City of Central Point, Oregon
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541.664.3321 Fax 541.664.6384
www.centralpointoregon.gov

Community Development
Tom Humphrey, AICP
Community Development Director

STAFF REPORT

April 7, 2015

AGENDA ITEM: File No. FP-15001

Consideration of a No-Rise Analysis for portions of Twin Creeks Crossing Phases I and II located within the regulatory floodway. The project site includes 30 lots identified on the Jackson County Assessor's Map as 37S 2W 03BD, Tax Lots 1100, 1200, 1400, 1500, 1700, 1800, 1900, 2000, 2300, 2400, 2500, 2600, 2900, 3000, 3200, 3201, 3202, 3203, 3400, 3500, 3600, 3700, 3800, 3900, 4000, & 4100; 37S 2W 03CA Tax Lots 802, 803 & 804; and 37S 2W 03CA Tax Lot 1200. **Applicant**: Twin Creeks Development, LLC; **Agent**: Dan O'Connor, Medford Law

STAFF SOURCE:

Stephanie Holtey, Community Planner II

BACKGROUND

In 2006 and 2007 Twin Creeks Crossing Phases I and II received final plat allowing development of the lots in those two phases. At the time of final plat approval all lots were located outside of the special flood hazard area and the regulatory floodway. In 2011 FEMA had prepared and the City adopted a new FEMA Flood Insurance Rate Map (FIRM). As a result of the new FIRM thirty (30) of the lots (Lots) in Phases I and II are now located in the special flood hazard area and most are fully impacted by the floodway (Attachment "A").

At this time the applicant proposes to construct single family dwellings and independent living cottages on the Lots. Any proposed construction activities within the floodway are subject to compliance with Section 8.24.200 floodway development requirements, which prohibits floodway encroachments unless it can be demonstrated that there will be no increase to the flood elevations. Per Section 8.24.200 there are two methods of demonstrating no increase in flood elevations:

1. A No-Rise Certification (A No-Rise Certification would leave the properties in the flood hazard area and subject to flood insurance); or
2. A Conditional Letter of Map Revision (CLOMR) followed by a Letter of Map Revision (LOMR) from FEMA (upon issuance of a LOMR the affected properties would be removed from the flood hazard area and no longer require flood insurance).

At this time the applicant has submitted an application for a No-Rise Certification (Attachment "B"). A No-Rise Certification must demonstrate that development will not aggravate flooding. Once a No-Rise Certificate is issued by the Planning Commission the applicant can commence construction on the Lots (est. April 2015).

In addition to the No-Rise application, the applicant has previously submitted, received, and is currently completing a floodway mitigation project approved by the Planning Commission in 2014 (Resolution No. 806). The basis of the approval was a technical analysis reviewed and

approved by FEMA as a Conditional Letter of Map Revision (CLOMR). The CLOMR confirmed that construction of a floodway overflow channel would remove floodway impacts on all of the platted lots that are the subject of the No-Rise application, as well as all remaining platted lots in Twin Creeks Crossing Phase I. Per the Applicant's Findings (Attachment "C"), the mitigation work per the CLOMR has been completed with the exception of the culvert installation at Twin Creeks Crossing, which is scheduled for installation late spring. It is expected that a LOMR will be submitted to FEMA shortly after completion of the culvert, with an estimated issuance date of early fall 2015.

In an effort to facilitate a productive construction season for 2015 it is the applicant's objective to pursue the No-Rise Certification first, followed shortly by completion of the CLOMR mitigation requirements and application for the LOMR.

PROJECT DESCRIPTION

Per the Twin Creeks Master Plan, the applicant proposes to construct single family dwellings and independent living cottages on the Lots. Per the No-Rise documentation, no additional fill material will be utilized to elevate building pads. Construction will entail site grading, foundation excavation and fill compaction consistent with the City's flood damage prevention standards.

The No-Rise Analysis evaluates the effective conditions against existing and proposed conditions based on full build-out of Twin Creeks Crossing Phases I-III, the North Village Phase III, and as-built survey data for the recently constructed floodway swale. According to the No-Rise documentation, there is no difference between existing and proposed conditions. The No-Rise Analysis concludes that the excavated swale mitigates any potential rise associated with the proposed development, consistent with the CLOMR findings and the City's no-rise standard.

To approve the proposal, the No-Rise documentation must demonstrate that the following criteria are satisfied:

- The proposal does not increase flood elevations or floodway widths based upon the effective FEMA flood mapping; and,
- The proposal is consistent with the CLOMR mapping approved by FEMA and the City in 2014, and will therefore not adversely impact the outcome of the LOMR.

Per the applicant's Findings and the No-Rise documentation, the proposal complies with these requirements.

ISSUES

The only issue relative to this application is the successful management of the No-Rise grading and construction activity in a manner that does not jeopardize issuance of the LOMR. Although the applicant can demonstrate that the proposed No-Rise construction does not adversely impact the base flood elevation within any part of Twin Creeks and is consistent with the CLOMR, issuance of a LOMR is needed to revise the effective FEMA mapping and alleviate the flood insurance purchase and development requirements associated with being in a floodway. The Development Agreement between Twin Creeks and the City

provides for a personal guarantee that the floodway mitigation construction per the CLOMR will be completed no later than October 1, 2015 (Attachment "D"). Section 8.24.170(B) provides that the applicant shall complete the LOMR within 6 months of project completion in accordance with Section 8.24.170(B).

CONDITIONS OF APPROVAL

1. Prior to the issuance of a building permit for any of the 30 lots the applicant shall submit a master grading plan for the 30 lots. The Master Grading Plan shall be approved by Northwest Hydraulic Consultants as compliant with and will not otherwise adversely affecting the CLOMR approved by FEMA. At time of submittal of a building permit for each lot, the applicant shall include a grading plan compliant with the approved Master Grading Plan; and prior to the issuance of a Certificate of Occupancy, the applicant shall provide certification by a licensed engineer that the grading plan, including any fill used for landscaping, is compliant with the approved Master Grading Plan.

2. Prior to the City's approval of the LOMR application, the applicant shall demonstrate that the LOMR is consistent with the approved CLOMR. The developer shall be responsible for correcting any deviation from the CLOMR that results in floodway impacts to currently platted lots in Twin Creeks Crossing Phases I-III.

3. For all remaining platted lots in the floodway, no additional no-rise certifications shall be permitted. Development of these lots must rely strictly on receipt of the LOMR.

ATTACHMENTS

Attachment "A" – Floodway Development Application Location map
Attachment "B" – No Rise Analysis
Attachment "C" – Applicant's Findings
Attachment "D" – Twin Creeks Transit Oriented Development Agreement
Attachment "E" – Resolution No. 817

ACTION

Consider Resolution No. 817 Approving the No-Rise Certification for a portion of Twin Creeks Crossing Phases I and II with conditions of approval

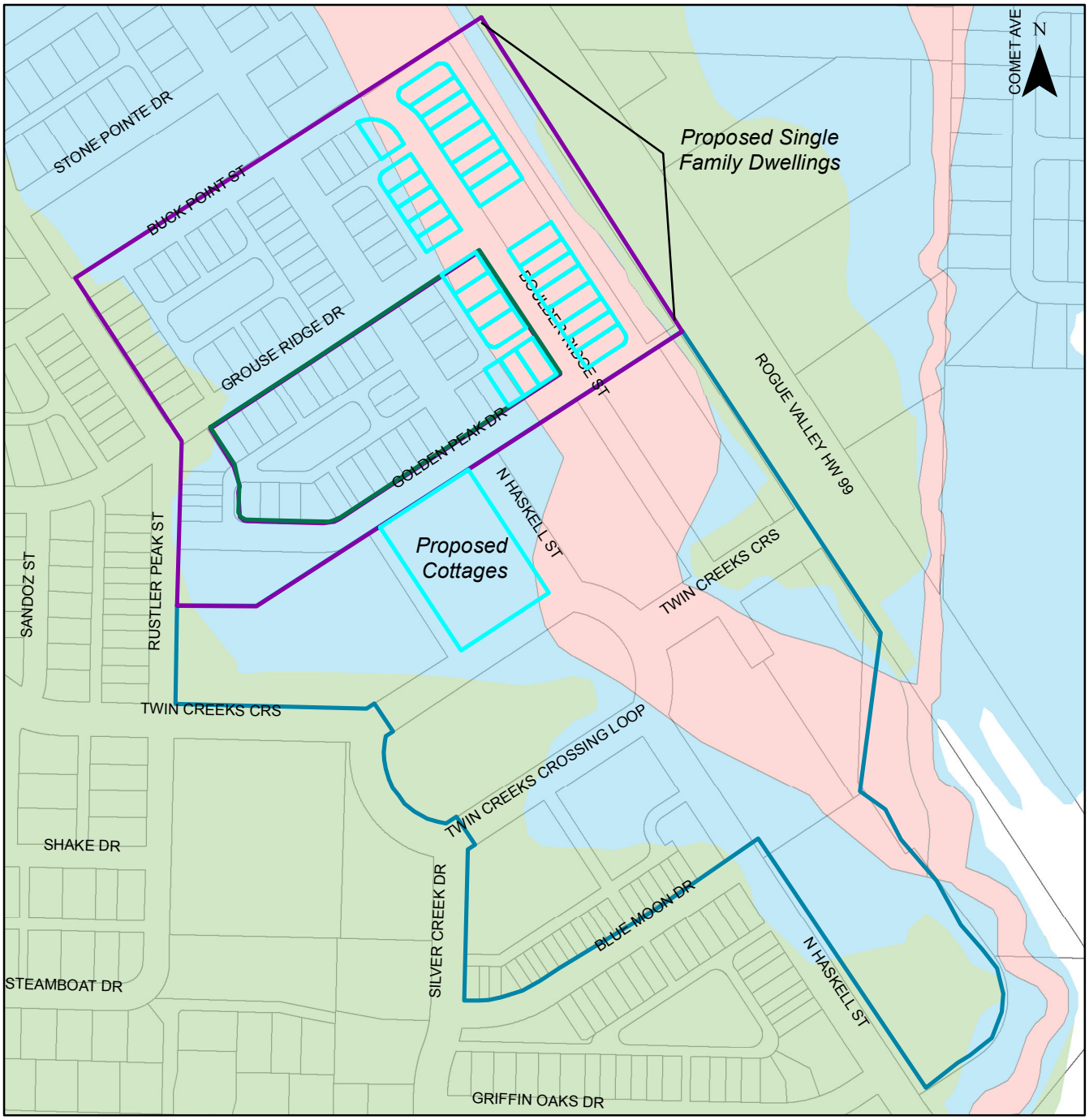
RECOMMENDATION

Approve Resolution No. 817.

ATTACHMENT "A"

Floodway Development Application

Twin Creeks Crossing Phases I and II



Legend

subdivisions

SUBNAME

- Twin Creek Crossing Phase 3
- Twin Creeks Crossing Ph 2
- Twins Creeks Crossing 1

FIRM Information

Flood Zone

- A
- AE
- AO
- FLOODWAY
- X
- X-SHADED

Flood Insurance Rate Map
Jackson County, Oregon & Incorporated Areas
City of Central Point - 410092
Map& Panel No.: 41029C 1768F, 1769F, 1956F, 1957F

Created by: Stephanie Holtey, CFM
Community Development Department
March 24, 2015

0 120 240 480 Feet

16300 Christensen Road, Suite 350 | Seattle, WA 98188 | 206.241.6000 | www.nhcweb.com

ATTACHMENT "B"

nhc
northwest hydraulic consultants

NHC Ref. No. 200044

25 March 2015

Twin Creeks Development Co. LLC
P.O. Box 3577
Central Point, OR
97502

Attention: **Bret Moore**

Via email: bretm@twncrks.com

Re: **Twin Creeks No-Rise Analysis 2015**

Dear Mr. Moore:

As requested, Northwest Hydraulic Consultants (NHC) has completed a "no-rise" analysis for the Twin Creeks Development Company LLC (TCDC) following the Federal Emergency Management Agency (FEMA) "*Procedures for 'No-Rise' Certification for Proposed Developments in the Regulatory Floodway".* This analysis confirms that work conducted to-date within the Twin Creeks Development, as well as the newly proposed work within the effective floodway in the Twin Creeks Crossing Phase I-III will not result in an increase to 100-year flood or floodway profiles relative to effective FEMA mapping (FEMA, 2011). The following letter serves as documentation of the no-rise analysis conducted by NHC.

1 TWIN CREEKS NO-RISE ANALYLSIS

1.1 Background

The Twin Creeks Development is located along a FEMA designated 100-year floodplain (Zone AE), with regulatory floodway. This floodplain mapping became effective with the adoption of the Jackson County Flood Insurance Study (FIS) in May, 2011 (FEMA, 2011). The effective mapping was determined through detailed studies of Jackson and Griffin Creeks conducted by NHC for the City of Central Point (City) and FEMA as part of the Jackson County FIS (FEMA, 2011). Findings from these studies indicated that flooding in the Twin Creeks Development originates from overflow of Griffin Creek, immediately upstream of Pacific Highway, and continues to the northwest to merge with Jackson Creek. The reach connecting Griffin and Jackson Creeks within the development is referred to as the 'Jackson Creek Overbank'.

The effective floodplain mapping between the two study reaches, through the Twin Creeks Development, is broad and unconfined, resulting in a relatively wide floodway delineation. It should be noted that this reach does not receive perennial flow and would function as an overflow channel during

infrequent, high magnitude flood events (there has been no observed flooding from Griffin Creek at the project site). Draft mapping for Griffin and Jackson Creeks was provided to FEMA in 2008, and the restudies of both creeks became effective when the Jackson County FIS was adopted by FEMA and Jackson County on May 3, 2011.

The Twin Creeks Development is a master plan community that precedes the most recent FEMA studies within the City. When construction of the Twin Creeks Development began, prior to initiation of NHC's detailed studies of Jackson and Griffin Creeks, the area was not mapped within a FEMA floodplain. Development continued while the technical analysis for the updated FIS was being conducted (2006 to 2009). In 2009, the City began using preliminary flood hazard mapping, provided by NHC, to regulate development. Thereafter, construction within the Twin Creeks Development was limited to areas outside what is now the effective floodway.

In 2014, NHC completed a FEMA Conditional Letter of Map Revision (CLOMR) for the TCDC (NHC, 2014). The purpose of the CLOMR was to provide documentation for proposed floodway mitigation measures, namely, the construction of a flood swale along the eastern edge of the development. The CLOMR considered full build-out conditions including construction of a flood swale, culvert crossing at the Twin Creeks crossing, and development of the entire North Village phase of the property based on plans prepared by Whetstone Engineering. The CLOMR proposed realignment of the effective regulatory floodway, primarily based on the proposed construction of the flood swale, while also meeting no-rise criteria. The CLOMR was accepted by FEMA in late 2014.

To-date, development within the Twin Creeks project site is considered compliant with both FEMA and City floodplain management regulations.

1.2 Purpose

The current no-rise analysis is being conducted so TCDC can have a productive 2015 construction season. To accomplish this the TCDC is proposing construction of approximately 29 lots located within the effective floodway in the Twin Creeks Crossing portion of the development. As such, a FEMA no-rise analysis is required. Full development of the Twin Creeks Crossing Phases I-III and North Village Phase 3, as well as the flood swale constructed in early 2015 is being considered in this analysis. This analysis is intended to meet FEMA regulatory requirements for development within an effective floodway.

A few items related to this analysis should be noted. First, additional fill material will not be imported to the site for any remaining construction (H. Farber, personal communication, March 17, 2015). Second, the proposed work associated with this no-rise analysis does not adversely impact findings from the 2014 CLOMR. This is because the work proposed here represents intermediate conditions that are consistent with those originally proposed in the CLOMR. Similarly, this work will not adversely affect the final Letter of Map Revision (LOMR) to be completed once all floodway mitigation measures are implemented.

1.3 Hydraulic Analysis

A no-rise analysis typically involves evaluation and comparison of (duplicate) effective, existing, and proposed conditions. For this analysis the no-rise comparison was conducted between only effective

and proposed conditions. Comparison between master plan grading and as-built data within Twin Creeks Crossing Phases of the development collected in 2012 show negligible difference. As such, existing conditions were not evaluated separately, but rather considered identical to proposed conditions. A description of effective and proposed conditions used in this analysis follows.

1.3.1 Duplicate Effective Conditions

NHC developed the original HEC-RAS hydraulic models used for effective FEMA flood hazard mapping on Griffin and Jackson Creeks (FEMA, 2011; NHC, 2014). As such, duplicate effective models were obtained directly from a Technical Support Data Notebook (TSDN) prepared by NHC and submitted to FEMA. Effective models and mapping reflect pre-2008 site conditions.

1.3.2 Proposed Conditions

General site grading, including the Twin Creeks Crossing Phases I, II, and III, as well as Phase 3 of the North Village portions of the development, was obtained from Whetstone Engineering on December 18, 2012. As-built topographic data of the recently constructed flood swale was provided to NHC by Farber Surveying on February 14, 2015. These proposed conditions differ from the 2014 CLOMR analysis in that they do not include Phases 1 and 2 of the North Village. As previously noted, proposed conditions are considered identical to existing conditions in Twin Creeks Crossing Phases I, II, and III.

1.4 Results

Results of the analysis show that construction of the flood swale has mitigated for any potential rise associated with the proposed development in the Twin Creeks Crossing Phases I, II, and III. This conclusion is summarized in the attached table comparing computed effective and revised floodplain and floodway profiles. In addition, the following supporting materials are attached:

- A workmap comparing effective and revised contour data, floodplain, and floodway mapping.
- Planimetric boundary survey of the Twin Creeks development (provided by Farber Surveying)
- Cross-section plots comparing effective and revised grading through the development
- A copy of the effective Floodway Data Table (FWDT) from FEMA (2011)
- Engineering “No-Rise” Certification is also attached.

1.5 References

Federal Emergency Management Agency (FEMA). 2011. Flood Insurance Study, Jackson County, Oregon and Incorporated Areas. Flood Insurance Study Number 41029V000A. May 3.

Northwest Hydraulic Consultants Inc. (NHC). 2014. FEMA Conditional Letter of Map Revision Application for the Twin Creeks Development Project. Prepared for Twin Creeks Development Co. LLC. July 28.

Sincerely,

Northwest Hydraulic Consultants Inc.

Prepared by:

Peter C. Brooks, P.E.
Senior Engineer

ENCLOSURES

cc: Herb Farber, P.L.S. – Farber Surveying (herb@farbersurveying.com)
Matthew Dusenbury, P.E. – Whetstone Engineering (whetstoneengineering@q.com)

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the State of Oregon.

It is to further certify that the attached technical data supports the fact that proposed Twin Creeks Development, Twin Creeks Crossing Phases 1,2, and 3 will not impact the 100-year flood elevations, floodway elevations and floodway widths on Jackson Creek Overbank at published sections
in the Flood Insurance Study for Jackson County, OR, dated May 3, 2011, and will not impact the 100-year flood elevations, floodway elevations, and floodway widths at unpublished cross-sections in the vicinity of the proposed development.

Attached are the following documents that support my findings:

1. Duplicate effective and revised condition HEC-RAS hydraulic models (floodplain and floodway runs) including input and output files
2. Table summarizing computed floodplain and floodway profiles
3. Work map showing contours, floodplain/floodway mapping, and base flood elevations for effective and revised conditions
4. Copy of effective Floodway Data Table
5. Cross-section plots comparing effective and revised conditions
6. Certified planimetric boundary survey of development
7. Printout of output files from effective and revised floodway runs
8. CD containing copies of all digital files

(Signature)

2/26/15
(Date)

SENIOR ENGINEER
(Title)

Northwest Hydraulic Consultants Inc.

16300 Christensen Road, Suite 350

Seattle, WA 98188

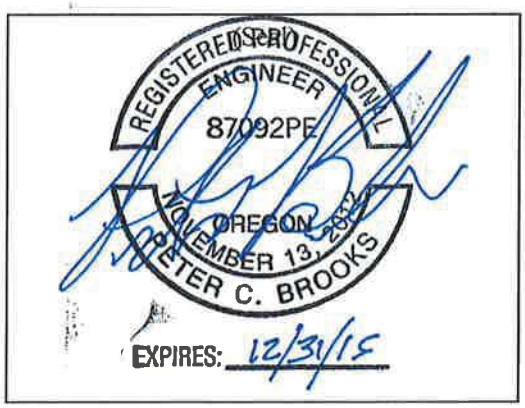
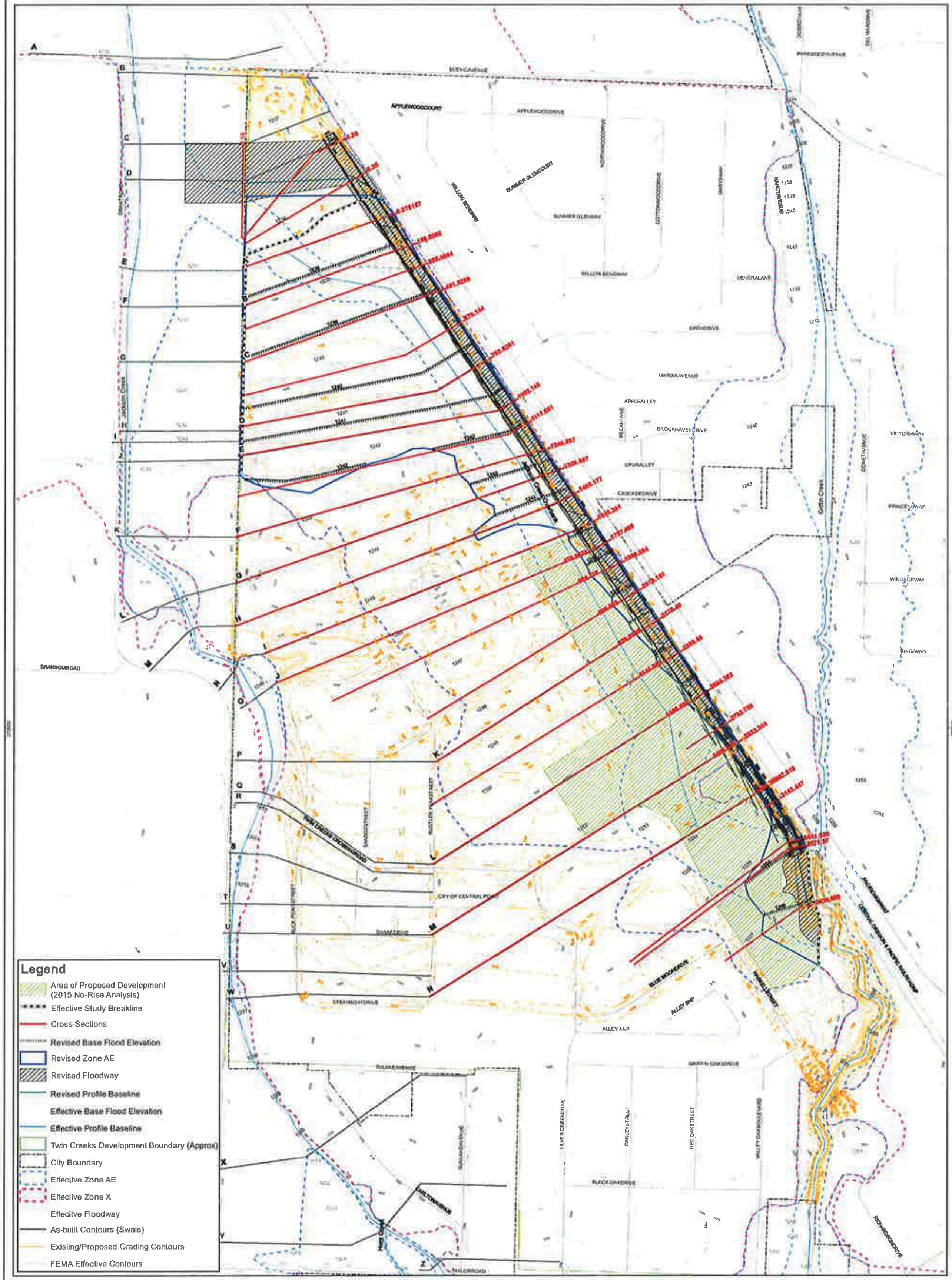


Table 1. Comparison of Effective and Revised 100-year Floodplain and Floodway Water Surface Elevations

River Station		100-Year Floodplain			Floodway		
Effective (FEMA Cross-section Letter in parenthesis, where appropriate)	Revised	Duplicate Effective Elevation (feet)	Revised Elevation (feet)	Difference (feet)	Duplicate Effective Elevation (feet)	Revised Elevation (feet)	Difference (feet)
-	0.15	-	1237.71	-	-	1238.64	-
-	0.2	-	1237.74	-	-	1238.65	-
-	0.25	-	1237.76	-	-	1238.61	-
793.2 (A)	0.28	1238.49*	1237.83	-0.66	1239.18	1238.81	-0.37
951.8 (B)	160.54	1238.84*	1238.04	-0.80	1239.60	1239.03	-0.57
-	265.49	-	1238.35	-	-	1239.18	-
1188.3 (C)	401.53	1239.72	1239.02	-0.70	1240.56	1239.62	-0.94
-	579.14	-	1239.38	-	-	1240.11	-
1554.8 (D)	783.83	1240.75	1240.49	-0.26	1241.33	1240.96	-0.37
1689.0 (E)	1002.15	1241.81	1241.39	-0.42	1242.55	1242.18	-0.37
-	1117.8	-	1242.04	-	-	1242.60	-
1966.3 (F)	1249.04	1242.82	1242.63	-0.19	1243.76	1243.33	-0.43
2113.1 (G)	1358.7	1243.65	1243.37	-0.28	1244.54	1244.08	-0.46
2270.1 (H)	1495.18	1244.37	1244.29	-0.08	1245.29	1244.74	-0.55
2422.0 (I)	1646.26	1245.25	1244.87	-0.38	1245.97	1245.31	-0.66
2548.0 (J)	1757.49	1245.86	1245.46	-0.40	1246.71	1245.69	-1.02
-	1866.28	-	1246.28	-	-	1246.41	-
-	2019.16	-	1247.39	-	-	1247.53	-
3071.0 (K)	2178.49	1248.34	1248.23	-0.11	1249.25	1248.34	-0.91
-	2350.68	-	1249.22	-	-	1249.31	-
3454.7 (L)	2564.28	1250.99	1250.50	-0.49	1251.94	1250.58	-1.36
-	2732.76	-	1251.26	-	-	1251.35	-
3722.3 (M)	2832.34	1252.21	1251.59	-0.62	1253.18	1251.68	-1.50
3956.5 (N)	3067.82	1254.01	1252.48	-1.53	1254.05	1252.59	-1.46
-	3143.45	-	1252.75	-	-	1252.86	-
-	3341.92	-	1253.25	-	-	1253.37	-
-	3370.57	-	1254	-	-	1254.03	-
-	3639.01	-	1255.21	-	-	1256.02	-

***Note: values shown in effective FEMA FWDT are incorrect (NHC, 2014)**



Note: Grading plan contour data provided to NHC by Whetstone Engineering.

Swale as-built survey data provided by Farber Surveying.

Data is shown in NAD 83 Oregon State Plane South horizontal datum and NAVD88 vertical datum.

Effective mapping on workmap from preliminary DFIRM prepared by NHC in 2009.

EXPIRES: 12/31/15

Twin Creeks Development No-Rise

Jackson Creek Overbank Workmap 2015 No-Rise Analysis

Scale - 1:2,400

200 100 0 200 Feet

coord. syst.: OR State Plane South	horz. datum: NAD 83	horz. units: Intl Feet
northwest hydraulic consultants	project no 200044	25 Feb-2015

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Jackson Creek Overbank								
A	390	200	575	2.1	1238.4	1238.4	1239.2	0.8
B	588	200	348	3.5	1238.6	1238.6	1239.6	1.0
C	986	239	674	1.8	1239.7	1239.7	1240.6	0.8
D	1394	224	340	3.6	1240.8	1240.8	1241.3	0.6
E	1592	270	452	2.7	1241.8	1241.8	1242.6	0.7
F	1833	292	403	3.0	1242.8	1242.8	1243.8	0.9
G	1949	264	385	3.2	1243.7	1243.7	1244.5	0.9
H	2091	259	464	2.6	1244.4	1244.4	1245.3	0.9
I	2236	283	398	3.1	1245.3	1245.3	1246.0	0.7
K	2790	351	443	2.8	1248.4	1248.4	1249.3	0.9
L	3172	360	411	3.0	1251.0	1251.0	1251.9	1.0
M	3446	423	632	1.9	1252.2	1252.2	1253.2	1.0
N	3683	310	407	3.0	1254.0	1254.0	1254.1	0.0

[1]Feet above confluence with Jackson Creek

Table 5

FEDERAL EMERGENCY MANAGEMENT AGENCY

JACKSON COUNTY, OR AND INCORPORATED AREAS

FLOODWAY DATA

JACKSON CREEK OVERBANK

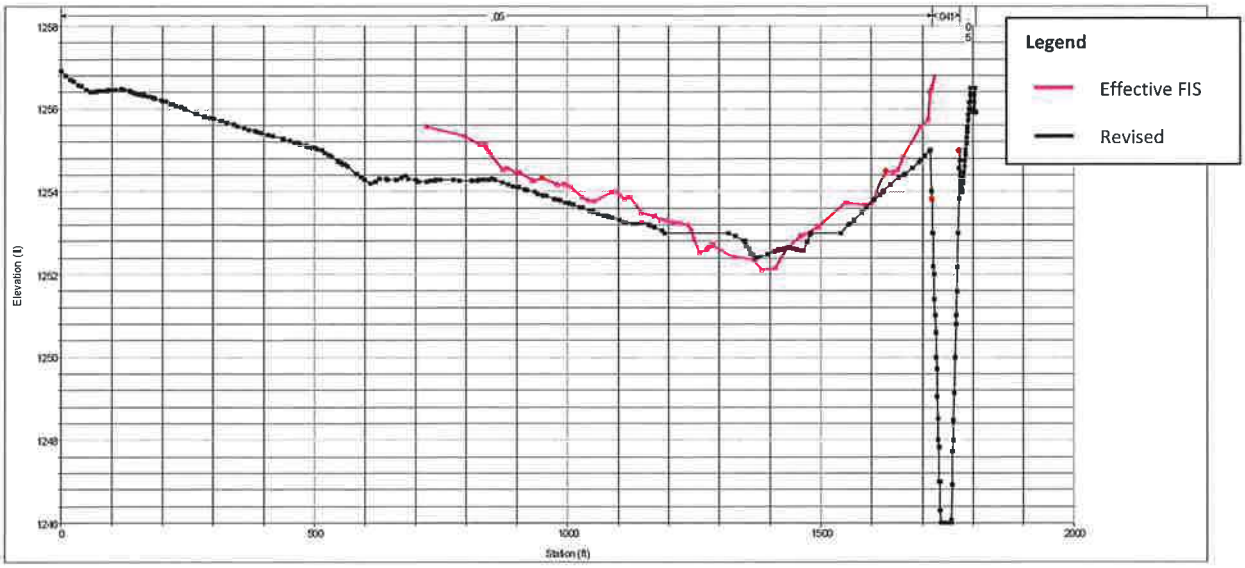


Figure 1. Effective RS 3956.45 (N), Revised RS 3067.82

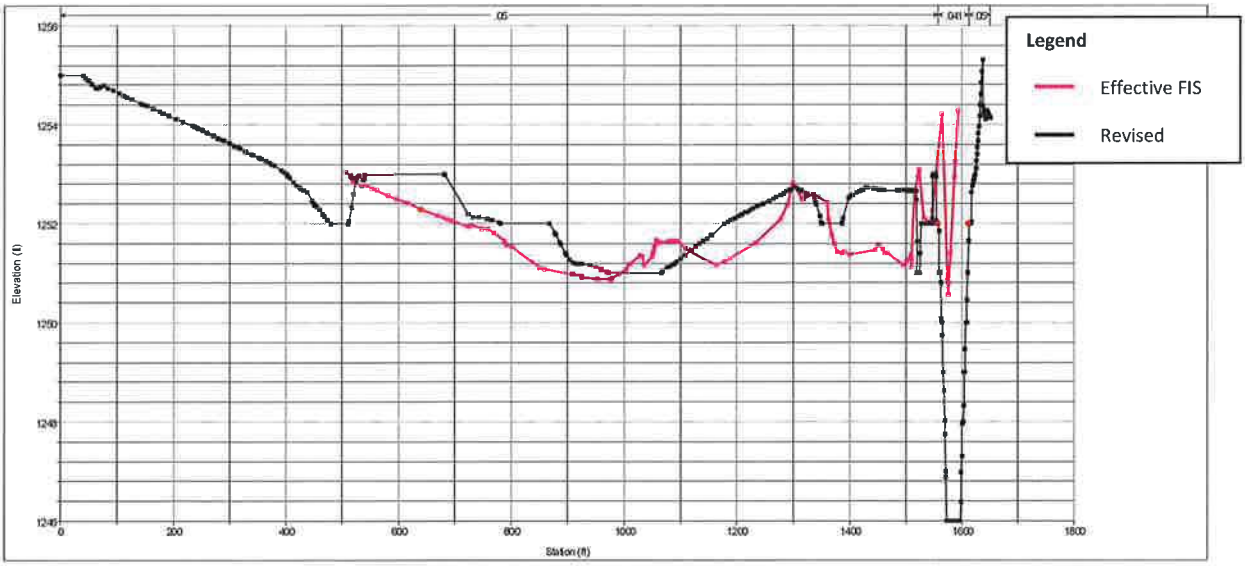


Figure 2. Effective RS 3722.35 (M), Revised RS 2832.34

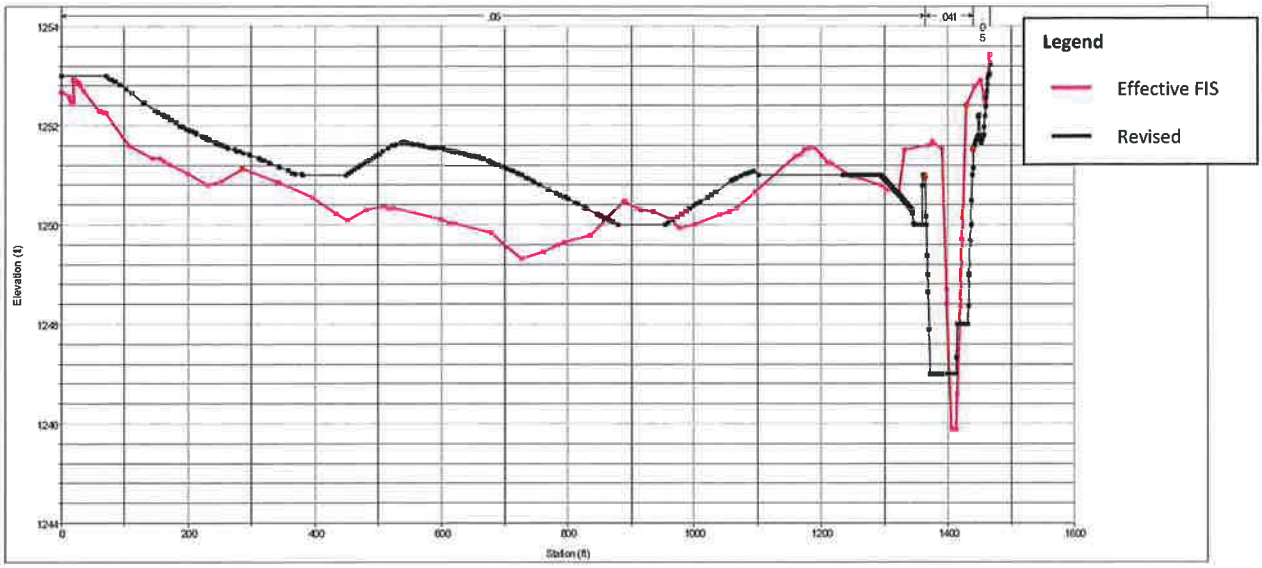


Figure 3. Effective RS 3454.72 (L), Revised RS 2564.28

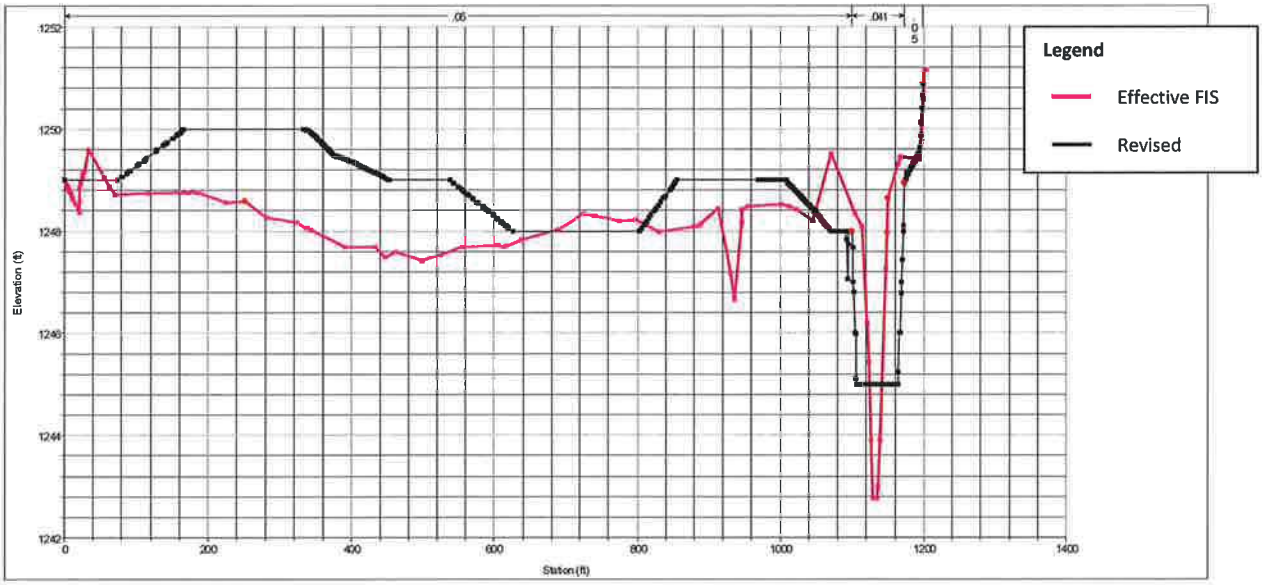


Figure 4. Effective RS 3070.97 (K), Revised RS 2178.49

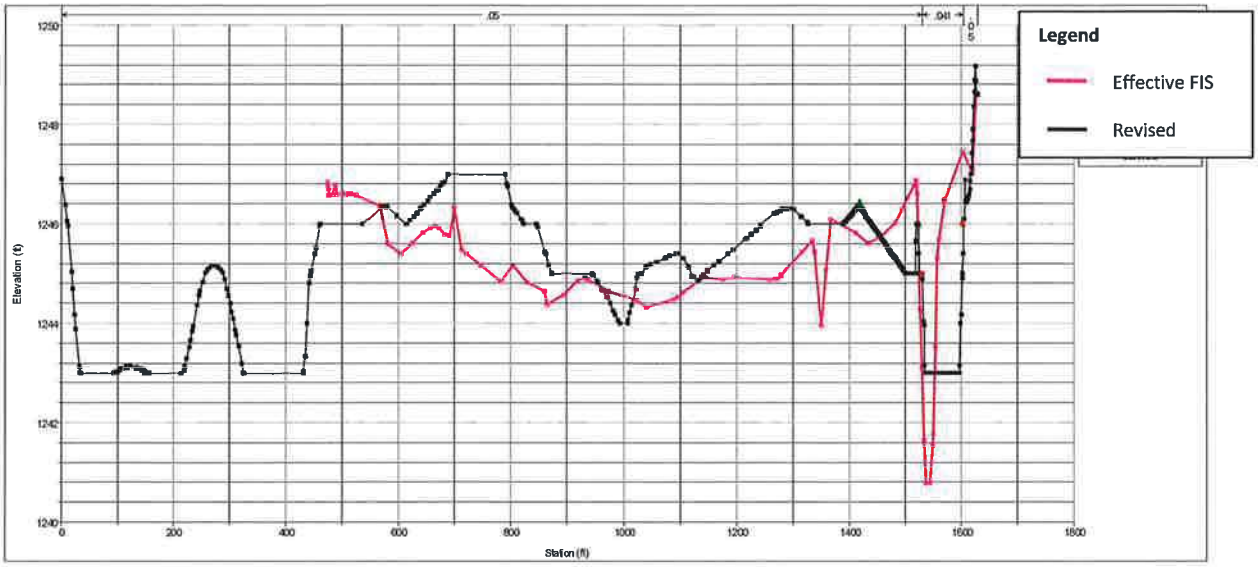


Figure 5. Effective RS 2547.98(J), Revised RS 1757.49

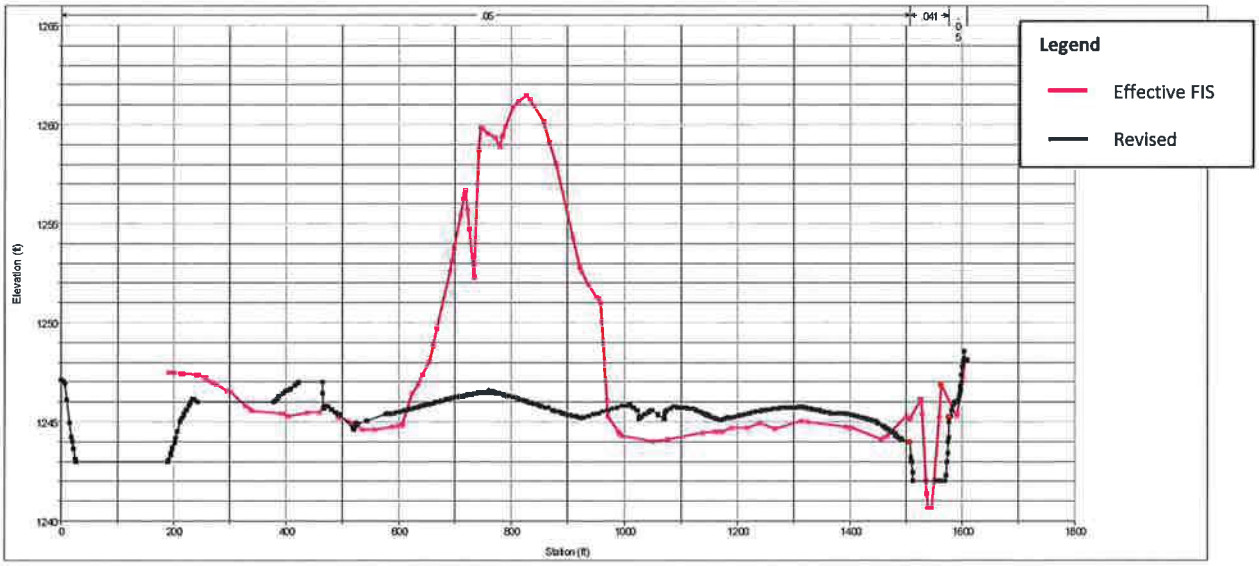


Figure 6. Effective RS 2422.05 (I), Revised RS 1646.26

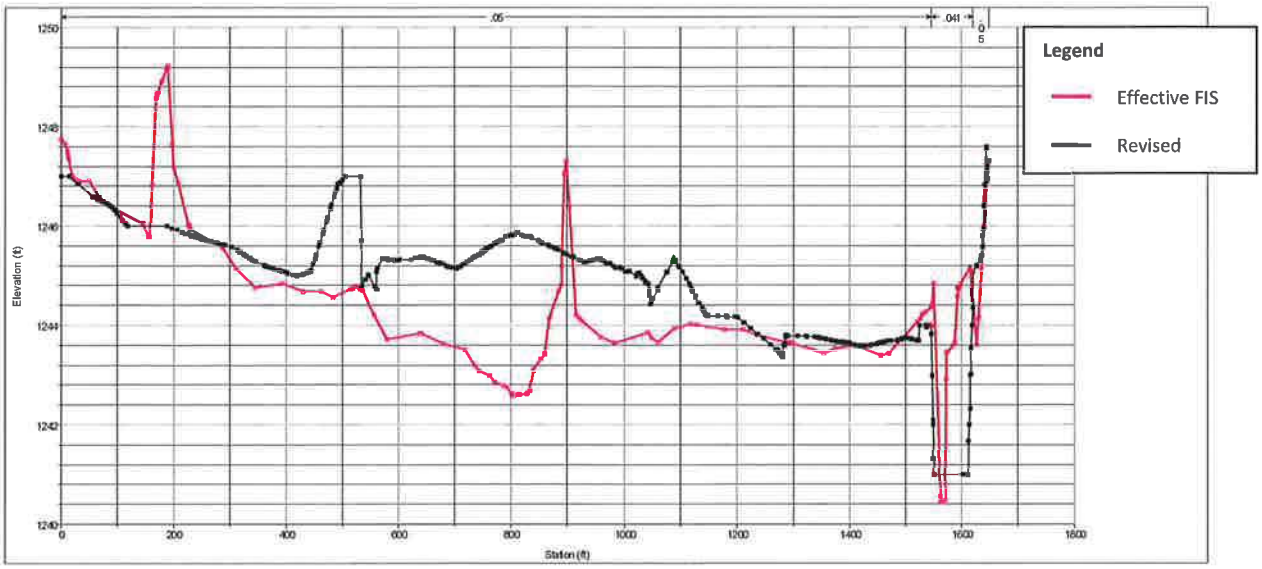


Figure 7. Effective RS 2279.06 (H), Revised RS 1495.18

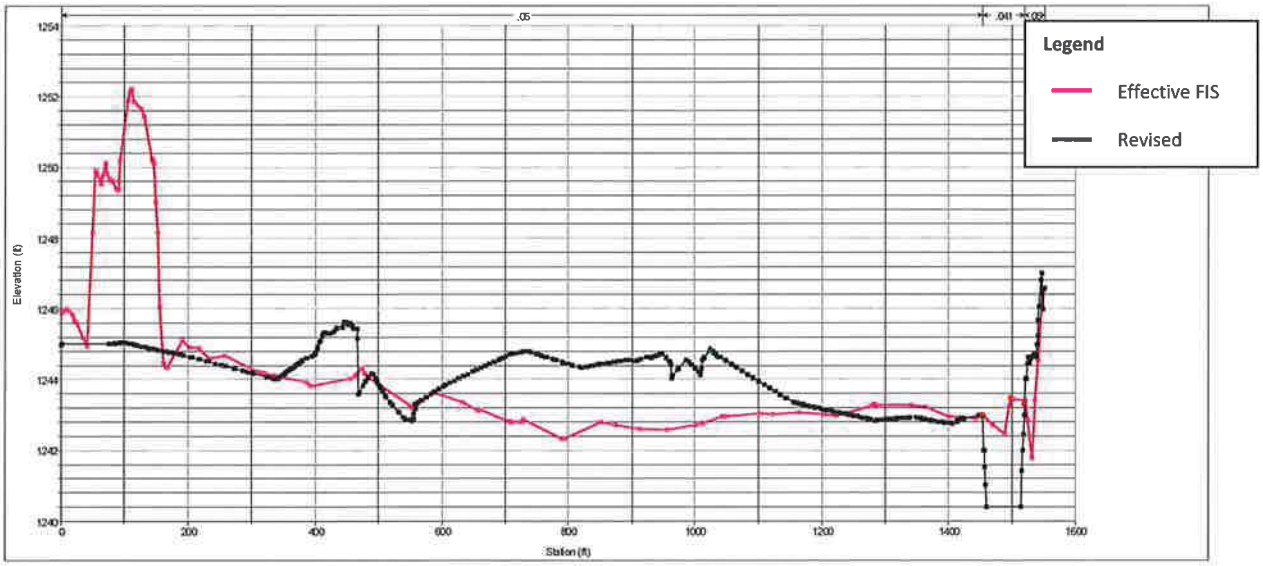


Figure 8. Effective RS 2113.14 (G), Revised RS 1358.70

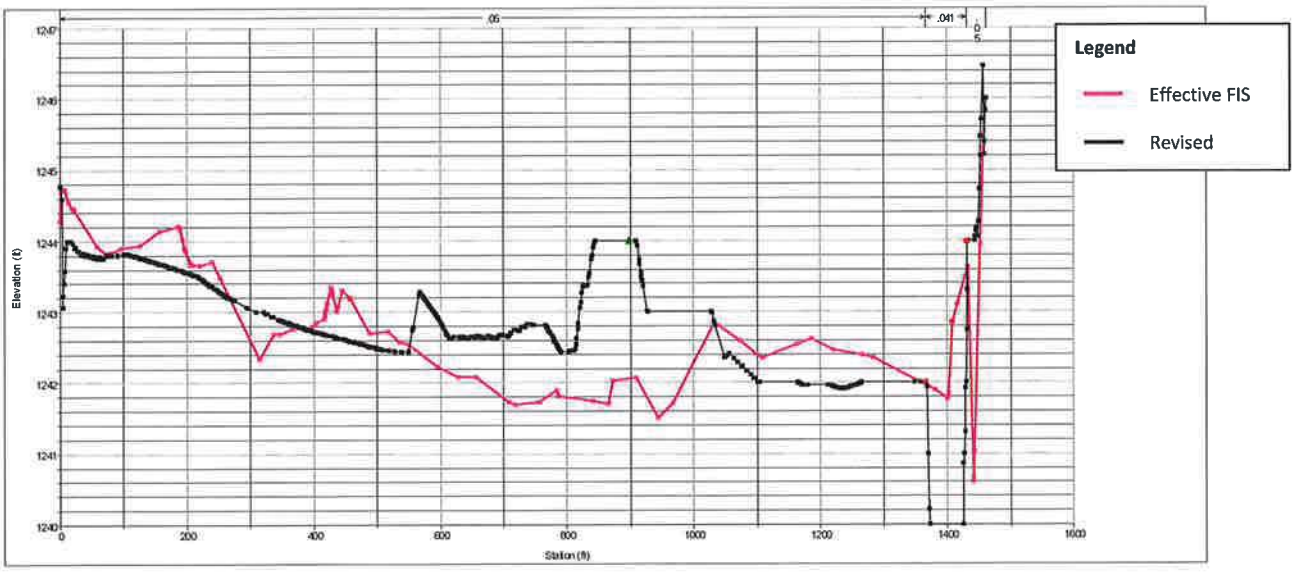


Figure 9. Effective RS 1966.35(F), Revised RS 1249.04

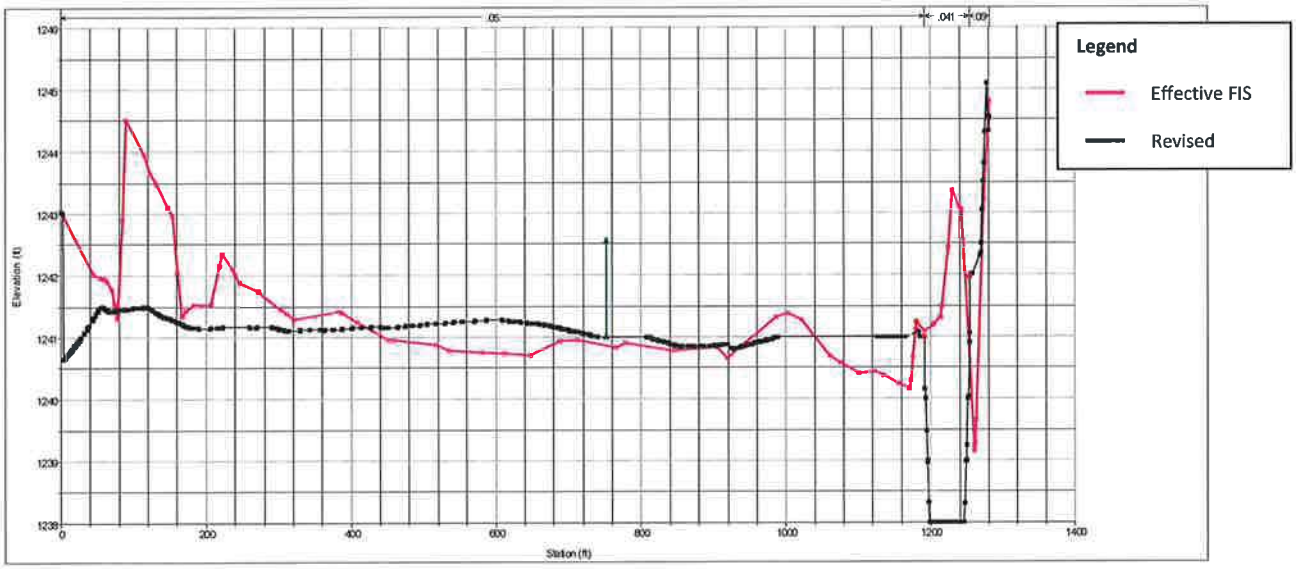


Figure 10. Effective RS 1689.04 (E), Revised RS 1002.15

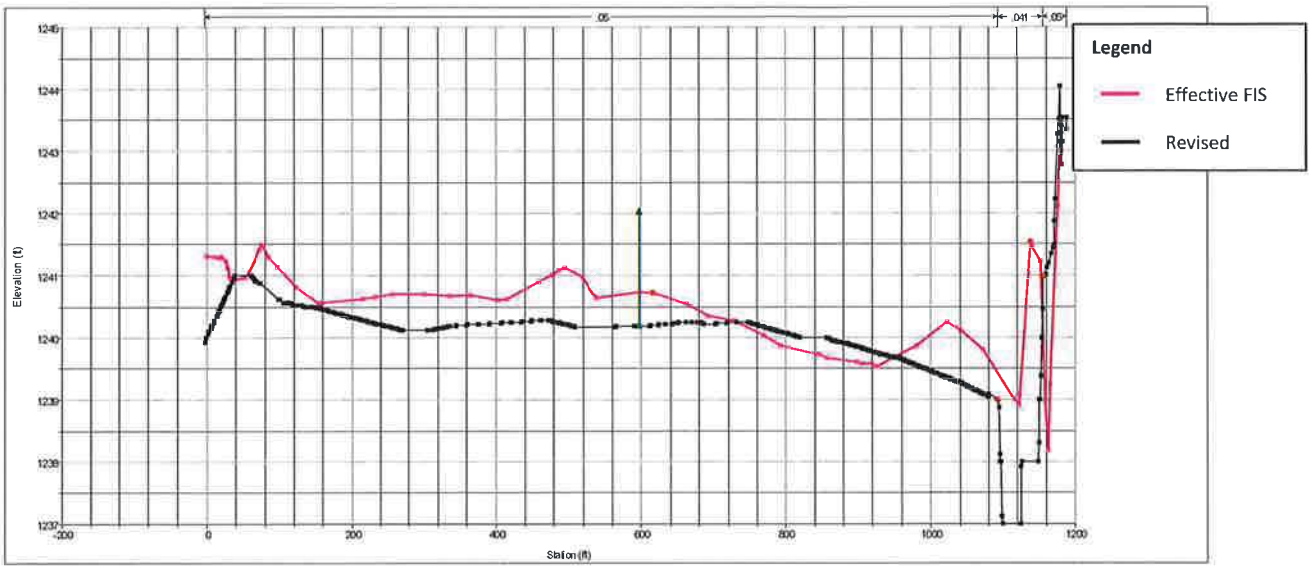


Figure 11. Effective RS 1554.78 (D), Revised RS 783.83

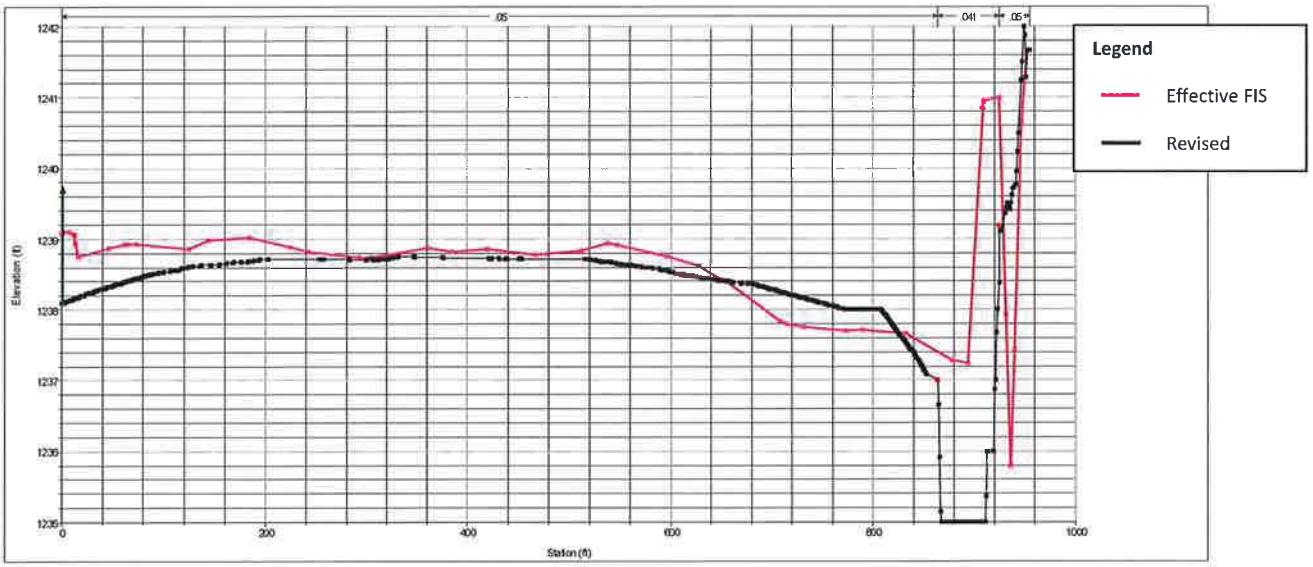


Figure 12. Effective RS 1118.32(C), Revised RS 401.53

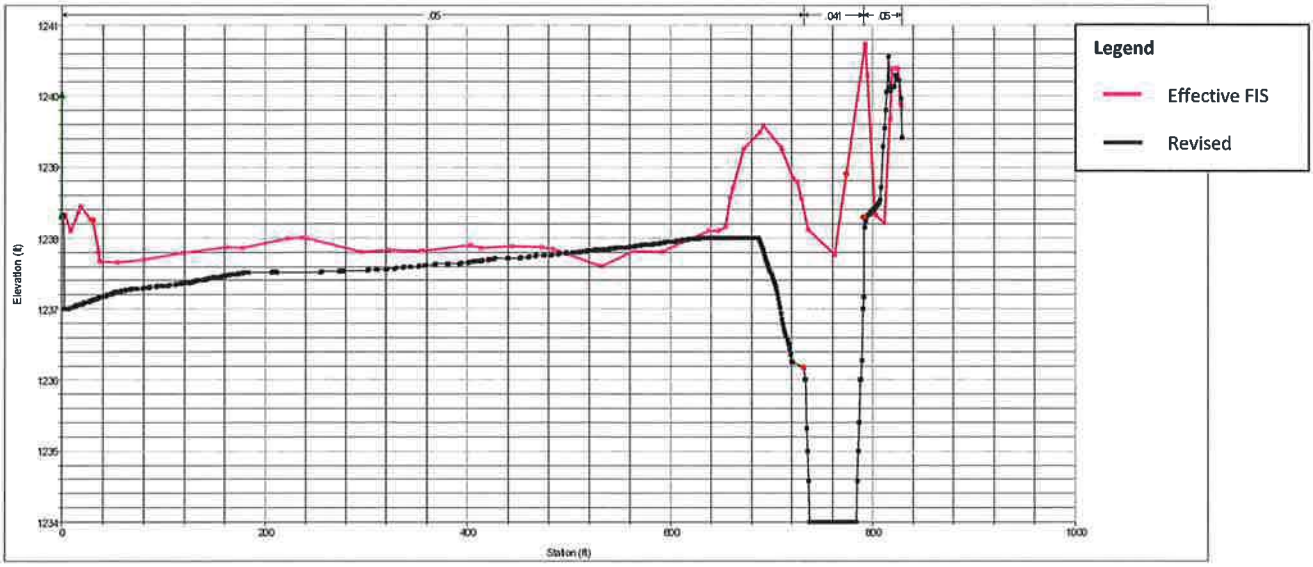


Figure 13. Effective RS 951.84(B), Revised RS 160.54

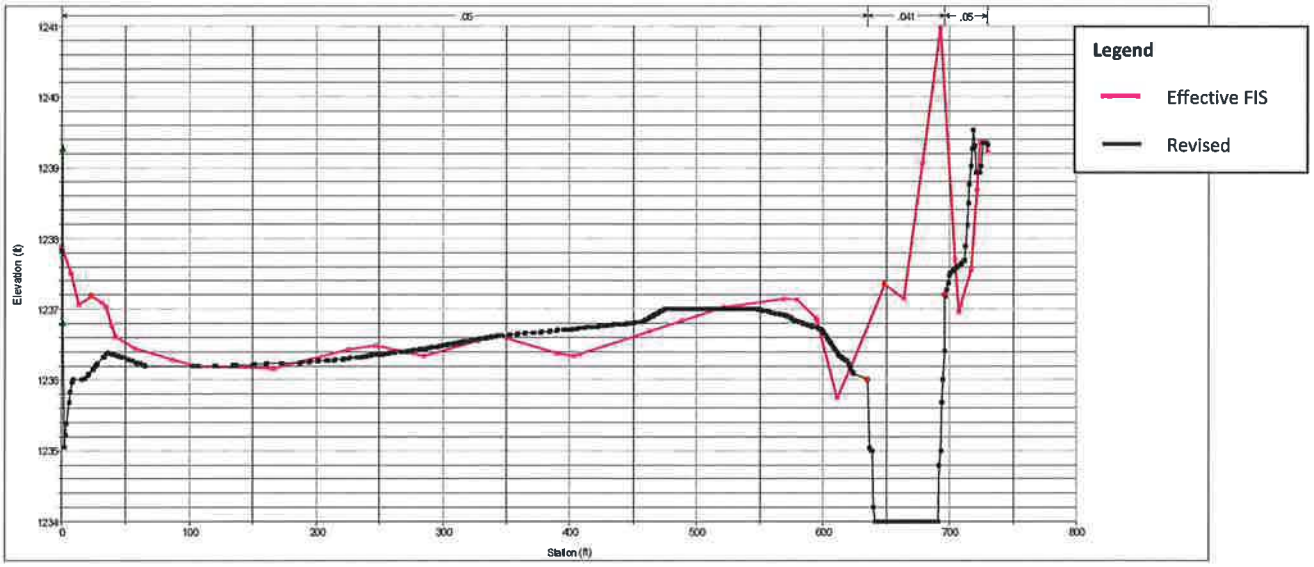


Figure 14. Effective RS 793.19 (A), Revised RS 0.275


NV-PHASE 1
(FUTURE)
NV-PHASE 2
(FUTURE)
NV-PHASE 4
(IN-PROGRESS)
NV-PHASE 3
(COMPLETE)
TWIN CREEKS CROSSING PHASE II
TWIN CREEKS CROSSING PHASE III
TWIN CREEKS CROSSING PHASE I
JACKSON OAKS PHASE III
JACKSON OAKS PHASE IV
JACKSON OAKS PHASE VI
JACKSON OAKS PHASE II
JACKSON OAKS PHASE V
JACKSON OAKS PHASE I
GRIFFIN OAKS UNIT NO. 3
GRIFFIN OAKS UNIT NO. 2 PHASE I
GRIFFIN OAKS PHASE I
GRIFFIN OAKS UNIT NO. 2 PHASE II & III
Surveyed by:
FARBER & SONS, INC.
dba FARBER SURVEYING
(541) 664-5599
PO BOX 5286
431 OAK STREET
CENTRAL POINT, OREGON 97502
LAND SURVEYOR

HEC-RAS Version 4.1.0 Jan 2010
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

```
X     X  XXXXXX    XXXX        XXXX       XX      XXXX
X     X  X        X    X      X   X     X  X    X
X     X  X             X      X   X    X    X   X
XXXXXXX  XXXX         X   XXX  XXXX     XXXXXX    XXXX
X     X  X            X        X  X     X    X       X
X     X  X        X   X        X   X    X    X       X
X     X  XXXXXX    XXXX        X    X   X    X   XXXXX
```

PROJECT DATA
Project Title: Jackson Creek Hydraulic Model
Project File : JAFISOct04.prj
Run Date and Time: 2/25/2015 3:23:11 PM

Project in English units

Project Description:
Jackson Creek HEC-RAS Model - Twin Creeks Development No-Rise
Developed by
Northwest Hydraulic Consultants, Inc
February 25, 2015
v4.1.0

Vertical
Datum: NAVD 1988
Survey obtained by NHC and terrain data supplied by the City
of Central Point, Farber Surveying and Whetstone Engineering

2015
AMMENDMENT
As-built of drainage swale grading added to model
Development
grading includes T.C. Crossing Phases 1, 2, and 3; N.V. Phase 3

PLAN DATA

Plan Title: Duplicate Effective Floodway
Plan File : Q:_B\200044_Twin Creeks CLOMR Preparation\2015_NoRise\Submittal\HEC-RAS\JAFISOct04.p15

Geometry Title: Jackson_Floodway_Effective
Geometry File : Q:_B\200044_Twin Creeks CLOMR Preparation\2015_NoRise\Submittal\HEC-RAS\JAFISOct04.g02

Flow Title : Jackson_Floodway_Effective
Flow File : Q:_B\200044_Twin Creeks CLOMR Preparation\2015_NoRise\Submittal\HEC-RAS\JAFISOct04.f03

Plan Summary Information:
Number of: Cross Sections = 72 Multiple Openings = 0

```
             Culverts       =    5    Inline Structures  =    2
             Bridges        =    8    Lateral Structures =    9

Computational Information
    Water surface calculation tolerance  =  0.01
    Critical depth calculation tolerance =  0.01
    Maximum number of iterations         =  20
    Maximum difference tolerance         =  0.3
    Flow tolerance factor                =  0.001

Computation Options
    Critical depth computed only where necessary
    Conveyance Calculation Method: At breaks in n values only
    Friction Slope Method:         Average Conveyance
    Computational Flow Regime:     Subcritical Flow

Encroachment Data
   Equal Conveyance = True
   Left Offset      =        0
   Right Offset     =        0

River = Jackson Creek    Reach = Main Channel
RS      Profile           Method  Value1  Value2
20208.45FLOODWAY               1 1067.75  1120.2
20198.01FLOODWAY               1 1144.75  1197.2
20166.90FLOODWAY               1  1152.5 1202.36
20090.33FLOODWAY               1 1016.25 1057.88
18967.88FLOODWAY               1  225.09  279.64
17994.36FLOODWAY               1      82  147.06
17931.56FLOODWAY               1      82     151
17857.52FLOODWAY               1     180     240
17716.39FLOODWAY               1     259     323
17671.40FLOODWAY               1     270     330
17620.46FLOODWAY               1     280     340
17591.36FLOODWAY               1  289.21     354
16942.29FLOODWAY               1  267.96  303.96
16403.44FLOODWAY               1   124.5  220.93
15919.80FLOODWAY               1   133.5  198.59
15857.49FLOODWAY               1   123.5  188.59
15411.86FLOODWAY               1   90.85  154.19
15372.82FLOODWAY               1      33     103
15319.58FLOODWAY               1       0   62.77
15288.48FLOODWAY               1    63.5  115.27
15069.27FLOODWAY               1     7.5    38.3
15002.72FLOODWAY               1   746.5  783.19
14531.71FLOODWAY               1  427.52   464.5
13739.75FLOODWAY               1    13.6   75.82
13618.45FLOODWAY               1    19.4    63.2
13447.21FLOODWAY               1   25.95    65.2
13314.60FLOODWAY               1   37.15   96.91
13087.59FLOODWAY               1    38.7   144.1
12851.71FLOODWAY               1   100.3   149.5
12799.54FLOODWAY               1   119.3   168.5
12651.65FLOODWAY               1   102.7     230
12352.91FLOODWAY               1      40     167
12184.87FLOODWAY               1   112.5  153.73
12153.40FLOODWAY               1   105.5  141.39
11900.70FLOODWAY               1  253.62  299.71
11885.36FLOODWAY               1     248  294.09
11748.96FLOODWAY               1  264.12  308.05
11366.76FLOODWAY               1   12.82   50.24
11034.75FLOODWAY               1   22.46      58
11018.94FLOODWAY               1   24.66    57.3
```

124	10990.71	FLOODWAY	1	25.71	58.37
125	10948.06	FLOODWAY	1	48.68	81.37
126	10897.78	FLOODWAY	1	0	50.22
127	10884.99	FLOODWAY	1	0	90
128	10589.80	FLOODWAY	1	0	150
129	10343.73	FLOODWAY	1	0	200
130	10325.40	FLOODWAY	1	0	200
131	10175.04	FLOODWAY	1	0	225
132	10159.97	FLOODWAY	1	0	235
133					
134	River = Jackson Creek		Reach = Main Lower		
135	RS	Profile	Method	Value1	Value2
136	9769.785	FLOODWAY	1	57.49	416.4
137	9747.670	FLOODWAY	1	57.61	420.25
138	9611.585	FLOODWAY	1	0	275.68
139	9595.562	FLOODWAY	1	0	275.68
140	9288.338	FLOODWAY	1	0	300
141	9235.024	FLOODWAY	1	361.59	700
142	9220.769	FLOODWAY	1	199.82	690
143	9000	FLOODWAY	1	225	670
144					
145	River = Jackson Overbank		Reach = Jackson Overbank		
146	RS	Profile	Method	Value1	Value2
147	3956.457	FLOODWAY	1	1290	1600
148	3722.349	FLOODWAY	1	1141	1564
149	3454.720	FLOODWAY	1	1070	1430.03
150	3070.973	FLOODWAY	1	800	1150.65
151	2547.979	FLOODWAY	1	1260	1571.73
152	2422.046	FLOODWAY	1	1280	1563.41
153	2270.064	FLOODWAY	1	1335	1594.29
154	2113.142	FLOODWAY	1	1235	1499.38
155	1966.347	FLOODWAY	1	1140	1432.21
156	1689.039	FLOODWAY	1	955	1225.42
157	1554.780	FLOODWAY	1	915	1138.8
158	1188.317	FLOODWAY	1	655	894
159	951.8403	FLOODWAY	1	296	496
160	794.192*	FLOODWAY	1	95	295
161	793.1924	FLOODWAY	1	95	295
162					
163					
164	Profile Output Table - Encroachment 1				
165					

166	River	Reach	River Sta	Profile	W.S. Elev	Prof Delta WS	E.G. Elev	Top Wdth Act	Q Left	Q Channel	Q Right	Enc Sta L	Ch Sta L	Ch Sta R	Enc Sta R
					(ft)	(ft)	(ft)	(ft)							
167															

```
167                                                                    cfs)(cfs)(cfs)(ft)(ft)(ft)(ft)
168
169    Jackson Creek     Main Lower        9000          100YR
       1233.89                  1234.71         395.15   389.05
       2066.70      1.27              436.95    479.00
170    Jackson Creek     Main Lower        9000          FLOODWAY
       1234.72           0.84   1235.60         445.00   787.16
       2552.01     71.83    225.00    436.95    479.00      670.00
171
172    Jackson Creek     Main Lower        9220.769      100YR
       1235.15                  1235.43         490.18   708.38
       1616.59    132.04              436.95    479.00
173    Jackson Creek     Main Lower        9220.769      FLOODWAY
       1236.04           0.89   1236.29         490.18  1166.96
       1839.93    404.11    199.82    436.95    479.00      690.00
174
175    Jackson Creek     Main Lower        9235.024      100YR
       1234.82                  1235.64         338.41    33.11
       2150.18    273.73              437.80    484.13
176    Jackson Creek     Main Lower        9235.024      FLOODWAY
       1235.80           0.98   1236.45         338.41   179.74
       2436.59    794.68    361.59    437.80    484.13      700.00
177
178    Jackson Creek     Main Lower        9245
       Culvert
179
180    Jackson Creek     Main Lower        9288.338      100YR
       1236.69                  1236.88         400.00   338.65
       1179.61    938.76               57.83     86.93
181    Jackson Creek     Main Lower        9288.338      FLOODWAY
       1237.39           0.69   1237.68         300.00   636.08
       1572.31   1202.62      0.00     57.83     86.93      300.00
182
183    Jackson Creek     Main Lower        9300                     Lat
```

```
183     Struct
184
185     Jackson Creek      Main Lower          9595.562        100YR
        1237.10                      1237.31          416.00    180.38
        1529.78   1353.09                    56.68       99.03
186     Jackson Creek      Main Lower          9595.562        FLOODWAY
        1237.91            0.81      1238.18          275.68    390.83
        1843.63   1176.54         0.00       56.68       99.03      275.68
187
188     Jackson Creek      Main Lower          9607.9                      Inl
        Struct
189
190     Jackson Creek      Main Lower          9611.585        100YR
        1237.15                      1237.35          414.00    213.86
        1505.68   1343.70                    54.68       97.03
191     Jackson Creek      Main Lower          9611.585        FLOODWAY
        1237.98            0.83      1238.23          275.68    424.60
        1788.58   1197.82         0.00       54.68       97.03      275.68
192
193     Jackson Creek      Main Lower          9700                        Lat
        Struct
194
195     Jackson Creek      Main Lower          9747.670        100YR
        1237.35                      1237.63          420.25    390.67
        1252.54   1538.02                    57.61       82.13
196     Jackson Creek      Main Lower          9747.670        FLOODWAY
        1238.26            0.91      1238.46          362.64
        1222.92   2188.08        57.61      57.61       82.13      420.25
197
198     Jackson Creek      Main Lower          9758    BR D    100YR
        1237.54                      1237.68          420.25    227.25
        655.55    2298.43                    57.61       82.13
199     Jackson Creek      Main Lower          9758    BR D    FLOODWAY
        1238.38            0.85      1238.49          362.64
        616.76    2794.24        57.61      57.61       82.13      420.25
200
201     Jackson Creek      Main Lower          9758    BR U    100YR
        1237.59                      1237.75          416.40    249.06
        638.58    2293.58                    57.49       83.13
202     Jackson Creek      Main Lower          9758    BR U    FLOODWAY
        1238.42            0.82      1238.53          358.91
        614.86    2796.14        57.49      57.49       83.13      416.40
203
204     Jackson Creek      Main Lower          9769.785        100YR
        1237.52                      1237.78          416.40    447.34
        1250.51   1483.38                    57.49       83.13
205     Jackson Creek      Main Lower          9769.785        FLOODWAY
        1238.35            0.83      1238.56          358.91
        1284.04   2126.96        57.49      57.49       83.13      416.40
206
207     Jackson Creek      Main Channel        10159.97        100YR
        1238.33                      1238.83           52.34     33.59
        911.59       0.53                    43.13       68.88
208     Jackson Creek      Main Channel        10159.97        FLOODWAY
        1239.04            0.71      1239.82          223.81    150.12
        1483.06    557.82         0.00       43.13       68.88      235.00
209
210     Jackson Creek      Main Channel        10168   BR D    100YR
        1237.52                      1239.20
        945.71                       43.13       68.88
211     Jackson Creek      Main Channel        10168   BR D    FLOODWAY
        1239.44            1.92      1239.87          235.00    113.21
        777.14    1300.66        0.00       43.13       68.88      235.00
```

```
212
213    Jackson Creek      Main Channel       10168   BR U   100YR
       1237.76                    1239.51
       945.71                              55.05      77.27
214    Jackson Creek      Main Channel       10168   BR U   FLOODWAY
       1239.56            1.80    1240.15          225.00    142.32
       890.87   1157.80         0.00      55.05      77.27      225.00
215
216    Jackson Creek      Main Channel       10175.04       100YR
       1239.65                    1239.69          552.82     54.39
       379.78    511.54                    55.05      77.27
217    Jackson Creek      Main Channel       10175.04       FLOODWAY
       1239.41           -0.24    1240.22          214.60    182.45
       1437.53    571.02          0.00      55.05      77.27      225.00
218
219    Jackson Creek      Main Channel       10200                     Lat
       Struct
220
221    Jackson Creek      Main Channel       10325.40       100YR
       1239.54                    1239.89           43.49      0.53
       1207.34      0.35                    16.27      55.15
222    Jackson Creek      Main Channel       10325.40       FLOODWAY
       1240.28            0.74    1240.80          200.00     11.51
       1801.26    378.23          0.00      16.27      55.15      200.00
223
224    Jackson Creek      Main Channel       10335   BR D   100YR
       1239.21                    1240.03            1.00
       1207.87      0.34                    16.27      55.15
225    Jackson Creek      Main Channel       10335   BR D   FLOODWAY
       1240.45            1.24    1240.82          200.00     38.93
       1241.49    910.58          0.00      16.27      55.15      200.00
226
227    Jackson Creek      Main Channel       10335   BR U   100YR
       1239.35                    1240.36           38.85
       1208.21                              16.02      55.04
228    Jackson Creek      Main Channel       10335   BR U   FLOODWAY
       1240.58            1.22    1241.01          200.00     47.89
       1271.70    871.41          0.00      16.02      55.04      200.00
229
230    Jackson Creek      Main Channel       10343.73       100YR
       1240.08                    1240.43           51.36      3.27
       1204.94                              16.02      55.04
231    Jackson Creek      Main Channel       10343.73       FLOODWAY
       1240.52            0.44    1241.05          200.00     20.83
       1752.55    417.61          0.00      16.02      55.04      200.00
232
233    Jackson Creek      Main Channel       10400                     Lat
       Struct
234
235    Jackson Creek      Main Channel       10589.80       100YR
       1240.37                    1241.41           34.92
       1853.30      0.03                    22.92      57.84
236    Jackson Creek      Main Channel       10589.80       FLOODWAY
       1241.19            0.82    1241.88          142.05      7.35
       1846.48    337.18          0.00      22.92      57.84      150.00
237
238    Jackson Creek      Main Channel       10600                     Lat
       Struct
239
240    Jackson Creek      Main Channel       10884.99       100YR
       1241.82                    1242.96           30.37
       1930.97      0.14                    19.65      49.65
241    Jackson Creek      Main Channel       10884.99       FLOODWAY
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241    1242.04           0.21     1243.42          32.10      0.17
       2190.56     0.28        0.00      19.65      49.65       90.00
242
243    Jackson Creek     Main Channel       10891    BR D   100YR
       1241.23                    1243.22
       1931.11                               19.65      49.65
244    Jackson Creek     Main Channel       10891    BR D   FLOODWAY
       1241.22          -0.01     1243.78
       2191.00                     0.00      19.65      49.65       90.00
245
246    Jackson Creek     Main Channel       10891    BR U   100YR
       1241.29                    1243.57
       1931.11                               17.42      50.14
247    Jackson Creek     Main Channel       10891    BR U   FLOODWAY
       1241.29           0.00     1244.23
       2191.00                     0.00      17.42      50.14       50.22
248
249    Jackson Creek     Main Channel       10897.78       100YR
       1242.73                    1243.71          39.44      3.67
       1925.61     1.84                      17.42      50.14
250    Jackson Creek     Main Channel       10897.78       FLOODWAY
       1243.39           0.66     1244.43          50.22     22.61
       2168.35     0.04        0.00      17.42      50.14       50.22
251
252    Jackson Creek     Main Channel       10900                     Lat
       Struct
253
254    Jackson Creek     Main Channel       10948.06       100YR
       1242.96                    1243.93          41.02      5.52
       1954.93     0.79                      48.68      81.37
255    Jackson Creek     Main Channel       10948.06       FLOODWAY
       1243.62           0.66     1244.65          32.69
       2191.00                    48.68      48.68      81.37       81.37
256
257    Jackson Creek     Main Channel       10990.71       100YR
       1243.18                    1244.10          39.76      4.14
       1956.63     0.46                      25.71      58.37
258    Jackson Creek     Main Channel       10990.71       FLOODWAY
       1243.85           0.67     1244.83          32.66
       2191.00                    25.71      25.71      58.37       58.37
259
260    Jackson Creek     Main Channel       11018.94       100YR
       1243.33                    1244.21          38.87      1.83
       1959.08     0.32                      24.66      57.30
261    Jackson Creek     Main Channel       11018.94       FLOODWAY
       1244.01           0.68     1244.95          32.64
       2191.00                    24.66      24.66      57.30       57.30
262
263    Jackson Creek     Main Channel       11027.9                   Inl
       Struct
264
265    Jackson Creek     Main Channel       11034.75       100YR
       1243.76                    1244.62          42.70      4.88
       1956.18     0.16                      24.41      57.05
266    Jackson Creek     Main Channel       11034.75       FLOODWAY
       1244.51           0.75     1245.41          35.54      6.77
       2183.60     0.63        22.46      24.41      57.05       58.00
267
268    Jackson Creek     Main Channel       11366.76       100YR
       1244.96                    1245.70          38.44      0.07
       1961.10     0.06                      12.82      50.24
269    Jackson Creek     Main Channel       11366.76       FLOODWAY
       1245.67           0.71     1246.44          37.42
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269    2191.00                12.82      12.82      50.24       50.24
270
271    Jackson Creek      Main Channel       11748.96       100YR
       1246.16                    1246.82          42.56
       1961.23                             264.12     308.05
272    Jackson Creek      Main Channel       11748.96       FLOODWAY
       1246.85            0.69    1247.54          43.59
       2191.00                264.12     264.12     308.05      308.05
273
274    Jackson Creek      Main Channel       11885.36       100YR
       1246.57                    1247.21          43.69
       1961.23                             248.00     294.09
275    Jackson Creek      Main Channel       11885.36       FLOODWAY
       1247.25            0.68    1247.90          45.29
       2191.00                248.00     248.00     294.09      294.09
276
277    Jackson Creek      Main Channel       11892   BR D   100YR
       1246.43                    1247.27          30.74
       1961.23                             248.00     294.09
278    Jackson Creek      Main Channel       11892   BR D   FLOODWAY
       1247.08            0.64    1247.98          30.73
       2191.00                248.00     248.00     294.09      294.09
279
280    Jackson Creek      Main Channel       11892   BR U   100YR
       1246.49                    1247.32          31.52
       1961.23                             258.28     295.05
281    Jackson Creek      Main Channel       11892   BR U   FLOODWAY
       1247.14            0.65    1248.03          31.52
       2191.00                253.62     258.28     295.05      299.71
282
283    Jackson Creek      Main Channel       11900.70       100YR
       1246.56                    1247.33          35.30
       1961.23                             258.28     295.05
284    Jackson Creek      Main Channel       11900.70       FLOODWAY
       1247.23            0.67    1248.04          37.96
       2191.00      0.00      253.62     258.28     295.05      299.71
285
286    Jackson Creek      Main Channel       12153.40       100YR
       1247.33                    1248.56          29.55
       1961.23                             105.50     141.39
287    Jackson Creek      Main Channel       12153.40       FLOODWAY
       1247.99            0.66    1249.28          31.79
       2191.00                105.50     105.50     141.39      141.39
288
289    Jackson Creek      Main Channel       12168   BR D   100YR
       1247.25                    1248.65          24.44
       1961.23                             105.50     141.39
290    Jackson Creek      Main Channel       12168   BR D   FLOODWAY
       1247.87            0.62    1249.39          24.46
       2191.00                105.50     105.50     141.39      141.39
291
292    Jackson Creek      Main Channel       12168   BR U   100YR
       1247.28                    1248.85          23.59
       1961.23                             112.50     153.73
293    Jackson Creek      Main Channel       12168   BR U   FLOODWAY
       1247.90            0.62    1249.60          23.58
       2191.00                112.50     112.50     153.73      153.73
294
295    Jackson Creek      Main Channel       12184.87       100YR
       1248.15                    1248.96          39.31
       1961.23                             112.50     153.73
296    Jackson Creek      Main Channel       12184.87       FLOODWAY
       1248.89            0.75    1249.72          40.97
```

```
296    2191.00              112.50     112.50     153.73      153.73
297
298    Jackson Creek      Main Channel       12352.91        100YR
       1249.06                    1249.12          157.95       2.66
       1958.27      0.29                  40.00     167.00
299    Jackson Creek      Main Channel       12352.91        FLOODWAY
       1249.81            0.75    1249.87          127.00
       2191.00                40.00      40.00     167.00      167.00
300
301    Jackson Creek      Main Channel       12651.65        100YR
       1249.09                    1249.23          110.62
       1961.23                               102.70     230.00
302    Jackson Creek      Main Channel       12651.65        FLOODWAY
       1249.84            0.75    1249.98          117.11
       2191.00              102.70     102.70     230.00      230.00
303
304    Jackson Creek      Main Channel       12799.54        100YR
       1248.93                    1251.14           37.16
       1961.23                               119.30     168.50
305    Jackson Creek      Main Channel       12799.54        FLOODWAY
       1249.39            0.45    1251.64           40.16
       2191.00              119.30     119.30     168.50      168.50
306
307    Jackson Creek      Main Channel       12825   BR D    100YR
       1249.61                    1251.24           41.61
       1961.23                               119.30     168.50
308    Jackson Creek      Main Channel       12825   BR D    FLOODWAY
       1250.05            0.44    1251.74           44.52
       2191.00              119.30     119.30     168.50      168.50
309
310    Jackson Creek      Main Channel       12825   BR U    100YR
       1250.67                    1251.72           49.06
       1961.19      0.04                  100.30     149.50
311    Jackson Creek      Main Channel       12825   BR U    FLOODWAY
       1251.10            0.43    1252.20           49.20
       2191.00              100.30     100.30     149.50      149.50
312
313    Jackson Creek      Main Channel       12851.71        100YR
       1250.68                    1251.72           49.15
       1961.18      0.05                  100.30     149.50
314    Jackson Creek      Main Channel       12851.71        FLOODWAY
       1251.11            0.43    1252.21           49.20
       2191.00              100.30     100.30     149.50      149.50
315
316    Jackson Creek      Main Channel       13087.59        100YR
       1252.41                    1252.96           77.29
       1961.23                                38.70     144.10
317    Jackson Creek      Main Channel       13087.59        FLOODWAY
       1252.85            0.45    1253.41           81.78
       2191.00                38.70      38.70     144.10      144.10
318
319    Jackson Creek      Main Channel       13314.60        100YR
       1253.22                    1254.04           66.33
       1958.31      2.92                   37.15      96.91
320    Jackson Creek      Main Channel       13314.60        FLOODWAY
       1253.61            0.39    1254.49           55.46
       2191.00                37.15      37.15      96.91       96.91
321
322    Jackson Creek      Main Channel       13447.21        100YR
       1253.10                    1255.60           32.01
       1944.20     17.03                   25.95      59.05
323    Jackson Creek      Main Channel       13447.21        FLOODWAY
       1253.46            0.37    1256.19           32.60
```

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323    2168.27     22.73       25.95      25.95      59.05       65.20
324
325    Jackson Creek      Main Channel       13618.45       100YR
       1255.97                    1256.87          40.70
       1859.02    102.21                  19.40      52.90
326    Jackson Creek      Main Channel       13618.45       FLOODWAY
       1256.52            0.55    1257.49          41.51
       2069.87    121.13      19.40      19.40      52.90       63.20
327
328    Jackson Creek      Main Channel       13739.75       100YR
       1256.51                    1257.32          72.09
       1751.09    210.14                  13.60      46.70
329    Jackson Creek      Main Channel       13739.75       FLOODWAY
       1257.14            0.62    1257.93          62.22
       1904.86    286.15      13.60      13.60      46.70       75.82
330
331    Jackson Creek      Main Channel       14531.71       100YR
       1260.41                    1262.25          34.06      2.49
       1958.74                          427.52     464.50
332    Jackson Creek      Main Channel       14531.71       FLOODWAY
       1260.83            0.42    1262.86          30.79
       2191.00               427.52     427.52     464.50      464.50
333
334    Jackson Creek      Main Channel       15002.72       100YR
       1263.86                    1264.54          98.23      6.61
       1954.62                          746.50     783.19
335    Jackson Creek      Main Channel       15002.72       FLOODWAY
       1264.58            0.72    1265.30          36.69
       2191.00               746.50     746.50     783.19      783.19
336
337    Jackson Creek      Main Channel       15069.27       100YR
       1263.81                    1264.93          33.82      0.35
       1656.88                           7.50      38.30
338    Jackson Creek      Main Channel       15069.27       FLOODWAY
       1264.53            0.72    1265.71          30.78
       1887.00                 7.50       7.50      38.30       38.30
339
340    Jackson Creek      Main Channel       15288.48       100YR
       1265.56                    1266.03          64.38      1.73
       1655.50                          63.50     115.27
341    Jackson Creek      Main Channel       15288.48       FLOODWAY
       1266.28            0.72    1266.76          51.77
       1887.00                 63.50      63.50     115.27      115.27
342
343    Jackson Creek      Main Channel       15319.58       100YR
       1265.39                    1266.28          62.42    106.37
       1550.86                          38.55      62.77
344    Jackson Creek      Main Channel       15319.58       FLOODWAY
       1266.10            0.71    1267.01          62.77    164.24
       1722.76                 0.00       38.55      62.77       62.77
345
346    Jackson Creek      Main Channel       15345
       Culvert
347
348    Jackson Creek      Main Channel       15372.82       100YR
       1267.07                    1267.40         228.66     22.61
       1559.65     74.98                  45.58      89.81
349    Jackson Creek      Main Channel       15372.82       FLOODWAY
       1267.99            0.92    1268.36          70.00     15.76
       1843.79     27.45      33.00      45.58      89.81      103.00
350
351    Jackson Creek      Main Channel       15411.86       100YR
       1266.97                    1267.58          49.99      0.05
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351    1657.18                          95.15     144.19
352    Jackson Creek     Main Channel       15411.86       FLOODWAY
       1267.94           0.97     1268.51          53.20      2.09
       1884.91                90.85      95.15     144.19      154.19
353
354    Jackson Creek     Main Channel       15857.49       100YR
       1268.90                    1269.40          57.24
       1657.23                         123.50     188.59
355    Jackson Creek     Main Channel       15857.49       FLOODWAY
       1269.52           0.62     1270.03          60.47
       1887.00              123.50     123.50     188.59      188.59
356
357    Jackson Creek     Main Channel       15890   BR D   100YR
       1268.41                    1269.40          51.77
       1657.23                         123.50     188.59
358    Jackson Creek     Main Channel       15890   BR D   FLOODWAY
       1268.41           0.00     1270.03          51.77
       1887.00              123.50     123.50     188.59      188.59
359
360    Jackson Creek     Main Channel       15890   BR U   100YR
       1268.41                    1269.85
       1657.23                         133.50     198.59
361    Jackson Creek     Main Channel       15890   BR U   FLOODWAY
       1268.41           0.00     1270.75
       1887.00              133.50     133.50     198.59      198.59
362
363    Jackson Creek     Main Channel       15919.80       100YR
       1269.45                    1269.85          60.11
       1657.23                         133.50     198.59
364    Jackson Creek     Main Channel       15919.80       FLOODWAY
       1270.38           0.93     1270.75          64.34
       1887.00              133.50     133.50     198.59      198.59
365
366    Jackson Creek     Main Channel       16403.44       100YR
       1270.77                    1271.17          60.40
       1657.23                         124.50     220.93
367    Jackson Creek     Main Channel       16403.44       FLOODWAY
       1271.51           0.73     1271.90          64.36
       1887.00              124.50     124.50     220.93      220.93
368
369    Jackson Creek     Main Channel       16942.29       100YR
       1272.45                    1275.14          23.26
       1657.23                         267.96     303.96
370    Jackson Creek     Main Channel       16942.29       FLOODWAY
       1273.01           0.56     1275.86          24.28
       1887.00              267.96     267.96     303.96      303.96
371
372    Jackson Creek     Main Channel       17591.36       100YR
       1279.62                    1280.21          35.46
       1657.23                         289.21     328.05
373    Jackson Creek     Main Channel       17591.36       FLOODWAY
       1280.39           0.77     1281.02          64.30
       1884.31      2.69      289.21     289.21     328.05      354.00
374
375    Jackson Creek     Main Channel       17620.46       100YR
       1278.94                    1281.31          22.17
       1657.23                         293.02     323.00
376    Jackson Creek     Main Channel       17620.46       FLOODWAY
       1279.76           0.82     1282.06          28.56
       1887.00              280.00     293.02     323.00      340.00
377
378    Jackson Creek     Main Channel       17645
       Culvert
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379
380    Jackson Creek      Main Channel       17671.40       100YR
       1280.37                    1282.19          41.00       1.67
       1655.57                             295.40     316.70
381    Jackson Creek      Main Channel       17671.40       FLOODWAY
       1281.21            0.83    1282.96          45.70      51.50
       1835.50                 270.00     295.40     316.70      330.00
382
383    Jackson Creek      Main Channel       17710                     Lat
       Struct
384
385    Jackson Creek      Main Channel       17716.39       100YR
       1282.47                    1282.80          43.90       0.24
       1692.59                             269.31     312.90
386    Jackson Creek      Main Channel       17716.39       FLOODWAY
       1283.18            0.72    1283.53          43.90       0.56
       1886.44                 259.00     269.31     312.90      323.00
387
388    Jackson Creek      Main Channel       17857.52       100YR
       1282.41                    1283.70          24.97       5.42
       1682.89      4.53                  213.50     228.50
389    Jackson Creek      Main Channel       17857.52       FLOODWAY
       1283.06            0.65    1284.47          29.73      14.09
       1858.52     14.40          180.00     213.50     228.50      240.00
390
391    Jackson Creek      Main Channel       17895
       Culvert
392
393    Jackson Creek      Main Channel       17931.56       100YR
       1284.30                    1285.41          59.00
       1617.22     75.62                   92.00     107.70
394    Jackson Creek      Main Channel       17931.56       FLOODWAY
       1285.17            0.88    1286.18          59.00
       1698.47    188.53          82.00      92.00     107.70      151.00
395
396    Jackson Creek      Main Channel       17950                     Lat
       Struct
397
398    Jackson Creek      Main Channel       17994.36       100YR
       1285.61                    1285.80          93.00      32.49
       1749.85                             91.00     147.06
399    Jackson Creek      Main Channel       17994.36       FLOODWAY
       1286.35            0.74    1286.53          65.00      15.24
       1871.76                 82.00      91.00     147.06      147.06
400
401    Jackson Creek      Main Channel       18960                     Lat
       Struct
402
403    Jackson Creek      Main Channel       18967.88       100YR
       1286.71                    1287.16          54.71
       1887.00                             220.50     284.46
404    Jackson Creek      Main Channel       18967.88       FLOODWAY
       1287.27            0.56    1287.65          54.55
       1887.00                 225.09     220.50     284.46      279.64
405
406    Jackson Creek      Main Channel       20090.33       100YR
       1292.83                    1296.59          16.00
       1887.00                          1016.25    1057.88
407    Jackson Creek      Main Channel       20090.33       FLOODWAY
       1292.82           -0.01    1296.59          16.00
       1887.00              1016.25    1016.25    1057.88     1057.88
408
409    Jackson Creek      Main Channel       20128
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409    Culvert
410
411    Jackson Creek      Main Channel       20166.90       100YR
       1299.95                    1301.09          15.67
       1887.00                 1152.50    1202.36
412    Jackson Creek      Main Channel       20166.90       FLOODWAY
       1299.95            0.00    1301.09          15.67
       1887.00               1152.50    1152.50    1202.36    1202.36
413
414    Jackson Creek      Main Channel       20198.01       100YR
       1301.02                    1301.23          87.22      0.09
       1879.57      7.33          1144.75    1197.20
415    Jackson Creek      Main Channel       20198.01       FLOODWAY
       1301.01            0.00    1301.23          52.45
       1887.00               1144.75    1144.75    1197.20    1197.20
416
417    Jackson Creek      Main Channel       20208.45       100YR
       1301.00                    1301.25          65.52
       1886.31      0.69          1067.75    1120.20
418    Jackson Creek      Main Channel       20208.45       FLOODWAY
       1301.00            0.00    1301.25          50.66
       1887.00               1067.75    1067.75    1120.20    1120.20
419
420    Jackson Overbank   Jackson Overbank   793.1924       100YR
       1238.50                    1238.54         693.16     31.99
       2154.57     48.97                23.37     648.59
421    Jackson Overbank   Jackson Overbank   793.1924       FLOODWAY
       1239.18            0.68    1239.25         200.00
       1220.00                 95.00      23.37     648.59     295.00
422
423    Jackson Overbank   Jackson Overbank   794.192*       100YR
       1238.53                    1238.55         694.26     19.39
       1279.30     29.20                23.42     649.38
424    Jackson Overbank   Jackson Overbank   794.192*       FLOODWAY
       1239.18            0.65    1239.25         200.00
       1220.00                 95.00      23.42     649.38     295.00
425
426    Jackson Overbank   Jackson Overbank   951.8403       100YR
       1238.73                    1238.81         721.73     19.15
       1301.81      6.94                31.09     774.35
427    Jackson Overbank   Jackson Overbank   951.8403       FLOODWAY
       1239.60            0.87    1239.79         200.00
       1220.00                296.00      31.09     774.35     496.00
428
429    Jackson Overbank   Jackson Overbank   1188.317       100YR
       1239.73                    1239.75         921.36      5.51
       1195.20     49.42                12.11     909.02
430    Jackson Overbank   Jackson Overbank   1188.317       FLOODWAY
       1240.56            0.83    1240.61         239.00
       1220.00                655.00      12.11     909.02     894.00
431
432    Jackson Overbank   Jackson Overbank   1554.780       100YR
       1240.74                    1240.87         919.71     16.17
       1149.97     83.99                616.04    1138.80
433    Jackson Overbank   Jackson Overbank   1554.780       FLOODWAY
       1241.33            0.59    1241.53         222.44
       1220.00                915.00     616.04    1138.80    1138.80
434
435    Jackson Overbank   Jackson Overbank   1689.039       100YR
       1241.81                    1241.84        1041.94     10.94
       1136.37     72.69                271.02    1180.82
436    Jackson Overbank   Jackson Overbank   1689.039       FLOODWAY
       1242.55            0.73    1242.66         270.04
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436    1108.27    111.73      955.00     271.02    1180.82     1225.42
437
438    Jackson Overbank   Jackson Overbank   1966.347        100YR
       1242.82                    1242.88        1051.44     13.79
       1162.22     44.00                 458.53    1408.70
439    Jackson Overbank   Jackson Overbank   1966.347        FLOODWAY
       1243.76            0.94    1243.91         292.21
       1201.51     18.50    1140.00     458.53    1408.70     1432.21
440
441    Jackson Overbank   Jackson Overbank   2113.142        100YR
       1243.65                    1243.70        1018.30
       1187.35     32.65                 485.34    1499.38
442    Jackson Overbank   Jackson Overbank   2113.142        FLOODWAY
       1244.54            0.89    1244.69         264.38
       1220.00               1235.00     485.34    1499.38     1499.38
443
444    Jackson Overbank   Jackson Overbank   2270.064        100YR
       1244.37                    1244.41        1007.27
       1216.14      3.86                 532.09    1594.29
445    Jackson Overbank   Jackson Overbank   2270.064        FLOODWAY
       1245.29            0.93    1245.40         259.29
       1220.00               1335.00     532.09    1594.29     1594.29
446
447    Jackson Overbank   Jackson Overbank   2422.046        100YR
       1245.25                    1245.35         679.23
       1220.00                               472.24    1563.41
448    Jackson Overbank   Jackson Overbank   2422.046        FLOODWAY
       1245.97            0.72    1246.12         277.21
       1220.00               1280.00     472.24    1563.41     1563.41
449
450    Jackson Overbank   Jackson Overbank   2547.979        100YR
       1245.86                    1245.90         851.99
       1220.00                               566.48    1571.73
451    Jackson Overbank   Jackson Overbank   2547.979        FLOODWAY
       1246.71            0.84    1246.83         303.77
       1220.00               1260.00     566.48    1571.73     1571.73
452
453    Jackson Overbank   Jackson Overbank   3070.973        100YR
       1248.34                    1248.48         723.51
       1220.00                               252.52    1150.65
454    Jackson Overbank   Jackson Overbank   3070.973        FLOODWAY
       1249.25            0.90    1249.36         337.96
       1220.00                800.00     252.52    1150.65     1150.65
455
456    Jackson Overbank   Jackson Overbank   3454.720        100YR
       1250.99                    1251.03         982.88      2.07
       1217.93                               288.24    1430.03
457    Jackson Overbank   Jackson Overbank   3454.720        FLOODWAY
       1251.94            0.95    1252.08         358.97
       1220.00               1070.00     288.24    1430.03     1430.03
458
459    Jackson Overbank   Jackson Overbank   3722.349        100YR
       1252.21                    1252.27         801.95
       1197.91     22.09                 689.68    1564.86
460    Jackson Overbank   Jackson Overbank   3722.349        FLOODWAY
       1253.18            0.97    1253.23         423.00
       1220.00               1141.00     689.68    1564.86     1564.00
461
462    Jackson Overbank   Jackson Overbank   3956.457        100YR
       1254.01                    1254.10         594.99
       1220.00                               999.33    1679.91
463    Jackson Overbank   Jackson Overbank   3956.457        FLOODWAY
       1254.05            0.04    1254.19         310.00
```

463 1220.00 1290.00 999.33 1679.91 1600.00
464
465

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                          HEC-RAS Version 4.1.0 Jan 2010
                           U.S. Army Corps of Engineers
                          Hydrologic Engineering Center
                                609 Second Street
                                Davis, California


             X     X  XXXXXX    XXXX        XXXX       XX      XXXX
             X     X  X        X    X       X   X     X  X    X
             X     X  X        X            X   X    X    X   X
             XXXXXXX  XXXX     X       XXX  XXXX     XXXXXX    XXXX
             X     X  X        X            X  X     X    X        X
             X     X  X        X    X       X   X    X    X        X
             X     X  XXXXXX    XXXX        X    X   X    X   XXXXX


PROJECT DATA
Project Title: Jackson Creek Hydraulic Model
Project File : JAFISOct04.prj
Run Date and Time: 2/25/2015 2:29:21 PM

Project in English units

Project Description:
Jackson Creek HEC-RAS Model - Twin Creeks Development No-Rise
Developed by
Northwest Hydraulic Consultants, Inc
February 25, 2015
v4.1.0

Vertical
Datum:  NAVD 1988
Survey obtained by NHC and terrain data supplied by the City
of Central Point, Farber Surveying and Whetstone Engineering

2015
AMMENDMENT
As-built of drainage swale grading added to model
Development
grading includes T.C. Crossing Phases 1, 2, and 3; N.V. Phase 3



PLAN DATA

Plan Title: Revised2015_Floodway
Plan File : Q:\_B\200044_Twin Creeks CLOMR
Preparation\2015_NoRise\Submittal\HEC-RAS\JAFISOct04.p09

           Geometry Title: Jackson_Floodfway_Revised_2015_v4
           Geometry File : Q:\_B\200044_Twin Creeks CLOMR
           Preparation\2015_NoRise\Submittal\HEC-RAS\JAFISOct04.g14

           Flow Title    : Jackson_Floodway_Revised_2015
           Flow File     : Q:\_B\200044_Twin Creeks CLOMR
           Preparation\2015_NoRise\Submittal\HEC-RAS\JAFISOct04.f04

Plan Description:
Revised floodway run.  2015 conditions.
```

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 61  v4
 62
 63
 64  Plan Summary Information:
 65  Number of:  Cross Sections =   85    Multiple Openings  =    0
 66              Culverts       =    5    Inline Structures  =    2
 67              Bridges        =    8    Lateral Structures =    9
 68
 69  Computational Information
 70      Water surface calculation tolerance  =  0.01
 71      Critical depth calculation tolerance =  0.01
 72      Maximum number of iterations         =  20
 73      Maximum difference tolerance         =  0.3
 74      Flow tolerance factor                =  0.001
 75
 76  Computation Options
 77      Critical depth computed only where necessary
 78      Conveyance Calculation Method: At breaks in n values only
 79      Friction Slope Method:         Average Conveyance
 80      Computational Flow Regime:     Subcritical Flow
 81
 82  Encroachment Data
 83     Equal Conveyance = True
 84     Left Offset      =        0
 85     Right Offset     =        0
 86
 87  River = Jackson Creek    Reach = Main Lower
 88  RS      Profile           Method  Value1  Value2
 89  9769.785FLOODWAY               1   57.49   416.4
 90  9747.670FLOODWAY               1   57.61  416.25
 91  9611.585FLOODWAY               1       0  275.68
 92  9595.562FLOODWAY               1       0  275.68
 93  9288.338FLOODWAY               1       0     300
 94  9235.024FLOODWAY               1     362     699
 95  9220.769FLOODWAY               1  199.82     690
 96  9000    FLOODWAY               1     225     670
 97
 98  River = Jackson Creek    Reach = Main Channel
 99  RS      Profile           Method  Value1  Value2
100  20208.45FLOODWAY               1 1067.75  1120.2
101  20198.01FLOODWAY               1 1144.75  1197.2
102  20166.90FLOODWAY               1  1152.5 1202.36
103  20090.33FLOODWAY               1 1016.25 1057.88
104  18967.88FLOODWAY               1  225.09  279.64
105  17994.36FLOODWAY               1      82  147.06
106  17931.56FLOODWAY               1      82     151
107  17857.52FLOODWAY               1     180     240
108  17716.39FLOODWAY               1     259     323
109  17671.40FLOODWAY               1     270     330
110  17620.46FLOODWAY               1     280     340
111  17591.36FLOODWAY               1  289.21     354
112  16942.29FLOODWAY               1  267.96  303.96
113  16403.44FLOODWAY               1   124.5  220.93
114  15919.80FLOODWAY               1   133.5  198.59
115  15857.49FLOODWAY               1   123.5  188.59
116  15411.86FLOODWAY               1   90.85  154.19
117  15372.82FLOODWAY               1      33     103
118  15319.58FLOODWAY               1       0   62.77
119  15288.48FLOODWAY               1    63.5  115.27
120  15069.27FLOODWAY               1     7.5    38.3
121  15002.72FLOODWAY               1   746.5  783.19
122  14531.71FLOODWAY               1  427.52   464.5
123  13739.75FLOODWAY               1    13.6   75.82
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13618.45	FLOODWAY	1	19.4	63.2	
13447.21	FLOODWAY	1	25.95	65.2	
13314.60	FLOODWAY	1	37.15	96.91	
13087.59	FLOODWAY	1	38.7	144.1	
12851.71	FLOODWAY	1	100.3	149.5	
12799.54	FLOODWAY	1	119.3	168.5	
12651.65	FLOODWAY	1	102.7	230	
12352.91	FLOODWAY	1	40	167	
12184.87	FLOODWAY	1	112.5	153.73	
12153.40	FLOODWAY	1	105.5	141.39	
11900.70	FLOODWAY	1	253.62	299.71	
11885.36	FLOODWAY	1	248	294.09	
11748.96	FLOODWAY	1	264.12	308.05	
11366.76	FLOODWAY	1	12.82	50.24	
11034.75	FLOODWAY	1	22.46	58	
11018.94	FLOODWAY	1	24.66	57.3	
10990.71	FLOODWAY	1	25.71	58.37	
10948.06	FLOODWAY	1	48.68	81.37	
10897.78	FLOODWAY	1	0	50.22	
10884.99	FLOODWAY	1	0	90	
10589.80	FLOODWAY	1	0	150	
10343.73	FLOODWAY	1	0	200	
10325.40	FLOODWAY	1	0	200	
10175.04	FLOODWAY	1	0	225	
10159.97	FLOODWAY	1	0	235	
9769.785	FLOODWAY	1	57.49	300	
9747.670	FLOODWAY	1	57.61	300	

River = Jackson Overbank Reach = Upper Main

RS	Profile	Method	Value1	Value2
3639.008	FLOODWAY	1	405.14	470.75
3370.57	FLOODWAY	117.78998	70.25	
3341.924	FLOODWAY	111.67999	66.44	
3143.447	FLOODWAY	19.809999	64.24	
3067.819	FLOODWAY	1	2.89	57.31
2832.344	FLOODWAY	1	72.63	127.37
2732.759	FLOODWAY	1	144.91	199.88
2564.282	FLOODWAY	1	128.85	205.76
2350.68	FLOODWAY	1	130.6	203.4
2178.49	FLOODWAY	1	129.63	203.43
2019.163	FLOODWAY	1	127.92	204.87
1866.284	FLOODWAY	1	129.92	205.87
1757.488	FLOODWAY	1	139.4	213.22
1646.261	FLOODWAY	1	1507.32	1577.27
1495.177	FLOODWAY	1	1545.16	1619.86
1358.697	FLOODWAY	1	1453.71	1520.7
1249.037	FLOODWAY	1	1366.99	1432.01
1117.801	FLOODWAY	1	1270.28	1335.06
1002.145	FLOODWAY	1	1191.48	1254.26
783.8261	FLOODWAY	1	1093.56	1155.53
579.144	FLOODWAY	1	981.97	1043.94
401.5288	FLOODWAY	1	860.33	924.29
265.4884	FLOODWAY	1	786.17	849.11
160.5392	FLOODWAY	1	719.5	795
0.275157	FLOODWAY	1	610.89	715.88
0.25	FLOODWAY	1	505	612.09
0.20	FLOODWAY	1	248	629.65
0.15	FLOODWAY	1	158.56	413.56

Profile Output Table - Encroachment 1

River	Reach	River Sta	Profile	W.S.

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186    Elev   Prof Delta WS   E.G. Elev   Top Wdth Act    Q Left   Q Channel
       Q Right   Enc Sta L   Ch Sta L   Ch Sta R   Enc Sta R
187
                                                                        (f
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                                                                        (f
                                                                        t)
                                                                        (f
                                                                        t)
                                                                        (f
                                                                        t)
                                                                        (c
                                                                        fs
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                                                                        fs
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                                                                        fs
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                                                                        (f
                                                                        t)
                                                                        (f
                                                                        t)
                                                                        (f
                                                                        t)
                                                                        (f
                                                                        t)
188
189    Jackson Creek      Main Lower     9000          100YR-dummy
       1233.85                    1234.68          389.79    363.94
       2047.46      1.13                436.95     479.00
190    Jackson Creek      Main Lower     9000          FLOODWAY
       1234.72            0.87     1235.60          445.00    787.16
       2552.01     71.83      225.00     436.95     479.00      670.00
191
192    Jackson Creek      Main Lower     9220.769      100YR-dummy
       1235.12                    1235.41          480.00    671.34
       1617.02    124.18                436.95     479.00
193    Jackson Creek      Main Lower     9220.769      FLOODWAY
       1236.04            0.92     1236.29          490.18   1166.96
       1839.93    404.11      199.82     436.95     479.00      690.00
194
195    Jackson Creek      Main Lower     9235.024      100YR-dummy
       1234.79                    1235.61          333.41     29.76
       2130.66    252.12                437.80     484.13
196    Jackson Creek      Main Lower     9235.024      FLOODWAY
       1235.79            1.00     1236.45          333.00    178.33
       2452.56    780.11      362.00     437.80     484.13      699.00
197
198    Jackson Creek      Main Lower     9245
       Culvert
199
200    Jackson Creek      Main Lower     9288.338      100YR-dummy
       1236.66                    1236.84          405.00    327.03
       1161.46    924.06                 57.83      86.93
201    Jackson Creek      Main Lower     9288.338      FLOODWAY
       1237.38            0.72     1237.68          300.00    635.99
       1572.49   1202.52       0.00      57.83      86.93      300.00
202
203    Jackson Creek      Main Lower     9300                        Lat
       Struct
204
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205    Jackson Creek      Main Lower     9595.562        100YR-dummy
       1237.07                    1237.22          530.00    155.74
       1365.17   1544.31                  56.68       99.03
206    Jackson Creek      Main Lower     9595.562        FLOODWAY
       1237.91            0.84     1238.18          275.68    390.75
       1843.76   1176.49        0.00       56.68       99.03      275.68
207
208    Jackson Creek      Main Lower     9607.9                          Inl
       Struct
209
210    Jackson Creek      Main Lower     9611.585        100YR-dummy
       1237.10                    1237.24          535.00    183.69
       1351.61   1529.92                  54.68       97.03
211    Jackson Creek      Main Lower     9611.585        FLOODWAY
       1237.98            0.88     1238.22          275.68    424.53
       1788.70   1197.77        0.00       54.68       97.03      275.68
212
213    Jackson Creek      Main Lower     9700                            Lat
       Struct
214
215    Jackson Creek      Main Lower     9747.670        100YR-dummy
       1237.25                    1237.50          513.00    343.50
       1179.91   1655.85                  57.61       82.13
216    Jackson Creek      Main Lower     9747.670        FLOODWAY
       1238.25            1.00     1238.46          358.64
       1232.08   2178.92        57.61       57.61       82.13      416.25
217
218    Jackson Creek      Main Lower     9758    BR D    100YR-dummy
       1237.43                    1237.54          513.00    177.61
       593.56    2408.09                  57.61       82.13
219    Jackson Creek      Main Lower     9758    BR D    FLOODWAY
       1238.38            0.95     1238.49          358.64
       622.33    2788.67        57.61       57.61       82.13      416.25
220
221    Jackson Creek      Main Lower     9758    BR U    100YR-dummy
       1237.48                    1237.60          513.78    194.26
       576.48    2408.52                  57.49       83.13
222    Jackson Creek      Main Lower     9758    BR U    FLOODWAY
       1238.42            0.94     1238.53          358.91
       614.71    2796.29        57.49       57.49       83.13      416.40
223
224    Jackson Creek      Main Lower     9769.785        100YR-dummy
       1237.40                    1237.63          513.78    394.04
       1183.11   1602.11                  57.49       83.13
225    Jackson Creek      Main Lower     9769.785        FLOODWAY
       1238.35            0.95     1238.56          358.91
       1283.70   2127.30        57.49       57.49       83.13      416.40
226
227    Jackson Creek      Main Channel   10159.97        100YR-dummy
       1238.23                    1238.52          519.64     22.82
       767.45     220.23                  43.13       68.88
228    Jackson Creek      Main Channel   10159.97        FLOODWAY
       1239.04            0.80     1239.82          223.81    150.08
       1483.20    557.72        0.00       43.13       68.88      235.00
229
230    Jackson Creek      Main Channel   10168   BR D    100YR-dummy
       1238.27                    1238.61          459.83
       560.51     449.99                  43.13       68.88
231    Jackson Creek      Main Channel   10168   BR D    FLOODWAY
       1239.45            1.18     1239.87          235.00    115.56
       774.19    1301.25        0.00       43.13       68.88      235.00
232
233    Jackson Creek      Main Channel   10168   BR U    100YR-dummy
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233    1238.43                    1238.76         461.47
       545.85    464.65                 55.05      77.27
234    Jackson Creek      Main Channel   10168   BR U   FLOODWAY
       1239.57            1.14     1240.15         225.00    144.42
       888.23   1158.35        0.00      55.05      77.27      225.00
235
236    Jackson Creek      Main Channel   10175.04       100YR-dummy
       1238.54                    1238.77         522.14     33.87
       682.52    294.11                 55.05      77.27
237    Jackson Creek      Main Channel   10175.04       FLOODWAY
       1239.42            0.88     1240.23         215.35    182.23
       1436.08    572.69        0.00      55.05      77.27      225.00
238
239    Jackson Creek      Main Channel   10200                        Lat
       Struct
240
241    Jackson Creek      Main Channel   10325.40       100YR-dummy
       1238.74                    1239.14         520.16
       1170.19     79.73                 16.27      55.15
242    Jackson Creek      Main Channel   10325.40       FLOODWAY
       1240.28            1.54     1240.80         200.00     11.53
       1801.12    378.36        0.00      16.27      55.15      200.00
243
244    Jackson Creek      Main Channel   10335   BR D   100YR-dummy
       1238.50                    1239.25         309.25
       1183.85     66.07                 16.27      55.15
245    Jackson Creek      Main Channel   10335   BR D   FLOODWAY
       1240.45            1.95     1240.82         200.00     38.99
       1241.26    910.75        0.00      16.27      55.15      200.00
246
247    Jackson Creek      Main Channel   10335   BR U   100YR-dummy
       1238.55                    1239.51         258.77
       1198.20     51.72                 16.02      55.04
248    Jackson Creek      Main Channel   10335   BR U   FLOODWAY
       1240.58            2.03     1241.02         200.00     47.94
       1271.50    871.56        0.00      16.02      55.04      200.00
249
250    Jackson Creek      Main Channel   10343.73       100YR-dummy
       1239.37                    1239.60         527.73
       969.49    280.43                 16.02      55.04
251    Jackson Creek      Main Channel   10343.73       FLOODWAY
       1240.52            1.15     1241.05         200.00     20.86
       1752.40    417.74        0.00      16.02      55.04      200.00
252
253    Jackson Creek      Main Channel   10400                        Lat
       Struct
254
255    Jackson Creek      Main Channel   10589.80       100YR-dummy
       1239.61                    1240.64         487.68
       1704.14    153.48                 22.92      57.84
256    Jackson Creek      Main Channel   10589.80       FLOODWAY
       1241.19            1.59     1241.89         142.06      7.35
       1846.43    337.22        0.00      22.92      57.84      150.00
257
258    Jackson Creek      Main Channel   10600                        Lat
       Struct
259
260    Jackson Creek      Main Channel   10884.99       100YR-dummy
       1241.28                    1242.49         213.40
       1874.85     54.83                 19.65      49.65
261    Jackson Creek      Main Channel   10884.99       FLOODWAY
       1242.07            0.79     1243.35          72.40      0.24
       2142.38     48.38        0.00      19.65      49.65       90.00
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262
263    Jackson Creek      Main Channel   10891   BR D   100YR-dummy
       1240.75                    1242.73          65.36
       1925.65      4.03                19.65       49.65
264    Jackson Creek      Main Channel   10891   BR D   FLOODWAY
       1241.19            0.43    1243.74          24.32
       2189.65      1.35       0.00      19.65       49.65       90.00
265
266    Jackson Creek      Main Channel   10891   BR U   100YR-dummy
       1240.80                    1243.08
       1929.68                          17.42       50.14
267    Jackson Creek      Main Channel   10891   BR U   FLOODWAY
       1241.26            0.46    1244.20
       2191.00                 0.00      17.42       50.14       50.22
268
269    Jackson Creek      Main Channel   10897.78       100YR-dummy
       1241.97                    1243.20          33.55
       1929.09      0.59                17.42       50.14
270    Jackson Creek      Main Channel   10897.78       FLOODWAY
       1243.33            1.36    1244.39          50.22     19.43
       2171.53      0.04       0.00      17.42       50.14       50.22
271
272    Jackson Creek      Main Channel   10900                        Lat
       Struct
273
274    Jackson Creek      Main Channel   10948.06       100YR-dummy
       1242.35                    1243.51          35.32      0.17
       1958.88      0.20                48.68       81.37
275    Jackson Creek      Main Channel   10948.06       FLOODWAY
       1243.57            1.22    1244.62          32.69
       2191.00                 48.68      48.68       81.37       81.37
276
277    Jackson Creek      Main Channel   10990.71       100YR-dummy
       1242.68                    1243.73          35.50      0.54
       1958.64      0.08                25.71       58.37
278    Jackson Creek      Main Channel   10990.71       FLOODWAY
       1243.82            1.14    1244.80          32.66
       2191.00                 25.71      25.71       58.37       58.37
279
280    Jackson Creek      Main Channel   11018.94       100YR-dummy
       1242.87                    1243.87          34.04      0.08
       1959.16      0.03                24.66       57.30
281    Jackson Creek      Main Channel   11018.94       FLOODWAY
       1243.97            1.10    1244.92          32.64
       2191.00                 24.66      24.66       57.30       57.30
282
283    Jackson Creek      Main Channel   11027.9                      Inl
       Struct
284
285    Jackson Creek      Main Channel   11034.75       100YR-dummy
       1243.45                    1244.39          38.63      1.26
       1957.99      0.01                24.41       57.05
286    Jackson Creek      Main Channel   11034.75       FLOODWAY
       1244.47            1.02    1245.38          35.54      6.59
       2183.81      0.60       22.46      24.41       57.05       58.00
287
288    Jackson Creek      Main Channel   11366.76       100YR-dummy
       1244.81                    1245.58          38.40      0.04
       1959.21      0.01                12.82       50.24
289    Jackson Creek      Main Channel   11366.76       FLOODWAY
       1245.65            0.84    1246.43          37.42
       2191.00                 12.82      12.82       50.24       50.24
290
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291    Jackson Creek      Main Channel   11748.96       100YR-dummy
       1246.08                    1246.76          42.38
       1959.26                             264.12     308.05
292    Jackson Creek      Main Channel   11748.96       FLOODWAY
       1246.84            0.76     1247.53          43.58
       2191.00                 264.12     264.12     308.05      308.05
293
294    Jackson Creek      Main Channel   11885.36       100YR-dummy
       1246.51                    1247.15          43.54
       1959.26                             248.00     294.09
295    Jackson Creek      Main Channel   11885.36       FLOODWAY
       1247.24            0.73     1247.90          45.27
       2191.00                 248.00     248.00     294.09      294.09
296
297    Jackson Creek      Main Channel   11892   BR D   100YR-dummy
       1246.37                    1247.21          30.74
       1959.26                             248.00     294.09
298    Jackson Creek      Main Channel   11892   BR D   FLOODWAY
       1247.07            0.70     1247.97          30.73
       2191.00                 248.00     248.00     294.09      294.09
299
300    Jackson Creek      Main Channel   11892   BR U   100YR-dummy
       1246.43                    1247.26          31.52
       1959.26                             258.28     295.05
301    Jackson Creek      Main Channel   11892   BR U   FLOODWAY
       1247.13            0.70     1248.02          31.52
       2191.00                 253.62     258.28     295.05      299.71
302
303    Jackson Creek      Main Channel   11900.70       100YR-dummy
       1246.50                    1247.27          35.23
       1959.26                             258.28     295.05
304    Jackson Creek      Main Channel   11900.70       FLOODWAY
       1247.22            0.73     1248.03          37.56
       2191.00      0.00       253.62     258.28     295.05      299.71
305
306    Jackson Creek      Main Channel   12153.40       100YR-dummy
       1247.28                    1248.53          29.46
       1959.26                             105.50     141.39
307    Jackson Creek      Main Channel   12153.40       FLOODWAY
       1247.98            0.70     1249.28          31.76
       2191.00                 105.50     105.50     141.39      141.39
308
309    Jackson Creek      Main Channel   12168   BR D   100YR-dummy
       1247.20                    1248.62          24.43
       1959.26                             105.50     141.39
310    Jackson Creek      Main Channel   12168   BR D   FLOODWAY
       1247.86            0.66     1249.39          24.46
       2191.00                 105.50     105.50     141.39      141.39
311
312    Jackson Creek      Main Channel   12168   BR U   100YR-dummy
       1247.23                    1248.82          23.59
       1959.26                             112.50     153.73
313    Jackson Creek      Main Channel   12168   BR U   FLOODWAY
       1247.89            0.66     1249.59          23.58
       2191.00                 112.50     112.50     153.73      153.73
314
315    Jackson Creek      Main Channel   12184.87       100YR-dummy
       1248.11                    1248.93          39.23
       1959.26                             112.50     153.73
316    Jackson Creek      Main Channel   12184.87       FLOODWAY
       1248.89            0.78     1249.71          40.96
       2191.00                 112.50     112.50     153.73      153.73
317
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318    Jackson Creek      Main Channel   12352.91        100YR-dummy
       1249.03                    1249.09         151.51      2.55
       1956.44      0.28                40.00     167.00
319    Jackson Creek      Main Channel   12352.91        FLOODWAY
       1249.81            0.78    1249.87         127.00
       2191.00                40.00      40.00     167.00      167.00
320
321    Jackson Creek      Main Channel   12651.65        100YR-dummy
       1249.06                    1249.20         110.38
       1959.26                         102.70     230.00
322    Jackson Creek      Main Channel   12651.65        FLOODWAY
       1249.83            0.77    1249.97         117.08
       2191.00               102.70     102.70     230.00      230.00
323
324    Jackson Creek      Main Channel   12799.54        100YR-dummy
       1248.94                    1251.14          37.19
       1959.26                         119.30     168.50
325    Jackson Creek      Main Channel   12799.54        FLOODWAY
       1249.39            0.45    1251.64          40.16
       2191.00               119.30     119.30     168.50      168.50
326
327    Jackson Creek      Main Channel   12825   BR D   100YR-dummy
       1249.60                    1251.24          41.56
       1959.26                         119.30     168.50
328    Jackson Creek      Main Channel   12825   BR D   FLOODWAY
       1250.05            0.45    1251.74          44.52
       2191.00               119.30     119.30     168.50      168.50
329
330    Jackson Creek      Main Channel   12825   BR U   100YR-dummy
       1250.67                    1251.71          49.02
       1959.22      0.04                100.30     149.50
331    Jackson Creek      Main Channel   12825   BR U   FLOODWAY
       1251.10            0.43    1252.20          49.20
       2191.00               100.30     100.30     149.50      149.50
332
333    Jackson Creek      Main Channel   12851.71        100YR-dummy
       1250.68                    1251.72          49.11
       1959.21      0.05                100.30     149.50
334    Jackson Creek      Main Channel   12851.71        FLOODWAY
       1251.11            0.43    1252.21          49.20
       2191.00               100.30     100.30     149.50      149.50
335
336    Jackson Creek      Main Channel   13087.59        100YR-dummy
       1252.40                    1252.95          77.25
       1959.26                         38.70     144.10
337    Jackson Creek      Main Channel   13087.59        FLOODWAY
       1252.85            0.45    1253.41          81.78
       2191.00                38.70      38.70     144.10      144.10
338
339    Jackson Creek      Main Channel   13314.60        100YR-dummy
       1253.21                    1254.03          66.27
       1956.38      2.88                37.15      96.91
340    Jackson Creek      Main Channel   13314.60        FLOODWAY
       1253.61            0.39    1254.49          55.46
       2191.00                37.15      37.15      96.91       96.91
341
342    Jackson Creek      Main Channel   13447.21        100YR-dummy
       1253.09                    1255.60          32.01
       1942.26     17.00                25.95      59.05
343    Jackson Creek      Main Channel   13447.21        FLOODWAY
       1253.46            0.37    1256.19          32.60
       2168.27     22.73          25.95      25.95      59.05       65.20
344
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345    Jackson Creek      Main Channel   13618.45       100YR-dummy
       1255.96                    1256.87          40.70
       1857.22    102.04                  19.40     52.90
346    Jackson Creek      Main Channel   13618.45       FLOODWAY
       1256.52            0.55    1257.49          41.51
       2069.87    121.13      19.40      19.40     52.90       63.20
347
348    Jackson Creek      Main Channel   13739.75       100YR-dummy
       1256.51                    1257.32          72.03
       1749.65    209.61                  13.60     46.70
349    Jackson Creek      Main Channel   13739.75       FLOODWAY
       1257.14            0.63    1257.93          62.22
       1904.86    286.15      13.60      13.60     46.70       75.82
350
351    Jackson Creek      Main Channel   14531.71       100YR-dummy
       1260.41                    1262.25          34.02      2.46
       1956.80                          427.52     464.50
352    Jackson Creek      Main Channel   14531.71       FLOODWAY
       1260.83            0.43    1262.86          30.79
       2191.00               427.52     427.52     464.50      464.50
353
354    Jackson Creek      Main Channel   15002.72       100YR-dummy
       1263.85                    1264.53          97.14      6.54
       1952.72                          746.50     783.19
355    Jackson Creek      Main Channel   15002.72       FLOODWAY
       1264.58            0.73    1265.30          36.69
       2191.00               746.50     746.50     783.19      783.19
356
357    Jackson Creek      Main Channel   15069.27       100YR-dummy
       1263.80                    1264.92          33.78      0.34
       1654.92                            7.50      38.30
358    Jackson Creek      Main Channel   15069.27       FLOODWAY
       1264.53            0.73    1265.71          30.78
       1887.00                7.50       7.50      38.30       38.30
359
360    Jackson Creek      Main Channel   15288.48       100YR-dummy
       1265.55                    1266.02          64.27      1.69
       1653.57                           63.50     115.27
361    Jackson Creek      Main Channel   15288.48       FLOODWAY
       1266.28            0.73    1266.76          51.77
       1887.00               63.50      63.50     115.27      115.27
362
363    Jackson Creek      Main Channel   15319.58       100YR-dummy
       1265.39                    1266.28          62.42    105.92
       1549.34                           38.55      62.77
364    Jackson Creek      Main Channel   15319.58       FLOODWAY
       1266.10            0.71    1267.01          62.77    164.24
       1722.76                0.00       38.55      62.77       62.77
365
366    Jackson Creek      Main Channel   15345
       Culvert
367
368    Jackson Creek      Main Channel   15372.82       100YR-dummy
       1267.07                    1267.39         228.46     22.42
       1558.40     74.44                 45.58      89.81
369    Jackson Creek      Main Channel   15372.82       FLOODWAY
       1267.99            0.92    1268.36          70.00     15.76
       1843.79     27.45      33.00      45.58      89.81      103.00
370
371    Jackson Creek      Main Channel   15411.86       100YR-dummy
       1266.97                    1267.58          49.96      0.05
       1655.21                           95.15     144.19
372    Jackson Creek      Main Channel   15411.86       FLOODWAY
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372    1267.94          0.97     1268.51          53.20      2.09
       1884.91               90.85      95.15     144.19      154.19
373
374    Jackson Creek    Main Channel   15857.49       100YR-dummy
       1268.90                    1269.39          57.22
       1655.26                         123.50     188.59
375    Jackson Creek    Main Channel   15857.49       FLOODWAY
       1269.52          0.62      1270.03          60.47
       1887.00              123.50     123.50     188.59      188.59
376
377    Jackson Creek    Main Channel   15890   BR D   100YR-dummy
       1268.41                    1269.39          51.77
       1655.26                         123.50     188.59
378    Jackson Creek    Main Channel   15890   BR D   FLOODWAY
       1268.41          0.00      1270.03          51.77
       1887.00              123.50     123.50     188.59      188.59
379
380    Jackson Creek    Main Channel   15890   BR U   100YR-dummy
       1268.41                    1269.84
       1655.26                         133.50     198.59
381    Jackson Creek    Main Channel   15890   BR U   FLOODWAY
       1268.41          0.00      1270.75
       1887.00              133.50     133.50     198.59      198.59
382
383    Jackson Creek    Main Channel   15919.80       100YR-dummy
       1269.44                    1269.85          60.07
       1655.26                         133.50     198.59
384    Jackson Creek    Main Channel   15919.80       FLOODWAY
       1270.38          0.93      1270.75          64.34
       1887.00              133.50     133.50     198.59      198.59
385
386    Jackson Creek    Main Channel   16403.44       100YR-dummy
       1270.77                    1271.16          60.37
       1655.26                         124.50     220.93
387    Jackson Creek    Main Channel   16403.44       FLOODWAY
       1271.51          0.74      1271.90          64.36
       1887.00              124.50     124.50     220.93      220.93
388
389    Jackson Creek    Main Channel   16942.29       100YR-dummy
       1272.44                    1275.13          23.24
       1655.26                         267.96     303.96
390    Jackson Creek    Main Channel   16942.29       FLOODWAY
       1273.01          0.57      1275.86          24.28
       1887.00              267.96     267.96     303.96      303.96
391
392    Jackson Creek    Main Channel   17591.36       100YR-dummy
       1279.62                    1280.21          35.45
       1655.26                         289.21     328.05
393    Jackson Creek    Main Channel   17591.36       FLOODWAY
       1280.39          0.77      1281.02          64.30
       1884.31    2.69      289.21     289.21     328.05      354.00
394
395    Jackson Creek    Main Channel   17620.46       100YR-dummy
       1278.94                    1281.30          22.15
       1655.26                         293.02     323.00
396    Jackson Creek    Main Channel   17620.46       FLOODWAY
       1279.76          0.82      1282.06          28.56
       1887.00              280.00     293.02     323.00      340.00
397
398    Jackson Creek    Main Channel   17645
       Culvert
399
400    Jackson Creek    Main Channel   17671.40       100YR-dummy
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400    1280.37                    1282.18          40.82      1.57
       1653.69                         295.40     316.70
401    Jackson Creek      Main Channel   17671.40       FLOODWAY
       1281.21            0.84     1282.96          45.70     51.50
       1835.50                270.00     295.40     316.70      330.00
402
403    Jackson Creek      Main Channel   17710                       Lat
       Struct
404
405    Jackson Creek      Main Channel   17716.39       100YR-dummy
       1282.46                    1282.79          43.90      0.24
       1688.50                         269.31     312.90
406    Jackson Creek      Main Channel   17716.39       FLOODWAY
       1283.18            0.72     1283.53          43.90      0.56
       1886.44                259.00     269.31     312.90      323.00
407
408    Jackson Creek      Main Channel   17857.52       100YR-dummy
       1282.41                    1283.69          24.95      5.36
       1678.91      4.47                213.50     228.50
409    Jackson Creek      Main Channel   17857.52       FLOODWAY
       1283.06            0.66     1284.47          29.73     14.09
       1858.52     14.40      180.00     213.50     228.50      240.00
410
411    Jackson Creek      Main Channel   17895
       Culvert
412
413    Jackson Creek      Main Channel   17931.56       100YR-dummy
       1284.29                    1285.40          59.00
       1614.37     74.37                92.00     107.70
414    Jackson Creek      Main Channel   17931.56       FLOODWAY
       1285.17            0.89     1286.18          59.00
       1698.47    188.53       82.00      92.00     107.70      151.00
415
416    Jackson Creek      Main Channel   17950                       Lat
       Struct
417
418    Jackson Creek      Main Channel   17994.36       100YR-dummy
       1285.60                    1285.79          93.00     32.06
       1748.53                         91.00     147.06
419    Jackson Creek      Main Channel   17994.36       FLOODWAY
       1286.35            0.75     1286.53          65.00     15.24
       1871.76                82.00      91.00     147.06      147.06
420
421    Jackson Creek      Main Channel   18960                       Lat
       Struct
422
423    Jackson Creek      Main Channel   18967.88       100YR-dummy
       1286.71                    1287.16          54.68
       1887.00                         220.50     284.46
424    Jackson Creek      Main Channel   18967.88       FLOODWAY
       1287.27            0.57     1287.65          54.55
       1887.00                225.09     220.50     284.46      279.64
425
426    Jackson Creek      Main Channel   20090.33       100YR-dummy
       1292.83                    1296.59          16.00
       1887.00                        1016.25    1057.88
427    Jackson Creek      Main Channel   20090.33       FLOODWAY
       1292.82           -0.01     1296.59          16.00
       1887.00             1016.25    1016.25    1057.88     1057.88
428
429    Jackson Creek      Main Channel   20128
       Culvert
430
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431    Jackson Creek      Main Channel   20166.90       100YR-dummy
       1299.95                    1301.09          15.67
       1887.00                         1152.50    1202.36
432    Jackson Creek      Main Channel   20166.90       FLOODWAY
       1299.95            0.00    1301.09          15.67
       1887.00               1152.50    1152.50    1202.36     1202.36
433
434    Jackson Creek      Main Channel   20198.01       100YR-dummy
       1301.02                    1301.23          87.22       0.09
       1879.57      7.33                1144.75    1197.20
435    Jackson Creek      Main Channel   20198.01       FLOODWAY
       1301.01            0.00    1301.23          52.45
       1887.00               1144.75    1144.75    1197.20     1197.20
436
437    Jackson Creek      Main Channel   20208.45       100YR-dummy
       1301.00                    1301.25          65.52
       1886.31      0.69                1067.75    1120.20
438    Jackson Creek      Main Channel   20208.45       FLOODWAY
       1301.00            0.00    1301.25          50.66
       1887.00               1067.75    1067.75    1120.20     1120.20
439
440    Jackson Overbank   Upper Main      0.15          100YR-dummy
       1237.71                    1237.74          413.21
       2168.76                         0.00        413.56
441    Jackson Overbank   Upper Main      0.15          FLOODWAY
       1238.64            0.93    1238.66          254.65
       1220.00               158.56       0.00      413.56      413.56
442
443    Jackson Overbank   Upper Main      0.20          100YR-dummy
       1237.74                    1237.76          634.56     12.65
       2156.11                        -2.01         631.16
444    Jackson Overbank   Upper Main      0.20          FLOODWAY
       1238.65            0.92    1238.66          381.65
       1220.00               248.00      -2.01      631.16      629.65
445
446    Jackson Overbank   Upper Main      0.25          100YR-dummy
       1237.76                    1237.80          609.55   1671.98
       496.62       0.16                547.18     610.10
447    Jackson Overbank   Upper Main      0.25          FLOODWAY
       1238.61            0.85    1238.76          107.09    147.00
       1072.11      0.89     505.00     547.18      610.10      612.09
448
449    Jackson Overbank   Upper Main      0.275157      100YR-dummy
       1237.83                    1237.91          711.82   1188.92
       737.74       2.68                634.89     695.89
450    Jackson Overbank   Upper Main      0.275157      FLOODWAY
       1238.81            0.98    1239.01          104.99    130.25
       1060.98     28.77     610.89     634.89      695.89      715.88
451
452    Jackson Overbank   Upper Main      160.5392      100YR-dummy
       1238.04                    1238.28          789.19    320.64
       1001.00                         731.45      791.41
453    Jackson Overbank   Upper Main      160.5392      FLOODWAY
       1239.03            0.99    1239.28           75.50     71.88
       1145.52      2.60     719.50     731.45      791.41      795.00
454
455    Jackson Overbank   Upper Main      265.4884      100YR-dummy
       1238.35                    1238.73          848.77    255.82
       1065.82                         786.17      849.11
456    Jackson Overbank   Upper Main      265.4884      FLOODWAY
       1239.18            0.83    1239.56           62.94
       1220.00               786.17     786.17      849.11      849.11
457
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458    Jackson Overbank   Upper Main     401.5288       100YR-dummy
       1239.02                  1239.17          923.35    426.28
       823.31                            863.33     924.29
459    Jackson Overbank   Upper Main     401.5288       FLOODWAY
       1239.62            0.60     1239.96           63.96     14.72
       1205.28                860.33     863.33     924.29      924.29
460
461    Jackson Overbank   Upper Main     579.144        100YR-dummy
       1239.38                  1239.76          411.72    213.51
       1036.08                           981.97    1043.94
462    Jackson Overbank   Upper Main     579.144        FLOODWAY
       1240.11            0.73     1240.52           61.97
       1220.00                981.97     981.97    1043.94     1043.94
463
464    Jackson Overbank   Upper Main     783.8261       100YR-dummy
       1240.49                  1240.71          559.22    439.80
       780.20                           1093.56    1155.53
465    Jackson Overbank   Upper Main     783.8261       FLOODWAY
       1240.96            0.47     1241.54           61.97
       1220.00               1093.56    1093.56    1155.53     1155.53
466
467    Jackson Overbank   Upper Main     1002.145       100YR-dummy
       1241.39                  1241.73          502.74    229.26
       990.74                           1191.48    1254.26
468    Jackson Overbank   Upper Main     1002.145       FLOODWAY
       1242.18            0.79     1242.58           62.78
       1220.00               1191.48    1191.48    1254.26     1254.26
469
470    Jackson Overbank   Upper Main     1117.801       100YR-dummy
       1242.04                  1242.25          431.44    431.83
       788.17                           1270.28    1335.06
471    Jackson Overbank   Upper Main     1117.801       FLOODWAY
       1242.60            0.56     1243.10           64.77
       1220.00               1270.28    1270.28    1335.06     1335.06
472
473    Jackson Overbank   Upper Main     1249.037       100YR-dummy
       1242.63                  1242.99          392.59    355.00
       865.00                           1366.99    1432.01
474    Jackson Overbank   Upper Main     1249.037       FLOODWAY
       1243.33            0.70     1243.91           65.00
       1220.00               1366.99    1366.99    1432.01     1432.01
475
476    Jackson Overbank   Upper Main     1358.697       100YR-dummy
       1243.37                  1243.84          367.84    164.47
       1055.53      0.00                1453.71    1520.70
477    Jackson Overbank   Upper Main     1358.697       FLOODWAY
       1244.08            0.71     1244.53           66.99
       1220.00               1453.71    1453.71    1520.70     1520.70
478
479    Jackson Overbank   Upper Main     1495.177       100YR-dummy
       1244.29                  1244.56          478.11    224.10
       995.90                           1545.16    1619.86
480    Jackson Overbank   Upper Main     1495.177       FLOODWAY
       1244.74            0.44     1245.09           74.69
       1220.00               1545.16    1545.16    1619.86     1619.86
481
482    Jackson Overbank   Upper Main     1646.261       100YR-dummy
       1244.87                  1245.47          123.27     43.64
       1176.36                           1507.32    1577.27
483    Jackson Overbank   Upper Main     1646.261       FLOODWAY
       1245.31            0.44     1245.80           69.95
       1220.00               1507.32    1507.32    1577.27     1577.27
484
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485    Jackson Overbank   Upper Main     1757.488       100YR-dummy
       1245.46                    1245.99          124.44     20.46
       1159.28                               139.40     213.22
486    Jackson Overbank   Upper Main     1757.488       FLOODWAY
       1245.69            0.23     1246.20           73.30
       1220.00                139.40     139.40     213.22      213.22
487
488    Jackson Overbank   Upper Main     1866.284       100YR-dummy
       1246.29                    1246.84          130.88     38.13
       1141.61                               129.92     205.87
489    Jackson Overbank   Upper Main     1866.284       FLOODWAY
       1246.41            0.12     1247.00           74.90
       1220.00                129.92     129.92     205.87      205.87
490
491    Jackson Overbank   Upper Main     2019.163       100YR-dummy
       1247.40                    1247.83          129.00     15.78
       1163.96                               127.92     204.87
492    Jackson Overbank   Upper Main     2019.163       FLOODWAY
       1247.53            0.13     1247.97           73.64
       1220.00                127.92     127.92     204.87      204.87
493
494    Jackson Overbank   Upper Main     2178.49        100YR-dummy
       1248.23                    1248.70          115.25      8.11
       1171.63                               129.63     203.43
495    Jackson Overbank   Upper Main     2178.49        FLOODWAY
       1248.34            0.10     1248.82           73.07
       1220.00                129.63     129.63     203.43      203.43
496
497    Jackson Overbank   Upper Main     2350.68        100YR-dummy
       1249.23                    1249.72          107.85      6.30
       1173.44                               130.60     203.40
498    Jackson Overbank   Upper Main     2350.68        FLOODWAY
       1249.31            0.08     1249.81           72.14
       1220.00                130.60     130.60     203.40      203.40
499
500    Jackson Overbank   Upper Main     2564.282       100YR-dummy
       1250.50                    1250.97          104.08      8.91
       1170.83                               128.85     205.76
501    Jackson Overbank   Upper Main     2564.282       FLOODWAY
       1250.58            0.07     1251.06           73.60
       1220.00                128.85     128.85     205.76      205.76
502
503    Jackson Overbank   Upper Main     2732.759       100YR-dummy
       1251.26                    1251.70           68.81      2.92
       1176.82                               144.91     199.88
504    Jackson Overbank   Upper Main     2732.759       FLOODWAY
       1251.35            0.08     1251.80           51.82
       1220.00                144.91     144.91     199.88      199.88
505
506    Jackson Overbank   Upper Main     2832.344       100YR-dummy
       1251.59                    1252.09           58.58      3.54
       1176.20                                72.63     127.37
507    Jackson Overbank   Upper Main     2832.344       FLOODWAY
       1251.68            0.09     1252.19           52.64
       1220.00                 72.63      72.63     127.37      127.37
508
509    Jackson Overbank   Upper Main     3067.819       100YR-dummy
       1252.49                    1252.92           47.24
       1179.74                                2.89      57.31
510    Jackson Overbank   Upper Main     3067.819       FLOODWAY
       1252.59            0.10     1253.03           47.48
       1220.00                  2.89       2.89      57.31       57.31
511
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512    Jackson Overbank   Upper Main     3143.447       100YR-dummy
       1252.76                    1253.15          47.92
       1179.74                              9.81     64.24
513    Jackson Overbank   Upper Main     3143.447       FLOODWAY
       1252.86            0.10     1253.26          48.22
       1220.00                  9.81       9.81     64.24       64.24
514
515    Jackson Overbank   Upper Main     3341.924       100YR-dummy
       1253.26                    1253.67         151.75     10.81
       1184.01                             11.68     66.44
516    Jackson Overbank   Upper Main     3341.924       FLOODWAY
       1253.37            0.10     1253.79          46.86
       1220.00                 11.68      11.68     66.44       66.44
517
518    Jackson Overbank   Upper Main     3370.57        100YR-dummy
       1254.00                    1254.51         294.51    350.70
       869.13      0.17                   17.79     70.25
519    Jackson Overbank   Upper Main     3370.57        FLOODWAY
       1254.03            0.04     1255.33          52.46
       1220.00                 17.79      17.79     70.25       70.25
520
521    Jackson Overbank   Upper Main     3639.008       100YR-dummy
       1255.21                    1255.40         271.83     82.64
       1135.25      2.11                  405.14    470.75
522    Jackson Overbank   Upper Main     3639.008       FLOODWAY
       1256.02            0.81     1256.20          65.61
       1220.00                405.14     405.14    470.75      470.75
523
524
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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 Universal Transverse Mercator (UTM) zone 10. The horizontal datum was NAD83, GRS1980 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, MD 20910-3282

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 Jackson County GIS Services, State of Oregon OLCD, and the National Geodetic Survey. This information was compiled at various map scales during the time period 2003-2008.

This 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 *in the Flood Insurance Study report (which contains authoritative hydraulic data)* may reflect stream channel distances that differ from what is shown on this map.

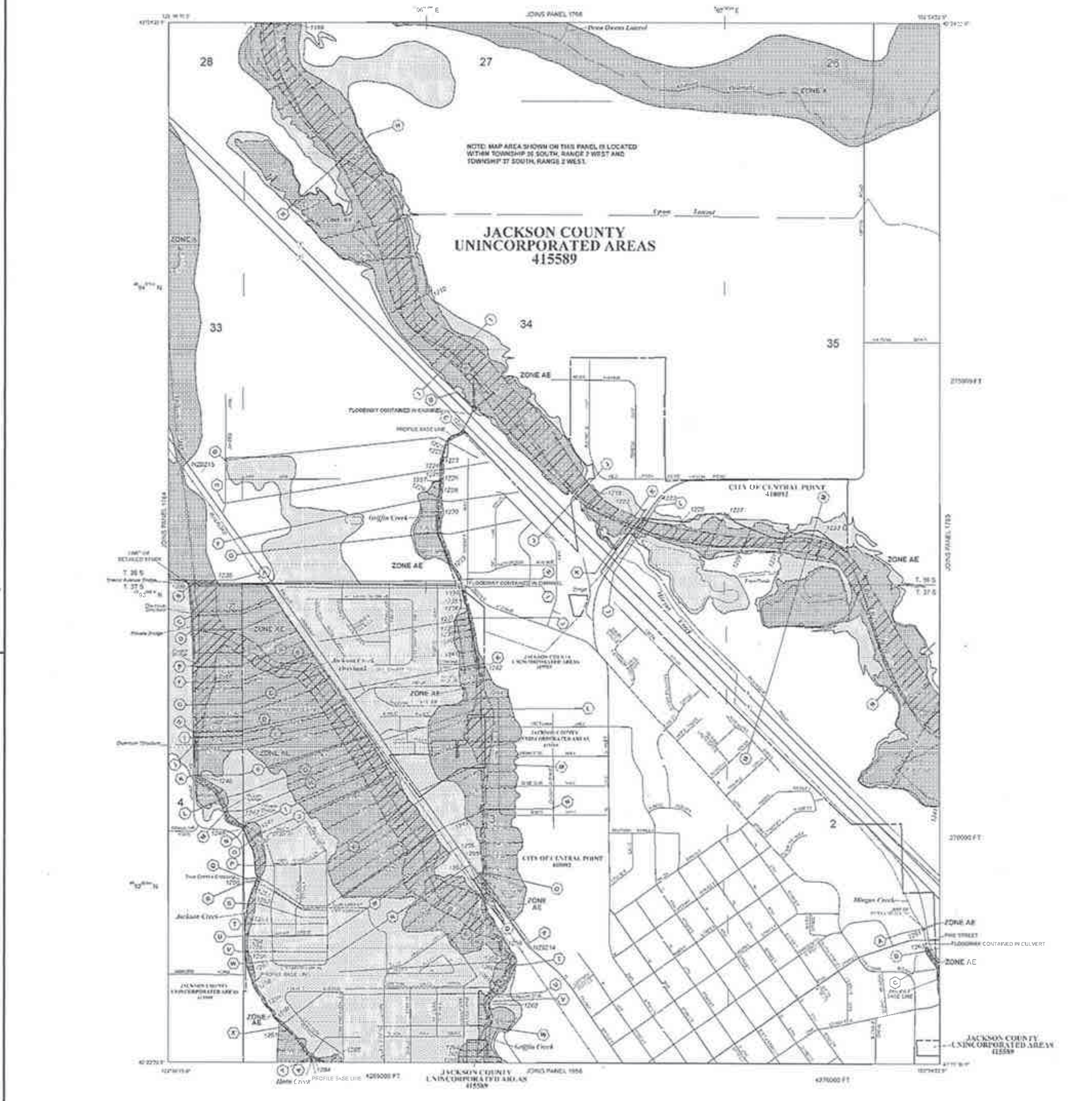
Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

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 Information eXchange at 1-877-FEMA MAP (1-877-336-2627) 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 Information eXchange may also be reached by Fax at 1-800-358-9620 and its website at http://www.msc.fema.gov/.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.

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.



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	[illegible]
ZONE AE	[illegible]
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 Area 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	[illegible]
ZONE D	[illegible]

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

[illegible]

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities

6000000 FT	5000-foot grid ticks: Oregon State Plane coordinate system, south zone (FIPSZONE 3602), Lambert Conformal Conic
	Bench mark (see explanation in Notes to Users section of this FIRM panel)

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
May 3, 2011
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

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'
250 0 500 1000 FEET
METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1768F

FIRM
FLOOD INSURANCE RATE MAP
JACKSON COUNTY, OREGON
AND INCORPORATED AREAS

PANEL 1768 OF 2327
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	415589	1768	F
CENTRAL POINT, CITY OF	410092	1768	F

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
41029C1768F

EFFECTIVE DATE
MAY 3, 2011

Federal Emergency Management Agency

TYPE 3 APPLICATION SUPPLEMENTAL FINDINGS
NO-RISE DETERMINATION – FLOODWAY DEVELOPMENT

A. Proposal.

Twin Creeks Development Co., LLC, an Oregon limited liability company, is the owner of certain real property located in Central Point, Oregon, and commonly known as Township 37 South, Range 2 West, Section 03BD, Tax Lots 1200, 1700, 2000, 2300, 2600, 2900, 3200, 3201, 3202, 3203, 3500, 3600, 3700, 3800, 3900, 4000 and 4100, Township 37 South Range 2 West, Section 03CA Tax Lots 802, 803 and 804, and Township 37 South Range 2 West, Section 03CA, Tax Lot 1200 ("Tax Lot 1200") (collectively, "the Twin Creeks property"). John and Marilyn Duke, as Trustees of the John A. Duke Trust, are the owners of the certain real property located in Central Point, Oregon, and commonly known as Township 37 South, Range 2 West, Section 03BD, Tax Lots 1100, 1400, 1500, 1800, 1900, 2400, 2500, 3000 and 3400 ("the Duke property"). Twin Creeks Development Co., LLC, and John and Marilyn Duke, as Trustees of the John A. Duke Trust, shall be collectively referred to herein as "Applicants". For the purposes of these supplemental findings, the Duke property and the Twin Creeks property shall be collectively referred to herein as "the parcels" or "the subject property". The purpose of this land use application is to obtain floodplain development permits to allow for the construction of single family dwellings on each of the parcels and the construction of independent living cottages on Tax Lot 1200 ("the Application"). No other development is being proposed in conjunction with the Application.

B. Schedule of Exhibits.

The following Exhibits have been submitted in support of this Application and by this reference are incorporated herein:

EXHIBIT "A":	**CLOMR Maps**
EXHIBIT "B":	**Assessor's Maps**
EXHIBIT "C":	**No-Rise Analysis**
EXHIBIT "D":	**Firm Panel 1768F**

C. Background.

The subject property, excluding Tax Lot 1200, consists of 29 parcels zoned High Mixed Residential/Commercial/Commercial (TOD), designated for single family development. Tax Lot 2800 is also zoned High Mixed Residential/Commercial/Commercial (TOD) and is designated for the construction of independent living cottages. A substantial portion of each of the parcels, excluding Tax Lot 1200, is located within the currently designated Floodway. Only the extreme southeastern corner of Tax Lot 1200 is located within the Floodway with the remainder of the property being located within the currently designated 100-year Floodplain.

Applicants obtained a Conditional Letter of Map Revision (CLOMR) from the Federal Emergency Management Agency (FEMA) on October 3, 2014 ("the CLOMR"). A map

depicting the approved Floodway boundary revision pursuant to the CLOMR is attached hereto as **Exhibit "A"** ("the CLOMR Map"). Applicants will obtain a Letter of Map Revision (LOMR) from FEMA subsequent to the completion of all work proposed in the CLOMR. All work has been completed except for the installation of large culverts in conjunction with the proposed Twin Creeks Crossing. It is anticipated that the aforementioned culverts will be installed in late spring, 2015. The LOMR application shall be submitted to FEMA subsequent to the installation of the culverts. As the CLOMR Map depicts, all of the subject property will be located outside of the designated Special Flood Hazard Area (SFHA) upon completion of the LOMR.

D. Applicable Criteria.

The standards and criteria that are applicable to this Application are set forth in Sections 8.24.090, 8.24.200 and 8.24.250 of the Central Point Municipal Code (CPMC). Findings addressing the aforementioned standards are set forth as follows:

1. CPMC 8.24.090. Review Procedure. Section 8.24.090 sets forth the requisite procedural review for floodplain development permits. The applicable provisions of CPMC 8.24.090 are as follows:

> *A. A floodplain development permit shall be required prior to initiating development activities in any special flood hazard areas as established in Section 8.24.070. The permit shall be for all improvements or structures (including manufactured homes and fences, as set forth in Sections 8.24.050, 8.24.250 and 8.24.260), and for all development including fill and other activities, also set forth in Section 8.24.260. Floodplain development permits shall be subject to the review procedures based on the type of development activity proposed, as set forth below:*
>
> * * * *
>
> *3. Section 17.05.400, Type III procedure (quasi-judicial), applies to floodplain development projects that meet the following criteria:*
>
> *a. Located in the regulatory floodway;*
>
> *b. Increases BFE more than one foot;*
>
> *c. Causes any rise in the regulatory floodway;*
>
> *d. Bridge and culvert replacement projects that are not deemed to be a public emergency as provided in subsection (A)(1)(d) of this section;*
>
> *e. Any bank stabilization that uses methods other than vegetative plantings to achieve shoreline stabilization and safety;*
>
> *f. Requires a conditional letter of map revision (CLOMR) and/or letter of map revision (LOMR) pursuant to Section 8.24.170(A) and (B); and*

g. Requests a variance to the provisions of this chapter. CPMC 8.24.090(A)(3).

Applicants' Findings: The subject property is located within the currently designated Floodway. Consequently, Applicants acknowledge that this Application is subject to a Type III review.

2. CPMC 8.24.200. Development in regulatory floodways. The proposed development within the designated Floodway is subject to the standards set forth in CPMC 8.24.200(A), (B) and (C), which are set forth as follows:

> *A. Except as provided in subsections E and F of this section, encroachments including fill, new construction, substantial improvements, and other development are prohibited unless certification by a registered professional civil engineer is provided demonstrating through hydrologic and hydraulic analyses performed in accordance with standard engineering practice that such encroachment shall not result in any increase in flood levels during the occurrence of the base flood discharge.* CPMC 8.24.200(A).

Applicants' Findings: A No-Rise Analysis dated February 26, 2015, and prepared by Peter Brooks, an Oregon registered professional engineer with Northwest Hydraulic Consultants is attached hereto as **Exhibit "C"** ("the No-Rise"). The No-Rise analysis is based upon current ground conditions including as-built topographic data of the recently constructed flood swale (*See* **Exhibit "A"**). The No-Rise states in part as follows:

> Results of the analysis show that construction of the flood swale has mitigated for any potential rise associated with development in the Twin Creeks Crossing Phases I, II and III (includes the subject property). No-Rise, Pg. 2 (explanation added).

The above-cited conclusion is based on the fact that all work in conjunction with the CLOMR has been completed excepting the installation of the culverts. Thus, the subject property would be located outside of the Special Flood Hazard Area (SFHA) based on current ground conditions. Consequently, new construction and/or other substantial improvements on the subject property will have no impact on flood levels because the subject property is effectively outside the SFHA.

> *B. Provided that the conditions in subsection A of this section are met, the following additional provisions shall apply:*
>
> *1. Floodplain development construction standards provided in Sections 8.24.250 and 8.24.260 are met;*
>
> *2. Any fill allowed to be placed in the floodway shall be designed to be stable under conditions of flooding, including rapid rise and rapid drawdown of floodwaters, prolonged inundation, and flood related erosion and scour;*
>
> *3. No manufactured dwelling shall be placed in a floodway except in an existing mobile home park or an existing mobile home subdivision, as conditionally*

approved by the local administrator or designee in consideration of the conditions of Section 8.24.250(G). CPMC 8.24.200(B).

Applicants' Findings: Applicants acknowledge and agree that the floodplain development construction development standards will apply to all new construction and standard improvements located within the designated Special Flood Hazard Area (SFHA). In the event any fill is placed in the designated Floodway, it shall be designed to be stable under conditions of flooding, including rapid rise and rapid drawdown of floodwaters, prolonged inundation and flood related erosion and scour. No manufactured dwellings will be located on the subject property.

C. The following activities are prohibited in the regulatory floodway:

1. Fences and walls as provided in Section 8.24.260(A)(1) and 17.57.030; and

2. Accessory structures as provided in Section 8.24.250(I). CPMC 8.24.200(C).

Applicants' Findings: No fences or walls (i.e. masonry walls or retaining walls) shall be constructed within the designated Floodway. Applicants acknowledge that no accessory structures shall be allowed within the designated Floodway.

3. CPMC 8.24.250. Floodplain Development Standards for Construction.
CPMC 8.24.250 sets forth specific construction standards for new construction and substantial improvements located within a designated Special Flood Hazard Area (SFHA).

Applicants' Findings: Applicants acknowledge and are in agreement that any new construction and substantial improvements located within a designated SFHA must comply with the construction standards set forth in CPMC 8.24.250. Applicants propose that these standards be imposed as a condition of approval.

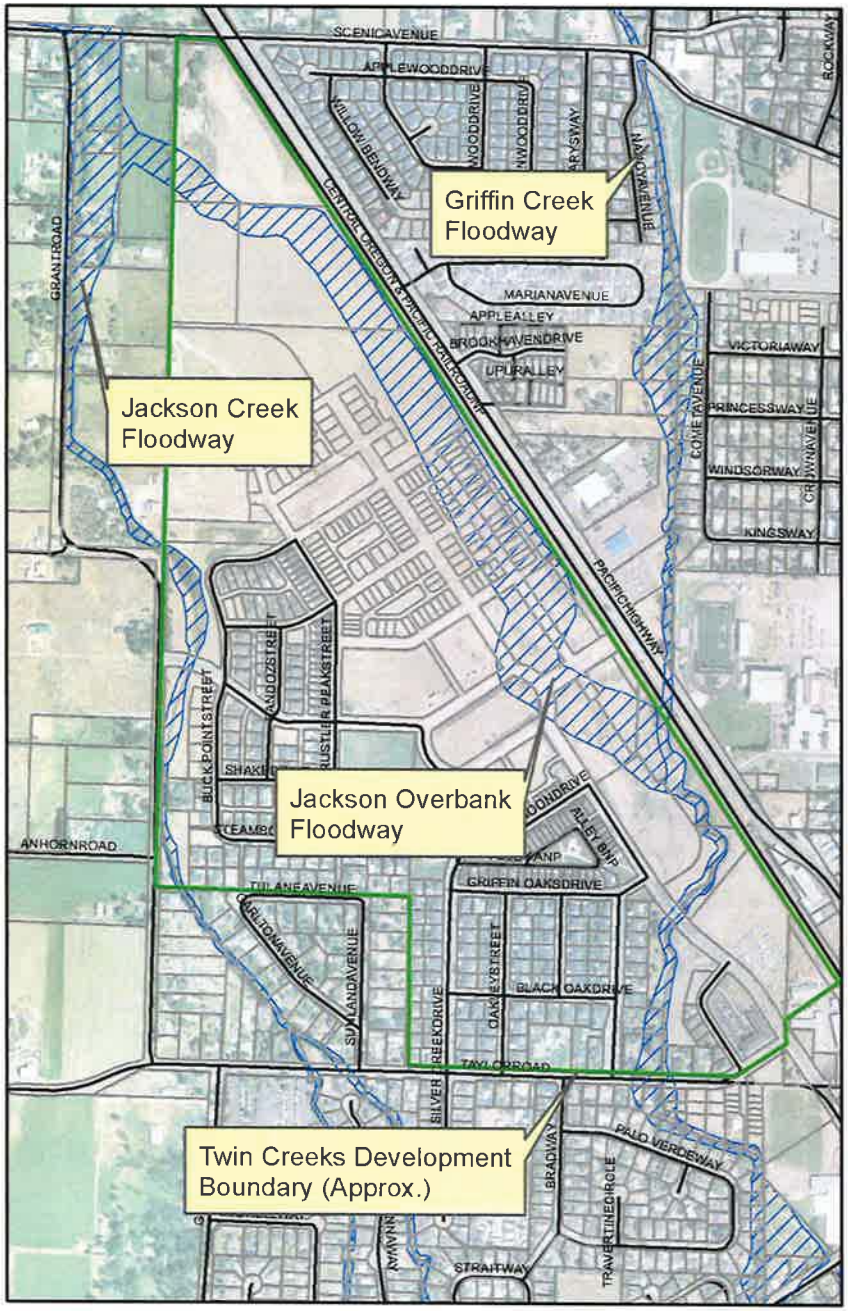
E. Conclusion.

For the reasons set forth above, Applicant respectfully requests that the Floodplain Development Permit application be approved.

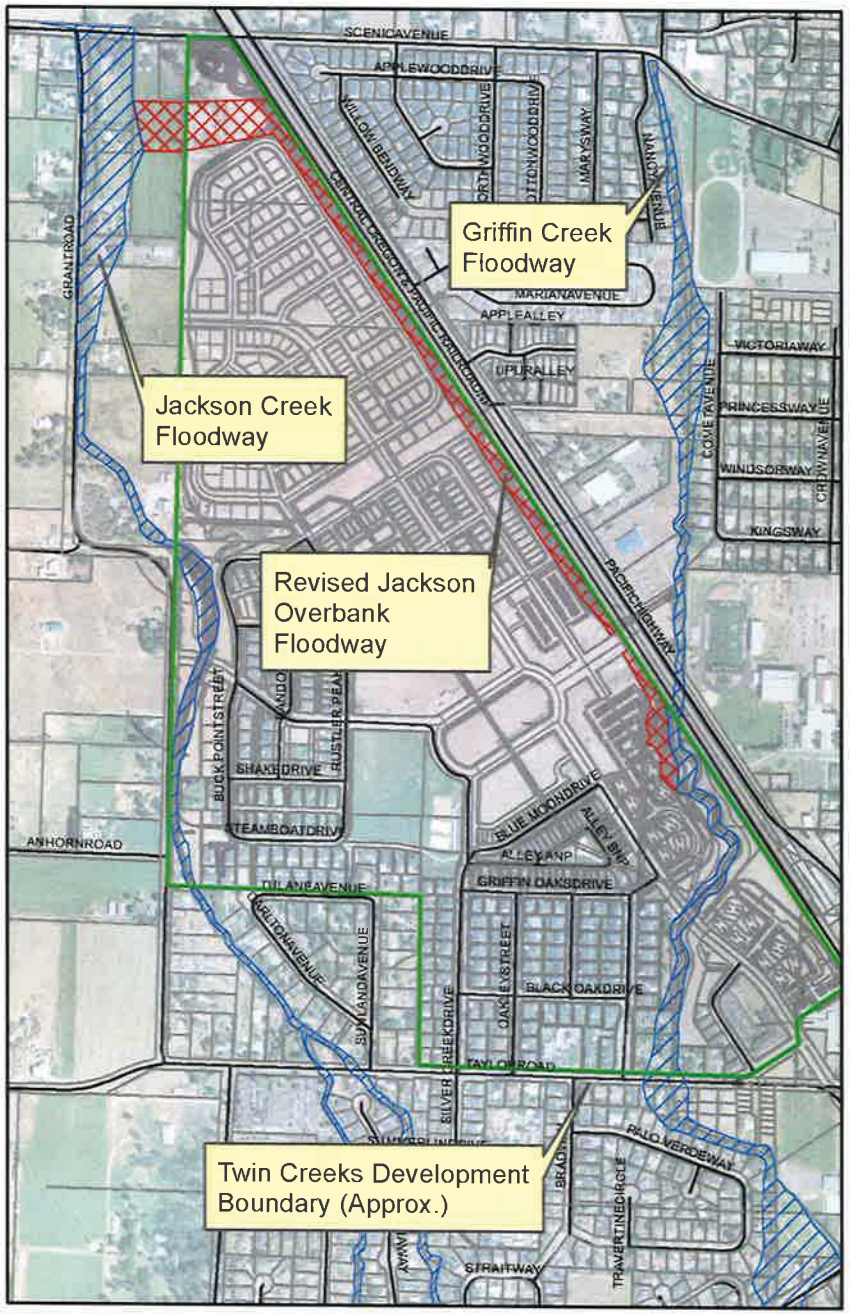
HUYCKE O'CONNOR JARVIS, LLP:

Daniel B. O'Connor, OSB# 950444
Attorney for Applicants

EXHIBIT "A"



Effective FEMA Floodway Mapping



Proposed Floodway Revision (Draft)

N
W E
S

0 500 1,000 2,000 Feet

Note: Flow direction is generally northward.

The reach connecting Griffin and Jackson Creeks within the development is referred to as the 'Jackson Creek Overbank'.

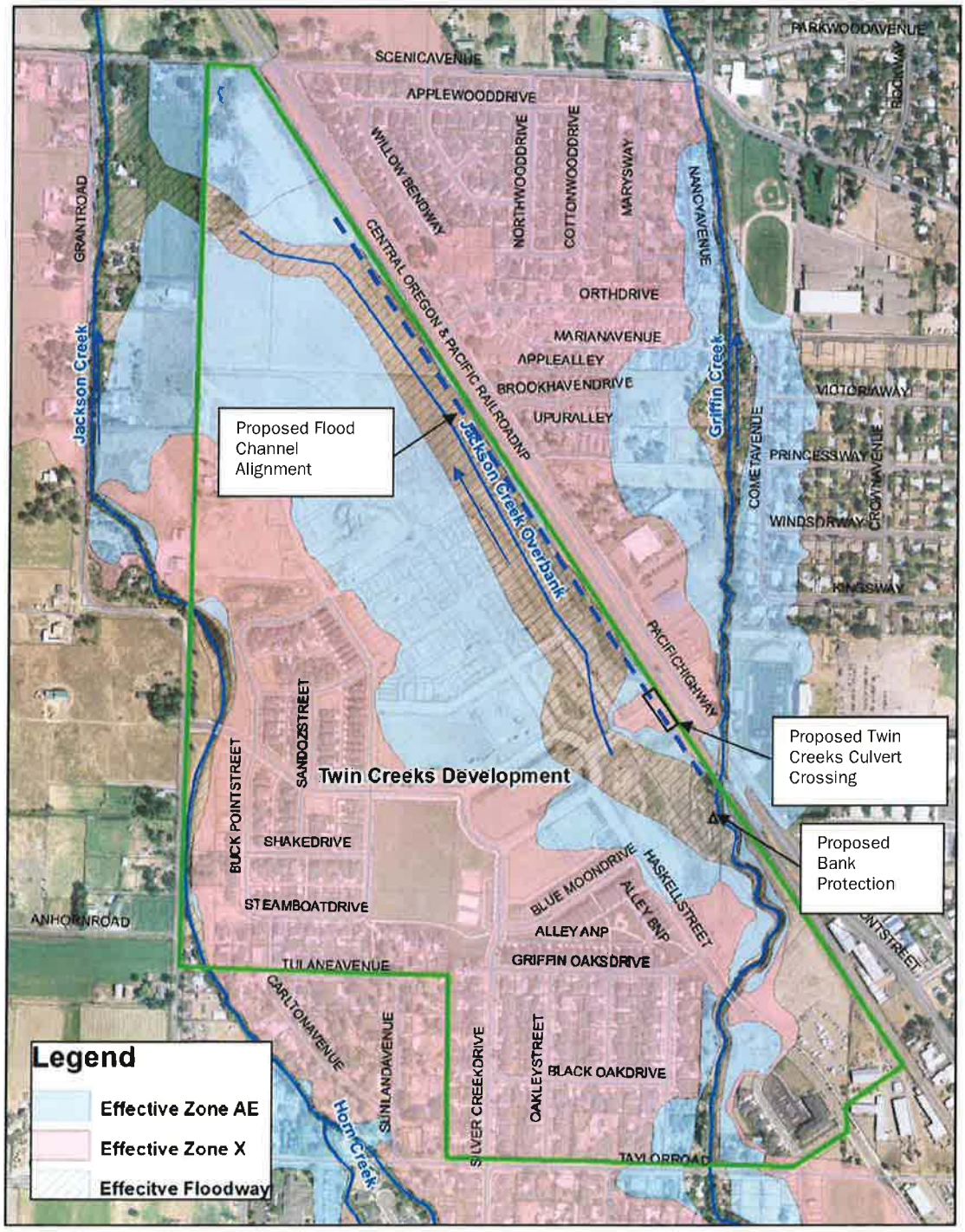
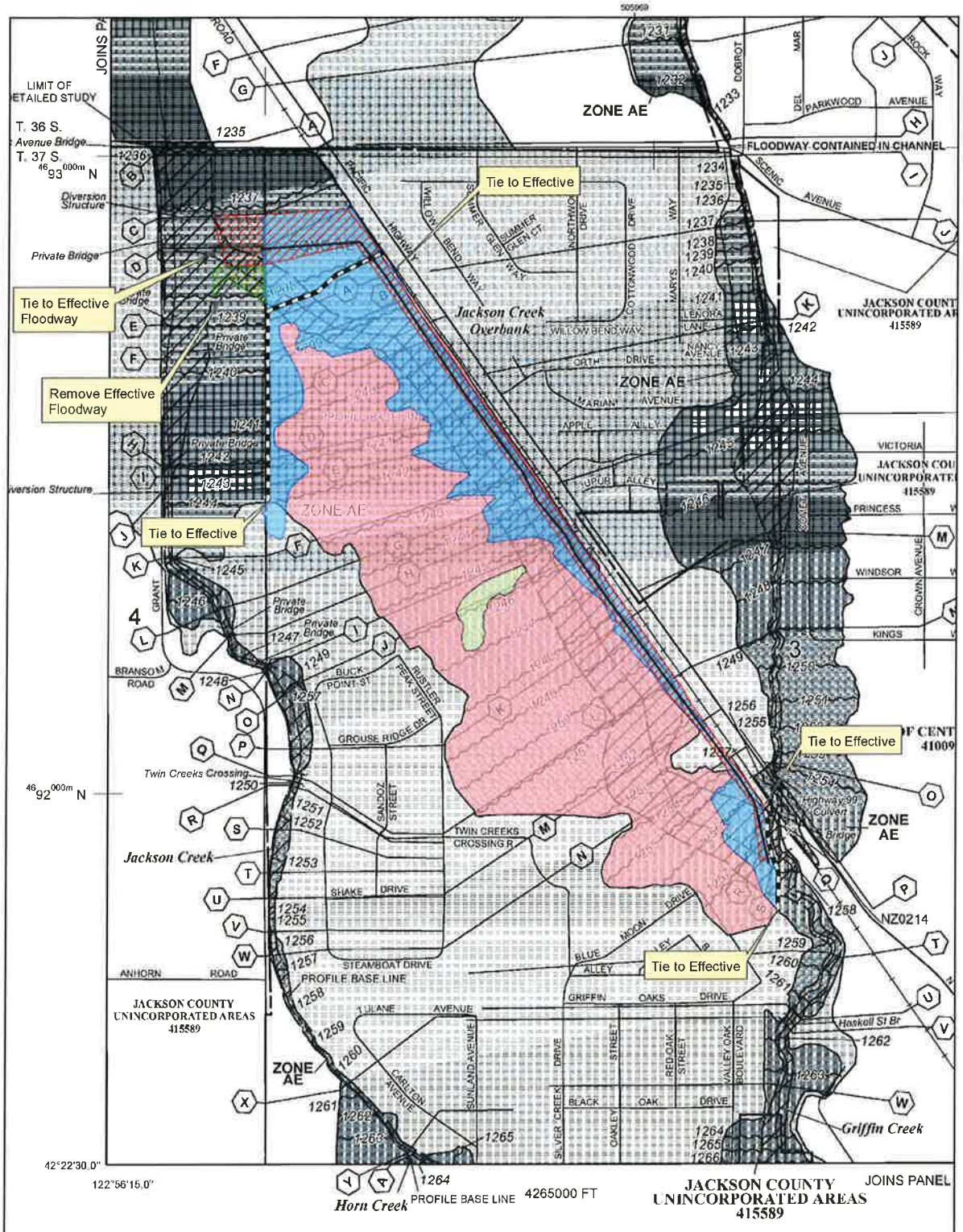


Figure 1 Effective FEMA flood hazard mapping and proposed Twin Creek flood improvement measures.

The effective floodplain mapping between the two study reaches, through the Twin Creeks Development, is broad and unconfined, resulting in a relatively wide floodway delineation. It should be noted that this reach does not receive perennial flow and would function as an overflow channel during



Legend

- Effective Study Breakline
- Revised Jackson Creek Overbank Profile Baseline
- Revised Floodway
- Revised Zone AH
- Revised Zone AE
- Revised Zone X
- Floodway_Removal

Twin Creeks Development CLOMR

Jackson Creek Overbank
Annotated FIRM 41029C 1768F

Scale - 1:6,000

500 250 0 500 Feet

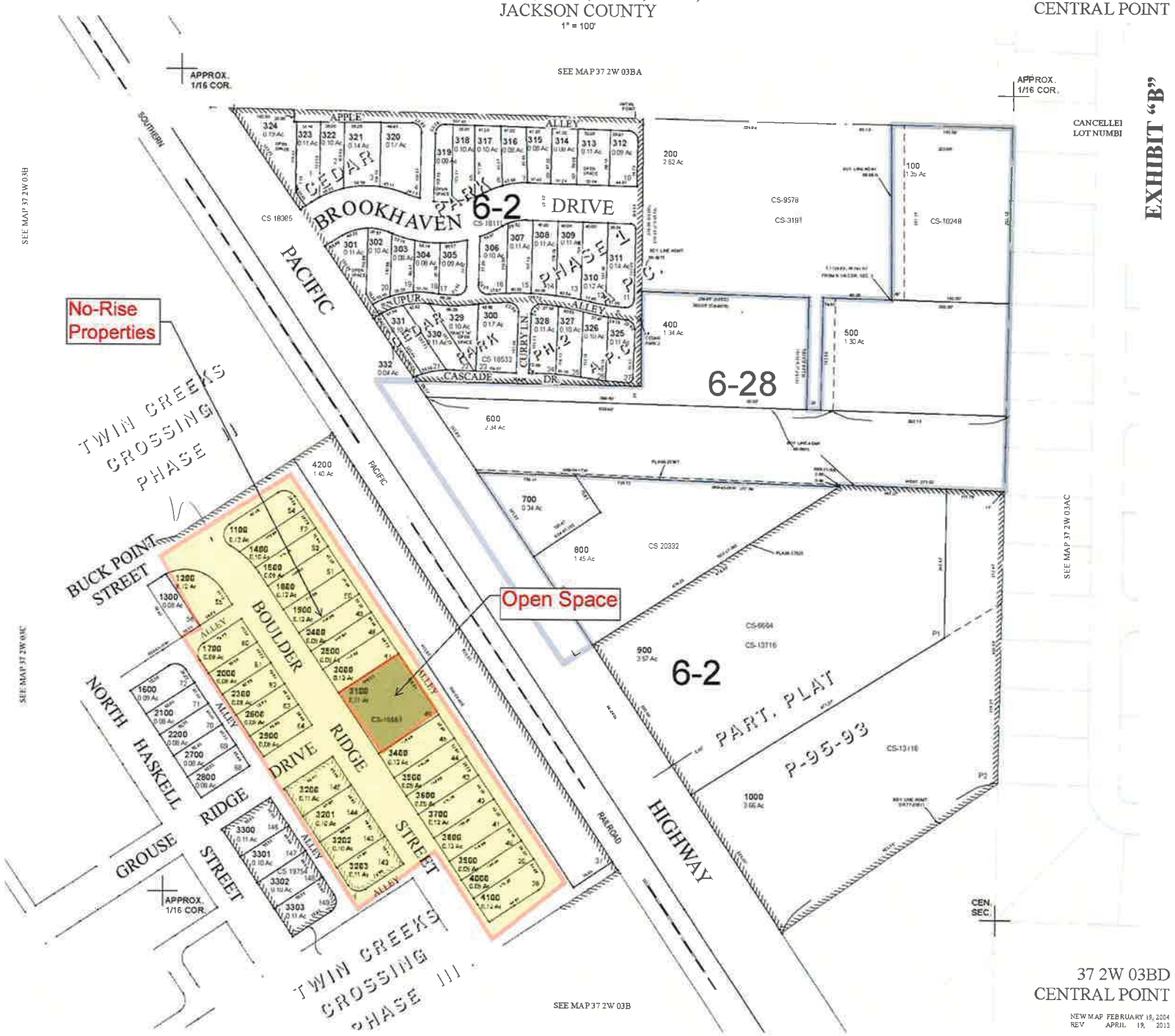
coord. syst.: UTM Zone 10N	horz. datum: NAD 83	horz. units: feet
northwest hydraulic consultants	project no. 200044	27-Jul-2014

FOR ASSESSMENT AND TAXATION ONLY

S.E.1/4, N.W.1/4, SEC.3, T.37S., R.2W., W.M.
JACKSON COUNTY
1" = 100'

37 2W 03BD
CENTRAL POINT

EXHIBIT "B"



GIS DATA
04/19/2013 11:23:40 AM JohnsonM

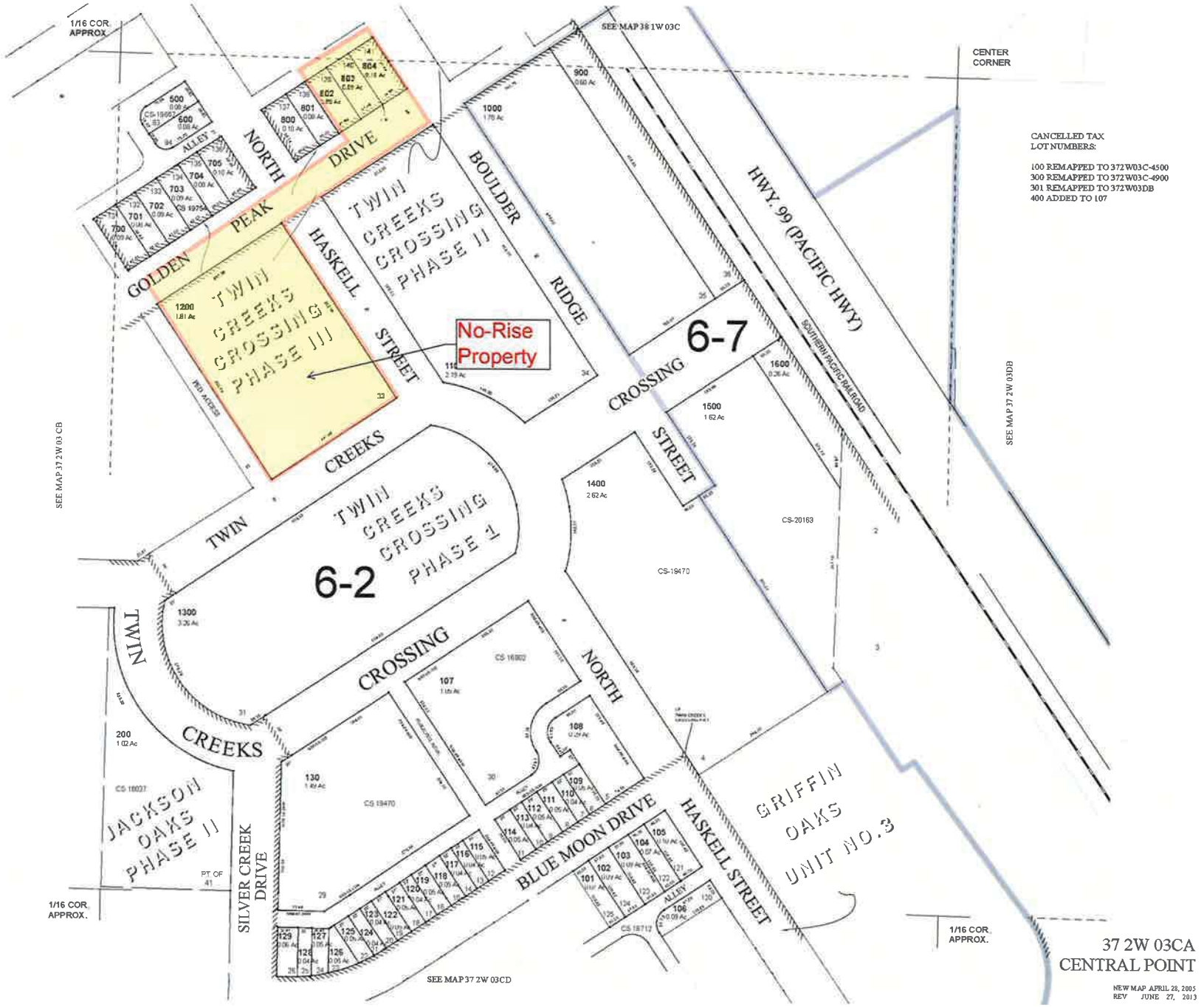
37 2W 03BD
CENTRAL POINT

NEW MAP FEBRUARY 19, 2004
REV APRIL 19, 2013

FOR ASSESSMENT AND TAXATION ONLY

N.E.1/4, S.W.1/4, SEC.3, T.37S., R.2W., W.M.
JACKSON COUNTY
1" = 100'

37 2W 03CA
CENTRAL POINT



GIS DATA
09/27/2013 4:15:38 PM: JohnsoWH

37 2W 03CA
CENTRAL POINT

NEW MAP APRIL 28, 2005
REV JUNE 27, 2013

TWIN CREEKS TRANSIT ORIENTED DEVELOPMENT AGREEMENT

Effective Date:

Parties:

City of Central Point
140 South Third Street
Central Point, OR 97502 ("City")

Twin Creek Development Co., LLC
P.O. Box 3577
Central Point, OR 97502 ("Developer")

Recitals:

A. Developer is the owner of real property located in Jackson County, Oregon more particularly described in Exhibit "A" attached hereto and incorporated herein by reference, located within the Twin Creeks TOD Master Plan. A copy of the Twin Creeks TOD Master Plan Map is attached hereto as Exhibit "B" (the "Subject Property").

B. In 2001, Developer applied for, and City approved, a Pre-Annexation Development Agreement and Master Plan for the Central Point Transit-Oriented District ("TOD"). As part of that agreement, Developer agreed to make a number of transportation and utility improvements to provide service to the Subject Property. Those improvements were incorporated into the Master Plan as conditions of approval. The improvements include, without limitation, railroad crossing and intersection improvements for a new TOD Crossing and upgrades at Twin Creeks Crossing (extended) and Highway 99 per Oregon Public Utilities Commission and ODOT requirements (the "Railroad Crossing").

C. Throughout the course of development of the Subject Property, City contributed substantial improvements to the transportation infrastructure improvements required of Developer under the Master Plan. Further, City has applied for a grant to aid Developer with the costs of the Railroad Crossing. Such grant will not cover the full cost of the Railroad Crossing and Developer will be required to contribute a share of the costs of the crossing in lieu of making the full improvements itself.

D. As City is relying upon Developer's contribution to the Railroad Crossing in applying for the grant, and Developer no longer owns all of the land within the

Master Plan area, the parties desire to clarify and assure the performance of Developer's obligations related to the Railroad Crossing.

Agreement:

1. The recitals are incorporated into this Agreement and made a part hereof.

2. As Developer's share of the cost of improving the Railroad Crossing, Developer shall:
   a. Prior to October 1, 2014 obtain the necessary permits from federal, state and local agencies for construction of the extension of utilities and the pavement of Twin Creeks Crossing from the current terminus easterly to the railroad right-of-way improvements as identified in the drawings entitled "Griffin Creek Overflow Flood Mitigation Plan" dated March 11, 2013, which is attached hereto as Exhibit "C", and complete construction of same no later than October 1, 2015. To secure such obligation, a personal guaranty shall be required, in substantially the form attached hereto as Exhibit "D". If Developer fails to complete construction within the time provided herein, the City may, at its option, make such improvements on Developer's behalf and seek reimbursement for such improvements from Developer, and/or its Guarantor as provided in the personal guaranty attached hereto as Exhibit "D"; and

   b. Pay to the City into the Railroad Crossing Account the following amounts: No later than December 1, 2014 cash in the amount of $125,000.00. No later than December 1, 2015 cash in the additional amount of $125,000.00. No later than December 1, 2016 cash in the additional amount of $125,000.00. No later than July 1, 2017 cash in the additional amount of $125,000.00. To secure such obligation, a personal guaranty shall be required, in substantially the form attached hereto as Exhibit "D".

      i. In the event any payment required of Developer pursuant to this agreement becomes past due for a period of 10 days or more, the principal balance owing pursuant to this Agreement shall, automatically and without further notice to Developer, accrue interest at the rate of twelve percent (12%) per annum until such time as the delinquent payment is paid ("Default Interest"). City may treat the failure to pay such additional interest as a default hereunder. The acceptance of payments or performance by City shall not be deemed a waiver of City's right to collect Default Interest. Interest shall be calculated on the basis of a 30-day month and a 360-day year.

      ii. In the event construction of the railroad crossing is abandoned by the City and said abandonment is replaced by an alternative route;

which actions shall be acknowledged in the City's Transportation System Plan ("TSP), then the City shall have the authority to use the payments for the designated alternative route. If the City abandons construction of the railroad crossing and does not designate an alternative route; which action shall be acknowledged in the City's TSP, then the City shall refund the payments made by Developer under Section 6 herein, without interest.

3. In consideration for the City's contribution to the transportation improvements identified in the Master Plan approval, Developer agrees to waive all rights to reimbursement from the City for any current or future qualifying Street SDC fees for streets already built or proposed to be built within the Subject Property.

4. As additional consideration for the City's contribution to the transportation improvements identified in the Master Plan approval, Developer agrees to waive all rights to reimbursement from the City for any qualifying Parks SDC fees for parks already built or required to be built in the future within the Subject Property.

5. Nothing herein is intended to alter or modify the requirements to improve the streets, utilities and parks identified in the Master Plan, except as expressly modified herein.

6. This Agreement has been prepared on behalf of the City of Central Point. Developer has been advised that it should seek independent legal counsel as to the effect of this Agreement on its rights.

OFFICIAL SEAL
ELAINE S FROST
NOTARY PUBLIC-OREGON
COMMISSION NO. 459162
MY COMMISSION EXPIRES JUNE 26, 2015

Dated: 7/3/2014

TWIN CREEKS DEVELOPMENT CO., LLC

By: Bret Moore, Manager

"Developer"

CITY OF CENTRAL POINT

Dated: 7/24/14

By: Hank Williams
Its: Mayor

EXHIBIT "A"

PROPERTY OWNED BY TWIN CREEKS DEVELOPMENT CO., LLC as of 12-20-2013

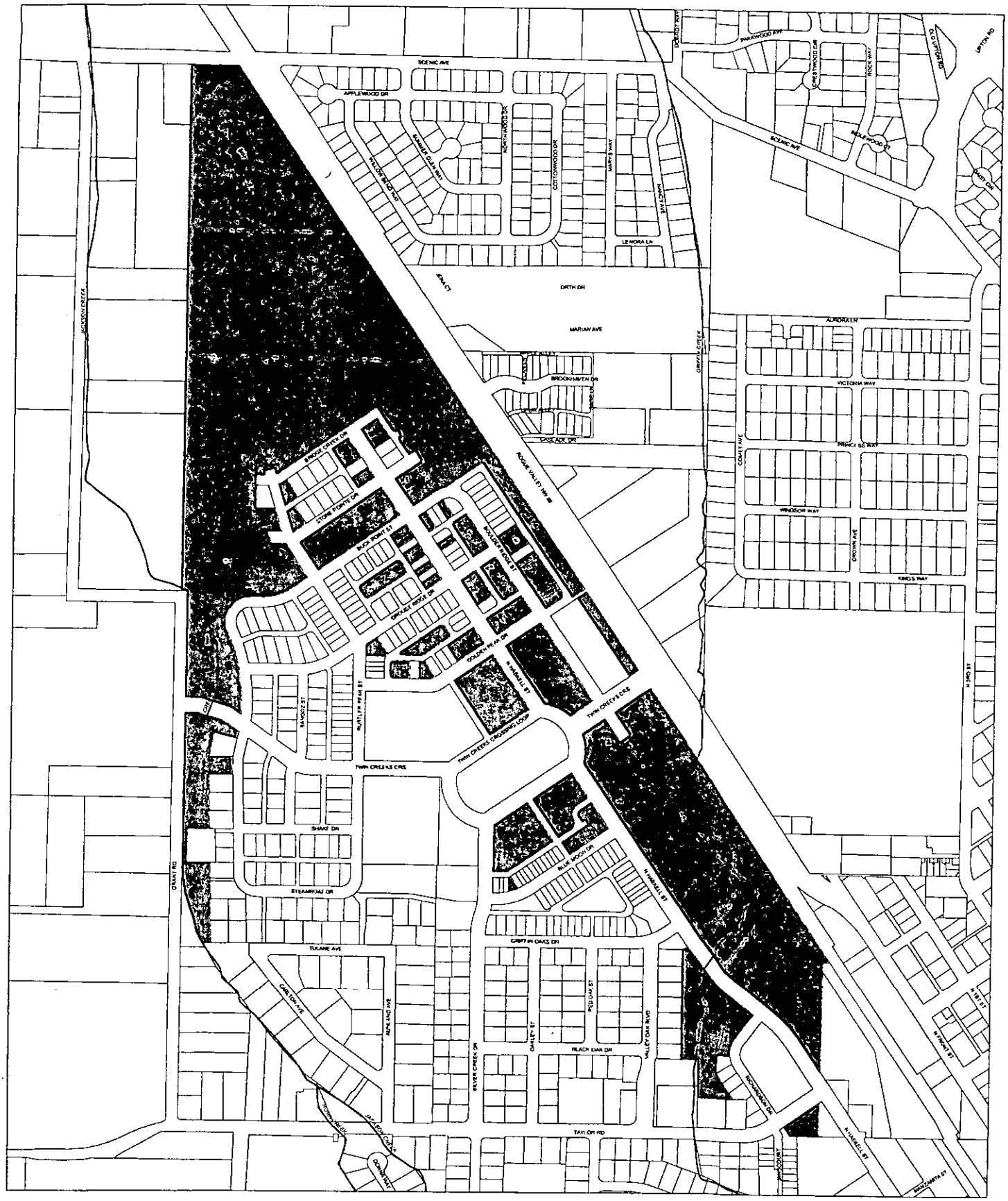
No.	ASSESSORS TAX LOT NO.	ASSESSORS ACCOUNT NO.	FEE OWNER
1	372W03DC3400	10140165	TWIN CREEKS DEVELOPMENT COMPANY, LLC
2	372W03CA900	10985724	TWIN CREEKS DEVELOPMENT COMPANY, LLC
3	372W03CA1500	10985726	TWIN CREEKS DEVELOPMENT COMPANY, LLC
4	372W03CA1600	10985725	TWIN CREEKS DEVELOPMENT COMPANY, LLC
5	372W03DB900	10985507	TWIN CREEKS DEVELOPMENT COMPANY, LLC
6	372W03CA126	10985748	TWIN CREEKS DEVELOPMENT COMPANY, LLC
7	372W03DC3402	10980147	TWIN CREEKS DEVELOPMENT COMPANY, LLC
8	372W03DC3409	10980154	TWIN CREEKS DEVELOPMENT COMPANY, LLC
9	372W03DC3411	10985594	TWIN CREEKS DEVELOPMENT COMPANY, LLC
10	372W03B1601	10631951	TWIN CREEKS DEVELOPMENT COMPANY, LLC
11	372W03CB7101	10986679	TWIN CREEKS DEVELOPMENT COMPANY, LLC
12	372W03BD4000	10986373	TWIN CREEKS DEVELOPMENT COMPANY, LLC
13	372W03BD4100	10986372	TWIN CREEKS DEVELOPMENT COMPANY, LLC
14	372W03CA704	10986692	TWIN CREEKS DEVELOPMENT COMPANY, LLC
15	372W03BD2900	10986398	TWIN CREEKS DEVELOPMENT COMPANY, LLC
16	372W03BC2700	10986415	TWIN CREEKS DEVELOPMENT COMPANY, LLC
17	372W03CA111	10985733	TWIN CREEKS DEVELOPMENT COMPANY, LLC
18	372W03CA130	10985752	TWIN CREEKS DEVELOPMENT COMPANY, LLC
19	372W03BD3800	10986375	TWIN CREEKS DEVELOPMENT COMPANY, LLC
20	372W03CA801	10986694	TWIN CREEKS DEVELOPMENT COMPANY, LLC
21	372W03BD2000	10986395	TWIN CREEKS DEVELOPMENT COMPANY, LLC
22	372W03BD2100	10986405	TWIN CREEKS DEVELOPMENT COMPANY, LLC
23	372W03BC2500	10986413	TWIN CREEKS DEVELOPMENT COMPANY, LLC
24	372W03BD3203	10986685	TWIN CREEKS DEVELOPMENT COMPANY, LLC
25	372W03CA702	10986690	TWIN CREEKS DEVELOPMENT COMPANY, LLC
26	372W03BC800	10986407	TWIN CREEKS DEVELOPMENT COMPANY, LLC
27	372W03BD4200	10986369	TWIN CREEKS DEVELOPMENT COMPANY, LLC
28	372W03CB7200	10986421	TWIN CREEKS DEVELOPMENT COMPANY, LLC
29	372W03BC2000	10986429	TWIN CREEKS DEVELOPMENT COMPANY, LLC
30	372W03B1800	10196422	TWIN CREEKS DEVELOPMENT COMPANY, LLC
31	372W03BC900	10986408	TWIN CREEKS DEVELOPMENT COMPANY, LLC
32	372W03CA703	10986691	TWIN CREEKS DEVELOPMENT COMPANY, LLC
33	372W03CA802	10986695	TWIN CREEKS DEVELOPMENT COMPANY, LLC
34	372W03CA803	10986696	TWIN CREEKS DEVELOPMENT COMPANY, LLC
35	372W03BD3201	10986683	TWIN CREEKS DEVELOPMENT COMPANY, LLC
36	372W03CA114	10985736	TWIN CREEKS DEVELOPMENT COMPANY, LLC
37	372W03BD3200	10986399	TWIN CREEKS DEVELOPMENT COMPANY, LLC
38	372W03BD2300	10986396	TWIN CREEKS DEVELOPMENT COMPANY, LLC
39	372W03BD3500	10986378	TWIN CREEKS DEVELOPMENT COMPANY, LLC
40	372W03BD3600	10986377	TWIN CREEKS DEVELOPMENT COMPANY, LLC

EXHIBIT "A"

No.	ASSESSORS TAX LOT NO.	ASSESSORS ACCOUNT NO.	FEE OWNER
41	372W03BD3300	10986401	TWIN CREEKS DEVELOPMENT COMPANY, LLC
42	372W03CA800	10986400	TWIN CREEKS DEVELOPMENT COMPANY, LLC
43	372W03CA1100	10985722	TWIN CREEKS DEVELOPMENT COMPANY, LLC
44	372W03CA1200	10985721	TWIN CREEKS DEVELOPMENT COMPANY, LLC
45	372W03BC700	10986393	TWIN CREEKS DEVELOPMENT COMPANY, LLC
46	372W03BD3202	10986684	TWIN CREEKS DEVELOPMENT COMPANY, LLC
47	372W03CA804	10986697	TWIN CREEKS DEVELOPMENT COMPANY, LLC
48	372W03CB7100	10986420	TWIN CREEKS DEVELOPMENT COMPANY, LLC
49	372W03C101	10633028	TWIN CREEKS DEVELOPMENT COMPANY, LLC
50	372W03CA108	10985730	TWIN CREEKS DEVELOPMENT COMPANY, LLC
51	372W03CA113	10985735	TWIN CREEKS DEVELOPMENT COMPANY, LLC
52	372W03BC2200	10986410	TWIN CREEKS DEVELOPMENT COMPANY, LLC
53	372W03BC2300	10986411	TWIN CREEKS DEVELOPMENT COMPANY, LLC
54	372W03CA109	10985731	TWIN CREEKS DEVELOPMENT COMPANY, LLC
55	372W03C138	10985727	TWIN CREEKS DEVELOPMENT COMPANY, LLC
56	372W03CB7103	10986681	TWIN CREEKS DEVELOPMENT COMPANY, LLC
57	372W03CA1400	10985728	TWIN CREEKS DEVELOPMENT COMPANY, LLC
58	372W03BD1700	10986394	TWIN CREEKS DEVELOPMENT COMPANY, LLC
59	372W03BD2600	10986397	TWIN CREEKS DEVELOPMENT COMPANY, LLC
60	372W03CA110	10985732	TWIN CREEKS DEVELOPMENT COMPANY, LLC
61	372W03CA112	10985734	TWIN CREEKS DEVELOPMENT COMPANY, LLC
62	372W03CA705	10986693	TWIN CREEKS DEVELOPMENT COMPANY, LLC
63	372W03BD1300	10986390	TWIN CREEKS DEVELOPMENT COMPANY, LLC
64	372W03BD3302	10986687	TWIN CREEKS DEVELOPMENT COMPANY, LLC
65	372W03BD3900	10986374	TWIN CREEKS DEVELOPMENT COMPANY, LLC
66	372W03BD3301	10986686	TWIN CREEKS DEVELOPMENT COMPANY, LLC
67	372W03BD3100	10986380	TWIN CREEKS DEVELOPMENT COMPANY, LLC
68	372W03BC201	10991725	TWIN CREEKS DEVELOPMENT COMPANY, LLC
69	372W03CA107	10985595	TWIN CREEKS DEVELOPMENT COMPANY, LLC
70	372W03BD3700	10986376	TWIN CREEKS DEVELOPMENT COMPANY, LLC
71	372W03CB6600	10986445	TWIN CREEKS DEVELOPMENT COMPANY, LLC
72	372W03BC354	10998395	TWIN CREEKS DEVELOPMENT COMPANY, LLC
73	372W03BC316	10998387	TWIN CREEKS DEVELOPMENT COMPANY, LLC
74	372W03BC318	10998389	TWIN CREEKS DEVELOPMENT COMPANY, LLC
75	372W03BC319	10998390	TWIN CREEKS DEVELOPMENT COMPANY, LLC
76	372W03BC303	10998373	TWIN CREEKS DEVELOPMENT COMPANY, LLC
77	372W03BC300	10633036	TWIN CREEKS DEVELOPMENT COMPANY, LLC
78	372W03BC310	10998381	TWIN CREEKS DEVELOPMENT COMPANY, LLC
79	372W03BC308	10998379	TWIN CREEKS DEVELOPMENT COMPANY, LLC
80	372W03BC309	10998380	TWIN CREEKS DEVELOPMENT COMPANY, LLC
81	372W03BC306	10998377	TWIN CREEKS DEVELOPMENT COMPANY, LLC
82	372W03BC305	10998376	TWIN CREEKS DEVELOPMENT COMPANY, LLC
83	372W03BC307	10998378	TWIN CREEKS DEVELOPMENT COMPANY, LLC
84	372W03BC100	10883813	TWIN CREEKS DEVELOPMENT COMPANY, LLC

EXHIBIT "A"

No.	ASSESSORS TAX LOT NO.	ASSESSORS ACCOUNT NO.	FEE OWNER
85	372W03BC200	10196414	TWIN CREEKS DEVELOPMENT COMPANY, LLC
86	372W03DC3303	10985506	TWIN CREEKS DEVELOPMENT COMPANY, LLC
87	372W03C208	10782603	TWIN CREEKS DEVELOPMENT COMPANY, LLC
88	372W03CB5700	10984649	TWIN CREEKS DEVELOPMENT COMPANY, LLC



N
W E
S

Legend

TWIN CREEK DEVELOP CO LLC

Date: 12/20/2013

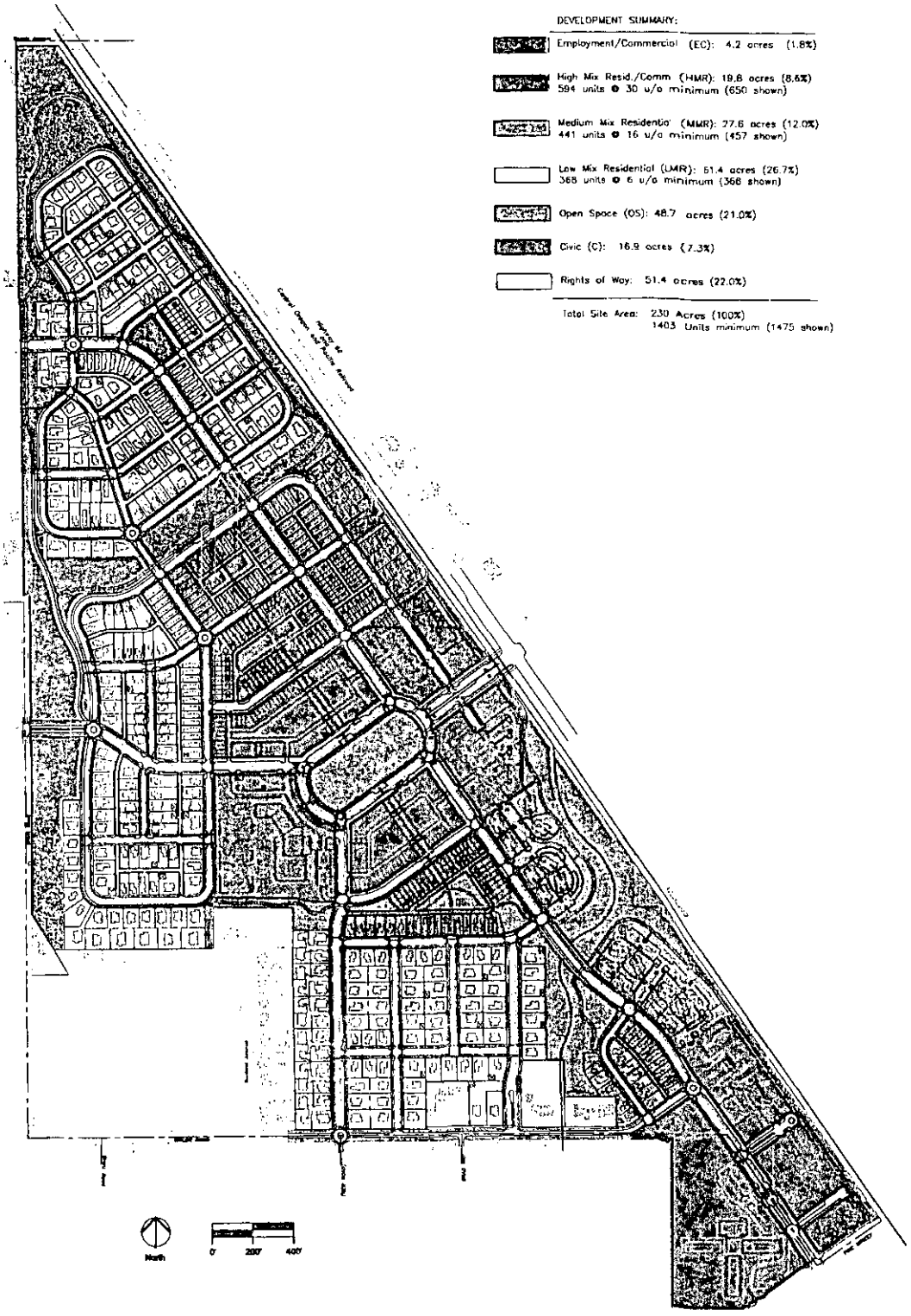
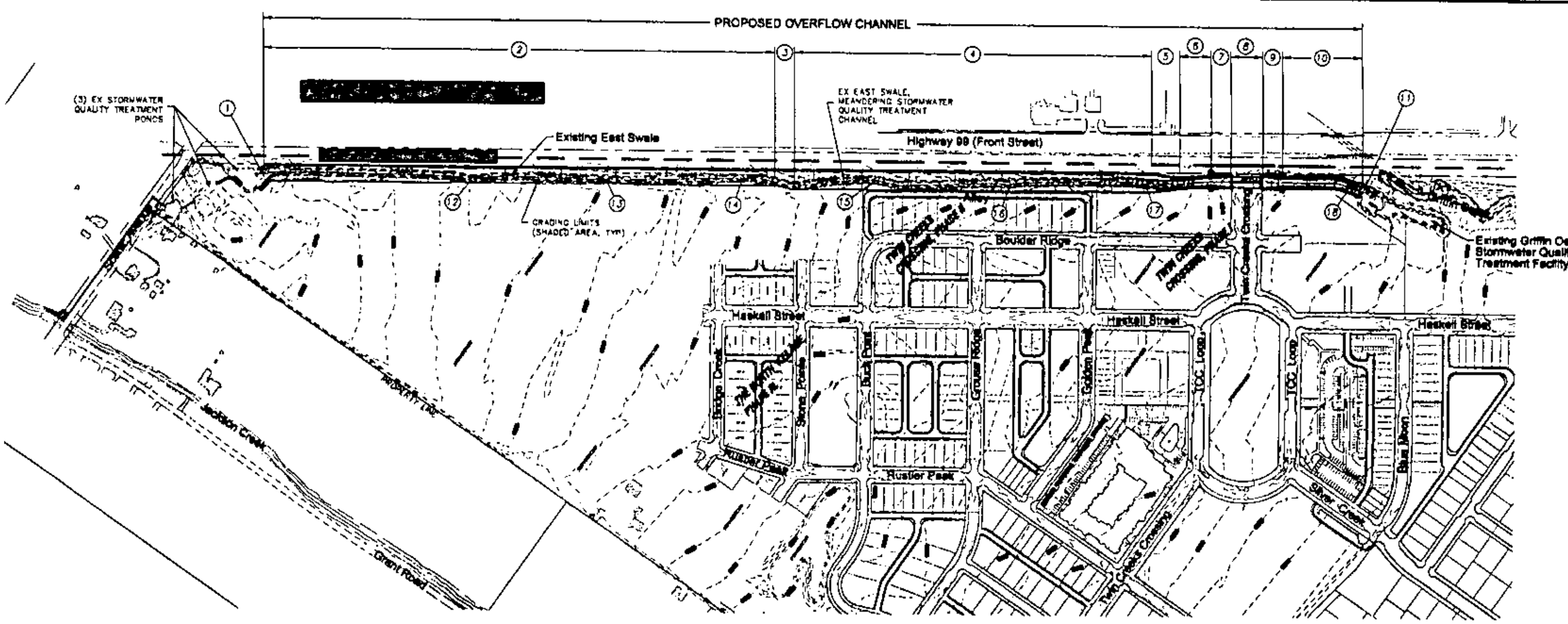


Exhibit 18, Land Use Plan

EXHIBIT "B"



PROPOSED OVERFLOW CHANNEL

GRAPHIC SCALE 0 200' 400'
SCALE: 1"=200'

Construction Notes:

1. Station 0+00
Begin Channel Grading on Both Sides of Ex East Swale Stormwater Channel (84-ft top width, 1232.00 beginning bench elev)
See Sheet 4 for Additional Details

2. Station 0+00 to Station 18+08.40
Construct 84-ft top width Channel on Both Sides of Ex East Swale Stormwater Channel
See Sheet 4 for Additional Details

3. Station 18+08.40 to Station 18+80.86
Construct Tapered Channel Section on Both Sides of Ex East Swale Stormwater Channel (84-ft top width to 73-ft top width)
See Sheet 4 for Additional Details

4. Station 18+80.86 to Station 31+50.00
Construct 73-ft top width Channel on Both Sides of Ex East Swale Stormwater Channel
See Sheet 4 for Additional Details

5. Station 31+50.00 to Station 32+50.00
Construct Tapered Channel Section (73-ft top width with benches to 22-ft bottom width with sloped sides)
See Sheet 4 for Additional Details

6. Station 32+50.00 to Station 33+81.85
Construct 22-ft bottom width Channel at 0.38% Avg Slope
See Sheets 2, 3, & 4 for Additional Details

7. Station 33+81.85 to Station 34+33.00
Construct Tapered Channel Section (22-ft bottom width to 40-ft bottom width)
Channel at 0.38% Avg Slope
See Sheets 2, 3, & 4 for Additional Details

8. Station 34+33.00 to Station 35+44.70
Install Culvert Crossing for Future Roadway
See Sheets 2, 3, & 4 for Additional Details

9. Station 35+44.70 to Station 36+14.75
Construct Tapered Channel Section (40-ft bottom width to 22-ft bottom width)
Channel at 0.06% Ave Slope
See Sheets 2, 3, & 4 for Additional Details

10. Station 36+14.75 to Station 38+04.81
Construct 22-ft bottom width
Channel at 0.06% Ave Slope
See Sheets 2, & 4 for Additional Details

11. Station 38+04.81
End Channel Grading
(22-ft bottom width)
See Sheets 2, & 4 for Additional Details

12. Station 7+38.43
Ex East Swale Stormwater Control Weir #1
Ex Top of Weir Elev = 1234.44
New Bench Elev = 1234.40

13. Station 12+17.15
Ex East Swale Stormwater Control Weir #2
Ex Top of Weir Elev = 1238.84
New Bench Elev = 1238.80

14. Station 16+83.73
Ex East Swale Stormwater Control Weir #3
Ex Top of Weir Elev = 1239.54
New Bench Elev = 1239.50

15. Station 21+73.82
Ex East Swale Stormwater Control Weir #4
Ex Top of Weir Elev = 1242.34
New Bench Elev = 1242.30

16. Station 26+51.54
Ex East Swale Stormwater Control Weir #5
Ex Top of Weir Elev = 1245.24
New Bench Elev = 1245.20

17. Station 31+27.02
Ex East Swale Stormwater Control Weir #6
Ex Top of Weir Elev = 1247.84
New Bench Elev = 1247.80

18. Station 38+57.08
Proposed Griffin Oaks Stormwater Control Weir
Proposed Top of Weir Elev = 1248.30

INDEX OF SHEETS

SHEET NO	DESCRIPTION
1	Overview - Proposed Overflow Channel
2	Upper Channel Plan and Profile
3	Culvert Plan and Profile
4	Channel Typical Sections/Culvert Headwall Elevation
E1	Erosion Control Plan - Lower Channel
E2	Erosion Control Plan - Upper Channel
E3	Erosion Control Notes and Details

CONTACTS

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NORTHWEST HYDRAULIC CONSULTANTS

CIVIL ENGINEER
WHETSTONE ENGINEERING, INC.
CENTRAL POINT, OR

CENTRAL POINT
CENTRAL POINT, OREGON

SURVEYOR
CENTRAL POINT, OR

DEVELOPER
TWIN CREEKS DEVELOPMENT CO., LLC
CENTRAL POINT, OR

DATUM
North American Vertical Datum of 1988 (NAVD 88)

Conceptual Plans
Not for Construction

WHETSTONE ENGINEERING, INC.
CENTRAL POINT, OREGON

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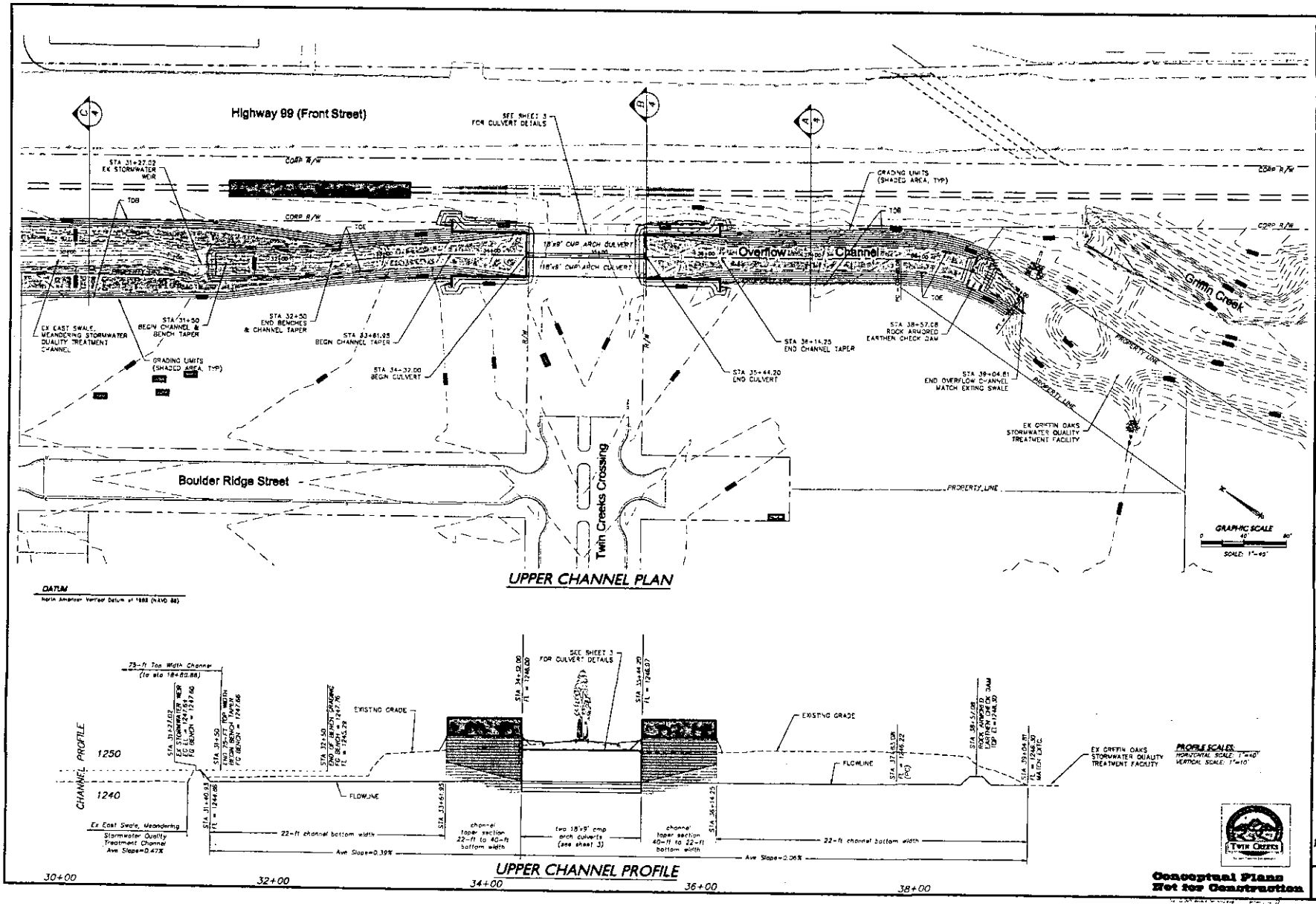
NO	REVISION	DATE	BY

APPROVED BY:
APPROVED BY:

CITY OF CENTRAL POINT
GRIFFIN CREEK OVERFLOW
FLOOD MITIGATION PLAN
Conditional Letter of Map Revision
Overview - Proposed Overflow Channel

SHEET NO. 1



WHETSTONE ENGINEERING, INC.

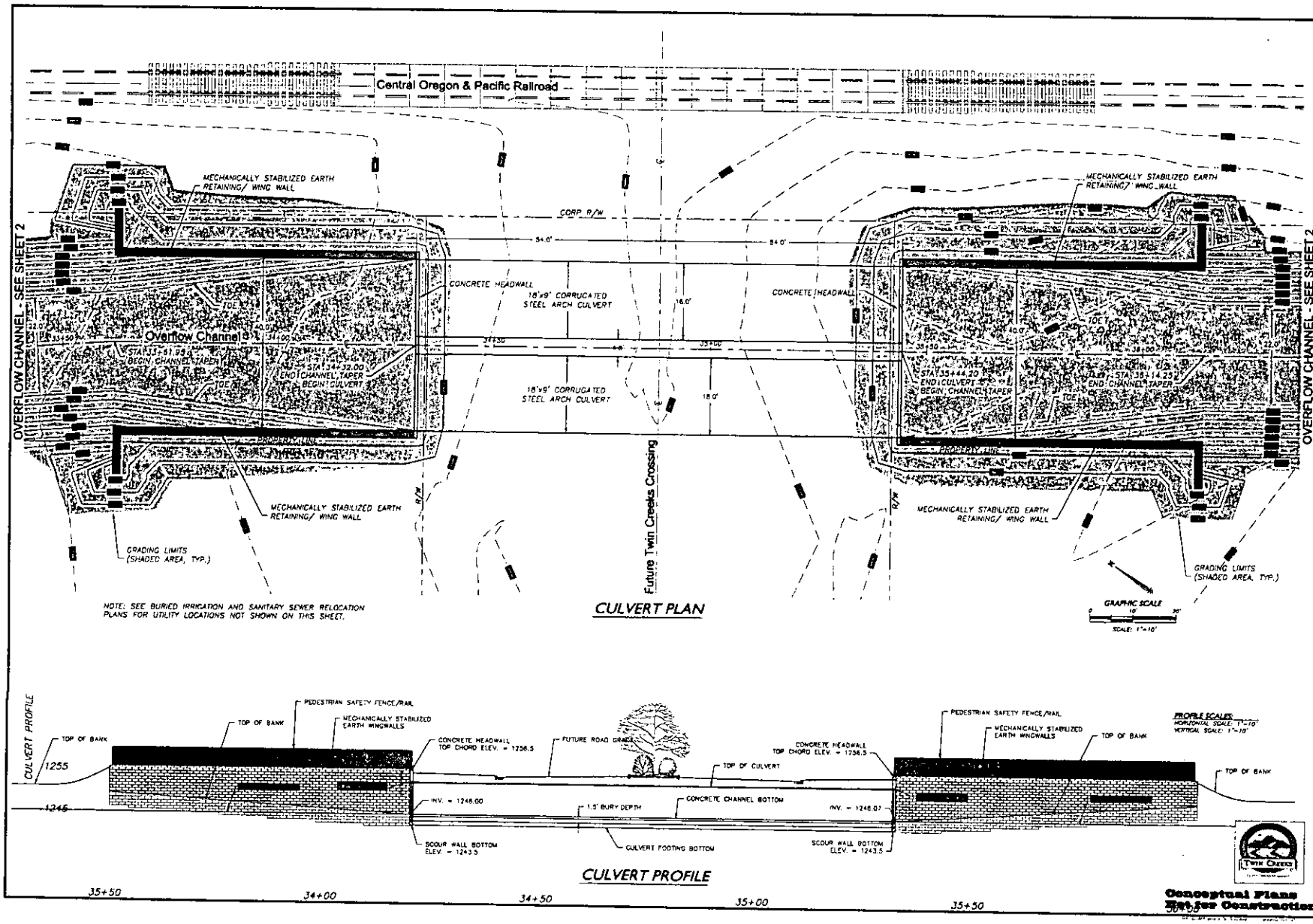
CITY OF CENTRAL POINT

GRIFFIN CREEK OVERFLOW FLOOD MITIGATION PLAN

Conditional Letter of Map Revision

Upper Channel Plan & Profile

SHEET NO. 2



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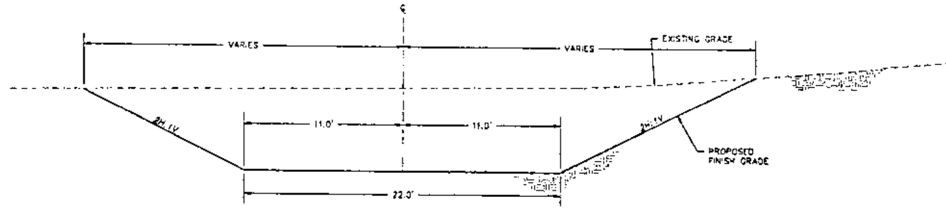
CITY OF CENTRAL POINT
GRIFFIN CREEK OVERFLOW
FLOOD MITIGATION PLAN
Conditional Letter of Map Revision
Culvert Plan & Profile

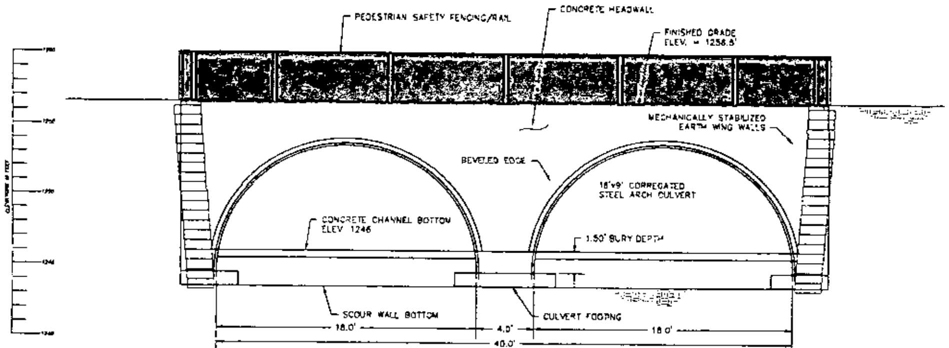
SHEET NO. 3

EXHIBIT



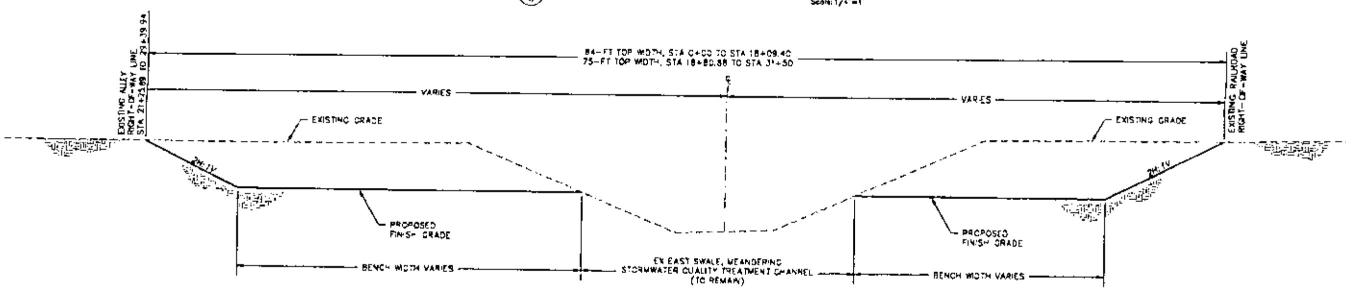
TYPICAL CHANNEL SECTION - STATION 32+50 TO CROSSING & ABOVE

Scale: 1/4"=1'



CULVERT HEADWALL ELEVATION

Scale: 1/4"=1'



TYPICAL CHANNEL SECTION - STATION 0+00 TO 31+50

Scale: 1/4"=1'

GRAPHIC SCALE

SCALE: 1"=4'

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CENTRAL POINT, OREGON 97502

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CITY OF CENTRAL POINT

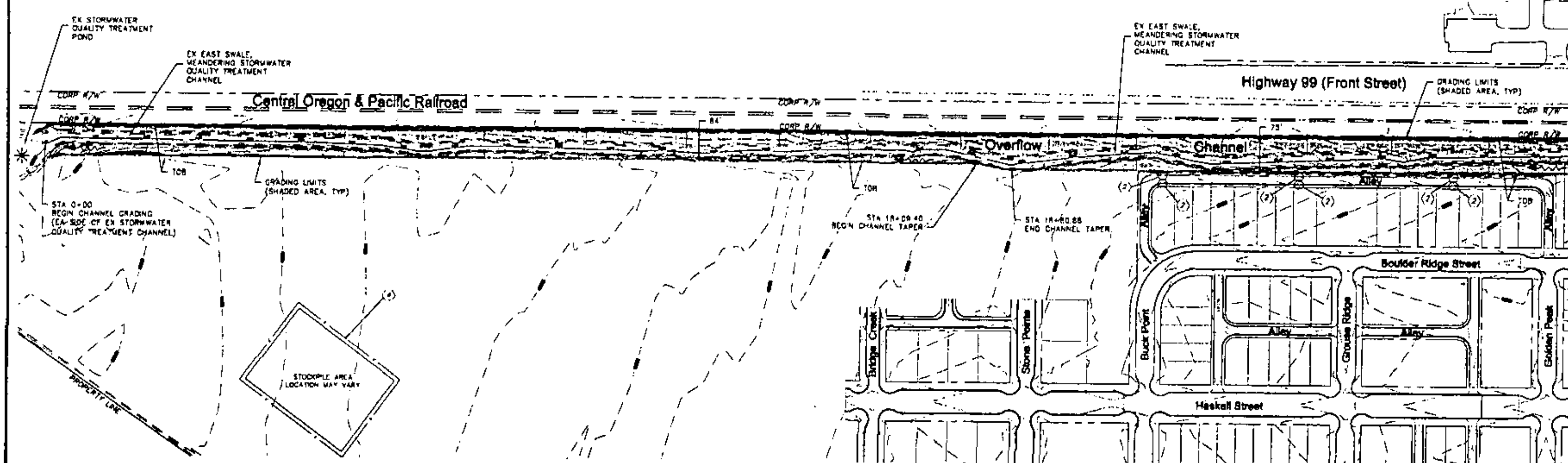
GRIFFIN CREEK OVERFLOW FLOOD MITIGATION PLAN

Conditional Letter of Map Revision

Typ Channel Sec/Culvert Headwall Elev

SHEET NO. 4

EXHIBIT "C"



EROSION AND SEDIMENT CONTROL PLAN - LOWER CHANNEL

GRAPHIC SCALE
0 100' 200'
SCALE: 1"=100'

SEEDING NOTES:

ALL DISTURBED AREAS SHALL BE HYDROSEEDED WITH THE FOLLOWING SEED MIX:

- 35% HARD FESCUE, 35% SHEEP FESCUE, 20% ANNUAL RYE, AND 10% CANADA BLUEGRASS.

SEED SHALL BE APPLIED AT A MINIMUM RATE OF 75 LBS/ACRE.

THE CONTRACTOR SHALL APPLY A COMMERCIALLY PREPARED FERTILIZER WITH THE ANALYSIS OF 16-20-0-14, APPLIED AT A RATE OF 250 LBS/ACRE.

MULCH SHALL BE APPLIED AT A RATE OF 2000 LBS/ACRE. MULCH SHALL BE VIRGIN WOOD CELLULOSE FIBER SPECIFICALLY PROCESSED AS A HYDROSEEDING MULCH AND CONTAIN NO GROWTH OR GERMINATION INHIBITING FACTORS.

TACKIFIER SHALL BE APPLIED AT THE RATE OF 40 POUNDS PER ACRE.

EROSION CONTROL NOTES

(1) ROCKED CONSTRUCTION ENTRANCE FOR 100' MINIMUM TO PREVENT TRACKING OF SOIL ONTO ROADWAY, 8" MIN. THICKNESS OF SHALE ON FILTER FABRIC. LINE AND GRADE SHALL CONFORM TO FUTURE ROAD IMPROVEMENTS. SEE SHEET ODOT STD. DWG. RD1000.

(2) STORM DRAIN INLETS SHALL BE PROTECTED BY CURB SOCK INLET PROTECTION (TYPE 4). SEE SHEET ODOT STD. DWG. 1015 ALTERNATE: GRATE INLETS SHALL BE PROTECTED BY TYPE 2-4. SEE ODOT STD. DWG. RD1010

(3) INSTALL CHECK DAM SEE ODOT STD. DWG. RD 1005

(4) INSTALL SEDIMENT FENCE. SEE ODOT STD. DWG. RD1040

LEGEND

Symbol	Description
○	STORM DRAIN INLET PROTECTION
⁓→	DIRECTION OF FLOW
✳	DISCHARGE POINT
(hatched)	STAGING AREA OR MATERIAL STORAGE
⊠	CONCRETE WASHOUT
	CHECK DAM
--x--x--	SEDIMENT FENCE

CONTOURS

CONTOUR INTERVAL = 1'
INDEX INTERVAL = 5'
EXISTING GROUND — — ELEV — —
FINISHED GROUND ——— ELEV ———

SEE SHEET E3 FOR ESPC NOTES

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WHETSTONE ENGINEERING, INC.
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5035 DOBBIT WAY
CENTRAL POINT, OREGON 97502

REGISTERED PROFESSIONAL ENGINEER 54,453PE OREGON JULY 09, 1991 MATTHEW C. DUSENBURY
RENEWAL DATE: 12/31/13

NO.	REVISION	DATE	BY

APPROVED BY:
APPROVED BY:

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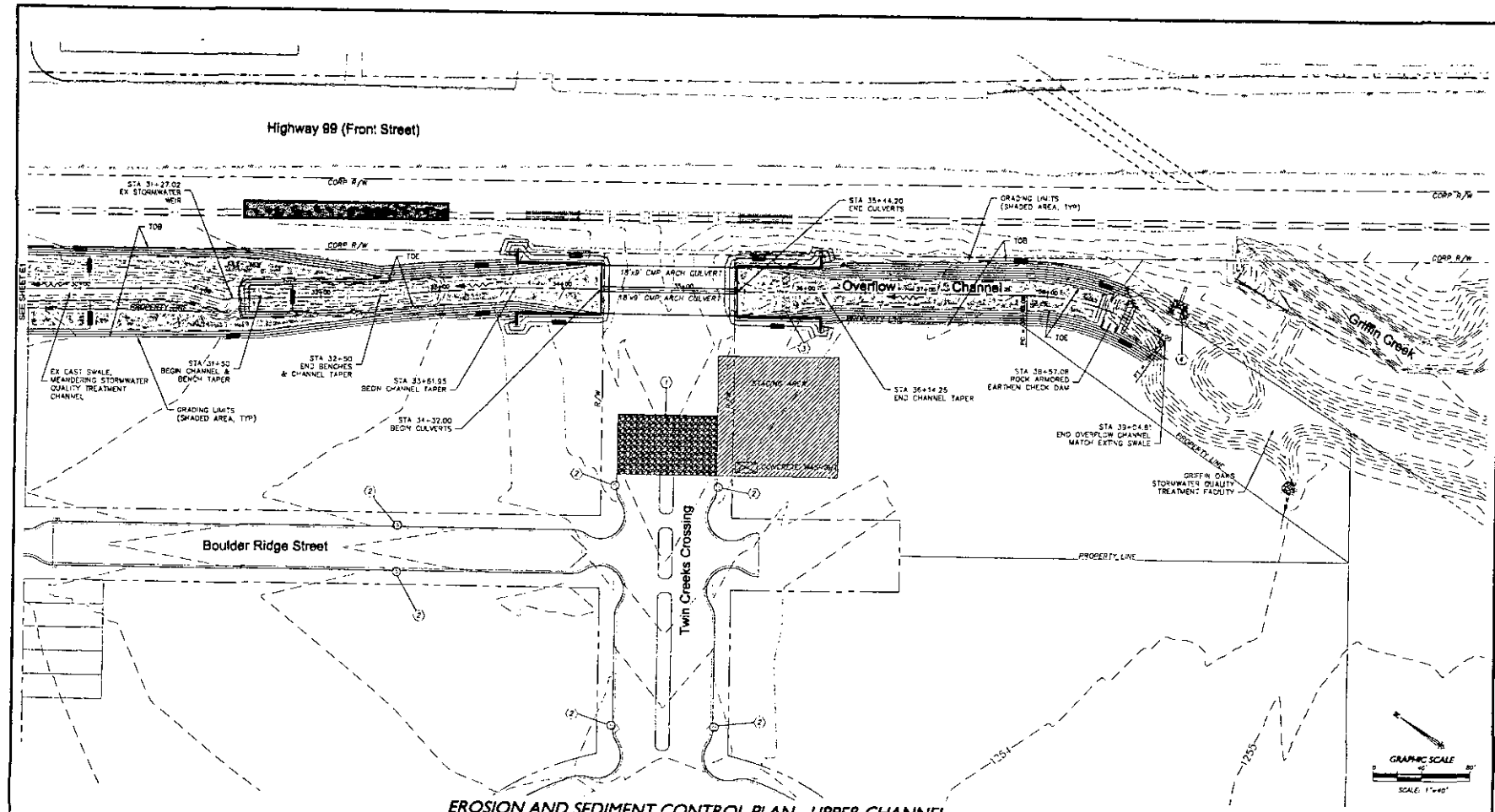
IF THIS LINE IS NOT 1 INCH SCALE IS NOT AS SHOWN

CITY OF CENTRAL POINT

GRIFFIN CREEK OVERFLOW FLOOD MITIGATION PLAN
Conditional Letter of Map Revision
Erosion & Sediment Control Plan - Lower Channel

SHEET NO
E1

EXHIBIT "C"



EROSION AND SEDIMENT CONTROL PLAN - UPPER CHANNEL

SEEDING NOTES:

ALL DISTURBED AREAS SHALL BE HYDROSEEDED WITH THE FOLLOWING SEED MIX:

- 35% HARD FESCUE, 35% SHEEP FESCUE, 20% ANNUAL RYE, AND 10% CANADA BLUEGRASS.

SEED SHALL BE APPLIED AT A MINIMUM RATE OF 75 LBS/ACRE.

THE CONTRACTOR SHALL APPLY A COMMERCIALLY PREPARED FERTILIZER WITH THE ANALYSIS OF 16-20-0-14, APPLIED AT A RATE OF 250 LBS/ACRE.

MULCH SHALL BE APPLIED AT A RATE OF 2000 LBS/ACRE. MULCH SHALL BE VIRGIN WOOD CELLULOSE FIBER SPECIFICALLY PROCESSED AS A HYDROSEEDING MULCH AND CONTAIN NO GROWTH OR GERMINATION INHIBITING FACTORS.

TACKIFIER SHALL BE APPLIED AT THE RATE OF 40 POUNDS PER ACRE.

EROSION CONTROL NOTES

1. ROCKED CONSTRUCTION ENTRANCE FOR 100' MINIMUM TO PREVENT TRACKING OF SOIL ONTO ROADWAY. 6" MIN. THICKNESS OF SHALE ON FILTER FABRIC. LINE AND GRADE SHALL CONFORM TO FUTURE ROAD IMPROVEMENTS. SEE SHEET ODOT STD. DWG. RD1000.
2. STORM DRAIN INLETS SHALL BE PROTECTED BY CURB SOCK INLET PROTECTION (TYPE A). SEE SHEET ODOT STD. DWG 1015. ALTERNATE: GRATE INLETS SHALL BE PROTECTED BY TYPE 2-4. SEE ODOT STD. DWG. RD1010
3. INSTALL CHECK DAM SEE ODOT STD. DWG. RD 1005
4. INSTALL SEDIMENT FENCE. SEE ODOT STD. DWG. RD1040

LEGEND

- STORM DRAIN INLET PROTECTION
- DIRECTION OF FLOW
- DISCHARGE POINT
- STAGING AREA OR MATERIAL STORAGE
- CONCRETE WASHOUT
- CHECK DAM
- SEDIMENT FENCE

CONTOURS

CONTOUR INTERVAL = 1'
INDEX INTERVAL = 5'
EXISTING GROUND ——— ELEV ———
FINISHED GROUND ——— ELEV ———

SEE SHEET E1 FOR ESPC NOTES

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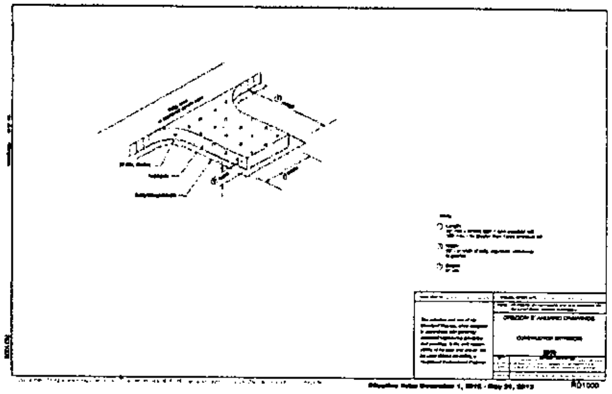
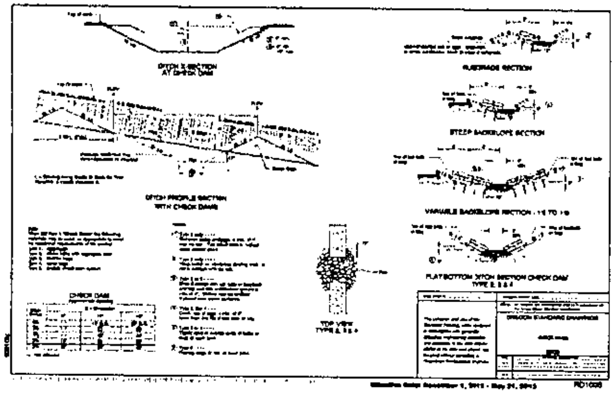
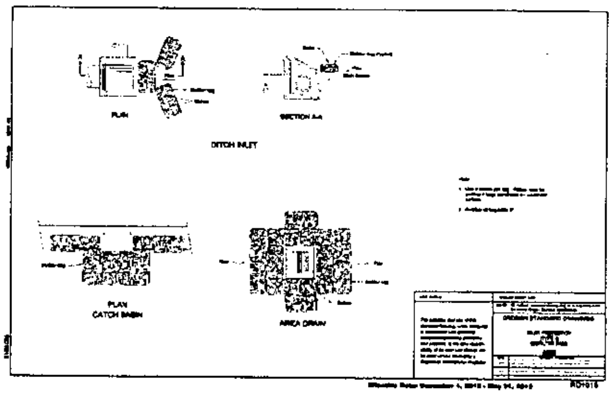
CITY OF CENTRAL POINT
GRIFFIN CREEK OVERFLOW FLOOD MITIGATION PLAN
Conditional Letter of Map Revision
Erosion & Sediment Control Plan - Upper Channel

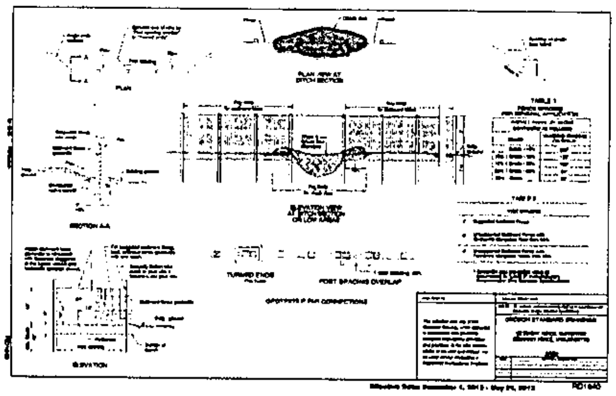
SHEET NO. E2

EXHIBIT









STANDARD NOTES FOR EROSION CONTROL PLANS

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

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

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

4. THE ESC FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

5. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.

6. THE ESC FACILITIES ON INACTIVE SITES SHALL BE INSPECTED AND MAINTAINED A MINIMUM OF ONCE A MONTH OR WITHIN THE 48 HOURS FOLLOWING A STORM EVENT.

7. AT NO TIME SHALL MORE THAN ONE FOOT OF SEDIMENT BE ALLOWED TO ACCUMULATE WITHIN A TRAPPED CATCH BASIN. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATION SHALL NOT FLUSH SEDIMENT LADEN WATER INTO THE DOWNSTREAM SYSTEM.

8. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

STANDARD NOTES FOR SEDIMENT FENCES

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN THE JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6 INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.

2. THE FILTER FABRIC SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.

3. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRE OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES AND SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.

4. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 12 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN THE 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.

5. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING ARE USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF THE ABOVE STANDARD NOTE FOR STANDARD STRENGTH FILTER FABRIC APPLYING.

6. SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.

7. SEDIMENT FENCES SHALL BE INSPECTED BY APPLICANT/CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

8. AT NO TIME SHALL MORE THAN ONE FOOT DEPTH OF SEDIMENT BE ALLOWED TO ACCUMULATE BEHIND A SEDIMENT FENCE. SEDIMENT SHOULD BE REMOVED OR REGRADED INTO SLOPES, AND THE SEDIMENT FENCES REPAIRED AND RE-ESTABLISHED AS NEEDED.

GENERAL NOTES

1. EROSION CONTROL MEASURES ARE TO BE IN PLACE PRIOR TO CONSTRUCTION ACTIVITIES OCCURRING, OR THAT THEY WILL BE INSTALLED AS SOON AS A STRUCTURE WHICH SHOULD BE PROTECTED IS COMPLETE.

2. NO AREAS OF SOIL STORAGE AND/OR WASTE IS ANTICIPATED ON-SITE.

3. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND/OR IMPROVE EROSION CONTROL MEASURES TO PREVENT VISIBLE OR MEASURABLE EROSION FROM LEAVING THE CONSTRUCTION SITE DEFINED AS:
A. DEPOSITS OF MUD, DIRT, SEDIMENT OR SIMILAR MATERIAL EXCEEDING 1/2 C.F. IN VOLUME IN ANY AREA OF 100 S.F. OR LESS ON PUBLIC OR PRIVATE STREETS, ADJACENT PROPERTY, OR INTO THE STORM & SURFACE WATER SYSTEM, EITHER BY DIRECT DEPOSIT, DROPPING, DISCHARGE, OR AS A RESULT OF THE ACTION OF EROSION; OR
B. EVIDENCE OF CONCENTRATED FLOWS OF WATER OVER BARE SOILS, TURBID OR SEDIMENT LADEN FLOWS, OR EVIDENCE OF ON-SITE EROSION SUCH AS RIVULETS ON BARE SOIL SLOPES, WHERE THE FLOW OF WATER IS NOT FILTERED OR CAPTURED ON THE SITE USING THE TECHNIQUES IN THE APPROVED EROSION CONTROL PLAN, OR EARTH SLIDES, MUD FLOWS, EARTH SLOUCHING, OR
C. OTHER EARTH MOVEMENT WHICH LEAVES THE PROPERTY. IF YOU HAVE ANY QUESTIONS ABOUT THE PERMIT REQUIREMENTS, PLEASE CONTACT THE DEQ AT (503) 229-5256 OR TOLL FREE INSIDE OREGON AT 1-800-452-4011.

4. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER TIGHT TRUCKS MUST BE USED OR LOADS SHALL BE REQUIRED TO DRAIN UNTIL DRIPPING HAS BEEN REDUCED TO LESS THAN 1 GALLON PER HOUR BEFORE LEAVING THE SITE.

5. NATURE OF CONSTRUCTION ACTIVITY IS FOR CONSTRUCTION OF A STORMWATER OVERFLOW CHANNEL FOR FUTURE RESIDENTIAL CONSTRUCTION.

6. TOTAL AREA TO BE DISTURBED IS < 4.5 ACRE.

7. THE CONTRACTOR SHALL PROVIDE A PROJECT SCHEDULE AND PROPOSED SCHEDULE FOR IMPLEMENTATION OF THE EROSION CONTROL TO THE ENGINEER FOR APPROVAL PRIOR TO STARTING CONSTRUCTION. THE PERMIT CONTROLLING THE EROSION CONTROL MEASURES SHALL BE IN THE OWNERS NAME AND THEREBY BECOMES HIS RESPONSIBILITY.

8. IF THERE WILL BE MORE THAN 25 CONSTRUCTION VEHICLE TRIPS PER DAY ON ANY OF THE INTERIOR ROADS, THEY SHOULD BE GRAVELED.

9. ALL UNSURFACED AREAS ARE TO RECEIVE SEED, MULCH, & IRRIGATION UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.

10. ALL AREAS IN THE DEVELOPMENT ARE SUBJECT TO GRADING. GRADING OF THE SITE WILL NOT CHANGE THE NATURAL DRAINAGE PATTERN OF THE SITE.

EROSION CONTROL NOTES AND DETAILS

Conceptual Plans
Not for Construction

WHETSTONE ENGINEERING, INC.
OFFICE: (541) 664-5344
5035 DOBROT WAY
CENTRAL POINT, OREGON 97502

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 08, 2007
MATTHEW C. DUSENBURY
RENEWAL DATE: 12/31/13

NO.	REVISION	DATE	BY

APPROVED BY:
APPROVED BY:

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CITY OF CENTRAL POINT
GRIFFIN CREEK OVERFLOW
FLOOD MITIGATION PLAN
Conditional Letter of Map Revision
Erosion Control Notes & Details

SHEET NO.
E3

Memorandum

Northwest Hydraulic Consultants
16300 Christensen Road, Suite 350
Seattle, WA 98188
206.241.6000
206.439.2420 (fax)

DATE:	August 5, 2013	NHC PROJECT: 200044
TO:	Bret Moore	
COMPANY/AGENCY:	Twin Creeks Development Company, LLC	
FROM:	Peter Brooks, P.E.	
SUBJECT:	FEMA Conditional Letter of Map Revision Application for the Twin Creeks Development Project	

Introduction

Northwest Hydraulic Consultants Inc. (NHC) has been retained by the Twin Creeks Development Company LLC (TCDC) to prepare a Conditional Letter of Map Revision (CLOMR) application package for the Twin Creeks Development in the City of Central Point, Jackson County, Oregon (FEMA Community Number 410092). The Twin Creeks Development is located along a recently designated FEMA 100-year floodplain (Zone AE), with regulatory floodway, which became effective with the adoption of the Jackson County Flood Insurance Study (FIS) in May, 2011 (FEMA, 2011). The floodplain within the development is an overflow path that connects the left overbank of Griffin Creek to the right overbank of Jackson Creek.

A conceptual-level flood improvement design has been developed to more efficiently convey Griffin Creek overflow through the site. The primary improvement consists of excavating a continuous overflow channel along the eastern edge of the project site to improve overall flood conveyance through the development. The flood improvement design also includes a proposed double-barreled culvert structure routing flows below the Twin Creeks Crossing. The Twin Creeks Crossing will serve as a main arterial connecting the development with Pacific Highway (State Highway 99) located to the east (see Figure 1). Anticipated flood improvements associated with these features include lowered Base Flood Elevations (BFEs) and reduced 100-year floodplain and floodway extents, relative to effective conditions. This memorandum summarizes the approach and results of the technical analysis conducted by NHC for the Twin Creeks Development CLOMR.

Background

The Twin Creeks Development is located within a recently designated Special Flood Hazard Area (SFHA) between two separate flooding sources, Jackson and Griffin Creeks (see Figure 1). The SFHA, including regulatory floodway, were determined through detailed studies of Jackson and Griffin Creeks conducted by NHC for the City of Central Point (City) and FEMA as part of the Jackson County FIS (FEMA, 2011). Findings from these studies indicated that flooding in the area originates from overflow of Griffin Creek, immediately upstream of Pacific Highway, and continues to the northwest to merge with Jackson Creek.

EXHIBIT "C"

The reach connecting Griffin and Jackson Creeks within the development is referred to as the 'Jackson Creek Overbank'.

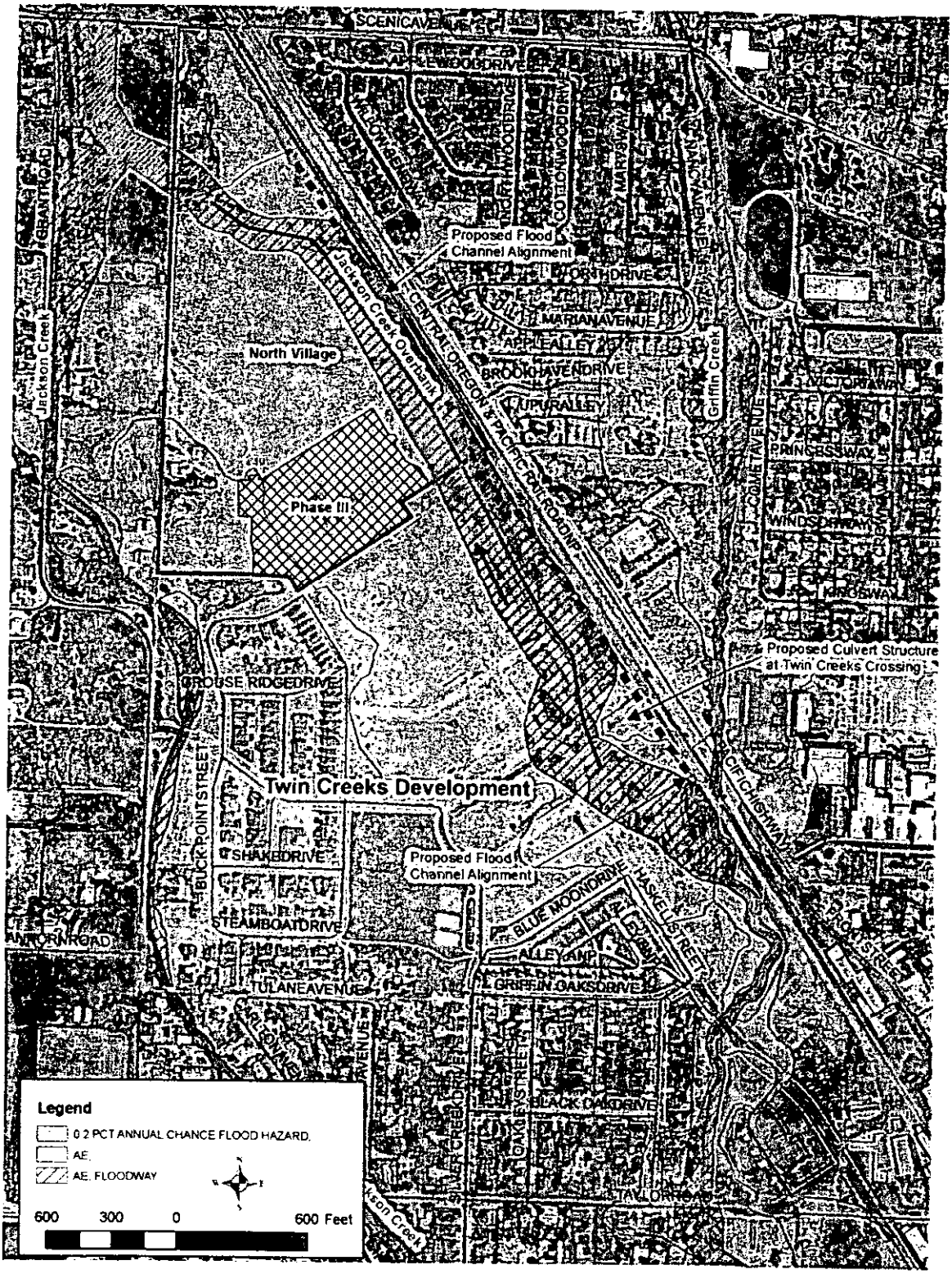

Figure 1 Location Map of Twin Creeks Development showing Effective FEMA Flood Hazard Mapping (FEMA, 011).

EXHIBIT "C"

The effective floodplain mapping between the two study reaches, through the Twin Creeks Development, is broad and unconfined, resulting in a relatively wide floodway delineation. It should be noted that this reach does not receive perennial flow and would function as an overflow channel during infrequent, high magnitude flood events (there has been no observed flooding from Griffin Creek at the project site). Draft mapping for Griffin and Jackson Creeks was provided to FEMA in 2008, and the restudies of both creeks became effective when the Jackson County FIS was adopted by FEMA and Jackson County on May 3, 2011.

The Twin Creeks Development is a master plan community that precedes the most recent FEMA studies within the City of Central Point. When construction of the Twin Creeks Development began, prior to initiation of NHC's detailed studies of Jackson and Griffin Creeks, the area was not mapped as a SFHA. Development continued while the technical analysis for the updated FIS was being conducted (2006 to 2009). In 2009, the City began using preliminary flood hazard mapping, provided by NHC, to regulate development. Thereafter, construction within the Twin Creeks Development was limited to areas outside what is now the effective floodway. To date, development within the Twin Creeks project site is compliant with both FEMA and City floodplain management regulations.

CLOMR Submittal Information

This memo contains appropriate supporting information for the CLOMR submittal. A narrative on the technical analysis is provided in the following text. Other supporting information prepared by NHC is provided in the appendices as follows:

Appendix A. Certified Topographic Floodplain and Floodway Map

Appendix B. Annotated FIRM

Appendix C. Completed MT-2 Application Forms

Appendix D. NFIP Regulatory Requirements, including a proposed example public announcement and notification letter for floodway revision

Additional supporting information to be attached to this submittal includes:

Conceptual-Level Flood Improvement Design Plans (provided by Whetstone Engineering)

Endangered Species Act (ESA) Compliance Documentation (provided by the TCDC)

Technical Analysis

NHC completed several technical tasks for this CLOMR following FEMA MT-2 instructions. Model scenarios presented include a Duplicate Effective Model that replicates the water surface elevations in the effective Jackson County FIS, and a Revised Conditions Model simulating the proposed construction of the flood channel. Elevations specified in this memo are referenced to the NAVD 1988 vertical datum.

Data Description

Duplicate Effective Conditions

NHC completed the most recent detailed flood studies of Griffin and Jackson Creeks for the City of Central Point and FEMA as part of the recently adopted Jackson County FIS (FEMA, 2011). As such, NHC already has possession of the duplicate effective hydraulic models for both Jackson and Griffin Creeks,

as well as the 2006 City of Central Point LiDAR topographic data used for the floodplain mapping. These data were located in the Technical Support Data Notebook (TSDN) submitted to FEMA at the conclusion of the Jackson County FIS.

Revised Conditions

Revised condition topographic data in the form of a master grading plan were provided to NHC by Whetstone Engineering on December 18, 2012. The grading plan consisted of 1-foot interval contours, in AutoCAD format, and included areas developed after the 2006 LiDAR were collected and while the effective FIS was being conducted from 2006 to 2009, as well as the proposed development of the Phase III area of the North Village (see Figure 1). This submitted technical assessment assumes there is no development of the North Village outside of the 'Phase III' portion (see Figure 1). NHC used the grading plan data provided by Whetstone Engineering to construct a digital elevation model (DEM) in ArcGIS of the Revised Conditions.

The grading plan includes construction of a continuous flood (or overflow) channel and culvert structure at the Twin Creeks Crossing. The flood channel would connect with the existing detention pond adjacent to Griffin Creek and proceed northward toward Jackson Creek. Physically, the flood channel terminates at a proposed detention pond at the northern limit of the Twin Creeks development, but during a 100-year event this area will be inundated and drain overland toward the Scenic Avenue Bridge crossing to the west on Jackson Creek. The proposed flood channel would consist of a compound channel (see Figure 2). The top width of the proposed flood channel would range from 65 to 75 feet with approximately 20-foot wide flood benches located on either side of an existing 20-foot wide drainage swale. This swale was constructed between 2006 and 2009 and includes six approximately 2-foot high check dam structures located within the channel for stormwater treatment purposes. The project also proposes to construct a culvert crossing consisting of two 18-foot wide, 9-foot tall arch structures at Twin Creeks Crossing, a primary access point between the Twin Creeks Development and Pacific Highway. Conceptual-level flood improvement plans for the proposed channel and culvert structure, prepared by Whetstone Engineering, are attached to this submittal.

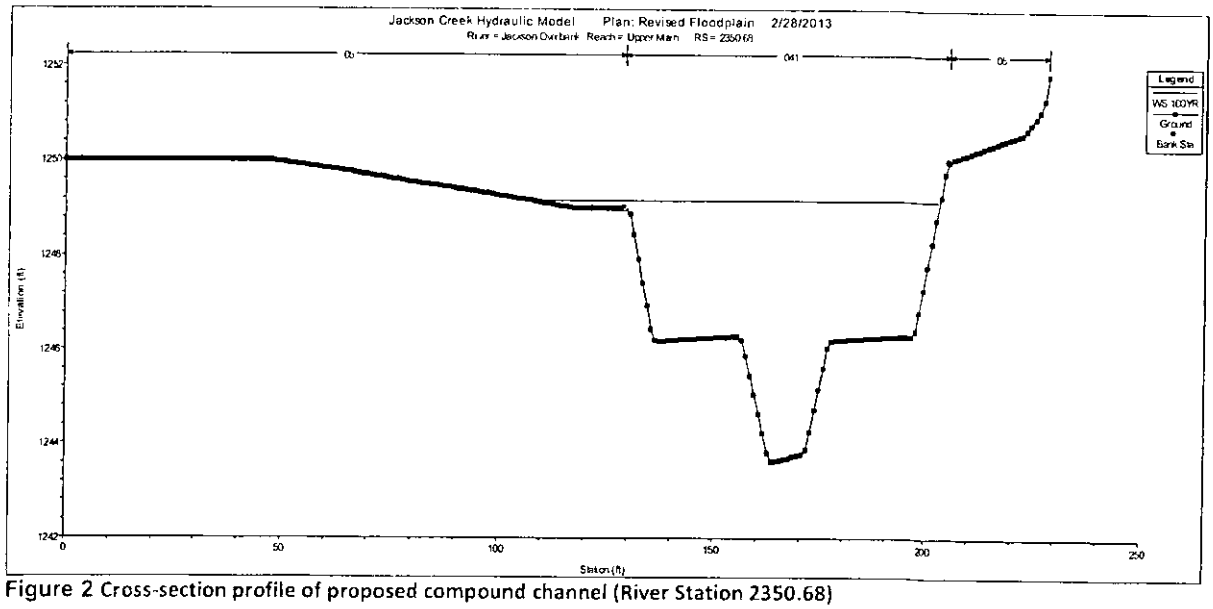

Figure 2 Cross-section profile of proposed compound channel (River Station 2350.68)

EXHIBIT "C"

Engineering Methods – Hydraulic Modeling

General Model Description

The Jackson Creek HEC-RAS hydraulic model includes the main stem of Jackson Creek located to the west of the Twin Creeks Development (see Figure 1), but also includes Jackson Creek Overbank reach which was used to compute flood levels within the Twin Creeks Development. As previously mentioned, flood waters enter the Jackson Overbank reach from Griffin Creek where overtopping of the left bank occurs upstream of Pacific Highway. Discharges escaping the Griffin Creek system and entering the Jackson Overbank reach were computed through a series of "lateral structures" within the HEC-RAS model for the 10-, 50-, 100-, and 500-year return periods. These discharges from the effective FIS were used for this CLOMR analysis and are provided in Table 1.

Table 1. Computed Flood Discharges Entering the Jackson Creek Overbank Reach from Griffin Creek (FEMA, 2011).

Return Period	10-year	50-year	100-year	500-year
Discharge (cfs)	326	922	1220	1850

Duplicate Effective and Revised Condition HEC-RAS models are being submitted as part of this CLOMR analysis. Two HEC-RAS 'plans' are associated with each modeled condition: a Floodplain and Floodway plan. Separate Floodplain and Floodway plans were developed because changes to the geometry files were necessary to perform the encroachment analysis (e.g. turning off optimization of lateral weirs).

Duplicate Effective Model

The effective model is available, as previously discussed; however, it was developed using HEC-RAS Version 3.1.3. The effective model was re-run in HEC-RAS Version 4.1.0 for the CLOMR analysis and the 100-year and Floodway simulations have been reproduced within 0.01 feet at FEMA lettered cross-sections C through N (Table 2). Differences at cross-section A and B are a maximum of 0.23 feet and are the result of late modifications made to the Jackson Creek model that did not get incorporated into the adopted Jackson County FIS (FEMA, 2011).

The Duplicate Effective Model consists of the entire Jackson Creek HEC-RAS model, including the Jackson Creek Overbank reach, which spans the area proposed to be physically modified by the project. The effective Jackson Creek Overbank reach contains a total of 16 cross-sections, 14 of which are lettered (A to N) as shown in Appendix B. The upstream and downstream limits of the Jackson Creek Overbank reach are delineated by study break lines. Therefore, any changes on the Overbank Reach do not propagate upstream and impact conditions in Griffin Creek as long as the submergence of the lateral structures does not change. The model includes downstream to Jackson Creek in order to tie into the effective model.

Revised Condition Model

The Revised Condition Model was created by adding the proposed flood channel and twin barrel culvert structure combined with the revised condition grading plan mentioned in the Data Description section. A total of 31 new cross-sections were inserted into the Jackson Overbank reach in the Revised Conditions Model to augment the 16 cross-sections in the Duplicate Effective Model (see Appendix A). The new cross-sections were added to represent the geometries of the six existing check-dam structures

and the Twin Creeks Crossing culvert structure as well as an additional proposed check-dam structure to be located at the outlet of the upstream detention pond.

An additional modification made to the Revised Condition Model included splitting the Jackson Creek Overbank reach into parallel reaches between effective cross-sections I and N, to separately compute flood levels between the proposed flood channel and the left overbank. Only 5% of the total 100-year discharge (Table 1) is computed as entering the left overbank split reach. Computed flooding in the overbank split reach is predominantly shallow (less than 1-foot) sheet flow, but deepens to over 1-foot in a small area in the vicinity of cross-section J. Considering the ponding nature of computed flooding in this area, i.e. constant elevation and low velocity, it was delineated Zone AH with an elevation of 1246 feet. Downstream of this area, shallow (less than 1-foot) sheet flow flooding resumes.

Table 2. Comparison of Effective FIS to Duplicate Effective Water Surface Elevations for the 100-year and Floodway Simulations.

Effective FIS Cross-Section	100-year Floodplain			Floodway		
(HEC-RAS Station in Parenthesis)	Effective FIS	Duplicate Effective	Difference (feet)	Effective FIS	Duplicate Effective	Difference (feet)
A (793.2)	1238.36	1238.49	-0.13	1239.18	1239.18	0.00
B (951.8)	1238.61	1238.84	-0.23	1239.60	1239.60	0.00
C (1188.3)	1239.72	1239.72	0.00	1240.56	1240.56	0.00
D (1554.8)	1240.75	1240.75	0.00	1241.33	1241.33	0.00
E (1689.0)	1241.82	1241.81	0.01	1242.55	1242.55	0.00
F (1966.3)	1242.82	1242.82	0.00	1243.76	1243.76	0.00
G (2113.1)	1243.65	1243.65	0.00	1244.54	1244.54	0.00
H (2270.1)	1244.36	1244.37	-0.01	1245.29	1245.29	0.00
I (2422.0)	1245.25	1245.25	0.00	1245.97	1245.97	0.00
J (2548.0)	-	1245.86	-	1246.71	1246.71	0.00
K (3071.0)	1248.35	1248.34	0.01	1249.25	1249.25	0.00
L (3454.7)	1250.99	1250.99	0.00	1251.94	1251.94	0.00
M (3722.3)	1252.21	1252.21	0.00	1253.18	1253.18	0.00
N (3956.5)	1254.01	1254.01	0.00	1254.05	1254.05	0.00

Overall, the Revised Condition Model shows reductions in flood levels along the entire Jackson Creek Overbank reach compared to the effective conditions (Table 3). The upstream and downstream limits of the Jackson Creek Overbank reach are delineated by study reach breaklines, between Griffin Creek and the mainstem of Jackson Creek, respectively. Downstream, the Revised Condition Model simulates effective conditions to within 0.20 feet, which is within the 0.5 foot threshold specified by FEMA. Upstream, the proposed work within the Twin Creek Development will not impact the quantity of overflow entering the project (Table 1), thus changes to BFEs will not propagate upstream into Griffin Creek and the flood hazard boundaries are effectively tied-in at the study breakline between the two reaches. Table 4 tabulates the FEMA Floodway Data Table information from the Revised Model.

EXHIBIT "C"

Table 3. Comparison of Duplicate Effective and Revised Conditions.

River Station		100-Year Floodplain			Floodway		
Effective (FEMA Cross-section Letter in parenthesis, where appropriate)	**Revised**	Duplicate Effective Elevation (feet)	Revised Elevation (feet)	Difference (feet)	Duplicate Effective Elevation (feet)	Revised Elevation (feet)	Difference (feet)
793.2 (A)	**0.28**	1238.49	1238.29	-0.20	1239.18	1239.17	-0.01
951.8 (B)	**160.54**	1238.84	1238.39	-0.45	1239.60	1239.31	-0.29
-	**232.77**	-	1238.42	-	-	1239.38	-
-	**247.95**	-	1238.49	-	-	1239.39	-
-	**265.49**	-	1238.57	-	-	1239.46	-
1188.3 (C)	**401.53**	1239.72	1238.84	-0.88	1240.56	1239.73	-0.83
-	**579.14**	-	1239.41	-	-	1240.12	-
-	**706.95**	-	1239.94	-	-	1240.52	-
-	**718.52**	-	1239.98	-	-	1240.49	-
-	**731.28**	-	1240.27	-	-	1240.71	-
1554.8 (D)	**783.83**	1240.75	1240.45	-0.30	1241.33	1240.92	-0.41
1689.0 (E)	**1002.15**	1241.81	1241.15	-0.66	1242.55	1241.76	-0.79
-	**1117.80**	-	1242.03	-	-	1242.28	-
-	**1187.03**	-	1242.18	-	-	1242.64	-
-	**1200.04**	-	1242.35	-	-	1242.59	-
-	**1211.98**	-	1242.57	-	-	1243.01	-
1966.3 (F)	**1249.04**	1242.82	1242.71	-0.11	1243.76	1243.26	-0.50
2113.1 (G)	**1358.70**	1243.65	1243.11	-0.54	1244.54	1243.72	-0.82
2270.1 (H)	**1495.18**	1244.37	1243.85	-0.52	1245.29	1244.27	-1.02
2422.0 (I)	**1646.26**	1245.25	1244.82	-0.43	1245.97	1244.94	-1.03
-	**1664.09**	-	1244.96	-	-	1245.01	-
-	**1677.51**	-	1244.96	-	-	1245.00	-
-	**1691.00**	-	1245.38	-	-	1245.43	-
2548.0 (J)	**1757.49**	1245.86	1245.70	-0.16	1246.71	1245.80	-0.91
-	**1866.28**	-	1246.13	-	-	1246.27	-
-	**2019.16**	-	1246.93	-	-	1247.08	-
-	**2138.75**	-	1247.67	-	-	1247.78	-
-	**2153.71**	-	1247.57	-	-	1247.70	-
3071.0 (K)	**2178.49**	1248.34	1248.33	-0.01	1249.25	1248.43	-0.82
-	**2350.68**	-	1249.15	-	-	1249.28	-
3454.7 (L)	**2564.28**	1250.99	1250.11	-0.88	1251.94	1250.23	-1.71
-	**2611.46**	-	1250.37	-	-	1250.49	-
-	**2626.62**	-	1250.38	-	-	1250.50	-
-	**2642.96**	-	1250.76	-	-	1250.89	-
-	**2673.75**	-	1250.81	-	-	1250.94	-
-	**2732.76**	-	1250.86	-	-	1250.98	-
3722.3 (M)	**2832.34**	1252.21	1251.22	-0.99	1253.18	1251.35	-1.83
-	**2865.01**	-	1251.36	-	-	1251.49	-
-	**2927.39**	-	1251.79	-	-	1251.94	-
-	**3048.78**	-	1252.80	-	-	1253.13	-
3956.5 (N)	**3067.82**	1254.01	1252.83	-1.18	1254.05	1253.16	-0.89
-	**3110.56**	-	1252.85	-	-	1253.18	-
-	**3143.45**	-	1252.97	-	-	1253.31	-
-	**3341.92**	-	1253.41	-	-	1253.71	-
-	**3355.18**	-	1253.30	-	-	1253.61	-
-	**3370.57**	-	1253.65	-	-	1253.90	-
-	**3639.01**	-	1254.33	-	-	1254.56	-

EXHIBIT "C"

Table 4. Revised Floodway Information.

Effective RAS River Station (FEMA Cross-section Letter in parenthesis, where appropriate)	**Revised RAS River Station**	Width (feet)	Area (sq ft)	Mean Velocity (ft/sec)	Without Floodway (feet)	With Floodway (feet)	Increase (feet)
793.2 (A)	**0.28**	82	379	3.2	1238.3	1239.0	0.7
951.8 (B)	**160.54**	65	335	3.6	1238.4	1239.2	0.8
-	**232.77**	65	313	3.9	1238.4	1239.3	0.8
-	**247.95**	66	289	4.2	1238.5	1239.3	0.8
-	**265.49**	66	307	4.0	1238.6	1239.3	0.8
1188.3 (C)	**401.53**	64	279	4.4	1238.8	1239.6	0.8
-	**579.14**	63	245	5.0	1239.4	1240.0	0.6
-	**706.95**	63	242	5.1	1239.9	1240.5	0.5
-	**718.52**	63	208	5.9	1240.0	1240.4	0.5
-	**731.28**	63	240	5.1	1240.3	1240.7	0.4
1554.8 (D)	**783.83**	63	235	5.2	1240.5	1240.9	0.4
1689.0 (E)	**1002.15**	63	223	5.5	1241.2	1241.8	0.6
-	**1117.80**	64	211	5.8	1242.0	1242.3	0.2
-	**1187.03**	63	210	5.8	1242.2	1242.6	0.5
-	**1200.04**	65	176	6.9	1242.4	1242.6	0.2
-	**1211.98**	64	222	5.5	1242.6	1243.0	0.4
1966.3 (F)	**1249.04**	69	237	5.2	1242.7	1243.3	0.5
2113.1 (G)	**1358.70**	72	244	5.0	1243.1	1243.7	0.6
2270.1 (H)	**1495.18**	78	244	5.0	1243.9	1244.3	0.4
2422.0 (I)	**1646.26**	73	220	5.5	1244.8	1244.9	0.1
-	**1664.09**	77	219	5.6	1245.0	1245.0	0.1
-	**1677.51**	76	186	6.6	1245.0	1245.0	0.1
-	**1691.00**	76	239	5.1	1245.4	1245.4	0.1
2548.0 (J)	**1757.49**	76	242	5.0	1245.7	1245.8	0.1
-	**1866.28**	77	230	5.3	1246.1	1246.3	0.1
-	**2019.16**	79	218	5.6	1246.9	1247.1	0.1
-	**2138.75**	75	218	5.6	1247.7	1247.8	0.1
-	**2153.71**	80	168	7.3	1247.6	1247.7	0.1
3071.0 (K)	**2178.49**	75	244	5.0	1248.3	1248.4	0.1
-	**2350.68**	76	241	5.1	1249.2	1249.3	0.1
3454.7 (L)	**2564.28**	74	226	5.4	1250.1	1250.2	0.1
-	**2611.46**	73	236	5.2	1250.4	1250.5	0.1
-	**2626.62**	77	206	5.9	1250.4	1250.5	0.1
-	**2642.96**	75	294	4.2	1250.8	1250.9	0.1
-	**2673.75**	68	270	4.5	1250.8	1250.9	0.1
-	**2732.76**	52	209	5.8	1250.9	1251.0	0.1
3722.3 (M)	**2832.34**	49	193	6.3	1251.2	1251.4	0.1
-	**2865.01**	42	191	6.4	1251.4	1251.5	0.1
-	**2927.39**	42	236	5.2	1251.8	1251.9	0.2
-	**3048.78**	42	281	4.4	1252.8	1253.1	0.3
-	**3067.82**	43	275	4.4	1252.8	1253.2	0.3
3956.5 (N)	**3110.56**	43	245	5.0	1252.9	1253.2	0.3
-	**3143.45**	49	262	4.7	1253.0	1253.3	0.3
-	**3341.92**	52	278	4.4	1253.4	1253.7	0.3
-	**3355.18**	49	216	5.7	1253.3	1253.6	0.3
-	**3370.57**	54	284	4.3	1253.7	1253.9	0.3
-	**3639.01**	66	267	4.6	1254.3	1254.6	0.2

EXHIBIT "C"

Notification

This CLOMR lowers BFEs, reduces the extent of the 100-year floodplain, and proposes to narrow the floodway. In order to comply with NFIP and FEMA standards and policy for a proposed floodway revision, the FEMA MT-2 instructing state that the community can either be alerted through a published public announcement or individual letters sent to affected landowners. Examples of the proposed public announcement and notification letter for floodway revision are provided in Appendix D. Following acceptance of the language in these documents one or the other will be used to alert the community of the proposed project.

Compliance with Endangered Species Act

The TCDC has completed environmental permitting that documents that the project does not "take" or harm endangered species and is therefore in compliance with the Endangered Species Act. The relevant ESA compliance documentation, provided by the TCDC, is attached to this submittal.

References

Federal Emergency Management Agency (FEMA). 2011. Flood Insurance Study, Jackson County, Oregon and Incorporated Areas. Flood Insurance Study Number 41029V000A. May 3.

Northwest Hydraulic Consultants (NHC). 2008. Hydraulic Summary, City of Central Point, Jackson County, Oregon. Document prepared for Michael Baker Jr. Corp. July 10.

EXHIBIT "C"

Appendix A. Certified Topographic Floodplain and Floodway Maps

EXHIBIT "C"

Appendix B. Annotated FIRM

EXHIBIT "C"

Appendix C. Completed MT-2 Application Forms

EXHIBIT "C"

Appendix D. NFIP Regulatory Requirements

EXHIBIT "C"

EXHIBIT "D"

GUARANTY

Date: July 3, 2014

OBLIGOR: TWIN CREEKS DEVELOPMENT CO., LLC

GUARANTOR: Noel Moore
John Duke
Bret Moore

CREDITOR: CITY OF CENTRAL POINT, a municipal corporation

OBLIGATIONS GUARANTEED: The payment and performance of all liabilities and obligations owing by Obligor to Creditor pursuant to the Twin Creeks Transit Oriented Development Agreement dated July 3, 2014 ("Agreement") for the extension of Twin Creeks Crossing, including contribution to the costs of a railroad crossing within Twin Creeks TOD Master Plan in the original amount of **Five Hundred Thousand and 00/100 Dollars ($500,000.00)** and the costs for construction of the extension of utilities and the pavement of Twin Creeks Crossing from the current terminus easterly to the railroad right-of-way improvements as identified in the drawings entitled "Griffin Creek Overflow Flood Mitigation Plan" dated March 11, 2013, as identified in Section 2a and 2b of the Agreement.

For a valuable consideration the undersigned Guarantor, and each of them, jointly and severally and unconditionally guarantees and promises to pay, on demand, in lawful money of the United States of America, any and all indebtedness of the above named Obligor to Creditor, and Creditor's successors and assigns, as follows:

1. MAXIMUM LIABILITY: The liability of Guarantor hereunder shall not exceed at any one time the sum of:

(a) The liabilities and obligations guaranteed described above including the principal amount thereof, if any;

(b) An amount equal to all interest owed by Obligor at any time hereafter upon the principal indebtedness of Obligor, or owing with respect to the guaranteed liabilities and obligations; provided, that if such indebtedness shall exceed the dollar amount specified in item (a) above, if any, interest to be included in this item shall

be on such indebtedness not exceeding the amount specified in item (a) as shall be designated by Creditor; and

(c) All costs, expenses and attorneys' fees, including any on appeals, incurred by Creditor in connection with the collection of the indebtedness of Obligor, with the guaranteed liabilities and obligations, or with the repossession, foreclosure and sale of any collateral.

Such limitation on liability shall not be a restriction on the amount of the indebtedness of Obligor to Creditor either in the aggregate or at one time.

2. "INDEBTEDNESS" DEFINED: The word "indebtedness" is used herein in its most comprehensive sense and includes, but is not limited to, any and all advances, debts, obligations, and liabilities of Obligor, or any one or more of them, including judgments against Obligor, heretofore, now, or hereafter made, incurred or created, whether voluntarily or involuntarily and however arising, whether due or not due, absolute or contingent, liquidated or unliquidated, determined or undetermined, and whether Obligor may be liable individually or jointly with others or primarily or secondarily, or as guarantor, and whether recovery upon such indebtedness may be or hereafter may become barred by any statute of limitations, and whether such indebtedness may be or hereafter may become otherwise unenforceable and whether such indebtedness arises from transactions which may be voidable on account of infancy, insanity, ultra vires or otherwise.

3. NATURE OF GUARANTOR'S UNDERTAKING: The liability of Guarantor hereunder shall be open and continuous for as long as this guaranty shall be in force. Guarantor intends to guarantee at all times the performance of all obligations of Obligor to Creditor within the limits set forth above. Thus, no payments made upon Obligor's indebtedness shall be held to discharge or diminish the liability of Guarantor for any and all remaining and succeeding indebtedness of Obligor to Creditor. The liability of Guarantor hereunder shall be enforceable against both the separate and community property of Guarantor existing at the date of execution hereof or hereafter acquired.

4. CREDITOR'S RIGHTS AND OBLIGATIONS IN DEALING WITH OBLIGOR: Guarantor authorizes Creditor to deal with Obligor and Obligor's sureties, endorsers and other guarantors in any manner in which Creditor sees fit in connection with any indebtedness of Obligor to Creditor, now or hereafter created, without any further consent or authorization from Guarantor being necessary. Specifically, but without limiting the powers of Creditor, Creditor may extend the time for payment of any indebtedness of Obligor, Creditor may release or agree not to sue Obligor's sureties, endorsers, or other guarantors on any terms it chooses; Creditor may sue or fail to sue Obligor upon any overdue indebtedness; all of the foregoing without the necessity of any notice to or consent from Guarantor and all without affecting Guarantor's liability hereunder.

5. DURATION OF GUARANTY: This guaranty shall take effect when received by Creditor, without the necessity of any acceptance by Creditor, and shall continue in full force until the obligations guaranteed have been fully paid and/or performed. This guaranty shall bind the estate of Guarantor as to indebtedness created both before and after the death or incapacity of Guarantor.

6. CREDITOR'S RIGHTS AGAINST AND OBLIGATIONS TO GUARANTOR: Guarantor hereby expressly waives presentment, protest, demand, or notice of any kind, including notice of nonpayment of any of Obligor's indebtedness or of any collateral thereto and notice of any action or non-action on the part of Obligor, the Creditor, or any surety, endorser, or other guarantor. Upon any default of Obligor on any obligation to Creditor, Creditor may, at its option, then and there demand and be entitled to payment from Guarantor of the full amount or any part of the amount of Obligor's indebtedness to Creditor, within the limitations set forth above, and if Guarantor shall not pay the sum demanded to Creditor, Creditor may proceed directly and at once against Guarantor to collect such sum without first proceeding against Obligor, or any surety, endorser, or other guarantor and without foreclosing upon or selling or otherwise disposing of any collateral it may have as security for any of Obligor's indebtedness. Failure of Creditor to make such demand at such time or to proceed shall not relieve Guarantor of its obligations hereunder or in any sense constitute a waiver. Creditor shall have the right to demand and collect from Guarantor all or any portion of Obligor's indebtedness and failure of Creditor at any time to demand from Guarantor or to proceed to collect from Guarantor the full amount of Obligor's indebtedness from Guarantor shall not preclude Creditor from later demanding or proceeding to collect from Guarantor any remaining indebtedness of Obligor to Creditor covered by this guaranty. In any action or suit against Guarantor to enforce this guaranty, Creditor shall be entitled to recover from Guarantor, in addition to costs and disbursements allowed by law, a reasonable amount for Creditor's attorneys' fees in such action or suit or appeal therefrom. In any action or suit brought by Creditor against Guarantor, Guarantor will not assert as a defense any statute of limitations if at the time the action or suit is commenced there is outstanding any indebtedness of Obligor to Creditor which is not barred by the statute of limitations of the State of Oregon. If payment is made by Obligor on a debt guaranteed hereby and thereafter the Creditor is forced to remit the amount of that payment to the Obligor's trustee in bankruptcy or similar person under any federal or state bankruptcy law or law for the relief of debtors, the Obligor's debt shall be considered unpaid for the purpose of enforcement of this guaranty.

7. SUBORDINATION OF GUARANTOR'S RIGHTS AGAINST OBLIGOR: Guarantor agrees that the indebtedness of Obligor to Creditor, whether now existing or hereafter created, shall be, and the same hereby is, declared to be prior to any claim that Guarantor may now have or hereafter acquire against Obligor, whether or not Obligor becomes insolvent, and Guarantor shall and does expressly subordinate any such claim Guarantor may have against Obligor, upon any account whatsoever, to any claim that Creditor may now or hereafter have against Obligor. In the event of insolvency and consequent liquidation of the assets of Obligor, through bankruptcy, by an assignment for the benefit of creditors, by voluntary liquidation, or otherwise, the assets of Obligor

applicable to the payment of the claims of both Creditor and Guarantor shall be paid to Creditor and shall be first applied by Creditor to the indebtedness of Obligor to Creditor, Guarantor does hereby assign to Creditor all claims which it may have or acquire against Obligor or any assignee or trustee in bankruptcy of Obligor; provided, that such assignment shall be effective only for the purpose of assuring to Creditor full payment of all indebtedness of Obligor to Creditor.

8. ASSIGNMENT OF GUARANTY: Assignment by Creditor of all or part of the indebtedness shall transfer to the assignee all benefits of this guaranty as to the portion of the indebtedness assigned. This guaranty shall remain in effect in favor of the Creditor as to the portion of the indebtedness not assigned.

9. GOVERNING LAW: This guaranty has been executed and delivered in the State of Oregon and the laws of such state shall govern the validity, construction, enforcement and interpretation of this guaranty.

10. VENUE AND JURISDICTION: If any suit or action is filed by any party to enforce this guaranty or otherwise with respect to the subject matter of this guaranty, exclusive venue and jurisdiction shall be in the state courts in Jackson County, Oregon.

11. REPRESENTATION: This Guaranty has been prepared on behalf of the City of Central Point. Guarantor is hereby advised that it should seek independent legal counsel as to the effect of this Guaranty on their individual rights.

IN WITNESS WHEREOF, Guarantor has executed this Guaranty on the date set forth above.

Noel Moore
Signature

NOEL MOORE
(Print Name Here)

Signature

JOHN DULEY
(Print Name Here)

BRET MOORE

Signature

_____

(Print Name Here) "

"Guarantor"

I, Elaine Frost, do hereby certify that Noel Moore, Bret Moore and John Duke. personally appeared before me This day & acknowledged the due execution of this instrument.

July 17, 2014

Elaine Frost

Oregon
Jackson County

City of Central Point, Oregon
140 S 3rd Street, Central Point, OR 97502
541.664.3321 Fax 541.664.6384
www.centralpointoregon.gov

City of CENTRAL POINT Oregon

Administration Department
Christopher Clayton, City Manager
Deanna Casey, City Recorder

March 4, 2014

Twin Creeks Development Co., LLC
PO Box 3577
Central Point OR 97502

Dear Developer,

Enclosed with this letter are two originals of the Twin Creeks Transit Oriented Development Agreement. The City has kept one of the originals.

We did not record this document with the County, as our City Attorney stated that it does not contain notary statements for the City officials or acknowledgement of the right to record.

If you have any questions please feel free to contact me at 541-423-1026.

Sincerely yours,

Deanna Casey, MMC
City Recorder

RESOLUTION NO. 817

A RESOLUTION OF THE PLANNING COMMISSION APPROVING THE NO-RISE CERTIFICATION FOR A PORTION OF TWIN CREEKS CROSSING PHASES I AND II WITH CONDITIONS OF APPROVAL

(File No: FP 15001)

WHEREAS, the applicant has submitted a No-Rise Certification to construct single family dwellings and independent living cottages in the regulatory floodway on 30 lots in Twin Creeks Crossing Phases I and II on property identified on the Jackson County Assessor's map as 37S 2W 03BD, Tax Lots 1100, 1200, 1400, 1500, 1700, 1800, 1900, 2000, 2300, 2400, 2500, 2600, 2900, 3000, 3200, 3201, 3202, 3203, 3400, 3500, 3600, 3700, 3800, 3900, 4000, & 4100; 37S 2W 03CA Tax Lots 802, 803 & 804; and 37S 2W 03CA Tax Lot 1200 in Central Point, OR 97502.

WHEREAS, the No-Rise Certification was prepared in accordance with FEMA's Guidance for "No-Rise/No-Impact" Certification for Proposed Developments in Regulatory Floodways; and

WHEREAS, the No-Rise Certification confirms that work conducted to-date within the Twin Creeks Development, as well as the newly proposed work within the effective floodway in Twin Creeks Crossing Phases I and II will not increase the base flood elevation or floodway profiles relative to the effective FEMA mapping and is consistent with the CLOMR issued by FEMA in 2014; and

WHEREAS, on April 7, 2015, at a duly noticed public hearing, the City of Central Point Planning Commission considered the Applicant's request for floodplain development approval for the Twin Creeks No Rise Certification (the "Project"); and,

NOW, THEREFORE, BE IT RESOLVED that the City of Central Point Planning Commission by Resolution No. 817 hereby approves the Twin Creeks No-Rise Certification based on the findings and conditions of approval as set forth in Exhibit "A" the Staff Report dated April 7, 2015, including attachments incorporated by reference; and

PASSED by the Planning Commission and signed by me in authentication of its passage this 7th day of April 7, 2015

_____
Planning Commission Chair

ATTEST:

_____
City Representative