershed and flows through the flat, wide, agricultural Willamette Valley for 185 miles to its mouth. Willamette River passes through Portland approximately 3 miles upstream of its confluence with Columbia River. Sandy River emerges from melting glaciers on Mount Hood, and then follows a steep and timbered valley until it meets Columbia River near Troutdale. Demand for recreated usage along the lower portion of the Sandy River is high. For example, Dabney and Lewis and Clark State Parks received 346,000 and 319,000 visitor days of use, respectively, in 1975 (USDA, 1983).

Flood plain development varies widely along Columbia River in the unincorporated portions of Multnomah County. Scenic Columbia River Gorge, upstream of Sandy River, is sparsely developed. From downstream of Sandy River to the Burlington Northern Railroad bridge, the south bank of the Columbia River has a broad flood plain protected by levee systems. Within those levee systems are agricultural lands, scattered industrial, commercial, and residential development. South of Columbia River, between the Burlington Northern Railroad and Willamette River, is Rivergate Industrial District, a recent development on dredged fill material that elevates previously low-lying land above expected flood levels. Farther downstream, Sauvie Island is bounded by Willamette River, Multnomah Channel, and Columbia River. The island is agricultural bottom land; most of the area is protected by levees.

The unincorporated portion of the Willamette River floodplain in Multnomah County extends upstream and downstream of the City of Portland. Flood plain development upstream of Portland is limited to residences along a narrow 2-mile-long strip on the west riverbank. The downstream portion is a 3-mile stretch, with the Sauvie Island perimeter levee on the west bank and the elevated Rivergate Industrial District on the east bank.

There are only a few homes and small businesses located along the riverbanks of Sandy River immediately upstream of the Troutdale corporate limits. But, because of its nearness to the Portland metropolitan area, it has considerable development potential.

Farther upstream, much of the river is within a forested canyon with moderately steep sides and a small flood-prone area. Downstream of the Troutdale corporate limits, there is no development within the flood plain.

Johnson Creek flows westerly for approximately 23 miles in southern Multnomah County and enters Willamette River at the county's southern boundary. The Johnson Creek floodplain is heavily developed in the study area between the corporate limits of Portland and Gresham. A wide flood-prone area extending from 100th Avenue to 136th Avenue and as far north of Johnson Creek as Holgate Boulevard includes many homes and some industries and warehouses. Upstream of Gresham, residences are scattered along the stream.

Columbia Slough enters Willamette River near its confluence with Columbia River in Portland. High-water levels in the slough and surrounding area are caused by Willamette River backwater. The detailed-study area within the unincorporated portions of Multnomah County is west of North Portland Road and almost entirely within the growing Rivergate Industrial District. Historically, the flood risk in that area has been too great to attract much development. Therefore, the bordering lowlands are still open for future land-use consideration.

Multnomah Channel is a natural bypass channel for Willamette River to the Columbia River. The channel leaves the Willamette River approximately 3 miles upstream of the mouth of the Willamette River and travels northerly along the west side of Sauvie Island for approximately 20 miles to its confluence with the Columbia River. The portion of the Multnomah County within unincorporated Multnomah County has limited development. Houseboats, several boat moorages, a marina, and a golf course are in the floodplain. Because of its proximity to Portland and major transportation routes, future floodplain development is probable.

Fairview Creek flows northerly from its source near Grants Butte, through the populated suburban area east of Portland, and empties into Fairview Lake near the Columbia River. It drains rolling pastureland interspersed with residential subdivisions. Fairview Creek has been channelized through a large subdivision between Burnside Road and Stark Street. South of the City of Fairview, the stream slopes gently as it passes through a thickly wooded area where a large planned-community development is under construction.

Beaver Creek, a tributary to Sandy River, flows northerly in a canyon with steep and forested side slopes. Because of the steep terrain, only a few areas are suitable for development within the Beaver Creek flood plain.

Kelley Creek enters Johnson Creek at 160th Avenue from low hills south of Johnson Creek. It drains an area of rolling farmlands with scattered residences. Mitchell Creek flows into Kelley Creek approximately 900 feet downstream of the Kelley Creek crossing of Foster Road.

Kelley Creek enters Johnson Creek at 160th Avenue from low hills south of Johnson Creek. It drains an area of rolling farmlands with scattered residences. Mitchell Creek flows into Kelley Creek approximately 900 feet downstream of the Kelley Creek crossing of Foster Road.

The only stream studied west of Willamette River is Unnamed Tributary to Rock Creek, which is within the Tualatin River drainage basin. That stream flows from the steep and forested slopes of the low Tualatin Range and enters the flat pastured area of the study area south of Germantown Road. There is no development in the flood plain except for Kaiser Road. Just upstream of the Kaiser Road crossing, Unnamed Tributary to Rock Creek is joined by a small stream flowing southerly to its confluence.

Multnomah County Drainage District No. 1 fronts the Columbia River between approximately 20th Avenue and Fairview Avenue. There is both agricultural and industrial development in its flood plain.

Multnomah County has a temperate climate that is influenced by the Pacific Ocean, which is approximately 70 miles to the west. Summers are dry with pleasant temperatures; in the lower elevations, winters are rainy and mild with a narrow temperature range. Temperatures in Portland range from an average January minimum of 35°F to an average July maximum of 79°F (Climatological Handbook Vol.1, 1969). Near Willamette River, average annual precipitation is approximately 39 inches, with over one-half falling during the months of November through February. From Willamette River toward the east, average annual precipitation increases drastically. In the foothills of the Cascade Mountain Range, over 100 inches have been recorded (Climatological Handbook Vol.2, 1969). Soil drainage characteristics in the eastern portion of the county are generally good, while they are poor west of the Willamette River.

The City of Troutdale is located near the confluence of the Sandy and Columbia Rivers in Multnomah County, Oregon, approximately 15 miles east of Portland, at the mouth of the Columbia River Gorge, and 19 miles southeast of Vancouver, Washington. Troutdale is also bordered to the west by the City of Gresham and to the north, southwest and southeast by unincorporated Multnomah County. The city was founded in 1890 and incorporated in 1907. Troutdale's location at the western gateway of the Columbia River Gorge influenced its development as a river and railroad commerce center. Shipping, railroading and logging remained the primary commercial industries of Troutdale until the late 1940s. The economic character of Troutdale has changed dramatically since 1960.Troutdale is currently classified as a bedroom community in the greater Portland metropolitan area. As a result, it's economic base is now very similar to the highly economic base of Portland. The three largest employers in the urban service area of Troutdale are the Portland-Troutdale Airport, the Reynolds School district, and Home Depot.

The population of Troutdale in the 1990 census was 7,852; in the 2000 census was 13,777; and as of 2010, the population for Troutdale was 15,962. Population increase has primarily been through construction of new housing on land previously farmed: 3,587 new dwelling units have been constructed in Troutdale since 1994.

The climate of Troutdale is characterized by mild, wet winters and dry, pleasant summers. However, due to its proximity to the Columbia River Gorge and the Cascade Mountains, winter wind speeds and precipitation are higher than in Portland. Troutdale averages 45 inches of yearly precipitation compared to 39 inches in Portland.

Sandy River, the third largest river in Multnomah County, drains an area of 502.3 square miles. Its origin is the Reed, Zigzag, and Palmer Glaciers on Mt. Hood. The Mt. Hood Wilderness Area, the Mt. Hood National Forest and the Bull Run Watershed Preserve comprise approximately 70 percent of the watershed area (USDA 1977). Beaver Creek is a tributary of Sandy River and Drains an area of approximately 13 square miles.

Both the Sandy River and Beaver Creek are characterized by deeply entrenched river valleys. The elevation variation of the Sandy River Basin is 10 to 11,245 feet mean sea level (msl). The elevation range is 15 to 600 feet msl for the Beaver Creek Basin. The steep slopes of Beaver Creek preclude any significant development within its floodplain except in the lower one-half mile. A similar condition exists for all but the first six miles of the Sandy River.

Recreational usage along the lower portion of the Sandy River and Beaver Creek remains high. The City owns and maintains Glenn Otto Park, a 6.38-acre park with picnic areas, restroom, conference buildings and caretaker lodging. The park is located on the west bank of the Sandy River and the east bank of Beaver Creek. The entrance to the park is on the south side of East Historic Columbia River Highway just west of the Troutdale Bridge over the Sandy River.

A small City park (Depot Park) north of East Historic Columbia River Highway and south of the Union Pacific Railroad, has frontage on both banks of Beaver Creek at its confluence with the Sandy River.

The City also owns property fronting on the Sandy River north of the East Historic Columbia River Highway and south of I-84 that is proposed for mixed-use development including a riverfront promenade.

Arata Creek flows into Troutdale from Wood Village several times along their common boundary along the western edge of Troutdale. From Halsey Street upstream, the drainage area is less than one square mile. At both the northwestern corporate limits and Marine Drive, where Arata Creek leaves the city for the final time, the drainage area is about 1.5 square miles.

The City of Wood Village is located in north-central Multnomah County. Wood Village is bounded by the City of Troutdale to the east, by the City of Gresham to the south, and by The City of Fairview to the west. It was incorporated in 1951 and had an approximate population of 3,878 as of the 2010 Census. The approximate land area of the community is 0.9 square miles. The City of Wood Village is currently identified as non-flood-prone.

2.3 Principal Flood Problems

Columbia River flooding in Multnomah County usually occurs in spring during the Columbia River Basin snowmelt freshet. However, intense winter rainstorms are the primary cause of flooding on the remaining Multnomah County streams, and they occasionally cause Columbia River flooding. Additionally, several localized ponding areas in the county are subject to flooding from seepage through levees during prolonged high Columbia River stages. Intense winter-storm runoff is the primary cause of flooding the large ponding area along Johnson Creek.

The annual Columbia River snowmelt freshet occurs in May or June and has caused flooding in Portland during high-runoff years. The Willamette River floods during the spring freshet primarily as a result of backwater from the Columbia River. The June 1894, 1948, and 1956 floods, with recurrence intervals of 80, 48, and 18 years, respectively, were snowmelt freshets. Those flood events had peak discharges at The Dalles, Oregon, the nearest gaging station with a reliable discharge measurement of 1,240,000, 1,010,000 and 823,000 cubic feet per second (cfs), respectively.

Minor flooding in Multnomah County begins when flows at The Dalles reach 450,000 cfs, and major damage begins when flows reach 600,000 cfs.

Multnomah County flood damage from the June 1894 flood, the largest recorded on Columbia River, is not well documented. However, that flood is estimated to have covered the broad, flat area on the south bank of Columbia River from Sandy River to Willamette River below the elevation of approximately 36 feet. Additionally, on Sauvie Island and Hayden Island, only a few isolated knolls were above water. The Willamette River, backed up from the high Columbia River stage, caused damage primarily to development in the incorporated area of Portland.

The June 1948 flood, the second largest of record on Columbia River, resulted in Willamette River backwater that crested 12 feet above bankfull stage at the Morrison Street Bridge and inundated many riverside establishments. Multnomah County Drainage District No. 1 was flooded when the levee system failed. Flood depths in the drainage district ranged from 10 to 20 feet (PNRBC, 1971).

Damage in the unincorporated portion of the district included farm crops, farm buildings, and residences. Sandy Drainage District, which adjoins Multnomah Drainage District No. 1 on the east and extends to the Sandy River, was not flooded. However, the aluminum plant within the district suspended operations and provided approximately 600 people for flood fighting (USACE, 1949). Willamette River

flooding downstream of Portland included the side of Oregon Shipbuilding Corporation, immediately downstream from Portland Terminal Four, and the lowlands that are now filled for Rivergate Industrial District. The area within Sauvie Island is divided roughly in half by two diking districts. The northern half, which contains the Columbia Diking District, was flooded. The floodwaters caused damage to farmland, residences, and farm structures. The southern half, protected by the Sauvie Island Drainage District, was nearly flooded. Sandbags were added to approximately 4 miles of levee crest to reinforce the levees, which were seeping heavily.

The December 1964 winter flood resulted from intense rainfall augmented by snowmelt. High concurrent discharges on both the Willamette and Columbia Rivers resulted in unusually high flood stages in Multnomah County. Along the Willamette River in the southern portion of the county, damage to residences was heavy. However, downstream of Portland, flood heights were less than in 1948, and damage to property fronting on the Columbia and Willamette Rivers and Multnomah Channel was limited to houseboats, boat moorages, and a lumber mill. A Hayden Island mobile home court was partially inundated, and adjacent areas of the island were flooded. Without reservoir control, the 1964 flood would have exceeded the 1894 and 1948 floods at the Morrison Street Bridge gage.

Flooding along the Sandy River can occur as a result of spring snowmelt runoff from the Mt. Hood watershed. However, intense winter rainstorms are the primary cause of flooding. The Sandy River watershed has experienced many flood events. Recent significant floods occurred in December 1964, January 1956, and January 1972. These floods had recurrence intervals of 300, 10, and 30 years, respectively (USACE, 1978). Flows of 61,400, 23,900, and 36,200 cfs, respectively, were recorded at the U.S. Geological Survey (USGS) Sandy River near Marmot gage (No. 14137000). This gage was established in 1911, and measures data from a drainage area of 263 square miles (USGS, 1966-1970). Because the floodplain was only lightly developed, damage in the unincorporated portions of the county was relatively minor. Most of the damage consisted of severe bank erosion, as most of the homes along the stream were above the flood levels. Downstream of the Troutdale corporate limits, Sandy River flood elevations are controlled by Columbia River stages.

The Johnson Creek Flood season extends from October through March. Streamflow records at the Sycamore gage, located 2 miles downstream from the Gresham corporate limits, show that flows have exceeded the major flood stage 10 or more times during the period of record commencing in 1940. Recent floods include January 1972 and December 1977, which had peak discharges of 2,190 and 2,230 cfs, respectively, and average recurrence intervals of approximately 10 years. Flood shaving average recurrence intervals larger than 10 years (USACE, 1973, USACE, 1978) inundate the low-lying area between 100th Avenue and 122nd Avenue as far north as Harold Street. During a 100-year (1-percent-annual-chance) flood, this inundated area is expected to extend as far east as 140th Avenue and Holgate Street. The December 1964 flood had a peak discharge of 2,620 cfs and an average

recurrence interval of approximately 15 years (USACE, 1973). Overbank flows occurred at Southeast Regner Road and continued downstream along the Portland Traction Company Railroad right-of-way. The largest area flooded included the Gresham City Park, where Johnson Creek makes a deep bend; the bend has since been bypassed by a short-excavated channel. Downstream of Southwest Walters Avenue, flooding was confined between the Portland Traction Company Railroad right-of-way to the north and the slopes of Walters Hill to the south. Areas of sparse residential development and agricultural lands were flooded along Johnson Creek within the City of Gresham.

The main concern is the flooding of Fairview Creek in the downtown Fairview area. Most floods occur because of excessive rainfall from October to March. Snowmelt is usually an insignificant factor. Because Fairview is located at the lowest elevation in the Fairview Creek drainage basin, flood problems within the city will be influenced by any upstream development unless proper stormwater retention facilities are constructed.

Constrictions of Fairview Creek by partially plugged or undersized culverts at Southeast Burnside Road, at an unnamed road immediately upstream of the Tri-Met Lightrail bridge, at Southeast 202nd Avenue, and at the Portland Traction Company Railroad crossing upstream of Southeast 202nd Avenue have created backwater flooding over a wide area extending from Southeast Burnside to upstream of Northwest Division Street.

Flooding along Burlingame Creek have occurred frequently in the past and have been characterized by shallow overflows near the intersection of Hogan Place and Burnside Road.

Flooding along the Columbia River is caused in spring by the Columbia River Basin snowmelt freshet and in winter by intense rainstorms that result in high flows in the Columbia and Willamette Rivers. Flooding also occurs in more localized areas as a result of ponding from seepage through levees during prolonged high-river stages.

Past flood damage along the remaining streams studied is not well documented. Damage has been relatively low, however, because these streams are small and located in partially developed areas.

2.4 Flood Protection Measures

Levees exist in the study area that provide the county with some degree of protection against flooding. However, it has been ascertained that some of these levees may not protect the community from rare events such as the 1-percent-annual-chance flood. The criteria used to evaluate protection against the 1-percent-annual-chance flood are 1) adequate design, including freeboard, 2) structural stability, and 3) proper operation and maintenance. Levees that do not protect against the 1-pecent-annual-chance flood are not considered in the hydraulic analysis of the 1-percent-annual-chance floodplain.

A significant flood elevation reduction of Columbia and Willamette Rivers, and Multnomah Channel, has been achieved through the use of flood-control storage reservoirs. There are 22 major reservoirs in the Columbia River Basin upstream of Multnomah County, with a total food-control storage volume of approximately 40 million acre-feet. There are 11 major flood-control reservoirs in the Willamette River Basin, with approximately 1.7 million acre-feet of flood storage. The stage-reduction effect of the Columbia and Willamette River flood-control storage reservoirs (PNRC, 1971).

The drainage districts along the Columbia River in the unincorporated portions of Multnomah County have levees of varying flood-protection capabilities. Thus, safe-water levels have been established by the USACE (USACE, 1978). The safe-water levels is the highest flood elevation, considering surveillance and minor remedial work, for which reasonable assurance can be given that a levee system will not fail. The criteria used to evaluate protection against the 1-percent-annual-chance flood are: (*1) adequate design, including freeboard; (2) structural stability; and (3) proper operation and maintenance*. Levees that do not protect against the 1-percent-annual-chance flood are not considered in the hydraulic analysis of the 1-percent-annual-chance flood plain. Columbia Drainage District levees on the northern end of Sauvie Island would be overtopped by a 1-percent- annual-chance flood, whereas Sauvie Island Drainage District, Multnomah Drainage District No. 1, and Sandy Drainage District, with proper surveillance and maintenance, are expected to withstand the 0.2-percent-annual-chance flood event. However, these levees are currently certified for the 1-percent-annual-chance flood. Although the perimeter levee of a particular drainage district may be capable of withstanding large floods, major rainstorms could cause extensive interior ponding in low areas if runoff exceeds the capacity of the dewatering- drainage pumps.

There are no flood-control structures on Sandy River, Johnson Creek, Fairview Creek, Beaver Creek, Arata Creek or Unnamed Tributary to Rock Creek.

Another measure for providing flood protection from future floods is floodplain management. By restricting development in hazardous floodplain areas, flood related damage is prevented from occurring from all but the extremely large floods. Multnomah County has enacted floodplain management regulations. The regulations require that the county use existing flood plain information to determine whether new developments are reasonably safe from flooding. The regulations requires new developments to have first-floor elevations at least one foot above the 1-percent-annual-chance flood levels and discourages development within the floodway.

Elected officials of the tri-county Metropolitan Service District, formed in May 1978, have established a Johnson Creek Task Force representing the six counties and communities within that drainage basin. The task force has proposed storm water runoff management guidelines for adoption by the six political bodies. These guidelines apply to new development and are intended to control the rate of storm water runoff, thereby stemming the upward trend in flood damage. The task force is also considering a detailed drainage management plan, channel clearing and cleaning, and institution of an annual channel maintenance program.

Table 5. Regulatory Effect of Flood-Control Reservoirs

Location	Flood Crest Elevation (Feet, NAVD88) June 1894	June 1948	June 1956	December 1964
Vancouver Gage, Columbia River				
Observed	39.7	36.3	32.9	33.0
Unregulated	39.7	36.3	35.3	37.8
Regulated[1]	27.6	26.8	22.3	32.0
Portland Gage, Willamette River				
Observed	38.1	35.0	31.5	34.9
Unregulated	38.1	35.1	33.8	39.5
Regulated	26.0	25.2	20.7	34.0
Days Duration Above Flood Stage[2]				
Bankfull	74	51	70	9
Major Flood	38	26	12	2

[1]Based on present level of irrigation on reservoir development
[2]Flood or bankfull stage for Columbia River is 21.3 feet at the Vancouver gage.
A flood of 31.3 feet or higher results in extensive damage and is considered a major flood.
Vancouver gage vertical conversion to NAVD88 +3.46 ft, Portland gage vertical conversion to NAVD88 +3.48 ft.

Flood protection measures in the City of Fairview consist primarily of minor channelization. The National Weather Service in Portland, Oregon, is responsible for flood-warning and river-forecasting services in Multnomah County. General weather forecasts are also available. No flood-control structures have been built on Fairview Creek or on Unnamed Tributary east of Fairview Creek.

Nonstructural measures (a comprehensive land use plan, a zoning ordinance, and building permits) are being used to aid in the prevention of future flood damage in the City of Fairview. Zoning Ordinance No. 9-1974, enacted on November 10, 1974, follows Federal guidelines for controlling development within the 1-percent-annual-chance floodplain. The City of Fairview requires building permits, and it reviews those permits for compliance with the provisions of the zoning ordinance to ensure that sites are reasonably safe from flooding. The Comprehensive Land Use Plan was approved by the Oregon Land Conservation and Development Commission of July 10, 1980.

Storm runoff facilities are located throughout the City of Gresham urban area. A major diversion structure, built by the City of Gresham in 1976, diverts high flow through a 6-foot diameter underground pipe from Burlingame Creek to Kelly Creek. The intake facility is located on Southeast Burnside Road between Bull Run Road and Northeast Division Street and is designed to divert up to 200 cfs to Kelly Creek when flows in Burlingame Creek are greater than 100 cfs.

Gresham's comprehensive plan is used to limit development in the floodplain. It recommends areas of bordering streams as greenways and, within the greenway, only minimal new construction is allowed. In areas adjacent to those streams, the zoning ordinance, adopted as a prerequisite to participation in the NFIP, requires developers to furnish floodplain information to substantiate that proposed new development will not be subject to flooding.

The City of Troutdale has flood protection development standards. The most recent standards were adopted in the Troutdale Development Code November 24, 2000. The most significant standards include: balanced cut and fill within the 100-year floodplain; limitations of impervious area to not more than 30% of the 100-year floodplain; no new land division is permitted that would create a lot that is exclusively within the 100-year floodplain; residential construction is required to be elevated one foot above the Base Flood Elevation; and non-residential construction must either be elevated one foot above the BFE or dry-floodproofed.

The City requires that detention facilities be designed for the control of stormwater and floodwater runoff in accordance with the Construction Standards for Public Works Facilities.

The Sandy Drainage Improvement Company maintains drainage ditches and levees within the City of Troutdale for flood control north of I-84 to the Columbia and Sandy Rivers.

3.0 ENGINEERING METHODS

For the flooding sources studied by detailed methods in the community, standard hydrologic and hydraulic study methods were used to determine the flood hazard data required for this study. Flood events of a magnitude that are expected to be equaled or exceeded once on the average during any 10-, 50-, 100-, or 500-year period (recurrence interval) have been selected as having special significance for floodplain management and for flood insurance rates. These events, commonly termed the 10-, 50-, 100-, and 500-year floods, have a 10-, 2-, 1-, and 0.2-percent chance, respectively, of being equaled or exceeded during any year. Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 1-percent-annual-chance (100-year) flood in any 50-year period is approximately 40 percent (4 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

Although the recurrence interval represents the long-term, average period between floods of a specific magnitude, rare floods could occur at short intervals or even within the same year. The risk of experiencing a rare flood increases when periods greater than 1 year are considered. For example, the risk of having a flood that equals or exceeds the 100-year flood (1-percent chance of annual exceedance) during the term of a 30-year mortgage is approximately 26 percent (about 3 in 10); for any 90-year period, the risk increases to approximately 60 percent (6 in 10). The analyses reported herein reflect flooding potentials based on conditions existing in the community at the time of completion of this study. Maps and flood elevations will be amended periodically to reflect future changes.

3.1 Hydrologic Analyses

Hydrologic analyses were carried out to establish peak discharge-frequency relationships for each flooding source studied by detailed methods affecting the community.

Pre-Countywide FIS Reports

The stage-discharge relationship for the Columbia River and Multnomah Channel near Multnomah County is influenced by ocean tides and by stages on the Willamette River. Similarly, the stage-discharge relationship of Willamette River in the study area is influenced by stages on the Columbia River. Thus, flood frequencies on both rivers and Multnomah Channel are more reliably determined for stages than for discharges. Combined stage-frequency curves were developed for seven locations on the Willamette River. Those locations include USGS gage No. 14144700 on

Columbia River at Vancouver, Washington (USACE, 1976), and USGS gage No. 1421172 on Willamette River at the Morrison Street Bridge (USACE, 1976). Both gages were established in 1876. These curves were based on the statistical combination for stage-frequency curves for fall-winter floods and spring-summer floods.

Multnomah Channel discharges were estimated using the USACE HEC-2 step-backwater computer program. The HEC-2 computer model was calibrated to Columbia and Willamette River flood profiles, and Multnomah Channel discharges were derived by a trial-and-correction process.

Elevations for floods of the selected recurrence intervals on the Columbia River, the Willamette River, and Multnomah Channel are shown in Table 6.

Table 6. Summary of Elevations

Flooding Sources and Location	Drainage Area (Square Miles)	Elevation (Feet, NAVD 88) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Columbia River At Vancouver, Washington (River Mile 106.5)	241,000	25.8	29.9	31.6	35.2
Willamette River At Morrison Street Bridge (River Mile 12.8)	11,200	25.5	30.2	32.3	37.2
Multnomah Channel At Sauvie Island Bridge	--[1]	25.1	29.2	30.8	34.9

[1]Not Applicable
Vancouver gage vertical conversion to NAVD88 +3.46 ft.
Portland gage vertical conversion to NAVD88 +3.48 ft.
Multnomah Channel vertical conversion to NAVD88 +3.39 ft.

Discharges for the 1-percent-annual-chance flood were determined at several locations on Discharges for Arata Creek and Unnamed Tributary to Fairview Creek were developed by the regional analysis presented in the U.S. Geological Survey Open-File Report 79-553, Magnitude and Frequency of Foods in Western Oregon

(USGS, 1979). Those discharges were modified based on culvert capacity and overflow computations.

Stream gage records for Johnson Creek were statistically analyzed using the standard log-Pearson Type III distribution. A discharge-frequency curve (USACE, 1973) for the Johnson Creek stream gage at Sycamore was developed using records from 1941 to 1972. Peak discharges were adjusted downstream of the Sycamore gage to account for overbank storage in a large depression that extends from Interstate Highway 205 east to 140th Avenue and from Johnson Creek north to Holgate Street. The 10- and 2-percent-annual-chance discharges were reduced to compensate for flood storage available in that depression. The depression was considered to fill before peak 1- and 0.2-percent-annual-chance flood flows occur.

Discharges for Fairview Creek and Unnamed Tributary to Rock Creek were determined by correlations with available stream discharge-frequency relationships for similar watersheds. The discharges for Fairview Creek were correlated with Beaver Creek and Johnson Creek based on drainage area and slope on the discharge-frequency curves. The Unnamed Tributary to Rock Creek 1-percent-annual-chance discharges were computed using a USACE standardization procedure for ungaged streams (USACE, 1969). The discharge-frequency curve slope was correlated with an existing curve for Burnt Bridge Creek (USACE 1970).

Flow estimates for the 1-percent-annual-chance flood on Beaver Creek were correlated with flow records of the Sandy River stream gage, located 2 miles northwest of the community of Bull Run. The data were based on reading from 1910 to 1914 and from 1929 to the present. However, flood recurrence interval relationships for the 10-, 2-, and 0.2-percent-annual-chance flows were based on the data from the Johnson Creek gage near Sycamore.

The hydrologic analyses for the City of Troutdale portion of Beaver Creek were obtained from the FIS report for the City of Troutdale (USACE, 1976). This analysis was performed by the National Resources Conservation Service (formerly the SCS), Oregon State Office. Stream flow data at gaging stations in the Sandy River basin were processed in accordance with the method described by the Water Resources Council (USWRC,1976). A regional analysis of the peak flow-frequency characteristics as a function of the drainage area was made and used to determine the unit peak discharge-frequency for Beaver Creek. The discharge at Troutdale Road was obtained by prorating the discharge at Southeast Stark Street to account for the reduction in drainage area.

The rate and volume of runoff for the 1-percent-annual-chance flood within Multnomah County Drainage District No. 1 were determined using the Environmental Protection Agency Stormwater Management Model (EPA, 1982). The model calculates the rate of runoff at specific time intervals throughout the storm based on characteristics of rainfall and the physical characteristics of the drainage basin. The computed runoff draining into Columbia Slough was then balanced

against the ability of the drainage district pumps to discharge water from the slough. The volume of runoff draining to the slough that exceeded district pumping capabilities was calculated at specific time intervals throughout the storm. The peak water-surface elevation for the 1-percent-annual-chance storm was then determined using the volume of storage at various elevations in the slough (Multnomah Drainage Hydrology Study, 1984).

Discharges used for approximate-study stream lengths were derived by correlations with similar drainage basins and based on a comparison of drainage areas.

December 18, 2009
The Initial Countywide FIS Report

No hydrologic updates were made as part of the initial countywide update.

This Physical Map Revision

Hydrologic analysis for Fairview Creek was conducted using HEC-HMS (USACE, 2009). The model was calibrated using flow data from USGS Gage 14211814, Fairview Creek at Glisan Road. A long term continuous simulation was performed using 61 years of precipitation data. Log-Pearson Type III analyses were performed on the simulation results in order to develop revised discharge-frequency relationships for Fairview Creek.

Hydrologic analysis for the Johnson Creek basin was developed using HEC-HMS (USACE, 2009). The model was calibrated and validated using flow data from USGS Gage 14211400, Johnson Creek at Regner Road, USGS Gage 14211500, Johnson Creek at Sycamore, and USGS Gage 14211499, Kelley Creek at SE159th Avenue. A long term continuous simulation was performed using 61 years of precipitation data. Log-Pearson Type III analyses were performed on the simulation results in order to develop revised discharge-frequency relationships for Johnson Creek. In addition, discharge-frequency relationships were developed for the following tributaries of Johnson Creek: Brick Creek, Hogan Creek, Kelley Creek, North Fork Johnson Creek, MacDonald Creek, and Sunshine Creek during the restudy.

Discharges for the approximate studies of Brigman Creek, Butler Creek, Hogan Creek, Jenne Creek, Kelley Creek, McNutt Creek, and four unnamed tributaries to Kelley Creek were developed using the results of the HEC-HMS model for the Johnson Creek basin.

Discharges for the Sandy River were based on discharge drainage area relationships developed from eight USGS gages within the Sandy River Watershed: USGS gage 14131400 Zigzag River near Rhododendron Oregon (USGS, 2011c), USGS gage 14135000 Salmon River at Welches Oregon (USGS, 2011d), USGS gage 14135500 Salmon River at Boulder Creek near Brightwood Oregon (USGS, 2011e), USGS

gage 14137000 Sandy River upstream of Marmot Dam (USGS, 2011f), USGS gage 14140000 Bull Run River near Bull Run, Oregon (USGS, 2011g), USGS gage 14141500 Little Sandy River near Bull Run, Oregon (USGS, 2011h), USGS gage 14142500 Sandy River below Bull Run River (USGS, 2011i), and USGS gage 14142800 Beaver Creek at Troutdale Oregon (USGS, 2011j).

The gage data was analyzed by Bulletin 17B (WRC, 1981) methodology and the log-Pearson Type III distribution, using the USGS PeakFQ computer program (Flynn, et al, 2006). The Sandy River gage (14137000), discharges below 5,000 cubic feet per second (cfs) were considered to be outliers, based on information provided in the USGS regional regression equation report for Oregon (Cooper, 2005). Additionally, the State of Oregon has a specific mean square error value of 0.112 which was used in the PeakFQ program (Flynn, et al, 2006).

Hydrologic analysis for Beaver Creek (upstream of Cochran Road), Kelly Creek and Burlingame Creek was developed using HEC-HMS (USACE, 2009). The model was calibrated to the storm events in 2003 and 2009 by comparing results with real-time climatic data and observed stream data at USGS gage 14142800, Beaver Creek at Troutdale Oregon.

Peak discharge-drainage area relationships for each flooding source studied in detail are shown in Table 7.

Exhibit B2

Table 7- Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Beaver Creek					
At Crown Point Road[1]	13	1,200	1,800	2,100	3,300
At SE Stark Street[1]	11.7	551	871	1,038	1,485
At Kelly Creek[1]	6.6	329	520	620	887
At Cochrane Road	6.0	992	1,539	1,686	2,300
Burlingame Creek					
Confluence with Kelly Creek	2.01	360	564	618	832
At Powell Valley Road	0.89	227	346	377	504
Brick Creek					
At mouth	0.1	17	24	27	33
Columbia River below Gresham, Oregon At Vancouver, Washington (River Mile106.5)	241,000	22.3	26.4	28.1	31.7

[1]Downstream reaches of Beaver Creek were not updated with this PMR..

Exhibit B2

Table 7- Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Fairview Creek					
At mouth[2]	5.2	280	420	490	640
At Sandy Boulevard[2]	4.5	260	370	430	560
At Banfield Expressway[2]	4.4	185	295	350	505
At NE Halsey Street[2]	4.3	180	290	345	495
At NE Glisan Street, below split flow[2]	3.28	134	139	145	153
At NE Glisan Street, above split flow[2]	3.28	155	216	245	318
Upstream of Fujitsu Ponds[2]	3.08	203	262	287	349
At NE Stark Street[2]	2.87	162	203	221	262
At NW Burnside Road[2]	2.25	124	165	185	235
Downstream of Birdsdale Ave[2]	2.15	178	218	232	264
At NE Division Street[2]	0.60	19	28	33	44
Above NE Division Street	0.55	69	106	124	171
Hogan Creek					
At mouth	1.0	181	255	286	356

[2]Regulated by detention facility.

Exhibit B2

Table 7- Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
Johnson Creek					
At 82nd Avenue	46	2,450	4,050	5,400	7,700
At USGS Gage 14211500	26.3	2,554	3,497	3,869	4,680
At Southeast 174th Avenue (Gresham corporate limits)	21	2,005	2,808	3,142	3,908
At USGS Gage 14211400	15.5	1,641	2,261	2,504	3,029
At Southeast 252nd Avenue	12.7	1,461	2,005	2,212	2,645
Below Confluence with MacDonald Creek	7.2	839	1,174	1,301	1,567
Below Highway 26 (Above Confluence with MacDonald Creek)	4.8	587	818	905	1,084
Kelley Creek					
At Study Limit, approximately 900 feet downstream of SE Foster Road	3.0	508	745	849	1102
At SE Ritchey Road	1.1	203	287	321	399
Kelly Creek					
Confluence with Beaver Creek	4.34	496	720	780	961
Just Upstream of Confluence with Burlingame Creek	2.12	187	295	325	451
At Powell Valley Road	1.29	93	151	162	221

Exhibit B2

Table 7- Summary of Discharges (continued)

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (cfs) 10-Percent-Annual-Chance	2-Percent-Annual-Chance	1-Percent-Annual-Chance	0.2-Percent-Annual-Chance
MacDonald Creek					
At mouth	2.4	275	410	463	579
North Fork Johnson Creek					
At mouth	1.2	133	188	210	258
Sandy River					
At mouth	502	51,668	74,628	85,139	112,342
At Dabney Park	483	49,672	71,742	81,853	107,994
Sunshine Creek					
At mouth	3.8	486	660	726	861
Unnamed Tributary to Rock Creek					
At Kaiser Road	3.2	160	240	260	340

3.2 Hydraulic Analyses

Pre-Countywide FIS Reports

Analyses of the hydraulic characteristics of flooding from the sources studied were carried out to provide estimates of the elevations of floods of the selected recurrence intervals. Users should be aware that flood elevations shown on the FIRM represent rounded whole-foot elevations and may not exactly reflect the elevations shown on the Flood Profiles or in the Floodway Data tables in the FIS report. Flood elevations shown on the FIRM are primarily intended for flood insurance rating purposes. For construction and/or floodplain management purposes, users are cautioned to use the flood elevation data presented in this FIS in conjunction with the data shown on the FIRM.

Water-surface elevations were computed through the use of the USACE HEC-2 step-backwater program (USACE, 1977).

Columbia River flood profiles for specific recurrence intervals were plotted directly from the combined stage-frequency curves described in Section 3.1. The HEC-2 computer program was calibrated to the plotted 1-percent-annual-chance flood profile and used for the Columbia River floodway determination. Discharges used in the floodway computations were correlated, based on data at USGS gage No. 14105700 (established in 1857) at The Dalles, Oregon (USGS, 1978), to yield water-surface elevations similar to the combined stage-frequency curves.

Willamette River flood profiles are referenced to combined frequency computations for the Morrison Street Bridge gage. A HEC-2 computer model was used to estimate flood elevations upstream and downstream of the gage. Discharges used in the HEC-2 model were correlated, based on data at USGS gage No. 1419100 (established in 1892) at Salem, OR (USGS, 1978), to yield water-surface elevations similar to the combined stage-frequency curves.

The HEC-2 program was used to prepare Multnomah Channel flood profiles that connect corresponding Columbia and Willamette River combined frequency flood profiles downstream and upstream of the study reach.

Johnson Creek Flood profiles were computed using the HEC-2 step-backwater computer program.

Fairview Creek flood profiles were also computed using the HEC-2 step-backwater program.

The Fairview Creek study was revised on July 3, 1995, to add base flood elevations, and to update the flood boundary delineations from Bridge Street to Fairview Lake. The hydraulic analysis conducted for this restudy utilized the HEC-2 step-backwater

program. Cross-sectional data were obtained from the field surveys performed in May 1991, and were supplemented with topographic maps provided by Multnomah County. The 1-percent-annual-chance flood elevation calculated at the farm road crossing, which acts as a weir, at the outlet of Fairview Lake was used as the starting-water surface elevation. The revised floodway was established using equal conveyance. The results are shown on Table 8.

The HEC-2 analysis of Unnamed Tributary to Rock Creek had to compensate for sheet flow losses. During floods, the stream overtops its north bank and flows westerly across the county boundary. Flows were reduced in the computer model to account for these losses.

Columbia and Willamette River cross sections were based on USACE condition surveys, dated 1974 and 1976, and topographic maps (USACE, CL-106-92, USACE, CL-52-). Multnomah Channel cross sections were measured by hydrographic survey methods. Cross sections for Johnson Creek, Fairview Creek, and Unnamed Tributary to Rock Creek were field measured. Overbank topography for Multnomah Channel was defined by USGS topographic maps (USACE, 1986). Cross sections on Johnson and Fairview Creeks were supplemented with information from topographic maps (USGS, 1970 and 1975). Bridge drawings for structures on Columbia and Willamette Rivers were provided by government agencies and private industry. Bridge information for structures on Johnson Creek and Fairview Creek was obtained by field measurement.

Roughness values (Manning's "n") used in detailed hydraulic computations were chosen by engineering judgment and based on field observations of the streams and flood plain areas. The acceptability of all assumed hydraulic factors, cross sections, and hydraulic structure date was check by computations that duplicated historical flood profiles (USACE, 1973). Surveyed highwater marks for Beaver Creek were used to calibrate the computer model and determine the accuracy of the friction factor chosen. Where the computed elevation did not adequately reflect the actual experiences, the chosen factor was adjusted. Ranges of values for streams are summarized in Table 7.

The starting water-surface elevations for Columbia River flood profiles were based on the appropriate combined stage-frequency curve, while Willamette River and Multnomah Channel starting elevations were on coinciding Columbia River flood elevations.

There is overflow from Sandy River and interflow with Beaver Creek from Crown Point Highway downstream to their confluence, and Beaver Creek computed water surface elevations reflect the increase in the discharge because it was assumed that the two streams will peak together. A split-flow analysis was made to determine the quantity of overflow into Beaver Creek for the 2- and 1-percent-annual-chance floods.

Johnson Creek starting elevations were obtained from the Flood Insurance Study for the City of Portland (FEMA, 2004). Previous flood elevations, channel slopes, and bank elevations were considered when the starting water-surface elevations were determined for Unnamed Tributary to Rock Creek.

Starting water-surface elevations for Fairview Creek were based on normal-depth calculations. Starting water-surface elevations for the reach being revised, from River Mile 2.13 upstream to NE. Gilsan Street, were obtained by using the computed energy grade slope at cross section 2.13 from the last Flood Insurance Study for Fairview, Oregon, dated September 30, 1987 (FEMA, 1987).

Water-surface elevations within Multnomah County Drainage District No. 1 are based on a July 1984 hydrology study for the district (Multnomah County Drainage District Hydrology, 1984). As a result of this study, the 100-year water-surface elevation within the district was reduced from 17 feet to 14 feet (NGVD 29).

The Beaver Creek study was revised on August 3, 1998 to add detailed flood information, including the adoption of a regulatory floodway, from just upstream of Jackson Park Road to approximately 200 feet downstream of Southeast Stark Street.

Flooding along Beaver Creek occurs from two sources. Overflow from Sandy River creates a backwater effect along Beaver Creek from its confluence point with the Sandy River to approximately 6,200 feet upstream. Flooding along the remainder of Beaver Creek is due only to flow originating from the Beaver Creek watershed. Because of the backwater effects from the Sandy River, the lower portion of Beaver Creek is a level pool with essentially constant elevations. From approximately 6,200 feet upstream, the steep slope of the basin results in supercritical flow.

The hydraulic analysis of Beaver Creek was performed using the USACE HEC-2 step-backwater program (USACE, 1991). Starting water-surface elevations just upstream of Jackson Park Road were taken from the previous published FIS. Cross-section information was developed from topographic work maps at a scale of 1”=100’, with a contour interval of 2 feet (Troutdale Orthophoto Topographic Maps, 1983). Roughness factors (Manning’s “n”) used in the hydraulic computations were chosen based on engineering judgment and field observations of the channel and overbank areas. Manning’s “n” values of 0.04 and 0.07 were chosen for the channel and overbanks, respectively.

The floodway along the studied portion of Beaver Creek was computed on the basis of equal conveyance reduction from each side of the floodplain. From just upstream of Jackson Park Road to approximately 3,100 feet upstream, and from Troutdale Road to Southeast Stark Street, the floodway width was determined by the width of the encroachment needed to cause a 1-foot rise in the water surface. From 3,100 feet upstream of Jackson Park Road to Troutdale Road, the floodway width was

determined by the width of the encroachment needed to cause a 1-foot rise in the energy gradeline.

The approximate analysis on Columbia River upstream of the Sandy River was based on existing 1-percent-annual-chance profiles (USACE, 1971) and existing topographic maps (USACE, CL-106-92). Sandy River approximate analysis included field investigations to recover the 1964 high-water marks and normal-depth calculations to define the flood plain, using available topographic information (USGS, 1961).

Fairview Creek approximate analyses was completed based on existing topographic information (Multnomah County Topographic Maps, 1963, 1986, and 1978) and normal-depth calculations.

Kelley Creek, Butler Creek and Unnamed Tributary to Johnson Creek approximate elevations were derived from field analysis and using 2-foot contour interval maps (Multnomah County Topographic Maps, 1963, 1986, and 1978).

The approximate analysis on Arata Creek was based upon existing topographic maps (Multnomah County Topographic Maps, 1963, 1986, and 1978), culvert analyses, and normal depth computations.

Locations of selected cross sections used in the hydraulic analyses are shown on the Flood Profiles (Exhibit 1). For stream segments for which a floodway was computed (Section 4.2), selected cross section locations are also shown on the Flood Insurance Rate Map (Exhibit 2).

The hydraulic analyses for this study were based on unobstructed flow, except for the culverts at Birdsdale Avenue and the Tri-Met Lightrail, which were modeled as found, half-filled with sediment. The culvert at Division Street, which was submerged and assumed mostly filled with sediment during surveys in 1985, was modeled as being open because it was reported as being cleaned out in 1987. The flood elevations shown on the profiles are thus considered valid for these conditions (with noted exceptions) only if hydraulic structures remain unobstructed, operate properly, and do not fail.

December 18, 2009
Initial Countywide FIS Report

No hydraulic updates were made as part of the initial countywide update.

This Physical Map Revision

The City of Gresham portion of this PMR was prepared by WEST Consultants, Inc September 2012. Table 2 was updated to reflect streams studied in detail and their included segments. Detailed hydraulic analyses were conducted using HEC-RAS (DOGAMI, 2010). Cross section data were obtained from field surveys performed between December 2009 and April 2010 and were supplemented with LiDAR derived topographic data provided by the City of Gresham (USACE, 2009).

Roughness values (Manning's n) used in the hydraulic analyses were selected using engineering judgment and are based on field observations of the stream channels and floodplains. Table 8, "Roughness Coefficients", was updated to reflect the range of roughness values used for the detailed study streams.

Starting water surface elevations for Johnson Creek, and Fairview Creek were obtained from the previous Flood Insurance Study for Multnomah County and Incorporated Areas, Oregon (FEMA, 2009). Starting water surface elevations for the remaining detailed study streams were based on normal depth using the surveyed channel slope.

The Lower Columbia-Sandy Watershed portion of this PMR was prepared by STARR in 2016. Water surface elevations (WSELs) of the 10-, 4-, 2-, 1-, and 0.2-percent-annual-chance floods for Beaver Creek, Burlingame Creek, Kelly Creek, and Sandy River in Multnomah County, Oregon were estimated using of the USACE HEC-RAS 4.1.0 computer program (HEC, 2010). Cross sectional geometries for the detailed analysis of these streams were comprised of field run survey data and a digital terrain model (DTM) generated from Light Detection and Ranging (LIDAR) data collected by the Oregon Department of Geology & Mineral Industries (DOGAMI) in 2011 (DOGAMI, 2011). Topography for the upper portion of Kelly Creek was based on LIDAR from 2007 (DOGAMI, 2009). Surveyed channel sections were transferred upstream and downstream to LIDAR generated cross sections and were blended with the LIDAR data to create a consistent channel profile. Floodway encroachment stations were established, first using Method 4. The Method 4 encroachment stations were imported and the Method 1 encroachment analysis was then executed to create the final floodway.

Manning's Roughness were determined based on surface conditions in the channel and on the overbanks based on site visit, aerial photography and photographs. Manning's roughness used in the modeling is summarized in Table 8

Table 8 - Roughness Coefficients

Stream	Channel	Overbank
Beaver Creek	0.035 - 0.050	0.050 - 0.120
Brick Creek	0.050 - 0.055	0.080 - 0.100
Burlingame Creek	0.035 - 0.050	0.035 - 0.100
Columbia River	0.025 - 0.038	0.050 - 0.100
Fairview Creek	0.025 - 0.095	0.016 - 0.150
Fairview Creek - East Pond	0.025 - 0.050	0.08
Fairview Creek - NE Glisan Street Overflow	0.016 - 0.080	0.040 - 0.080
Hogan Creek	0.040 - 0.085	0.045 - 0.100
Johnson Creek	0.030 - 0.050	0.035 - 0.100
Johnson Creek City Park Side Channel	0.04	0.040 - 0.080
Johnson Creek Telford Split	0.040 - 0.070	0.040 – 0.075
Kelley Creek	0.050 - 0.075	0.060 - 0.120
Kelly Creek	0.035-0.060	0.035 – 0.120
MacDonald Creek	0.04	0.050 - 0.070
Multnomah Channel	0.030	0.050 - 0.100
North Fork Johnson Creek	0.045 - 0.050	0.060 - 0.100
North Fork Johnson Creek Split Flow	0.04	0.06
Sandy River	0.030 – 0.040	0.035 – 0.120
Sunshine Creek	0.040 - 0.045	0.040 - 0.090
Unnamed Tributary to Rock Creek	0.015 - 0.080	0.050 - 0.100
Willamette River	0.030 - 0.050	0.050 - 0.100

3.3 Vertical Datum

All FIS reports and FIRMs are referenced to a specific vertical datum. The vertical datum provides a starting point against which flood, ground, and structure elevations can be referenced and compared. Until recently, the standard vertical datum in use for newly created or revised FIS reports and FIRMs was NGVD. With the finalization of NAVD, many FIS reports and FIRMs are being prepared using NAVD as the referenced vertical datum.

Flood elevations shown in this FIS Report and on the FIRMs are referenced to NAVD88. These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum.
For additional information regarding conversion between NGVD and NAVD, visit the NGS website at www.ngs.noaa.gov.

Table 9 – Vertical Datum Conversions

Quadrangle Name	Quadrangle Corner	Latitude	Longitude	Conversion from NGVD29 to NAVD88 (feet)
Damascus	NE	45.500	-122.375	3.423
Sandy	NE	45.500	-122.250	3.424

Average Conversion from NGVD29 to NAVD88 = 3.423 (FEET)

The conversion factor from NGVD to NAVD for all streams in this report is +3.423 feet. Temporary vertical monuments are often established during the preparation of a flood hazard analysis for the purpose of establishing local vertical control. Although these monuments are not shown on the FIRM, they may be found in the Technical Support Data Notebook associated with the FIS report and FIRM for this community. Interested individuals may contact FEMA to access these data.

To obtain current elevation, description, and/or location information for benchmarks shown on this map, please contact the Information Services Branch of the NGS at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

4.0 FLOODPLAIN MANAGEMENT APPLICATIONS

The NFIP encourages State and local governments to adopt sound floodplain management programs. Therefore, each FIS provides 1-percent-annual-chance (100-year) flood elevations and delineations of the 1- and 0.2-percent-annual-chance (500-year) floodplain boundaries and 1-percent-annual-chance floodway to assist communities in developing floodplain management measures. This information is presented on the FIRM and in many components of the FIS report, including Flood Profiles, Floodway Data Table, and Summary of Discharges Table. Users should reference the data presented in the FIS report as well as additional information that may be available at the local map repository before making flood elevation and/or floodplain boundary determinations.

4.1 Floodplain Boundaries

Pre-Countywide FIS Reports

To provide a national standard without regional discrimination, the 1-percent-annual-chance flood has been adopted by FEMA as the base flood for floodplain management purposes. The 0.2-percent-annual-chance flood is employed to indicate additional areas of flood risk in the community.

For each stream studied by detailed methods, the 1- and 0.2-percent-annual-chance floodplain boundaries have been delineated using the flood elevations determined at each cross section. Between cross sections, the boundaries were interpolated using topographic maps at scales of 1:1,200 and 1:2,400, with a contour interval of 2 feet and 1:24,000, with contour intervals of 10 and 20 feet (USACE, CL-52-1/16-to 26) and (Troutdale Ortho Topographic Maps, 1983).

The 1- and 0.2-percent-annual-chance floodplain boundaries are shown on the FIRM (Exhibit 2). On this map, the 1-percent-annual-chance floodplain boundary corresponds to the boundary of the areas of special flood hazards (Zone A and AE), and the 0.2-percent-annual-chance floodplain boundary corresponds to the boundary of areas of moderate flood hazards. In cases where the 1- and 0.2-percent-annual-chance floodplain boundaries are close together, only the 1-percent-annual-chance floodplain boundary has been shown. Small areas within the floodplain boundaries may lie above the flood elevations but cannot be shown due to limitations of the map scale and/or lack of detailed topographic data.

For streams studied by approximate methods, the boundaries of the 1-percent-annual-chance floodplain were delineated on the aforementioned topographic maps in conjunction with previously estimated elevations.

Boundaries for the shallow flooding areas were delineated using topographic maps at a scale of 1:2,400, with a contour interval of 2 feet (Multnomah Topographic Maps , 1963, 1968, 1978), in conjunction with the previously estimated elevations.

For the streams studied by approximate methods, only the 1-percent-annual-chance floodplain boundary is shown on the FIRM (Exhibit 2).

Base map aerial imagery shown on this FIRM is from the Metro Data Resource Center and was collected during July 2004. Non-revised floodplains were compared to this new base map data and adjusted where appropriate.

In accordance with FEMA Procedure Memo 36, profile base lines have been included in all areas of detailed study. Profile base lines are shown in the location of the original stream centerline or original profile base line without regard to the adjusted floodplain position on the new base map. This was done to maintain the relationship of distances between cross sections along the profile base line between the hydraulic models, profiles and floodway data tables.

December 18, 2009
The Initial Countywide FIS Report

As part of the countywide update, floodplain boundaries within the City of Fairview for portions of the Columbia River, Fairview Lake, Blue Lake, and Fairview Creek were revised based on topographic maps at a scale of 1:1,200 with a contour interval of 2 feet. Additionally, portions of the Columbia River,

Willamette River, and Multnomah Channel were revised based on 2-foot contour interval topographic data developed from LiDAR data created by the Puget Sound LiDAR Consortium. The data can be used at a horizontal scale of 1:12,000 (1inch=1,000 feet) or smaller.

The floodplain boundaries for the remaining streams were digitized from the effective FIRM and Floodway panels. Aerial photography was used to adjust floodplain and floodway boundaries where appropriate.

This Physical Map Revision

For this PMR, studied streams floodplains delineated based on 2-foot contour interval data developed from LiDAR data developed by the Oregon Department of Geology and Mineral Industries (DOGAMI,2007). The data can be used at a horizontal scale of 1:12,000 (1inch=1,000 feet) or smaller.

The floodplain for Beaver Creek from its confluence with Sandy River to Cochrane Road and the floodplain for Columbia River from the confluence of Sandy River to 4 miles upstream of the confluence of Sandy River was redelineated to this same terrain.

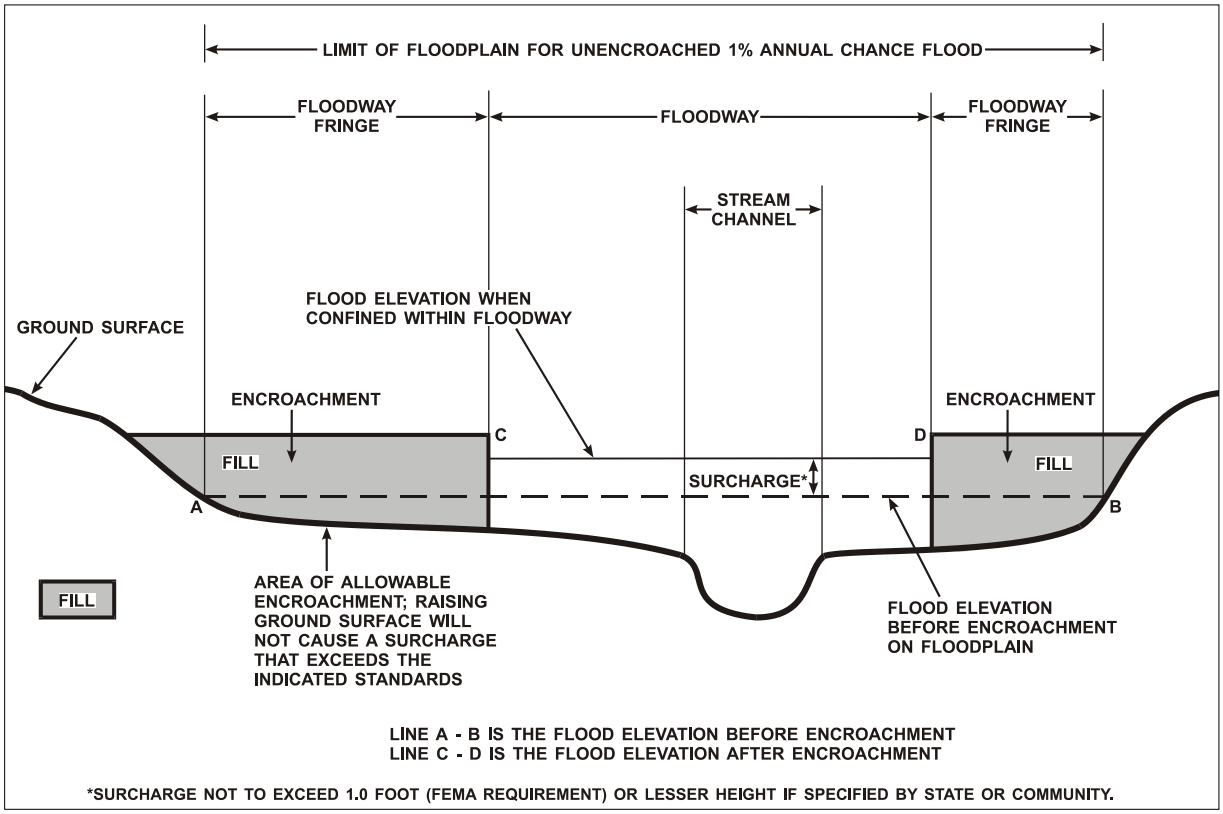
4.2 Floodways

Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. One aspect of floodplain management involves balancing the economic gain from floodplain development against the resulting increase in flood hazard. For purposes of the NFIP, a floodway is used as a tool to assist local communities in this aspect of floodplain management. Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1 foot, provided that hazardous velocities are not produced. The floodways in this study are presented to local agencies as minimum standards that can be adopted directly or that can be used as a basis for additional floodway studies.

The floodways presented in this study were computed for certain stream segments on the basis of equal-conveyance reduction from each side of the floodplain. Floodway widths were computed at cross sections. Between cross sections, the floodway boundaries were interpolated. The results of the floodway computations are tabulated for selected cross sections (see Table 10). In cases where the floodway and 1-percent-annual-chance floodplain boundaries are either close together or collinear, only the floodway boundary is shown.

The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water surface elevation WSEL of the 1-percent-annual-chance flood more than 1 foot at any point. Typical relationships between the floodway and the floodway fringe and their significance to floodplain development are shown in Figure 4.

Figure 4 - Floodway Schematic



Portions of the floodways of Columbia River, Willamette River, and Johnson Creek are outside of the unincorporated areas of Multnomah County.

December 18, 2009
The Initial Countywide FIS Report

In accordance with FEMA Guidelines and Specifications for Flood Hazard Mapping Partners, floodways which abut certified levees are to be mapped to the landward toe of the levee. Several locations where the effective mapping did not reflect this were revised and the floodway boundary was moved to the landward toe as determined by new topographic data. This was done for the Columbia River at cross sections C, D, and Q and for the Multnomah Channel at cross sections D and E. Floodway widths shown in Table 10 were updated to reflect the revised floodway boundary.

Exhibit B2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (Feet NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (Feet)	SECTION AREA (Square Feet)	MEAN VELOCITY (Feet Per Second)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	633	144	2,080	2.3	38.0	38.0	38.5	0.5
B	1,373	151	2,000	2.4	39.3	39.3	39.6	0.3
C	1,848	117	1,720	2.6	39.5	39.5	39.7	0.2
D	2,006	66	690	6.8	39.5	39.5	39.7	0.2
E	2,270	111	1,130	1.8	42.9	42.9	43.2	0.3
F	2,798	101	2,050	1.0	43.0	43.0	43.2	0.2
G	3,115	74	485	4.1	43.1	43.1	44.1	1.0
H	3,500	101	1,042	1.4	43.4	43.4	44.4	1.0
I	6,350	42	173	11.6	47.1	47.1	47.5	0.4
J	8,150	36	170	11.8	114.6	114.6	114.6	0.0
K	9,350	48	170	11.7	157.5	157.5	157.7	0.2
L	10,530	44	316	3.4	186.9	186.9	186.9	0.0
M	12,290	44	148	7.0	198.2	198.2	198.4	0.2
N	12,778	30	133	7.8	214.1	214.1	215.1	1.0
O	12,988	120	1,520	0.7	215.4	215.4	216.2	0.8
P	13,593	163	955	1.1	215.5	215.5	216.2	0.7
Q	13,886	43	167	6.2	215.6	215.6	216.3	0.7
R	14,362	12	142	7.3	219.9	219.9	220.8	0.9
S	14,679	14	206	5.0	223.5	223.5	224.1	0.6
T	14,995	62	140	7.4	228.9	228.9	228.9	0.0
U	15,523	61	207	5.0	233.3	233.3	234.1	0.8

[1]Stream Distance In Feet Above Confluence With Sandy River

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BEAVER CREEK

Exhibit B2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (Feet NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (Feet)	SECTION AREA (Square Feet)	MEAN VELOCITY (Feet Per Second)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	15,787	28	163	3.8	234.2	234.2	235.2	1.0
W	16,421	36	119	5.2	237.3	237.3	238.2	0.9
X	16,843	30	143	4.4	240.2	240.2	240.9	0.7
Y	16,896	7	59	10.5	241.1	241.1	241.1	0.0
Z	16,949	65	285	2.2	243.1	243.1	243.1	0.0
AA	17,160	39	95	6.5	243.2	243.2	243.2	0.0
AB	17,449	60	291	5.8	245.2	245.2	245.2	0.0
AC	17,655	108	1,199	1.4	258.7	258.7	259.4	0.7
AD	18,784	133	460	3.7	259.0	259.0	259.8	0.8

[1]Stream Distance In Feet Above Confluence With Sandy River

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BEAVER CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Brick Creek								
A	416[2]	9	10	2.7	333.7	333.7	334.4	0.7
B	526[2]	9	14	1.9	336.9	336.9	337.1	0.2
C	760[2]	15	16	1.6	343.1	343.1	343.1	0.0
D	965[2]	3	7	4.0	347.6	347.6	347.6	0.0
E	1,284[2]	9	42	1.3	363.4	363.4	363.4	0.0
F	1,775[2]	5	7	4.1	371.9	371.9	372.0	0.1

[1] Feet above confluence with Sandy River [2] Feet above confluence with Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

BRICK CREEK

Exhibit B2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (Feet NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (Feet)	SECTION AREA (Square Feet)	MEAN VELOCITY (Feet Per Second)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	63	49	115	5.4	314.2	314.2	314.2	0.0
B	366	39	117	5.3	316.0	316.0	316.0	0.0
C	912	60	273	2.3	317.0	317.0	317.2	0.2
D	1,577	60	337	1.8	317.1	317.1	317.6	0.5
E	2,351	60	321	1.9	317.1	317.1	317.8	0.7
F	3,000	60	250	2.5	317.2	317.2	318.2	1.0
G	3,278	61	325	1.9	317.5	317.5	318.4	0.9

[1]Stream Distance In Feet Above Confluence With Kelly Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: BURLINGAME CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek								
A	72	---[3]	---[3]	---[3]	20.0[2]	20.0	---[3]	---[3]
B	610	---[3]	---[3]	---[3]	20.1[2]	20.1	---[3]	---[3]
C	790	---[3]	---[3]	---[3]	20.1[2]	20.1	---[3]	---[3]
D	810	---[3]	---[3]	---[3]	20.2[2]	20.2	---[3]	---[3]
E	1,150	---[3]	---[3]	---[3]	20.3[2]	20.3	---[3]	---[3]
F	1,771	38	144	3.1	20.3	20.3	20.3	0.0
G	2,041	35	137	3.3	20.5	20.5	20.7	0.2
H	2,601	50	119	3.8	21.0	21.0	21.3	0.3
I	2,870	---[3]	---[3]	---[3]	21.9[2]	21.9	---[3]	---[3]
J	2,930	---[3]	---[3]	---[3]	28.5[2]	28.5	---[3]	---[3]
K	3,320	---[3]	---[3]	---[3]	28.9[2]	28.9	---[3]	---[3]
L	3,610	---[3]	---[3]	---[3]	31.2[2]	31.2	---[3]	---[3]
M	3,800	---[3]	---[3]	---[3]	31.2[2]	31.2	---[3]	---[3]
N	3,980	---[3]	---[3]	---[3]	31.7[2]	31.7	---[3]	---[3]
O	4,100	---[3]	---[3]	---[3]	34.4[2]	34.4	---[3]	---[3]
P	4,160	---[3]	---[3]	---[3]	38.9[2]	38.9	---[3]	---[3]
Q	4,200	---[3]	---[3]	---[3]	45.4[2]	45.4	---[3]	---[3]
R	4,380	---[3]	---[3]	---[3]	45.7[2]	45.7	---[3]	---[3]
S	4,540	---[3]	---[3]	---[3]	48.9[2]	48.9	---[3]	---[3]
T	4,850	---[3]	---[3]	---[3]	56.9[2]	56.9	---[3]	---[3]
U	5,150	---[3]	---[3]	---[3]	88.4[2]	88.4	---[3]	---[3]
V	5,340	---[3]	---[3]	---[3]	94.8[2]	94.8	---[3]	---[3]
W	5,780	---[3]	---[3]	---[3]	102.3[2]	102.3	---[3]	---[3]
X	6,060	---[3]	---[3]	---[3]	110.9[2]	110.9	---[3]	---[3]

[1] Feet above mouth [2] Values read from effective flood profiles [3] Data not available

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek (continued)								
Y	6,250	---[3]	---[3]	---[3]	115.8[2]	115.8	---[3]	---[3]
Z	6,300	---[3]	---[3]	---[3]	122.9[2]	122.9	---[3]	---[3]
AA	6,625	---[3]	---[3]	---[3]	128.1[2]	128.1	---[3]	---[3]
AB	6,748	---[3]	---[3]	---[3]	130.9[2]	130.9	---[3]	---[3]
AC	6,965	---[3]	---[3]	---[3]	132.7[2]	132.7	---[3]	---[3]
AD	7,180	---[3]	---[3]	---[3]	134.9[2]	134.9	---[3]	---[3]
AE	7,305	---[3]	---[3]	---[3]	143.8[2]	143.8	---[3]	---[3]
AF	7,532	30	71	4.9	150.8	150.8	151.0	0.2
AG	7,665	50	227	1.5	151.3	151.3	151.8	0.5
AH	7,835	45	168	2.1	151.5	151.5	152.0	0.5
AI	8,185	30	95	3.7	152.4	152.4	152.8	0.4
AJ	8,337	37	74	4.7	158.9	158.9	159.2	0.3
AK	8,392	56	369	1.0	159.4	159.4	159.8	0.4
AL	8,527	55	128	2.8	159.5	159.5	160.0	0.5
AM	8,697	65	138	2.5	159.7	159.7	160.6	0.9
AN	8,727	70	157	2.2	160.2	160.2	161.2	1.0
AO	9,117	86	223	1.5	162.6	162.6	162.6	0.0
AP	9,517	48	77	4.4	165.4	165.4	165.4	0.0
AQ	9,757	48	139	2.4	169.6	169.6	169.6	0.0
AR	10,137	54	101	3.4	174.3	174.3	174.3	0.0
AS	10,672	66	106	3.2	182.2	182.2	182.2	0.0
AT	11,079	87	200	1.7	188.7	188.7	188.7	0.0
AU	11,759	34	81	1.9	192.9	192.9	193.2	0.3

[1] Feet above mouth [2] Values read from effective flood profiles [3] Data not available

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek (continued)								
AV	12,944	90	174	0.9	197.9	197.9	198.3	0.4
AW	14,052	80	87	1.5	200.6	200.6	201.1	0.5
AX	14,832	122[2]	35	3.8	205.4	205.4	206.0	0.6
AY	15,337	14	20	6.7	208.8	208.8	208.8	0.0
AZ	15,465	83[2]	41	3.5	210.2	210.2	210.2	0.0
BA	15,524	22	75	1.3	211.1	211.1	211.1	0.0
BB	15,551	23	76	1.3	212.0	212.0	212.2	0.2
BC	15,683	723[2]	1033	0.1	212.0	212.0	212.2	0.2
BD	16,022	95	179	1.1	212.0	212.0	212.2	0.2
BE	16,275	25	62	0.6	214.6	214.6	215.0	0.4
BF	16,576	260	1108	0.2	214.6	214.6	215.0	0.4
BG	17,101	344	1360	0.2	214.6	214.6	215.0	0.4
BH	17,546	82	309	0.7	214.6	214.6	215.0	0.4
BI	17,685	48	226	1.0	214.6	214.6	215.0	0.4
BJ	17,919	31	127	1.8	214.7	214.7	215.0	0.3
BK	18,080	22	40	7.8	215.2	215.2	215.2	0.0
BL	18,122	15	28	7.8	218.1	218.1	218.1	0.0
BM	18,146	15	65	3.4	221.1	221.1	221.7	0.6
BN	18,674	24	37	6.0	228.4	228.4	229.3	0.9
BO	19,277	11	43	5.1	236.0	236.0	236.9	0.9
BP	19,772	13	42	5.2	240.0	240.0	240.4	0.4
BQ	19,956	10	40	5.5	241.0	241.0	241.6	0.6
BR	19,973	10	44	5.0	241.3	241.3	242.1	0.8

[1] Feet above mouth [2] Floodway width includes island in middle of channel

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek (continued)								
BS	20,074	11	36	6.1	241.9	241.9	242.6	0.7
BT	20,285	13	56	4.5	243.7	243.7	244.0	0.3
BU	20,385	11	47	4.7	246.9	246.9	247.0	0.1
BV	20,801	8	33	5.6	248.2	248.2	248.6	0.4
BW	21,082	15	55	3.3	249.4	249.4	250.0	0.6
BX	21,163	15	66	2.8	251.4	251.4	251.6	0.2
BY	21,568	10	33	5.6	252.4	252.4	252.6	0.2
BZ	22,014	15	68	2.7	253.7	253.7	253.9	0.2
CA	22,325	21	63	3.5	255.8	255.8	255.8	0.0
CB	22,552	8	25	7.4	257.6	257.6	258.0	0.4
CC	22,826	17	52	3.6	260.9	260.9	261.0	0.1
CD	22,918	62	234	0.8	264.9	264.9	264.9	0.0
CE	22,960	53	231	1.0	265.0	265.0	265.0	0.0
CF	23,376	14	111	2.1	265.0	265.0	265.0	0.0
CG	23,959	15	114	2.0	265.0	265.0	265.7	0.7
CH	24,164	16	117	2.0	265.0	265.0	265.9	0.9
CI	24,279	23	161	1.4	265.0	265.0	265.9	0.9
CJ	24,454	13	100	2.6	265.0	265.0	265.9	0.9
CK	24,518	13	96	0.3	265.1	265.1	266.1	1.0
CL	24,599	15	89	0.4	265.1	265.1	266.1	1.0
CM	24,939	18	95	0.3	265.1	265.1	266.1	1.0
CN	25,028	18	112	0.3	265.2	265.2	266.2	1.0
CO	25,075	13	47	0.7	265.2	265.2	266.2	1.0

[1] Feet above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek (continued)								
CP	25,531	17	64	0.5	265.3	265.3	266.2	0.9
CQ	26,078	18	47	0.7	265.4	265.4	266.3	0.9
CR	26,152	13	36	0.9	265.5	265.5	266.4	0.9
CS	26,718	13	27	1.2	266.6	266.6	266.9	0.3
CT	27,029	16	38	0.9	267.0	267.0	267.3	0.3
CU	27,216	19	41	0.8	267.2	267.2	267.4	0.2
CV	27,399	19	101	1.2	267.2	267.2	267.4	0.2
CW	27,764	15	81	1.5	267.3	267.3	267.5	0.2
CX	28,677	17	102	1.2	267.4	267.4	267.8	0.4
CY	29,496	23	142	0.9	267.4	267.4	267.9	0.5

[1] Feet above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek-East Pond Split Flow								
A	67	1074	2050	0.1	212.0	212.0	212.2	0.2
B	237	1026	2154	0.1	212.0	212.0	212.2	0.2
C	322	573	1323	0.1	212.0	212.0	212.2	0.2
D	424	636	1405	0.1	212.0	212.0	212.2	0.2
E	583	264	505	0.1	212.0	212.0	212.2	0.2
F	756	105	190	0.3	212.0	212.0	212.2	0.2
G	951	3	7	8.1	212.4	212.4	212.5	0.1
H	1004	9	24	4.0	214.4	214.4	214.7	0.3
I	1065	26	89	0.7	214.7	214.7	215.1	0.4
J	1139	30	101	0.6	214.7	214.7	215.1	0.4

[1] Feet above confluence with Fairview Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK – EAST POND

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Fairview Creek-NE Glisan St. Overflow								
A	51	216	941	0.2	204.8	204.8	204.8	0.0
B	326	34	65	1.5	204.8	204.8	204.8	0.0
C	825	12	30	3.4	207.9	207.9	208.1	0.2
D	1156	33	44	2.3	209.6	209.6	209.8	0.2
E	1507	110	81	1.2	210.6	210.6	210.6	0.0
F	1860	104	126	0.8	210.9	210.9	210.9	0.0
G	2068	96	73	1.4	211.1	211.1	211.1	0.0
H	2410	64	59	3.2	211.6	211.6	211.6	0.0
I	2558	19	44	4.3	212.0	212.0	212.3	0.3
J	2797	21	42	4.5	212.3	212.3	212.9	0.6
K	2958	53	39	4.9	213.7	213.7	213.9	0.2
L	3076	75	127	1.5	214.6	214.6	214.9	0.3

[1] Feet above upstream end of culvert at Northeast Glisan Street

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FAIRVIEW CREEK – NE GLISAN STREET OVERFLOW

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Hogan Creek								
A	158	11	39	7.3	332.4	332.4	332.9	0.5
B	716	14	48	6.0	342.3	342.3	342.9	0.5
C	1,924	7	42	6.8	364.7	364.7	365.6	0.9
D	2,092	10	76	3.8	370.8	370.8	370.8	0.0
E	2,500	24	153	1.9	376.5	376.5	376.6	0.1
F	3,088	29	62	4.6	390.8	390.8	391.7	1.0
G	3,484	22	195	2.0	418.2	418.2	418.9	0.7
H	3,582	25	177	1.6	418.3	418.3	419.2	0.9
I	4,140	16	34	8.3	439.4	439.4	439.5	0.1
J	4,528	17	59	4.9	455.8	455.8	456.7	0.9
K	5,018	15	48	6.0	470.0	470.0	470.4	0.4
L	5,474	15	52	5.5	485.1	485.1	486.1	1.0
M	5,640	26	68	4.2	490.1	490.1	491.1	1.0
N	6,122	19	43	6.7	509.4	509.4	510.1	0.8
O	6,453	15	62	4.9	529.8	529.8	530.2	0.4
P	6,489	23	102	2.8	530.8	530.8	531.0	0.2

[1] Feet above confluence with Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

HOGAN CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek								
BB[3]	11.733	130 / 10[2]	694	3.7	250.2	250.2	251.1	0.9
BC	11.823	129 / 24[2]	819	3.1	250.9	250.9	251.7	0.8
BD	11.928	155	710	3.6	251.7	251.7	252.5	0.8
BE	11.969	57	543	4.7	254.1	254.1	255.0	0.9
BF	12.099	79 / 47[2]	808	3.1	255.2	255.2	255.8	0.6
BG	12.337	50	300	8.3	255.5	255.5	256.0	0.5
BH	12.572	48	357	6.9	259.8	259.8	259.9	0.1
BI	12.656	49	473	6.6	260.7	260.7	261.3	0.6
BJ	12.736	51	530	5.9	261.5	261.5	262.0	0.5
BK	12.806	55	591	5.3	261.8	261.8	262.4	0.6
BL	12.827	121	849	3.7	262.5	262.5	263.1	0.6
BM	12.849	38	443	7.1	262.5	262.5	263.0	0.5
BN	12.869	41	475	6.6	262.7	262.7	263.2	0.5
BO	12.947	50	478	6.6	263.2	263.2	263.8	0.6
BP	12.984	49	465	6.8	263.5	263.5	264.2	0.7
BQ	12.989	57	502	6.3	263.5	263.5	264.2	0.7
BR	13.001	57	505	6.2	263.7	263.7	264.4	0.7
BS	13.010	47	515	6.1	263.8	263.8	264.6	0.8
BT	13.042	67	674	4.7	264.1	264.1	265.0	0.9
BU	13.106	70	554	5.7	264.3	264.3	265.0	0.7
BV	13.182	85	764	4.1	265.1	265.1	265.9	0.8
BW	13.248	117	853	3.7	265.4	265.4	266.2	0.8
BX	13.331	83	616	5.1	265.5	265.5	266.4	0.9
BY	13.424	54	367	8.6	265.5	265.5	266.4	0.9

[1] Miles above mouth [2] Width/width within study area

[3] Cross sections A through BA are located within the City of Portland – See FIS for City of Portland, OR Community No. 410183

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek (continued)								
BZ	13.442	27	245	12.8	265.6	265.6	266.5	0.9
CA	13.451	27	266	11.8	267.1	267.1	267.4	0.3
CB	13.460	56	496	6.3	269.0	269.0	269.0	0.0
CC	13.502	94	763	4.1	269.9	269.9	269.9	0.0
CD	13.589	101	843	3.7	270.3	270.3	270.4	0.1
CE	13.694	78	744	4.2	270.6	270.6	271.0	0.4
CF	13.791	54	477	6.6	270.8	270.8	271.3	0.5
CG	13.795	54	374	8.4	270.8	270.8	270.9	0.1
CH	13.886	52	459	6.9	272.3	272.3	272.6	0.3
CI	13.934	65	581	5.4	272.6	272.6	273.5	0.9
CJ	13.967	99	665	4.7	272.9	272.9	273.9	1.0
CK	14.069	150	1058	3.0	274.0	274.0	274.7	0.7
CL	14.150	126	723	4.3	274.0	274.0	275.0	1.0
CM	14.250	161	696	4.5	275.2	275.2	275.9	0.7
CN	14.354	130	592	5.3	275.8	275.8	276.7	0.9
CO	14.427	70	347	9.0	277.3	277.3	277.7	0.4
CP	14.521	86	545	5.8	279.4	279.4	280.4	1.0
CQ	14.620	60	427	6.6	280.6	280.6	281.6	1.0
CR	14.707	46	334	8.4	281.9	281.9	282.7	0.8
CS	14.768	46	378	7.4	283.2	283.2	284.0	0.8
CT	14.786	48	306	9.2	283.2	283.2	283.8	0.6
CU	14.801	72	473	6.0	287.7	287.7	287.7	0.0
CV	14.820	112	930	3.0	288.8	288.8	288.8	0.0

[1] Miles above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek (continued)								
DT	16.026	42	520	3.4	301.4	301.4	302.0	0.6
DU	16.056	76	797	3.5	302.8	302.8	303.4	0.6
DV	16.091	115	902	3.1	303.1	303.1	303.8	0.7
DW	16.106	99	761	3.7	303.1	303.1	303.9	0.8
DX	16.123	53	607	4.6	303.1	303.1	303.9	0.8
DY	16.150	61	698	4.0	303.7	303.7	304.5	0.8
DZ	16.207	100	852	3.3	304.1	304.1	304.8	0.7
EA	16.250	150	1087	2.9	304.2	304.2	304.9	0.7
EB	16.289	185	915	3.4	304.5	304.5	305.1	0.6
EC	16.341	189	914	3.1	304.6	304.6	305.5	0.9
ED	16.427	112	592	4.8	305.0	305.0	306.0	1.0
EE	16.458	131	571	5.2	305.2	305.2	306.1	0.9
EF	16.459	131	636	4.7	306.1	306.1	306.6	0.5
EG	16.520	135	728	3.9	307.4	307.4	307.6	0.2
EH	16.605	140	532	5.3	308.1	308.1	308.3	0.2
EI	16.622	138	401	7.0	308.2	308.2	308.5	0.3
EJ	16.626	135	650	4.3	311.1	311.1	311.2	0.1
EK	16.637	135	779	3.6	311.5	311.5	311.5	0.0
EL	16.730	92	545	5.2	312.2	312.2	312.4	0.2
EM	16.824	102	478	5.9	312.9	312.9	313.6	0.7
EN	16.887	71	419	6.7	315.4	315.4	315.6	0.2
EO	16.911	122	543	5.2	316.0	316.0	316.2	0.2
EP	16.922	125	701	5.4	318.9	318.9	318.9	0.0

[1] Miles above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek (continued)								
CW	14.904	97	896	3.1	289.0	289.0	289.0	0.0
CX	14.994	83	800	3.5	289.1	289.1	289.2	0.1
CY	15.081	83	775	3.6	289.5	289.5	289.5	0.0
CZ	15.150	112	893	3.2	289.6	289.6	289.8	0.2
DA	15.283	122	1228	2.3	289.8	289.8	290.2	0.4
DB	15.339	116	738	3.8	289.8	289.8	290.2	0.4
DC	15.457	120	687	4.1	289.9	289.9	290.7	0.8
DD	15.482	137	536	5.3	289.9	289.9	290.8	0.9
DE	15.494	135	630	4.6	290.7	290.7	291.4	0.7
DF	15.507	150	614	4.6	291.0	291.0	291.4	0.4
DG	15.573	88	455	6.2	291.9	291.9	292.2	0.3
DH	15.672	49	288	9.8	293.6	293.6	294.2	0.6
DI	15.728	41	310	9.1	296.0	296.0	296.4	0.4
DJ	15.744	44	342	8.2	297.0	297.0	297.2	0.2
DK	15.760	40	392	7.2	297.5	297.5	297.9	0.4
DL	15.785	53	460	6.1	297.6	297.6	298.3	0.7
DM	15.792	58	554	5.1	298.2	298.2	298.8	0.6
DN	15.865	40	364	7.7	298.4	298.4	299.0	0.6
DO	15.869	40	372	7.6	298.5	298.5	299.2	0.7
DP	15.926	38	496	5.7	300.0	300.0	300.5	0.5
DQ	15.981	34	392	7.2	300.2	300.2	300.7	0.5
DR	15.989	34	394	7.1	300.3	300.3	300.8	0.5
DS	16.013	46	498	3.6	301.3	301.3	301.9	0.6

[1] Miles above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek (continued)								
EQ	17.002	353	1021	2.5	319.8	319.8	319.8	0.0
ER	17.113	92	436	5.7	322.3	322.3	322.7	0.4
ES	17.262	112	361	7.7	326.1	326.1	326.6	0.5
ET	17.266	188	602	4.2	327.2	327.2	327.5	0.3
EU	17.345	160	524	4.8	328.2	328.2	328.5	0.3
EV	17.478	117	584	4.3	331.4	331.4	332.3	0.9
EW	17.635	81	428	5.3	334.6	334.6	335.4	0.8
EX	17.677	55	291	7.9	336.1	336.1	336.9	0.8
EY	17.702	65	332	6.9	337.6	337.6	338.1	0.5
EZ	17.713	54	314	7.3	337.9	337.9	338.2	0.3
FA	17.730	66	344	6.7	339.3	339.3	339.3	0.0
FB	17.829	87	471	4.9	341.5	341.5	342.2	0.7
FC	17.924	118	270	5.0	343.6	343.6	344.6	1.0
FD	17.930	133	221	6.2	343.7	343.7	344.6	0.9
FE	17.979	129	666	3.4	347.1	347.1	348.0	0.9
FF	18.092	109	451	5.1	348.7	348.7	349.4	0.7
FG	18.166	113	439	5.2	350.7	350.7	351.4	0.7
FH	18.232	138	428	5.3	352.6	352.6	353.4	0.8
FI	18.323	180	598	3.8	356.8	356.8	357.1	0.3
FJ	18.487	233	612	3.7	361.3	361.3	362.2	0.9
FK	18.602	155	621	3.7	366.2	366.2	366.2	0.0
FL	18.678	140	357	6.2	367.9	367.9	367.9	0.0
FM	18.704	170	506	4.4	368.9	368.9	369.4	0.5

[1] Miles above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek (continued)								
FN	18.715	170	1000	2.2	372.6	372.6	372.9	0.3
FO	18.738	156	827	2.7	372.6	372.6	373.0	0.4
FP	18.828	58	388	5.7	374.1	374.1	375.1	1.0
FQ	18.939	87	429	5.2	378.5	378.5	378.6	0.1
FR	19.031	89	420	5.3	380.5	380.5	381.4	0.9
FS	19.113	85	381	5.8	382.7	382.7	383.6	0.9
FT	19.194	108	402	5.5	385.4	385.4	386.2	0.8
FU	19.288	116	409	5.4	389.1	389.1	389.5	0.4
FV	19.405	186	617	3.4	392.3	392.3	393.3	1.0
FW	19.527	120	306	3.0	397.1	397.1	397.2	0.1
FX	19.584	23	101	8.0	397.8	397.8	398.2	0.4
FY	19.712	44	139	5.4	402.6	402.6	402.8	0.2
FZ	19.768	63	166	2.1	404.8	404.8	405.2	0.4
GA	19.831	80	314	2.9	406.6	406.6	407.0	0.4
GB	19.916	61	230	3.9	407.9	407.9	408.3	0.4
GC	19.992	68	197	4.6	409.3	409.3	409.6	0.3
GD	20.072	71	184	6.7	411.4	411.4	411.5	0.1
GE	20.081	124	651	1.8	415.7	415.7	416.4	0.7
GF	20.124	140	549	1.6	415.8	415.8	416.6	0.8
GG	20.162	122	370	5.5	415.8	415.8	416.5	0.8
GH	20.195	100	365	3.4	417.7	417.7	418.4	0.7
GI	20.209	63	168	5.4	417.8	417.8	418.4	0.6
GJ	20.265	55	232	3.9	419.4	419.4	420.2	0.8

[1] Miles above mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek (continued)								
GK	20.370	54	221	4.1	421.7	421.7	422.4	0.7
GL	20.476	61	205	4.4	425.0	425.0	425.5	0.5
GM	20.556	62	210	4.3	427.4	427.4	428.3	0.9
GN	20.589	50	164	5.5	428.4	428.4	429.0	0.6
GO	20.631	75	242	3.7	430.9	430.9	431.6	0.7
GP	20.691	140	283	3.2	431.7	431.7	432.6	0.9
GQ	20.881	26	93	10.6	439.1	439.1	439.8	0.7
GR	21.016	200	451	2.2	445.9	445.9	446.9	1.0
GS	21.036	258	1,669	0.6	450.3	450.3	451.1	0.8
GT	21.136	57	182	5.5	451.3	451.3	452.3	1.0
GU	21.317	39	161	6.1	458.9	458.9	459.6	0.7
GV	21.519	73	233	4.3	463.9	463.9	464.5	0.6
GW	21.755	29	124	8.0	472.2	472.2	472.7	0.5
GX	21.838	77	309	3.2	474.4	474.4	475.1	0.7
GY	21.911	40	151	6.6	476.0	476.0	476.7	0.7
GZ	22.034	30	143	6.9	481.3	481.3	481.8	0.5
HA	22.043	30	218	4.5	483.9	483.9	484.5	0.6
HB	22.143	33	130	7.6	485.6	485.6	486.5	0.9
HC	22.366	61	215	4.6	494.7	494.7	495.5	0.8
HD	22.510	93	265	2.2	496.3	496.3	497.3	1.0
HE	22.577	29 / 15[2]	90	6.4	497.7	497.7	498.3	0.6

[1] Miles above mouth [2] Width / width within study area

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Johnson Creek-City Park Side Channel								
A	0.023[1]	55	430	2.4	301.2	301.2	302.0	0.8
B	0.025[1]	55	432	2.4	301.2	301.2	302.0	0.8
C	0.063[1]	49	428	2.4	301.4	301.4	302.1	0.7
Johnson Creek-Telford Split Flow								
A	141[2]	39	113	2.6	399.8	399.8	400.2	0.4
B	679[2]	125	362	1.5	404.7	404.7	405.2	0.5
C	907[2]	114	179	0.0	405.0	405.0	405.5	0.5

[1] Miles above confluence with Johnson Creek. [2] Feet above confluence with North Fork Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

JOHNSON CREEK CITY PARK SIDE CHANNEL
JOHNSON CREEK TELFORD ROAD SPLIT

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Kelley Creek								
A	5,180	49	224	3.8	321.1	321.1	322.1	1.0
B	5,980	28	127	6.7	324.1	324.1	324.6	0.5
C	6,068	43	448	1.9	333.7	333.7	334.7	1.0
D	6,998	101	594	1.4	334.0	334.0	335.0	1.0
E	7,451	65	393	2.2	334.3	334.3	335.2	0.9
F	8,375	38	150	5.6	336.1	336.1	336.3	0.2
G	8,869	36	154	5.5	339.8	339.8	340.0	0.2
H	9,139	34	138	2.5	342.2	342.2	342.9	0.7
I	9,513	39	119	2.7	342.5	342.5	343.1	0.6
J	9,711	35	127	2.5	342.9	342.9	343.6	0.7
K	9,885	36	130	2.5	343.5	343.5	344.0	0.5
L	10,082	36	417	1.1	352.3	352.3	352.8	0.5
M	10,741	33	247	1.3	352.4	352.4	352.8	0.4
N	11,122	18	65	4.9	354.8	354.8	355.0	0.2
O	11,232	23	182	1.8	357.6	357.6	357.7	0.1
P	11,635	31	96	3.3	357.8	357.8	357.8	0.0
Q	11,980	25	98	3.3	358.5	358.5	359.2	0.7
R	12,220	16	39	8.3	360.1	360.1	360.2	0.1
S	12,293	42	247	2.1	367.5	367.5	367.5	0.0
T	12,837	21	70	4.6	367.6	367.6	367.8	0.2
U	13,173	19	285	1.1	387.3	387.3	388.3	1.0
V	13,726	61	325	1	387.4	387.4	388.4	1.0
W	14,250	25	71	4.5	395.0	395.0	395.0	0.0

[1] Feet above confluence with Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

KELLEY CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Kelley Creek (continued)								
X	14,595	25	53	6	403.6	403.6	403.8	0.2
Y	15,183	19	66	4.9	420.4	420.4	421.0	0.6
Z	15,701	17	44	7.4	435.3	435.3	435.6	0.3
AA	16,245	18	58	5.5	454.3	454.3	454.7	0.4

[1] Feet above confluence with Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

KELLEY CREEK

Exhibit B2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (Feet NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (Feet)	SECTION AREA (Square Feet)	MEAN VELOCITY (Feet Per Second)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	136	34	93	8.4	239.5	239.5	239.5	0.0
B	521	31	83	9.4	251.8	251.8	251.9	0.1
C	1,054	199	746	1.1	294.2	294.2	294.2	0.0
D	1,778	49	146	6.0	294.2	294.2	294.2	0.0
E	2,113	44	279	3.1	304.1	304.1	304.1	0.0
F	2,625	36	130	6.8	310.8	310.8	310.8	0.0
G	2,734	47	170	5.1	313.3	313.3	313.3	0.0
H	2,894	25	38	8.6	314.5	314.5	314.5	0.0
I	2,995	30	51	6.3	317.0	317.0	317.0	0.0
J	3,506	21	63	5.1	324.8	324.8	324.8	0.0
K	4,097	29	69	4.7	330.7	330.7	330.7	0.0
L	5,294	23	72	4.5	339.1	339.1	339.1	0.0
M	5,534	30	99	3.3	341.6	341.6	341.6	0.0
N	6,251	19	69	4.7	345.1	345.1	345.1	0.0
O	6,392	34	189	1.7	348.4	348.4	349.0	0.6
P	7,417	28	130	2.5	349.3	349.3	349.8	0.5
Q	7,698	18	180	1.8	358.1	358.1	358.1	0.0
R	8,742	38	206	1.6	358.2	358.2	358.4	0.2
S	9,815	32	72	4.5	359.8	359.8	359.8	0.0
T	10,263	23	214	1.5	370.6	370.6	370.9	0.3
U	11,039	34	170	1.9	370.8	370.8	371.2	0.4

[1]Stream Distance In Feet Above Confluence With Beaver Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: KELLY CREEK

Exhibit B2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (Feet NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (Feet)	SECTION AREA (Square Feet)	MEAN VELOCITY (Feet Per Second)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
V	11,782	21	62	5.3	375.9	375.9	375.9	0.0
W	12,119	26	62	5.2	378.2	378.2	378.3	0.1
X	12,781	22	52	6.2	385.3	385.3	385.4	0.1
Y	12,967	40	86	1.9	388.5	388.5	388.5	0.0
Z	14,117	32	42	3.8	392.9	392.9	392.9	0.0
AA	15,339	25	45	3.6	403.8	403.8	403.8	0.0
AB	15,497	269	1,588	0.2	414.9	414.9	414.9	0.0
AC	16,274	127	591	0.3	414.9	414.9	414.9	0.0
AD	16,808	96	159	1.0	414.9	414.9	414.9	0.0
AE	17,265	49	355	1.1	424.0	424.0	424.0	0.0
AF	17,756	40	206	1.9	424.1	424.1	424.2	0.1
AG	18,250	17	58	6.8	428.0	428.0	428.6	0.6
AH	18,401	30	176	2.3	431.9	431.9	432.5	0.6
AI	18,948	22	85	4.7	433.8	433.8	434.8	1.0
AJ	19,749	28	85	4.7	442.5	442.5	443.1	0.6
AK	20,019	35	340	1.2	453.5	453.5	454.0	0.5
AL	20,549	43	250	1.0	453.5	453.5	454.2	0.7
AM	20,696	42	284	0.9	455.0	455.0	455.7	0.7
AN	21,535	25	48	5.1	459.3	459.3	459.7	0.4

[1]Stream Distance In Feet Above Confluence With Beaver Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: KELLY CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE-FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
AO	16,458	40	35	3.5	436.9	436.9	436.9	0.0
AP	16,747	40	34	2.9	439.3	439.3	439.3	0.0
AQ	17,089	43	97	0.9	447.3	447.3	447.3	0.0
AR	17,600	19	28	3.1	449.4	449.4	449.5	0.1
AO	16,458	40	35	3.5	436.9	436.9	436.9	0.0
AP	16,747	40	34	2.9	439.3	439.3	439.3	0.0
AQ	17,089	43	97	0.9	447.3	447.3	447.3	0.0
AR	17,600	19	28	3.1	449.4	449.4	449.5	0.1
AS	17,684	21	43	2.0	450.0	450.0	450.1	0.1
AT	17,757	19	21	4.1	450.3	450.3	450.4	0.1
AU	18,566	15	24	3.7	459.3	459.3	459.6	0.3

[1] Feet above downstream end of culvert at Kane Road

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: KELLY CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
MacDonald Creek								
A	107	17	73	6.3	404.4	404.4	405.4	1.0
B	597	14	56	8.2	410.0	410.0	410.3	0.3
C	1,157	16	70	6.6	414.2	414.2	414.6	0.4
D	1,750	22	87	5.3	417.4	417.4	417.7	0.3

[1] Feet above confluence with Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

MACDONALD CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY[2] (FEET NAVD)	WITH FLOODWAY[2] (FEET NAVD)	INCREASE (FEET)
Multnomah Channel								
A	12.68	800	28,977	3.9	28.8	26.8	27.7	0.9
B	14.79	760	28,278	4.0	29.6	27.4	28.3	0.9
C	17.03	800	30,177	3.7	30.0	28.0	28.8	0.8
D	19.08	870[3]	30,687	3.6	30.5	28.3	29.2	0.9
E	20.55	836[3]	40,034	2.8	30.7	28.5	29.5	1.0
F	21.21	800	38,085	2.9	30.8	28.6	29.6	1.0

[1] Miles above mouth [2] Elevations computed without consideration of influence from Columbia and Willamette Rivers

[3] Includes width of levee to landward toe

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

MULTNOMAH CHANNEL

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
North Fork Johnson Creek								
A	109	9	20	2.9	394.1[2]	391.3	391.3	0.0
B	460	60	169	1.0	398.7	398.7	398.8	0.1
C	995	20	41	5.1	401.1	401.1	401.2	0.1
D	1,170	27	151	1.4	407.0	407.0	408.0	1.0
E	1,698	18	56	3.8	407.7	407.7	408.7	1.0
F	1,816	16	45	5.8	408.7	408.7	409.1	0.4
G	2,031	22	121	2.2	414.8	414.8	414.8	0.0
H	2,204	31	116	1.8	415.2	415.2	416.2	1.0
I	2,519	10	46	4.6	415.6	415.6	416.5	0.9
J	2,665	18	106	2.0	421.5	421.5	421.6	0.1
K	2,797	16	94	2.2	421.5	421.5	421.7	0.2
L	3,284	16	69	3.0	421.7	421.7	422.2	0.5
M	3,726	11	33	6.4	423.1	423.1	423.7	0.6
N	4,349	17	60	3.5	427.4	427.4	427.7	0.3
O	4,818	13	37	5.7	431.7	431.7	431.9	0.2
P	5,133	13	54	3.9	433.6	433.6	434.5	0.9
Q	5,688	12	48	4.4	436.4	436.4	437.0	0.6
R	6,129	11	32	6.6	440.8	440.8	441.0	0.2
S	6,851	13	51	4.1	447.1	447.1	447.7	0.6
T	7,437	12	36	5.8	454.2	454.2	454.6	0.4
U	7,543	13	54	3.9	455.1	455.1	455.7	0.6
V	7,607	22	215	1.0	464.5	464.5	464.8	0.3
W	7,701	33	250	0.8	464.5	464.5	464.8	0.3

[1] Feet above confluence with Johnson Creek [2] Backwater effects from Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK JOHNSON CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
North Fork Johnson Creek-Split Flow								
A	55	17	48	3.2	394.5	394.5	394.5	0.0
B	312	21	61	1.4	397.7	397.7	397.7	0.0

[1] Feet above confluence with North Fork Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

NORTH FORK JOHNSON CREEK SPLIT FLOW

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Sunshine Creek								
A	81	26	118	6.2	396.8	396.8	397.8	0.9
B	617	40	129	5.6	401.6	401.6	401.7	0.1
C	1,067	60	179	4.1	405.0	405.0	405.4	0.4
D	1,603	45	134	5.4	406.7	406.7	407.3	0.6
E	1,714	47	178	4.1	408.7	408.7	408.7	0.0
F	1,819	104	297	2.4	409.1	409.1	409.1	0.0
G	2,140	48	168	4.3	409.4	409.4	409.4	0.0
H	2,485	22	125	5.8	410.2	410.2	410.2	0.0
I	2,591	29	265	3.9	414.5	414.5	415.1	0.6
J	2,692	41	300	2.4	414.7	414.7	415.4	0.7
K	3,254	45	210	3.5	414.7	414.7	415.6	0.9

[1] Feet above confluence with Johnson Creek

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

SUNSHINE CREEK

Exhibit B2

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (Feet NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (Feet)	SECTION AREA (Square Feet)	MEAN VELOCITY (Feet Per Second)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	12,656	906	15,597	5.5	35.7	35.7	36.0	0.3
B	13,839	519	8,114	10.5	35.7	35.7	36.1	0.4
C	14,151	826	12,778	6.7	37.8	37.8	37.9	0.1
D	15,120	333	6,128	13.4	37.8	37.8	37.9	0.1
E	15,818	336	6,658	12.3	39.1	39.1	39.3	0.2
F	16,088	514	10,236	8.0	41.2	41.3	41.4	0.1
G	17,153	1,124	12,459	6.6	41.5	41.5	41.6	0.1
H	18,098	861	14,044	5.8	43.5	43.5	43.6	0.1
I	19,066	359	7,309	11.2	43.5	43.5	43.7	0.2
J	21,054	446	9,678	8.5	45.7	45.8	45.9	0.1
K	21,948	358	8,160	10.0	46.7	46.7	46.8	0.1
L	22,765	345	8,034	10.2	47.2	47.2	47.3	0.1
M	23,904	529	10,850	7.5	48.7	48.7	48.7	0.0
N	26,030	264	6,012	13.6	48.9	48.9	49.1	0.2
O	27,116	465	9,747	8.4	51.6	51.6	52.0	0.4
P	29,155	288	7,030	11.6	53.0	53.0	53.2	0.2
Q	30,853	287	6,556	12.5	54.8	54.8	55.2	0.4
R	31,106	280	7,436	11.0	56.0	56.0	56.3	0.3
S	31,955	379	9,699	8.4	57.4	57.4	57.6	0.2
T	33,085	678	16,240	5.0	58.5	58.5	58.8	0.3

[1]Stream Distance in Miles Above Mouth

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: SANDY RIVER

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Unnamed Tributary to Rock Creek								
A	0.74	80 / 15[2]	122	2.7	204.4	204.4	204.9	0.5
B	0.86	100[3]	173	1.9	207.8	207.8	208.4	0.6
C	0.97	64	106	3.2	210.7	210.7	211.0	0.3
D	1.16	148	263	1.3	214.0	214.0	214.5	0.5
E	1.19	8	32	10.4	214.5	214.5	214.5	0.0
F	1.33	85	173	0.7	218.5	218.5	219.3	0.8

[1] Miles above mouth [2] Width/Width within county limits [3] Floodway located entirely outside county limits

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

UNNAMED TRIBUTARY TO ROCK CREEK

Exhibit B2

FLOODING SOURCE		FLOODWAY			1-PERCENT-ANNUAL-CHANCE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY (FEET NAVD)	WITHOUT FLOODWAY (FEET NAVD)	WITH FLOODWAY (FEET NAVD)	INCREASE (FEET)
Willamette River								
A	0.38	1600 / 799[3]	85,130	3.1	30.8	29.3[4]	30.1[4]	0.8
B	1.52	1700 / 1020[3]	113,090	2.3	30.9	29.4[4]	30.2[4]	0.8
C	2.40	2300 / 1126[3]	142,790	1.8	30.9	29.5[4]	30.3[4]	0.8
D	3.03	2073 / 829[3]	110,545	2.4	30.9	29.5[4]	30.3[4]	0.8
AE[2]	17.83	985 / 16[3]	63,627	5.9	35.1	35.1	36.0	0.9
AF	18.31	815 / 66[3]	51,102	7.3	35.4	35.4	36.3	0.9
AG	18.63	1325 / 25[3]	85,861	4.4	36.2	36.2	37.0	0.8
AH	19.10	1530 / 24[3]	63,914	5.9	36.2	36.2	37.0	0.8

[1] Miles above mouth [2] Cross sections E through AD are located within the City of Portland – See FIS for City of Portland, OR Community No. 410183
[3] Width / Width within study area [4] Elevation computed without consideration of influence from Columbia River

TABLE 10

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS

FLOODWAY DATA

WILLAMETTE RIVER

5.0 INSURANCE APPLICATIONS

For flood insurance rating purposes, flood insurance zone designations are assigned to a community based on the results of the engineering analyses. These zones are as follows:

Zone A

Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by approximate methods. Because detailed hydraulic analyses are not performed for such areas, no BFEs or base flood depths are shown within this zone.

Zone AE

Zone AE is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AH

Zone AH is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are between 1 and 3 feet. Whole-foot BFEs derived from the detailed hydraulic analyses are shown at selected intervals within this zone.

Zone AO

Zone AO is the flood insurance risk zone that corresponds to the areas of 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between 1 and 3 feet. Average whole-foot base flood depths derived from the detailed hydraulic analyses are shown within this zone.

Zone X

Zone X is the flood insurance risk zone that corresponds to areas outside the 0.2-percent-annual-chance floodplain, areas within the 0.2-percent-annual-chance floodplain, areas of 1-percent-annual-chance flooding where average depths are less than 1 foot, areas of 1-percent-annual-chance flooding where the contributing drainage area is less than 1 square mile, and areas protected from the 1-percent-annual-chance flood by levees. No BFEs or base flood depths are shown within this zone.

Table 11- Flood Insurance Zones Within Each Community

Community	Flood Zone(s)
Fairview, City of	A, AE, AH, X
Gresham, City of	A, AE, AH, AO, X
Multnomah County (Unincorporated Areas)	A, AE, AH,X
Troutdale, City of	A, AE, X
Wood Village, City of	AE, X

6.0 FLOOD INSURANCE RATE MAP

The FIRM is designed for flood insurance and floodplain management applications.

For flood insurance applications, the map designates flood insurance risk zones as described in Section 5.0 and, in the 1-percent-annual-chance floodplains that were studied by detailed methods, shows selected whole-foot BFEs or average depths. Insurance agents use the zones and BFEs in conjunction with information on structures and their contents to assign premium rates for flood insurance policies.

For floodplain management applications, the map shows by tints, screens, and symbols, the 1- and 0.2-percent-annual-chance floodplains, floodways, and the locations of selected cross sections used in the hydraulic analyses and floodway computations.

The countywide FIRM presents flooding information for the entire geographic area of Multnomah County, Oregon (Excluding the City of Portland). Previously, FIRMs were prepared for each incorporated community and the unincorporated areas of the County identified as flood-prone. This countywide FIRM also includes flood-hazard information that was presented separately on Flood Boundary and Floodway Maps, where applicable. Historical data relating to the maps prepared for each community are presented in Table 12.

Exhibit B2

COMMUNITY NAME	INITIAL IDENTIFICATION	FLOOD HAZARD BOUNDARY MAP REVISION DATE	FIRM EFFECTIVE DATE	FIRM REVISION DATE
Fairview, City of	May 10, 1974	February 28, 1975	September 30, 1987	June 17, 1991 July 3, 1995
Gresham, City of	December 7, 1973	April 30, 1976	July 16, 1979	January 18, 1984 June 17, 1986 September 28, 1990 February 16, 1996 May 2, 2002
Maywood, City of [1, 2]	None	None	None	None
Multnomah County (Unincorporated Areas)	February 4, 1972	None	June 15, 1982	March 18, 1986
Troutdale, City of	December 7, 1973	June 4, 1976 March 20, 1979	September 30, 1988	August 3, 1988
Wood Village, City of [1, 2]	None	None	None	None

[1]No special flood hazard areas identified
[2]This community does not have map history prior to the first countywide mapping

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY AND INCORPORATED AREAS

COMMUNITY MAP HISTORY

Exhibit B2

Table 13: Listing of NFIP Jurisdictions

Community	CID	HUC-8 SubBasin(s)	Located on FIRM Panel(s)	If Not Included, Location of Flood Hazard Data
City of Fairview	410180	17080001 17090012	41051C0205H, 41051C0210J, 41051C0212H, 41051C0214J, 41051C0216J, 41051C0218J	
City of Gresham	410181	17080001 17090012	41051C0211H, 41051C0212H, 41051C0213H[2], 41051C0214J, 41051C0218J, 41051C0219J, 41051C0401J, 41051C0402J, 41051C0403J, 41051C0404J, 41051C0406J, 41051C0407J, 41051C0408J, 41051C0426J	
City of Lake Oswego	410018	17090010 17090012	N/A	Clackamas County FIS, 2019
City of Maywood Park[1]	410068	17090012	41051C0190H[2], 41051C0195H[2]	
City of Milwaukie	410019	17090012	N/A	Clackamas County FIS, 2019
Multnomah County (Unincorporated Areas)	410179	17070105 17080001 17090010 17090012	41051C0025H[2], 41051C0030H, 41051C0035H, 41051C0040H, 41051C0045H, 41051C0065H, 41051C0100H, 41051C0125H[2], 41051C0130H, 41051C0135H, 41051C0140H[2], 41051C0145H[2], 41051C0155H, 41051C155H, 41051C0160H[2], 41051C0165H[2],41051C0170H[2], 41051C0180H, 41051C0185H, 41051C0190H[2], 41051C0195H[2], 41051C0205H, 41051C0210J, 41051C0212H, 41051C0213H[2],41051C0214J, 41051C0216J, 41051C0217J, 41051C0218J, 41051C0219J, 41051C0228J, 41051C0238J, 41051C0240J, 41051C0245J, 41051C0275H, 41051C0300H, 41051C0325H, 41051C0350H[2], 41051C0355H[2], 41051C0360H, 41051C0365H[2], 41051C0367H, 41051C0370H[2], 41051C0400H[2], 41051C0401J, 41051C0402J, 41051C0403J, 41051C0404J, 41051C0406J, 41051C0407J, 41051C0408J, 41051C0409J, 41051C0426J, 41051C0427J, 41051C0428J, 41051C0429H, 41051C0435J, 41051C0475H[2], 41051C0500H[2], 41051C0525H[2], 41051C0550H[2]	
City of Portland	410183	17090010 17090012	N/A	City of Portland FIS, 2010
City of Troutdale	410184	17080001 17090012	41051C0210J, 41051C0216J, 41051C0217J, 41051C0218J, 41051C0219J, 41051C0238J, 41051C0240J	
City of Wood Village[1]	410185	17090012	41051C0216J, 41051C0218J	

[1] No Special Flood Hazard Areas Identified

[2] Panel Not Printed

7.0 OTHER STUDIES

This report either supersedes or is compatible with all previous studies on streams studied in this report and should be considered authoritative for purposes of the NFIP.

8.0 LOCATION OF DATA

Information concerning the pertinent data used in the preparation of this study can be obtained by contacting FEMA, Mitigation Division, Federal Regional Center, 130 228th Street, SW, Bothell, Washington 98021-9796.

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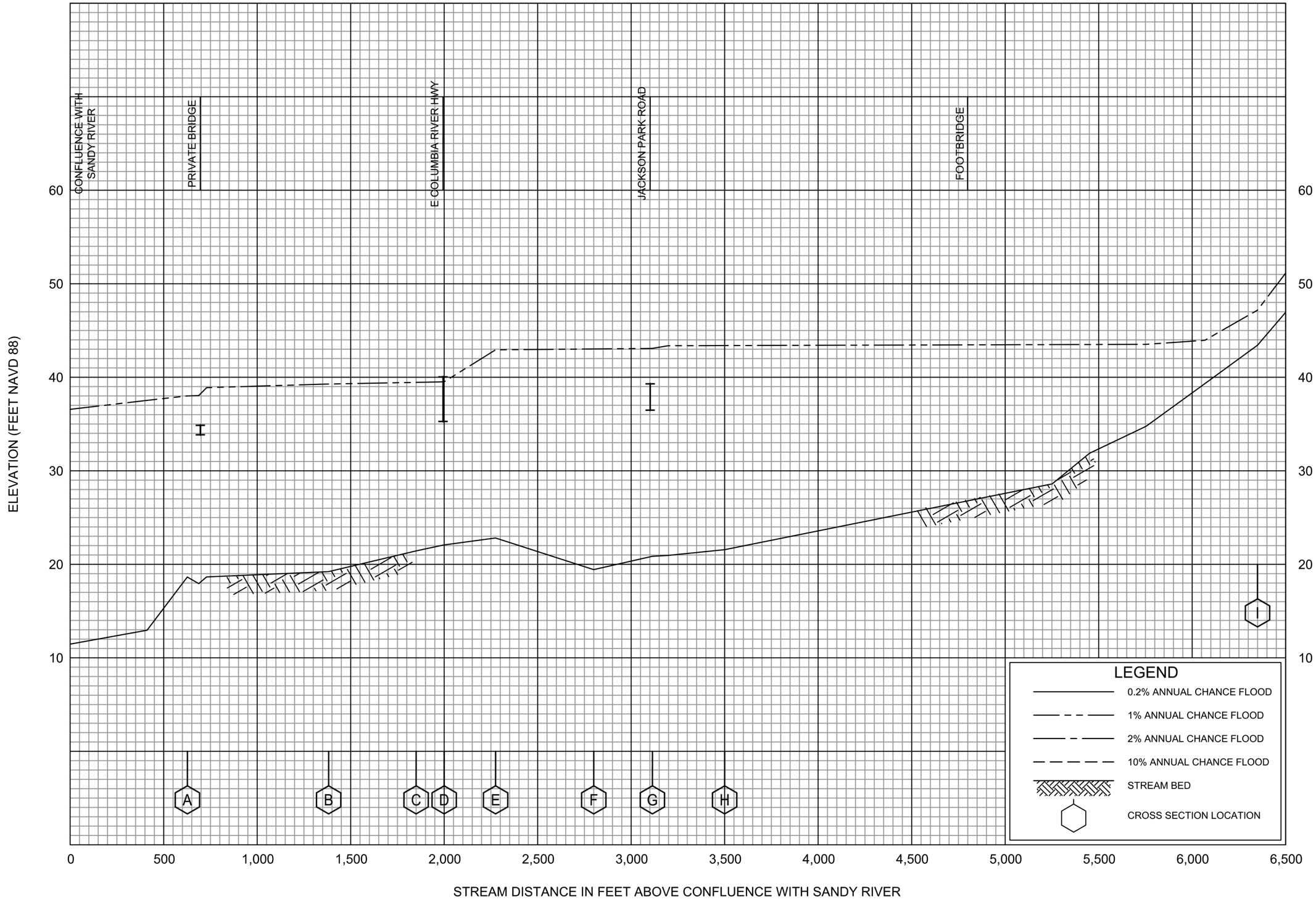
Exhibit B2



FLOOD PROFILES

BEAVER CREEK

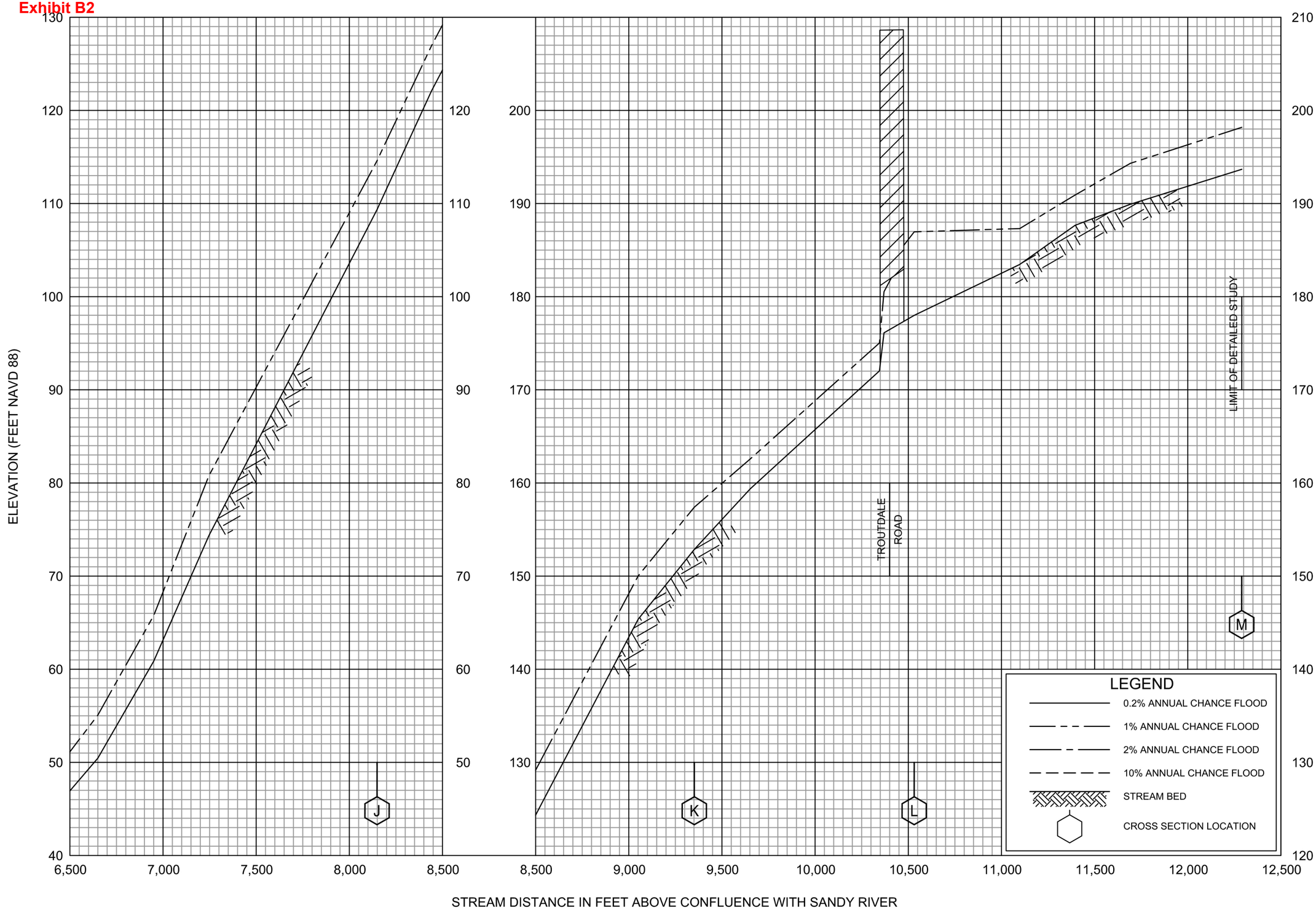
FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

01P

Exhibit B2



FLOOD PROFILES

BEAVER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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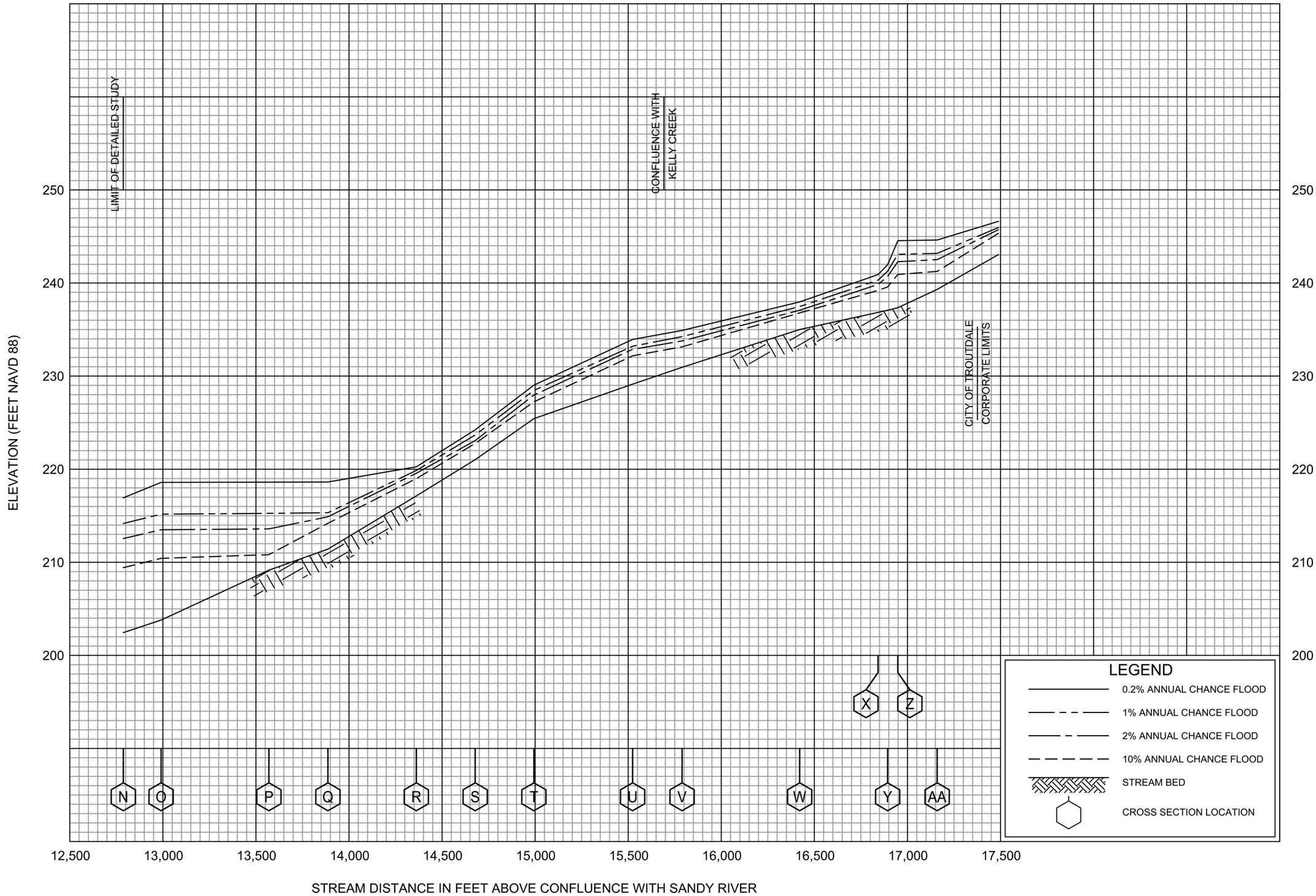

FLOOD PROFILES

BEAVER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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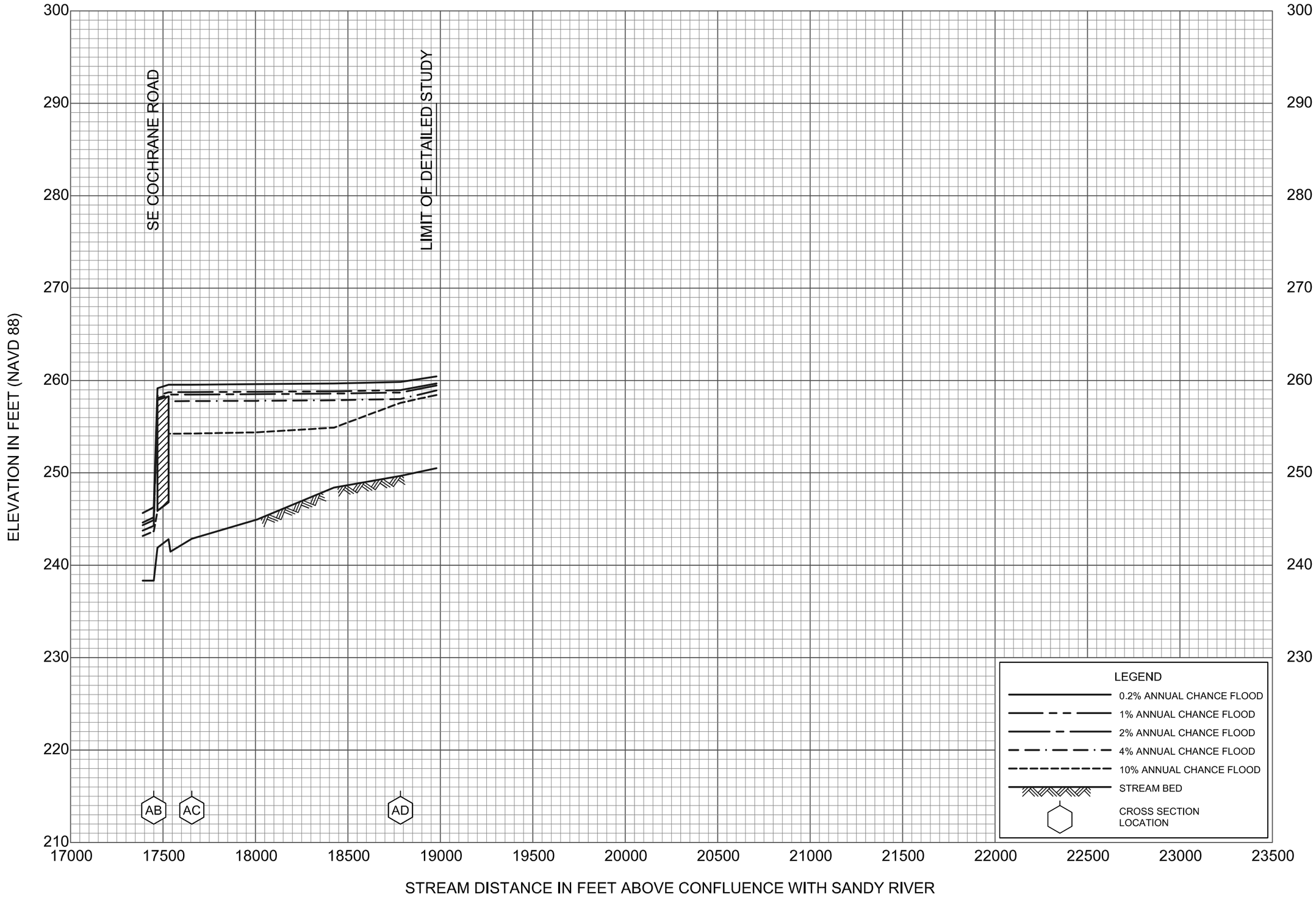

FLOOD PROFILES

BEAVER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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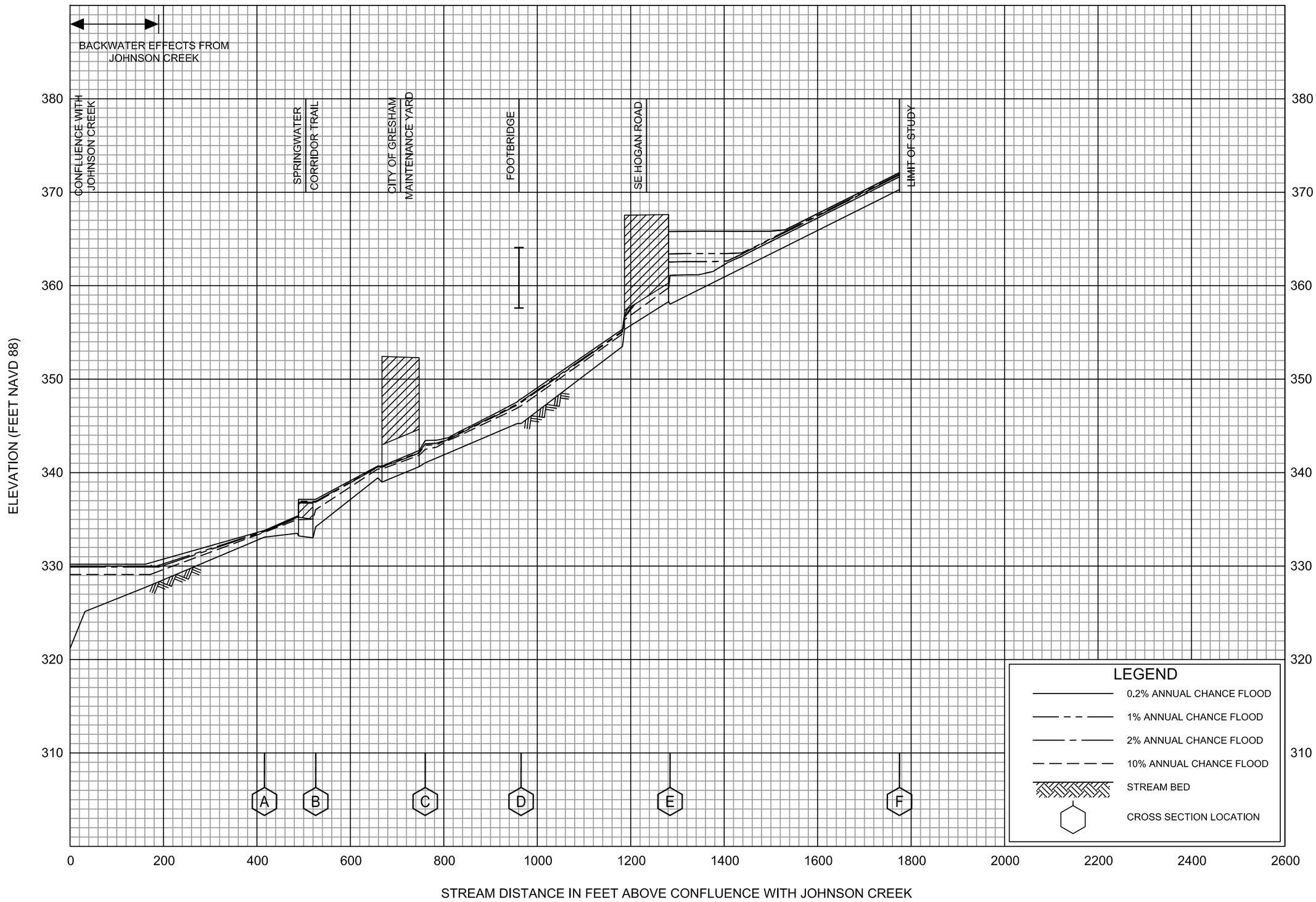

FLOOD PROFILES

BRICK CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

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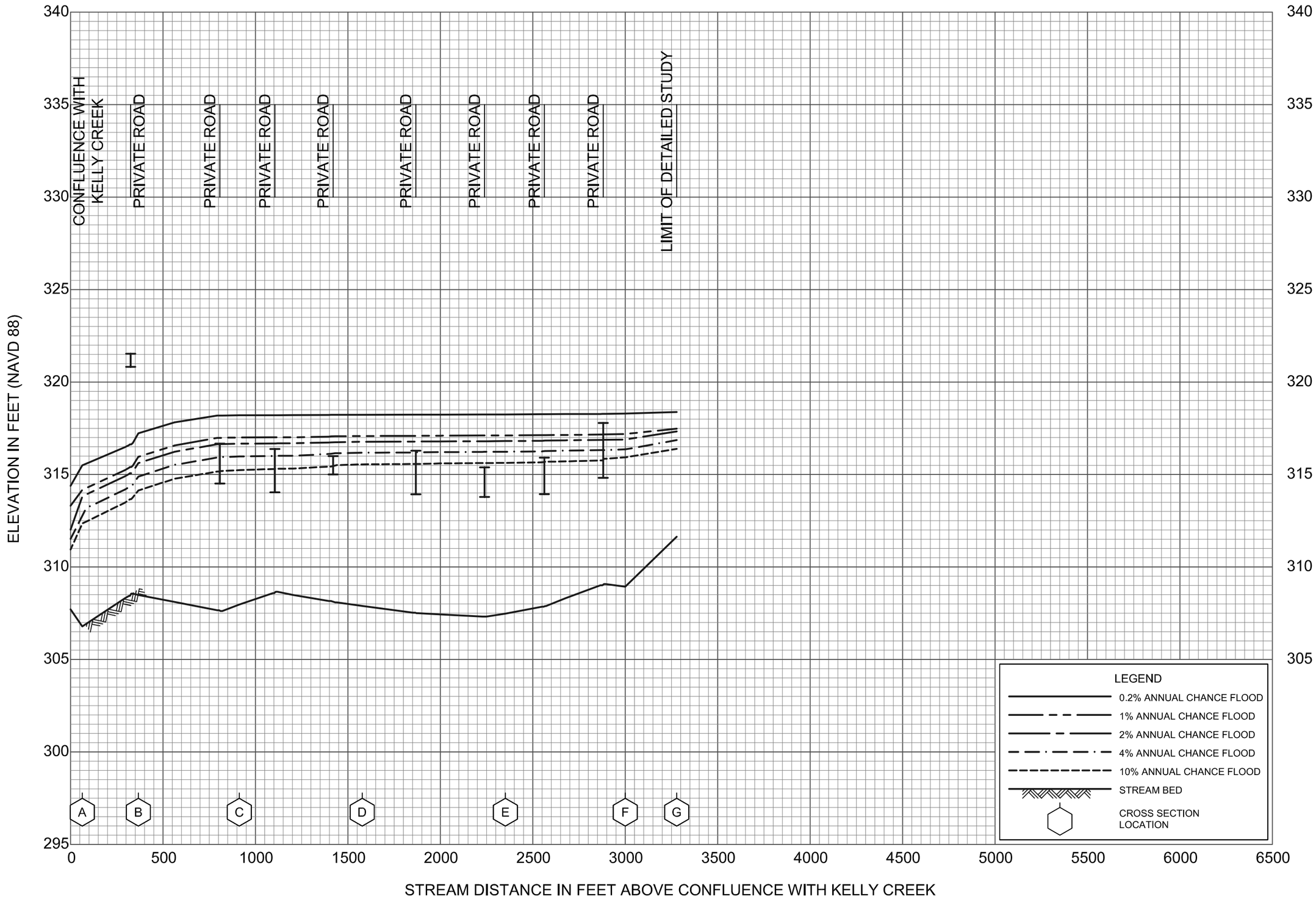

FLOOD PROFILES

BURLINGAME CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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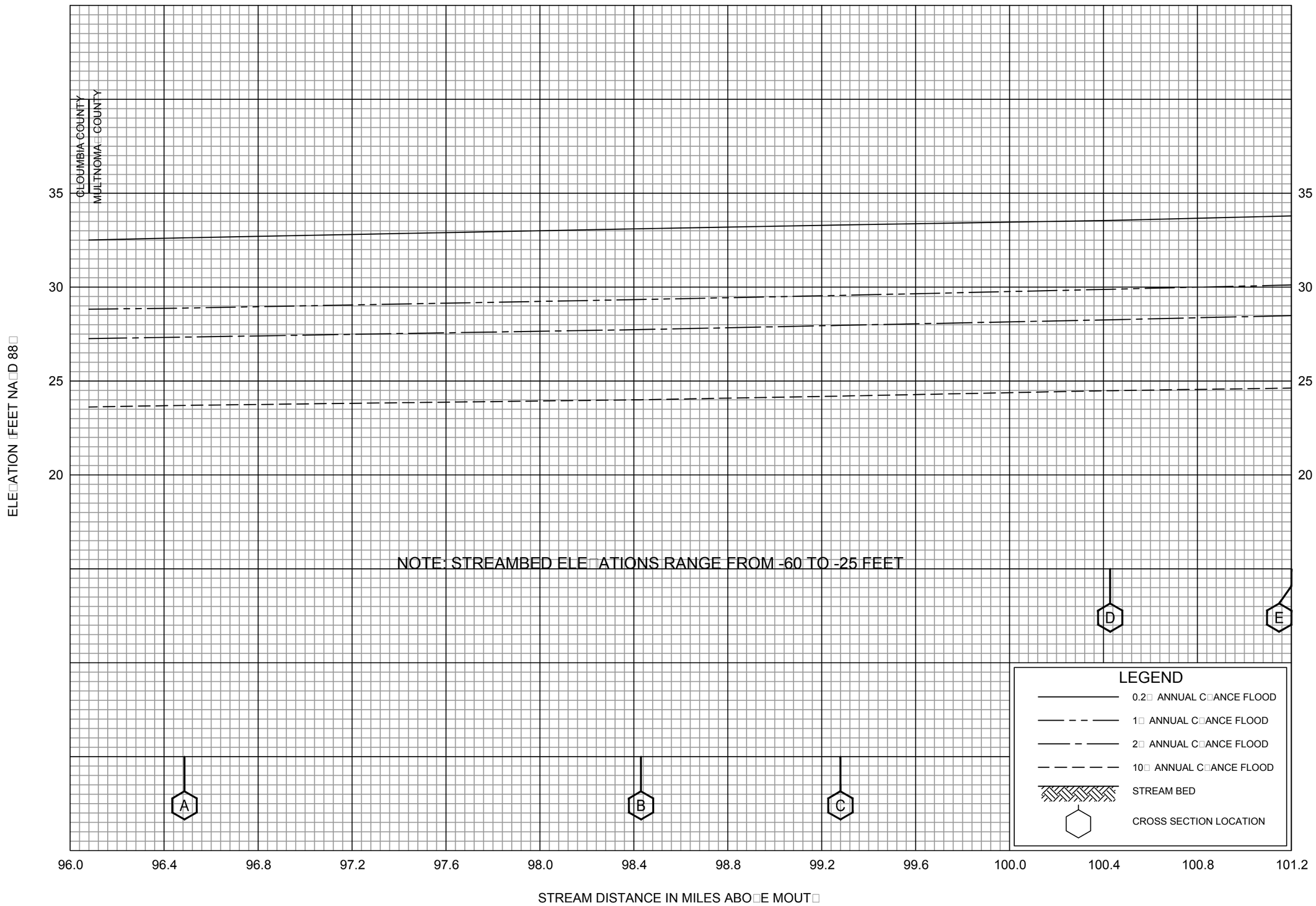

FLOOD PROFILES

COLUMBIA RI ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

07P

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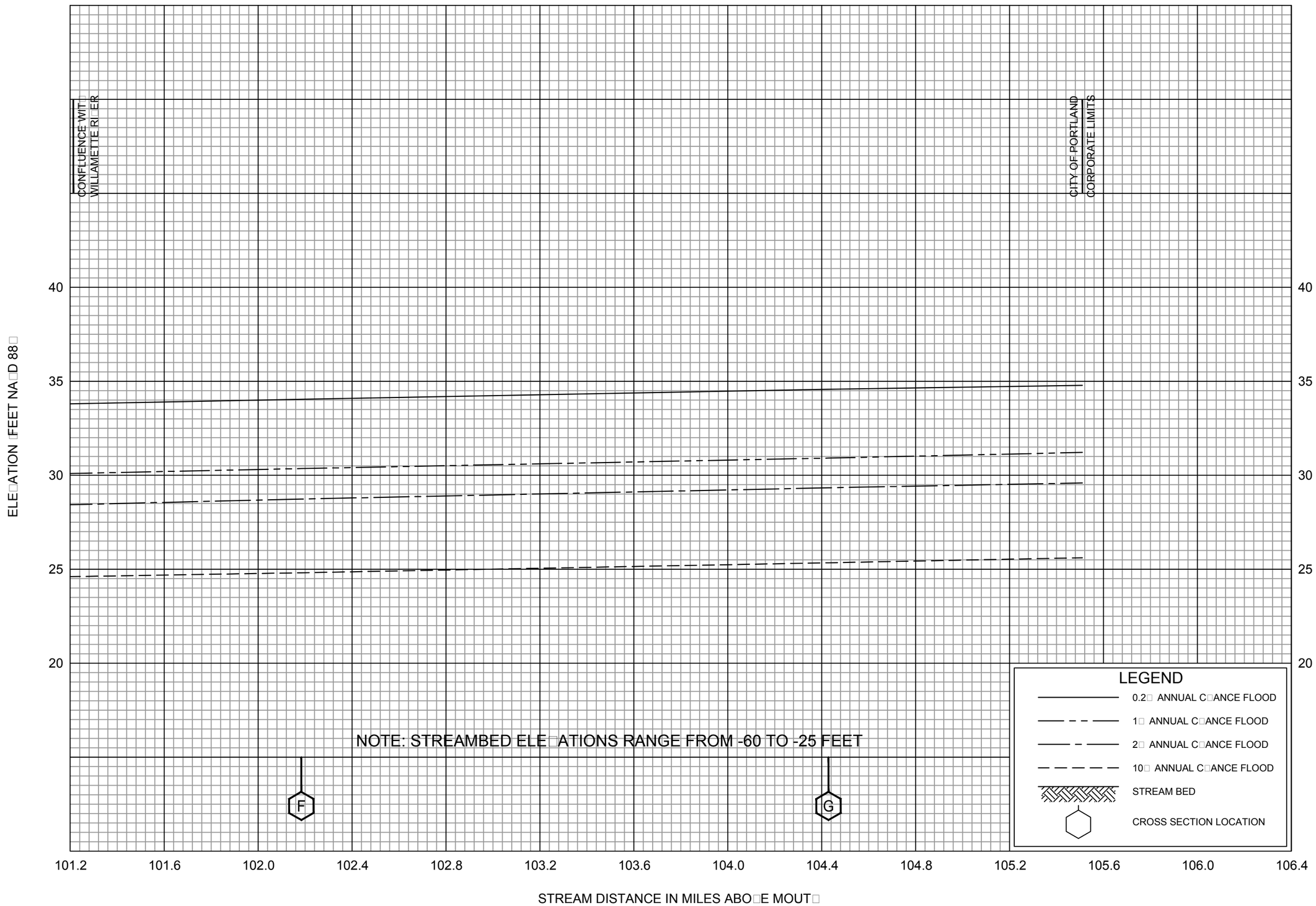

FLOOD PROFILES

COLUMBIA RI ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

08P

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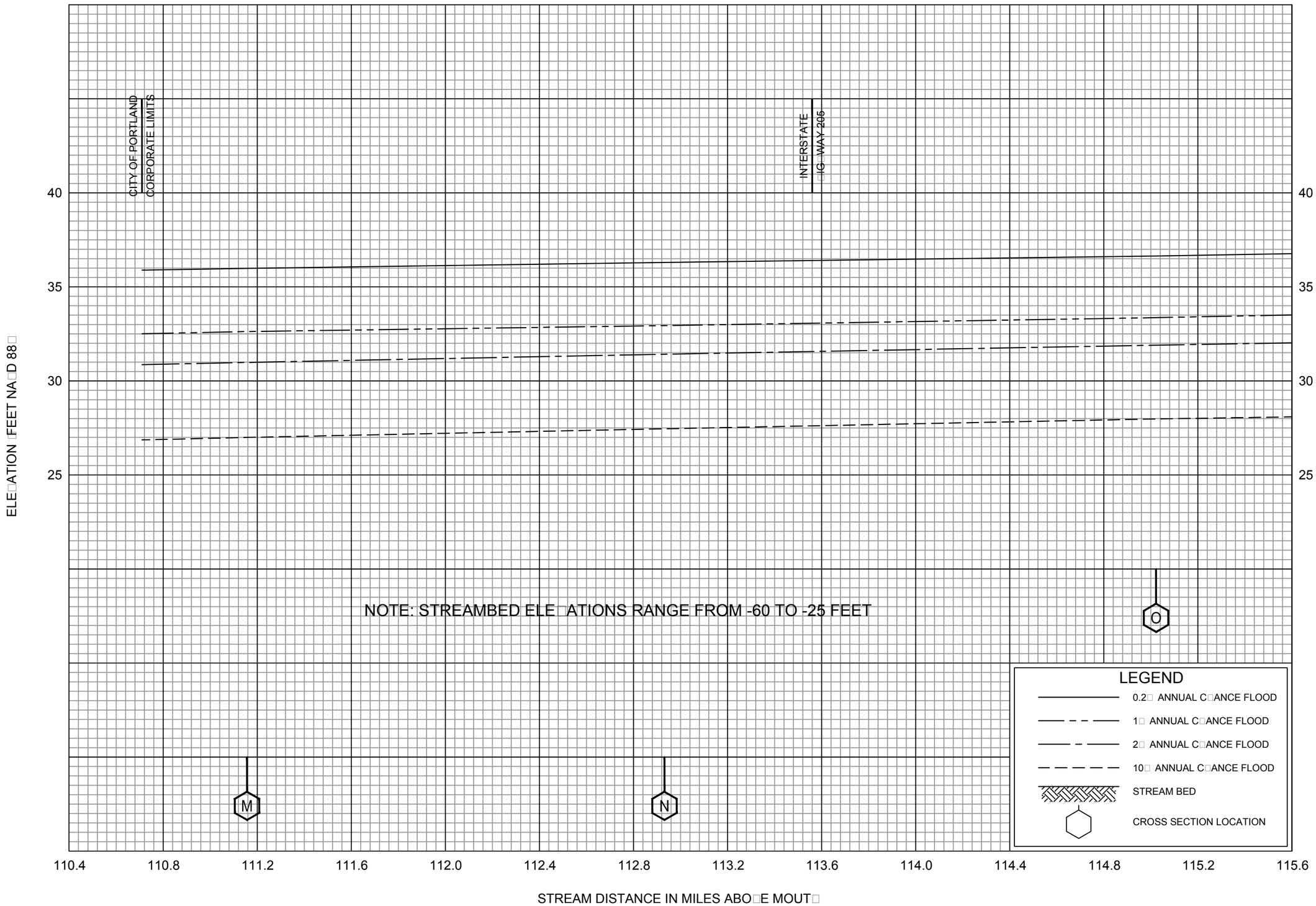

FLOOD PROFILES

COLUMBIA RI ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

09P

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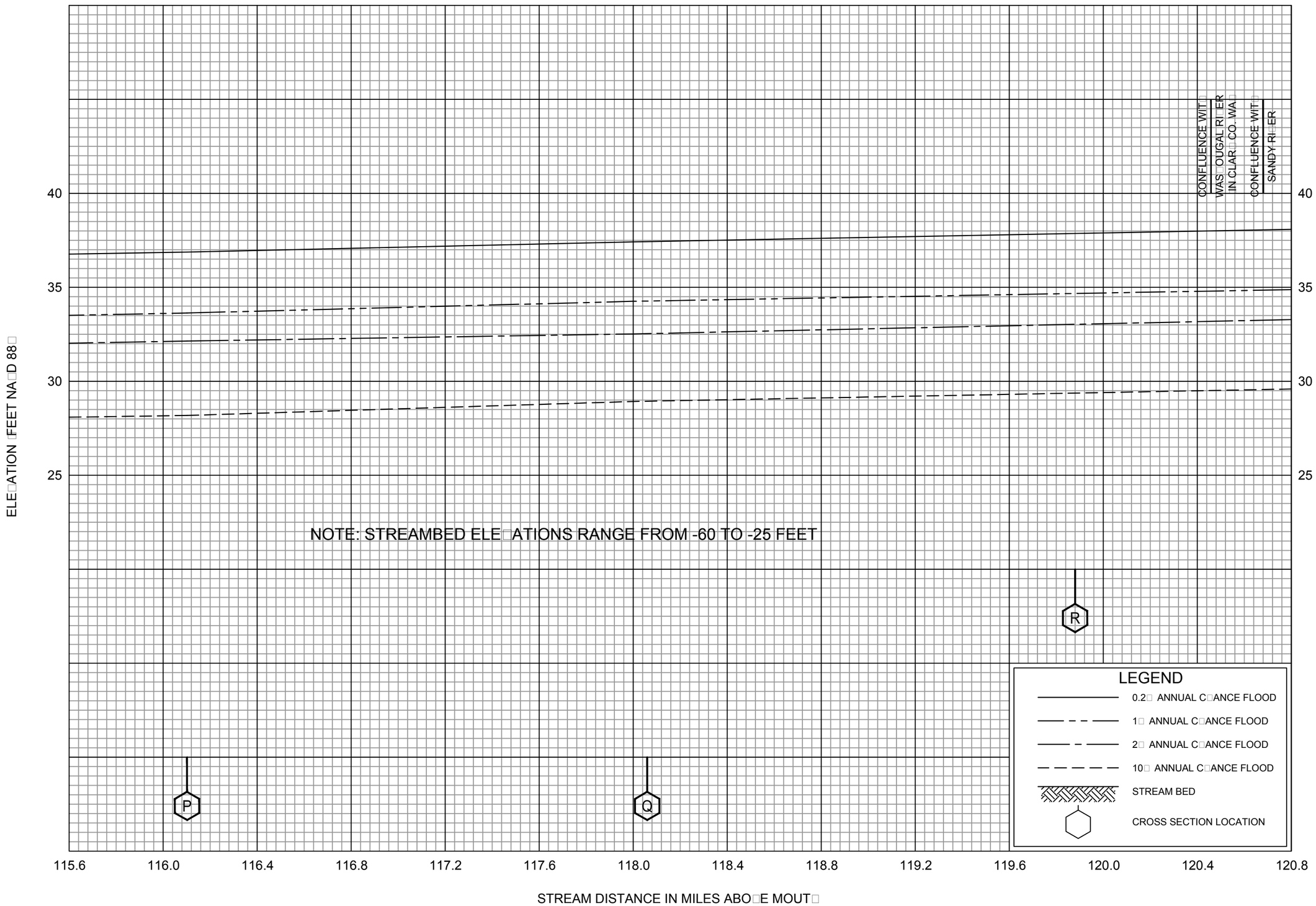

FLOOD PROFILES

COLUMBIA RI□ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

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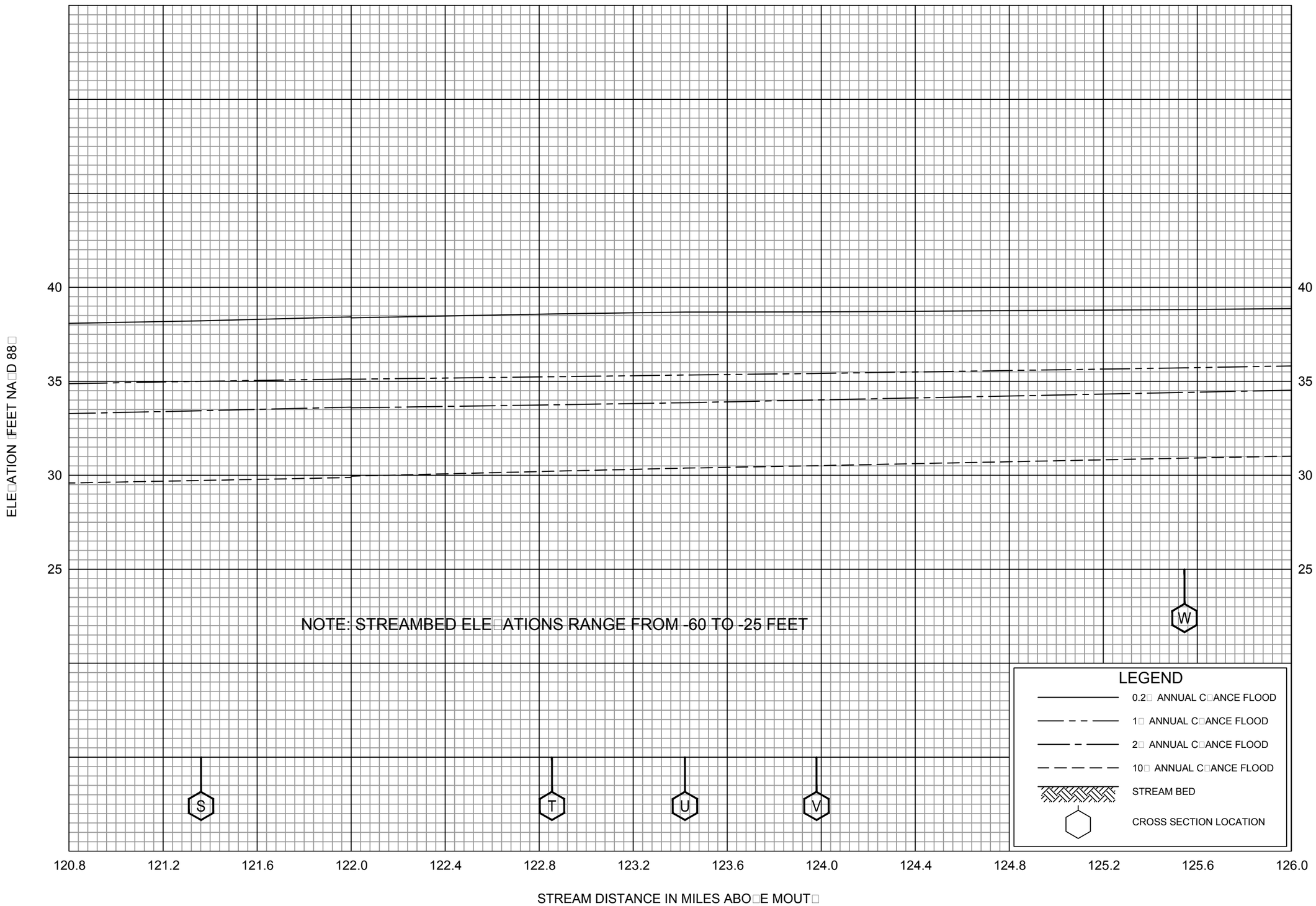

FLOOD PROFILES

COLUMBIA RI□ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

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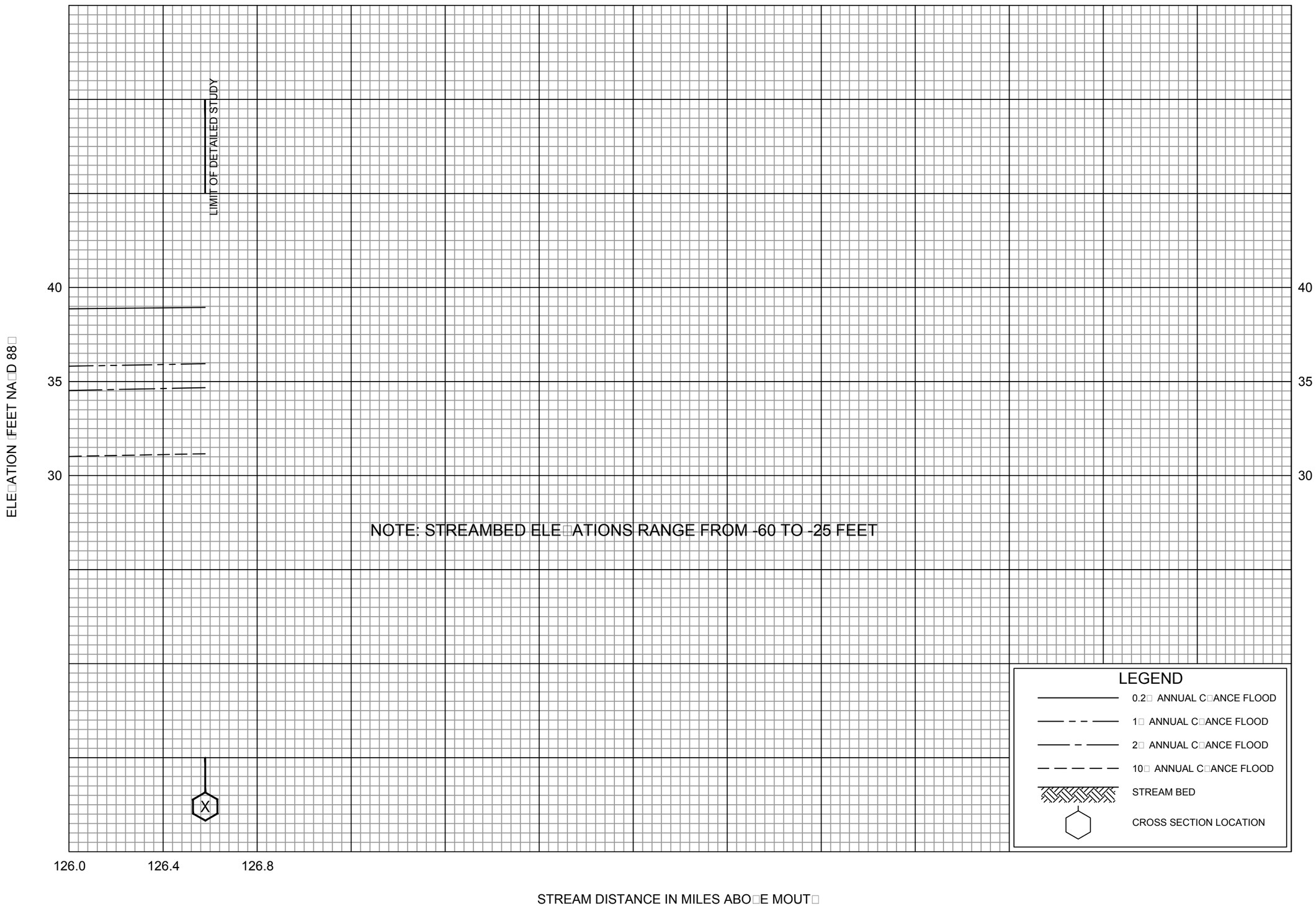


FLOOD PROFILES

COLUMBIA RI□ER

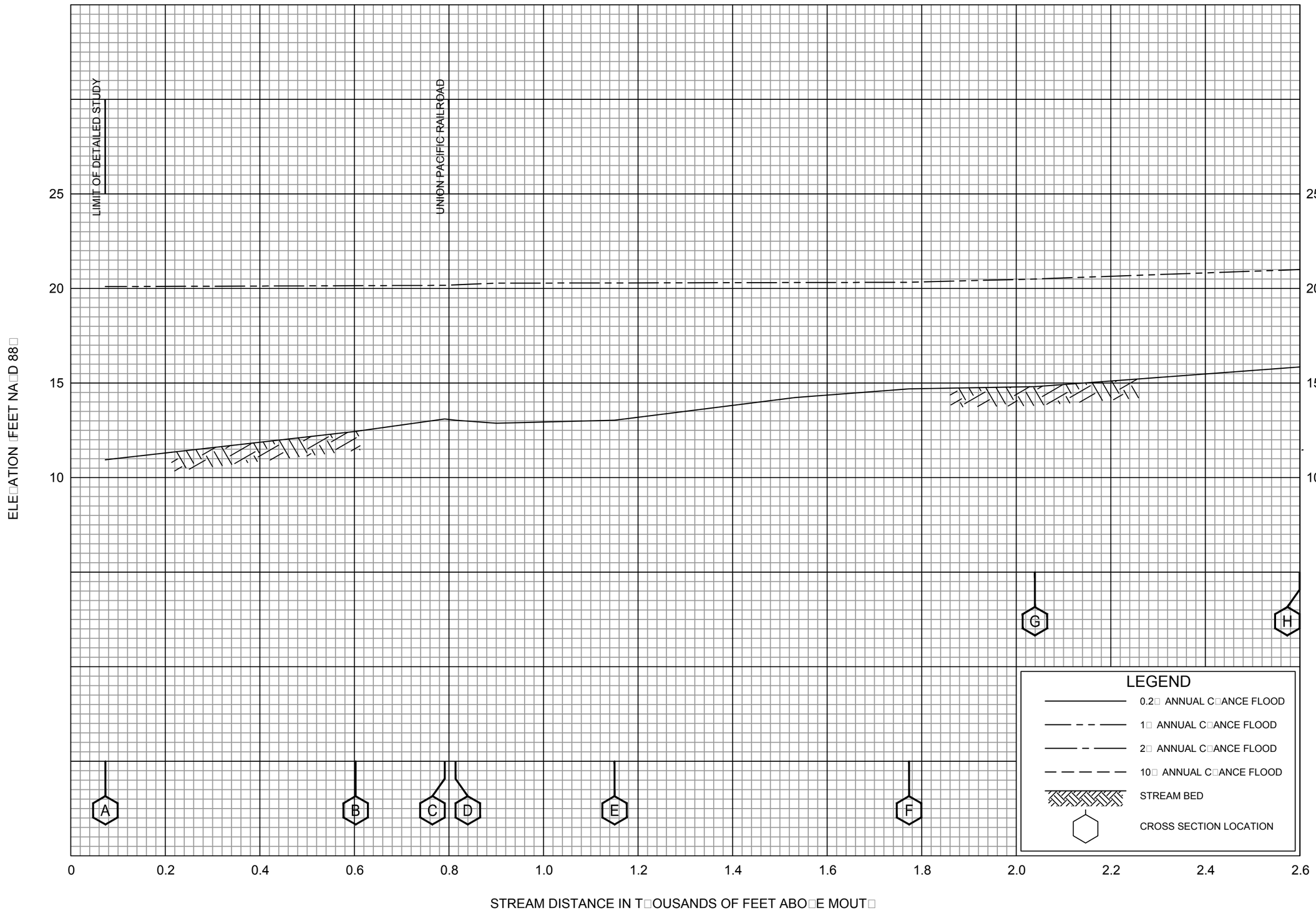
FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

12P

Exhibit B2



FLOOD PROFILES

FAIRVIEW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

13P

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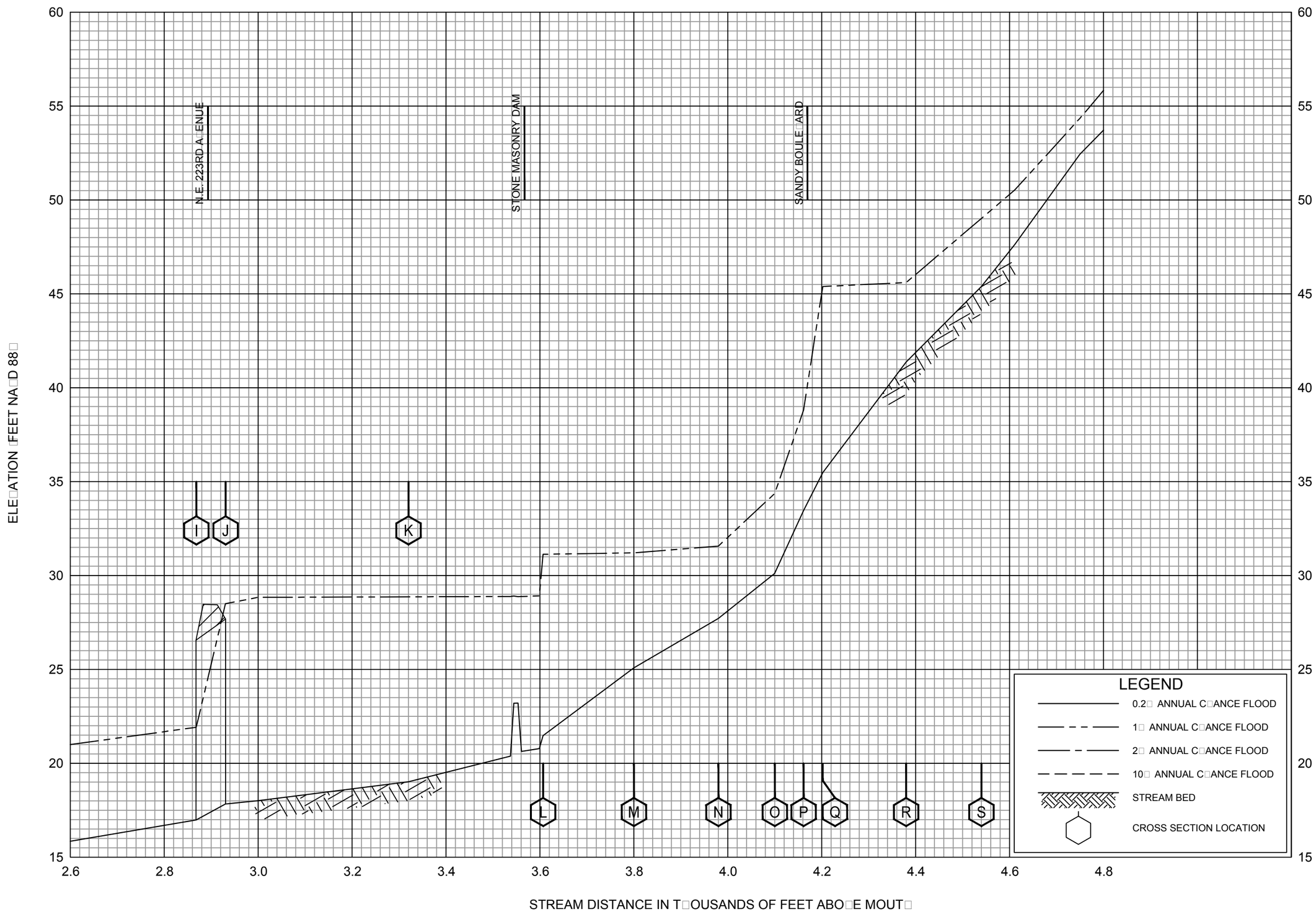

FLOOD PROFILES

FAIRVIEW CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

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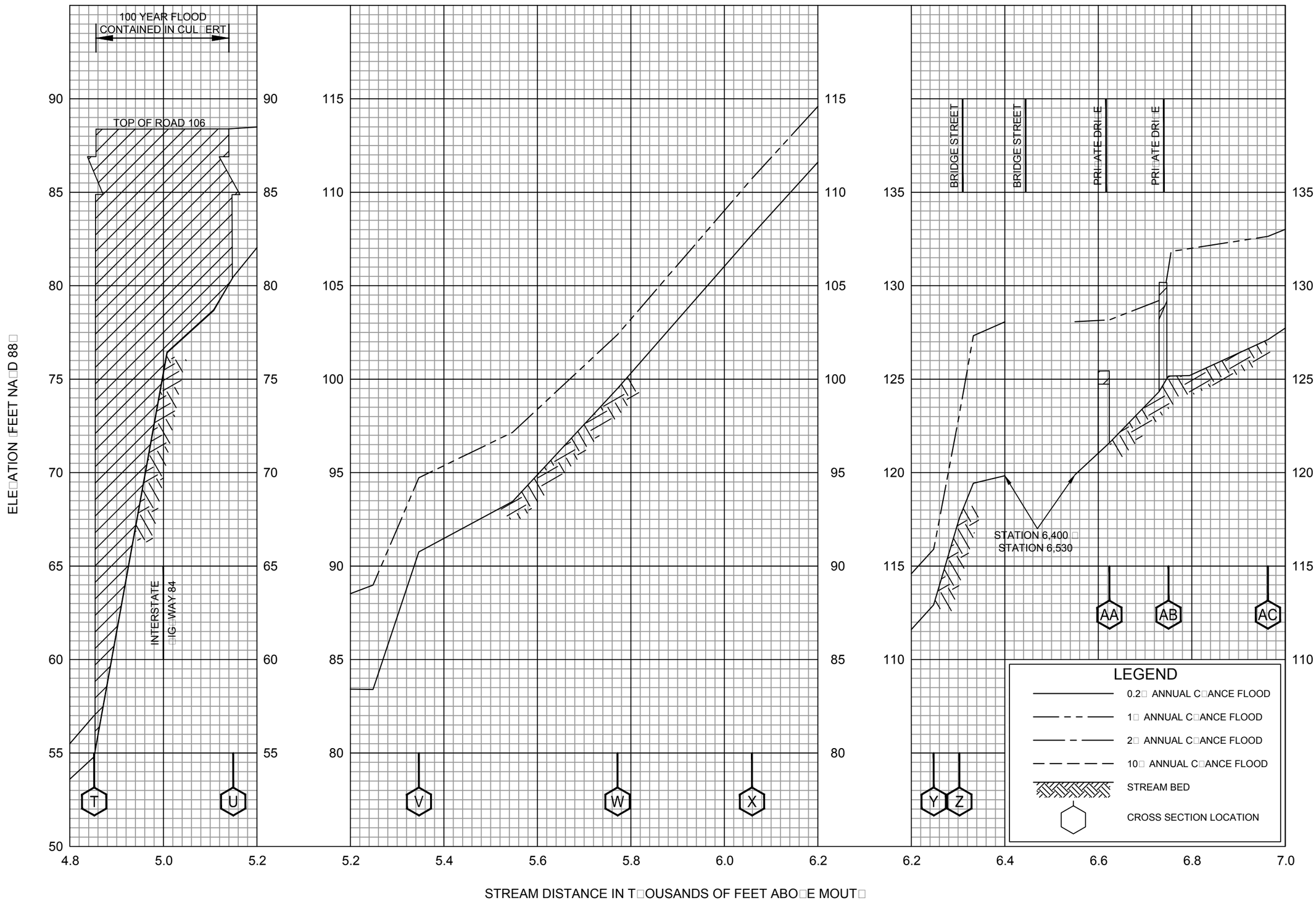

FLOOD PROFILES

FAIR IEW CREE

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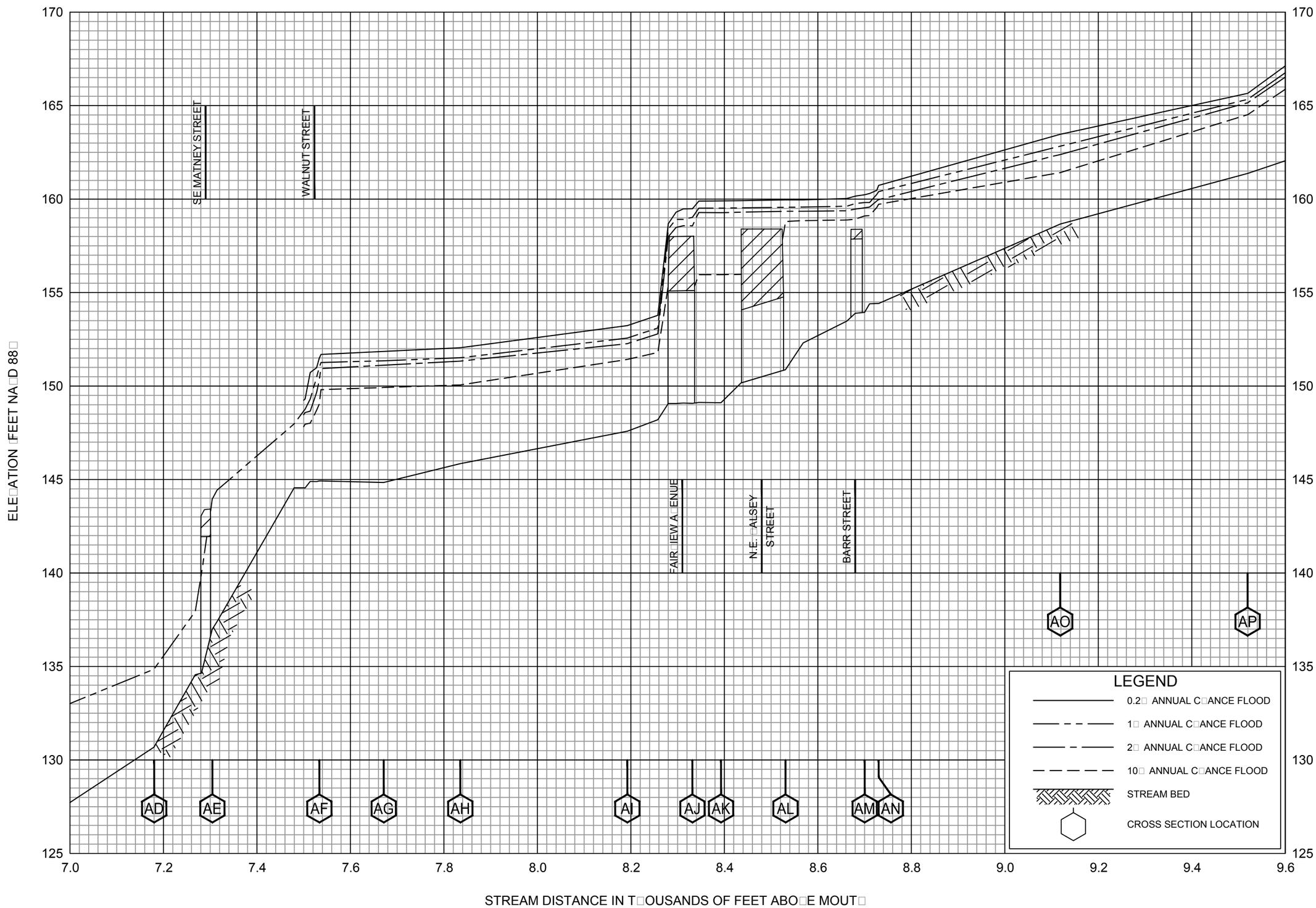

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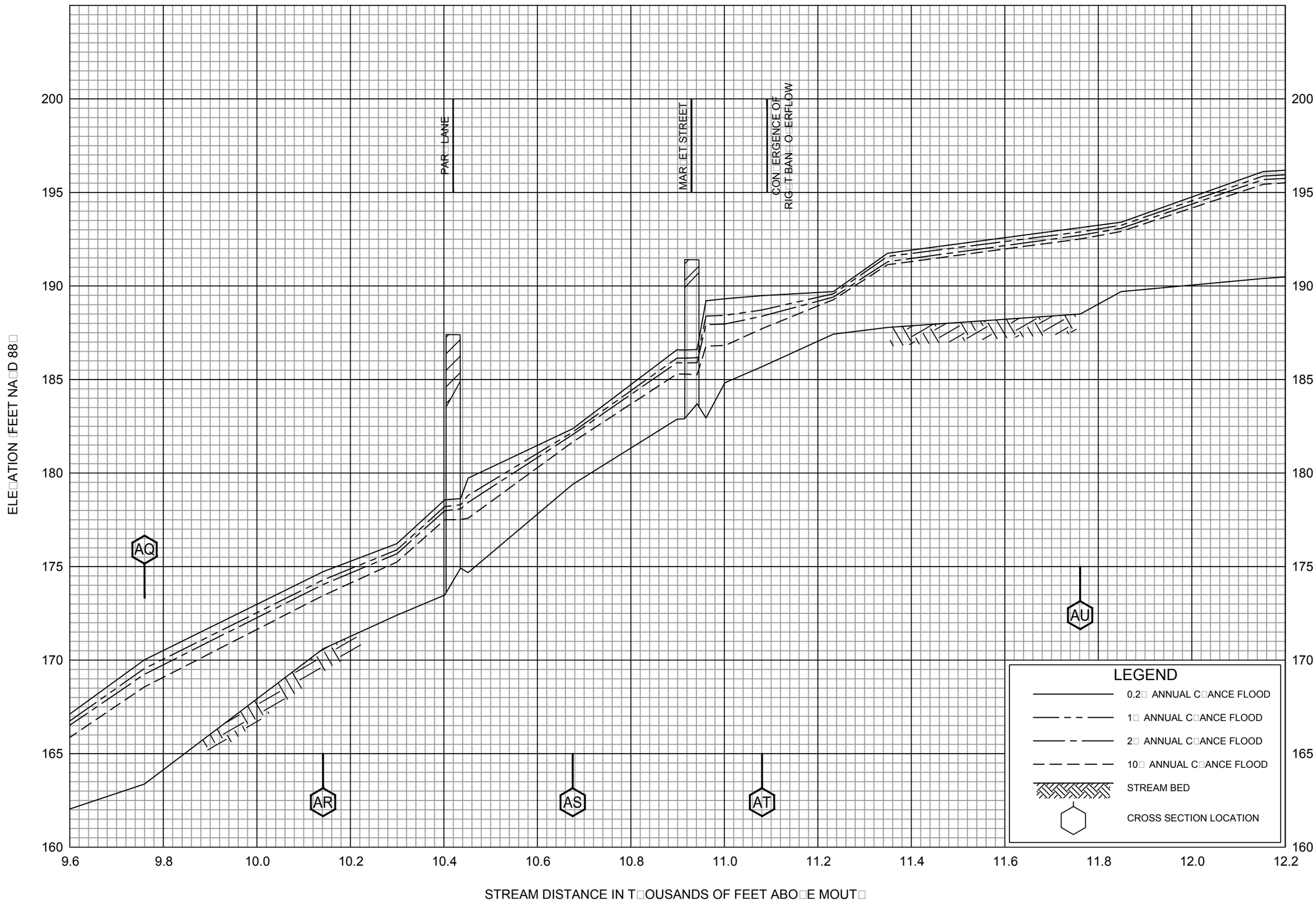

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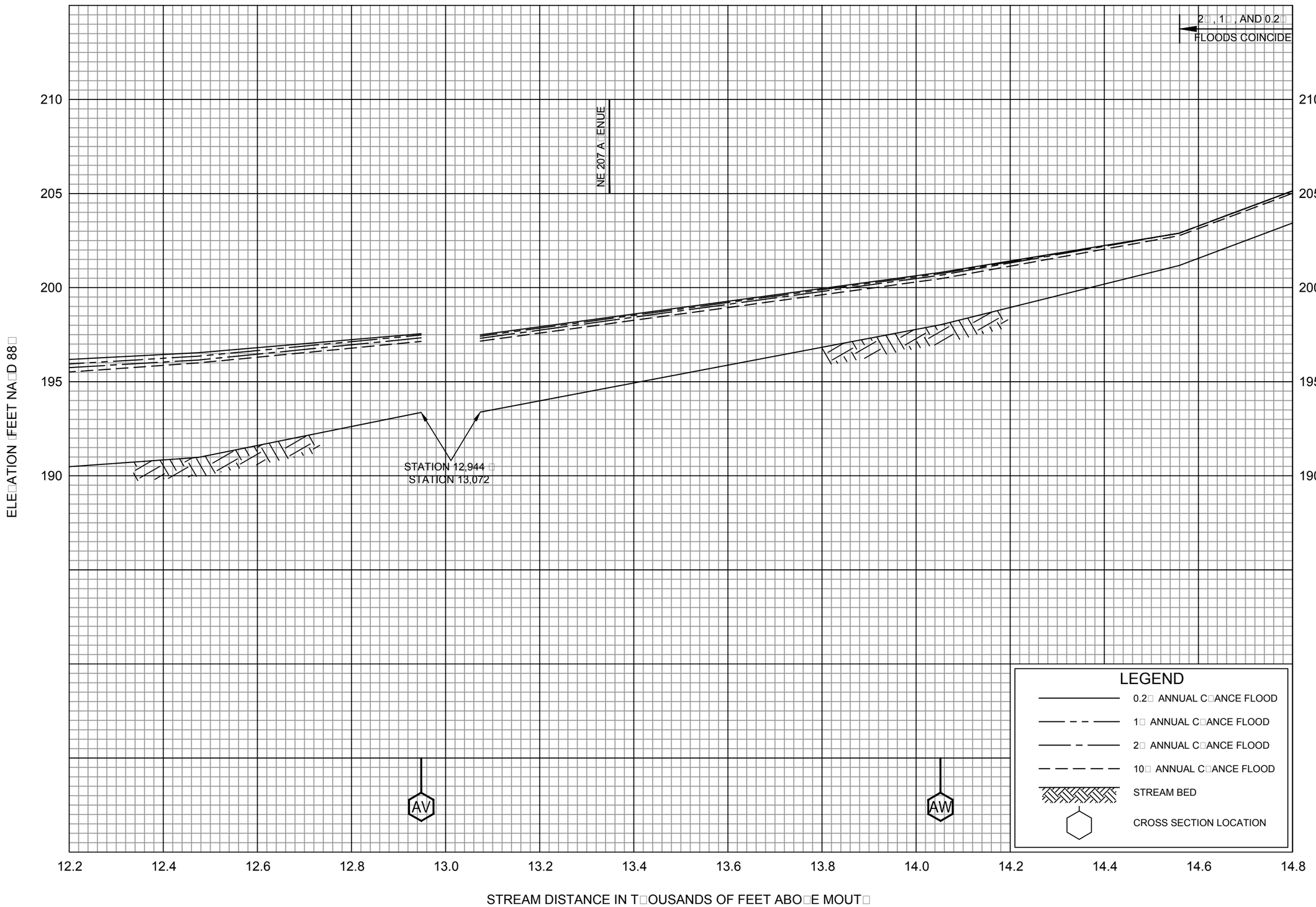

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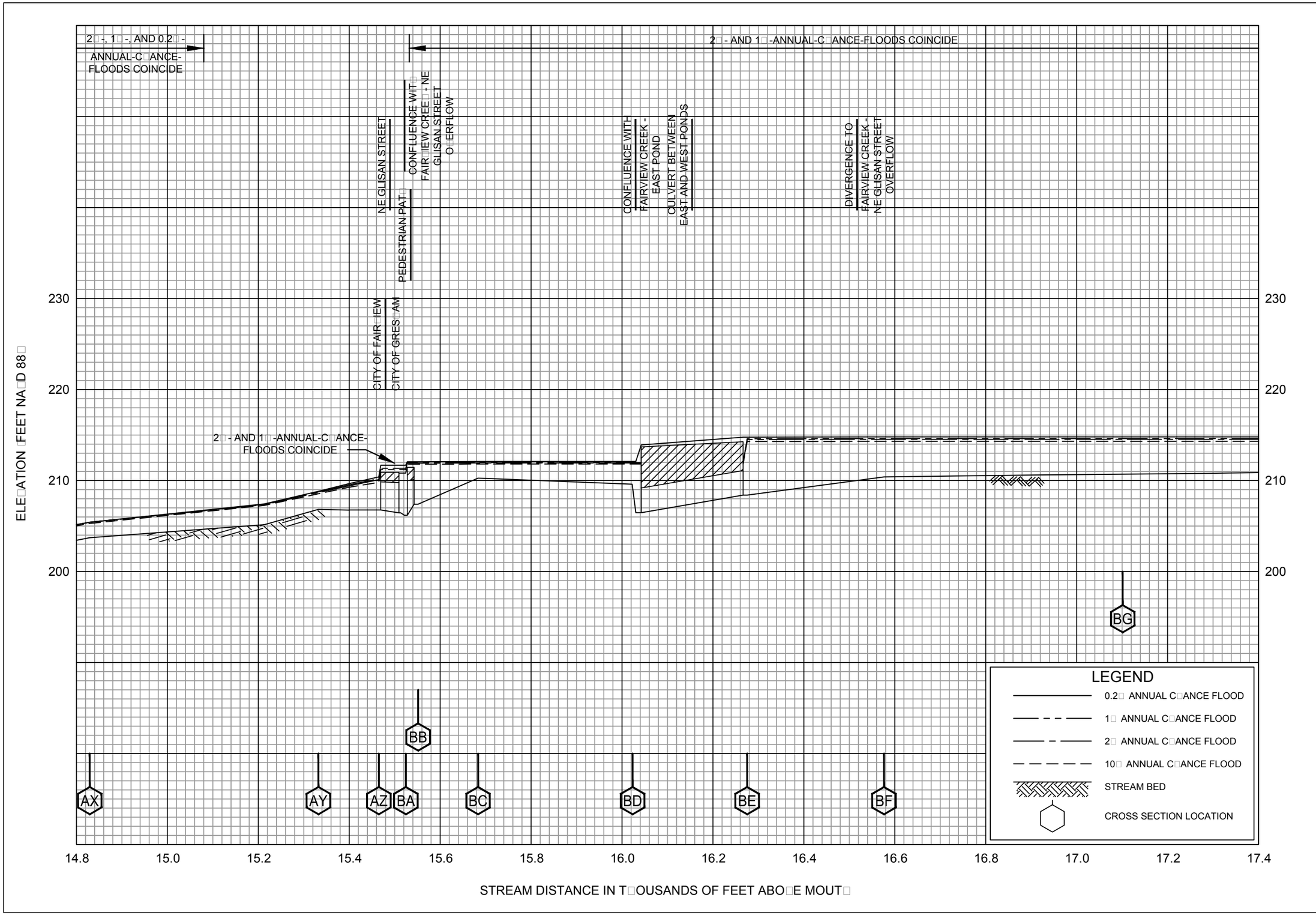

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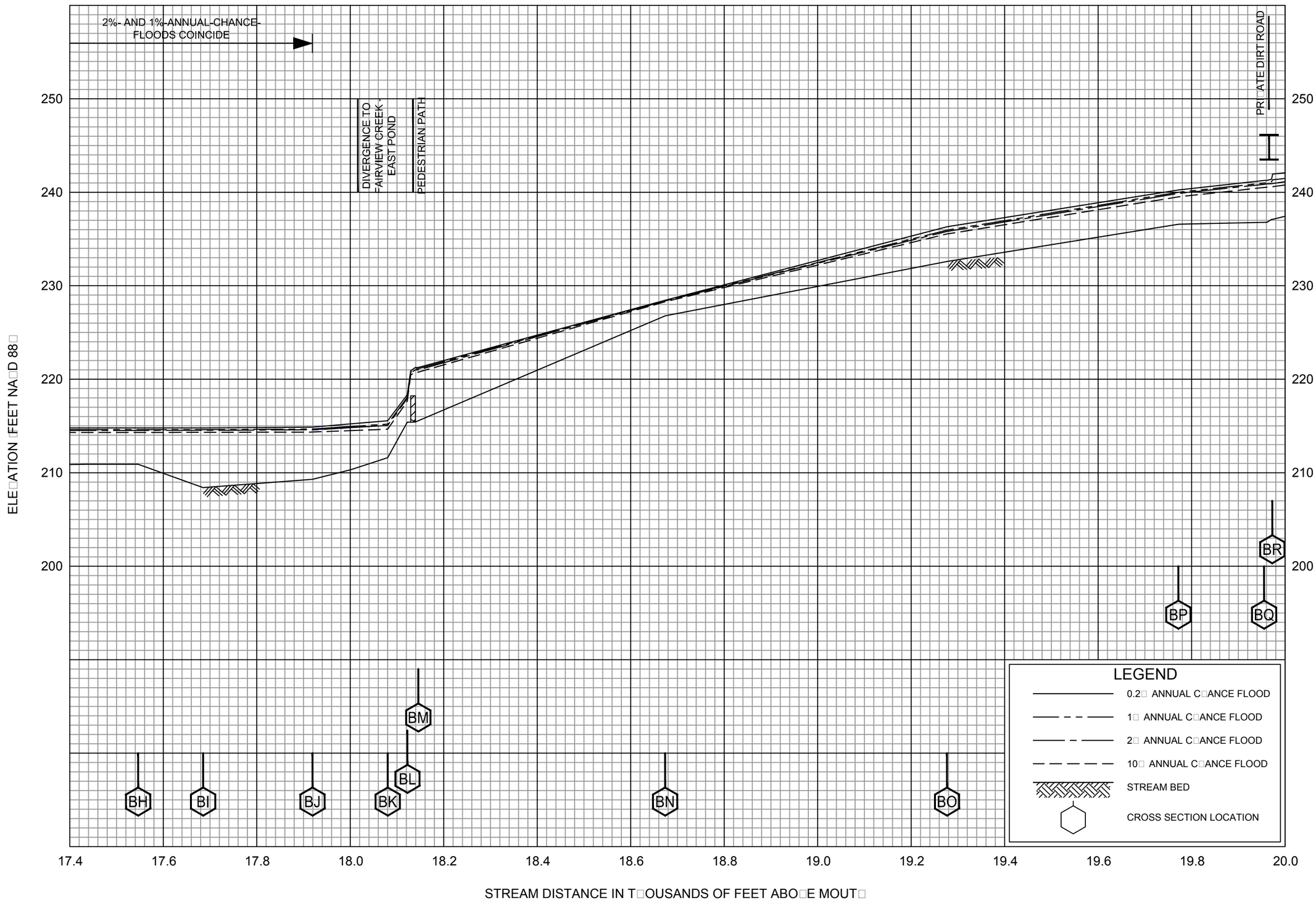

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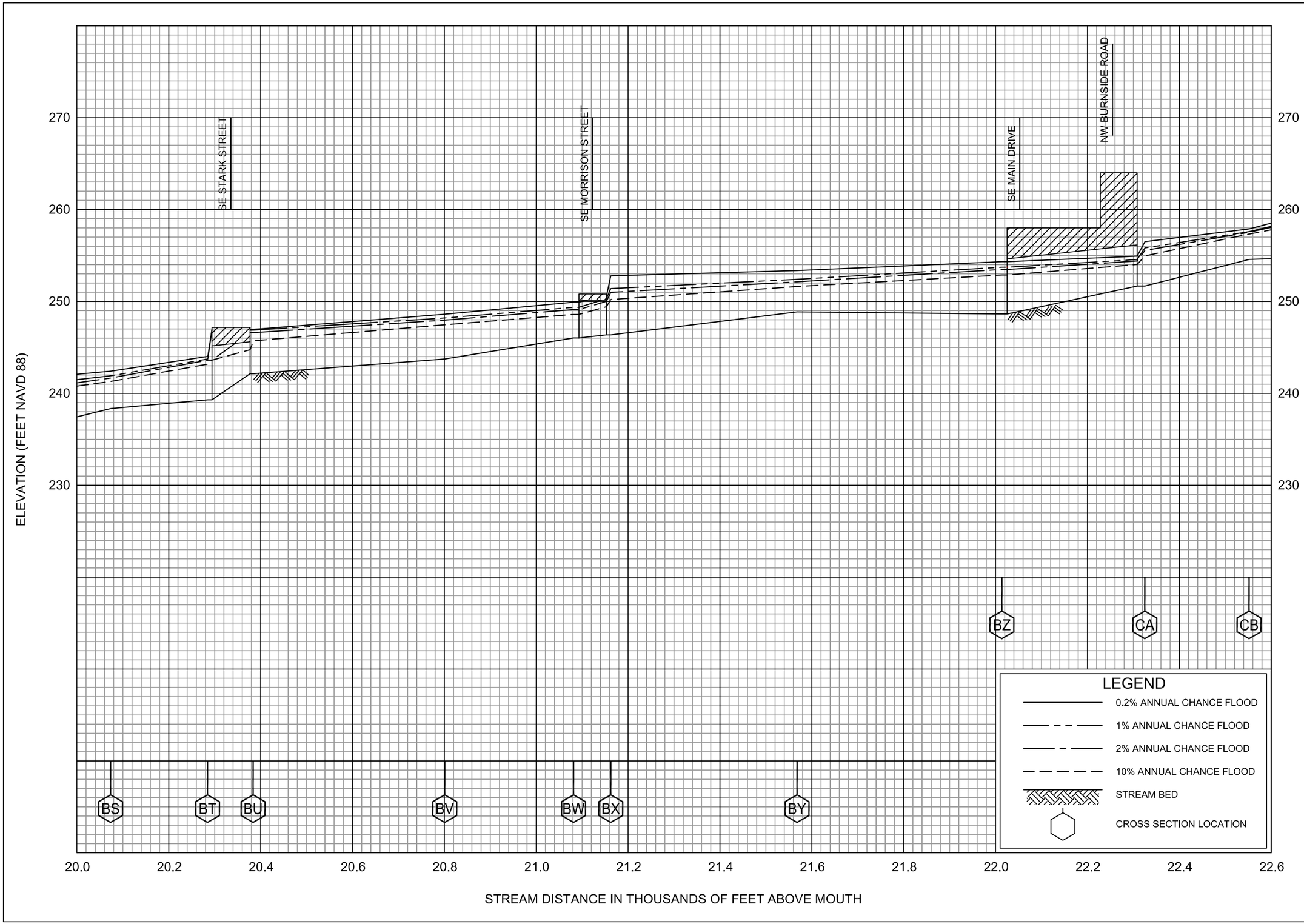

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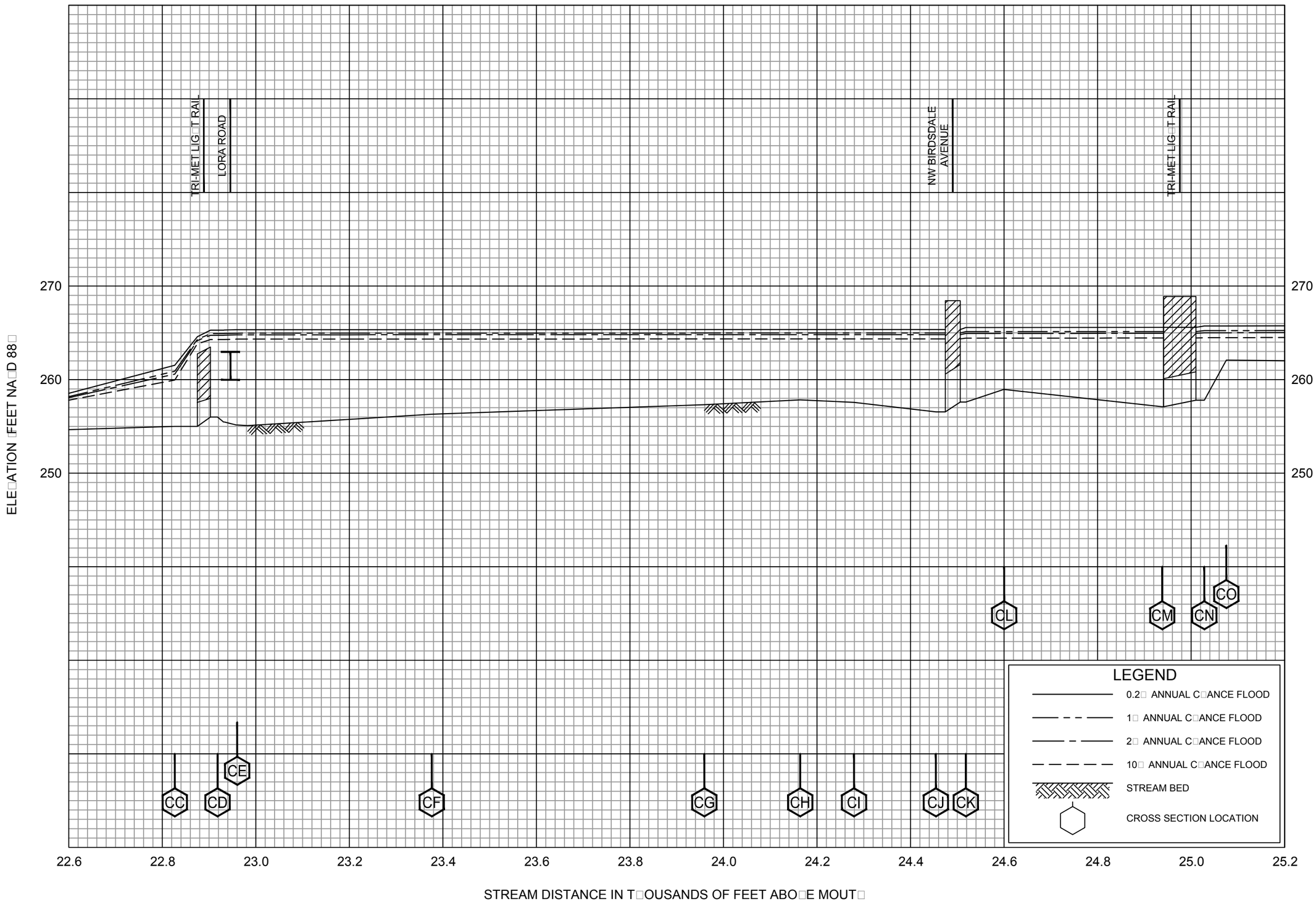

FLOOD PROFILES

FAIR□IEW CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

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AND INCORPORATED AREAS

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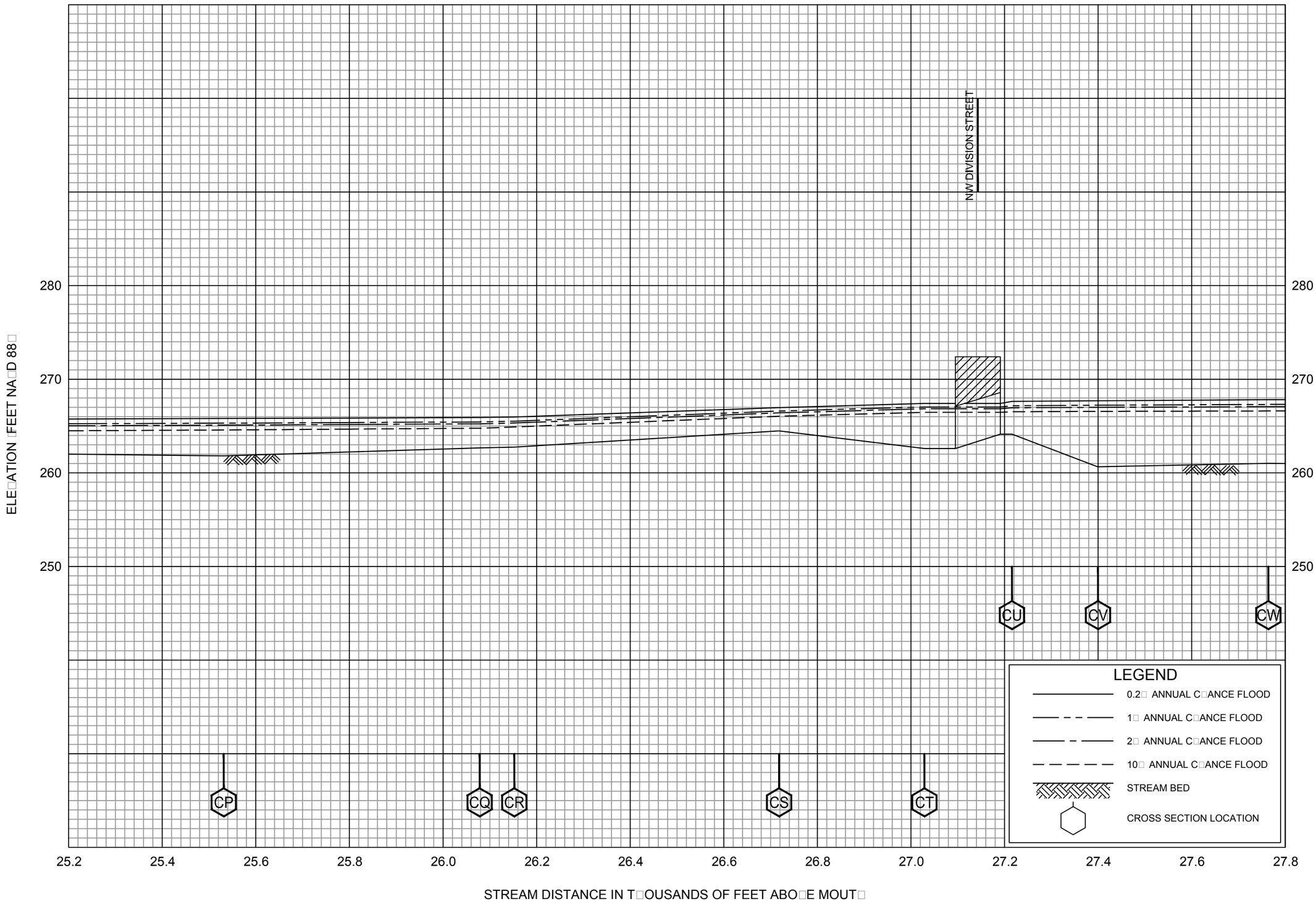

FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

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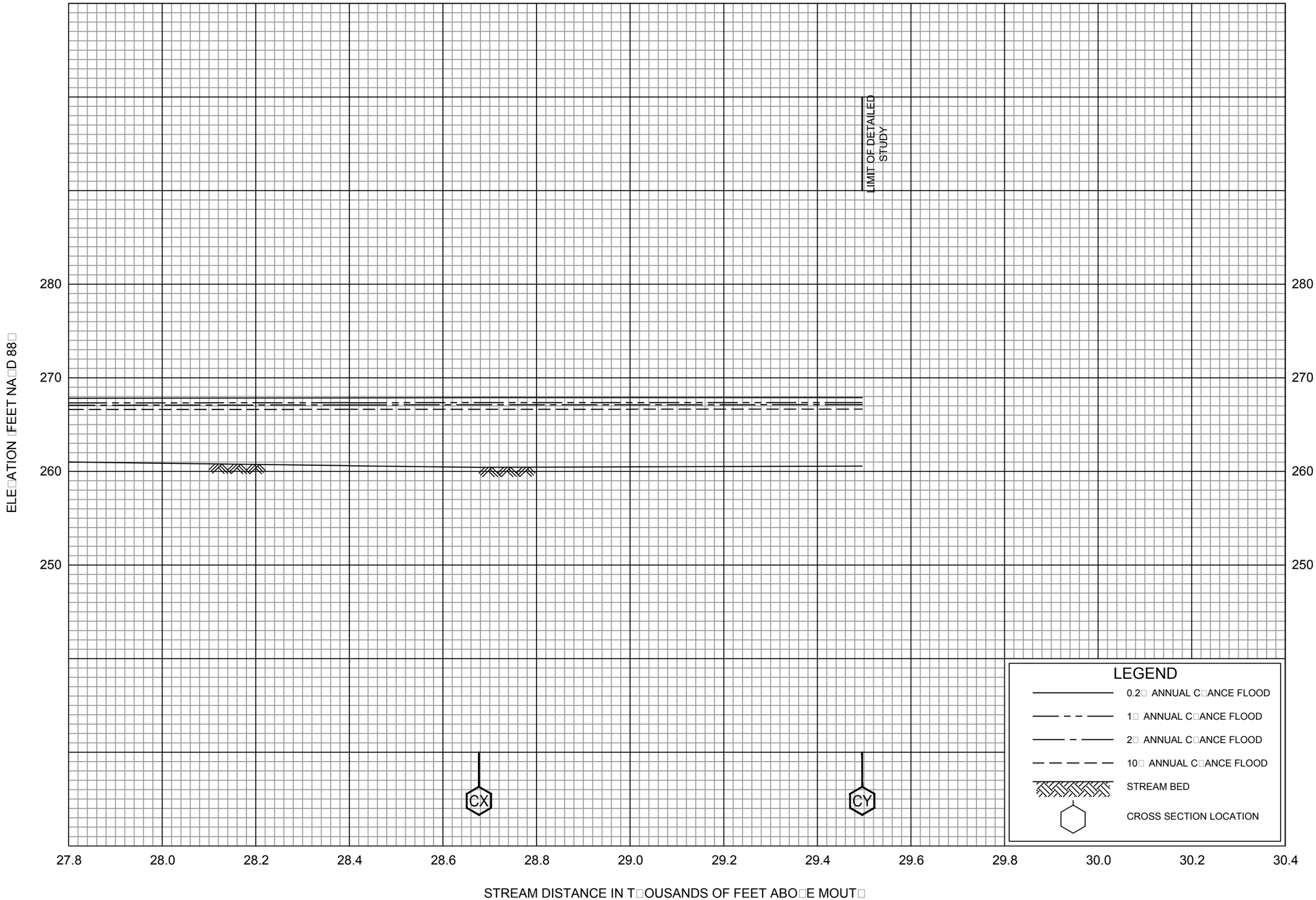

FLOOD PROFILES

FAIR□IEW CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

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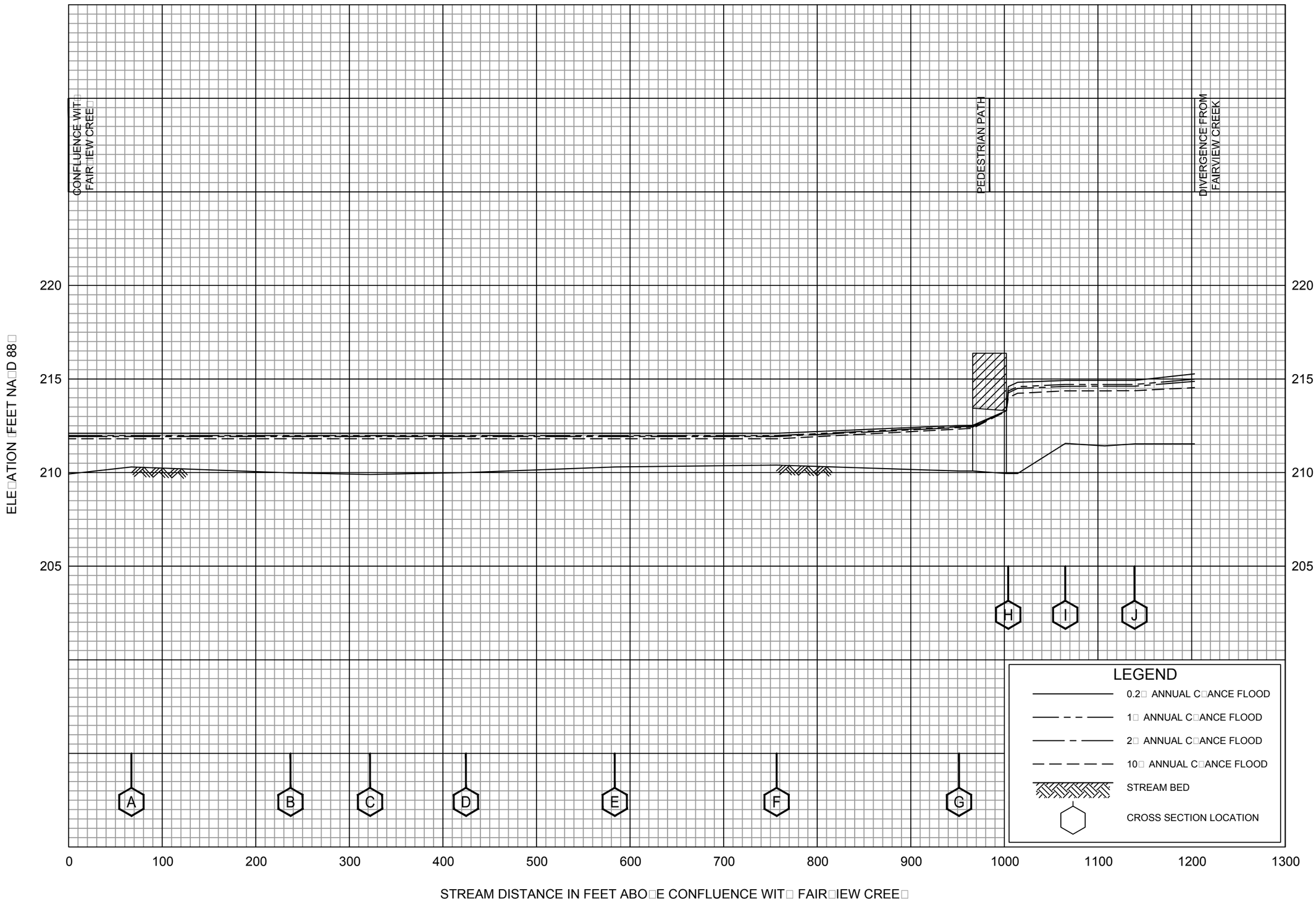

FLOOD PROFILES

FAIR IEW CREE - EAST POND

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

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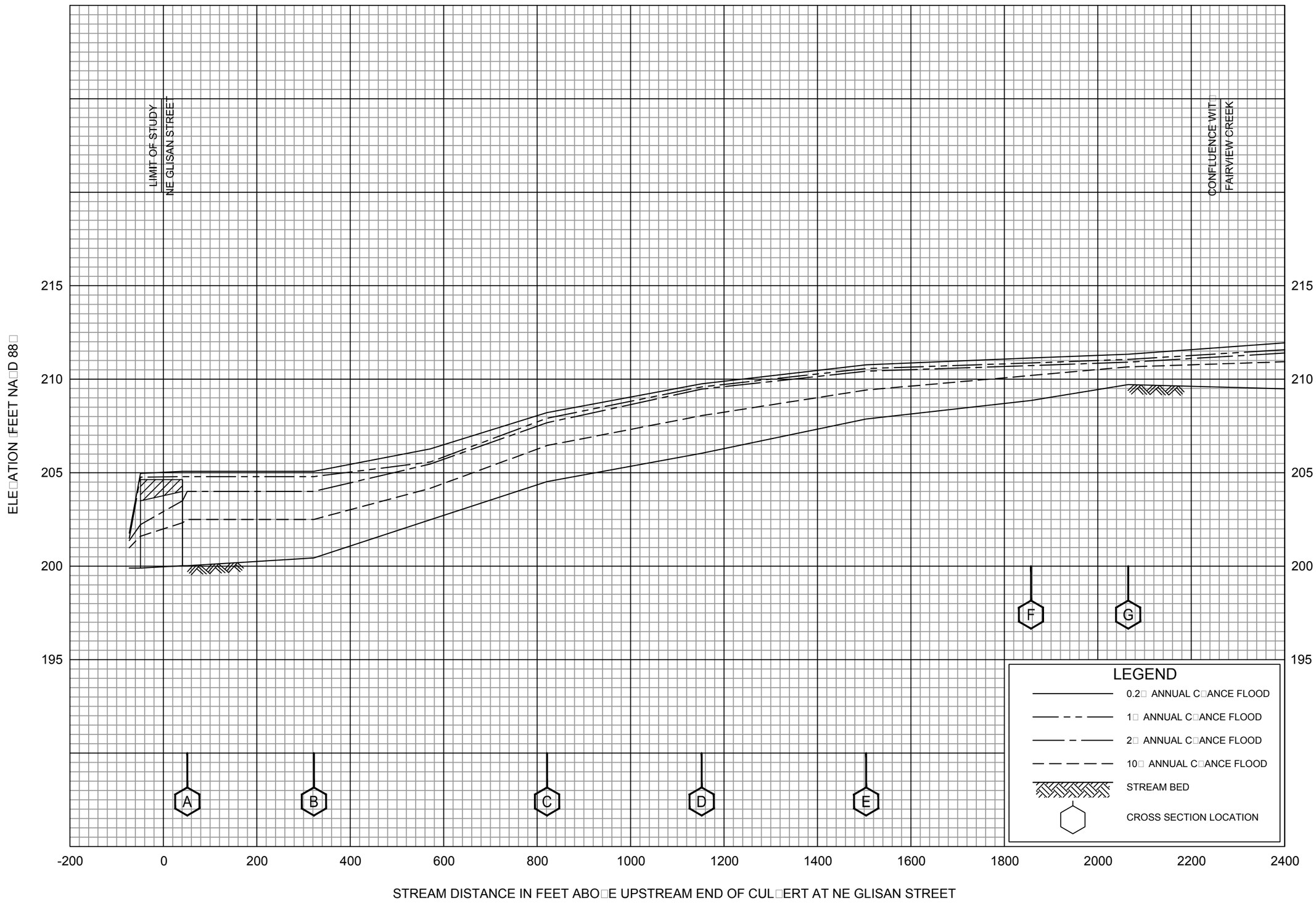

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FAIR IEW CREE - NE GLISAN STREET O ERFLOW

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

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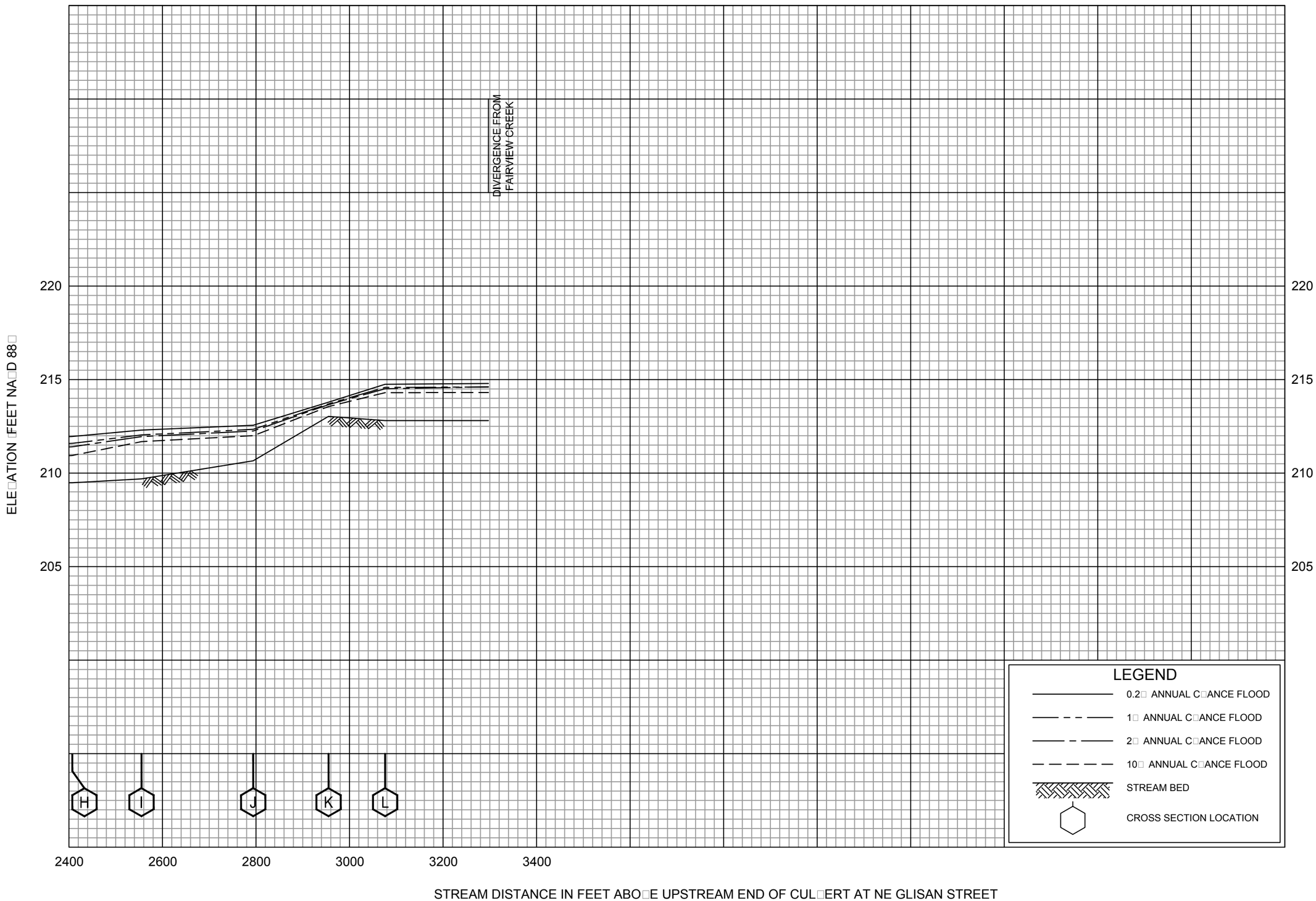

FLOOD PROFILES

FAIR□IEW CREE□ - NE GLISAN STREET O□ERFLOW

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

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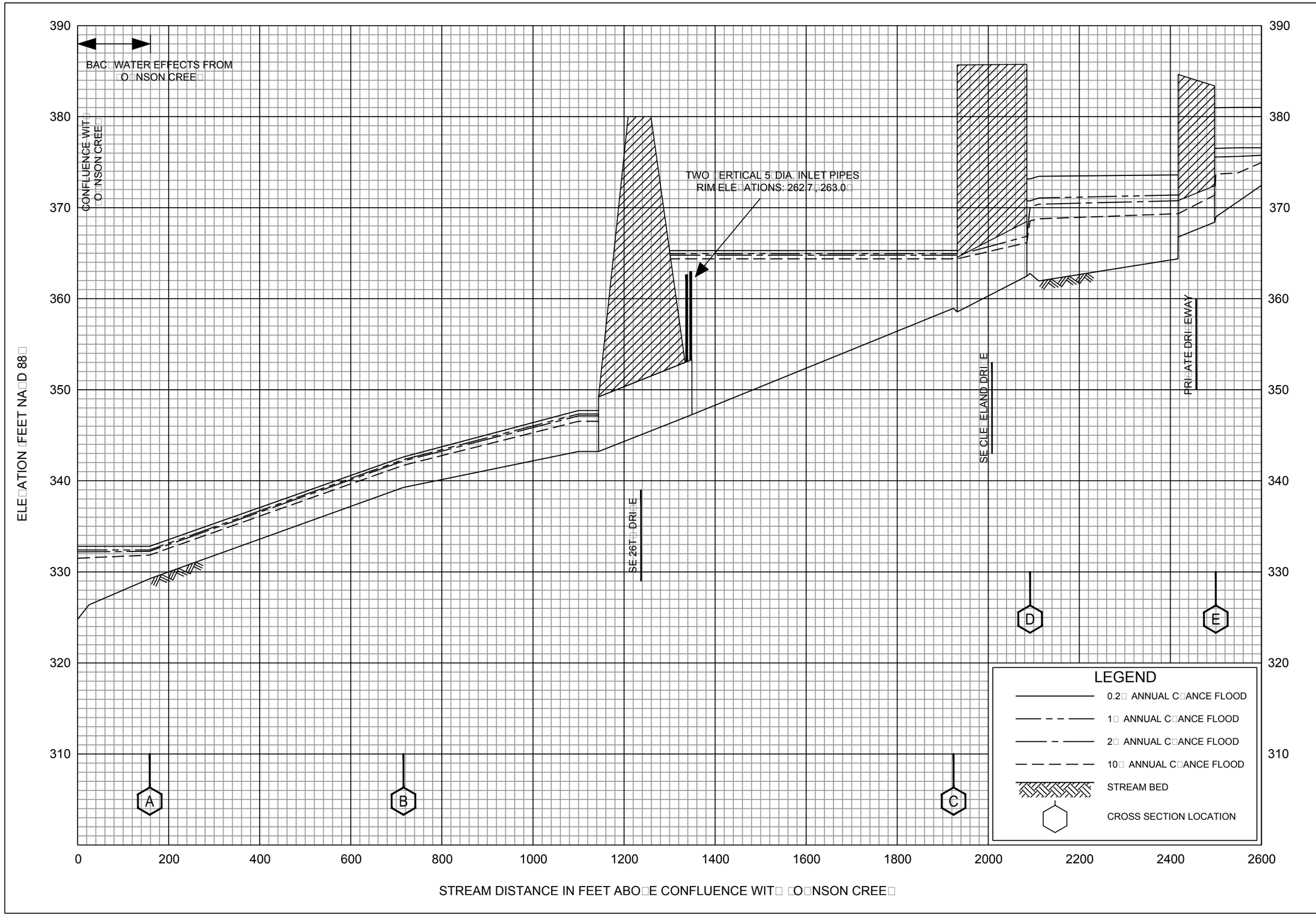

FLOOD PROFILES

JOHNSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

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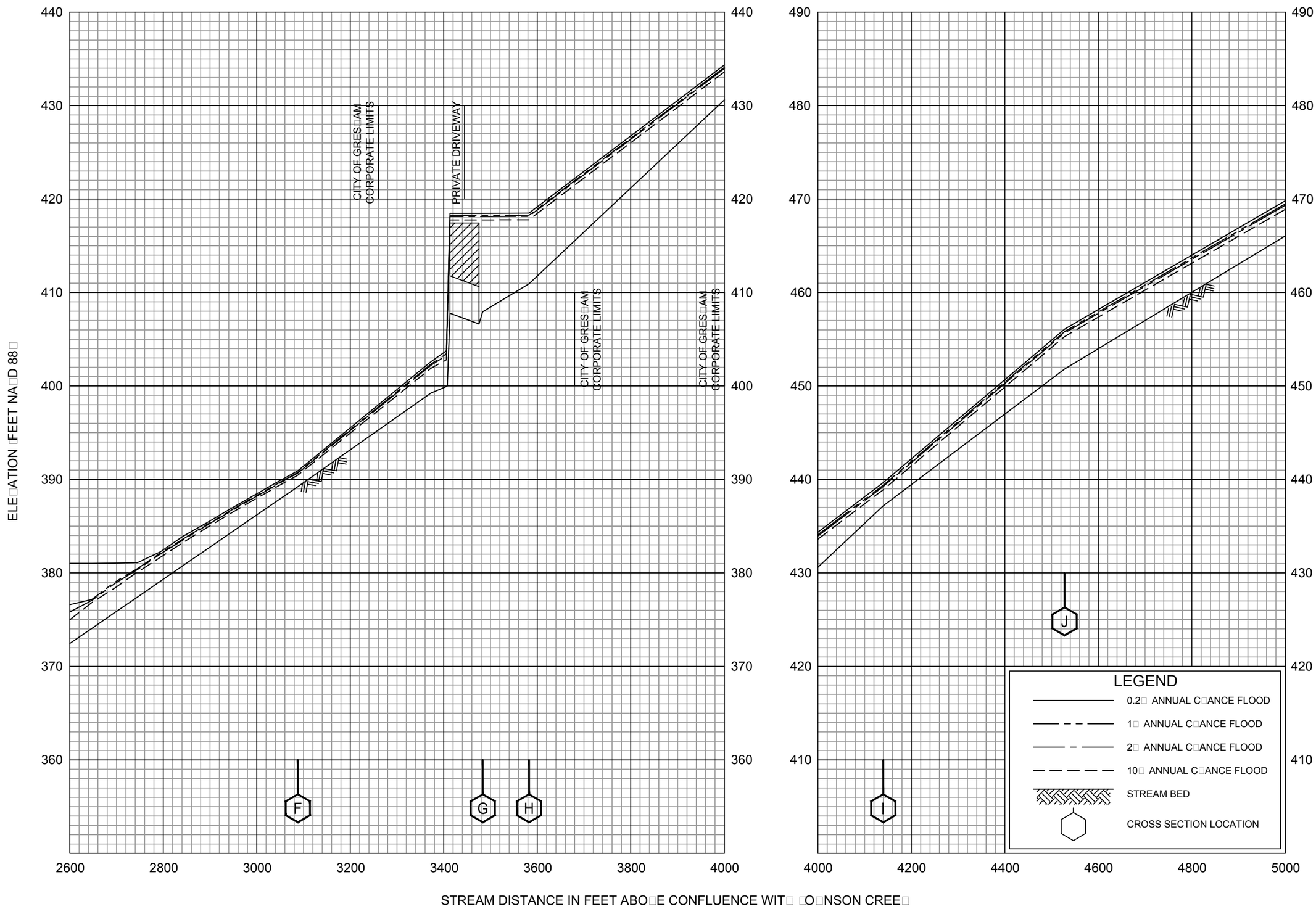

FLOOD PROFILES

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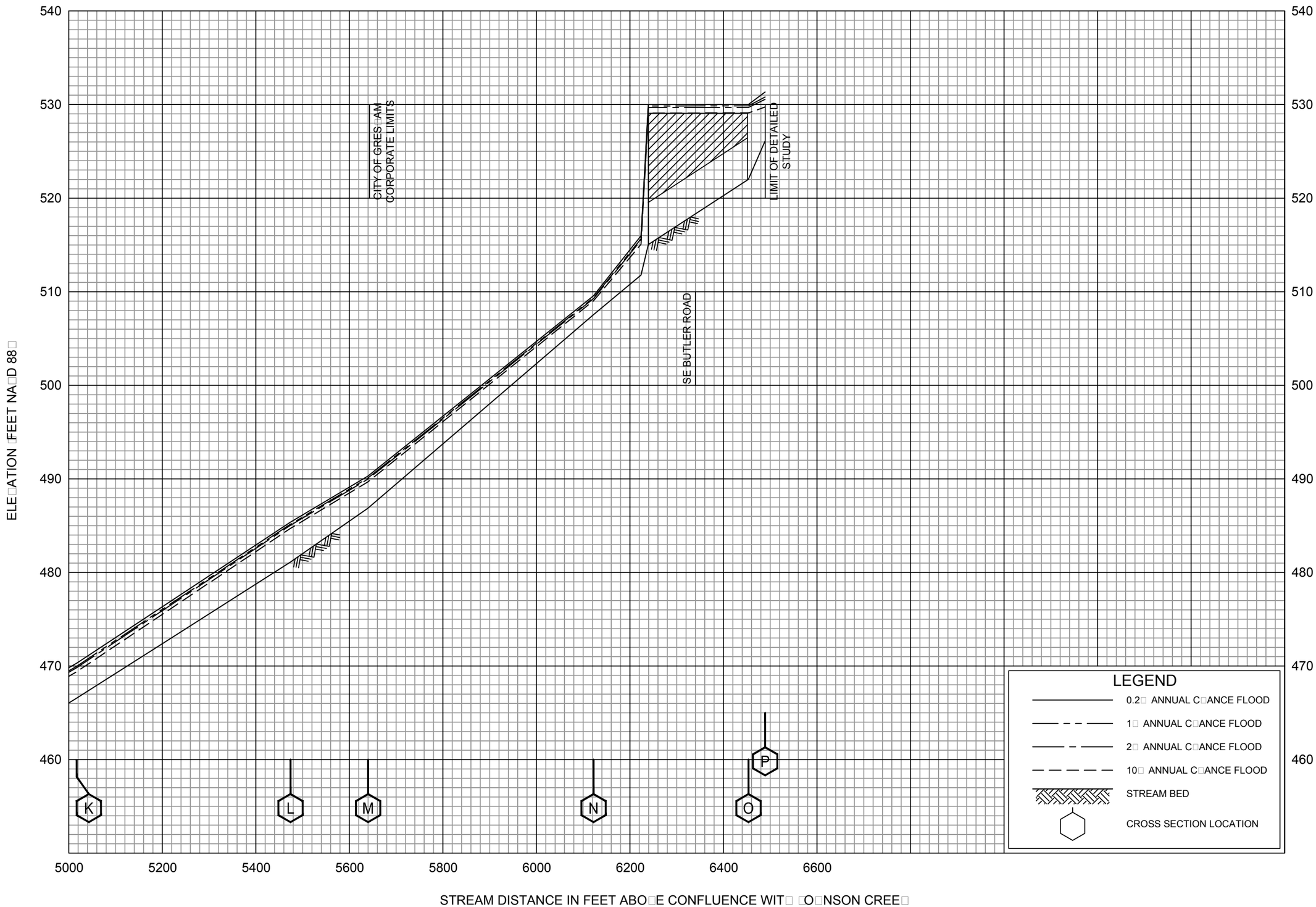

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□OGAN CREE□

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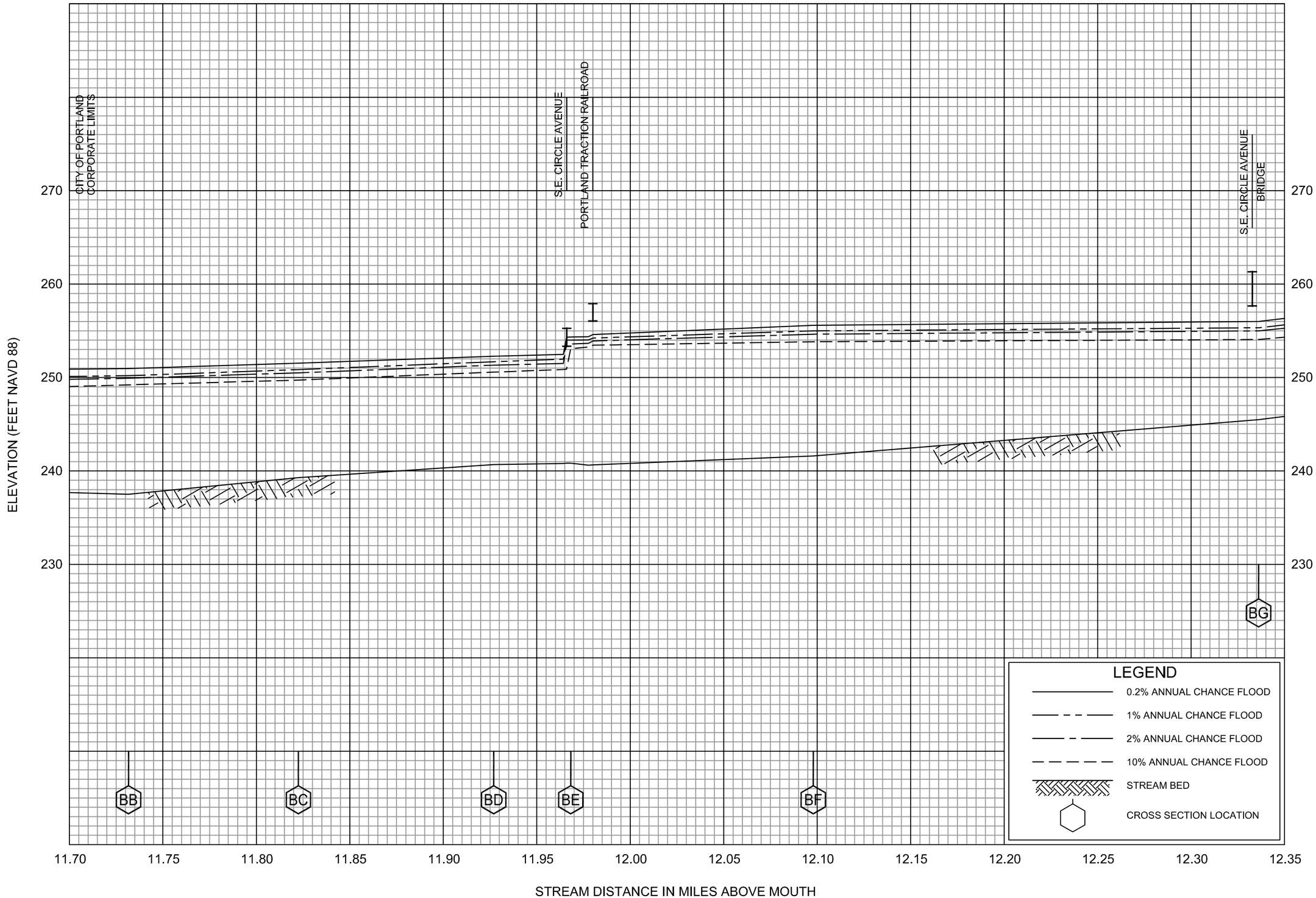

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JOHNSON CREEK

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MULTNOMAH COUNTY, OR

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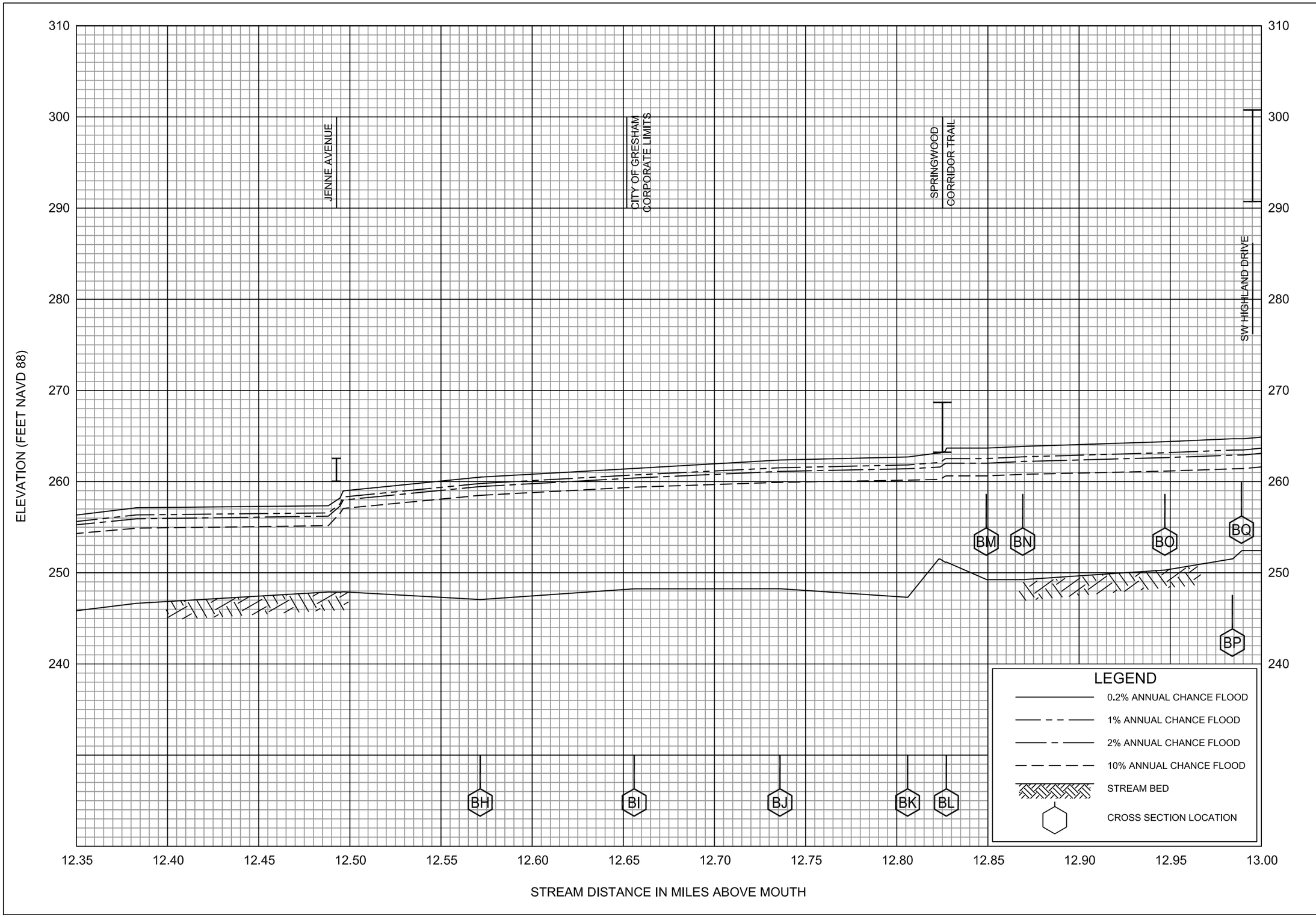

FLOOD PROFILES

JOHNSON CREEK

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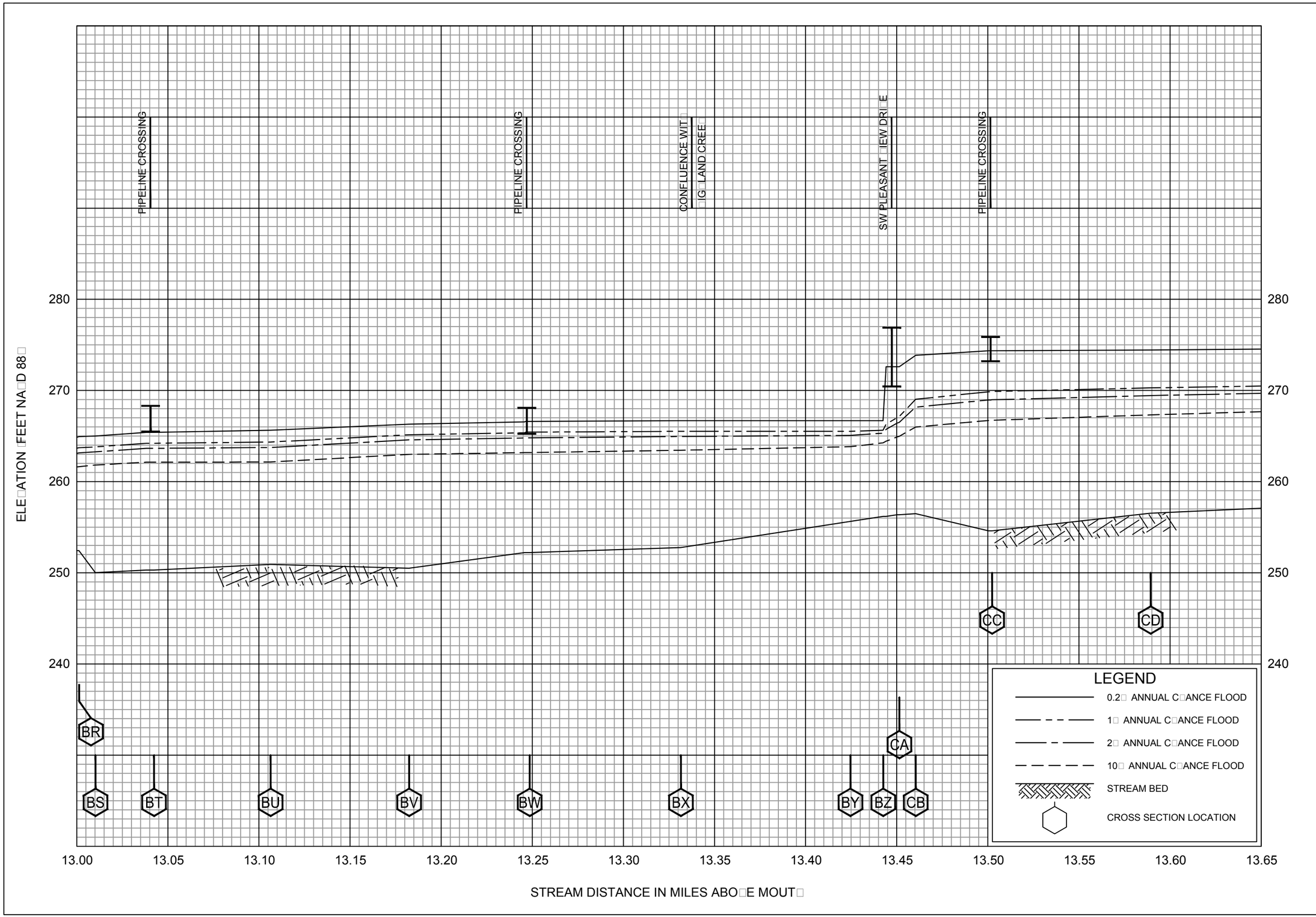

FLOOD PROFILES

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FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

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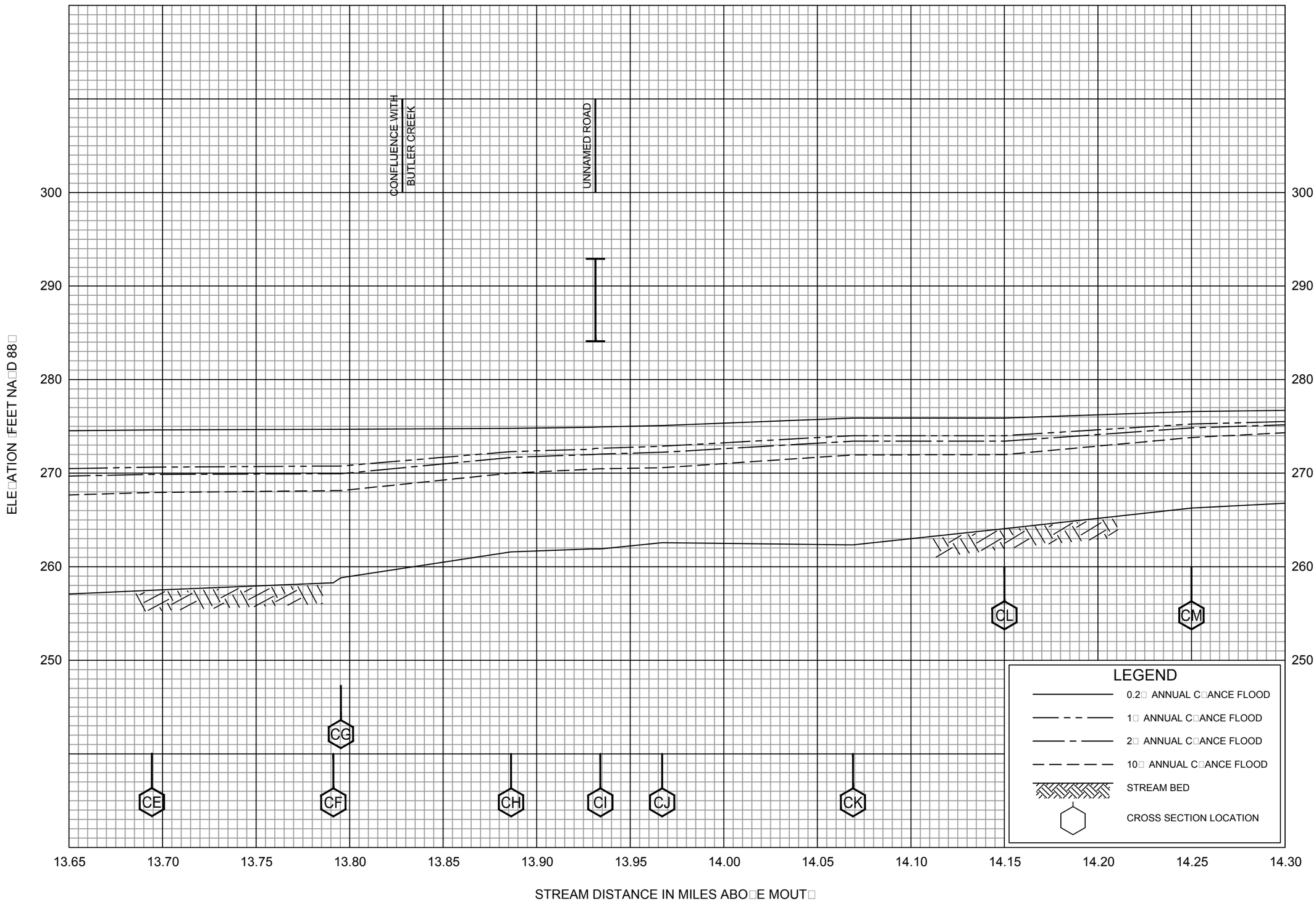

FLOOD PROFILES

O NSON CREE

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

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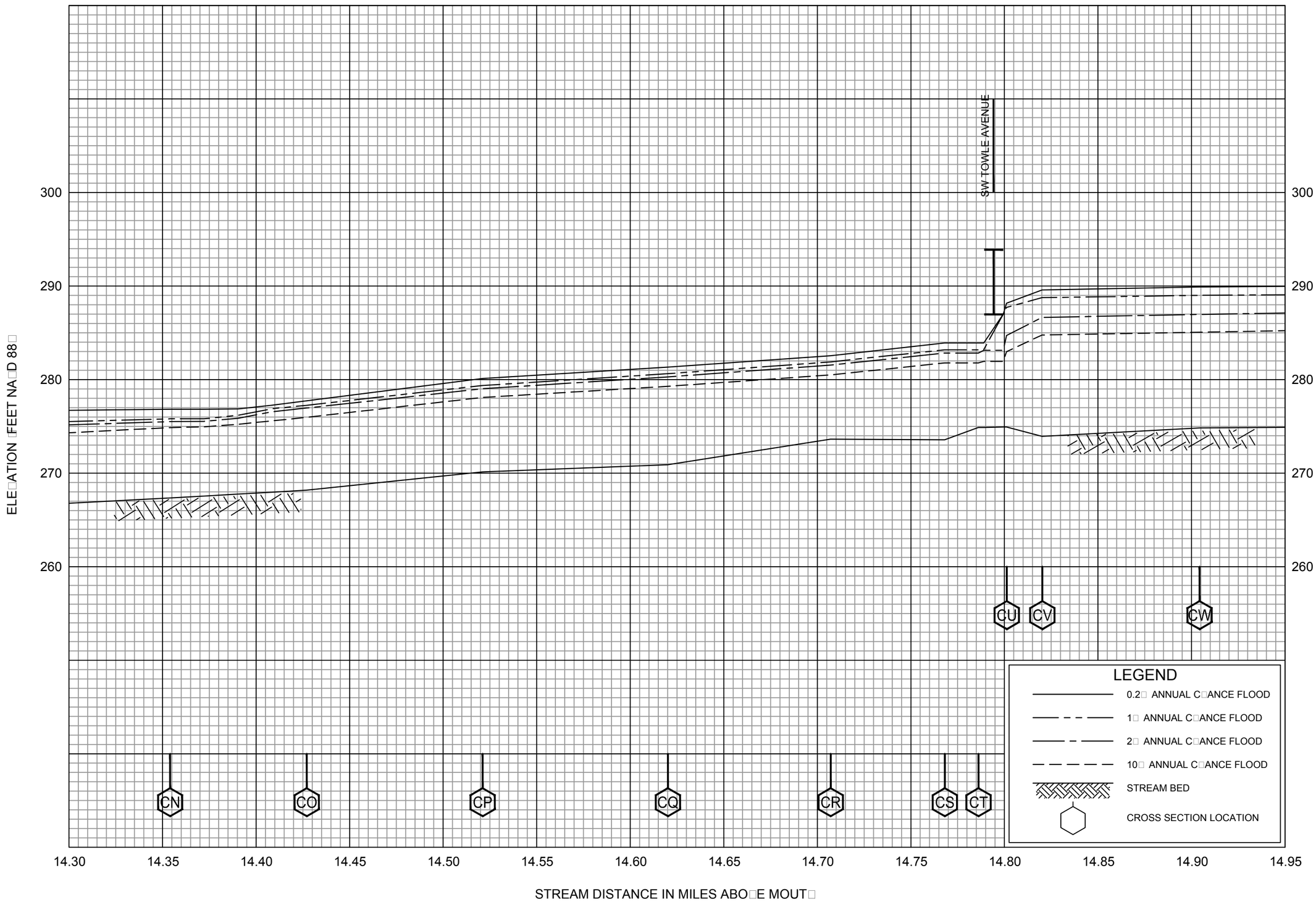

FLOOD PROFILES

JOHNSON CREEK

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MULTNOMAH COUNTY, OR

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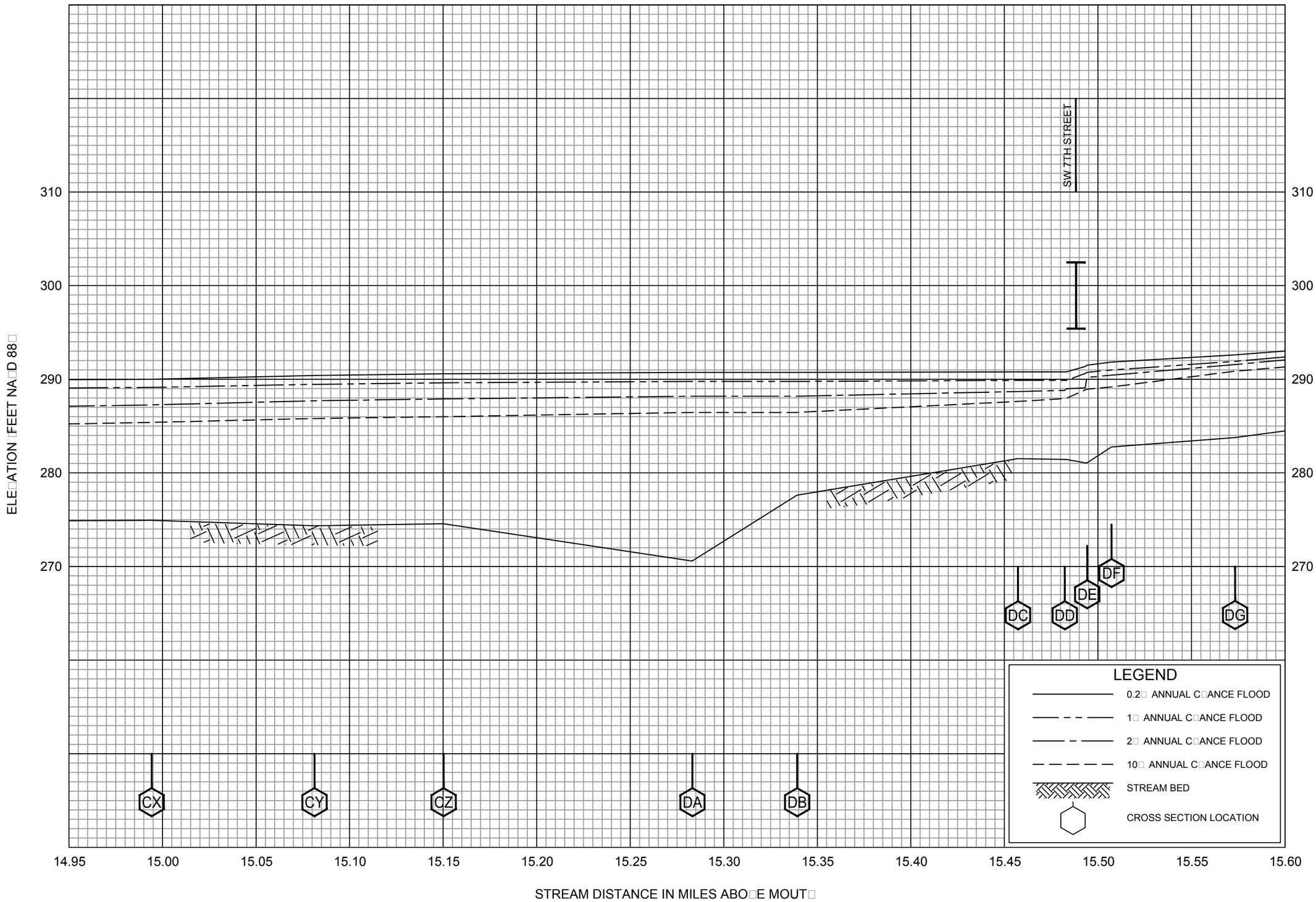

FLOOD PROFILES

O NSON CREE

FEDERAL EMERGENCY MANAGEMENT AGENCY

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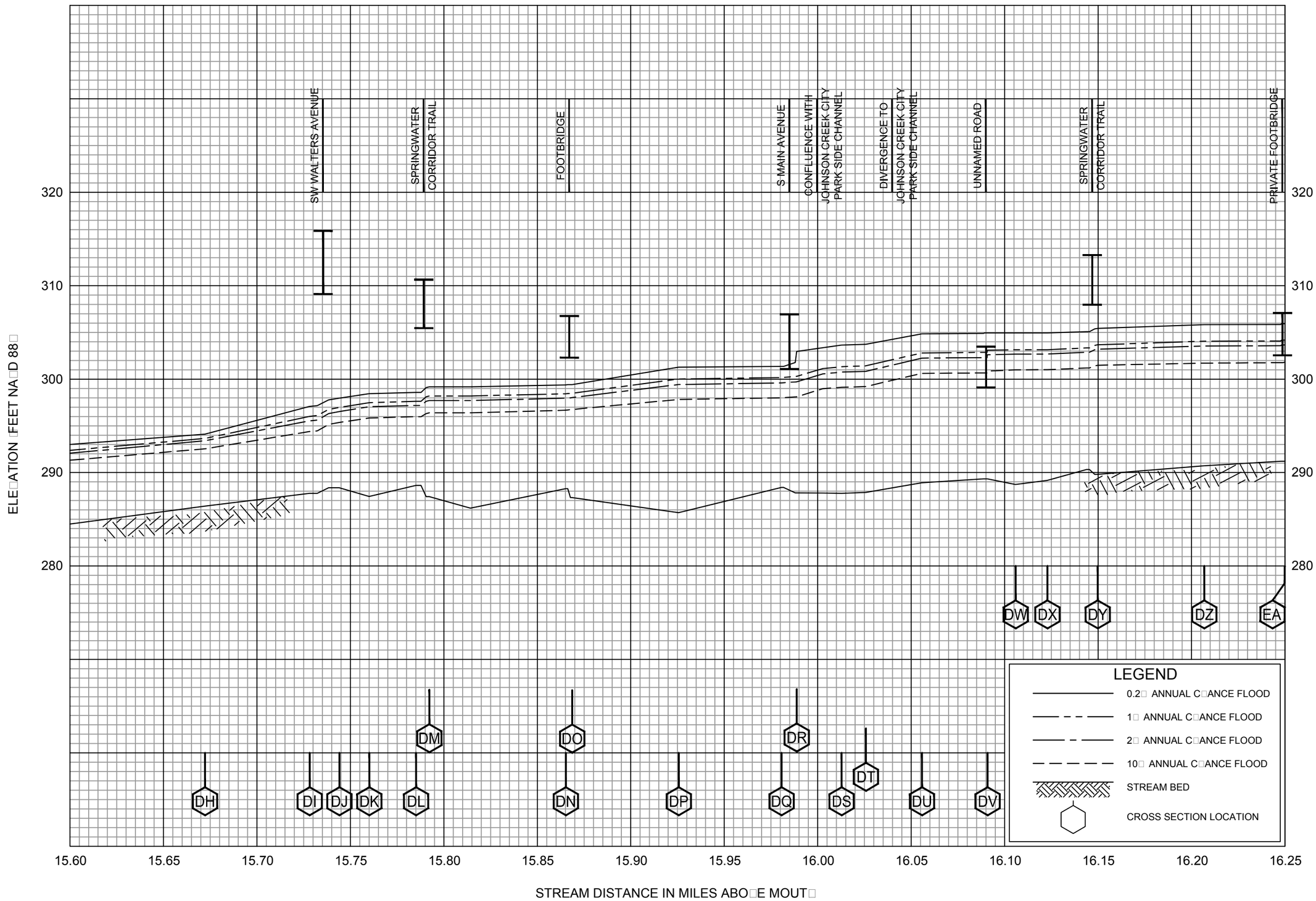

FLOOD PROFILES

JOHNSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

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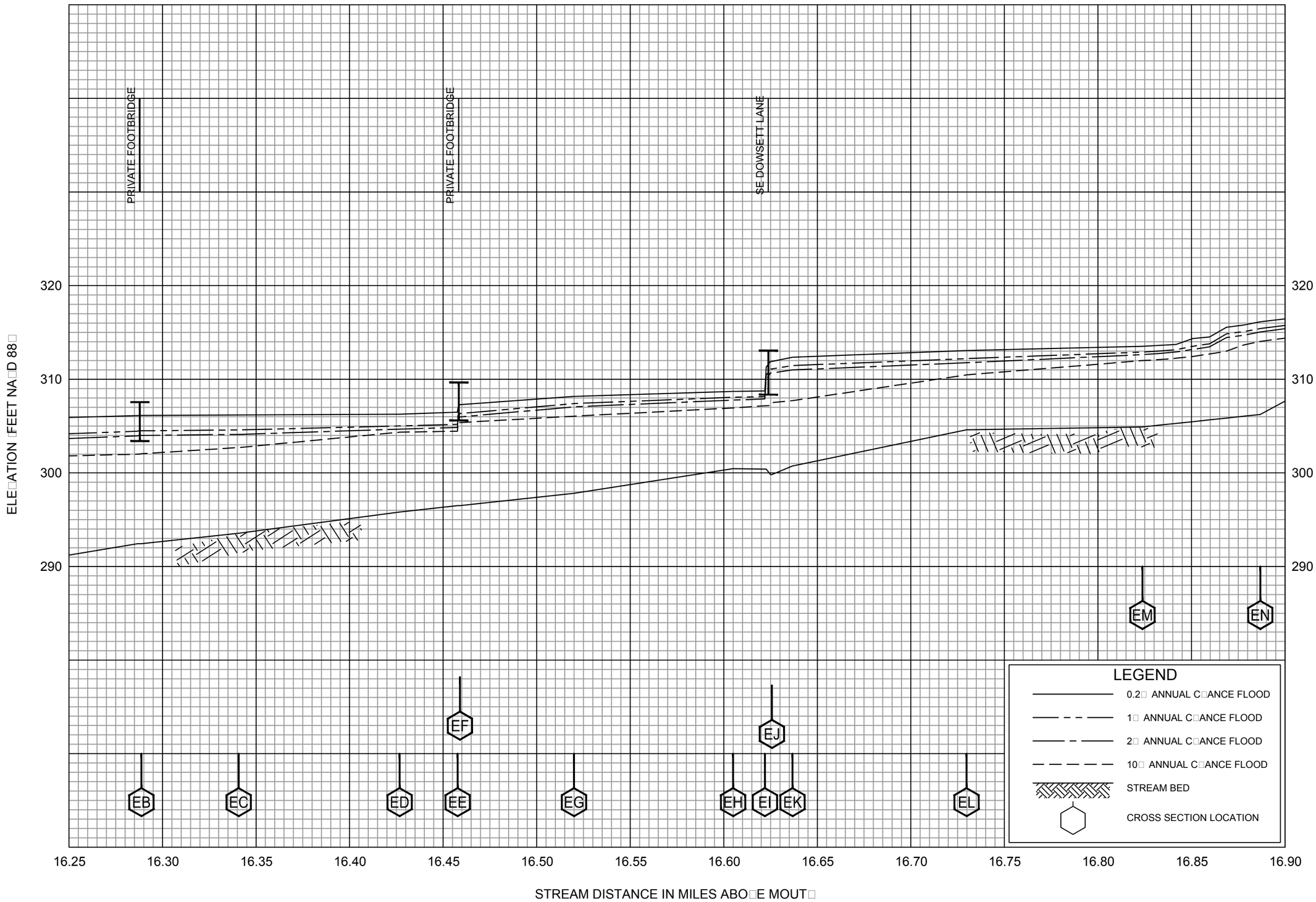

FLOOD PROFILES

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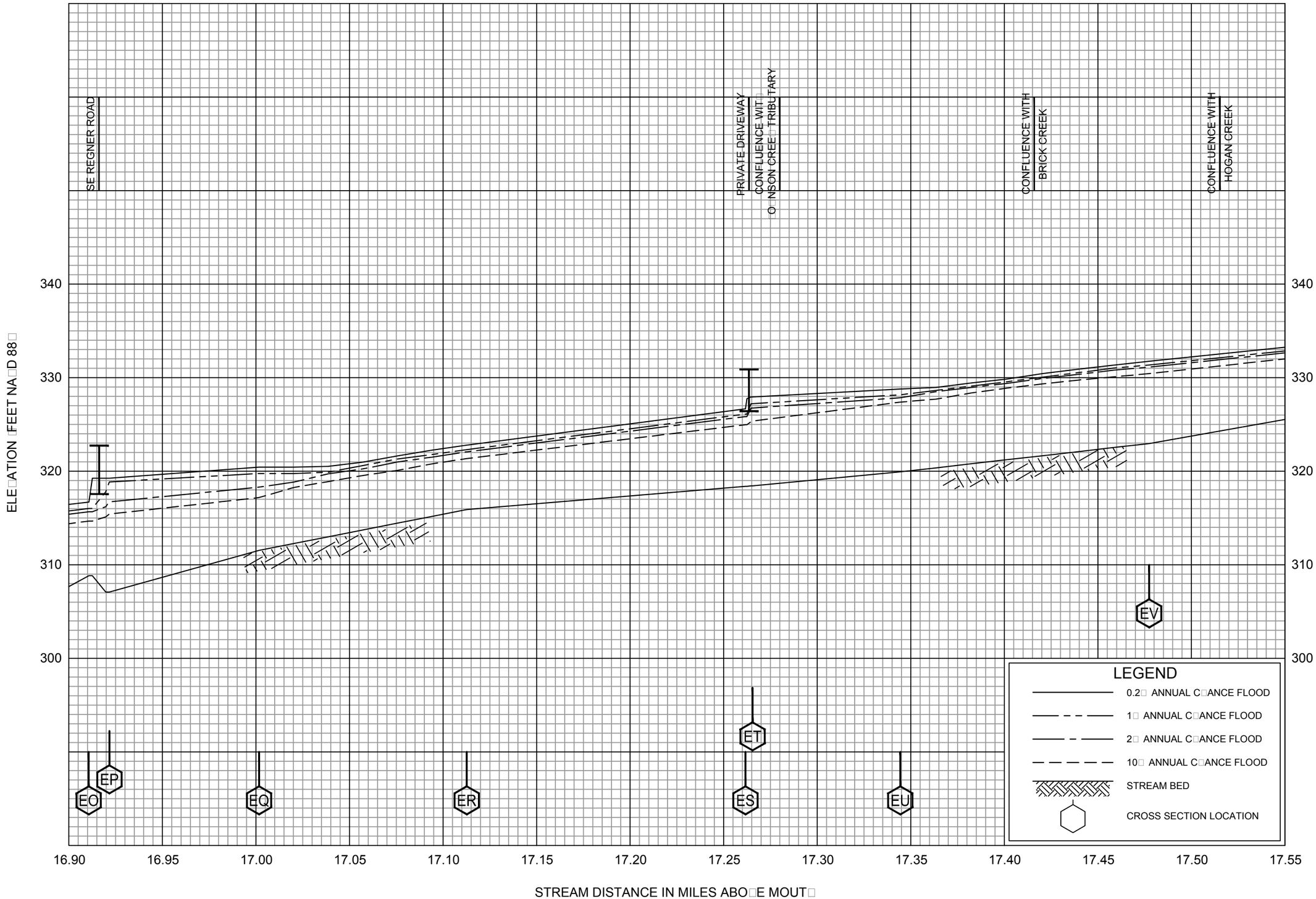

FLOOD PROFILES

□O□NSON CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

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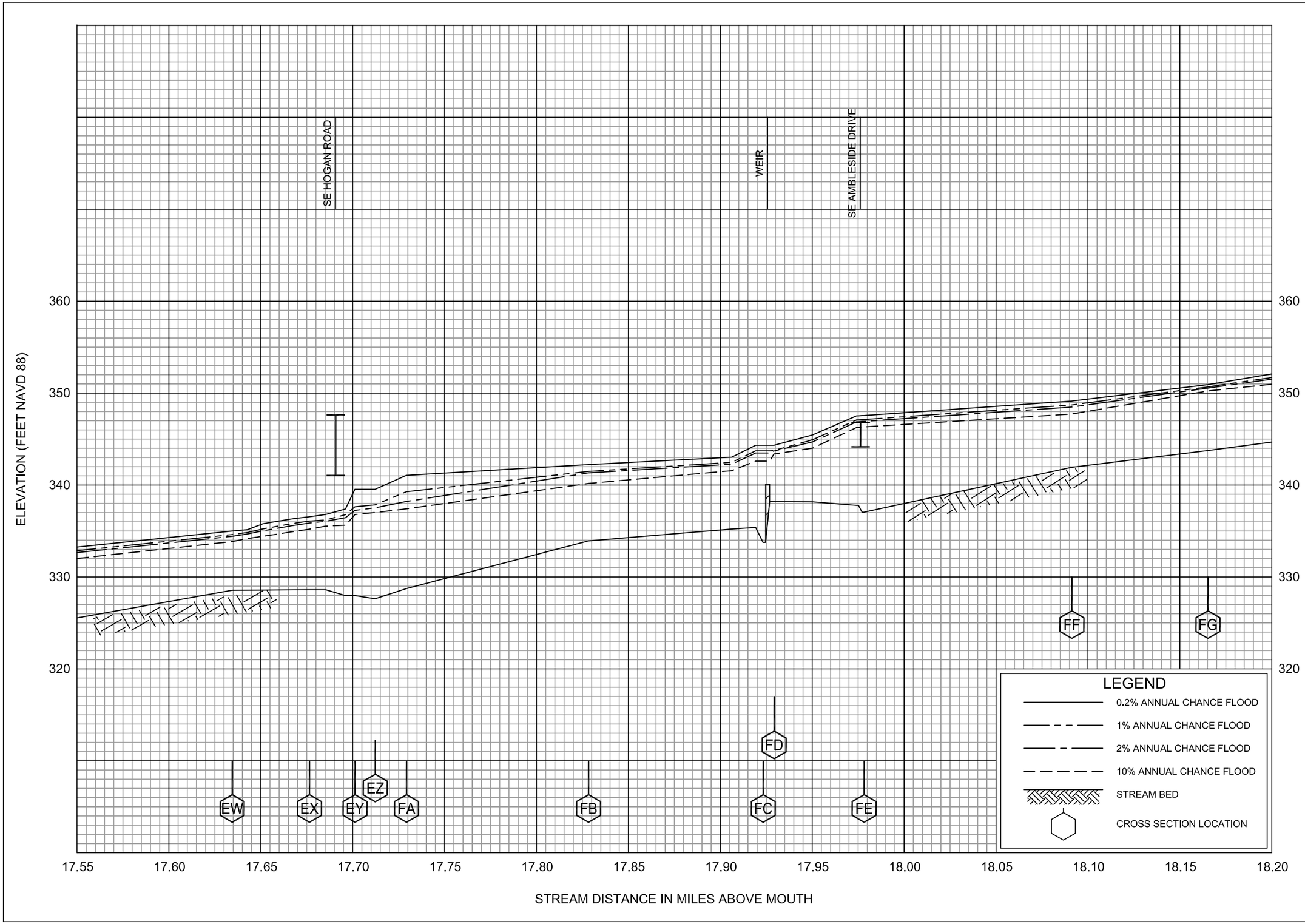

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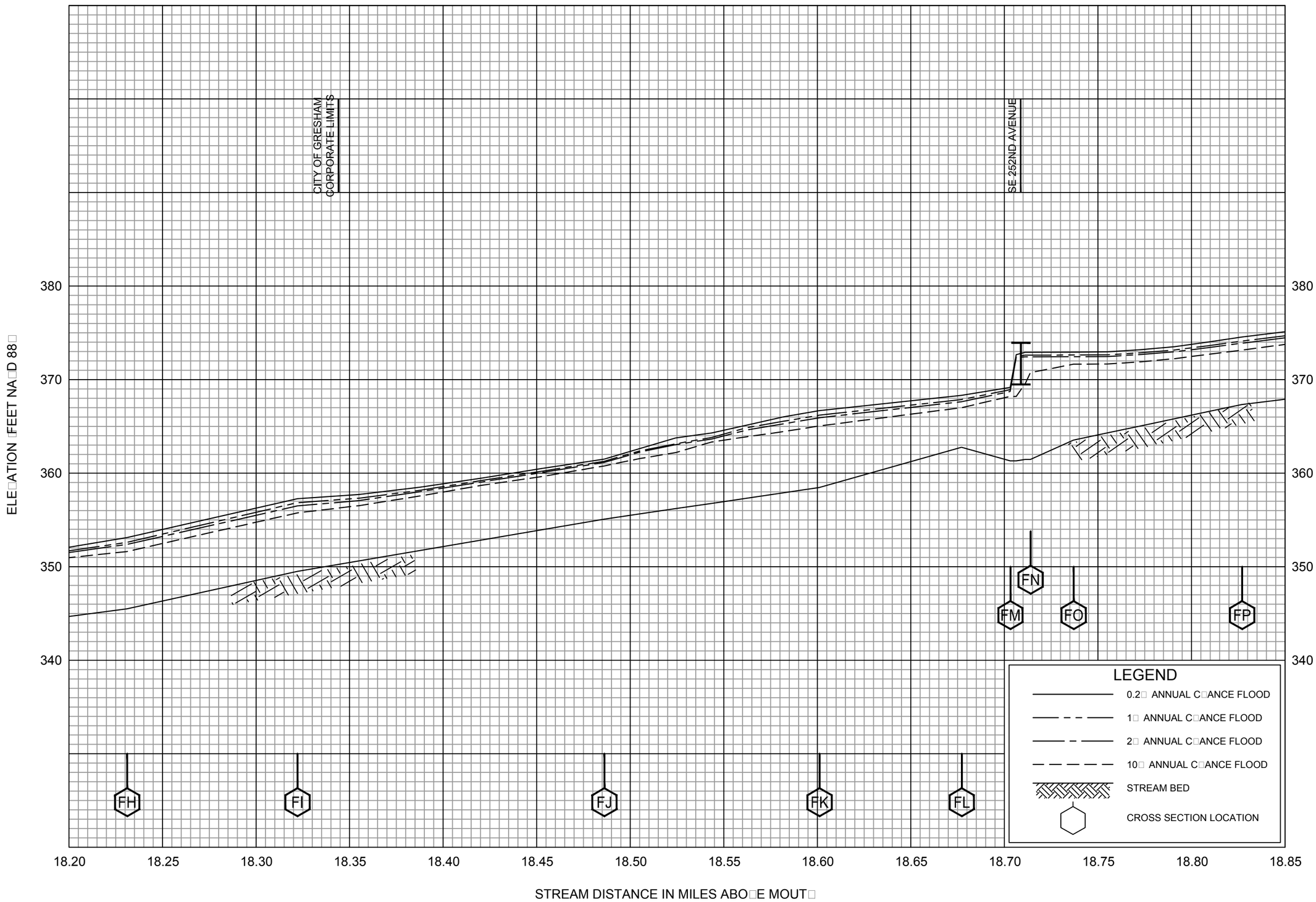

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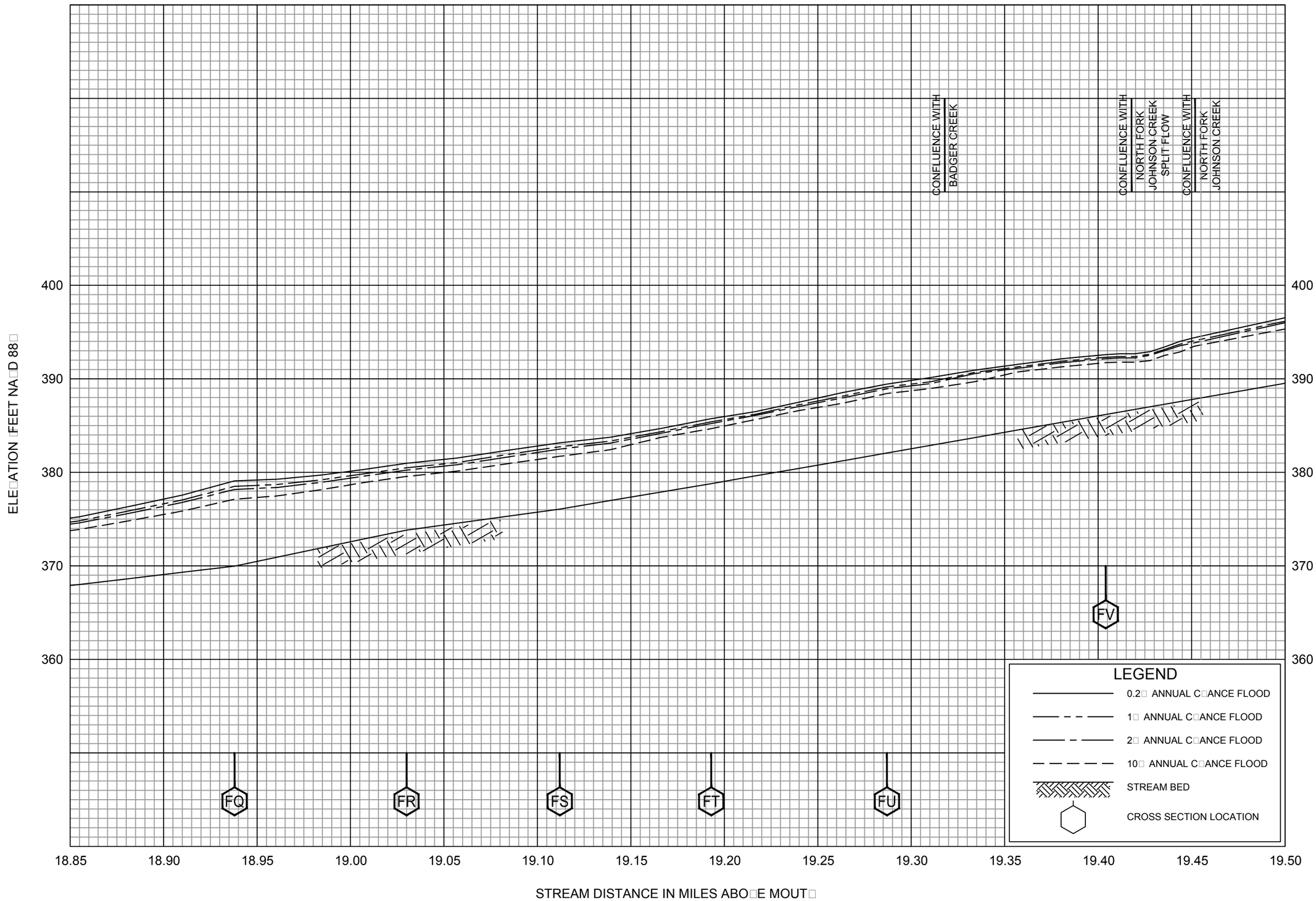

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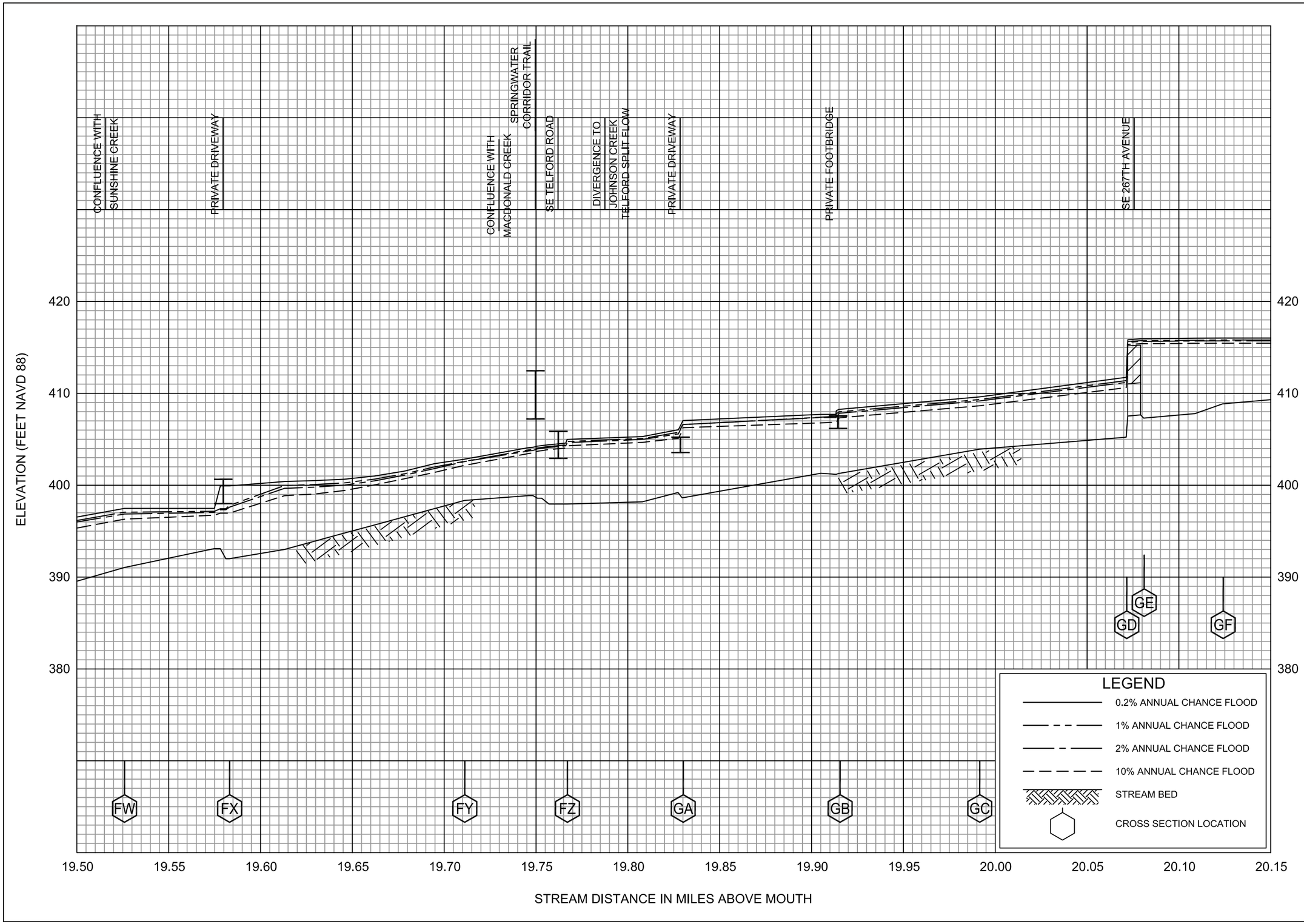

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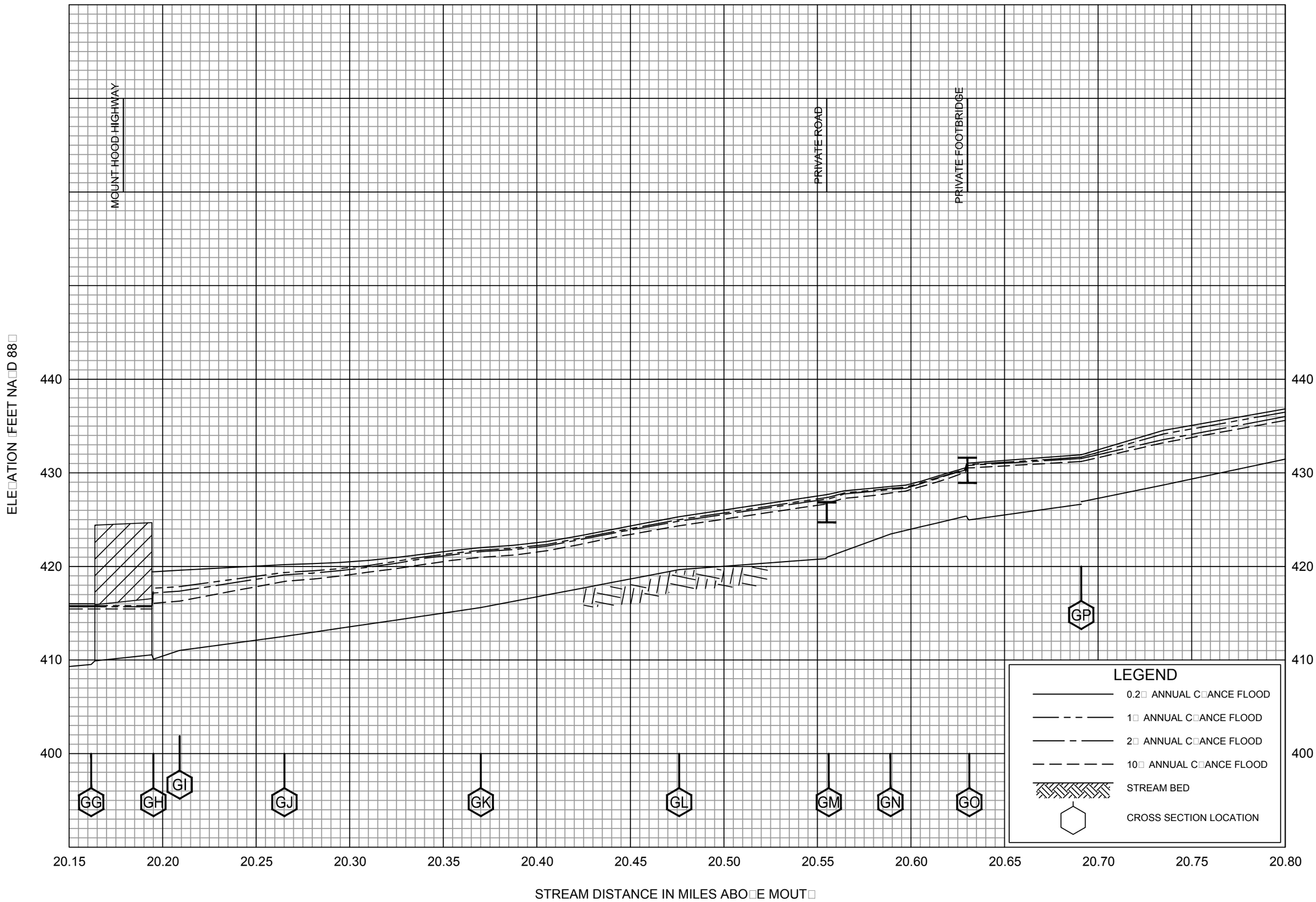

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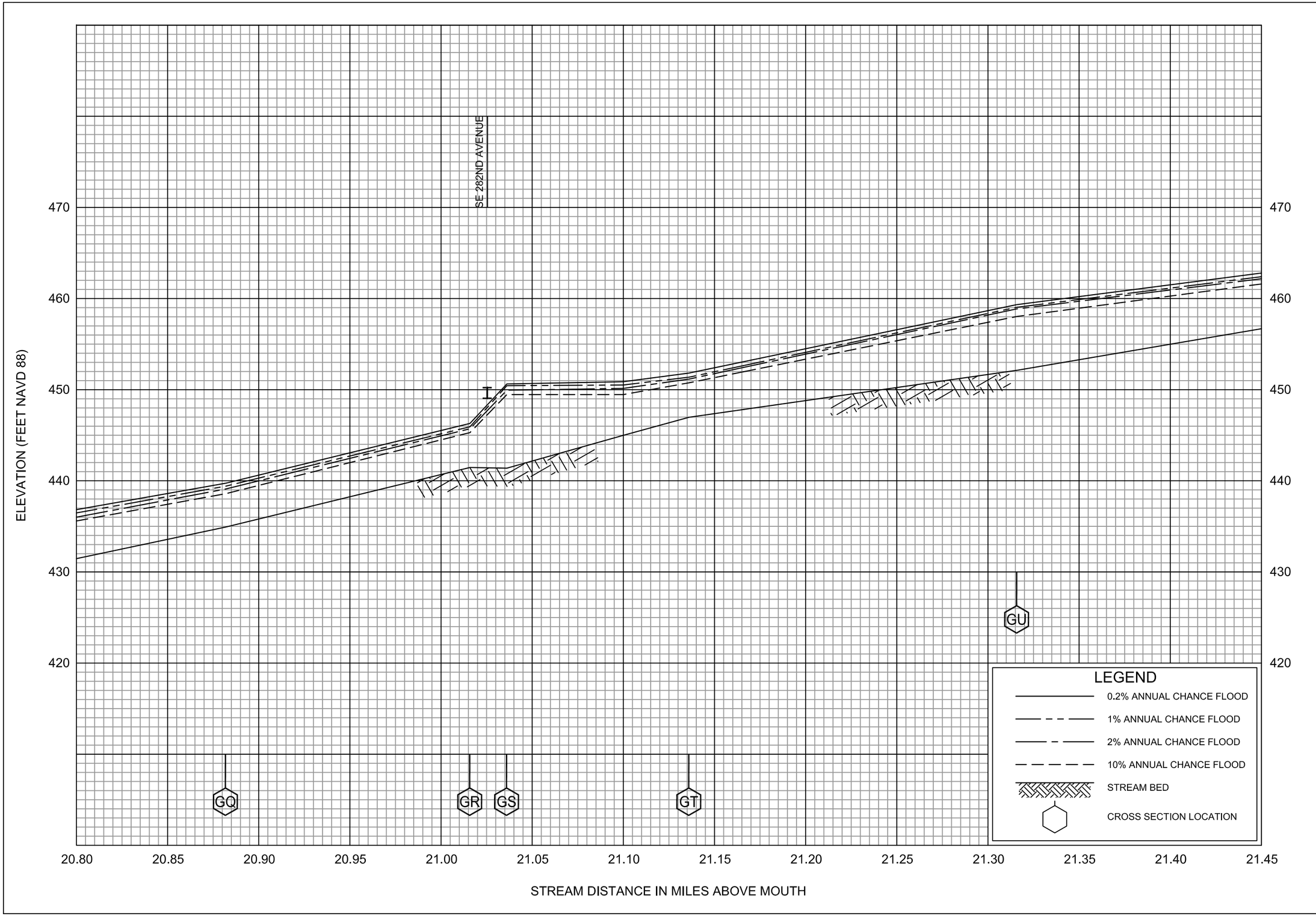

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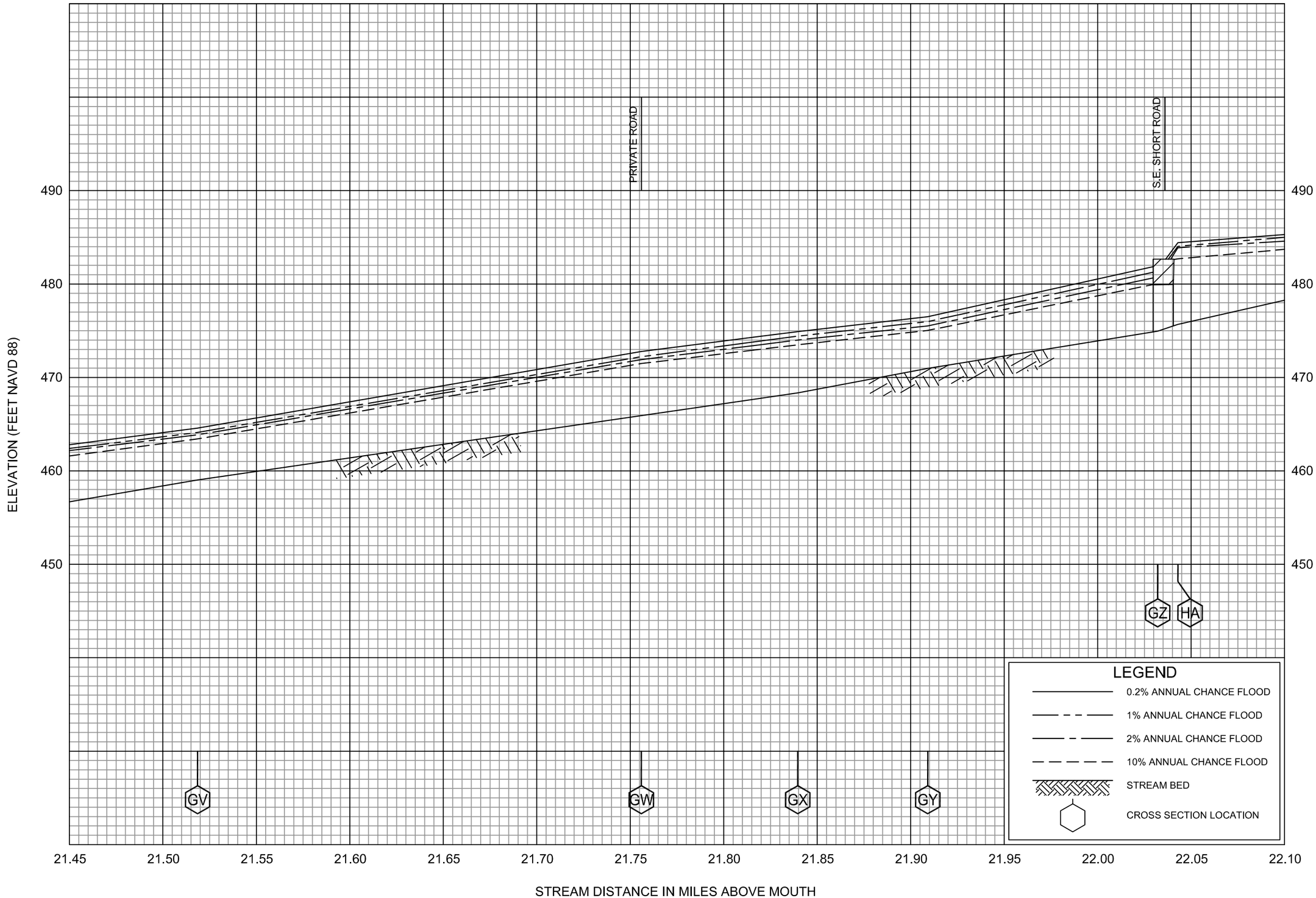

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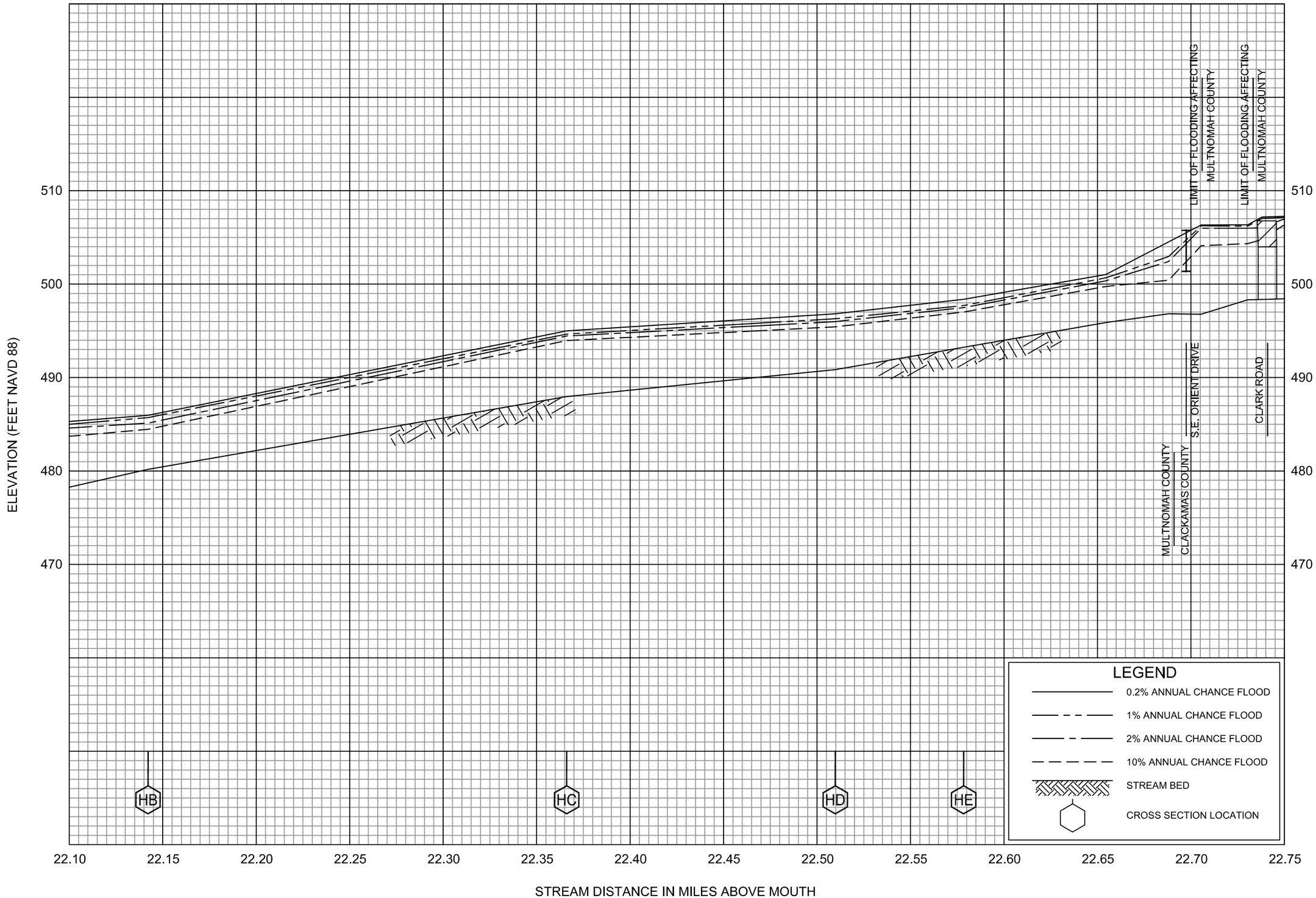

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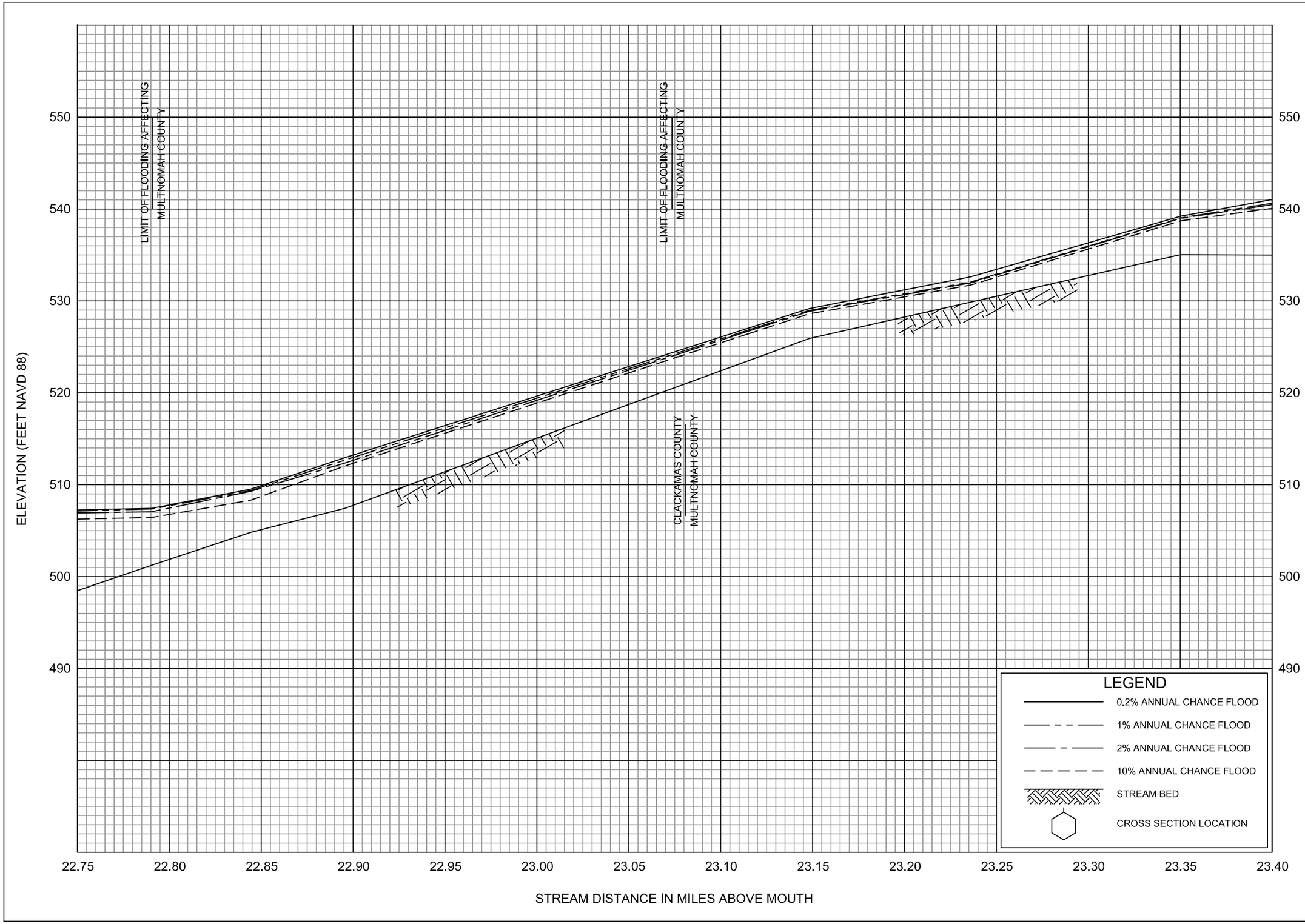

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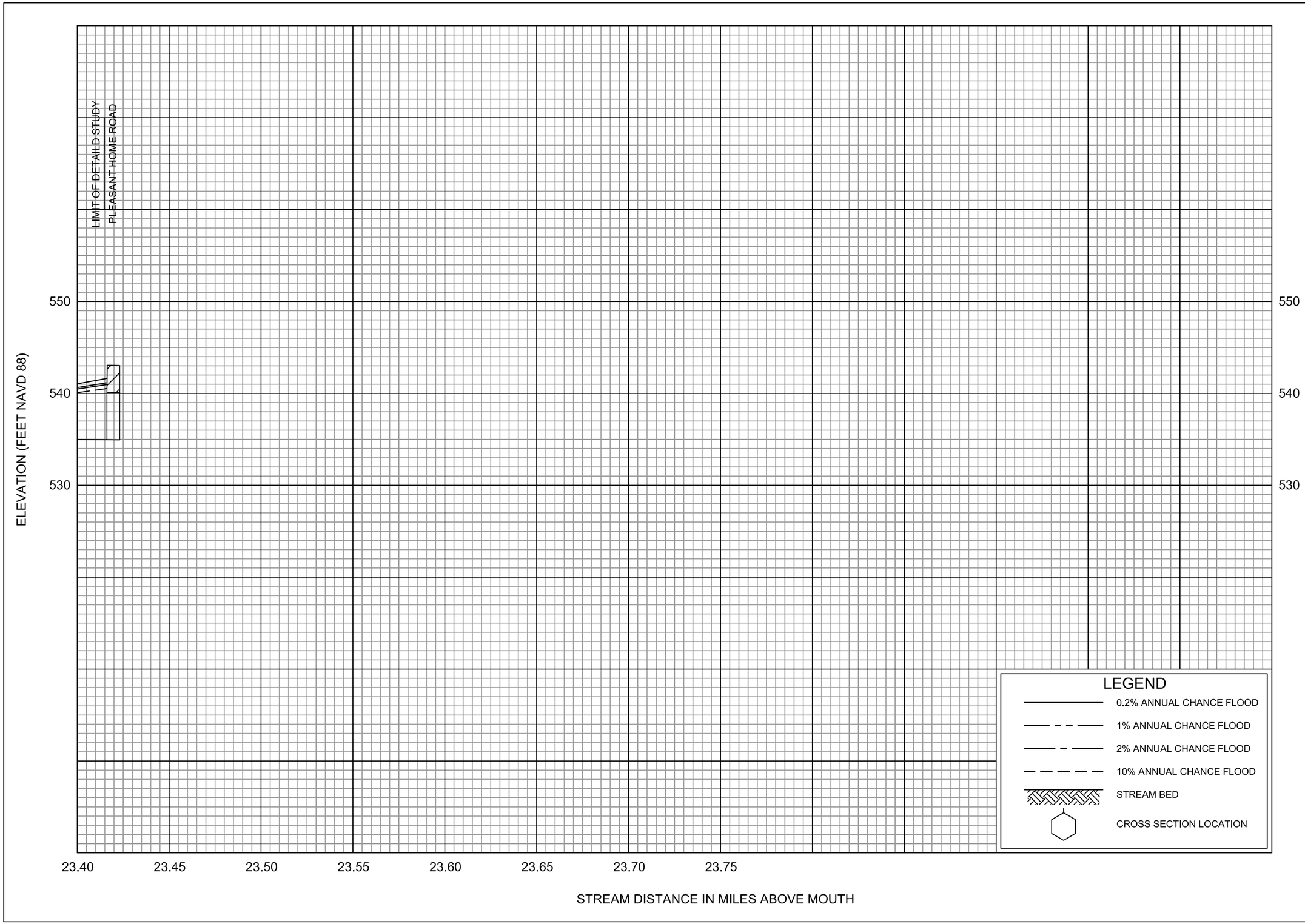

FLOOD PROFILES

JOHNSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

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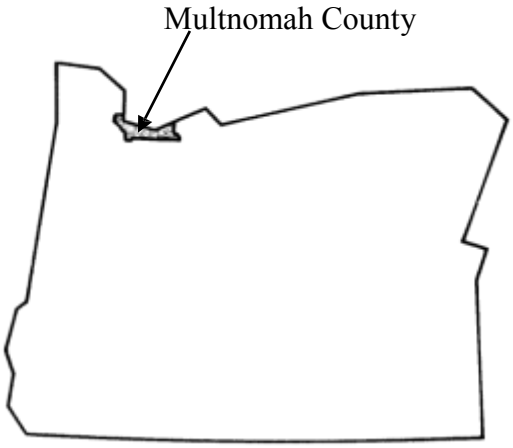
FLOOD INSURANCE STUDY

Volume 2 of 2

MULTNOMAH COUNTY, OREGON AND INCORPORATED AREAS



COMMUNITY NAME	COMMUNITY NUMBER
FAIRVIEW, CITY OF	410180
GRESHAM, CITY OF	410181
*MAYWOOD PARK, CITY OF	410068
MULTNOMAH COUNTY UNINCORPORATED AREAS	410179
TROUTDALE, CITY OF	410184
*WOOD VILLAGE, CITY OF	410185

*No Special Flood Hazard Data

REVISED: February 1, 2019

Federal Emergency Management Agency

Flood Insurance Study Number

41051CV002B

Exhibit B2

NOTICE TO
FLOOD INSURANCE STUDY USERS

Communities participating in the National Flood Insurance Program have established repositories of flood hazard data for floodplain management and flood insurance purposes. This Flood Insurance Study (FIS) report may not contain all data available within the Community Map Repository. Please contact the Community Map Repository for any additional data.

The Federal Emergency Management Agency (FEMA) may revise and republish part or all of this FIS report at any time. In addition, FEMA may revise part of this FIS report by the Letter of Map Revision process, which does not involve republication or redistribution of the FIS report. Therefore, users should consult with community officials and check the Community Map Repository to obtain the most current FIS report components.

This preliminary FIS report does not include unrevised Floodway Data Tables or unrevised Flood Profiles. These Floodway Data Tables and Flood Profiles will appear in the final FIS report.

Initial Countywide FIS Effective Date: December 18, 2009
Revised Countywide Date: February 1, 2019

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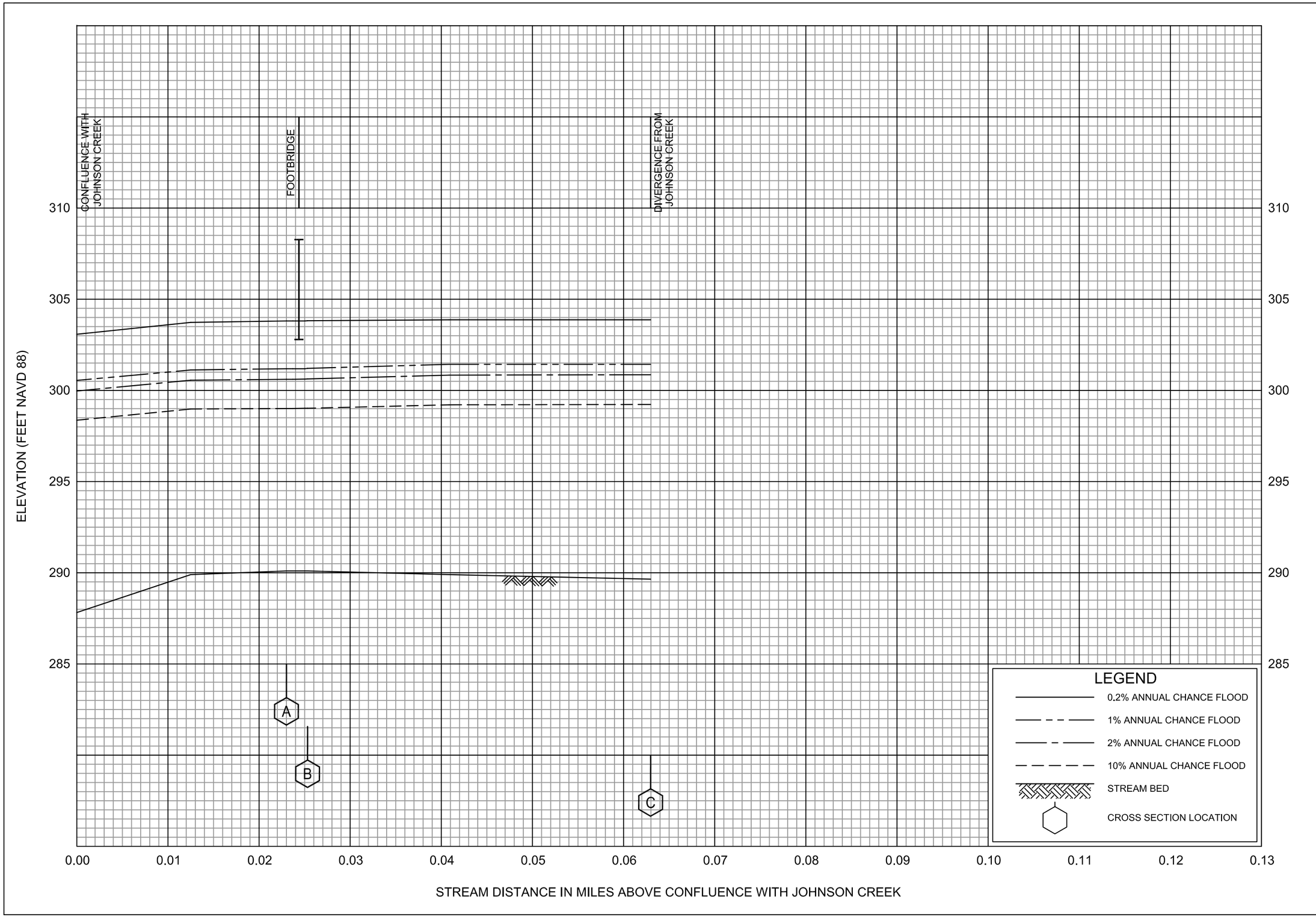
Johnson Creek City Park Side Channel	50P
Johnson Telford Split Flow	51P
Kelley Creek	52P– 56P
Kelly Creek	57P – 60P
MacDonald Creek	61P
Multnomah Channel	62P – 63P
North Fork Johnson Creek	64P – 66P
North Fork Johnson Creek Split Flow	67P
Sandy River	68P – 71P
Sunshine Creek	72P
Unnamed Tributary to Rock Creek	73P
Willamette River	74P – 75P

PUBLISHED SEPARATELY

Exhibit 2 - Flood Insurance Rate Map Index
Flood Insurance Rate Map

Exhibit B2



FLOOD PROFILES

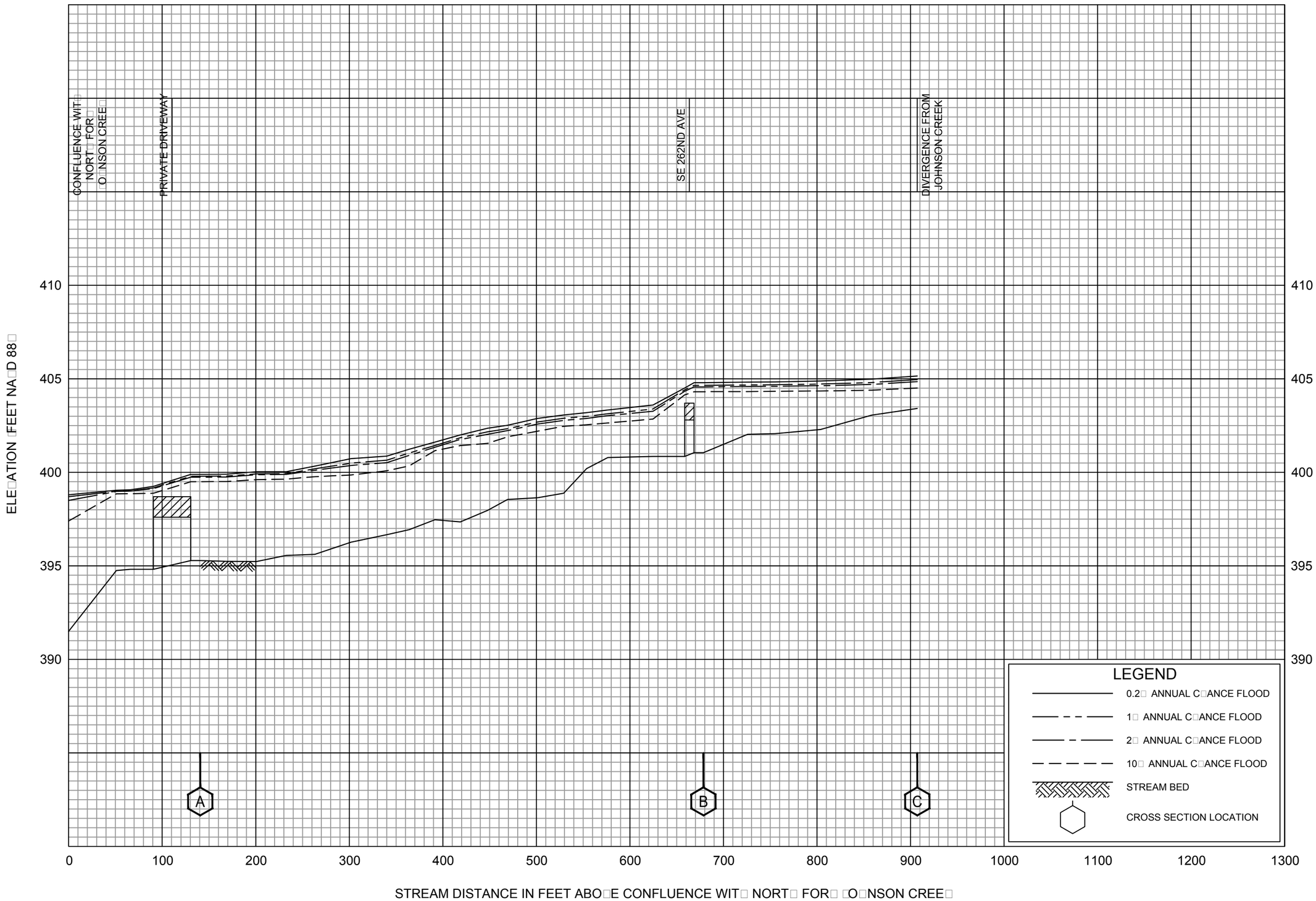
JOHNSON CREEK CITY PARK SIDE CHANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

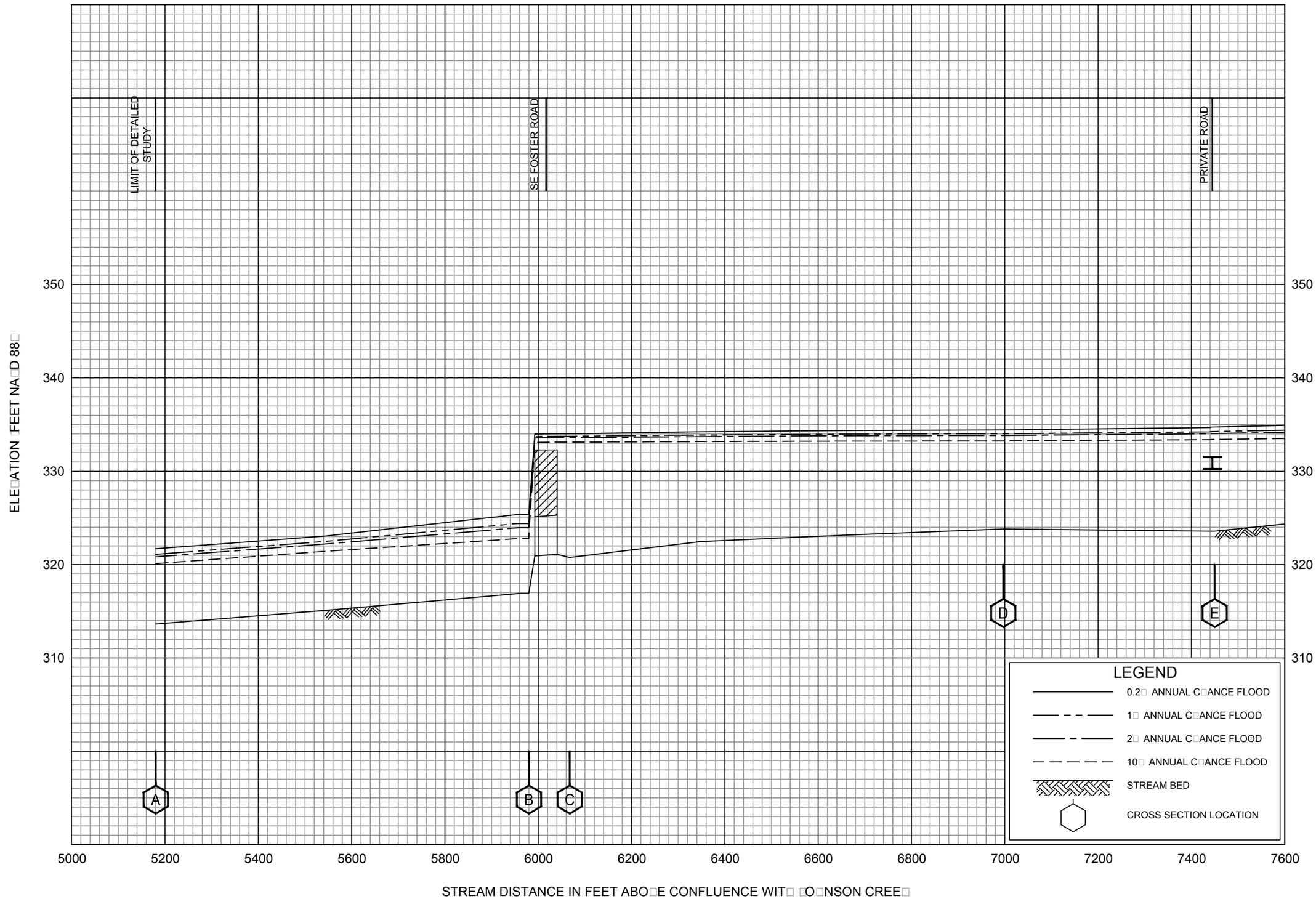
O NSON CREE TELFORD SPLIT FLOW

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

□ELLEY CREE□

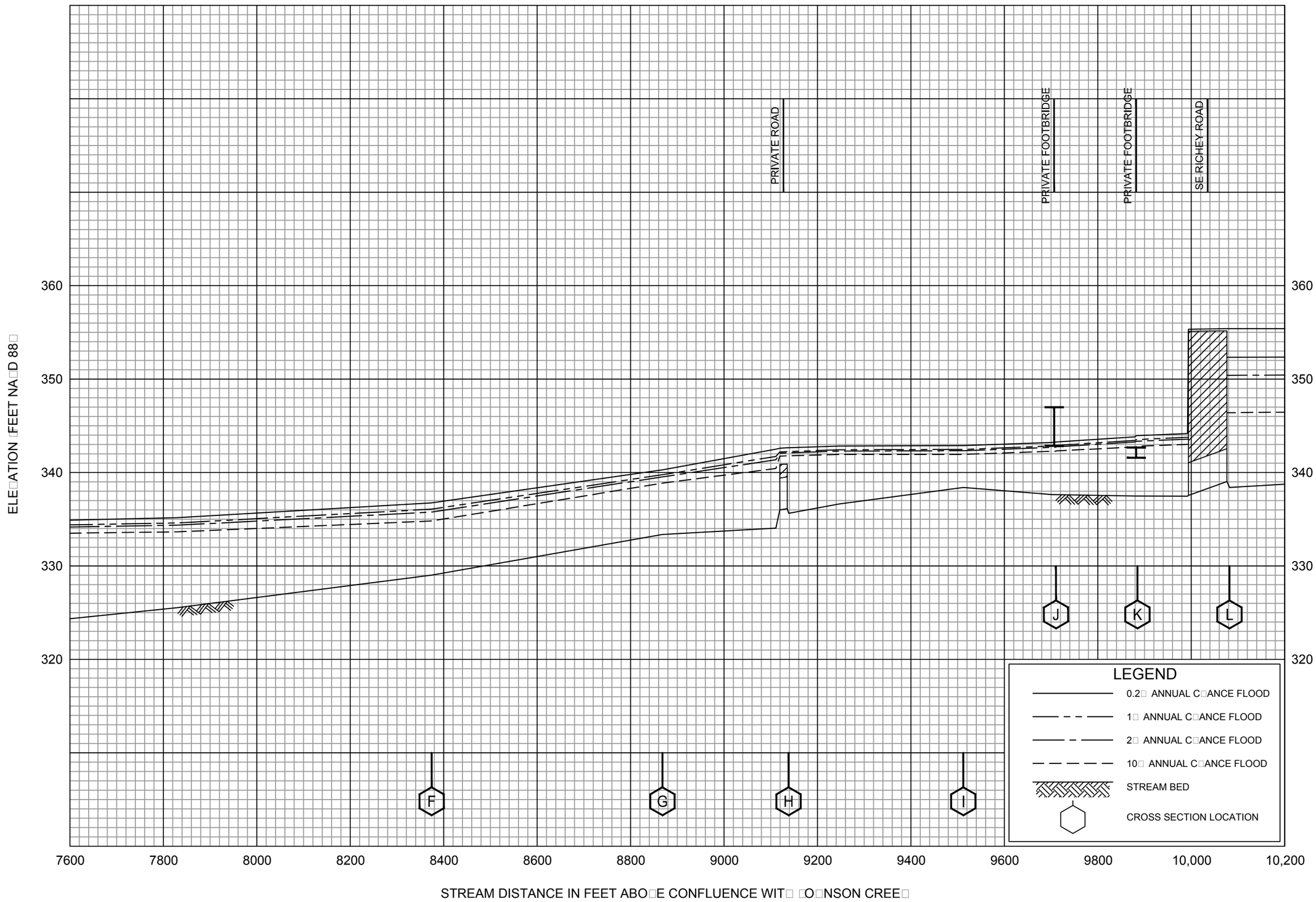
FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

52P

Exhibit B2



FLOOD PROFILES

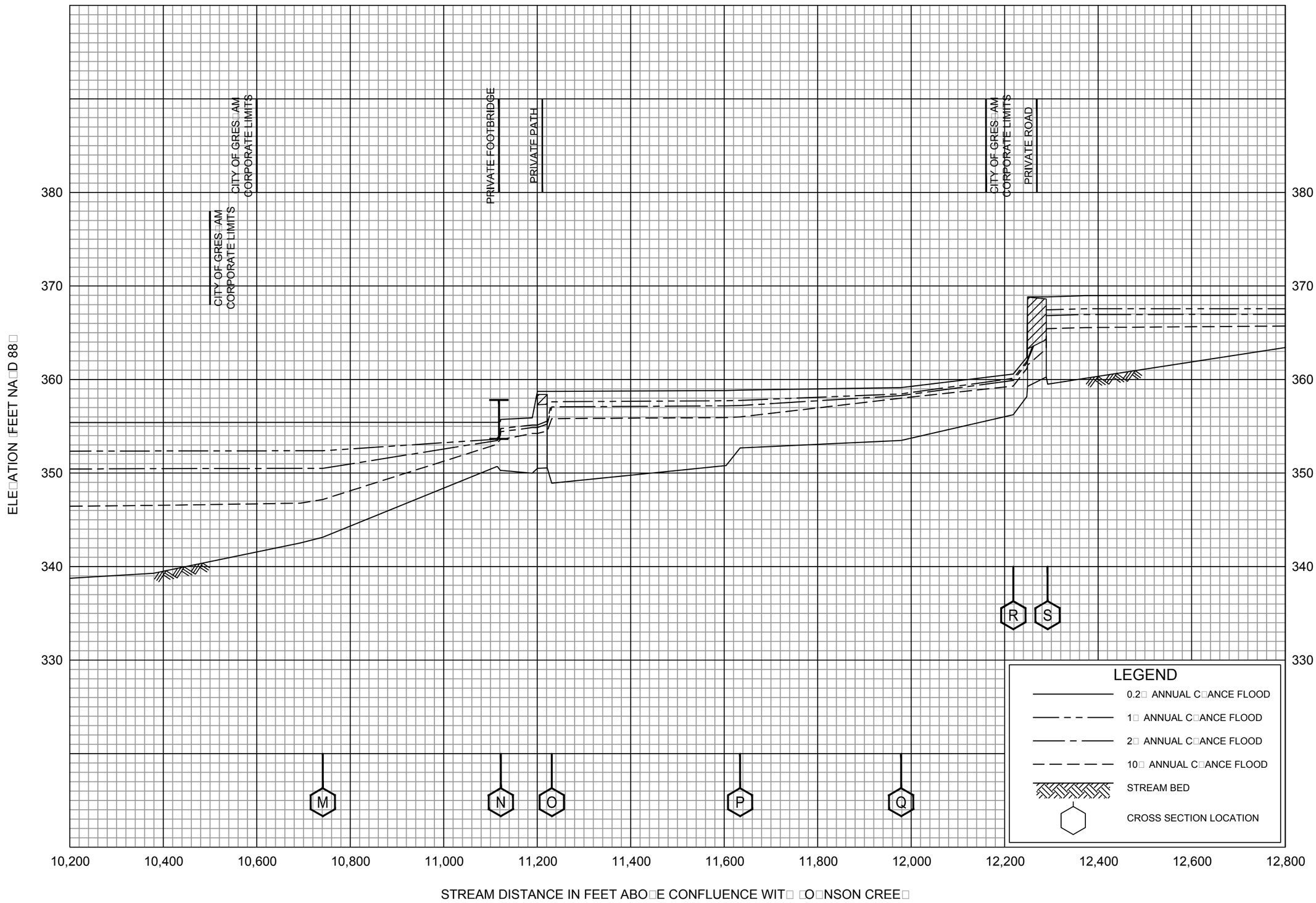
ELLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

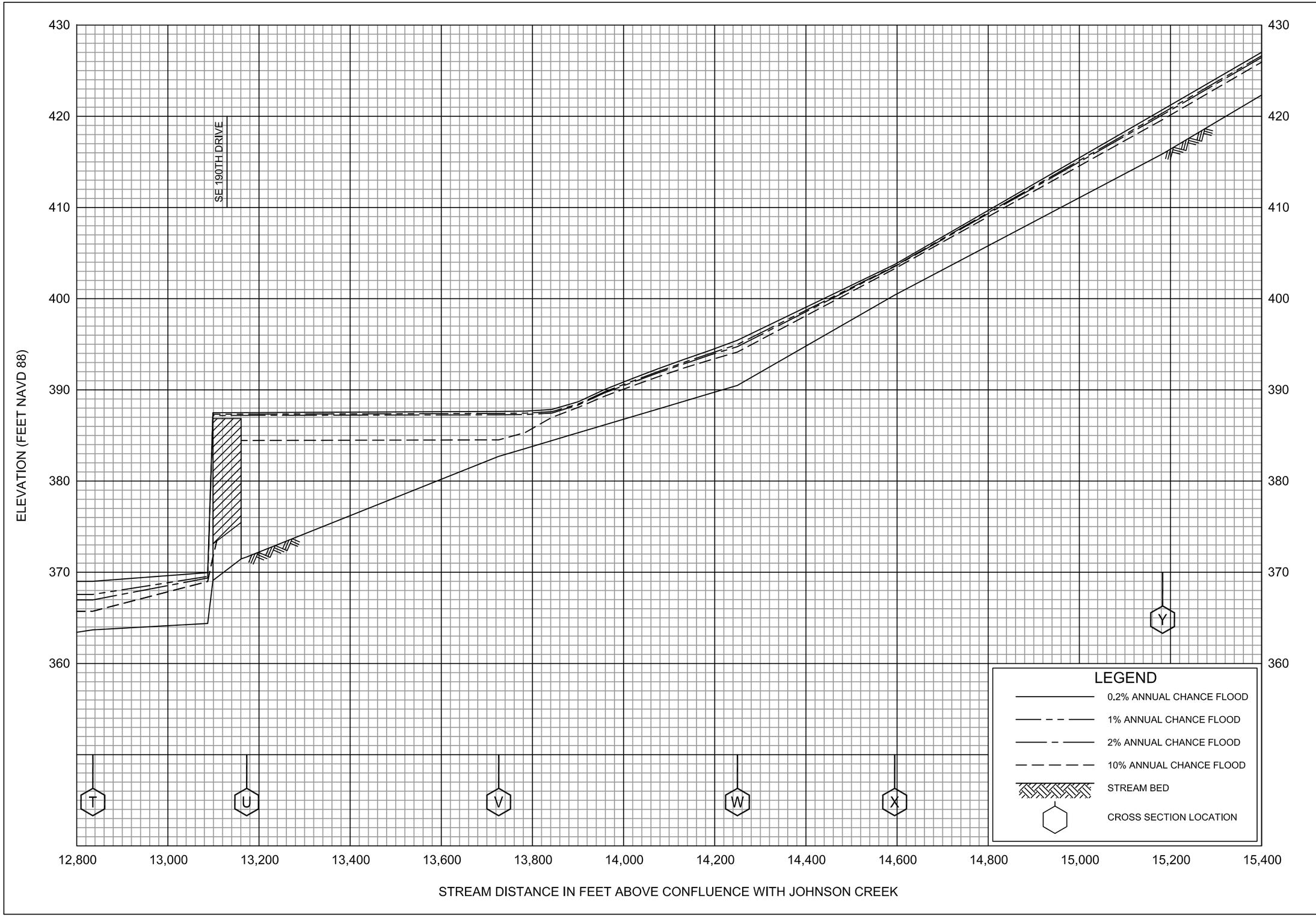
□ELLEY CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

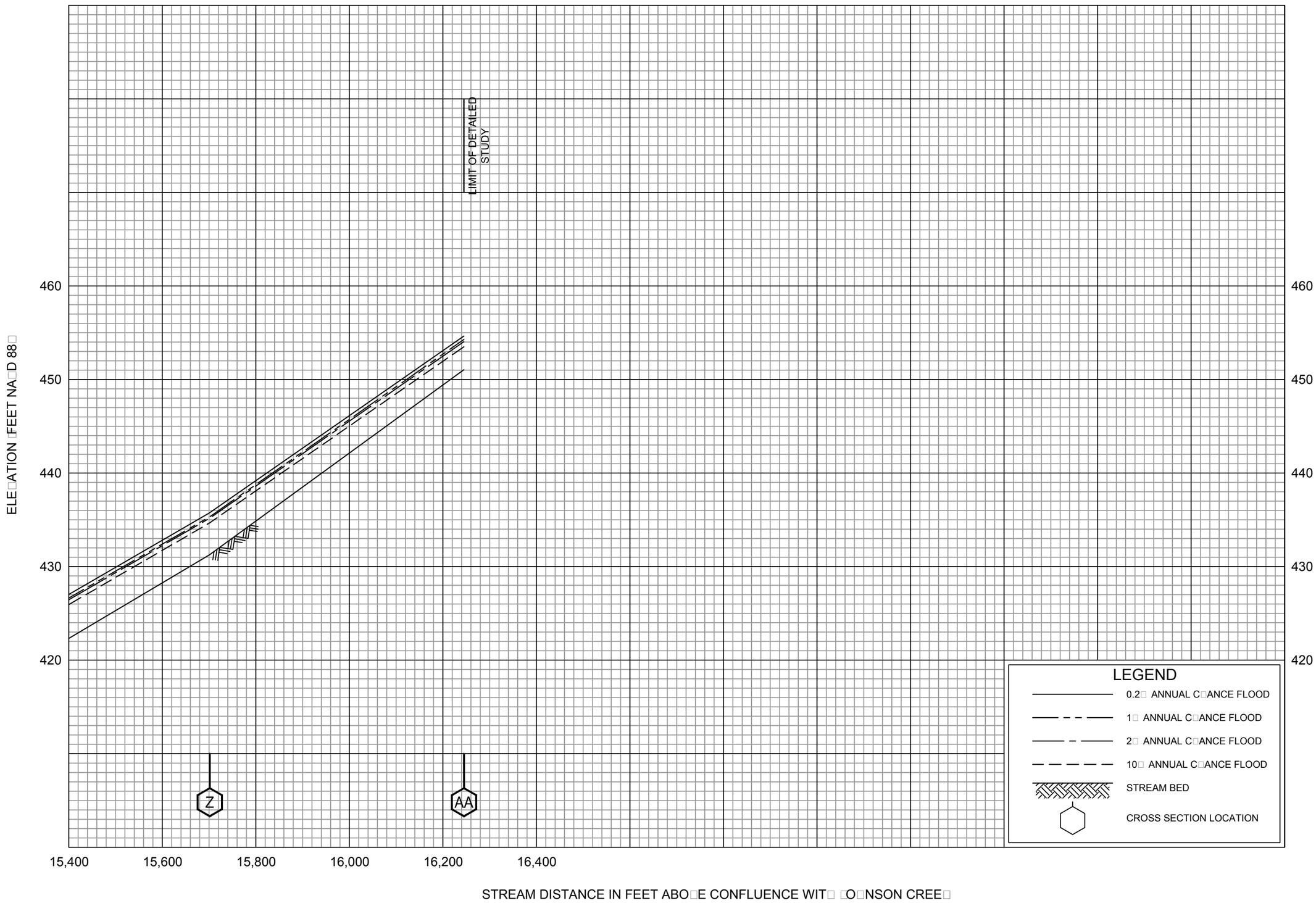
KELLEY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

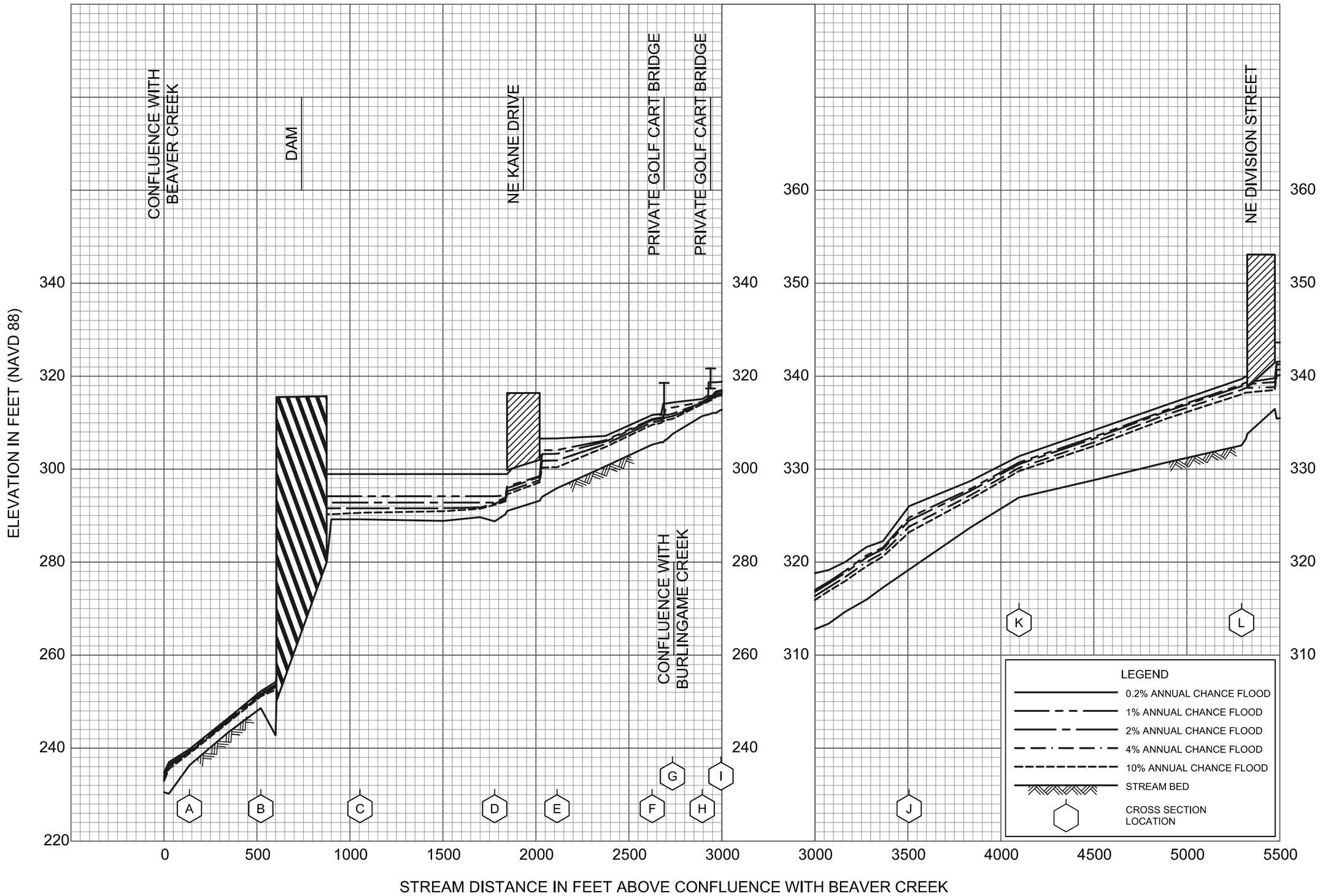
□ELLEY CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

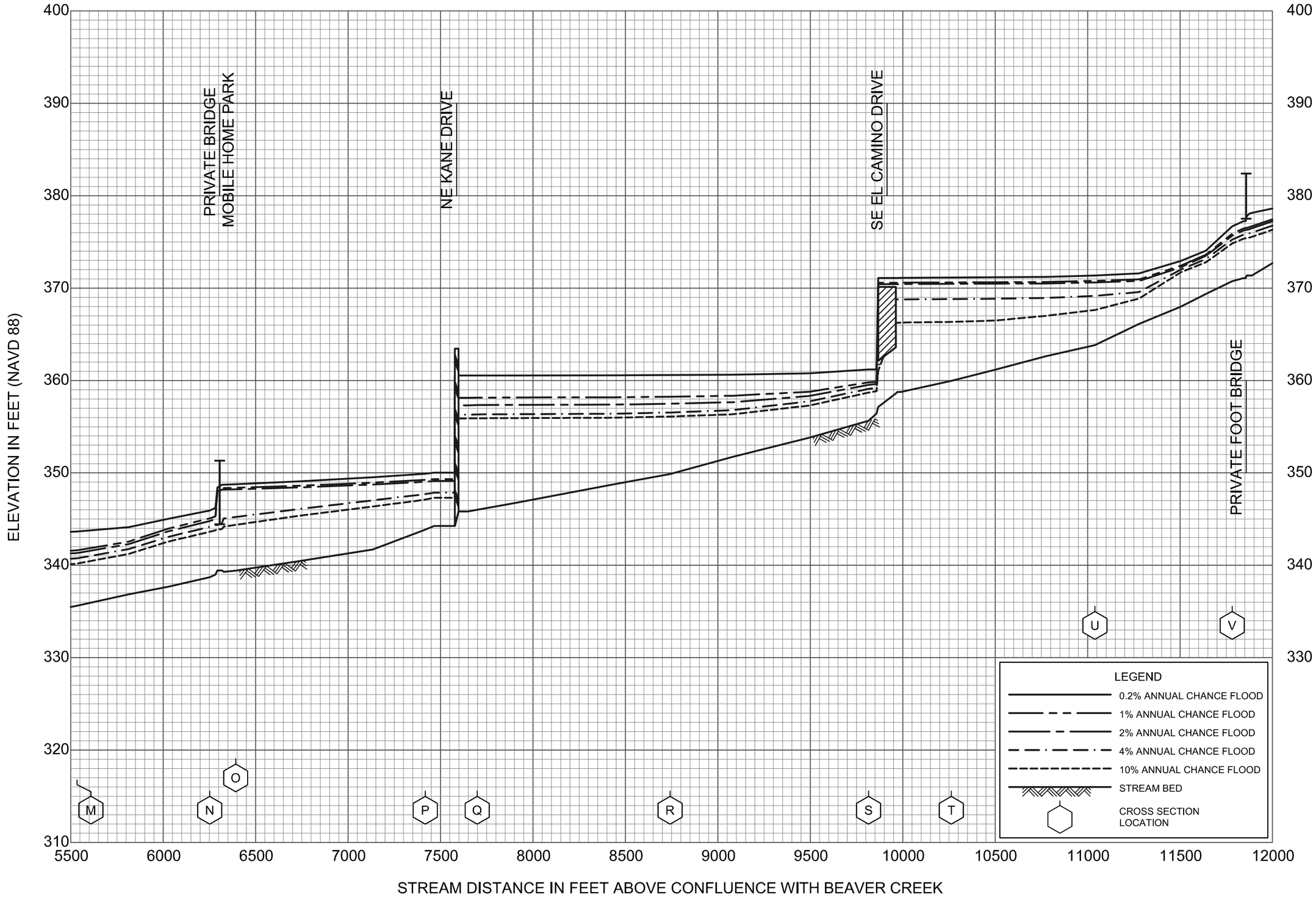
KELLY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

KELLY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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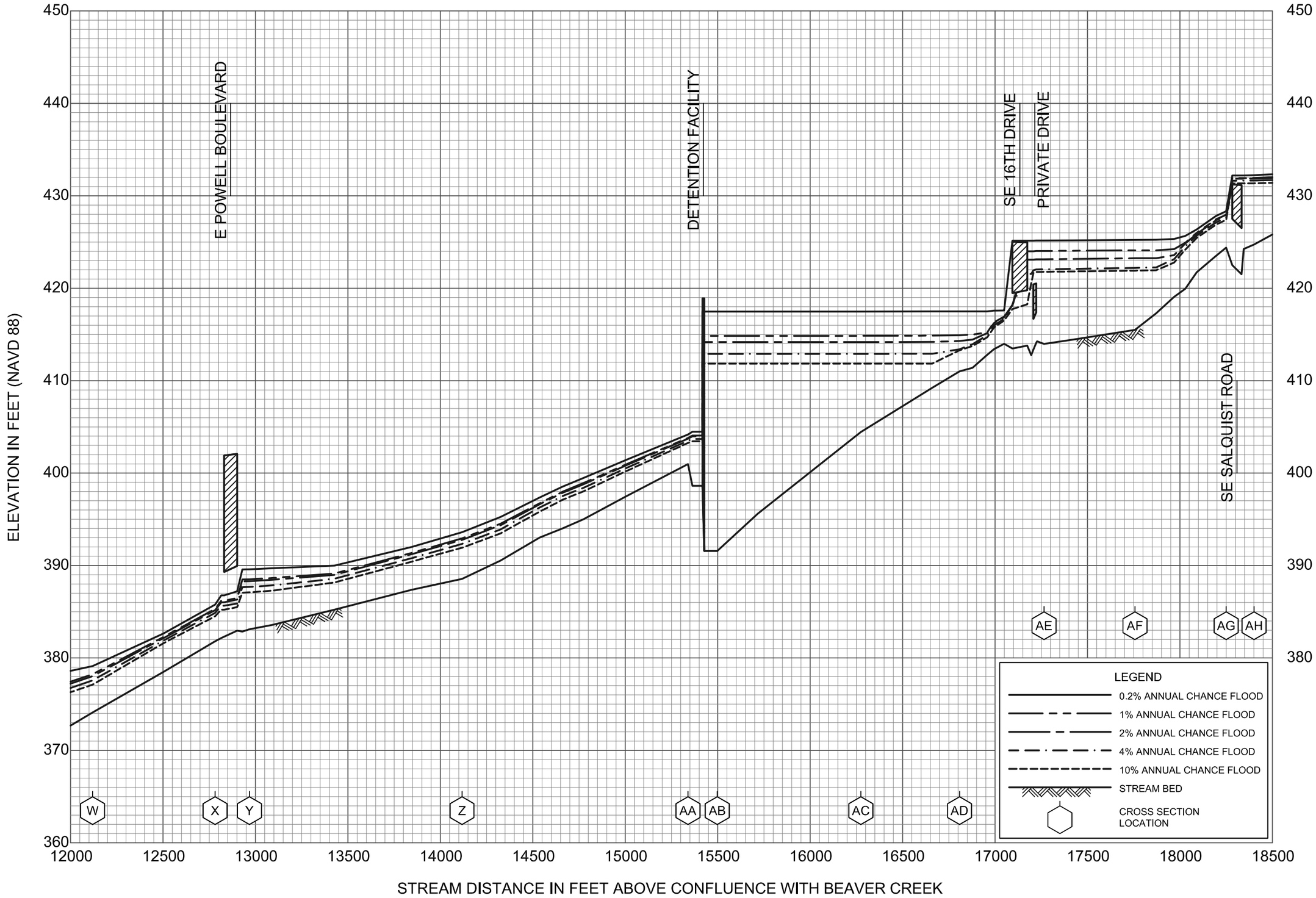


FLOOD PROFILES

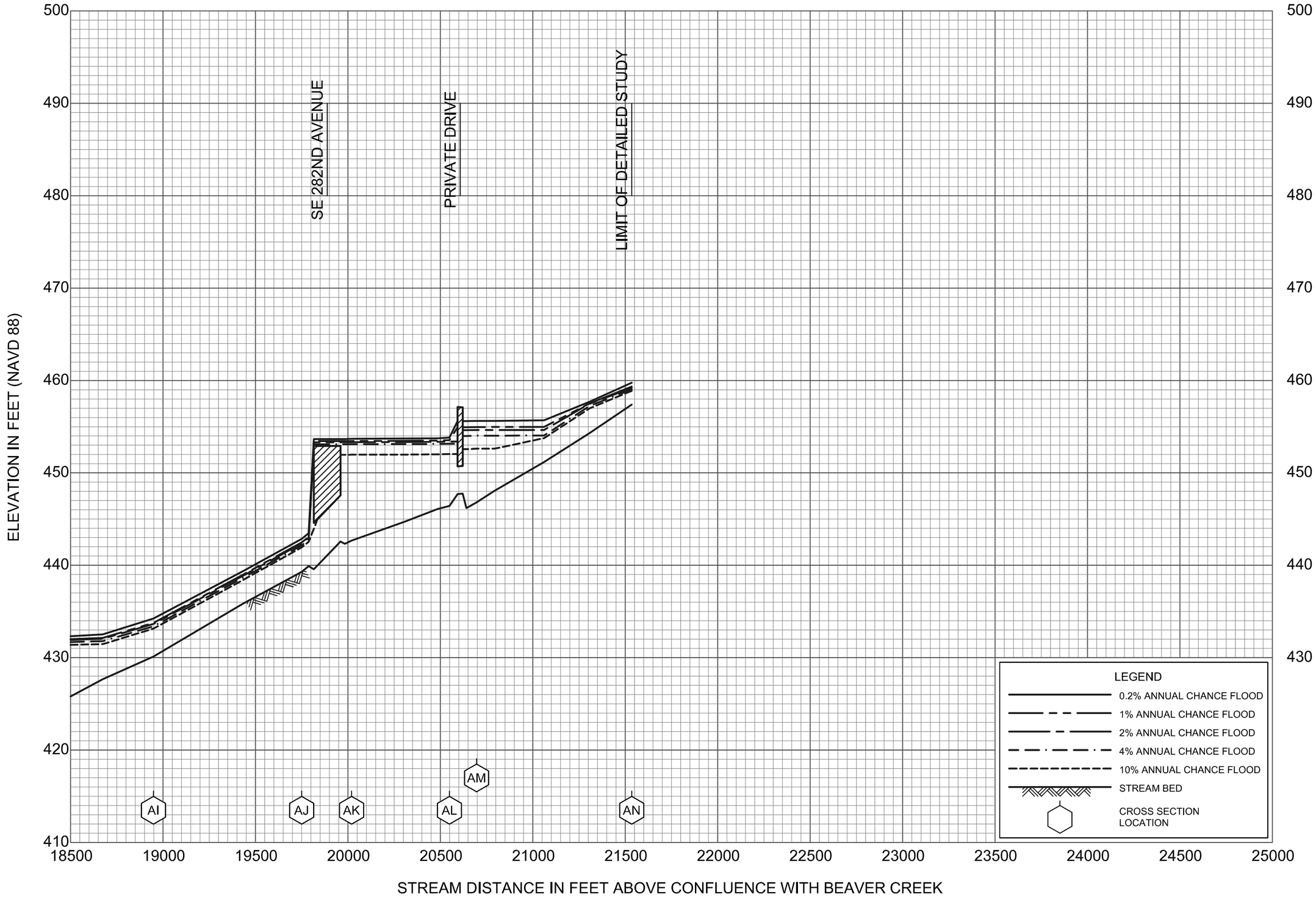
KELLY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

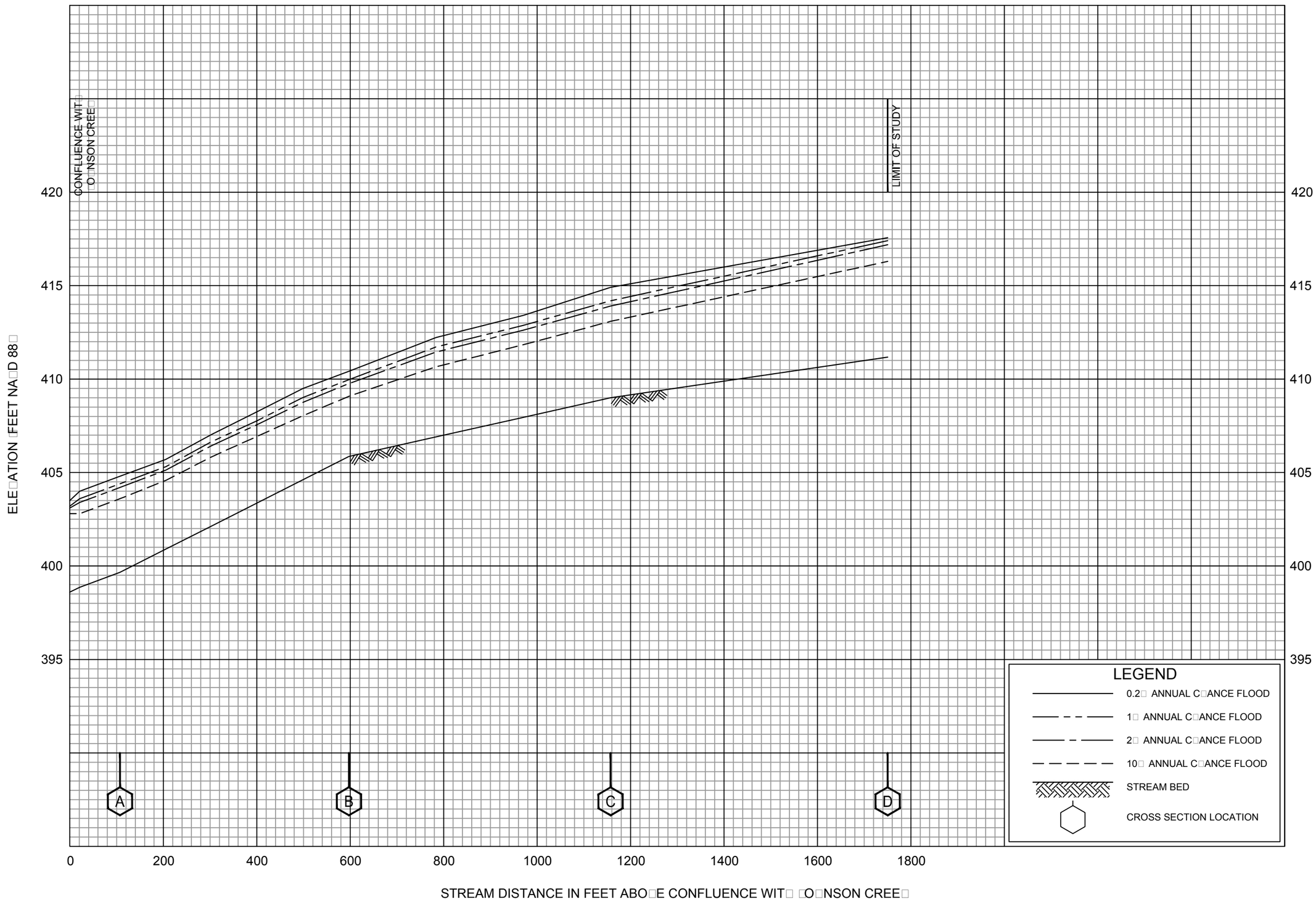
KELLY CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

MACDONALD CREE

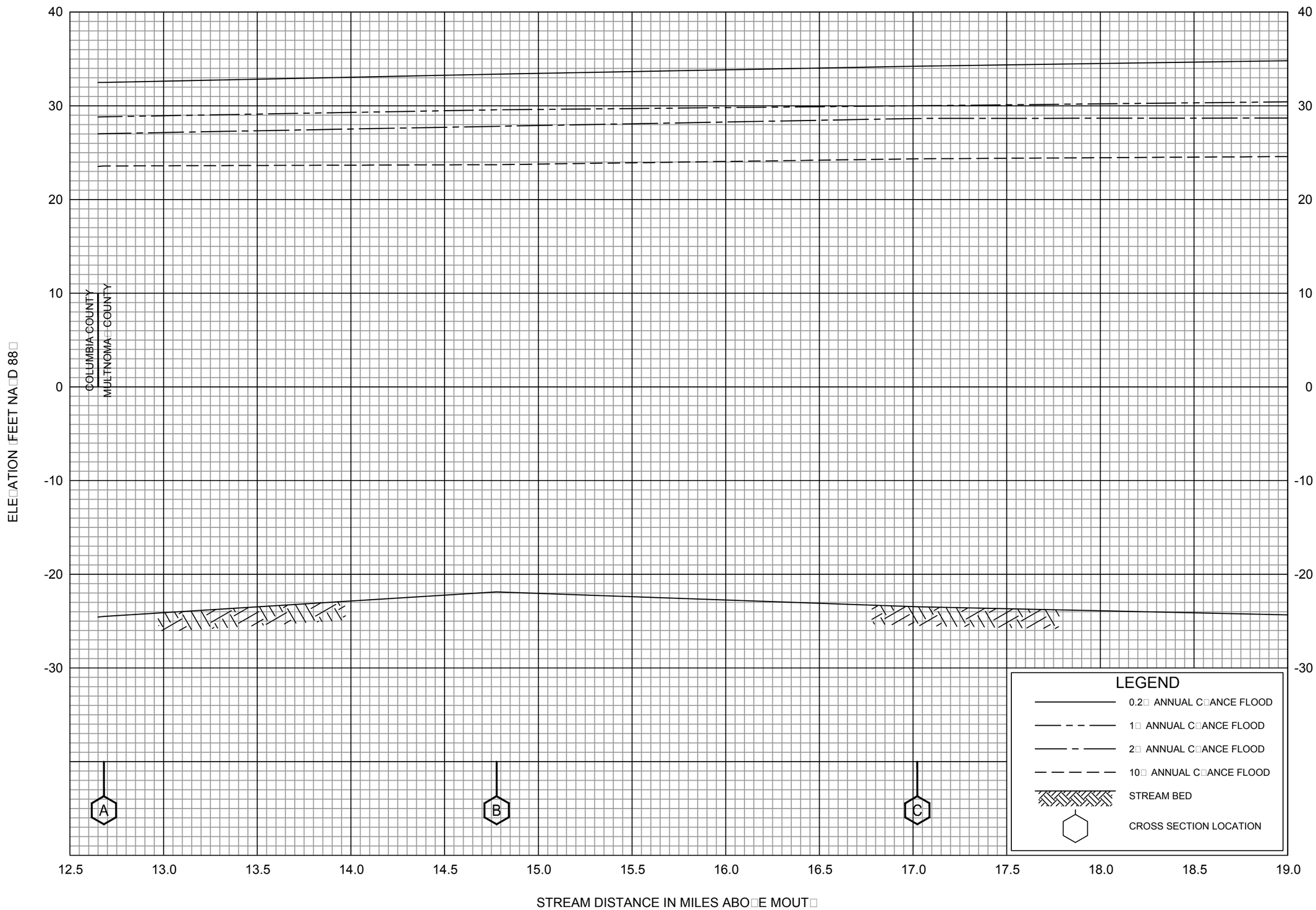
FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

61P

Exhibit B2



FLOOD PROFILES

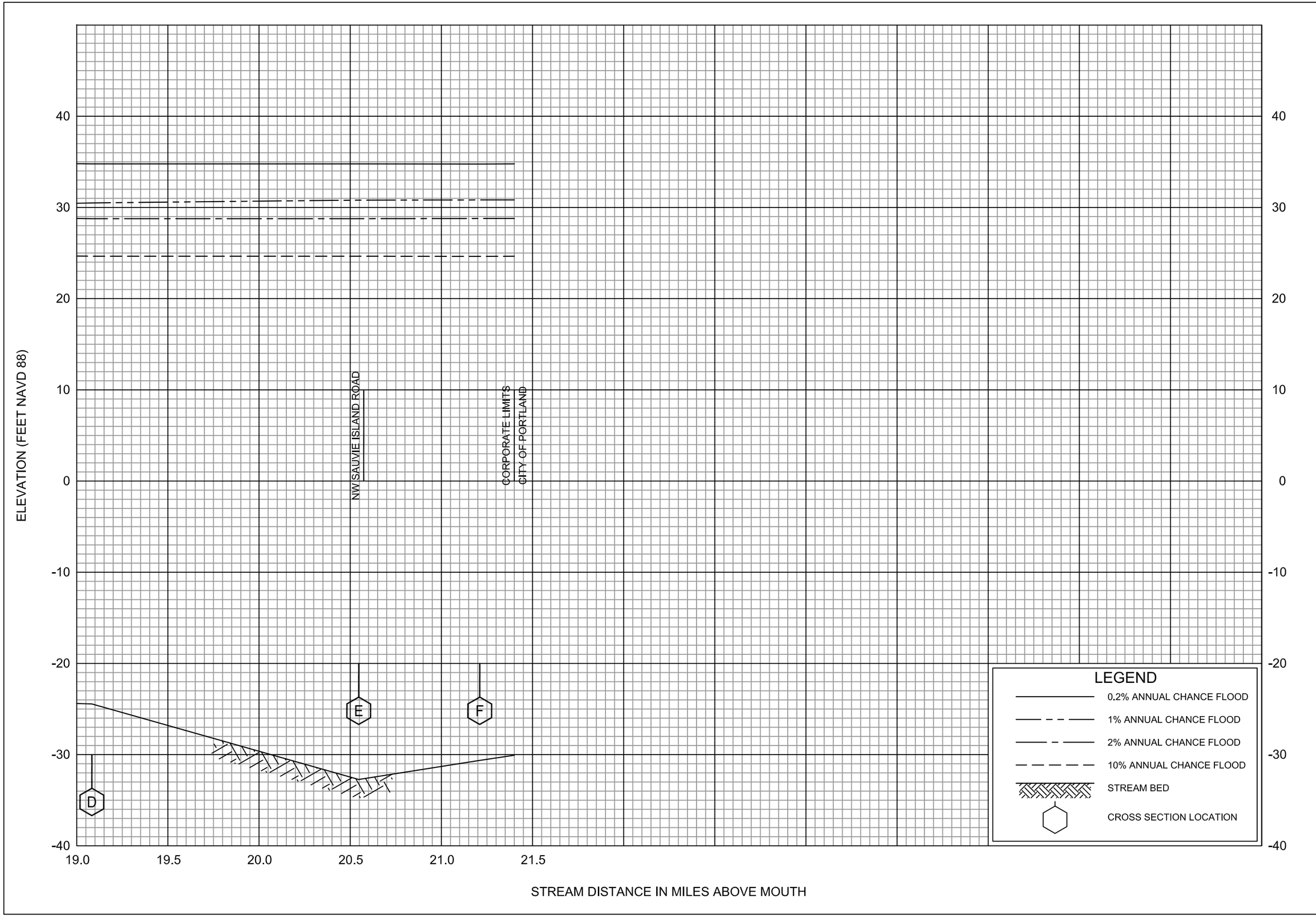
MULTNOMA□ C□ANNEL

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

MULTNOMAH CHANNEL

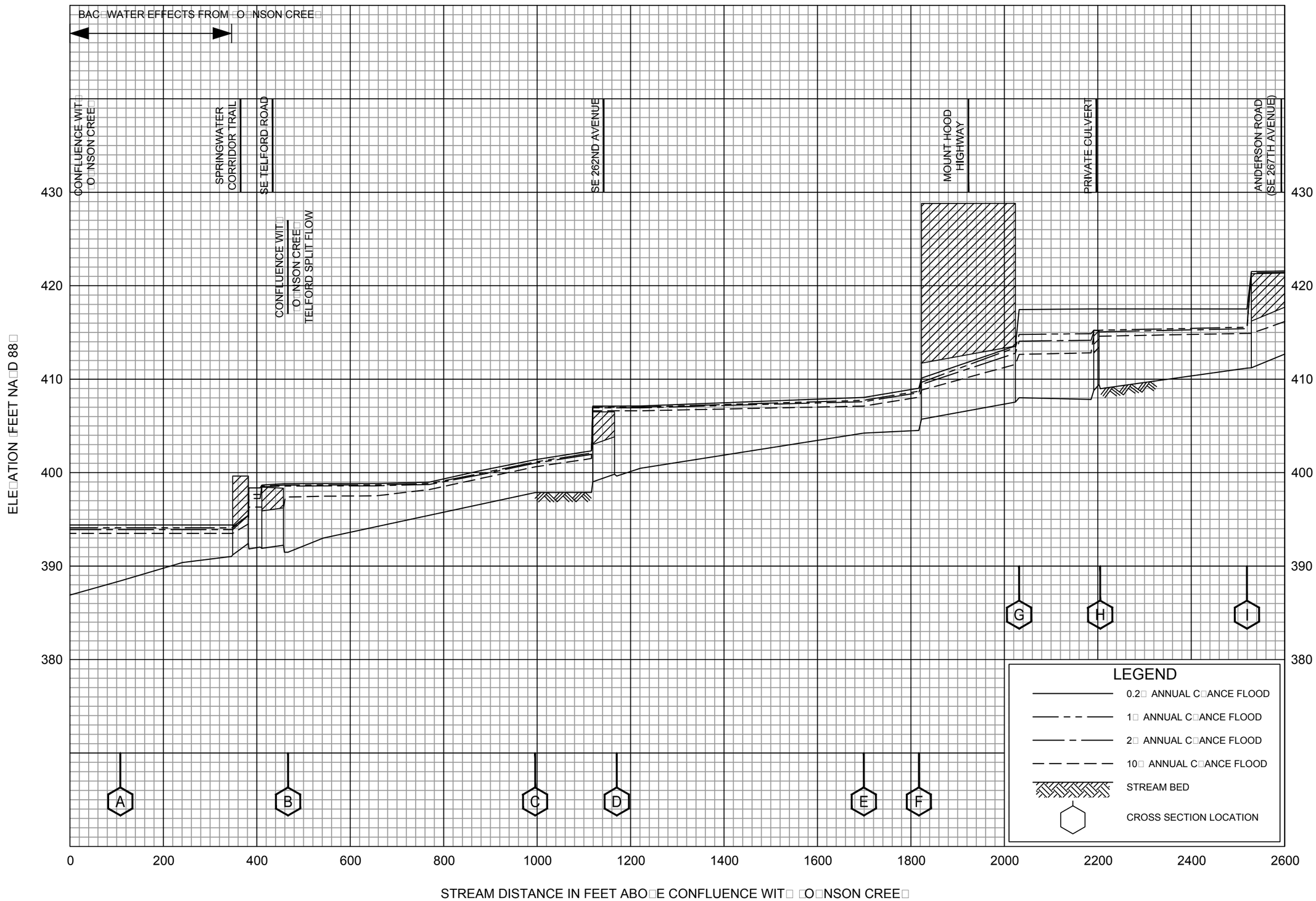
FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

63P

Exhibit B2



FLOOD PROFILES

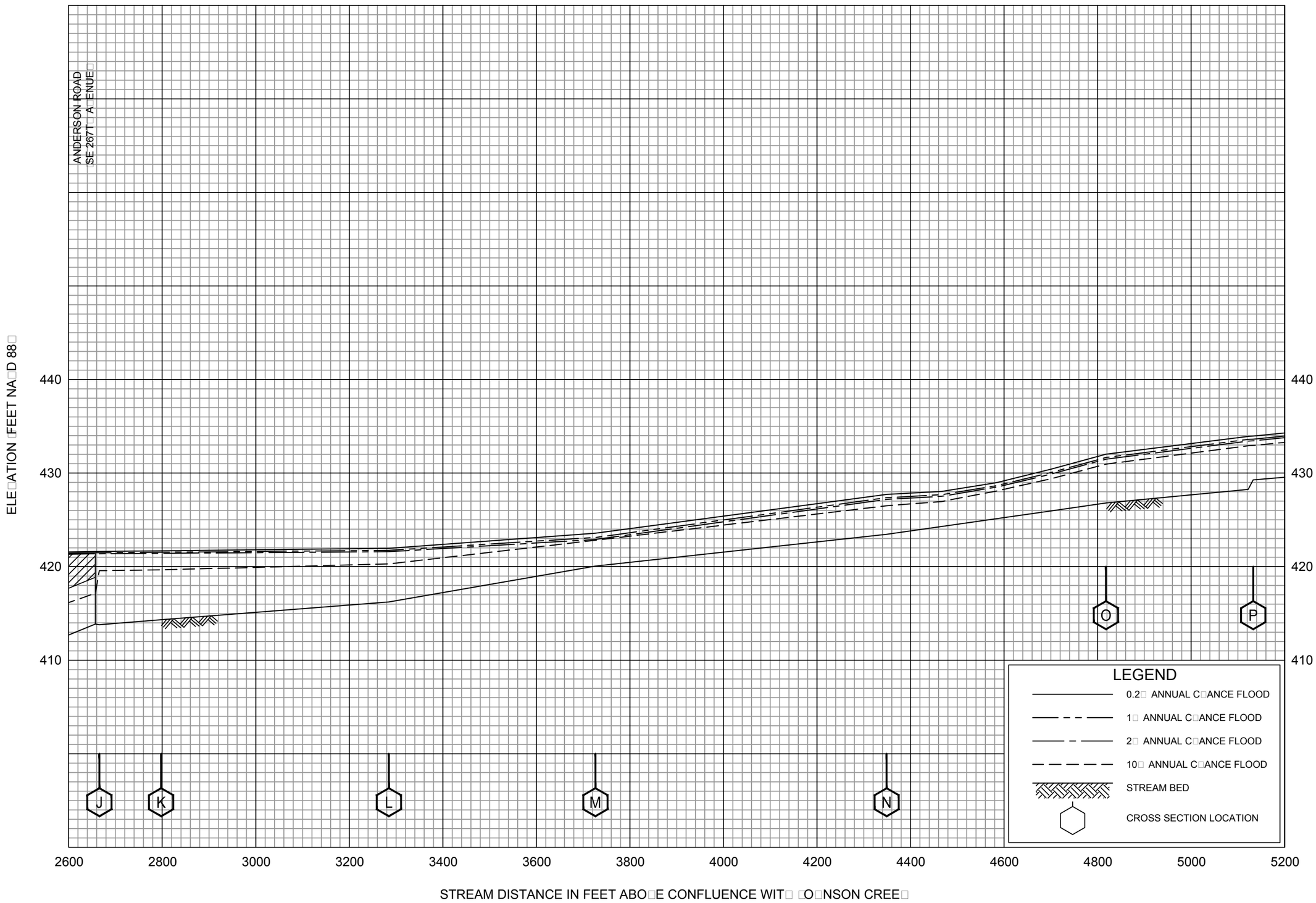
NORTH FORK JOHNSON CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

NORT□ FOR□ □O□NSON CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

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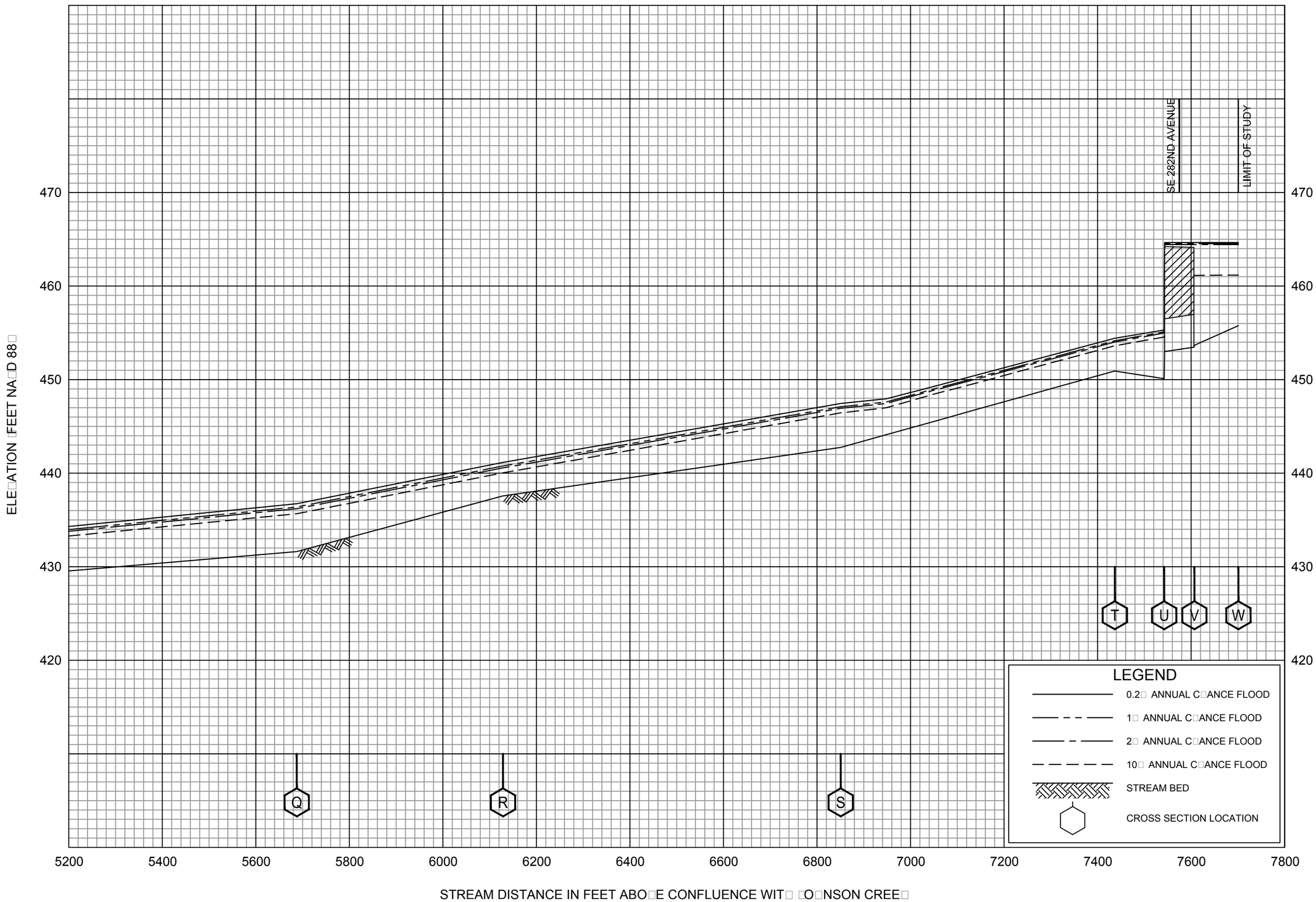

FLOOD PROFILES

NORT□ FOR□ □O□NSON CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

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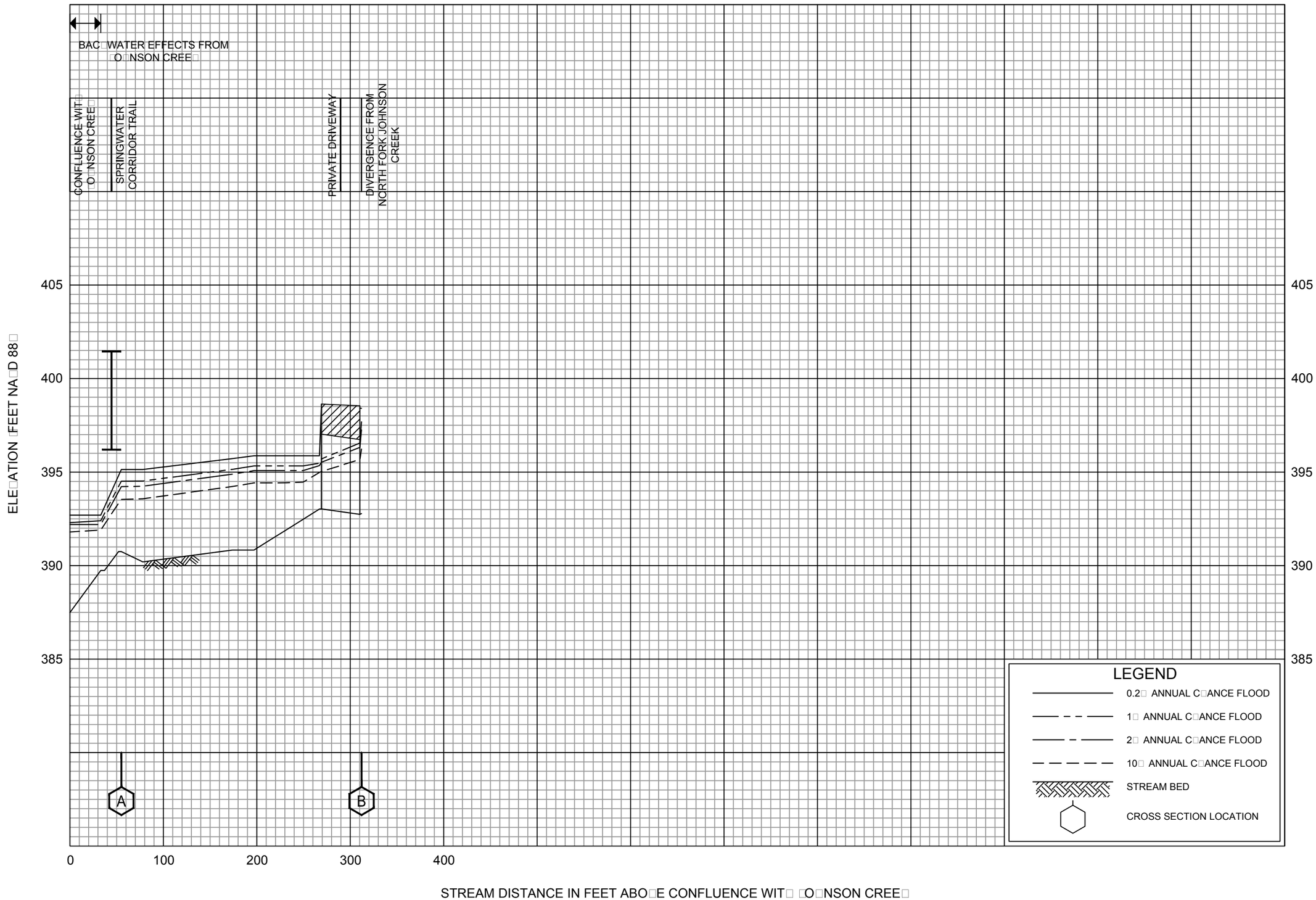


FLOOD PROFILES

NORT FOR O NSON CREE SPLIT FLOW

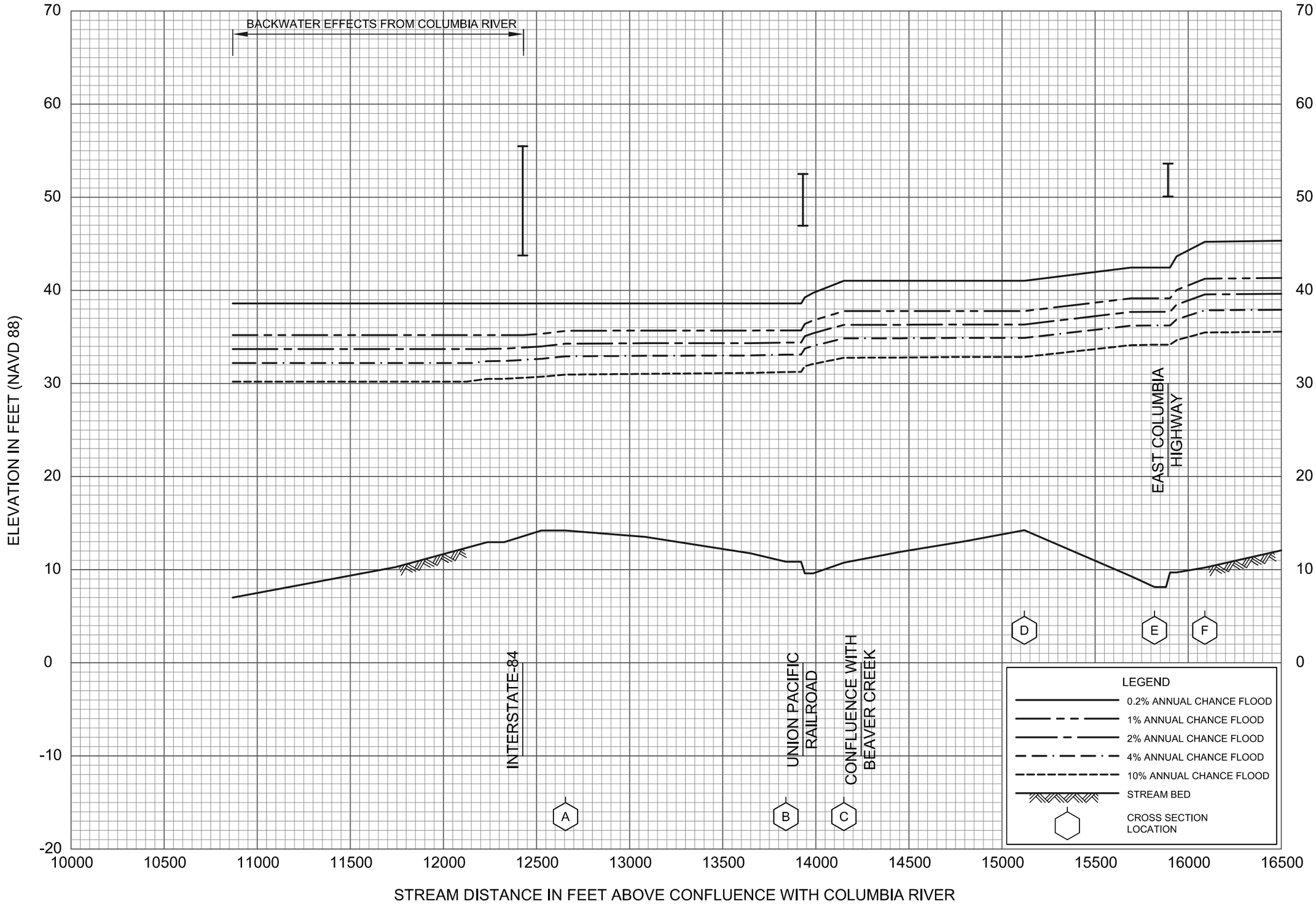
FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

67P

Exhibit B2



FLOOD PROFILES

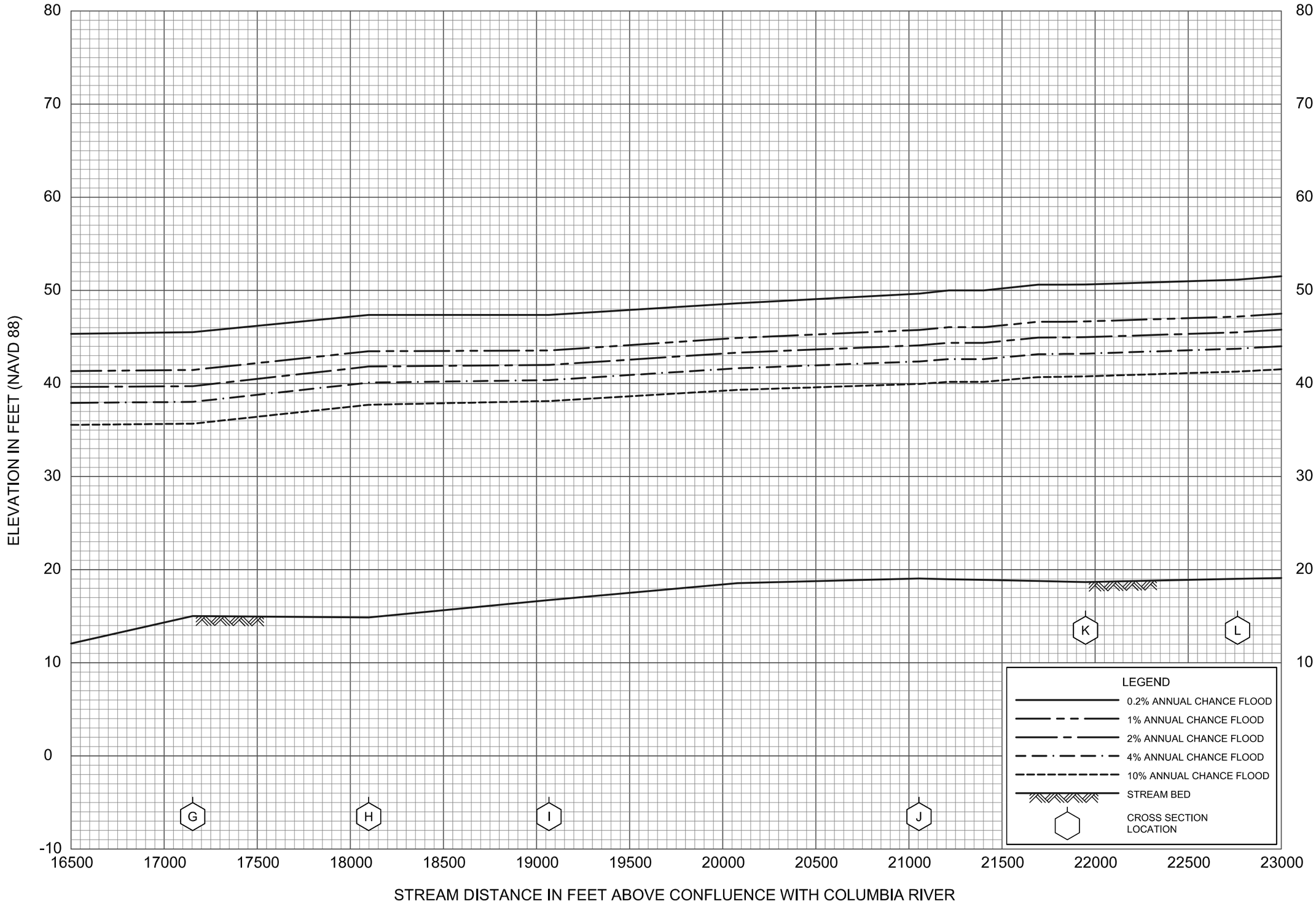
SANDY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

SANDY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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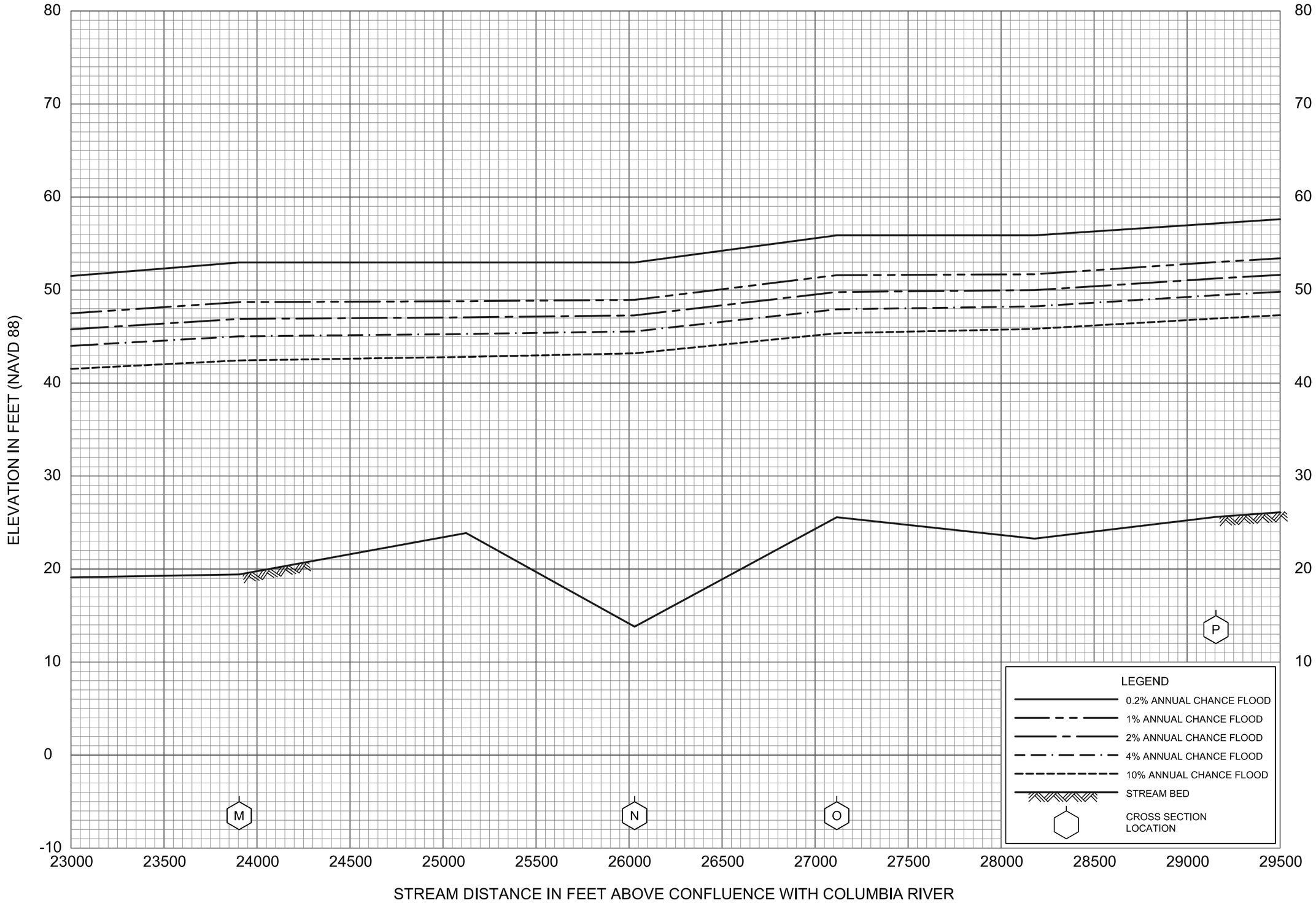


FLOOD PROFILES

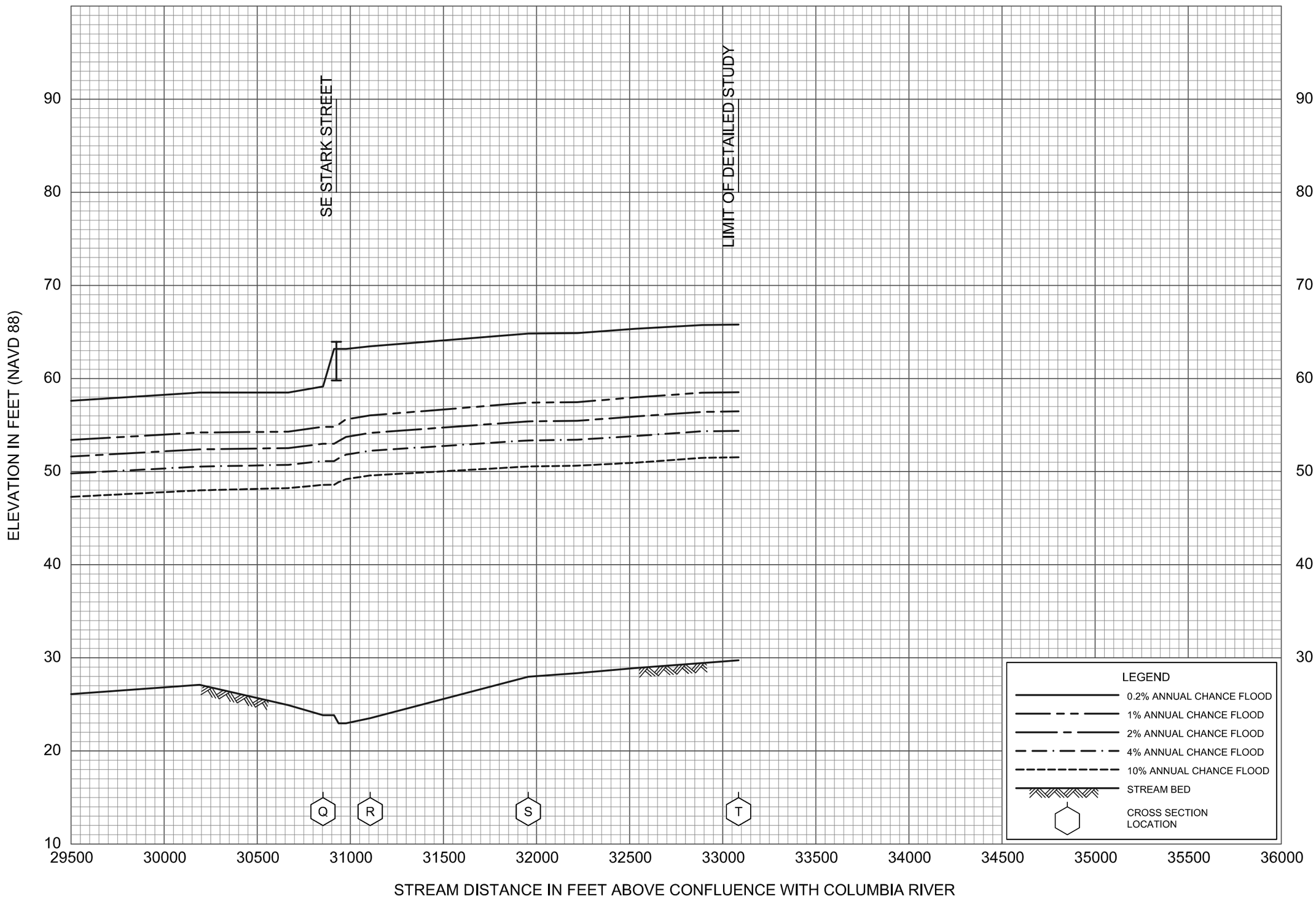
SANDY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

SANDY RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMAH CO, OR

AND INCORPORATED AREAS

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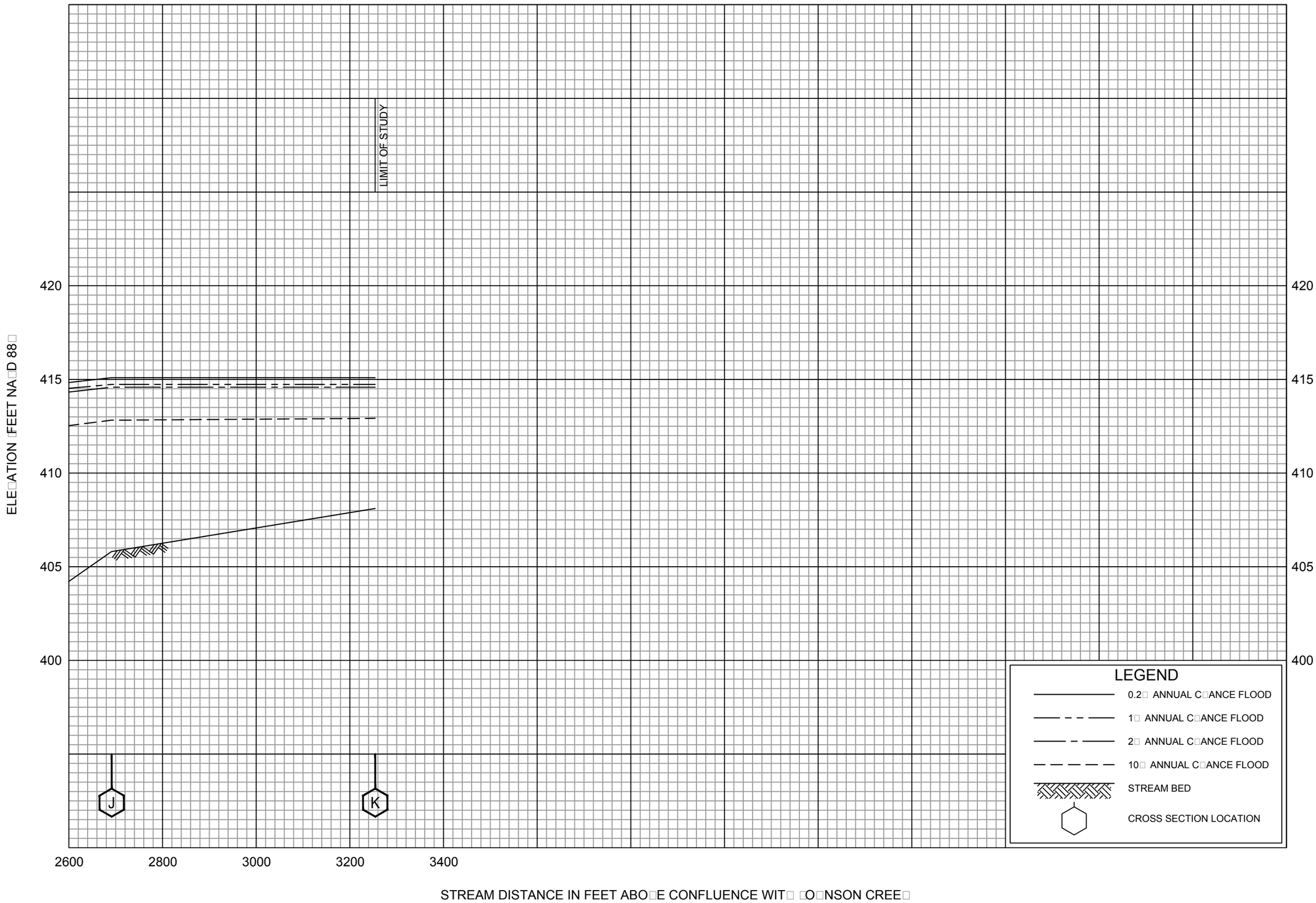


FLOOD PROFILES

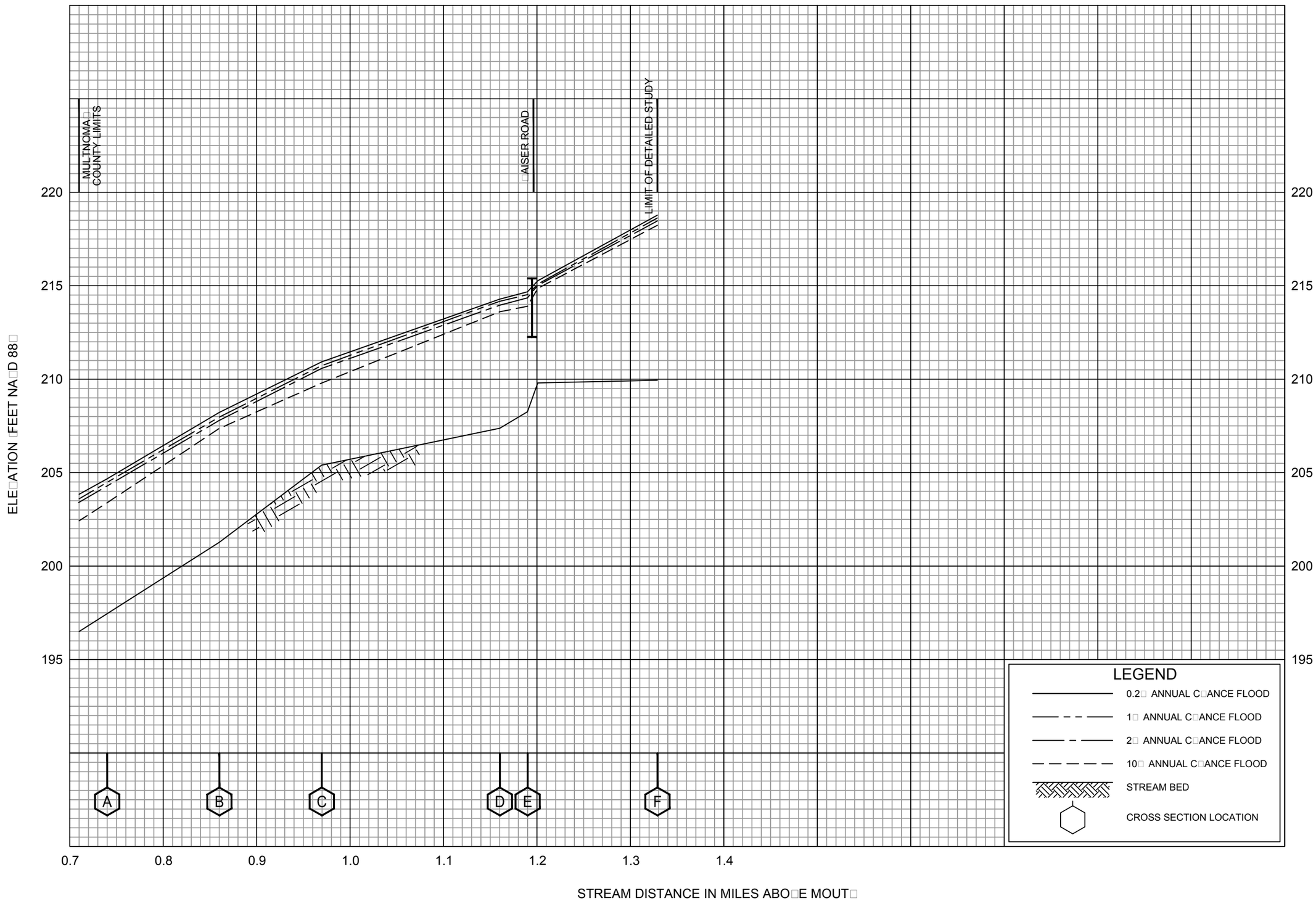
SUNS□INE CREE□

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

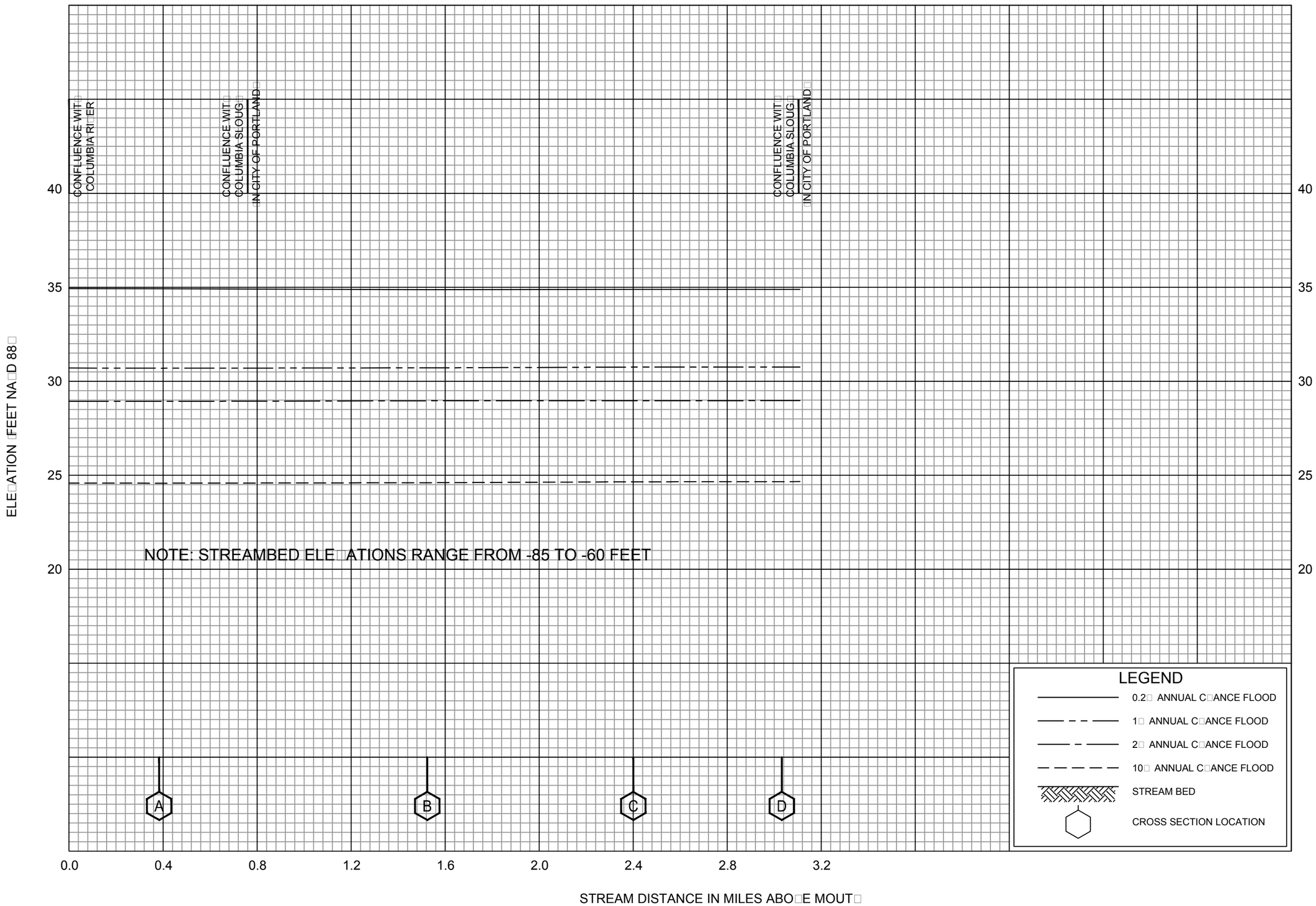
UNNAMED TRIBUTARY TO ROC CREE

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

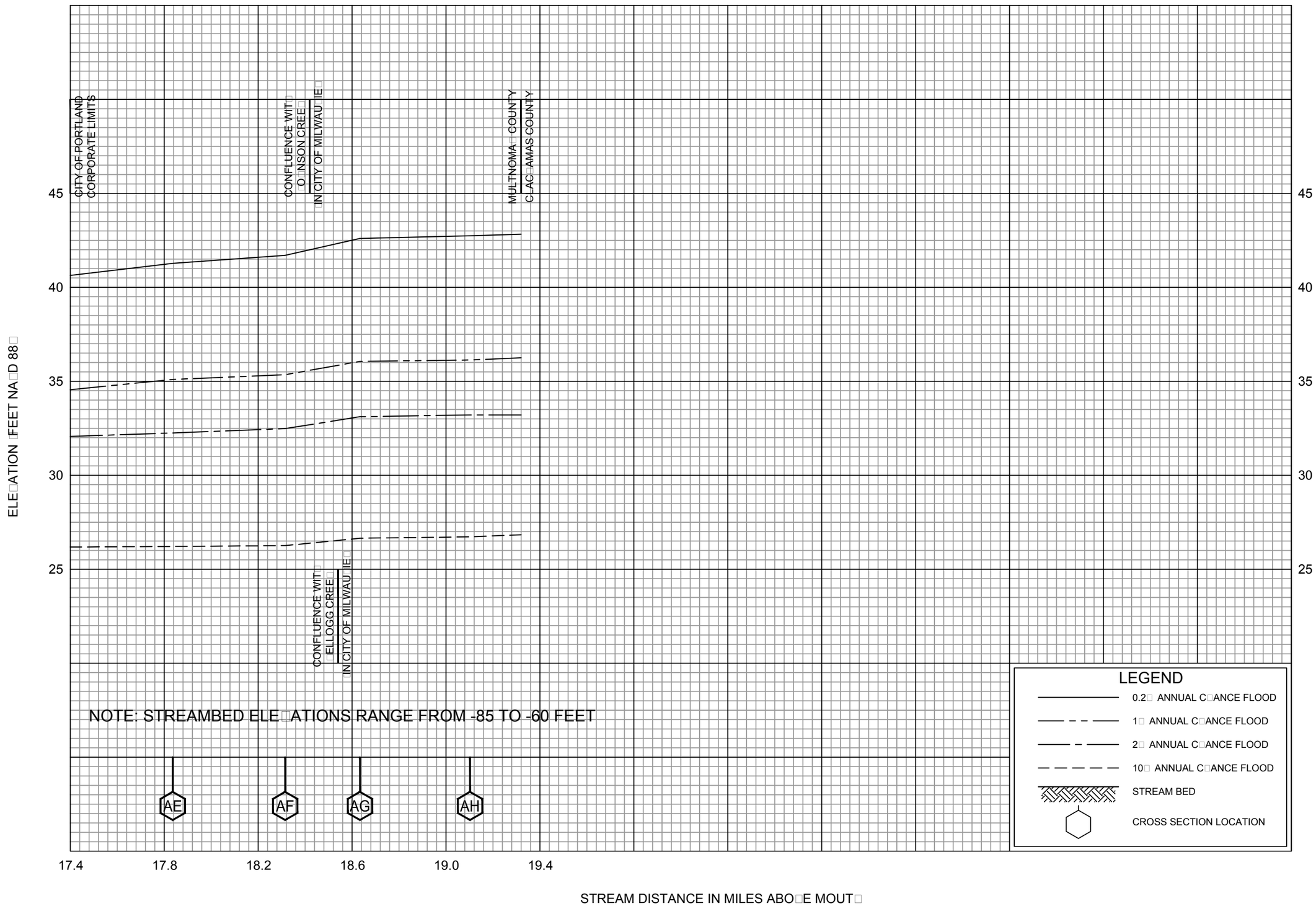
WILLAMETTE RI ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA COUNTY, OR

AND INCORPORATED AREAS

Exhibit B2



FLOOD PROFILES

WILLAMETTE RI□ER

FEDERAL EMERGENCY MANAGEMENT AGENCY

MULTNOMA□ COUNTY, OR

AND INCORPORATED AREAS

75P

Exhibit C1

Eric Rutledge

From:	Allan Berry
Sent:	Tuesday, December 11, 2018 3:20 PM
To:	Sarah Selden
Subject:	FW: Fairview Floodplain code
Attachments:	Fairview FMC 19.105_DLCD_final review_12112018.docx; Fairview ORD 10-2009 Exhibit A_DLCD_final_review 12112018.doc; Example staff report language - ordinance revisions.docx

From: Adair, Celinda [mailto:celinda.adair@state.or.us]
Sent: Tuesday, December 11, 2018 2:02 PM
To: Allan Berry; 'Pilkenton, Roxanne'
Cc: Donnelly, Jennifer
Subject: RE: Fairview Floodplain code

Hi Allan,
In follow-up to our phone conversation the other day. FEMA has delegated the final review of your community's flood ordinance to me since Roxanne has been deployed to Alaska and I am coordinating with FEMA to complete your ordinance review process. I have finished the final review of your flood ordinance and I only have a few additional minor changes (see the attached documents). To save your community drafting time I have incorporated those final changes in the attached documents via track changes. Please let me know if you have any questions.

The next steps in the process are:

1) Please respond to this email and indicate if your community will accept and proceed with adopting the revisions shown in the attached documents.
2) If your community accepts and intents to move forward towards adopting these requested changes then I will respond with a final email completing the ordinance review process. If not, then please identify any areas of concern so that we can resolve them as quickly as possible.
3) Submit these final revisions to the DLCD online PAPA database.
4) Proceed towards adoption of the revised changes to your community's floodplain ordinance.
5) When the revised ordinance is adopted send an executed copy to Roxanne with FEMA and myself prior to the deadline of Feb. 1, 2019.
6) Submit a notice of adoption to the DLCD online PAPA database.

I've also attached some generic language for your staff report and if you'd like me to attend your council meeting via conference call or in person please advise and I will do my best to make myself available.

If you have any questions, feel free to give me a call or send me an email.
Kind regards,
Celinda

Celinda Adair, CFM
National Flood Insurance Program (NFIP) Coordinator
Oregon Department of Land Conservation and Development
635 Capitol Street NE, Suite 150 | Salem, OR 97301-2540
Direct: 503-934-0069 | Cell: 503-930-9739 | Main: 503-373-0050
celinda.adair@state.or.us | www.oregon.gov/LCD

Exhibit C2

EXHIBIT "A"

Chapter 16.05
FLOOD DAMAGE PREVENTION

Sections:

16.05.010 Definitions.
16.05.030 General Provisions.
16.05.040 Administration.
16.05.050 Provisions for Flood Hazard Reduction.

Section 16.05.010 Definitions
Unless specifically defined below, words or phrases used in this Chapter shall be interpreted to give them their meaning in common usage and give these regulations their most reasonable application/scope.

1. "Appeal" means a request for a review of the interpretation of any provision of this ordinance or a request for a variance.

2. "Area of Shallow Flooding" means a designated AO or AH Zone on a community's ~~the~~ Flood Insurance Rate Map (FIRM) with a 1 percent or greater annual chance of flooding to an average depth of 1 to 3 feet where ~~. The base flood depths range from one to three feet;~~ a clearly defined channel does not exist, where~~;~~ the path of flooding is unpredictable, and where ~~and indeterminate; and~~ velocity flow may be evident. ~~AO is characterized as sheet flow and AH indicates ponding~~Such flooding is characterized by ponding or sheet flow.

3. "Area of Special Flooding Hazard" means the land in the flood plain within a community subject to a one percent ~~(~~1 percent~~%)~~ or greater chance of flooding in any given year. The area may be designated as Zone A on the FHBM. After detailed ratemaking has been completed in preparation for publication of flood insurance rate map, Zone A usually is refined into Zones A, AO, AH, A1-30, AE, A99, AR, AR/A1-30, AR/AE, AR/AO, AR/AH, AR/A, VO, V1-30, VE, or V. ~~Designation on maps always includes the letters A or V.~~For purposes of these regulations, the term "special flood hazard area" is synonymous in meaning with the phrase "area of special flood hazard".

4. "Base Flood" means the flood having a one percent (1%) chance of being equaled or exceeded in any given year.~~, also known as a "100-year flood." Designation on maps always includes the letters A or V.~~

Comment [AC1]: FEMA requires that all definition language matches verbatim the definition language in 44 CFR 59.1 (the code of federal regulations). So that it is as legally defensible as possible.

5. "Basement" means any area of a building having its floor sub-grade (below ground level) on all sides.

6. "Below-Grade Crawl Space" means an enclosed area below the base flood elevation in which the interior grade is not more than two feet (2') below the lowest adjacent exterior grade and the height - measured from the interior grade of the crawlspace to the top of the crawlspace foundation - does not exceed four feet (4') at any point.

7. "Breakaway Wall" means a wall not part of the structural support of a building and is intended through its design and construction to collapse under specific lateral loading forces, without causing damage to the elevated portion of the building or supporting foundation system.

8. "City" means the City of Fairview, Oregon.

9. "Council" or "City Council" means the Fairview City Council or such person(s) or entity(ies) designated by that body to perform the appeal or variance review functions given it buy the terms of this Chapter.

10. "Critical Facility" means a facility where a slight chance of flooding may be too great. Critical facilities include:
    1. Schools;
    2. Nursing homes;
    3. Hospitals;
    4. Police, fire and other emergency response installations; and
    5. Installations producing, using or storing hazardous materials or waste.

11. "Director" means the City's Community Development Director or designate.

12. "DEQ" means the Oregon Department of Environmental Quality.

13. "Development" means any man-made change to improved or unimproved real property, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations or storage of equipment or materials.~~:~~
    ~~1. Buildings or other structures;~~
    ~~2. Mining operations;~~
    ~~3. Dredging, filling, grading, paving, excavation;~~
    ~~4. Drilling operations; or~~
    ~~5. Storage of equipment or materials located within the area of special flood hazard.~~

14. "DLCD" means the Oregon Department of Land Conservation and Development.

Exhibit C2

15. "Elevated Building" means, for insurance purposes, a non-basement building which has its lowest elevated floor raised above ground level by foundation walls, shear walls, post, piers, pilings, or columns.

~~16. "Existing Manufactured Home Park of Subdivision" means a park subdivision where construction of facilities needed for servicing the lots where the manufactured homes are to be affixed is completed before the effective date of the adopted floodplain management regulations, including installation of utilities, construction of streets and either final site grading or the pouring of concrete pads.~~

~~17. "Expansion to an Existing Manufactured Home Park or Subdivision" means the preparation of additional sites through construction of facilities for servicing the lots on which the manufactured homes are to be affixed, including the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads.~~

16. "Flood or Flooding" means:

~~18.~~ (a) a general and temporary condition of partial or complete inundation of normally dry land areas from:

1. The overflow of inland or tidal waters.~~; and/or~~
2. The unusual and rapid accumulation or~~f~~ runoff of surface waters from any source.
3. Mudslides (i.e., mudflows) which are proximately caused by flooding as defined in paragraph (a)(2.) of this definition and are akin to a river of liquid and flowing mud on the surfaces of normally dry land areas, as when earth is carried by a current of water and deposited along the path of the current.

~~2.~~ (b) The collapse or subsidence of land along the shore of a lake or other body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels or suddenly caused by an unusually high water level in a natural body of water, accompanied by a severe storm, or by an unanticipated force of nature, such as flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseeable event which results in flooding as defined in paragraph (a)(1.) of this definition.

~~19.~~17. "Flood Insurance Rate Map (FIRM)" means ~~the~~ an official map of a community, on which the Federal Insurance ~~Administration~~ Administrator has delineated both the ~~areas of~~ special flood hazard areas ~~s~~ and the risk premium zones applicable to the community.

~~20.~~18. "Flood Insurance Study" means an examination, evaluation and determination of flood hazards and, if appropriate, corresponding water surface elevations, or an examination, evaluation and determination of mudslide (i.e., mudflow) and/or flood-related erosion hazards. ~~the official report provided by the Federal Insurance Administration that includes flood profiles, the Flood Boundary-Floodway Map and the water surface elevation of the base flood.~~

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Exhibit C2

~~21.~~19. "Floodway" means the ~~river~~ channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (one foot (1')).

~~22.~~20. "Lowest Floor" means the lowest floor of the lowest enclosed area (including ~~a~~ basement). An unfinished or flood resistant enclosure, usable solely for parking of vehicles, building access or storage in an area other than a basement area is not considered a building's lowest floor; provided, that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of these regulations.

~~23.~~21. "Manufactured ~~Home~~Dwelling" means a structure transportable in one or more sections built on a permanent chassis and designed for use with or without a permanent foundation when attached to required utilities. The term "manufactured ~~home~~dwelling" does not include a "recreational vehicle." The term "manufactured dwelling" is synonymous with the term "manufactured home".

Comment [AC2]: Changed for consistency with the State of Oregon's Manufactured Dwelling Installation Specialty Code

~~24.~~22. "Manufactured Home Park or Subdivision" means a parcel (or contiguous parcels) of land divided into two or more manufactured home lots for rent or sale.

~~25.~~23. "New Construction" means structures for which the "start of construction" commenced on or after the effective date of a floodplain management regulation adopted by a community and includes any subsequent improvement to such structures ~~these 2009 regulations~~.

~~26. "New Manufactured Home Park or Subdivision" means a manufactured home park or subdivision for which the construction of facilities for servicing the lots on which the manufactured homes are to be affixed (including at a minimum, the installation of utilities, the construction of streets, and either final site grading or the pouring of concrete pads) is completed on or after the effective date of adopted floodplain management regulations.~~

~~27.~~24. "Recreational Vehicle" means a vehicle which is:

1. Built on a single chassis;
2. 400 square feet or less when measured at the largest horizontal projection;
3. Designed to be self-propelled or permanently towable by a light duty truck; and
4. Designed primarily not for use as a permanent dwelling but as temporary living quarters for recreational, camping, travel, or seasonal use.

~~28.~~ "Start of Construction" includes substantial improvement, and means the date the~~a~~ building permit was lawfully issued, provided the actual ~~commencement~~ start of construction, repair, reconstruction, rehabilitation, addition placement, or other ~~action~~ improvement was within 180 days ~~there~~of the permit date. The

actual start means either the first placement of permanent construction of a structure on construction of a structure on a site, such as the pouring of slab or footings, the installation of piles, the construction of columns, or any work beyond the stage of excavation; or the placement of a manufactured home on a foundation. Permanent construction does not include land preparation, such as clearing, grading and filling; nor does it include the installation of streets and/or walkways; nor does it include excavation for a basement, footings, piers, or foundations or the erection of temporary forms; nor does it include the installation on the property of accessory buildings, such as garages or sheds not occupied as dwelling units or not part of the main structure. ~~Construction does not include:~~

~~1. Land preparation, such as clearing, grading and filling;~~
~~2. The installation of streets and/or walkways;~~
~~3. Excavation for a basement, footings, piers or foundations;~~
~~4. The erection of temporary forms; or~~
~~5. Installation(s) on the affected real property of accessory buildings such as garages or sheds not meant or designed to be occupied as dwelling units.~~

For a "substantial improvement", the actual start of construction means the first alteration of any wall, ceiling, floor, or other structural part of a building, ~~regardless of~~ whether or not that~~e~~ alteration affects the external dimensions of the building.

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29. "State Building Code" means the combined specialty codes.

30. "Structure" means, for floodplain management purposes, a walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a manufactured dwelling.

31. "Substantial Damage" means damage ~~regardless~~ of any origin ~~cause~~ sustained by a structure whereby the cost of restoring~~ation~~ the structure to its before -damaged condition would~~is~~ equal ~~to~~ or exceed~~s~~ 50 percent (50%) of the ~~structure's~~ market value of the structure before ~~prior to~~ the damage occurred.

32. "Substantial Improvement" means any reconstruction, rehabilitation, addition, or other improvement of a ~~the first alteration of any wall, ceiling, floor, or other structural part of a structure or building regardless of whether the alteration affects the external dimensions of the~~ structure, the cost of which equals or exceeds 50 percent (50%) of the market value of the structure ~~either:~~before the "start of construction" of the improvement. This term includes structures which have incurred "substantial damage", regardless of the actual repair work performed. The term does not , however, include either:
    1. ~~Before the improvement or repair is started;~~Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions or

2. ~~If the structure has been damaged and is being restored, before the damage occurred.~~ Any alteration of a "historic structure", provided that the alteration will not preclude the structure's designation as a "historic structure".

~~The term does not include either:~~

~~1. Any project for improvement of a structure to correct existing violations of state or local health, sanitary, or safety code specifications which have been identified by the local code enforcement official and which are the minimum necessary to assure safe living conditions; or~~

~~2. Any alteration of a structure listed on the National Register of Historic Places or a State Inventory of Historic Places.~~

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33. "Variance" means a grant of relief by a community from the ~~requirements~~ terms of a floodplain management ~~of these~~ regulation~~s permitting construction in a manner that would otherwise be prohibited hereby~~.

34. "Water Dependent" means a structure for commerce or industry which cannot exist in any other location and is dependent on the water by reason of the intrinsic nature of its operations.

Section 16.05.030 General Provisions

1. This Chapter applies to all areas of "special flood hazards" within the City as described in subsection (2) below.

2. The areas of "special flood hazard" are those areas identified by the Federal Insurance Administration in a report entitled "*The Flood Insurance Study for the Multnomah County, Oregon and Incorporated Areas*" (dated ~~December 18, 2009~~February 1, 2019) (hereinafter Study) along with accompanying FIRMs. Those documents are adopted by reference and declared to be part of this Chapter. A copy of the Maps and Study are on file in the Office of the Public Works Director. The best available information for flood hazard area identification shall be the basis for regulation until a new FIRM is issued.

3. No structure shall hereafter be constructed, located, extended, converted, or altered without full compliance with the terms of this Chapter. The City may seek any remedy lawfully available to it to effect compliance and in the event the City is compelled to seek judicial redress for violation(s) of this Chapter, the City shall be entitled to recover its reasonable attorneys and expert witness fees both at trial and on appeal.

4. This Chapter is not intended to repeal, abrogate or impair existing easements, covenants or deed restrictions. Where these regulations and another local, state or federal law conflict, the more restrictive shall control.

5. If any section clause, sentence, or phrase of this Chapter is held to be invalid or unconstitutional, then said holding shall in no way affect the validity of the remaining portions hereof.

6. These regulations shall be considered minimum requirements, liberally construed in favor of the City, and not deemed to either limit or repeal any other powers granted the City by state or federal law or its inherent plenary powers.

~~6.~~7. The degree of flood protection required by this ordinance is considered reasonable for regulatory purposes and is based on scientific and engineering considerations. Larger floods can and will occur on rare occasions. Flood heights may be increased by man-made or natural causes. This ordinance does not imply that land outside the areas of special flood hazards or uses permitted within such areas will be free from flooding or flood damages. This ordinance shall not create liability on the part of the City of Fairview, any officer or employee thereof, or the Federal Insurance Administration, for any flood damages that result from reliance on this ordinance or any administrative decision lawfully made hereunder.

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SECTION 16.05.040 Administration

1. Development Permit Required. A development permit shall be obtained prior to construction or development within any area of special flood hazard. The permit shall be for all structures including manufactured homes, and for all development including fill and other development activities, as set forth in the section 16.05.010 "Definitions".

Comment [AC3]: Floodplain permits are required for fill, excavation and other development activities besides construction of structures.

2. Application for Development Permit. Application(s) for a development permit shall be on forms furnished by the City, submitted to the Director and include plans in duplicate drawn to scale showing:
   1. The nature, location, dimensions and elevations of the development area;
   2. Existing and/or proposed structures;
   3. Fill;
   4. Storage of materials; and
   5. Drainage facilities.

   In addition to the foregoing, the following information is to be provided on the plans at the time application is made:
   1. Elevation of the lowest floor (including basement) of all structures in relation to mean sea level;
   2. Elevation in relation to mean sea level of flood-proofing in any structure;
   3. Certification by a registered professional engineer or Oregon licensed architect that flood-proofing methods for nonresidential structure(s) meet the requirements set out in 16.05.050(2)(2); and
   4. Description of the extent (if any) to which a watercourse may be altered as a result of the development.

3. Designation and Duties of Floodplain Administrator~~Director~~. The Director is hereby appointed to administer and implement this Chapter by granting or denying development permit applications with its provisions; duties include (but are not limited to) the following:
   1. Review of all development permit applications and all resulting permits to ensure compliance with requirements imposed by this Chapter;
   2. Determine whether appropriate federal, state and/or local regulatory permits have been obtained;
   3. Maintain all records pertaining to the provisions of this Chapter for public inspection;
   4. Notify adjacent communities, DLCD and other appropriate state and federal agencies prior to the alteration/relocation of a watercourse and cause the submission of evidence thereof to the Federal Insurance Administration as well as requiring that maintenance is provided within the altered or relocated portion of said watercourse so that ~~of~~ the flood carrying capacity ~~thereof~~ is not diminished;
   5. Make interpretations as to the location of boundaries of special flood hazard areas (for example, where there appears to be a conflict between a mapped boundary and actual field conditions). The person contesting the location of the boundary shall be given a reasonable opportunity to appeal;
   6. Determine if the proposed development is located in the floodway. If the proposed development is located in a floodway, ensure the appropriate provisions of Section 16.50.050 are met;
   7. When base flood elevation data has not been provided (A and V Zones), the floodplain administrator shall obtain, review and reasonably utilize any~~use such~~ base flood elevation and floodway data ~~reasonably~~ available from Federal, State or other sources in order to ~~address issues raised~~ administer ~~in~~ Section 16.05.050;
   8. Where base flood elevation data is provided through the Flood Insurance Study, FIRM, or otherwise, the Director shall obtain and record the actual elevation (in relation to mean sea level) of the lowest floor (including basements and below-grade crawlspaces) of all new or substantially improved structures and whether the structure contains a basement; and
   9. For all new or substantially improved flood-proofed structures where base flood elevation data is provided through the Flood Insurance Study, FIRM, or as required in Section 16.05.040:
      a. Verify and record the actual elevation (in relation to mean sea level); and
      b. Maintain flood-proofing certifications required by Section 16.50.040.

10. Provide to building officials the base flood elevation and freeboard applicable to any building requiring a building permit.

~~b.~~ 11. Review all development permit applications to determine if the proposed development qualifies as a substantial improvement, as set forth in Section 16.05.010 "Definitions".

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Exhibit C2

4. Requirement to Submit New Technical Data
   a. Notify FEMA within six months of project completion when an applicant has obtained a Conditional Letter of Map Revision (CLOMR) from FEMA, or when development altered a watercourse, modified floodplain boundaries, or modified Base Flood Elevations. This notification shall be provided as a Letter of Map Revision (LOMR).
   b. The applicant shall be responsible for preparing technical data to support the LOMR application and paying any processing application fees to FEMA.
   c. Upon occurrence, notify the Administrator in writing whenever the boundaries of the community have been modified by annexation or the community has otherwise assumed or no longer has authority to adopt and enforce flood plain management regulations for a particular area. In order that all FHBM's and FIRM's accurately represent the community's boundaries, include within such notification a copy of a map of the community suitable for reproduction, clearly delineating the new corporate limits or new area for which the community has assumed or relinquished flood plain management regulatory authority.

~~4.~~5. Variances and Appeals. The Council is to hear appeals and requests for variance from the terms of this Chapter. In consideration of an appeal, the Council may consider technical evaluations and such other factors or standards deemed by it to be relevant, but variances may only be issued upon Council determination that the grant is the minimum necessary, considering the flood hazard, to afford relief. The applicant shall be notified in writing over the signature of a community official, that the issuance of a variance to construct a structure below the base flood level will result in increased premium rates for flood insurance and increases risks to life and property. Such notification shall be maintained with a record of all variance actions.

~~5.~~6.

1. Council Determination Needed for Variance. Variances may be granted only in the event Council determines that:
   a. There is good and sufficient cause therefor;
   b. Failure to grant the variance would result in exceptional hardship to the applicant;
   c. The variance will not result in increased flood heights, additional threat(s) to public safety, extraordinary public expense, creation of a nuisance, cause fraud on or victimization of the public nor otherwise conflict with existing local laws or regulations; and, in the event the variance relates to a structure within a designated floodway
   d. Issuance of the variance will not result in any increase in flood levels during a base flood discharge.

2. General Standards/Criteria for All Variances; Imposition of Conditions. In considering the issuance of a variance, Council shall consider the following factors, if relevant:

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Comment [AC4]: This bullet is optional, but recommended to ensure the applicants does not expect the community cover the costs associated with submitting the required LOMR to FEMA within the required timeframe.

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Comment [AC5]: Added to reflect required language in 44 CFR 60.6(a)(5) the rest of the required language found in the code of federal regulations is already found in this section.

a. The danger that materials may be swept onto other lands to the injury of others;
b. The danger to life and property due to flooding or erosion damage;
c. The susceptibility of any proposed development and its contents to flood damage and the impact of such damage on the owner(s) thereof;
d. The importance of services provided by the proposed development facility to the City and community;
e. The necessity to the facility of a waterfront location, where applicable;
f. The availability of alternative location(s) for the proposed use not subject to flooding or erosion damage;
g. The compatibility of the proposed use with existing and anticipated development;
h. The relationship of the proposed use to the comprehensive plan and flood plain management program for that area;
i. The safety of access to the property in times of flood for ordinary and emergency vehicles;
j. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and
k. The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

Upon consideration of the aforementioned factors, the Council may attach such reasonable conditions as it deems necessary.

3. Variance from elevation standards may be issued only for new construction or substantial improvements to an existing structure where construction is on a lot of ½-acre or less and contiguous to and surrounded by lots with existing structures constructed below the base flood level. All relevant factors in Section 16.05.040 must be addressed. As lot size increases, technical justification(s) supporting the variance also increase.

4. Variances applicable to Residential Properties. Variances as interpreted in the National Flood Insurance Program pertain to a piece of real property; they are not personal, do not pertain to the structure, its inhabitants, economic or financial circumstances. Variances primarily address small lots in densely populated residential neighborhoods; thus, variances from flood elevations should be rare.

5. Variances applicable to Non-Residential Property. Variances for non-residential buildings may be issued in limited circumstances to allowing for a lesser degree of flood-proofing than watertight or dry flood-proofing, where

Council can determine that such action will have low damage potential, complies with all other relevant variance criteria and complies with Section 16.05.050.

6. Variances for Historic Properties. Variances may be issued for the reconstruction, rehabilitation, or restoration of structures listed on the National Register of Historic Places or the Statewide Inventory of Historic Properties, without regard to the procedures set forth in this section.

7. The Director shall maintain a record of all Council actions taken on variances and report the grant thereof (and the condition(s) imposed, if any) to the Federal Insurance Administration upon request.

Section 16.05.050 General Standards for Flood Hazard Reduction

1. In all areas of special flood hazards, the following is required:
   1. Anchoring.
      a. All new construction and substantial improvement(s) shall be anchored to prevent flotation, collapse, or lateral movement of the structure; and
      b. All manufactured ~~homes~~ dwellings shall be anchored to prevent flotation, collapse, or lateral movement and installed using methods and practices designed to minimize flood damage. Anchoring methods may include, but are not limited to use of over-the-top or frame ties to ground anchors (*see*, FEMA's "Manufactured Home Installation in Flood Hazard Areas").

   2. Construction Materials and Methods.
      a. All new construction and substantial improvement(s) shall be constructed with materials and utility equipment resistant to flood damage;
      b. All new construction and substantial improvement(s) shall be constructed using methods and practices designed to minimize flood damage; and
      c. Electrical, heating, ventilation, plumbing, air-conditioning and other service equipment/facilities shall be designed and/or elevated or located to prevent water from entering or accumulating within the components during flooding.

   3. Utilities.
      a. All new and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the system;
      b. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of flood waters into the systems and discharge from the systems into flood waters; and
      c. On-site waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding consistent with rules adopted by DEQ.

   4. Subdivision Proposals.

a. All subdivision proposals shall be consistent with the need to minimize flood damage;
b. All subdivision proposals shall have public utilities/facilities such as sewer, gas, electrical and water systems located and constructed to minimize or eliminate flood damage;
c. All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage; and
d. Where base flood elevation data has not been provided nor available from an authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or 5 acres, whichever is less.

5. Review of Building Permits. Where elevation data is unavailable through the Flood Insurance Study, FIRM or other authoritative source, building permit applications shall be reviewed with the aim of promoting safety from flooding. Use of historical data, high water marks, photographs of past flooding, etc. should be used where available. Failure to elevate at least two feet (2') above grade in these zones may result in higher insurance rates.

6. AH Zone Drainage. Adequate drainage paths are required around structures on slopes to guide floodwaters around and away from proposed structures.

2. In areas of special flood hazard where base flood elevation data has been provided (Zones A1-30, AH, AE, A and V), the following requirements are to be met:
   1. Residential Construction. New construction and substantial improvement of any residential structure shall have the lowest floor, including basement, elevated to a minimum of one foot (1') above the base flood elevation. Fully enclosed areas subject to flooding below the lowest floor are either prohibited or be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by an Oregon registered/licensed professional engineer or architect or meet or exceed the following minimum criteria:
      a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
      b. The bottom of all openings shall be no higher than one foot (1') above grade; and
      c. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
      ~~c.~~d. If a building has more than one enclosed area below the lowest floor, each area shall be equipped with adequate flood openings.

   2. Nonresidential Construction. New construction and/or substantial improvement of any commercial, industrial or other nonresidential structure shall either have

the lowest floor, including basement, elevated at or above the base flood elevation or, together with attendant utility and sanitary facilities, shall:

a. Be flood-proofed such that below the base flood level, the structure is watertight with walls substantially impermeable to the passage of water;
b. Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and
c. Be certified by a Oregon registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this subsection based on their development and/or review of the structural design, specifications and plans.

3. Elevated nonresidential structures. All elevated nonresidential structures not flood-proofed and with space below the lowest floor are either prohibited or must be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must be certified by an Oregon registered/licensed professional engineer or architect or meet or exceed the following minimum criteria:
   a. A minimum of two openings having a total net area of not less than one square inch for every square foot of enclosed area subject to flooding;
   b. The bottom of all openings shall be no higher than one foot (1') above grade; and
   c. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.
   ~~c.~~d. If a building has more than one enclosed area below the lowest floor, each area shall be equipped with adequate flood openings.

4. Persons flood-proofing nonresidential buildings shall be notified that flood insurance premiums will be based on rates that are one foot (1') below the flood-proofed level (e.g. a building flood-proofed to the base flood level will be rated as one foot (1') below.)

5. Manufactured ~~Homes~~Dwellings.
   1. M~~All m~~anufactured ~~homes~~ dwellings supported on solid foundation walls shall be constructed with flood openings that comply with Section 16.05.050 (2.)(1.)(a. – d.) above;
   2. The bottom of the longitudinal chassis frame beam shall be at or above the BFE;
   3. The manufactured dwelling shall be anchored to prevent flotation, collapse, and lateral movement during the base flood. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors (Reference FEMA's "Manufactured Home Installation in Flood Hazard Areas" guidebook for additional techniques), and;

Comment [AC6]: The State of Oregon Manufactured Dwelling Installation Specialty Code requirements for manufactured dwellings have been updated in the last 4 years and they no longer differentiate between existing, new, or expanding manufactured dwelling parks. The State of Oregon has higher standards than the NFIP minimum requirements for manufactured dwellings.

~~1.~~4. Electrical crossover connections shall be a minimum of 12 inches above BFE.~~placed or substantially improved on sites:~~

~~a. In a new manufactured home park or subdivision;~~

~~b. Outside a manufactured home park or subdivision;~~

~~c. In an expansion to an existing manufactured home park or subdivision; or~~

~~d. In an existing manufactured home park or subdivision on which a manufactured home has incurred "substantial damage" as the result of a flood,~~

~~shall be elevated on a permanent foundation such that the finished floor of the manufactured home is elevated to a minimum 18 inches (46 cm) above the base flood elevation (BFE) and is securely anchored to an adequately designed foundation system to resist flotation, collapse and lateral movement.~~

~~2. Manufactured homes placed or substantially improved on sites in an existing manufactured home park or subdivision within Zones A1-30, AH, and AE on the City's FIRM not otherwise subject to the above are to be elevated so that either:~~

~~a. The finished floor of the manufactured home is elevated to a minimum of 18 inches (46 cm) above the base flood elevation; or~~

~~b. The manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches (92 cm) in height above grade and be securely anchored to an adequately designed foundation system to resist flotation, collapse, and lateral movement.~~

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6. Recreational Vehicles.
   Recreational vehicles placed on sites in special flood hazard zones are required to:
   1. Be on the site for fewer than 180 consecutive days; and
   2. Be licensed and ready for highway use on its wheels or jacking system and attached to the site only by quick disconnect type utility and security devices; and
   3. Have no permanently attached additions; or, alternatively,
   4. Meet the requirements for manufactured dwellings in section 16.05.050 (5) above, including but not limited to the elevation and anchoring requirements for manufactured ~~homes~~dwellings.

7. Below-grade crawl spaces.
   Below-grade crawlspaces are allowed subject to standards found in FEMA's Technical Bulletin 11-01 "*Crawlspace Construction for Buildings Located in Special Flood Hazard Areas*":
   1. The building must be designed and anchored to resist flotation, collapse, and lateral movement as a result of hydrodynamic and/or hydrostatic loads,

including the effects of buoyancy. Hydrostatic loads and the effects of buoyancy can be addressed through openings described below.

2. Crawlspace construction is not allowed in areas with flood velocities greater than five feet (5') per second unless designed by an Oregon registered/licensed architect or professional engineer.
3. The crawlspace is an enclosed area below the base flood elevation (BFE) and must have openings equalizing hydrostatic pressures by allowing the automatic entry and exit of floodwaters with the bottom of each flood vent opening no more than one foot (1') above the lowest adjacent exterior grade.
4. Portions of the building below the BFE must be constructed with materials resistant to flood damage. This includes not only the foundation walls of the crawlspace used to elevate the building, but also any joists, insulation, or other materials that extend below the BFE. The recommended construction practice is to elevate the bottom of joists and all insulation above BFE.
5. Any building utility systems within the crawlspace must be elevated above BFE or designed so floodwaters cannot enter or accumulate within the system components. Ductwork, in particular, must either be placed above the BFE or sealed from floodwaters.
6. The interior grade of a crawlspace below the BFE must not be more than two feet (2') below the lowest adjacent exterior grade.
7. The height of the below-grade crawlspace measured from the interior grade of the crawlspace to the top of the crawlspace foundation wall must not exceed four feet (4') at any point. The height limitation is the maximum allowable unsupported wall height according to the engineering analysis and building code requirements for flood hazard areas.
8. There must be a drainage system providing for removal of floodwaters from the interior area of the crawlspace such that the area is drained within a reasonable time after a flood event. The system will vary as a result of the site gradient and other drainage characteristics. Possible options include natural drainage through porous, well-drained soils and installation of drainage systems such as perforated pipes, drainage tiles, gravel or crushed stone top allow for drainage by gravity or mechanical means.
9. The velocity of floodwaters at the site should not exceed five feet (5') per second for any crawlspace. For velocities in excess of five feet (5') per second, other foundation types should be used.

~~9.~~10. Higher insurance premiums may apply to structures with below-grade crawlspaces.

For more detailed information refer to FEMA Technical Bulletin 11-01.

8. Floodway Not Established. Where a regulatory floodway has not been designated, no new construction, substantial improvement(s) or other development (including fill) is permitted within Zones A1-30 and AE on the City's FIRM, unless it is demonstrated that the cumulative effect(s) of the proposed

development, when combined with other existing and anticipated development, ~~does~~ will not increase the water surface elevation of the base flood more than one foot (1') at any point within the City.

9. Floodway Established.

~~9.~~ Located within areas of special flood hazard are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply to areas designated as floodways.

1. ~~In areas where a regulatory floodway has been designated, n~~No encroachments (including fill), new construction, substantial improvement(s) and~~/or~~ other development shall occur unless certification by a registered professional civil engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that ~~said~~ encroachments will not result in any increase in base flood or floodway elevations ~~levels~~ during a base flood discharge.

~~1.~~2. If paragraph (9.)(1.) above is satisfied, ~~A~~all new construction and ~~any~~ substantial improvement(s) shall comply with all applicable flood hazard reduction provisions.

~~2. Projects for stream habitat restoration may be permitted in a floodway provided:~~

~~a. The project qualifies for a Department of the Army, Portland District *Regional General Permit for Stream Habitat Restoration* (NWP-2007-1023);~~

~~b. A qualified professional (a Registered Professional Engineer, staff of Natural Resources Conservation Service (NRCS) or staff of Oregon or federal fisheries, natural resources or water resources agencies) has provided a feasibility analysis and certification that the project was designed to keep any rise in 100-year flood levels to as close to zero as practically possible given the goals of the project; and~~

~~c. No structures would be impacted by a potential rise in flood elevation; and~~

3. ~~An agreement to monitor the project, correct problems, and ensure that flood carrying capacity remains unchanged is included as part of the local approval.~~Manufactured dwellings may be located in floodways only under the following circumstances:

a. If there is an existing manufactured dwelling, placement was permitted at the time of the original installation and its continued use is not a threat to life, health, property, or the general welfare of the public; or

b. A new manufactured dwelling is replacing an existing one where the original placement was permitted at the time and the replacement will not be a threat to life, health, property or the general welfare of the public; and

c. The location of the dwelling meets all the following:

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Comment [AC7]: FEMA is requesting that this language be removed from communities ordinances.

Comment [AC8]: FEMA is requesting that this language for stream habitat restoration exceptions within the floodway is removed.

i. Demonstration that the manufactured dwelling and any accessory building(s), structure(s) or other improvement(s) will not result in any increase in flood levels during the occurrence of a base flood discharge;

ii. The replacement dwelling and any accessory building(s)/structure(s) ~~have a finished floor elevation of at least 18 inches (46 cm)~~ are elevated so that the bottom of the longitudinal chassis frame beam is at or above the BFE;

iii. The replacement dwelling is placed, anchored and secured to a foundation support system designed by an Oregon professional engineer or architect and approved by the City;

iv. The replacement dwelling, its foundation supports and any accessory building(s)/structure(s) or property improvement(s) do not displace water so as to cause a rise in water level or divert water in a manner likely to cause erosion/damage to other properties;

v. The replacement dwelling is appropriately zoned; and

vi. Location of the replacement dwelling will not violate any other local, state or federal law.

10. Shallow Flooding Areas.

The following restrictions apply in Shallow Flooding Areas:

1. New construction and substantial improvements of residential structures and manufactured homes shall have the lowest floor (including basement) elevated above the highest grade adjacent to the building, a minimum of one foot (1') above the depth number specified on the FIRM and at least two feet (2') if no depth number is specified.
2. New construction and substantial improvements of nonresidential structures shall either:
   i. Have the lowest floor (including basement) elevated above the highest adjacent grade of the building site, one foot (1') or more above the depth number specified on the FIRM (at least two feet (2') if no depth number is specified); or
   ii. Together with attendant utility and sanitary facilities, be completely flood-proofed to or above that level such that any space below that level is watertight with walls substantially impermeable to the passage of water and with structural components having the capability of resisting hydrostatic and hydrodynamic loads and effects of buoyancy. If this method is used, compliance shall be certified by a registered professional engineer or architect.
3. Require adequate drainage paths around structures on slopes to guide floodwaters around and away from proposed structures.
4. Recreational vehicles placed on sites must either:
   i. Be on the site for fewer than 180 consecutive days, and
   ii. Be fully licensed and ready for highway use, on its wheels or jacking

system, is attached to the site only by quick disconnect type utilities and security devices, and ~~has~~ have no permanently attached additions; or

iii. Meet the elevation and anchoring requirements for manufactured ~~homes~~ dwellings set out ~~above.~~ in Section 16.05.050(5).

Comment [AC9]: Recommend inserting specific citation to the manufactured dwelling section above.

11. Critical Facilities.
    1. Construction of new critical facilities shall, to the extent possible, be located outside the limits of the Special Flood Hazard Area (SFHA) (100-year floodplain).
    2. Construction of new critical facilities shall be permissible within the SFHA if no feasible alternative site is available. Critical facilities constructed within the SFHA shall have the lowest floor elevated three feet above BFE or to the height of the 500-year flood, whichever is higher. Access to and from the facility should be protected to the height noted. Flood-proofing and sealing measures must be taken to ensure that toxic substances will not be displaced by or released into floodwaters. Access routes elevated to or above the level of the base flood elevation shall be provided to all critical facilities to the extent possible.

Exhibit C3

Chapter 19.105

FLOODPLAIN OVERLAY

Sections:

19.105.010 Purpose.
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19.105.010 Purpose.

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas~~.~~ by provisions designed to: (1) Protect human life and health; (2) Minimize expenditure of public money and costly flood control projects; (3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public; (4) Minimize prolonged business interruptions; (5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard; (6) help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas; (7) Ensure that potential buyers are notified that property is in an area of special flood hazard; and (8) Ensure that those whom occupy the areas of special flood hazard assume responsibility for their actions. (Ord. 6-2001 § 1)

Comment [AC1]: FEMA requires that the purpose shown either here or in your ordinance reflects the language of 44 CFR 59.22.

19.105.020 Area affected.

This section shall apply to all areas designated as areas of special flood hazard by the federal insurance administration on its current ~~flood hazard boundary map (FHBM),~~Flood Insurance Rate Map applicable to and including all areas within the boundaries of the city of Fairview or more current information such as Metro flood management maps, if demonstrated to be accurate. (Ord. 6-2001 § 1)

19.105.030 Compliance.

No structure or land shall hereafter ~~be~~ be developed, constructed, located, extended, converted or altered without full compliance with the terms of Chapter 16.05 FMC. (Ord. 6-2001 § 1)

19.105.040 Procedures.

A development permit shall be obtained before construction or development begins within any area of special flood hazard. Requirements for the permit as well as specific and general standards are outlined in Chapter 16.05 FMC. (Ord. 6-2001 § 1)

19.105.050 Permitted uses.

The following uses are permitted outright:

A. Excavation and fill required to plant any new trees or vegetation in areas outside of the floodway.

~~B. Restoration or enhancement of floodplains, riparian areas, upland and streams. (Ord. 6-2001 § 1)~~

Comment [AC2]: You may want to further amend this section. FEMA does not allow restoration or enhancement of floodplains, riparian areas, upland and streams without a floodplain permit. If in a floodway a Hydraulic and Hydrologic analysis is required to identify if there will be an increase in the base flood level. If there will be an increase then it can be permitted but a LOMR must be done to amend the Flood Insurance Rate Maps to reflect the change.

19.105.060 Conditional uses.

The following uses are permitted conditionally:

A. All uses allowed in the base zone or existing flood hazard overlay zone. (Ord. 6-2001 § 1)

19.105.070 Prohibited uses.

The following uses are not permitted:

Exhibit C3

A. Any use otherwise prohibited in the base zone or existing flood hazard overlay zone.

B. Any uncontained area of hazardous materials as defined by DEQ. (Ord. 6-2001 § 1)

19.105.090 Performance standards.
A. Any development should maintain or increase the capacity of the flood management area.

B. All fill placed at or below design flood elevation within the special flood hazard area shall result in no net loss of natural floodplain storage. The volume of the loss of flood water storage due to filling in the special flood hazard area shall be balanced by providing an ~~with at least an~~ equal ~~amount~~ volume of flood storage by ~~of~~ soil material removal or other compensatory measures at or directly adjacent to the development (fill) site in compliance with all terms of Chapter 16.05 FMC.

C. Excavation of areas that would be filled with water in non-stormwater conditions is not to be counted as part of the floodplain balance referenced in subsection B of this section.

D. Temporary fills permitted during construction shall be removed ~~in a timely manner~~within 180 days. (Ord. 6-2001 § 1)

Comment [AC3]: Fill not allowed in floodway unless requirements of Chapter 16.05 are met.

Comment [AC4]: This is the compensatory storage (balanced cut and fill) language recommended by the Association of State Floodplain Managers (ASFPM).

Comment [AC5]: Recommend stating a specific timeframe. Temporary fill must comply with requirements of Chapter 16.05.

Comment [AC6]: Can adjust so long as there is a number of days specified.